

# STARPLUS<sup>®</sup>

*digital systems*

## HYBRID KEY TELEPHONE SYSTEMS

### GENERAL DESCRIPTION, INSTALLATION AND MAINTENANCE MANUAL



COMMUNICATIONS  
SYSTEMS



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### ISSUE CONTROL SHEET

ISSUE	DATE	CHANGE
Issue 1	November, 1991	<p>First Release of Starplus Digital Systems (SPD 1428 &amp; SPD 2856) General Description, Installation and Maintenance Manual</p> <div></div> <p><b>A to Z KELLATRONICS, Inc.</b></p> <p><b>_____ Tel: 800.766.3425</b> <b>email: info@kellatronics.com Fax: 818.773.8899</b></p>

# SECTION 100

## INTRODUCTION

### 100.1 PURPOSE

This manual provides the information necessary to program, install, operate and maintain the Starplus Digital (SPD) Key Telephone System.

### 100.2 REGULATORY INFORMATION (USA)

The Federal Communications Commission (FCC) has established rules which allow the direct connection of the Starplus Digital (SPD) Key Telephone System to the telephone network. Certain actions must be undertaken or understood before the connection of customer provided equipment is completed.

#### A. Telephone Company Notification

Before connecting the Starplus Digital (SPD) Key Telephone System to the telephone network, the local serving telephone company must be given advance notice of intention to use customer provided equipment and provided with the following information:

- The telephone numbers to be connected to the system.
- The Ringer Equivalence Number also located on the KSU: 1.9
- The Universal System Ordering Code (USOC) jack required for direct interconnection with the telephone network: RJ21X

#### SPD 1428 FCC Registration Numbers:

- For systems configured as a key system:  
(button appearances)  
DLPHKG-65152-KF-E
- For systems configured as a Hybrid system:  
(dial access codes)  
DLPHKG-65153-MF-E

#### SPD 2856 FCC Registration Numbers:

- For systems configured as a key system:  
(button appearances)  
DLPHKG-65102-KF-E
- For systems configured as a Hybrid system:  
(dial access codes)  
DLPHKG-65101-MF-E

#### B. Incidence of Harm

If the telephone company determines that the customer provided equipment is faulty and possibly causing harm or interruption to the telephone network, it should be disconnected until repairs can be made. If this is not done, the telephone company may temporarily disconnect service.

#### C. Changes in Service

The local telephone company may make changes in its communications facilities or procedures. If these changes should affect the use of the Starplus Digital (SPD) Key Telephone System or compatibility with the network, the telephone company must give written notice to the user to allow uninterrupted service.

#### D. Maintenance Limitations

Maintenance on the Starplus Digital (SPD) Key Telephone System is to be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs except as specifically noted in this manual. If unauthorized alterations or repairs are made, any remaining warranty may be voided.

#### E. Notice of Compliance

The Starplus Digital (SPD) Key Telephone System complies with rules regarding radiation and radio frequency emissions by Class A computing devices. In accordance with FCC Standard 15 (Subpart J), the following information must be supplied to the end user:

CAUTION
---------

"This equipment generates and uses RF energy and if not installed and used in accordance with the Instruction Manual, may cause interference to Radio Communications. It has been tested and found to comply with the limits for a Class A computing device, pursuant to Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference, when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case

the user, at his own expense, will be required to take whatever measures may be required to correct the interference."

#### F. Hearing Aid Compatibility

All Starplus Digital (SPD) Terminals are Hearing Aid Compatible, as defined in Section 68.316 of Part 68 FCC Rules and Regulations.

#### G. OPX Circuit

The Starplus Digital (SPD) Key Telephone System may be equipped with Single Line Adapters (OPX) modules which provide a 48 volt FCC registered 2500- type single line off-premise extension interface port.

- Each OPX port when used to support an off-premise extension requires an OL13C network circuit.
- An FCC registered interface such as a RJ21X is also required to connect to the public network.

### 100.3 REGULATORY INFORMATION (CANADIAN)

- Department of Communications (DOC)  
Certification Number: 526 2933 A
- Load Number: 100
- Standard Connector: CA11A/CA21A
- Canadian Standards Association (CSA)  
File Number: LR57228-27

#### A. Notice

The Canadian Department of Communications' label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. This Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above condition may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

#### CAUTION

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

#### B. Explanation of Load Number

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the load numbers of all the devices does not exceed 100.

#### C. Maintenance Limitations

Maintenance on the Starplus Digital (SPD) Key Telephone System is to be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs except as specifically noted in this manual. If unauthorized alterations or repairs are made, any remaining warranty may be voided.

#### D. Notice of Compliance

The Starplus Digital (SPD) Key Telephone System complies with Class A or Class B limits of the Canadian Radio Interference Regulations. In accordance with FCC Standard 15 (Subpart J), the following information must be supplied to the end user:

#### CAUTION

"This equipment generates and uses RF energy and if not installed and used in accordance with the Instruction Manual, may cause interference to Radio Communications. It has been tested and found to

comply with the limits for a Class A or Class B computing device, pursuant to Subpart J or Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference, when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.”

#### **E. OPX Circuit**

The Starplus Digital (SPD) Key Telephone System may be equipped with Single Line Adapters (OPX) modules which provide a 48 volt FCC registered 2500- type single line off-premise extension interface port.

- A DOC registered interface such as a CA21A is also required to connect to the public network.

#### **100.4 UL/CSA SAFETY COMPLIANCE**

The Starplus Digital (SPD) Key Telephone System has met all safety requirements and was found to be in compliance with the Underwriters Laboratories (UL) 1459 Second Edition and Canadian Standards Association (CSA) CS-03 Standard. The Starplus Digital (SPD) Key Telephone System is authorized to bear the UL and CSA marks.

## SECTION 200

# KEY STATION FEATURE DESCRIPTIONS

The System and Key Station features of the Starplus Digital (SPD) Key Telephone System are listed and described below in alphabetical order. An abbreviated feature index is provided in Table 200-1.

### 200.1 ACCOUNT CODES

An account code is the last field within Station Message Detail Recording (SMDR), that provides the ability to track specific calls by entering a non-verified, variable length (up to 12 digits) identifier. The use of forced Account Codes is optional, offered on a system wide basis.

### 200.2 ATTENDANT RECALL

When a line has been left on hold for a programmable period of time, the station placing that line on hold will be recalled. If that station fails to answer the recall, the call will be recalled to the attendant(s) for handling. There can be three attendants per system. Transferred, Parked and Camp-on recalls will also recall the Attendant.

### 200.3 AUTOMATIC LINE ACCESS

Each station, key or SLT, may have their phone programmed to access a particular CO Line such as a private line or a line from a Group of CO lines upon going off-hook. This is useful in Centrex or PBX applications when station users have dedicated or individual lines. Outside line dial tone is received just by going off-hook, without the need to dial an access code.

### 200.4 AUTOMATIC NIGHT SERVICE

The system may optionally be programmed to go into and out-of night service automatically. This method does not require the attendant to activate or deactivate night service on a daily basis. The automatic night service is enabled and disabled on a programmable daily schedule including Saturday and Sunday schedules. A time can be set to enable Night Service and to Disable Night Service on a per day basis.

### 200.5 AUTOMATIC PAUSE INSERTION WITH SPEED DIAL

If a flash command is placed into system speed dial numbers, station speed dial numbers, save number redial or last number redial, a pause will automatically be inserted after the flash. A pause will also be automatically inserted after a PBX dialing code has been used.

### 200.6 AUTOMATIC PRIVACY

Privacy is automatically provided on all calls. If one station is conversing, another station cannot intrude on that line. The Automatic Privacy feature can be disabled, allowing another station to join in on existing CO line conversations.

### 200.7 AUTOMATIC SELECTION

The user can select an outside line, intercom station, speed dial button, or dial a feature and automatically place the phone in the dialing mode without pressing the ON/OFF button or lifting the handset.

### 200.8 BACKGROUND MUSIC

Each Digital Terminal user may receive music over their speaker when an optional music source is connected to the system. This feature can be allowed or denied on a system-wide basis by programming.

### 200.9 BATTERY BACK-UP (MEMORY)

A NICAD battery is located on the Central Processing Board (CPB) to protect system memory in case of commercial power outage or the system power being turned off for a period of time. Battery Back-up Memory retains all system features including both system and station speed dial during a power outage.

### 200.10 BUSY LAMP FIELD (BLF)

When a button on a Digital Terminal is assigned as a DSS, it also serves as a Busy Lamp Field to display the status of that telephone.

### 200.11 CALL ANNOUNCE - PRIVACY

Each telephone user can set their intercom signaling switch to receive intercom call announcements without having the calling party hear any conversations in progress.

### 200.12 CALL BACK

A station can initiate a call back request to another busy station. As soon as that station becomes idle, the station that left the call back request is signaled.

### 200.13 CALL FORWARD: STATION

#### A. Call Forward - All Calls

This feature allows a station the ability to have all their calls (internal or external) forwarded immediately to a designated station, a UCD

Table 200-1 Alphabetical Feature Index

FEATURE	AVAILABLE	INTERNAL EQUIPMENT REQUIRED	EXTERNAL EQUIPMENT REQUIRED
Account Code	S	N	Printer
Attendant Recall	S	N	N
Automatic Line Access	S	N	N
Automatic Night Service	S	N	N
Automatic Pause Insertion w/Speed Dial	S	N	N
Automatic Privacy	S	N	N
Automatic Selection	S	N	N
Background Music	S	N	Music Source
Battery Backup (Memory)	S	N	N
Busy Lamp Field (BLF)	S	N	N
Call Announce Privacy	S	N	N
Call Back	S	N	N
Call Forward: Station			
Call Forward - All Calls	S	N	N
Call Forward - Busy	S	N	N
Call Forward - No Answer	S	N	N
Call Forward - Busy/No Answer	S	N	N
Forward to Pilot (UCD, VM, Hunt)	S	N	N
Station Off-Net Forward (via speed dial)	S	N	N
Call Forward: Preset			
Call Forward Preset to Stations	S	N	N
Call Forward Preset to Hunt Groups	S	N	N
Call Forward Preset to Off-Net (via speed dial)	S	N	N
Call Forward Preset to UCD Groups	S	N	N
Call Forward Preset to Voice Mail Groups	S	N	Voice Mail System
Call Forward: CO Lines			
Incoming CO Lines Off-Net (via speed dial)	S	N	N
Calling Station Tone Mode Option	S	N	N
Call Park	S	N	N
Call Pick-up:			
Group Pick-up	S	N	N
Directed Call Pick-up	S	N	N
Call Transfer	S	N	N
Camp-On	S	N	N
Camp-On Recall	S	N	N
Canned Toll Restriction	S	N	N
Centrex Compatability	S	N	N
Centrex/PBX Transfer	S	N	N
Chaining Speed Bins	S	N	N
CO Line Access	S	N	N
CO Line Class of Service	S	N	N

S = Standard Feature; O=Optional: Requires additional hardware; N=No additional hardware required

Table 200-1 Alphabetical Feature Index (Cont'd)

FEATURE	AVAILABLE	INTERNAL EQUIPMENT REQUIRED	EXTERNAL EQUIPMENT REQUIRED
CO Line Control (contact)	S	N	N
CO Line Groups	S	N	N
CO Line Loop Supervision	S	N	N
CO Line Queue	S	N	N
CO Line Incoming Ring Assignment:			
Assigned Per CO Line	S	N	N
CO Ring Detect	S	N	N
Conference:			
Add-on Conference	S	N	N
Multi-Line Conference	S	N	N
Unsupervised Trunk-to-Trunk Conferencing	S	N	N
Conference Enable/Disable	S	N	N
Data Base Printout (dump)	S	N	Printer
Day/Night Class of Service (COS)	S	N	N
Default Button Mapping	S	N	N
Dial Pulse Sending	S	N	N
Dialing Privileges	S	N	N
Direct CO Line Ringing:			
To Stations	S	N	N
To UCD Groups	S	N	N
To Hunt Groups	S	N	N
To Off-Net (via speed dial)	S	N	N
To Voice Mail Groups	S	N	Voice Mail System
Direct Station Selection	S	N	N
Directed Call Pick-up	S	N	N
Direct Inward Station Access (DISA):	O	DTMF Rcvr	N
Programmable Access	S	N	N
CO Line Group Access	S	N	N
Station Access	S	N	N
Do Not Disturb (DND)	S	N	N
One-Time Do Not Disturb	S	N	N
DTMF Sending	S	N	N
Emergency Transfer	O	OPX/PFTU	48V Supply or 12V
End to End Signalling	S	N	N
Exclusive Hold	S	N	N
Executive Override	S	N	N
Executive/Secretary Transfer	S	N	N
External Night Ringing	S	N	Paging Equip
Flash	S	N	N
Flash on Intercom	S	N	N
Flash with Speed Dial	S	N	N

S = Standard Feature; O=Optional: Requires additional hardware; N=No additional hardware required

Table 200-1 Alphabetical Feature Index (Cont'd)

FEATURE	AVAILABLE	INTERNAL EQUIPMENT REQUIRED	EXTERNAL EQUIPMENT REQUIRED
Flexible Attendant(s)	S	N	N
Flexible Button Assignment	S	N	34 Button
Forced Account Codes	S	N	N
Group Call Pick-up	S	N	N
Headset Compatability	S	N	Headset
Headset Mode	S	N	Headset
Hearing Aid Compatible	S	N	N
Hold Preference	S	N	N
Hold Recall	S	N	N
Hot Line/Ring Down	S	N	34 Button
Hunt Groups: (8 x 8)			
Pilot Hunting	S	N	N
Station Hunting	S	N	N
Hunt Group Chaining	S	N	N
Intercom Calling	S	N	N
Intercom Signaling Select	S	N	N
Last Number Redial (LNR)	S	N	N
LCD Interactive Display	S	N	34 Button Display
Least Cost Routing (LCR):			
LCR 3 Digit Tables	S	N	N
LCR 6 Digit Tables	S	N	N
Route List Tables	S	N	N
Insert/Delete Tables	S	N	N
Weekly Time Tables	S	N	N
Daily Start Time Tables	S	N	N
Exception Tables	S	N	N
Default LCR Database	S	N	N
LCR Routing for Toll Information	S	N	N
Loop Button CO Line Access	S	N	N
Loud Bell Control (LBC)	S	N	Gen & Bells
Meet Me Page	S	N	N
Message Waiting	S	N	N
Message Waiting Reminder Tone	S	N	N
Music On Hold	S	N	Music Source
Mute Key	S	N	N
Name in LCD Display	S	N	34 Button Display
Night Service:			
Manual Operation	S	N	N
Automatic Operation	S	N	N
Weekly Night Mode Schedule	S	N	N
Night Class of Service (COS)	S	N	N

S = Standard Feature; O=Optional: Requires additional hardware; N=No additional hardware required

Table 200-1 Alphabetical Feature Index (Cont'd)

FEATURE	AVAILABLE	INTERNAL EQUIPMENT REQUIRED	EXTERNAL EQUIPMENT REQUIRED
Universal Night Answer (UNA)	S	N	N
Night Ringing Assignment	S	N	N
External Night Ringing	S	N	Paging Equip
Off-Hook Preference	S	N	N
Auto Line Access	S	N	N
Auto Feature Access	S	N	Keypad
Hot Line/Ring down	S	N	Keypad
Intercom Access	S	N	Keypad
User Programmable Preference	S	N	Keypad
Off-Hook Signalling	S	N	N
Off-Premise Extensions (OPX)	O	SLA (OPX)	48V Supply
On Hook Dialing	S	N	N
On-Line Programming	S	N	N
Page/Relay Control			
SPD 1428 system	O	N	Relay/Sensor Module
SPD 2856 system	S	N	N
Paging			
External Paging	S	N	Paging Equip
Internal Paging	S	N	N
Paging Access Restriction	S	N	N
Pause Timer	S	N	N
PBX Dialing Codes	S	N	N
Personalized Messages	S	N	N
Personalized Message Code on a Flex Key	S	N	N
Pool Button Operation	S	N	N
Preferred Line Answer	S	N	N
Privacy Release:			
Per Station Option	S	N	N
Per CO Line Option	S	N	N
Private Line	S	N	N
Pulse-To-Tone Switchover	S	N	N
Range Programming	S	N	N
Remote Administration (Database)	S	N	PC Term & Modem
Remote System Monitor and Maintenance	S	N	PC Term & Modem
Save Number Redial (SNR)	S	N	N
Single Line Telephone (SLT) Compatibility	O	SLT/OPX/RG	2500 Type SLT
Station Message Detailed Recording (SMDR)	S	N	Printer
Speakerphone	S	N	N
Station Class of Service	S	N	N
Station Speed Dial	S	N	N

S = Standard Feature; O=Optional: Requires additional hardware; N=No additional hardware required

Table 200-1 Alphabetical Feature Index (Cont'd)

FEATURE	AVAILABLE	INTERNAL EQUIPMENT REQUIRED	EXTERNAL EQUIPMENT REQUIRED
System Capacity:			
up to 14x28 Configuration	S	N	Expansion KSU
up to 28x56 Configuration	S	N	N
System Hold	S	N	N
System Speed Dial	S	N	N
Toll Restriction (Table Driven)			
Transfer Recall	S	N	N
Uniform Call Distribution (UCD): (8 x 8)			
Alternate UCD Group Assignments	S	N	N
Overflow Station Assignment	S	N	N
Incoming CO Direct Ringing	S	N	N
Recorded Announcements (RAN)	O	N	RAN Device
Number of Calls in Queue Display	S	N	N
UCD Auto Wrap-up with Timer	S	N	N
UCD No-Answer Return to Queue Timer	S	N	N
UCD Available/Unavailable Mode	S	N	N
Universal Night Answer (UNA)	S	N	N
Voice Mail Groups: VM (8 x 8)		OPX/48V PS	Voice Mail System
In Band Signaling Integration	O	OPX/48V PS	N
Voice Mail Message Waiting Indication	S	N	N
Voice Mail CO Disconnect Signal Pass thru	S	N	N
Voice Mail Tone Mode Calling Option	S	N	N
Volume Control	S	S	N

S = Standard Feature; O=Optional: Requires additional hardware; N=No additional hardware required

group pilot number, Voice Mail group number, or Hunt group. (See Note)

#### B. Call Forward - Busy

This feature allows a station the ability to have their calls forwarded to a designated station, a UCD group pilot number, Voice Mail group number, or Hunt group when their station is busy. (See Note)

#### C. Call Forward - No Answer

This feature allows a station the ability to have their calls forwarded to a designated station, a UCD group pilot number, Voice Mail group number or Hunt group number when there is no answer at the station. No answer calls forward when the system-wide "no answer timer" expires. (See Note)

#### D. Call Forward - Busy/No Answer

Allows a stations the ability to forward a combination busy/no answer calls to a designated station, a UCD group pilot number, Voice Mail group number, or Hunt group. No answer calls forward when the system-wide "no answer timer" expires. Initial CO ringing, transferred CO ringing and intercom ringing calls can all be forwarded. Calls that ring to an idle station will be call forwarded after expiration of the No Answer ring timer. (See Note)

#### E. Call Forward - Off-Net

Stations will be allowed to forward intercom and transferred CO line calls to an off-net location. This allows a station to reroute calls that would normally be lost. Calls can be forwarded to home or another off-net site. Initially ringing CO calls cannot be forwarded with this feature (see Incoming CO lines Off-Net Forward feature).

*NOTE: Initial Ringing Incoming: calls will forward to groups, (ie: UCD, Voice Mail, Hunt) if the station forwarded is the only station assigned to ring on the CO line.*

### 200.14 CALL FORWARD: PRESET

This feature allows the system data base to be configured so that incoming CO Lines, which are programmed to ring at a particular station, can be forwarded elsewhere in the system predetermined by programming. This feature is active if the station ringing is not answered in a specified time. This is particularly useful in "overflow" applications where a Voice Mail or Auto Attendant may be in use.

A station may have one designated preset forward location defined in the data base.

Preset Call Forward is chainable only to other predetermined preset forward stations specified in the database up to a chain of 5 stations.

Chainable Preset Call Forwarding will force the incoming CO Line to ring at each station preassigned in the database for the Preset Forward Ring Timer specified in the database before forwarding.

Each station in the system may, independently, have incoming CO calls preset forwarded to the following destinations:

#### A. Preset Call Forward - Stations

Each Digital Terminal user may have preset in the database Initial Ringing Incoming to be directed to another station in the system, if the call goes unanswered for a predetermined amount of time.

#### B. Preset Call Forward - Hunt Groups

CO Lines can be preset forwarded to ring into a Hunt Group from any station. A CO line will not preset forward to a busy Hunt group, however each time the preset forward timer expires (for a total of five attempts) the group will be checked for an idle station. If a member of the group is idle the call will then be presented to that member.

#### C. Preset Call Forward - UCD Groups

CO Lines can be preset forwarded to ring into a UCD Group from any station. A CO line will not preset forward to a busy UCD group, however each time the preset forward timer expires (for a total of five attempts) the group will be checked for an idle station. If a member of the group is idle the call will then be presented to that member.

#### D. Preset Call Forward - VM Groups

CO Lines can be preset forwarded to ring into a Voice Mail Group from any station. A CO line will not preset forward to a busy Voice Mail group, however each time the preset forward timer expires (for a total of five attempts) the group will be checked for an idle Voice Mail port. If a VM port is idle the call will then be presented to Voice Mail.

*NOTE: Calls will forward only if they ring nowhere else.*

#### E. Preset Call Forward - Off-Net

CO Lines can be preset forwarded to ring Off-Net via speed dial from any station. After the expiration of the preset forward timer, the system will select an idle CO line and dial the off-net location, then connect the two CO lines.

**200.15 CALLING STATION TONE MODE OPTION**

This feature will provide an easy means for a Calling station to override a desired stations H (handsfree) or P (call announce) intercom switch setting. A dial code has been added that is dialed in front of the extension number to force the tone ringing.

**200.16 CALL PARK**

An outside line can be placed into one of eight (8) parking locations and can be retrieved by any station that has a direct line appearance or an available loop button. Parked calls have their own recall timer and will recall the originating station and if still unanswered, the attendant(s).

**200.17 CALL PICK-UP:****A. Group Pick-up**

Stations can be placed in one or more of four pick-up groups. Stations within a group can pick up tone ringing intercom calls, transferred, incoming, or recalling outside line calls for another station in that group.

**B. Directed Call Pick-up**

A station can pick up an intercom call, transferred, incoming, or recalling outside line call to a specific unattended station. The call must be a tone ringing call.

**200.18 CALL TRANSFER**

An outside CO line can be transferred from one keyset to another. By using the TRANS button, screened (announced) or unscreened transfers can be made. The line being transferred rings on the keyset and provides Exclusive Hold flashing indication to the receiving party's keyset. Any number of attempts can be made to locate someone by calling different keysets without losing the call. If a line is transferred to a busy station, it will receive muted ringing.

**200.19 CAMP-ON**

A station may alert a busy party that an outside line is on hold and waiting for them by using the CAMP-ON button. To camp on a call, press the TRANS button to transfer the call to the desired busy station, then press the CAMP ON button. The busy party will receive a muted ring over the keyset speaker, and a visual flashing CAMP ON LED. By pressing the CAMP ON button, the person called places his existing outside call on hold and is connected to the person placing the Camp On. He can then pick up the call on the appropriate line. Calls cannot be camped on when a station is in DND or in Conference.

**200.20 CAMP-ON RECALL**

When a station does not answer a Camp On, that call will recall the person placing the Camp On, and if unanswered by them, will recall the attendant(s).

**200.21 CANNED TOLL RESTRICTION**

The system provides an easy means of applying the most common form of toll restriction where 1+ and 0+ along with 976, 555, and 411 type of calls are restricted with all local calls and 1-800, 911, 1-911, and 1-611 type of calls are allowed. This canned toll restriction is applied through the use of a single pre-built Class-of-Service and can be assigned to stations using range programming.

**200.22 CENTREX COMPATIBILITY**

The Starplus Digital (SPD) Key Telephone System provides features that are Centrex compatible so that Centrex users can utilize the Starplus Digital (SPD) Key Telephone System to enhance their Centrex capabilities. The system actually simplifies and provides easier access to many Centrex features by offering the following features:

**A. Flex Button Programming**

Flexible button programming allows Centrex users to program complex Centrex dial codes onto a key set button for easy one touch access to Centrex features.

**B. Off-hook Preference**

Both Digital Terminals and Single line telephones may be programmed to have their personal Centrex line accessed automatically just by lifting the handset or pressing the ON/ OFF button. Internal features to the Starplus Digital (SPD) Key Telephone System are still made available to Digital Terminals by accessing intercom before going off-hook.

**C. Private Line appearance**

The Starplus Digital (SPD) Key Telephone System allows for private line assignment on an unlimited bases. Each station may have sole access to a particular outside line if desired and may also be assigned to receive incoming ringing on that line.

**D. Programmable Flash Timer**

CO line flash is a momentary opening on a CO line used for signaling. When using the Starplus Digital (SPD) Key Telephone System in a Centrex environment the CO line flash is to signal the intention to transfer a caller using Centrex transfer. The CO line flash timer is programmable on a per CO line bases to facili-

tate a mixture of Centrex and CO lines within the same system.

#### E. Programming \*, #, and Hook-Flashes into Speed Dial

Many Centrex codes utilize a hook-flash followed by in many cases the digit [\*] and or [#]. The Starplus Digital (SPD) Key Telephone System allows these codes to be programmed as a part of system or station speed dial sequences.

#### 200.23 CENTREX/PBX TRANSFER

When Centrex or PBX lines are connected to the Starplus Digital (SPD) Key Telephone System, users may, by using the Flash button, transfer callers to other Centrex or PBX extensions. Additionally, the Flash command may be included within a Speed Bin and programmed onto a flex button for one button transfer.

#### 200.24 CHAINING SPEED BINS

Speed dial bins may be chained together by simply pressing one speed bin, then another and another as required.

This is helpful for accessing Long Distant carriers or banking services when Account Codes may be required.

#### 200.25 CO LINE ACCESS

Through programming, telephones are allowed or denied access to particular outside lines or line groups.

#### 200.26 CO LINE CLASS OF SERVICE

Each CO Line may be programmed with a Class-of-Service to provide dialing privileges. The Starplus Digital (SPD) Key Telephone System uses an array between CO Line Class-of-Service and Station Class-Of-Service to offer a wide variety of dialing privilege possibilities.

#### 200.27 CO LINE CONTROL (CONTACT)

There are seven control contacts which may be individually programmed as either CO Line Control (to control ancillary equipment) or Loud Bell Control to control a customer provided ringing device to external areas. When programmed as CO Line Control and assigned to a CO line, the corresponding contact will close whenever that CO line is accessed by a station. (One contact for each 4x8 port card)

#### 200.28 CO LINE GROUPS

Outside lines can be placed in one of eight groups if the customer's business requires such grouping. Stations are then individually assigned access to these lines and given the ability to dial on particular lines.

#### 200.29 CO LINE LOOP SUPERVISION

The Starplus Digital (SPD) Key Telephone System can be programmed to monitor CO lines while on-hold or connected to RAN devices or Voice Mail systems or in Trunk-to-Trunk connections for disconnect signal provided by the Telco.

After a disconnect signal is detected, the Starplus Digital (SPD) Key Telephone System will release the CO lines and automatically place them back in service.

#### 200.30 CO LINE QUEUE

When all the outside lines in a group are busy, stations can be placed in queue awaiting a line in the same group to become available. If a station doesn't answer the queue signal within 15 seconds, that station is dropped from the queue.

#### 200.31 CO LINE INCOMING RINGING ASSIGNMENT

Each CO line may be programmed (in data base admin) so that incoming ringing on the specified CO line(s) may be assigned initial ringing to one of the following destinations:

- one or more stations (Keyset or SLT)
- To a UCD, Voice Mail or Hunt Group
- Off-Net (via Speed Dial)

The ring-in will follow Day Ring assignments unless Night Service mode is active, in which case all incoming CO calls will follow Night Ring assignments.

When ringing is assigned to a keyset, a direct line appearance or an idle Loop button must be available to receive the call. Station call forwarding of initial ringing CO call is possible and can be directed to other keysets with an available Loop button or direct appearance.

If the initially ringing CO call cannot ring at the destination assigned, it will ring at the first Attendant station.

*NOTE: You cannot Station Call Forward an initially ringing CO call to UCD, Voice Mail, or Hunt groups if the line is assigned to ring at more than one station.*

#### 200.32 CO RING DETECT

The duration of the ringing signal from the CO or the PBX is matched with ringing detection circuitry in the KSU. The ring detect can range from 200 to 900 msec, programmed in 100 msec increments. This timer helps prevent false ringing.

#### 200.33 CONFERENCE

There are three different types of conferencing:

**A. Add On Conference**

Up to five internal parties can engage in a conference, or four internal parties with a limit of one external party.

**B. Multi-Line Conference**

One internal station can engage in a conference with two outside parties.

**C. Unsupervised Conference**

The conference initiator can exit a conference with two outside parties and leave them in an unsupervised conference. The initiator can re-enter the conference at any time. The Starplus Digital (SPD) Key Telephone System can automatically terminate the call when both parties hang up, when Loop Supervision is provided by the telco and enabled in the data base.

A programmable conference timer will disconnect the unsupervised conference if the initiator does not re-enter.

**200.34 CONFERENCE ENABLE/DISABLE**

This feature will allow the system to be administered on a per station basis for the ability of a station to initiate a conference.

**200.35 DATA BASE PRINTOUT (DUMP)**

Through a system programming command, either portions of or a complete data base dump can be printed using the RS232C connector located on the Starplus Digital (SPD) Key Telephone System Central Processing Board (CPB).

**200.36 DAY/NIGHT CLASS OF SERVICE (COS)**

This feature allows stations that are a certain COS during the day, to be assigned a different COS when the system is put in the night mode. The night COS goes into affect when the system is placed into the night mode, manually or automatically. This prevents the misuse of phones after hours.

**200.37 DEFAULT BUTTON MAPPING**

The Starplus Digital (SPD) Key Telephone System allows for 28 flexible buttons on each Enhanced or Executive Digital Terminals to be flexibly assigned to CO/PBX lines, DSS buttons, Speed Dial or Feature buttons. However the system will power up with a default button mapping as shown in Figure 200-1.

**200.38 DIAL PULSE SENDING**

Each CO interface circuit for outside lines can be programmed to send dial pulse or DTMF signals. Dialing speed and break/make ratios are programmable.

**200.39 DIALING PRIVILEGES**

The system provides a flexible means of providing toll or dialing restriction. Through the assignment of class of service (both station and outside line) many combinations of allow and deny numbers can be set. Both area and office codes can be screened for allow/deny privileges.

**200.40 DIRECT INWARD SYSTEM ACCESS (DISA)**

Allows as many as three simultaneous outside line calls to be programmed to provide direct access to the system and the use of features such as WATS lines, intercom dial tone or the ability to dial out on outgoing trunks without going through the attendant. The duration of a Trunk to Trunk DISA call can be set by the system administrator.

**A. Programmable Access**

A 3-digit security code can be assigned in the system database to restrict unwanted use of the DISA circuits. Each DISA line can be programmed independently for 24 hour DISA use or night DISA use only.

**B. CO Line Group Access**

Incoming DISA callers may access all line groups such as FX or WATS lines or other outgoing services from home or while away from the office.

**C. Station Access**

DISA callers may dial any station directly without going thru the attendant.

If a DISA caller attempts to call a station that is busy or does not answer the system will return ICM dial tone at the end of a programmable timer (Preset Forward Timer). This will allow the DISA caller to try another station without having to dial into the system again.

**D. Trunk-to-Trunk:**

The DISA Trunk-to-Trunk (or Conference) mark on the CO line governs a DISA callers ability to access other outside lines. CO lines must have DISA Trunk-to-Trunk enabled to allow a DISA caller to establish an outgoing trunk-to-trunk connection. This allows for specific CO line access restriction on DISA calls.

**200.41 DIRECT STATION SELECTION**

The user with DSS buttons assigned at their Digital Terminal can call an intercom station by simply pressing the appropriate DSS button. The called station is automatically signaled.

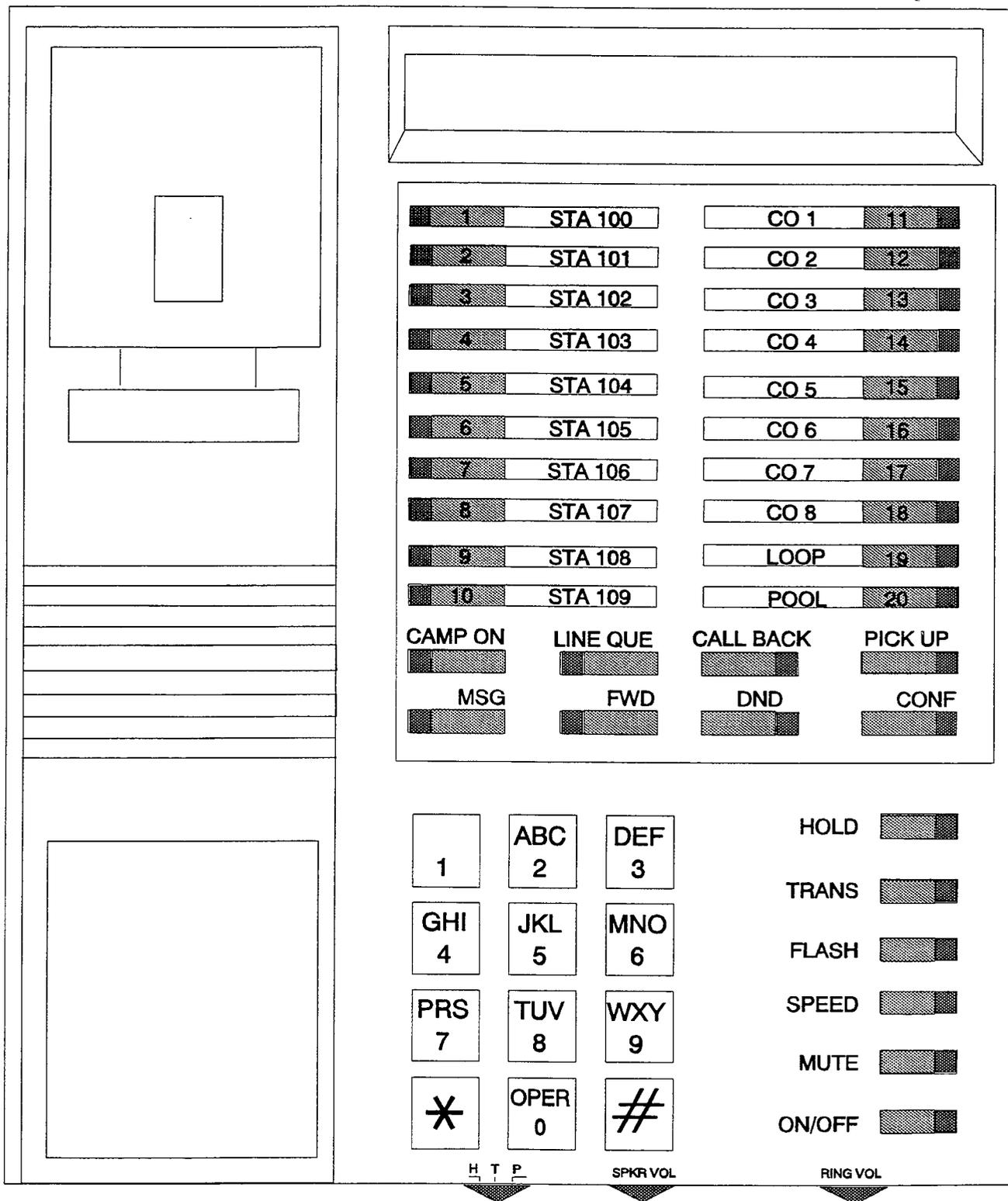


Figure 200-1 Default Button Mapping

**200.42 DIRECTED CALL PICKUP****A. Call Pick-up - Station**

A station can pick up an intercom call, transferred, incoming, or recalling outside line call to a specific unattended station. The call must be a tone ringing call.

**B. Call Pick-up - UCD Groups**

Stations outside of a UCD group can pick up an intercom call, transferred, incoming, or recalling outside line call ringing to a specific UCD station. The call must be a tone ringing call.

**200.43 DISABLE OUTGOING CO LINE ACCESS**

This feature allows the first Attendant station to dial a code and disable a CO line from outgoing CO calls. This applies to all station(s) that have access to that line. Incoming status is not affected. This feature is a part of the "Maintenance" package.

**200.44 DO NOT DISTURB (DND)**

Placing a keyset in DND will eliminate incoming outside line ringing, intercom calls, transfers and paging announcements. A ringing station may go into DND to silence ringing. The attendant can override a station in DND. The station in DND can use the telephone to make normal outgoing calls. A station can be denied this feature through programming.

**A. One-Time Do Not Disturb**

Allows a station user to turn off muted ringing that occurs while off hook (handset or ON/OFF) on another call. Useful when having an important conversation and do not wish to be disturbed by ringing. The station, while off hook, (ON/OFF or handset) depresses the DND button which eliminates muted ringing. When the station goes on-hook the DND button is extinguished and DND is canceled.

**200.45 DTMF SENDING**

Each CO interface circuit for outside lines can be individually programmed to send DTMF (tone) or dial pulse signals.

**200.46 EMERGENCY TRANSFER**

Each OPX box will provide power transfer to specified customer provided SLT's.

**200.47 END TO END SIGNALLING**

This feature indicates the capability of the system to accept DTMF tones from stations, send them through the public network and have them received at the distant end for computer access, or a variety

of control functions or inward call completion at a distant switching system.

**200.48 EXCLUSIVE HOLD**

When a line is placed on Exclusive Hold, no other station in the system can retrieve this call. Hold may be programmed to be activated on the first or second depression of the Hold button. CO Lines while in a transfer hold are always placed in an Exclusive Hold condition.

**200.49 EXECUTIVE OVERRIDE**

This feature allows certain stations to be designated as executive stations with the ability to override and "Barge in" on other keysets engaged in conversation on a CO line. Stations engaged in intercom conversations can be overridden, however, the intercom call will be dropped when the override occurs.

In addition to the station programmable option a system programmable option will enable or disable a warning tone when the station marked as an executive is cut into the conversation. This is useful for UCD agent supervisor or training personnel who require a service observing option.

*NOTE: A decrease in volume may occur on the CO line after the barge-in occurs and each user will receive a conference display message on their keysets.*

**CAUTION: USE OF THIS FEATURE WHEN THE EXECUTIVE OVERRIDE WARNING TONE IS DISABLED MAY BE INTERPRETED AS A VIOLATION OF FEDERAL OR STATE LAWS, AND AN INVASION OF PRIVACY. CONSULT COUNSEL WITH RESPECT TO APPLICABLE LAW BEFORE INTERRUPTING ON CALLS USING THIS FEATURE.**

**200.50 EXECUTIVE/SECRETARY TRANSFER**

There are four sets of Executive/ Secretary pairings available. When the Executive station is busy or in DND, the Secretary station will receive intercom calls and transfers. The Secretary station can signal the Executive in DND by using the Camp On feature.

**200.51 EXTERNAL NIGHT RINGING**

The system can be programmed so that CO lines marked for UNA will provide ringing out the external page ports when the system is placed into Night mode.

**200.52 FLASH**

Provides telephone users with the ability to terminate an outside call or transfer a call behind a PBX or Centrex and restore dial tone without hanging up the handset. A FLASH button is located on each Digital Terminal.

**200.53 FLASH ON INTERCOM**

This feature enables key station users to utilize the Flash Key to terminate pages and intercom calls. While connected to a page zone or another internal station pressing the Flash key will terminate the call and return intercom dial tone.

**200.54 FLASH WITH SPEED DIAL**

A flash can be programmed within a speed dial number. When this is done, a pause will automatically be inserted before the remaining speed dial digits are sent.

**200.55 FLEXIBLE ATTENDANT**

Any three Digital Terminals in the system can be assigned as attendant stations. These stations will receive recalls and can place the system into Night Service. The attendant stations must be either Enhanced or Executive stations.

**200.56 FLEXIBLE BUTTON ASSIGNMENT**

Each Digital Terminal has 28 flexible buttons which can be individually programmed. One of the following seven operations can be selected for each button: Also refer to Sec. 200.22.

- Outside line. Automatically accesses assigned line. (Assigned in database)
- DSS/BLF. Automatically signal assigned station and provides BLF for off-hook and DND. (User programmable)
- Feature. Any feature with a dialing code (ie: Personalized Messages, Paging, Account Code, Call Park, Music, etc.) can be assigned to a flexible button. (User programmable)
- Group Access. (ie: UCD, Hunt, Voice Mail group pilot numbers) (User programmable)
- Speed dial. Automatically dials a Speed number. (System, Station, Saved Number Redial, Last Number Redial) (User programmable)
- Pooled group access. Some or all outside lines can be grouped; pressing this button accesses the highest numbered unused CO line in that group. (Assigned in database)
- Loop. Used to answer a transferred call on a line for which a user does not have a button assigned. (Assigned in database)

**200.57 FORCED ACCOUNT CODES**

The Starplus Digital (SPD) Key Telephone System allows the system to be arranged so that station users must enter an account code before placing an outside call. Account codes can also be used as a Traveling Class-of-Service to upgrade a restricted stations class-of-service for unrestricted dialing. Ac-

count codes must be entered before the call when forced.

**200.58 FORCED LEAST COST ROUTING (LCR)**

The Starplus Digital (SPD) Key Telephone System may be programmed on a per station basis to force the use of LCR for outgoing accessed. This allows the system administrator to maintain greater control over dialing patterns and the lines used for placing outgoing CO calls.

**200.59 GROUP CALL PICK-UP**

Stations can be placed in one or more of four pick-up groups. Stations within a group can pick up tone ringing intercom calls, recalling outside line ringing, or transferred outside line calls for another station in that group.

**200.60 HEADSET COMPATIBILITY**

The electronic Digital Terminals are designed to allow the connection of an industry standard, electret mic compatible, modular headset. The user connects the modular headset to the handset jack on the telephone leaving the handset in place. The ON/OFF button on the Digital Terminal is then used to activate the headset.

**200.61 HEADSET MODE**

Each Electronic Digital Terminal can be individually programmed for headset operation. When programmed, an industry standard Headset with it's adapter box may be connected to a Digital Terminal for headset use. This allows handset or headset operation by switching the selector switch on the adapter box. Speakerphone operation and call announce on intercom are disabled while a station has enabled headset mode.

Once programmed in station programming the user may then select between headset mode or normal handset/speakerphone mode by simply dialing a code or pressing a user programmable flex button.

**200.62 HEARING AID COMPATIBLE**

All Electronic Digital Terminals and Single Line Telephones are hearing aid compatible in compliance with the FCC Part 15, section 68.316. This allows the telephone to be used in conjunction with users wearing hearing aids.

**200.63 HOLD PREFERENCE**

This allows either Exclusive or System hold as the primary hold on the first depression of the HOLD button, depending on programming.

**200.64 HOLD RECALL**

When an outside call has been on Hold for a programmable length of time, recall ringing tone is sent to the station placing the call on Hold. If this station does not answer the recall, a recall tone is sent to the attendant(s).

**200.65 HOT LINE/RING DOWN**

Electronic Digital Terminals may be programmed to immediately call or ring down a particular station or outside number upon going off hook. This is performed by programming the stations Off-Hook preference to activate a DSS or Speed dial feature key.

**200.66 HUNT GROUPS**

The system can be arranged for up to eight (8) Hunt groups. Each Hunt group can contain up to eight stations each. Each Hunt group is independently arranged to utilize either a pilot hunting technique or station hunting technique.

**A. Pilot Hunting**

Incoming CO, transferred CO, and intercom calls can be directed to a pilot extension number of a Hunt group. The system will search sequentially (in the order the extensions were entered in the data base programming) for an idle station in the group and will ring that station. Calls directed directly to stations (by calling the extension number) within the hunt group will not hunt but receive call progress tones of the extension dialed.

**B. Station Hunting**

Incoming CO, transferred CO, and intercom calls that are presented to a busy, or DND station, that is a member of a Station Hunt group, will search sequentially (in the order the extensions were entered in data base programming) for an idle station in the group and will ring that station. Calls can also be directed to the groups pilot number for hunting.

**C. Hunt Group Chaining**

Hunt Groups can be chained or joined together forming larger Hunt Groups. This is accomplished by assigning a pilot hunt group number as the last member of a group.

**200.67 INCOMING CO LINES OFF-NET FORWARD (VIA SPEED DIAL)**

Allows the first attendant to forward incoming CO calls to an off-net location. The attendant can forward a group of CO lines or all CO lines to a off-net location. The attendant must have a direct appearance of the CO line(s) to be forwarded. Off-net

forwarding is accomplished via use of a speed dial bin.

**200.68 INTERCOM CALLING**

The System's architecture allows non-blocking of intercom calls. A station is reached on intercom by dialing the associated three-digit number.

**200.69 INTERCOM SIGNALING SELECT**

Users can control the method by which they receive intercom calls and signals. A convenient intercom signal switch is located on each Digital Terminal for easy selection. The choices are:

- Handsfree (H)(left position). The station user, upon hearing a tone burst and voice announcement over the speaker, can reply handsfree.
- Tone Ringing (T)(center position). A standard tone ring notifies the party of an incoming intercom call. The called party answers by lifting the handset or moving the switch to the handsfree (H) position or pressing the ON/OFF button.
- Privacy (P)(right position). The station user receives a burst of tone and a voice announcement over his/her speaker. The microphone is deactivated for privacy. The called party must lift the handset or press the MUTE button to answer the call.

**200.70 LAST NUMBER REDIAL (LNR)**

Permits the automatic redialing of the last telephone number dialed on an outside line. Up to 32 digits can be stored. Outside line selection of the same line used is automatic.

**200.71 LCD INTERACTIVE DISPLAY**

The 34 button Executive Digital Terminal provides the user with visual indication of call status, Calls to and from other extensions, number dialed, line used and camp-on are some of the features displayed.

**200.72 LEAST COST ROUTING (LCR)**

Allows the system to automatically select the least costly route available according to the number dialed, the time of day/day of week, the class of service (COS) assigned to the station/trunk group priority level assigned.

**A. LCR 3-Digit Table**

This table is divided into 2 sections: "Leading 1" ("1" is dialed before the number) and "Non Leading 1" (no "1" is dialed before the number). This gives the system the ability to handle call routing in areas that require a "1" before a long

distance number as well as in areas that do not require the "1".

#### **B. LCR 6-Digit Table (Office Codes)**

The 6-Digit Table can include 20 office code maps. Each map can be programmed to route up to 800 office codes to one of the 16 possible route lists. Each map must be associated with a specific area code in the 3-Digit Table. Several different office code maps can be used with the same area code to provide additional routing flexibility.

#### **C. Route List Tables**

Up to 16 different routes can be programmed. Each route can contain up to 4 route lists - one for each of the 4 time periods. Up to 7 CO line groups (routing choices) and their corresponding Insert/Delete Tables may be programmed within each route list.

#### **D. Insert/Delete Tables**

There are 20 Insert/Delete Tables. Up to 20 digits, including pauses, can be inserted and up to 16 digits deleted. Digits can be inserted before or after the number dialed, but can be deleted only from the beginning of a number dialed.

#### **E. Weekly Time Tables**

The least costly route for a particular dialed number may be different at different times of the day and on different days of the week. To accommodate this situation, there are 2 Time-of-Day tables - Daily Start Time Table and Weekly Schedule Table.

The Weekly Time table determines which one of the 4 Routes LCR should use based on the Time-of-Day and Day-of-the-Week.

#### **F. Daily Start Time Tables**

The Daily Start Time tables allow the user to match the Time Periods discount structure to the carriers rate schedule.

#### **G. Exception Tables**

This table is used to route operator assisted calls and any other calls which would use a 1- or 2-digit number rather than a 3-digit area code.

#### **H. Default LCR Database**

In an effort to decrease installation and set up time usually associated with LCR a default LCR data base has been incorporated. The default LCR data base will provide basic routing for all local and long distance dialing.

#### **I. LCR Routing for Toll Information**

This feature adds provisions to the LCR call processing which will allow common call routing for all toll information calls.

1-(XXX)555-1212, (XXX)555-1212, 1-555-1212 and 555-1212 calls will all be intercepted and sent to a selected route in the Route List Table. Numbers dialed will be integrated and if it is determined to be a toll information call, either preceded with an area code or without or with a leading digit 1 or not, the call will be sent to the route designated in programming.

#### **200.73 LOOP BUTTON CO LINE ACCESS**

A station not having a direct appearance for a CO line will receive incoming CO calls and transferred CO calls under the loop button. Only one call at a time can be connected to a keyset on the loop button. If more than one loop button is on a key set, the loop buttons may be conferenced together. If all programmed Loop buttons on a keyset are busy or have a CO call on hold, the party attempting to transfer a CO line to that station will receive busy tone and cannot transfer the call to that station. If a transfer is attempted, the CO line will recall the initiator immediately.

CO lines are also presented to a Loop when dialing out using LCR or when using speed dial to dial out and the line chosen does not appear on the key station.

#### **200.74 MEET ME PAGE**

Users may answer a page call from any phone in the system by dialing a special code. The party who initiated the page must remain off-hook.

#### **200.75 MESSAGE WAITING**

Stations that are busy, unattended, or in DND can be left a message indication by other stations in the system. Up to five messages can be left at one keyset. Upon return to the station, the user can press the flashing MSG WAIT button to ring each party in sequential order.

#### **200.76 MESSAGE WAITING REMINDER TONE**

A key station with a message waiting can be reminded at a timed interval with a tone.

#### **200.77 MUSIC ON HOLD**

A music source, when connected to the system, provides music to all lines on Hold, parked calls, transferred calls and calls waiting to be answered by Uniform Call Distribution (UCD).

#### **200.78 MUTE KEY**

Pressing the MUTE button while in the speaker-phone mode or using the handset will disable the

microphone but not affect the speech coming over the speaker or handset. Pressing the illuminated MUTE button again will reactivate the microphone.

#### **200.79 NAME IN LCD DISPLAY**

This feature allows every extension (Key or SLT) the capability to program the users name, for that station, so that people using display telephones will see the name instead of the station number on their display. The name is programmed at each station by the user and may be up to seven (7) letters in length.

#### **200.80 NIGHT SERVICE**

##### **A. Manual Operation**

The Attendant(s) can control the use of Night Mode manually by pressing the NIGHT (DND) button. An LED will indicate when the system is in Night Mode operation.

##### **B. Automatic Night Mode Operation**

The Starplus Digital (SPD) Key Telephone System can be programmed so that the system is automatically placed into night mode. A programmable weekly time schedule allows the system administrator to preset the time the system is placed into night mode and removed from night mode on a daily basis including weekend operation.

The Attendant(s) can override the Automatic Night mode schedule simply by pressing the NIGHT (DND) button.

##### **C. Weekly Night Mode Schedule**

A programmable weekly night mode schedule provides for 24 hour, 7 day a week automatic night mode operation. The system can be put into and out of night mode automatically on a daily basis.

##### **D. Night Class of Service (COS)**

The system allows each station to be assigned a different COS for night operation. The night COS goes into effect when the system is put into night mode manually or via the automatic schedule. Prevents the misuse of phones after hours.

##### **E. Universal Night Answer (UNA)**

Incoming CO lines can be programmed for Universal Night Answer (UNA). Stations which do not have access to a line during the day can answer that line while the System is in the Night Mode by dialing a UNA code.

##### **F. Night Ringing Assignments**

Each CO line may be individually programmed for Night ringing to other stations, to Hunt groups, UCD groups, Voice Mail groups, or off-net via speed dial. When the system is placed into night mode, manually or automatically, ringing will follow the night ringing assignments for each CO line.

##### **G. External Night Ringing**

The system can be programmed so that CO lines marked for UNA will ring on the external page speakers.

#### **200.81 OFF-HOOK PREFERENCE**

##### **A. Auto Line Access**

Each station, key or SLT, may have their phone programmed to access a particular CO Line such as a private line or a line from a Group of CO lines upon going off-hook. This is useful in Centrex or PBX applications when station users have dedicated lines. Outside line dial tone is received just by going off-hook, without the need to dial an access code.

##### **B. Auto Feature Access**

In addition to auto line access Digital Terminals have the ability to have their off-hook preference select a DSS or feature button upon going off-hook or pressing the ON/OFF button.

##### **C. Hot Line/Ring Down**

Electronic Digital Terminals may be programmed to immediately call or ring down a particular station or outside number upon going off hook. This is performed by programming the stations Off-Hook preference to activate a DSS or Speed dial feature key.

##### **D. Intercom Access**

When off-hook preference is enabled, at a key station, that station may still obtain intercom dial tone for accessing internal stations or other system features. This is done either by pressing an intercom button or dialing their own intercom station number prior to going off-hook.

##### **E. User Programmable Preference**

Based on a station programmable option Digital Terminals may be given the ability to enable, disable or change their off-hook preference by dialing a code. This option can be denied in station programming on a per key station basis.

**200.82 OFF-HOOK SIGNALLING**

If a station has been programmed to receive direct outside line ringing and is busy on another call, that station will receive muted ring to indicate another call is ringing in. Additionally CO calls may be "camped-on" to a busy station and receive muted ringing.

**200.83 OFF-PREMISE EXTENSIONS (OPX)**

The Off-Premises Extension Box (OPX) provides 1 FCC registered 2500-type single line interface ports. This enables the use of 1 off-premise 2500 telephone sets. A precise tone plan is provided to OPX stations. A 48 volt power supply is required when installing an OPX Box.

**200.84 ON HOOK DIALING**

The Digital Terminal user can place calls without lifting the handset. If the speakerphone is disabled, the handset must be lifted to converse.

**200.85 ON LINE PROGRAMMING**

Changes to the system data base can be made without interrupting normal system operation. Programming may be performed using a key station terminal connected to the system (Sta 100) or via an external terminal either on-site or remotely.

**200.86 PAGE/RELAY CONTROL**

The SPD 1428 and SPD 2856 systems offer relays that may be individually programmed for: External Page, Loud Bell Control, CO Line Control, Power Failure Transfer, and Recorded Announcement uses. Up to four Relay/Sensor interface modules may be installed on either system. Each relay/sensor interface module contains three (3) independent relays and three (3) sensing input circuits. In addition, each 4x8 CO/Station Interface card of the SPD 2856 system contains a Relay Contact (for up to seven (7) "on-board" relays) that may also be assigned to any of the functions mentioned above.

**200.87 PAGING****A. External Paging**

There are four (4) external paging zones available in the SPD 1428 and seven (7) available in the SPD 2856 systems. External Paging requires a three-digit dialing code. External paging requires an externally provided amplifier and paging system. One (1) make and one (1) break contact are provided with the page zone on the 4x8 CO/Station board. Since no "on-board" relay contacts are available on the SPD 1428 for external paging, the Relay/Sensor Interface module is used for this purpose.

**B. Internal Paging**

There are four internal paging zones available in the Starplus Digital (SPD) Key Telephone Systems. A station can be in any or all zones or in no zone at all. Stations not assigned to a page group can still make page announcements, if allowed in station programming. Stations can be assigned to a page group in order to receive pages but not allowed to make page announcements. Since no "on-board" relay contacts are available on the SPD 1428 for internal paging, the Relay/Sensor Interface module is used for this purpose.

**C. Paging Access Restriction**

Programming on a per-station basis, can deny any station the ability to make any type of page.

**200.88 PAUSE TIMER**

When dialing a speed number, a timed pause between digit sending can be placed in the number. The length of this pause can be programmed in the system database.

**200.89 PBX DIALING CODES**

The System will allow five one or two-digit access codes to be entered into memory. When one of these codes is dialed, this signals the KSU that toll restriction is to be applied at the next dialed digits after the code. If one of these codes is not dialed, toll restriction does not apply. This allows the dialing of PBX extensions 100, 110, 111, etc. This functions on lines marked as PBX type lines in programming.

**200.90 PERSONALIZED MESSAGES**

Each station (Key and SLT) can select a pre-assigned message to be displayed on the LCD of the Digital Terminal calling that station. There are ten possible messages which can be displayed:

- VACATION
- RETURN MORNING
- RETURN AFTERNOON
- RETURN TOMORROW
- RETURN NEXT WEEK
- BUSINESS TRIP
- MEETING
- HOME
- ON BREAK
- LUNCH

**A. Personalized Message Code on a Flex Key**

This feature allows a key station user to program the pre-selected message code [633] under a Flex key. This speeds access of the pre-selected messages.

### 200.91 POOL BUTTON OPERATION

The Pool Group Key is used primarily to access CO lines that do not appear on a station so that outgoing calls may be made. Pooled group keys are associated to CO line groups and may be programmed for use on any of the flexible line buttons. CO lines are accessed in descending order of priority starting with the highest numbered available (not busy) CO line in a CO line group.

Stations may have as many POOL buttons as their are CO line groups (7). Multiple POOL buttons for the same group are also allowed.

### 200.92 PREFERRED LINE ANSWER

A station with Preferred Line Answer can answer any assigned outside, transferred, or recalling line, or queue callbacks by lifting the handset or pressing the ON/OFF button.

### 200.93 PRIVACY RELEASE

Privacy is insured on all communications in the system. If desired, the customer may elect to disable the Automatic Privacy feature. Thus allowing another station to join in on existing CO Line conversations.

#### A. Per Station Option

Each station may be programmed to give the station the capability to join an existing conversation simply by pressing the CO line button that is in use. A warning tone is presented to all parties when the station enters the conversation. The CO line must also have privacy disabled to allow the cut-thru.

#### B. Per CO Line Option

This feature allows each CO line to be individually programmed for privacy. This feature is useful for maintaining security on such lines as Data lines, Private lines, or special circuits requiring privacy. If privacy is disabled on a CO line then, while in use, another station may enter the conversation simply by pressing the CO line button. A warning tone is presented to all parties prior to actual cut-thru. The station attempting to enter the conversation must also have privacy disabled.

### 200.94 PRIVATE LINE

Private line programming allows certain lines to ring at a specific station only. When placed on Hold, these lines are active at the programmed station only. A private line can be transferred to other stations.

### 200.95 PULSE-TO-TONE SWITCHOVER

When commanded, the system will change the signaling on an outside line from dial pulse to DTMF (tone), allowing the use of common carriers behind a dial pulse outside line. This can be done manually when dialing, or can be stored within a speed dial number.

### 200.96 RANGE PROGRAMMING

The Starplus Digital (SPD) Key Telephone System allows for range programming when programming Co lines and Stations. Range programming allows you to program all parameters alike for the entire range or you can change or modify a few items that will be copied to all members in the range.

### 200.97 REMOTE ADMINISTRATION

The Remote Administration feature allows authorized personnel to access the administration programming via a terminal device (portable terminal device or personal computer with communications software package).

The feature permits the review and entry of the customer database in the same manner as via the telephone at "admin" extension 100. The terminal device can be connected directly to the RS232 connector on the CPB board, or can be accessed by a telephone modem linking the CPB's RS232 connector (via a CO line) to a remote location.

### 200.98 REMOTE SYSTEM MONITOR AND MAINTENANCE

#### A. Remote System Monitor

The Remote Monitor feature provides remote access to the installed system for diagnostic purposes. These capabilities benefit Service personnel enabling them to support the end user remotely. Different levels of access, via password, allows authorized personnel to trace, monitor and "up-load" critical information directly from the Starplus Digital (SPD) Key Telephone System. This provides a more accurate means of acquiring system information that leads to a quick resolution of problems that may occur. This is all done without interfering with ongoing call processing or normal system operation, and in many cases may be performed without a site visit.

Capabilities allowed and reserved for this "High level troubleshooting" in addition are:

- Monitor Mode
- Enable & Disable Event "Trace"
- Dump "Trace Buffer" (up-load)

**B. Remote System Maintenance**

The Remote Maintenance feature allows the Interconnects' technical staff to review the systems configuration data and individual card slot configuration data. This can be done "on site" using a data terminal or remotely using modem to modem access to a remote data terminal.

**200.99 SAVE NUMBER REDIAL (SNR)**

Any number dialed on an outside line can be saved permanently to be used at any time. This number is saved until a new number is stored.

**200.100 SINGLE LINE TELEPHONE (SLT) COMPATIBILITY**

The Starplus Digital (SPD) Key Telephone System supports industry standard 2500 Type (DTMF) single line instruments. A maximum of 55 single line telephones may be installed and operate on the SPD 2856 Digital Terminal System. OPX Boxes are required.

**200.101 STATION MESSAGE DETAIL RECORDING (SMDR)**

The Starplus Digital (SPD) Key Telephone System provides one industry standard RS-232C port for dual purpose use and a second port is optional for SMDR output, each allowing connection to an external printer or call accounting device. The system provides details on both incoming and outgoing calls. This feature is programmable to allow all calls or just outgoing long distance calls to be recorded. The system tracks calls by outside line, number dialed, time of day, date, station that placed the call and duration of call. Account codes may also be entered and recorded.

**200.102 SPEAKERPHONE**

Both Enhanced and Executive Digital Terminals are equipped with a speakerphone. However, the speakerphone can be programmed to work in one of three ways:

- Normal speakerphone operation.
- Disabled for outgoing and incoming CO calls but handsfree on intercom allowed.
- Headset operation allowed.

**200.103 STATION CLASS OF SERVICE**

Each station is assigned a Class of Service which governs that stations dialing privileges. Day Class of Service and Night Class of Service assignments to stations provide the system administrator additional control over station dialing, preventing misuse of phones after hours. Six uniquely defined Classes of Service are available for assignment to stations on a per station basis and all six are available for day

and night assignment. Station Class of Service works in conjunction with CO line Class of Service to provide the most flexible means for offering custom toll restriction. As a part of the Dialing privilege assignment through Class of Service the system offers two programmable Allow and Deny tables for additional customization of a toll restriction plan for a particular customer. In addition, each station can reference up to 4 special area code tables.

**200.104 STATION SPEED DIAL**

Each station user can program up to 20 frequently dialed numbers of up to 24 digits in length. Pauses, flash commands, pulse-to-tone switchover, and NO-DISPLAY characters take up digit spaces. There are a total of 1120 speed locations to be divided among all telephones.

Numbers are dialed by use of the SPEED button and a two-digit code. This feature can additionally be assigned to any of the 28 buttons in the flexible button field on each keyset for one-button activation.

**200.105 SYSTEM CAPACITY****A. Up to 14x28 Configuration:**

The SPD 1428 system will support a maximum of 14 outside CO circuits and 28 station circuits.

**B. Up to 28x56 Configuration**

The SPD 2856 system will support a maximum of 28 outside CO circuits and 56 station circuits.

**200.106 SYSTEM HOLD**

When a line is placed on System Hold, any station in the system with access to that line can retrieve the call.

**200.107 SYSTEM SPEED DIAL**

Up to 80 commonly dialed numbers can be programmed into System Speed Dial for use by stations allowed this feature. These numbers can be up to 24 digits including pauses, flash commands, pulse-to-tone switchover, and no-display characters. The last 40 numbers will not be monitored by toll restriction.

**200.108 TOLL RESTRICTION (TABLE DRIVEN)**

The system provides a flexible means of providing toll restriction to internal stations of the Starplus Digital (SPD) Key Telephone System. Each station is assigned a Class of Service for day mode operation and one for night mode operation these station COS's work in conjunction with a CO line Class of service to allow for customized toll restriction. Two (2) Allow and Deny tables along with four (4) special tables afford the system administrator to devise a

variety of complex toll restriction or dialing privilege schemes.

### 200.109 TRANSFER RECALL

Screened and unscreened transfers will recall the initiating party if unanswered for a programmable length of time, and then if unanswered, will recall the attendant.

### 200.110 UNIFORM CALL DISTRIBUTION (UCD)

Eight Uniform Call Distribution (UCD) groups can be programmed, each containing up to eight 3-Digit station numbers. Each group is assigned a pilot number. When this number is dialed, the first available agent in that group is rung. Calls are routed to the station that has been on-hook for the longest period of time.

#### A. Alternate UCD Group Assignments

An alternate UCD group can be programmed so that if stations in one group are busy, the alternate group will be checked for an available station.

#### B. Overflow Station Assignments

An overflow station may be assigned to route callers in queue to a designated station after a specified time. The overflow station may not be one of the UCD group stations.

#### C. Incoming CO Direct Ringing

CO Lines can be programmed to ring directly into a UCD group. When all agents are busy and RAN is enabled, the system will answer the caller and present the 1st RAN announcement automatically.

#### D. Recorded Announcements (RAN)

Recorded announcement devices can be assigned to provide up to two different messages, if all stations in a UCD group are busy. The two messages are available to all eight (8) UCD groups in different configurations. A RAN device can provide an announcement to one caller at a time. Subsequent callers will be queued onto the message on a first-in basis.

#### E. Number of Calls in Queue Display

There are two methods of viewing UCD Group call queue status.

1. In-service UCD agents and the assigned overflow station will see the quantity of calls in queue on the LCD of their station for the UCD group of which they are a member. If every member of a UCD group is busy and calls are in queue, the "XX CALLS IN QUEUE" display will be seen at all UCD members of that group.

*NOTE: If a UCD member is taken out of the group (ie. DND, Call Forward, Unavailable etc.) they will not receive calls in queue information.*

2. Any station not assigned in a UCD group can view the number of calls in queue for any given UCD Group. To view the number of calls in queue the station user dial's the Calls In Queue code (or presses a programmed FLEX button with this code) then enters the UCD group desired. The LCD will display, on a real time basis, the number of calls in queue for that group.

#### F. UCD Auto Wrap-Up w/ Timer

After completion of a UCD call (on-hook) the agent will not be subjected to another UCD call for the duration of the Auto Wrap-Up timer (regardless of the number of calls in queue), allowing the agent to finish call related work or access other facilities. This will allow agents to remove themselves from the group (ie. DND, Unavailable, Call Forward or originate another call). The auto wrap-up timer is programmed as part of the UCD data base. (System-wide)

#### G. UCD No-Answer Timer

If a call routed to a station via UCD is not answered by the UCD Agent/Station before the No-Answer timer expires, the call will be returned to UCD Queue with the highest priority. In addition, the station that failed to answer the ringing UCD call will be placed into an unavailable state.

#### H. UCD Available / Unavailable Mode

Stations programmed into a UCD group may log off and on to their assigned UCD group by dialing an Available/Unavailable code. When an agent is in the Available mode that agent will receive UCD calls in the normal manner. When an agent is in the Unavailable mode that agent will no longer receive UCD type calls, however may receive non-UCD calls. Agents that have logged off by going Unavailable will receive a visual reminder that they are logged off with a flashing LED and or a LCD display message.

### 200.111 UNIVERSAL NIGHT ANSWER (UNA)

Incoming CO lines can be programmed for Universal Night Answer (UNA). Stations which do not have access to a line during the day can answer that line while the System in the Night Mode by dialing a UNA code. In order to utilize this feature, a loop button must be present on the station.

**200.112 VOICE MAIL GROUPS (VM)**

The Voice Mail feature automatically handles unanswered calls. Stations may forward calls to a voice mail group (for leaving mail) or may call the voice mail group directly (to retrieve mail) with no assistance from the attendant. Up to eight (8) voice mail groups can be configured in the system. Each group can contain up to eight voice mail stations, each of which interfaces with a port on an OPX box. Each voice mail "station" can be shared by a number of actual users. An OPX Box and a 48 vdc power supply are required when utilizing the Starplus Digital (SPD) Key Telephone System Voice Mail "In-Band" integration.

**A. VM In-Band Signaling Integration**

The Starplus Digital (SPD) Key Telephone System integrates with a wide range of Voice Mail systems through the use of "In-Band" signaling.

**B. VM Message Waiting Indication**

When Voice Mail has received a voice message for a user who has a station on the Starplus Digital (SPD) Key Telephone System, the VM connected to the system will leave a message waiting indication at the VM users station. When the station user retrieves their mail, the VM system will cancel the message waiting indication left at a station via a VM port.

The message waiting indication will appear on the programmed Voice Mail (group) button. If such a button has not been programmed, a voice mail message waiting indication will appear on the MSG WAIT button as a normal message waiting signal.

**C. VM CO Disconnect Signal - Pass Thru**

To avoid Voice Mail ports from being tied up, as a result of CO line callers abandoning the call or not exiting the VM system properly, a disconnect signal has been provided to notify the VM system that a CO caller has abandon. "Silence" is provided to the VM port followed by "busy tone" to aid the VM system to recognize that an intercom caller has abandoned the call.

Disconnect digits may also be programmed.

**D. VM Tone Mode Calling Option**

Voice mail systems and/or Automated Attendants can utilize the Calling Station Tone Mode option. This is useful when using supervised transfer or call screening options on voice mail or auto attendant(s) requiring ringback tone for proper call handling.

**200.113 VOLUME CONTROLS**

Both speaker and tone ringing volume can be separately adjusted by utilizing the two slide switches on the right side of the keyset.

## SECTION 210

# SINGLE LINE TELEPHONE FEATURE DESCRIPTION

Single Line telephones have access to most of the system and station features listed in the previous section, however, the additional features listed below are unique to Single Line Telephones. (An OPX Box and 48 vdc power supply must be installed in the system for proper SLT operation) An abbreviated feature index is provided in Table 210-1.

### 210.1 ACCOUNT CODE

SLT stations may enter an account code, up to 12 digits in length, to identify calls for billing/tracking purposes. The account code may be entered either before the call or during the call (the outside caller is placed on hold while the account code is entered if during the call.). The account code is recorded on the SMDR printout. Account codes are non-verified and can vary in length from 1 to 12 digits.

### 210.2 AUTOMATIC LINE ACCESS

SLT's may have their station programmed to access a particular CO Line such as a private line or a line from a Group of CO lines upon going off-hook. This is useful in Centrex or PBX applications when station users have dedicated or individual lines. Outside line dial tone is received just by going off-hook, without the need to dial access codes.

### 210.3 CALL FORWARD

Single line telephones may direct intercom calls and transferred CO lines to be forwarded to another station. SLTs have access to all forwarding options that Key station users have:

- Call Forward - All Calls
- Call Forward - No Answer [7]
- Call Forward - Busy [8]
- Call Forward - Busy/No Answer [9]
- Call Forward - Off-Net [\*]
- Preset Call Forward

### 210.4 CAMP ON

A busy station can be notified that an outside line is on hold and waiting for them. The busy station is notified of this by a beep tone. Single line telephones can receive a camp on indication or initiate one by using an access code.

### 210.5 CONFERENCE

An SLT user can initiate a conference with an outside line and one other internal station.

### 210.6 CONFERENCE /WITH PERSONAL PARK

Single Line Telephones (SLT) can initiate a conference between two outside (CO) calls. The Personal Park feature is used in conjunction with the SLT conference code to make this possible. A combination of features are derived from these dial codes (Personal Park, Flip/Flop, and Multi-line Conference).

### 210.7 DIRECT OUTSIDE LINE ACCESS

Single line telephones can access outside lines by dialing CO line group access codes 9 or 81-87.

### 210.8 DIRECT OUTSIDE LINE RINGING

Single line telephones can be set up to receive direct outside line ringing. SLTs may be programmed to receive incoming CO Ringing on more than one CO line. However, an SLT can answer only ONE call at a time. If a SLT is busy when a CO call rings in, camp-on tone will be given to that SLT station.

### 210.9 DIRECTED CALL PICK UP

Tone ringing intercom calls, Initial Ringing CO calls and transferred outside line calls to specific stations can be picked up by single line telephones. For this type of pickup, the stations do not have to be in the same pickup group.

### 210.10 DO NOT DISTURB

Each telephone user can be allowed to place their phone in Do No Disturb. The user will receive error tone if they are not allowed this feature. They will also receive a confidence tone when lifting the handset to remind them they are in Do Not Disturb. The attendant can override a station in DND.

### 210.11 GROUP CALL PICK UP

Tone ringing intercom calls, transferred outside line calls, and initially ringing calls can be picked up by single line telephones by dialing a special pickup code. The telephones must be in the same pickup group.

### 210.12 INTERCOM CALLING

Single line telephones can make and receive intercom calls.

### 210.13 MESSAGE WAITING/CALL BACK

Single Line Telephones calling a station that is busy, idle, or in Do Not Disturb can leave a message waiting indication to signal the station to call back.

Table 210-1 SLT Alphabetical Feature Index

FEATURE	AVAILABLE	INTERNAL EQUIPMENT REQUIRED	EXTERNAL EQUIPMENT REQUIRED
Account Code	S	N	Printer
Automatic Line Access	S	N	N
Call Forward	S	N	N
Camp-On	S	N	N
Conference	S	N	N
Conference with Personal Park	S	N	N
Direct Outside Line Access	S	N	N
Direct Outside Line Ringing	S	N	N
Directed Call Pick-up	S	N	N
Do Not Disturb (DND)	S	N	N
Intercom Calling	S	N	N
Message Waiting/Call Back	S	N	N
Night Service	S	N	N
Off-Hook Preference	S	N	N
Personal Park	S	N	N
Queuing	S	N	N
Station Speed Dial	S	N	N
Transfer	S	N	N

S = Standard Feature; O=Optional: Requires additional hardware; N=No additional hardware required

**210.14 NIGHT SERVICE**

When outside lines are marked UNA and the system is placed into night service, a single line telephone can answer incoming calls on lines it does not normally have access to by dialing [#3]. When External Night Ringing is enabled in database programming, ringing is outputted on the external page ports.

**210.15 OFF-HOOK PREFERENCE**

SLT's may have their station programmed to access a particular CO Line such as a private line or a line from a Group of CO lines upon going off-hook. This is useful in Centrex or PBX applications when station users have dedicated lines. Outside line dial tone is received just by going off-hook, without the need to dial access codes.

**210.16 PERSONAL PARK**

Single line telephones can be connected to two calls (Intercom or CO lines) at the same time and "flip/flop" between the two calls. This can be performed with originated or received calls. This feature is also used with SLT multi-line conference feature.

**210.17 QUEUING**

Single line telephones can be placed in a queue awaiting the first available outside line in a group to become available.

**210.18 STATION SPEED DIAL**

Each SLT user may program up to 20 individual speed dial numbers. Each speed dial number can be up to 24 digits in length.

**210.19 SYSTEM SPEED DIAL**

Each SLT user can be allowed access to system speed dial numbers on a programmable basis. The last forty system speed numbers override toll restriction.

**210.20 TRANSFER**

Outside lines may be transferred by or to single line telephones. These transfers can be either announced or unannounced.

## SECTION 220

# ATTENDANT FEATURE DESCRIPTION

The Attendant and Attendant(s) with DSS/DLS features of the Starplus Digital (SPD) Key Telephone System are listed and described below in alphabetical order. An abbreviated feature index is provided in Table 220-1.

### 220.1 ATTENDANT DISABLE OUTGOING ACCESS

The first attendant can disable CO lines, preventing outgoing access to those lines. This is useful for removing a faulty line from service, or for reserving CO lines for important use. All stations that can normally make calls on the lines are affected, but incoming calls are not affected. A CO line may be disabled while it is being used; when the trunk becomes idle, further outgoing access will be prevented.

### 220.2 ATTENDANT OVERFLOW

System programming allows the attendant station to be programmed so that if the attendant is busy or not there, the call will be automatically forwarded to another predetermined station, VM Group, Hunt Group or UCD group after a programmed period of time. (Refer to Call Forward, Station and Preset)

### 220.3 ATTENDANT OVERRIDE

Attendant stations may override a busy station or ring a station in DND. While busy, pressing the override key provides override tone and a five second delay before voice cut-through to the called party occurs, automatically placing any outside line call on Hold. The Attendant Override function may be programmed on to a flex button and can be enabled or disabled in programming.

### 220.4 ATTENDANT POSITION

The system identifies a maximum of three programmable stations as attendants for line recalls and

attendant features. The first programmed attendant can enter system date and time information as well as System Speed numbers from this position without entering the programming mode. The Starplus Digital (SPD) Key Telephone System is placed in Night Service by any programmed attendant pressing the NIGHT (DND) button or dialing the NIGHT code.

### 220.5 ATTENDANT RECALL

A held CO call left unattended by a station will recall the attendant(s) after a programmable period of time has elapsed. A recalling CO line flashes at a distinctive rate that identifies the originating station of the unanswered call.

### 220.6 AUTOMATIC NIGHT MODE

In addition to the attendants capability to place the system into and out of night mode manually, by pressing the Night key, an automatic night mode schedule has been added to the system. The automatic schedule is set in data base programming on a week day basis, including Saturday and Sunday. The Attendant can override the automatic schedule by pressing the NIGHT (DND) button.

### 220.7 INCOMING CO LINE OFF-NET FORWARD

Allows the first attendant to forward incoming CO calls to an Off-Net location. The attendant must have a direct appearance of the CO line to be forwarded. Forwarding can be established on a per CO line group basis, or all CO lines may be simultaneously forwarded to an off-net location.

### 220.8 TIME AND DATE PROGRAMMING

This feature allows the first programmed attendant to set the time and date without entering the programming mode.

Table 220-1 Attendant(s) Alphabetical Feature Index

FEATURE	AVAILABLE	INTERNAL EQUIPMENT REQUIRED	EXTERNAL EQUIPMENT REQUIRED
Attendant Disable Outgoing Access	S	N	N
Attendant Overflow	S	N	N
Attendant Override	S	N	N
Attendant Position	S	N	N
Attendant Recall	S	N	N
Automatic Night Mode	S	N	N
Incoming CO Lines Off-Net (via speed dial)	S	N	N
Time and Date Programming	S	N	N
<b>ATTENDANT W/DSS/DLS FEATURES:</b>			
Attendant Search	S	N	N
Busy Lamp Field Indicators	S	N	N
Direct Station Calling	S	N	N
Mapping Options	S	N	N
Release	S	N	N

S = Standard Feature; O=Optional: Requires additional hardware; N=No additional hardware required

**ATTENDANT W/DSS/DLS FEATURES**

**220.9 ATTENDANT SEARCH**

Allows a user to make a series of intercom calls without hanging up the handset. An intercom connection is switched to another station whenever a DSS key is pressed. Pressing the next DSS key terminates the previous intercom call.

**220.10 BUSY LAMP FIELD INDICATORS**

Each station key on the DSS console has a corresponding indicator which shows whether the station is idle or busy. The indicator is lit when the station is busy and unlit if the station is idle. A station in DND mode is shown by a flashing indicator.

**220.11 DIRECT STATION CALLING**

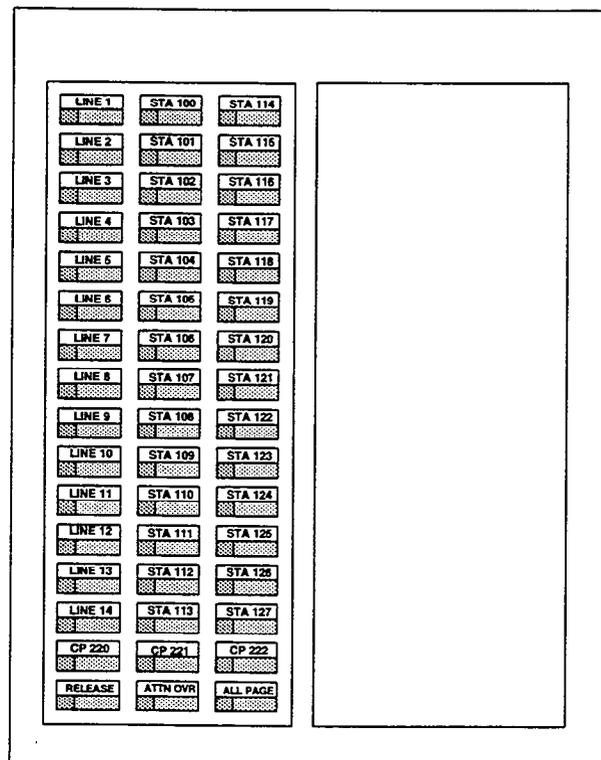
Enables the user to make an intercom voice call to any Digital Terminal in the system. Permits you to automatically put an outside caller on hold and simultaneously make an intercom call to an internal station. Also allows you to transfer an intercom call or outside call that is on hold to another station.

**220.12 MAPPING OPTIONS**

Each Attendant may have up to three (3) DSS/DLS terminals programmed to work with one attendant station. Each DSS terminal can be programmed in one of three ways:

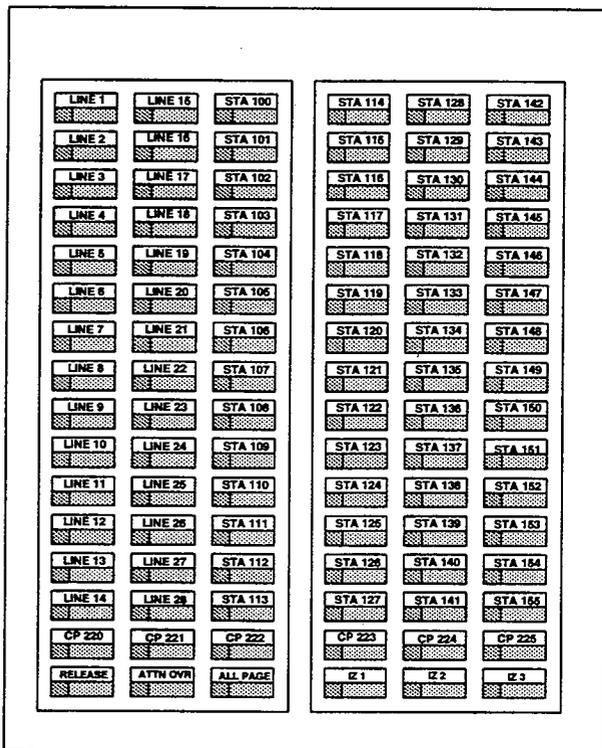
- MAP 1. CO lines 1-14 and Stations 100-127 appear in sequential order with the bottom 6

buttons programmed as the following features: Call Park Zones, Page Zones, Attendant Override, and Release.



DSS/DLS Console Map 1

- MAP 2. CO lines 1-28 and station 100-113 appear in sequential order with 6 button programmed as features on the button.
- MAP 3. Stations 114-157 appear in sequential order with the bottom 6 buttons programmed as features. Provides the receiving station with DSS buttons when used in conjunction with DSS Map 2 for a full 28x56 CO/Station mapping.



**DSS/DLS Console Maps 2 & 3**

CO Line ringing on Map 1,2 is determined by CO Line Ringing Assignments.

**220.13 RELEASE KEY**

Allows the user to disconnect calls while off-hook, speeding up call handling time (MAP 1,3 only).

## SECTION 300

# STATION FEATURE OPERATION

### 300.1 INTRODUCTION

The Starplus Digital (SPD) Key Telephone System has a wide variety of features and flexible programming, allowing each telephone user to program his/her telephone to meet his/her own individual needs.

This section of the manual contains the operating instructions for key telephone and Single Line users and includes an illustration of the key telephone used in the Starplus Digital (SPD) Key Telephone System and description of the keys on the telephones and their functions. It is designed to provide step-by-step instructions for operating the Digital Terminals and Single Line telephones in the system. Visual and audible cues which accompany the various steps in the operation of the features are also include

Literature similar to these operating instructions has been prepared for use by the customer in the form of Station, SLT, and Attendant User's Guides.

### 300.2 KEY TELEPHONE STATION FEATURES

Each Starplus Digital (SPD) Key Telephone System provides the following keys, indicators and features:

**HANDSET AND SPEAKER** are located at the left side of the front panel. A handset is provided to allow confidential conversation when desired. Lifting the handset from its cradle (going off-hook) disengages the station's built-in speaker.

The speaker is located directly below the center portion of the handset. The station may be operated with the handset on-hook. When this occurs, audio is transmitted to the station user through the station's speaker.

**HOLD** button enables you to place an outside caller on hold.

**TRANSFER (TRANS)** button is used to transfer an outside call from one station to another.

**FLASH** button is used to terminate an outside call and restore dial tone without having to hang up the handset. It is also used to transfer calls behind a PBX or Centrex within those systems.

**SPEED** button provides you with access to speed dialing, save number redial and last number redial. This button is also used to access speed dial and flex button programming.

**MUTE** button allows you to switch the built-in microphone on or off when using the speakerphone, or the handset microphone when using the handset. A flex button must be assigned to use this feature.

**ON/OFF** button enables you to make a telephone call without lifting the handset. It turns the telephone on and off when using the speakerphone.

**FLEXIBLE BUTTONS** are used to access idle outside lines, provide DSS/BLF for internal stations, access speed dial number and activate features. These buttons are programmed by the individual station user. The default flex feature buttons are described below:

**CAMP-ON** (flex) button enables you to alert a busy party that an outside line is on hold and waiting for them. A flex button must be assigned to use this feature.

**LINE QUEUE** (flex) button allows you to queue onto an outside line when all lines in a group are busy. Your station is placed in queue awaiting a line in the same group to become available. A flex button must be assigned to use this feature.

**CALL BACK** (flex) button allows you to initiate an automatic call back request to another busy station. As soon as that station becomes idle, the station that left the call back request is signalled. A flex button must be assigned to use this feature.

**PICK UP** (flex) button allows you to pickup a tone ringing intercom call, transferred, incoming, or recalling outside line call to a specific unattended station either by group or directed call pick-up.

**MESSAGE WAIT (MSG WAIT)** (flex) button allows you to initiate a message waiting indication at stations that are busy, unattended, or in Do Not Disturb. Message Waiting Callback request left at your station will be indicated by a flashing Message Wait LED.

**CALL FWD** (flex) button allows you to forward your calls to another station.

**DO NOT DISTURB (DND)** (flex) button allows the user to place his/her telephone into a Do Not Disturb mode to eliminate incoming outside line ringing, intercom calls, transfers and paging announcements. The station in DND can use the telephone to make normal outgoing calls. On Attendant stations, this button becomes the system Night Mode button. A flex button must be assigned to use this feature.

**CONFERENCE (CONF)** (flex) button is used to establish and build conference calls.

**OUTSIDE CALLS** are announced by a tone signal repeated every 3.2 seconds. The corresponding outside line indicator will flash slowly.

**INTERCOM CALLS** can be tone ringing or voice announce. If it is voice announced, the receiving station will receive 2 bursts of tone prior to the announcement. If it is a tone ringing call, the receiving station will hear a tone ring every 2.4 seconds.

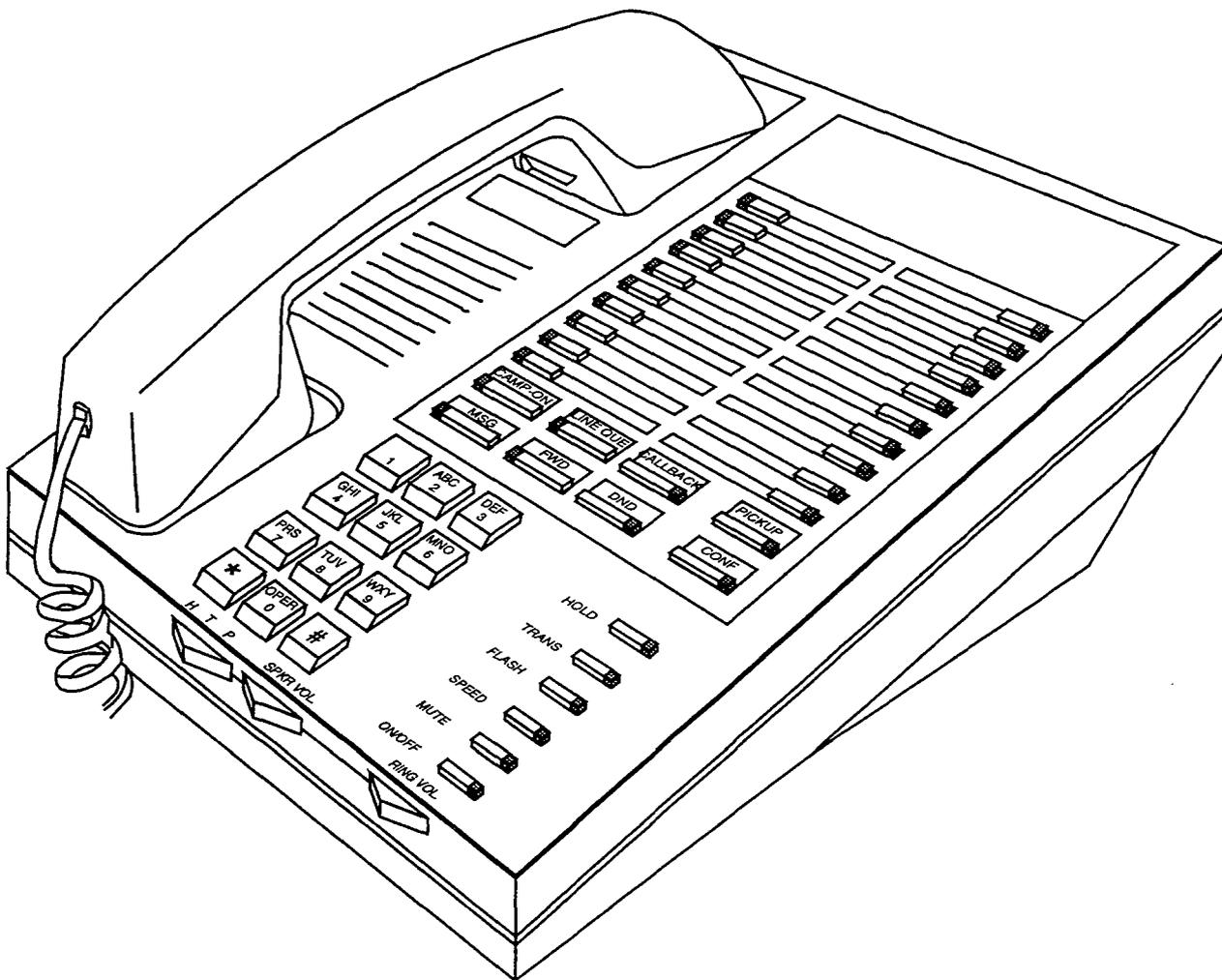


Figure 300-1 34 Button Digital Display Terminal

Table 300-1 Starplus Digital Terminal Numbering Plan

100-127	<b>Station Intercom Numbers (SPD 1428)</b>	72	<b>Internal Page Zone 2</b>
100-155	<b>Station Intercom Numbers (SPD 2856)</b>	73	<b>Internal Page Zone 3</b>
199	Modem via DISA access	74	<b>Internal Page Zone 4</b>
22 [C]	<b>Call Park Location 0-7 (system)</b>	75	<b>Internal All Call Page</b>
228	<b>Personal Park</b>	76 [0]	<b>External All Call Page (All Zones)</b>
33 [H]	<b>Hunt Group Pilot Numbers 0-7</b>	76 [P]	<b>External Page Zones 1-7</b>
44 [V]	<b>Voice Mail Group Pilot Numbers 0-7</b>	77	<b>Meet-Me-Page Answer</b>
420 [XXX]	Voice Mail enable MSG Wait	81	<b>CO Line Group 1 (if LCR is enabled)</b>
421 [XXX]	Voice Mail cancel MSG Wait	82	<b>CO Line Group 2</b>
55 [U]	<b>UCD Group Pilot Numbers 0-7</b>	83	<b>CO Line Group 3</b>
566	<b>UCD Available/Unavailable</b>	84	<b>CO Line Group 4</b>
567 55 [U]	<b>UCD Calls in Queue Display</b>	85	<b>CO Line Group 5</b>
6# [XXX]	<b>Tone Mode Ring Option</b>	86	<b>CO Line Group 6</b>
601	<b>Attendant Override</b>	87	<b>CO Line Group 7</b>
602	<b>Disable Outgoing CO Line Access</b>	88	<b>All CO line Groups (CO Line Off-Net Forward)</b>
603	<b>CO Line Off-Net Forward</b>	9	<b>LCR or CO Line Group 1 (if LCR is disabled)</b>
604	<b>Night Service</b>	0	<b>Attendant</b>
620	<b>Camp-On</b>	#0	<b>Group Call Pick Up (Key &amp; SLT)</b>
621	<b>Line Queue</b>	#1	<b>Directed Call Pick-up (SLT)</b>
622	<b>Call Back</b>	#22 [C]	<b>Call Park Pickup (Key and SLT)</b>
623	<b>Message Wait</b>	#3	<b>Universal Night Answer</b>
624	<b>Conference</b>	[SPD] YY	<b>Speed Dial Access (00-19 Station) (20-99 System)</b>
625	<b>Executive Override</b>	[SPD] *	<b>Save Number Redial</b>
626	<b>LCR Queue Cancel</b>	[SPD] #	<b>Last Number Redial</b>
627	<b>Account Code Enter</b>	** [3226]	<b>Data Base Admin Manager (default [DBAM])</b>
631	<b>Do Not Disturb</b>		
632	<b>Background Music</b>		
633 [ZZ]	<b>Personalized Messages</b>		
633 [00]	<b>Clear Personalized Messages</b>		
634	<b>Headset Mode</b>		
635	ICLID Display - (unanswered calls)		
[FWD]	<b>All Call Forward</b>		
[FWD]+[7]	<b>No Answer - Call Forward</b>		
[FWD]+[8]	<b>Busy - Call Forward</b>		
[FWD]+[9]	<b>Busy/No Answer - Call Forward</b>		
[FWD]+[*]	<b>Off-Net - Call Forward</b>		
690	Name in Display Programming		
691 [BB]	Off-hook Preference Programming		
692	Time & Date Programming (1st programmed Attendant)		
70	<b>All Call Page (Internal &amp; External)</b>		
71	<b>Internal Page Zone 1</b>		

XXX = Intercom Station Numbers

YY = Speed Dial Bin numbers

ZZ = Personalized Messages

BB = Button Number

U = UCD Group Number 0-7

C = Call Park Location 0-7

H = Hunt Group Number 0-7

V = Voice Mail Group Number 0-7

P = External Page Zone Number 1-7

**NOTE: Items shown in BOLD may be programmed onto FLEX Buttons.**

**300.3 ANSWERING AN OUTSIDE CALL**

- a. Lift handset.
- b. Press slow flashing outside line button, or Loop button. (If your telephone is programmed with Preferred Line Answer, you may answer an outside line by lifting the handset.)

**300.4 PLACING AN OUTSIDE CALL ON HOLD**

- a. If your system is programmed for Exclusive Hold Preference, press HOLD button once for Exclusive Hold and twice for System Hold.
- b. If your system is programmed for System Hold Preference, press HOLD button once for System Hold and twice for Exclusive Hold.

**300.5 ANSWERING A RECALL**

When an outside line has remained on hold for an extended period of time, you will be reminded with a recalling ring. (If Preferred Line Answer is enable, skip Step A.)

- a. Press outside line, Loop or Pool button flashing at very fast rate.
- b. Lift handset to converse.

**300.6 ACCOUNT CODES**

When connected to an outside line call:

- a. Press pre-programmed\* ACCOUNT CODE button.
- b. Dial account code up to 12 digits. (The other party will not hear the digits being dialed).
- c. If account code is less than 12 digits, an [\*] must be entered to return to the call.
- d. If account codes are forced the account code must be entered prior to dialing the outside number.

\*Refer to Flexible Button programming

**300.7 DISABLE OUTGOING CO LINE ACCESS**

The First Attendant station can disable CO lines, preventing outgoing CO calls.

- a. Lift handset or press ON/OFF button.
- b. Dial [602]. Confirmation tone is heard
- c. Depress the line button(s) of the CO Line(s) to be disable Confirmation tone is heard and the CO Line Button LED is flashing.

To re-activate the CO Line(s), repeat the steps followed to disable it.

**300.8 PLACING AN OUTSIDE CALL (Automatic Line Selection)**

- a. Press outside line or Pool button. ON/OFF button LED will light and dial tone will be heard.
- b. Dial desired party.
- c. When called party answers, lift handset to converse or use speakerphone.

Station user may also dial the individual trunk group access code to access an outside line.

**300.9 BACKGROUND MUSIC (Optional)**

- a. Dial [632] on the dial pad, or press the pre-programmed\* flexible button. (music is heard)
- b. Dial [632], or press the pre-programmed\* flexible button again, and music is discontinue.
- c. When you pick up the handset or press the ON/OFF button, music is discontinued automatically.

\*Refer to Flexible Button programming

**300.10 AUTOMATIC SELECTION**

Pressing an outside line button, Loop or Pool button; a Speed button; a Station button; or dialing a number in the Starplus Digital (SPD) Key Telephone System Numbering Plan will automatically activate the speakerphone and light the ON/OFF button, if your keyset is programmed as a speakerphone.

**300.11 CALL BACK**

If you dial a telephone that is busy or in DND and want to activate Call Back:

- a. Press the pre-programmed\* CALL BACK button.
- b. Hang up.
- c. When busy station hangs up, you will be signaled.
- d. Answer call; station you called will then be signaled. (If your station is busy when signaled, an automatic MSG will be left at your phone.)

Only one Call Back request can be left at a station; the second request will be converted to a message wait call back request.

\*A flex button must be programmed for this feature to operate. Refer to Flexible Button programming

**300.12 CALL FORWARD: STATION****A. Call Forward - All Calls**

If you have been given the ability to forward your calls:

1. Lift handset or press ON/OFF button.
2. Press the pre-programmed\* FWD button.
3. Press station key or dial intercom number where calls are to be forwarded, including UCD, Voice Mail, and Hunt group pilot numbers.
4. Replace the handset or press the ON/OFF button.

Line Queue, Call back requests, message wait requests, and pre-selected messages are canceled when a station activates call forward. Call back requests are not allowed at a station where a call is forwarded. CO Line calls can be transferred by the receiving station back to the original forwarded station. A station in the call forward mode may still make outgoing calls.

To Remove Call Forwarding:

1. Lift handset or press ON/OFF button.
2. Press the pre-programmed\* FWD button.
3. Hang up.

\*Refer to Flexible Button programming

**B. Call Forward - No Answer**

If you have been given the ability to forward your calls:

1. Lift the handset or press ON/OFF button.
2. Press the pre-programmed\* FWD button.
3. Dial the Call Forward No Answer code [7] on the dial pad.
4. Dial the 3-digit extension number where calls are to be forwarded. Confirmation tone will be heard.

To cancel Call Forwarding:

1. Lift the handset or press the ON/OFF button.
2. Press the pre-programmed\* FWD button.

\*Refer to Flexible Button programming

**C. Call Forward - Busy**

If you have been given the ability to forward your calls:

1. Lift the handset or press ON/OFF button.
2. Press the pre-programmed\* FWD button.
3. Dial the Call Forward Busy code [8] on the dial pad.

4. Dial the 3-digit extension number where calls are to be forwarded. Confirmation tone will be heard.

To cancel Call Forwarding:

1. Lift the handset or press the ON/OFF button.
2. Press the pre-programmed\* FWD button.

\*Refer to Flexible Button programming

**D. Call Forward - Busy/No Answer**

If you have been given the ability to forward your calls:

1. Lift the handset or press ON/OFF button.
2. Press the pre-programmed\* FWD button.
3. Dial the Call Forward Busy/No Answer code [9] on the dial pad.
4. Dial the 3-digit extension number where calls are to be forwarded. Confirmation tone will be heard.

To cancel Call Forwarding:

1. Lift the handset or press the ON/OFF button.
2. Press the pre-programmed\* FWD button.

\*Refer to Flexible Button programming

**E. Call Forward - Off-Net (via speed dial)**

In a speed dial bin, store the number of the off-net location where calls are to be forwarded. Follow instructions provided for storing station or system speed dial numbers.

Allows stations to forward intercom and transferred CO calls to an off-net location.

1. Lift handset or press ON/OFF button.
2. Press the pre-programmed\* FWD button.
3. Dial [\*]. Then dial the speed bin number that contains the number where calls are to be forwarded,

OR

4. Press the pre-programmed button for the speed bin.
5. Confirmation tone is heard. FWD button LED is flashing.

Line Queue, Call back requests, message wait requests, and pre-selected messages are canceled when a station activates call forward. Call back requests are not allowed at a station where a call is forwarded. CO Line calls can be transferred by the receiving station back to the original forwarded station. A station in the call forward mode may still make outgoing calls.

**Canceling Off-Net Forwarding**

1. Lift handset or press ON/OFF button.
2. Press the pre-programmed\* FWD button. CALL FWD button LED is extinguished.

\*Refer to Flexible Button programming

**F. Call Forward - UCD Groups**

If you have been given the ability to forward your calls:

1. Lift the handset or press ON/OFF button.
2. Press the pre-programmed\* FWD button.
3. Dial the desired code:
  - [7] = no answer calls
  - [8] = busy calls
  - [9] = busy and no answer calls.

*NOTE: Skip the preceding step for immediate forwarding.*

4. Dial the 3-digit UCD group pilot number (550-557) for the group (1-8) where calls are to be forwarded. Confirmation tone will be heard.

\*Refer to Flexible Button programming

To cancel Call Forwarding:

1. Lift the handset or press the ON/OFF button.
2. Press the pre-programmed\* FWD button.

\*Refer to Flexible Button programming

**G. Call Forward - Voice Mail Groups**

Intercom and Transferred CO callers may be routed directly to your mail box by forwarding your phone to a voice mail group. Callers will then be greeted by your personal voice mail greeting if available.

If you have been given the ability to forward your calls:

1. Lift the handset or press ON/OFF button.
2. Press the pre-programmed\* FWD button.
3. Dial the desired code:
  - [7] = no answer calls
  - [8] = busy calls
  - [9] = busy and no answer calls.

*NOTE: Skip the preceding step for immediate forwarding.*

4. Dial the 3-digit Voice Mail group pilot number (440-447) for the group (1-8) where calls are to be forwarded. Confirmation tone will be heard.

To cancel Call Forwarding:

1. Lift the handset or press the ON/OFF button.
2. Press the pre-programmed\* FWD button.

\*Refer to Flexible Button programming

**H. Call Forward - Hunt Groups**

If you have been given the ability to forward your calls:

1. Lift the handset or press ON/OFF button.
2. Press the pre-programmed\* FWD button.
3. Dial the desired code:
  - [7] = no answer calls
  - [8] = busy calls
  - [9] = busy and no answer calls.

*NOTE: Skip the preceding step for immediate forwarding.*

4. Dial the 3-digit Hunt group pilot number (330-337) for the group (1-8) where calls are to be forwarded. Confirmation tone will be heard.

To cancel Call Forwarding:

1. Lift the handset or press the ON/OFF button.
2. Press the pre-programmed\* FWD button.

\*Refer to Flexible Button programming

**300.13 CALL FORWARD: PRESET**

If a CO Line forwarded by Preset Call Forward encounters a manually forwarded station (Call Forward - Station), or a station in DND, then the incoming CO Line will bypass that station and forward to the next in the chain. If that station is the last in the chain, then the call will not forward any further and will continue to ring at the previous station until answered or terminate.

**300.14 CALL FORWARD: CO LINES****A. Incoming CO Lines Off-Net (via speed dial)**

Allows the first attendant station to forward incoming CO calls to an off-net location.

In a speed dial bin, store the number of the off-net location where calls are to be forwarded. Follow instructions provided for storing station or system speed dial numbers.

- a. Dial [603] on the dial pad.
- b. Dial the CO group access code for the CO Line group to be forwarded or press an individual CO Line button.

81=CO Group 1  
 82=CO Group 2  
 83=CO Group 3  
 84=CO Group 4  
 85=CO Group 5  
 86=CO Group 6  
 87=CO Group 7  
 88=All CO Line

- c. Dial the speed bin number that contains the number where calls are to be forwarded or

press the programmed button for the speed bin.  
Confirmation tone is heard.

#### Canceling Off-Net Forwarding

- a. Dial [603] on the dial pad.
- b. Dial the CO group access code or press an individual CO Line button.
- c. Dial [#]. Confirmation tone is heard.

### 300.15 CALLING STATION TONE MODE OPTION

Allows a calling station to override a called stations H or P intercom switch settings.

When placing a call to a station and Tone ringing is desired:

- a. Dial [6#] on the dial pad.
- b. Dial the 3-digit station extension or press DSS button of desired station. (call tone rings station).

### 300.16 CALL PARK

To place an outside call on hold and consult with, page, or call an internal party and/or transfer the outside call.

While connected to an outside line:

- a. Press TRANS button. The caller is put on Exclusive hold.
- b. Dial parking location (220 to 227). Hear confirmation tone.
- c. If you hear busy tone, press TRANS and dial another parking location.

#### Retrieving a Parked Call

- a. Lift handset or press ON/OFF button.
- b. Press the pound [#] button.
- c. Dial parking location (220 to 227) where the call was parked.

### 300.17 CALL PICK-UP: GROUP

When intercom tone ringing, transferred outside line ringing, recall ringing or initially ringing call is heard at an unattended telephone:

- a. Lift the handset  
OR  
Press the ON/OFF button.
- b. Dial [#0] on the dial pad or press the pre-programmed\* PICK UP button to be connected to the calling party.

*NOTE: You must be in the same pick up group as the ringing telephone to pick up the call.*

\*Refer to Flexible Button programming

### 300.18 CALL TRANSFER

Outside lines can be transferred from one phone to another within the system. The transfer can be either screened (announced) or unscreened to either an idle or busy station, or UCD or Hunt Group.

#### Screened Transfer

- a. While connected to an outside line, press station button where call is to be transferred (if programmed on your telephone), or press TRANS button and dial station number (100 to 155).
- b. The called extension signals according to the intercom signal switch position.
- c. When that extension answers, announce the transfer.
- d. Hang up to complete transfer.

#### Unscreened Transfer

When the called extension begins to signal, hang up to transfer the call (Recall timer starts).

#### Transfer Search

- a. When attempting to locate a party, press a station key to signal a station or press the TRANS button and dial station desired.
- b. If the party is not located, press another station key to continue the search, or press the TRANS button and dial the station number.
- c. If the party is not located, press the TRANS button again and dial another station number to continue the search.
- d. When the called party answers, hang up to complete the transfer.

#### Answering a Screened Transfer

- a. Your intercom will be signaling according to the intercom signal switch position.
- b. Answer the intercom and receive the transfer notice.
- c. Press the outside line button or loop button flashing on hold.

### 300.19 TRANSFERRING CO CALLS TO A STATION FORWARDED TO VM

While connected to a CO line:

- a. Press the TRANS button and dial the extension number of the station forwarded to voice mail.
- b. The transferring station hangs up. The CO call will be directed to the mailbox of the forwarded station.

*NOTE: If the transferring station attempts to supervise the transfer or just waits until the voice mail system answers, then it becomes necessary to re-access the CO line and re-transfer them and go on-hook before the voice mail system answers. This will ensure that the CO party will hear the personal*

*greeting of the mailbox user and any applicable instructions.*

### 300.20 CAMP-ON

If you call a station that is busy and wish to alert them to your call:

- a. Press the pre-programmed\* CAMP ON button.
- b. Called station will receive two bursts of ringing.
- c. Wait for their response
- d. When called party answers, consult with them or hang up to transfer the call.

If a station is in DND, only the attendant can Camp On using the attendant override feature.

\*A flex button must be programmed for this feature to operate. Refer to Flexible Button programming

#### Answering a Camp On

If you are on a connected call, hear two bursts of muted ringing, and your CAMP ON button is flashing, you have a call waiting for you.

To answer:

- a. Press the CAMP ON button.
- b. Any outside line you are connected to will be placed on hold. You may converse with the station placing the call.
- c. Press flashing outside line button, if a call is being transferred.

If you do not have a pre-programmed\* Camp-On button either:

- a. Go on-hook with present call. Camp-On will ring through, or
- b. Place present call on hold. Then go on-hook. Camp-On will ring through.

\*Refer to Flexible Button programming

### 300.21 CO LINE ACCESS

To access outside line:

- a. Press idle CO line button, Pool button, or dial CO line group access code or LCR access code.
- b. Dial number desired for outside call.
- c. Lift handset to converse or use speakerphone.

### 300.22 QUEUING

A station can queue only one line at a time. If you see that a particular outside line is busy and you wish to be placed on a list waiting for that line to become available:

To Place a Queue

- a. Press desired busy outside line button or pool button. (Busy tone is heard)

- b. Press pre-programmed\* LINE QUEUE button.
- c. Hang up.

To Answer a Queue

If you hear ringing and an outside line of the line group (or a Loop or Group Key), you queued onto is rapidly flashing:

- a. Lift handset.
- b. Press flashing outside line button to answer.

If your station has been programmed for Preferred Line Answer, you will have the line automatically upon lifting the handset.

\*A flex button must be programmed for this feature to operate. Refer to Flexible Button programming

### 300.23 CONFERENCE COMBINATIONS

Only stations that have conference enabled will be able to institute a conference.

- Add-on Conference: Four internal and one external or five party internal
- Multi-Line Conference: One internal and two external.

Establishing a Conference

A maximum of five parties can be included in a conference. The internal party must lift the handset.

- a. Lift handset.
- b. Select intercom station or dial desired outside party.
- c. When called party answers, press the pre-programmed\* CONF button.
- d. Add next conference party by selecting another outside line or intercom station.
- e. When party answers, press the pre-programmed\* CONF button twice.
- f. All parties are connected.

Exiting a Conference (Controller only)

There are three methods of exiting a conference:

1. Press the ON/OFF button to ON, press the MUTE button, and replace the handset (to monitor a conference).

Use the following method only if multi-line conference is in progress:

2. Press HOLD button to place outside parties on hold. Hold timer starts. If one of the two parties is internal, that party will be dropped.
3. Press the pre-programmed\* CONF and hang up or press the ON/OFF button to leave the other conference parties still connected in an unsupervised conference. CONF button will flash and timer will start. There will be a warning tone before the other parties are dropped.

**Re-entering a Conference**

When the controller re-enters the conference, the disconnect timer is reset.

- a. Lift handset to re-enter a monitored conference.
- b. To re-enter a conference placed on hold, repeat steps for establishing a conference.
- c. To re-enter an unsupervised conference, lift handset and press flashing pre-programmed\* CONF button. The CONF button lights steady and confirmation tone will be heard.

**Terminating a Conference**

To terminate a conference the conference initiator who is actively in the conference replaces handset or push ON/OFF button to OFF. To terminate an unsupervised conference, press the flashing pre-programmed\* CONF button while on hook, all parties will be dropped.

\*Refer to Flexible Button programming

**300.24 DIRECTED CALL PICK-UP**

When incoming, transferred, or recalling outside line ringing, intercom ringing, or Camp On ringing is heard at an unattended telephone:

- a. Dial the station number of the known ringing telephone.
- b. Receive ringback tone, or call announce tone.
- c. Press the pre-programmed\* PICK UP button to answer the call.

User must have access to the specific outside line or a Loop key to do a directed call pickup.

\* A flex button must be programmed for this feature to operate. Refer to Flexible Button programming

**300.25 DIRECT INWARD SYSTEM ACCESS (DISA)**

- a. Call the phone number the system administrator specified as the DISA line.
- b. The system answers and returns intercom dial tone.
- c. Enter the DISA access code also specified by the system administrator, if applicable.
- d. Dial tone is returned.

To place an outgoing call:

- a. Dial a group access code: 9, 81 - 87.
- b. CO Dial tone is returned.
- c. Dial the desired telephone number.

*NOTE: LCR cannot be accessed from DISA. If LCR is enabled, DISA users may dial 81 to access lines in trunk group 1.*

*NOTE: The conference timer (Refer to Sec. 610.1) will monitor a DISA "trunk-to-trunk" call and release the lines one (1) minute after the time expires.*

To reach an internal station:

- a. Dial the 3-digit station number. Ringback tone will be heard.
- b. Converse when party answers.

*NOTE: If the station dialed is unattended, busy or in DND, intercom dial tone will be returned. (after the Preset Call Forward Timer expires) Refer to Sec. 610.1.*

**300.26 DO NOT DISTURB**

Activating Do Not Disturb:

- a. If you have been given the ability to place your phone in Do Not Disturb, press the pre-programmed\* DND button.
- b. DND button lights steady.

The DND button can be pressed while the phone is ringing to stop the ringing. (Refer to One-Time Do Not Disturb below.)

Removing Do Not Disturb

- a. Press the pre-programmed\* DND button.
- b. The button LED extinguishes and DND is canceled. A flex button must be programmed for this feature to operate.

\*Refer to Flexible Button programming

**A. One-Time Do Not Disturb**

Allows you to prevent calls from ringing at your station while you're on a call. The One-Time DND condition will automatically cancel when you end your call.

- a. Press the pre-programmed\* DND button while you're off-hook and connected to a CO line or intercom call. The DND button LED lights and off-hook tones at your station are canceled.

To cancel:

- a. Replace handset. The DND button LED extinguishes and DND is canceled.

\*A flex button must be programmed for this feature to operate. Refer to Flexible Button programming

**300.27 EXCLUSIVE HOLD**

When a line is placed on Exclusive Hold, no other station in the system can retrieve this call. Exclusive Hold may be programmed to be activated on the first or second depression of the Hold button. CO Lines while in a transfer hold are always placed in an Exclusive Hold condition.

**300.28 EXECUTIVE OVERRIDE**

Allows stations designated as "Executive" the ability to override and "barge in" on other keysets engaged in conversation.

If you call a busy station:

- a. Press the pre-programmed\* EXECUTIVE OVERRIDE button. Executive station will be bridged onto the CO line conversation in progress at the called station. Optional warning tone is heard and presented to all parties prior to cut-thru.
- b. Replace handset at Executive station to terminate the override.

\*Refer to Flexible Button Programming

*NOTE: If the busy party is connected via intercom to another party, the intercom connection will be dropped when the override occurs.*

CAUTION: USE OF THIS FEATURE WHEN THE EXECUTIVE OVERRIDE WARNING TONE IS DISABLED MAY BE INTERPRETED AS A VIOLATION OF FEDERAL OR STATE LAWS, AND AN INVASION OF PRIVACY. CONSULT COUNSEL WITH RESPECT TO APPLICABLE LAWS BEFORE INTRUDING ON CALLS USING THIS FEATURE.

*NOTE: A decrease in volume may occur on the CO line after the barge-in occurs.*

**300.29 EXECUTIVE/SECRETARY TRANSFER**

If you are designated the Executive station and your phone is busy or in DND, all calls will be routed to the Secretary station.

If you are the designated Secretary station, you can signal the Executive that is busy or in DND by using the Camp On feature.

**300.30 FLASH**

When connected to an outside line:

- a. Press FLASH button to disconnect outside line and re-seize outside line dial tone.

**300.31 FLASH ON INTERCOM**

When connected to a page zone or another internal party, press FLASH button to disconnect page or intercom call. Intercom dial tone will be heard.

**300.32 FLEXIBLE BUTTON ASSIGNMENT**

If you have buttons on your telephone which have NOT been assigned as CO lines, Pooled group, or

**Table 300-2 Flex Button Programming Codes**

100-155	Station Intercom Numbers	640	All Call Forward
22 [C]	Call Park Location 1-7 (system)	70	All Call Page (Internal & External)
228	Personal Park	71	Internal Page Zone 1
33 [H]	Hunt Group Pilot Numbers 0-7	72	Internal Page Zone 2
44 [V]	Voice Mail Group Pilot Numbers 0-7	73	Internal Page Zone 3
55 [U]	UCD Group Pilot Numbers 0-7	74	Internal Page Zone 4
566	UCD Available/Unavailable	75	Internal All Call Page
567	UCD Calls in Queue Display	76 [0]	External All Call Page(All Ext Zones)
601	Attendant Override	76 [P]	External Page 1-7
602	Disable Outgoing CO Line Access	77	Meet-Me-Page Answer
603	CO Line Off-Net Forward	#0	Group Call Pick Up
620	Camp-On	#3	Universal Night Answer (UNA)
621	Line Queue	[SPD] YY	Speed Dial Access (00-19 Station) (20-99 System)
622	Call Back	[SPD] *	Save Number Redial
623	Message Wait	[SPD] #	Last Number Redial
624	Conference		
625	Executive Override		
627	Account Code Enter		
631	Do Not Disturb		
632	Background Music		
633 [ZZ]	Personalized Messages		
633 00	Clear Personalized Messages		
634	Headset Mode		

*YY = Speed Dial Bin numbers,  
ZZ = Personalized Messages,  
U = UCD Group Number 0-7,  
C = Call Park Location 0-7  
H = Hunt Group Number 0-7,  
V = Voice Mail Group Number 0-7  
P = External Page Zone Number 1-7*

Loop buttons, you may program them to suit your own individual needs. There are five possible functions you may assign to these buttons:

**DSS/BLF:** This button, when pressed, will automatically signal the assigned intercom station. DSS/BLF buttons are programmed by the station user.

- **FEATURES:** This button can be programmed so that when pressed it will activate a particular feature, thus eliminating the need for dialing the feature code. Some features require a flex button to be programmed for that feature to be accessible to the station user. Where this is the case it is so designated in this Feature Operation Section and user guide. Feature buttons are programmed by the station user. Refer to Table 300-2 for a complete listing of code/features that may be programmed onto a flexible button.
- **SPEED DIAL:** This button can be programmed to automatically access a speed number location for one-step operation. PBX and Centrex codes can be programmed into a speed dial bin and accessed by one button depression.
- **POOLED GROUP ACCESS:** A group of outside lines can be placed under one button. When this button is pressed, the system will select an available line from this group for the user to place a call on. Pool buttons are assigned in data base administration.
- **LOOP:** This button will act as the direct appearing button for outside lines that do not appear on the user's individual telephone. Any phone that doesn't have all lines appear on it must have a loop key. There is NO limit to the number of LOOP buttons a station may have. Loop buttons are assigned in data base administration.

To program flexible buttons:

- a. Press SPEED button twice.
- b. Press the assigned button to be programmed (it must be programmed in data base as a multi-function button).
- c. Dial desired code (Refer to Button Programming Codes).

To erase a flexible button:

- a. Press SPEED button twice.
- b. Press the button to be erase
- c. Press FLASH button.
- d. Replace handset or press ON/OFF button.

### 300.33 HEADSET MODE

If you wish to use a headset and have been given the ability to do so in programming.

To activate Headset Mode:

- a. Dial [634] on the dial pad or press pre-programmed\* HEADSET MODE button.
- b. LED will light steady.

While Headset mode is active, the ON/OFF button will activate the headset and disable speakerphone and intercom call announce operation at your station.

To de-activate Headset Mode:

- a. Dial [634] on the dial pad or press the pre-programmed\* HEADSET MODE button.
- b. LED will extinguish.

\*Refer to Flexible Button programming

### 300.34 INTERCOM CALLING

Placing an Intercom Call

- a. Press station key of party to be called (if programmed at your phone); or dial station number (100 to 155).

*NOTE: Dialing a number in the numbering plan activates the telephone automatically.*

- b. You will hear ringing if called station is in the "T" answering mode; or two bursts of tone if called station is in the "H" or "P" position.
- c. Lift handset or use speakerphone, after the two tone bursts stop.
- d. Hang up to end call.

Answering an Intercom Call

With your intercom signal switch in the T (center) mode, you will hear repeated bursts of intercom tone ringing and the HOLD button will slow flash.

- a. Lift handset or press ON/OFF button to answer, or move the intercom signal switch to the "H" mode to reply.
- b. Hang up to end call.

In the "P" mode, you will hear two bursts of tone and one-way announcement. The HOLD button will slow flash and the calling party cannot hear conversations in progress.

- a. Lift handset or press ON/OFF button to answer, or move the intercom signal switch to the "H" mode to reply.

In the "H" mode, you will hear two bursts of tone and an announcement. Reply handsfree or lift handset for privacy.

**300.35 INTERCOM TRANSFER**

Intercom transfer without DSS buttons:

- a. Receive or make an intercom call.
- b. Press the TRANS button. Intercom dial tone is heard.
- c. Dial the station where the call is to be transferred.
- d. When 2nd station answers, you are in a supervised transfer mode (1st station is staged for transfer).
- e. Hang up (station 1 and 2 are connected).

Intercom transfer using DSS buttons:

- a. Receive or make an intercom call using a DSS button.
- b. Press the TRANS button. Intercom dial tone is heard.
- c. Press DSS button where call is to be transferred.
- d. Hang up (station 1 and 2 are connected).

**300.36 LAST NUMBER REDIAL**

- a. Press SPEED button.
- b. Press pound [#] key.
- c. The last number dialed over an outside line will be automatically re-dialed.
  - The system will automatically select the original line used to place the call and redial the number.
  - If that line is busy, the system will automatically select another line from the same group and redial the number.
  - If no lines are available in the same group, station will receive busy tone and can queue for a line.
  - If the station user preselects a line before activating LNR, the preselection will override the line which was used originally.

**300.37 LEAST COST ROUTING**

To place an outside call when LCR has been enabled in the system:

- a. Dial [9] on the dial pad.
- b. Dial the desired 7 digit telephone number (ie: 1+ area code+7-digit number).
- c. Wait for answer. Lift handset or use speakerphone to converse.

If all lines available to you are busy, remain off-hook for four (4) seconds to automatically be queued onto LCR for an available line.

**LCR Que Callback**

If an LCR Queue Callback has been activated:

- a. When telephone is signalled, answer the call.
- b. Desired telephone number will automatically be re-dialed.

*NOTE: Only one LCR Queue Call Back request may be initiated by a station. When a second request is made, the first request will be canceled.*

**300.38 LCR QUE CANCEL**

- a. Dial the LCR Queue Cancel code, [626].
- b. Replace handset or press ON/OFF button.

**300.39 MEET ME PAGE**

To request another party to meet you on a page:

- a. Dial the desired two-or three-digit paging code or press pre-programmed\* PAGING button.
- b. Request that party meet you on the page.
- c. Do not hang up; wait for the requested party to answer. As soon as the paged party answers and is connected to you, the page circuit is released.

Answering a Meet Me Page

- a. Go to the nearest Telephone and dial [77] or press the pre-programmed\* MEET ME PAGE ANSWER button.
- b. You will be connected to the party that paged you.

\*Refer to Flexible Button programming

**300.40 MESSAGE WAITING**

Leaving a Message Waiting Indication

Up to five messages can be left at any Station. If you dial a station that is busy, unattended, or in DND, you can leave a message waiting indication.

- a. Press the pre-programmed\* MSG button.
- b. Called party's MSG button will slow flash.
- c. Hang up.

Answering a Message Waiting Indication

If your MSG WAIT button is flashing at a slow rate, you have a message waiting for you. The first message left will be the first one called.

- a. Press flashing pre-programmed\* MSG button.
- b. Station that left message will be signaled with tone ringing.
- c. If called station does not answer, press MSG button once to leave message.

\*Refer to Flexible Button programming

**300.41 MUTE KEY**

The MUTE button provides privacy during speakerphone or handset operation by disabling the microphone.

- a. Press the MUTE button while off-hook on speakerphone or handset to activate.
- b. Press the MUTE button again to deactivate.

The mute feature automatically deactivates upon call termination.

**300.42 OFF-HOOK PREFERENCE**

If your phone has been programmed for Off-Hook Preference, you will access an outside line, or a feature by going off-hook or pressing the ON/OFF button.

While Off-Hook Preference is enabled, you may access internal intercom dial tone by:

- a. Pressing your pre-programmed\* ICM button. LED lights steady  
OR
- b. Dial your own 3-digit intercom number. (Do not lift handset or press ON/OFF button before dialing intercom number.)
- c. Intercom dial tone will be heard.

You may now dial an internal station or Feature Access code.

\*Refer to Flexible Button programming

**300.43 PAGING**

If you have been given the ability to make page announcements:

- a. Lift handset.
- b. Dial the two-or three-digit paging code, or press pre-programmed\* PAGE button.
  - 70 All Call - Internal & External
  - 71 Internal Zone 1
  - 72 Internal Zone 2
  - 73 Internal Zone 3
  - 74 Internal Zone 4
  - 75 Internal All Call
  - 76 [0] External All Call (All Ext Zones)
  - 76 [Z] External Zone (Z=1-7)
- c. Speak in normal tone of voice to deliver message.

Stations off-hook or in DND will not hear the page announcement.

*NOTE: When making a zone page or All Call page and the zone is busy, the page initiator will receive ringback tone until the zone becomes available. You will then hear a warning tone and can make the page announcement.*

**300.44 PBX/CENTREX TRANSFER**

While connected to an outside line (PBX/Centrex):

- a. Press FLASH button. Receive transfer dial tone.
- b. Dial PBX/Centrex station number.
- c. Hang up to complete transfer.

**300.45 PERSONALIZED MESSAGES**

Each station can select a pre-assigned message to be displayed on the LCD of any Key Telephone calling that station.

There are ten possible messages which can be left.

- a. Dial [633] on the dial pad or press a programmed flex button.
- b. Dial the two-digit code for the message which will appear.
  - 00 clears messages
  - 01 VACATION
  - 02 RETURN MORNING
  - 03 RETURN AFTERNOON
  - 04 RETURN TOMORROW
  - 05 RETURN NEXT WEEK
  - 06 BUSINESS TRIP
  - 07 MEETING
  - 08 HOME
  - 09 ON BREAK
  - 10 LUNCH

*NOTE: This feature is not available to the attendant(s).*

**300.46 PERSONALIZED MESSAGE CODE ON A FLEX KEY**

You can program the code 633 onto a flexible key to speed access of pre-selected messages.

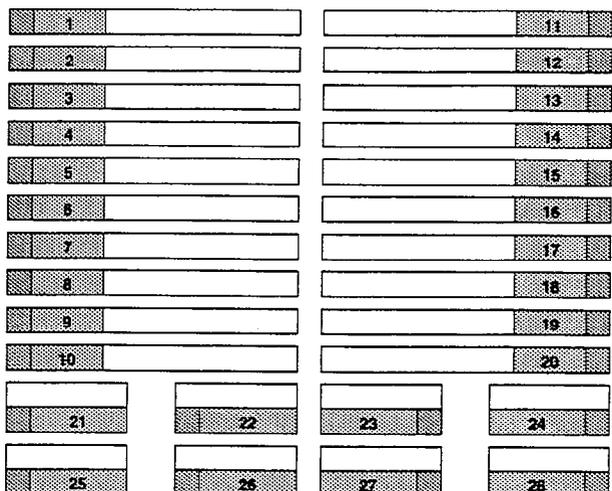
- a. Press SPEED button twice.
- b. Press the desired flex button. LED flashes.
- c. Dial [633] + [#] or dial [00] thru [10]. Confirmation tone is heard.

User can now press that flex button and dial the two-digit message number 00-10 to activate or deactivate a personalized message. Confirmation tone will be heard.

**300.47 PRIME FLEX BUTTON PROGRAMMING**

If your phone is programmed for off-hook preference and have been given the ability to enable or change the prime flex button.

- a. Dial [691] on the dial pad
- b. Then dial two-digit button number. (Refer to following chart.



To disable Off-Hook Preference:

- a. Dial [691] on the dial pad.
- b. Dial [00] on the dial pad.

**300.48 PROGRAMMING YOUR NAME INTO THE LCD DISPLAY**

Every extension (key and SLT) has the capability to program the users name so that people using display telephones will see the name instead of the station number.

- a. Dial [690] on the dial pad.
- b. Enter your name (up to 7 letters) using the pattern shown below.

A=21	N=62	1=1#	"=01
B=22	O=63	2=2#	,=02
C=23	P=71	3=3#	?=03
D=31	Q=74	4=4#	/=04
E=32	R=72	5=5#	!=*1
F=33	S=73	6=6#	\$=*2
G=41	T=81	7=7#	&=*4
H=42	U=82	8=8#	*=*#
I=43	V=83	9=9#	(=#1
J=51	W=91	0=0#	)=#2
K=52	X=92	Space=11	+=#3
L=53	Y=93	: =12	==#4
M=61	Z=94	- =13	#=##
		' =14	

- c. Press SPEED button to complete the programming process.

To erase your name:

- a. Dial [690] on the dial pad.
- b. Press SPEED button.

**300.49 PULSE TO TONE SWITCHOVER**

The signaling on an outside line can be changed from dial pulse to tone (DTMF) manually while dialing out.

To perform the change-over

- a. Dial an [\*] on the dial pad.
- b. Remaining digit(s) will be sent using DTMF.

The Pulse to Tone Switchover command may also be included into a speed dial bin. Refer to speed dial programming.

**300.50 SAVE NUMBER REDIAL**

If you wish to save the last number you dialed for use later:

- a. After placing an outside call, keep handset off-hook.
- b. Press SPEED button twice.

To Dial a number that was saved using the steps above:

- a. Press SPEED button.
- b. Dial the asterisk [\*] key.
  - System will automatically select the original line used to place the call and redial the number.
  - If that line is busy, the system will automatically select another line from the same group and redial the number.
  - If no lines are available in the same group, station will receive busy tone and can queue for a line.
  - If the station user preselects a line before activating SNR, the preselection will override the line which was used originally.

**300.51 PROGRAMMING PBX/CENTREX CODES ONTO A FLEX BUTTON**

For easy one-button access to Centrex or PBX features, perform the following steps:

- a. Program the Centrex or PBX code into a station or system speed dial bin, including hook-flash (flash key), [\*], and [#] commands. (Refer to station or system speed dial programming)
- b. Program that speed bin onto a flexible\* button.

\*Refer to Flexible Button programming

**300.52 SPEAKERPHONE**

- a. Press ON/OFF button to "ON". Intercom dial tone will be heard.
- b. Press station key of desired party, or press available outside line button and dial number. Speakerphone is activated.
- c. Press ON/OFF button to "OFF" to end call.

*NOTE: For further references in this section where "lift handset" is specified, you may also use the method of pressing the "ON/OFF" button, if the telephone is programmed to be a true two-way speakerphone.*

**300.53 STATION SPEED DIAL**

If no outside line has been specified in programming, one will be chosen automatically or you can choose one now.

- a. Press SPEED button and dial bin location, or press pre-programmed\* speed bin button. Station Speed numbers are 00 to 19.
- b. When called party answers, pick up handset or use speakerphone.

\*Refer to Flexible Button programming

**300.54 STORING SPEED NUMBERS**

Station Speed numbers can be entered by keyset users. System Speed numbers must be entered by the first programmed attendant. If no attendant is specified, enter at Station 100.

- a. Press SPEED once, then press a desired outside line key or pool key or select an outside line automatically by pressing the SPEED button a second time.
- b. Dial the speed bin location. 00 to 19 for Station Speed numbers; 20 to 99 for System Speed numbers.
- c. Dial telephone number. (including special codes described below)
  - TRANS - Pressing the TRANS button during number entry initiates a Pulse-To-Tone switchover.
  - HOLD - Pressing the HOLD button during number entry inserts a Pause.
  - FLASH - Pressing the FLASH key inserts a Flash into the speed number.
  - TRANS - Pressing the TRANS button as the first entry in the speed bin inserts a no-display character causing the numbers stored in the bin not to appear on the Digital Terminals display when the bin is accessed.
- d. Press the SPEED button.
- e. Hang up.

To program several speed numbers in a row, press the SPEED button twice to conclude programming a number and then just enter the next speed number bin to be programmed. If the station has no line appearance for the line programmed into the speed bin, that line will come up under the Loop button or Pool button when accessed.

**300.55 SYSTEM SPEED DIAL**

If no outside line has been specified in programming, one will be chosen automatically or you can choose one now.

- a. Press the SPEED button and dial bin location, or press pre-programmed\* speed bin button. System Speed numbers are 20 to 99.
- b. When called party answers, pick up handset or use speakerphone.

\*Refer to Flexible Button programming

**300.56 UNIFORM CALL DISTRIBUTION (UCD)****A. Number of Calls in Queue Display**

From an idle display key telephone:

1. Dial [567] on the dial pad  
OR  
Press pre-programmed\* flex button. (ON/OFF button LED lights steady)
2. Dial the 3-digit UCD group number (550-557).
3. Your display will tell you how many calls are in queue for that group.
4. Dynamic update of display occurs as queue condition changes.
5. Hang up the handset or press the ON/OFF button to terminate mode.

*NOTE: This feature cannot be used with a call in progress and the station will be considered busy for incoming calls during this operation.*

\*Refer to Flexible Button programming

**B. Available/Unavailable Mode**

If you are a UCD agent, you may place your station in the Available mode to receive UCD type of calls or you may place your station in the Unavailable mode to block UCD type calls from ringing your station.

To go Available:

1. Dial [566] on the dial pad  
OR  
Press the pre-programmed\* Available/Unavailable button.
2. You may now receive calls.

To go Unavailable:

1. Dial [566] on the dial pad  
OR  
Press the pre-programmed\* Available/Unavailable button.
2. You are now blocked from receiving UCD calls.

\*Refer to Flexible Button programming

### C. No-Answer Timer

After a UCD call rings into an agent, the No-Answer timer takes effect. If the agent does not answer the call before this timer expires, then that agent is set to "UCD Unavailable" and the call is routed back to the UCD group for another available agent or queue. In order to continue receiving UCD calls, the agent then needs to press their UCD Available button.

#### 300.57 UNIVERSAL NIGHT ANSWER (UNA)

If you hear outside line ringing at another station and wish to answer it, dial [#3] on the dial pad. The connected outside line can be transferred or disconnected. Each telephone utilizing Universal Night Answer must have a loop button appearance if the ringing outside line does not appear at their phone.

#### 300.58 VOICE MAIL OPERATION (VM)

##### Forward Callers to your Mail box

Intercom and Transferred CO callers may be routed directly to your mail box by forwarding your phone to a voice mail group. Callers will then be greeted by your personal voice mail greeting if available (Refer to Call Forward - Voice Mail Operation)

##### Retrieving Voice Messages

If your Message Waiting key or programmed Voice Mail group key is flashing, you may have a voice message waiting for you. To enter the voice mail system to check for mail:

- a. Dial the Voice Mail group number or press the pre-programmed\* voice mail group key or flashing Message Wait key.
- b. You will immediately be prompted to enter your password for your mail box.

##### Receiving a Voice Mail Message Wait

To receive a message waiting indication that a voice message has been taken for you, the Voice Mail system must be programmed to provide such an indication.

After the voice mail system receives a voice message for a station user:

- a. The voice mail must go off-hook and dial the voice mail message wait code [420].
- b. Then dial the 3-digit extension number of the station user who received a voice message.

##### Turning the Message Waiting Lamp Off

When a station user retrieves the voice messages from the voice mail system, the voice mail system must:

- a. Be programmed to go off-hook and dial the message cancel code [421].
- b. Then dial the 3-digit extension number of the station user who retrieved the voice message.

\*Refer to Flexible Button programming

### A. VM Tone Mode Calling Option

Allows the Voice Mail system to override a called stations H or P intercom switch settings.

When placing a call to a station and Tone ringing is desire (the Voice Mail system MUST be programmed to:

- a. Dial [6#].
- b. Then dial 3-digit station extension (call tone rings station).

#### 300.59 VOLUME CONTROLS

There are two volume control slide switches on the front of the Key Telephone. Sliding the switch to the left decreases the volume. The left slide switch is for voice, background music, and speakerphone volume. The right slide switch is for tone ringing volume.

## SECTION 310

# SLT FEATURE OPERATION

### 310.1 INTRODUCTION

This section of the manual contains the operating instructions for Single Line users. It is designed to provide step-by-step instructions for operating the Single Line telephones in the system.

Literature similar to these operating instructions has been prepared for use by the customer in the form of a Single Line Telephone User's Guide.

### 310.2 ACCOUNT CODE

SLT stations can enter an account code to identify the call or calling station.

Entering Account Code before a call:

- a. Lift the handset.
- b. Dial [627].
- c. Dial the account code. If the account code contains fewer than 12 digits, dial [\*] to return to intercom dial tone. Dial tone is heard.
- d. Dial [9] or CO Access code and the desired number.

Entering Account Code during a call:

- a. Depress the hookswitch momentarily. Your call will be placed on hold while you enter your account code.
- b. Dial [627].
- c. Dial the account code. If the account code contains fewer than 12 digits, dial [\*] to return automatically to the call.

### 310.3 CALL BACK

You call a busy station and receive busy:

- a. Briefly depress and release the hookswitch.
- b. Dial [622].
- c. Replace handset.

Only one Call Back request can be left at a station; the second request will convert to Message Waiting Request.

### 310.4 CALL FORWARDING

To call forward calls to another station:

- a. Lift handset.
- b. Dial [640].
- c. Skip step c for immediate forwarding, otherwise dial the appropriate code:  
[7] = Call Forward No Answer  
[8] = Call Forward Busy  
[9] = Call Forward Busy/No Answer  
[\*] = Call Forward Off-Net (via speed dial)
- d. Dial the 3-digit extension number or speed bin number where calls are to be forwarded. Confirmation tone will be heard.
- e. Replace handset.

To Remove Call Forwarding:

- a. Lift handset.
- b. Dial [640] or [662]. Confirmation tone will be heard.
- c. Replace the handset.

### 310.5 CALLING STATION TONE MODE OPTION

Allows a calling station to override a called key station's H or P intercom switch setting.

When placing a call to a key station and Tone ringing is desired:

- a. Dial [6#].
- b. Dial 3-digit station extension (call tone rings station).

### 310.6 CAMP-ON

After receiving intercom busy tone:

- a. Briefly depress and release the hookswitch.
- b. Dial [620]. When the called party answers, consult with them.

While on a CO line you receive a Camp-on warning tone through handset:

- a. Choose desired call (hang up on present call and take the new one, or ignore the Camp-on signal). (also see Personal Park)

**Table 310-1 Starplus Digital SLT Numbering Plan**

100-127	Station Intercom Numbers (SPD 1428)	663	Message Wait return
100-155	Station Intercom Numbers (SPD 2856)	664	SLT Conference W/ Personal Park
22 [C]	Call Park Location 0-7 (system)	666 [YY]	SLT Speed Dial Access
228	Personal Park	690	Name in Display Programming
33 [H]	Hunt Group Pilot Numbers 0-7	70	All Call Page (Internal & External)
44 [V]	Voice Mail Group Pilot Numbers 0-7	71	Internal Page Zone 1
55 [U]	UCD Group Pilot Numbers 0-7	72	Internal Page Zone 2
566	UCD Available/Unavailable	73	Internal Page Zone 3
6# [XXX]	Tone Mode Ring Option	74	Internal Page Zone 4
620	Camp-On	75	Internal All Call Page
621	Line Queue	76 [0]	External All Call Page (All Zones)
622	Call Back	76 [P]	External Page Zones 1-7
623	Message Wait	77	Meet-Me-Page Answer
624	Conference	9	LCR or CO Line Group 1 (if LCR is disabled)
625	Executive Override	0	Attendant
626	LCR Queue Cancel	#0	Group Call Pick Up (Key & SLT)
627	Account Code Enter	#1	Directed Call Pick-up (SLT)
631	Do Not Disturb	#22 [C]	Call Park Pickup (Key and SLT)
633 [ZZ]	Personalized Messages	#3	Universal Night Answer
633 [00]	Clear Personalized Messages		
640	All Call Forward		
640 [7]	No Answer - Call Forward		
640 [8]	Busy - Call Forward		
640 [9]	Busy/No Answer - Call Forward		
640 [*]	Off-Net - Call Forward		
660	SLT Flash Command to CO Line		
661 [YY]	SLT Station Speed Dial Programming		
662	SLT Clear - Call Forward, DND, Personal Messages		

XXX = Intercom Station Numbers

YY = Speed Dial Bin numbers

ZZ = Personalized Messages

U = UCD Group Number 0-7

C = Call Park Location 0-7

H = Hunt Group Number 0-7

V = Voice Mail Group Number 0-7

P = External Page Zone Number 1-7

### 310.7 CALL PARK (System)

To place an outside call on hold and consult with, page, or call an internal party and/or transfer the outside call.

While connected to an outside line:

- Depress and release the hookswitch. The caller is put on Exclusive hold.
- Dial parking location (220 to 227). Hear confirmation tone.
- If you hear busy tone, depress and release the hookswitch and dial another parking location.

Retrieving a Parked Call

- Lift handset.
- Dial pound [#].

- Dial parking location (220 to 227) where the call was parked.

### 310.8 CALL TRANSFER:

Making an Unscreened Transfer

- Briefly depress and release the hookswitch.
- Dial desired intercom number.
- Hang up to complete the transfer.

Making a Screened Transfer:

- Briefly depress and release the hookswitch.
- Dial desired telephone number.
- Announce the call.
- Hang up to complete the transfer.

**310.9 CLEAR CALL FORWARD, DND, PERSONALIZED MESSAGES**

SLTs can activate and cancel call forward by dialing [640] and DND by dialing [631] and enable and cancel personalized messages by dialing [633xx].

A convenient code [662] has been incorporated to cancel either Call forwarding, DND, or Personalized Messages when the SLT user has forgotten which code has been programmed on the phone

To cancel Call Forward, DND, Personalized Messages:

- a. Lift handset. Notification tone will be heard.
- b. Dial [662]. Confirmation tone will be heard.
- c. Replace the handset.

**310.10 CO LINE QUEUING**

- a. Dial outside line access code. Receive busy tone.
- b. Briefly depress and release the hookswitch.
- c. Dial [621]. Confirmation tone is heard.

**310.11 CONFERENCE**

You may set up a conference of 1 external and 1 other internal station.

- a. Lift handset.
- b. Make outside call.
- c. Briefly depress and release the hookswitch to put the call on hold.
- d. Dial number of internal station you wish to add.
- e. When that station answers, briefly depress and release the hookswitch again and all 3 parties will be connected.

**310.12 CONFERENCE WITH PERSONAL PARK**

While connected to an outside line:

- a. Depress the hookswitch momentarily. Intercom dial tone is heard.
- b. Dial [228]. (1st call is placed in personal park).
- c. Dial desired number for 2nd call.
- d. Depress the hookswitch momentarily. Intercom dial tone is heard.
- e. Dial [664]. All three parties are conferenced.
- f. Hang up to terminate conference.

**310.13 DIRECT OUTSIDE LINE ACCESS**

- a. Lift handset.
- b. Dial access code (9, 81 - 87).
- c. Dial desired telephone number.

**310.14 DIRECTED CALL PICK-UP**

Upon hearing an unattended telephone ring:

- a. Lift handset.
- b. Dial [#1].
- c. Dial station number of ringing telephone. You will be connected to intercom, incoming, recalling or transferred outside line.

**310.15 DO NOT DISTURB**

Activating Do Not Disturb:

- a. Lift handset.
- b. Dial [631].
- c. Replace handset.

To cancel Do Not Disturb:

- a. Lift handset.
- b. Dial [631] or [662].
- c. Replace handset.

**310.16 PBX/CENTREX TRANSFER (Flash Command to CO Line)**

To initiate a PBX or Centrex Transfer command from an SLT.

While connected to a PBX or Centrex line:

- a. Briefly depress and release the hookswitch. Intercom dial tone will be heard.
- b. Dial [660]. A Flash command will be presented to the PBX or Centrex line.
- c. PBX or Centrex studder tone will be heard. Dial number of desired extension.
- d. Replace handset to complete transfer.

**310.17 GROUP CALL PICK-UP**

Upon hearing an unattended telephone ringing:

- a. Lift the handset.
- b. Dial [#0]. You will be connected to intercom or transferred or recalling outside line call.

*NOTE: You must be in the same pickup group.*

**310.18 PLACING CALLS ON EXCLUSIVE HOLD**

While connected to an outside line:

- a. Briefly press and release the hookswitch. (Call is placed on Exclusive Hold).

To retrieve the call:

- a. Press and release the hookswitch again.

**310.19 INTERCOM CALLING**

- a. Lift handset.
- b. Dial 3-digit intercom number (100-127 SPD 1428 or 100-155 SPD 2856).

**310.20 LCR QUEUING (Automatic)**

If all lines available to you are busy, remain off-hook for four (4) seconds to automatically be queued onto LCR for an available line.

**310.21 LCR QUE CALL BACK**

If an LCR Queue Call Back has been activated:

- a. When telephone is signalled, answer the call.
- b. Desired telephone number will automatically be re-dialed.
- c. Wait for answer. Lift handset to converse

*NOTE: Only one LCR Queue Call Back request may be initiated by a station. When a second request is made, the first request will be canceled.*

**310.22 LCR CANCEL**

- a. Lift handset.
- b. Dial the LCR Queue Cancel code, [626].
- c. Replace handset or press ON/OFF button.

**310.23 MESSAGE WAITING**

Leaving a Message Waiting Indication

- a. Lift handset.
- b. Dial intercom station. Receive no answer, or DND tone.
- c. Briefly depress and release the hookswitch.
- d. Dial [623].
- e. Replace handset.

Answering a Message Waiting Indication.

Your message waiting lamp is flashing:

- a. Lift handset.
- b. Dial [663]. Station that left the message will ring.

Only SLTs equipped with message waiting lamp will have access to this feature. OPX stations do not have message wait capability.

**310.24 OFF-HOOK PREFERENCE**

If your phone has been programmed for Off-Hook Preference, you will hear outside line dial tone when lifting the handset.

When this operation is enabled, you may not have access to all features contained in this User Guide. However, consult your Centrex or PBX User's Guide for additional features you may have.

**310.25 PERSONALIZED MESSAGES**

Each station can select a pre-assigned message to be displayed on the LCD of any Key Telephone calling that station. To select one of the ten available messages:

- a. Dial [633] on the dial pad.
- b. Dial the two-digit code for the message which will appear.
  - 00 clears messages
  - 01 VACATION
  - 02 RETURN MORNING
  - 03 RETURN AFTERNOON
  - 04 RETURN TOMORROW
  - 05 RETURN NEXT WEEK
  - 06 BUSINESS TRIP
  - 07 MEETING
  - 08 HOME
  - 09 ON BREAK
  - 10 LUNCH

*NOTE: This feature is not available to the attendant(s).*

- c. Hang up. (Activating DND or Call Forwarding cancels selected message.)

**310.26 PAGING**

- a. Lift handset.
- b. Dial the two-digit paging code. Wait for page warning tone
  - 70 All Call - Internal & External
  - 71 Internal Zone 1
  - 72 Internal Zone 2
  - 73 Internal Zone 3
  - 74 Internal Zone 4
  - 75 Internal All Call
  - 76 [0] External All Call (All Ext Zones)
  - 76 [Z] External Zone Z=1-7
- c. Speak in normal tone of voice to deliver message.

Stations off-hook or in DND will not hear the page announcement.

*NOTE: When making a zone page or All Call page and the zone is busy, the page initiator will receive ringback tone until the zone becomes available. You will then hear a warning tone and can make the page announcement.*

- d. Deliver page in normal tone of voice.
- e. Replace handset to terminate page.

**310.27 PERSONAL PARK (Flip-Flop)**

While connected to first call:

- a. Depress the hookswitch momentarily. Intercom dial tone is heard.
- b. Dial [228]. (call is placed in personal park).
- c. Dial desired number for 2nd call.
- d. Depress the hookswitch momentarily. Intercom dial tone is heard.
- e. Dial [228]. (1st call is returned and 2nd call is placed in personal park).

The user can alternately connect to the other call by doing a hook flash and dialing [228] as many times as necessary.

**310.28 PROGRAMMING YOUR NAME INTO THE LCD DISPLAY**

Every SLT extension has the capability to program the users name so that people using display telephones will see the name instead of the station number.

- a. Lift handset.
- b. Dial [690].
- c. Enter your name (up to 7 letters) using the pattern shown below.

A=21	N=62	1=1#	"=01
B=22	O=63	2=2#	,=02
C=23	P=71	3=3#	?=03
D=31	Q=74	4=4#	/=04
E=32	R=72	5=5#	!=*1
F=33	S=73	6=6#	\$=*2
G=41	T=81	7=7#	&=*4
H=42	U=82	8=8#	*=*#
I=43	V=83	9=9#	(=#1
J=51	W=91	0=0#	)=#2
K=52	X=92	Space=11	+=#3
L=53	Y=93	: =12	==#4
M=61	Z=94	- =13	#=##
		' =14	

- d. Press the hookswitch to complete the programming process.

**310.29 STATION SPEED DIAL**

- a. Lift handset.
- b. Dial [666].
- c. Dial desired station speed bin number (00-19).

**310.30 STORING STATION SPEED NUMBERS**

- a. Lift handset.
- b. Dial [661].
- c. Dial desired station speed bin number (00-19).
- d. Dial telephone number you wish to store.
- e. Briefly depress and release the hookswitch. (Confirmation tone is heard.)

*Line Group 1 will be programmed along with SLT speed numbers and thus Line Group 1 will be used when activating station speed dial from an SLT.*

**310.31 SYSTEM SPEED DIAL**

- a. Lift handset.
- b. Dial [666].
- c. Dial desired system speed bin number (20-99).

**310.32 UNIVERSAL NIGHT ANSWER (UNA)**

Upon hearing an incoming signal:

- a. Lift handset.
- b. Dial the UNA access code [#3]. You will be connected to ringing outside line.

**310.33 UCD AVAILABLE/UNAVAILABLE**

If you are a UCD Agent, you may place your station in the Available mode to receive UCD type of calls or you may place your station in the Unavailable mode to block UCD type of calls from ringing at your station.

To go Available:

- a. Dial [566] on the dial pad. You may now receive calls.

To go Unavailable:

- a. Dial [566] on the dial pad. You are now blocked from receiving UCD calls.

## SECTION 320

# ATTENDANT FEATURE OPERATION

### 320.1 INTRODUCTION

The Starplus Digital (SPD) Key Telephone System has a wide variety of features and flexible programming, allowing each telephone user to program his/her telephone to meet his/her own individual needs.

This section of the manual contains the operating instructions for Attendant Key Telephone users and includes an illustration of the key telephone used in the Starplus Digital (SPD) Key Telephone System and description of the keys on the telephones and their functions. It is designed to provide step-by-step instructions for operating the Attendant(s) Digital Terminal(s) in the system. Visual and audible cues which accompany the various steps in the operation of the features are also include

Literature similar to these operating instructions has been prepared for use by the customer in the form of an Attendant User's Guide.

### 320.2 ATTENDANT KEY TELEPHONE STATION FEATURES

Each Starplus Digital (SPD) Key Telephone System provides the following keys, indicators and features:

**HANDSET AND SPEAKER** are located at the left side of the front panel. A handset is provided to allow confidential conversation when desired. Lifting the handset from its cradle (going off-hook) disengages the station's built-in speaker.

The speaker is located directly below the center portion of the handset. The station may be operated with the handset on-hook. When this occurs, audio is transmitted to the station user through the station's speaker.

**HOLD** button enables you to place an outside caller on hold.

**TRANSFER (TRANS)** button is used to transfer an outside call from one station to another.

**FLASH** button is used to terminate an outside call and restore dial tone without having to hang up the handset. It is also used to transfer calls behind a PBX or Centrex within those systems.

**SPEED** button provides you with access to speed dialing, save number redial and last number redial. This button is also used to access speed dial and flex button programming.

**MUTE** button allows you to switch the built-in microphone on or off when using the speakerphone, or the

handset microphone when using the handset. A flex button must be assigned to use this feature.

**ON/OFF** button enables you to make a telephone call without lifting the handset. It turns the telephone on and off when using the speakerphone.

**FLEXIBLE BUTTONS** are used to access idle outside lines, provide DSS/BLF for internal stations, access speed dial number and activate features. These buttons are programmed by the individual station user. The default flex feature buttons are described below:

**CAMP-ON** (flex) button enables you to alert a busy party that an outside line is on hold and waiting for them. A flex button must be assigned to use this feature.

**LINE QUEUE** (flex) button allows you to queue onto an outside line when all lines in a group are busy. Your station is placed in queue awaiting a line in the same group to become available. A flex button must be assigned to use this feature.

**CALL BACK** (flex) button allows you to initiate an automatic call back request to another busy station. As soon as that station becomes idle, the station that left the call back request is signalled. A flex button must be assigned to use this feature.

**PICK UP** (flex) button allows you to pickup a tone ringing intercom call, transferred, incoming, or recalling outside line call to a specific unattended station either by group or directed call pick-up.

**MESSAGE WAIT (MSG WAIT)** (flex) button allows you to initiate a message waiting indication at stations that are busy, unattended, or in Do Not Disturb. Message Waiting Callback request left at your station will be indicated by a flashing Msg Wait LED.

**CALL FWD** (flex) button allows you to forward your calls to another station.

**DO NOT DISTURB (NIGHT SERVICE)** (flex) button allows the Attendant(s) to place the system into Night Service mode. A flex button must be assigned to use this feature.

**CONFERENCE (CONF)** (flex) button is used to establish and build conference calls.

**OUTSIDE CALLS** are announced by a tone signal repeated every 3.2 seconds. The corresponding outside line indicator will flash slowly.

**INTERCOM CALLS** can be tone ringing or voice announce. If it is voice announced, the receiving station will receive 2 bursts of tone prior to the announcement. If it is a tone ringing call, the receiving station will hear a tone ring every 2.4 seconds.

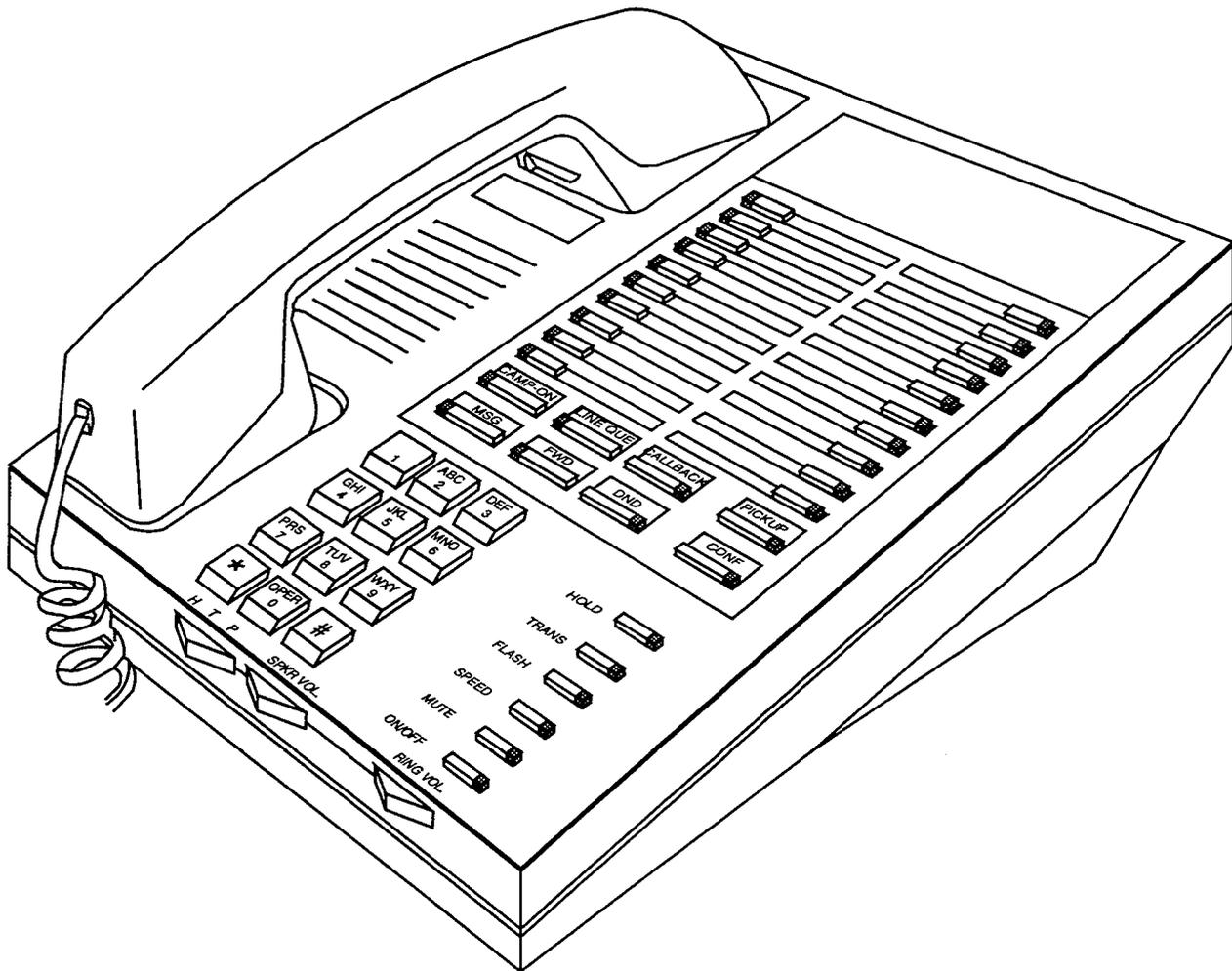


Figure 320-1 34 Button Attendant Digital Terminal

Table 320-1 Starplus Digital Attendant Numbering Plan

100-127	Station Intercom Numbers (SPD 1428)	73	Internal Page Zone 3
100-155	Station Intercom Numbers (SPD 2856)	74	Internal Page Zone 4
22 [C]	Call Park Location 0-7 (system)	75	Internal All Call Page
228	Personal Park	76 [0]	External All Call Page (All Zones)
33 [H]	Hunt Group Pilot Numbers 0-7	76 [P]	External Page Zones 1-7
44 [V]	Voice Mail Group Pilot Numbers 0-7	77	Meet-Me-Page Answer
55 [U]	UCD Group Pilot Numbers 0-7	81	CO Line Group 1 (if LCR is enabled)
566	UCD Available/Unavailable	82	CO Line Group 2
567 55 [U]	UCD Calls in Queue Display	83	CO Line Group 3
6# [XXX]	Tone Mode Ring Option	84	CO Line Group 4
601	Attendant Override	85	CO Line Group 5
602	Disable Outgoing CO Line Access	86	CO Line Group 6
603	CO Line Off-Net Forward	87	CO Line Group 7
604	Night Service	88 [YY]	All CO line Groups (CO Line Off-Net Forward)
620	Camp-On	9	LCR or CO Line Group 1 (if LCR is disabled)
621	Line Queue	0	Attendant
622	Call Back	#0	Group Call Pick Up (Key & SLT)
623	Message Wait	#1	Directed Call Pick-up (SLT)
624	Conference	#22 [C]	Call Park Pickup (Key and SLT)
625	Executive Override	#3	Universal Night Answer
626	LCR Queue Cancel	[SPD] YY	Speed Dial Access (00-19 Station) (20-99 System)
627	Account Code Enter	[SPD] *	Save Number Redial
631	Do Not Disturb	[SPD] #	Last Number Redial
632	Background Music		
633 [ZZ]	Personalized Messages		
633 [00]	Clear Personalized Messages		
634	Headset Mode		
FWD	All Call Forward		
[FWD]+[7]	No Answer - Call Forward		
[FWD]+[8]	Busy - Call Forward		
[FWD]+[9]	Busy/No Answer - Call Forward		
[FWD]+[*]	Off-Net - Call Forward		
690	Name in Display Programming		
691 [BB]	Off-hook Preference Programming		
692	Time & Date Programming (1st programmed Attendant)		
70	All Call Page (Internal & External)		
71	Internal Page Zone 1		
72	Internal Page Zone 2		

XXX = Intercom Station Numbers

YY = Speed Dial Bin numbers

ZZ = Personalized Messages

BB = Button Number

U = UCD Group Number 0-7

C = Call Park Location 0-7

H = Hunt Group Number 0-7

V = Voice Mail Group Number 0-7

P = External Page Zone Number 1-7

**NOTE: Items shown in BOLD may be programmed onto FLEX Buttons.**

**320.3 ANSWERING AN OUTSIDE CALL**

- a. Lift handset.
- b. Press slow flashing outside line button. (If your telephone is programmed with Preferred Line Answer, you may answer an outside line by lifting the handset.)

**320.4 PLACING OUTSIDE LINE ON HOLD**

- a. If your system is programmed for Exclusive Hold Preference, press HOLD button once for Exclusive Hold and twice for System Hold.
- b. If your system is programmed for System Hold Preference, press HOLD button once for System Hold and twice for Exclusive Hold.

**320.5 ANSWERING A RECALLING OUTSIDE LINE**

When an outside line has remained on hold for an extended period of time, you will be reminded with a recalling ring.

- a. Press outside line button flashing at very fast rate.
- b. Lift handset to converse.

**320.6 ATTENDANT DISABLE OUTGOING ACCESS**

The attendant station can disable CO lines, preventing outgoing CO calls.

- a. Lift handset or press ON/OFF button.
- b. Dial [602]. Confirmation tone is heard.
- c. Depress the line button(s) of the CO Line(s) to be disabled. Confirmation tone is heard and the CO Line Button(s) LED is flashing.
- d. To re-activate the CO Line(s), repeat the steps followed to disable it.

**320.7 ATTENDANT OVERRIDE**

If Attendant Override is allowed, Attendant(s) stations may override or call stations that are either busy or in Do Not Disturb.

If the Attendant calls a station that is busy on a CO call and wishes to alert them of a waiting call:

- a. Press the pre-programmed\* ATTN OVERRIDE button. Three short tone bursts will be presented to the called party.
- b. After five (5) seconds, the station's CO line will automatically be placed on hold and the Attendant will be cut-thru.

If the Attendant calls a station that is in Do Not Disturb mode and wishes to alert them of a call:

- a. Press the pre-programmed\* ATTN OVERRIDE button. The station will be signalled with a Camp-on tone.

\*Refer to flexible button programming

**320.8 ATTENDANT RECALL**

When an outside line has remained on hold for an extended period of time, you will be reminded with a recalling ring.

- a. Press outside line button flashing at a very fast rate.
- b. Lift handset to converse.

**320.9 EXECUTIVE OVERRIDE**

Allows stations designated as "Executive" the ability to override and "barge in" on other keysets engaged in conversation.

If you call a busy station:

- a. Press pre-programmed\* EXECUTIVE OVERRIDE button. Executive station will be bridged onto the CO conversation in progress at the called station. Optional warning tone is heard and presented to all parties prior to cut-thru.
- b. Replace handset at Executive station to terminate the override.

\*Refer to Flexible Button Programming

*NOTE: If the busy party is connected via intercom to another party, the intercom connection will be dropped when the override occurs.*

**CAUTION: USE OF THIS FEATURE WHEN THE EXECUTIVE OVERRIDE WARNING TONE IS DISABLED MAY BE INTERPRETED AS A VIOLATION OF FEDERAL OR STATE LAWS, AND AN INVASION OF PRIVACY. CONSULT COUNSEL WITH RESPECT TO APPLICABLE LAWS BEFORE INTRUDING ON CALLS USING THIS FEATURE.**

*NOTE: A decrease in volume may occur on the CO line after the barge-in occurs.*

**320.10 INTERCOM CALLING**

Placing an Intercom Call

- a. Press station key of party to be called (if programmed at your phone); or dial station number (100 to 155).
- b. You will hear ringing if called station is in the "T" answering mode; or two bursts of tone if called station is in the "H" or "P" position.
- c. Lift handset or use speaker-phone, when tone bursts stop.
- d. Hang up to end call.

Answering an Intercom Call

With your intercom signal switch in the T mode, you will hear repeated bursts of intercom tone ringing and the HOLD button will slow flash.

- a. Lift handset or press ON/OFF button to answer.
- b. Hang up to end call.

In the P mode, you will hear two bursts of tone and one-way announcement. The HOLD button will slow flash and the calling party cannot hear conversations in progress.

In the H mode, you will hear two bursts of tone and an announcement. Reply handsfree or lift handset for privacy.

### 320.11 INCOMING CO LINES OFF-NET (via speed dial)

Allows the first attendant station to forward incoming CO calls to an off-net location.

In a speed dial bin, store the number of the off-net location where calls are to be forwarded. Follow instructions provided for storing station or system speed dial numbers.

- a. Dial [603] on the dial pad or press pre-programmed\* CO Off-Net Forward button.
- b. Dial the CO group access code of the group to be forwarded or press the CO Line button for an individual CO Line for Off-Net forward.

81=CO Group 1  
82=CO Group 2  
83=CO Group 3  
84=CO Group 4  
85=CO Group 5  
86=CO Group 6  
87=CO Group 7  
88=All CO Lines

- c. Dial the speed bin number that contains the number where calls are to be forwarded or press the pre-programmed\* button for the speed bin. Confirmation tone is heard.

\*Refer to flexible button programming

Canceling Off-Net Forwarding

- a. Dial [603] on the dial pad or press pre-programmed\* CO Off-Net Forward button.
- b. Dial the CO group access code or press the CO Line button.
- c. Dial [#]. Confirmation tone is heard.

### 320.12 NIGHT SERVICE

- a. Any designated attendant can place the system into Night Service by pressing the pre-programmed Night Service button (DND) or by dialing [604].
- b. Pressing the pre-programmed Night Service button again removes the system from Night Service.

### 320.13 SETTING SYSTEM TIME AND DATE

Must be set by the first programmed attendant.

- a. Dial [692] on the dial pad. Confirmation tone is heard.
- b. Enter date and time as follows:  
YYMMDDHHMM  
YY = year 00-99  
MM = month 01-12  
DD = day 01-31  
HH = hour 00-23  
MM=minute 00-59

When the correct number of digits are entered, confirmation tone will be heard and the display will update.

### 320.14 STORING SYSTEM SPEED NUMBERS

System Speed numbers must be entered by the first programmed attendant. If no attendant is specified, enter at Station 100.

- a. Press SPEED once, then press a desired outside line key or select an outside line automatically by pressing the SPEED button a second time.
- b. Dial the System speed bin location (20 to 99).
- c. Dial telephone number.
- d. Press the SPEED button.
- e. Hang up.
  - Pressing the TRANS button during number entry initiates a Pulse-To-Tone switchover. Pressing the HOLD button during number entry inserts a Pause. Pressing the FLASH key inserts a Flash into the speed number.
  - Pressing the TRANS button as the first entry in the speed bin inserts a no-display character causing the numbers stored in the bin not to appear on the Digital Terminals display when the bin is accessed.

Speed Bin numbers 60-99 are NOT monitored by Toll Restriction.

**ATTENDANT with DSS/DLS FEATURES**

The attendant console may be programmed in one of five different ways. Therefore, you may not have all of the features listed below on your console. Refer to Sec. 200.146 for a description of each map.

**320.15 ATTENDANT TRANSFER SEARCH**

When attempting to locate a party:

- a. Press a station button to signal that station. If the party is not located, press another station button to continue the search.

**320.16 PLACING AN OUTSIDE CALL (Automatic Line Selection)**

- a. Press outside line button. ON/OFF button LED will light and dial tone will be heard.
- b. Dial desired party.
- c. When called party answers, lift handset to converse or use speakerphone

**320.17 CALL PARK**

While connected to an outside line:

- a. Press programmed CALL PARK button. The caller is put on Exclusive hold.
- b. At this time, you can page or call another internal station.
- c. When the party you called responds, announce the call park location and replace handset.

**320.18 DO NOT DISTURB INDICATION**

The associated station button will flash at a medium rate to indicate that station is in Do Not Disturb.

**320.19 RETRIEVING A PARKED CALL**

- a. Lift handset or press ON/OFF button.
- b. Dial [#].
- c. Dial the parking location (220 to 227) where the call was parked.

**320.20 CALL TRANSFER**

Outside lines can be transferred from one phone to another within the system. The transfer can be either screened (announced) or unscreened to either an idle or busy station.

Screened Transfer

- a. While connected to an outside line, press station button where call is to be transferred (if programmed on your telephone), or press TRANS button and dial station number (100 to 155).

- b. The called extension signals according to the intercom signal switch position.
- c. When that extension answers, announce the transfer.
- d. Hang up to complete transfer.

Unscreened Transfer

When the called extension begins to signal, hang up to transfer the call (Recall timer starts).

Transfer Search

- a. When attempting to locate a party, press a station key to signal a station.
- b. If the party is not located, press another station key to continue the search, or press the TRAN button and dial the station number.
- c. If the party is not located, press the TRANS button twice and dial another station number to continue the search.
- d. When the called party answers, hang up to complete the transfer.

**320.21 CAMP-ON**

While connected to an outside line:

- a. Press desired station button.
- b. When busy tone is heard, press CAMP-ON button.
- c. Replace handset, access another CO Line or press RELEASE button (if you have one).

**320.22 FLEXIBLE BUTTON PROGRAMMING**

- a. Press SPEED button twice.
- b. Press FLEX button to be programmed (it must be programmed in data base as a flexible button).
- c. Dial desired code (Refer to Table 300-2 Flex Button Programming Codes).

**320.23 MEET ME PAGE**

To request another party meet you on a page:

- a. Dial the desired two-digit paging code or press pre-programmed\* button.
- b. Request that party meet you on the page.
- c. Do not hang up; wait for the requested party to answer.

Answering a Meet Me Page

- d. Go to the nearest Telephone and dial [77].
- e. You will be connected to the party that paged you.

\*Refer to flexible button programming

### 320.24 PAGING

#### A. External Paging

1. Dial the two- or three-digit External paging code.  
Wait for page warning tone.  
76 [0] External All Call (Zones 1-7)  
76 [1] External Zone 1  
76 [2] External Zone 2  
76 [3] External Zone 3  
76 [4] External Zone 4  
76 [5] External Zone 5  
76 [6] External Zone 6  
76 [7] External Zone 7
2. Speak in normal tone of voice to deliver message.

Stations off-hook or in DND will not hear the page announcement.

*NOTE: When making a zone page or All Call page and the zone is busy, the page initiator will receive ringback tone until the zone becomes available. You will then hear a warning tone and can make the page announcement.*

3. Deliver page in normal tone of voice.
4. Replace handset to terminate page announcement.

#### B. Internal Paging

Stations off-hook or in DND will not receive the page announcement.

1. Press programmed PAGE button or dial one of the following codes:  
70 All Call - Internal & External  
71 Internal Zone 1  
72 Internal Zone 2  
73 Internal Zone 3  
74 Internal Zone 4  
75 Internal All Call
2. Speak in normal tone of voice to deliver message.
3. Replace handset to terminate page announcement.

#### C. All Call Paging (Internal/External)

1. Dial [70] or press the pre-programmed\* PAGE button.
2. Speak in normal tone of voice to deliver message.
3. Replace handset to terminate page announcement.

\*Refer to flexible button programming

### 320.25 RELEASE BUTTON

All DSS/DLS maps contain a Release button that may be pressed to disconnect or terminate an intercom call, transfer sequence, page announcement or CO call.

**330.1 LCD DISPLAYS**

The display is arranged into an upper and lower field. The upper field displays the current activity of the telephone. The lower field is divided into two sections. The left section of the lower field displays the date, speed bin number, connected intercom

station or outside line number. The right section of the lower field displays the current time or elapsed time on an outside call. The following Table shows what will appear on the LCD displays based on the function performed.

**Table 330-1 Liquid Crystal Displays (LCD)**

FUNCTION	CALLING STATION'S DISPLAY	CALLED STATION'S DISPLAY
Idle Station	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>STATION XXX</b>  <b>MM/DD/YY      HH:MM am</b> </div>	
Manually Dialing Outgoing Calls	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>18005551212</b>  <b>LINE XX      HH:MM :SS</b> </div>	
Recalling Line from Hold	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>LINE XX RECALLING</b>  <b>MM/DD/YY      HH:MM am</b> </div>	
Recalling Line from Another Station	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>RECALL FROM STA XXX</b>  <b>LINE XX      HH:MM:SS</b> </div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 5px;"> <b>RECALL FROM ..(name)..</b>  <b>LINE XX      HH:MM:SS</b> </div>	
Connected to an Incoming CO Line		<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>STATION XXX</b>  <b>LINE XX      00:00:10</b> </div>
Intercom Call	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>CALL TO STA XXX</b>  <b>MM/DD/YY      HH:MM am</b> </div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 5px;"> <b>CALL TO ..(name)..</b>  <b>MM/DD/YY      HH:MM am</b> </div>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>CALL FROM STA XXX</b>  <b>MM/DD/YY      HH:MM am</b> </div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 5px;"> <b>CALL FROM ..(name)..</b>  <b>MM/DD/YY      HH:MM am</b> </div>

Table 330-1 LCD Displays (Cont'd)

FUNCTION	CALLING STATION'S DISPLAY	CALLED STATION'S DISPLAY
Camp-on	<p>CALL TO STA XXX MM/DD/YY      HH:MM am</p>	<p>CAMP-ON BY STA XXX MM/DD/YY      HH:MM am</p>
	<p>CALL TO ..(name).. MM/DD/YY      HH:MM am</p>	<p>CAMP-ON BY ..(name).. MM/DD/YY      HH:MM am</p>
Conference	<p>CONFERENCE MM/DD/YY      HH:MM am</p>	<p>CONFERENCE MM/DD/YY      HH:MM am</p>
Internal Page	<p>INTERNAL PAGE ZONE X              HH:MM am</p>	<p>PAGE FROM STA XXX MM/DD/YY      HH:MM am</p>
		<p>PAGE FROM ..(name).. MM/DD/YY      HH:MM am</p>
External Page	<p>EXTERNAL PAGE ZONE X              HH:MM am</p>	
All Call Page	<p>ALL CALL PAGE MM/DD/YY      HH:MM am</p>	<p>PAGE FROM STA XXX MM/DD/YY      HH:MM am</p>
Meet Me Page	<p>ALL CALL PAGE MM/DD/YY      HH:MM am</p>	<p>PAGE FROM XXX MM/DD/YY      HH:MM am</p>
	<p>CALL FROM XXX MM/DD/YY      HH:MM am</p>	<p>CALL TO XXX MM/DD/YY      HH:MM am</p>

Table 330-1 LCD Displays (Cont'd)

FUNCTION	CALLING STATION'S DISPLAY	CALLED STATION'S DISPLAY
Station Call Forward (Originating Station) (Name in Display)	<div style="border: 1px solid black; padding: 2px; text-align: center;">                         FORWARDED TO STA XXX                          MM/DD/YY      HH:MM am                     </div> <div style="border: 1px solid black; padding: 2px; text-align: center;">                         FORWARDED TO ..(name)..                          MM/DD/YY      HH:MM am                     </div>	
Station No-Answer Call Forward (Originating Station)	<div style="border: 1px solid black; padding: 2px; text-align: center;">                         NO ANS FWD TO STA XXX                          MM/DD/YY      HH:MM am                     </div> <div style="border: 1px solid black; padding: 2px; text-align: center;">                         NO ANS FWD TO ..(name)..                          MM/DD/YY      HH:MM am                     </div>	
Station Busy/No-Answer Call Forward (Originating Station)	<div style="border: 1px solid black; padding: 2px; text-align: center;">                         BSY/NA FWD TO STA XXX                          MM/DD/YY      HH:MM am                     </div> <div style="border: 1px solid black; padding: 2px; text-align: center;">                         BSY/NA FWD TO ..(name)..                          MM/DD/YY      HH:MM am                     </div>	
Station Busy Call Forward (Originating Station)	<div style="border: 1px solid black; padding: 2px; text-align: center;">                         BUSY FWD TO STA XXX                          MM/DD/YY      HH:MM am                     </div> <div style="border: 1px solid black; padding: 2px; text-align: center;">                         BUSY FWD TO ..(name)..                          MM/DD/YY      HH:MM am                     </div>	
Forwarded Call (Name in Display)	<div style="border: 1px solid black; padding: 2px; text-align: center;">                         FORWARDED TO STA XXX                          VIA STA XXX      HH:MM am                     </div> <div style="border: 1px solid black; padding: 2px; text-align: center;">                         FORWARDED TO ..(name)..                          VIA STA XXX      HH:MM am                     </div>	<div style="border: 1px solid black; padding: 2px; text-align: center;">                         CALL FROM STA XXX                          VIA STA XXX      HH:MM am                     </div> <div style="border: 1px solid black; padding: 2px; text-align: center;">                         CALL FROM ..(name)..                          VIA STA XXX      HH:MM am                     </div>

Table 330-1 LCD Displays (Cont'd)

FUNCTION	CALLING STATION'S DISPLAY	CALLED STATION'S DISPLAY
Forwarded Intercom Call	<p>FORWARDED TO STA XXX VIA STA XXX    HH:MM am</p>	<p>CALL FROM STA XXX VIA STA XXX    HH:MM am</p>
Station Forwarding to a Voice Mail Group (Station Idle)	<p>FORWARDED TO VOICE MAIL MM/DD/YY        HH:MM am</p>	
Station Forwarding to a UCD Group (Station Idle)	<p>FORWARDED TO UCD 55X MM/DD/YY        HH:MM am</p>	
Preset Forward		<p>FORWARD RING LINE XX         HH:MM am</p>
Station calling a Station Forwarded to a Voice Mail Group	<p>FORWARDED TO VOICE MAIL VIA STA XXX    HH:MM am</p>	<p>FORWARDED TO VOICE MAIL MM/DD/YY        HH:MM am</p>
Call Pickup	<p>CALL TO STA XXX PICKED UP BY STA XXX    HH:MM am</p>	<p>CALL TO STA XXX FROM STA XXX    HH:MM am</p> <p>TRANSFER FROM STA XXX LINE XX         HH:MM am</p>
Exclusive Hold	<p>LINE HOLDING LINE XX         HH:MM am</p>	

Table 330-1 LCD Displays (Cont'd)

FUNCTION	CALLING STATION'S DISPLAY	CALLED STATION'S DISPLAY
Do Not Disturb	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>DO NOT DISTURB STA XXX MM/DD/YY      HH:MM am</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>DO NOT DISTURB ..(name).. MM/DD/YY      HH:MM am</p> </div>	<div style="border: 1px solid black; padding: 5px;"> <p>STATION IN DO NOT DISTURB MM/DD/YY      HH:MM am</p> </div>
Call Back	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>CALL BACK FROM STA XXX MM/DD/YY      HH:MM am</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>CALL BACK FROM ..(name).. MM/DD/YY      HH:MM am</p> </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>CALL FROM STA XXX MM/DD/YY      HH:MM am</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>CALL FROM ..(name).. MM/DD/YY      HH:MM am</p> </div>
Outside Line Transfer		<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>TRANSFER FROM STA XXX LINE XX      HH:MM am</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>TRANSFER FROM ..(name).. LINE XX      HH:MM am</p> </div>
Message Waiting		<div style="border: 1px solid black; padding: 5px;"> <p>MSG: XXX XXX XXX XXX XXX MM/DD/YY      HH:MM am</p> </div>
Reply to a Message Waiting	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>CALL TO STA XXX MM/DD/YY      HH:MM am</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>CALL TO ..(name).. MM/DD/YY      HH:MM am</p> </div>	<div style="border: 1px solid black; padding: 5px;"> <p>CALL BACK FROM STA XXX MM/DD/YY      HH:MM am</p> </div>

Table 330-1 LCD Displays (Cont'd)

FUNCTION	CALLING STATION'S DISPLAY	CALLED STATION'S DISPLAY
Programmed Flash Command (F)	<div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0;"> <p>F*12</p> </div>	
Programmed Pause Command (P)	<div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0;"> <p>950777P1234567 SPEED XX      HH:MM am</p> </div>	
Programmed Pulse-To-Tone Switchover (S)	<div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0;"> <p>950777S1234567 SPEED XX      HH:MM am</p> </div>	
CO Line Queuing	<div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0;"> <p>PLACED IN QUEUE FOR LINE XX      HH:MM am</p> </div> <div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0; margin-top: 10px;"> <p>QUEUE CALL BACK LINE XX      HH:MM am</p> </div>	
Hunt Groups	<div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0;"> <p>CALL TO STA XXX VIA HUNT      HH:MM am</p> </div> <div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0; margin-top: 10px;"> <p>CALL TO ..(name).. VIA HUNT      HH:MM am</p> </div>	
UCD Groups	<div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0;"> <p>CALL TO STA XXX VIA UCD      HH:MM am</p> </div> <div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0; margin-top: 10px;"> <p>CALL TO ..(name).. VIA UCD      HH:MM am</p> </div>	

Table 330-1 LCD Displays (Cont'd)

FUNCTION	CALLING STATION'S DISPLAY	CALLED STATION'S DISPLAY
Ringing CO Lines		<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>LINE RINGING</b>  <b>LINE XX            HH:MM am</b> </div>
Display Security Feature	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>DISPLAY SECURITY</b>  <b>LINE XX            HH:MM:SS</b> </div>	
Station Forwarding Off-Net	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>FORWARDED TO SPEED XX</b>  <b>MM/DD/YY            HH:MM am</b> </div>	
Calling a Station Forwarded Off-Net (before and after call is answered)	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>FORWARDED OFF NET</b>  <b>LINE XX            CALLED 102</b> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>2331234</b>  <b>LINE XX            HH:MM:SS</b> </div>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>FORWARDED TO SPEED XX</b>  <b>MM/DD/YY            HH:MM am</b> </div>
Calls in Queue (Agents and Overflow Stations)	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>01 CALLS IN QUEUE</b>  <b>MM/DD/YY            HH:MM am</b> </div>	
Calls in Queue (using Dial Code)	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>UCD 55X 02 CALLS IN QUEUE</b>  <b>MM/DD/YY            HH:MM am</b> </div>	
Unavailable Mode (Agent Station)	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>UNAVAILABLE UCD * XXX *</b>  <b>MM/DD/YY            HH:MM am</b> </div>	
Station calling a Voice Mail Group Pilot Number	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>CALL TO VOICE MAIL</b>  <b>MM/DD/YY            HH:MM am</b> </div>	

## SECTION 400

# GENERAL DESCRIPTION

### 400.1 SYSTEM TECHNOLOGY

The Starplus Family of Digital Key Telephone systems is comprised of two fully digital hybrid key telephone systems, the SPD 1428 and SPD 2856. These systems are designed to meet the telecommunications needs of a small to medium sized business offices. Both systems incorporate state of the art digital technology for command processing and voice switching utilizing a Pulse Coded Modulation/Time Division Multiplexing (PCM/TDM) voice control module. The family of Starplus Digital systems are also engineered to allow migration of the family of Starplus digital terminals and terminal accessories throughout the entire product line. In addition standard 2500-type telephone devices are supported by use of Single line interface PCB's and or SLA (OPX) adapters.

The SPD 1428 is the smallest member of the Starplus Digital family and fully configured supports a maximum of 14 CO/PBX/Centrex lines and 28 digital station devices. The SPD 1428 is a "flatpack", or single mother board system with plug on modules expanding the system via expansion and expander modules configured with either two (2) CO/PBX/Centrex lines by four (4) stations or four (4) CO/PBX/Centrex lines by eight (8) stations. A complete system capacity allows for use of up to 112 time slots for Stations, CO Lines, DTMF Receivers, or Data switching Modules. This extends non-blocking access to all system resources.

The SPD 1428 Basic KSU comes fully configured with power supply, Common control processor, PCM/TDM Voice switching matrix and interface circuits for four (4) CO/PBX/Centrex lines and interface circuits for eight (8) Digital terminal stations. The basic system is also equipped with one (1) RS-232C I/O port, one (1) DTMF receiver, a connector for one (1) Music On Hold channel that also provides for Background Music, and an on-board modem (300 baud) that provides access to the system for data base programming or remote maintenance and or diagnostics. Modules to provide additional I/O ports, and an optional 1200 baud modem module can also be added to the system.

The SPD 2856 system is the middle system in a family of Digital Hybrid Key Telephone systems and supports a maximum configuration of 28 CO/PBX/Centrex lines and 56 digital station devices. The SPD 2856 is a typical KSU system with plug in PCB's. The system capacity is expanded by installing four (4) circuit CO/PBX/Centrex lines by eight (8)

circuit station expansion PCB's. The complete system capacity allows for use of up to 112 time slots for Stations, CO Lines, DTMF Receivers, or Data switching Modules. This extends virtual non-blocking access to all system resources.

A basic SPD 2856 KSU ships complete with an on-board power supply. The CPB which is the only common equipment required for operation provides the microprocessor for command processing and Voice PCM/TDM switching. The CPB is also equipped with one (1) modular RS-232C I/O port, a connector for one (1) Music On Hold channel that also provides for Background Music, and an on-board modem (300 baud) that provides access to the system for data base programming or remote maintenance and or diagnostics. Modules to provide additional I/O ports, and an optional 1200 baud modem module can also be added to the CPB.

Both systems are installed using industry standard blocks, jacks and skinny wire cabling. This combined with the ability to program the system using a key terminal (digital display terminal) reduces installation cost and maintenance requirements.

All CO interfaces are equipped with transformer barriers, for system classification as an FCC fully protected system. Each CO circuit supports rotary (out-pulse) dialing and loop supervision (disconnect detection) under software control. The DTMF tone signals and system supervisory tones can be generated in each keyset or on the main PCB. Both Starplus Digital systems use a proprietary tone plan for providing internal progress tones with the exception of OPX stations which are provided with a "pre-ise" tone plan.

The Starplus family of digital terminals include a display and non-display 34 button stations. Optional station terminals include a Digital DSS/DLS Console, and a Single Line adapter (Off-Premise Extension (OPX) adapter) which are all upward and downward compatible to the entire Starplus digital product line.

The system architecture allows system programming changes to be made without interrupting state event software control of normal communications. Call processing continues while the customer data base is updated. All programming changes to the customer data base programming are made either from a digital terminal (digital display terminal) connected to Port 01 or from a data terminal or PC connected to either a I/O port or remotely via the on-board modem.

The Starplus product line is tailored to meet immediate and long term customer needs. Most commonly used features are activated by direct button selection. However, many functions may be alternately accessed by dialing specific codes or as another option by assigning these dial codes to a FLEX button on a digital terminal. This permits flexible use of the Starplus Digital systems.

Future software enhancements and upgrades are easily retrofitted and installed in the system. This will in most cases provide backward compatibility with existing Starplus Digital hardware further reducing the cost to upgrade or add features to an installed system.

#### 400.2 SPD 1428 COMMON EQUIPMENT

##### A. Basic Key Service Unit with Power Supply (BKSU)

The SPD 1428 Basic Key Service Unit (KSU) is housed in a wall mountable cabinet the contains the Key Service board (KSB), Power Supply and pre-wired connectors for stations and CO Line interface. The SPD 1428 Digital Key Telephone System is a microprocessor (68000) controlled, solid state electronic switch which distributes communications using Pulse Coded Modulation/Time Division Multiplexing (PCM/TDM) technology. All control, switching and interface circuitry is condensed onto a single printed circuit board (PCB), the main key service board, located inside the key service unit (KSU).

The basic system comes fully configured for four (4) CO/PBX/Centrex lines and eight (8) Stations. The basic KSU also contains one (1) RS-232C I/O port, one (1) DTMF Receiver, one (1) connector for Background Music and Music on Hold, an on-board 300 baud modem port, and one external page port. The basic KSU also contains two connectors for adding a 2x4 CO/Station Expander module (J9 and J10), an optional I/O module that adds one additional RS-232C port and one RS-422 port, and an optional 1200 baud modem module can be added to increase the speed of transmission of the on-board modem port. A reset (halt) switch and a BGM volume control are also mounted on the PCB. In addition two connectors are provided for adding an Expansion KSU which will allow the system to expand to a total of 14 CO/PBX/Centrex lines and 28 digital station ports. Refer to Figure 400-1 for a PCB layout and location of connectors.

##### Power Supply:

The power supply, installed in the KSU at the time of manufacture, has an input voltage of 117 VAC  $\pm 10\%$ . The power supply provides power, a filtered/unregulated  $\pm 12$  VDC, to the main key service

board. A slo-blow 1.5 amp fuse on the AC side of the transformer provides the necessary fire and overload protection. Power is regulated and distributed to stations / circuitry in the system on the main key service board. The power supply and cabinet meet all safety requirements to comply with UL 1459 Second Edition and CSA 0.3 standards.

##### CPU and Memory:

The SPD 1428 system is controlled by a 16-bit (68000) main micro-processor which controls all system functions including the PCM/TDM voice switching under the direction of ROM and RAM software coding. The main key service board is responsible for all control functions, execution of all logic operations and control of system modules including control over the circuitry necessary for voice switching and conference connections. The main key service board is also responsible for all system tones, system timing, and station status control. In addition the main key service board provides software and hardware support of the following:

- Real Time clock.
- Watch dog timer and recovery.
- PCB status as to presence/absence of modules for automatic software configuration setup.
- State/event software design.
- Backup of customer database RAM memory via a "supper Cap" (supper capacitor).

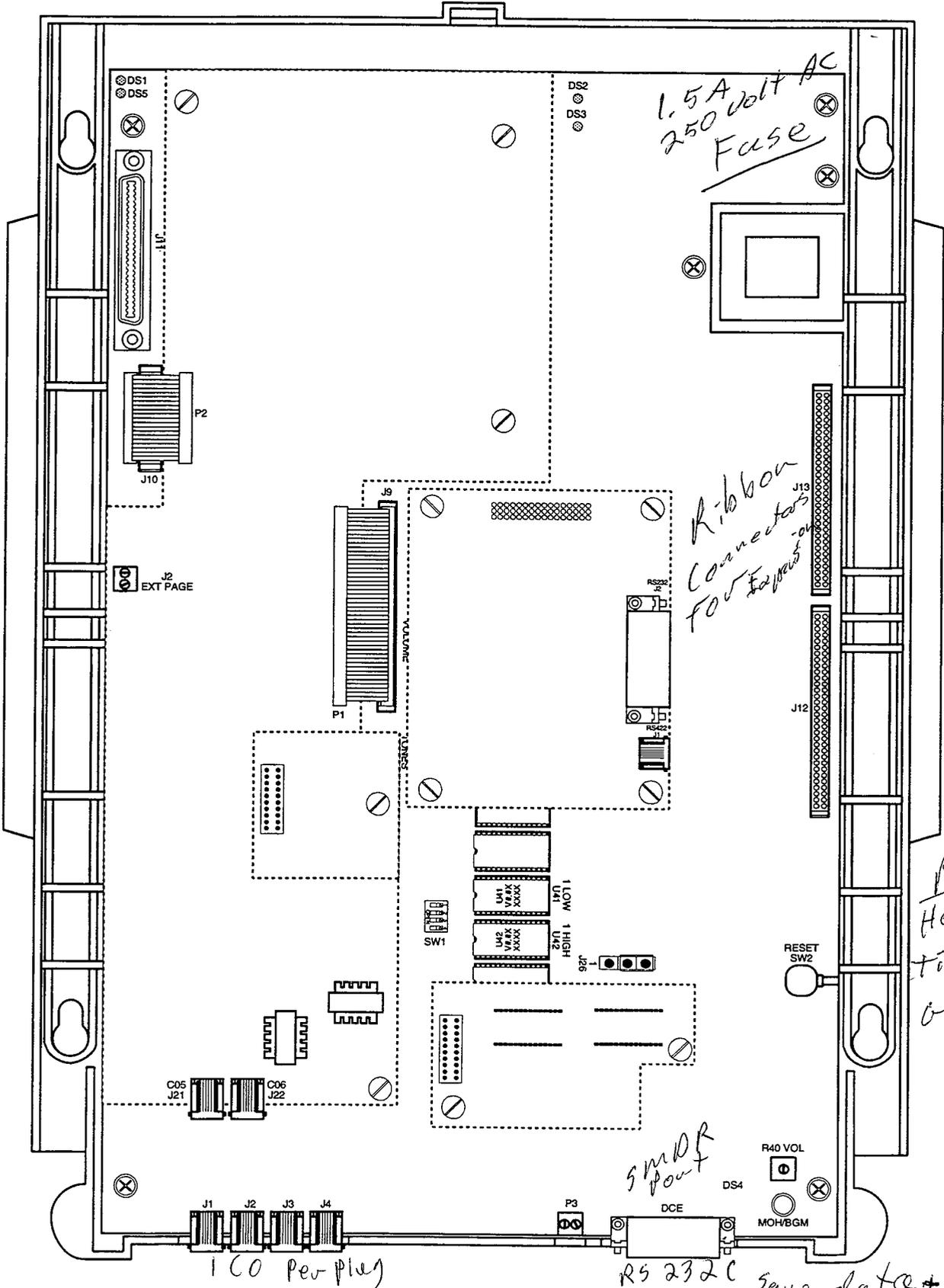
System software is provided in EPROM memory and is installed on the main key service board. The system contains (512) kilobytes of EPROM storage and is equipped with 128K of "battery"-backed static RAM. Provisions have been made on the card to address up to (2) megabytes of EPROM memory and up to (2) megabytes of static RAM.

##### CO Line/Station Interfaces:

The BKSU contains the necessary circuitry to connect four (4) CO/Centrex/PBX loop start lines and eight (8) Digital Key Telephones to the system. This card also contains one additional voice (transmit) path for external paging.

The main key station board contains four (4) Central Office, Centrex or PBX loop start, line interfaces. The protection circuitry to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). Each CO line interface design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA 0.3 standards. CO

300  
Baud  
Modem



Clear  
Room  
For  
Expansion

Reset  
Hold down  
till DS4  
goes out

Figure 400-1 Starplus Basic KSU & Main Key Service Board

save data +  
program

lines are connected to the system via RJ-11 modular jacks mounted on the bottom of the main key service board.

The main key station board also provides the interface for eight (8) Digital Key Telephones using two (2) 64 kilobyte channel arrangements. Stations connect to the board via the MDF through a 50 pin connector located inside the KSU. Each station connection requires four (4) wires to connect to the board.

A Digital DSS/DLS Console, and Single Line Telephone Adapter (OPX) or other specifically designed adapter with a digital interface can be assigned to any one of the interface circuits. The Key Station interface circuits are protected from mis-wiring and over-current.

The main key service also contains an on-board modem that is capable of transmitting data at a rate of 300 baud. The modem supports and is compatible with the Hayes command protocol. The Bell System (Western Electric) standards 103 and 212A for modem design is incorporated into the design of this modem. The modem operates on-line in both Full and Half duplex modes. An optional 1200 baud module may be added to the main key service unit to allow transmission at the rate of 1200 baud.

#### **B. SPD 1428 Expansion KSU with Power Supply (EKSU)**

The SPD 1428 Expansion KSU is a unit which comes equipped with a power supply and circuitry providing four (4) additional loop start CO/PBX/Centrex line ports and eight (8) digital station ports to the Basic KSU. The Expansion KSU is a wall mountable cabinet that mounts directly to the right of the Basic KSU and connects via two (2) ribbon type cables provided with the unit. All processing and control functions as well as voice connections and switching are controlled by circuitry on the Basic KSU and transmitted to the Expansion KSU through the ribbon cables.

The Expansion key service board allows connection of one optional application module (i.e. DTMF Receiver) to the system and connector(s) for installing an additional SPD 1428 2x4 Expander Module or the SPD 1428 4x8 Expander Module. Refer to Figure 400-2 for the Expansion Key Service board (PCB) layout and location of connectors.

#### **Power Supply**

The power supply, installed in the Expansion KSU at the time of manufacture, has an input voltage of 117 VAC  $\pm 10\%$ . The power supply provides power, a filtered / unregulated  $\pm 12$  VDC, to the Expansion key service board. A slo-blow 1.5 amp fuse on the AC side of the transformer provides the necessary fire and overload protection. Power is regulated and distributed to stations / circuitry in the system on the Expansion key service board. The power supply and cabinet meet all safety requirements to comply with UL 1459 Second Edition and CSA 0.3 standards.

#### **CO Line/Station Interfaces**

The EKSU contains the necessary circuitry to connect an additional four (4) CO/Centrex/PBX loop start lines and eight (8) Digital Key Telephones to the system. This card also contains one additional voice (transmit) path for external paging.

The Expansion key station board contains four (4) Central Office, Centrex or PBX loop start, line interfaces. The protection circuitry to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). Each CO line interface design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA 0.3 standards. CO lines are connected to the system via RJ-11 modular jacks mounted on the bottom of the Expansion key service board.

The Expansion key station board also provides the interface for eight (8) Digital Key Telephones using two (2) 64 kilobyte channel arrangements. Stations connect to the board via the MDF through a 50 pin connector located inside the KSU. Each station connection requires four (4) wires to connect to the board.

A Digital DSS/DLS Console, and a Single Line Telephone Adapter (OPX) or other specifically designed adapter with a digital interface can be assigned to any one of the interface circuits. The Key Station interface circuits are protected from mis-wiring and over-current.

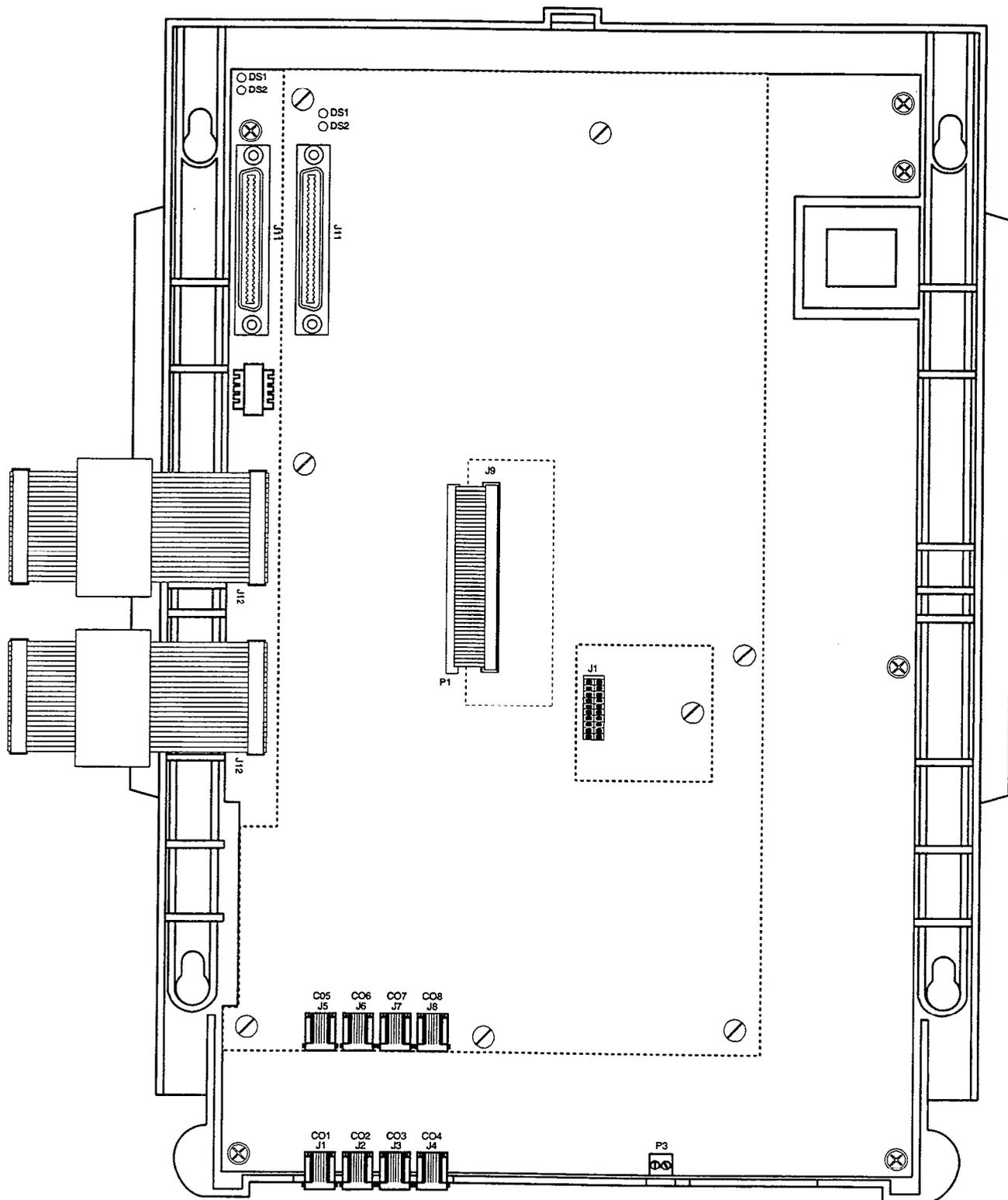


Figure 400-2 Starplus Expansion KSU (EKSU)

**C. 2x4 CO/Station Expander Module**

The SPD 1428 2x4 CO/STA Expander Module is a Two (2) CO by four (4) Key Station Interface module that plugs onto the main key service board of the basic KSU or the Expansion Key Service board of the Expansion KSU with the use of two ribbon cables. This module is a combination board that contains the necessary circuitry to connect two (2) CO/Centrex/PBX loop start lines and four (4) Digital Key Telephones to the system. This card also contains one additional voice (transmit) path for external paging, and a connector for adding one application module (i.e. DTMF Receiver) to the system.

*NOTE: When the 2x4 Expander module is installed in the Expansion KSU two CO ports and four Station ports become unusable. This DOES NOT however reduce the total system capacity of 14 CO lines and 28 Stations.*

**CO Line/Station Interfaces**

The 2x4 CO/STA Expander Module provides the interface for two (2) Central Office, Centrex or PBX loop start, lines. The protection circuitry necessary to allow the system to be classified as a fully protected system are located on the card for each CO

circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). The module design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA 0.3 standards. CO lines are connected to the system via RJ-11 modular connectors mounted on the bottom edge of the board.

The 2x4 CO/STA Expander module also provides the interface for four (4) Digital Key Telephones using two (2) 64 kilobyte channel arrangements. Stations connect to the board via the MDF through a 50 pin connector located on the main key service board inside the basic KSU or a similar connector on the expansion key service board when installed in the EKSU. Each station connection requires four (4) wires to connect to the board.

A Digital DSS/DLS Console, and a Single Line Telephone Adapter (OPX), or other specifically designed adapter with a digital interface can be assigned to any one of the interface circuits. The Key Station interface circuits are protected from mis-wiring and over-current.

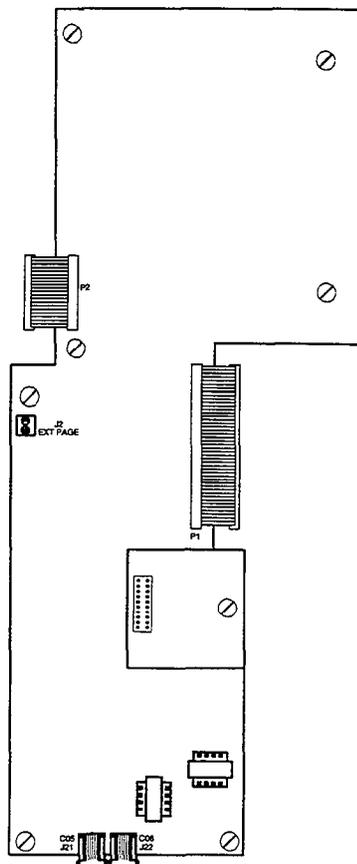


Figure 400-3 2x4 Expander Module

#### D. 4x8 CO/Station Expander Module

The SPD 1428 4x8 CO/STA Expander Module is a four (4) CO by eight (8) Key Station Interface module that may plug onto the Expansion key service board of the Expansion KSU only. This module is a combination board that contains the necessary circuitry to connect four (4) CO/Centrex/PBX loop start lines and eight (8) Digital Key Telephones to the system. This card also contains one additional voice (transmit) path for external paging, and a connector for adding one application module (i.e. DTMF Receiver) to the system.

#### CO Line/Station Interfaces

The 4x8 CO/STA Expander Module provides the interface for four (4) Central Office, Centrex or PBX loop start, lines. The protection circuitry necessary to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). The module design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA 0.3 standards. CO lines are connected to the

system via RJ11 modular connectors mounted on the bottom edge of the board.

The 4x8 CO/STA Expander module also provides the interface for eight (8) Digital Key Telephones using two (2) 64 kilobyte channel arrangements. Stations connect to the board via the MDF through a 50 pin connector located on the board. Each station connection requires four (4) wires to connect to the board.

A Digital DSS/DLS Console, and a Single Line Telephone Adapter (OPX) or other specifically designed adapter with a digital interface can be assigned to any one of the interface circuits. The Key Station interface circuits are protected from mis-wiring and over-current.

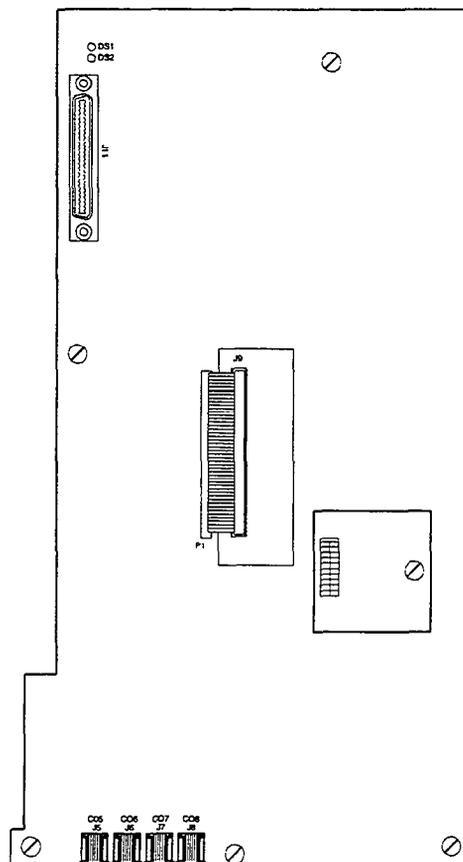


Figure 400-4 4x8 Expander Module

### 400.3 SPD 2856 SYSTEM COMPONENTS

The following components are necessary to operate the SPD 2856 Digital Key Telephone System: (Refer to Appendix B for a complete Starplus Digital (SPD) Key Telephone System component list with Part #'s)

- Equipment Cabinet w/Power Supply (KSU)
- Central Processing Board (CPB)
- 4x8 CO/Digital Interface Board (CKB)
- 4x8 CO/SLT Interface Board (CSB) (Future)

#### A. Equipment Cabinet With Power Supply (KSU)

The SPD 2856 system main cabinet contains the power supply and mother board to support a fully configured system of 28 CO Lines and 56 Stations. The mother board has eight (8) card slots. Card Slot J8 (the right most card slot) is used for the Central Processor Board (CPB) PCB. Card slots J1 through J7 each support a four (4) CO line by eight (8) station PCB's. Cable exits through the bottom of the KSU through a cable exit raceway near the back of the KSU. Refer to Figure 400-5 for printed circuit board layout and location of connectors.

#### Power Supply

The power supply is installed in the KSU at the time of manufacture and ships with the KSU. The power supply input voltage is 117 VAC  $\pm 10\%$ . The power supply provides power distribution of filtered / unregulated 12 VDC and a regulated -5 VDC to the backplane bus. An ON/OFF switch is located on the front of the power supply along with a slo-blow 5 amp fuse on the AC side of the transformer. The power supply provides an input for a 48 VDC source for future use. Power is regulated and distributed to stations / circuitry in the system on each PCB. Three fuses located inside the power supply protect the system from over-current situations. The power supply and cabinet meet all safety requirements to comply with UL 1459 Second Edition and CSA 0.3 standards.

#### B. Central Processor Board (CPB)

This plug-in card is the only common equipment card required to make the system operational and controls all system activity. The CPB contains the main micro-processor a 16-bit (68000) and a real time clock which controls all system functions including the PCM/TDM voice switching under direction of ROM and RAM software coding. The CPB is responsible for all control functions, execution of all logic operations and control of system modules including control over circuitry necessary for voice switching and conference connections. The CPB is also responsible for all system tones, system timing, and station status control. In addition the CPB also

provides software and hardware support to ensure the following:

- Watch dog timer and recovery.
- PCB status as to presence/absence of cards for automatic software configuration setup.
- Interpret an ID code from each PCB so that card type can be determined automatically.
- State/event software design.
- Battery backup of customer database RAM memory.

The CPB contains the circuitry and connection (RCA type) for background music/music on hold, and the standard 300 Baud Modem. An optional 1200 Baud Modem can be installed on the CPB to allow the on-board modem to transmit at a 1200 baud rate. In addition there is one RS-232 (modular connector) input/output port on the CPB and a connector to support the use of an optional I/O expansion module. The I/O expansion module adds (1) RS-232 I/O port and (1) RS-422 I/O port to the system for a system total of three (3) I/O ports. A reset (halt) push button switch and a BGM/MOH volume control pot is located on the front of the PCB. Refer to Figure 400-6 for the location of the Central Processing Board connectors.

System software is provided in EPROM memory and is installed on the CPB. The CPB contains (512) kilobytes of EPROM storage and is equipped with 256K of battery-backed static RAM. Provisions have been made on the card to address up to (4) megabytes of EPROM memory and up to (2) megabytes of static RAM.

#### Modem Interface

The CPB contains an on-board modem that is capable of transmitting data at a rate of 300 baud. The modem supports and is compatible with the Hayes command protocol. The Bell System (Western Electric) standards 103 and 212A for modem design is incorporated into the design of this modem. The modem operates on-line in both Full and Half duplex modes. An optional 1200 baud module may be added to the CPB to allow transmission at the rate of 1200 baud.

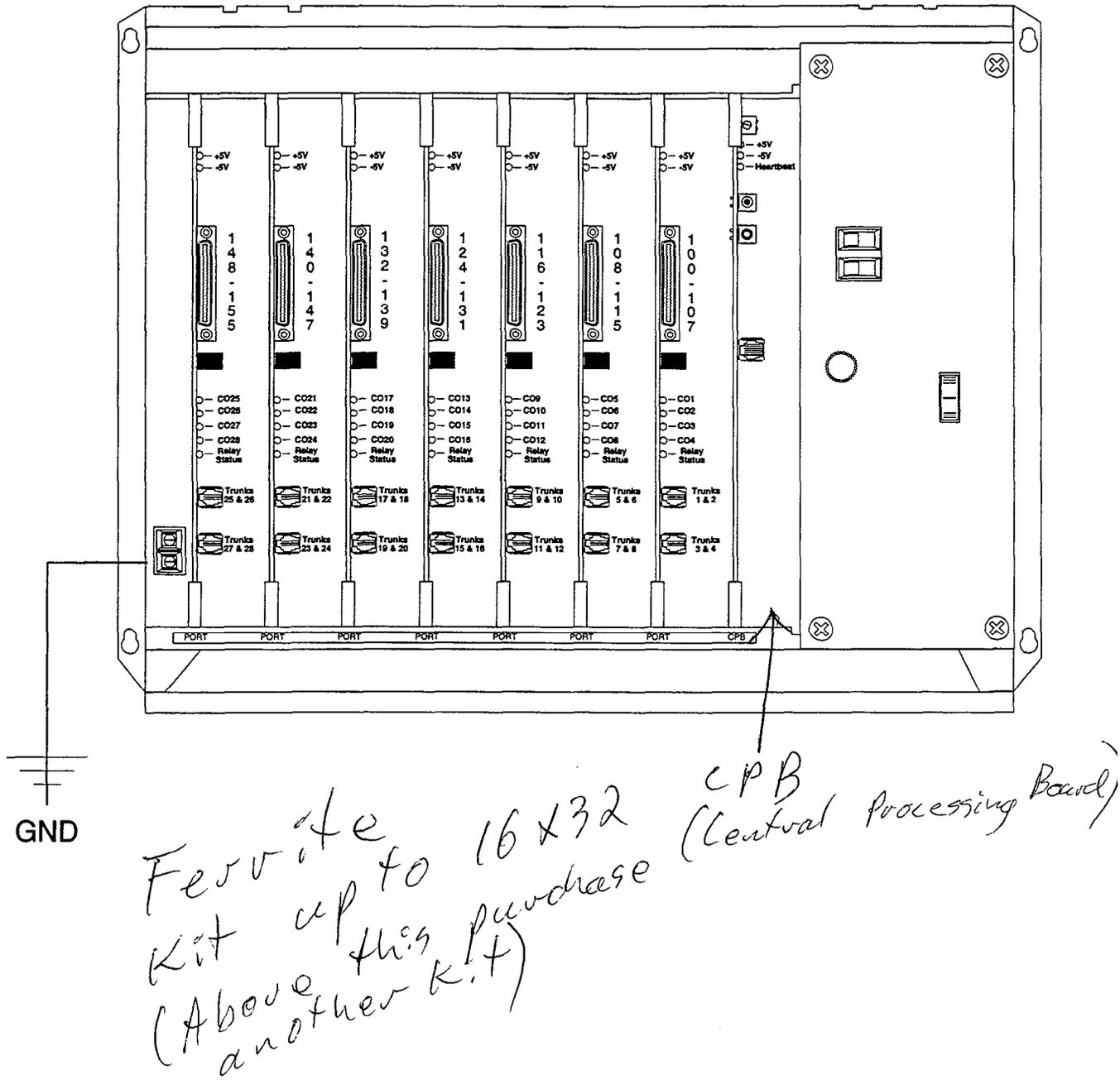


Figure 400-5 Starplus SPD 2856 Equipment Cabinet (KSU)

*straps should be in on position in all applications - except storage*

*Change out all exchange 4 chips if you exchange with 2 chips*

*Tells if meg 2 or 4 chips*

*None 1 protocol*

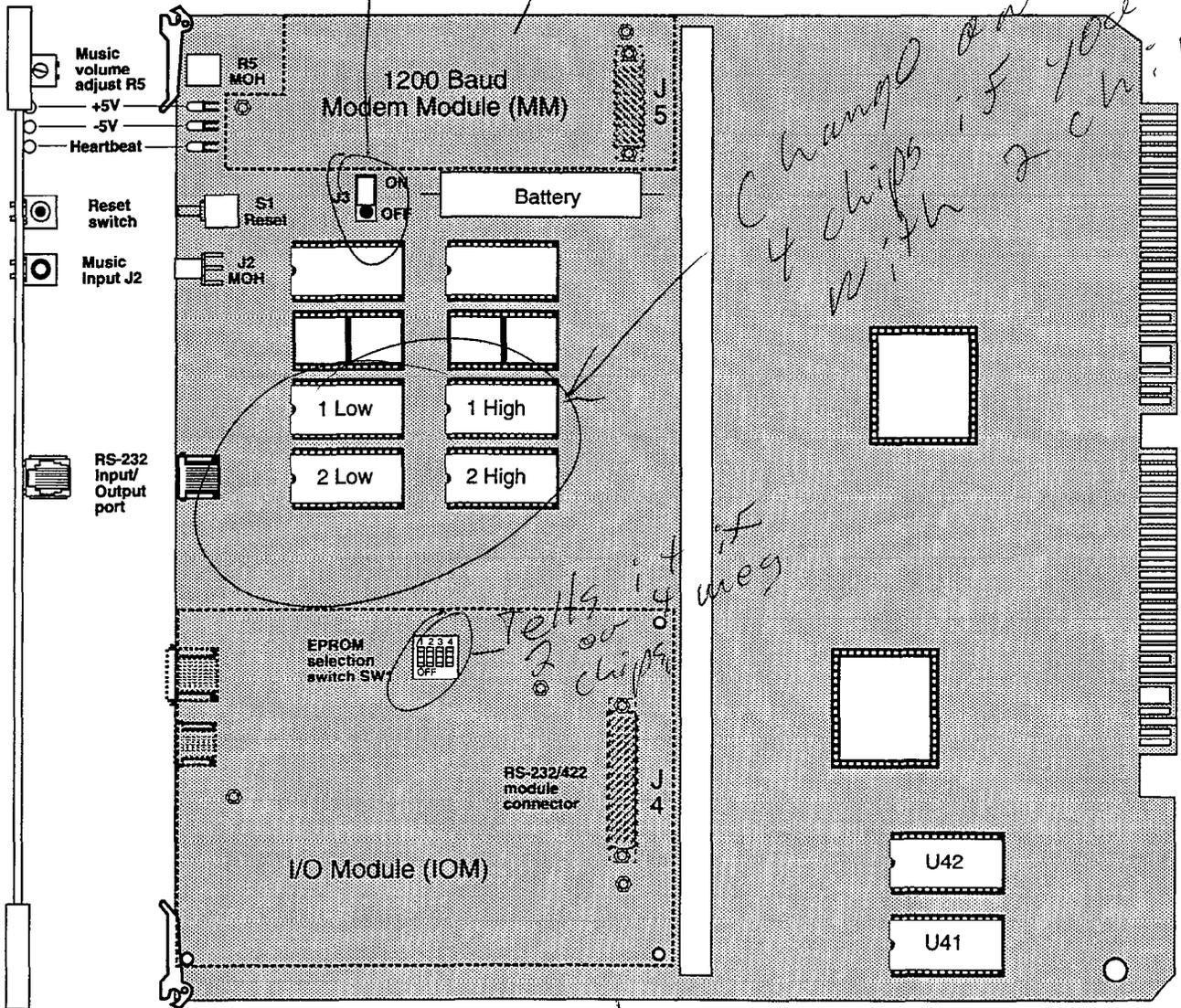


Figure 400-6 Central Processing Board (CPB)

**C. 4 x 8 CO/Station Key Interface Board (CKB)**

The CKB is a four (4) CO by eight (8) Key Station Interface board. The CKB board is a combination card that contains the necessary circuitry to connect four (4) CO/Centrex/PBX loop start lines and eight (8) Digital Key Telephones to the system. This card also contains one additional voice (transmit) path for external paging, a multi purpose relay and a connector for adding one application module to the system. Refer to Figure 400-7 for location of connectors.

**CO Line/Station Interfaces**

The CKB provides the interface for four (4) Central Office, Centrex or PBX loop start, lines. The protection circuitry necessary to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). The CKB design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA 0.3 standards.

The CKB also provides the interface for eight (8) Digital Key Telephones using two (2) 64 kilobyte channel arrangements. Stations connect to the board via the MDF through a 50 pin connector located on the front edge of the board. Each station connection requires four (4) wires to connect to the board.

A Digital DSS/DLS Console, and a Single Line Telephone Adapter (OPX), or other specifically designed adapter with a digital interface can be assigned to any one of the interface circuits. The Key Station interface circuits are protected from mis-wiring and over-current.

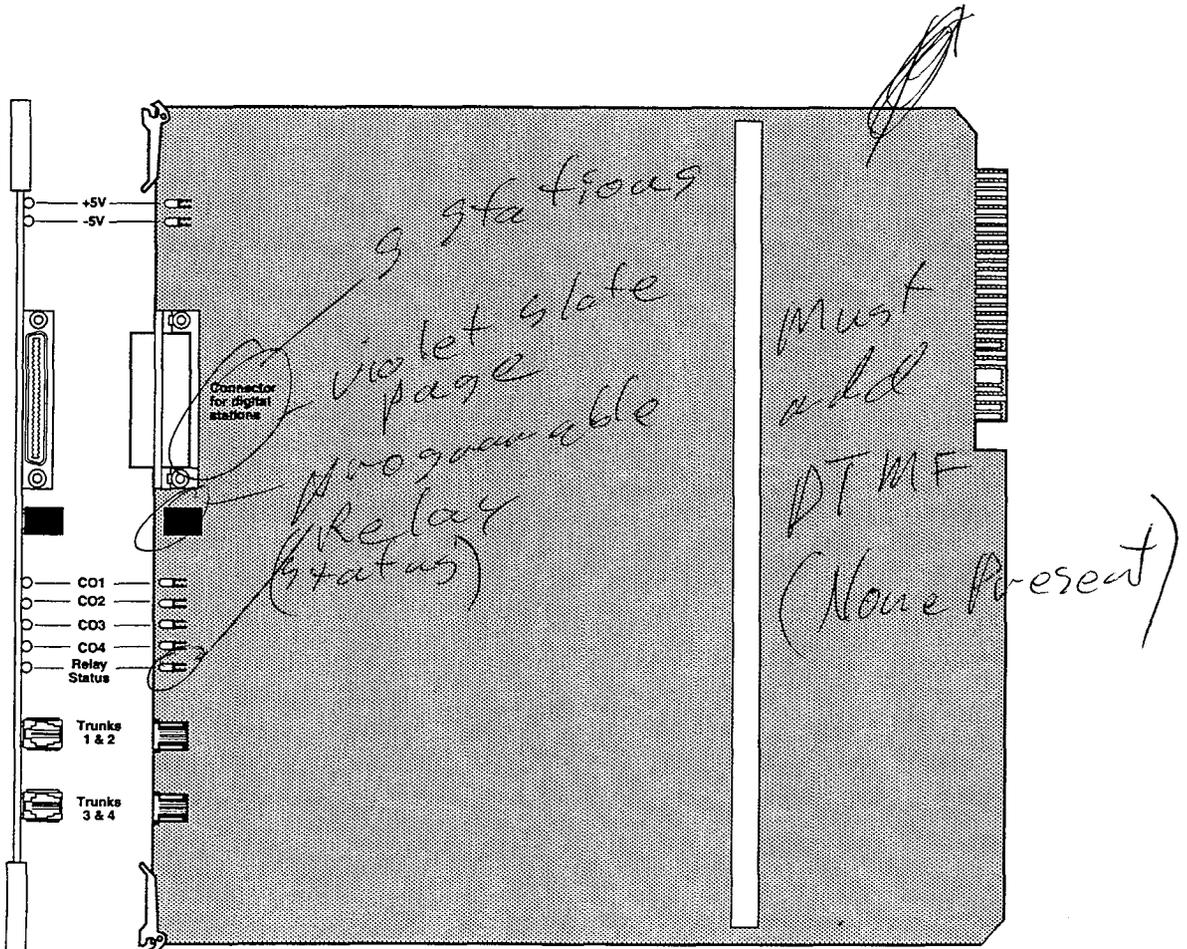


Figure 400-7 4x8 CO/Station Interface Board (CKB)

**D. 4x8 CO/SLT Interface Board (CSB) (Future)**

The CSB is a four (4) CO Line by eight (8) Single Line Station Interface board. The CSB board is a combination card that contains the necessary circuitry to connect four (4) CO/Centrex/PBX loop start lines and eight (8) Standard Single Line Telephone (2500 type) to the system. This card also contains one additional voice (transmit) path for external paging, a multi purpose relay and a connector for adding one application module to the system. The CSB requires a 48 Vdc Power Supply/Ring Generator, and at least one DTMF Receiver module (RM) must be installed in the system. Refer to Figure 400-8 for location of connectors.

Edition and CSA 0.3 standards. The CSB does not support data devices for data switching.

The CSB provides the control and interface for eight (8) standard Single line telephones (2500 type). Eight 24 volt DC single line circuits are provided on the PCB. These single line telephones can be equipped with a standard Message Waiting Lamp (90V T & R) that operate on the "tip" and "ring" leads. Additionally each circuit may be individually "strapped" or "optioned" to provide a loop interrupt to the connected SLT or device. The card will support single line Telephones up to 1500 feet from the KSU.

**CO Line/Station Interfaces**

The CSB provides the interface for four (4) Central Office, Centrex or PBX loop start, lines. The protection circuitry necessary to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). The CSB design also provides proper fusing or protection to comply with the requirements of UL 1459 Second

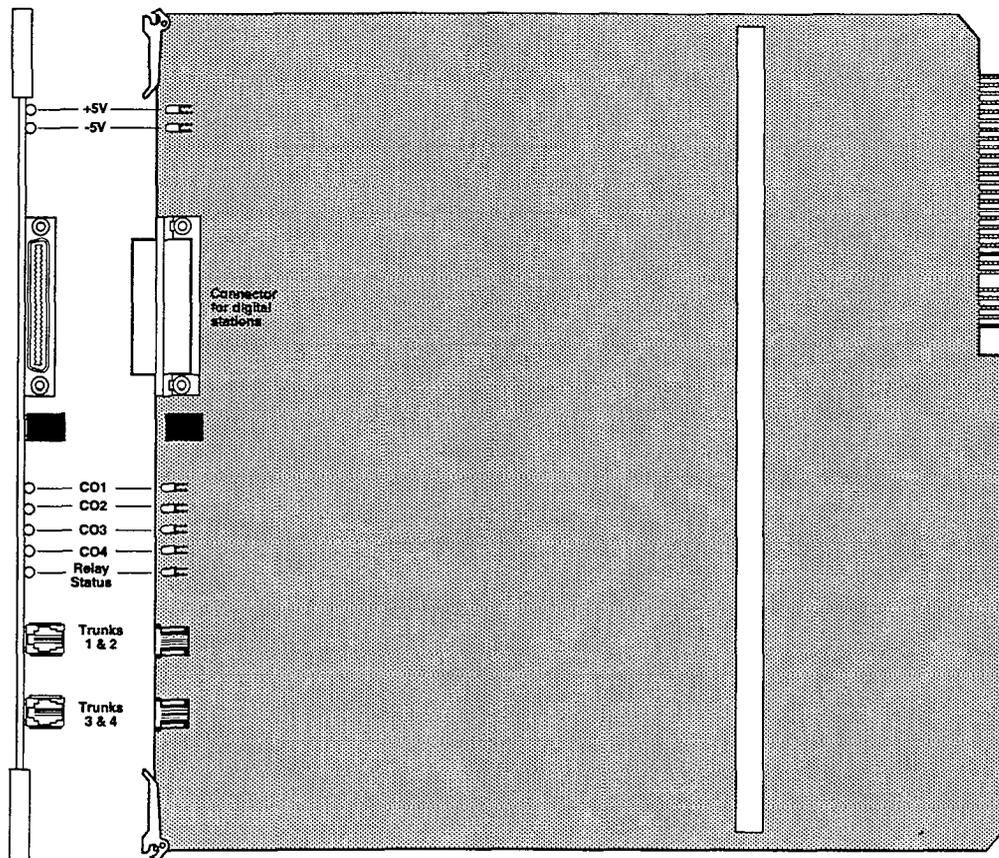
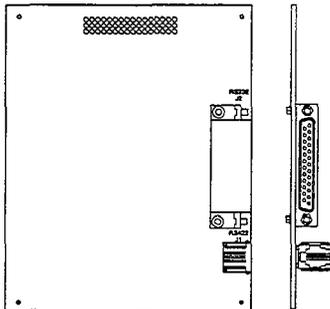


Figure 400-8 4x8 CO/SLT Interface Board (CSB)

#### 400.4 APPLICATION MODULES

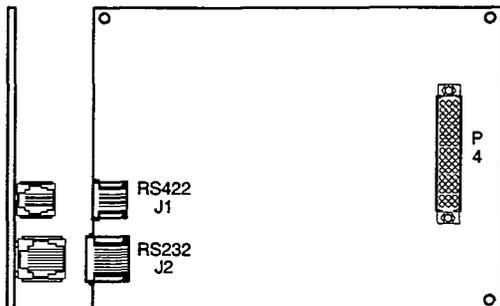
##### A. SPD 1428 Expansion I/O Module (IOM)

The SPD 1428 contains one RS-232C, I/O port (Female, DB-25 type connector) located on the main key service board (J5). This optional I/O module may be added to the main key service board (on connector J15) adding one additional RS-232C port (female, DB-25 type connector) and one RS-422 port (6 pin modular jack connector). Each I/O port on this module is capable of transmitting and receiving data at 300, 1200, 2400, 4800 and 9600 baud rates.



##### B. SPD 2856 Expansion I/O Module (IOM)

This module provides one (1) RS-232 I/O port (8 pin modular jack) and one (1) RS-422 I/O port (6 pin modular jack). This module is installed on the SPD 2856 CPB PCB and adds the two I/O ports to the one (1) RS-232 I/O port already on the CPB for a total of three (3) I/O ports allowed in the system. Each port is independently programmed for its use and the rate of speed in which it transmits and receives data (baud rate). The options are 300, 1200, 2400, 4800, and 9600 baud rates all at 8 data bits, 1 stop bit, with No parity.

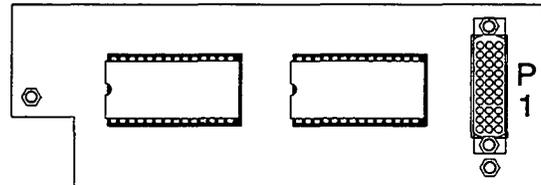


##### C. 1200 Baud Modem Module (MM)

This optional 1200 baud modem can be installed on either the SPD 1428 or the SPD 2856 to add the capability of communicating with the system from a remote site or location at the rate of 1200 baud. Both systems provide as standard an on-board modem capable of transmitting data at 300 baud. With this module installed, transmission baud rate of 1200 baud is selected.

Connection to the modem is accomplished by simply calling into the system and connecting to the modem. This can be done by; ringing directly to the modem, by going through DISA, or after being answered by a station user and transferred to the modem port. Connection to the modem port is under software control.

The 1200 baud modem module maintains the compatibility with the Hayes command protocol and uses the Bell System (Western Electric) standards 103 and 212A for modem design. The modem operates on-line in both Full and Half duplex modes.



##### D. DTMF Receiver Module (RM)

This module is used to provide DTMF receivers in the system to support single line telephone and DISA applications. Currently this module can be added to the SPD 1428 Expansion KSU, SPD 1428 2x4 and 4x8 Expander modules and to any SPD 2856 combination CO / Station Board. Each module contains 1 DTMF receiver for a maximum of four (4) in the SPD 1428\* and seven (7) modules that can be installed in the SPD 2856 system.

\*NOTE: The SPD 1428 Basic KSU was designed with one (1) DTMF Receiver incorporated onto the main key service board.

The DTMF Receiver module plugs onto a 20 pin connector on the following PCB's (one module may be installed on each PCB);

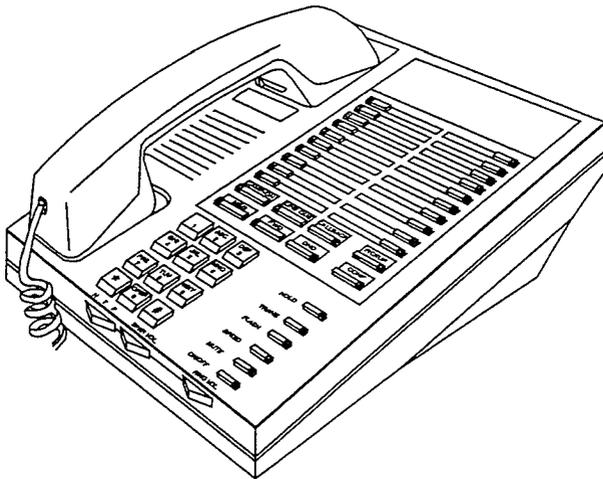
- SPD 1428 Expansion KSU, (expansion key service unit)
- SPD 1428 2x4 Expander Module
- SPD 1428 4x8 Expander Module
- SPD 2856 4x8 CO/Station Interface board (CKB)
- SPD 2856 4x8 CO/SLT Interface board (CSB)
- Additional PCB's as designed.

**400.5 SPD 1428 & SPD 2856 TERMINALS**

**A. 34 Button Digital Terminal (Enhanced)**

The 34 button Digital Terminal is a new line of Digital electronic telephone terminals. The line consists of an Enhanced (non-display) and an Executive (with display). This new line of telephones will be designed to operate with the new line of Starplus digital key and PBX systems. The 34 button Digital Terminal is connected to the KSU via a four wire (two twisted pair) connections from an appropriate electronic terminal interface board.

The terminal communicates to the KSU through two (2) 64K digital channel arrangements. One channel is used as the primary voice channel, a second is used for terminal to KSU command transmission. Power is also provided to the terminal via the four (4) wire connection.



**Buttons and LED's:**

The 34 button Digital terminal key board PCB provides long life "super bright" Light Emitting Diodes (LED's) and button assemblies that protrude through the top housing. The buttons are small rectangle in shape with a clear end for proper LED visibility and diffusion. The 34 button Digital Terminal has 34 buttons all containing LED's plus a 12 key dial pad.

The 34 button Digital Terminal scans the key board for dial pad and button debounces and depressions for command transmission to the KSU. The keyset has the following buttons defined as follows:

**Display and Non-Display**

- 12 Dial Key Pad\*
- 28 Flexible Buttons
- 1 ON/OFF button (fixed)
- 1 MUTE button (fixed)
- 1 SPEED button (fixed)
- 1 FLASH button (fixed)
- 1 TRANSfer button (fixed)

- 1 HOLD button (fixed)

\* All buttons except the 12 Dial key pad have an LED associated with it. Refer to Figure 400-9 for default button mapping.

**Speakerphone:**

Each 34 button Digital Terminal is equipped with a unit that enables the telephone to be used handsfree in two-way conversations. The user activates the speakerphone by pressing the ON/OFF button (LED lights steady). To terminate a speakerphone call the ON/OFF button is toggled OFF (LED extinguished). The MUTE feature is used in conjunction with the speakerphone option. To mute the speakerphone microphone the MUTE button is pressed (LED lights steady), to reactivate the microphone the MUTE button is pushed again (LED extinguished).

Several programmable options control the speakerphone operation. Each digital terminal can be programmed for full speakerphone operation, or monitor/On-Hook dialing capabilities with no full speaker phone operation.

When Automatic pre-selection is enabled at the station when any button is pressed (i.e. CO, DSS, Page etc...) the station and speakerphone is automatically activated.

**Volume Controls:**

Separate "slide" switches are provided on the front of the Starplus Digital Terminal to adjust the volume of the voice and tones presented to the terminal speaker.

- The "SPKR VOL" will control all voice signals sent to the speaker i.e. Speaker Phone conversations, BGM, and Page announcements.
- The "RING VOL" will control all tone signals presented to the speaker i.e. Ringing, splash tones, Camp-On etc... Muted ringing will also be controlled by the "RING VOL" slide switch. The Muted ringing volume will be proportionately quieter than normal ringing based on the current switch setting.

**H-T-P Switch:**

A three (3) position slide switch is located on the front of the Digital Display Terminal that controls the method of receiving intercom calls.

- The "H" position allows intercom call announce with hands free reply.
- The "T" position provides Tone only intercom ringing.
- The "P" position allows Call Announce intercom calls only.

*Push mute key to respond or pick up handset*

*Full speed*  
*Enhanced or Executive - LCD*  
*Basic Non display of keys*

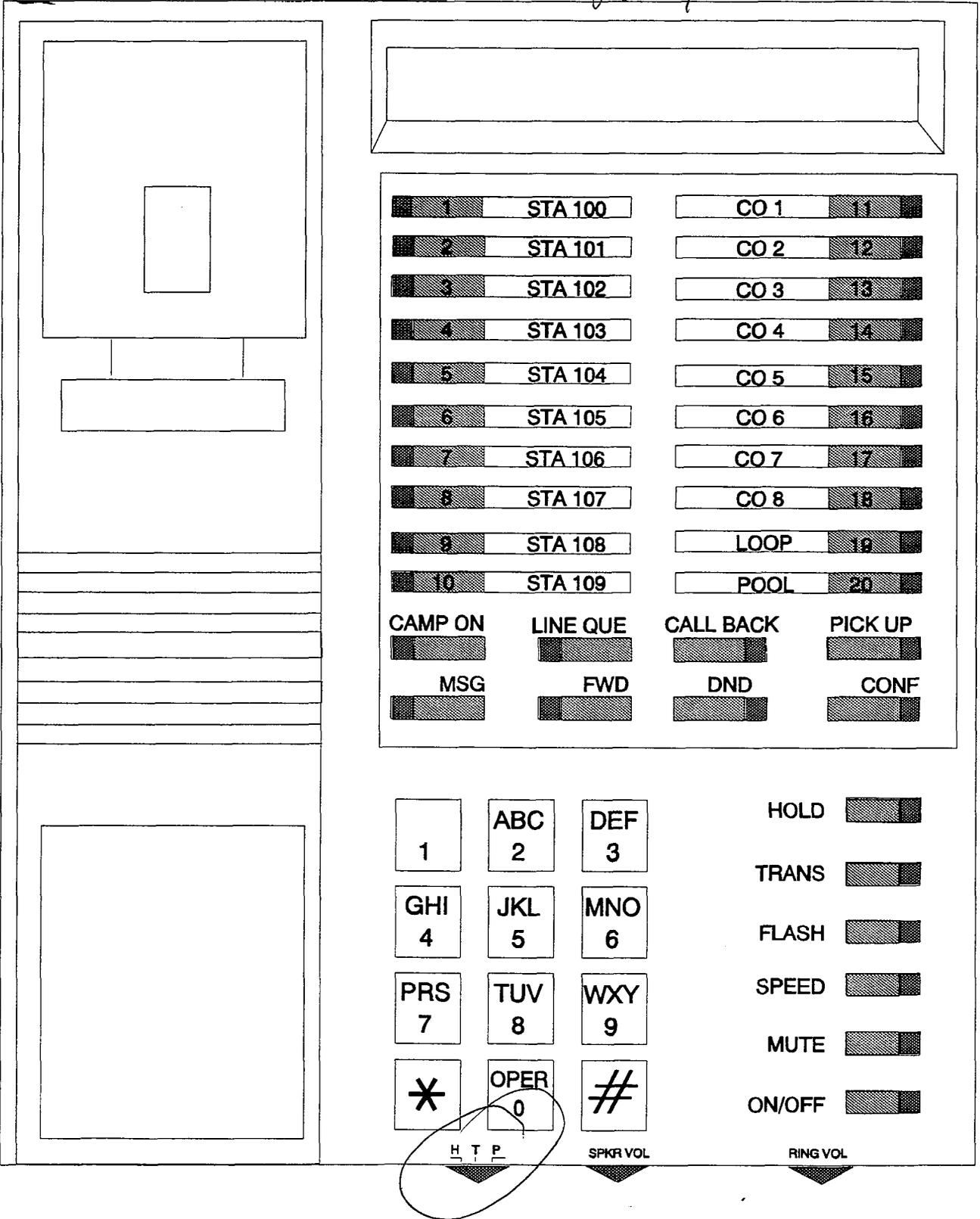


Figure 400-9 Digital 34 Button Terminal

This switch allows users to set and control the method in which they receive their intercom calls. However a dial code that users can dial before placing an intercom call can override a called stations switch setting of H or P to force the station to Tone ring.

#### **Directory Tray:**

Each 34 button Digital Terminal is equipped with a slide out Directory Tray accessed in the front of the Terminal.

#### **Wall Mounting:**

The 34 button Digital Terminal was designed with a reversible base that will allow the Terminal to be wall mounted on industry standard 630 type wall jacks. A convenient 4 inch line cord is also provided as a standard item with each phone (the line cord is placed inside the reversible wall mount base).

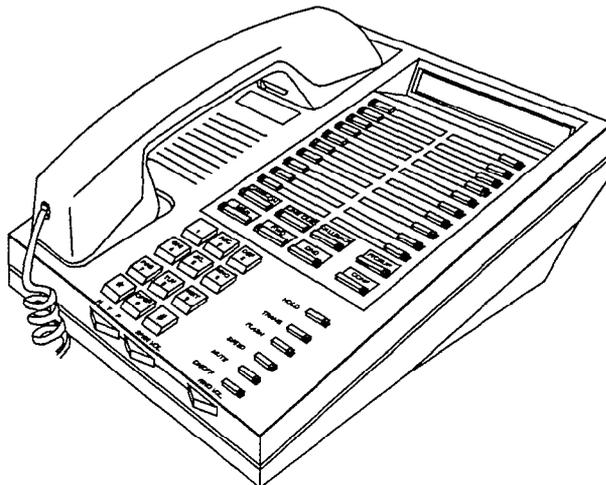
#### **Handset/line Cords:**

The 34 button Digital Terminal uses a color coordinated K-Style handset with a matching 12 foot handset cord. A 9 foot four (4) conductor base line cord is included with every Terminal.

The 34 button Digital Terminal uses an electret type transmitter. Compatible headsets can be plugged into the Terminal's headset jack for headset operation.

#### **B. 34 Button Digital Display Terminal (Executive)**

The 34 button Digital Display Terminal is similar to the 34 Button non-Display model and all the information listed above applies to the display terminal with the addition of a 48 character interactive LCD display. The display provides information such as station extensions calling, Line ringing information, camp-on information, Message waiting information and so on.



#### **LCD Display:**

The 34 button Digital Display Terminal has a 48 character Liquid Crystal Display. The LCD Display is a 24 character by two (2) line display divided into 3 (3) fields:

- Field 1 =Current Status (top line, 24 characters)
- Field 2 =Date (Left half of bottom line, 12 characters)
- Field 3 =Time of day (Right half of bottom line, 12 characters)

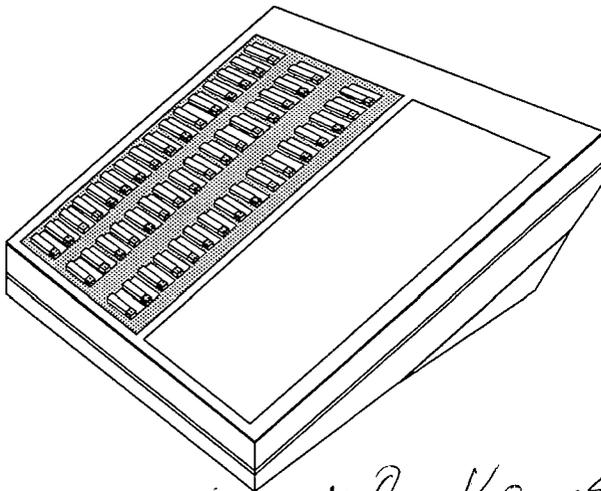
These fields are separately maintained by the KSU processing to show current and pending station activity. Each field is recreated upon any display change except additional digits which are added to the end of the existing display.

**C. Digital DSS/DLS Console**

The Digital Direct Station Selector /Direct Line Selector (DSS/DLS) Consoles can be installed in place of any digital terminal circuit. The DSS/DLS Digital Console was designed in a housing similar in looks to the 34 button digital terminal.

The Direct Station Selector/Direct Line Selector (DSS/DLS) Console to be used with the family of Starplus digital systems is modular in nature. A basic unit provides 48 buttons (3 columns of sixteen (16) buttons) on the left half of the top housing while the right half will have a removable cover (blank). Once this cover is removed, a second forty-eight (48) button modular DSS/DLS unit may be installed for a total capacity of ninety-six (96) buttons in one housing. Each of the 48 button units requires a separate four-conductor line cord each connected to a digital terminal station port.

The DSS/DLS Console unit can access Stations, Direct Appearing CO Lines, or Features that may be assigned to any of the Flexible buttons. A DSS/DLS unit may be assigned to one of the different MAP configurations available. Any one of the three (3) MAP configurations may be assigned to a DSS/DLS and any number of maps may be assigned to one station. However, "duplicate" MAP's or appearances of Stations and/or CO lines between the MAP's are not allowed.



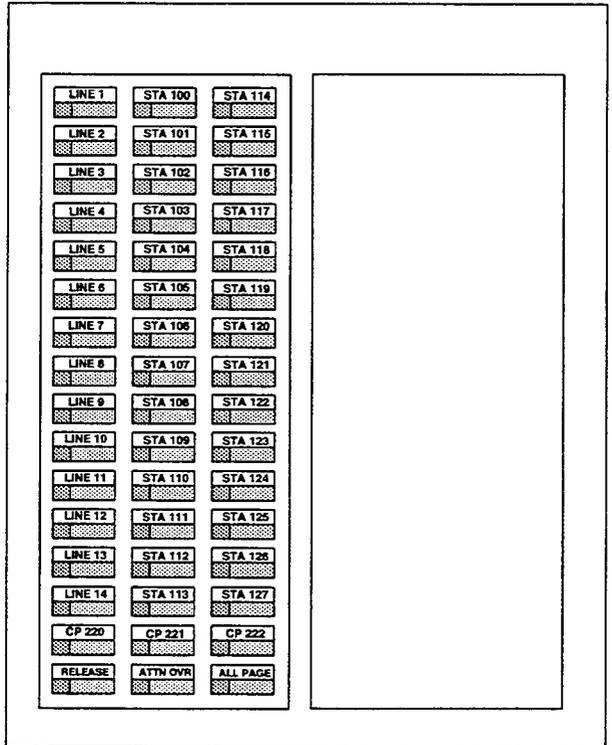
*Each 48 Keys  
occupies 1 Key station Port  
C.O.'s cannot be  
moved other keys can*

**DSS/DLS Console Button Mapping:**

The Buttons on the DSS/DLS console can be mapped with either a combination of fixed and flexible or completely flexible buttons where the station user may change the button programming to suit their needs.

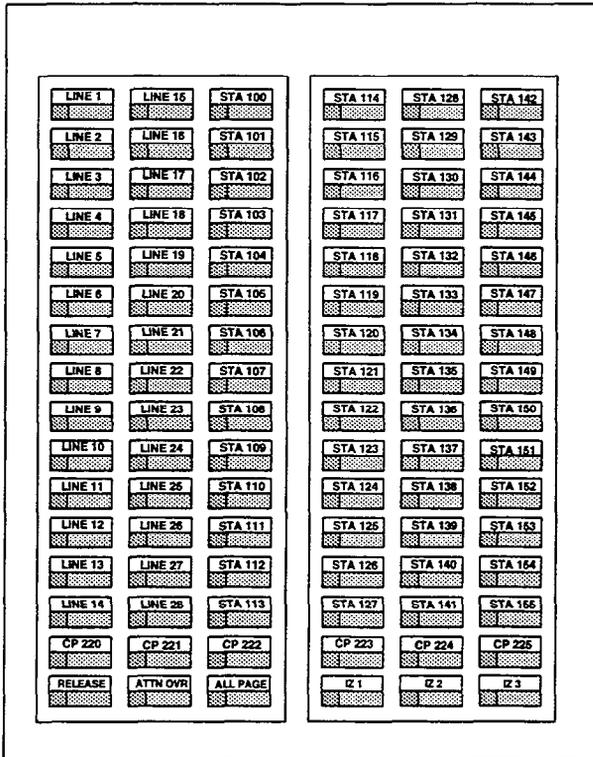
There are three (3) pre-defined MAP's for the DSS/DLS Console with default Button Programming. Each MAP is defined as follows:

- **MAP #1** has by default the first 14 CO Lines and the first 28 Station's (Sta's 100-127), the first three Call Park locations, Release, Attendant Override, and an All Call Page button mapped to the buttons. All buttons except the 14 CO line buttons are flexible and can be changed by the station user.



**DSS/DLS Console Map 1**

- **MAP #2** has by default all 28 CO lines the first 14 Stations (Sta's 100-113), the first three Call Park locations, Release, Attendant Override, and an All Call Page button mapped to the buttons. All buttons except the 28 CO line buttons are flexible and can be changed by the station user.
- **MAP #3** by default is intended to be used with MAP # 2 on an SPD 2856, in that it has the remaining stations (Sta's 114-155) to provide a full CO Line by Station mapping. Additionally, Call Park locations 223-225 along with Internal Page Ports 1, 2, and 3 appear. All of the buttons on MAP #3 are flexible and can be changed by the user.



DSS/DLS Console Maps 2 & 3

**Wall Mounting:**

The DSS/DLS Console was designed with a reversible base that will allow the Terminal to be wall mounted on industry standard 630 type wall jacks. A convenient 4 inch line cord is also provided as a standard item with each DSS/DLS Console (the line cord is placed inside the reversible wall mount base).

**Expansion Module:**

The DSS/DLS console allows one DSS/DLS expansion module to be installed into the right half of the basic unit. The expansion unit provides an addi-

tional 48 buttons with LED's for a total of 96 buttons and LED's in one base housing.

The Expansion Modules may also be assigned as any one of the three (3) pre-defined MAPs.

**400.6 SLT ADAPTER / OFF-PREMISE EXTENSION MODULE**

This external module provides the interface for one long loop (OPX) single line telephone (2500 type) extension. This module requires a separately provided -48 VDC power supply to provide the necessary current for long loop applications and to support ring generation. This module is wired to and interfaces with a digital terminal (key station) port from either the SPD 1428 or SPD 2856 systems. The OPX card meets the requirements of the FCC for connection to the telephone (Telco) network. Telephones connected to the OPX must be DTMF only (2500 type).

This module also provides for one Power Fail circuit in the event of an AC power failure.

**400.7 RELAY / SENSOR INTERFACE MODULE**

The Relay Sensor Interface Module connects to either the SPD 1428 or SPD 2856 systems using one digital station port and provides three relay activated contacts and three sensing circuits. The relays provide for applications such as Loud Bell Control contacts, CO Line control contacts, RAN Start contacts, Page Relays, Power Fail contact and additional applications as software will permit. The sensing circuits provide for such applications as RAN Stop (end of message) and other applications as developed and allowed by software.

An external power source is required to drive equipment connected to the relay contacts. The contacts are rated at 24Vdc max at 1 amp.

**400.8 POWER FAILURE TRANSFER UNIT (PFTU)**

This unit provides the relay transfer circuits for up to 12 CO lines in the event of a power or processor failure. The unit is housed in its own enclosure and mounts external to the KSU. Activation of the PFT relays is controlled by a multi-use relay on any one of the CO / Station Interface boards that is programmed for PFT. A customer provided 12 volt DC power supply is required to operate the unit. There is a manual switch that activates the PFTU for testing purposes.

With loss of power to the system or a failure of system processing, the PFTU will automatically connect up to twelve CO lines to prewired 500/2500 type telephones. When power is restored, the PFTU will automatically restore the CO trunks and stations to

normal operation. These SLT stations do not have to be used for intercom, but can be if so desired.

#### **400.9 SYSTEM SPECIFICATIONS AND CAPACITY**

The SPD 1428 Basic KSU is housed in a wall-mountable cabinet that contains the system power supply and the motherboard for stations and CO lines. This Basic KSU supports a loaded capacity of 6 CO lines and 12 stations. DSS/DLS's can be installed in place of any Digital Key terminal. Standard single line telephones (2500 type) can be installed by using Single Line Telephone Adapters (OPX) boxes.

The SPD 2856 Basic KSU is housed in a wall-mountable cabinet that contains the system power supply and the backplane for station and CO line boards. This Basic KSU supports a loaded capacity of 28 CO lines and 56 stations. DSS/DLS's can be installed in place of any Digital Key terminal. Standard single line telephones (2500 type) can be installed by exchanging Digital key terminal interface boards. Eight single line telephones can replace eight Digital Display Terminals for each board exchanged. An ON/OFF switch is located on the front of the power supply.

The system capacities are listed in Table 400-1. Electrical specifications, environmental specifications, and Loop limits are listed in Tables 400-2, 400-3 and 400-4. Dialing specifications are listed in Table 400-5. FCC Registrations Numbers for SPD 1428 and SPD 2856 are listed in Tables 400-6 and 400-7. Dimensions and weight are listed in Table 400-8. Miscellaneous Specifications are listed in Table 400-9. Key telephone, Single Line Telephone and OPX Audible Indications are listed in Tables 400-10, 400-11 and 400-12. Key Telephone Visual Indications are listed in Tables 400-13, 400-14, and 400-15.

Table 400-1 - SPD 1428 and SPD 2856 System Capacities

Time Slots:	112 PCM/TDM time slots
Ports: (SPD 1428) CO/PBX/Centrex Lines Digital Terminal Stations Off-Premise Extensions (SLT's)	14 (max) loop start (2 or 4 per CO/Station board) 28 (max) Digital Terminals (4 or 8 per CO/Station board) 27 (max) OPX/SLT Stations (1 per OPX adapter)
Ports: (SPD 2856) CO/PBX/Centrex Lines Digital Terminal Stations Standard Single Line Telephones Off-Premise Extensions	28 (max) loop start (4 per CO/Station board) 56 (max) Digital Terminals (8 per CO/Station board) 56 (max) Standard (2500 type) SLT's (8 per CO/SLT Expander board) (Future) 55 (max) OPX Stations (1 per OPX adapter)
Paging: (SPD 1428) Internal Paging External Paging (one way paging)	4 (max) Internal Page Zones (software controlled) 4 (max) One per CO/Station board
Paging: (SPD 2856) Internal Paging External Paging (one way paging)	4 (max) Internal Page Zones (software controlled) 7 (max) One per CO/Station board
DTMF Receivers: (SPD 1428)	4 (max) per system (1 provided standard in BKSU, 1 each provided on additional DTMF module)
DTMF Receivers: (SPD 2856)	7 (max) per system (1 each provided on DTMF module)
DTMF Sender: (SPD 1428 & SPD 2856)	1 per system (time shared)
I/O Ports:	3 (max) per system (1 RS232C included on BKSU/CPB), 2 on optional I/O module (1-RS232C and 1-RS422)
Contacts (multi-purpose) (SPD 2856 )	7 (max) per system (1 included on each CO/Station board) (additional relays may be used with the relay sensor module)
Contacts/Sensors (Relay Sensor Module) (SPD 1428 & SPD 2856)	4 Relay / Sensor Modules per system. Each Relay/Sensor Module has 3 relays and 3 sensing circuits.
Conference: Circuits Parties per "bridge"	4 Conference "bridges" per system 5 parties per "bridge"
DISA Circuits:	3 CO Lines may be programmed simultaneously.
Attendants:	Up to 3 stations can be designated as attendant(s).
SPD 1428 Digital DSS/DLS Consoles:	21 (max) Up to 3 DSS/DLS units can be programmed to function with each station. (Each DSS/DLS unit reduced station capacity by 1)
SPD 2856 Digital DSS/DLS Consoles:	42 (max) Up to 3 DSS/DLS units can be programmed to function with each station. (Each DSS/DLS unit reduced station capacity by 1)
Hunt Groups: Groups: Members: Types:	Software supports up to 8 groups. Software supports up to 8 stations in each group. Station or Pilot Hunting

Table 400-1 - System Capacities (Cont'd)

UCD Groups: Groups: Members: RAN Announcements: Calls in Queue:	Software supports 8 groups. Software supports up to 8 stations in each group. Two (2) RAN announcements per UCD Group. All CO Lines (14 or 28) may be in queue for a UCD Group.
Voice Mail Groups: Groups: Members: (ports) Integration Method: VM Message Wait: VM Disconnect Signal:	Software supports 8 Groups. Software supports up to 8 stations in each group. In-Band Signaling. (DTMF) Yes ([420] to turn on, [421] to turn off) Programmable 12 digit (DTMF) string. If no digits are programmed, 15 seconds of silence followed by busy tone.

Table 400-2 - Electrical Specifications

AC Input to Power Supply Power Consumption (SPD 1428 and SPD 2856)	117V ac ± 10%, 60 Hz single phase 120v AC @ 1.5A max 180 watts (maximum)
Power Supply Fuse - AC input (SPD 1428 and SPD 2856)	1.5A <del>125V AC</del> <sup>125VAC</sup> <i>correct for 1428</i>
Longitudinal Balance:	Better than 60 db from 200 Hz to 1,000 Hz Better than 40 db from 1,000 Hz to 4,000 Hz
Idle Channel Noise:	Less than 15 dbmc for all connections
Cross Talk Attenuation:	Greater than 75 dbm Station to CO and Station to Station
Single Frequency Distortion: (1,000 Hz)	Station to CO Line and Station to Station: Better than 2.0% or 34 db Output level -30 dbm to 0 dbm
Ringing Sensitivity:	16 Hz to 30 Hz at 40 VRMS minimum 30 Hz to 67 Hz at 50 VRMS minimum
Ringer Equivalence Number: (REN)	1.9
CO Line Signaling - DTMF:	Frequency pair at -5 dbm +1.0 dbm Frequency tolerance, better than ±1.5%
Music Source (input)	2 mW max. at 0 dBm 600 ohms input impedance
Contact Rating Multi Purpose Relay	1.0A, 24V dc
External Page Port Output Impedance Output Power w/o compression	600 ohms @ 0 dBm 1 mW Maximum
UL File Number:	E109461

*Handwritten notes:*  
 1428  
 2856  
 120 VAC @ 1.5 A  
 600 watt  
 5 A 125VAC Fuse

Table 400-3 - Environmental Specifications

Operating Temperature	40° to 104° F
Recommended Operating Temperature	70° to 78° F
Storage Temperature	-40° to 140° F
Relative Humidity	5% to 90% non-condensing
Heat Dissipation (BTU's) (SPD 1428 and SPD 2856)	615 BTU's Maximum

**Table 400-4 - Loop Limits**

Electronic Telephone: (including Single Line Telephone, and DSS/DLS)	1000 feet of 26 AWG Cable 1000 feet of 24 AWG Cable 1000 feet of 22 AWG Cable
Off-Premise Extensions (OPX) (Adapter to SLT)	1400 Ohms maximum loop, not including telephone.

**Table 400-5- Dialing Specifications**

DTMF Dialing	
Frequency Deviation	±1%
Rise Time	3 msec.
Duration of DTMF Signal	75 msec. minimum
Interdigit Time	75 msec. minimum
PULSE Dialing	
Pulse Dialing Rate	10 or 20 pps.
Pulse Break/Make Duration	60/40 or 66/33
CO Type	Loop Start, 600 ohm, current sensing

**Table 400-6 - FCC Registration Numbers for SPD 1428**

For Systems configured as a key system (button appearance) use:	DLPHKG-65152-KF-E
For Systems configured as a hybrid system (dial access codes) use:	DLPHKG-65153-MF-E

**Table 400-7 - FCC Registration Numbers for SPD 2856**

For Systems configured as a key system (button appearance) use:	DLPHG-65102-KF-E
For Systems configured as a hybrid system (dial access codes) use:	DLPHG-65101-MF-E

Table 400-8 - Dimensions and Weight

<p><b>SPD 1428 BASIC KEY SERVICE UNIT</b>                  Height 20.0"                  Width 14.0"                  Depth 4.0"                  Weight 13.5 lbs. (unloaded)</p>	<p><b>DIGITAL TERMINAL (non-display)</b>                  Height 3.5"                  Width 7.625"                  Depth 9.625"                  Weight 3 lbs.</p>
<p><b>SPD 1428 EXPANSION KEY SERVICE UNIT</b>                  Height 20.0"                  Width 14.0"                  Depth 4.0"                  Weight 13.5 lbs. (unloaded)</p>	<p><b>DIGITAL DISPLAY TERMINAL</b>                  Height 3.5"                  Width 7.625"                  Depth 9.625"                  Weight 3 lbs.</p>
<p><b>SPD 2856 KEY SERVICE UNIT w/POWER</b>                  Height 15.2"                  Width 18.5"                  Depth 14.75"                  Weight 60 lbs. (unloaded)</p>	<p><b>DSS/DLS CONSOLE</b>                  Height 3"                  Width 7.625"                  Depth 9.625"                  Weight 2 lbs.</p>
<p><b>OFF-PREMISE EXTENSION MODULE</b>                  Height 1.75"                  Width 7.625"                  Length 8.0"                  Weight 3.5 lbs.</p>	<p><b>RELAY/SENSOR MODULE</b>                  Height 1.75"                  Width 7.625"                  Length 8.0"                  Weight 3.5 lbs.</p>

Table 400-9 - Miscellaneous Specifications

<p>Memory: (SPD 1428)                  Programmable Read-Only Memory (EPROM)                  Random Access Memory (RAM):</p>	<p>512 Kilobytes expandable to 2 Megabytes                  128 Kilobytes expandable to 2 Megabytes</p>
<p>Memory: (SPD 2856)                  Programmable Read-Only Memory (EPROM)                  Random Access Memory (RAM):</p>	<p>512 Kilobytes expandable to 4 Megabytes                  256 Kilobytes expandable to 2 Megabytes</p>
<p>Telephone Transmitter:</p>	<p>Electret mic compatible.</p>
<p>Talk Paths:                  CO/PBX/Centrex paths:                  Intercom Paths:</p>	<p>28 CO/PBX/Centrex talk paths (non-blocking)                  Non blocking</p>
<p>Music Channels:</p>	<p>1 channel provides music for music-on-hold and background music</p>
<p>Account Codes:                  Number of digits per account code:                  Number of Account Codes:</p>	<p>up to 12 unverified digits                  unlimited (unverified)</p>
<p>Speed Dialing Memory:                  Station Speed Dial:                  System Speed                  Total system speed dial bins:</p>	<p>20 bins per station (24 digits)                  80 bins per system (24 digits)                  1200 bins per system (24 digits)</p>

Table 400-10 - Digital Terminal Audible Signals

TYPE OF SIGNAL	FREQUENCY	SIGNAL DURATION
<u>Key Telephone Signals:</u>		
Incoming CO Line	1215/1471	0.8s on/2.4s off; repeated
Intercom Tone Ringing	1215/1471	0.4s on/0.4s off/0.4s on/2.0s off
Intercom Call Announce (H-P)	935	0.2s on/0.2s off (2 bursts)
Transferred CO Line	1215/1471	0.8s on/2.4s off
CO Line Recall	1215/1471	0.2s on/.6s off, repeated
Message Wait Call Back	1215/1471	0.4s on/0.4s off/0.4s on/2.0s off
Message Wait Reminder Tone	771	0.6s on (timed)
CO Queue Call Back	1215/1471	0.2s on/0.6s off; repeated
Camp-on	1215/1471	0.2s on/0.2s off/0.2s on (once)
Paging Alert Tone	935	1 sec. (burst)
<u>Key Telephone Confidence Tones:</u>		
Intercom Ringback	701	0.4s on/0.4s off/0.4s on/2.0s off
Call Announce	935	0.2s on/0.2s off (2 bursts)
Busy Tone	701	0.4s on/0.4s off, repeated
Error Tone	701	0.2s on/0.2s off, repeated
Intercom Dial Tone	421	Continuous
DND Tone	701	0.2s on/0.2s off, repeat 3x's. pause, 0.6s repeat
Paging Confirmation	935	1 sec burst
Programming Confirmation	1471	1.4 sec burst
Programming Error	1471	0.2s on/0.2s off, 6x's
Confirmation Tone	1471	1.4 sec burst, 1 time

Table 400-11 - Single Line Telephone Audible Signals

TYPE OF SIGNAL	FREQUENCY	SIGNAL DURATION
<u>Single Line Signals:</u>		
Incoming CO Line	20 Hz, 50-90V AC	2.0s on/4.0s off
Intercom Tone Ringing	20 Hz, 50-90V AC	1.0s on/0.2s off/0.8s on/4.0s off
Transferred CO Line	20 Hz, 50-90V AC	2.0s on/4.0s off
CO Line Recall	20 Hz, 50-90V AC	2.0s on/4.0s off
CO Queue Call Back	20 Hz, 50-90V AC	2.0s on/4.0s off
<u>Single Line Confidence Tones:</u>		
Intercom Ringback	440+480	1.0s on/3.0s off; repeated
Call Announce	420	0.2s on/0.2s off (3 bursts)
Busy Tone	480+620	0.5s on/0.5s off; repeated
Error Tone	480+620	0.25s on/0.25s off; repeated
Intercom Dial Tone	420	Continuous
DND Tone	480+620	0.2s on/0.2s off, repeat 3x's, pause, 0.5s; repeated
Paging Time-out	480+620	0.5s on/0.5s off; repeated
Call FWD Warning Tone	420	0.2s on/0.2s off (six times)
Camp-on Tone	420	0.2s burst (1 time)
Conference Warning Tone	420	1 sec burst (1 time)
Confirmation Tone	420	1.4 sec burst (1 time)
DND Warning Tone	420	0.2s on/0.2s off (6 bursts)

Table 400-12 - OPX Telephone Audible Signals

TYPE OF SIGNAL	FREQUENCY	SIGNAL DURATION
<u>OPX Signals:</u>		
Incoming CO Line	20 Hz, 50-90V AC	2.0s on/4.0s off
Intercom Ringing	20 Hz, 50-90V AC	2.0s on/4s off
Transferred CO Line	20 Hz, 50-90V AC	2.0s on/4.0s off
CO Line Recall	20 Hz, 50-90V AC	2.0s on/4.0s off
CO Queue Call Back	20 Hz, 50-90V AC	2.0s on/4.0s off
<u>OPX Confidence Tones:*</u>		
Intercom Ringback		1 s on/3s off
Busy Tone	440+480	0.5s on/0.5s off; repeated
Error Tone	480+620	0.25s on/0.25s off, repeated
Intercom Dial Tone	480+620	Continuous
DND Tone	350+440	0.2s on/0.2s off, repeat 3x's, pause,
	480+620	0.5s; repeated
Paging Time-out	420	0.5s on/0.5s off
Call FWD Warning Tone	420	0.2s on/0.2s off (six times)
Camp-on Tone	420	0.2s burst (1 time)
Conference Warning Tone	420	1 sec burst (1 time)
Confirmation Tone	420	1.4 sec burst (1 time)
DND Warning Tone	420	0.2s on/0.2s off (6 bursts)
*Precise Tone Plan		

Table 400-13 - DSS/BLF Button Visual Indicators

TYPE OF SIGNAL	INDICATOR FLASH RATES
Off-Hook/Busy (All Stations)	Steady
Incoming Intercom Ring (Destination)	120 ipm flutter
Call Announce (Destination)	steady
Message Waiting Call Back (Destination)	120 ipm flutter
Do Not Disturb (All Stations)	480 ipm triple wink
Automatic Call Back (Destination)	120 ipm flash
UCD Available/Unavailable	60 imp flash

Table 400-14 - CO Line Button Visual Indicators

TYPE OF SIGNAL	INDICATOR FLASH RATES
Incoming CO Ring	30 ipm flash
Transferred CO Ring	120 ipm flash
Recall	480 ipm flutter
Queued Line	480 ipm flutter
Exclusive Hold	120 ipm flash
System Hold	60 ipm double wink
I-Hold (only when hold preference is system)	60 ipm wink
In Use	Steady

Table 400-15 - Function Button Visual Indicators

TYPE OF SIGNAL	INDICATOR FLASH RATES
Call Forward (active)	30 ipm flash
Message Waiting (active)	15 ipm flash
Camp-on (active)	120 ipm flash
Call Back (active-initiator)	120 ipm flash
CO Line Queue (active)	480 flutter
Do Not Disturb (DND active)	60 ipm flash
Mute (microphone off, handset xmit off)	Steady
ON/OFF (speakerphone on/on-hook dialing)	Steady
Conference (active)	Steady
Speed (momentarily ON until bin address dialed)	Steady
Personalized Messages	15 ipm flash
Intercom Call (Hold Button)	15 ipm flash
Loop	Same as CO Line buttons
Pool	Same as CO Line buttons
Transfer	Steady until transfer complete

## SECTION 500

# INSTALLATION

### 500.1 SITE PLANNING

Selection of a suitable location is the most basic, yet most critical consideration in the installation of a telephone system. The following should be considered when choosing an appropriate location for equipment installation:

- Ample space must be allowed to remove the KSU cover, to access assemblies and cards within the cabinet and allow space for the MDF (Main Distribution Frame).
- Location of CO/PBX line terminations must be considered when selecting a location for the KSU. In the case of telephone company line, FCC approved connectors supplied by the telephone company, should be within 5 feet (1.5 meters) of the cabinet/main distribution frame.
- To minimize the length of cable runs between the stations and the system KSU, the location of the majority of the telephone sets (stations) should be taken into consideration when selecting a location for the cabinet.
- A well ventilated, and well lighted area having an optimum temperature range of 60 degrees to 80 degrees F and a relative humidity range of 5 to 90% (non-condensing) must be provided.
- Area lighting should be adequate for installation and maintenance of the system. Hazardous or flammable materials should be removed from the vicinity. The immediate area must not be subject to flooding or excess moisture. The KSU should be isolated from areas of moving machinery or equipment. It is also recommended that static electricity-producing carpets not be installed in this area.
- A separately fused, dedicated 117 volts AC,  $\pm$  10%, 15 Amp., 60 Hz, single phase, 3-wire (parallel blade with ground) power outlet should be located within 5 feet (1.5 meters) of the system power supply.
- The KSU and main distribution frame should be placed in an electrically noise free environment, isolated and shielded from equipment that causes electro-magnetic interference (EMI) or radio frequency interference (RFI). Examples of electrical noise are rotating electrical machinery and arc welding equipment, refrigerators, copy machines, etc. Floor coverings that generate static electricity should also be avoided.
- The system KSU should not be installed close to any equipment which may produce RFI (Radio Frequency Interference) such as a radio frequency transmitter.
- If the system is to be installed in a location prone to lightning strikes, provide lightning protection on the power line, any station cable runs outside the building, and CO lines.

#### A. System Grounding

To ensure that the system will operate properly, a good earth ground is required. Use of the Telco ground (source not demark) or a metallic COLD water pipe usually provides a reliable ground path. Carefully check that the pipe does not contain insulated joints that could isolate the ground. In the absence of the COLD water pipe, a ground rod or other source may be used. A no.12 AWG copper wire should be used between the ground source and the KSU (25 feet maximum). The farther from the ground source, the larger the ground wire used should be. The wire should be kept as short as possible and can be connected to the ground lug provided on the lower left side of the backplane on the KSU with the cover off.

#### B. Lightning Protection

The Starplus Digital (SPD) Key Telephone System should have Central Office lines and OPX stations protected with proper lightning surge arresters. This will provide protection from damaging surges on sensitive cabling by non-direct lightning strikes.

The protection should contain a compliment of three-element gas-discharged tubes to ground high potential surges, and associated circuits to absorb and filter lower level surges. This type of lightning protection is available through telephone equipment supply houses. Care should be taken to ensure that such protection devices are installed in accordance with the manufacturer's instructions and to ensure that no more than one set of protectors be installed on central office lines at the installation premises. Improper installation can be a serious safety hazard. Failure to provide the proper lightning protection will increase maintenance expense and require more available spare parts.

### 500.2 SPD 1428 INSTALLATION PLANNING

Prior planning of the installation will aid in a smooth cut-over and a satisfied customer. Select a suitable location for the system. Determine the number of

telephones of each type, and the number of CO/Station ports from the sales contract and discussions with the customer.

*NOTE: Only one station set is allowed per digital extension number. It is not possible to bridge digital station ports so that an extension number may appear in more than one location.*

- Programming information should also be gathered from the customer at this time so that the system may be programmed either before, or while the system is being installed.
- Determine the location and type of each telephone, and mark floor plans accordingly.
- Determine the location for the operator stations, and mark the floor plans.
- Arrange for power cabling (if necessary) and station cabling of the site.
- If the system is to be installed in an area subject to frequent lightning storms, consideration should be given to providing additional lightning protection on the CO lines beyond what is provided by the local telephone operating company.

*NOTE: Installers should be trained and thoroughly familiar with the basic components of the SPD 1428 before attempting installation of this product.*

### 500.3 SPD 1428 COMMON EQUIPMENT

#### A. Basic Key Service Unit with Power Supply (BKSU)

The SPD 1428 Basic Key Service Unit is a system which comes fully configured for four (4) CO/PBX/Centrex lines and eight (8) Stations. The basic KSU also contains one (1) RS-232C I/O port, one (1) DTMF Receiver, one (1) connector for Background Music and Music on Hold, an on-board 300 baud modem port, and one external page port. The basic KSU also contains two connectors for adding a 2X4 CO/Station Expander module (J9 and J10), an optional I/O module that adds one additional RS-232C port and one RS-422 port, and an optional 1200 baud modem module can be added to increase the speed of transmission of the on-board modem port. A reset (halt) switch and a BGM volume control are also mounted on the PCB. In addition two connectors are provided for adding an Expansion KSU which will allow the system to expand to a total of 14 CO/PBX/Centrex lines and 28 digital station ports. Refer to Figure 500-1 for a PCB layout and location of connectors.

#### Power Supply:

The power supply, installed in the KSU at the time of manufacture, has an input voltage of 117 VAC

±10%. The power supply provides power, a filtered/unregulated ±12 VDC, to the main key service board. A slo-blow 1.5 amp fuse on the AC side of the transformer provides the necessary fire and overload protection. Power is regulated and distributed to stations / circuitry in the system on the main key service board. The power supply and cabinet meet all safety requirements to comply with UL 1459 Second Edition and CSA 0.3 standards.

#### LEDS & Indicators:

Four green LED's are located on the main key station board along the top of the PCB. Two of the LED's (DS2 & DS3) indicate the presence of +5 & -5 volts. LED's DS1 and DS5 indicate the presence of +12 VDC used to supply power to the key stations (one LED per four stations). An extinguished LED indicates the absences of the associated voltage.

A red LED (DS4) located in the lower right portion of the PCB provides a system "heart beat" indication.

#### SPD 1428 BKSU Mounting:

The SPD 1428 Basic Key Service Unit (BKSU) is housed in a wall mountable cabinet which contains the Key Service board (KSB), Power Supply and pre-wired connectors for stations and CO Line interface. Once the area for the telephone equipment has been selected, mount a plywood back board to the wall. The back board size will vary depending upon the size of the MDF. The entire system and frame can be mounted on a 4' x 6' x 3/4" plywood. If mounting the KSU alone, the minimum back board size is 25" x 17" x 3/4". A fully loaded KSU can weigh approximately 15 lbs. Make certain proper mounting procedures are followed.

*NOTE: Check local building and electrical codes before mounting the system. For example, certain areas may require a flame retardant plywood back board.*

Mount the cabinet to the plywood using 3/4" #12 pan-head sheet metal screws such that the top of the KSU is approximately three feet (1 meter) from the ceiling, and bottom is four feet (1.2 meters) from the floor.

Use the mounting template supplied with the cabinet to locate the mounting holes. Refer to Figure 500-2. Drill the holes and mount the KSU.

#### Grounding

A No. 12 AGW copper wire should be used to connect a ground between the ground source and the KSU (25 feet maximum). A two position terminal strip P3 is located along the bottom edge of the main key service unit and is accessible through the bottom of the KSU. One terminal position can be used to connect the ground wire from a ground source and

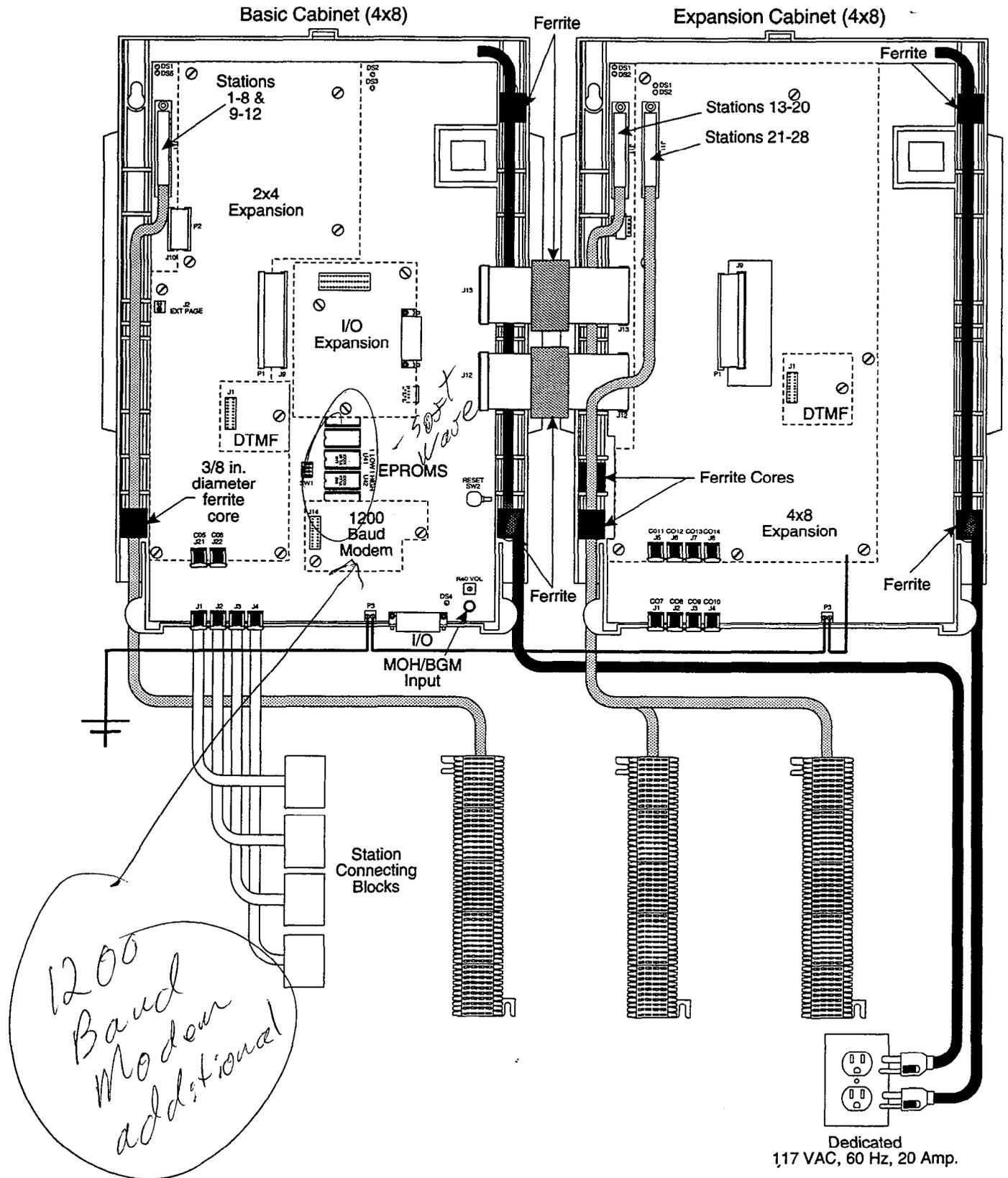


Figure 500-1 SPD 1428 Mounting Arrangements

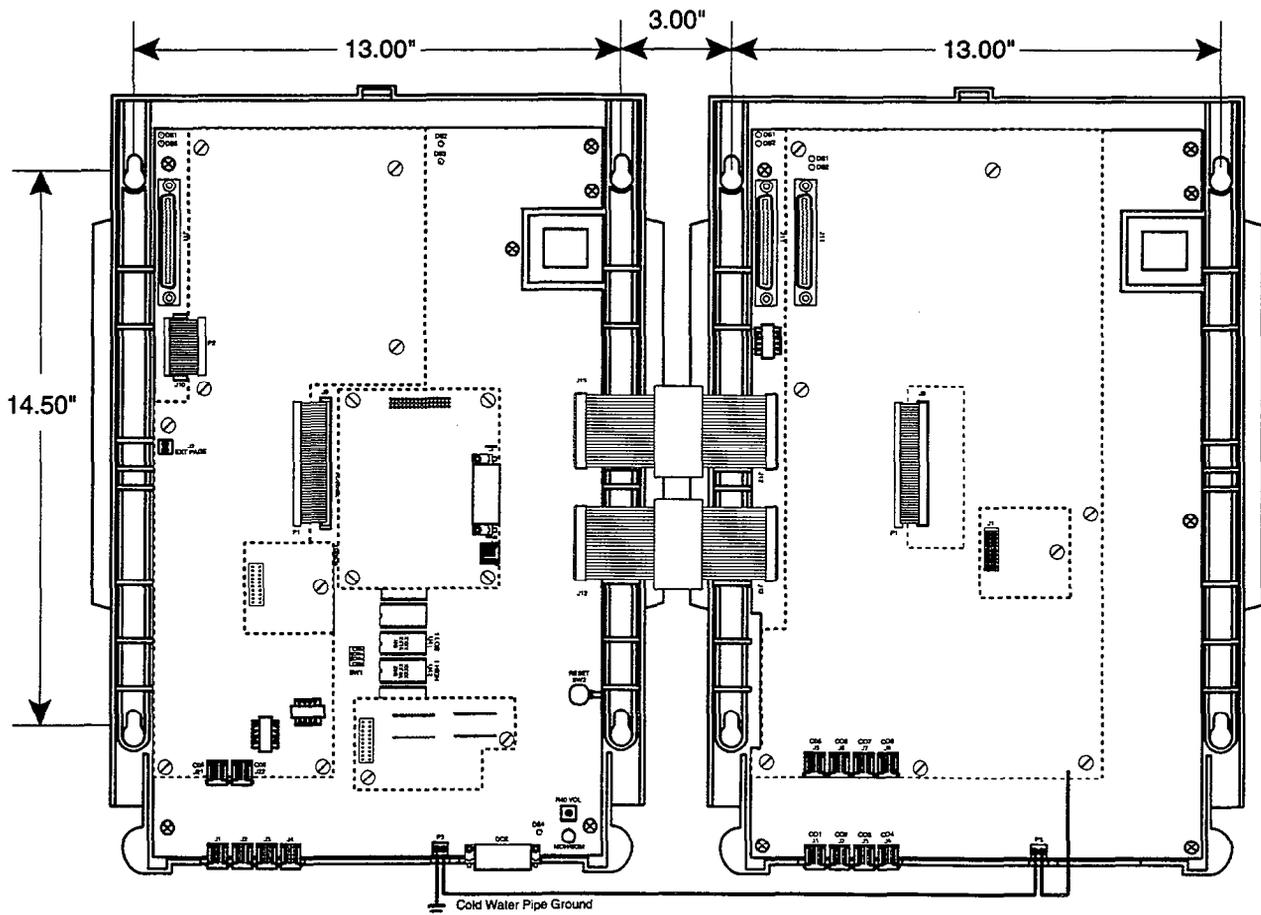


Figure 500-2 SPD 1428 Mounting Dimensions

the other position may be used to connect the ground from the basic KSU to the Expansion KSU.

### **CPU and Memory:**

The SPD 1428 system is controlled by a 16-bit (68000) main micro-processor which controls all system functions including the PCM/TDM voice switching under the direction of ROM and RAM software coding. The main key service board is responsible for all control functions, execution of all logic operations and control of system modules including control over the circuitry necessary for voice switching and conference connections. The main key service board is also responsible for all system tones, system timing, and station status control. In addition the main key service board provides software and hardware support of the following:

- Real Time clock.
- Watch dog timer and recovery.
- PCB status as to presence/absence of modules for automatic software configuration setup.
- State/event software design.
- Backup of customer database RAM memory via a "supper Cap" (supper capacitor).

System software is provided in EPROM memory and is installed on the main key service board. The system contains (512) kilobytes of EPROM storage and is equipped with 128K of "battery"-backed static RAM. Provisions have been made on the card to address up to (2) megabytes of EPROM memory and up to (2) megabytes of static RAM.

An option "dip" switch (SW1) located on the main key service board allows the system EPROM memory to be configured utilizing different size EPROM chips. 1 Megabit, 2 Megabit, 4 Megabit and 8 Megabit chips may be used to provide the generic software. Refer to Sec. 800 Maintenance & Troubleshooting for "dip" switch (SW1) settings for various allowable configurations.

A separate option strap (J26) allows the use of either 256Kbit, 1 Megabit, or 4 megabit static RAM chips to be used for RAM memory. Refer to Sec. 800 Maintenance & Troubleshooting for the option strap choices.

### **CO Line/Station Interfaces:**

The BKSU contains the necessary circuitry to connect four (4) CO/Centrex/PBX loop start lines and eight (8) Digital Key Telephones to the system. This card also contains one additional voice (transmit) path for external paging.

The main key station board contains four (4) Central Office, Centrex or PBX loop start, line interfaces.

The protection circuitry to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). Each CO line interface design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA 0.3 standards. CO lines are connected to the system via RJ-11 modular jacks mounted on the bottom of the main key service board.

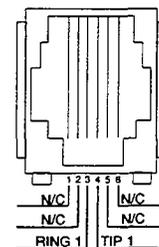
The main key station board also provides the interface for eight (8) Digital Key Telephones using two (2) 64 kilobyte channel arrangements. Stations connect to the board via the MDF through a 50 pin connector located inside the KSU. Each station connection requires four (4) wires to connect to the board.

A Digital DSS/DLS Console, and Single Line Telephone Adapter (OPX) or other specifically designed adapter with a digital interface can be assigned to any one of the interface circuits. The Key Station interface circuits are protected from mis-wiring and over-current.

The main key service also contains an on-board modem that is capable of transmitting data at a rate of 300 baud. The modem supports and is compatible with the Hayes command protocol. The Bell System (Western Electric) standards 103 and 212A for modem design is incorporated into the design of this modem. The modem operates on-line in both Full and Half duplex modes. An optional 1200 baud module may be added to the main key service unit to allow transmission at the rate of 1200 baud.

### **CO Lines Connections:**

CO Lines are connected to the system via modular RJ-11 connectors accessed through the bottom of the KSU. The Basic KSU connects CO Line ports 1, 2, 3, and 4 to the system through modular connectors J1, J2, J3, and J4 respectively. The CO Line is wired to the green/red pair. The pinouts of the modular connector are as follows.

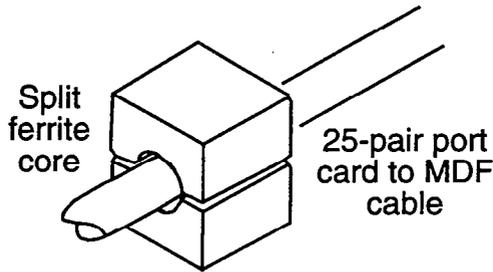


### **Stations Connections:**

The station ports of the SPD 1428 are wired to the main distribution frame via a 25-pair, (50-pin) male amphenol-type connector located on the main key service board, connector J11. A 25-pair cable with

a 50-pin Female amphenol-type connector is required to extend the station ports to the main distribution frame. Refer to Table 500-1 for pinout information.

*NOTE: The 25 pair cable used to extend the stations to the MDF does not have to be shielded. However, the 25 pair cable must pass through a 3/8" diameter ferrite core before exiting the KSU again to comply with FCC Part 15 regulations.*



**External Paging Connections:**

The Basic KSU is equipped with an external page port (a one-way, transmit voice path) that is wired to the J11 connector (50-pin male amphenol-type connector) on the Violet/Slate, Slate/Violet pair of wires (pin's 50 and 25). Refer to Table 500-1 for pinout information.

**Background Music Connections:**

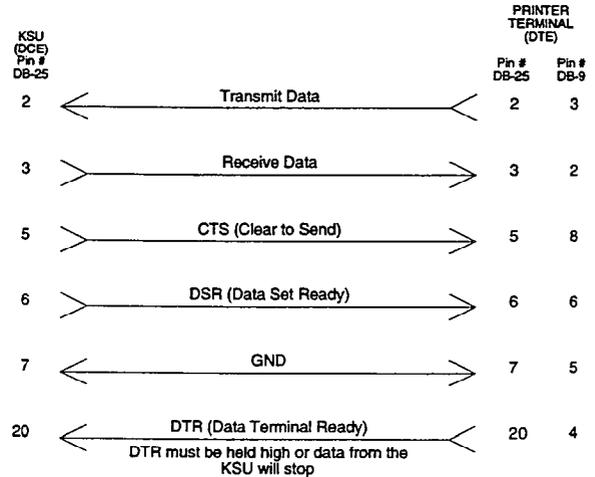
The source for Background Music / Music on Hold is connected to the system via an RCA type connector (J7) located in the bottom right corner of the main key service board. Refer to Figures 500-1 and 500-2 for location of components. A potentiometer labeled R40 located directly above the RCA connector allows for volume adjustment for Music On Hold.

**Modem Connections:**

The optional 1200 baud modem module may be installed on the main key service board to connector J14 located directly below the EPROMS. The modem port itself is accessed via system software control. No hardware connections are required to connect to the modem.

**I/O Ports Connections:**

The SPD 1428 contains one RS-232C, I/O port (Female, DB-25 type connector) located on the main key service board (J5). This I/O port is capable of transmitting and receiving data at 300, 1200, 2400, 4800 and 9600 baud rates.



**RS-232C PINOUT**

Data Communication Requirements are:

- A) Serial Port Compatible
- B) ASCII Code Compatible
- C) 8 Data Bits and 1 Stop Bit
- D) No Parity
- E) Flow Control Method: Xon/Xoff

NOTE: Arrows show flow control direction

**Figure 500-3 SPD 1428 RS-232C Connections**

An optional I/O module may be added to the main key service board (on connector J15) adding one additional RS-232C port (female, DB-25 type connector) and one RS-422 port (modular jack connector). Refer to Sec. 500.6 for the pinouts and communication requirements for the SPD 1428 RS-232/RS-422 I/O Module.

**Table 500-1 SPD 1428 Basic KSU J11 Station Connections**

PAIR	PIN	COLOR	DESIG
1	26	WH/BL	Port 001 Xmt Tip
	1	BL/WH	Xmt Ring
2	27	WH/OR	Rcve Tip
	2	OR/WH	Rcve Ring
3	28	WH/GN	Port 002 Xmt Tip
	3	GN/WH	Xmt Ring
4	29	WH/BN	Rcve Tip
	4	BN/WH	Rcve Ring
5	30	WH/SL	Port 003 Xmt Tip
	5	SL/WH	Xmt Ring
6	31	RD/BL	Rcve Tip
	6	BL/RD	Rcve Ring
7	32	RD/OR	Port 004 Xmt Tip
	7	OR/RD	Xmt Ring
8	33	RD/GN	Rcve Tip
	8	GN/RD	Rcve Ring
9	34	RD/BN	Port 005 Xmt Tip
	9	BN/RD	Xmt Ring
10	35	RD/SL	Rcve Tip
	10	SL/RD	Rcve Ring
11	36	BK/BL	Port 006 Xmt Tip
	11	BL/BK	Xmt Ring
12	37	BK/OR	Rcve Tip
	12	OR/BK	Rcve Ring
13	38	BK/GN	Port 007 Xmt Tip
	13	GN/BK	Xmt Ring
14	39	BK/BN	Rcve Tip
	14	BN/BK	Rcve Ring
15	40	BK/SL	Port 008 Xmt Tip
	15	SL/BK	Xmt Ring
16	41	YL/BL	Rcve Tip
	16	BL/YL	Rcve Ring
17	42	YL/OR	Port 009* Xmt Tip
	17	OR/YL	Xmt Ring
18	43	YL/GN	Rcve Tip
	18	GN/YL	Rcve Ring
19	44	YL/BN	Port 010* Xmt Tip
	19	BN/YL	Xmt Ring
20	45	YL/SL	Rcve Tip
	20	SL/YL	Rcve Ring
21	46	VI/BL	Port 011* Xmt Tip
	21	BL/VI	Xmt Ring
22	47	VI/OR	Rcve Tip
	22	OR/VI	Rcve Ring
23	48	VI/GN	Port 012 *Xmt Tip
	23	GN/VI	Xmt Ring
24	49	VI/BN	Rcve Tip
	24	BN/VI	Rcve Ring
25	50	VI/SL	External Page Tip
	25	SL/VI	External Page Ring

\*Active only when the SPD 1428 2x4 Expander Module is installed in the Basic KSU.

**B. Expansion KSU with Power Supply (EKSU)**

The SPD 1428 Expansion KSU is a unit which comes equipped with a power supply and circuitry providing four (4) additional loop start CO/PBX/Centrex line ports and eight (8) digital station ports to the Basic KSU. All processing and control functions as well as voice connections and switching are controlled by circuitry on the Basic KSU and transmitted to the Expansion KSU through the ribbon cables.

The Expansion key service board allows connection of one optional application module (i.e. DTMF Receiver) to the system and connector(s) for installing an additional SPD 1428 2X4 Expander Module or the SPD 1428 4X8 Expander Module. Refer to Figure 500-4 for an expansion key service board (PCB) layout and location of connectors.

**Power Supply**

The power supply, installed in the Expansion KSU at the time of manufacture, has an input voltage of 117 VAC  $\pm 10\%$ . The power supply provides power, a filtered / unregulated  $\pm 12$  VDC, to the Expansion key service board. A slo-blow 1.5 amp fuse on the AC side of the transformer provides the necessary fire and overload protection. Power is regulated and distributed to stations / circuitry in the system on the Expansion key service board. The power supply and cabinet meet all safety requirements to comply with UL 1459 Second Edition and CSA 0.3 standards.

**LED's & Indicators**

Four green LED's are located on the expansion key station board. Two of the LED's (DS2 & DS3) indicate the presence of +5 & -5 volts. LED's DS1 and DS5 indicate the presence of +12 VDC used to supply power to the key stations (one LED for every four stations). An extinguished LED indicates the absences of the associated voltage.

**Expansion KSU Mounting:**

The SPD 1428 Expansion KSU (EKSU) is housed in a wall mountable cabinet which contains the Expansion Key Service board (EKSB), Power Supply and pre-wired connectors for station and CO Line interfaces. The Expansion KSU is mounted directly to the right of the Basic KSU and connects via two (2) ribbon type cables provided with the unit. Once the area for the telephone equipment has been selected, mount a plywood back board to the wall. The back board size will vary depending upon the size of the MDF. The entire system and frame can be mounted on a 4' x 6' x 3/4" plywood. If mounting the KSU alone, the minimum back board size is 25" x 17" x 3/4". A fully loaded KSU can weigh approximately 15 lbs. Make certain proper mounting procedures are followed.

*NOTE: Check local building and electrical codes before mounting the system. For example, certain areas may require a flame retardant plywood back board.*

Mount the cabinet to the plywood using 3/4" #12 pan-head sheet metal screws such that the top of the KSU is approximately three feet (1 meter) from the ceiling, and bottom is four feet (1.2 meters) from the floor.

Use the mounting template supplied with the cabinet to locate the mounting holes. Refer to Figure 500-2. Drill the holes and mount the KSU.

**Grounding:**

A No. 12 AWG copper wire should be used to connect a ground between the Basic KSU and the Expansion KSU. A two position terminal strip (P3) is located along the bottom edge of the main key service unit and is accessible through the bottom of the BKSU. A similar two position terminal strip (P3) is located along the bottom edge of the expansion key service board and is accessible through the bottom of the EKSU. One terminal position on each P3 connector can be used to connect the ground wire from the basic KSU to the Expansion KSU.

**CO Line/Station Interfaces:**

The EKSU contains the necessary circuitry to connect an additional four (4) CO/Centrex/PBX loop start lines and eight (8) Digital Key Telephones to the system. This card also contains one additional voice (transmit) path for external paging.

The Expansion key station board contains four (4) Central Office, Centrex or PBX loop start, line interfaces. The protection circuitry to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). Each CO line interface design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA 0.3 standards. CO lines are connected to the system via RJ-11 modular jacks mounted on the bottom of the Expansion key service board.

The Expansion key station board also provides the interface for eight (8) Digital Key Telephones using two (2) 64 kilobyte channel arrangements. Stations connect to the board via the MDF through a 50 pin connector located inside the KSU. Each station connection requires four (4) wires to connect to the board.

A Digital DSS/DLS Console, and a Single Line Telephone Adapter (OPX) or other specifically designed adapter with a digital interface can be assigned to any one of the interface circuits. The Key Station

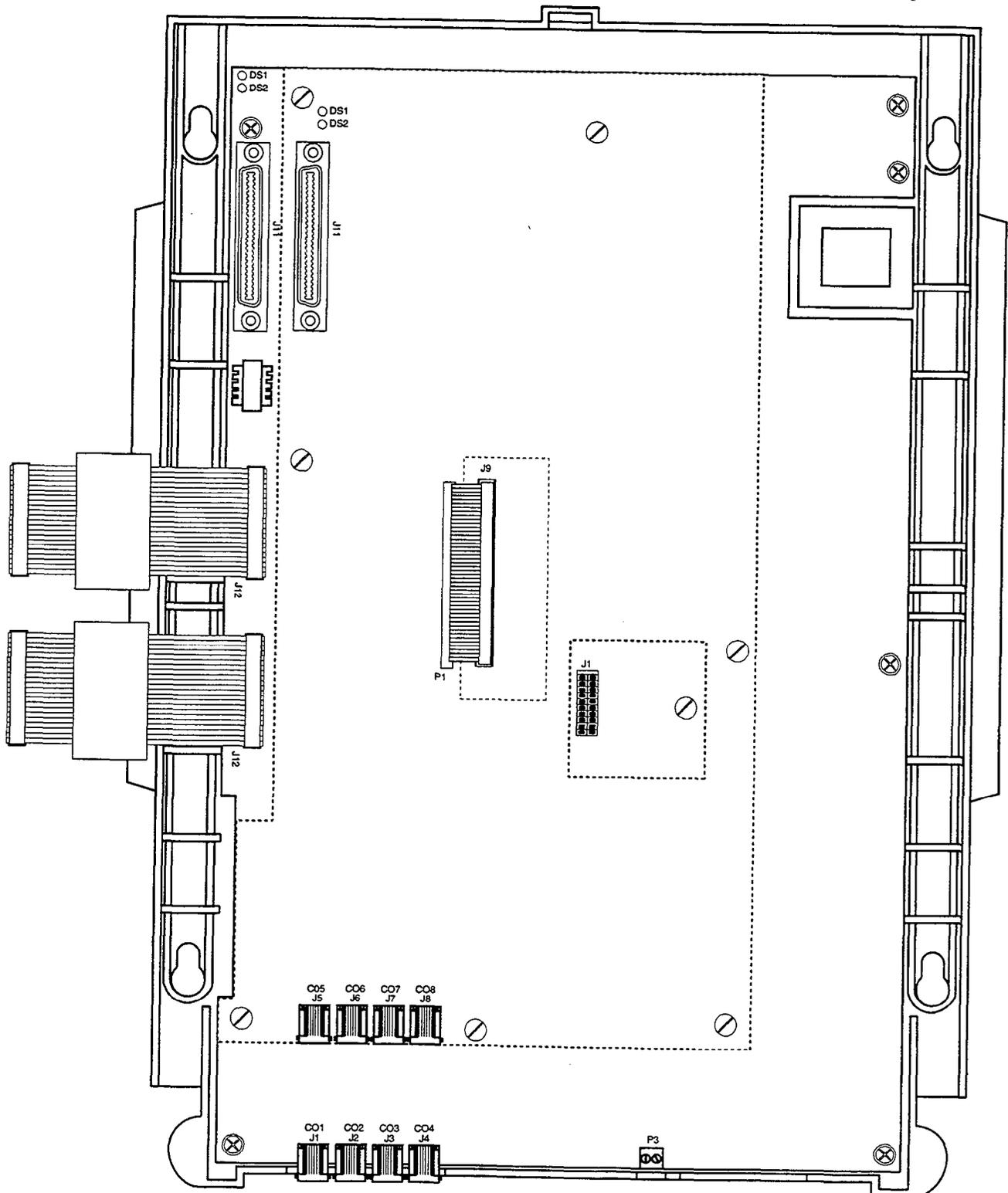
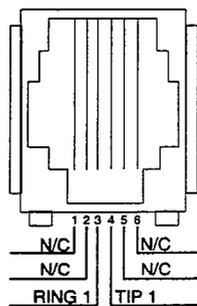


Figure 500-4 Expansion KSU & Main Key Service Bd (EKSU)

interface circuits are protected from mis-wiring and over-current.

### **CO Lines Connections:**

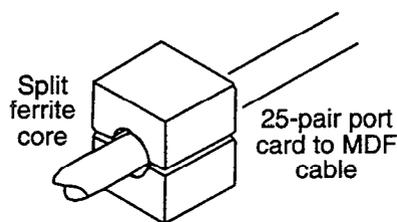
CO Lines are connected to the system via modular RJ-11 connectors accessed through the bottom of the EKSU. The Expansion KSU connects CO Line ports 9, 10, 11, and 12 to the system through modular connectors J1, J2, J3, and J4 respectively. The pinouts of the modular connector are as follows:



### **Stations Connections:**

The station ports of the SPD 1428 are wired to the main distribution frame via a 25-pair, (50-pin) male amphenol-type connector located on the expansion key service board, connector J11. A 25-pair cable with a 50-pin Female amphenol-type connector is required to extend the station ports to the main distribution frame. Refer to Table 500-2 for additional pinouts information.

*NOTE: The 25 pair cable used to extend the stations to the MDF does not have to be shielded. However, the 25 pair cable must pass through a 3/8" diameter ferrite core before exiting the KSU again to comply with FCC Part 15 regulations.*



### **External Paging Connections**

The Expansion KSU is equipped with an external page port (a one-way, transmit voice path) that is wired to the J11 connector (50-pin male amphenol-type connector) on the Violet/Slate, Slate/Violet pair of wires (pin's 50 and 25). Refer to Table 500-2 for additional information.

### **Application Module(s) Connections:**

The J1 connector on the expansion key service board allows the installation of one application module (i.e. DTMF receiver) to the system. Refer to Sec. 500.6 for a description of the available application modules.

### **C. 2x4 CO/STA Expander Module**

The SPD 1428 2x4 CO/STA Expander Module is a Two (2) CO by four (4) Key Station Interface module that plugs onto the main key service board of the basic KSU or the expansion key service unit of the Expansion KSU with the use of two ribbon cables. This module is a combination board that contains the necessary circuitry to connect two (2) CO/Centrex/PBX loop start lines and four (4) Digital Key Telephones to the system. This card also contains one additional voice (transmit) path for external paging, and a connector for adding one application module (i.e. DTMF Receiver) to the system.

*NOTE: When the 2x4 Expander module is installed in the Expansion KSU, two CO ports and four Station ports become unusable.*

### **LED's & Indicators**

Two green LED's indicate the presence of +5 & -5 volts dc and a third LED monitors the +12 VDC used to supply power to the key stations. An extinguished LED indicates the absences of the associated voltage.

### **Module Installation:**

- Remove power from the Basic KSU.
- Locate the J9 connector on the Basic KSU motherboard and the P1 connector on the 2x4 CO/Station Expander Module. Refer to Figure 500-12.
- Gently push the cable from the P1 connector on the 2x4 CO/Station Expander Module onto the J9 connector on the Basic KSU motherboard.
- Locate the J10 connector on the Basic KSU motherboard and the P2 connector on the 2x4 CO/Station Expander Module. Refer to Figure 500-12.
- Gently push the cable from the P2 connector on the 2x4 CO/Station Expander Module onto the J10 connector on the Basic KSU motherboard.
- Secure the six (6) screws attached to the 2x4 CO/Station Expander module to the Basic KSU motherboard.
- Restore power to the Basic KSU.

### **CO Line/Station Interfaces:**

The 2x4 CO/STA Expander Module provides the interface for two (2) Central Office, Centrex or PBX loop start, lines. The protection circuitry necessary to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). The module design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and

Table 500-2 SPD 1428 EKSU J11 Station Connections

PAIR	PIN	COLOR	DESIG
1	26	WH/BL	Port 013 Xmt Tip
	1	BL/WH	Xmt Ring
2	27	WH/OR	Rcve Tip
	2	OR/WH	Rcve Ring
3	28	WH/GN	Port 014 Xmt Tip
	3	GN/WH	Xmt Ring
4	29	WH/BN	Rcve Tip
	4	BN/WH	Rcve Ring
5	30	WH/SL	Port 015 Xmt Tip
	5	SL/WH	Xmt Ring
6	31	RD/BL	Rcve Tip
	6	BL/RD	Rcve Ring
7	32	RD/OR	Port 016 Xmt Tip
	7	OR/RD	Xmt Ring
8	33	RD/GN	Rcve Tip
	8	GN/RD	Rcve Ring
9	34	RD/BN	Port 017 Xmt Tip
	9	BN/RD	Xmt Ring
10	35	RD/SL	Rcve Tip
	10	SL/RD	Rcve Ring
11	36	BK/BL	Port 018 Xmt Tip
	11	BL/BK	Xmt Ring
12	37	BK/OR	Rcve Tip
	12	OR/BK	Rcve Ring
13	38	BK/GN	Port 019 Xmt Tip
	13	GN/BK	Xmt Ring
14	39	BK/BN	Rcve Tip
	14	BN/BK	Rcve Ring
15	40	BK/SL	Port 020 Xmt Tip
	15	SL/BK	Xmt Ring
16	41	YL/BL	Rcve Tip
	16	BL/YL	Rcve Ring
17	42	YL/OR	Port 021* Xmt Tip
	17	OR/YL	Xmt Ring
18	43	YL/GN	Rcve Tip
	18	GN/YL	Rcve Ring
19	44	YL/BN	Port 022* Xmt Tip
	19	BN/YL	Xmt Ring
20	45	YL/SL	Rcve Tip
	20	SL/YL	Rcve Ring
21	46	VI/BL	Port 023* Xmt Tip
	21	BL/VI	Xmt Ring
22	47	VI/OR	Rcve Tip
	22	OR/VI	Rcve Ring
23	48	VI/GN	Port 024 *Xmt Tip
	23	GN/VI	Xmt Ring
24	49	VI/BN	Rcve Tip
	24	BN/VI	Rcve Ring
25	50	VI/SL	External Page Tip
	25	SL/VI	External Page Ring

Table 500-3 SPD 1428 4x8 Expander Module Connection

PAIR	PIN	COLOR	DESIG
1	26	WH/BL	Port 021 Xmt Tip
	1	BL/WH	Xmt Ring
2	27	WH/OR	Rcve Tip
	2	OR/WH	Rcve Ring
3	28	WH/GN	Port 022 Xmt Tip
	3	GN/WH	Xmt Ring
4	29	WH/BN	Rcve Tip
	4	BN/WH	Rcve Ring
5	30	WH/SL	Port 023 Xmt Tip
	5	SL/WH	Xmt Ring
6	31	RD/BL	Rcve Tip
	6	BL/RD	Rcve Ring
7	32	RD/OR	Port 024 Xmt Tip
	7	OR/RD	Xmt Ring
8	33	RD/GN	Rcve Tip
	8	GN/RD	Rcve Ring
9	34	RD/BN	Port 025 Xmt Tip
	9	BN/RD	Xmt Ring
10	35	RD/SL	Rcve Tip
	10	SL/RD	Rcve Ring
11	36	BK/BL	Port 026 Xmt Tip
	11	BL/BK	Xmt Ring
12	37	BK/OR	Rcve Tip
	12	OR/BK	Rcve Ring
13	38	BK/GN	Port 027 Xmt Tip
	13	GN/BK	Xmt Ring
14	39	BK/BN	Rcve Tip
	14	BN/BK	Rcve Ring
15	40	BK/SL	Port 028 Xmt Tip
	15	SL/BK	Xmt Ring
16	41	YL/BL	Rcve Tip
	16	BL/YL	Rcve Ring
17	42	YL/OR	Xmt Ring
	17	OR/YL	Xmt Ring
18	43	YL/GN	Rcve Tip
	18	GN/YL	Rcve Ring
19	44	YL/BN	Xmt Ring
	19	BN/YL	Xmt Ring
20	45	YL/SL	Rcve Tip
	20	SL/YL	Rcve Ring
21	46	VI/BL	Xmt Ring
	21	BL/VI	Xmt Ring
22	47	VI/OR	Rcve Tip
	22	OR/VI	Rcve Ring
23	48	VI/GN	Xmt Ring
	23	GN/VI	Xmt Ring
24	49	VI/BN	Rcve Tip
	24	BN/VI	Rcve Ring
25	50	VI/SL	Ext Page Tip
	25	SL/VI	Ext Page Ring

\*Active only when the SPD 1428 2x4 Expander Module is installed in the Expansion KSU.

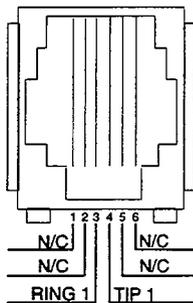
CSA 0.3 standards. CO lines are connected to the system via RJ-11 modular connectors mounted on the bottom edge of the board.

The 2x4 CO/STA Expander module also provides the interface for four (4) Digital Key Telephones using two (2) 64 kilobyte channel arrangements. Stations connect to the board via the MDF through a 50 pin connector located on the main key service board inside the basic KSU or a similar connector on the expansion key service board when installed in the EKSU. Each station connection requires four (4) wires to connect to the board.

A Digital DSS/DLS Console, and a Single Line Telephone Adapter (OPX), or other specifically designed adapter with a digital interface can be assigned to any one of the interface circuits. The Key Station interface circuits are protected from mis-wiring and over-current.

### **CO Lines Connections:**

CO Lines are connected to the system via modular RJ-11 connectors mounted on the 2x4 Expander Module and accessed on the bottom of the KSU. The 2x4 Expander Module connects CO Line ports 5 and 6 (when installed on the Basic KSU) or ports 13 and 14 (when installed in the Expansion KSU) to the system through modular connectors J21 and J22 respectively. The pinouts of the modular connector are as follows.



### **Stations Connections:**

The station ports of the SPD 1428 2x4 Expander Module are wired to the main distribution frame via a 25-pair, (50-pin) male amphenol-type connector located on the main key service board or expansion key service board, connector J11. A 25-pair cable with a 50-pin Female amphenol-type connector is required to extend the station ports to the main distribution frame. The pinouts for the stations on the 2x4 Expander module activate ports 009 through 012 on connector J11 as shown in Table 500-1 when installed on the main key service unit in the Basic KSU. The pinouts for the stations on the 2x4 Expander module activate ports 025 through 028 on connector J11 are shown in Table 500-2 when installed on the expansion key service unit in the Expansion KSU.

### **Paging Connections:**

A two position terminal strip J2 mounted on the 2x4 Expander board provides connection to the external page port (a one-way, transmit voice path) provided for on the 2x4 module.

### **Application Module(s) Connections:**

The J1 connector on the 2x4 Expander module allows the installation of one application module (i.e. DTMF receiver) to the system. Refer to Sec. 500.6 for a description of the available application modules.

### **D. 4x8 CO/STA Expander Module**

The SPD 1428 4x8 CO/STA Expander Module is a four (4) CO by eight (8) Key Station Interface module that may plug onto the Expansion key service board of the Expansion KSU only. This module is a combination board that contains the necessary circuitry to connect four (4) CO/Centrex/PBX loop start lines and eight (8) Digital Key Telephones to the system. This card also contains one additional voice (transmit) path for external paging, and a connector for adding one application module (i.e. DTMF Receiver) to the system.

### **LED's & Indicators**

Four green LED's are located on the 4x8 Expander Module. Two of the LED's (DS2 & DS3) indicate the presence of +5 & -5 volts dc. LED's DS1 and DS5 indicate the presence of +12 VDC used to supply power to the key stations (one LED for every four stations). An extinguished LED indicates the absence of the associated voltage.

### **Module Installation:**

- Remove power from the Expansion KSU.
- Locate the J9 connector on the Expansion KSU motherboard and the P1 connector on the 4x8 CO/Station Expander Module. Refer to Figure 500-12.
- Gently push the cable from the P1 connector on the 4x8 CO/Station Expander Module onto the J9 connector on the Expansion KSU motherboard.
- Locate the J10 connector on the Expansion KSU motherboard and the P2 connector on the 4x8 CO/Station Expander Module. Refer to Figure 500-12.
- Gently push the cable from the P2 connector on the 4x8 CO/Station Expander Module onto the J10 connector on the Expansion KSU motherboard.
- Secure the six (6) screws attached to the 4x8 CO/Station Expander module to the Expansion KSU motherboard.

- g. Restore power to the Expansion KSU.

### **Module Grounding:**

A No. 12 AWG stranded wire is used to connect a ground between the Expansion KSU and the 4x8 CO/Station Expander Module. A two position terminal strip (P3) is located along the bottom edge of the expansion key service unit and is accessible through the bottom of the BKSU. One terminal position on the P3 connector is used to connect the ground wire from the basic KSU to the Expansion KSU.

The other terminal position is used to connect the ground wire from the 4x8 CO/Station Expander Module to the Expansion KSU.

### **CO Line/Station Interfaces**

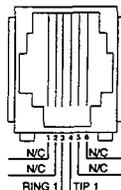
The 4x8 CO/STA Expander Module provides the interface for four (4) Central Office, Centrex or PBX loop start, lines. The protection circuitry necessary to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). The module design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA 0.3 standards. CO lines are connected to the system via RJ11 modular connectors mounted on the bottom edge of the board.

The 4x8 CO/STA Expander module also provides the interface for eight (8) Digital Key Telephones using two (2) 64 kilobyte channel arrangements. Stations connect to the board via the MDF through a 50 pin connector located on the board. Each station connection requires four (4) wires to connect to the board.

A Digital DSS/DLS Console, and a Single Line Telephone Adapter (OPX) or other specifically designed adapter with a digital interface can be assigned to any one of the interface circuits. The Key Station interface circuits are protected from mis-wiring and over-current.

### **CO Lines Connections:**

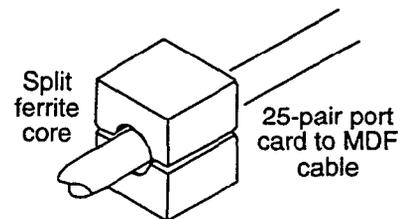
CO Lines are connected to the system via modular RJ-11 connectors accessed through the bottom of the EKSU. The 4x8 Expander Module connects CO Line ports 13, 14, 15, and 16 to the system through modular connectors J1, J2, J3, and J4 respectively. The pinouts of the modular connector are as follows:



### **Wiring / Pinouts / Connections - Stations**

The station ports of the SPD 1428 4x8 Expander Module are wired to the main distribution frame via a 25-pair, (50-pin) male amphenol type connector located on the 4x8 Expander module, connector J11. A 25-pair cable with a 50-pin Female amphenol-type connector is required to extend the station ports to the main distribution frame. The pinouts are shown in Table 500-3.

*NOTE: The 25 pair cable used to extend the stations to the MDF does not have to be shielded. However, the 25 pair cable must pass through a 3/8" diameter ferrite core before exiting the KSU again to comply with FCC Part 15 regulations.*



### **External Paging Connections:**

The 4x8 Expander Module is equipped with an external page port (a one-way, transmit voice path) that is wired to the J11 connector (50-pin male amphenol-type connector) on the Violet/Slate, Slate/Violet pair of wires (pin's 50 and 25). Refer to Table 500-3 for wiring information.

### **Application Module(s) Connections:**

The J1 connector on the expansion key service board allows the installation of one application module (i.e. DTMF receiver) to the system. Refer to Sec. 500.6 for a description of the available application modules.

#### 500.4 SPD 2856 INSTALLATION PLANNING

Prior planning of the installation will aid in a smooth cut-over and a satisfied customer. Select a suitable location for the system. Determine the number of telephones of each type, and the number of 4x8 CO/Station cards from the sales contract and discussions with the customer.

*NOTE: Only one station set is allowed per digital extension number. It is not possible to bridge digital station ports so that an extension number may appear in more than one location.*

- Programming information should also be gathered from the customer at this time so that the system may be programmed either before, or while the system is being installed.
- Determine the location and type of each telephone, and mark floor plans accordingly.
- Determine the location for the operator stations, and mark the floor plans.
- Arrange for power cabling (if necessary) and station cabling of the site.
- If the system is to be installed in an area subject to frequent lightning storms, consideration should be given to providing additional lightning protection on the CO lines beyond what is provided by the local telephone operating company.

*NOTE: Installers should be trained and thoroughly familiar with the basic components of the SPD 2856 before attempting installation of this product.*

#### 500.5 SPD 2856 SYSTEM COMPONENTS

##### A. Equipment Cabinet With Power Supply (KSU)

The SPD 2856 system main cabinet contains the power supply and mother board to support a fully configured system of 28 CO Lines and 56 Stations. The mother board has eight (8) card slots. Card Slot J8 (the right most card slot) is used for the Central Processor Board (CPB) PCB. Card slots J1 through J7 each support a four (4) CO line by eight (8) station PCB's. Cable exits through the bottom of the KSU through a cable exit raceway near the back of the KSU. Refer to Figure 500-5 for PCB layout and location of connectors.

##### Power Supply

The power supply is installed in the KSU at the time of manufacture and ships with the KSU. The power supply input voltage is 117 VAC  $\pm$ 10%. The power supply provides power distribution of filtered / unregulated 12 VDC and a regulated -5 VDC to the backplane bus. An ON/OFF switch is located on the

front of the power supply along with a slo-blow 5 amp fuse on the AC side of the transformer. The power supply provides an input for a 48 VDC source for future use. Power is regulated and distributed to stations / circuitry in the system on each PCB. Three fuses located inside the power supply protect the system from over-current situations. The power supply and cabinet meet all safety requirements to comply with UL 1459 Second Edition and CSA 0.3 standards.

The power supply is installed inside the system cabinet, on the right side, in the first card slot (J9). The power supply is designed to be an integral, structural part of the system. Do not attempt to install the system, or interface cards unless the power supply is installed with all four screws securely in place. The cabinet, includes the power supply already installed. The power supply is recognized under the Component Program of Underwriters Laboratories Inc.

*NOTE: Make certain a 1/2 inch diameter ferrite core is in place on the power cord at a point as close to the power supply as possible. If this core is not in place, it is shipped with the cabinet and must be installed before operating the system. Refer to Figure 500-6 for the proper location. Keep the ferrite core from sliding down the cable by installing a cable tie on the power cord just below the ferrite cord.*

The power supply is unique in that the transformer is not present on the power supply card and its enclosure. The transformer is mounted inside the cabinet next to the bottom right of the backplane. When the power supply card is installed, the transformer is totally enclosed by the power supply card's "L" shaped enclosure, and the right side of the cabinet. This creates a totally enclosed, operational, power supply. Since the transformer is installed in the cabinet, and the power supply card is removable from the cabinet, the AC connections are made directly to the system backplane.

WARNING

Since hazardous voltages are always present on the backplane while the system AC power cord is plugged in, AT NO TIME SHOULD THE POWER SUPPLY CARD BE REMOVED WHILE THE SYSTEM AC POWER CORD IS PLUGGED IN. THE POWER SUPPLY BOARD AND ITS "L" SHAPED METAL ENCLOSURE PROVIDE THE ONLY PROTECTION FROM SHOCK HAZARD WHILE THE AC POWER CORD IS PLUGGED IN. There are very few instances when the power

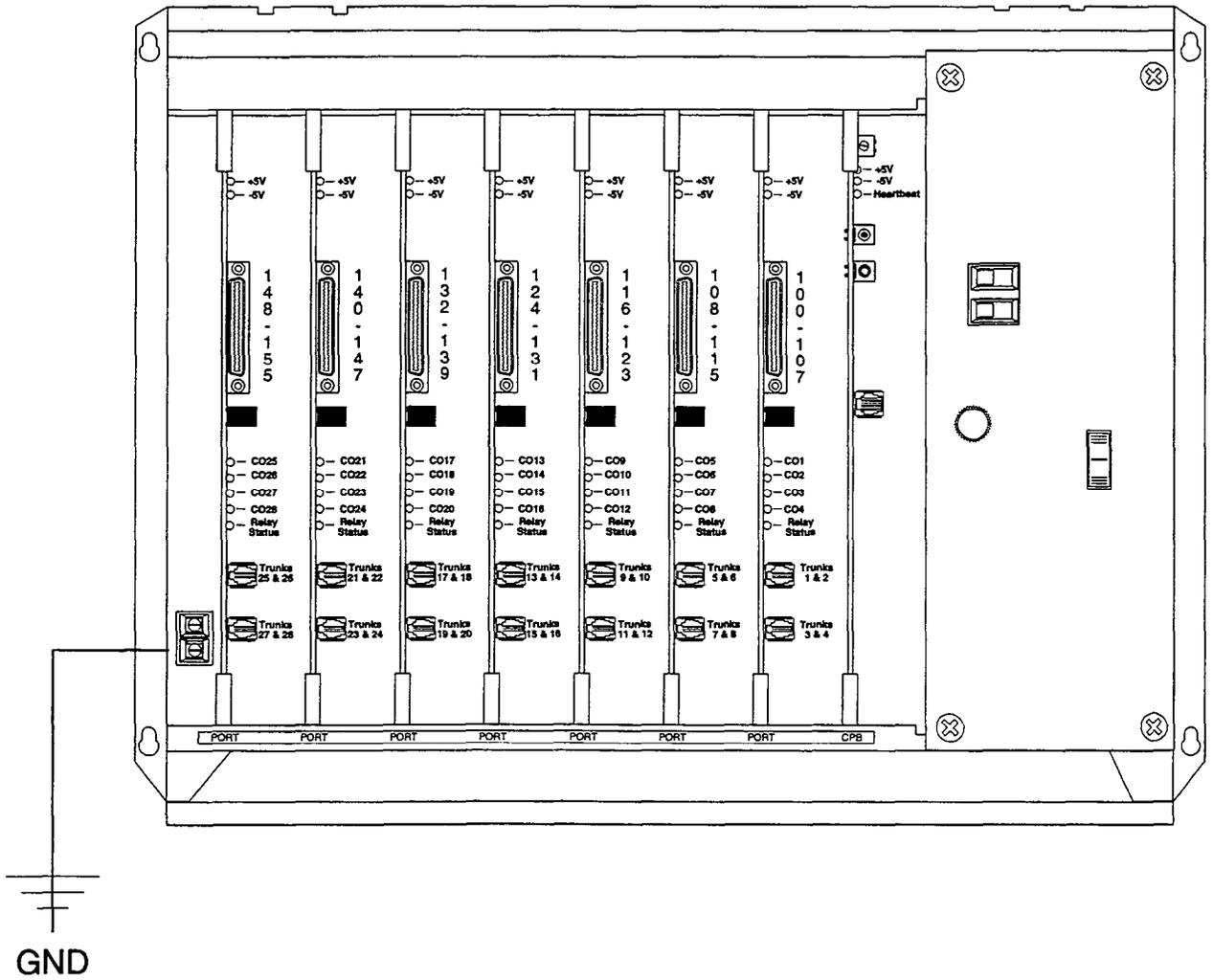


Figure 500-5 SPD 2856 Basic Cabinet with Power Supply

supply card should be removed. If an instance arises where it must be removed, ALWAYS unplug the system AC power cord FIRST.

The power supply cord plugs into an isolated, dedicated, (with dedicated ground) 117VAC outlet for power. This is necessary to prevent possible voltage spikes and transients that may be caused by equipment sharing the same AC circuit.

The AC connection to the power supply requires a parallel blade with a ground receptacle. A three wire to two wire isolation adapter should not be used. The use of a surge suppressor is required.

**Grounding**

A no. 12 AGW copper wire should be used to connect a ground between the ground source and the KSU (25 feet maximum). A two position terminal strip (J10) is located on the lower left corner of the mother board and is accessible through the left side of the KSU. One terminal position can be used to connect the ground wire from a ground source.

**B. Cabinet Installation**

Once the area for the telephone equipment has been selected, mount a plywood back board to the wall. The back board size will vary depending upon the size of the MDF. The entire system and frame can be mounted on a 4' x 6' x 3/4" plywood. If mounting the cabinet alone, the minimum back board size is 25" x 17" x 3/4". A fully loaded cabinet can weigh approximately 64 lbs. Make certain proper mounting procedures are followed.

*NOTE: Check local building and electrical codes before mounting the system. For example, certain areas may require a flame retardant plywood back board.*

Mount the cabinet to the plywood using 3/4" #12 pan-head sheet metal screws such that the top of the cabinet is approximately three feet (1 meter) from the ceiling, and bottom is four feet (1.2 meters) from the floor. Make certain before mounting the cabinet that circuit cards slide easily in and out of their respective card slots.

Use the mounting template supplied with the cabinet to locate the mounting holes. Also refer to Figure 500-6. Drill the holes and mount the cabinet.

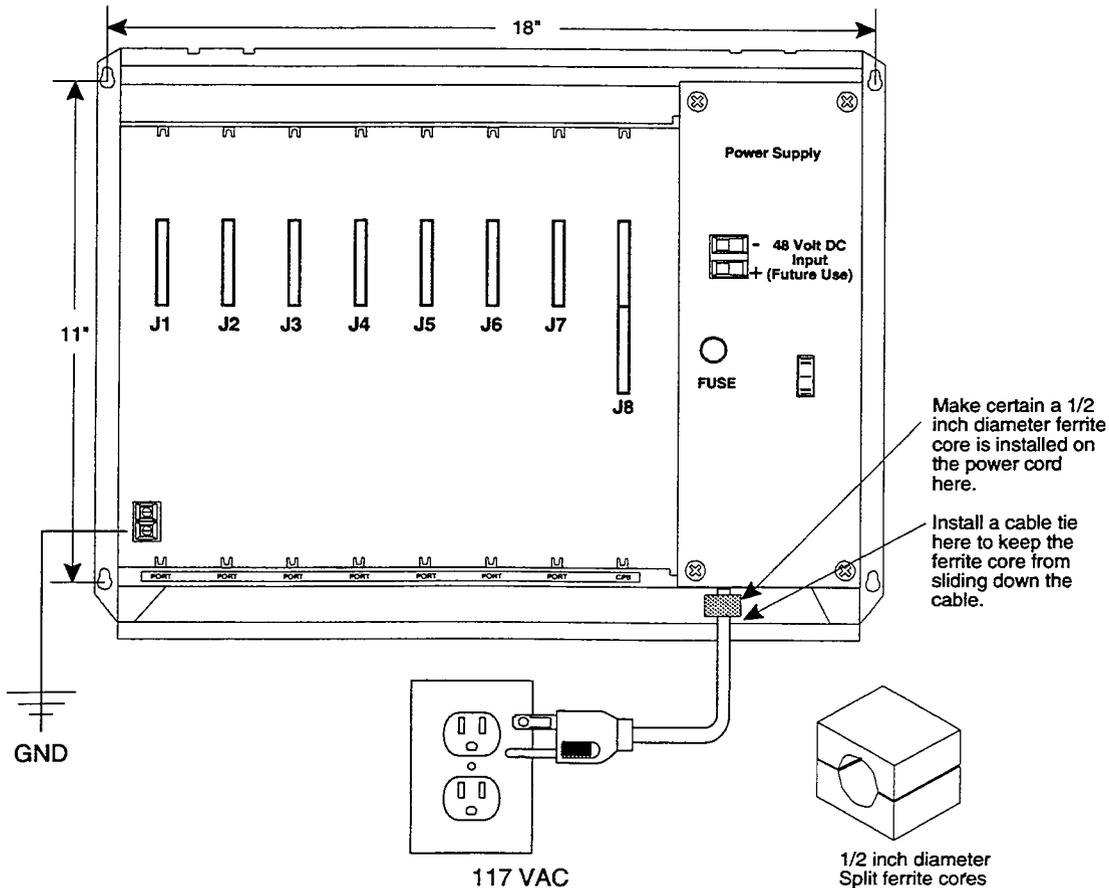


Figure 500-6 SPD 2856 Mounting Dimensions

### C. Central Processor Board (CPB)

This plug-in card is the only common equipment card required to make the system operational and controls all system activity. The CPB contains the main micro-processor a 16-bit (68000) and a real time clock which controls all system functions including the PCM/TDM voice switching under direction of ROM and RAM software coding. The CPB is responsible for all control functions, execution of all logic operations and control of system modules including control over circuitry necessary for voice switching and conference connections. The CPB is also responsible for all system tones, system timing, and station status control. In addition the CPB also provides software and hardware support to ensure the following:

- Watch dog timer and recovery.
- PCB status as to presence/absence of cards for automatic software configuration setup.
- Interpret an ID code from each PCB so that card type can be determined automatically.
- State/event software design.
- Battery backup of customer database RAM memory.

The CPB contains the circuitry and connection (RCA type) for background music/music on hold, and the standard 300 Baud Modem. An optional 1200 Baud Modem can be installed on the CPB to allow the on-board modem to transmit at a 1200 baud rate. In addition there is one RS-232 (modular connector) input/output port on the CPB and a connector to support the use of an optional I/O expansion module. The I/O expansion module adds (1) RS-232 I/O port and (1) RS-422 I/O port to the system for a system total of three (3) I/O ports. A reset (halt) push button switch and a BGM/MOH volume control pot is located on the front of the PCB. Refer to Figure 500-5 for CPB layout and location of connectors.

System software is provided in EPROM memory and is installed on the CPB. The CPB contains (512) kilobytes of EPROM storage and is equipped with 256K of battery-backed static RAM. Provisions have been made on the card to address up to (4) megabytes of EPROM memory and up to (2) megabytes of static RAM.

An option "dip" switch located on the CPB allows the system EPROM memory to be configured utilizing different size EPROM chips. 1 Megabit, 2 Megabit, 4 Megabit and 8 Megabit chips may be used to provide the generic software. Refer to Sec. 800 Maintenance & Troubleshooting for "dip" switch settings for various allowable configurations.

The CPB allows the use of either 1 Megabit or 4

megabit static RAM chips to be used for RAM memory. The size and type of memory used is automatically determined and set by the system.

#### IMPORTANT STEP

The battery backup strap must be placed in the "ON" position to activate memory battery backup (J3). Do this prior to inserting the CPB into the KSU (Refer to Figure 500-5). If the optional 1200 baud modem module or expansion I/O module are to be installed, do this now prior to inserting the CPB. The CPB board is inserted into the J8 slot with components on the card facing the right. This board must NOT be installed with the power on. The edge connector on the CPB is offset to prevent it from being installed in an incorrect slot. Do not force the card into another slot. One CPB is required per system.

#### LED's & Indicators

Two green LED's located along the front edge of the CPB provide an indication of the presence of +5 VDC & -5 VDC to the PCB. A third red LED located just below the two green LED's provides a system "heart beat" indication.

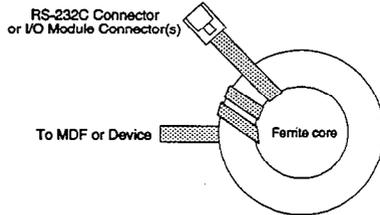
#### Modem Interface

The CPB contains an on-board modem that is capable of transmitting data at a rate of 300 baud. The modem supports and is compatible with the Hayes command protocol. The Bell System (Western Electric) standards 103 and 212A for modem design is incorporated into the design of this modem. The modem operates on-line in both Full and Half duplex modes. An optional 1200 baud module may be added to the CPB to allow transmission at the rate of 1200 baud.

#### I/O Port(s) Connections:

The SPD 2856 CPB contains one RS-232C, I/O port (8 pin modular jack type connector) located near the front edge of the PCB. This I/O port is capable of transmitting and receiving data at 300, 1200, 2400, 4800, and 9600 baud rates. The pinouts and communication requirements are shown in Figure 500-8.

**NOTE:** RS-232C modular cables must pass through a 1.2" thick, 2-3/8" diameter, round ferrite core three times prior to exiting the KSU in order to comply with FCC regulations. Up to five cables can be wrapped around one ferrite core.



An optional I/O module may be added to the CPB adding one additional RS-232C port (8 pin modular jack type connector) and one RS-422 port (6 pin modular jack connector). Refer to Sec. 500.6 for the

pinouts and communication requirements for the SPD 2856 RS-232C/RS-422 I/O Module.

**Modem Connections:**

The optional 1200 baud modem module may be installed on the CPB to connector J5 located directly above the battery. The modem port itself is accessed via software control. No hardware connections are required to connect to the modem.

**Background Music Connections:**

Background Music / Music On Hold is connected to the system via an RCA type connector (J2) located on the front edge of the CPB. A potentiometer labeled R5, accessible from the front of the CPB, allows for volume adjustment for Music On Hold.

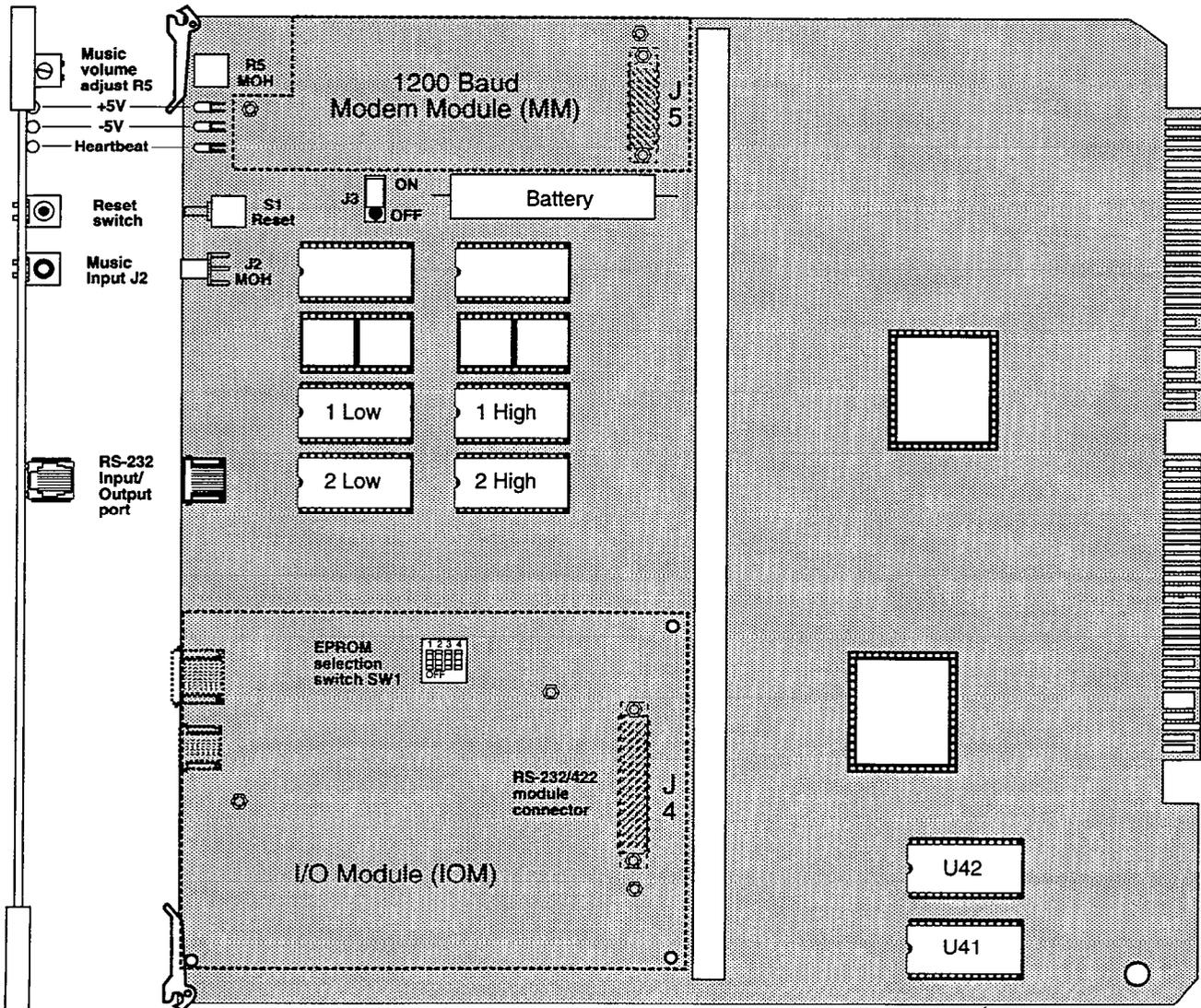
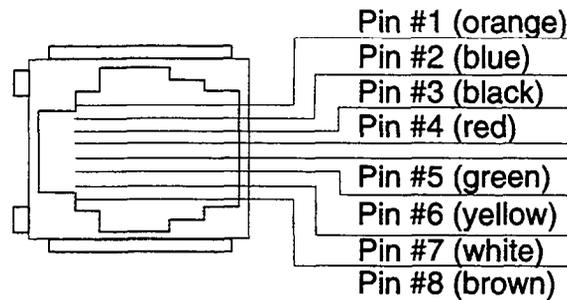
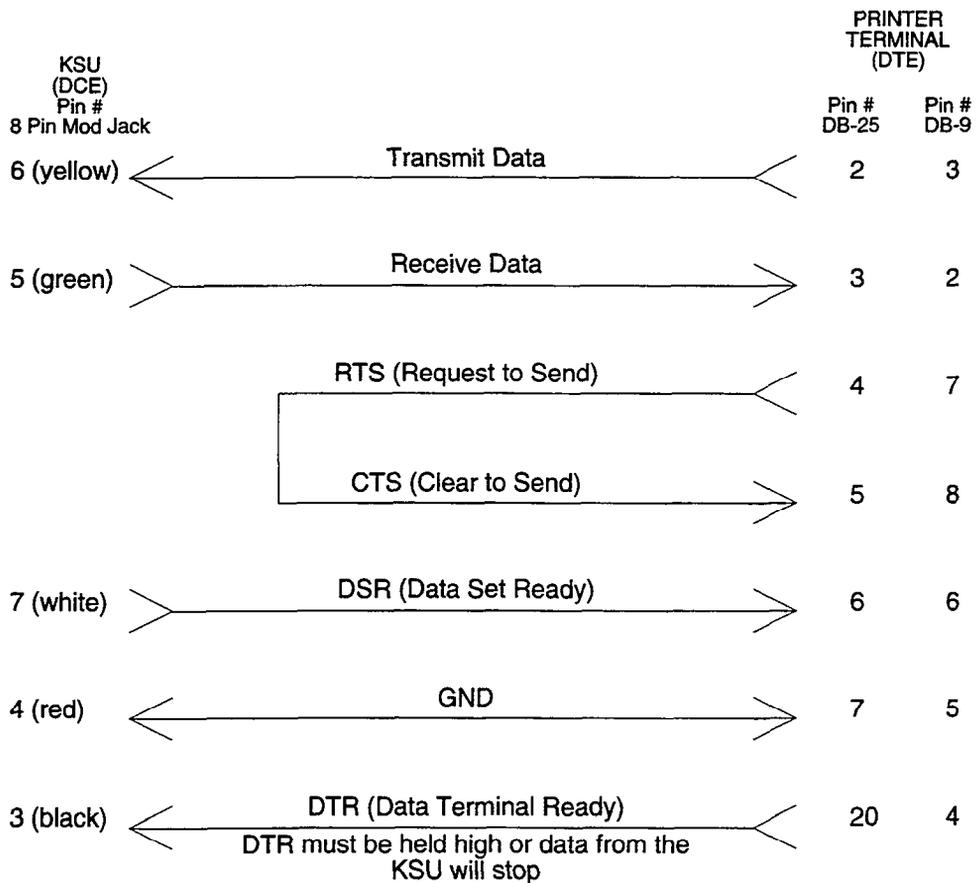


Figure 500-7 Central Processor Board (CPB)



CPB I/O 8 Pin Modular Jack Pinout



RS-232C PINOUT

Data Communication Requirements are:

- A) Serial Port Compatible
- B) ASCII Code Compatible
- C) 8 Data Bits and 1 Stop Bit
- D) No Parity
- E) Flow Control Method: Xon/Xoff

NOTE: Arrows show flow control direction.

\* If required by the printer or terminal

Figure 500-8 SPD 2856 CPB RS-232C Connections

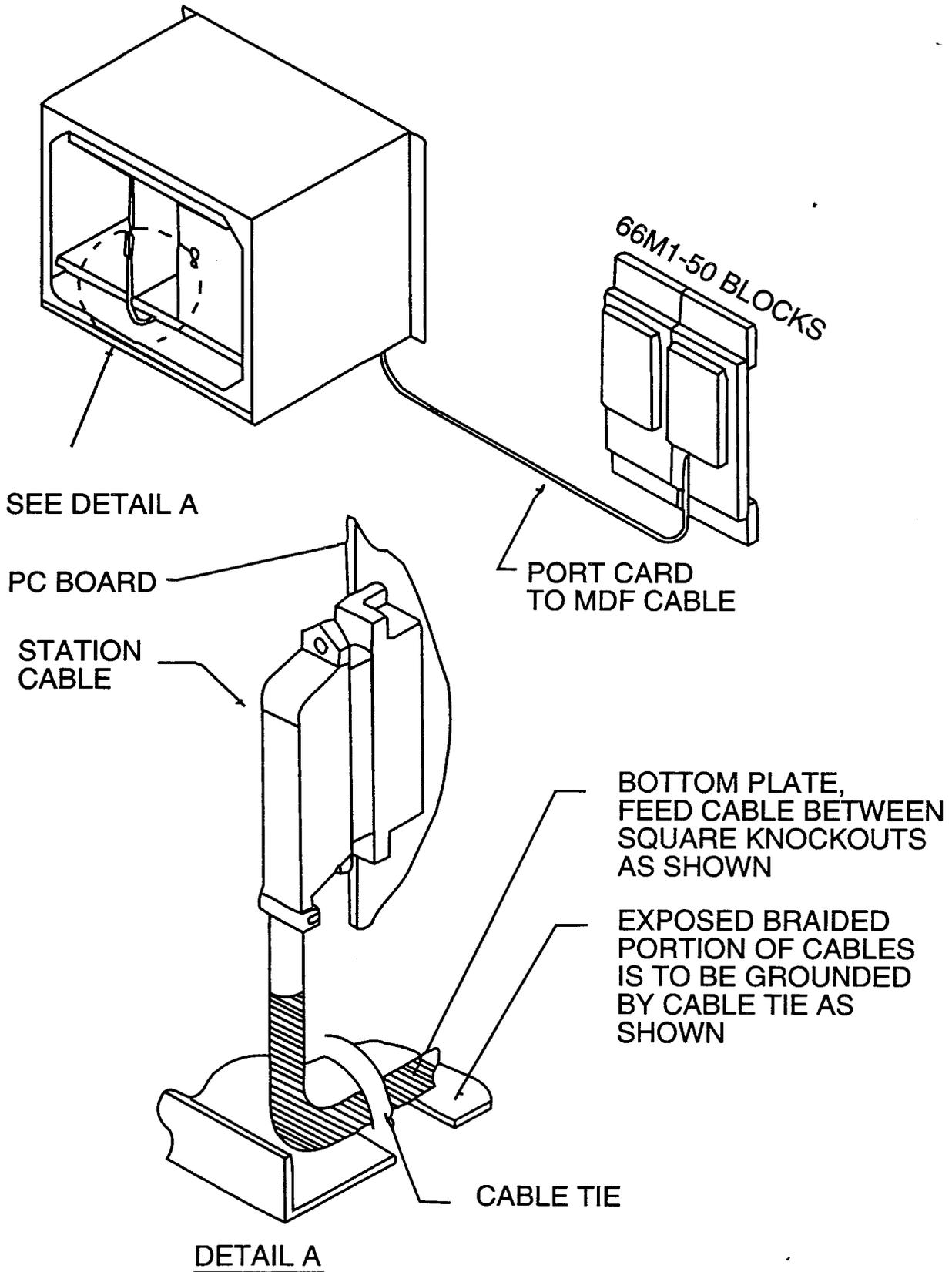


Figure 500-9 SPD 2856 Shielded Cable Terminations

**D. 4 x 8 CO/Station Key Interface Board (CKB)**

The CKB is a four (4) CO by eight (8) Key Station Interface board. The CKB board is a combination card that contains the necessary circuitry to connect four (4) CO/Centrex/PBX loop start lines and eight (8) Digital Key Telephones to the system. This card also contains one additional voice (transmit) path for external paging, a multi purpose relay and a connector for adding one application module to the system. The CKB may be installed into KSU PCB card slots J7 through J1 and may be removed or inserted while power is applied to the KSU (power on). Refer to Figure 500-5 for PCB layout and location of connectors.

**LED's & Indicators**

Five (5) red LED's are located along the front edge of the PCB one for each CO Line to indicate when it is in use and one LED that monitors the contact operation of the multi use contact located on the board. Two green LED's also located along the front edge of the CKB indicate the presence of +5 & -5 volts DC.

**CO Line/Station Interfaces:**

The CKB provides the interface for four (4) Central Office, Centrex or PBX loop start, lines. The protection circuitry necessary to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). The CKB design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA 0.3 standards.

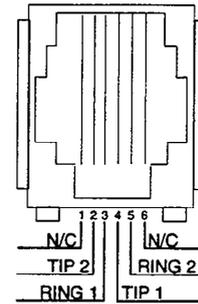
The CKB also provides the interface for eight (8) Digital Key Telephones using two (2) 64 kilobyte channel arrangements. Stations connect to the board via the MDF through a 50 pin connector located on the front edge of the board. Each station connection requires four (4) wires to connect to the board.

A Digital DSS/DLS Console, and a Single Line Telephone Adapter (OPX), or other specifically designed adapter with a digital interface can be assigned to any one of the interface circuits. The Key Station interface circuits are protected from mis-wiring and over-current.

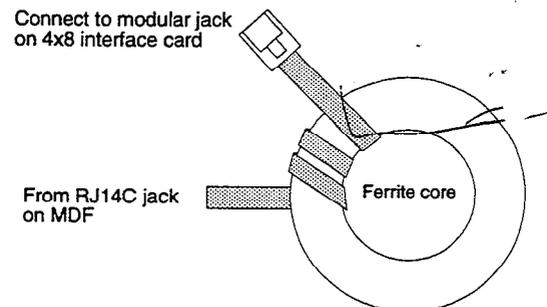
**CO Lines Connections:**

CO Lines are connected to the system via modular RJ-14 connectors mounted to the front edge of the CKB and accessed through the bottom of the KSU. Each CKB connects four (4) CO Line ports to the system through modular connectors J2 and J3 found on each KSB. The pinouts of the modular connector are as follows:

**NOTE:** Currently ALL CO Line modular cables must

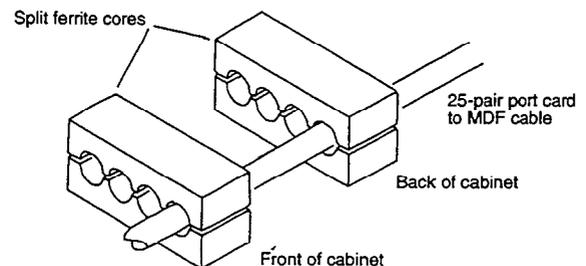


pass through a 1.2" thick, 2-3/8" diameter, round ferrite core three times prior to exiting the KSU in order to comply with FCC regulations. Up to five cables can be wrapped around one ferrite core.

**Stations Connections:**

The station ports of the SPD 2856 CKB are wired to the main distribution frame via a 25-pair, (50-pin) male amphenol type connector located on the front edge of the board, connector J1. A 25-pair cable with a 50-pin Female amphenol-type connector is required to extend the station ports to the main distribution frame. Refer to Table 500-4 for pin-out information.

**NOTE:** Currently the 25 pair cable (supplied with the CKB) used to extend the stations to the MDF must be shielded, with the exposed end of the shield closest to the KSU. This cable must be used to comply with FCC Part 15 regulations. In addition the 25 pair cable must pass through a ferrite core before exiting the KSU again to comply with FCC Part 15 regulations. Refer to Figure 500-9.



**External Paging Connections:**

The CKB is equipped with an external page port (a one-way, transmit voice path) that is wired to the J1 connector (50-pin male amphenol-type connector) on the Violet/Slate, Slate/Violet pair of wires (pin's 50 and 25). Refer to Table 500-4 for wiring information.

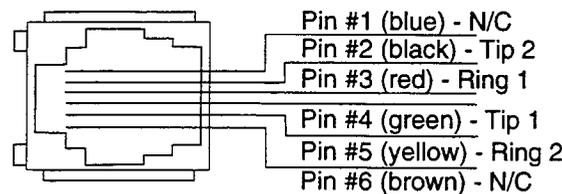
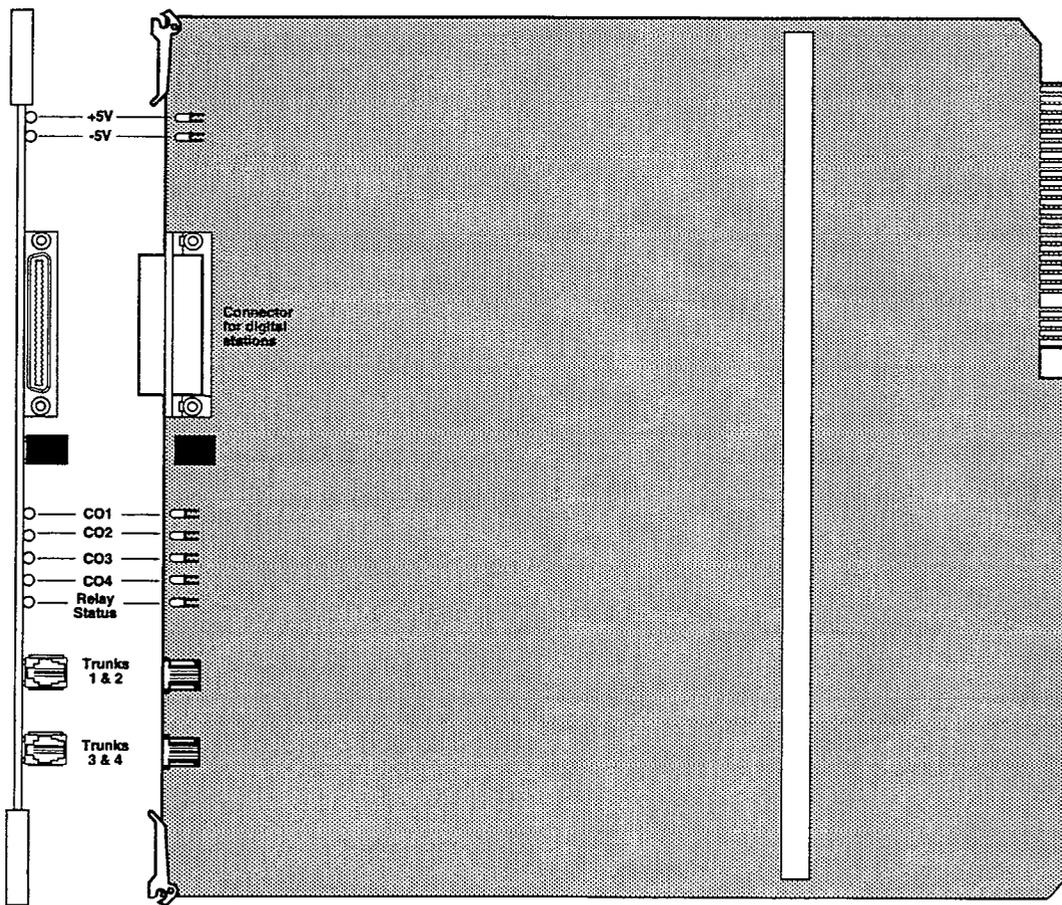
**Miscellaneous Relay Connections:**

Each CKB also contains a miscellaneous relay (K1) that can be used as a Page, Loud Bell, CO Line control, Power Fail, RAN, other functions as software will allow. The relay provides both an Open and a Closed loop upon activation. Therefore each relay may be used for various applications. The

relay provides a dry output and is rated for 1 AMP at 24 volts DC. The relay is wired to the MDF via the J1 connector (50-pin male amphenol-type connector) on the Violet/Orange, Violet/Green and Brown/Violet wires (pin's 47, 48 and 24). Refer to Table 500-4 for wiring information.

**Application Module(s) Connections:**

The J14 connector on the CKB board allows the installation of one application module (i.e. DTMF receiver) to the system. Refer to Sec. 500.6 for a description of the available application modules.



CKB RJ-14 Modular Jack Pinout

Figure 500-10 CO/STA Interface Board (CKB)

### E. 4x8 CO/SLT Interface Board (CSB) (Future)

The CSB is a four (4) CO Line by eight (8) Single Line Station Interface board. The CSB board is a combination card that contains the necessary circuitry to connect four (4) CO/Centrex/PBX loop start lines and eight (8) Standard Single Line Telephone (2500 type) to the system. This card also contains one additional voice (transmit) path for external paging, a multi purpose relay and a connector for adding one application module to the system. The CSB requires a 90Vdc Power Supply/Ring Generator, and at least one DTMF Receiver module (RM) must be installed in the system. This board can be removed or inserted with power on the KSU. Refer to Figure 500-5 for a PCB layout and location of connectors.

#### LED's & Indicators

Five (5) red LED's are located along the front edge of the PCB one for each CO Line to indicate when it is in use and one LED that monitors the contact operation of the multi use relay located on the board. Two green LED's also located along the front edge of the CKB indicate the presence of +5 & -5 volts DC.

#### CO Line/Station Interfaces:

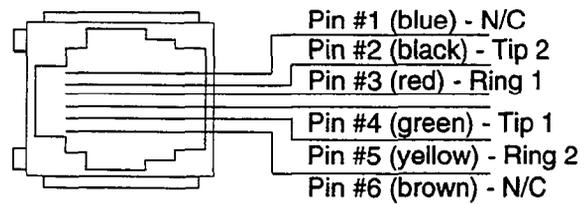
The CSB provides the interface for four (4) Central Office, Centrex or PBX loop start, lines. The protection circuitry necessary to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). The CSB design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA 0.3 standards. The CSB does not support data devices for data switching.

The CSB provides the control and interface for eight (8) standard Single line telephones (2500 type). Eight 24 volt DC single line circuits are provided on the PCB. These single line telephones can be equipped with a standard Message Waiting Lamp (90V T & R) that operate on the "tip" and "ring" leads. Additionally each circuit may be individually "strapped" or "optioned" to provide a loop interrupt to the connected SLT or device. The card will support single line Telephones up to 1500 feet from the KSU.

#### CO Lines Connections:

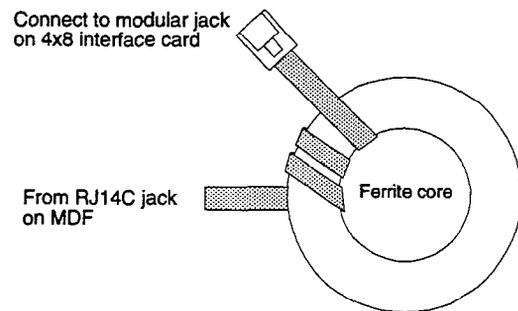
CO Lines are connected to the system via modular RJ-14 connectors mounted to the front edge of the CSB and accessed through the bottom of the KSU. Each CSB connects four (4) CO Line ports to the system through modular connectors J2 and J3 found on each CSB. The pinouts of the modular connector are as follows:

**NOTE:** Currently ALL CO Line modular cables must



CSB RJ-14 Modular Jack Pinout

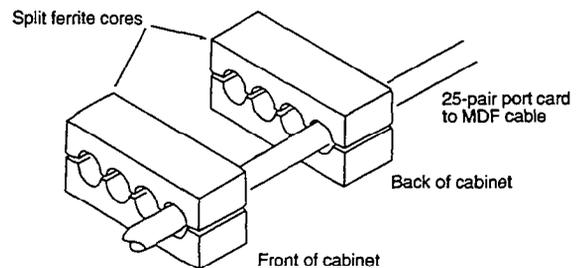
pass through a 1.2" thick, 2-3/8" diameter, round ferrite core three times prior to exiting the KSU in order to comply with FCC regulations. Up to five cables can be wrapped around one ferrite core.



#### Stations Connections:

The SLT station ports of the SPD 2856 CSB are wired to the main distribution frame via a 25-pair, (50-pin) male amphenol type connector located on the front edge of the board, connector J1. A 25-pair cable with a 50-pin Female amphenol-type connector is required to extend the station ports to the main distribution frame. The pinouts are shown in Table 500-5.

**NOTE:** Currently the 25 pair cable (supplied with the CSB) used to extend the stations to the MDF must be shielded, with the exposed end of the shield closest to the KSU. This cable must be used to comply with FCC Part 15 regulations. In addition the 25 pair cable must pass through a ferrite core before exiting the KSU again to comply with FCC Part 15 regulations. Refer to Figure 500-9.



**External Paging Connections:**

The CSB is equipped with an external page port (a one-way, transmit voice path) that is wired to the J1 connector (50-pin male amphenol-type connector) on the Violet/Slate, Slate/Violet pair of wires (pin's 50 and 25). Refer to Tables 500-4 and 500-5 for wiring information.

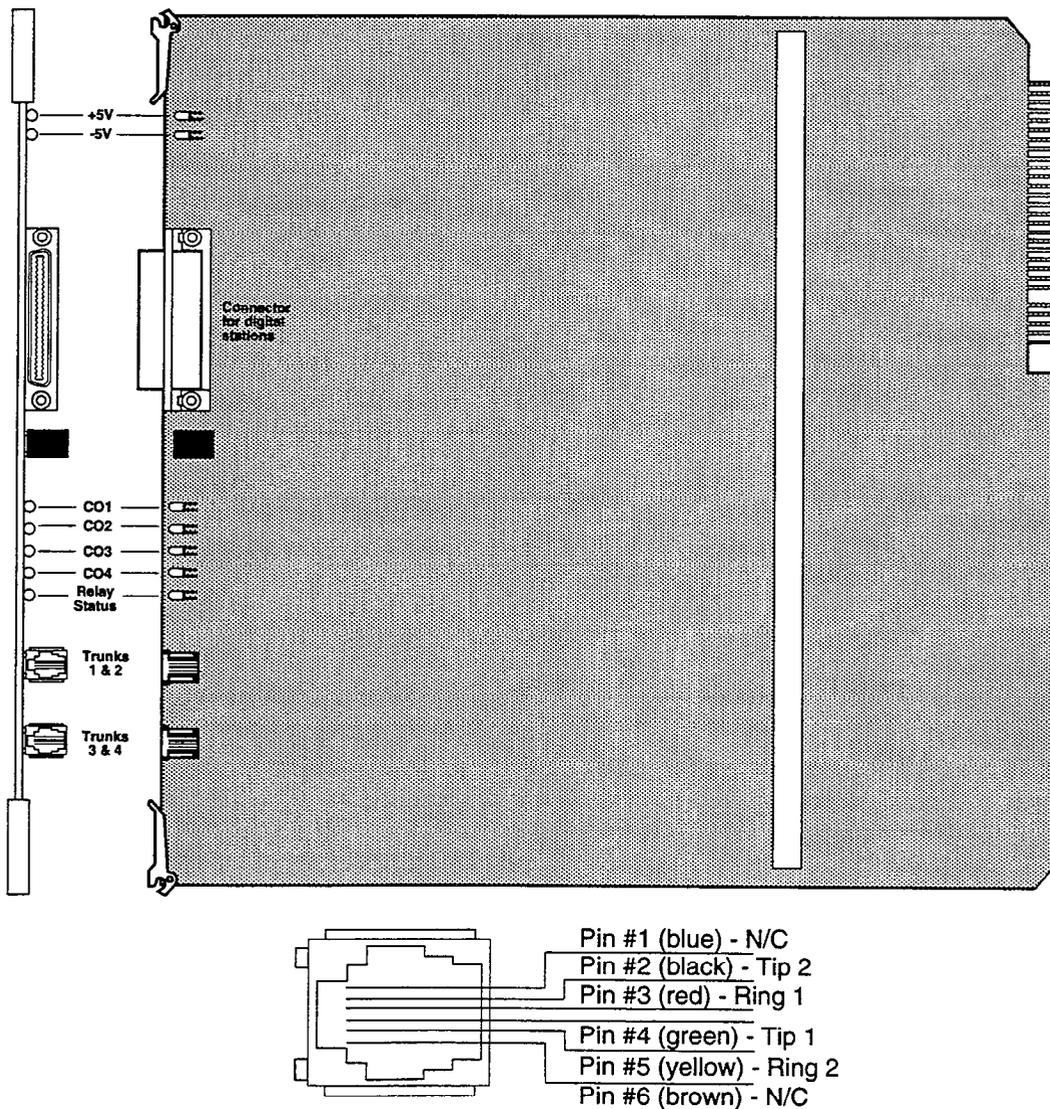
**Miscellaneous Relay Connections:**

Each CSB also contains a miscellaneous relay (K1) that can be used as a Page, Loud Bell, CO Line control, Power Fail, RAN, other functions as software will allow. The relay provides both an Open and a Closed loop upon activation. Therefore each relay may be used for various applications. The

relay provides a dry output and is rated for 1 AMP at 24 volts DC. The relay is wired to the MDF via the J1 connector (50-pin male amphenol-type connector) on the Violet/Orange, Violet/Green and Brown/Violet wires (pin's 47, 48 and 24). Refer to Tables 500-4 and 500-5 for wiring information.

**Application Module(s) Connections:**

The J14 connector on the CSB board always the installation of one application module (i.e. DTMF receiver) to the system. Refer to Sec. 500.6 for a description of the available application modules.



CSB RJ-14 Modular Jack Pinout

Figure 500-11 CO/SLT Interface Board (CSB)

Table 500-4 4x8 CO/Station Interface Board (CKB)

PAIR	PIN	COLOR	DESIG
1	26	WH/BL	Port 001 Xmt Tip
	1	BL/WH	Xmt Ring
2	27	WH/OR	Rcve Tip
	2	OR/WH	Rcve Ring
3	28	WH/GN	Port 002 Xmt Tip
	3	GN/WH	Xmt Ring
4	29	WH/BN	Rcve Tip
	4	BN/WH	Rcve Ring
5	30	WH/SL	Port 003 Xmt Tip
	5	SL/WH	Xmt Ring
6	31	RD/BL	Rcve Tip
	6	BL/RD	Rcve Ring
7	32	RD/OR	Port 004 Xmt Tip
	7	OR/RD	Xmt Ring
8	33	RD/GN	Rcve Tip
	8	GN/RD	Rcve Ring
9	34	RD/BN	Port 005 Xmt Tip
	9	BN/RD	Xmt Ring
10	35	RD/SL	Rcve Tip
	10	SL/RD	Rcve Ring
11	36	BK/BL	Port 006 Xmt Tip
	11	BL/BK	Xmt Ring
12	37	BK/OR	Rcve Tip
	12	OR/BK	Rcve Ring
13	38	BK/GN	Port 007 Xmt Tip
	13	GN/BK	Xmt Ring
14	39	BK/BN	Rcve Tip
	14	BN/BK	Rcve Ring
15	40	BK/SL	Port 008 Xmt Tip
	15	SL/BK	Xmt Ring
16	41	YL/BL	Rcve Tip
	16	BL/YL	Rcve Ring
17	42	YL/OR	
	17	OR/YL	
18	43	YL/GN	
	18	GN/YL	
19	44	YL/BN	
	19	BN/YL	
20	45	YL/SL	
	20	SL/YL	
21	46	VI/BL	
	21	BL/VI	
22	47	VI/OR	Misc .Relay N.C.
	22	OR/VI	
23	48	VI/GN	Misc. Relay N.O.
	23	GN/VI	
24	49	VI/BN	
	24	BN/VI	Misc. Relay Common
25	50	VI/SL	External Page Tip
	25	SL/VI	External Page Ring

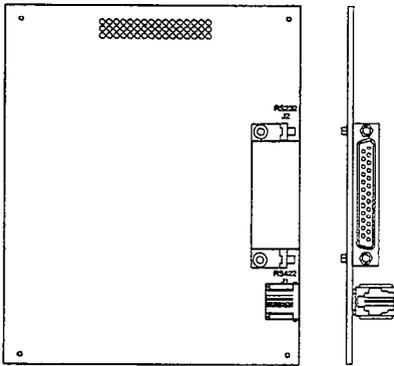
Table 500-5 4x8 CO/SLT Interface Board (CSB)

PAIR	PIN	COLOR	DESIG
1	26	WH/BL	Port 001 SLT Tip
	1	BL/WH	SLT Ring
2	27	WH/OR	
	2	OR/WH	
3	28	WH/GN	Port 002 SLT Tip
	3	GN/WH	SLT Ring
4	29	WH/BN	
	4	BN/WH	
5	30	WH/SL	Port 003 SLT Tip
	5	SL/WH	SLT Ring
6	31	RD/BL	
	6	BL/RD	
7	32	RD/OR	Port 004 SLT Tip
	7	OR/RD	SLT Ring
8	33	RD/GN	
	8	GN/RD	
9	34	RD/BN	Port 005 SLT Tip
	9	BN/RD	SLT Ring
10	35	RD/SL	
	10	SL/RD	
11	36	BK/BL	Port 006 SLT Tip
	11	BL/BK	SLT Ring
12	37	BK/OR	
	12	OR/BK	
13	38	BK/GN	Port 007 SLT Tip
	13	GN/BK	SLT Ring
14	39	BK/BN	
	14	BN/BK	
15	40	BK/SL	Port 008 SLT Tip
	15	SL/BK	SLT Ring
16	41	YL/BL	
	16	BL/YL	
17	42	YL/OR	
	17	OR/YL	
18	43	YL/GN	
	18	GN/YL	
19	44	YL/BN	
	19	BN/YL	
20	45	YL/SL	
	20	SL/YL	
21	46	VI/BL	
	21	BL/VI	
22	47	VI/OR	Misc. Relay N.C.
	22	OR/VI	
23	48	VI/GN	Misc. Relay N.O.
	23	GN/VI	
24	49	VI/BN	
	24	BN/VI	Misc. Relay Common
25	50	VI/SL	External Page Tip
	25	SL/VI	External Page Ring

## 500.6 APPLICATION MODULE(S) INSTALLATION:

### A. SPD 1428 Expansion I/O Module (IOM)

The SPD 1428 contains one RS-232C, I/O port (Female, DB-25 type connector) located on the main key service board (J5). This optional I/O module may be added to the main key service board (on connector J15) adding one additional RS-232C port (female, DB-25 type connector) and one RS-422 port (6 pin modular jack connector). Each I/O port on this module is capable of transmitting and receiving data at 300, 1200, 2400, 4800 and 9600 baud rates.



Installing the SPD 1428 I/O Module:

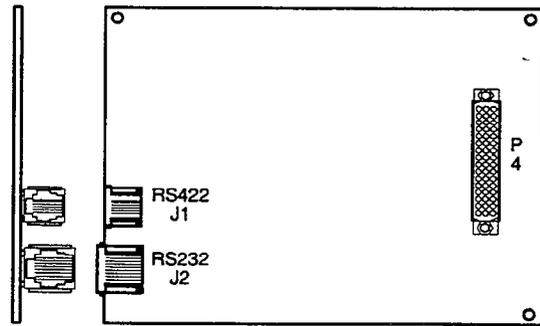
- Remove power from the KSU.
- Locate the J15 connector on the KSU motherboard and the P4 connector on the I/O Module. Refer to Figure 500-12.
- Gently push the P4 connector on the I/O Module onto the J15 connector on the KSU motherboard.
- Secure with the screws provided on the module.

#### Connections:

The pinouts and communication requirements for the expansion I/O module are shown in Figure 500-13.

### B. SPD 2856 Expansion I/O Module (IOM)

This module provides one (1) RS-232 I/O port (8 pin modular jack) and one (1) RS-422 I/O port (6 pin modular jack). This module is installed on the CPB PCB and adds the two I/O ports to the one (1) RS-232 I/O port already on the CPB for a total of three (3) I/O ports allowed in the system. Each port is independently programmed for its use and the rate of speed in which it transmits and receives data (baud rate). The options are 300, 1200, 2400, 4800, and 9600 baud rates all at 8 data bits, 1 stop bit, with No parity.



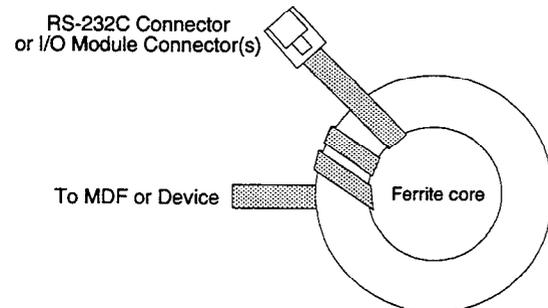
To install the SPD 2856 I/O Module:

- Power down the KSU. Then remove the Central Processor Board (CPB) from the KSU.
- Locate the J4 connector on the CPB board and the P4 connector on the I/O Module. Refer to Figure 500-7.
- Gently push the P4 connector on the I/O Module onto the J4 connector on the CPB board.
- Secure with the screws provided on the module.
- Re-insert the CPB board in the KSU.

#### Connections:

- Refer to Figure 500-14 for the pin-outs and function of the two I/O ports.

**NOTE:** Currently ALL RS-232C modular cables must pass through a 1.2" thick, 2-3/8" diameter, round ferrite core three times prior to exiting the KSU in order to comply with FCC Regulations.



### C. 1200 Baud Modem Module (MM)

This optional 1200 baud modem can be installed on either the SPD 1428 or the SPD 2856 to add the capability of communicating with the system from a remote site or location at the rate of 1200 baud. Both systems provide as standard an on-board modem capable of transmitting data at 300 baud. With this module installed a transmission baud rate of 1200 baud can be selected. A programmable option allows for auto baud detection between 300 and 1200 baud.

Connection to the modem is accomplished by simply calling into the system and connecting to the modem. This can be done by; ringing directly to the modem, by going through DISA, or after being answered by

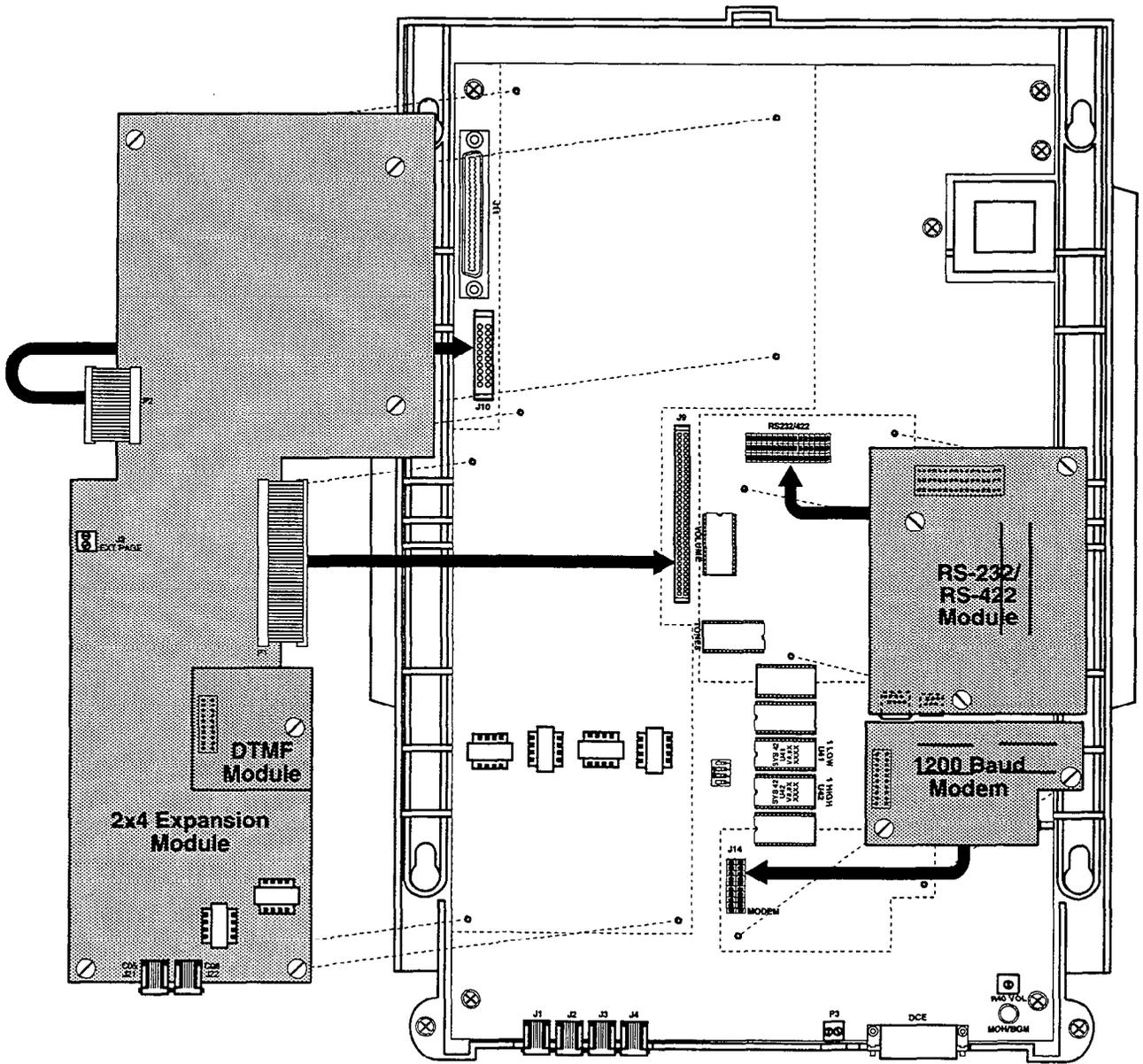
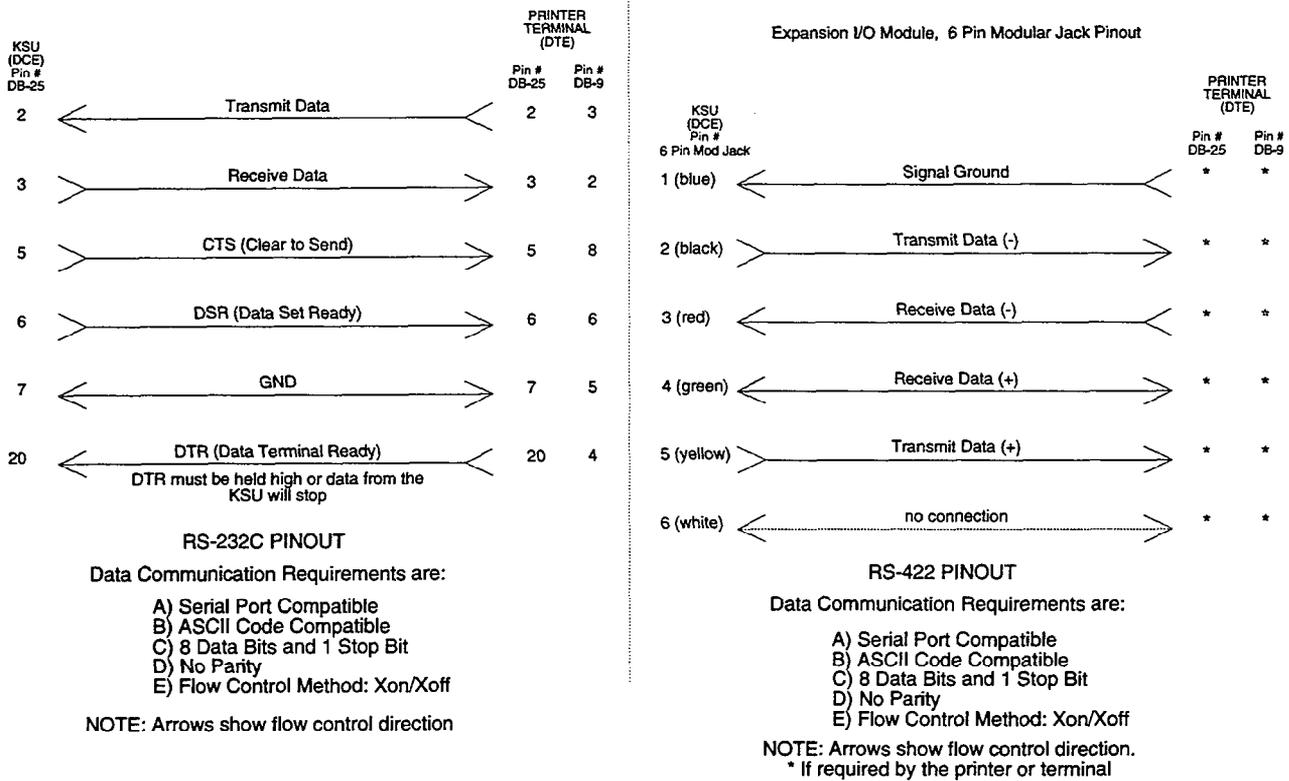
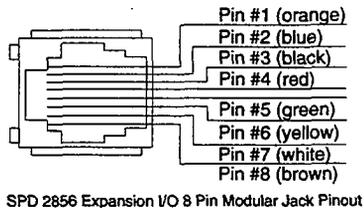


Figure 500-12 SPD 1428 Basic KSU Plug-in Card Locations

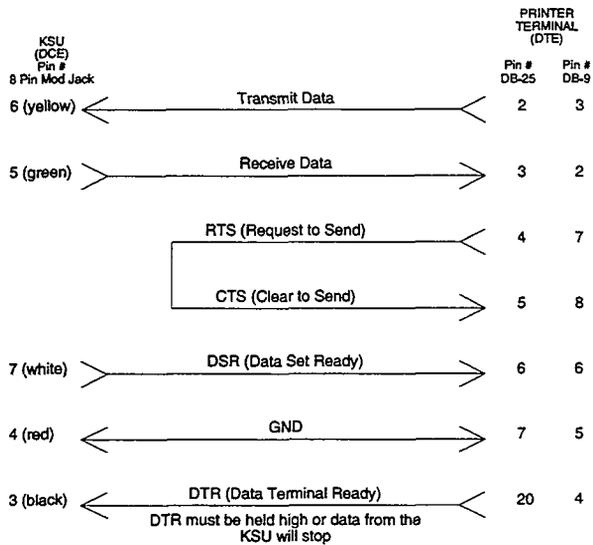


\* There is no set standard for pins to be used with RS-422 connectors. Refer to your particular terminal installation guide for proper hook-up.

Figure 500-13 SPD 1428 Expansion I/O Module Pin-outs



SPD 2856 Expansion I/O 8 Pin Modular Jack Pinout

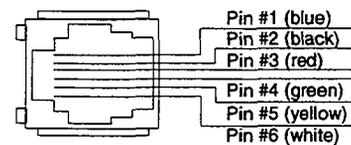


**RS-232C PINOUT**

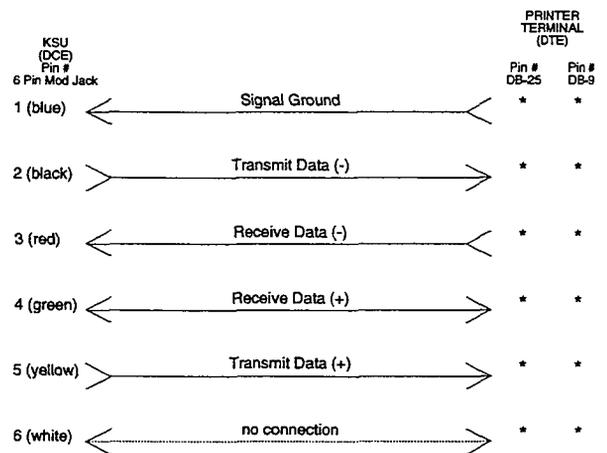
Data Communication Requirements are:

- A) Serial Port Compatible
- B) ASCII Code Compatible
- C) 8 Data Bits and 1 Stop Bit
- D) No Parity
- E) Flow Control Method: Xon/Xoff

NOTE: Arrows show flow control direction.  
\* If required by the printer or terminal



SPD 2856 Expansion I/O Module, 6 Pin Modular Jack Pinout



**RS-422 PINOUT**

Data Communication Requirements are:

- A) Serial Port Compatible
- B) ASCII Code Compatible
- C) 8 Data Bits and 1 Stop Bit
- D) No Parity
- E) Flow Control Method: Xon/Xoff

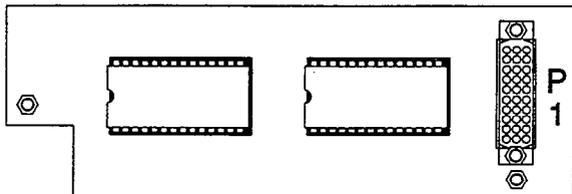
NOTE: Arrows show flow control direction.  
\* If required by the printer or terminal

\* There is no set standard for pins to be used with RS-422 connectors. Refer to your particular terminal installation guide for proper hook-up.

Figure 500-14 SPD 2856 Expansion I/O Module Pin-outs

a station user and transferred to the modem port. Connection to the modem port is under software control.

The 1200 baud modem module maintains the compatibility with the Hayes command protocol and uses the Bell System (Western Electric) standards 103 and 212A for modem design. The modem operates on-line in both Full and Half duplex modes.



Installing the 1200 Baud Modem Module into the SPD 1428 Basic Key Service Unit (BKSU):

- Remove power from the KSU.
- Locate the J14 connector on the KSU motherboard and the P1 connector on the Modem Module. Refer to Figure 500-12.
- Gently push the P1 connector on the Modem Module onto the J14 connector on the KSU motherboard.
- Secure with the screws provided on the module.

Installing the 1200 Baud Modem Module into the SPD 2856 Basic Cabinet:

- Power down the KSU. Then remove the Central Processor Board (CPB) from the KSU.
- Locate the J5 connector on the CPB board and the P1 connector on the Modem Module. Refer to Figure 500-7.
- Gently push the P1 connector on the Modem Module onto the J5 connector on the CPB board.
- Secure with the screws provided on the module.
- Re-insert the CPB board in the KSU.

#### **Connections:**

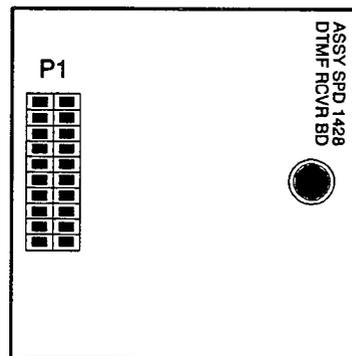
Connection is under system software control.

#### **D. Installing the DTMF Receiver Module (RM)**

This module is used to provide DTMF receivers in the system to support single line telephone and DISA applications. Currently this module can be added to the SPD 1428 Expansion KSU, SPD 1428 2x4 and 4x8 Expander modules. Each module contains 1 DTMF receiver for a maximum of three (3) in the SPD 1428 system.

Generally, one receiver will support DISA and/or 8 SLT stations under light to moderate traffic. If SLT

and or DISA traffic is heavy, additional OPX boxes should be added. It is also recommended to add additional OPX boxes when a Voice Mail or Auto



Attendant is connected to the system.

Installing the DTMF Receiver Module into the SPD 1428 Basic Key Service Unit (BKSU):

- Locate the J1 connector on the 2x4 Module and the P1 connector on the DTMF Receiver Module. Refer to Figure 500-12.
- Take the RM and push the P1 pin connector gently onto the J1 pins on the 2x4 Module.
- Secure the DTMF Receiver Module with the screw provided on the RM Module.

Installing the DTMF Receiver Module into the SPD 2856 Basic Cabinet:

- Locate the J1 connector on the CO/SLT Interface Board and the P1 connector on the DTMF Receiver Module. Refer to Figure 500-7.
- Take the RM and push the P1 pin connector gently onto the J1 pins on the CO/SLT Interface board.
- Secure the DTMF Receiver Module with the screws provided with the RM Module.
- Replace the CO/SLT Interface board back in the KSU.

#### **Connections:**

The DTMF Receiver module plugs onto a 20 pin connector on the following PCB's (one module may be installed on each PCB);

- SPD 1428 Expansion KSU, (expansion key service unit)
- SPD 1428 2x4 Expander Module
- SPD 1428 4x8 Expander Module
- SPD 2856 4x8 CO/Station Interface board (CKB)
- SPD 2856 4x8 CO/SLT Interface board (CSB)
- Additional PCB's as designed.

## 500.7 SPD 1428 & SPD 2856 TERMINALS

### A. Digital Terminal Installation:

The Digital Terminals are interfaced with the SPD 1428 KSU motherboard and have eight (8) circuits. Each of the eight (8) circuits are interfaced from the J11 connector on the KSU motherboard to the MDF. The Digital Terminals are interfaced with the SPD 2856 CKB boards which each have eight (8) circuits per board. Each CKB board interface is extended from the KSU to the MDF through the front edge connector on the CKB board.

At the MDF are the terminated distribution cables that are run from each Key Telephone location. Each Key Telephone requires two-pair twisted cable wiring to connect the Digital Terminals to the System on a "home run" basis. The telephone end of the cable is terminated on a modular jack and the MDF end of the cable should terminate on a punchdown block making up the MDF. Refer to Figures 500-1 and 500-5.

Telephones are connected to the station interfaces via industry-standard twisted, 2-pair, 22 or 24 gauge wire. The station cable run from the main distribution frame to the station wall jack should not exceed 1000 feet. It is recommended that the station cable contain 4 pairs of wires. Refer to Figure 500-15.

Station cable is connected to the MDF at one end, and a modular connecting block at the other end. The modular line cord of the telephone is then plugged into the connecting block.

Only one station may be connected to a port. It is not possible to bridge station ports.

The system communicates with each phone using 4 wires. Two of the wires are used to send digital information (voice and control signals) from the system to the telephone, and two wires are used by the telephone to send digital information to the system. All 4 wires are necessary for the telephone to function. Each telephone connected to a station port has two digital channels. The primary channel is used for voice communications only. The secondary channel is used to provide a secondary path for data switching applications (future).

The installer should exercise caution when connecting a Key Telephone while System power is on. Each key station circuit is overload protected by internal circuitry on the CKB card, however the proper polarity of the wired connections must be maintained for proper operation.

The Single Line Telephone Adapter (OPXI), and Digital DSS/DLS Console are all considered to be telephones by the system. These interfaces are all wired to digital key station ports the same as a digital telephone.

### B. Digital DSS/DLS Installation:

The Digital DSS/DLS is assigned to operate with a Digital Terminal. Up to 3 units can be assigned to a station. There is no limit to the number of units that can be installed in a system, but each unit uses a Digital Terminal interface circuit and this reduces station capacity on a one-per-one basis.

A two-pair twisted cable is required for connecting the DSS/DLS unit to the MDF. The cable should be placed from the DSS/DLS to the MDF in a "home run" manner. The DSS/DLS end of the cable is terminated on a three-pair modular jack and the MDF is "punched down" on a terminal block for cross connection to the appropriate station cable. Refer to Figure 500-15.

Since the system supplies power to the DSS/DLS, no transformer or external power device is required.

### Installing an Expanded DSS/DLS Module: (future)

### C. Wall Mounting the Telephone

All connections to the Digital Terminal are fully modular. To wall mount the Digital Terminal, it is necessary to use the Wall Mount bracket that comes with each Digital Terminal and one standard-type jack assembly designed for normal wall hanging applications.

- a. Unplug the line cord from the phone. This line cord will be re-used and should be retained.
- b. Using a screw driver, remove the plastic number retainer by inserting the screw driver underneath the middle of the retainer and prying upwards. Remove the screw and the handset tab. Be careful to position the tab so that the protrusion faces the hookswitch. This will allow the handset to remain secure when the telephone is on the wall. Replace the screw and snap the number retainer back into place.
- c. Reverse the back plate on the telephone for wall mounting.
- d. Line up the hooks at the bottom of the bracket so that they engage with the slots cut in the bottom of the telephone base. Tilt the telephone back and lock the telephone into the hooks at the top of the bracket. The bracket will snap in place.
- e. Route the line cord from the wall jack and plug into the connector on the back of the telephone. Now match the two key hole slots on the baseplate with the lugs on the 630-A type jack. Align the modular connector and slide telephone into place. Refer to Figure 500-16.

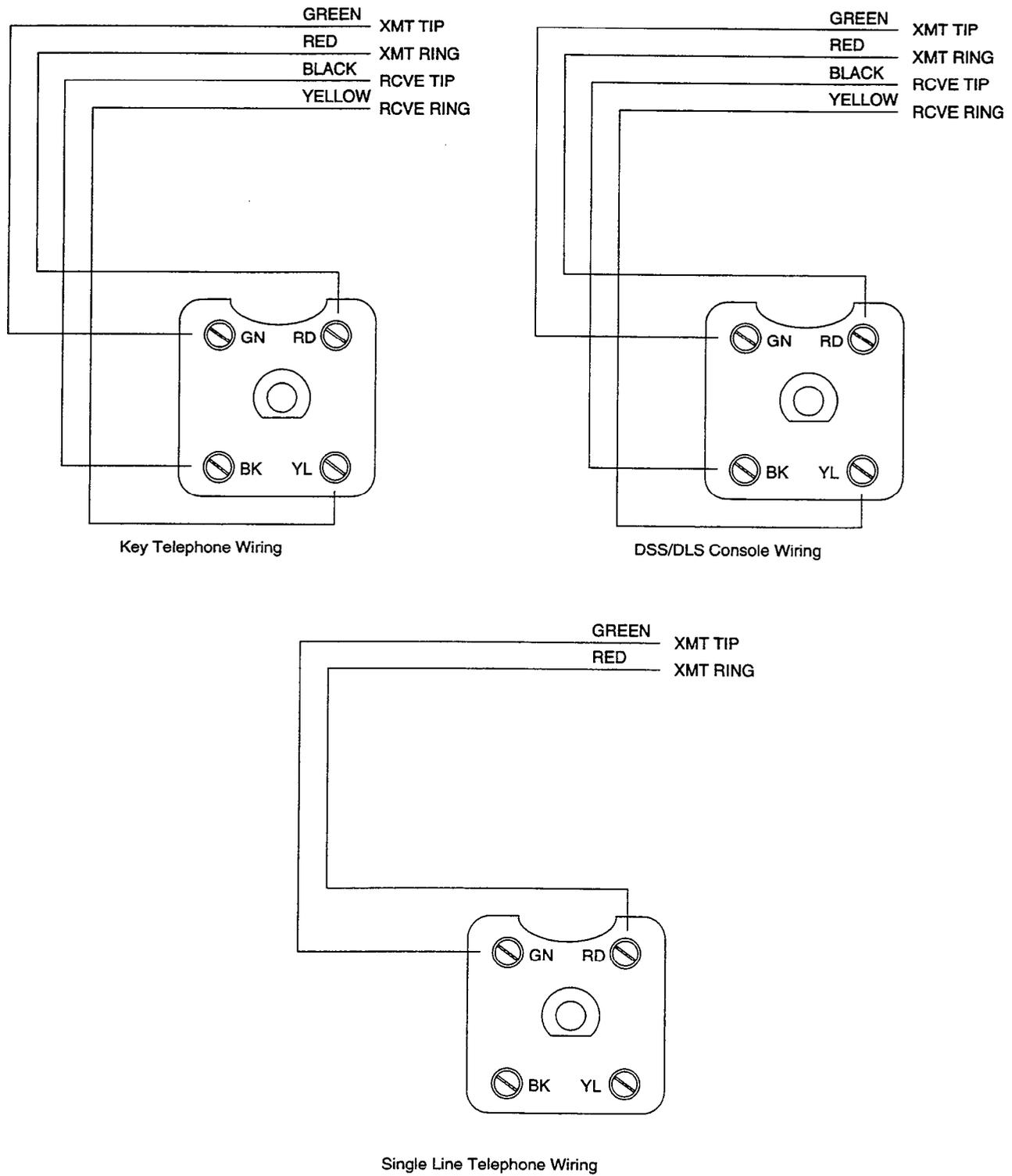


Figure 500-15 Station Modular Block Wiring

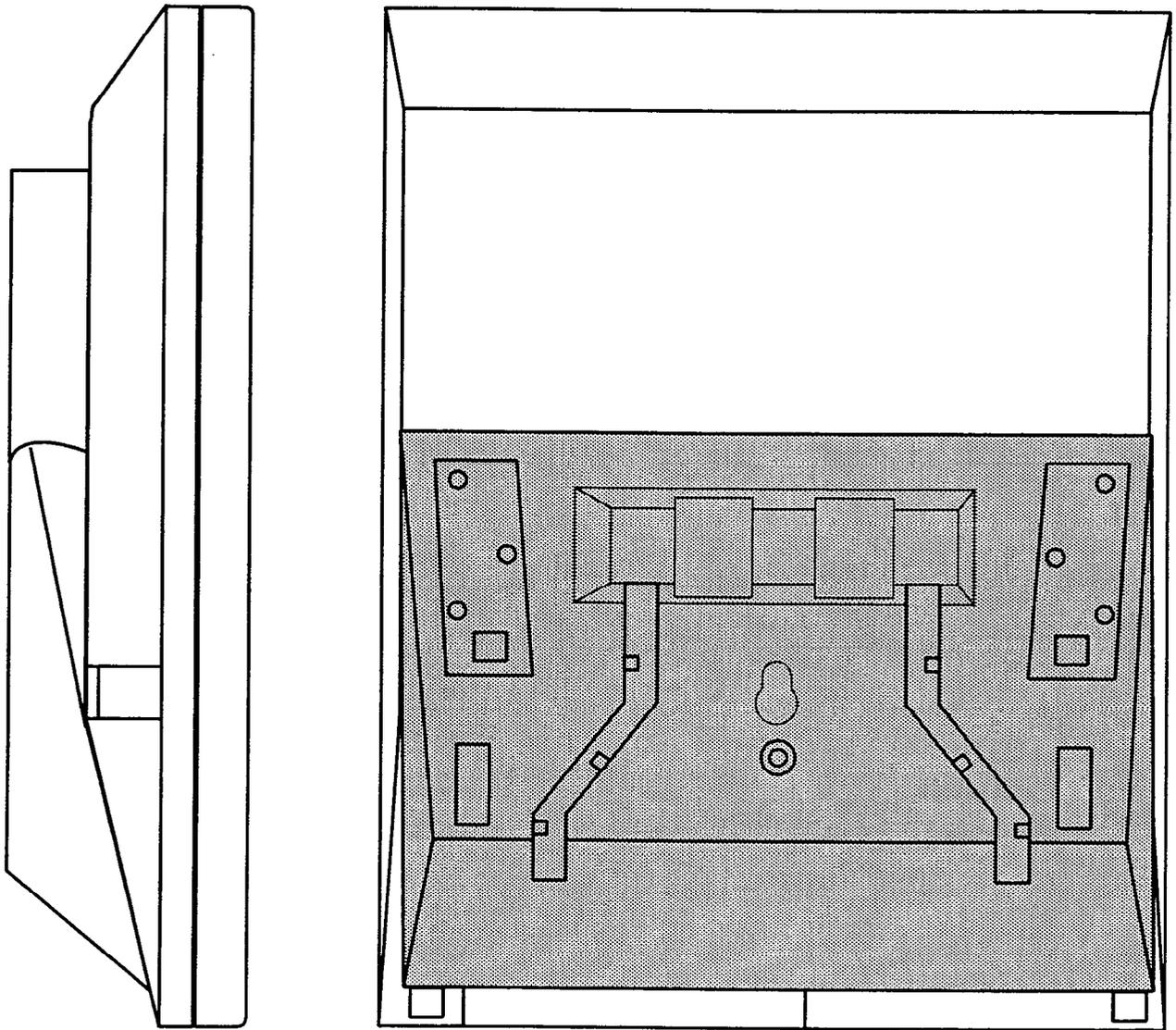


Figure 500-16 Wall Mounting the Starplus Digital Terminal

**D. Single Line Telephone Installation: (future)**

Single Line Telephones (SLT's) can be exchanged for Digital Terminals on an one-for-one basis. The following items are required for a system installing SLT's:

- 4x8 CO/SLT Interface Board (CSB)
- DTMF Receiver Module (RM)

The CSB plugged into any designated CKB card slot. Each CSB board supports eight telephones (standard DTMF Single Line Telephones and message waiting DTMF SLT's). A 48V Power Supply Unit must be installed in the system to provide power for ringing and message waiting for SLT's. Refer to Figure 500-17. The DTMF Receiver Module should be installed for each CSB installed. The DTMF Receiver Module (RM) installs onto either a 4x8 CO/Station Interface cards or 4x8 CO/SLT Interface cards and provides 1 DTMF receiver. DTMF receivers can be added to the system to support Single Line Telephones. If SLT traffic is heavy or a Voice Mail system is being installed, it is recommended that additional DTMF Receiver Modules be installed in the system.

Each SLT requires one-pair cable. The cable should be placed from the telephone location to the MDF in a "home run" manner. The telephone end of the cable run should be terminated in a modular jack. Refer to Figures 500-1 and/or 500-5. The MDF end should be "punched down" on a terminal block for cross connection to the appropriate station cable. Refer to Table 500-5 for SLT wiring connections.

**E. SLT Adapter / Off-Premise Extension Module**

This external module provides the interface for one long loop (OPX) single line telephone (2500 type) extension. This module requires a separately provided -48 VDC power supply to provide the necessary current for long loop applications and to support ring generation. This module is wired to and uses a key station port from any digital key terminal station port on any card plugged into the system. The OPX card meets the requirements of the FCC for connection to the telephone (Telco) network. Telephones must be DTMF only (2500 type).

This module also provides for one Power Fail circuit in the event of an AC power failure.

**Buttons and LED's:**

An LED located on the back of the unit indicates correct connection and will light when the SLT station is taken off-hook.

**Connections:**

All connections to the SLA (OPX) adapter are made on the back of the unit. Two modular jacks and a two wire cable are located on the back of the unit for connection to the KSU and power supply. The two wire cable connects to a 48V dc power supply / ring generator. The Modular jack marked KSU is connected to a KSU Digital terminal station port. This connection requires all four wires and wires the same as a key station. The modular jack marked OPX is wired to the SLT station (2500 type), OPX circuit or SLT device. Additionally a CO line may be wired to the second pair of the SLT modular connector for Power fail operation.

**Cable Loop Limits:**

The maximum loop limit from the KSU to the SLA (OPX) adapter is 1000 feet.

The maximum loop limit from the SLA (OPX) adapter to the connected SLT or device is 1400 ohms not including the telephone or device.

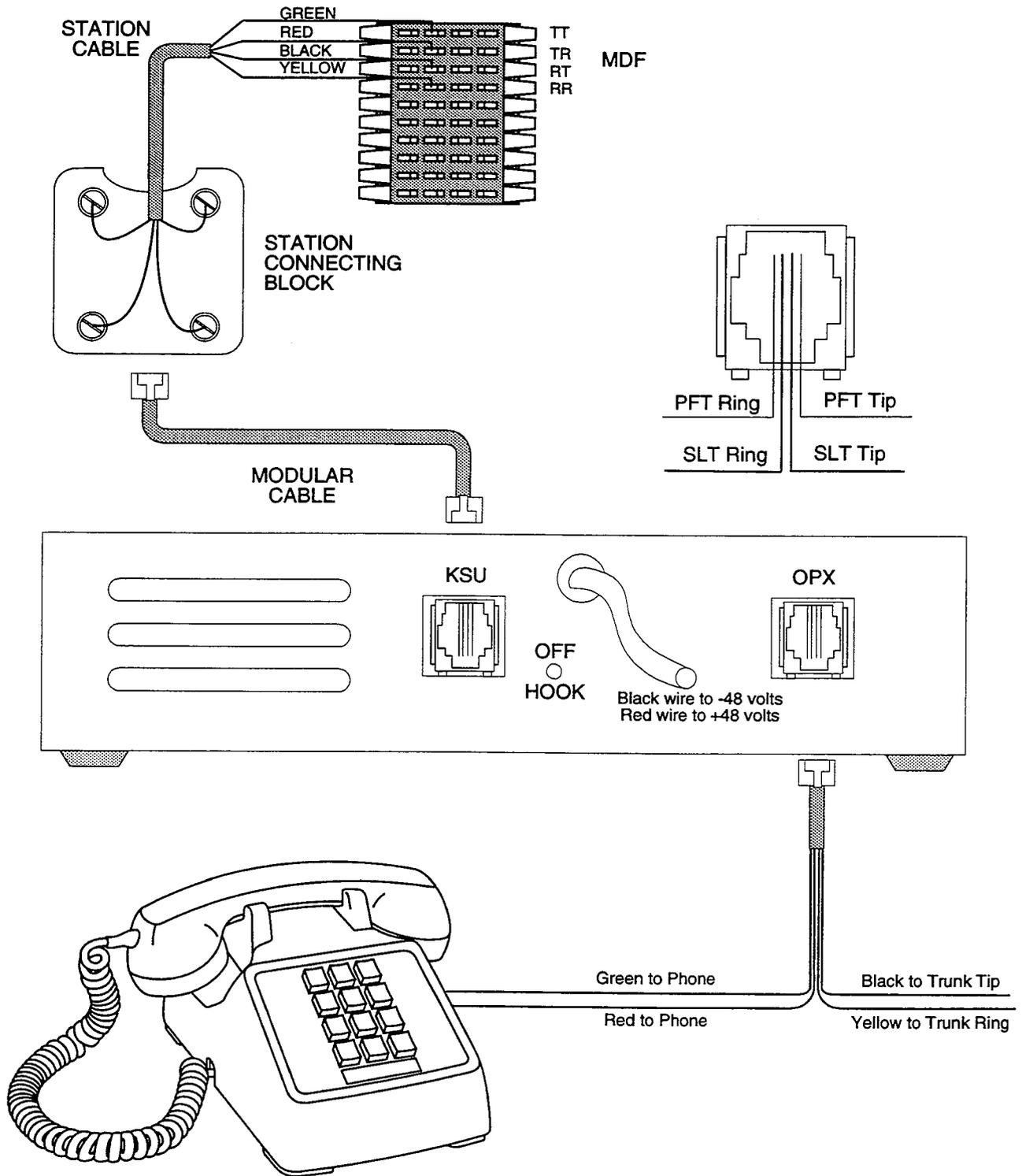


Figure 500-17 Off-Premise Extension (OPX) Module

## 500.8 POWER FAILURE TRANSFER

### A. Relay / Sensor Interface Module

The Relay Sensor Interface Module connects to the system using one digital station port and provides three relay activated contacts and three sensing circuits. The relays provide for applications such as Loud Bell Control contacts, CO Line control contacts, RAN Start contacts, Page Relays, Power Fail contact and additional applications as software will permit. The sensing circuits will provide for such applications as Alarm signaling input, RAN Stop (end of message) and other applications as developed and allowed by software.

#### Connections:

All connections to the Relay Sensor Module are made on the back of the unit. Two terminal strips with screw terminals each provide connection to the ancillary devices for relay control or sensing monitoring. The Modular jack marked KSU is connected to a KSU Digital terminal station port. This connection requires all four wires and wires the same as a key station. Refer to Figure 500-18 for wiring information.

An external power source may be required to drive equipment connected to the relay contacts. The contacts are rated at 24Vdc max at 1 amp.

#### Cable Loop Limits:

The maximum loop limit from the KSU to the relay Sensor Module is 1000 feet.

### B. Starplus Power Failure Transfer Unit (PFTU)

This unit provides the relay transfer circuits for up to 12 CO lines in the event of a power or processor failure. The unit is housed in its own enclosure and mounts external to the KSU. Activation of the PFT relays is controlled by a multi-use relay on any one of the CO / Station Interface boards that is programmed for PFT. A customer provided 12 volt DC power supply is required to operate the unit. There is a manual switch that activates the PFTM for testing purposes.

With loss of power to the system or a failure of system processing, the PFTU will automatically connect up to twelve CO lines to prewired 500/2500 type telephones. When power is restored, the PFTU will automatically restore the CO trunks and stations to normal operation. These SLT stations do not have to be used for intercom, but can be if so desired.

#### Wiring / Pinouts / Connections

The PFTU has two 50-pin male amphenol connectors labeled CONN1 and CONN2 located on the front of the unit. Each connector wires 6 CO lines for

power fail transfer. Refer to Tables 500-6 and 500-7 for pin-outs of each of the connectors.

The PFTU is connected to the KSU via the modular connector on the side of the unit. This is connected in series to a customer provided 12 dc supply. and to a multi use relay programmed as a power failure relay.

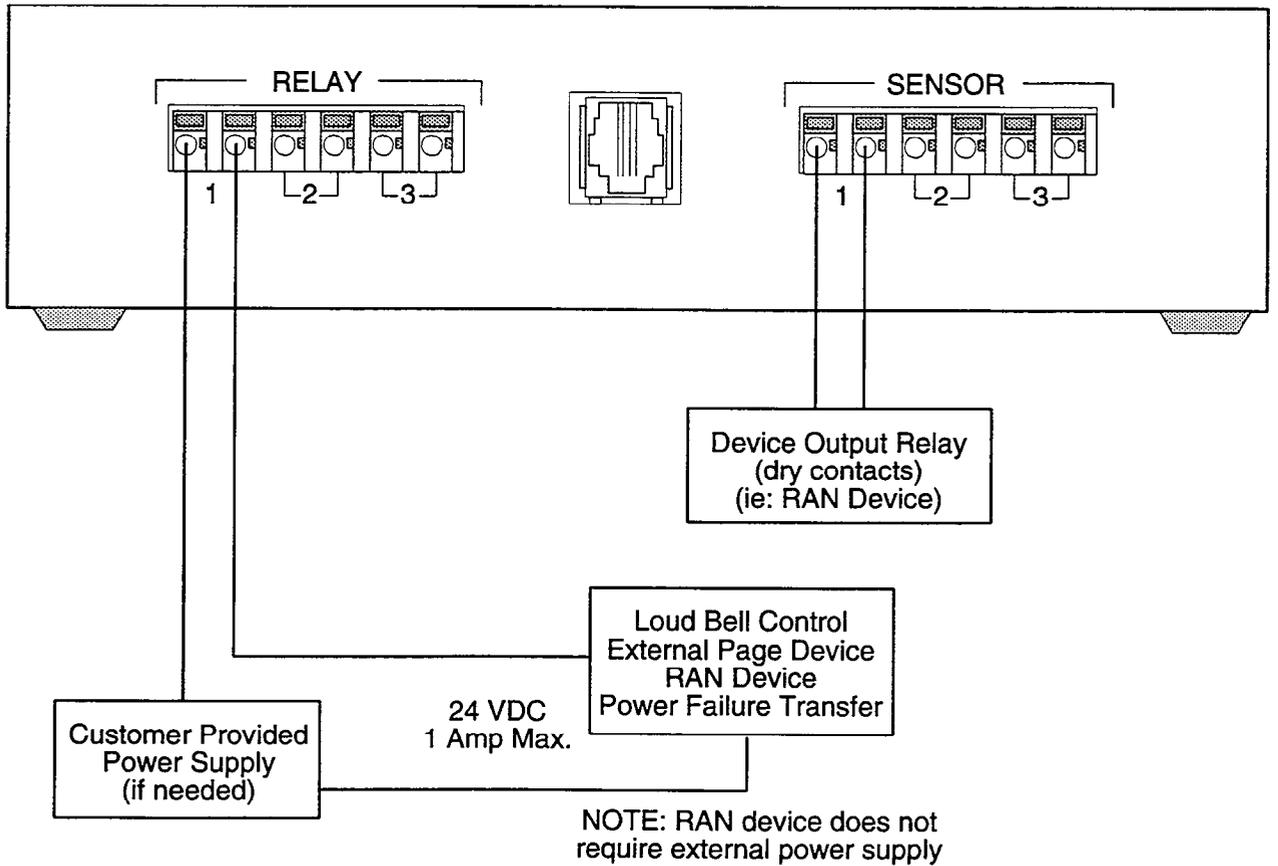
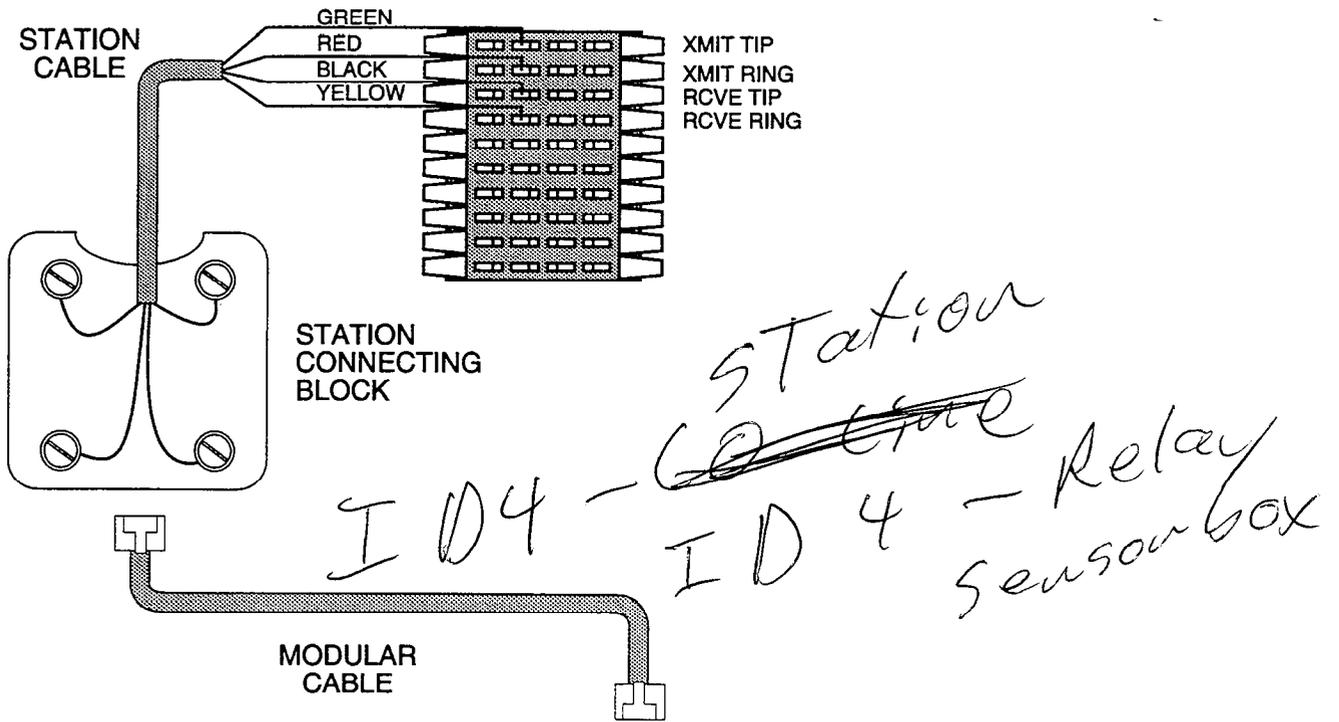


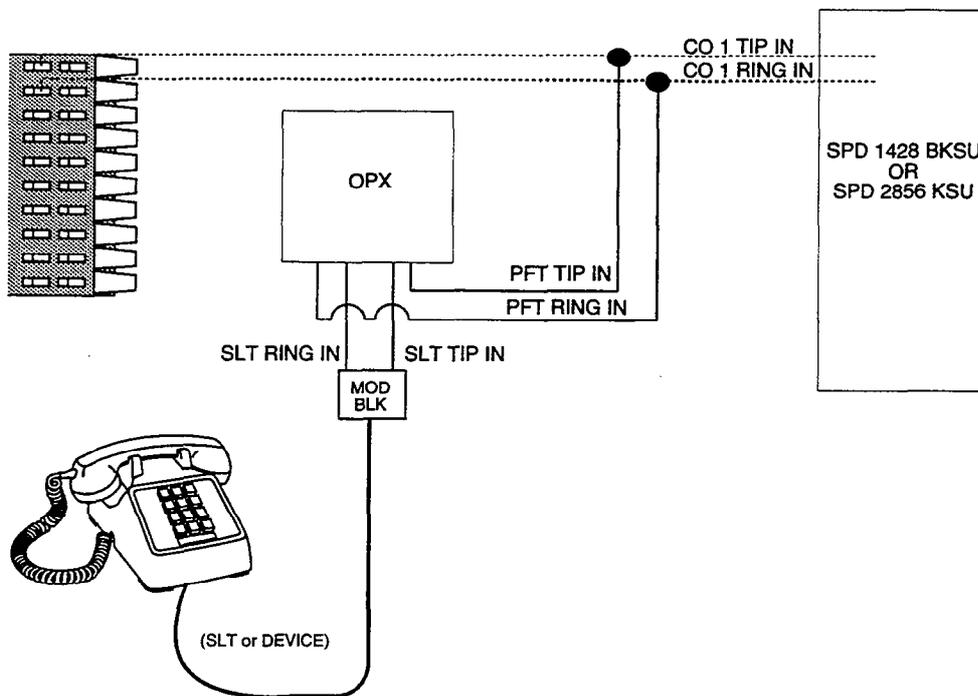
Figure 500-18 Relay / Sensor Interface Module

Table 500-6 PFTU Conn A Connecting Block

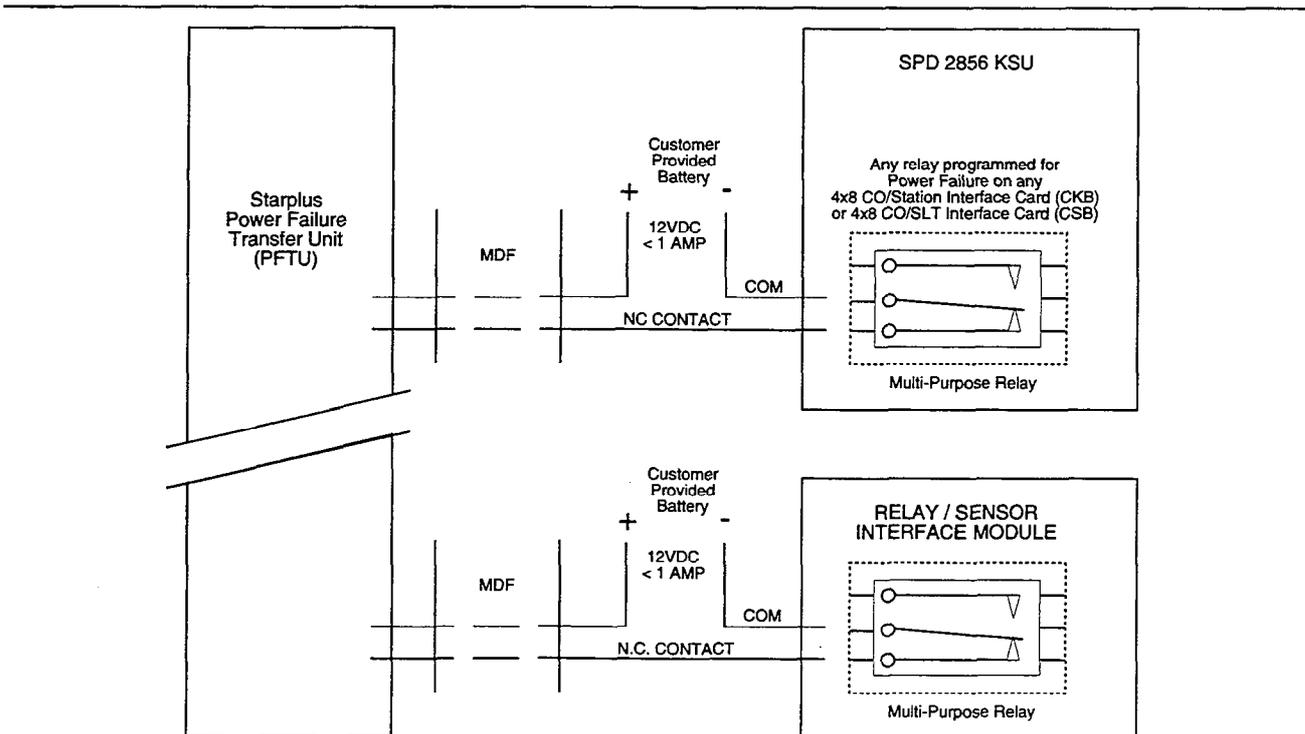
PAIR	PIN	COLOR	DESIG
1	26	WH/BL	1TIT
	1	BL/WH	1TIR
2	27	WH/OR	1 STA IN TIP
	2	OR/WH	1 STA IN RING
3	28	WH/GN	1 TRUNK OUT TIP
	3	GN/WH	1 TRUNK OUT RING
4	29	WH/BN	1 STOT
	4	BN/WH	1 STOR
5	30	WH/SL	2TIT
	5	SL/WH	2TIR
6	31	RD/BL	2 STA IN TIP
	6	BL/RD	2 STA IN RING
7	32	RD/OR	2 TRUNK OUT TIP
	7	OR/RD	2 TRUNK OUT RING
8	33	RD/GN	2 STOT
	8	GN/RD	2 STOR
9	34	RD/BN	3TIT
	9	BN/RD	3TIR
10	35	RD/SL	3 STA IN TIP
	10	SL/RD	3 STA IN RING
11	36	BK/BL	3 TRUNK OUT TIP
	11	BL/BK	3 TRUNK OUT RING
12	37	BK/OR	3 STOT
	12	OR/BK	3 STOR
13	38	BK/GN	4TIT
	13	GN/BK	4TIR
14	39	BK/BN	4 STA IN TIP
	14	BN/BK	4 STA IN RING
15	40	BK/SL	4 TRUNK OUT TIP
	15	SL/BK	4 TRUNK OUT RING
16	41	YL/BL	4 STOT
	16	BL/YL	4 STOR
17	42	YL/OR	5TIT
	17	OR/YL	5TIR
18	43	YL/GN	5 STA IN TIP
	18	GN/YL	5 STA IN RING
19	44	YL/BN	5 TRUNK OUT TIP
	19	BN/YL	5 TRUNK OUT RING
20	45	YL/SL	5 STOT
	20	SL/YL	5 STOR
21	46	VI/BL	6TIT
	21	BL/VI	6TIR
22	47	VI/OR	6 STA IN TIP
	22	OR/VI	6 STA IN RING
23	48	VI/GN	6 TRUNK OUT TIP
	23	GN/VI	6 TRUNK OUT RING
24	49	VI/BN	6 STOT
	24	BN/VI	6 STOR
25	50	VI/SL	
	25	SL/VI	

Table 500-7 PFTU Conn A Connecting Block

PAIR	PIN	COLOR	DESIG
1	26	WH/BL	7TIT
	1	BL/WH	7TIR
2	27	WH/OR	7 STA IN TIP
	2	OR/WH	7 STA IN RING
3	28	WH/GN	7 TRUNK OUT TIP
	3	GN/WH	7 TRUNK OUT RING
4	29	WH/BN	7 STOT
	4	BN/WH	7 STOR
5	30	WH/SL	8TIT
	5	SL/WH	8TIR
6	31	RD/BL	8 STA IN TIP
	6	BL/RD	8 STA IN RING
7	32	RD/OR	8 TRUNK OUT TIP
	7	OR/RD	8 TRUNK OUT RING
8	33	RD/GN	8 STOT
	8	GN/RD	8 STOR
9	34	RD/BN	9TIT
	9	BN/RD	9TIR
10	35	RD/SL	9 STA IN TIP
	10	SL/RD	9 STA IN RING
11	36	BK/BL	9TRUNK OUT TIP
	11	BL/BK	9 TRUNK OUT RING
12	37	BK/OR	9 STOT
	12	OR/BK	9 STOR
13	38	BK/GN	10TIT
	13	GN/BK	10TIR
14	39	BK/BN	10 STA IN TIP
	14	BN/BK	10 STA IN RING
15	40	BK/SL	10 TRUNK OUT TIP
	15	SL/BK	10TRUNK OUTRIN G
16	41	YL/BL	10 STOT
	16	BL/YL	10 STOR
17	42	YL/OR	11TIT
	17	OR/YL	11TIR
18	43	YL/GN	11 STA IN TIP
	18	GN/YL	11 STA IN RING
19	44	YL/BN	11 TRUNK OUT TIP
	19	BN/YL	11TRUNK OUT RING
20	45	YL/SL	11 STOT
	20	SL/YL	11 STOR
21	46	VI/BL	12TIT
	21	BL/VI	12TIR
22	47	VI/OR	12 STA IN TIP
	22	OR/VI	12 STA IN RING
23	48	VI/GN	12 TRUNK OUT TIP
	23	GN/VI	12TRUNK OUT RING
24	49	VI/BN	12 STOT
	24	BN/VI	12 STOR
25	50	VI/SL	
	25	SL/VI	



Method #1



Method #2

Figure 500-19 Power Failure Transfer Wiring Options

**500.9 INSTALLING RECORDED ANNOUNCEMENT DEVICE (RAN)**

The Recorded Announcement feature (RAN) is used with the Uniform Call Distribution feature (UCD) to provide unanswered incoming CO calls or calls in queue with a Recorded Announcement while waiting for an available UCD station. The system may be programmed to provide this announcement on specified RAN output ports on the system (unused SLT and CO ports). The system can be programmed to connect the waiting caller to a different RAN port for the second, and subsequent RAN messages.

When a CO line port is used for a ground start application, a 24V dc power source must be connected to the CO line port for talk battery. A Page/Relay contact assigned to an announcement table in programming would provide contact closure to start the Recorded Announcement device.

When an SLT port is used, the RAN device must be configured for ring trip operation (loop start). The 90V ac voltage sent to the SLT port will be recognized by the RAN device which will then answer the call. Refer to Figure 500-20.

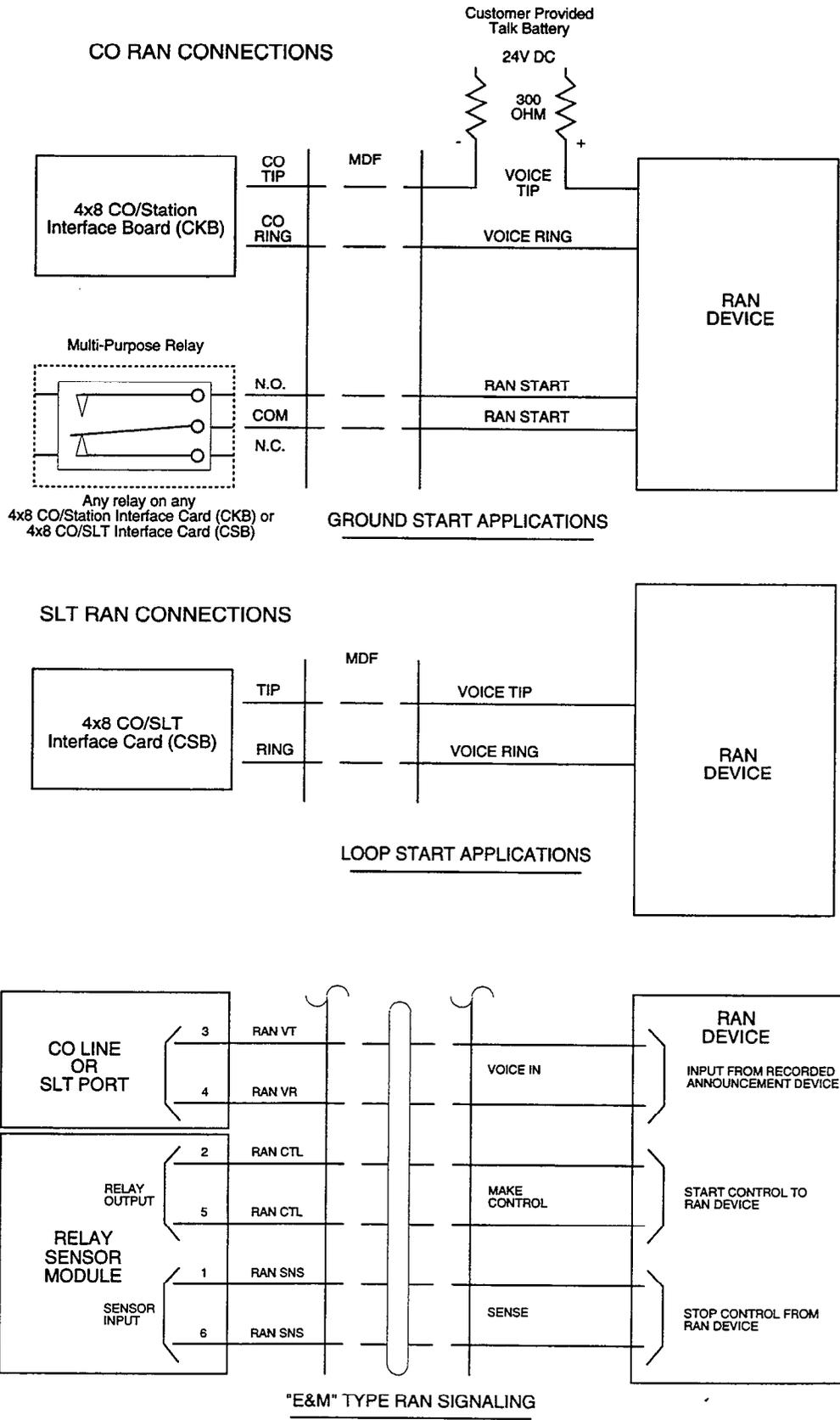


Figure 500-20 CO and SLT RAN Connections

Table 500-8 SMDR Printout

The SMDR feature provides detailed records of all outgoing and/or incoming, long distance only or all calls exceeding 30 seconds. This feature is enabled or disabled in system programming. By default, SMDR is not enabled and is set to record long distance calls only. A printout format of 80 characters maximum or 30 character maximum may be selected in system programming. The standard format is 69 characters on a single line. A 30 character format will generate 3 lines per message. If the SMDR feature is enabled, the system starts collecting information about the call as soon as it starts and terminates when the call ends. If the call was longer then 30 seconds, the following information is printed:

**30 character format selected**

```

1           2           3
123456789012345678901234567890
116 08 00:02:00 14:13 05/11/90
0123456789012345678901234
123456789012
    
```

```

1           2           3
123456789012345678901234567890
AAA BB HH:MM:SS HH:MM MM/DD/YY (CR) (CR) (LF)
HCCCCCCCCCCCCCCCCCCCCCCCCC (CR) (CR) (LF)
GGGGGGGGGGG (CR) (CR) (LF)
    
```

**80 character format selected**

```

1           2           3           4           5           6           7           8
1234567890123456789012345678901234567890123456789012345678901234567890
STA CO TOTAL   START   DATE   DIALED   ACCOUNT CODE
116 08 00:02:00 14:13 05/11/90 0123456789012345678901234 123456789012
AAA BB HH:MM:SS HH:MM MM/DD/YY HCCCCCCCCCCCCCCCCCCCCCCCCC GGGGGGGGGGGG (CR) (CR) (LF)
    
```

- AAA = Station originator or Trunk on DISA and Off-Net (CO Line) calls.
- BB = Outside line number
- HH:MM:SS = Duration of call in Hours, Minutes and Seconds
- HH:MM = Time of day (start time) in Hours and Minutes
- MM/DD/YY = Date of Call
- H = Indicates call type
  - "I" = Incoming
  - "O" = Outgoing
  - "T" = Transferred
- CC...CC = Number dialed
- GG...GG = Last Account code entered (optional)
- (CR) = Carriage return
- (LF) = Line Feed



A to Z KELLATRONICS, Inc.

Tel: 800.766.3425  
 email: info@kellatronics.com Fax: 818.773.8899

## SECTION 600

# CUSTOMER DATA BASE PROGRAMMING

### 600.1 INTRODUCTION

The Starplus Digital (SPD) Key Telephone System can be programmed to meet each customer's individual needs. All programming is done either at Station 100 using the 34-button display digital terminal as the programming instrument or an ASCII terminal or PC. The digital display model is suggested since the display is designed to assist in programming.

When the program mode is entered, the Digital Terminal being used no longer operates as a terminal but as a programming instrument with all of the buttons redefined. The keys of the dial pad are used to enter data fields (Program Codes) associated with system, station, and CO line features as well as enter specific data that requires a numeric entry. Flexible buttons are used to toggle on or off features or allow entry into specific data fields. LED's and the LCD display provide visual indication of entered data and their value.

Programming can also be performed by using an ASCII terminal, or a computer capable of emulating an ASCII terminal. This form of programming can be done either locally (on-site) by connecting the terminal directly to the RS232C connector on the CPB or can be performed remotely (off-site) through the use of the on-board modem located on the CPB. The method and steps to program the system via a terminal are identical to that used when programming from a digital keyset. A button to keyboard mapping has been incorporated (see Figure 600-1) to help minimize familiarization and training time.

At the time the system is installed it must be initialized to load default data into memory. If this pre-programming suits the customer, initialization is all that is needed. Refer to Table 600-1 for a listing of all the default values.

Any time data is to be changed, the program mode must be entered and then the individual data field (program code). A data field can be entered to determine current programming or to change a specific feature within that field.

During programming, the other Digital Terminals in the System operate normally. If a data field is entered but nothing is changed, or changed but not entered, the previous data will remain intact upon leaving that data field. Data fields can be entered at random.

In many of the data fields, programming is performed by toggling LED's on or off, or entering digits on the keypad. If no changes are to be made to the line or station, exit the data field by either leaving the program mode (pressing the ON/OFF button to OFF) or entering another data field (pressing the FLASH button and entering that program code).

When features are being programmed, tones are provided to help the programmer determine if a correct or incorrect entry has been made. A solid one second tone indicates the data was accepted. An interrupted tone means an error was made.

When this occurs, re-enter the data field and re-enter the information. Until new data is entered and accepted, the system will continue to operate under default or previously entered values.

The system database is updated on a real-time basis as new data is entered, by pressing the Hold button. The system continues to operate with the current data base and is updated with any newly entered or changed data without interruption to telephone operation or call processing in progress. However, if for example a station's attributes are changed while that station is off-hook on an active call, the newly entered data will not take effect until the station goes on-hook or becomes idle.

*NOTE: Some features must have more than one data field programmed for that feature to work. Where this is the case, it will be stated in the instructions.*

### 600.2 PROGRAM MODE ENTRY (Key Station)

Programming a digital terminal is performed at Port 01 (Station 100) using a 34 Button Digital Display Terminal. Programming is always done at this port regardless of the class of service or which station has been assigned the attendant(s).

Before entering the program mode, the programmer must first verify that the Digital Terminal is properly connected to Port 01 (Station 100).

To enter the program mode:

- a. Press ON/OFF button. (optional) LED lights and intercom dial tone is heard.
- b. On the dial pad, press the asterisk (\*) twice.
- c. On the dial pad, enter the digits [3][2][2][6] (DBAM)\*. Confirmation tone is heard.

\* This is a default setting, however may be changed after entering programming.

Go in thru RS232  
or remove EPROM  
move strap and  
reinsert EPROM

When using a data terminal (I/O device) to program the system, the following chart presents the data terminal characters that are equivalent to the keyset buttons.

```
adm> ?
REMOTE ADMIN KEY DEFINITIONS
```

Keyset	Term	Keyset	Term	Keyset	Term
0	0	FLEX 1	Q	FLEX 11	A
1	1	FLEX 2	W	FLEX 12	S
2	2	FLEX 3	E	FLEX 13	D
3	3	FLEX 4	R	FLEX 14	F
4	4	FLEX 5	T	FLEX 15	G
5	5	FLEX 6	Y	FLEX 16	H
6	6	FLEX 7	U	FLEX 17	J
7	7	FLEX 8	I	FLEX 18	K
8	8	FLEX 9	O	FLEX 19	L
9	9	FLEX 10	P	FLEX 20	M
*	*	FLASH	,	ON-OFF	N
#	#	HOLD	CR	SPEED	X
TRANS	X	DND	C	MUTE	V

adm>

*Exit Programming*

In place of keyset button toggling to enable/disable a feature, the associated data terminal key can be toggled (pressed again) to enable/disable a feature, or the plus (+) character can be used to turn on or enable a feature and the minus (-) character can be used to turn off or disable a feature.

Figure 600-1 Data Terminal Program Codes Cross Reference

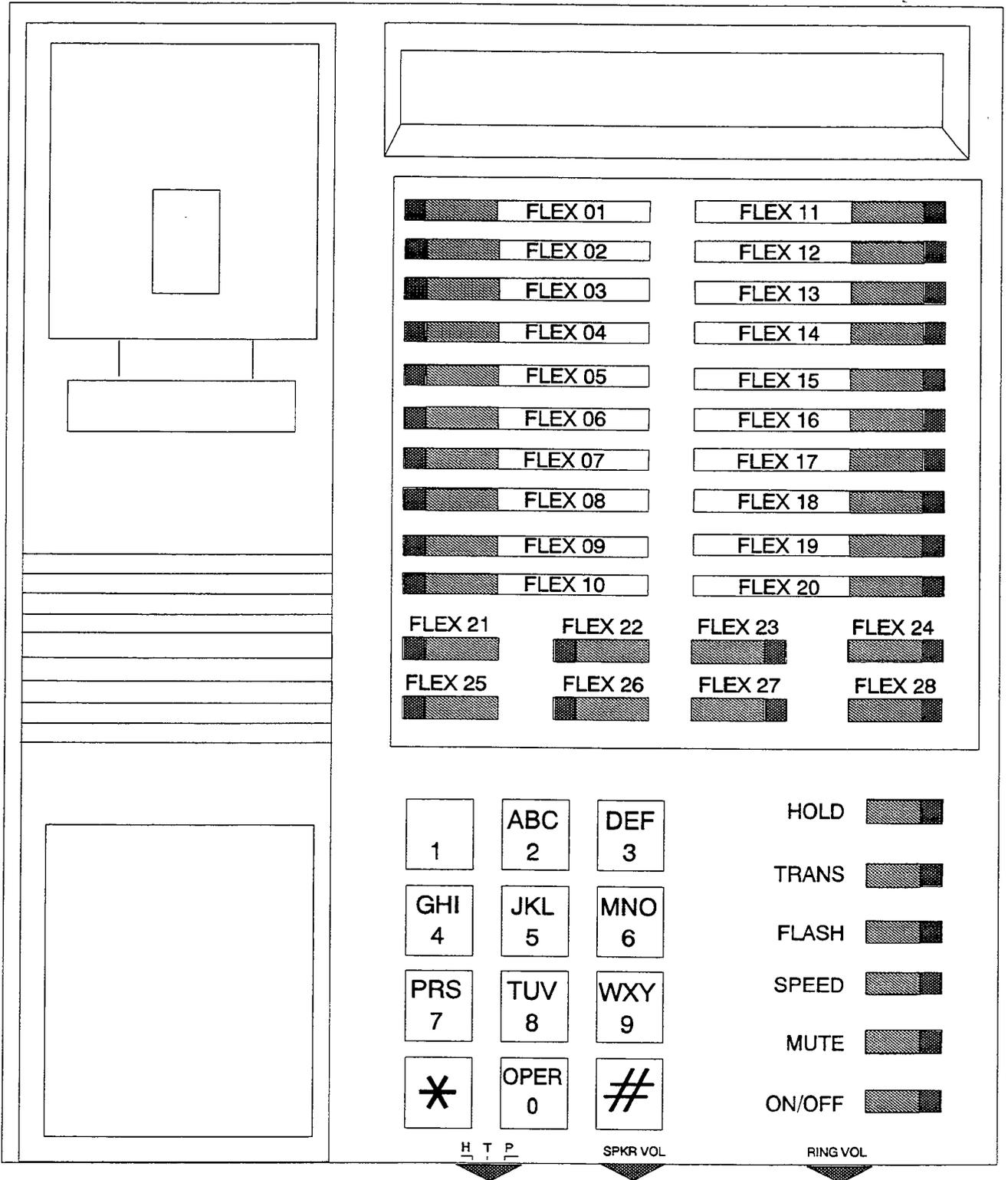


Figure 600-2 Starplus SPD Programming Button Mapping

Table 600-1 Default Values

FEATURE	PROGRAM CODE	FLEX BUTTON	DEFAULT VALUE
<b>SYSTEM TIMERS:</b>	Flash 01		
System Hold Recall Timer		Button 1	060 sec.
Exclusive Hold Recall Timer		Button 2	180 sec.
Attendant Recall Timer		Button 3	01 min.
Transfer Recall Timer		Button 4	045 sec.
Preset Forward Timer		Button 5	10 sec.
Call Forward No/Answer Timer		Button 6	01 min.
Pause Timer		Button 7	2 sec.
Call Park Timer		Button 8	180 sec.
Conference/DISA Timer		Button 9	10 min.
Paging Timeout Timer		Button 10	15 sec.
CO Ring Detect Timer		Button 11	3 (100 msec.)
SLT DTMF Receiver Timer		Button 12	020
MSG Waiting Reminder Tone		Button 13	000 min.
Hookflash Timer		Button 14	10 (1 sec.)
Hookflash Debounce Timer	Button 15	010 msec.	
<b>SYSTEM FEATURES:</b>	Flash 05		
Attendant Override		Button 1	No
Hold Preference		Button 2	System
External Night Ring		Button 3	No
Executive Override Warning Tone		Button 4	Yes
Page Warning Tone		Button 5	Yes
Background Music		Button 6	Yes
LCR Enable		Button 7	Disabled
Forced Account Codes (Y/N)	Button 8	Disabled	
Attendant Station Assignment (3 Stations)	Flash 10		100
Set Date and Time	Flash 11	Button 1-4	
PBX Dialing Codes	Flash 12	Buttons 1-5	None
Executive/Secretary Assignments	Flash 13	Buttons 1-4	None
Relay/Sensor Programming	Flash 14	Buttons 1-7	None
Baud Rate Assignments	Flash 15		
Port #1 ("On-Board" RS-232C)		Button 1	4800 Baud
Port #2 ("On-Board" Modem)		Button 2	300 Baud
Port #3 (I/O Expander Module RS-232C)		Button 3	
Port #4 (I/O Expander Module RS-422)	Button 4		
Access Codes	Flash 20		
DISA Access Code		Button 1	100
Admin Password for Digital Key Terminal		Button 2	3226
SMDR Programming	Flash 21		
SMDR (Y/N)		Button 1	No
Call Type (LD or ALL)		Button 2	LD

Table 600-1 Default Values (Cont'd)

FEATURE	PROGRAM CODE	FLEX BUTTON	DEFAULT VALUE
Print Format (30 or 80)		Button 3	80
Baud Rate (300/1200/2400/4800/9600)		Button 4	4800
Port (1/2/3/4)		Button 5	1
<b>NIGHT MODE PROGRAMMING:</b>			
Auto/Manual (Y/N)	Flash 22	Button 1	Manual
Days of the Week Schedule		Buttons 2-8	0-4 08:00-17:00 5-6 ####-####
<b>HUNT GROUP PROGRAMMING:</b>			
Groups 1-8	Flash 30	Buttons 1-8	
Pilot/Circular		Button 9	
<b>CO LINE GROUP PROGRAMMING:</b>			
DTMF/Dial Pulse Signaling (Y/N)	Flash 40	Button 1	DTMF
CO/PBX Flag (Y/N)		Button 2	CO
UNA Flag (Y/N)		Button 3	Yes
Conference Flag		Button 4	Disabled
Privacy Flag		Button 5	Enabled
Loop Supervision (0=none, 1-9=timer)		Button 6	No
DISA (0=none, 1=24hr, 2=night)		Button 7	No
Flash Timer (01-10)		Button 8	10
CO Line Group (0-8)		Button 9	1
Line COS (1-6)		Button 10	1
Ring Assignment		Button 11	None
Display Ring Assignment(s)		Button 17	Ring at Sta 100
Next (forward) CO		Button 18	
Next (backward) CO		Button 19	
New Range		Button 20	
Dial Pulse, Speed/Ratio Programming	Flash 41		
Break/Make		Button 1	60/40
Dial Speed		Button 2	10 pps
<b>STATION PROGRAMMING:</b>			
Page Access (Y/N)	Flash 50 Page A	Button 1	Yes
DND Access (Y/N)		Button 2	Yes
Conference (Y/N)		Button 3	Yes
Executive Override (Y/N)		Button 4	Yes
Privacy (Y/N)		Button 5	No
System Speed (Y/N)		Button 6	Yes
Queuing (Y/N)		Button 7	Yes
Preferred Line Answer (Y/N)		Button 8	Disabled
OHVO (Y/N) (Future)		Button 9	Disabled
Call Forward (Y/N)		Button 10	Disabled
Forced LCR (Y/N)		Button 11	Enabled

Table 600-1 Default Values (Cont'd)

FEATURE	PROGRAM CODE	FLEX BUTTON	DEFAULT VALUE
Select Page A		Button 18	
Select Page B		Button 19	
New Station Range (#'s)		Button 20	
<b>STATION PROGRAMMING; (Cont'd)</b>	Flash 50		
Station ID (0-6)	Page B	Button 1	0 (Keyset) 5(SLT w/o MWt)
COS (day & night)		Button 2	1
Speakerphone (0-3)		Button 3	0
Group Pickup (1,2,3,4)		Button 4	1
Paging Zones (1,2,3,4)		Button 5	1
Preset Forward (Sta #)		Button 6	None
CO Line Group Access (0-7)		Button 7	1
LCR Class of Service		Button 8	
Off-Hook Preference		Button 9	
Flexible Button Assignments		Button 10	
Display Button Assignments		Button 17	
Select Page A		Button 18	
Select Page B		Button 19	
New Station Range (#'s)		Button 20	
<b>UCD GROUP PROGRAMMING:</b>	Flash 60		
UCD Groups (1-8)		Buttons 1-8	None
Alternate UCD Group		Button 9	None
Overflow Assignment		Button 10	None
Station Assignments		Button 11	None
Announcement Table(s) Entries		Button 12	None
<b>UCD TIMERS:</b>	Flash 61		
Ring Timer		Button 1	60 sec.
BGM Timer		Button 2	60 sec.
Over Flow Timer		Button 3	60 sec.
Wrap-Up Timer		Button 4	04 sec.
UCD RAN Announcement Tables	Flash 62		None
<b>VM GROUP PROGRAMMING:</b>	Flash 65		
VM Groups (1-8)		Buttons 1-8	None
Alternate VM Group		Buttons 9	None
Leave Mail Table entry		Button 10	None
Retrieve Mail Table entry		Button 11	None
Station Assignments		Button 12	None
VM Leave/Retrieve Disconnect Tables	Flash 66	Buttons 1-8	
VM ID on Incoming CO Calls	Flash 67	Button 1	No
<b>ALLOW/DENY &amp; SPECIAL TABLES:</b>	Flash 70		
Allow Table A		Button 1	None

Table 600-1 Default Values (Cont'd)

FEATURE	PROGRAM CODE	FLEX BUTTON	DEFAULT VALUE	
Deny Table A		Button 2	None	
Allow Table B		Button 3	None	
Deny Table B		Button 4	None	
Special Table 1		Button 5	All Codes Allowed	
Special Table 2		Button 6	All Codes Allowed	
Special Table 3		Button 7	All Codes Allowed	
Special Table 4		Button 8	All Codes Allowed	
Area Code for Special Table 1		Button 9		
Area Code for Special Table 2		Button 10		
Area Code for Special Table 3		Button 11		
Display Tables		Button 12		
<b>LCR PROGRAMMING:</b>		Flash 75		
3-Digit Routing Table			Button 1	Default
6-Digit Routing Table	Button 2		None	
Exception Code Table	Button 3			
Route List Table	Button 4			
Insert/Delete Table	Button 5			
Daily Start Time Table	Button 6			
Weekly Schedule Table	Button 7			
Route for 555-1212	Button 8			
<b>INITIALIZE DATA BASE PARAMETERS:</b>	Flash 80			
Init System Parameters		Button 1		
Init CO Line Attributes		Button 2		
Init Station Attributes		Button 3		
Init Group Parameters (Hunt, UCD, VM)		Button 4		
Init Exception Tables		Button 5		
Init System Speed		Button 6		
Init LCR Tables		Button 7		
Init Entire System and Reset		Button 8		
<b>PRINT DATA BASE PARAMETERS:</b>		Flash 85		
Print System Parameters	Button 1			
Print CO Line Attributes	Button 2			
Print Station Attributes	Button 3			
Print Group Parameters (Hunt, UCD, VM)	Button 4			
Print Exception Tables	Button 5			
Print System Speed	Button 6			
Print LCR Tables	Button 7			
Print Entire Data Base	Button 8			
Abort Printing	Button 9			

*By Terminal*

d. The ON/OFF button LED is lit. The system is ready to program.

Other telephones connected to the system continue to function normally.

**600.3 PROGRAM MODE ENTRY (Data Terminal or PC)**

A data terminal connected to the RS-232C port on the CPB or remotely through the on-board modem can be used for data base programming.

When using a data terminal (ASCII or PC capable of emulating an ASCII terminal) on-site or locally, to program the System:

- a. Press return (enter) on the terminal.
- b. Enter the password [VODAVI], and press return again. Proper entry of the password will result in the ADM> prompt. Proceed with programming referring to Figure 600-1 for terminal characters that represent the keyset buttons. By entering a [?] from the terminal, a HELP screen will appear.

When entering the system remotely via a data terminal, access to the on-board modem is accomplished by accessing Port [199] either through a direct ringing assignment or through DISA or by being transferred to port [199] by any internal station.

Proper entry of the password will result in the ADM> prompt. Proceed with programming referring to Figure 600-1 for terminal characters that represent the keyset buttons. By entering a [?] from the terminal, a HELP screen will appear, similar to that shown in Figure 600-1.

Using the Remote Admin Key Definitions follow the same steps and procedures to program the Starplus Digital (SPD) Key Telephone System when using a terminal (as outlined in the following sections).

**600.4 BEGINNING TO PROGRAM**

Once the program mode has been entered via a digital terminal or via an ASCII terminal, you may proceed with programming by:

*NOTE: Initialize here if necessary. Refer to the following section for initialization instructions*

- a. Press the FLASH button.
- b. Dial the two-digit program code for the desired data field.
- c. Enter customer data.
- d. To permanently store the entered data, press the HOLD button. ~~A burst of one second confirmation tone should be heard.~~ If an interrupted (error) tone is heard, re-enter the data starting with step A.
- e. Repeat from step A. until all data has been entered into memory.

**600.5 INITIALIZATION**

The system has been pre-programmed with certain features which are called default data (Refer to Table 600-1). These features are loaded into memory when the system is initialized.

*NOTE: The system should be initialized when installed or at any time the data base has been corrupted.*

Use the procedures below to return the system data base to default values:

- a. Enter the programming mode.
- b. Press FLASH button and dial [80].
- c. Press the System Reset flexible button (Button #8).
- d. Press HOLD button to initialize the system data base to default values. Confirmation tone will be heard upon completion of the initialization process.
- e. Repeat from Step C. to return only parts of the data base to default values using the following flexible buttons:

C 1	SYSTEM PARAMETERS	11 A
W 2	CO LINE ATTRIBUTES	12 S
E 3	STATION ATTRIBUTES	13 D
R 4	GROUP PARAMETERS	14 F
T 5	EXCEPTION TABLES	15 G
Y 6	SYSTEM SPEED	16 H
U 7	LCR TABLES	17 J
I 8	SYSTEM & RESET	18 K

*NOTE: Buttons 1-7 DO NOT initialize the database, but returns all programmable data to its default value.*

**600.6 CUSTOMER DATA WORKSHEETS**

Before any attempt at programming is made, it is strongly recommended that customer data worksheets be prepared (Refer to Appendix A). These worksheets should become part of the permanent record of customer programming. Refer to the following sections when preparing the worksheets.

**600.7 DATA BASE FIELDS**

The data fields are used to set system timers, determine central office line features and Key Telephone features. When entering CO line data and station data, be sure to enter the exact number of digits specified. The data fields and features are further described in the following sections.

# SECTION 610

## SYSTEM PARAMETERS PROGRAMMING

### 610.1 SYSTEM TIMERS

#### Programming Steps

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. (Refer to Sec. 600.2).

If any System Timers are to be changed:

1. Press FLASH and dial [01]. The following message is shown on the display phone:

**SYSTEM TIMERS  
ENTER BUTTON NUMBER**

#### Description

This section describes the procedures and steps necessary to program system timers.

The buttons on the digital terminal are defined as shown below when entering the System Timers programming.

O 1	SYSTEM HOLD RECALL	CO RING DETECT	11 A
W 2	EXCL HOLD RECALL	DISA/SLT RCVR	12 S
E 3	ATTENDANT RECALL	MSG WAIT REMINDER	13 D
R 4	TRANSFER RECALL	HOOKFLASH	14 F
T 5	PRESET FORWARD	HKFLASH DEBOUNCE	15 G
Y 6	CALL FWD NO/ANS		16 H
U 7	PAUSE TIMER		17 J
I 8	CALL PARK TIMER		18 K
Q 9	CONF/DISA TIMER		19 L
P 10	PAGING TIMEOUT		20 .

PROGRAM CODE	FLEX BUTTON	FEATURE	DEFAULT VALUE (after initializing)
<b>SYSTEM TIMERS:</b>			
FLASH 01	1	System Hold Recall	060 seconds
	2	Exclusive Hold Recall	180 seconds
	3	Attendant Recall Timer	01 minutes
	4	Transfer Recall Timer	045 seconds
	5	Preset Forward Timer	10 seconds
	6	Call Forward No Answer	015 seconds
	7	Pause Timer	2 seconds
	8	Call Park Timer	180 seconds
	9	Conference/DISA Timer	10 minutes
	10	Paging Timeout Timer	15 seconds
	11	CO Ring Detect Timer	300 milliseconds
	12	SLT DTMF Receiver Timer	020 seconds
	13	MSG Wait Reminder Tone	000 minutes
	14	SLT Hook-flash Timer	10 (1 seconds)
	15	SLT Hook-flash Debounce	010 (.1 second)

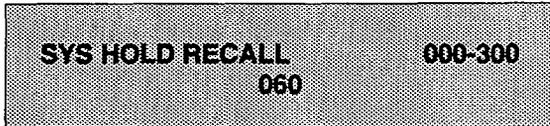
**SYSTEM TIMERS (Cont'd)**

**A. System Hold Recall Timer**

Programming Steps

If this timer is to be changed:

1. Press the SYSTEM HOLD RECALL TIMER flexible button (Button #1). The following message is shown on the display phone:



2. Enter three digits on the dial pad.
3. Press HOLD button. Display will now update.

Description

Determines the amount of time before a call placed on System Hold will recall the station placing the hold. If unanswered by that station, the call will recall the attendant.

**Default:** Default value is 060 seconds and is variable from 001 to 300 seconds.

An entry of 000 will disable the timer and there will be no recall.

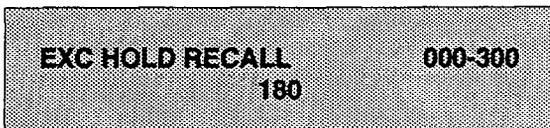
**Related Programming:** Hold Preference programming for selecting System Hold Preference; Attendant Programming for assigning the Attendant(s) to receive recalls.

**B. Exclusive Hold Recall Timer**

Programming Steps

If this timer is to be changed:

1. Press the EXCLUSIVE HOLD RECALL TIMER flexible button (Button #2). The following message is shown on the display phone:



2. Enter three digits on the dial pad.
3. Press HOLD button. Display will now update.

Description

Determines amount of time before a call placed on Exclusive Hold recalls the station placing the Hold. If unanswered by that station, the call recalls the attendant.

**Default:** The default value is 180 seconds and is variable from 001 to 300 seconds.

An entry of 000 will disable the timer and there will be no recall.

**Related Programming:** Hold Preference programming for selecting Exclusive Hold Preference; Attendant Programming for assigning the Attendant(s) to receive recalls.

**SYSTEM TIMERS (Cont'd)****C. Attendant Recall Timer**Programming Steps

If this timer is to be changed:

1. Press the ATTENDANT RECALL TIMER flexible button (Button #3). The following message is shown on the display phone:

ATND RECALL TIMER	00-60
01	

2. Enter two digits on the dial pad.
3. Press HOLD button.

Description

Determines the amount of time a recalling call will ring at the attendant station(s) before the system will release the line.

When a CO Line recalls to the Attendant station and is still unanswered, the system will release the line at the expiration of this timer and automatically place the line back to an idle condition.

**Default:** This timer is variable from 00 to 60 minutes and default is 01 minutes.

An entry of 00 will cause the Attendant(s) to ring until answered.

**Related Programming:** Attendant programming; System Hold Recall Timer; Exclusive Hold Recall Timer; Call Park Recall Timer, Transfer Recall Timer. Also refer to Loop Supervision in CO Line programming (Sec. 620.1).

**D. Transfer Recall Timer**Programming Steps

If this timer is to be changed:

1. Press the TRANSFER RECALL TIMER flexible button (Button #4). The following message is shown on the display phone:

TRANSFER RECALL	000-300
045	

2. Enter three digits on the dial pad.
3. Press HOLD button. Display will now update.

Description

Determines amount of time a transferred call rings at the station receiving the transfer before it recalls the station making the transfer. If unanswered by that station, the call recalls the attendant.

**Default:** Default value is 045 seconds and is variable from 001 to 300 seconds. A 000 entry disables the timer and there will be no recall.

**Related Programming:** Attendant Programming for assigning the Attendant(s) to receive recalls.

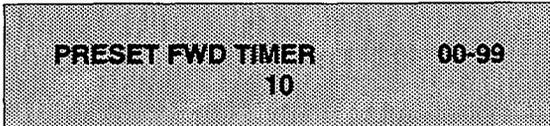
**SYSTEM TIMERS (Cont'd)**

**E. Preset Forward Timer**

Programming Steps

If this timer is to be changed:

1. Press the PRESET FORWARD TIMER flexible button (Button #5). The following message is shown on the display phone:



2. Enter two digits on the dial pad.
3. Press HOLD button. Display will now update.

Description

Determines the amount of time an outside line will ring before being forwarded to a predetermined station. This entry works with Preset Forward station assignments in Station Programming. More than one station can be forwarded to the same party.

This timer also governs the time the DISA call will ring at a station before being returned to intercom dial tone, if not answered.

**Default:** Default time is set at 10 seconds and is variable from 01 to 99 seconds.

A 00 entry disables the timer and there will be no forward.

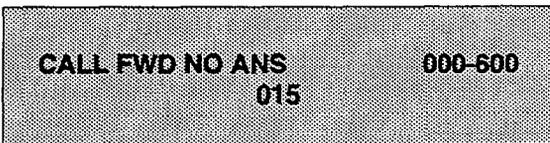
**Related Programming:** Preset Forward assignments in Station Programming (Sec. 630.1) for instruction on assigning a stations preset forward destination.

**F. Call Forward No/Answer Timer**

Programming Steps

If this timer is to be changed:

1. Press the CALL FORWARD NO/ANSWER TIMER flexible button (Button #6). The following message is shown on the display phone:



2. Enter three-digit timer value on the dial pad which corresponds to 000-600 seconds.
3. Press HOLD button.

Description

The Call Forward No answer timer is used when a station in the system specifies that "no answer" calls be forwarded to another station. The timer determines how long an intercom or transferred call will ring before it is considered a "no-answer" call. The call will then forward to the designated station for handling.

*NOTE: Initial incoming CO lines will follow the Preset Call Forward Timer when encountering a station in the Forward/No answer mode. (Refer to Section 610.1 for instructions on setting the Preset/Forward Timer)*

The timer is variable from 000-600 seconds.

**Default:** Default is 015 seconds.

**Related Programming:** Preset Forward Timer, Sec. 610.1; Station Attributes, Call Forward option.



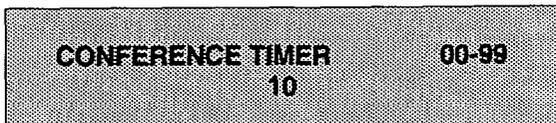
SYSTEM TIMERS (Cont'd)

I. Conference/DISA Timer

Programming Steps

If this timer is to be changed:

1. Press the CONFERENCE/DISA TIMER flexible button (Button #9). The following message is shown on the display phone:



2. Enter two digits on the dial pad.
3. Press HOLD button. Display will now update.

Description

Determines the amount of time an unsupervised conference can continue after the initiator of the conference has exited the conference.

**Default:** Default is 10 minutes and is variable from 01 to 99 minutes.

A 00 entry disables the timer and means no automatic disconnect occurs.

*NOTE: The Conference Timer also allows the system administrator to control the length of time a DISA caller is allowed after establishing a "Trunk-to-Trunk" call. At the expiration of the Conference Timer, a tone will be presented to both DISA parties, then one minute later the system will automatically release both trunks. The Conference Timer does not affect or control a DISA-to-Station call.*

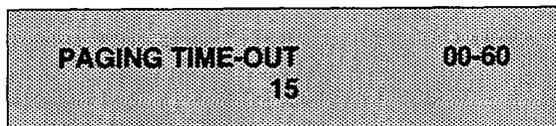
**Related Programming:** Refer to Loop Supervision, DISA and Conference Attributes in CO Line programming. Also refer to the Conference option in Station programming.

J. Paging Timeout Timer

Programming Steps

If this timer is to be changed:

1. Press the PAGING TIMEOUT TIMER flexible button (Button #10). The following message is shown on the display phone:



2. Enter two digits on the dial pad.
3. Press HOLD button. Display will now update.

Description

Determines the maximum length of a page announcement (internal, external or All Call). The system will automatically disconnect the page at the end of this time unless the person making the page has already hung up.

**Default:** Default is 15 seconds and is variable from 01 to 60 seconds.

A 00 entry disables the timer and pages will not be limited in length.

**Related Programming:** Station Attributes for allowing stations access to the system paging resources.

**SYSTEM TIMERS (Cont'd)****K. CO Ring Detect Timer**Programming Steps

If this timer is to be changed:

1. Press the CO RING DETECT TIMER flexible button (Button #11). The following message is shown on the display phone:

<b>CO RING DETECT</b> <b>3</b>	<b>2-9</b>
-----------------------------------	------------

2. Enter one digit on the dial pad.
3. Press HOLD button. Display will now update.

Description

This timer controls the time necessary to detect an outside line as ringing into the system.

**Default:** Default is 3 (hundred milliseconds) and is variable from 2 to 9. There is no 0 or 1 entry.

**L. SLT DTMF Receiver Timer**Programming Steps

If this timer is to be changed:

1. Press the SLT DTMF RECEIVER TIMER flexible button (Button #12). The following message will then be shown on the display.
2. Enter the three digits on the dial pad.

<b>SLT RCVR TIMER</b> <b>020</b>	<b>005-100</b>
-------------------------------------	----------------

3. Press the HOLD button. The display will now update.

Description

Single line telephones require the use of a DTMF receiver when going off-hook and dialing. When SMDR or toll restriction, (via COS assignments) is enabled in the system a DTMF receiver will monitor and screen an SLT's digits for the duration of this timer. By adjusting this timer the system administrator may either free up system DTMF receivers sooner if system SLT traffic is heavy or provide for a longer monitoring period if toll restriction becomes a problem. It should be understood that when LCR is enabled the DTMF receivers are released when the expected number of digits are dialed as entered in the LCR data base.

**Default:** By default, the timer is set at 020 seconds.

**Related Programming:** SMDR programming, Sec. 610.10; Toll Restriction in both CO line and Station Attributes programming. Also refer to LCR programming.

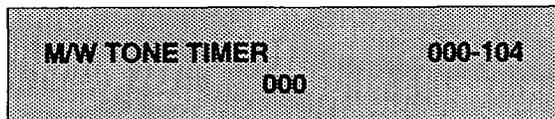
**SYSTEM TIMERS (Cont'd)**

**M. Message Wait Reminder Tone**

Programming Steps

If this feature is to be changed:

1. Press the MESSAGE WAIT REMINDER TONE flexible button (Button #13). The following message is shown on the display phone:



2. Enter three digits on the dial pad.
3. Press HOLD button. Display will now update.

Description

The Message Wait Tone Timer determines the amount of time between repeated reminder tones to a key telephone with a message waiting.

Key station users may be reminded of a message waiting on their telephone with an audible signal presented at a timed interval.

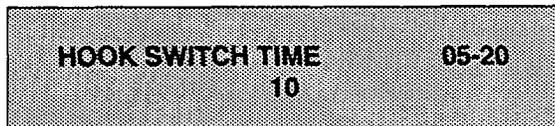
**Default:** Default is 000 (disabled) and is variable from 000 to 104 minutes.

**N. SLT Hook Flash Timer**

Programming Steps

If this timer is to be changed:

1. Press the SLT HOOK FLASH TIMER flexible button (Button #14). The following message is shown on the display phone:



2. Enter a two digit number on the dial pad.
3. Press HOLD button.

Description

This timer determines how long an SLT user should press the hookswitch in order for it to be considered a valid on hook (disconnect) request. An on-hook shorter in duration (but longer than the Hook Switch Bounce Timer) will be considered a Hook Flash (transfer) request. (Refer to Figure 710-1)

The timer is variable from 0.5 seconds to 2.0 seconds. The entry should be a two digit number between 05 and 20.

**Default:** Default is 10 (one second).

*NOTE: Some Single Line telephones have a fixed or programmable Flash Timer (Flash or Tap button). This Hook Switch Timer (SPD 1428 & SPD 2856 Timer) must be set longer than the SLT Flash timer to allow Hook Flash transfer.*

**SYSTEM TIMERS (Cont'd)**

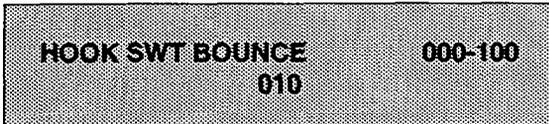
**0. SLT Hook Flash Debounce Timer**

Programming Steps

Description

If this timer is to be changed:

1. Press the SLT HOOK FLASH DEBOUNCE TIMER flexible button (Button #15). The following message is shown on the display phone:

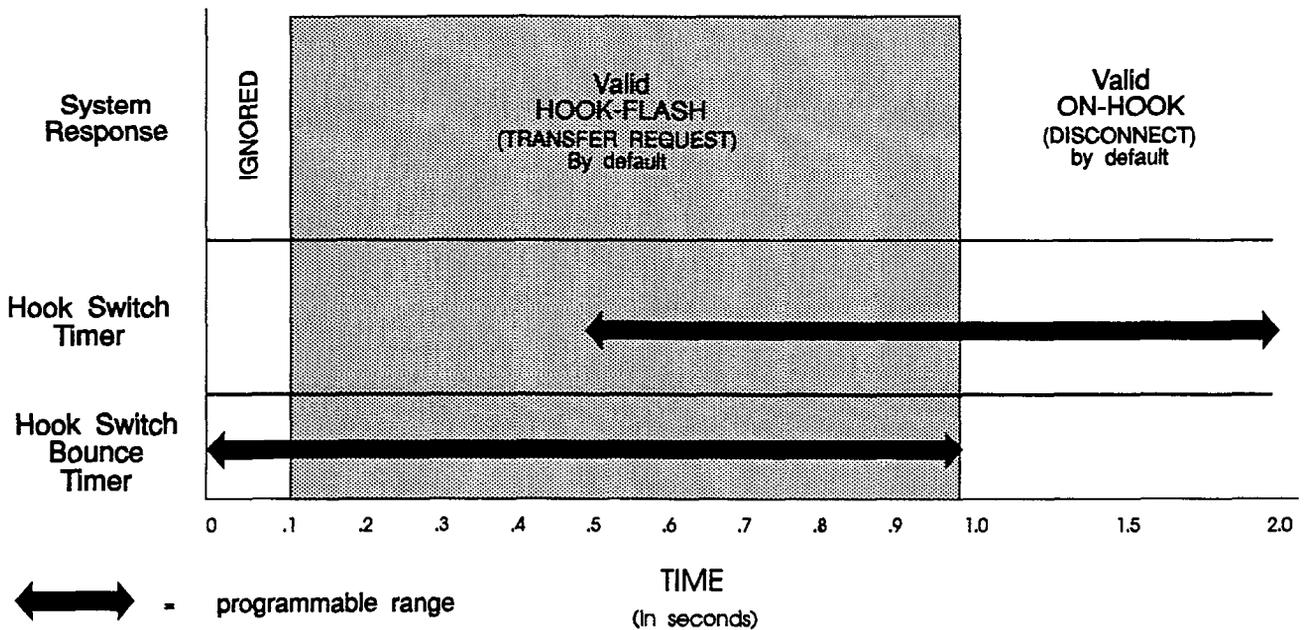


2. Enter a three digit number on the dial pad.
3. Press HOLD button.

This timer determines the length of time that is needed to determine a valid on hook or off hook condition for single line telephones. On-Hook or Off-Hook signals that are shorter in duration than this timer will be ignored by the system. (Refer to Table 610.1)

The timer is variable from 0 to 1 second in 10 ms increments This entry is a three-digit entry where 010 equals .1 seconds.

**Default:** By default, the timer is set to 0.10 sec.



**Figure 610-1 Hook Switch Activity**

*set at .3 or .4 to get rid of phantom ring backs when handset slammed or hang up weird.*

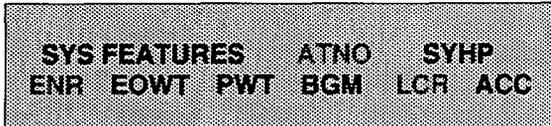
610.2 SYSTEM FEATURES PROGRAMMING

Programming Steps

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. (Refer to Sec.600.2).

If any System Features are to be changed:

1. Press FLASH and dial [05]. The following message is shown on the display phone:



Description

This section describes the procedures and steps necessary to program System Features.

The buttons on the key telephone are defined as shown below when entering the System Features programming area.

Q 1	ATTN OVERRIDE	11 A
W 2	HOLD PREF	12 S
E 3	EXT NIGHT RING	13 D
R 4	EXEC OVER WARN	14 F
T 5	PAGE WARN TONE	15 G
Y 6	BACKGROUND MUSIC	16 H
U 7	LCR ENABLE	17 J
I 8	ACCOUNT CODES	18 K

System Parameters

PROG CODE	FLEX BTN	FUNCTION	FORMAT	DEFAULT	CUSTOMER DATA
FLASH 05	1	Attendant Override	Yes/No	No	
	2	Hold Preference	Sys/Excl	System	
	3	External Night Ring	Yes/No	No	
	4	Executive Warning Tone	Yes/No	Yes	
	5	Page Warning Tone	Yes/No	Yes	
	6	Background Music	Yes/No	Yes	
	7	LCR Enable	Yes/No	No	
	8	Account Codes	Yes/No	No	
FLASH 10		Attendant Station Assignment	100-155	100	
FLASH 11	1-4	Time/Date Format	12/24 HR:M/D	12 HR:M/D	
FLASH 12	1-5	PBX Dialing Codes	Five 2-Digit	None	
FLASH 13	1	Exec/Secy Pair 1	Sta #, Sta #	None	
	2	Exec/Secy Pair 2	Sta #, Sta #	None	
	3	Exec/Secy Pair 3	Sta #, Sta #	None	
	4	Exec/Secy Pair 4	Sta #, Sta #	None	
FLASH 14	1-7	Page/Contact Programming		None	
FLASH 20	1	DISA Access Code	100-999	100	
	2	Admin. Password	One 4-Digit	3226	
FLASH 21	1	SMDR Enable/Disable	Yes/No	No	
	2	Call Type	All/LD Only	LD Only	
	3	Print Columns	80/29	80	
	4	Baud Rate	300/1200/2400 4800/9600	4800	
	5	Port	1/2/3/4	1	
FLASH 22	1	Night Mode Operation	Auto Manual	Manual	
	2	ANM Schedule - Monday	Off Time On Time	0	/
	3	ANM Schedule - Tuesday	Off Time On Time	1	/
	4	ANM Schedule - Wednesday	Off Time On Time	2	/
	5	ANM Schedule - Thursday	Off Time On Time	3	/
	6	ANM Schedule - Friday	Off Time On Time	4	/
	7	ANM Schedule - Saturday	Off Time On Time	5#####	/
	8	ANM Schedule - Sunday	Off Time On Time	6#####	/
FLASH 41	1	Dial Pulse	60/40, 66/33	60/40	
	2	Dialing Speed	10/20 pps	10 pps	

Figure 610-2 Example of System Parameters Pgmng Form

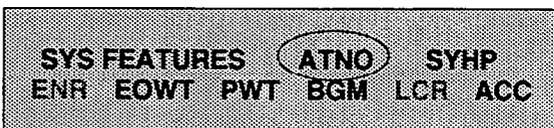
## SYSTEM FEATURES (Cont'd)

## A. Attendant Override

Programming Steps

If this feature is to be changed:

1. Press the ATTN OVERRIDE flexible button (Button #1). It will toggle on and off with each depression.
  - LED off = Attendant Override is disabled
  - LED on = Attendant Override is enabled
2. Press HOLD button. The display will update.

Description

When this feature is set for yes, it allows the attendant to override a busy station or a station in DND.

**Default:** By default, Attendant Override is disabled.

**Related Programming:** Attendant Assignments for designating a station as an Attendant.

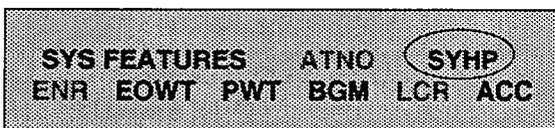
**NOTE:** Attendant override will function **ONLY** when the Attendant station is assigned a flex button assigned as Attendant Override.

## B. Hold Preference

Programming Steps

If this feature is to be changed:

1. Press the HOLD PREF flexible button (Button #2). It will toggle on and off with each depression.
  - LED off = Exclusive Hold is preferred
  - LED on = System Hold is preferred
2. Press HOLD button. The display will update.

Description

The system may be programmed to have either Exclusive or System Hold preferred. If Exclusive Hold is preferred, the user will press the HOLD button once for Exclusive Hold and twice for System Hold. If System Hold is preferred, the user will press the HOLD button once for System Hold and twice for Exclusive Hold.

Refer to System Timer programming for recall times for both System and Exclusive Hold.

**Default:** By default, Hold Preference is System.

**Related Programming:** System Hold Recall Timer and Exclusive Hold Recall Timer for setting the appropriate recall timers.

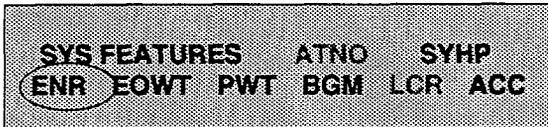
**SYSTEM FEATURES (Cont'd)**

**C. External Night Ring**

Programming Steps

If this feature is to be changed:

1. Press the EXT NIGHT RING flexible button (Button #3). It will toggle on and off with each depression.
  - LED off = Ext. Night Ring is disabled
  - LED on = Ext. Night Ring is enabled
2. Press HOLD button. The display will update.



Description

When this feature is set to yes, it activates external night ring which produces a tone that is sent over all external page groups. When outside lines are marked UNA, ringing will activate a tone over external paging when an incoming call occurs on those lines during night service.

**Default:** By default, External Night Ring is disabled.

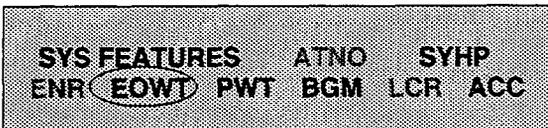
**Related Programming:** Page/Relay Assignments; CO Line Attributes for assigning UNA status to a CO Line(s).

**D. Exec Override Warning Tone**

Programming Steps

If this feature is to be changed:

1. Press the EXEC OVER WARN TONE flexible button (Button #4). It will toggle on and off with each depression.
  - LED off = Executive Override Tone disabled
  - LED on = Executive Override Tone enabled
2. Press HOLD button. Display will now update



Description

A Station programmable option allows stations to be designated as "Executive" stations with the ability to override and "barge-in" on other keysets engaged in conversation on a CO line. Prior to actual cut through of the third party, a warning tone is presented to all parties notifying them of the "barge-in".

This warning tone however is a programmable option, on a system wide basis, that either enables or disables the tone. When the tone is disabled no audible signal is presented to the parties to signal the "barge-in".

**Default:** By default, Executive Override Warning Tone is enabled.

**Related Programming:** Station Attributes for assigning stations as Executive stations.

CAUTION: USE OF THIS FEATURE WHEN THE EXECUTIVE OVERRIDE WARNING TONE IS DISABLED MAY BE INTERPRETED AS A VIOLATION OF FEDERAL OR STATE LAWS, AND AN INVASION OF PRIVACY. CONSULT COUNSEL WITH RESPECT TO APPLICABLE LAW BEFORE INTRUDING ON CALLS USING THIS FEATURE.

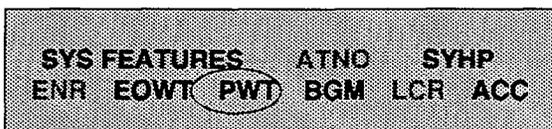
**SYSTEM FEATURES (Cont'd)**

**E. Page Warning Tone**

Programming Steps

If this feature is to be changed:

1. Press the PAGE WARN TONE flexible button (Button #5). It will toggle on and off with each depression.
  - LED on = Page Warning Tone is enabled
  - LED off = Page Warning Tone is disabled
2. Press HOLD button. Display will now update.



Description

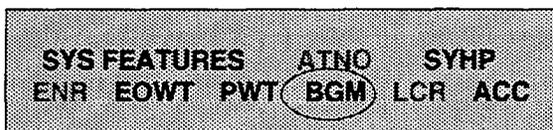
Determines whether a page warning tone will be sounded over the Key Telephone speakers or external paging speakers, prior to a page announcement.  
**Default:** By default, Page Warning Tone is enabled.  
**Related Programming:** Station Attributes, Sec. 630.1; Page Access and Page Group Assignments.

**F. Music Channel**

Programming Steps

If Background Music is to be enabled/disabled:

1. Press the BACKGROUND MUSIC flexible button (Button #6). It will toggle on and off with each depression.
  - LED on = Background Music is enabled
  - LED off = Background Music is disabled
2. Press HOLD button. Display will now update.



Description

The system can be programmed to allow stations to activate Background Music at their stations, in addition to Music-On-Hold. A music source must be connected to the BGM/MOH connector on the CPU.  
**Default:** By default, the Background Music channel is enabled.  
**Related Programming:**

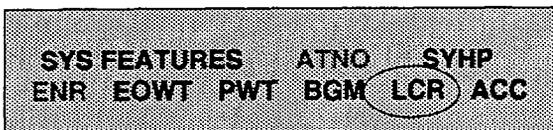
**SYSTEM FEATURES (Cont'd)**

**G. LCR Enable**

Programming Steps

If this feature is to be assigned:

1. Press the LCR ENABLE flexible button (Button #7). It will toggle on and off with each depression.
  - LED on = LCR is enabled
  - LED off = LCR is disabled
2. Press HOLD button. Display will now update.



Description

If Least Cost Routing is to be used, it must be enabled here. Before enabling LCR, refer to the Least Cost Routing section and programming tables (Appendix A). When the tables have all been programmed, you may then enable LCR for the system. After system initialization, a default LCR data base is loaded into the LCR section of memory. Refer to Figure 665-7 for a listing of the LCR default data base.

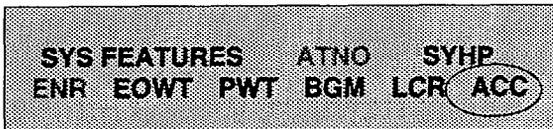
**Default:** By default, LCR is disabled.

**Related Programming:** LCR Programming.

**H. Account Codes - Forced**

Programming Steps

1. Press ACCOUNT CODES flexible button (Button #8) to determine whether the use of Account Codes will be forced or optional.
  - LED ON = Account Codes are forced
  - LED OFF = Account Codes are optional
2. Press HOLD button to accept the data.



Description

The system can force the use of account codes on all restricted calls.

If forced account code option is enabled, then a stations Class of Service is upgraded to day COS1, night COS1, when the account code is entered.

If forced account code option is disabled, then a stations Class of Service is not upgraded but the account code continues to be part of the SMDR record.

**Default:** By default, the use of account codes is not forced but optional.

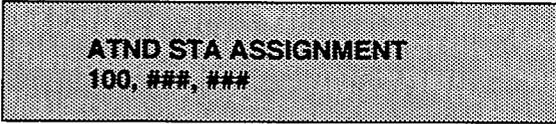
MISC. SYSTEM PARAMETERS

610.3 ATTENDANT STATION ASSIGNMENT

Programming Steps

If Attendant Stations are to be changed:

- a. Press FLASH and dial [10]. The following message is shown on the display phone:



- b. Enter up to three (3) three-digit station number(s) on the dial pad.
- c. Press HOLD button.

Description

The system will identify an attendant station for the purpose of receiving recalls and activating night service. The system can have up to three attendant(s) programmed.

Entering three pounds [###] will remove that attendant assignment or different station numbers can be programmed.

**Default:** By default, Station 100 is assigned as attendant.

**Related Programming:** System Hold Recall Timer; Exclusive Hold Recall Timer; Call Park Recall Timer; Attendant Recall Timer; Attendant Override; Night Mode Operation.

610.4 SETTING SYSTEM TIME AND DATE

Programming Steps

To set the time and date which appears on display Digital Terminals:

- a. Press FLASH and dial [11]. The following message is shown on the display phone.



- b. Choose display format by pressing the appropriate button in the flexible button field.
- c. Press the HOLD button or dial in the time and date as follows (twelve digits):

YYMMDDHHMMSS

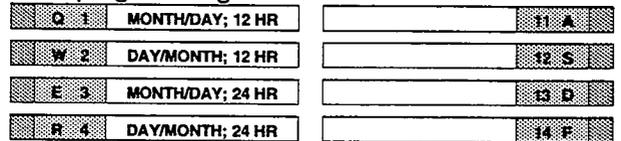
- d. Then press HOLD button.

*NOTE: The Time and Date can be changed or set by the First Attendant station using dial code [692]*

Description

The date can be displayed in either the US (month/day) format or the European (day/month) format on Executive Display stations. In addition, the time can be displayed in either the standard 12 hour format or the 24 hour format.

The buttons on the key telephone are defined as shown below when entering the System Time and Date programming area:



When entering the time and date, use the following data:

- YY (year) = 00 to 99
- MM (month) = 01 to 12
- DD (day) = 01 to 31
- HH (hour) = 00 to 23
- MM (minute) = 00 to 59
- SS (second) = 00 to 59 (optional)

**Default:** By default, the date is set for month/day format and the time is in the 12 hour format.

**Related Programming:** Attendant Operation, Sec. 300.102, for setting System Date and Time from the First Programmed Attendant; Attendant programming for the First Assigned Attendant, Sec. 610.3.

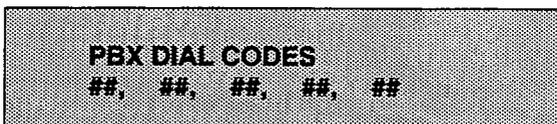
MISC. SYSTEM PARAMETERS (Cont'd)

610.5 PBX DIALING CODES

Programming Steps

If PBX Dialing Codes are to be assigned:

- a. Press FLASH and dial [12]. The following message is shown on the display phone:



- b. Enter 5-two digit code numbers, one right after the other, on the dial pad up to a maximum of ten digits.
- c. Press HOLD button.

Description

Five one or two-digit PBX access codes can be programmed into memory. When dialed, these codes signal the system so that toll restriction is applied at the next dialed digit. When a single digit code [9] is entered, it must be followed by the pound [#] as the second digit.

To delete an entry, enter two pounds [##] and press the HOLD button.

Lines must be programmed as PBX lines before these codes will apply.

**Default:** By default, no PBX dialing codes are assigned.

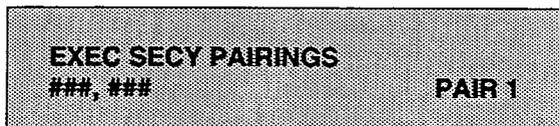
**Related Programming:** CO Line Attributes for assigning a CO Line(s) as PBX Line(s).

610.6 EXECUTIVE/SECRETARY PAIRS

Programming Steps

If Executive/Secretary pairs are to be assigned:

- a. Press FLASH and dial [13]. The following message is shown on the display phone:



- b. The top left button in the flexible button field will be lit indicating the first pair may be programmed.
- c. Enter the three digit Executive station number.
- d. Enter the three digit Secretary station number.
- e. Press HOLD button.
- f. To program a second pair, press the second flexible button in the flexible button field and enter station numbers as in steps c., d., and e.
- g. To program a third pair, press the third button in the flexible button field and enter station numbers as in steps c., d., and e.
- h. To program a fourth pair, press the fourth button in the flexible button field and enter station numbers as in steps c., d., and e.

Description

There are four Executive/Secretary pairs available. When an Executive station is busy or in DND, intercom calls and transfers will be automatically routed to the designated Secretary.

The buttons on the key telephone are defined as shown below when entering the Executive/Secretary programming area:

Q 1	EXEC/SEC'Y PAIR 1	11 A
W 2	EXEC/SEC'Y PAIR 2	12 B
E 3	EXEC/SEC'Y PAIR 3	13 C
R 4	EXEC/SEC'Y PAIR 4	14 F

The assigned secretary may, however, Camp-On to the Executive Station when the station is busy or in Do-Not-Disturb.

There can be only one pairing of stations, with no duplicates. You cannot pair Executive 100 to Secretary 101 and then pair Secretary 101 to Executive 100. You can have the same Secretary station for more than one Executive station (101 to 105 and 102 to 105).

An entry of six pounds [#####] will remove the assignments. Individual pairs may be changed by pressing the associated flexible button.

**Default:** By default, no Exec/Sec'y pairs are assigned.

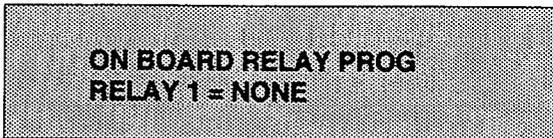
MISC. SYSTEM PARAMETERS (Cont'd)

610.7 RELAY/SENSOR PROGRAMMING

Programming Steps

If Relays are to be assigned:

- a. Press FLASH and dial [14]. Relay #1 (Flex Button #1) and On-Board Relays (Flex Button #11) LED's will be lit indicating the system is in the programming mode for "On-Board" relay programming. The following message is shown on the display phone:



To program "On-Board" relays:

- a. Press the "On-Board" Relays (Flex Button #11) to indicate the system is in the "On-Board" relay programming mode.
- b. Press the desired flex button that corresponds to the relay to be programmed and follow the steps outlined in the following section.

To program relays on the Relay/Sensor Module:

- a. Press the appropriate flex button 12 thru 15 to indicate which Relay/Sensor Interface Module is to be programmed.
- b. Press flex buttons (1-3) to indicate the relay to be programmed.

To program Sensing circuits on a Relay/Sensor Module:

- a. Press the appropriate flex button 12 thru 15 to indicate which Relay/Sensor Interface Module is to be programmed.
- b. Press flex buttons (4-6) to select the sensing circuit to be programmed.

*NOTE: It is necessary to assign a station number to the Relay/Sensor Interface Module. Refer to "F" in this section. In Station Programming, it is also necessary to assign a Station ID to the station port used for a Relay/Sensor Interface Module.*

To disable a relay or sensor circuit:

- a. Press the desired flex button that corresponds to the relay or sensor circuit to be disabled.
- b. Dial [0] on the dial pad.
- c. Press the HOLD button to complete the entry.

Description

The SPD 1428 and SPD 2856 systems offer relays that may be individually programmed for: External Page, Loud Bell Control, CO Line Control, Power Failure Transfer, and Recorded Announcement uses. Up to four (4) Relay/Sensor interface modules may be installed on either system. Each Relay/Sensor Interface module contains three (3) independent relays and three (3) sensing input circuits. In addition, the SPD 2856 4x8 CO/Station Interface boards each contain a Relay Contact (for up to seven (7) "on-board" relays) that may also be assigned to any of the functions mentioned above.

The buttons on the key telephone are defined as shown below when entering the Relay/Sensor programming area:

G 1	RELAY 1	ON-BOARD RELAYS	11 A
W 2	RELAY 2	RELAY/SENSOR #1	12 S
E 3	RELAY 3	RELAY/SENSOR #2	13 D
R 4	RELAY 4/SENSOR 1	RELAY/SENSOR #3	14 F
T 5	RELAY 5/SENSOR 2	RELAY/SENSOR #4	15 G
Y 6	RELAY 6/SENSOR 3		16 H
U 7	RELAY 7		17 J
I 8	STATIONS		18 K

Where:

- Button 11 = On-Board Relay programming (Relays on the 4x8 CO/Sta boards 1/board)
- Button 12 = Relay/Sensor Interface Module #1 programming
- Button 13 = Relay/Sensor Interface Module #2 programming
- Button 14 = Relay/Sensor Interface Module #3 programming
- Button 15 = Relay/Sensor Interface Module #4 programming

On-Board relays are numbered from 1-7 correlating to the CO/Station boards plugged into the system (i.e. the right most CO/STA board in slot J7 corresponds to relay number 1, a CO/STA board in slot J6 corresponds to relay 2 etc...).

**Default:** By default, there is no relay programming.

**Related Programming:** RAN Table programming

RELAY/SENSOR PROGRAMMING (Cont'd)

A. Programming relay for External Paging:

Programming Steps

- a. Press the flex button that corresponds to the desired relay to be programmed.
- b. Dial [1] on the dial pad.
- c. Press the HOLD button to complete the entry. The following message is shown on the display phone:

**ON BOARD RELAY  
RELAY 1 = EXT PAGE 76X**

Description

**EXTERNAL PAGE RELAY:** When assigning a relay as an External Page relay, the relay will activate when the external page zone the relay is assigned to is accessed. The relay will remain activated during the page announcement until the station hangs up or the page timer expires and releases the page zone.

B. Programming relay for RAN Starting:

Programming Steps

- a. Press the flex button that corresponds to the desired relay to be programmed.
- b. Dial [2] on the dial pad.
- c. Enter a one-digit RAN Table number (1 or 2) the relay should be associated to.
- d. Press the HOLD button to complete the entry. The following message is shown on the display phone:

**ON BOARD RELAY  
RELAY 1 = RAN START X**

Description

**RAN START RELAY:** When a CO line port is used for a ground start application, a 24V dc power source must be connected to the CO line port for talk battery. A Loud Bell Control contact assigned to that CO line port in programming would provide contact closure to start the Recorded Announcement device.

When an SLT port is used, the RAN device must be configured for ring trip operation (loop start). The 90V ac voltage sent to the SLT port will be recognized by the RAN device which will then answer the call.

**Related Programming:** RAN Announcement Tables

Where:

X= RAN Table number

C. Programming relay for Power Failure Transfer:

Programming Steps

- a. Press the flex button that corresponds to the desired relay to be programmed.
- b. Dial [3] on the dial pad.
- c. Press the HOLD button to complete the entry. The following message is shown on the display phone:

**ON BOARD RELAY  
RELAY 1 = POWER FAIL**

Description

**POWER FAILURE TRANSFER:** When the Starplus Power Failure Transfer Unit is used for Power Failure, it provides the relay transfer circuits for up to 12 CO lines in the event of a power or processor failure. Activation of the PFT relays is controlled by a multi-use relay on any 4x8 CO/Station Interface Board or Relay/Sensor Module. A customer provided 12 volt DC power supply is required to operate the unit.

With loss of power to the system or a failure of system processing, the PFTU will automatically connect up to twelve (12) CO lines to pre-wired 500/2500 type telephones. When power is restored, the PFTU will automatically restore the CO trunks

## RELAY/SENSOR PROGRAMMING (Cont'd)

**D. Programming relay for Loud Bell Control:**Programming Steps

- a. Press the flex button that corresponds to the desired relay to be programmed.
- b. Dial [4] on the dial pad.
- c. Enter the three-digit station number (100-155)
- d. Press the HOLD button to complete the entry. The following message is shown on the display phone:

Where:

XXX= Station number

**ON BOARD RELAY  
RELAY 1 = LOUD BELL XXX**

**E. Programming relay for CO Line Control:**Programming Steps

- a. Press the flex button that corresponds to the desired relay to be programmed.
- b. Dial [5] on the dial pad.
- c. Enter a two-digit CO Line number (01-28)
- d. Press the HOLD button to complete the entry. The following message is shown on the display phone:

Where:

**ON BOARD RELAY  
RELAY 1 = CO LINE XX**

XX= CO Line number

Description

and stations to normal operation. These SLT stations do not have to be used for intercom, but can be if so desired.

**Related programming:**Description

**LOUD BELL CONTROL:** There are three (3) control contacts on the Relay/Sensor Module, which can be individually programmed as Loud Bell Control to control a customer provided ringing device to external areas.

There are seven (7) control contacts on the SPD 2856, which can be individually programmed as Loud Bell Control to control a customer provided ringing device to external areas. One contact for each 4x8 CO/Station Expander module.

Loud Bell Control contacts can be assigned to any station and will follow the ringing assignments of that station including tone ringing intercom, and transferred CO lines.

Remember to assign ringing to any station programmed for Loud Bell Control.

Description

**CO LINE CONTROL:** There are three (3) control contacts on the Relay/Sensor Module, which can be individually programmed as CO Line Control to control customer provided ancillary equipment.

There are seven (7) control contacts on the SPD 2856, which can be individually programmed as Loud Bell Control to control customer provided ancillary equipment. One contact on each 4x8 CO/Station Expander module.

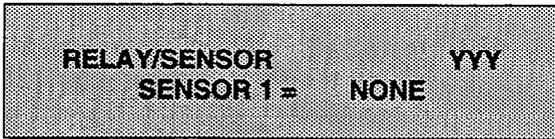
When programmed as CO Line Control and assigned to a CO line, the corresponding contact will close whenever that CO line is accessed.

**RELAY/SENSOR PROGRAMMING (Cont'd)**

**F. Assign Relay/Sensor Interface Module to a station:**

Programming Steps

- a. Press the STA flex button (Button #8).
- b. Enter the three-digit station assignment of the relay sensor.
- c. Press the HOLD button to complete the entry. The following display is shown on the display phone:



Where:

YYY= Station Assignment

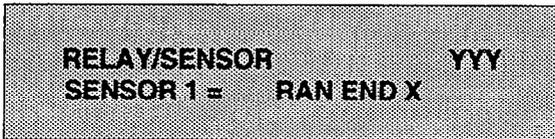
To delete a station assignment:

- a. Press the STA flex button (Button #8).
- b. Press the TRANSfer button.
- c. Press the HOLD button to complete the entry.

**G. Program sensing circuit as a RAN Sensing (RAN END) circuit:**

Programming Steps

- a. Dial [6] on the dial pad.
- b. Enter a one-digit RAN Table number (1 or 2) the sensing circuit should be associated to.
- c. Press the HOLD button to complete the entry. The following display is shown on the display phone:



Where:

X= RAN Table number

Description

**STATION ASSIGNMENTS:**

The programming of this station represents the station port that the Relay/Sensor Module is associated to.

**Related Programming:** It is necessary to assign a station ID to the station port used for a Relay/Sensor Interface module in Station Programming.

Description

**RAN SENSING (RAN END):** The Recorded Announcement feature (RAN) is used with the Uniform Call Distribution feature (UCD) to provide unanswered incoming CO calls or calls in queue with a Recorded Announcement while waiting for an available UCD station. The system may be programmed to provide this announcement on specified RAN output ports on the system (unused SLT and CO ports). The system can be programmed to connect the waiting caller to a different RAN port for the second, and subsequent RAN messages.

When a CO line port is used for a ground start application, a 24V dc power source must be connected to the CO line port for talk battery. A Page/Relay contact assigned to an announcement table in programming would provide contact closure to start the Recorded Announcement device.

**Related Programming:** RAN Tables

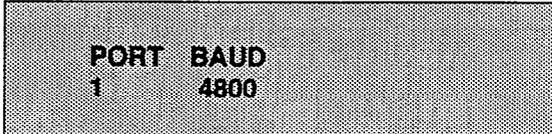
MISC. SYSTEM PARAMETERS (Cont'd)

610.8 BAUD RATE ASSIGNMENTS

Programming Steps

If Baud Rate(s) are to be assigned:

1. Press FLASH and dial [15]. The first button will be lit and ready for programming Port #1. The following message is shown on the display phone:



To program the Baud Rate(s) for Ports #1, #3 or #4:

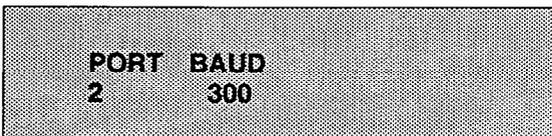
Programming Steps

1. Press the desired PORT # flexible button (Buttons #1, #3 or #4) to determine the port to be programmed.
2. Enter a one-digit number for the Baud Rate:
  - 1= 300 Baud
  - 2= 1200 Baud
  - 3= 2400 Baud
  - 4= 4800 Baud
  - 5= 9600 Baud
3. Press the HOLD button to accept the data. The display will now update.

To verify Port #2 Baud Rate:

Programming Steps

1. Press the PORT #2 flexible button (Button #2). to verify the baud rate of the "On-Board" modem. The following message is shown on the display phone:



Description

The Starplus Digital (SPD) Key Telephone Systems can provide outputs such as SMDR or ICLID to either the standard RS-232C "On-Board" connector on the SPD 1428 BKSU or CPB board or to the optional RS-232C/422 I/O Expander Module connector(s). When features such as SMDR or ICLID are desired, the Baud Rate(s) need to be programmed to determine how the information will be distributed.

When programming port Baud Rate(s), the flexible buttons are mapped as follows:

Q 1	PORT #1-CPB RS-232C		11 A
W 2	PORT #2-MODEM		12 S
E 3	PORT #3-I/O RS-232C		13 D
R 4	PORT #4-I/O RS-422		14 F

Description

**PORT #1:** Port #1 is the "On-Board" RS-232C port on either the SPD 1428 and SPD 2856 systems.

**PORT #3:** Port #3 is the RS-232C connector on the I/O Expander Module used in the Starplus Digital (SPD) Key Telephone systems.

**PORT #4:** Port #4 is the RS-422 connector on the I/O Expander Module used in the Starplus Digital (SPD) Key Telephone systems.

**Default:** By default, Port #1 (CPB RS-232C), Port #3 (RS-232C) and Port #4 (RS-422) Baud Rate(s) are 4800 Baud.

**Related Programming:** Station Message Detailed Recording features, ICLID Features

Description

**PORT #2:** Port #2 is the "On-Board" modem which is included in either SPD 1428 or SPD 2856 Digital systems. The baud rate will be 300 Baud for the "On-Board" modem or 1200 Baud for the optionally installed 1200 Baud modem.

**Default:** By default, the "On-Board" modem Baud Rate is 300 Baud.

**ACCESS CODE PROGRAMMING**

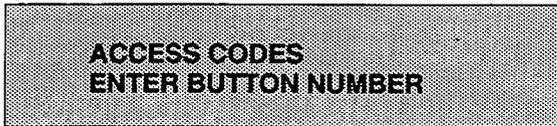
**610.9 ACCESS CODES**

Programming Steps

If the system is in the programming mode, continue using program codes. If starting to program here, enter the programming mode. Refer to Sec. 600.2.

If any Access Codes are to be changed:

1. Press FLASH and dial [20]. The following message is shown on the display phone:

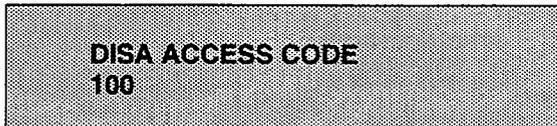


**A. DISA Access Code**

Programming Steps

If this feature is to be assigned:

1. Press the DISA ACCESS CODE flexible button (Button #1). The following message is shown on the display phone:



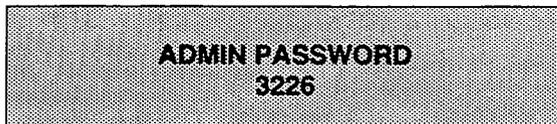
2. Enter three digits on the dial pad.
3. Press HOLD button.

**B. Set Data Base Admin. Password**

Programming Steps

If this feature is to be assigned:

1. Press the ADMIN PASSWORD flexible button (Button #2). The following message is shown on the display phone:



2. Enter four digits between 0000 and 9999.
3. Press HOLD button.

Description

This section describes the procedures and steps necessary to program Access codes.

The buttons on the key telephone are defined as shown below when entering the Access Codes programming area:

Q 1	DISA ACCESS CODE		11 A
W 2	ADMIN PASSWORD		12 B

Description

This allows a three digit access code to be assigned to the system. Anyone calling in on a DISA line must use the access code in order to gain access to system features.

Refer to CO line programming for assignment of DISA lines.

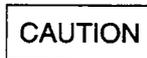
To disable the DISA access code, enter three (3) pounds (###).

**Default:** By default, 100 is assigned as the access code.

**Related Programming:** Preset Forward Timer, Sec. 610.1; Conference Time-out Timer, Sec. 610.1; CO Line Attributes, Sec.620.1; DISA programming. A CO Line(s) must be assigned for DISA operation. Also see CO Line Privacy and Conference options.

Description

The password used to enter customer database programming can be individualized by each customer. This allows the system administrator to block unauthorized personnel from entering database admin.



Care should be taken when changing the programming password so not to "lockout" authorized personnel that may prevent or delay them from making necessary programming changes.

**Default:** By default the numbers 3226 (DBAM) are assigned.

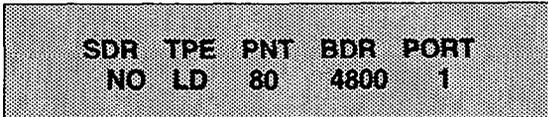
**MISC. SYSTEM PARAMETERS (Cont'd)**

**610.10 STATION MESSAGE DETAIL RECORDING (SMDR)**

Programming Steps

If Station Message Detail Recording is to be used:

1. Press FLASH and dial [21]. The following message is shown on the display phone:



2. To program SMDR features, use the flexible button(s) as defined in the following procedures.
3. The SMDR, TYPE, PRINT buttons toggle on and off.
4. After all entries are made, press the HOLD button to accept the data.

**A. SMDR Enable/Disable**

Programming Steps

1. Press the SMDR flexible button (Button #1) to enable/disable this feature.
  - LED ON = SMDR is enabled
  - LED OFF = SMDR is disabled
2. Press HOLD button to accept the data.

**B. Long Distance/Local Assignment**

Programming Steps

1. Press the CALL TYPE flexible button (Button #2) to determine the type of calls to be recorded.
  - LED ON = Long Distance is enabled
  - LED OFF = All Calls is enabled
2. Press HOLD button to accept the data.

Description

The Starplus Digital (SPD) Key Telephone Systems can provide SMDR output to either the standard RS-232C "On-Board" connector on the SPD 1428 BKSU or CPB board or to the optional RS-232C/422 I/O Expander Module connector(s). When SMDR is desired, the following system-wide parameters will determine how the SMDR information will be reported.

When programming SMDR features, the flexible buttons are mapped as follows:

Q 1	SMDR	11 A
W 2	CALL TYPE	12 S
E 3	PRINT FORMAT	13 D
R 4	BAUD RATE	14 F
T 5	PORT	15 G

**Related Programming:** PBX Dialing Codes that may affect SMDR, Sec. 610.5. SLT Receiver Timer, Sec. 610.1; Station Class of Service, Sec. 630.1 and Toll Tables, Sec. 650.1.

Description

A call accounting device can be installed allowing the system to track calls by outside line number, number dialed, time of day, date, station that placed or received the call, and duration of the call.

Refer to Sec. 610.1 for further instruction regarding the relationship between SLT Receivers and SMDR.

**Default:** By default, SMDR is disabled.

Description

The system can be set to record either all outgoing calls or only outgoing long distance calls. Long Distance calls are defined as either beginning with a '1' or '0' or containing 8 or more digits. Incoming calls are only recorded if TYPE is set for all calls.

**Default:** By default, the system is set to record long distance (LD) calls only.

## STATION MESSAGE DETAIL RECORDING (Cont'd)

### C. Character Print Assignment

#### Programming Steps

1. Press PRINT FORMAT flexible button (Button #3) to determine the print format of SMDR records.
  - LED ON = 80 Character is enabled
  - LED OFF = 30 Character is enabled
2. Press HOLD button to accept the data.

#### Description

The system can be programmed to print individual SMDR records in either a 1-line 80 character format or a 3-line 30 character format.

**Default:** By default, the 1-line 80 character format is selected.

### D. Baud Rate Display

#### Programming Steps

The SMDR Baud Rate is programmed using Flash 15 Baud Rate Assignments. Button #4 will return error tone when pressed. The LCD displays the current baud rate based on which Port number is assigned to the SMDR Port number.

#### Description

The Starplus Digital (SPD) Key Telephone Systems can provide SMDR output to either the standard RS-232C "On-Board" connector on the SPD 1428 BKSU or SPD 2856 CPB board or to the optional RS-232C/422 I/O Expander Module connector(s). The Baud Rate will be displayed as either 300 baud, 1200 baud, 2400 baud, 4800 baud, 9600 baud.

**Related Programming:** Baud Rate Assignments

### E. SMDR Port Assignment

#### Programming Steps

1. Press the PORT flexible button (Button #5) to determine which port is to be used for SMDR information.
2. Enter a one-digit number for the SMDR Port number:
  - 1= Port #1 ("On-Board" RS-232C)
  - 2= Port #2 ("On-Board" Modem)
  - 3= Port #3 (I/O Expander Module RS-232C)
  - 4= Port #4 (I/O Expander Module RS-422)
3. Press HOLD button to accept the data.

#### Description

**Port #1** refers to the standard RS-232C "On-Board" connector on the SPD 1428 Basic KSU or the CPB board on the SPD 2856.

**Port #2** refers to the "On-Board 300 Baud modem provided with the system.

**Port #3** refers to the RS-232C connector on the I/O Expander Module.

**Port #4** refers to the RS-422 connector on the same I/O Expander Module installed in either Starplus Digital system.

**Default:** By default, Port #1 is used for SMDR.

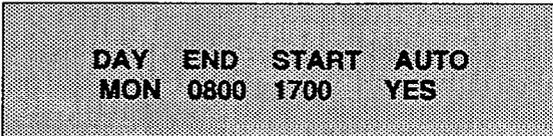
MISC. SYSTEM PARAMETERS (Cont'd)

610.11 WEEKLY NIGHT MODE SCHEDULE

Programming Steps

If entries or changes need to be made to this schedule:

- a. Press FLASH and dial [22]. The following message will then be shown on the display:



Description

The Starplus Digital (SPD) Key Telephone System can be programmed so that the system is automatically placed into and out of night mode. A programmable weekly time schedule allows the system administrator to preset the time the system is put into night mode and the time to remove night mode on a daily basis including weekend operation.

When programming Night Mode Schedule, the flexible buttons are mapped as follows:

C 1	AUTO/MANUAL	11 A
W 2	MONDAY	12 S
E 3	TUESDAY	13 D
R 4	WEDNESDAY	14 F
T 5	THURSDAY	15 G
Y 6	FRIDAY	16 H
U 7	SATURDAY	17 J
I 8	SUNDAY	18 K

**A. Automatic/Manual Operation**

Programming Steps

1. The AUTO/MANUAL flexible button (Button #1) LED is lit.
  - LED on= Automatic Night Mode
  - LED off= Manual operation.

Description

If the system is operated in the automatic night mode the attendant(s) can override the automatic mode by pressing the night key on the attendant(s) phone. The schedule will not go back into effect until the attendant(s) press the night key again.

When the system is placed into night mode CO line ringing will follow the Night ringing assignments and stations will be governed by their respective night COS.

**Default:** The default times for automatic night mode is as follows:

Monday thru Friday 08:00 17:00  
(day time operation 8:00am to 5:00pm)  
Saturday and Sunday ##:## ##:##  
(24 hour night mode operation)

An entry of "00:00 23:59" would indicate 24 hours of day mode

**Related Programming:** Ringing Assignments; Night Class of Service (COS) assignments; Attendant station assignments.

**B. Day of Week programming**

Programming Steps

1. The MONDAY flexible button (Button #2) LED is lit.
2. To change days of the week, press the appropriate flexible button (buttons 3-8) and perform the following procedures.
3. Enter the four digits to indicate the hour and minutes to end night mode.
4. Enter the four digits to indicate the hour and minutes for the system to go into the night mode for that particular day.

*8 groups x 8 stations*

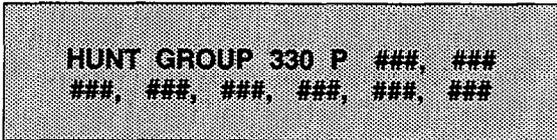
610.12 HUNT GROUPS

A. Hunt Group Programming

Programming Steps

If Hunt Groups are to be assigned:

- 1. Press FLASH and dial [30]. The following message will be shown on the display:



- 2. The top left button in the flexible button field will be lit for programming Hunt Group 1 (330). To change Hunt Groups or enter a different Hunt Group, press the appropriate flexible button 1-8 (330-337) and perform the following procedures.
- 3. Enter the 3-digit station numbers up to a maximum of 24 digits (8 stations). Hunt groups are joined together by entering another Hunt Group Pilot Number as the last entry of the group.
- 4. Press HOLD button. Confirmation tone is heard.

B. Station/Pilot Hunting Assignment

Programming Steps

- 1. Press the STATION/PILOT flexible button (Button #9) to indicate Station Hunting or Pilot Hunting.
  - LED on= Station Hunting enabled
  - LED off= Pilot Hunting enabled

Description

The system can be arranged for up to eight hunt groups. Each hunt group can contain up to eight stations each. Each hunt groups can be independently arranged to utilize either a pilot hunting technique or station hunting technique. Hunt groups may also be chained together when larger Hunt groups are desired.

Hunt groups can be joined together by programming another hunt group number as the last member of a hunt group.

If a station is in DND or is forwarded to another station, it is considered busy.

To remove stations from a hunt group, enter three ### (pounds) on the keypad and press HOLD button. This will remove all stations previously programmed in that group.

When programming Hunt Groups, the flexible buttons are mapped as follows:

G 1	HUNT GP 330	11 A
W 2	HUNT GP 331	12 S
E 3	HUNT GP 332	13 D
R 4	HUNT GP 333	14 F
T 5	HUNT GP 334	15 G
Y 6	HUNT GP 335	16 H
U 7	HUNT GP 336	17 J
I 8	HUNT GP 337	18 K
O 9	STATION/PILOT	19 L

Description

- Pilot Hunting. Incoming CO, transferred CO, and intercom calls can be directed to a pilot number of a hunt group. The system will search sequentially (in the order the extensions were entered in the data base programming) for an idle station in the group and will ring that station. Calls directed directly to stations (by calling the extension number) within the hunt group will not hunt but receive call progress tones from the extension.
- Station Hunting. Incoming CO, transferred CO, and intercom calls that are presented to a busy, or DND station, that is a member of a Station Hunt group, will search sequentially (in the order the extensions were entered in data base programming) for an idle station in the group and will ring that station. Calls will still be allowed to be directed to the groups pilot number for hunting.

*Programmer times just don't count  
with default for later expansion*

# SECTION 620 CO LINE ATTRIBUTES PROGRAMMING

## 620.1 INTRODUCTION

### Programming Steps

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. (Refer to Sec. 600.2).

If any CO line features are to be changed:

- a. Press FLASH and dial [40]. The following message is shown on the display phone:

**CO LINE ATTRIBUTES  
SELECT A CO LINE RANGE**

- b. Enter a four digit number for the range of lines being programmed. If only one line is being programmed, enter that number twice (0101).
- c. Press HOLD button. Program button #20 (New Range) will be lit. The following message is shown on the display phone to indicate current programming of that line or group of lines.

**CO XX-XX DT CO UNA C P  
LS0 DSA FL10 GRP1 COS1**

Where:

XX-XX= The CO Line Range being programmed. (01-28)

*Flash 80  
Rewrites De Fault  
for all C.O.'s.*

### Description

This section describes the procedures and steps necessary to program CO Line attributes. When entering the CO Line attributes portion of the data base the programmer may decide to enter information for either a range of CO lines or one specific CO Line.

Range programming allows the programmer to change a specific parameter or a few parameters for an entire range of CO Lines leaving intact the remaining data fields that do not require change. Those data fields will continue to operate with the previously programmed data. For example if CO lines are programmed into several CO line groups with different Class of service etc... but it is desired to enable Loop Supervision (SUPV) on all CO Lines the programmer may enter as the range ALL CO lines (01-28) and enable loop supervision, then exit programming. This will enable loop supervision for all CO lines leaving intact the various CO line group programming and COS data for the range.

The buttons on the key telephone are defined as shown below when entering the CO Line Attribute programming.

Q 1	DTMF/DIAL PULSE	RING ASSIGNMENTS	11 A
W 2	CO/PBX		12 S
E 3	UNA		13 D
R 4	DISA TRK-TO-TRK		14 F
T 5	PRIVACY		15 G
Y 6	LOOP SUPV		16 H
U 7	DISA	DISPLAY RING ASSIGN	17 J
I 8	FLASH TIMER	NEXT (FORWARD)	18 K
G 9	CO LINE GROUP	NEXT (BACKWARD)	19 L
P 10	LINE COS	NEW RANGE	20 :

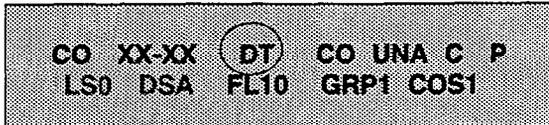
- Button #17 [Ring Display] will display the ringing assignments for the CO line.
- Button #18 [Next Forward] will take you to the next higher CO line.
- Button #19 [Next Backward] will take you to the next lower CO line.
- Button #20 [Select Range] will prompt for a new CO Line range.

**CO LINE ATTRIBUTES (Cont'd)**

**A. DTMF/Dial Pulse Programming**

Programming Steps

1. Press the DTMF/DIAL PULSE flexible button (Button #1).
  - LED on = DTMF enabled
  - LED off= Dial Pulse enabled
2. Press HOLD button. Display will now update.



Description

**DTMF/DIAL PULSE.** Each individual outside line can be programmed to be either DTMF (tone) or dial pulse. When a line is assigned as dial pulse, you can program the break/ make ratio and dial speed.

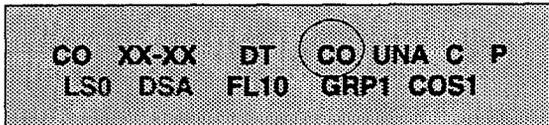
**Default:** By default, all lines are set for DTMF.

**Related Programming:** Refer to Dial Pulse parameter, Sec. 610.8; and Ring Detect Timer, Sec. 610.1.

**B. CO/PBX Programming**

Programming Steps

1. Press the CO/PBX flexible button (Button #2).
  - LED on = CO type is enabled
  - LED off= PBX is enabled
2. Press HOLD button. Display will now update.



Description

**CO/PBX.** Each individual outside line connected to the system may be programmed as either a CO or PBX line. Also use the PBX mark when identifying Centrex lines.

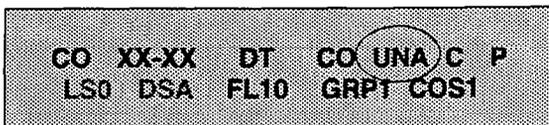
**Default:** By default, all lines are assigned as CO lines.

**Related Programming:** Refer to PBX Dialing Codes, Sec. 610.5; Ring Detect Timer, Sec. 610.1; and Flash Timer later in this section.

**C. UNA Programming**

Programming Steps

1. Press the UNA flexible button (Button #3).
  - LED on = UNA is enabled
  - LED off= UNA is disabled



Description

**UNA.** If a line is marked UNA, and if the system is in night service mode and if UNA is enabled in system parameters, then when a CO line rings into the system, a ring tone is generated over all external page zones.

**Default:** By default, UNA is enabled

**Related Programming:** Refer to External Night Ring, Sec. 610.2; and Page/Relay Programming, Sec. 610.7.

2. Press HOLD button. Display will now update.

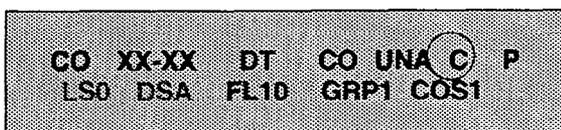
**CO LINE ATTRIBUTES (Cont'd)**

**D. DISA Trunk-to-Trunk (Per CO Line)**

Programming Steps

If the CO line DISA Trunk-to-Trunk (Conference) attributes is to be changed:

1. Press the DISA TRK-TO-TRK flexible button (Button #4).
  - LED on = DISA Trunk-to-Trunk is enabled (a "C" is displayed)
  - LED off = DISA Trunk-to-Trunk is disabled
2. Press HOLD button. Display will now update.



Description

**DISA TRK-TO-TRK.** The DISA Trunk-to-Trunk (or Conference) mark on the CO line governs a DISA callers ability to access other outside lines. CO lines must have DISA Trunk-to-Trunk enabled to allow a DISA caller to establish an outgoing trunk-to-trunk connection. This allows for specific CO line access restriction on DISA calls.

A station with conference enable will be allowed to initiate a Conference on CO lines regardless of the CO line DISA Trunk-to-Trunk marking.

**Default:** By default, DISA Trunk-to-Trunk is enabled for all CO lines.

**Related Programming:** Station Attributes, Sec. 630.1 for Conference feature

The CO line DISA Trunk-to-Trunk flag affects a DISA callers ability to access outgoing CO lines as shown in the following table:

Incoming DISA Trunk	Trunk DISA caller attempts to access	
	T-t-T Enabled	T-t-T Disabled
T-t-T Enabled	Call Allowed	Call Denied
T-t-T Disabled	Call Denied	Call Denied

CO LINE ATTRIBUTES (Cont'd)

E. Privacy

Programming Steps

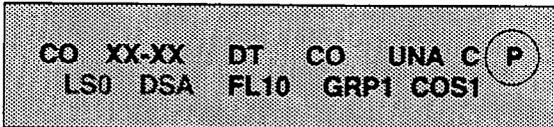
Description

If CO Line privacy is to be changed:

**PRIVACY.** If desired, the system can be programmed to eliminate CO Line privacy, allowing another station to join in on existing outside line conversations.

1. Press the PRIVACY flexible button. (Button #5.
  - LED on = Privacy is enabled
  - LED off = Privacy is disabled
2. Press HOLD button. Display will now update.

Stations must have a direct CO line appearance to join CO line conversations in progress.



A station must also have Privacy disabled before the system will allow that station to enter into an existing conversation.

Both parties will hear an alert tone just prior to a station joining the call.

The CO line Privacy flag affects a station users ability to access CO lines already engaged in conversation by another station in the system as shown in the following table:

When privacy is disabled, only one other station may join in on an existing conversation.

**Default:** By default, Privacy is enabled for all CO Lines.

**Related Programming:** Privacy option and button assignments in Station Attributes, Sec. 630.1, programming.

Station Attempting to Access CO Line	CO Line In use by another Station	
	Privacy Enabled	Privacy Disabled
Privacy Enabled	Private (No Cut-through)	Private (No Cut-through)
Privacy Disabled	Private (No Cut-through)	Privacy Released Cut-through Allowed

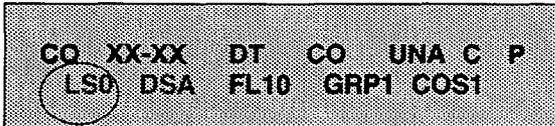
*LCD Reads Conference when someone comes in on line.*

CO LINE ATTRIBUTES (Cont'd)

F. Loop Supervision Programming

Programming Steps

1. Press the LOOP SUPV flexible button (Button #6).
2. Enter a one-digit timer value on the dial pad between 1 and 9 which corresponds to 100-900 msec.
3. Press HOLD button. Display will now update.



*To loop CO line  
when CO sends signal  
that calling party hangs  
up*

Description

**LOOP SUPV.** Loop supervision is used primarily with DISA, Voice Mail/Auto Attendant and with unsupervised conference applications. It provides the system with the ability to detect when loop current has been broken and an outside line is no longer being used. (To determine timer value for loop supervision, consult your local serving central office for type and duration of loop supervision signal.)

It is recommended that Loop Supervision be enabled, especially when connecting a Voice Mail or Auto Attendant to the Starplus Digital (SPD) Key Telephone System.

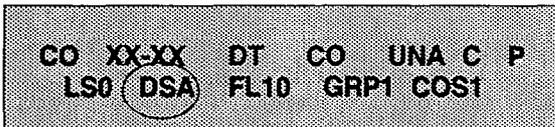
**Default:** By default, loop supervision is disabled for all CO Lines.

**Related Programming:** Conference Timer, Sec. 610.1; DISA programming (see below), Voice Mail programming, Sec. 645.1 and 645.2.

G. DISA Programming

Programming Steps

1. Press the DISA flexible button (Button #7).
2. Enter a one-digit value to indicate type of DISA desired.
  - 1= 24 hour
  - 2= Night only
  - 0= no DISA (disable DISA)
3. Press HOLD button. Display will now update.



Description

**DISA.** A line can be assigned as a DISA line during night service only or on a 24 hour basis.

A maximum of three DISA lines can be programmed into the system. A DISA access code can also be programmed. Incoming DISA callers may dial any valid internal station or access outside line groups. DISA callers will be subjected to the Class of Service placed on the line accessed for outdialing. It is recommended that Loop Supervision be enabled when setting up DISA line(s). The Conference Timer (Sec. 610.1) also allows the system administrator to control the length of time a DISA caller is allowed after establishing a "Trunk-to-Trunk" call. After expiration of the Conference Timer, a tone will be presented to both DISA parties, then one minute later the system will automatically release both trunks. The Conference Timer does not affect or control a DISA-to-Station call.

**Default:** By default, there are no outside lines assigned as DISA lines.

**Related Programming:** Conference Timer, Sec. 610.1; DISA Access Code, Sec. 710.9; Loop Supervision (see above), CO Line Conference, CO Line Class of Service, Toll Tables, Sec. 650.

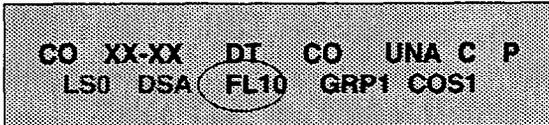
**NOTE:** A DTMF Receiver must be installed in the system.

**CO LINE ATTRIBUTES (Cont'd)**

**H. Flash Timer Programming**

Programming Steps

1. Press the FLASH TIMER flexible button (Button #8).
2. Enter a two-digit timer value between 01-20 which corresponds to 100 msec-2 seconds.
3. Press HOLD button. Display will now update.



Description

**FLASH TIMER.** Flash is a programmable opening on a line for signaling. When using an outside line, flash allows a user to obtain new dial tone without losing the line. This is particularly useful behind a PBX or Centrex. Each individual CO line can be programmed for a flash time.

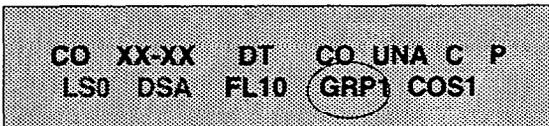
**Default:** Default is 10 (1.0 seconds) and is variable from 01 to 20 (100msec. to 2 seconds).

**Related Programming:** CO/PBX programming.

**I. Line Group Programming**

Programming Steps

1. Press the CO LINE GROUP flexible button (Button #9).
2. Enter a one-digit value between 0-7 which corresponds to Groups 0-7.
3. Press HOLD button. Display will now update.



Description

**CO LINE GROUP.** Eight line groups are available for CO line assignment. Groups should be assigned according to type (local, FX, WATS, etc.) Line group 0 is used for programming a line(s) as a private line.

Line Grouping affects Line Queuing, Pooled Group access (Pool Buttons), Speed Dial, and LCR features.

**Default:** By default, All lines are placed in Line Group 1.

**Related Programming:** Flex Button programming - Pool Buttons, Sec. 630.1; LCR Programming - Routing Tables, Sec. 655.

*Group 0  
No code  
(Private line)*

CO LINE ATTRIBUTES (Cont'd)

J. Class of Service (COS) Programming

Programming Steps

1. Press the LINE COS flexible button (Button #10).
2. Enter a one-digit value between 1-5 which corresponds to five possible class of service to which a line may be assigned:  
 COS1= No restrictions.  
 COS2= Table A governs, Station COS 2 and 4 are monitored.  
 COS3= Table B governs, Station COS 3 and 4 are monitored.  
 COS4= Restricts 0,1,\*,# dialed as first digit and places a seven digit dialing limitation. In addition, 1-800, 1911, and 1611 are allowed and 411, 976, and 555 numbers are denied.  
 COS5= Overrides station COS 2,3,4, and 5 and allows unrestricted dialing.
3. Press HOLD button. Display will now update.

Description

**LINE COS.** Through assignments of a CO Class of Service the assigned CO line will either interact with a station Class of Service, provide a "canned" restriction or provide unrestricted dialing capabilities. (When a CO line is marked PBX, COS restrictions apply to the station only if one of five codes are dialed first.)

Refer to Table 620-1 for CO to Station COS relationship.

**Default:** By default, all CO lines are assigned Class of Service 1.

**Related Programming:** Station Class of Service programming, Sec. 630.1; Toll Table programming, Sec. 650.1.

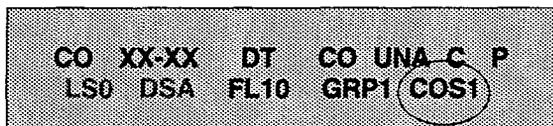


Table 620-1 Class of Service (COS)

		CO LINE CLASS OF SERVICE				
		1	2	3	4	5
STATION  COS	1	Unrestricted	Unrestricted	Unrestricted	Canned Restriction*	Unrestricted
	2	Table A	Table A	Unrestricted	Canned Restriction	Unrestricted
	3	Table B	Unrestricted	Table B	Canned Restriction	Unrestricted
	4	Tables A&B	Table A	Table B	Canned Restriction	Unrestricted
	5	Canned Restriction	Canned Restriction	Canned Restriction	Canned Restriction	Unrestricted
	6	Intercom only	Intercom only	Intercom only	Intercom only	Intercom only
*Canned Restriction= No '0', 1, #, '*' as a first dialed digit, and 7 digits maximum plus 1-800, 1911, 1611 are allowed and 411, 976, and 555 numbers are denied.						

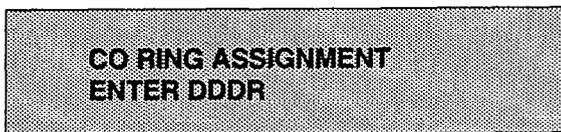
CO LINE ATTRIBUTES (Cont'd)

K. CO Line Ringing Assignment

Programming Steps

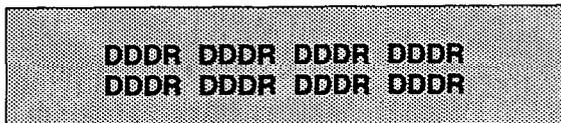
Each CO line in the system may be assigned initial incoming ringing to one of the following destinations:

- one or more stations (keyset or SLT)
  - to a UCD, Voice Mail or Hunt Group
  - Off-Net (via speed dial)
1. Press the RING ASSIGNMENT flexible button (Button #11) to toggle to the Ringing Assignment display. The display will show the following information:



2. Enter the 3-digit destination (DDD) and the single digit ring type (R) followed by the HOLD button.
3. Press Button #17 to display ring assignments. Assignments will be displayed in sets of 8 up to the number programmed. Press Button #17 additional times to cycle to the next group of 8 ring assignments.

The following LCD format will be used to display the assignments:



Where:

- DDD= Destination
- R= D for Day
- N= Night
- B= Both Day & Night.

Ring assignments will be continuous and will be displayed in order of the destination number from 001 to 557.

Description

**RING ASSIGNMENT.** When ringing is assigned as a part of the CO line parameters, ringing of a station is independent of that stations button configuration. However, Stations that are assigned for initial ring-in **MUST HAVE** a LOOP button(s) to answer the call(s) if a direct CO appearance is not available.

Multiple station assignments are allowed for a particular CO line in a mixture of Day, Night, or Day & Night ring types. An incoming CO line may be programmed to ring a mixture of stations and groups (ie. a Hunt Group and 4 stations, or more than one Hunt Group).

Incoming calls directed Off-Net will be connected to an outgoing system speed bin.

CO lines assigned to ring multiple stations will not follow any stations' forward to a UCD, Voice Mail, Hunt Group or Off-Net. Forwarding to another station will be allowed.

Valid 3 digit destinations are:

- 020-099 = System Speed Bins 20-99, for off-net ringing.
- 100-155 = Station extension Numbers
- 330-337 = Hunt Groups 1-8
- 440-447 = Voice Mail Groups 1-8
- 550-557 =UCD Groups 1-8

Valid Ring types are:

- 0 = unassigned (to delete a station)
- 1 = Day Ringing
- 2 = Night Ringing
- 3 = Day & Night Ringing

Multiple station assignments are accomplished by assigning another destination with ring status, DDDR, and pressing the HOLD button. This can be done for up to the maximum number of stations on the system.

Deleting a station (entering a 0 for ring type) only removes that station from the ring assignment.

**Default:** By default, all CO lines are assigned to ring at the attendant, Station 100.

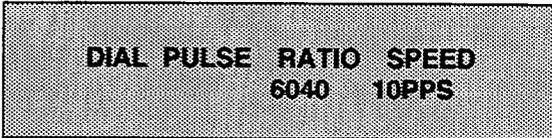
CO LINE ATTRIBUTES (Cont'd)

620.2 DIAL PULSE PARAMETERS

Programming Steps

If this feature is to be assigned:

- a. Press FLASH and dial [41]. The following message is shown on the display phone:

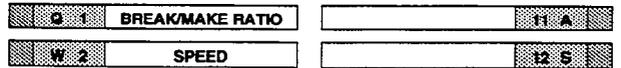


- b. Choose dial pulse features by pressing the appropriate flexible button(s) in the flexible field.
- c. The buttons toggle on and off:
  - LED on = 60/40 (RATIO), 10pps (SPEED)
  - LED off = 66/33 (RATIO), 20pps (SPEED)
- d. Press HOLD button.

Description

By default all lines are DTMF (tone) signaling. If outpulsing is required, the individual outside line must be programmed for pulse. Refer to CO line programming section. The break/make ratio and the dial speed can be programmed at this time.

The buttons on the key telephone are defined as shown below when entering the Dial Pulse Parameter programming area:



**Default:** By default the break/make ratio (RATIO) is set at 60/40 but can be changed to 66/33.

**Default:** By default the dialing speed (SPEED) is 10pps but can be changed to 20pps.

**Related Programming:** CO Line Attributes, Sec. 620.1; Dial Pulse/DTMF programming.

*NOTE: This program code is only used when an outside (CO) line has been programmed for dial pulse.*

## SECTION 630

# STATION ATTRIBUTES PROGRAMMING

### 630.1 INTRODUCTION

#### Programming Steps

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. (Refer to Sec. 600.2).

If station features are to be changed:

- a. Press FLASH and dial [50]. The following message is shown on the display phone:

**STATION ATTRIBUTES  
SELECT A STATION RANGE**

- b. Enter a six digit number (100-155) for station range being programmed. If only one station is being programmed, enter that number twice i.e. (100100).
- c. Press HOLD button. Program button #20 (New Range) will be lit. The display updates to current programming for Page A:

**XXX-XXX A PA DD CF EO PR  
SP QU PL OH FW LC**

Where:

- XXX= Station Range
- A= Page "A" Features
- PA= Paging Access is allowed
- DD= Do Not Disturb is allowed
- CF= Conference is allowed
- EO= Executive Override is allowed
- PR= Privacy is enabled
- SP= System Speed Dial is allowed
- QU= Queuing is allowed
- PL= Preferred Line Answer is enabled
- OH= Off-Hook Voice Over is allowed
- FW= Call Forward is allowed
- LC= Forced LCR Enabled

#### Description

This section describes the steps and procedures necessary to program station attributes for stations connected to the Starplus Digital (SPD) Key Telephone System. When entering the Station attributes portion of the data base the programmer may decide to enter information for either a range of stations or one specific station.

Range programming allows the programmer to change a specific parameter or a few parameters for an entire range of stations leaving intact the remaining data fields that do not require change. Those data fields will continue to operate with the previously programmed data. For example if station data varies from station to station i.e. button data is different or Class-of-service assignments are different etc... but it is desired to enable Preferred Line Answer (PLA) for all stations the programmer may enter as the range ALL stations (100-155) and enable PLA, then exit programming. This will enable PLA for all stations leaving intact the various other station programming for the range.

Station Attributes are divided between those features that require either a simple allow/deny or Enable/Disable (toggle) operation and those that require a numeric entry. The allow/deny (toggle) type features are programmed on page "A". Entries that require a numeric entry i.e. Station ID, COS etc... are programmed on page "B".

PAGE "A" STATION ATTRIBUTES (Cont'd)

Programming Steps

Description

Station Attributes that require only an Allow/Disallow or Enable/Disable (toggle) operation to set in programming for stations are all programmed on Page "A" of Station Attribute programming.

When programming the Page "A" features, the flexible buttons are mapped as follows:

Q 1	PAGE ACCESS	FORCED LCR	11 A
W 2	DO NOT DISTURB		12 S
E 3	CONFERENCE	<i>Override Block</i>	13 D
R 4	EXECUTIVE OVERRIDE		14 F
T 5	PRIVACY		15 G
Y 6	SYSTEM SPEED		16 H
U 7	LINE QUEUING		17 J
I 8	PREF LINE ANSWER	SELECT PAGE A	18 K
O 9	OHVO	SELECT PAGE B	19 L
P 10	CALL FORWARD	NEW STATION RANGE	20 .

Button #17 [Additional Feature Display] will display additional features as needed (future).

Button #18 [PAGE "A"] Indicates displayed parameters are Page "A" parameters and also selects Page "A".

Button #19 [PAGE "B"] Indicates displayed parameters are Page "B" parameters and also selects Page "B".

Button #20 [Select Range] will prompt for a new Station range.

**A. Paging Access**

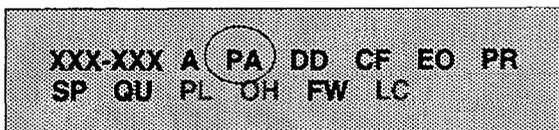
Programming Steps

Description

1. Press the PAGE ACCESS flexible button (Page A, Button #1). It will toggle on and off with each depression.
  - LED on = Paging is allowed
  - LED off = Paging is denied
2. Press HOLD button. Display will now update.

**PAGE ACCESS.** Stations can individually be allowed or denied the ability to make pages. This applies to all internal and external zone paging. A station denied access to paging may still answer a meet-me page announcement. (Station COS 6 will not deny a station the ability to make a page.)

**Default:** By default, Paging is allowed at all stations.



**PAGE "A" STATION ATTRIBUTES (Cont'd)**

**B. Do Not Disturb**

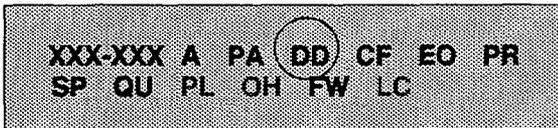
Programming Steps

1. Press the DO NOT DISTURB flexible button (Page A, Button #2). It will toggle on and off with each depression.
  - LED on = Do Not Disturb is allowed
  - LED off = Do Not Disturb is denied
2. Press HOLD button. Display will now update.

Description

**DO NOT DISTURB.** Stations can be individually allowed or denied the ability to place their telephone in Do Not Disturb.

**Default:** By default, Do Not Disturb is allowed at all stations.



**C. Conference Enable/Disable (Per Station)**

Programming Steps

1. Press the CONFERENCE flexible button (Page A, Button #3). It will toggle on and off with each depression.
  - LED on = Conference is enabled
  - LED off = Conference is disabled
2. Press HOLD button. Display will now update.

Description

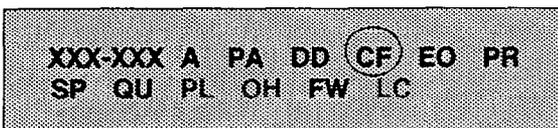
**CONFERENCE.** This feature allows the system to be programmed on a per Station basis for the ability to initiate a conference.

Only stations that have Conference enabled will be able to initiate a conference.

A station that is denied conferencing capabilities in programming can be a party to another stations conference provided that station does have conferencing privileges.

**Default:** By default, Conference is enabled for all stations.

**Related Programming:**

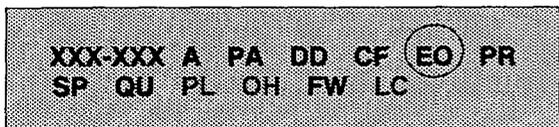


PAGE "A" STATION ATTRIBUTES (Cont'd)

D. Executive Override

Programming Steps

1. Press the EXECUTIVE OVERRIDE flexible button (Page A, Button #4). It will toggle on and off with each depression.
  - LED on = Executive Override is allowed
  - LED off= Executive Override is denied
2. Press HOLD button. Display will now update.



Description

**EXECUTIVE OVERRIDE.** This feature allows certain stations to be designated as "Executive" stations with the ability to override and "barge-in" on other keysets engaged in CO line conversation. If an extension is engaged in an intercom conversation the call can be overridden but the intercom connection will be dropped. This is a useful feature for UCD agent supervisors or for alternate answering positions.

An optional warning tone is programmed on a system wide basis to either enable or disable the tone. This tone will be presented to all parties prior to actual cut thru of the third party.

**Default:** By default, Executive Override is disabled for all stations.

**Related Programming:** Executive Override Warning Tone.

CAUTION: USE OF THIS FEATURE WHEN THE EXECUTIVE OVERRIDE WARNING TONE IS DISABLED MAY BE INTERPRETED AS A VIOLATION OF FEDERAL OR STATE LAWS, AND AN INVASION OF PRIVACY. CONSULT COUNSEL WITH RESPECT TO APPLICABLE LAW BEFORE INTRUDING ON CALLS USING THIS FEATURE.

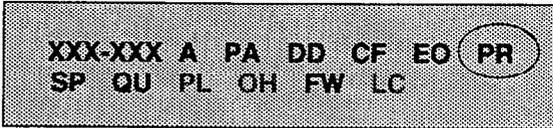
PAGE "A" STATION ATTRIBUTES (Cont'd)

E. Privacy (Per Station)

Programming Steps

To program station(s) for Automatic Privacy:

1. Press the PRIVACY flexible button (Page A, Button #5). It will toggle on and off with each depression.
  - LED on = Privacy is enabled on Stations(s)
  - LED off = Privacy is disabled on Station(s)
2. Press HOLD button. Display will now update.



The Station Privacy flag affects a station users ability to access CO lines already engaged in conversation by another station in the system as shown in the following table:

Station Attempting to Access CO Line	CO Line In Use by Another Station	
	Privacy Enabled	Privacy Disabled
Privacy Enabled	Private (No Cut-through)	Private (No Cut-through)
Privacy Disabled	Private (No Cut-through)	Privacy Released (Cut-through Allowed)

Description

**PRIVACY.** The system provides privacy on all communications in the system which prevents other stations from accidentally entering an existing conversation. However, if desired, the system will allow on a per station basis the ability for a station to join an existing outside CO line conversation. Each station can be granted the privilege to join an existing CO line conversation by simply pressing the CO line button of a CO line in use.

Both the station and the CO line must have privacy disabled before the system will allow cut-thru.

If privacy is disabled and a station joins an existing call, both parties will hear an alert tone.

If privacy is disabled, only one other station may join in on an existing conversation.

**Default:** Privacy is enabled for all stations in default.

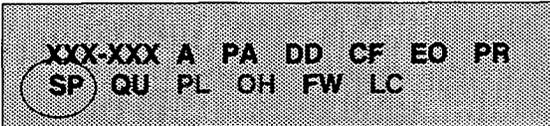
**Related Programming:** CO Line Attributes, Sec. 620.1, programming: Privacy feature.

PAGE "A" STATION ATTRIBUTES (Cont'd)

F. Speed Dialing Access

Programming Steps

1. Press the SPEED flexible button (Page A, Button #6). It will toggle on and off with each depression.
  - LED on = Speed Dialing access is allowed
  - LED off= Speed Dialing access is denied
2. Press HOLD button. Display will now update.



Description

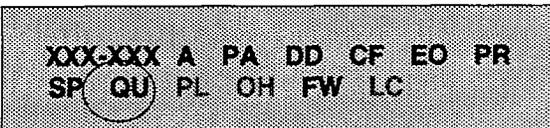
**SPEED DIALING ACCESS.** Stations can be individually allowed or denied the ability to use system speed dial numbers. The last forty system speed numbers are not monitored by toll restriction, refer to toll restriction programming. Stations can not be prevented from using station speed dial.

**Default:** By default, Speed Dialing is allowed at all stations.

G. Line Queuing

Programming Steps

1. Press the QUEUING flexible button (Page A, Button #7). It will toggle on and off with each depression.
  - LED on = Queuing is allowed
  - LED off= Queuing is denied
2. Press HOLD button. Display will now update.



Description

**LINE QUEUING.** Stations can be allowed or denied the ability to manually queue for a busy group of CO lines. Even when disabled, stations will have automatic LCR queuing privileges.

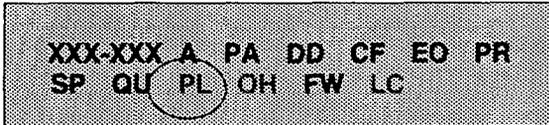
**Default:** By default, CO Line Queuing is allowed at all stations.

PAGE "A" STATION ATTRIBUTES (Cont'd)

H. Preferred Line Answer

Programming Steps

1. Press the PREF LINE ANSWER flexible button (Page A, Button #8). It will toggle on and off with each depression.
  - LED on = Preferred Line Answer is allowed
  - LED off = Preferred Line Answer is denied
2. Press HOLD button. Display will now update.



Description

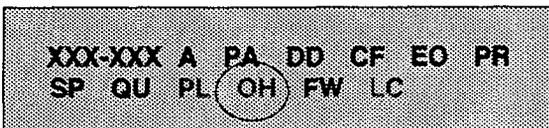
**PREF LINE ANSWER.** Stations can be given the ability to answer incoming outside line calls, transferred and recalling lines and line queues by simply going off-hook. (Preferred Line Answer)

**Default:** By default, Preferred Line Answer is disabled on all stations.

I. Off-Hook Voice Over (Future)

Programming Steps

1. Press the OHVO flexible button (Page A, Button #9). It will toggle on and off with each depression.
  - LED on = Off-Hook Voice Over is allowed
  - LED off = Off-Hook Voice Over is denied
2. Press HOLD button. Display will now update.



Description

**OHVO.** This feature allows a station to receive OHVO calls. Only OHVO Digital Terminals may receive an OHVO call. A station can be denied the ability to receive OHVO calls by disabling the OHVO option.

**Default:** By default, Off-Hook Voice Over is disabled for all stations.

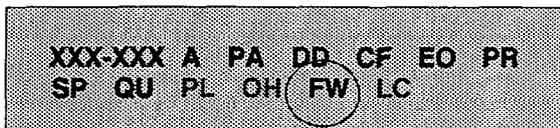
**Related Programming:**

PAGE "A" STATION ATTRIBUTES (Cont'd)

J. Call Forwarding

Programming Steps

1. Press the CALL FORWARD flexible button (Page A, Button #10). It will toggle on and off with each depression.
  - LED on = Call Forwarding is allowed
  - LED off= Call Forwarding is denied
2. Press HOLD button. Display will now update.



Description

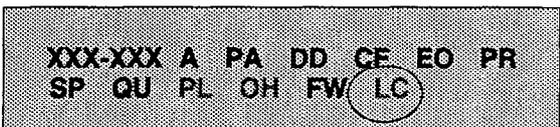
**CALL FORWARD.** Stations can be allowed or denied the ability to have incoming CO calls, intercom, transferred outside lines forwarded to another station, UCD, Hunt or Voice Mail group or Off-Net Forward via speed dial.

**Default:** By default, Call Forwarding is allowed at all stations.

K. Forced Least Cost Routing

Programming Steps

1. Press the FORCED LCR flexible button (Page A, Button #11). It will toggle on and off with each depression.
  - LED on = Least Cost Routing is forced
  - LED off= Least Cost Routing is optional
2. Press HOLD button. Display will now update.



Description

**FORCED LCR.** Stations may be forced to place outgoing CO calls by use of LCR (dial [9]) to access an outside line). This allows the system administrator to control dialing patterns and the lines used for outgoing CO calls more effectively. This can be enabled/disabled on a per station basis for additional flexibility and control.

**Default:** Forced LCR is optional for all stations.

**Related Programming:** LCR Class of Service, LCR Enable/Disable, Sec. 610.2; LCR programming, Sec. 655.

**PAGE "B" STATION PROGRAMMING**

Programming Steps

The remaining station features are located and programmed on Page B.

- a. Press [PG B] button. The display of current programming for those features will appear as follows:

```

XXX-XXX B ID0 COS1 1 SPO
AAAA BBBB CCC DDDDDDD L0
    
```

Where:

- XXX= Station Range
- B= Page "B" Features
- ID= Station Identification (0-5)
- COS= Class of Service (1-6)
- SPK= Speakerphone Option (0-2)
- A= Pickup Group (1-4)
- B= Paging Zone (1-4)
- CC= Preset Forward Destination
- DD= CO Line Group access
- L0= LCR Class of Service

Description

When programming Page B features, the flexible buttons are mapped as follows:

G 1	STATION ID		11 A
W 2	CLASS OF SERVICE		12 B
E 3	SPEAKERPHONE		13 D
R 4	GROUP PICKUP		14 F
T 5	PAGING ZONES		15 G
Y 6	PRESET FORWARD		16 H
U 7	CO LINE GP ACCESS	DISPLAY BUTTONS	17 J
J 8	LCR COS	SELECT PAGE A	18 K
D 9	OFF-HOOK PREF	SELECT PAGE B	19 L
P 10	BUTTON ASSIGN	NEW STATION RANGE	20

*NOTE: Features programmed in Page "B" require a numeric entry after pressing the flexible button.*

PAGE "B" STATION ATTRIBUTES (Cont'd)

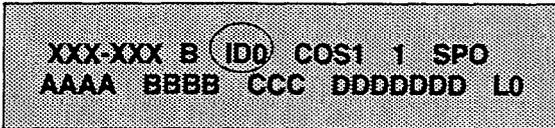
L. Station Identification

Programming Steps

1. Press the STATION ID flexible button (Page B, Button #1).

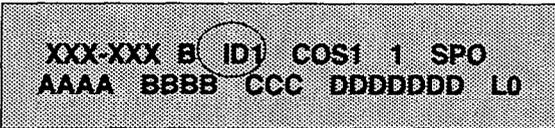
To program the Station ID for a Digital Terminal:

1. Dial a [0] on the dial pad.
2. Press HOLD button to complete the entry. Display will now update.



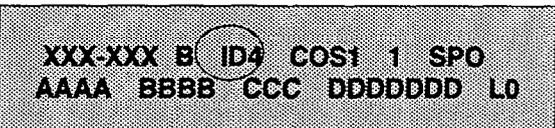
To program the Station ID for a DSS/DLS Console with Map 1, Map 2 or Map 3:

1. Dial either a [1],[2] or [3] on the dial pad.
2. Enter the three-digit station number (100-155) which the DSS/DLS Console is associated with.
3. Press HOLD button to complete the entry. Display will now update.



To program the Station ID for a Relay/Sensor Module:

1. Dial a [4] on the dial pad.
2. Press HOLD button to complete the entry. Display will now update.



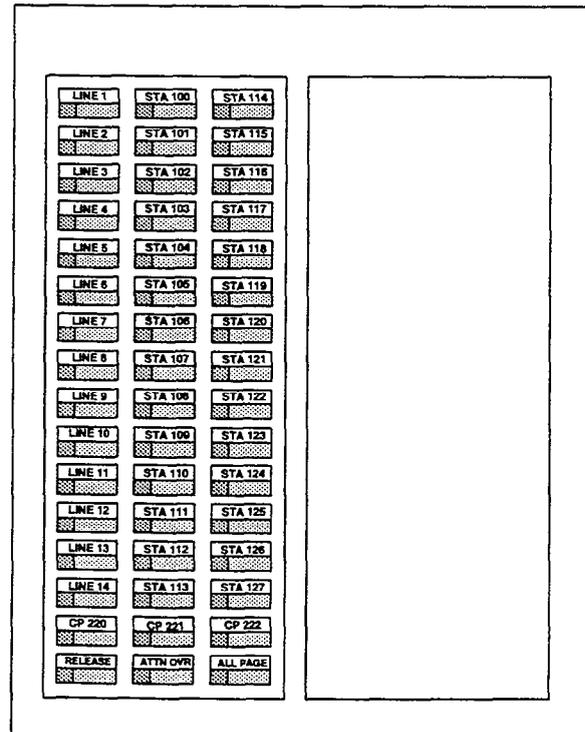
Description

**STATION ID.** Each system port must be programmed to identify the type of station that will operate on that port. Each station type must be identified.

**Default:** By default, all 4x8 CO/Station Port Cards default to ID 0 (Digital Terminal), all SLT's default to ID 5 (SLT or OPX).

*NOTE: When identifying a station as a DSS/DLS Console, you must also enter the station number of the Key Telephone the DSS/DLS Console is attached to.*

**MAP 1.** CO Lines 1-14 are fixed buttons. Stations 100-127 are flexible buttons and appear in sequential order with the bottom 6 buttons programmed as the following features: Call Park Zones, Page Zones, Attendant Override, and Release.



DSS Console Map 1

**Related Programming:** CO Line ringing on Map 1 is determined by CO Line Attributes, Sec. 620.1; CO Line Ringing Assignments

PAGE "B" STATION ATTRIBUTES (Cont'd)

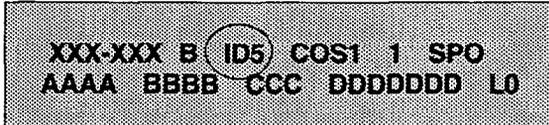
Station Identification (Cont'd)

Programming Steps

Description

To program the Station ID for a SLT or OPX Station:

1. Dial a [5] on the dial pad.
2. Press HOLD button to complete the entry. Display will now update.

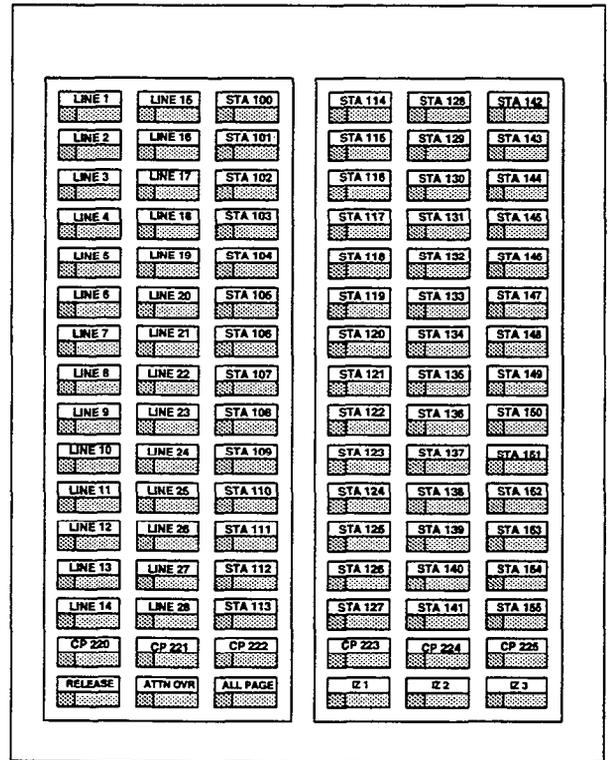
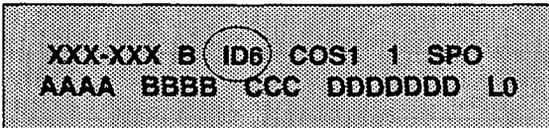


**MAP 2.** CO Lines 1-28 are fixed buttons and Stations 100-113 are flexible buttons and appear in sequential order with 6 buttons programmed as features.

**MAP 3.** Stations 114-157 are flexible buttons and appear in sequential order with the bottom 6 buttons programmed as features. Provides the receiving stations with DSS buttons when used in conjunction

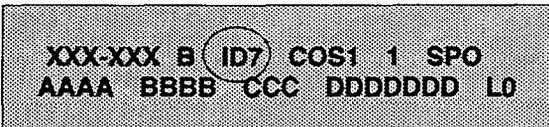
To program the Station ID for a SLT w/Message Waiting Lamp:

1. Dial a [6] on the dial pad.
2. Press HOLD button to complete the entry. Display will now update.



To program the Station ID for an SLT w/Message Waiting and In Use Lamp: (2605, 2607)

1. Dial a [7] on the dial pad.
2. Press HOLD button to complete the entry. Display will now update.



DSS Console Map 2 & 3

**Related Programming:** CO Line ringing on Map 2 is determined by CO Line Attributes, Sec. 620.1; CO Line Ringing Assignments

PAGE "B" STATION ATTRIBUTES (Cont'd)

M. Station Class of Service (COS)

Programming Steps

1. Press the CLASS OF SERVICE flexible button (Page B, Button #2).
2. Enter a two-digit Class of Service entry as follows:
  - 1st digit is day COS
  - 2nd digit is night COS

The six classes of service are:

- 1= unrestricted
- 2= governed by Table A
- 3= governed by Table B
- 4= governed by Tables A and B
- 5= no 0,1,\*,# as first digit, 7 digits max.
- 6= intercom only (no CO Line access)

3. Press HOLD button. Display will now update.

Description

**CLASS OF SERVICE.** Each stations must be assigned a certain COS for day mode operation, and also be assigned a COS for night mode operation. The night COS goes into affect when the system is placed into the night mode, manually or automatically. This prevents the misuse of phones after hours.

Class of service (COS) determines the stations dialing privileges. Refer to Table 630-1.

**Default:** By default, all stations are assigned a COS 1 for day mode and COS 1 for night mode.

**Related Programming:** CO Line Attributes, Sec. 620.1; Class of Service programming, Sec. 620.1; Exception Tables programming, Sec. 650.1.

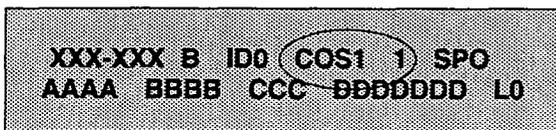


Table 630-1 Class of Service (COS)

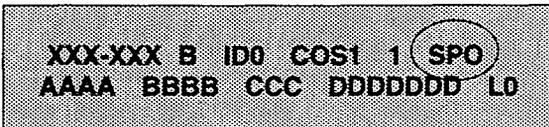
S T A T I O N  C O S	CO LINE CLASS OF SERVICE					
		1	2	3	4	5
	1	Unrestricted	Unrestricted	Unrestricted	Canned Restriction*	Unrestricted
2	Table A	Table A	Unrestricted	Canned Restriction	Unrestricted	
3	Table B	Unrestricted	Table B	Canned Restriction	Unrestricted	
4	Tables A&B	Table A	Table B	Canned Restriction	Unrestricted	
5	Canned Restriction	Canned Restriction	Canned Restriction	Canned Restriction	Unrestricted	
6	Intercom only	Intercom only	Intercom only	Intercom only	Intercom only	

\*Canned Restriction= No '0', 1, #, '\*' as a first dialed digit, and 7 digits maximum plus 1-800, 1911, 1611 are allowed and 411, 976, and 555 numbers are denied.

PAGE "B" STATION ATTRIBUTES (Cont'd)

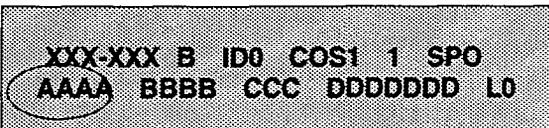
N. Speakerphone Programming

- | <u>Programming Steps</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <u>Description</u>                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. Press the SPEAKERPHONE flexible button (Page B, Button #3).</li> <li>2. Enter a one-digit number between 0 and 3 to identify the speakerphone operation.                             <ul style="list-style-type: none"> <li>0 = works as normal speakerphone. Full speakerphone capabilities on both CO lines and Intercom.</li> <li>1 = Speakerphone enabled for intercom calls only. Speakerphone capabilities disabled for outgoing CO line calls (monitoring and on-hook dialing are still allowed).</li> <li>2 = Speakerphone is disabled completely. Allows for headset operation.</li> </ul> </li> <li>3. Press HOLD button. Display will now update.</li> </ol> | <p><b>SPEAKERPHONE.</b> Each telephone's speakerphone ability is programmable in one of three ways. A speakerphone ID of 2 will allow the station user to enable headset mode by dialing a code. The station user may then return to full speakerphone operation by dialing the same code again.</p> <p><b>Default:</b> By default, all stations are assigned an ID of 0.</p> |



O. Pick-Up Group(s) Programming

- | <u>Programming Steps</u>                                                                                                                                                                                                                                                                                                                                                                                                   | <u>Description</u>                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. Press the GROUP PICKUP flexible button (Page B, Button #4).</li> <li>2. Enter a one-to-four digit number to program pickup groups.                             <ul style="list-style-type: none"> <li>0= no group</li> <li>1= Group 1</li> <li>2= Group 2</li> <li>3= Group 3</li> <li>4= Group 4</li> </ul> </li> <li>3. Press HOLD button. Display will now update.</li> </ol> | <p><b>GROUP PICKUP.</b> Each station is assigned into pick up groups. Stations can be in any combination of the four groups or in no group at all.</p> <p><b>Default:</b> By default, all stations are in group 1.</p> |



PAGE "B" STATION ATTRIBUTES (Cont'd)

P. Paging Zone(s) Programming

Programming Steps

1. Press the PAGING ZONES flexible button (Page B, Button #5).
2. Enter a one-to-four digit number to program paging zone(s).
  - 0= no zone (no pages received)
  - 1= Zone 1
  - 2= Zone 2
  - 3= Zone 3
  - 4= Zone 4
3. Press HOLD button. Display will now update.

Description

**PAGING ZONES.** Each station is assigned to internal paging zones. A station can be in any or all zones or in no zone at all.

All Call is all page zones combined. If a station is not in any internal zone, it will not receive any all call pages.

Stations not assigned to a page group can still make page announcements if allowed in station programming. Stations can be assigned to a page group in order to receive pages but not allowed to make pages.

**Default:** By default, all stations are in page zone 1.

```

XXX-XXX B ID0 COS1 1 SPO
AAAA BBBB CCC DDDDDDD L0
    
```

## PAGE "B" STATION ATTRIBUTES (Cont'd)

## Q. Preset Call Forward Programming

Programming Steps

1. Press the PRESET FORWARD flexible button (Page B, Button #6).
2. Enter a three-digit number to determine the destination where calls are to be routed when the preset forward timer expires.

Valid 3 digit destinations are:

020-099= System Speed Bins 20-99 for off-net forwarding

100-155= Station Numbers

330-337= Hunt Groups 1-8

440-447= Voice Mail Groups 1-8

550-557= UCD Groups 1-8

3. Press HOLD button. Display will now update.

```

XXX-XXX B IDL COS1 1 SPO
AAAA BBBB CCC DDDDDDD LD
  
```

Description

**PRESET FORWARD.** This feature allows the system database to be configured so that incoming CO Lines, which are programmed to ring at a particular station, can be forwarded elsewhere in the system predetermined by programming. This feature is active if the station ringing is not answered in a specified time. This is particularly useful in "overflow" applications where a Voice Mail or Auto Attendant may be in use.

A station may have one designated preset forward location defined in the database.

Preset Call Forward is chainable only to other predetermined preset forward stations specified in the database up to a chain of 5 stations. If a CO Line forwarded by Preset Call Forward encounters a manually forwarded station (Call Forward - Station), or a station in DND, then the incoming CO Line will bypass that station and forward to the next in the chain. If that station is the last in the chain, then the call will not forward any further and will continue to ring at that station until answered or terminated.

Chainable Preset Call Forwarding will force the incoming CO Line to ring at each station preassigned in the database for the Preset Forward Ring Timer, specified in the database, before forwarding.

CO Lines can be preset forwarded to ring into a UCD, Voice Mail, Hunt Group or Off-Net via speed dial from any station. A CO line will not preset forward to a busy hunt, voice mail, or UCD group, however each time the preset forward timer expires (for a total of five attempts) the group will be checked for an idle station. If a member of the group is idle the call will then be presented to that member.

**Default:** By default, no preset forward destinations are programmed.

**Related Programming:** Call Forward Preset Timer.

PAGE "B" STATION ATTRIBUTES (Cont'd)

R. CO Line Group Access

Programming Steps

1. Press the CO LINE GROUP ACCESS flexible button (Page B, Button #7).
2. Enter up to seven digits (0, or 1-7) for the outside line groups the station will have access to.
  - 0 =no access
  - 1 =access to Group 1, Code 9 or 81
  - 2 =access to Group 2, Code 82
  - 3 =access to Group 3, Code 83
  - 4 =access to Group 4, Code 84
  - 5 =access to Group 5, Code 85
  - 6 =access to Group 6, Code 86
  - 7 =access to Group 7, Code 87
3. Press HOLD button. Display will now update.

Description

**CO LINE GROUP ACCESS.** A station is allowed access to any combination of outside line groups. Or a station may not be allowed any access to outside lines. The following are the line group numbers and their access codes.

CO line groups are used primarily by single line telephones or for flexible buttons assigned as pooled group buttons on a Key Telephone.

**Default:** By default, all stations are allowed access to Group 1.

**Related Programming:** CO Line Group programming.

```

XXX-XXX B ID0 COS1 1 SPO
AAAA BBBB CCC DDDDDDD L0
    
```

S. LCR Class of Service

Programming Steps

1. Press the LCR COS flexible button (Page B, Button #8).
2. Enter a one-digit number between 0 and 6 to correspond to the LCR Class of Service desired.
3. Press HOLD button. Display will now update.

Description

**LCR COS.** Stations can be given a class of service assignment for Least Cost Routing. The range is between 0 and 6 with 0 being unrestricted and 6 being the most restricted. A station will be allowed use of LCR routes with a priority number equal to or higher than the stations LCR COS assignment.

**Default:** By default, all stations are given unrestricted access (0).

**Related Programming:** LCR Route List Table programming.

```

XXX-XXX B ID0 COS1 1 SPO
AAAA BBBB CCC DDDDDDD L0
    
```

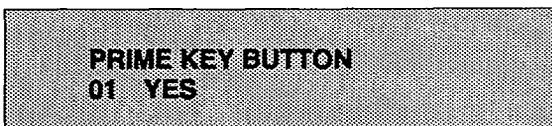
## PAGE "B" STATION ATTRIBUTES (Cont'd)

## T. Off-Hook Preference Programming

Programming Steps

To program a station for Off-Hook Preference;

1. Press the OFF-HOOK PREF flexible button (Page B, Button #9). The following message is shown on the display phone:



**PRIME KEY BUTTON**  
**01 YES**

2. Enter the two-digit button number (01-28) or (00) to indicate no specific button is preferred. SLT's use 01 to enable or 00 to disable.
3. Then, enter either 0 or 1 where:
  - 0 = Disable user programmable preference so that users may not change the off-hook preference as set in programming. Also use for SLT stations.
  - 1 = Enable user programmable preference to key station users so that they may change the off-hook preference through a user dial code
4. Press the HOLD button. The display will now update.

Description

**OFF HOOK PREF.** This allows a key station user to automatically have a flex button selected when going off-hook or when pressing the ON/OFF button. SLT user may have a particular CO line or a CO line group selected automatically when going off-hook.

This may be established in programming so that key station users may select and/or change their off-hook preference through the use of a dial code. This user programmable preference may be allowed or denied in programming.

When establishing an off-hook preference for SLT stations it is necessary to program the SLT's CO line, or line group, to be accessed when going off-hook, first using a flex button programming procedure. Refer to Flex Button programming (Button #10) for instructions described earlier in this section.

**Default:** By default, all digital terminals are allowed to change their preference but no button is assigned (00). SLT stations are not allowed this feature.

**Related Programming:** Refer to Flex Button Programming.

## PAGE "B" STATION ATTRIBUTES (Cont'd)

## U. Flexible Button Programming

Programming Steps

1. Press the BUTTON ASSIGN flexible button (Page B, Button #10). The following message is shown on the display phone:

**FLEX BUTTON PROG  
ENTER BUTTON DATA**

2. Enter the two-digit button number [BB] to be programmed followed by the desired button function as follows:

where: BB = Button number (01-28)

**MULTI:** To assign a button as a multi-function button (user programmable) enter:

BB [0] HOLD

**CO LINE:** To assign a button as a CO Line button, enter:

BB [1] LL HOLD (LL = CO Line 01-28)

**LOOP:** To assign a button as a Loop button, enter:

BB [2] HOLD

**POOL:** To assign a button as a pooled group button, enter:

BB [3] G HOLD (G = Line Group # 1-7)

**UNASSIGN:** To unassign a button, enter:

BB [#] HOLD

Description

**BUTTON ASSIGN.** Each 34 Button Digital terminal has 28 flexible buttons which can be individually programmed. One of the following five (5) operations can be selected in programming for each button.

**MULTI.** When a button is assigned as a multi-function button [0], the user then has the ability to program any features or functions on the buttons that the user has access to. For a complete list of user programmable code (functions and features), refer to Table 630-2.

**CO.** Buttons assigned as specific CO lines will provide direct access and appearance of the CO line at the station. The station will receive all call status indications such as LED flash rates for incoming ringing, when the line has been placed on HOLD, etc... CO Line ringing is programmed in CO line Attribute Programming.

**LOOP.** Used for a station without a direct CO Line appearance to answer the line ringing in or transferred to the station. It is recommended that all stations be given a loop button so they can receive a transferred call on a line for which they have no button access.

**POOL.** Some or all outside CO Lines may be grouped together and accessed via a POOL button for the purpose of placing an outgoing CO call. Pressing this button accesses the highest numbered unused CO line in that CO Line group. When programming a button as a pooled group button, refer to CO Line group programming. Pooled group numbers match CO Line group numbers.

**UNASSIGN (locked out).** Specific buttons may be designated as unused or locked out. When a button is programmed as unused, the button may not be programmed by the station user using flex button programming procedures.

**PAGE "B" STATION ATTRIBUTES (Cont'd)****Flexible Button Programming (Cont'd)**Programming Steps

If SLT stations are to be programmed for Off-Hook Preference, it is necessary to program the desired CO line, or CO line group, the SLT is to access when going off-hook.

To assign a CO Line for a SLT with Off-Hook Preference, enter:

00 [1] LL HOLD (LL= CO Line 01-28)

To assign a CO Line group for an SLT with Off-Hook Preference, enter:

00 [3] G HOLD (G= Line Group # 1-7)

Description

**Default:** By default, Station 100 will ring on a line. However, if Station 100 is not given button access to a line, another station must be programmed to ring on that line.

**Related Programming:** When programming a button as a CO Line button, refer to CO Line Attributes for assigning CO Line Ringing, Sec. 620.1; Off-Hook Preference.

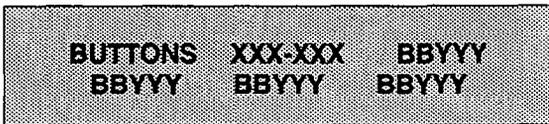
PAGE "B" STATION ATTRIBUTES (Cont'd)

V. Display Flexible Buttons

Programming Steps

If the flexible buttons are to be viewed:

1. Press the DISPLAY BUTTONS flexible button (Page B, Button #17). The programming assignment on four buttons will be displayed starting with the lowest button number. With each sub-subsequent depression of the DISPLAY BUTTONS button, the next four buttons will be displayed. The following message is shown on the display:



Where:

- XXX= Station number
- BB= Button Number
- YYY= Button function (see table below)

Description

**DISPLAY BUTTONS.** Any time a display of button programming (default or changed) is needed, press the DISPLAY BUTTONS button (button 17) on Page B and it will display four buttons' programming assignments (starting with the lowest button number). With each subsequent depression of the DISPLAY BUTTONS button, the next four buttons will be displayed.

When a button is assigned as a multi-function button [0], the user then has the ability to program any features or functions on the buttons that the user has access to. When the buttons are programmed with user programmed functions, the display will show the function that has been assigned to the button.

For a complete list of user programmable code (functions and features), refer to Sec. 200.56.

Table 630-2 Flexible Button Display Designations

<b>MUL</b> = Multi Function button. A button which has not been given a function by the user.	<b>PKU</b> = Pick Up button
<b>CO[LL]</b> = CO Line button (for CO line [LL])	<b>MSG</b> = Message Wait button
<b>LP</b> = LOOP Button	<b>FWD</b> = Call Forward button
<b>PL[G]</b> = POOL Button with CO Line group number	<b>DND</b> = Do Not Disturb button
<b>D[XXX]</b> = Station DSS/BLF button	<b>CNF</b> = Conference button
<b>H[HHH]</b> = Hunt Group with pilot number	<b>UNA</b> = Universal Night Answer
<b>P[CCC]</b> = Call Park with park location	<b>ACC</b> = Account Code enter button
<b>U[UUU]</b> = UCD Group with pilot number	<b>MUS</b> = BackGround Music button
<b>V[VVV]</b> = Voice Mail Group with pilot number	<b>HST</b> = Headset mode button
<b>M[ZZ]</b> = Personalized Message with message number	<b>PPK</b> = Personal Park button
<b>S[YY]</b> = Speed Dial button with bin number	<b>AVL</b> = Available/Unavailable button
<b>LNR</b> = Last Number Redial button	<b>CIQ</b> = UCD Calls in queue button
<b>SNR</b> = Save Number Redial button	<b>EOR</b> = Executive Override button
<b>IP[N]</b> = Internal Page with Zone	
<b>IAC</b> = Internal All Call Page button	<u>Key</u>
<b>EP[N]</b> = External Page with Zone	LL = CO Line number
<b>EAC</b> = External All Call button	G = Pool or CO Line Group number
<b>ACP</b> = All Call Page button	XXX = Station Number
<b>MMP</b> = Meet Me Page button	HHH = Hunt Group number
<b>AOR</b> = Attendant Override button (attn)	CCC = Call Park location
<b>CPO</b> = Camp-On button	UUU = UCD Group pilot number
<b>LQU</b> = Line Queue button	VVV = Voice Mail Group number
<b>CBK</b> = Call Back Button	ZZ = Personalized Message number
	YY = Speed Dial Bin
	N = Page Zone number

# SECTION 640

## UNIFORM CALL DISTRIBUTION (UCD)

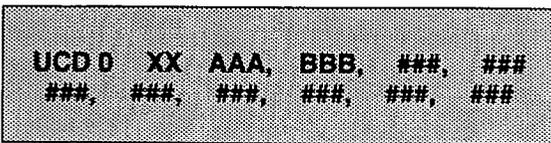
### 640.1 UCD GROUP PROGRAMMING

#### Programming Steps

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. Refer to Sec. 600.2.

If UCD Groups are to be assigned:

1. Press FLASH and dial [60]. The following message is shown on the display phone:



Where:

XX= RAN Announcement Table(s)

AAA= Alternate UCD Group Assignment

BBB= UCD Overflow Assignment

###= UCD Station(s) Assignment(s)

2. The top left button in the flexible button field will be lit for programming UCD group 0 (550). To change UCD groups or enter further UCD groups (550 to 557), press the appropriate flexible button and perform the following procedures.

#### Description

There can be eight UCD groups of no more than eight stations each. The UCD groups use a pilot hunting technique. If the pilot number is dialed, the assigned stations in that UCD group are searched for the station which has been in an idle condition for the longest period of time.

Each UCD Group may have an assigned Alternate UCD Group, an Overflow station and up to eight stations as UCD members. The two system RAN ports (tables) may also be referenced on a per UCD group basis.

While programming UCD Groups, the flexible buttons are mapped as follows:

G 1	UCD GP 550	STATION ASSIGN	11 A
W 2	UCD GP 551	ANNOUNCEMENT TBL	12 S
E 3	UCD GP 552		13 D
R 4	UCD GP 553		14 F
T 5	UCD GP 554		15 G
Y 6	UCD GP 555		16 H
U 7	UCD GP 556		17 J
I 8	UCD GP 557		18 K
O 9	ALTERNATE UCD GP		19 L
P 10	OVERFLOW ASSIGN		20 ;

**Default:** By default, UCD Group Tables are empty.

**Related Programming:** UCD Timers for setting ringing, Message Interval Timer, Overflow, and Wrap-up Timers, Sec. 640.2; RAN Table programming for assigning RAN device ports and message times, Sec. 640.3.

### A. Alternate UCD Group Assignment

#### Programming Steps

To program an alternate group:

1. Press the ALTERNATE UCD GP flexible button (Button #9).
2. Enter the three-digit pilot number (550 to 557) of the desired alternate UCD group.
3. Press the HOLD button to enter data.

#### Description

**ALTERNATE UCD GP.** An alternate UCD group can be programmed so that if no station in one group is available, the alternate group will be checked for an available station. This provides a means to chain or link UCD groups together.

To delete an Alternate UCD Group, press the pound key three times [###] and press the HOLD button.

**UNIFORM CALL DISTRIBUTION (Cont'd)****B. Overflow Station Assignment**Programming Steps

To program UCD Overflow station:

1. Press the OVERFLOW ASSIGN flexible button (Button #10).
2. Enter the three-digit station number (100 to 155) to designate the UCD Groups overflow station.
3. Press the HOLD button to enter the data.

Description

**OVERFLOW ASSIGN.** When an overflow station is assigned, callers that have remained in queue for a specified amount of time will be routed to the assigned overflow station. The overflow station may not be one of the UCD group stations. Only CO calls transferred to a UCD group will overflow to the overflow station when RAN tables have not been assigned.

To delete an Overflow Station, press the pound key three times [###] and press the HOLD button.

**C. UCD Station Assignment(s)**Programming Steps

To program stations into a UCD group:

1. Press the STATION ASSIGN flexible button (Button #11).
2. Enter the three digit station numbers of the stations in the UCD group in the order in which they will be checked. A maximum of eight stations may be entered.
3. Press HOLD button.

Description

**STATION ASSIGN.** Any type of station (excluding DSS/DLS Consoles) may be entered as valid UCD stations. Calls will be routed to station in the order they are entered for the first round of calls only. After that the calls are routed to stations based on On-Hook time. The station with the longest On-Hook time will receive the next call.

If a specific station number is dialed, only that station is rung; no distribution will be done if that station is busy.

To erase all stations, press the pound key three times [###] and press HOLD.

**D. Recorded Announcement Assignment(s)**Programming Steps

To program a Recorded Announcement:

1. Press the ANNOUNCEMENT TBLS flexible button (Button #12).
2. Enter one of the following digit sequences:
  - 1# = RAN port specified in Table 1 will be used.
  - 2# = RAN port specified in Table 2 will be used.
  - 1,2 = Port 1 will answer the call; port 2 will provide a subsequent message.
  - 2,1 = Port 2 will answer the call; port 1 will provide a subsequent message.

Description

**ANNOUNCEMENT TBLS.** An optional Recorded Announcement device may be connected to the system to provide an announcement if all stations in a UCD group are busy. Two ports in the system may be assigned to provide a path to a Recorded Announcement device.

Incoming CO Callers will only be answered and routed to the Overflow assignment if a RAN Table is assigned.

To erase Recorded Announcement(s), press the pound key two times [##] and press HOLD.

Refer to RAN Announcement Table programming (Sec. 640.3) for further information regarding each RAN Table.

640.2 UCD TIMERS

Programming Steps

If UCD timers are to be changed:

- a. Press FLASH and dial [61]. The following message is shown on the display phone:

UCD TIMERS	RING 060	MIT 060
OVR 060	WRP 004	NAT000

Description

Four timers for UCD operation are programmable on a system-wide basis. The UCD timers include: A Ring Timer, Message Interval Timer, an Overflow Timer, a Auto Wrap-Up Timer, and No/Answer Timer. Each timer is described below:

**Related Programming:** UCD Group Assignments; Announcement Table programming; Installation Section for connection of Music-On-Hold and Recorded Announcements, Sec. 500.

When programming UCD Timers, the flexible buttons are mapped as follows:

Q 1	RING TIMER	11 A
W 2	MIT TIMER	32 S
E 3	OVERFLOW TIMER	13 D
R 4	AUTO-WRAP TIMER	14 F
T 5	NO-ANSWER TIMER	15 G

**A. UCD Ring Timer**

Programming Steps

To make a change to the UCD Ring Timer:

1. Press the RING TIMER flexible button (Button #1).
2. Enter the three-digit timer value on the dial pad which corresponds to 000-300 seconds.
3. Press HOLD button. Display will now update.

Description

**RING TIMER.** The UCD Ring Timer determines how long a call will ring into a busy UCD group before being presented to the first recorded announcement. The timer is variable from 000 to 300 seconds.

**Default:** By default, the UCD Ring Timer is set for 60 seconds.

*NOTE: A RAN Table must be specified in UCD programming (Sec. 610.1) for the ring timer to be in effect. If a RAN Table is NOT specified, incoming CO callers will not be answered but will continue to receive ringback.*

## UCD TIMERS (Cont'd)

### B. UCD Message Interval Timer

#### Programming Steps

To make a change to the UCD Message Interval Timer:

1. Press the MIT TIMER flexible button (Button #2).
2. Enter the three-digit timer value on the dial pad which corresponds to 000-600 seconds.

Press HOLD button. Display will now update.

*NOTE: The UCD Ring and Message Interval Timers only apply when RAN ports have been specified. If RAN ports are not specified, incoming callers will continue to receive ringback tone.*

#### Description

**MIT TIMER.** The UCD Message Interval Timer (MIT) determines the length of time a caller remains in queue (listening to MOH, if provided) between recorded announcements.

The timer is variable from 000 to 600 seconds.

**Default:** By default, the UCD Message Interval Timer is set for 60 seconds.

### C. UCD Overflow Timer

#### Programming Steps

To make a change to the UCD Overflow Timer:

1. Press the OVERFLOW TIMER flexible button (Button #3).
2. Enter the three-digit value on the dial pad which corresponds to 000-600 seconds.
3. Press HOLD button. Display will now update.

#### Description

**OVERFLOW TIMER.** The UCD Overflow Timer determines the total length of time a caller will remain in queue for a particular UCD group. When the timer expires, the caller will be routed to the designated overflow station. The timer starts when an incoming call is answered and presented to the first recorded announcement. Transferred CO callers will overflow at the expiration of the Overflow Timer.

The timer is variable from 000 to 600 seconds.

**Default:** By default, the UCD Overflow Timer is set for 60 seconds.

### D. UCD Auto Wrap-Up Timer

#### Programming Steps

To make a change to the UCD Auto Wrap-up Timer:

1. Press the AUTO-WRAP TIMER flexible button (Button #4).
2. Enter the three-digit value on the dial pad which corresponds to 000-600 seconds.
3. Press HOLD button. Display will now update.

#### Description

**AUTO-WRAP TIMER.** After completion of a UCD call (on-hook) the agent will not be subjected to another UCD call for the duration of the Auto Wrap-Up timer allowing the agent to finish call related work or access other facilities. This will allow agents to remove themselves from the group (ie. DND, Call Forward) or originate another call.

This timer is variable from 000-600 seconds.

**Default:** By default, the UCD Auto Wrap-up Timer is set for 04 seconds.

**UCD TIMERS (Cont'd)****E. UCD No-Answer Timer**Programming Steps

To make a change to the UCD No-Answer Timer:

1. Press the NO-ANSWER TIMER flexible button (Button #5).
2. Enter the three-digit value on the dial pad which corresponds to 000-300 seconds.
3. Press HOLD button. Display will now update.

Description

**NO-ANSWER TIMER.** After a UCD call rings to an agent, this timer takes effect. If the agent does not answer the call before this timer expires, then that agent is set to "UCD Unavailable" and the call is routed back to the UCD group for another available agent or queue.

The timer is variable from 000-300 seconds.

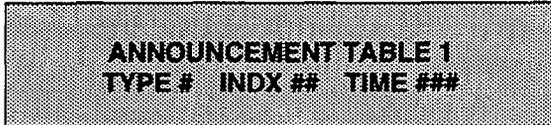
**Default:** By default, the UCD No-Answer Timer is disabled with an entry of 000.

640.3 UCD RAN ANNOUNCEMENT TABLES

Programming Steps

If Recorded Announcement devices are installed to operate with UCD, these tables must be programmed:

- a. Press FLASH and dial [62]. The following message is shown on the display phone:



- b. The top left button in the flexible button field will be lit for programming UCD RAN Announcement Table 1. To change to UCD RAN Announcement Table 2, press flexible button #2.
- c. Enter a string of six, or seven digits on the dial pad. The order of data entry will be:

Type Number:

- 1= CO Port interface
- 2= SLT Port interface

Index (port) Number:

- 01-28= CO Line Port
- 100-155= SLT Station Port

Message Time:

000-300 seconds

- d. Press HOLD button.

*NOTE: When a CO port is designated as a RAN port, a relay and/or sensor should be programmed as a RAN start for Announcement Table 1 or 2.*

Description

Determines the type, index (port) number and message length for the two available Recorded Announcements (RAN). There are two RAN tables that can be programmed. Table 1 can be the answer port for unanswered incoming calls to a UCD group. Table 2 can provide the secondary message or vice versa.

While programming UCD RAN Announcement Tables, the flexible buttons are mapped as follows:



The type can be either a CO line port, or a SLT port. The index number specifies which circuit for the type of interface.

The message length is used to match the maximum length of the message to the device that is used.

Example:

To program Table 1 for CO line port:

- a. Press the TABLE 1 flexible button (Button #1).
- b. Dial [1] for CO port interface.
- c. Dial [01 to 28] for CO line used.
- d. Enter message duration (000-300 sec.)

Example:

To program Table 2 for SLT port:

- a. Press the TABLE 2 flexible button (Button #2).
- b. Dial [2] for SLT port interface.
- c. Dial [100 to 155] for SLT station used.
- d. Enter Message duration (000-300 sec.)

**Related Programming:** UCD Group programming; UCD Timer programming; Installation Section for instructions on how to install Recorded Announcement devices, Sec. 500.

# SECTION 645

## VOICE MAIL GROUPS (VM)

### 645.1 VOICE MAIL PROGRAMMING

#### Programming Steps

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. (Refer to Sec. 600.2).

If Voice Mail Groups are to be programmed:

1. Press FLASH and dial [65]. The following message is shown on the display phone.

VM 44G AAA L R XXX, XXX,  
XXX, XXX, XXX, XXX, XXX, XXX

Where:

G= Voice Mail group number (0-7)

AAA= Alternate group (440-447)

L= "Leave" mail index from outpulsing table for leaving messages (0-7)

R= "Retrieve" mail index from outpulsing table for retrieving messages (0-7)

xxx= voice mail station numbers (ports).  
(up to 8 max.)

2. The top left button in the flexible button field will be lit for programming voice mail group 440. To change Voice Mail groups or enter further Voice Mail groups, press the appropriate flexible button 1-8 (440-447) and perform the following procedures.

*NOTE: Certain programming will be required in the Voice Mail system connected to the Starplus Digital (SPD) Key Telephone System for proper operation.*

*1. Mail Box numbers must match Starplus Digital (SPD) Key Telephone System station extension numbers. (100-155)*

*2. Tone Mode Calling option (6#) must be programmed as leading digits in transfer sequence(s) to force tone ringing to key telephone.*

#### Description

Up to eight (8) Voice Mail groups can be configured in the Starplus Digital (SPD) Key Telephone System. Each group can contain up to eight (8) Voice Mail designated ports, each of which interfaces with a port on an SLT or OPX card.

An externally provided Voice Mail system or Auto Attendant must be connected to the Starplus Digital (SPD) Key Telephone System for Voice Mail or Auto Attendant operation. Voice Mail automatically handles unanswered calls. Station user can then retrieve messages left at their stations. Auto Attendants can handle incoming calls and route callers to station users without intervention from the systems attendant.

Direct incoming ring to Voice Mail/Auto Attendant groups can be done directly through CO Line Ringing Assignments.

When programming Voice Mail Groups, the flexible buttons are mapped as follows:

G 1	VM GP 440	R (RETRIEVE)	11 A
W 2	VM GP 441	STATION ASSIGN	12 S
E 3	VM GP 442		13 D
R 4	VM GP 443		14 F
T 5	VM GP 444		15 G
Y 6	VM GP 445		16 H
U 7	VM GP 446		17 J
I 8	VM GP 447		18 K
O 9	ALTERNATE VM GP		19 L
P 10	L (LEAVE)		20 .

**Related Programming:** Voice Mail Outpulsing Table, Sec. 645.2; Voice Mail ID digits for incoming CO calls, Sec. 645.3; CO Line Attributes, CO Line Ringing Assignments, Sec. 620.1.

**VOICE MAIL GROUPS (Cont'd)****A. Alternate Voice Mail Group**Programming Steps

To program an alternate group:

1. Press the ALTERNATE VM GP flexible button (Button #9).
2. Enter the three-digit pilot number (440 to 447) of the desired group.
3. Press the HOLD button to enter data.

Description

**ALTERNATE VM GP.** An Alternate Voice Mail Group may be programmed so that if all Voice Mail ports are in use, the call can be routed to an alternate group. This is useful when more than eight ports are required for Voice Mail traffic.

To delete an Alternate Voice Mail Group assignment, enter three pounds [###] on the keypad and press the HOLD button.

**B. "Leave" Mail Index Entry**Programming Steps

To specify the "Leave" mail index (outpulsing table) to be accessed by a Voice Mail group:

1. Press the LEAVE flexible button (Button #10).
2. Enter the one-digit outpulsing table number (0-7) on the dial pad.
3. Press the HOLD button to enter the data.

Description

**LEAVE.** The "Leave" mail index specifies the outpulsing Table where the "in-band" digits required to connect a caller, forwarded into Voice Mail, to the called stations mail box are stored. Refer to Sec. 645.2 for programming entries into an outpulsing table.

To delete a "Leave" mail index entry, enter one pound [#] on the keypad and press the HOLD button.

**C. "Retrieve" Mail Index Entry**Programming Steps

To program the "Retrieve" mail index (outpulsing table) to be accessed by the Voice Mail group:

1. Press the RETRIEVE flexible button (Button #11).
2. Enter the one-digit outpulsing table number (0-7) on the dial pad.
3. Press the HOLD button to enter the data.

Description

**RETRIEVE.** The "Retrieve" mail Index specifies the outpulsing table where the "In-band" digits required to connect a station user to their own mail box are stored. Refer to Sec. 645.2 for programming entries into an outpulsing table.

*NOTE: In order for the Starplus Digital (SPD) Key Telephone System to send the Station Identification digits (station three-digit extension number), a "Leave" and a "Retrieve" table must be referenced when assigning Voice Mail groups. However, the "Leave" and "Retrieve" outpulsing Tables (Sec. 645.2) can be empty (no entries in the referenced table).*

To delete a "Retrieve" mail index entry, enter one pound [#] on the keypad and press the HOLD button.

**VOICE MAIL GROUPS (Cont'd)****D. Station Assignment(s)**

<u>Programming Steps</u>	<u>Description</u>
To program the stations in the Voice Mail group: <ol style="list-style-type: none"><li>1. Press the STATION ASSIGN flexible button (Button #12).</li><li>2. Enter the three digit station numbers. A maximum of eight SLT stations may be entered.</li><li>3. Press the HOLD button to enter the data.</li></ol>	Up to eight (8) SLT or OPX port extension numbers may be programmed into a Voice Mail group. The ports will be designated as two-way ports by directing calls to any one of the ports and allowing any one of the ports (or all ports) to be used as VM out dial and/or VM notify ports. A flexible button may be programmed with a Voice Mail group pilot number. This button will then act as a DSS for that Voice Mail group when pressed and also serves as the message waiting indication for that VM group.

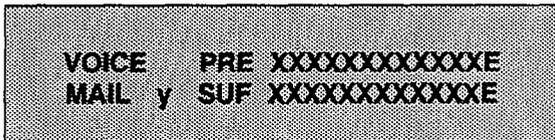
645.2 VOICE MAIL OUTPULSING TABLE

A. Voice Mail In-Band Signaling:

Programming Steps

If Voice Mail In-Band signalling is to be used:

1. Press FLASH and dial [66]. The following message is shown on the display phone.



Where:

y = the table index (0-7)

x = entered digits (0-9, #, \*, Pauses)

2. The TABLE 1 flexible button (Button #1) led is lit. To change tables, press the appropriate flexible button (Buttons 2-8) and perform the following procedures.
3. Dial one of the following, if required:
  - 0 = if a prefix is required
  - 1 = if a suffix is required
  - # = if entry is to be deleted
4. Enter up to 12 digits required including '\*' and '#'. TRAN button = pause.
5. Press the HOLD button. Display will now update.

Description

Entries into one of the eight (8) Voice Mail Outpulsing Tables determine the In-Band signaling required for "Retrieving" messages (allows for stations to pick up mail) and "Leaving" messages (allows stations to leave messages in voice mail).

When programming Voice Mail In-Band Signaling tables and Disconnect table, the flexible buttons are mapped as follows:

Q 1	TABLE 0	11 A
W 2	TABLE 1	12 B
E 3	TABLE 2	13 D
R 4	TABLE 3	14 F
T 5	TABLE 4	15 G
Y 6	TABLE 5	16 H
U 7	TABLE 6	17 J
I 8	TABLE 7	18 K
D 9	DISCONNECT TABLE 8	19 L

Build a table ("0" for example) for any additional digits other than the Station Extension Number (Voice Mail Box Number) needed for a caller to leave a message in a station's mailbox. ("Leave")

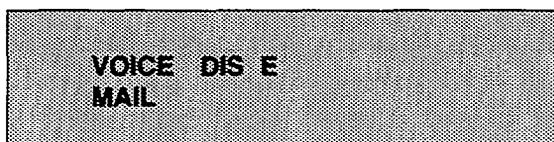
Build another table ("1" for example) for any additional digits needed for a mailbox holder to retrieve a message ("Retrieve").

*NOTE: Entries are not required in the Outpulsing Table, however a table must be referenced when setting up the Voice Mail groups (FLASH 65) for both Leave and Retrieve data fields, if In-Band signaling is desired.*

**Related Programming:** Voice Mail Group programming, In-band digits sent on incoming CO Calls.

**VOICE MAIL OUTPUTSING TABLE (Cont'd)****B. Voice Mail Disconnect Table:**

- | <u>Programming Steps</u>                                                                                                                                                                                                                                                                                                                                                    | <u>Description</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. Press the DISCONNECT TABLE 8 flexible button (Button #9) . This is the table number used for the Voice Mail disconnect signal.</li> <li>2. Enter up to 12 digits which will be used for the disconnect signal, including '*' and '#'. TRAN button = pause.</li> <li>3. Press the HOLD button. Display will now update.</li> </ol> | <p>To avoid Voice Mail ports from being tied up as a result of CO line callers abandoning the call or not exiting the VM system properly, a disconnect signal can be programmed into the Starplus Digital (SPD) Key Telephone System to notify the VM system that a call has been abandoned. This is accomplished through "in-band" signaling. If a CO disconnect signal is detected, the Starplus Digital (SPD) Key Telephone System will send a series of DTMF digits programmed in the Voice Mail disconnect table (outputting table eight (8)) to the Voice Mail port. This can be any digit stream up to 12 digits including "*" and "#". This table will serve all eight voice mail groups. These digits are not used as a result of an internal station disconnecting from Voice Mail. In this case silence is provided for a short period followed by busy tone. This method is also used for CO lines when the VM disconnect table is empty.</p> <p>The Starplus Digital (SPD) Key Telephone System will provide Loop Supervision monitoring while a CO call is connected to a port designated as Voice Mail.</p> <p><b>Default:</b> By default programming there are no entries in the disconnect table (table eight (8)).</p> <p><i>NOTE: Loop supervision must be enabled on the CO lines (in CO line programming) in order for VM disconnect feature to operate.</i></p> |

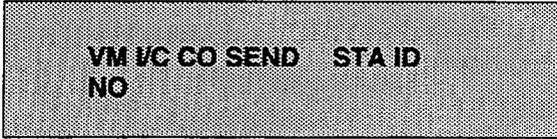


## 645.3 VOICE MAIL IN-BAND DIGITS

Programming Steps

If Voice Mail ID digits are to be enabled or disabled for Incoming CO callers:

1. Press FLASH and dial [67]. The following message will be shown on the display:



VM I/C CO SEND STA ID  
NO

2. Press Flex button 1 to enable or disable ID digits.
  - LED on = ID digits are enabled
  - LED off = ID digits are disabled
3. Press HOLD button. The display will now update.

Description

The Starplus Digital (SPD) Key Telephone System allows the system to be programmed so that if a station programmed to receive incoming CO line ringing is forwarded to Voice Mail they may have direct incoming callers routed directly into their stations voice mail box through the use of "In-Band" signalling. Alternately, when disabled, callers will be answered by the Voice Mail or Auto Attendant Main greeting.

Incoming CO callers can be Station Call Forwarded into voice mail only when the ringing CO line is programmed to ring at one station. Additionally CO lines programmed to ring at an attendant station will station call forward into the Voice Mail system (if programmed to ring only at one attendant station) and be presented to the main greeting (not the attendant stations mail box) even when ID digits are enabled.

**Default:** By default, ID digits for incoming CO calls is disabled.

**Related Programming:** Voice Mail group programming, Sec. 645.1; Voice Mail Outpulsing table, Sec. 645.2)

# SECTION 650

## EXCEPTION TABLES PROGRAMMING

### 650.1 INTRODUCTION

#### Programming Steps

The Starplus Digital (SPD) Key Telephone System offers a flexible means of applying toll restriction to stations or individuals. Dialing privileges (or toll restriction) is determined through assignment of station and CO line Class Of Service (COS). Several types of restriction can be derived simply by programming COS assignments and CO line access to stations. This may, in some cases, be all that is necessary. However, when a more complex or specific type of restriction is desired the system offers two allow and two deny tables along with four special tables. These tables can be programmed in a variety of ways to handle applications that are straight forward or applications that require a more complex arrangement.

The allow and deny tables are assigned to stations based on their station Class of Service (COS) assignment. The Station (COS) interacts with CO Line COS assignments to provide several different types of dialing privileges (Refer to CO/Station COS matrix below).

The Allow and Deny tables allow entries of either general or specific allow and deny codes such as allowing all [1-800] type calls, and/or denying all [1]+ or [0]+ calls. The allow and deny tables allow a maximum of eight digits to be entered as allow or deny digits. This allows for entry of certain area codes or office codes or a combination of area code

plus office code that can specifically be allowed or denied. For example the code [1 555-1212] may be entered in the deny table to deny local toll information calls. Each allow table contains twenty (20) bins for entry of allow codes. Each deny table contains ten (10) bins for entry of deny codes

The following rules should be remembered when setting up the Allow/Deny tables (Refer to Table 650-2).

1. If both tables (allow and deny) have no entries, no restriction is applied.
2. If entries are made in the allow table and only there, then only those numbers are allowed. All other dialing is denied.
3. If entries are made in the deny table and only there, then only those numbers are denied. All other dialing is allowed.
4. If there are entries in both allow and deny tables, the allow table is searched first and if a match is found, it is allowed. If a match is not found, the deny table is searched and if a match is found there, the call is denied. If the number does not match an entry in either table, it is allowed.

A special "Don't Care" ("D") character may be entered as a digit to either allow or deny any digit dialed in that digit sequence. For example a code [1 "D" 0] and [1 "D" 1] may be entered in the deny table which would allow local long distance calls (numbers dialed

**Table 650-1 Class of Service (COS)**

S T A T I O N	C O S	CO LINE CLASS OF SERVICE				
		1	2	3	4	5
1	1	Unrestricted	Unrestricted	Unrestricted	Canned Restriction*	Unrestricted
2	2	Table A	Table A	Unrestricted	Canned Restriction	Unrestricted
3	3	Table B	Unrestricted	Table B	Canned Restriction	Unrestricted
4	4	Tables A&B	Table A	Table B	Canned Restriction	Unrestricted
5	5	Canned Restriction	Canned Restriction	Canned Restriction	Canned Restriction	Unrestricted
6	6	Intercom only	Intercom only	Intercom only	Intercom only	Intercom only
		*Canned Restriction= No '0', 1, #, '*' as a first dialed digit, and 7 digits maximum plus 1-800, 1911, 1611 are allowed and 411, 976, and 555 numbers are denied.				

**Table 650-2 Allow/Deny Toll Table**

	ALLOW TABLE	DENY TABLE	CONDITIONS AND RESULTS			
			DIALED NO.	A/D	DIALED NO.	A/D
RULE 1	NO ENTRIES	NO ENTRIES	ALLOW			
RULE 2	ENTRIES	NO ENTRIES	FOUND	A		
			NOT FOUND	D		
RULE 3	NO ENTRIES	ENTRIES			FOUND	D
					NOT FOUND	A
RULE 4	ENTRIES	ENTRIES	FOUND	A	FOUND	D
			NOT FOUND	→	NOT FOUND	A

with a 1 followed by a seven digit local number), but would deny long distance calls (numbers dialed with a 1 followed by an area code).

The Starplus Digital (SPD) Key Telephone System also offers four (4) special tables that can be referenced from within the two allow tables. Three of the special tables can be assigned to specific area codes that require further toll restriction definition. The fourth special table is reserved for use as a home area code table (numbers within the same area code as the site where the system is installed). This provides expanded ability to apply toll restriction on numbers that are dialed within an area code. Each special table will allow up to (800) entries (200-999). This offers the ability to allow every office code on an individual basis

**650.2 RELATED ITEMS TO TOLL RESTRICTION**

**A. CO/PBX Lines**

When CO lines are marked as PBX lines (refer to CO line programming Sec. 620) the system will first check the PBX code table (refer to Sec. 610.5) for a valid match. If the first digits dialed do not match the entries in the PBX code table the call is considered an attempt to call another PBX extension and no toll restriction is applied. If the first digits dialed are found in the PBX code table then toll restriction will start with the next dialed digit.

**B. Forced Account Codes**

The system can optionally force the use of account codes on all restricted calls. When forced account codes are enabled (see Sec. 610.9), an account code must be entered to place a call that is otherwise restricted through toll restriction. By entering an account code the stations effective class of service becomes that equal to class of service 1 (unrestricted).

When account codes are forced on a system wide basis selected users may be instructed on how to enter account codes from any station and be allowed to dial unrestricted from a station that may otherwise be restricted. Use of account codes in this manner, as a traveling class-of-service, is however not controlled by the system. Any station user with knowledge of how to enter account codes to override a stations toll restriction will be allowed to do so.

**C. SLT DTMF Receivers**

When single line telephones are connected to the Starplus Digital (SPD) Key Telephone System and toll restriction is enabled the system DTMF receivers located on the CO/Station board will monitor the call for a programmed period of time (refer to Sec. 610.1, SLT Receiver Timer). While the DTMF receiver is monitoring the digits being dialed, by a single line telephone, it is considered busy and not available for monitoring another SLT attempting to dial. When all DTMF receivers are busy, an SLT attempting to go off-hook will not receive dial tone until a receiver is available. The system allows up to seven (7) DTMF receivers to be installed in the system for monitoring SLT dialing. If a system has heavy SLT usage toll restriction may inhibit dialing by SLT stations. Two options are available to help alleviate this problem; 1) shorten the SLT receiver timer (refer to Sec. 610.1). This will free up DTMF receivers faster, however, may not provide the desired toll restriction for SLT stations; 2) Enable LCR and force LCR on SLT stations. When the LCR data base is set up the three digit table allows for entry of the number of digits to be expected. When a SLT dials the appropriate number of digits LCR will release the DTMF receiver and then be available for another SLT call.

**D. LCR VS. Toll Restriction**

LCR is not intended to be an alternative to toll restriction nor is toll restriction intended to be a alternate to LCR. In fact they both work best when programmed together. Toll restriction provides the dialing privileges that stations are allowed and LCR provides the routing of calls onto the proper type of lines. LCR can enhance toll restriction in that LCR provides a "Store and Forward" operation that allows the system to analyze the digits being dialed before a trunk is seized. This prevents users from by-pass-

ing toll restriction by taking advantage of the time it takes for a central office line to provide dial tone. Because of this it is recommended that LCR be considered when toll restriction is desired.

650.3 TOLL RESTRICTION PROGRAMMING

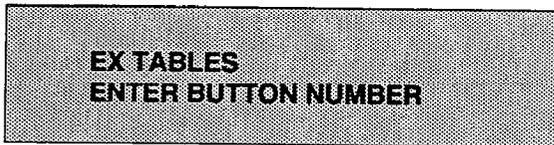
A. Entering Toll Table Programming

Programming Steps

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. (Refer to Sec. 600.2).

*NOTE: It is recommended that the Exception Tables be initialized prior to entering data into the tables. Do this by following the instructions in Sec. 600.5 for initializing the Exception Tables (Flash 80). This procedure may also be repeated if it is determined that data in the exception tables has become corrupt. However, after initializing the exception tables, for this purpose, all data must be re-entered into the tables.*

1. Press FLASH and dial [70]. The following message will be shown on the display phone:



2. To program allow/deny tables, press the appropriate Table button and enter information as outlined in the following procedures.
3. To program Special Tables 1-3, it is necessary to associate an area code to the table. This is done by pressing the appropriate "AREA-CODE TBL" button and assign the area code.

*NOTE: Special Table 4 is reserved for the home area code and does not require a area code entry.*

4. To display entries in any of the tables, press the DISPLAY TABLES button (button #12). Entries in the allow/deny tables will display two at a time. Entries in the special tables will be displayed six (6) at a time in ascending order.

Description

All toll tables have been conveniently placed under one program code to allow entry of all toll restriction data. When entering toll information the buttons on the phone will be mapped as follows:

Q 1	ALLOW TABLE A	AREA CODE TBL3	11 A
W 2	DENY TABLE A	DISPLAY TABLES	12 S
E 3	ALLOW TABLE B		13 D
R 4	DENY TABLE B		14 F
T 5	SPECIAL TABLE 1		15 G
Y 6	SPECIAL TABLE 2		16 H
U 7	SPECIAL TABLE 3		17 J
I 8	SPECIAL TABLE 4		18 K
O 9	AREA CODE TBL1		19 L
P 10	AREA CODE TBL2		20 ;

When the system searches the allow and deny tables, the entries are checked starting with Bin 01 and proceeding sequentially through the table to the last bin. In addition The allow table is always searched before looking at the deny table. Therefore the order of entry is important. Entries that are specific (i.e. [1 716]) should be placed ahead of entries that are more general (usually include "Don't Care" digits i.e. [1 "D" 1]).

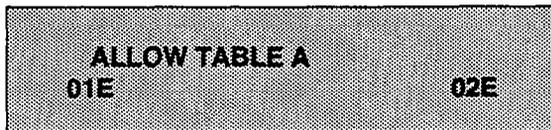
Once a match is found, in the allow table, that references a special table the number dialed will be checked for an allowed code in the special table. If a match is not found in the special table the system will continue to check for a match in the next allow or deny table that is to be checked. The system will not return to the table that sent the call to the special table.

## Exception Tables Programming (Cont'd)

### B. Allow Table Programming

#### Programming Steps

1. Press the ALLOW TABLE A or ALLOW TABLE B flexible button (Button #1 or #3). The following display will be shown on the display telephone:



The first two bins locations are displayed.

2. Enter the two-digit bin number (01-20) of the bin to be programmed.

*NOTE: It is recommended that:*

*Bin 17 be reserved for an entry that will reference special table number 1;*

*Bin 18 be reserved for an entry that will reference special table number 2;*

*Bin 19 be reserved for referencing special table number 3;*

*Bin 20 be reserved for referencing the Home area code table, special table number 4.*

3. Enter the allow code:

where:

0 to 9, \*, # = corresponding allow digits (numbers)

MUTE = Don't Care digit ("D")

TRANS = search special table ("S")

4. Press HOLD button after each entry.

5. When all entries for one table are complete, press the flexible button for the next table.

The following rules should be applied when making entries that will reference the special tables:

1. For entries referencing the first three special tables a specific area code must be identified (one for each table needed). Then make note as to how the numbers will be dialed when dialing numbers to this area code (i.e. with a leading digit [1] or no leading digit [1]). The entry into the allow table would be entered as follows:

Leading digit [1] - BB 1 XXX DDD {S}

or

Non Leading [1] - BB XXX DDD {S}

Where:

BB = Bin number (recommended 17-19)

#### Description

**Allow Table** - Each Allow table contains twenty (20) bin numbers. Each bin number may be up to eight (8) digits in length including {Don't Care} digits and {Search Special Table} commands. Entries into the allow table represent exceptions to numbers or codes that are to be allowed only if they would otherwise be restricted by an entry in the deny table. For example if [1 555 1212] is to be allowed but [1+] numbers are denied, by an entry into the deny table, then [1 555 1212] should be entered into the allow table as an allowed number.

- Allow table A is referenced and searched first (before the deny table A) when Station COS is 2 and CO line COS is either 1 or 2.
- Allow table B is referenced and looked at first (before the deny table B) when Station COS is 3 and CO line COS is either 1 or 3.
- When station COS is 4 and CO line COS is 1 both allow tables are looked at first (allow table A first then allow table B) then both deny tables (deny table A first then deny table B).

**Don't Care** digits specify that the system should consider any digit dialed in that position as a match. Don't Care digits should not be entered as the last digit in an entry, as this would be an unnecessary or meaningless command.

**Search Special Table** commands must be entered in a specific manner and should always be placed as the last entries in the Allow table. It is recommended that the last four bins (17-20) in the allow table be reserved for referencing the four (4) special tables with the reference to the home area code (special table 4) always being located in bin number 20. Search Special table commands can only be entered into the allow tables.

To erase a bin, enter the two-digit bin number following by pressing the HOLD button.

**Exception Tables Programming (Cont'd)****Allow Table Programming (Cont'd)**Programming StepsDescription

XXX = Area code (must match AREA-X entry)

DDD = "Don't Care" digit (three entries,  
DND button)

{S}= Search Special Table Command  
(TRANS button)

2. For an entry that is to reference the Home Area Code table (special table 4) the entry may also be entered to expect or not expect a leading digit [1]. In fact in some cases it may be desirable to enter both of the following entries;

Leading digit [1] - BB 1 DDD {S}

and/or

Non Leading [1] - BB DDD {S}

Where:

BB = Bin number (recommended bin 20)

DDD = "Don't Care" digit (three entries,  
MUTE button)

{S}= Search Special Table Command  
(TRANS button)

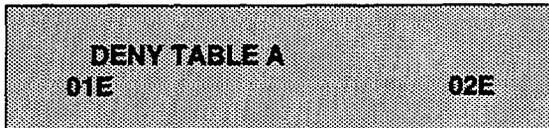
*NOTE: If both leading digit [1] and non-leading digit [1] entries are made to reference the same table it is necessary to place the leading digit [1] entry ahead of the non-leading digit [1] entry in the allow table.*

## Exception Tables Programming (Cont'd)

## C. Deny Table Programming

Programming Steps

1. Press the DENY TABLE A or DENY TABLE B flexible button (Button #2 or #4). The following display will be shown on the display phone:



The first two bin locations are displayed.

2. Enter the two-digit bin number (01-10) of the bin to be programmed.
3. Enter the deny code:  
where:  
0 to 9, \*, # = corresponding deny digits (numbers)  
MUTE = Don't Care digit
4. Press HOLD button after each entry.
5. When all entries for one table are complete, press the flexible button for the next table.

Description

**Deny Table** - Each Deny table contains ten (10) bin numbers. Each bin number may be up to eight (8) digits in length including {Don't Care} digits. Entries in the deny table represent numbers or codes that are to be denied or restricted. Common entries would be [1] for restricting all [1+] type of calls. Exceptions to this restriction would be entered into the allow table.

- Deny table A is referenced and searched only after the allow table A is checked when Station COS is 2 and CO line COS is either 1 or 2.
- Deny table B is referenced and searched only after the allow table B is checked when Station COS is 3 and CO line COS is either 1 or 3.
- When station COS is 4 and CO line COS is 1 both allow tables are looked at first (allow table A first then allow table B) then both deny tables (deny table A first then deny table B).

**Don't Care** digits specify that the system should consider any digit dialed in that position as a match. Don't Care digits should not be entered as the last digit in an entry.

Search Special table commands can not be entered into the Deny tables.

To erase a bin, enter the two-digit bin number followed by pressing the HOLD button.

Exception Tables Programming (Cont'd)

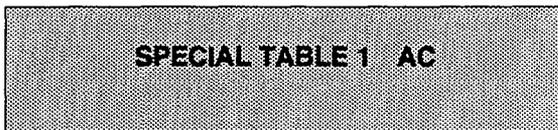
D. Special Table Programming

Programming Steps

To program a special table, it is first necessary to assign an area code to the table (except for the home area code).

To assign an area code to a special table:

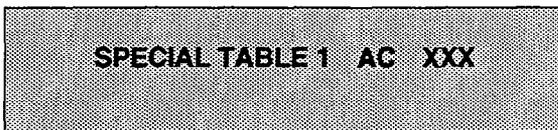
1. Press the appropriate AREA CODE TABLE (1-4) flexible button (button #9-11). The following display will be shown on the display phone:



2. Enter the three (3) digit area code.
3. Press the HOLD button. The display will now update.

To enter office codes into the special table:

4. Press the SPECIAL TABLE (1-4) flexible button (button #5 - #8) that corresponds to the area code programmed above. The following display will be shown on the display phone:



Where:

XXX= Area Code

5. Enter the three (3) digit office codes that are to be allowed followed by a [1] which means to allow this code. To remove a code from the allow list enter the three (3) digit office code followed by a [0] which will remove the code from the allow list.

XXX [1] = Allow code

XXX [0] = Remove code from the list

Where XXX = an office code from 200 to 999.

6. Press HOLD after every code entered. Multiple codes may be entered in a row. The display will update showing the first six codes in ascending order.

Description

The special tables provide greater flexibility in designing a toll plan for a particular site. Each special table allows entry of up to 800 three digit office codes (200 - 999). Three of these tables must be assigned an area code by which they are referenced. The fourth table is reserved for the home area code and requires no area code entry.

The special tables are referenced through entries in the allow tables. Four area codes, including the home area code, can be referenced to these special tables for further definition. When a special table is referenced, entries must be made in the special table specifying what office codes will be allowed. By default no codes are on the allow list.

Codes can be added to the allow list or removed from the list. When a special table is checked for a match, to a three digit code, but not found the system will then continue to search the next allow deny table that is to be checked. The system does not return to the allow table which routed the call to the special table.

## Exception Tables Programming (Cont'd)

### E. Displaying Toll Table Entries

<u>Programming Steps</u>	<u>Description</u>
<p>To display entries in either the Allow/Deny tables or the special tables:</p> <ol style="list-style-type: none"> <li>1. Press the DISPLAY TABLES flexible button (button #12) while entering information into a table.</li> <li>2. While viewing entries made into an allow or deny table, two (2) entries at a time will be displayed on the bottom line of the display. By pressing the DISPLAY TABLES button again, the next higher bins will be displayed. When the last entries are displayed pressing the DISPLAY TABLES button again will show the first two entries.</li> </ol>	<p>It is possible to view entries in the toll tables using the display on the Executive telephone. To view all entries, the DISPLAY TABLES flexible button (Button #12) is pressed multiple times to scroll through the entries.</p> <p><i>NOTE: It is recommended to view all entries in the Allow and Deny table before leaving programming. Entries can be entered near the bottom of the list either for searching the special tables or entries that may have been made in error. Viewing the entire allow table will ensure proper entry and operation.</i></p>

```

ALLOW TABLE A
01 XXXXXXXE 02 XXXXXXXX

```

Where:

X= Allow or Deny Code

E= End of Entry

While viewing entries in a special table, six (6) three digit codes, that have been allowed, will be displayed in ascending order starting with the lowest entry. By pressing the DISPLAY TABLES button again, the next six (6) entries will be displayed. This will continue until all codes have been displayed.

```

SPECIAL TABLE 1  AC  XXX
YYY YYY YYY YYY YYY YYY

```

Where:

XXX= Area Code

YYY= Allowed Office Code

## SECTION 655

# LEAST COST ROUTING PROGRAMMING

### A. Introduction

Least Cost Routing (LCR) selects the most economical programmed route for an outgoing call. When a station user dials an outside number, the LCR feature analyzes the number and then automatically chooses an outside line from the group that has been programmed as most economical. The LCR feature puts the responsibility of choosing the least expensive route for each area code and exchange code on the system administrator, not on the station user. In order to make a routing decision, the LCR feature is programmed in the system database. The successful operation of this feature is completely dependent on the accuracy of the programming.

There are eight (8) different tables which are set up to monitor the dialing of digits and to select the best route for the call depending on time of day and day of week.

These tables are:

- Three (3) Digit Area/Office Code Routing Table
- Six (6) Digit Office Code Routing Table
- Exception Table
- Route List Table
- Insert/Delete Table
- Daily Start Time Table
- Weekday (Weekly) Schedule
- Toll Information Table

### B. LCR Operation

The system first checks to see if the number dialed is more than two digits. If it is two digits or less, the call is processed according to instructions in the Exception Table. If the number is not found in the Exception Table, the call is denied.

If the number is more than two digits, it goes to the 3 Digit Table. If the first digit dialed is a "1" the leading 1 table will be checked with the following three digits. If the first digit dialed is not a "1" then the first three digits are checked against the Non-Leading 1 three digit table. The first three digits (either office code or area code) are then checked to see if they are in the 3 Digit Table. If they are not found there, the call is denied. If the digits are found in the 3 Digit Table, the system then checks for an entry to see if the 6 Digit Table must be referenced.

If the 6 Digit column is marked [yes] in the three digit table entry, the number is then checked in the 6 Digit Table.

There are twenty (20) six digit tables. Each six digit table is programmed and becomes associated to a specific area code with a selected route. Office codes are entered into the six (6) digit table that will be routed to a specific route list table. This allows the system administrator to split area codes for routing to different lines connected to the system. This helps when Foreign Exchange lines (FX Lines), Banded WATS lines, or "Dedicated" Lines (OPX's from another system) are in use.

If the office code is not found in the 6 Digit Table, the call is referred back to the 3 Digit Table for selecting a route list table. And then goes through the same procedures as described below.

Before actually selecting a route list table, the number is checked against the toll restriction tables (station COS). When LCR is enabled, only station Class of Service is referenced. CO line Class of Service is no longer applicable. All CO lines are considered Class of Service 1.

If the call is not allowed through the toll restriction tables, the call is denied. If it is allowed, the call then goes to the Route List Table as specified by either the three (3) digit or six (6) digit table.

The Time of day and Day of week is determined and the call is presented to the corresponding time period route within the specified route table. Each of the sixteen (16) Route Tables contain four time sensitive

routes. Routes are determined by the time of day and day of week as specified in the Daily Start Time table and the Weekly Schedule table.

After the appropriate route is selected, LCR Class of Service becomes applicable. A station can use only those line groups programmed with a priority number equal to or higher than the station's LCR Class of Service.

If a line is not available in the first choice line group, the system advances to the next choice line group and searches for a free line. This process continues until an available line is found, or the last available line group is searched, or until a line group is reached with a priority assignment lower than the station's LCR Class of Service assignment.

When a line is available the system will seize that line and wait for dial tone. Then before dialing, the system checks the Insert/Delete table for digits that should be deleted from the front of the number or digits that should be inserted either before or after the number dialed. Finally the system begins to dial the number out over the selected line. All of this analyzing and manipulation of the number takes only a fraction of a second from the time the station user begins to dial until the number is dialed out over the public network lines.

If no lines are available in any of the CO line groups programmed for that route and allowed to that station, the call can be automatically queued on to the first choice (least costly) line group. If the user waits three seconds after dialing the number, they will hear confirmation tone which indicates that an automatic LCR Queue Callback has been activated on the first choice line group. When a CO line becomes available in the first choice line group the system will ring the calling station. When answered by the station the system will automatically seize the line and redial the number.

**LCR PROGRAMMING (Cont'd)**

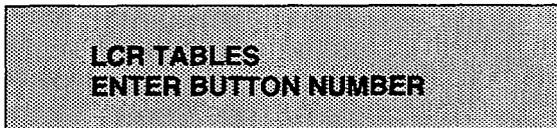
**C. LCR Programming**

Programming Steps

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. (Refer to Sec. 600.2).

To program the system for Least Cost Routing:

1. Press FLASH and dial [75]. The following message is shown on the display phone:



2. There are eight tables which can be programmed here for LCR (you must also program LCR Class of Service in Station Programming). Use the procedures listed below to program these LCR tables:

*NOTE: It is extremely important that the worksheets be completed before programming the LCR tables.*

Description

The Least Cost Routing (LCR) feature allows for the automatic selection of the most economical trunk according to the number dialed and the time of day and day of the week. There are eight different tables which are set up to monitor the dialing of digits of a station and to select the best route programmed for the call. These tables are:

- Three (3) Digit Area/Office Code Routing Table
- Six (6) Digit Office Code Routing Table
- Exception Table
- Route List Table
- Insert/Delete Table
- Daily Start Time Table
- Weekday (Weekly) Schedule
- Toll Information Table

When programming LCR the flexible buttons are mapped as follows:

Q 1	3-DIGIT TABLE		T1 A
W 2	6-DIGIT TABLE		T2 S
E 3	EXCEPTION TABLES		T3 D
R 4	ROUTE LIST TABLE		T4 F
I 5	INSERT/DELETE TABLE		T5 G
T 6	DAILY TIME TABLE		T6 H
U 7	WEEKLY TIME TABLE		T7 J
J 8	TOLL INFORMATION		T8 K

**Default:** The three digit tables contain a default where all Long distance (numbers requiring an area code) with a leading digit "1" are routed to Route List Table 00. Route List Table 00 will route calls on lines in group 1 for all time periods. All Local calls (numbers that are dialed without an area code) with or without a leading digit "1" are routed to route list table 01. Route table 01 also routes calls using lines in line group 1 for all time periods. Refer to the LCR Data Base printout Table 665.7 for a complete listing of the LCR default data.

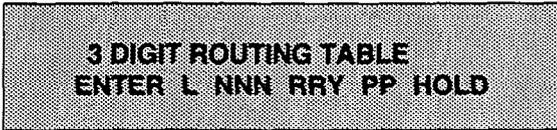
**Related Programming:** LCR Enable/Disable, Sec. 610.23; Station Class of service and station LCR Class of service in Sec. 630.

LCR PROGRAMMING (Cont'd)

D. 3-Digit Area/Office Code Table

Programming Steps

1. Press 3-DIGIT TABLE flexible button (Button # 1). The following message will be shown on the display phone:



Where:

- L = [0] for non leading 1("1" not dialed)  
[1] for leading 1("1" is dialed)
- NNN = area/office code
- RR = route list number 00-15
- Y = [0] do not go to 6 digit table  
[1] go to 6 digit table
- PP = number of digits expected to be dialed.

2. Press the HOLD button to enter the data. Display will now update.

Description

**3 Digit Area/Office Code Table.** This table is divided into two sections - Leading 1 (a [1] is dialed before the number) and Non Leading 1 (no [1] is dialed before the number). This gives the system the ability to handle call routing in areas that require a [1] before a long distance number, as well as in areas that do not require the [1].

Both of these tables include all area codes (NPA's), and office codes (NXX's), from 000 to 999, including such numbers as 911, 411, etc. A complete entry into these tables include a route list table to be used, if the 6 Digit Table is to be checked and the number of digits likely to be dialed (example 7 digits or 10 digits).

All local office codes must be entered in this table even if they do not require long distance calling.

The number of digits to expect entry will aid the system in identifying when the last digit is dialed and to begin routing the call. This also helps to free SLT DTMF receivers if SLT traffic in the system is heavy.

For international calls, use "00" as number of digits to expect. This causes the system to wait 5 seconds after user dials last digit before the system accesses a CO line and dials out.

Appendix A-13 3-Digit Area/Office Code Route List Table

NON-LEADING (0) LEADING (1)	CODE (NNN)	RTE (RR)	6 DIG(6) (Y/N)	# DIG	NON-LEADING (0) LEADING (1)	CODE (NNN)	RTE (RR)	6 DIG(6) (Y/N)	# DIG
0					0				
1					1				
0					0				
1					1				
0					0				
1					1				
0					0				
1					1				
0					0				
1					1				
0					0				
1					1				
0					0				
1					1				
0					0				
1					1				
0					0				
1					1				

Figure 655-1 Ex: 3-Digit Area/Office Code Table Pgm Form



**LCR PROGRAMMING (Cont'd)**

**F. Exception Code Table**

Programming Steps

1. Press EXCEPTION TABLES flexible button (Button #3). The following message will be shown on the display phone:

**EXCEPTION CODE TABLE  
ENTER S XX RR HOLD**

Description

**Exception Table.** This table is used for operator calls and any other calls which would use a one- or two-digit entry rather than a three-digit area code.

Where:

- S = [0] to remove code from table
- [1] to add code to table
- XX= exception codes  
(for single digit codes, press MUTE button (flexible button 27) as 2nd digit).
- The digits [\*] and [#] may be entered as valid digits.
- RR= route table number, 00-15

2. HOLD must be pressed after each entry. Display will now update.
3. Press Button #3 again for further entries. Up to 20 Exception codes may be programmed in this table.

**Appendix A-15 LCR Exception Code Table**

CODE #	EXCEPTION CODES (XX)	ROUTE (00-15) (RR)	CODE #	EXCEPTION CODES (XX)	ROUTE (00-15) (RR)
1			11		
2			12		
3			13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

**Figure 655-3 Ex: Exception Code Table Pgm Form**

**LCR PROGRAMMING (Cont'd)**

**G. Route List Table**

Programming Steps

1. Press the ROUTE LIST TABLE flexible button (Button #4). The following message will be shown on the display phone:

**ROUTE LIST TABLE  
ENTER RR T G DD L HOLD**

Where:

- RR = Route List Table number 00-15
- T = Time Period Route list 1-4
- G = CO Line Group 1-7
- DD = Insert/Delete Table reference 00-19  
(## for none)
- L = LCR Class of Service (LCOS)

2. Press HOLD. Display will now update.
3. To enter additional CO line groups in the same time period route list number: Dial G DD L HOLD

To enter data for a different time period route list:

4. Press program button 4 and enter all data (RR T G DD L).
5. Repeat above to program a new Route Number 00 to 15 or press a flexible button to program other LCR data.

**Table 655-1 LCR Class of Service Table**

Allowed access to Route	LCR CO Line Group Priority							
	0	1	2	3	4	5	6	
STATION LCR COS	0	Y	Y	Y	Y	Y	Y	Y
	1	N	Y	Y	Y	Y	Y	Y
	2	N	N	Y	Y	Y	Y	Y
	3	N	N	N	Y	Y	Y	Y
	4	N	N	N	N	Y	Y	Y
	5	N	N	N	N	N	Y	Y
	6	N	N	N	N	N	N	Y

N= Cannot use Line Group  
Y= Has access to Line Group

Description

**Route List Table.** Up to sixteen different Route list tables can be programmed. Each route list table contains four time period routing lists, one for each of the available (four) daily start time periods. Within each time period route list up to seven CO (outside) line groups and their corresponding Insert/Delete Table if any and LCR class of service priority are programmed on a per line group basis.

When routing a CO call through LCR, CO Line groups are accessed in sequence so that the first line group entered represents the least costly (and first selected) and the last line group entered represents the most costly (and last selected).

The Route List Table references many other tables when processing a call for routing. First of all, the Daily start time table is referenced to determine what start time entry should be checked in the weekly schedule table. The corresponding entry in the weekly schedule table depending on the day of the week then determines which Time Period Route list should be used within the Route List Table.

The system then begins to check for idle lines in the first entered CO line group and will proceed until an idle line is found. While it is searching for an idle CO line the Station LCR COS is checked against the entries for LCR COS Priority of the specific CO line groups (see LCR COS Priority explanation below). Once an idle CO line is found with a LCR priority equal to or higher than the stations LCR COS then a final check is made to determine if an Insert/Delete table should be referenced. Once all of the tables and entries are checked the system then processes the call on the outside CO line.

*NOTE: Make sure you have made entries into all Time Period Route List that are referenced in the weekly schedule table.*

**LCR COS Priority.** A station should be assigned a class of service for LCR (refer to station programming ,Sec. 630.1). The LCR COS can be between 0 and 6, with 0 being unrestricted and 6 being the most restrictive. Within the time period route List Table, line groups are given an LCR COS Priority assignment between 0 and 6. A station using LCR will be able to use only those CO (outside) line groups with a priority assignment of equal or higher value than the station's LCR Class of Service (i.e. a station with LCOS 3 can use line groups with a priority of 3-6).

LCR PROGRAMMING (Cont'd)

H. Insert/Delete Table

Programming Steps

1. Press INSERT/DELETE TABLE flexible button (button #5). The following message will be shown on the display phone:



Enter the table information as follows;

Where:

TT = Insert/Delete Table Number 00-19

X = [0] Pre-Delete numbers (first digits dialed in the number)

[1] Pre-Insert numbers (insert digits in front of number dialed)

[2] Post-Insert numbers (insert digits behind number dialed)

DDD = digits (up to 16 digits may be deleted from the beginning of the number dialed and up to 40 digits can be inserted (20 pre and 20 post)).

2. Press HOLD after programming each table. Display will now update.

To add and delete numbers in the same table, enter the different insertion / deletion tables in step 2 and enter as separate entries using the same table number.

In the Insert Tables for LCR programming, press the TRANS button for a pause. Also both the [\*] and [#] digits are allowed as valid digits for inserting digits dialed over the network. The [\*] and [#] are valid entries for adding digits in both the pre (in front of) or post (behind the number) tables.

The [\*] and [#] can not be used as delete characters in the Delete Tables.

Description

**Insert/Delete Table.** Digits can be either added or deleted when dialing a number. For instance, if a user dials a long distance call that should be placed on a foreign exchange (FX) line, the digit [1] and the three digit area code (NPA) dialed by the user must be deleted before the call can be placed on that FX line. An Insert/Delete Table can be programmed to do this. Digits can also be added to a number that has been dialed by the user. For instance, Other Common Carrier (OCC) access codes and authorization (ID) codes can be automatically inserted by the system either in front of and/or behind the number dialed.

There are twenty Insert/Delete Tables and each table allows for entries into a delete table and a pre and post insert table. Up to forty (40) digits (including pauses) can be inserted (twenty (20) pre and twenty (20) post) and up to sixteen digits can be deleted. Digits can be inserted before or after the number dialed but can be deleted only from the start of the number dialed.

Appendix A-12 Insert/Delete Tables

TABLE	DIGITS DIALED	
00	INSERT	PRE
		POST
	DELETE	(PRE)
01	INSERT	PRE
		POST
	DELETE	(PRE)
02	INSERT	PRE
		POST
	DELETE	(PRE)
03	INSERT	PRE
		POST
	DELETE	(PRE)
04	INSERT	PRE
		POST
	DELETE	(PRE)
05	INSERT	PRE
		POST
	DELETE	(PRE)
06	INSERT	PRE
		POST
	DELETE	(PRE)
07	INSERT	PRE
		POST
	DELETE	(PRE)
08	INSERT	PRE
		POST
	DELETE	(PRE)
09	INSERT	PRE
		POST
	DELETE	(PRE)
10	INSERT	PRE
		POST
	DELETE	(PRE)
11	INSERT	PRE
		POST
	DELETE	(PRE)
12	INSERT	PRE
		POST
	DELETE	(PRE)

Figure 655-4 Ex: Insert/Delete Pgm Form

LCR PROGRAMMING (Cont'd)

I. Daily Start Time Table

Programming Steps

1. Press the DAILY START flexible button (button #6). The following message will be shown on the display phone:

**DAILY START TIME TABLE**  
**HHMM HHMM HHMM HHMM HOLD**

2. Enter times in military form (2400 Hours) in succession. Pressing the HOLD button after each time entered. Default times are 0800, 1700, 2300 (8 AM, 5 PM, and 11 PM), and the fourth time is disabled (####). To change a start time all times must be re-entered.
3. Display will now update. #### will display if nothing is entered for a specific time.

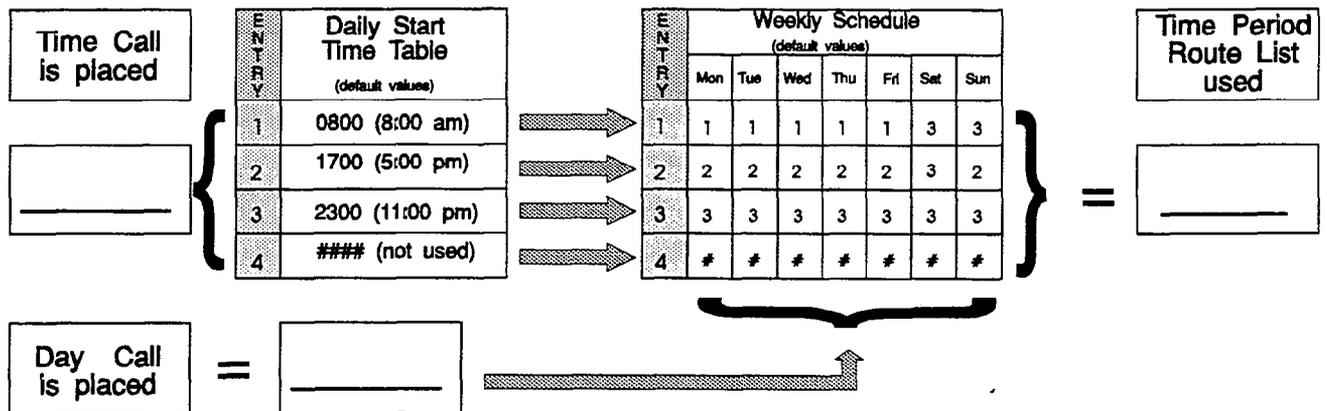
Description

**Daily Start Time Table.** The daily start time table is used to correlate the LCR routing table to the time sensitive discount structure offered by the customers carrier. For example in the most common situation the most expensive rate period is between 8:00 am and 5:00 pm, often called the day rate. The first discount period usually starts at 5:00 pm and runs until 11:00 pm, often called Evening Rates. The remaining time (from 11:00 pm until 8:00 am) in this example is referred to as night time rates which usually has the biggest discount. With the wide selection of Common Carriers the least costly route for a particular area code may be different at different times of the day. To accommodate this situation, this table and the Weekly Schedule Table work together, dividing the day into four possible time periods. By default these tables are set at the standard divisions of 8AM, 5PM, and 11PM. However, these times can be changed.

The entries in the Daily Start Time table are used to select the time period to reference in the weekly schedule. Based on the time a call is placed the daily start time table selects the time period to choose in the weekly schedule. The weekly schedule is then used to determine the time period route list in the Route List Table to use for routing the call for a particular day of the week.

The times are entered in the 24 hour format.

Table 655-2 Daily Start Time & Weekly Schedule Tables



LCR PROGRAMMING (Cont'd)

J. Weekly Schedule Table

Programming Steps

1. Press the WEEKLY SCHED flexible button (button #7). The following message will be shown on the display phone:



Where: D= Day of the Week

- 0= Monday
- 1= Tuesday
- 2= Wednesday
- 3= Thursday
- 4= Friday
- 5= Saturday
- 6= Sunday

T = Time Period Route List (1-4) to use for the time of day (based on the daily start time table). Enter values for all time periods specified in the daily start time table for that day.

- 1st T = Time Period Route list for the FIRST Daily Start Time. (applies to all Route List Tables)
- 2nd T = Time Period Route List for the SECOND Daily Start Time. (applies to all Route List Tables)
- 3rd T = Time Period Route List for the THIRD Daily Start Time. (applies to all Route List Tables)
- 4th T = Time Period Route List for the FOURTH Daily Start Time. (applies to all Route List Tables)

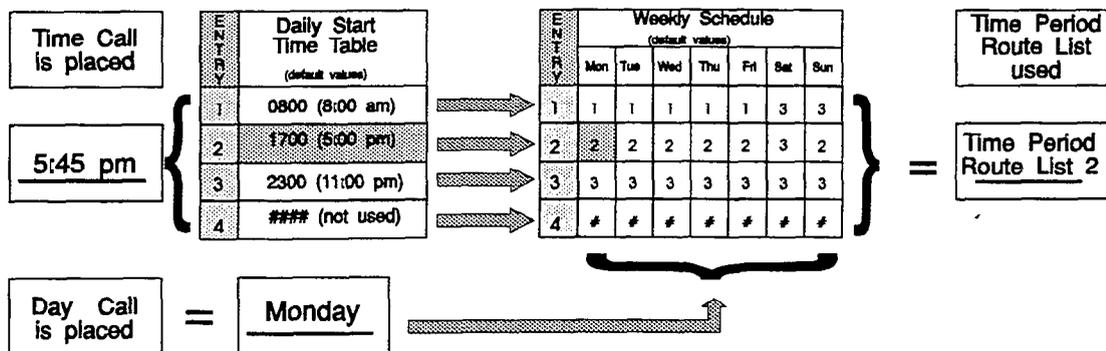
2. Press HOLD button after each complete daily entry. Display will now update.

Description

**Weekly Schedule Table.** The weekly schedule table determines what Time Period Route list to use within the Route List Table. When a call is placed and ultimately sent to a route list (call is not denied) based on the time of day the call is placed the Daily Start Time Table (see description above) selects the time period to reference in the weekly schedule table. The time period route entered for the specified time period, as determined in the daily start time table and based on the day of week, is then selected and the call will be routed according to the specified time period route list.

For example: if a call is placed at 5:45 pm on a Monday then according to the daily start time table (using default values) the entry for time period two of the weekly schedule is checked. Because it is Monday the entry for time period two on Monday is used and the result is that the Time Period Route List number two (again using default values) will be used for all routes. Thus the call is routed according to the entries in Time Period Two (2) route list no matter what route (00-15) is selected. Refer to Table 655.3 below.

Table 655-3 Ex: Daily & Weekly Start Time Tables



**LCR PROGRAMMING (Cont'd)**

**K. LCR Routing for Toll Information**

Programming Steps

1. Press TOLL INFO flexible button (button #8)  
The following message will be shown on the display phone:

**LCR ROUTE FOR 555-1212  
ENTER ROUTE**

2. Enter 2-digit Route List number (00-15) for the Route to be referenced in the Route List Table.
3. Press HOLD after programming the Route number. Display will now update.  
Enable LCR at this point. Refer to System programming.

Description

Toll Information routing adds provisions to the LCR call processing which will allow common call routing for all toll information calls. Both 1-(XXX)555-1212 and (XXX)-555-1212 calls will be intercepted and sent to a selected "Route List" in the "Route List Table". The number dialed will be "looked at" before reaching the "Three Digit Table" and if it is determined to be a toll information call, preceded with an area code with or without a leading digit 1, the call will be sent to the "Route List" assigned in the toll information table.

Default programming for Toll Information Calls will be to Route List Table zero (0) which will allow toll information calls to be placed on the system at default.

A Toll Information route will be chosen over a 3-digit or 6-digit route assignment if both are assigned.

Entering ## will deny all Toll Information calls.

*NOTE: Local information calls (555-1212 or 1-555-1212) must be programmed separately within the 3-Digit Area/Office Code Table.*

TOLL INFORMATION ROUTE LIST TABLE	DEFAULT 00	
-----------------------------------	---------------	--

**Figure 655-5 Ex: LCR Toll Information Routing Pgm Form**

LCR PROGRAMMING (Cont'd)

L. Default LCR Data Base

Programming Steps

Description

In an effort to decrease installation and set up time, usually associated with LCR, a default LCR data base has been incorporated. The default LCR data base will provide basic routing for local and long distance dialing. Default entries have been made in the Three Digit Table for local office codes (NNX's) and all area codes (NPA's). Two routes have been established with the default data base for routing of all calls under default. The entire default data base is shown in Table 665.7.

The three digit tables contain a default where all Long distance (numbers requiring an area code) with a leading digit "1" are routed to Route table 00. Route Table 00 will route calls on lines in group 1 for all time periods. All Local calls (numbers that are dialed without an area code) with or without a leading digit "1" are routed to route list table 01. Route list table 01 also routes calls using lines in line group 1 for all time periods.

# SECTION 660

## INITIALIZE DATA BASE PARAMETERS

### A. Introduction

#### Programming Steps

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. (Refer to Sec. 600.2).

If Data Base Parameters need to be initialized:

1. Press FLASH and dial [80]. The following message will be shown on the display of a display phone:

**INITIALIZE DATA-BASE  
ENTER BUTTON NUMBER**

#### Description

This section describes the procedures and steps necessary to initialize the system data base returning any programmed data to its original or default value. The entire system data base may be initialized or various portions of the data base may be individually initialized. In addition to initialization of the entire data base, a system reset (Button 8) command is also included in this section for clearing meantime errors.

The buttons on the programming terminal are defined as shown below when initializing or resetting the system data base.

G 1	SYSTEM PARAMETERS	11 A
W 2	CO LINE ATTRIBUTES	12 B
E 3	STATION ATTRIBUTES	13 D
R 4	GROUP PARAMETERS	14 F
T 5	TOLL TABLES	15 G
Y 6	SYSTEM SPEED	16 H
U 7	LCR TABLES	17 J
I 8	SYSTEM & RESET	18 K
O 9	ICLID TABLE	19 L

**Initialize Data Base Parameters**

**B. Initialize System Parameters**

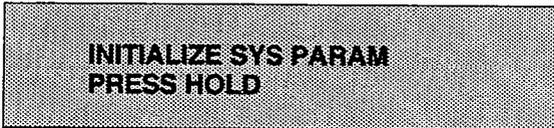
Programming Steps

Description

If System Parameters need to be initialized:

The system parameters may be initialized setting all data fields to their original, default values. The following data fields are returned to their default values upon initializing the System parameters;

1. Press the System Parameters flexible button (Button #1). The following message will be shown on the display phone:



2. To initialize the system parameters, press the HOLD button. Confirmation tone is heard.

PROGRAM CODE	FLEX BUTTON	FEATURE	DEFAULT VALUE (after initializing)
<b>SYSTEM TIMERS:</b>			
FLASH 01	1	System Hold Recall	060 seconds
	2	Exclusive Hold Recall	180 seconds
	3	Attendant Recall Timer	01 minutes
	4	Transfer Recall Timer	045 seconds
	5	Preset Forward Timer	10 seconds
	6	Call Forward No Answer	015 seconds
	7	Pause Timer	2 seconds
	8	Call Park Timer	180 seconds
	9	Conference/DISA Timer	10 minutes
	10	Paging Timeout Timer	15 seconds
	11	CO Ring Detect Timer	300 milliseconds
	12	DISA/SLT Receiver Timer	020 seconds
	13	MSG Wait Reminder Tone	000 minutes
	14	SLT Hook-flash Timer	10 (1 seconds)
	15	SLT Hook-flash Debounce	010 (.1 second)
<b>SYSTEM FEATURES:</b>			
FLASH 05	1	Attendant Override	NO (disabled)
	2	Hold Preference	System HOLD
	3	External Night Ringing	NO (disabled)
	4	Executive Warning Tone	NO (disabled)
	5	Page Warning Tone	YES (enabled)
	6	Background Music	YES (enabled)
	7	LCR Enable	NO (disabled)
	8	Forced Account Codes	NO (disabled)
<b>MISC. SYSTEM FEATURES</b>			
FLASH 10		Attendant Assignment	STA 100
FLASH 11	1-4	Time and Date Format	12 HR, M/D/Y
FLASH 12		PBX Dialing Codes	None

## Initialize Data Base Parameters (Cont'd)

## Initialize System Parameters (Cont'd)

	<u>Programming Steps</u>		<u>Description</u>
PROGRAM CODE	FLEX BUTTON	FEATURE	DEFAULT VALUE (after initializing)
MISC. SYSTEM FEATURES (Cont'd)			
FLASH 13	1	Exec/Secy Pair #1	None
	2	Exec/Secy Pair #1	None
	3	Exec/Secy Pair #1	None
	4	Exec/Secy Pair #1	None
FLASH 14	1	Relay/Sensor Programming	None
	2	Relay/Sensor Programming	None
	3	Relay/Sensor Programming	None
	4	Relay/Sensor Programming	None
	5	Relay/Sensor Programming	None
	6	Relay/Sensor Programming	None
	7	Relay/Sensor Programming	None
FLASH 20	1	DISA Access Code	000
	2	Data Base Admin. Access	[DBAM] 3226
FLASH 21	1	SMDR	NO (disabled)
	2	Reported Call Type	LD only
	3	Print Format	80 column
	4	SMDR Baud Rate	4800
	5	SMDR Reporting Port	Port 1
FLASH 22	1	Night Mode Operation	Manual
	2	ANM Schedule - Mon.	08:00/17:00
	3	ANM Schedule - Tues.	08:00/17:00
	4	ANM Schedule - Wed.	08:00/17:00
	5	ANM Schedule - Thur.	08:00/17:00
	6	ANM Schedule - Fri.	08:00/17:00
	7	ANM Schedule - Sat.	##:##/##:##
	8	ANM Schedule - Sun.	##:##/##:##

Initialize Data Base Parameters (Cont'd)

C. Initialize CO Line Attributes

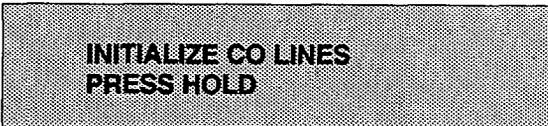
Programming Steps

Description

If CO Line Attributes need to be initialized:

1. Press the CO Line Attributes flexible button (Button #2). The following message will be shown on the display phone:

The CO Line parameters may be initialized setting all data fields to their original, default values. The following data fields are returned to their default value upon initializing the CO Line parameters;



2. To initialize the CO Line Attributes, press the HOLD button. Confirmation tone will be heard.

PROGRAM CODE	FLEX BUTTON	FEATURE	DEFAULT VALUE (after initializing)
FLASH 40	1	DTMF/Pulse Signaling	ALL Lines set for DTMF
	2	CO/PBX Marking	ALL Lines set for CO
	3	Universal Night Answer	Enabled on all Lines
	4	DISA TRK-to-TRK (Conf)	Enabled on all Lines
	5	Automatic Privacy	Enabled on all Lines
	6	Loop Supervision	NO (disabled on all lines)
	7	DISA Operation	NO (disabled on all lines)
	8	Flash Time	10 (1 second)
	9	Line Group Assignment	All Lines are in Group 1
	10	Line Class of Service	All Lines assigned COS1
	11	CO Line Ring Assignment	All Lines Ring at STA 100
FLASH 41	1	Dial Pulse Break/Make Ratio	60/40
	2	Dial Pulse Dialing Speed	10 pps

## Initialize Data Base Parameters (Cont'd)

## D. Initialize Station Attributes

Programming StepsDescription

If Station Attributes need to be initialized:

1. Press the Station Attributes flexible button (Button #3). The following message will be shown on the display phone:

**INITIALIZE STATIONS  
PRESS HOLD**

The Station parameters may be initialized setting all data fields to their original, default values. The following data fields are returned to their default value upon initializing the Station parameters;

2. To initialize the Station Attributes, press the HOLD button. Confirmation tone will be heard.

PROGRAM CODE	FLEX BUTTON	FEATURE	DEFAULT VALUE (after initializing)
FLASH 50	A/1	Page Access	Allowed (enabled)
	A/2	Do Not Disturb	Allowed (enabled)
	A/3	Conference	Allowed (enabled)
	A/4	Executive Override	Dis-allowed (disabled)
	A/5	Privacy Release	Dis-allowed (disabled)
	A/6	System Speed Dial	Allowed (enabled)
	A/7	Line Queuing	Allowed (enabled)
	A/8	Preferred Line Answer	Dis-allowed (disabled)
	A/9	Off-Hook Voice-Over	Dis-allowed (disabled)
	A/10	Call Forward	Allowed (enabled)
	A/11	Forced LCR	Not Required (disabled)
	B/1	Station ID	All Key Station default to Station ID 0 (keyset) All Single Line Telephones and OPX's default to ID 5 (SLT w/o MSG Wait)
	B/2	Station Class of Service	All Stations assigned COS 1
	B/3	Speakerphone Option	All Stations assigned option 1
	B/4	Pick-Up Group(s)	All Stations assigned into Group 1
	B/5	Paging Zone(s)	All Stations assigned into Zone 1
	B/6	Preset Forward Destination	None assigned
	B/7	CO Line Group Access	All Stations assigned access to Group 1
	B/8	LCR Class of Service	All Stations given an LCR COS of 0
	B/9	Off-Hook Preference	Is allowed to all stations with the ability to change the assignment
	B/10	Flex Button Assignment	See default button assignment

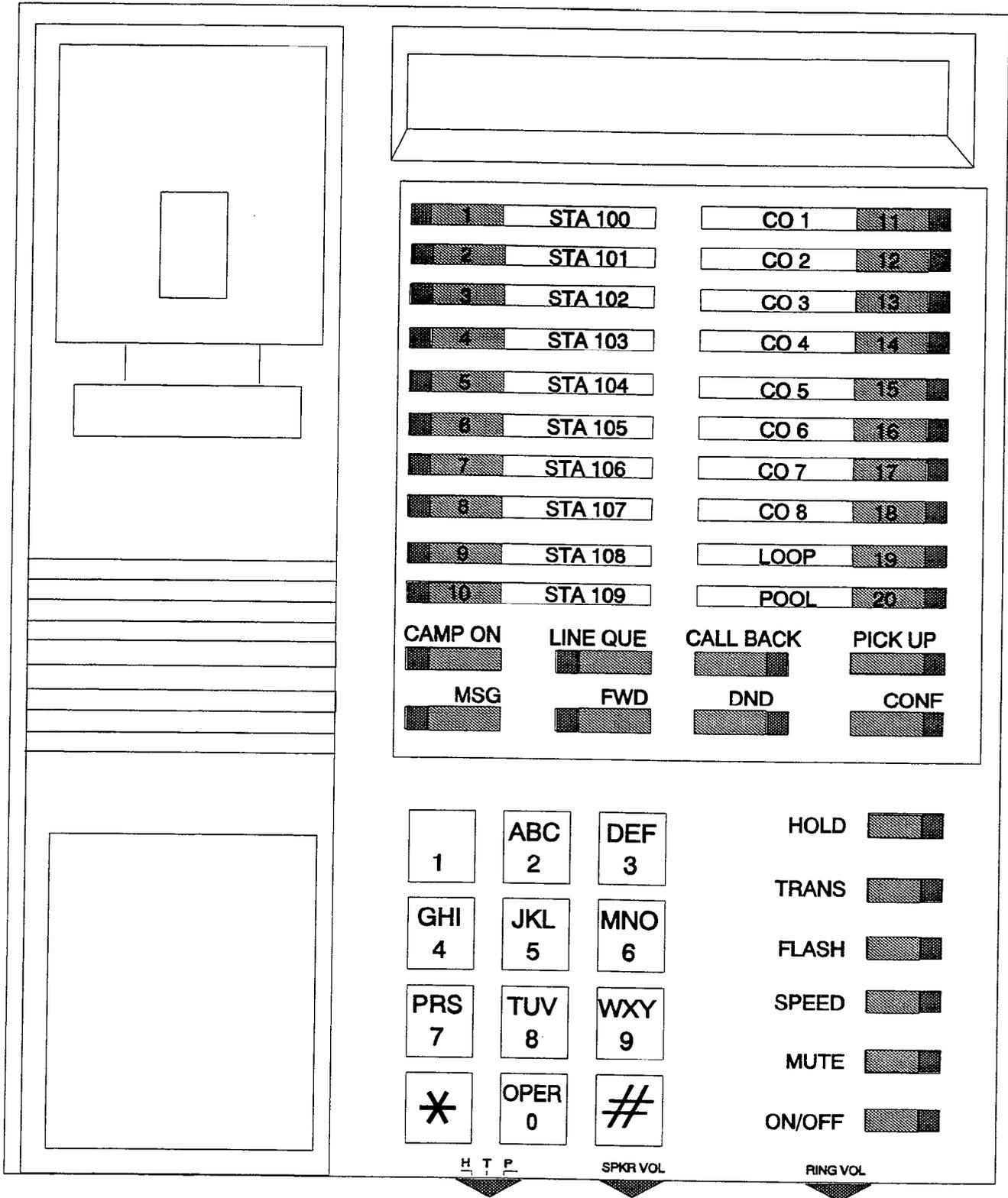


Figure 660-1 Default Button Mapping

## Initialize Data Base Parameters (Cont'd)

## E. Initialize Group Parameters

Programming StepsDescription

If Group Parameters need to be initialized:

1. Press the Group Parameters flexible button (Button #4). The following message will be shown on the display phone:

**INITIALIZE GROUP DATA  
PRESS HOLD**

Hunt, UCD and Voice Mail Group parameters may be initialized setting all data fields to their original, default values. The following data fields are returned to their default value upon initializing Group parameters;

2. To initialize the Group parameters, press the HOLD button. Confirmation tone will be heard.

PROGRAM CODE	FLEX BUTTON	FEATURE	DEFAULT VALUE (after initializing)
FLASH 30	1-8	Hunt Groups 330-337	No Hunt Groups established
	9	Station or Pilot Hunting	All Hunt Groups default using Pilot Hunting
FLASH 60	1-8	UCD Groups 550-557	No UCD groups established
	9	Alternate UCD Group Assign	No UCD Alternates group assignments is made
	10	Overflow Assignment	No Overflow assignment is made
	11	UCD Station Assignments	No stations are assigned
	12	Announcement Table Assign	No RAN tables are specified
FLASH 61	1	UCD Ring Timer	060 seconds
	2	UCD Message Interval Timer	060 seconds
	3	UCD Overflow Timer	060 seconds
	4	UCD Wrap-Up Timer	004 seconds
	5	UCD No Answer Timer	000 seconds (disabled)
FLASH 62	1-2	RAN Tables 1 and 2	No RAN parameters set
FLASH 65	1-8	Voice Mail Groups 440-447	No Voice Mail groups are established
	9	Alternate VM Group Assign	No Alternate VM group assignment is made
	10	Leave Table	No outpulsing table is referenced
	11	Retrieve Table	No outpulsing table is referenced
	12	VM Station Assignments	NO stations are assigned
FLASH 66	1-7	Voice Mail Out-Pulsing Tables for in-band signaling	Out-pulse tables are empty by default
	8	Voice Mail Disconnect Table	Disconnect table is empty
FLASH 67	1	In-Band Digits for Incoming CO Calls	Disabled by default

**Initialize Data Base Parameters (Cont'd)**

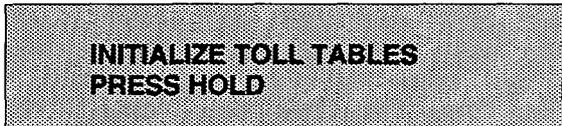
**F. Initialize Toll Tables**

Programming Steps

Description

If Exception Tables need to be initialized:

1. Press the Toll Tables flexible button (Button #5). The following message will be shown on the display phone:



The Toll Table parameters including the Allow/Deny Tables and the Special Tables may be initialized setting all tables to their original, default values. The following Tables are cleared returning to their default value upon initializing the Exception Tables parameters;

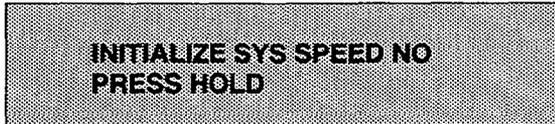
2. To initialize the Toll Tables, press the HOLD button. Confirmation tone will be heard.

TABLE	DEFAULT VALUE (after initializing)
ALLOW TABLE - A	Table Cleared (no entries)
DENY TABLE - A	Table Cleared (no entries)
ALLOW TABLE - B	Table Cleared (no entries)
DENY TABLE - B	Table Cleared (no entries)
SPECIAL TABLE 1	Table Cleared (no entries allowed, no area code specified)
SPECIAL TABLE 2	Table Cleared (no entries allowed, no area code specified)
SPECIAL TABLE 3	Table Cleared (no entries allowed, no area code specified)
SPECIAL TABLE 4 (home area code)	Table Cleared (no entries allowed)

**Initialize Data Base Parameters (Cont'd)****G. Initialize System Speed**Programming Steps

If System Speed bins need to be initialized:

1. Press the System Speed flexible button (Button #6). The following message will be shown on the display phone:



**INITIALIZE SYS SPEED NO  
PRESS HOLD**

2. To initialize the System Speed bins, press the HOLD button. Confirmation tone will be heard.

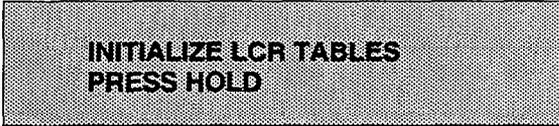
Description

Numbers entered into the System Speed dial Table may be initialized clearing all bins to their original, default value (empty). All bins 20 through 99 are cleared returning to their default value (empty) upon initializing the Speed Dial Table.

**Initialize Data Base Parameters (Cont'd)****H. Initialize LCR Tables**Programming Steps

If LCR Tables need to be initialized:

1. Press the LCR Tables flexible button (Button #7). The following message will be shown on the display phone:



**INITIALIZE LCR TABLES  
PRESS HOLD**

2. To initialize the LCR Tables, press the HOLD button. Confirmation tone will be heard.

Description

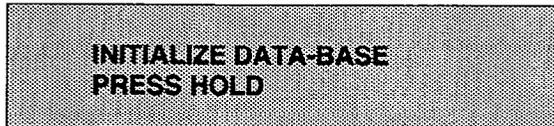
The LCR Tables may be initialized setting all tables to their original, default values. The following tables will be reset to their original default value after initialization of the LCR tables;

- Exception Table
- 3-Digit table
- 6-Digit Table
- Route List Table
- Daily Start Time Table
- Weekly Schedule
- Insert/Delete Table
- Toll Information Route

**Initialize Data Base Parameters (Cont'd)****I. Initialize Entire System and Reset (all parameters)**Programming Steps

If System needs to be initialized:

1. Press the System and Reset flexible button (Button #8). The following message will be shown on the display phone:



**INITIALIZE DATA-BASE  
PRESS HOLD**

2. To initialize the entire system data base, press the HOLD button. The system will perform a hard reset.

Description

To completely initialize the data base area including all non-programmable parameters held in Dynamic RAM (DRAM) and reset the system also clearing any meantime errors that may exist this command may be used. The system will require reprogramming of any customer specific data after using this command. This provides an easy way to re-initialize the system and clearing any meantime errors that may have accumulated inhibiting system operation or performance.

**Initialize Data Base Parameters (Cont'd)**

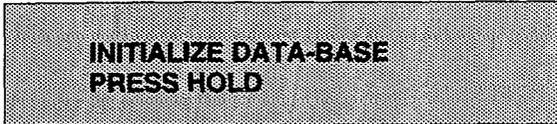
**J. Initialize ICLID Table**

Programming Steps

Description

If the ICLID Table(s) need to be initialized:

1. Press the ICLID TABLE flexible button (Button #9). The following message will be shown on the display phone:



2. To initialize the ICLID Table(s), press the HOLD button. Confirmation tone will be heard.

# SECTION 665

## PRINTING SYSTEM DATA BASE PARAMETERS

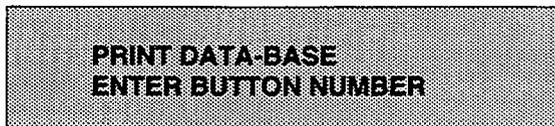
### A. Introduction

#### Programming Steps

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. (Refer to Sec. 600.2).

If Data Base Parameters need to be printed:

1. Press FLASH and dial [85]. The following will be shown on the display phone:



2. Choose the portion of the data base to be printed by pressing the appropriate button in the flexible button field.

#### Description

This section describes the procedures and steps necessary to print Data Base Parameters and various portions of the system.

The buttons on the key telephone are defined as shown below when entering the Print Data Base Parameters programming area.

G 1	SYSTEM PARAMETERS	11 A
W 2	CO LINE ATTRIBUTES	12 B
E 3	STATION ATTRIBUTES	13 D
R 4	GROUP PARAMETERS	14 F
T 5	EXCEPTION TABLES	15 G
Y 6	SYSTEM SPEED	16 H
U 7	LCR TABLES	17 J
I 8	ENTIRE SYSTEM	18 K

With a printer connected to the RS-232C port, of the CPB, the currently stored customer data base can be printed or "uploaded" into a file. This command allows the entire data base to be "dumped" as a permanent record which can serve as a hard copy of the data base.

The system Baud rate must match that of the printer or receiving device.

Refer to the following Figures for examples of the data base printouts. Also refer to the following paragraphs for instructions on printing only portions of the data base.

**Default:** None

**Related Programming:** SMDR Programming for setting the baud rate or the RS232C port.

## System Data Base Printouts (Cont'd)

## B. Printing System Parameters

Programming Steps

If a printout of all System Parameters is desired:

1. Press the SYSTEM PARAMETERS flexible button (Button #1). The following message will be shown on the display phone:

**PRINT SYS PARAM  
PRESS HOLD**

2. To print the system parameter data base, press the HOLD button. The display will update.

**PRINTING SYS PARAM**

When the system has finished sending the information to the printer, confirmation tone will be heard.

Description

With a printer connected to the RS-232C port, of the CPB, the currently stored customer data base can be printed or "uploaded" into a file. This command allows the System Parameters data base to be "dumped" as a permanent record which can serve as a hard copy.

The system Baud rate must match that of the printer or receiving device.

When printing the System Parameters the following data is printed;

- All System Timers
- All System wide options (i.e. external night ringing, Hold preference etc...)
- Attendant programming
- Other system assignments (i.e. Page/Relay Assignments, Executive/Secretary, SMDR etc...)
- Weekly Night Mode schedule

Refer to the following Figure for an example of the system parameters data base print out.

**Default:** None

**Related Programming:** SMDR Programming for setting the baud rate or the RS232C port.

2856 Digital Key-System	2 NONE
Eng. Ver. 0.1H	3 NONE
DATE: MM/DD/YY TIME: HH:MM:SS	4 NONE
ENTER PASSWORD:	5 NONE
adm>	6 NONE
ENTER PROGRAM NO	RELAY/SENSOR ###
adm>85	1 NONE
PRINT DATA-BASE	2 NONE
ENTER BUTTON NUMBERB	3 NONE
adm>q	4 NONE
PRINTING SYS PARAM	5 NONE
adm>SYSTEM PARAMETERS	6 NONE
Eng. Ver. 0.1H	I/O BAUD RATES
SYSTEM TIMERS	PORT 1/ON BOARD=
SHR EHR ART XFR PFT CFN PT	PORT 2/MODEM=
60 180 1 45 10 15 2	PORT 3/RS232=
CPT CFT PTO COT SRT MWT HFT	PORT 4/RS422=
180 10 15 3 20 0 10	ACCESS CODE
HFD	1 DISA ACCESS 100
10	2 ADMIN PASSWORD 3226
SYSTEM FEATURES	SDR TPE PNT BDR PORT
ATNO SYHP ENR EOWT PWT	N LD 80 4800 1
N Y N Y Y	AUTO NIGHT MODE N
BGM LCR ACC GL	WEEKLY NIGHT MODE SCHEDULE
Y N N Y	DAY END START
ATTENDANT STATIONS	TIME TIME
100 ### ##	M 0 0800 1700
DATE & TIME FORMAT	T 1 0800 1700
MM/DD/YY, 12 HOURS	W 2 0800 1700
PBX DIALING CODES	T 3 0800 1700
## ## ## ## ##	F 4 0800 1700
EXECUTIVE/SECRETARY PAIRINGS	S 5 #### ####
1 = ### ##	S 6 #### ####
2 = ### ##	DIAL PULSE
3 = ### ##	RATIO SPEED
4 = ### ##	6040 10PPS
RELAY ASSIGNMENTS	adm>m
ON BOARD RELAY	exiting admin...
1 NONE	<b>Description</b>
2 NONE	<b>System Timers:</b>
3 NONE	SHR= System Hold Recall Timer
4 NONE	EHR= Exclusive Hold Recall Timer
5 NONE	ART= Attendant Recall Timer
6 NONE	XFR= Transfer Recall Timer
7 NONE	PFT= Preset Forward Timer
RELAY/SENSOR ###	CFN= Call Forward No-Answer Timer
1 NONE	PT= Pause Timer
2 NONE	CPT= Call Park Timer
3 NONE	CFT= Conference Timer
4 NONE	PTO= Page Timeout Timer
5 NONE	COT= CO Ring Detect Timer
6 NONE	SRT= Single Line Receiver Timer
RELAY/SENSOR ###	MWT= Message Wait Reminder Tone
1 NONE	HFT= Hook Flash Timer
	HFD= Hookswitch Bounce Timer
	<b>System Features:</b>
	ATNO=Attendant Override
	SYHP= Hold Preference
	ENR= External Night Ringing
	EOWT=Exec Override Warn Tone
	PWT= Page Warning Tone
	BGM= Background Music
	LCR= LCR Enable/Disable
	ACC=Forced Account Codes
	GL=Group Listening

Figure 665-1 DB Printout of System Parameters

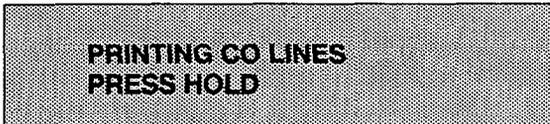
**System Data Base Printouts (Cont'd)**

**C. Printing CO Line Attributes**

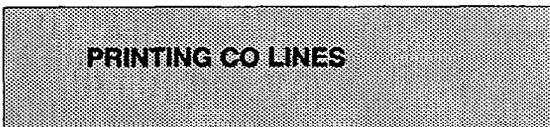
Programming Steps

If a printout of the CO Line Attributes is desired:

1. Press the CO LINE ATTRIBUTES flexible button (Button #2). The following message will be shown on the display phone:



2. To print the data for ALL CO Lines, press the HOLD button. To print CO Line data for a specified CO Line Range enter four digits to specify the CO Line range (two digits for the first line within the range and two digits for the last line in the range i.e. [0115]). If a print out of only one line is desired enter that line twice (i.e. [0101]). Then press the HOLD button.
3. The following display will be shown on the display phone and the CO Line data will be printed:



When the system has finished sending the requested information to the printer, confirmation tone will be heard.

Description

With a printer connected to the RS-232C port, of the CPB, the currently stored customer data base can be printed or "uploaded" into a file. This command allows either a range of CO Lines or the entire CO Line data base to be "dumped" as a permanent record which can serve as a hard copy of the CO Line attribute data base.

The system Baud rate must match that of the printer or receiving device.

When printing the CO Line attributes the following data is printed;

- All CO Line parameters within the specified range.
- CO Line ringing assignments within the specified range.
- Dial Pulse Ratio and Speed settings

Refer to the following Figure for an example of the CO Line attribute data base print out.

**Default:** None

**Related Programming:** SMDR Programming for setting the baud rate or the RS232C port.

```

2856 Digital Key-System
Eng. Ver. 0.1H
DATE: MM/DD/YY TIME: HH:MM:SS
ENTER PASSWORD:
adm>,
    ENTER PROGRAM NO
adm>85
adm>w
    PRINT CO LINES
    PRESS HOLD
adm>
    PRINTING CO LINES

CO LINE ATTRIBUTES

```

CO 1	Description
SIGNAL TYPE UNA CONF PRI	SIGNAL= DTMF/Dial Pulse
DTMF CO Y Y Y	TYPE= CO/PBX
SUPV DISA FLTM GRP COS	UNA= Universal Night Answer
N N 10 1 1	PRI= CO Line Privacy
RING ASSIGNMENTS	SUPV= Loop Supervision
100B	DISA= Direct Inward System Access
CO 2	FLTM= Flash Timer
SIGNAL TYPE UNA CONF PRI	GRP= CO Line Group
DTMF CO Y Y Y	COS= CO Line Class of Service
SUPV DISA FLTM GRP COS	
N N 10 1 1	
RING ASSIGNMENTS	
100B	
CO 3	
SIGNAL TYPE UNA CONF PRI	
DTMF CO Y Y Y	
SUPV DISA FLTM GRP COS	
N N 10 1 1	
RING ASSIGNMENTS	
100B	
CO 4	
SIGNAL TYPE UNA CONF PRI	
DTMF CO Y Y Y	
SUPV DISA FLTM GRP COS	
N N 10 1 1	
RING ASSIGNMENTS	
100B	
adm>m	
exiting admin...	

Figure 665-2 DB Printout of CO Line Attributes

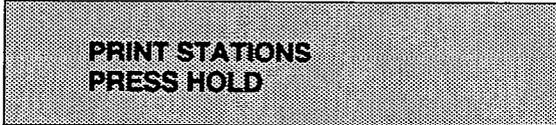
System Data Base Printouts (Cont'd)

D. Printing Station Attributes

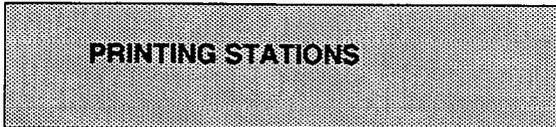
Programming Steps

If a printout of the Station Attributes is desired:

1. Press the STATION ATTRIBUTES flexible button (Button #3). The following message will be shown on the display phone:



2. To print data for all stations, press the HOLD button. To print Station data for a specified Station Range enter six digits to specify the Station range (three digits for the first station within the range and three digits for the last station in the range i.e. [100109]). If a print out of only one station is desired enter that station twice (i.e. [101101]). Then press the HOLD button.
3. The following display will be shown on the display phone and the requested information will be printed:



When the system has finished sending the requested information to the printer, confirmation tone will be heard.

Description

With a printer connected to the RS-232C port, of the CPB, the currently stored customer data base can be printed or "uploaded" into a file. This command allows either a range of station data or all stations data information to be "dumped" as a permanent record which can serve as a hard copy of the station attribute data base.

The system Baud rate must match that of the printer or receiving device.

When printing the Station attributes the following data is printed;

- All current station parameters
- Current Flex Button assignments

Refer to the following Figure for an example of a Station attribute data base print out.

**Default:** None

**Related Programming:** SMDR Programming for setting the baud rate or the RS232C port.

```

2856 Digital Key-System
Eng. Ver. 0.1H
DATE: MM/DD/YY TIME: HH:MM:SS
ENTER PASSWORD:
adm>,
    ENTER PROGRAM NO
adm>85
adm>e
    PRINTING STATIONS

STATION ATTRIBUTES
-----
STA 100

PAGE DND CONF EOR PRI SPD QUE
  Y  Y  Y  Y  N  Y  Y
PLA OHVO FWD LCR
  N  N  Y  N
SID AID DCOS NCOS SPK
  0  1  1  0
PICKUP PAGE PREFWD LCOS
  1  1  N
CO ACCESS 1

BUTTONS
01D100 02D101 03D102
04D103 05D104 06D105
07D106 08D107 09D108
10D109 11CO01 12CO02
13CO03 14CO04 15CO05
16CO06 17CO07 18CO08
19PL1  20LP  21CPO
22LQU  23CBK 24PKU
25MSG  26FWD 27DND
28CNF

PRIME KEY 0 Y

STA 103

PAGE DND CONF EOR PRI SPD QUE
  Y  Y  Y  Y  N  Y  Y
PLA OHVO FWD LCR
  N  N  Y  N
SID AID DCOS NCOS SPK
  1  1  1  0
PICKUP PAGE PREFWD LCOS
  1  1  N
CO ACCESS 1

BUTTONS
01CO01 02CO02 03CO03
04CO04 05CO05 06CO06
07CO07 08CO08 09CO09
10CO10 11CO11 12CO12
13CO13 14CO14 15P220
16REL  17D100 18D101
19D102 20D103 21D104
22D105 23D106 24D107
25D108 26D109 27D110
28D111 29D112 30D113
31P221 32AOR  33D114
34D115 35D116 36D117
37D118 38D119 39D120
40D121 41D122 42D123
43D124 44D125 45D126
46D127 47P222 48IAC

PRIME KEY 0 Y

adm>m
exiting admin...
    
```

**Description**

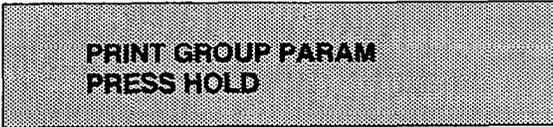
- PAGE= Paging Access
- DND= Do Not Disturb
- CONF= Conference
- EOR=Executive Override
- PRI= Privacy
- SPD= System Speed Dial Access
- QUE= Line Queue Access
- PLA= Preferred Line Answer
- OHVO=Off-Hook Voice Over
- FWD= Station Call Forward Access
- LCR= LCR Class of Service
- SID= Station ID
- AID= Associated ID (DSS/DLS Console)
- DCOS= Day Class of Service
- NCOS= Night Class of Service
- SPK= Speakerphone Option
- PICKUP= Pickup Groups
- PAGE= Paging Groups
- PREFWD= Preset Forward Assignment
- LCOS=LCR Class of Service
- BUTTONS= Refer to Table 630-2)

Figure 665-3 DB Printout of Station Attributes

**System Data Base Printouts (Cont'd)****E. Printing Group Parameters**Programming Steps

If a printout of the Group Parameters is desired:

1. Press the GROUP PARAMETERS flexible button (Button #4). The following message will be shown on the display phone:



**PRINT GROUP PARAM  
PRESS HOLD**

2. To print data for all Group Parameters, press the HOLD button. The following display will be shown on the display phone:

When the system has finished sending the requested information to the printer, confirmation tone will be heard.

Description

With a printer connected to the RS-232C port, of the CPB, the currently stored customer data base can be printed or "uploaded" into a file. This command allows either a range of station data or all stations data information to be "dumped" as a permanent record which can serve as a hard copy of the station attribute data base.

The system Baud rate must match that of the printer or receiving device.

When printing the Group Parameters, the following data is printed;

- Hunt Group Parameters
- UCD Group Parameters
- UCD Timers
- RAN Announcement Tables
- Voice Mail Group Parameters
- Voice Mail Outputting Table (including the disconnect table)
- Voice Mail Options

Refer to the following Figure for an example of a Group Parameter data base print out.

**Default:** None

**Related Programming:** SMDR Programming for setting the baud rate or the RS232C port.



## System Data Base Printouts (Cont'd)

## F. Printing Toll Tables

Programming Steps

If a printout of the Toll tables are desired:

1. Press the TOLL TABLES flexible button (Button #5). The following message will be shown on the display phone:



PRINT TOLL TABLES  
PRESS HOLD

2. To print the Toll Tables, press the HOLD button. When the system has finished sending the requested information to the printer, confirmation tone will be heard.

Description

With a printer connected to the RS-232C port, of the CPB, the currently stored customer data base can be printed or "uploaded" into a file. This command allows each exception table to be printed individually to serve as a permanent record which can be saved as a hard copy of the exception table data base.

The system Baud rate must match that of the printer or receiving device.

When printing information from the Toll tables, the following data is printed:

- Allow Table A
- Deny Table A
- Allow Table B
- Deny Table B
- Special Table 1
- Special Table 2
- Special Table 3
- Special Table 4

Refer to the following Figure for an example of the Toll Tables data base print out.

**Default:** None

**Related Programming:** SMDR Programming for setting the baud rate or the RS232C port.

```

2856 Digital Key-System
Eng. Ver. 0.1H
DATE: MM/DD/YY TIME: HH:MM:SS
ENTER PASSWORD:
adm>,
    ENTER PROGRAM NO
adm>85
adm>t
    PRINT EX TABLES
    PRESS HOLD
adm>

    PRINTING EX TABLES

adm>
Allow Table A
-----
01          11
02          12
03          13
04          14
05          15
06          16
07          17
08          18
09          19
10          20

Deny Table A
-----
01          06
02          07
03          08
04          09
05          10

Allow Table B
-----
01          11
02          12
03          13
04          14
05          15
06          16
07          17
08          18
09          19
10          20

Deny Table B
-----
01          06
02          07
03          08
04          09
05          10

SPECIAL TABLE 1 AREA CODE
ALLOWED OFFICE CODES

SPECIAL TABLE 2 AREA CODE
ALLOWED OFFICE CODES

SPECIAL TABLE 3 AREA CODE
ALLOWED OFFICE CODES

SPECIAL TABLE 4 HOME AREA CODE
ALLOWED OFFICE CODES

adm>m
exiting admin...
    
```

Figure 665-5 DB Printout of Exception Tables

**System Data Base Printouts (Cont'd)**

**G. Printing System Speed Bins**

Programming Steps

If a printout of the System speed dial entries are desired:

1. Press the SYSTEM SPEED flexible button (Button #6). The following message will be shown on the display phone:

**PRINT SYS SPEED NO  
PRESS HOLD**

2. To print the System Speed bins, press the HOLD button. The following will be shown on the display phone:

**PRINTING SYS SPEED NO**

When the system has finished sending the requested information to the printer, confirmation tone will be heard.

Description

With a printer connected to the RS-232C port, of the CPB, the currently stored customer data base can be printed or "uploaded" into a file. This command allows either a range of system speed dial bins or all bins can be "dumped" as a permanent record which can serve as a hard copy of the system speed dial data base.

The system Baud rate must match that of the printer or receiving device.

Refer to the following Figure for an example of a System Speed Dial data base print out.

**Default:** None

**Related Programming:** SMDR Programming for setting the baud rate or the RS232C port.

2856 Digital Key-System	
Eng. Ver. 0.1H	49
DATE: MM/DD/YY TIME: HH:MM:SS	
ENTER PASSWORD:	50
adm>	
ENTER PROGRAM NO	51
adm>85	
adm>y	52
PRINT SYS SPEED NO	
PRESS HOLD	53
adm>	
	54
PRINTING SYS SPEED NO	55
SYSTEM SPEED NUMBERS	56
20	57
21	58
22	59
23	60
24	61
25	62
26	63
27	64
28	65
29	66
30	67
31	68
32	69
33	70
34	71
35	72
36	73
37	74
38	75
39	76
40	77
41	78
42	79
43	80
44	adm>m
45	exiting admin...
46	
47	
48	

Figure 665-6 DB Printout of System Speed Numbers

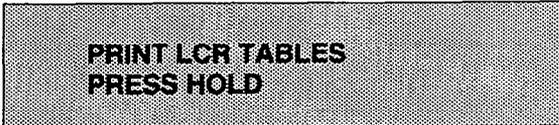
System Data Base Printouts (Cont'd)

H. Printing LCR Tables

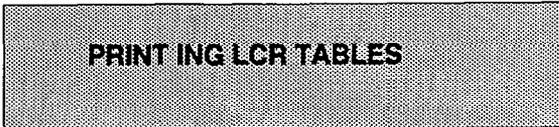
Programming Steps

If a printout of the LCR tables are desired:

1. Press the LCR TABLES flexible button (Button #7). The following message will be shown on the display phone:



2. To print the LCR Tables, press the HOLD button. The following will be shown on the display phone.



When the system has finished sending the requested information to the printer, confirmation tone will be heard.

Description

With a printer connected to the RS-232C port, of the CPB, the currently stored customer data base can be printed or "uploaded" into a file. This command allows each exception table to be printed individually to serve as a permanent record which can be saved as a hard copy of the exception table data base.

The system Baud rate must match that of the printer or receiving device.

When printing information from the LCR Tables, the following data is printed:

- 3-Digit Table
- 6-Digit Table
- Exception Table
- Route List Table
- Insert/Delete Table
- Daily Time Table
- Weekly Time Table
- Toll Tables

Refer to the following Figures for examples of the LCR Tables data base print out.

**Default:** None

**Related Programming:** SMDR Programming for setting the baud rate or the RS232C port.

2856 Digital Key-System				255	1	8	N	1	7	N
Eng. Ver. 0.1H				256	1	8	NN	1	7	NN
DATE: MM/DD/YY TIME: HH:MM:SS				257	1	8	NN	1	7	NN
ENTER PASSWORD:				258	1	8	NN	1	7	NN
adm>				259	1	8	NN	1	7	NN
ENTER PROGRAM NO				260	1	8	NN	1	7	NN
adm>85				261	1	8	NN	1	7	NN
adm>u				262	1	8	NN	1	7	NN
PRINT LCR TABLES				263	1	8	NN	1	7	NN
PRESS HOLD				264	1	8	NN	1	7	NN
adm>				265	1	8	NN	1	7	NN
				266	1	8	NN	1	7	NN
				267	1	8	NN	1	7	NN
PRINTING LCR TABLES				268	1	8	NN	1	7	NN
				269	1	8	NN	1	7	NN
3 DIGIT TABLE				270	1	8	NN	1	7	NN
				271	1	8	NN	1	7	NN
				272	1	8	NN	1	7	NN
				273	1	8	NN	1	7	NN
				274	1	8	NN	1	7	NN
				275	1	8	NN	1	7	NN
				276	1	8	NN	1	7	NN
				277	1	8	NN	1	7	NN
				278	1	8	NN	1	7	NN
				279	1	8	NN	1	7	NN
				280	1	8	NN	1	7	NN
				281	1	8	NN	1	7	NN
				282	1	8	NN	1	7	NN
				283	1	8	NN	1	7	NN
				284	1	8	NN	1	7	NN
				285	1	8	NN	1	7	NN
				286	1	8	NN	1	7	NN
				287	1	8	NN	1	7	NN
				288	1	8	NN	1	7	NN
				289	1	8	NN	1	7	NN
				290	1	8	NN	1	7	NN
				291	1	8	NN	1	7	NN
				292	1	8	NN	1	7	NN
				293	1	8	NN	1	7	NN
				294	1	8	NN	1	7	NN
				295	1	8	NN	1	7	NN
				296	1	8	NN	1	7	NN
				297	1	8	NN	1	7	NN
				298	1	8	NN	1	7	NN
				299	1	8	NN	1	7	NN
				300	0	11	NN	##	##	NN
				301	0	11	NN	##	##	NN
				302	0	11	NN	##	##	NN
				303	0	11	NN	##	##	NN
				304	0	11	NN	##	##	NN
				305	0	11	NN	##	##	NN
				306	0	11	NN	##	##	NN
				307	0	11	NN	##	##	NN
				308	0	11	NN	##	##	NN
				309	0	11	NN	##	##	NN
				310	0	11	NN	##	##	NN
				312	0	11	NN	##	##	NN
				313	0	11	NN	##	##	NN
				314	0	11	NN	##	##	NN
				315	0	11	NN	##	##	NN
				316	0	11	NN	##	##	NN
				317	0	11	NN	##	##	NN
				318	0	11	NN	##	##	NN
				319	0	11	NN	##	##	NN
				320	1	8	NN	1	7	NN
				321	1	8	NN	1	7	NN
				322	1	8	NN	1	7	NN
				323	1	8	NN	1	7	NN
				324	1	8	NN	1	7	NN
				325	1	8	NN	1	7	NN
				326	1	8	NN	1	7	NN
				327	1	8	NN	1	7	NN
				328	1	8	NN	1	7	NN
				329	1	8	NN	1	7	NN

Figure 665-7 DB Printout of LCR Default

330	1	8	N	1	7	N	404	0	11	N	##	##	N
331	1	8	N	1	7	N	405	0	11	N	##	##	N
332	1	8	N	1	7	N	406	0	11	N	##	##	N
333	1	8	N	1	7	N	407	0	11	N	##	##	N
334	1	8	N	1	7	N	408	0	11	N	##	##	N
335	1	8	N	1	7	N	409	0	11	N	##	##	N
336	1	8	N	1	7	N	410	0	11	N	##	##	N
337	1	8	N	1	7	N	411	1	4	N	1	3	N
338	1	8	N	1	7	N	412	0	11	N	##	##	N
339	1	8	N	1	7	N	413	0	11	N	##	##	N
340	1	8	N	1	7	N	414	0	11	N	##	##	N
341	1	8	N	1	7	N	415	0	11	N	##	##	N
342	1	8	N	1	7	N	416	0	11	N	##	##	N
343	1	8	N	1	7	N	417	0	11	N	##	##	N
344	1	8	N	1	7	N	418	0	11	N	##	##	N
345	1	8	N	1	7	N	419	0	11	N	##	##	N
346	1	8	N	1	7	N	420	1	8	N	1	7	N
347	1	8	N	1	7	N	421	1	8	N	1	7	N
348	1	8	N	1	7	N	422	1	8	N	1	7	N
349	1	8	N	1	7	N	423	1	8	N	1	7	N
350	1	8	N	1	7	N	424	1	8	N	1	7	N
351	1	8	N	1	7	N	425	1	8	N	1	7	N
352	1	8	N	1	7	N	426	1	8	N	1	7	N
353	1	8	N	1	7	N	427	1	8	N	1	7	N
354	1	8	N	1	7	N	428	1	8	N	1	7	N
355	1	8	N	1	7	N	429	1	8	N	1	7	N
356	1	8	N	1	7	N	430	1	8	N	1	7	N
357	1	8	N	1	7	N	431	1	8	N	1	7	N
358	1	8	N	1	7	N	432	1	8	N	1	7	N
359	1	8	N	1	7	N	433	1	8	N	1	7	N
360	1	8	N	1	7	N	434	1	8	N	1	7	N
361	1	8	N	1	7	N	435	1	8	N	1	7	N
362	1	8	N	1	7	N	436	1	8	N	1	7	N
363	1	8	N	1	7	N	437	1	8	N	1	7	N
364	1	8	N	1	7	N	438	1	8	N	1	7	N
365	1	8	N	1	7	N	439	1	8	N	1	7	N
366	1	8	N	1	7	N	440	1	8	N	1	7	N
367	1	8	N	1	7	N	441	1	8	N	1	7	N
368	1	8	N	1	7	N	442	1	8	N	1	7	N
369	1	8	N	1	7	N	443	1	8	N	1	7	N
370	1	8	N	1	7	N	444	1	8	N	1	7	N
371	1	8	N	1	7	N	445	1	8	N	1	7	N
372	1	8	N	1	7	N	446	1	8	N	1	7	N
373	1	8	N	1	7	N	447	1	8	N	1	7	N
374	1	8	N	1	7	N	448	1	8	N	1	7	N
375	1	8	N	1	7	N	449	1	8	N	1	7	N
376	1	8	N	1	7	N	450	1	8	N	1	7	N
377	1	8	N	1	7	N	451	1	8	N	1	7	N
378	1	8	N	1	7	N	452	1	8	N	1	7	N
379	1	8	N	1	7	N	453	1	8	N	1	7	N
380	1	8	N	1	7	N	454	1	8	N	1	7	N
381	1	8	N	1	7	N	455	1	8	N	1	7	N
382	1	8	N	1	7	N	456	1	8	N	1	7	N
383	1	8	N	1	7	N	457	1	8	N	1	7	N
384	1	8	N	1	7	N	458	1	8	N	1	7	N
385	1	8	N	1	7	N	459	1	8	N	1	7	N
386	1	8	N	1	7	N	460	1	8	N	1	7	N
387	1	8	N	1	7	N	461	1	8	N	1	7	N
388	1	8	N	1	7	N	462	1	8	N	1	7	N
389	1	8	N	1	7	N	463	1	8	N	1	7	N
390	1	8	N	1	7	N	464	1	8	N	1	7	N
391	1	8	N	1	7	N	465	1	8	N	1	7	N
392	1	8	N	1	7	N	466	1	8	N	1	7	N
393	1	8	N	1	7	N	467	1	8	N	1	7	N
394	1	8	N	1	7	N	468	1	8	N	1	7	N
395	1	8	N	1	7	N	469	1	8	N	1	7	N
396	1	8	N	1	7	N	470	1	8	N	1	7	N
397	1	8	N	1	7	N	471	1	8	N	1	7	N
398	1	8	N	1	7	N	472	1	8	N	1	7	N
399	1	8	N	1	7	N	473	1	8	N	1	7	N
400	0	11	N	##	##	N	474	1	8	N	1	7	N
401	0	11	N	##	##	N	475	1	8	N	1	7	N
402	0	11	N	##	##	N	476	1	8	N	1	7	N
403	0	11	N	##	##	N	477	1	8	N	1	7	N

Figure 665-7 DB Printout of LCR Default (Cont'd)

478	1	8	N	1	7	N	553	1	8	N	1	7	N
479	1	8	N	1	7	NN	554	1	8	NN	1	7	NN
480	1	8	NN	1	7	NN	555	1	8	NN	1	7	NN
481	1	8	NN	1	7	NN	556	1	8	NN	1	7	NN
482	1	8	NN	1	7	NN	557	1	8	NN	1	7	NN
483	1	8	NN	1	7	NN	558	1	8	NN	1	7	NN
484	1	8	NN	1	7	NN	559	1	8	NN	1	7	NN
485	1	8	NN	1	7	NN	560	1	8	NN	1	7	NN
486	1	8	NN	1	7	NN	561	1	8	NN	1	7	NN
487	1	8	NN	1	7	NN	562	1	8	NN	1	7	NN
488	1	8	NN	1	7	NN	563	1	8	NN	1	7	NN
489	1	8	NN	1	7	NN	564	1	8	NN	1	7	NN
490	1	8	NN	1	7	NN	565	1	8	NN	1	7	NN
491	1	8	NN	1	7	NN	566	1	8	NN	1	7	NN
492	1	8	NN	1	7	NN	567	1	8	NN	1	7	NN
493	1	8	NN	1	7	NN	568	1	8	NN	1	7	NN
494	1	8	NN	1	7	NN	569	1	8	NN	1	7	NN
495	1	8	NN	1	7	NN	570	1	8	NN	1	7	NN
496	1	8	NN	1	7	NN	571	1	8	NN	1	7	NN
497	1	8	NN	1	7	NN	572	1	8	NN	1	7	NN
498	1	8	NN	1	7	NN	573	1	8	NN	1	7	NN
499	1	8	NN	1	7	NN	574	1	8	NN	1	7	NN
500	0	11	NN	##	##	NN	575	1	8	NN	1	7	NN
501	0	11	NN	##	##	NN	576	1	8	NN	1	7	NN
502	0	11	NN	##	##	NN	577	1	8	NN	1	7	NN
503	0	11	NN	##	##	NN	578	1	8	NN	1	7	NN
504	0	11	NN	##	##	NN	579	1	8	NN	1	7	NN
505	0	11	NN	##	##	NN	580	1	8	NN	1	7	NN
506	0	11	NN	##	##	NN	581	1	8	NN	1	7	NN
507	0	11	NN	##	##	NN	582	1	8	NN	1	7	NN
508	0	11	NN	##	##	NN	583	1	8	NN	1	7	NN
509	0	11	NN	##	##	NN	584	1	8	NN	1	7	NN
510	0	11	NN	##	##	NN	585	1	8	NN	1	7	NN
512	0	11	NN	##	##	NN	586	1	8	NN	1	7	NN
513	0	11	NN	##	##	NN	587	1	8	NN	1	7	NN
514	0	11	NN	##	##	NN	588	1	8	NN	1	7	NN
515	0	11	NN	##	##	NN	589	1	8	NN	1	7	NN
516	0	11	NN	##	##	NN	590	1	8	NN	1	7	NN
517	0	11	NN	##	##	NN	591	1	8	NN	1	7	NN
518	0	11	NN	##	##	NN	592	1	8	NN	1	7	NN
519	0	11	NN	##	##	NN	593	1	8	NN	1	7	NN
520	1	8	NN	1	7	NN	594	1	8	NN	1	7	NN
521	1	8	NN	1	7	NN	595	1	8	NN	1	7	NN
522	1	8	NN	1	7	NN	596	1	8	NN	1	7	NN
523	1	8	NN	1	7	NN	597	1	8	NN	1	7	NN
524	1	8	NN	1	7	NN	598	1	8	NN	1	7	NN
525	1	8	NN	1	7	NN	599	1	8	NN	1	7	NN
526	1	8	NN	1	7	NN	600	0	11	NN	##	##	NN
527	1	8	NN	1	7	NN	601	0	11	NN	##	##	NN
528	1	8	NN	1	7	NN	602	0	11	NN	##	##	NN
529	1	8	NN	1	7	NN	603	0	11	NN	##	##	NN
530	1	8	NN	1	7	NN	604	0	11	NN	##	##	NN
531	1	8	NN	1	7	NN	605	0	11	NN	##	##	NN
532	1	8	NN	1	7	NN	606	0	11	NN	##	##	NN
533	1	8	NN	1	7	NN	607	0	11	NN	##	##	NN
534	1	8	NN	1	7	NN	608	0	11	NN	##	##	NN
535	1	8	NN	1	7	NN	609	0	11	NN	##	##	NN
536	1	8	NN	1	7	NN	610	0	11	NN	##	##	NN
537	1	8	NN	1	7	NN	612	0	11	NN	##	##	NN
538	1	8	NN	1	7	NN	613	0	11	NN	##	##	NN
539	1	8	NN	1	7	NN	614	0	11	NN	##	##	NN
540	1	8	NN	1	7	NN	615	0	11	NN	##	##	NN
541	1	8	NN	1	7	NN	616	0	11	NN	##	##	NN
542	1	8	NN	1	7	NN	617	0	11	NN	##	##	NN
543	1	8	NN	1	7	NN	618	0	11	NN	##	##	NN
544	1	8	NN	1	7	NN	619	0	11	NN	##	##	NN
545	1	8	NN	1	7	NN	620	1	8	NN	1	7	NN
546	1	8	NN	1	7	NN	621	1	8	NN	1	7	NN
547	1	8	NN	1	7	NN	622	1	8	NN	1	7	NN
548	1	8	NN	1	7	NN	623	1	8	NN	1	7	NN
549	1	8	NN	1	7	NN	624	1	8	NN	1	7	NN
550	1	8	NN	1	7	NN	625	1	8	NN	1	7	NN
551	1	8	NN	1	7	NN	626	1	8	NN	1	7	NN
552	1	8	NN	1	7	NN	627	1	8	NN	1	7	NN

Figure 665-7 DB Printout of LCR Default (Cont'd)

628	1	8	N	1	7	N	702	0	11	N	##	##	N
629	1	8	N	1	7	N	703	0	11	N	##	##	N
630	1	8	N	1	7	N	704	0	11	N	##	##	N
631	1	8	N	1	7	N	705	0	11	N	##	##	N
632	1	8	N	1	7	N	706	0	11	N	##	##	N
633	1	8	N	1	7	N	707	0	11	N	##	##	N
634	1	8	N	1	7	N	708	0	11	N	##	##	N
635	1	8	N	1	7	N	709	0	11	N	##	##	N
636	1	8	N	1	7	N	710	0	11	N	##	##	N
637	1	8	N	1	7	N	712	0	11	N	##	##	N
638	1	8	N	1	7	N	713	0	11	N	##	##	N
639	1	8	N	1	7	N	714	0	11	N	##	##	N
640	1	8	N	1	7	N	715	0	11	N	##	##	N
641	1	8	N	1	7	N	716	0	11	N	##	##	N
642	1	8	N	1	7	N	717	0	11	N	##	##	N
643	1	8	N	1	7	N	718	0	11	N	##	##	N
644	1	8	N	1	7	N	719	0	11	N	##	##	N
645	1	8	N	1	7	N	720	1	8	N	1	7	N
646	1	8	N	1	7	N	721	1	8	N	1	7	N
647	1	8	N	1	7	N	722	1	8	N	1	7	N
648	1	8	N	1	7	N	723	1	8	N	1	7	N
649	1	8	N	1	7	N	724	1	8	N	1	7	N
650	1	8	N	1	7	N	725	1	8	N	1	7	N
651	1	8	N	1	7	N	726	1	8	N	1	7	N
652	1	8	N	1	7	N	727	1	8	N	1	7	N
653	1	8	N	1	7	N	728	1	8	N	1	7	N
654	1	8	N	1	7	N	729	1	8	N	1	7	N
655	1	8	N	1	7	N	730	1	8	N	1	7	N
656	1	8	N	1	7	N	731	1	8	N	1	7	N
657	1	8	N	1	7	N	732	1	8	N	1	7	N
658	1	8	N	1	7	N	733	1	8	N	1	7	N
659	1	8	N	1	7	N	734	1	8	N	1	7	N
660	1	8	N	1	7	N	735	1	8	N	1	7	N
661	1	8	N	1	7	N	736	1	8	N	1	7	N
662	1	8	N	1	7	N	737	1	8	N	1	7	N
663	1	8	N	1	7	N	738	1	8	N	1	7	N
664	1	8	N	1	7	N	739	1	8	N	1	7	N
665	1	8	N	1	7	N	740	1	8	N	1	7	N
666	1	8	N	1	7	N	741	1	8	N	1	7	N
667	1	8	N	1	7	N	742	1	8	N	1	7	N
668	1	8	N	1	7	N	743	1	8	N	1	7	N
669	1	8	N	1	7	N	744	1	8	N	1	7	N
670	1	8	N	1	7	N	745	1	8	N	1	7	N
671	1	8	N	1	7	N	746	1	8	N	1	7	N
672	1	8	N	1	7	N	747	1	8	N	1	7	N
673	1	8	N	1	7	N	748	1	8	N	1	7	N
674	1	8	N	1	7	N	749	1	8	N	1	7	N
675	1	8	N	1	7	N	750	1	8	N	1	7	N
676	1	8	N	1	7	N	751	1	8	N	1	7	N
677	1	8	N	1	7	N	752	1	8	N	1	7	N
678	1	8	N	1	7	N	753	1	8	N	1	7	N
679	1	8	N	1	7	N	754	1	8	N	1	7	N
680	1	8	N	1	7	N	755	1	8	N	1	7	N
681	1	8	N	1	7	N	756	1	8	N	1	7	N
682	1	8	N	1	7	N	757	1	8	N	1	7	N
683	1	8	N	1	7	N	758	1	8	N	1	7	N
684	1	8	N	1	7	N	759	1	8	N	1	7	N
685	1	8	N	1	7	N	760	1	8	N	1	7	N
686	1	8	N	1	7	N	761	1	8	N	1	7	N
687	1	8	N	1	7	N	762	1	8	N	1	7	N
688	1	8	N	1	7	N	763	1	8	N	1	7	N
689	1	8	N	1	7	N	764	1	8	N	1	7	N
690	1	8	N	1	7	N	765	1	8	N	1	7	N
691	1	8	N	1	7	N	766	1	8	N	1	7	N
692	1	8	N	1	7	N	767	1	8	N	1	7	N
693	1	8	N	1	7	N	768	1	8	N	1	7	N
694	1	8	N	1	7	N	769	1	8	N	1	7	N
695	1	8	N	1	7	N	770	1	8	N	1	7	N
696	1	8	N	1	7	N	771	1	8	N	1	7	N
697	1	8	N	1	7	N	772	1	8	N	1	7	N
698	1	8	N	1	7	N	773	1	8	N	1	7	N
699	1	8	N	1	7	N	774	1	8	N	1	7	N
700	0	11	N	##	##	N	775	1	8	N	1	7	N
701	0	11	N	##	##	N	776	1	8	N	1	7	N

Figure 665-7 DB Printout of LCR Default (Cont'd)

777	1	8	N	1	7	N	852	1	8	N	1	7	N
778	1	8	N	1	7	N	853	1	8	N	1	7	N
779	1	8	N	1	7	N	854	1	8	N	1	7	N
780	1	8	N	1	7	N	855	1	8	N	1	7	N
781	1	8	N	1	7	N	856	1	8	N	1	7	N
782	1	8	N	1	7	N	857	1	8	N	1	7	N
783	1	8	N	1	7	N	858	1	8	N	1	7	N
784	1	8	N	1	7	N	859	1	8	N	1	7	N
785	1	8	N	1	7	N	860	1	8	N	1	7	N
786	1	8	N	1	7	N	861	1	8	N	1	7	N
787	1	8	N	1	7	N	862	1	8	N	1	7	N
788	1	8	N	1	7	N	863	1	8	N	1	7	N
789	1	8	N	1	7	N	864	1	8	N	1	7	N
790	1	8	N	1	7	N	865	1	8	N	1	7	N
791	1	8	N	1	7	N	866	1	8	N	1	7	N
792	1	8	N	1	7	N	867	1	8	N	1	7	N
793	1	8	N	1	7	N	868	1	8	N	1	7	N
794	1	8	N	1	7	N	869	1	8	N	1	7	N
795	1	8	N	1	7	N	870	1	8	N	1	7	N
796	1	8	N	1	7	N	871	1	8	N	1	7	N
797	1	8	N	1	7	N	872	1	8	N	1	7	N
798	1	8	N	1	7	N	873	1	8	N	1	7	N
799	1	8	N	1	7	N	874	1	8	N	1	7	N
800	0	11	N	##	##	N	875	1	8	N	1	7	N
801	0	11	N	##	##	N	876	1	8	N	1	7	N
802	0	11	N	##	##	N	877	1	8	N	1	7	N
803	0	11	N	##	##	N	878	1	8	N	1	7	N
804	0	11	N	##	##	N	879	1	8	N	1	7	N
805	0	11	N	##	##	N	880	1	8	N	1	7	N
806	0	11	N	##	##	N	881	1	8	N	1	7	N
807	0	11	N	##	##	N	882	1	8	N	1	7	N
808	0	11	N	##	##	N	883	1	8	N	1	7	N
809	0	11	N	##	##	N	884	1	8	N	1	7	N
810	0	11	N	##	##	N	885	1	8	N	1	7	N
812	0	11	N	##	##	N	886	1	8	N	1	7	N
813	0	11	N	##	##	N	887	1	8	N	1	7	N
814	0	11	N	##	##	N	888	1	8	N	1	7	N
815	0	11	N	##	##	N	889	1	8	N	1	7	N
816	0	11	N	##	##	N	890	1	8	N	1	7	N
817	0	11	N	##	##	N	891	1	8	N	1	7	N
818	0	11	N	##	##	N	892	1	8	N	1	7	N
819	0	11	N	##	##	N	893	1	8	N	1	7	N
820	1	8	N	1	7	N	894	1	8	N	1	7	N
821	1	8	N	1	7	N	895	1	8	N	1	7	N
822	1	8	N	1	7	N	896	1	8	N	1	7	N
823	1	8	N	1	7	N	897	1	8	N	1	7	N
824	1	8	N	1	7	N	898	1	8	N	1	7	N
825	1	8	N	1	7	N	899	1	8	N	1	7	N
826	1	8	N	1	7	N	900	0	11	N	##	##	N
827	1	8	N	1	7	N	901	0	11	N	##	##	N
828	1	8	N	1	7	N	902	0	11	N	##	##	N
829	1	8	N	1	7	N	903	0	11	N	##	##	N
830	1	8	N	1	7	N	904	0	11	N	##	##	N
831	1	8	N	1	7	N	905	0	11	N	##	##	N
832	1	8	N	1	7	N	906	0	11	N	##	##	N
833	1	8	N	1	7	N	907	0	11	N	##	##	N
834	1	8	N	1	7	N	908	0	11	N	##	##	N
835	1	8	N	1	7	N	909	0	11	N	##	##	N
836	1	8	N	1	7	N	910	0	11	N	##	##	N
837	1	8	N	1	7	N	911	1	4	N	1	3	N
838	1	8	N	1	7	N	912	0	11	N	##	##	N
839	1	8	N	1	7	N	913	0	11	N	##	##	N
840	1	8	N	1	7	N	914	0	11	N	##	##	N
841	1	8	N	1	7	N	915	0	11	N	##	##	N
842	1	8	N	1	7	N	916	0	11	N	##	##	N
843	1	8	N	1	7	N	917	0	11	N	##	##	N
844	1	8	N	1	7	N	918	0	11	N	##	##	N
845	1	8	N	1	7	N	919	0	11	N	##	##	N
846	1	8	N	1	7	N	920	1	8	N	1	7	N
847	1	8	N	1	7	N	921	1	8	N	1	7	N
848	1	8	N	1	7	N	922	1	8	N	1	7	N
849	1	8	N	1	7	N	923	1	8	N	1	7	N
850	1	8	N	1	7	N	924	1	8	N	1	7	N
851	1	8	N	1	7	N	925	1	8	N	1	7	N

Figure 665-7 DB Printout of LCR Default (Cont'd)

926	1	8	N	1	7	N
927	1	8	N	1	7	N
928	1	8	N	1	7	N
929	1	8	N	1	7	N
930	1	8	N	1	7	N
931	1	8	N	1	7	N
932	1	8	N	1	7	N
933	1	8	N	1	7	N
934	1	8	N	1	7	N
935	1	8	N	1	7	N
936	1	8	N	1	7	N
937	1	8	N	1	7	N
938	1	8	N	1	7	N
939	1	8	N	1	7	N
940	1	8	N	1	7	N
941	1	8	N	1	7	N
942	1	8	N	1	7	N
943	1	8	N	1	7	N
944	1	8	N	1	7	N
945	1	8	N	1	7	N
946	1	8	N	1	7	N
947	1	8	N	1	7	N
948	1	8	N	1	7	N
949	1	8	N	1	7	N
950	1	8	N	1	7	N
951	1	8	N	1	7	N
952	1	8	N	1	7	N
953	1	8	N	1	7	N
954	1	8	N	1	7	N
955	1	8	N	1	7	N
956	1	8	N	1	7	N
957	1	8	N	1	7	N
958	1	8	N	1	7	N
959	1	8	N	1	7	N
960	1	8	N	1	7	N
961	1	8	N	1	7	N
962	1	8	N	1	7	N
963	1	8	N	1	7	N
964	1	8	N	1	7	N
965	1	8	N	1	7	N
966	1	8	N	1	7	N
967	1	8	N	1	7	N
968	1	8	N	1	7	N
969	1	8	N	1	7	N
970	1	8	N	1	7	N
971	1	8	N	1	7	N
972	1	8	N	1	7	N
973	1	8	N	1	7	N
974	1	8	N	1	7	N
975	1	8	N	1	7	N
976	1	8	N	1	7	N
977	1	8	N	1	7	N
978	1	8	N	1	7	N
979	1	8	N	1	7	N
980	1	8	N	1	7	N
981	1	8	N	1	7	N
982	1	8	N	1	7	N
983	1	8	N	1	7	N
984	1	8	N	1	7	N
985	1	8	N	1	7	N
986	1	8	N	1	7	N
987	1	8	N	1	7	N
988	1	8	N	1	7	N
989	1	8	N	1	7	N
990	1	8	N	1	7	N
991	1	8	N	1	7	N
992	1	8	N	1	7	N
993	1	8	N	1	7	N
994	1	8	N	1	7	N
995	1	8	N	1	7	N
996	1	8	N	1	7	N
997	1	8	N	1	7	N
998	1	8	N	1	7	N
999	1	8	N	1	7	N

Figure 665-7 DB Printout of LCR Default (Cont'd)

2856 Digital Key-System					ICLID TRANSLATION TABLE		
Eng. Ver. 0.1H							
DATE: MM/DD/YY TIME: HH:MM:SS							
ENTER PASSWORD:							
adm>					ENTRY	NUMBER	NAME
ENTER PROGRAM NO					00	11111111111111	
adm>85					AAAAAAAAAAAAAAAAAAAA		
adm>I					01		
6 DIGIT TABLE					02		
AREA ROUTE OFFICE CODES					03		
CODE NO					04		
					05		
EXCEPTION CODE TABLE					06		
CODE ROUTE NO					07		
					08		
ROUTE LIST TABLE					09		
RT TIME CO GRP INS/DEL GRP PR					10		
					11		
0	1	1	##	1	12		
	2	1	##	1	13		
	3	1	##	1	14		
	4	1	##	1	15		
1	1	1	##	1	16		
	2	1	##	1	17		
	3	1	##	1	18		
	4	1	##	1	19		
DIGIT INS/DEL TABLE					20		
TABLE DIGITS					21		
					22		
DAILY START TIME TABLE					23		
TABLE TIME					24		
					25		
1			800		26		
2			1700		27		
3			2300		28		
4			####		29		
WEEKLY SCHEDULE TABLE					30		
START TIME M T W T F S S					31		
					32		
800	1	1	1	1	1	3	3
1700	2	2	2	2	2	3	2
2300	3	3	3	3	3	3	3
####	3	3	3	3	3	3	3
LCR ROUT FOR 555-1212					33		
00					34		
ICLID NAME BDR PORT					35		
N Y 4800 2					36		
					37		
					38		
					39		
					40		
					41		
					42		
					43		
					44		
					45		
					46		
					47		
					48		
					49		
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					51		
					52		
					53		
					54		
					55		
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					57		
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					60		
					61		
					62		
					63		
					64		
					65		
					66		
					67		
					68		

Figure 665-8 DB Printout of LCR Tables (Cont'd)

```

69
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87
88
89
90
91
92
93
94
95
96
97
98
99 22222222222222 BBBB

```

ICLID UNANSWERED CALL TABLE

DATE	TIME	CO	NUMBER	NAME
11/22	12:34	00	00000000000000	AAAAAAAAAAAAAAAAAAAA
11/22	12:34	01	11111111111111	BBBBBBBBBBBBBBBBBB
11/22	12:34	02	22222222222222	CCCCCCCCCCCCCCCC
11/22	12:34	03	33333333333333	DDDDDDDDDDDDDDDD
11/22	12:34	04	44444444444444	EEEEEEEEEEEEEEEE
11/22	12:34	05	55555555555555	FFFFFFFFFFFFFFFF
11/22	12:34	06	66666666666666	GGGGGGGGGGGGGGGG
11/22	12:34	07	77777777777777	HHHHHHHHHHHHHHHH
11/22	12:34	08	88888888888888	IIIIIIIIIIIIIIIIII
11/22	12:34	09	99999999999999	JJJJJJJJJJJJJJJJJ
11/22	12:34	10	00000000000000	KKKKKKKKKKKKKKKK
11/22	12:34	11	11111111111111	LLLLLLLLLLLLLLLL
11/22	12:34	12	22222222222222	MMMMMMMMMMMMMMMM
11/22	12:34	13	33333333333333	NNNNNNNNNNNNNNNN
11/22	12:34	14	44444444444444	OOOOOOOOOOOOOOOO
11/22	12:34	15	55555555555555	PPPPPPPPPPPPPPPP
11/22	12:34	16	66666666666666	QQQQQQQQQQQQQQQQ
11/22	12:34	17	77777777777777	RRRRRRRRRRRRRRRR
11/22	12:34	18	88888888888888	SSSSSSSSSSSSSSSS
11/22	12:34	19	99999999999999	TTTTTTTTTTTTTTTT
11/22	12:34	20	00000000000000	UUUUUUUUUUUUUUUU
11/22	12:34	21	11111111111111	VVVVVVVVVVVVVVVV
11/22	12:34	22	22222222222222	WWWWWWWWWWWWWWW
11/22	12:34	23	33333333333333	XXXXXXXXXXXXXXXXXX
11/22	12:34	24	44444444444444	YYYYYYYYYYYYYYYYYY
11/22	12:34	25	55555555555555	ZZZZZZZZZZZZZZZZ
11/22	12:34	26	66666666666666	[[[[[[[[[[[[[[[[[[[[
11/22	12:34	27	77777777777777	\\\\\\\\\\\\\\\\\\\\\\\\\\\\
11/22	12:34	28	88888888888888	]]]]]]]]]]]]]]]]]]
11/22	12:34	29	99999999999999	^^^
11/22	12:34	30	00000000000000	_____
11/22	12:34	31	11111111111111	~~~~~
11/22	12:34	32	22222222222222	aaaaaaaaaaaaaaaaaaaa
11/22	12:34	33	33333333333333	bbbbbbbbbbbbbbbbbb
11/22	12:34	34	44444444444444	cccccccccccccccccc
11/22	12:34	35	55555555555555	dddddddddddddddddd
11/22	12:34	36	66666666666666	eeeeeeeeeeeeeeeeee
11/22	12:34	37	77777777777777	ffffff

Figure 665-9 DB Printout of LCR Tables (Cont'd)

11/22	12:34	38	88888888888888	gggggggggggggggggggg
11/22	12:34	39	99999999999999	hhhhhhhhhhhhhhhhhhhh
11/22	12:34	40	00000000000000	iiiiiiiiiiiiiiiiiiiiii
11/22	12:34	41	11111111111111	jjjjjjjjjjjjjjjjjjjj
11/22	12:34	42	22222222222222	kkkkkkkkkkkkkkkkkkkk
11/22	12:34	43	33333333333333	llllllllllllllllllllll
11/22	12:34	44	44444444444444	nnnnnnnnnnnnnnnnnnnn
11/22	12:34	45	55555555555555	oooooooooooooooooooo
11/22	12:34	46	66666666666666	pppppppppppppppppppp
11/22	12:34	47	77777777777777	qqqqqqqqqqqqqqqqqqqq
11/22	12:34	48	88888888888888	rrrrrrrrrrrrrrrrrrrr
11/22	12:34	49	99999999999999	

adm>m  
exiting admin...

Figure 665-10 DB Printout of LCR Tables (Cont'd)

System Data Base Printouts (Cont'd)

I. Printing Entire System Data Base

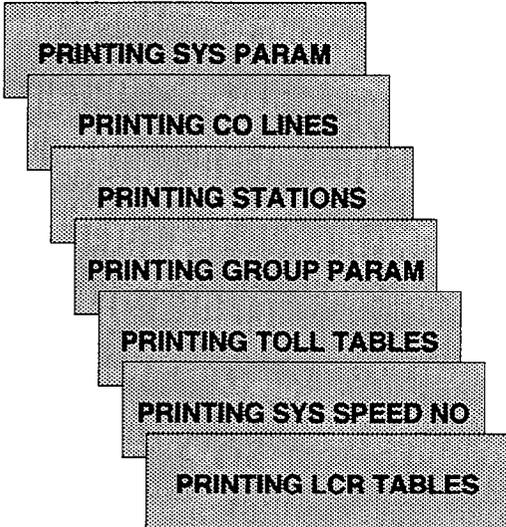
Programming Steps

If a complete printout of the entire data base in desired:

- 1. Press the ENTIRE SYSTEM flexible button (Button #8). The following will be shown on the display phone:



- 2. To print the entire data base, press the HOLD button. The display will update to indicate what portion of the data base in being printed.



When the system has finished sending the entire data base to the printer, confirmation tone will be heard.

Description

With a printer connected to the RS-232C port, of the CPB, the currently stored customer data base can be printed or "uploaded" into a file. This command allows the entire data base to be "dumped" as a permanent record which can serve as a hard copy of the data base.

The system Baud rate must match that of the printer or receiving device.

Printing the entire data base takes a while to print. The data base is printed in the following order:

- All System Parameters
- All CO Line programming (CO Lines 01-28)
- All Station attributes (Stations 100-155)
- All Group No (UCD, Hunt, VM)
- Toll Tables (allow, deny and special tables)
- System Speed Dial Numbers (bins 20-99)
- LCR Tables

Default: None

Related Programming: SMDR Programming for setting the baud rate or the RS232C port.

## SECTION 700

# SYSTEM CHECKOUT

### 700.1 INTRODUCTION

Prior to actual power up and initialization, the Starplus Digital (SPD) Key Telephone System should be checked over to avoid start up delays or improper loading. A step-by-step checklist is provided for this purpose.

### 700.2 PRELIMINARY PROCEDURES

1. Make sure that the Basic Key Service Unit (KSU) is properly grounded.
2. Verify that all PCB's are firmly plugged into the correct card slot positions or expander modules are firmly seated onto their connectors.
3. Inspect the MDF for shorted wiring and improper polarity that would affect the Digital Terminal or DSS console.
4. Make certain that the nicad battery is set to "ON". (SPD 2856 only)
5. Make sure that plug-ended MDF cables connected to the KSU are secure and are plugged into the correct position.

### 700.3 POWER UP SEQUENCE

The power up sequence involves the proper application of AC power to the System, and CPB LED's. A successful power up is assured if the installation checklist has been followed.

1. Plug the AC power cord of the Key Service Unit into the dedicated 117V ac outlet.
2. Turn the power switch of the KSU to ON.
3. The CPB has one (1) red LED located on the front of the CPB card. If the power up is successful, the red LED will flash.
4. Press the reset button on the CPB. The above CPB LED indication will repeat.
5. The system is ready for programming. If any problems have occurred, Refer to Section 800, Maintenance and Troubleshooting.

**Table 700-1 Power Supply Tests**

VOLTAGE DESIGNATIONS	VOLTAGE READING	TEST POINT LOCATION	REMARKS
117 VAC	+117 VAC $\pm$ 10%	Commercial Power Source	

\*The power supply is pre-set at the time of manufacturing, but should be checked at system initialization with a digital volt meter having an accuracy of  $\pm$ 1%.



**A to Z KELLATRONICS, Inc.**

Tel: 800.766.3425  
email: info@kellatronics.com Fax: 818.773.8899

## SECTION 800

# MAINTENANCE AND TROUBLESHOOTING

### 800.1 PRINTED CIRCUIT BOARD (PCB) TROUBLESHOOTING CHARTS

**Table 800-1 SPD 1428 Basic KSU**

FUNCTION	CONTROL	OPTIONS	FAULT OPTIONS
1. Central Processor board (CPB) to control system operation. 2. Read Only Memory (ROM) with factory set instructions. 3. Random Access Memory (RAM) protected by a nicad battery. 4. Halt switch for manual system restart. 5. Provides RS-232C port for SMDR and Terminal/Remote Programming. 6. Contains on-board 300 baud modem for remote system access. 7. Provides all system tones such as ICM dial tone and busy tone, etc.		I/O Module  1200 Baud Modem  Switch settings for EPROM Memory Size (See Table below)  J26 Jumper for setting RAM Memory Size (See Table below)	1. Complete system failure. 2. Erroneous call processing. 3. Inoperative features in system operation. 4. Partial failures in system operation. 5. Continual system restarts. 6. Failure of SMDR. 7. Loss of unique customer data-base programming.

**Table 800-2 SPD 1428 EPROM Memory Size**

SIZE OF CHIPS (in Megabits)	SW1 SWITCH POSITIONS				EPROM MEMORY SIZE (in bytes)
	1 (SA)	2 (SB)	3 (SC)	4 (not used)	
1 Megabit chips (1024's)	OFF	OFF	OFF	OFF	2 - 1 Meg chips = 256K bytes
2 Megabit chips (2048's)	ON	OFF	OFF	OFF	2 - 2 Meg chips = 512K bytes
4 Megabit chips (4096's)	ON	ON	OFF	OFF	2 - 4 Meg chips = 1024K bytes
8 Megabit chips (8192's)	ON	ON	ON	OFF	2 - 8 Meg chips = 2048K bytes

**Table 800-3 SPD 1428 Static RAM Memory Size**

SIZE OF CHIPS (in Bits)	J26 JUMPER POSITION	EPROM MEMORY SIZE (in bytes)
256 Kbit chips (256K chips)	2 - 3	2 - 256K chips = 64K bytes 4 - 256K chips = 128K bytes
1 Megabit chip (2048 chips)	2 - 3	2 - 1 Meg chips = 256K bytes 4 - 1 Meg chips = 512K bytes
4 Megabit chips (4096 chips)	1 - 2	2 - 4 Meg chips = 1024 bytes 4 - 4 Meg chips = 2048K bytes

**Table 800-4 SPD 2856 Central Processing Board (CPB)**

FUNCTION	CONTROL	OPTIONS	FAULT OPTIONS
1. Central Processor board (CPB) to control system operation. 2. Read Only Memory (ROM) with factory set instructions. 3. Random Access Memory (RAM) protected by a nicad battery. 4. Halt switch for manual system restart. 5. Provides RS-232C port for SMDR and Terminal/Remote Programming. 6. Contains on-board 300 baud modem for remote system access. 7. Provides all system tones such as ICM dial tone and busy tone, etc.			1. Complete system failure. 2. Erroneous call processing. 3. Inoperative features in system operation. 4. Partial failures in system operation. 5. Continual system restarts. 6. Failure of SMDR. 7. Loss of unique customer data- base programming.

**Table 800-5 SPD 2856 CPB Static RAM Memory Size**

SIZE OF CHIPS (in Bits)	EPROM MEMORY SIZE (in bytes)
1 Megabit chip (2048 chips)	2 - 1 Meg chips= 256K bytes 4 - 1 Meg chips= 512K bytes
4 Megabit chips (4096 chips)	2 - 4 Meg chips= 1024 bytes 4 - 4 Meg chips= 2048K bytes

**Table 800-6 SPD 2856 CPB EPROM Memory Size**

SIZE OF CHIPS (in Megabits)	SW1 SWITCH POSITIONS				EPROM MEMORY SIZE (in bytes)
	1 (SA)	2 (SB)	3 (SC)	4 (not used)	
1 Megabit chips (1024 chips)	OFF (open)	OFF (open)	OFF (open)	OFF (open)	2 - 1 Meg chips = 256K bytes 4 - Meg chips = 512K bytes
2 Megabit chips (2048 chips)	ON (closed)	OFF (open)	OFF (open)	OFF (open)	2 - 2 Meg chips = 512K bytes 4 - 2 Meg chips = 1024K bytes
4 Megabit chips (4096 chips)	ON (closed)	ON (closed)	OFF (open)	OFF (open)	2 - 4 Meg chips = 1024K bytes 4 - 4 Meg chips = 2048K bytes
8 Megabit chips (8192 chips)	ON (closed)	ON (closed)	ON (closed)	OFF (open)	2 - 8 Meg chips = 2048K bytes 4 - 8 Meg chips = 4096K bytes

OFF= OPEN    ON=CLOSED

Table 800-7 4x8 CO/Station Interface Board (CKB)

FUNCTION	CONTROL	OPTIONS	FAULT OPTIONS
Provides interface for 8 Digital Terminals, DSS/DLS Consoles or SLA (OPX) modules.	Busy state LED that monitors circuits for busy condition.	None	<ol style="list-style-type: none"> <li>1.Unable to receive intercom dial tone.</li> <li>2.Poor transmission characteristics.</li> <li>3.Key telephone set inoperative.</li> <li>4.Key telephone unable to invoke features</li> <li>5.No LED indications.</li> </ol>

Table 800-8 4x8 CO/SLT Interface Board (CSB)

FUNCTION	CONTROL	OPTIONS	FAULT OPTIONS
Provides interface for 8 SLTs. Also provides for SLTs with M/W lights.	Busy state LED that monitors circuits for busy condition.	None	<ol style="list-style-type: none"> <li>1.SLT can't receive dial tone.</li> <li>2.Poor transmission characteristics.</li> </ol>

Table 800-9 DTMF Receiver Module (RM)

FUNCTION	CONTROL	OPTIONS	FAULT OPTIONS
Used to add DTMF receivers to the system to support DBA and SLT operation.	Adds 1 DTMF receiver.	None	<ol style="list-style-type: none"> <li>1. SLT cannot receive or break dial tone.</li> <li>2. DISA call can't receive or break dial tone.</li> </ol>

Table 800-10 I/O Module (IOM)

FUNCTION	CONTROL	OPTIONS	FAULT OPTIONS
Provides 2nd RS232C port and a RS422 port to the system.	None	None	1.Loss of SMDR data.

Table 800-11 Single Line Telephone Adapter (OPX)

FUNCTION	CONTROL	OPTIONS	FAULT OPTIONS
Provides one (1) 48 volt loop to interface an OPX circuit.	Busy state LED that monitors circuits for busy condition.	None	<ol style="list-style-type: none"> <li>1.SLT can't receive dial tone.</li> <li>2.Poor transmission characteristics.</li> </ol>

## 800.2 REMOTE MAINTENANCE

### A. General Overview

The Remote Maintenance feature allows authorized personnel to survey system and slot configuration information. This can be done through a modem or data terminal connected to the I/O Expansion Module via the RS-232C/RS-422 port. The commands are entered from a keyboard and are limited to those listed.

### B. Overview of Maintenance Commands

There are four (4) basic commands available in the Remote Maintenance feature. All commands begin with a single character, followed by a space, another character and an optional digit or digits. All commands are terminated with a carriage return.

Basic format of the commands are shown in Figure 800-1:

```
maint>?
command list:
  d s[nn] - dump system or slot configuration data
           [nn] specifies an optional slot number parameter
           no parameter indicates that the entire system will be du
           examples:
                 maint>d s      (dumps entire system configuration
                 maint>d s2     (dumps slot 2 configuration, etc.)
  ?       - help menu
  x       - exit maint
maint>
```

### C. Maintenance Password

The Remote Maintenance feature, like Remote Programming, is entered via a six-character alphanumeric string. The password prompt is given by entering a carriage return at the device connected to the I/O Module RS-232C/422 port. After the prompt is printed out, the password should be entered followed by a carriage return. Proper entry of the password will result in the maintenance prompt. The Remote Maintenance password is: {CONFIG}

### D. Exit Maintenance

The Exit command will terminate the current Remote Maintenance feature session. The Exit command format is: MAINT>X

Figure 800-1 Remote Maintenance Help Menu

**E. System Configuration**

Figure 800-2 is a configuration of the Starplus Digital (SPD) Key Telephone System with LCR and shows what is printed out when:

a. The installer enters **D<space>S** at the maint> prompt.

```

maint>d s
  SLOT  TYPE  FW VER.  BRD TYPE  BRD OPTS  SERV STAT
-----
   1    CPB   0.01    CPU       2856,LCR  INS
   2    4x8   N/A     COI/KSI   0         INS
   3    UNK   N/A     UNPOPULATED 0         OOS
   4    UNK   N/A     UNPOPULATED 0         OOS
   5    UNK   N/A     UNPOPULATED 0         OOS
   6    UNK   N/A     UNPOPULATED 0         OOS
   7    UNK   N/A     UNPOPULATED 0         OOS
   8    UNK   N/A     UNPOPULATED 0         OOS

maint>

```

**Figure 800-2 System Configuration w/LCR**

where:

**Column 1:** lists the card slot.

**Column 2:** lists card type of that card slot.

**Column 3:** lists the firmware version of the card.

**Column 4:** lists card type and if that card is installed.

**Column 5:** lists card options:

**Column 6:** lists card status:

**OOS** status can indicate the entire card is out of service or a specific station is not installed or installed but not operational

**INS** status can indicate a specific station is installed and operating correctly.

**F. CO/Station Configuration**

Figure 800-3 is the CO/Station Configuration and shows what is printed out when:

a. The installer enters **D<space>S4** at the maint> prompt.

```

maint>d s2
SLOT : 2
Board Type : 4x8 - COI/KSI

```

CO	STATUS	PULSE/DTMF	CO/PBX
1	INS, Outgoing Enabled	DTMF	CO
2	INS, Outgoing Enabled	DTMF	CO
3	INS, Outgoing Enabled	PULSE	CO
4	INS, Outgoing Enabled	DTMF	CO

STA	TYPE	STATUS	LCD
100	Keyset	INS	Y
101	Keyset	OOS	N
102	Keyset	INS	Y
103	Keyset	INS	Y
104	DXX 1	INS	N
105	Keyset	OOS	N
106	Keyset	OOS	N
107	Keyset	OOS	N

**Figure 800-3 CO/Station Configuration**

where: **CO Lines**

**Column 1:** lists the CO Line number.

**Column 2:** indicates status:

**OOS** status can indicate the entire card is out of service.

**INS** status can indicate a board station is installed and operating correctly. Outgoing enabled indicates the CO line is active in the system. Outgoing disabled indicates that the Attendant has disabled the CO line for outgoing access

**Column 3:** indicates whether the CO Line is Pulse or DTMF. (programmable option)

**Column 4:** indicates whether the CO Line is a CO Line or a PBX Line. programmable option)

where: **Stations**

**Column 1:** lists the station number.

**Column 2:** indicates station type (keyset, DSS, SLT).

**Keyset** - ID 0 = Key station

**DLS** - ID 1 = DSS Map 1

**DSS** - ID 2 = DSS Map 2

**DSS/DLS** - ID 3 = DSS Map 3

**Relay/Sensor** - ID 4 = Relay/Sensor Module

**SLT** - ID 5 = SLT/OPX

**SLT w/lamp** - ID 6 = SLT w/Message Waiting

**2605, 2606** - ID 7 = SLT w/Message Waiting & In-Use Indicator

**Column 3:** indicates status:

**OOS** status can indicate the entire card is out of service or a specific station is not installed or installed but not operational.

**INS** status can indicate a specific station is installed and operating correctly.

**Column 4:** indicates whether the station has an LCD Display or doesn't have an LCD Display.

### G. Event Trace Buffer

The Event Trace Buffer is used to store and dump event traces (up to 30) that occur just prior to a Starplus Digital (SPD) Key Telephone System soft or hard restart. These can then be reviewed by authorized personnel to aid in system troubleshooting..

The basic format for the commands are:

- T<space><return> - display the current status of the Event trace buffer
- T<space>0<return> - turns the Trace buffer OFF.

- T<space>1<return> - turns the Trace buffer ON to record events prior to a soft system reset.
- T<space>2<return> - turns the Trace buffer ON to record events prior to a hard system restart.
- T<space>3<return> - turns the Trace Buffer ON to record events prior to either a soft reset or a hard system restart.

d<space>E<return> - dumps Trace Events stored from last system reset. (soft or hard)

*NOTE: Ctrl C will abort the Data Dump and return to the maint> prompt.*

### 800.3 REMOTE SYSTEM MONITOR

#### A. General Overview

The Remote Monitor feature provides remote access to the installed system for diagnostic purposes. These capabilities benefit Service personnel enabling them to support the end user remotely. Different levels of access, via password, allows authorized personnel to trace, monitor and "up-load" critical information directly from the Starplus Digital (SPD) Key Telephone System. This provides a more accurate means of acquiring system information that leads to a quick resolution of problems that may occur. This is all done without interfering with ongoing call processing or normal system operation, and in many cases may be performed without a site visit. The built-in 300 baud modem is used for remote access.

Capabilities allowed and reserved for this "High level troubleshooting" in addition are:

- Monitor Mode
- Enable & Disable Event "Trace"
- Dump "Trace Buffer" (up-load)

#### B. Monitor Password

The Remote Monitor feature, like Remote Maintenance, is entered via a six-character alphanumeric string. The password prompt is given by entering a carriage return at the device connected to the I/O Module RS232-C/RS-422 port. After the prompt is printed out, the password should be entered followed by a carriage return. Proper entry of the password will result in the MON> prompt. The Remote Maintenance password is: {ETRACE}

*NOTE: The remote monitor feature is intended for use only under the guidance and instruction by authorized personnel from a Technical Assistance Center (TAC). Care and caution must be observed when using this feature as permanent damage to the software structure can occur.*

#### C. Help Menu (?)

A convenient on screen Help Menu is provided by typing a "?" then pressing Enter. The following will appear on the screen:

```

2856 Digital Key-System
Eng. Ver. 0.01
DATE: 05/24/91 TIME: 10:51:07
ENTER PASSWORD:
mon>?
command list:
c [c] - dump co data
s [s] - dump sta data
t [d] - set trace key
d [a][a] - dump memory
m a - modify memory
b rate - set baud rate
? - help menu
x - exit monitor
mon>

```

#### D. Dump Memory Data

Three options allow the memory structure to be "dumped" for viewing. The three options are entered as follows:

- c [c] - Dump CO Line memory structure
- s [s] - Dump Station memory Structure
- d [a][a] - Dump a memory address Structure

The data obtained from these commands is in hexadecimal format and is used primarily for manufacture level support.

*NOTE: Ctrl C will abort the Data Dump and return to the mon> prompt.*

**E. Event Trace Mode**

The "T" command enables and disables the Starplus Digital (SPD) Key Telephone System Trace mode. While the trace mode is enabled events for the trace desired will be displayed on the monitor, printer or PC connected to the Starplus Digital (SPD) Key Telephone System in an event record. To view the current status of the trace mode type "T"<return>at the MON> prompt then the following screen will be displayed:

```

mon>t

      Messages      Y/N
      -----
BOARD EVT  -> N
MSC States -> N
Dev        -> N
PCM        -> N
COL States -> N
Stn States -> N
Error Msg  -> N
Que Evt    -> N

mon>
    
```

- a. To enable an event trace type "t" <space> (space bar)
- b. Then type of trace desired [d], where d is determined as follows:

- B= Board event trace (traces events associated with PCB's)
- M= Miscellaneous State event trace
- P= Pulse Coded Modulation (PCM) traces events associated with voice communications.
- C= CO Line (CKB) States (traces events associated with CO Line activity)
- S= Station (STA) States (traces events associated with Station activity)
- E= Error Messages (traces error messages)
- Q= Queue (QUE) Events (traces queuing events, i.e. DTMF receiver, UCD, LCR, etc...)
- D= Device Command (traces commands to peripheral devices).

- c. Then enter the specific board, CO line or Station number of the trace desired or type "all" if all board's, CO line's or Station's events are desired.

- 1-7 = Board KSU card slot position (CPB= 1)
- 01-28 = CO Line port
- 100-155 = Station location
- All= All Boards, CO lines or Stations

- d. Then press Enter to enable the trace. A screen similar to the following will appear:

```

mon>t b

      Messages      Y/N
      -----
BOARD EVT  -> Y
MSC States -> N
Dev        -> N
PCM        -> N
COL States -> N
Stn States -> N
Error Msg  -> N
Que Evt    -> N

mon>
    
```

- e. To disable or turn off a particular trace mode do not enter a specific board, CO line or Station number (i.e. "t<space>s<return>" to disable station event trace).

To have event trace's displayed on the screen you must first exit the MONitor mode by typing "X" at the MON> prompt. After you exit the event(s), the trace will begin as shown in Table 800-6.

**CAUTION**

Unless instructed by personnel at a Technical Assistance Center (TAC) **do not** leave the trace mode enabled for extended periods of time. The system will "dump" the requested event(s) trace which may use up paper or fill memory buffers on the collecting device. It is recommended that the trace events be disabled (turned off) for all event(s) traces before leaving the system site.

```

Sta 100: State= IDLE, Evt= Key Data (27), Data=34
Sta 100: State= IDLE, Evt= Mon Key (146), Data=-1
Sta 100: State= DIAL-TONE, Evt= Dial Pad (26), Data=1
Sta 100: State= DIALING, Evt= Dial Pad (26), Data=2
Sta 100: State= DIALING, Evt= Dial Pad (26), Data=3
Sta 100: State= MISC-TONE, Evt= Dial Pad (26), Data=5
Sta 100: State= MISC-TONE, Evt= Dial Pad (26), Data=6
Sta 100: State= DIALING, Evt= Dial Pad (26), Data=8
Sta 100: State= MISC-TONE, Evt= Key Data (27), Data=34
Sta 100: State= MISC-TONE, Evt= Mon Key (146), Data=-1
Sta 100: State= MISC-TONE, Evt= On Hook (17), Data=0
Sta 104: State= IDLE, Evt= Key Data (27), Data=34
Sta 104: State= IDLE, Evt= Mon Key (146), Data=-1
Sta 104: State= DIAL-TONE, Evt= Dial Pad (26), Data=7
Sta 104: State= DIALING, Evt= Dial Pad (26), Data=8
Sta 104: State= MISC-TONE, Evt= Dial Pad (26), Data=9
Sta 104: State= MISC-TONE, Evt= Dial Pad (26), Data=6
Sta 104: State= DIALING, Evt= Dial Pad (26), Data=4
Sta 104: State= DIALING, Evt= Dial Pad (26), Data=1
Sta 104: State= MISC-TONE, Evt= Dial Pad (26), Data=2
Sta 104: State= MISC-TONE, Evt= Key Data (27), Data=34

```

Figure 800-4 Event Trace as it appears on Display

#### F. Modify Memory command

The Modify Memory Command is for Engineering Use only.

**CAUTION**

Use of this command can alter or damage the Starplus Digital (SPD) Key Telephone Systems operating data base which can result in system malfunction. If this occurs it will be necessary to power the system down and re-initialize the data base, then completely re-program the customer programming data.

#### G. Baud Rate Command

This command provides a convenient means for changing the baud rate, for the RS232-C port located on the CPB, while in the Monitor mode. To change the baud rate type "B" plus the desired baud rate, then the enter key.

*NOTE: After changing the Baud Rate via Baud Rate command, you must change your Baud Rate on your Receiver/Terminal.*

#### H. Exit the Monitor mode

The Exit command will terminate the current Remote Monitor enable/disable session. If Event(s) Trace have been or are still enabled the event records will be displayed only after exiting the MONitor mode. The Exit command format is: MON X

**CAUTION**

Unless instructed by personnel at a Technical Assistance Center (TAC) **do not** leave the trace mode enabled for extended periods of time. The system will "dump" the requested event(s) trace which may use up paper or fill memory buffers on the collecting device. It is recommended that the event traces be disabled (turned off) for all event(s) before leaving the system site.



A to Z KELLATRONICS, Inc.

Tel: 800.766.3425  
 email: info@kellatronics.com Fax: 818.773.8899

# APPENDIX A

## CUSTOMER DATABASE PROGRAMMING

### Appendix A-1 System Parameters

PROG CODE	FLEX BTN	FUNCTION	FORMAT	DEFAULT	CUSTOMER DATA
FLASH 01	1	System Hold Recall	000-300 s	060 s	
	2	Exclusive Hold Recall	000-300 s	180 s	
	3	Attendant Recall Timer	00-60 min	01 min	
	4	Transfer Recall	000-300 s	045 s	
	5	Preset Forward Timer	00-99 s	10 s	
	6	Call Forward No/Answer	000-600 s	015 s	
	7	Pause Timer	1-9 s	2 s	
	8	Call Park Timer	000-600 m	180 s	
	9	Conference/DISA Timer	00-99 m	10 m	
	10	Paging Timeout Timer	00-60 s	15 s	
	11	CO Ring Detect Timer	200-900 msec	300 msec	
	12	DISA/SLT Receiver Timer	005-100	020 s	
	13	MSG Wait Reminder Tone	000-104 m	000 m	
	14	SLT Hook-Flash Timer	05-20 s	1.0 s	
	15	SLT Hook-Flash Debounce Tmr	0.00-1.00 sec	0.1 s	
<b>SYSTEM FEATURES:</b>					
FLASH 05	1	Attendant Override	Yes/No	No	
	2	Hold Preference	Sys/Excl	System	
	3	External Night Ring	Yes/No	No	
	4	Executive Warning Tone	Yes/No	Yes	
	5	Page Warning Tone	Yes/No	Yes	
	6	Background Music	Yes/No	Yes	
	7	LCR Enable	Yes/No	No	
	8	Account Codes	Yes/No	No	
FLASH 10		Attendant Station Assignment	100-155	100	
FLASH 11	1-4	Time/Date Format	12/24 HR:M/D	12 HR:M/D	
FLASH 12	1-5	PBX Dialing Codes	Five 2-Digit	None	
FLASH 13	1	Exec/Secy Pair 1	Sta #, Sta #	None	
	2	Exec/Secy Pair 2	Sta #, Sta #	None	
	3	Exec/Secy Pair 3	Sta #, Sta #	None	
	4	Exec/Secy Pair 4	Sta #, Sta #	None	
FLASH 14	1-7	Page/Contact Programming		None	
FLASH 20	1	DISA Access Code	100-999	100	
	2	Admin. Password	One 4-Digit	3226	
FLASH 21	1	SMDR Enable/Disable	Yes/No	No	
	2	Call Type	All/LD Only	LD Only	
	3	Print Columns	80/29	80	
	4	Baud Rate	300/1200/2400 4800/9600	4800	
	5	Port	1/2/3/4	1	

*Busy or DND goes straight to sec 40*

Appendix A-1 System Parameters (Cont'd)

PROG CODE	FLEX BTN	FUNCTION	FORMAT		DEFAULT	CUSTOMER DATA
FLASH 22	1	Night Mode Operation	Auto/Manual		Manual	
	2	ANM Schedule - Monday	Off Time	On Time	0	/
	3	ANM Schedule - Tuesday	Off Time	On Time	1	/
	4	ANM Schedule - Wednesday	Off Time	On Time	2	/
	5	ANM Schedule - Thursday	Off Time	On Time	3	/
	6	ANM Schedule - Friday	Off Time	On Time	4	/
	7	ANM Schedule - Saturday	Off Time	On Time	5#####	/
	8	ANM Schedule - Sunday	Off Time	On Time	6#####	/
FLASH 41	1	Dial Pulse	60/40, 66/33		60/40	
	2	Dialing Speed	10/20 pps		10 pps	

Appendix A-2 UCD and Hunt Group Parameters

PROG CODE	FLEX BTN	FUNCTION	PILOT or STATION	STATIONS (up to 8 Stations)
FLASH 30	1	Hunt Group 0 (330)		
	2	Hunt Group 1 (331)		
	3	Hunt Group 2 (332)		
	4	Hunt Group 3 (333)		
	5	Hunt Group 4 (334)		
	6	Hunt Group 5 (335)		
	7	Hunt Group 6 (336)		
	8	Hunt Group 7 (337)		

PROG CODE	FLEX BTN	FUNCTION	ALT	OVR	RAN	STATIONS (up to 8 Stations)
FLASH 60	1	UCD Group 0 (550)				
	2	UCD Group 1 (551)				
	3	UCD Group 2 (552)				
	4	UCD Group 3 (553)				
	5	UCD Group 4 (554)				
	6	UCD Group 5 (555)				
	7	UCD Group 6 (556)				
	8	UCD Group 7 (557)				

PROG CODE	FLEX BTN	FUNCTION	FORMAT	DEFAULT	CUSTOMER DATA
FLASH 61	1	UCD Ring Timer	000-300	060	
	2	UCD Message Timer	000-300	060	
	3	UCD Overflow Timer	000-300	060	
	4	UCD Wrap-up Timer	000-999	004	
	5	UCD No-Answer Timer	000-300	000	
FLASH 62	1	Announcement Table 1	YXXXMMM	None	
	2	Announcement Table 2	YXXXMMM	None	

Appendix A-3 Voice Mail Group Parameters

PROG CODE	FLEX BTN	FUNCTION	ALT	L	R	STATIONS (Up to 8 Stations)
FLASH 65	1	Voice Mail Group 0 (440)				
	2	Voice Mail Group 1 (442)				
	3	Voice Mail Group 2 (443)				
	4	Voice Mail Group 3 (444)				
	5	Voice Mail Group 4 (445)				
	6	Voice Mail Group 5 (446)				
	7	Voice Mail Group 6 (447)				
	8	Voice Mail Group 7 (448)				

PROG CODE	FLEX BTN	FUNCTION	OUTPULSING DIGITS	L or R
FLASH 66	1	VM Outpulsing Table 0	Prefix	
			Suffix	
	2	VM Outpulsing Table 1	Prefix	
			Suffix	
	3	VM Outpulsing Table 2	Prefix	
			Suffix	
	4	VM Outpulsing Table 3	Prefix	
			Suffix	
	5	VM Outpulsing Table 4	Prefix	
			Suffix	
	6	VM Outpulsing Table 5	Prefix	
			Suffix	
	7	VM Outpulsing Table 6	Prefix	
			Suffix	
	8	VM Outpulsing Table 7	Prefix	
			Suffix	
	9	VM Disconnect Table 8	Disconnect	
FLASH 67		Voice Mail ID digits for Incoming CO Calls	Yes or No	

Appendix A-4 CO Line Programming (Flash 40)

FLEX BTN		1	2	3	4	5	6	7	8	9	10	11	
	LINE NO	TONE/PULSE	CO/PBX	UNA	DISA Trk-Trk	AUTO PRIVACY	LOOP SUPV	DISA	FLASH TIME	LINE GRP	LINE COS	RING*	REMARKS
C O #1	01												
	02												
	03												
	04												
C O #2	05												
	06												
	07												
	08												
C O #3	09												
	10												
	11												
	12												
C O #4	13												
	14												
	15												
	16												
C O #5	17												
	18												
	19												
	20												
C O #6	21												
	22												
	23												
	24												
DEFAULT		Tone	CO	Yes	Yes	Yes	No	No	10	1	1		

\*Refer to CO Line Ringing Assignments



**Appendix A-5 CO Line Ringing Assignment Chart**

	Day Ringing Assignments:		Day Ringing Assignments:
CO LINE		CO LINE	
Type	Night Ringing Assignments:	Type	Night Ringing Assignments:
Number		Number	
	Day Ringing Assignments:		Day Ringing Assignments:
CO LINE		CO LINE	
Type	Night Ringing Assignments:	Type	Night Ringing Assignments:
Number		Number	
	Day Ringing Assignments:		Day Ringing Assignments:
CO LINE		CO LINE	
Type	Night Ringing Assignments:	Type	Night Ringing Assignments:
Number		Number	
	Day Ringing Assignments:		Day Ringing Assignments:
CO LINE		CO LINE	
Type	Night Ringing Assignments:	Type	Night Ringing Assignments:
Number		Number	

COI # \_\_\_\_\_

Button 11 = Enter Ringing Assignments  
 Button 17 = Display Ringing Assignments

Ringling Assignments:  
 0 = No Ring (Deletes Station from Ringing Assignment)  
 1 = D (Day Ringing)  
 2 = N (Night Ringing)  
 3 = B (Both Day and Night Ringing)

Appendix A-6 Station Programming (Flash 50)

DATA FIELD	Page/ BTN	STATION NUMBER								DEFAULT
PAGE ACCESS	A/1									Yes
DO NOT DISTURB	A/2									Yes
CONFERENCE	A/3									Disabled
EXECUTIVE OVERRIDE	A/4									Disabled
PRIVACY	A/5									Yes
SYSTEM SPEED	A/6									Yes
QUEUING	A/7									Yes
PREFERRED LINE ANSWER	A/8									No
OHVO	A/9									
CALL FORWARD	A/10									Yes
FORCED LCR	A/11									No

Page A is selected by pressing Button 18 of the flexible buttons.

STA ID (0-6)	B/1									0
COS (1-6)	B/2									1
SPEAKERPHONE (0-1)	B/3									0
PICKUP GROUP (0-4)	B/4									1
PAGING ZONE (0-4)	B/5									1
PRESET FORWARD	B/6									None
CO LINE GROUP (0-8)	B/7									
LCR CLASS OF SERVICE	B/8									Yes
OFF-HOOK PREFERENCE	B/9									Yes
BUTTON ASSIGN	B/10	See Button Assignment Chart								

Page B is selected by pressing Button 19 of the flexible buttons.

STA # \_\_\_\_\_ to \_\_\_\_\_

## Appendix A-7 Button Assignment Chart (Flash 50)

STA # _____		PORT # _____	
1			11
2			12
3			13
4			14
5			15
6			16
7			17
8			18
9			19
10			20
21	22	23	24
25	26	27	28

STA # _____		PORT # _____	
1			11
2			12
3			13
4			14
5			15
6			16
7			17
8			18
9			19
10			20
21	22	23	24
25	26	27	28

This chart is to be used to assign each flexible button a function. By default, Buttons 1 through 10 are assigned as Stations 100 through 109, Buttons 11 through 20 are assigned as CO Lines 01 through 10.

## WHERE:

- BB = Button Number (01 through 28)
- LL = CO Line Number (01 through 28)
- G = Line Group (1 through 7)

**KEY STATION BUTTON PROGRAMMING:**

1. To assign a button as a multi-function button (user programmable) enter:  
BB [0] HOLD
2. To assign a button as a CO Line button, enter:  
BB [1] LL HOLD
3. To assign a button as a loop button, enter:  
BB [2] HOLD
4. To enter a button as a pooled group button (refer to Section 630.1 for CO Line Group numbers) enter:  
BB [3] G HOLD
5. To unassign a button, enter:  
BB [#] HOLD

**SLT ENTRY: (Off-Hook Preference)**

6. When an SLT is being assigned for Off-Hook Preference, enter:  
00 [1] LL HOLD for a specific CO Line  
or  
00[3] G HOLD for CO Group Access.

**Appendix A-8 System Speed Dial Numbers**

Programmed from the first Attendant station.

Monitored by Toll Restriction (COS)

BIN #	Telephone Number
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	

BIN #	Telephone Number
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	

Appendix A-8 System Speed Dial (Cont'd)

Programmed from the first Attendant station.

Overrides Toll Restriction (COS)

BIN #	Telephone Number
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	
76	
77	
78	
79	

BIN #	Telephone Number
80	
81	
82	
83	
84	
85	
86	
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	

Appendix A-9 Exception Tables (Flash 70)

Allow Table A

BIN 1	
BIN 2	
BIN 3	
BIN 4	
BIN 5	
BIN 6	
BIN 7	
BIN 8	
BIN 9	
BIN 10	
BIN 11	
BIN 12	
BIN 13	
BIN 14	
BIN 15	
BIN 16	
BIN 17	
BIN 18	
BIN 19	
BIN 20	

Allow Table B

BIN 1	
BIN 2	
BIN 3	
BIN 4	
BIN 5	
BIN 6	
BIN 7	
BIN 8	
BIN 9	
BIN 10	
BIN 11	
BIN 12	
BIN 13	
BIN 14	
BIN 15	
BIN 16	
BIN 17	
BIN 18	
BIN 19	
BIN 20	

Deny Table A

BIN 1	
BIN 2	
BIN 3	
BIN 4	
BIN 5	
BIN 6	
BIN 7	
BIN 8	
BIN 9	
BIN 10	

Deny Table B

BIN 1	
BIN 2	
BIN 3	
BIN 4	
BIN 5	
BIN 6	
BIN 7	
BIN 8	
BIN 9	
BIN 10	



Appendix A-10 Least Cost Routing (Flash 75)

CO LINE GROUPS

1	2	3	4	5	6	7

Enter what type lines are programmed in each group.

DAILY START TIME TABLE		
START TIME	DEFAULT TIME	CHANGED TIME
1	0800	
2	1700	
3	2300	
4	####	

WEEKLY SCHEDULE TABLE							
START TIME (From Daily Start Table)	TIME PERIOD ROUTE LIST						
	MON	TUE	WED	THU	FRI	SAT	SUN
1							
2							
3							
4							

TOLL INFORMATION ROUTE LIST TABLE	DEFAULT 00	
-----------------------------------	---------------	--

Appendix A-11 Route List Table

Route	Time	1st Group	Insert/ Delete	PRI/O	2nd Group	Insert/ Delete	PRI/O	3rd Group	Insert/ Delete	PRI/O	4th Group	Insert/ Delete	PRI/O	5th Group	Insert/ Delete	PRI/O	6th Group	Insert/ Delete	PRI/O	7th Group	Insert/ Delete	PRI/O		
00	1																							
	2																							
	3																							
	4																							
01	1																							
	2																							
	3																							
	4																							
02	1																							
	2																							
	3																							
	4																							
03	1																							
	2																							
	3																							
	4																							

Appendix A-11 Route List Table (Cont'd)

Route	Time	1st Group	Insert/ Delete	PRIO	2nd Group	Insert/ Delete	PRIO	3rd Group	Insert/ Delete	PRIO	4th Group	Insert/ Delete	PRIO	5th Group	Insert/ Delete	PRIO	6th Group	Insert/ Delete	PRIO	7th Group	Insert/ Delete	PRIO		
04	1																							
	2																							
	3																							
	4																							
05	1																							
	2																							
	3																							
	4																							
06	1																							
	2																							
	3																							
	4																							
07	1																							
	2																							
	3																							
	4																							

Appendix A-11 Route List Table (Cont'd)

Route	Time	1st Group	Insert/ Delete	PRI/O	2nd Group	Insert/ Delete	PRI/O	3rd Group	Insert/ Delete	PRI/O	4th Group	Insert/ Delete	PRI/O	5th Group	Insert/ Delete	PRI/O	6th Group	Insert/ Delete	PRI/O	7th Group	Insert/ Delete	PRI/O		
08	1																							
	2																							
	3																							
	4																							
09	1																							
	2																							
	3																							
	4																							
10	1																							
	2																							
	3																							
	4																							
11	1																							
	2																							
	3																							
	4																							

Appendix A-11 Route List Table (Cont'd)

Route	Time	1st Group	Insert/ Delete	PRI/O	2nd Group	Insert/ Delete	PRI/O	3rd Group	Insert/ Delete	PRI/O	4th Group	Insert/ Delete	PRI/O	5th Group	Insert/ Delete	PRI/O	6th Group	Insert/ Delete	PRI/O	7th Group	Insert/ Delete	PRI/O		
12	1																							
	2																							
	3																							
	4																							
13	1																							
	2																							
	3																							
	4																							
14	1																							
	2																							
	3																							
	4																							
15	1																							
	2																							
	3																							
	4																							

Appendix A-12 Insert/Delete Tables

TABLE	DIGITS DIALED	
00	INSERT	PRE
		POST
	DELETE	(PRE)
01	INSERT	PRE
		POST
	DELETE	(PRE)
02	INSERT	PRE
		POST
	DELETE	(PRE)
03	INSERT	PRE
		POST
	DELETE	(PRE)
04	INSERT	PRE
		POST
	DELETE	(PRE)
05	INSERT	PRE
		POST
	DELETE	(PRE)
06	INSERT	PRE
		POST
	DELETE	(PRE)
07	INSERT	PRE
		POST
	DELETE	(PRE)
08	INSERT	PRE
		POST
	DELETE	(PRE)
09	INSERT	PRE
		POST
	DELETE	(PRE)
10	INSERT	PRE
		POST
	DELETE	(PRE)
11	INSERT	PRE
		POST
	DELETE	(PRE)
12	INSERT	PRE
		POST
	DELETE	(PRE)

Appendix A-12 Insert/Delete Tables (Cont'd)

TABLE	DIGITS DIALED	
13	INSERT	PRE
		POST
	DELETE	(PRE)
14	INSERT	PRE
		POST
	DELETE	(PRE)
15	INSERT	PRE
		POST
	DELETE	(PRE)
16	INSERT	PRE
		POST
	DELETE	(PRE)
17	INSERT	PRE
		POST
	DELETE	(PRE)
18	INSERT	PRE
		POST
	DELETE	(PRE)
19	INSERT	PRE
		POST
	DELETE	(PRE)





Appendix A-15 LCR Exception Code Table

CODE #	EXCEPTION CODES (XX)	ROUTE (00-15) (RR)	CODE #	EXCEPTION CODES (XX)	ROUTE (00-15) (RR)
1			11		
2			12		
3			13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

## APPENDIX B

### DIGITAL SYSTEMS PART NUMBERS

#### Appendix B-1 Digital System Component List

<u>Description</u>	<u>Part No.</u>
<b>SPD 1428 Components:</b>	
4x8 Basic System (BKSU)	1400-00
2x4 CO/Sta Expander Module	1431-00
4x8 Expansion KSU	1402-00
4x8 CO/Sta Expander Module	1432-00
RS232/422 I/O Module	1437-00
<b>SPD 2856 Components:</b>	
Key Service Unit w/Power Supply (KSU)	2800-00
Central Processor Board (CPB)	2830-00
4x8 CO/Station Interface Board (CKB)	2831-00
4x8 CO/SLT Interface Board (CSB)	2833-00
RS232/422 I/O Module	2837-00
<b>SPD 1428 &amp; SPD 2856 Digital Terminals:</b>	
Enhanced Key Telephone	1412-00
Executive Key Telephone	1414-08
Data Key Telephone (Data Module Unit)	1416-08
DSS Console Unit	1410-08
DSS Expansion Module	1410-10
Single Line Adapter	1484-00
Starplus Power Failure Transfer Unit (PFTU)	SP536-00
Key Telephone Overlay (Pkg 25)	1460-XX*
Key Telephone Underlay (Pkg 100)	1462-99
<b>Manuals:</b>	
Description, Installation & Maintenance Manual	1450-00
Station Users Guide	1452-00
SLT Users Guide	1453-00
Attendant Users Guide	1454-00
<b>Optional Components:</b>	
DTMF Receiver Module	2834-00
1200 Baud Modem Module	2837-10
Relay/Sensor Interface Module	1436-00
* XX=	
00 - Black	
11 - Dark Green	
54 - Grey	
60 - Burgundy	

## APPENDIX C

# ICLID GENERAL DESCRIPTION

### C.1 Introduction

This specification provides the functional and implementation definition for the addition of the ICLID feature to the Vodavi Key Systems.

### C.2 System Configuration

The preceding illustration depicts the configuration presumed for the implementation of the ICLID feature for the system. The phones are presumed to be in a UCD group in order to allow proper operation with the system.

### C.3 Functional Performance

The ICLID (Incoming Calling Line IDentification) feature has been added to the Vodavi Key Systems as a first step in providing it generally. The key system operation of this feature is dependent on the feature first being activated from the central office so that the

numbers of the calling party will be delivered over the individual tip and ring of the CO lines during the first silent interval between ringing.

The features implemented are:

1. Display of calling number/name on initial ring-in of a line on the display keysets.
2. Recording of incoming call number/name on the SMDR printout.
3. Management of an "unanswered call" table from a display phone with appropriate privilege level to allow tracking of unanswered calls for statistical information and return call management.
4. Local translation of incoming numbers to names according to a table of number/name equivalences which can be administered by the system.

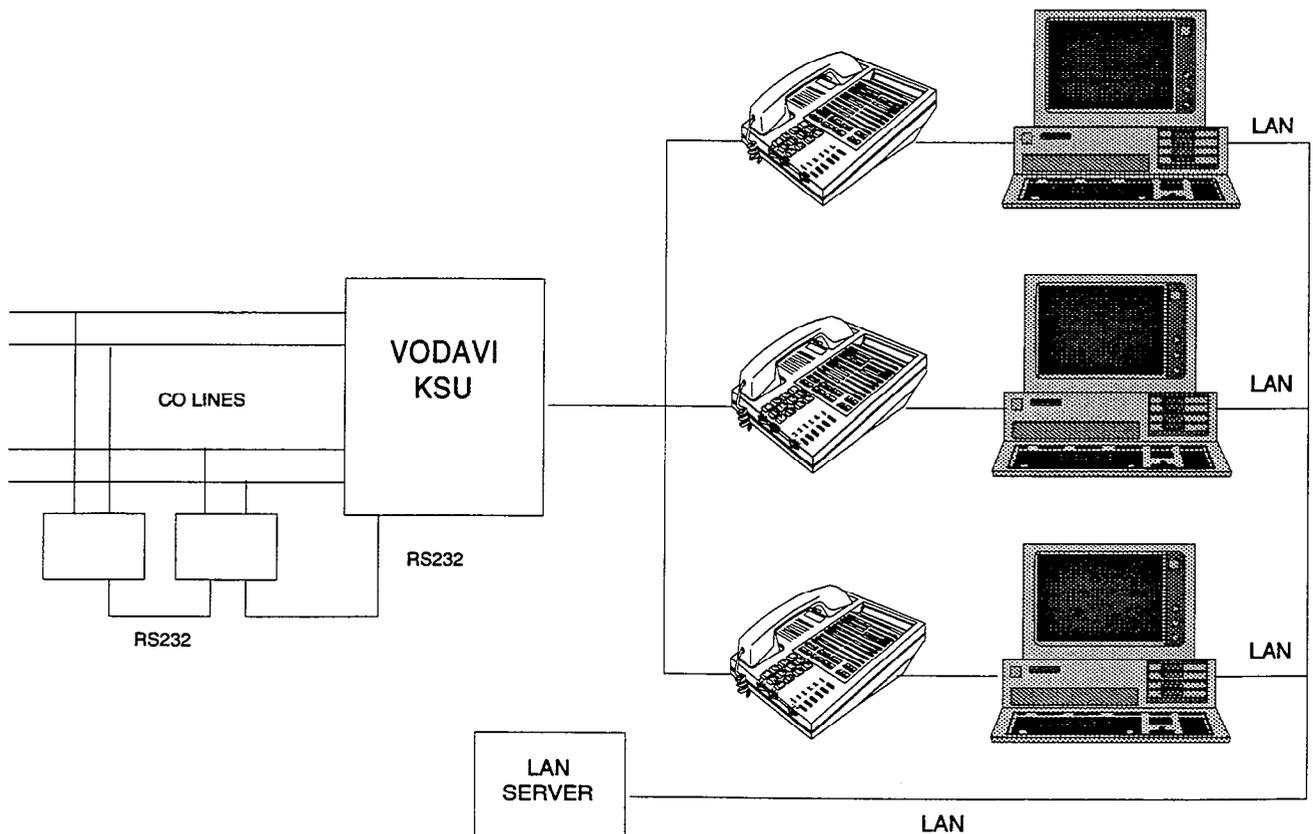


Figure C-1 ICLID System Configuration

**C.3.1 Calling Number/Name Display**

This feature is intended as the basic offering of the ICLID service when associated with a VCS keysystem. Essentially, whenever an incoming call is received at the system, the number received along with the ringing signal will be stored in the line control tables and used at various points in the processing of the call.

The primary function will be that the calling number will be displayed (if available) at any point at which the "LINE RINGING" is displayed in the system.

In addition, with the availability of the *calling name* feature, if the calling name is provided, the system will deliver that to the display instead of the calling number.

The specification for this feature is that the system will display its "LINE RINGING" message as normally implemented and alter that display to the calling number/name if the information is made present on the line. This will allow the normal operation of the system when ICLID information is not presented or the device which intercepts it and provides the information to the KSU is missing or failed.

00000000011111111122222 123456789012345678901234
-----------------------------------------------------

bbbbNNNNNNNNNNNNNNNNNNbbbb
----------------------------

or

XXXXXXXXXXXXXXXXXXXXXXXXXX
----------------------------

If the *calling name* is available, the display will be shown as above where the X's represent the internal table storage of the calling name. Note that although the Central Office delivery of the calling name is 15 characters, the internal table used to store the name for translation of a received number is 24 characters in width. If the Central Office delivers a name, it will be positioned left justified in the 24 character field on the display. Note that if a number is received which matches a number/name translation, the translated name will be used and the name delivered from the Central Office will be effectively discarded.

If no name is available, either supplied from the Central Office or internally from the translation table, the delivered number will be positioned centered in the display as shown above for the 14 N's.

**C.3.2 Incoming Number/Name SMDR**

As with the above feature implementation, the intent is that the system operate normally in the absence of ICLID information or the failure of the ICLID equipment. If the information is present at the time that an SMDR record is generated for a call, it will alter the content and format of the SMDR output record.

If the calling number is available, the number will be output in the SMDR record in the same location as the dialed number is located in the outgoing calls.

If the calling name is present, an additional line will be output in the SMDR identifying the name. This record will immediately follow the normal SMDR record. The normal SMDR record will include an indicator which identifies that a following record with name identification is present.

Unanswered calls will be recorded on the SMDR for incoming as a system option to allow the identification of callers for statistical and call-back purposes. These calls will be identified with an indicator in the SMDR record.

**C.3.3 Unanswered Call Management**

A 50 entry table will be maintained in the system. The calling number/name information pertaining to any unanswered call will be placed in this table at the time the system has determined that the call has been abandoned.

This table may be administered from appropriately privileged phones so that the unanswered calls may be reviewed and handled by the customer. Upon entry into the review process, the functions available to a phone are:

Function	Function Button
1. Go to beginning of list	Dial Code 635 <sup>1</sup>
2. Review next item in this list entry	MUTE
3. Step to next list entry.	HOLD
4. Delete this list entry.	FLASH
5. Delete entire list.	Note <sup>2</sup>
6. Exit list review function.	ON/OFF
7. Step to previous list entry.	TRANS
8. Call Back.	SPEED

<sup>1</sup> The access code is used to enter the list processing function. The remaining functions are exercised by use of a redefinition of the "fixed" function buttons.

<sup>2</sup> This feature will be implemented initially as an Admin Programming function only due to an ongoing investigation as to whether it is practical to allow complete list deletion at the phones when it is relatively easy to clear the list one entry at a time.

**C.3.4 Local Name Translation**

An administrable table in the KSU will be provided. This will provide a local translation from a received calling number to a name. This will be administrable by the customer from the attendant console position<sup>1</sup>. In cases of conflict between the name delivered from the CO and that in the local translation table, the local translation table shall rule. One hundred (100) entries will be provided in this table.

**C.3.5 ICLID Display Phone Operation**

The phone, modified as described in paragraph, will be used to deliver specific data messages identifying call states to a device attached to the phone via a serial channel following the data transmission requirements of RS232. The interface parameters to be used are 2400bps, no parity, 8 data bits, and 1 stop bit. The implementation of this will be to deliver ICLID data to a Personal Computer attached to the phone for look-up of customer records and subsequent processing by the individual answering the telephone call.

**C.3.5a Information from the Phone to the PC**

The messages are provided from the keyset to the connected PC are:

The formats of these messages are shown in the below table as follows:

These messages are transmitted from the KSU to the phone and subsequently from the phone to the data line as the appropriate events occur within the system. Each event is separate and does not require any history to be maintained. A PC connected to the phone must be prepared to accept and process any of these messages at any time.

The data is sent from the KSU to the keyset using command F0. The keyset then takes the data byte and sends it out to the PC at 2400 baud, no parity, eight data bits, and one stop bit. There is no handshaking in the keyset so the PC must always be ready to receive the data sent to it. The data is in the form specified in the ICLID specification.

**C.3.5b Information from the PC to the Phone**

The ICLID phone allows information from a connected PC to be used to simulate button depressions internally within the phone. The characters sent from the PC to the phone must be paced to provide at least 100ms between characters (500ms for DTMF pad depressions). The data received from the PC is converted to keystroke data. The data is received at 2400 baud, no parity, eight data bits, and one stop bit. There is no handshaking in the keyset receive. To allow the keyset time to send the data to the KSU character pacing of 100ms is required. To allow DTMF outgoing digits to complete, 500ms pacing is required. The character received has bits seven and eight striped off and is converted to the

Message Type	Message Format	Size
1. Caller information	1iNNNNNNNNNNNNNNN NXXXXXXXXXXXXXXXXXX XXXXXXXXX(Cr)	42
2. Call answered at this station.	2ii(Cr)	4
3. Call answered at some other station.	3ii(Cr)	4
4. Call abandoned.	4ii(Cr)	4
5. Call completed at this station (on-hook).	5ii(Cr)	4
6. Transferred ICLID call.	6iNNNNNNNNNNNNNNN XXXXXXXXXXXXXXXXXX XXXXX(Cr)	42
7. Recalled ICLED.	7iNNNNNNNNNNNNNNN XXXXXXXXXXXXXXXXXX XXXXX(Cr)	42

Note: ii = Two bytes used to identify a call for subsequent messages so that a PC will be able to identify current call status for processing purposes.

N...N = This is the number received from the Central Office.

X...X = This is the name to be used for look-up purposes as delivered either from the Central Office or via the

<sup>1</sup> This function will be implemented for the initial implementation as an Admin Programming feature (FLASH 55 program) for efficiency purposes. Further investigation will be necessary to determine the feasibility of implementing this in attendant console processing.

key strokes as per the following chart. Time must be allowed from the access of a CO line before digits are sent out to the line. The following table lists The ASCII characters and the button depression they cause.

ASCII Value	Btn #	Pacing	ASCII Char(s)
0x00			NUL
0x01	Flex #01	100ms	SOH
0x02	Flex #02	100ms	STX
0x03	Flex #03	100ms	ETX
0x04	Flex #04	100ms	EOT
0x05	Flex #05	100ms	ENQ
0x06	Flex #06	100ms	ACK
0x07	Flex #07	100ms	BEL
0x08	Flex #08	100ms	BS
0x09	Flex #11	100ms	HT
0x0A	Flex #12	100ms	LF
0x0B	Flex #13	100ms	VT
0x0C	Flex #14	100ms	FF
0x0D	Flex #15	100ms	CR
0x0E	Flex #16	100ms	SO
0x0F	Flex #17	100ms	SI
0x10	Flex #18	100ms	DLE
0x11	Flex #21	100ms	DC1
0x12	Flex #22	100ms	DC2
0x13	Flex #23	100ms	DC3
0x14	Flex #24	100ms	DC4
0x15	Flex #25 <sup>4</sup>	100ms	NAK
0x16	Flex #26 <sup>5</sup>	100ms	SYN
0x17	Flex #27 <sup>6</sup>	100ms	ETB
0x18	Flex #28 <sup>7</sup>	100ms	CAN
0x19	Digit 1	500ms	EM
0x1A	Digit 4	500ms	SUB
0x1B	Digit 7	500ms	ESC
0x1C	Digit *	500ms	FS
0x1D	Flex #09	100ms	GS
0x1E	Flex #19	100ms	RS
0x1F	HOLD	100ms	US
0x20	TRAN	100ms	SP
0x21	Digit 2	500ms	!
0x22	Digit 5	500ms	"
0x23	Digit 8	500ms	#
0x24	Digit 0	500ms	\$
0x25	Flex #10	100ms	%
0x26	Flex #20	100ms	&
0x27	FLASH	100ms	'
0x28			(
0x29	Digit 3	500ms	)
0x2A	Digit 6	500ms	*

0x2B	Digit 9	500ms	+
0x2C	Digit #	500ms	,
0x2D	SPEED	100ms	-
0x2E	MUTE	100ms	.
0x2F	ON/OFF	100ms	/
0x30	H/W Error		0
0x31			1
0x32			2
0x33			3
0x34			4
0x35			5
0x36			6
0x37			7
0x38			8
0x39			9
0x3A			:
0x3B			;
0x3C			<
0x3D			=
0x3E			>
0x3F			?

<sup>4</sup>. Normally the MSG button.  
<sup>5</sup>. Normally the FWD button.  
<sup>6</sup>. Normally the DND button.  
<sup>7</sup>. Normally the CONF button.

**C.4 Implementation Plan**

The reference for this data delivery is the BellCoRe specification TR-TSY-000030 Issue 1 dated November 1988. Other specifications will be consulted as they become available. In particular, the implementation of the multiple message format provided by Northern Telecom must be examined for deviations from the multiple message format definition in the TR-TSY-000030 document.

The steps necessary to implement this are detailed in the following sections.

**C.4.1 ICLID KTU Display Phone**

The ICLID KTU provides transmit, receive, and ground data lines from the phone μ-processor which are used on command from the KSU to output information. The use of this capability would be to output the ICLID information to a PC attached to the phone. Future use could be made of this capability for low speed data provided to equipment attached to the phone.

**C.4.2 Table Structures**

**C.4.2a Incoming Number Table (per CO line)**

CO Line	Received # (14)	Received Name (24)	Date (2)	Time (2)	CO Line (2)
1					
2					
3					
•	•	•	•	•	•
•	•	•	•	•	•
•	•	•	•	•	•
n-1					
n					

**C.4.2b Unanswered Call Table**

CO Line	Received # (14)	Received Name (24)	Date (2)	Time (2)	CO Line (2)
0					
1					
2					
3					
4					
•	•	•	•	•	•
•	•	•	•	•	•
•	•	•	•	•	•
48					
49					

Oldest index
Newest index

**C.4.2c Number to Name Translation Table**

Entry #	Received # (14)	Received Name (24)
0		
1		
2		
•	•	•
•	•	•
•	•	•
99		

**C.4.3 Logic Operation**

To be supplied.

**C.4.4 ICLID Input Device Data Format**

**C.4.4a Tel-Control Incorporated TC-1082 Data Format**

<b>TC-1082 DATA FORMAT</b>			
Each data stream will be 72 characters in length. Each field within the data stream is a fixed character length, right justified.			
Field #	Nmbr of Chars	Field Name	Typical Field Contents
1	2	Line Number	01 to 64
2	5	Spaces	
3	5	Date	12/31
4	5	Spaces	
5	8	Time	12:56 PM
6	5	Spaces	
7	14	Phone Number	1-205-881-4000 205-881-4000 1-881-4000 881-4000
8	5	Spaces	
9	1	Long Distance indicator	L
10	5	Spaces	
11	15	Name	Charles Gross John Richeson
12	1	Carriage Return	
13	1	Line Feed	
Fields 3, 4, and 5 are also used to display "MESSAGE WAITING" and "MESSAGE RECEIVED". Both are right justified starting at the last character of field 5.			

**C.5 Potential Additional Features for Later Implementation**

(Features to be included in the Keysystem Software)

Advantage System Integration. This should be generalized to the point where the data currently provided to the special ICLID KTU would be instead tagged with a phone number and sent via an RS232/RS422 processor port from the KSU to a host computer. The concept in this case is that the host computer handles multiple terminals associated with the telephones. As a telephone is identified as receiving ICLID data, the host computer would provide the appropriate data to the terminal associated with the message.

**C.6 Direction of Specific Numbers to Special Handling (Favored Customer Treatment).**

- e.g. Calling Number Blocking
- Favored Customer UCD Group Selection
- Favored Customer Off-net Forwarding
- Special UCD Recording Selection
- Accumulate multiple counts of the same number incoming, rather than entering the same number into the unanswered number table again.

**C.7 Features Implemented External to the KSU Software**

- Customer name/address look-up based on the incoming number. This would be a data base program which would be indexed on the customer name and number.

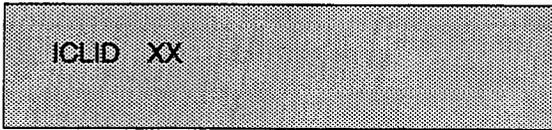
**C.8 ICLID Programming**

**C.8.1 Local Name Translation**

Programming Steps

If changes need to be made to ICLID Table:

1. Press FLASH and dial [55]. The following message is shown on the display phone:



Where:

XX=ICLID Index Number 00-99

To program a phone number into the ICLID translation table:

2. Press the PHONE NUMBER flexible button (Button #1) to enter the desired phone number into the translation table. Maximum number of numbers is 14 including hyphens. The BACK SPACE flexible button can be used to erase the current number to correct for errors. Use the following table for table entries.

A=21	N=62	1=1#	"=01
B=22	O=63	2=2#	,=02
C=23	P=71	3=3#	?=03
D=31	Q=74	4=4#	/=04
E=32	R=72	5=5#	!=*1
F=33	S=73	6=6#	\$=*2
G=41	T=81	7=7#	&=*4
H=42	U=82	8=8#	*=*#
I=43	V=83	9=9#	(=#1
J=51	W=91	0=0#	)=#2
K=52	X=92	Space=11	+=#3
L=53	Y=93	: =12	==#4
M=61	Z=94	- =13	#=##
		' =14	

3. Press the HOLD button to update the database.

To program a name into the ICLID translation table:

1. Press the NAME flexible button (Button #2) to enter the desired name into the translation table. Maximum number of characters is 24. The BACK SPACE flexible button can be used to erase the current letter to correct for errors.
2. Press the HOLD button to update the database.

To erase a current phone number and name entry:

1. Press the CLEAR ENTRY flexible button (Button #3) to clear an entire phone number and name from the current index.

Description

An administrable table in the KSU is provided. This table provides a local translation from a received calling number to a name. This is administrable by the customer from the attendant console position. In cases of conflict between the name delivered from the CO and that in the local translation table, the local translation table shall rule. One hundred (100) entries are provided in this table.

When programming the ICLID Translation Table, the flexible buttons are as follows:

Q 1	PHONE NUMBER		11	A
W 2	NAME		12	B
E 3	CLEAR ENTRY		13	D
R 4	BACK SPACE		14	F
T 5			15	G
Y 6			16	H
U 7			17	J
I 8		NEXT INDEX	18	K
O 9		PREV INDEX	19	L
P 10		EDIT AN INDEX	20	

*NOTE: If a match is found between a number in the translation table and an incoming call record, the translated name is displayed and/or stored in the unanswered call table.*

*NOTE: Entry of phone numbers and names from a terminal require keystrokes corresponding to a keyset keystroke. Example: to enter a "1" from the terminal, an entry of "1#" is required or to enter an "A", the terminal programmer must enter "21".*

**ICLID Programming (Cont'd)**

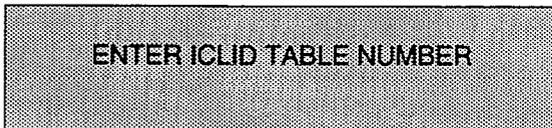
**Local Name Translation Table (Cont'd)**

Programming Steps

2. Press the NEXT INDEX flexible button (Button #18) to advance to the next index and continue entering information into the ICLID translation table, or
3. Press the PREV INDEX flexible button (Button #19) to go back to a previous index that is already programmed.

To locate an existing index for editing:

1. Press the EDIT INDEX flexible button (Button #20). The following message is shown on the display phone:



2. Enter a two-digit number which corresponds to the index numbers 00-99.
3. Press the HOLD button to complete the entry.

Description

An administrable table in the KSU is provided. This table provides a local translation from a received calling number to a name. This is administrable by the customer from the attendant console position. In cases of conflict between the name delivered from the CO and that in the local translation table, the local translation table shall rule. One hundred (100) entries are provided in this table.

When programming the ICLID Translation Table, the flexible buttons are as follows:

G 1	PHONE NUMBER		11	A
W 2	NAME		12	S
E 3	CLEAR ENTRY		13	D
R 4	BACK SPACE		14	F
T 5			15	G
Y 6			16	H
U 7			17	J
I 8				
G 9				
P 10				
		NEXT INDEX	18	K
		PREV INDEX	19	L
		EDIT AN INDEX	20	

*NOTE: If a match is found between a number in the translation table and an incoming call record, the translated name is displayed and/or stored in the unanswered call table.*

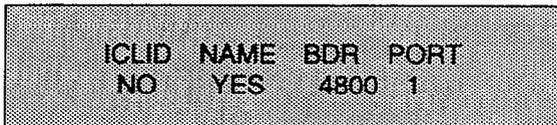
**ICLID Programming (Cont'd)**

**C.8.2 ICLID Features**

Programming Steps

If ICLID is to be used:

1. Press FLASH and dial [56]. The following message is shown on the display phone:



2. To program ICLID features, use the flexible button(s) as defined in the following procedures. The ICLID, NAME buttons toggle on and off.
3. After all entries are made, press the HOLD button to accept the data.

Description

The Starplus Digital (SPD) Key Telephone System can provide ICLID output to either the standard RS-232C connector on the SPD 1428 Basic KSU motherboard or CPB board or to the optional RS-232C/422 I/O Module connector(s). When ICLID is desired, the following system-wide parameters will determine how the ICLID information will be distributed.

When programming ICLID features, the flexible buttons are mapped as follows:

Q 1	ICLID	11 A
W 2	FORMAT	12 S
E 3	BAUD RATE	13 D
R 4	PORT	14 F

**Related Programming:** ICLID Translation Table.

**C.8.2a ICLID Enable/Disable**

Programming Steps

1. Press the ICLID flexible button (Button #1) to enable/disable this feature.
  - LED ON = ICLID is enabled
  - LED OFF = ICLID is disabled
2. Press the HOLD button to accept the data. The display will now update.

Description

**Default:** By default, ICLID is disabled.

**C.8.2b NAME in Display**

Programming Steps

1. Press the NAME flexible button (Button #2) to determine whether the name will appear in the LCD display instead of the incoming telephone number.
  - LED ON = Name will appear in display
  - LED OFF = Telephone number will appear in display
2. Press the HOLD button to accept the data. The display will now update.

Description

The system can be set to display either the incoming telephone number or the person's name on the LCD display.

**Default:** By default, the system will show the telephone number on the LCD display.

**ICLID Programming (Cont'd)****ICLID Features (Cont'd)**

<u>Programming Steps</u>	<u>Description</u>
<p><b>C.8.2c Baud Rate Display</b>            The ICLID Baud Rate is programmed using Flash 15 Baud Rate Assignments. Button #3 will return error tone when pressed. The LCD displays the current baud rate based on which Port number is assigned to the ICLID Port number.</p>	<p>The Starplus Digital (SPD) Key Telephone Systems can provide ICLID input to either the standard RS-232C "On-Board" connector on the SPD 1428 BKSU or SPD 2856 CPB board or to the optional RS-232C/422 I/O Expander Module connector(s). The Baud Rate will be displayed as either 300 baud, 1200 baud, 2400 baud, 4800 baud, or 9600 baud.</p>

**Related Programming:** Baud Rate Assignments

**C.8.2d ICLID Port Assignment**

<u>Programming Steps</u>	<u>Description</u>
<ol style="list-style-type: none"> <li>1. Press the PORT flexible button (Button #4) to determine which port is to be used for ICLID information.</li> <li>2. Enter a one-digit number for the ICLID Port number:               <ul style="list-style-type: none"> <li>1= Port #1 ("On-Board" RS-232C)</li> <li>2= Port #2 ("On-Board" 300 Baud Modem)</li> <li>3= Port #3 (I/O Expander Module RS-232C)</li> <li>4= Port #4 (I/O Expander Module RS-422)</li> </ul> </li> <li>3. Press the HOLD button to accept the data. The display will now update.</li> </ol>	<p><b>Port #1</b> refers to the standard RS-232C "On-Board" connector on the SPD 1428 Basic KSU or the CPB board on the SPD 2856.</p> <p><b>Port #2</b> refers to the "On-Board" 300 Baud modem provided with the system.</p> <p><b>Port #3</b> refers to the RS-232C connector on the I/O Expander Module.</p> <p><b>Port #4</b> refers to the RS-422 connector on the same I/O Expander Module installed in either Starplus Digital system.</p> <p><b>Default:</b> By default, Port #1 is used for ICLID operation.</p>



**SYSTEM FEATURES**

- Dial By Name
- Directory Dialing Internal/External
- Local Number/Name Translation Table
- Off Hook Voice Over
- Messages Canned
- Messages Date & Time
- Message Custom
- Text Messaging (Silent Response)
- Distinctive Ringing
- Group Listening
- Flex Button Programming
- Idle Speaker Mode
- Music On Hold
- Automatic Call Back Timer
- Executive Override

**DIAL BY NAME**

**Description:**

The system will allow station users to dial extension numbers or speed bin by entering a name of a person that has been programmed for that station. The system data base will allow entry of a name (alphanumeric) up to 24 characters in length for each station. This programmed name can be used for dialing-by-name station users.

**Operation:**

To dial a station user by name:

- a. The user dials the Dial-By-Name code [6.\*] on the dial pad.
- b. Dial the desired person's name using the keys on the key pad. For example: if you wanted to call Linda Murphy, and last names were entering into the directory dialing list, you would press the digit 6 (M), then the digit 8 (U), then the digit 7 (R), the digit 7 again (P), the digit 4 (H) and finally the digit 9 (Y).

ALPHA NUMERIC CHAR	DIGIT	ALPHA NUMERIC CHAR	DIGIT
A,B,C	2	M,N,O	6
D,E,F	3	P,Q*,R,S	7
G,H,I	4	T,U,V	8
J,K,L	5	W,X,Y,Z*	9

\* = does not appear on the keypad

- c. When the system finds a unique numeric match (MURPHY=687749) to the name being dialed, the call will be placed to the station matching the name. The intercom call will signal the station according to the H-T-P switch setting. If fewer than eight digits are dialed, the numeric match will be dialed after a 10 sec. inter-digit time-out occurs, or if a "#" (pound), is pressed.

**Conditions:**

- 1. The Dial-by-Name code [6.\*] may be programmed onto a flex button.
- 2. The system will dial the station that matches the dialed name when a unique match is found.
- 3. Numbers may be entered as part of a name.
- 4. If multiple names are located (found) after 8 digits, the first one is dialed.

**Programming**

The names will be entered as a part of the system attributes data base. To avoid conflicts, all names must have a unique numerical sequence.

**DIAL BY NAME (cont'd)**

**Hardware:**

None

**LCD Display**

When a station user dials the dial-by-name code, the LCD will prompt for the name as follows:

123456789012345678901234

DIAL NAME:
MM/DD/YY      HH:MM pm

**DIRECTORY DIALING - Station**

**Description:**

Station users with Executive Display telephones may view a list, of up to 200 names, from the system directory on the station's LCD display, then automatically dial the station or speed dial bin or entry in the Local Number/Name Translation Table by pressing a single key. Names placed in the directory list may be associated to intercom numbers, system speed dial bins, or entries in the Local Number/Name Translation Table. Users may view the directory list beginning with any letter of the alphabet, then scroll through the list either forward or backwards. When the desired name is displayed on the LCD display, pressing the SPEED button will automatically place a call to that destination. Directory dialing may also be used to transfer a call from one station to another.

**Operation:**

- a. Dial the Directory List dial code [680], or press the pre-programmed flex button programmed as a directory dialing button.
- b. Press a button on the key pad, once, twice or three times, to represent the letter of the alphabet, to begin viewing the list of names. (i.e. the first depression of the digit 2 produces the names beginning with an "A". The second depression of the digit 2 produces the names beginning with a "B", while the third depression of the digit 2 produces the names beginning with a "C".) The letters of the alphabet are represented on the key pad as follows:

ALPHA NUMERIC CHAR	DIGIT	ALPHA NUMERIC CHAR	DIGIT
A,B,C	2	M,N,O	6
D,E,F	3	P,Q*,R,S	7
G,H,I	4	T,U,V	8
J,K,L	5	W,X,Y,Z*	9

\* = does not appear on the keypad

- c. Names beginning with the letter chosen will appear on the LCD display.

*If there are no names in the Directory List beginning with the desired letter, a name with the next higher letter will be shown on the LCD display.*

- d. Dial [\*] to scroll up (next entry) through the list,  
or  
Dial [#] to scroll down (previous entry) through the list,  
or  
Press another key to view the list for a different letter of the alphabet.

---

**DIRECTORY DIALING - Station (cont'd)**

- e. When the desired name is shown in the LCD display, pressing the SPEED button will automatically dial the destination station or outside phone number (via speed dial).
- If the desired party is an intercom station, that station will be signaled according to that station's intercom selector switch (SLT stations will tone ring).
  - If the desired party is associated to a speed dial bin, the system will select a CO line and dial the number programmed into the speed dial bin. Call progress tones will then be heard.
  - If the desired party is associated to an entry in the Local Number/Name Translation Table, the system will and dial the number programmed into the translation table. Call progress tones will then be heard.

To Transfer a Call using Directory Dialing:

While on a call;

- a. Press the TRANSfer button.
- b. Dial the Directory Dial Code [680] on the dial pad,  
  
or  
  
Press a pre-programmed flex button programmed for directory dialing.
- c. Press the SPEED button to automatically dial the destination station.
- d. Hang up to complete the transfer.

*Note: Calls may only be transferred to internal stations only. An attempt to transfer a call off-net (via a Speed dial bin) will result in the call recalling upon going on-hook.*

**Programming**

None

**DIRECTORY DIALING - Attendant**

**Description**

Attendants with Executive Display telephones may view a list, of up to 200 names, from the system directory on the station's LCD display, then automatically dial the station, speed dial bin, or entry in the Local Number/Name Translation Table by pressing a single key. Names placed in the directory list may be associated to intercom numbers, system speed dial bins, or entries in the Local Number/Name Translation Table. Users may view the directory list beginning with any letter of the alphabet, then scroll through the list either forward or backwards. When the desired name is displayed on the LCD display, pressing the SPEED button will automatically place a call to that destination. Directory dialing may also be used to transfer a call from one station to another.

**Operation:**

- a. Dial the Directory List dial code [680], or press the pre-programmed flex button programmed as a directory dialing button.
- b. Press a button on the key pad, once, twice or three times, to represent the letter of the alphabet, to begin viewing the list of names. (i.e. the first depression of the digit 2 produces the names beginning with an "A". The second depression of the digit 2 produces the names beginning with a "B", while the third depression of the digit 2 produces the names beginning with a "C".) The letters of the alphabet are represented on the key pad as follows:

ALPHA NUMERIC CHAR	DIGIT	ALPHA NUMERIC CHAR	DIGIT
A,B,C	2	M,N,O	6
D,E,F	3	P,Q*,R,S	7
G,H,I	4	T,U,V	8
J,K,L	5	W,X,Y,Z*	9

\* = does not appear on the keypad

- c. Names beginning with the letter chosen will appear on the LCD display.

*If there are no names in the Directory List beginning with the desired letter, a name with the next higher letter will be shown on the LCD display.*

- d. Dial [\*] to scroll up (next entry) through the list,  
or  
Dial [#] to scroll down (previous entry) through the list,  
or  
Press another key to view the list for a different letter of the alphabet.

---

**DIRECTORY DIALING - ATTENDANT (cont'd)**

- e. When the desired name is shown in the LCD display, pressing the SPEED button will automatically dial the destination station or outside phone number (via speed dial).
  - If the desired party is an intercom station, that station will be signaled according to that station's intercom selector switch (SLT stations will tone ring).
  - If the desired party is associated to a speed dial bin, the system will select a CO line and dial the number programmed into the speed dial bin. Call progress tones will then be heard.
  - If the desired party is associated to an entry in the local number/name translation table, the system will dial the number programmed into the translation table. Call progress tones will then be heard.

To Transfer a Call using Directory Dialing:

While on a call;

- a. Press the TRANSfer button.
- b. Dial the Directory Dial Code [680] on the dial pad,  
or  
Press a pre-programmed flex button programmed for directory dialing.
- c. Press the SPEED button to automatically dial the destination station.
- d. Hang up to complete the transfer.

*Note: Calls may only be transferred to internal stations only. An attempt to transfer a call off-net (via a Speed dial bin) will result in the call recalling upon going on-hook.*

**DIRECTORY DIALING (cont'd)**

**Programming - Attendant**

Names may be programmed into the directory dialing list from the first assigned attendant station. The system allows up to 200 names to be programmed into the directory. Each name can be associated to either a station intercom number, a System speed dial bin or an entry in the Local Number/Name Translation Table and can be up to 24 characters in length. Entries in the Local Number/Name Translation Table can be up to 14 characters in length. Names are programmed in one of two ways, either by themselves or while programming system speed dial numbers.

**A. Method One**

To enter, edit or erase names that appear in the Directory List for stations or speed dial numbers:

1. Dial the Directory List program code [693]. The first entry (entry 000) in the Directory List will be shown on the LCD display as follows:

123456789012345678901234



- AAA = Directory List entry number (000-199)
- XXX = Either a Station Number, System Speed dial bin Number, or Local Number/Name Translation Table number
- nnn = Programmed Name (blank if none)

To Select a different entry in the Directory List;

1. Press the HOLD button.
2. Enter the three-digit entry number (000-199) on the dial pad and press the SPEED button,  
OR  
Dial [\*] to scroll up (next entry) through the list  
OR  
Dial [#] to scroll down (previous entry) through the list.

**DIRECTORY DIALING - (cont'd)**

To Enter or Change the current name shown on the display:

1. Press the MUTE button.
2. Then enter the name (up to 24-characters may be entered) by using keys on the dial pad as follows:

A = 21	N = 62	1 = 1#	* = 01
B = 22	O = 63	2 = 2#	, = 02
C = 23	P = 71	3 = 3#	? = 03
D = 31	Q = 74	4 = 4#	/ = 04
E = 32	R = 72	5 = 5#	! = *1
F = 33	S = 73	6 = 6#	\$ = *2
G = 41	T = 81	7 = 7#	. = *3
H = 42	U = 82	8 = 8#	& = *4
I = 43	V = 83	9 = 9#	* = *#
J = 51	W = 91	0 = 0#	( = #1
K = 52	X = 92	Space = 11	) = #2
L = 53	Y = 93	: = 12	+ = #3
M = 61	Z = 94	- = 13	= = #4
		' = 14	# = ##

3. Press the SPEED button when finished. Confirmation tone will be heard and the display will update.

To enter the intercom number to be associated to the name:

1. Press the TRANS button.
2. Enter a three-digit station intercom number (100-155)
3. Press the SPEED button to save the entry. Confirmation tone will be heard and the display will update.

To clear an entry:

1. Press the TRANS button. Then press the FLASH button. Press the SPEED button to save the entry. Confirmation tone will be heard and the entry will be erased.

**DIRECTORY DIALING (cont'd)**

**C. Method Two:**

This method may be used to enter names that will be associated to the Local Number/Name Translation Table only.

To enter a name along with a local number/name translation table number:

1. Press the TRANS button.
2. Dial the three-digit local number/name translation table number (300-499) that represents the desired telephone number.

To Enter or Change the current name shown on the display:

1. Press the MUTE button.
2. Then enter the name (up to 24-characters may be entered) by using keys on the dial pad as follows: The display will update as the name is entered.

A = 21	N = 62	1 = 1#	* = 01
B = 22	O = 63	2 = 2#	, = 02
C = 23	P = 71	3 = 3#	? = 03
D = 31	Q = 74	4 = 4#	/ = 04
E = 32	R = 72	5 = 5#	! = *1
F = 33	S = 73	6 = 6#	\$ = *2
G = 41	T = 81	7 = 7#	. = *3
H = 42	U = 82	8 = 8#	& = *4
I = 43	V = 83	9 = 9#	* = *#
J = 51	W = 91	0 = 0#	( = #1
K = 52	X = 92	Space = 11	) = #2
L = 53	Y = 93	: = 12	+ = #3
M = 61	Z = 94	- = 13	= = #4
		' = 14	# = ##

3. Press the SPEED button when finished. Confirmation tone will be heard.

*NOTE: The Local Number/Name Translation Table can be used to enter additional speed dial numbers which can be used for directory dial or dial by name. The name entered into the local number/name translation table is not relevant when used with directory dialing and dial by name. In addition, it should be noted that the numbers entered into this table are limited to 14-digits and will be covered by toll restriction rules.*

**DIRECTORY DIALING (Cont'd)**

**B. Method Three**

This method may be used to enter names that will be associated to a system speed dial bin only.

To enter a name along with a system speed dial number:

1. Press the SPEED button once.
2. Then either press a desired outside line key;  
OR  
Press the SPEED button a second time to have an outside line selected automatically.
3. Dial the system speed dial bin location (20 to 99).
4. Dial the telephone number (including special characters TRANS, HOLD and FLASH).
5. Press the SPEED button to store the telephone number.

To enter a name:

1. Press the MUTE button.
2. Enter the name (up to 24-characters may be entered) by using keys on the dial pad as follows:

A = 21	N = 62	1 = 1#	* = 01
B = 22	O = 63	2 = 2#	, = 02
C = 23	P = 71	3 = 3#	? = 03
D = 31	Q = 74	4 = 4#	/ = 04
E = 32	R = 72	5 = 5#	! = *1
F = 33	S = 73	6 = 6#	\$ = *2
G = 41	T = 81	7 = 7#	. = *3
H = 42	U = 82	8 = 8#	& = *4
I = 43	V = 83	9 = 9#	* = *#
J = 51	W = 91	0 = 0#	( = #1
K = 52	X = 92	Space = 11	) = #2
L = 53	Y = 93	: = 12	+ = #3
M = 61	Z = 94	- = 13	= = #4
		' = 14	# = ##

3. Press the SPEED button when finished. Confirmation tone will be heard and the display will update.
4. Either hang up to end programming or begin at step 2 to program another System Speed Dial bin/Name combination.



**DIRECTORY DIALING (Cont'd)**

To Enter or Change the current name shown on the display:

- a. Press the NAME flexible button (Button #2).
- b. Enter the name (up to 24-characters may be entered) by using keys on the dial pad as follows:

A = 21	N = 62	1 = 1#	* = 01
B = 22	O = 63	2 = 2#	, = 02
C = 23	P = 71	3 = 3#	? = 03
D = 31	Q = 74	4 = 4#	/ = 04
E = 32	R = 72	5 = 5#	! = *1
F = 33	S = 73	6 = 6#	\$ = *2
G = 41	T = 81	7 = 7#	. = *3
H = 42	U = 82	8 = 8#	& = *4
I = 43	V = 83	9 = 9#	* = *#
J = 51	W = 91	0 = 0#	( = #1
K = 52	X = 92	Space = 11	) = #2
L = 53	Y = 93	: = 12	+ = #3
M = 61	Z = 94	- = 13	= = #4
		' = 14	# = ##

- c. If an error is made while entering the name, press the BACK SPACE flexible button (Button #4). This button may be pressed to backspace one character at a time.
- d. Press the HOLD button when finished. Confirmation tone will be heard and the display will update.

To clear an entry:

- a. Press CLEAR flexible button (Button #3).
- b. Press the HOLD button. Confirmation tone will be heard and the entry will be erased (both the BIN/ICM assignment and the programmed name).

**LOCAL NUMBER/NAME TRANSLATION**

**Description**

An administrable table in the KSU to provide a local translation from a received calling number to a name. This is administrable by the customer from the attendant console position. In cases of conflict between the name delivered from the CO and that in the local translation table, the local translation table shall rule. 100 entries are provided in this table for the Starplus SPD1428 system, 200 entries are provided for the Starplus SPD2856 system..

*NOTE: If a match is found between a number in the translation table and an incoming call record,, the translated name is displayed and/or stored in the unanswered call table.*

*NOTE: Entries of phone numbers and names from a terminal require keystrokes corresponding to a keyset keystroke. Example: to enter a "1" from the terminal,, an entry of "1#" is required or to enter an "A",, the terminal programmer must enter "21".*

**Programming:**

If entries or changes need to be made to the Local Number/Name Translation Table:

1. Press FLASH and dial [55]. The following message is shown on the display phone:

123456789012345678901234



Where:

XXX= Table Number 300-499 (SPD 1428 = 300-399; SPD 2856 = 300-499)  
##= Route Number 00-19

2. The ROUTE NUMBER Flexible Button (Button #1) LED is lit. Enter the two-digit Route Number from what was entered in program code, FLASH 43.  
00-09= SPD 1428 System  
00-19= SPD 2856 System

**LOCAL NUMBER/NAME TRANSLATION TABLE (Cont'd)**

To program a phone number into the Number/Name Translation table:

1. Press the PHONE NUMBER flexible button (Button #2) to enter the desired phone number into the translation table. Maximum number of numbers is 14-digits, including hyphens. The BACK SPACE flexible button (Button #5) can be used to erase the current number to correct for errors. Use the following table for table entries.

A = 21	N = 62	1 = 1#	* = 01
B = 22	O = 63	2 = 2#	, = 02
C = 23	P = 71	3 = 3#	? = 03
D = 31	Q = 74	4 = 4#	/ = 04
E = 32	R = 72	5 = 5#	! = *1
F = 33	S = 73	6 = 6#	\$ = *2
G = 41	T = 81	7 = 7#	. = *3
H = 42	U = 82	8 = 8#	& = *4
I = 43	V = 83	9 = 9#	* = *#
J = 51	W = 91	0 = 0#	( = #1
K = 52	X = 92	Space = 11	) = #2
L = 53	Y = 93	: = 12	+ = #3
M = 61	Z = 94	- = 13	= = #4
		' = 14	# = ##

2. Press the HOLD button to update the database.

**LOCAL NUMBER/NAME TRANSLATION TABLE (Cont'd)**

To program a name into the Number/Name Translation table:

1. Press the NAME flexible button (Button #3) to enter the desired name into the translation table. Maximum length of name is 24-characters.

A = 21	N = 62	1 = 1#	* = 01
B = 22	O = 63	2 = 2#	, = 02
C = 23	P = 71	3 = 3#	? = 03
D = 31	Q = 74	4 = 4#	/ = 04
E = 32	R = 72	5 = 5#	! = *1
F = 33	S = 73	6 = 6#	\$ = *2
G = 41	T = 81	7 = 7#	. = *3
H = 42	U = 82	8 = 8#	& = *4
I = 43	V = 83	9 = 9#	* = *#
J = 51	W = 91	0 = 0#	( = #1
K = 52	X = 92	Space = 11	) = #2
L = 53	Y = 93	: = 12	+ = #3
M = 61	Z = 94	- = 13	= = #4
		' = 14	# = ##

The BACK SPACE flexible button (Button #5) can be used to erase the current letter to correct for errors.

3. Press the HOLD button to update the database.

To erase a current phone number and name entry:

1. Press the CLEAR ENTRY flexible button (Button #4) to clear an entire phone number and name from the current index.
2. Press the NEXT INDEX flexible button (Button #18) to advance to the next index and continue entering information into the Local Number/Name Translation table, or press the PREV INDEX flexible button (Button #19) to go back to a previous index that is already programmed.

---

**LOCAL NUMBER/NAME TRANSLATION TABLE (Cont'd)**

To locate an existing index for editing:

1. Press the TABLE NUMBER flexible button (Button #20). The following message is shown on the display phone:

123456789012345678901234



2. Enter a three-digit number which corresponds to the table numbers 300-499.
3. Press the HOLD button to complete the entry.

---

## OFF HOOK VOICE OVER (OHVO)

### Description

This feature allows users, off-hook on a call (CO or Intercom), to receive a voice announcement through the handset receiver without interrupting the existing call. The Voice Over is muted so as not to "override" or "drown" out the existing conversation. The overridden party may then respond to the calling party using CAMP-ON procedures to talk to the calling party or may use Silent Text Messaging to respond to the calling party via LCD Displays.

### Operation

- Placing an Off-Hook Voice Over (OHVO):

When a station (Sta A) calls a busy keyset (Sta B), and busy tone is received, the calling station (Sta A) may dial the OHVO dial code [628], or press a pre-programmed flex button to initiate an OHVO announcement. The HOLD button LED will flash at the called OHVO station.

Both stations (Sta A AND Sta B) will receive a one beep warning tone, the calling party may then begin the voice announcement to the called party (Sta B). The called station's (Sta B) existing conversation will not be interrupted and the voice-over announcement will not "drowned" out the existing conversation. The calling station (Sta A) will not be able to hear the called station's (Sta B) conversation (the connection will only allow Sta A to transmit to Sta B).

- Responding to an Off-Hook Voice Over:

After receiving an OHVO announcement, two options are available to the called party to respond to the calling party:

1. The called station (Sta B) may respond to the calling station (Sta A) by using the Camp-On feature. The called station (Sta B) presses the flashing HOLD button to consult with the calling station (Sta A). The called station's (Sta B) existing CO call goes on Exclusive Hold automatically. This method then follows CAMP-ON procedures and operation.
2. The called station (Sta B) may respond to the calling station (Sta A) by using the Silent Text Messaging. This feature is only available to digital key terminals, and the calling station (Sta A) must be a Digital Display Terminal.) The calling station (Sta B) may press pre-programmed Message buttons to respond to the voice-over announcement without being released from the current call, (i.e. by pressing a flex button pre-programmed for the message "IN MEETING"), the calling station (Sta A) will then receive this message on the calling station's LCD display.

### Conditions

1. The station receiving the OHVO call MUST be off-hook and in the "H" mode.
2. The calling (originating) station and receiving station (Sta B) must be a Digital terminal.
3. When the dialed station responds via the CAMP-ON feature, all conditions and options available to CAMP-ON apply.

---

**OFF HOOK VOICE OVER (cont'd)**

3. OHVO may be used to notify the called party of a transferred call (CO Line or Intercom) by announcing the call then releasing to complete the transfer. When this occurs the receiving station does not need to respond to the OHVO.
4. When a call is transferred via OHVO the receiving station will not receive muted ringing after the transfer is complete.
5. Any messages including "CANNED", "CUSTOM", or "SILENT RESPONSE" text messaging may be used to respond to an OHVO call. The message will appear on the originating (Sta A) and receiving station (Sta B) LCD displays.
6. One Time DND may also be used as a response to an OHVO call (i.e. the DND display will appear on the calling station).
7. The called station may press a flex button programmed as Message code button ([633#]) then enter on the dial pad the specific message code desired. DTMF digits will not be heard by either party.
8. The receiving station must be programmed to allow OHVO calls.
9. When silent messaging is used to respond to an OHVO call the existing call (Sta B) will not be disconnected while the messages are being sent to the originating station (Sta A).
10. The originator (Sta A) of an OHVO call must remain off-hook to receive silent messages. The originating station's (Sta A) voice transmit will remain connected to the called station (Sta B) and may respond verbally to the text messages. The OHVO call ends when the originating station goes on-hook.
11. If the receiving station is on-hook in speakerphone mode and a calling party initiates OHVO, the receiving station will receive a CAMP-ON warning tone and normal camp-on procedures are followed.
12. The receiving station (Sta B) may send (multiple messages) and even after sending a message may press CAMP-ON to talk to the originating party (Sta A). Each time a message is sent the splash tone will be heard and both displays will be updated.
13. LED's will follow CAMP-ON LED lamping sequences.

**Programming**

Each station can be programmed to allow receiving OHVO calls. Each station may be programmed for OHVO in one of two ways, as follows:

1. OHVO disallowed (may not receive OHVO calls).
2. May receive OHVO calls.

OHVO is programmed as a part of station programming (program code 50, Page A).

**OFF HOOK VOICE OVER (cont'd)**

**LCD Display**

The following display will be seen on the displays of stations involved in an OHVO call.

After OHVO has been originated:

Originating Station

Receiving Station

123456789012345678901234

123456789012345678901234

ANNOUNCE TO STA XXX  
MM/DD/YY HH:MM am

ANNOUNCE FROM STA XXX  
(existing call data)

Displays will then follow either CAMP-ON or Message displays depending on the action of the receiving station. When the OHVO call is complete, the display on the receiving station will return to the existing call data.

---

**MESSAGES – CANNED****Description**

A station user may select a pre-assigned message from a list of "canned" messages in the system to be displayed on the LCD of a telephone that calls that station.

**Operation**

A station wishing to select a message, dials the Message Access Code [633], or presses the flexible button programmed for Message Access, then dials the two digit message code and hangs up. Example: [633] + [01] means that a telephone calling the station will receive the message "VACATION".

The individual canned message codes are as follows:

00	Clear Messages
01	ON VACATION
02	RETURN AM
03	RETURN PM
04	RETURN TOMORROW
05	RETURN NEXT WEEK
06	ON TRIP
07	IN MEETING
08	AT HOME
09	ON BREAK
10	AT LUNCH

To cancel the message, the station dials the Code [633] + [00] and hangs up.

**Conditions:**

1. The telephone receiving the message must be a display telephone.
2. Both key telephones and SLT can leave the message. SLT's are notified that they have left a message with a warning tone when going off-hook.
3. Incoming and outgoing calls are not inhibited in any way with a message displayed.
4. When a message is displayed by a key telephone, the DND button LED flashes at 15 ipm.
5. When DND is invoked on the telephone the message is canceled.
6. Message Access (with a desired message) may be assigned to a flex button.
7. Messages may be entered while off-hook on a call and an intercom call has camped-on to the station. This will cause the station calling to see the message.
8. Messages are retained in battery protected area of memory in the event of power failure or system reset.

**MESSAGES – CANNED (cont'd)**

- 9. The called station may press a flex button programmed as a Message Access button [633#], then enters the desired message number on the dial pad. DTMF digits will not be heard by either party.

**Programming**

A station user may store any of the available messages under a flexible button assigned as a Message Access button. In addition the user may program a button with the message access code only ([633]).

**LCD Display**

IDLE STATION DISPLAY

CALLING STATION DISPLAY

- A Station with the message [01], ON VACATION displayed;

123456789012345678901234

ON VACATION
MM/DD/YY      HH:MM pm

123456789012345678901234

ON VACATION
-------------

- A Station with the message [02], RETURN AM displayed;

123456789012345678901234

RETURN AM
MM/DD/YY      HH:MM pm

123456789012345678901234

RETURN AM
-----------

- A Station with the message [03], RETURN PM displayed;

123456789012345678901234

RETURN PM
MM/DD/YY      HH:MM pm

123456789012345678901234

RETURN PM
-----------

- A Station with the message [04], RETURN TOMORROW, displayed;

123456789012345678901234

RETURN TOMORROW
MM/DD/YY      HH:MM pm

123456789012345678901234

RETURN TOMORROW
-----------------

MESSAGES – CANNED (cont'd)

- A Station with the message [05], RETURN NEXT WEEK, displayed;

123456789012345678901234

RETURN NEXT WEEK  
MM/DD/YY      HH:MM pm

123456789012345678901234

RETURN NEXT WEEK

- A Station with the message [06], ON TRIP, displayed;

123456789012345678901234

ON TRIP  
MM/DD/YY      HH:MM pm

123456789012345678901234

ON TRIP

- A Station with the message [07], IN MEETING, displayed;

123456789012345678901234

IN MEETING  
MM/DD/YY      HH:MM pm

123456789012345678901234

IN MEETING

- A Station with the message [08], AT HOME, displayed;

123456789012345678901234

AT HOME  
MM/DD/YY      HH:MM pm

123456789012345678901234

AT HOME

- A Station with the message [09], ON BREAK, displayed;

123456789012345678901234

ON BREAK  
MM/DD/YY      HH:MM pm

123456789012345678901234

ON BREAK

- A Station with the message [10], AT LUNCH, displayed;

123456789012345678901234

AT LUNCH  
MM/DD/YY      HH:MM pm

123456789012345678901234

AT LUNCH

**MESSAGE – DATE & TIME ENTRY**

**Description**

As an enhancement to the original canned messages, station users can activate certain messages that will allow the user to enter a specific time or a date of return. These messages will appear on calling station's display to alert them of the desired party's return time or date.

**Operation**

Users may activate the following messages and be prompted to enter a time or date of return:

- 11 VACATION UNTIL: *MM/DD*
- 12 RETURN: *HH:MM xm* or *MM/DD*
- 13 ON TRIP UNTIL: *MM/DD*
- 14 MEETING UNTIL: *HH:MM xm*
- 15 AT HOME UNTIL: *HH:MM xm*
- 16 ON BREAK UNTIL: *HH:MM xm*
- 17 AT LUNCH UNTIL: *HH:MM xm*

- a. To activate a message with a custom return time or date, the station user dials the Message Access code [633] followed by the desired message number [11 - 17]. Enter the date/time by using keys on the dial pad as follows:

A = 21	N = 62	1 = 1#	* = 01
B = 22	O = 63	2 = 2#	, = 02
C = 23	P = 71	3 = 3#	? = 03
D = 31	Q = 74	4 = 4#	/ = 04
E = 32	R = 72	5 = 5#	! = *1
F = 33	S = 73	6 = 6#	\$ = *2
G = 41	T = 81	7 = 7#	. = *3
H = 42	U = 82	8 = 8#	& = *4
I = 43	V = 83	9 = 9#	* = *#
J = 51	W = 91	0 = 0#	( = #1
K = 52	X = 92	Space = 11	) = #2
L = 53	Y = 93	: = 12	+ = #3
M = 61	Z = 94	- = 13	= = #4
		' = 14	# = ##

- b. Press HOLD to enter message. Confirmation tone is received.
- c. To cancel the message the station dials the Code [633] + [00] and hangs up.

**MESSAGE – DATE & TIME ENTRY (cont'd)**

**Conditions**

1. The telephone receiving the message must be a display telephone.
2. Both key telephones and SLT's may activate the message. SLT's are notified that they have an active message with a warning tone when going off-hook.
3. Incoming and outgoing calls are not inhibited in any way with a message displayed.
4. When a message is displayed by a key telephone, the DND button LED flashes at 15 ipm.
5. When DND is invoked on the telephone, the message is canceled.
6. Message Access (with a desired message) may be assigned to a flex button.
7. Messages may be entered while off-hook on a call and an intercom call has camped-on to the station. This will cause the station calling to see the message.
8. Messages are retained in battery protected area of memory in the event of power failure or system reset.
9. The called station may press a flex button programmed as a Message Access button [633#], then enters the desired message number on the dial pad. DTMF digits will not be heard by either party.

**Programming**

A station user may store any of the available messages under a flexible button assigned as a Message Access button. In addition the user may program a button with the Message Access code only [633].

**LCD Display**

IDLE STATION DISPLAY

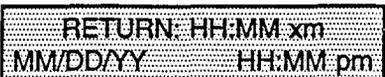
CALLING STATION DISPLAY

- A Station with the message [11], ON VACATION UNTIL: displayed;

123456789012345678901234  


123456789012345678901234  


- A Station with the message [12], RETURN: (hour or day), displayed;

123456789012345678901234  


123456789012345678901234  


MESSAGE – DATE & TIME ENTRY (cont'd)

123456789012345678901234

RETURN: MM/DD  
MM/DD/YY      HH:MM pm

123456789012345678901234

RETURN: MM/DD  
MM/DD/YY      HH:MM pm

- A Station with the message [13], ON TRIP UNTIL:, displayed;

123456789012345678901234

ON TRIP UNTIL: MM/DD  
MM/DD/YY      HH:MM pm

123456789012345678901234

ON TRIP UNTIL: HH:MM xm  
MM/DD/YY      HH:MM pm

- A Station with the message [14], MEETING UNTIL:, displayed;

123456789012345678901234

MEETING UNTIL: HH:MM xm  
MM/DD/YY      HH:MM pm

123456789012345678901234

MEETING UNTIL: HH:MM xm  
MM/DD/YY      HH:MM pm

- A Station with the message [15], AT HOME UNTIL:, displayed;

123456789012345678901234

AT HOME UNTIL: HH:MMxm

123456789012345678901234

AT HOME UNTIL: HH:MMxm

- A Station with the message [16], ON BREAK UNTIL:, displayed;

123456789012345678901234

ON BREAK UNTIL: HH:MMxm

123456789012345678901234

ON BREAK UNTIL: HH:MMxm

- A Station with the message [17], AT LUNCH UNTIL:, displayed;

123456789012345678901234

AT LUNCH UNTIL: HH:MMxm

123456789012345678901234

AT LUNCH UNTIL: HH:MMxm

**MESSAGES – CUSTOM**

**Description**

This feature allows the system administrator to enter up to ten custom messages for use by station users of the system. These messages may be specified and customized by the customer on a system wide basis.

**Operation**

- **Message Use** - A station wishing to select a message, dials the Code [633], or presses the flexible button programmed for message access, then dials the two digit message code and hangs up. Example: [633] + [21-30] means that a telephone calling the station will receive the custom message programmed at the attendant station by the system administrator.
- **Message Programming** - The system administrator programs the ten (10) custom messages at the first attendant station as follows: From the first attendant, station dial the Custom Message program code [694] then enter the bin number [21 - 30]. Then the message is entered using the dial pad keys to enter the letters as follows:

A = 21	N = 62	1 = 1#	* = 01
B = 22	O = 63	2 = 2#	, = 02
C = 23	P = 71	3 = 3#	? = 03
D = 31	Q = 74	4 = 4#	/ = 04
E = 32	R = 72	5 = 5#	! = *1
F = 33	S = 73	6 = 6#	\$ = *2
G = 41	T = 81	7 = 7#	. = *3
H = 42	U = 82	8 = 8#	& = *4
I = 43	V = 83	9 = 9#	* = *#
J = 51	W = 91	0 = 0#	( = #1
K = 52	X = 92	Space = 11	) = #2
L = 53	Y = 93	: = 12	+ = #3
M = 61	Z = 94	- = 13	= = #4
		' = 14	# = ##

Up to twenty-four (24) characters may be entered as the custom message (this will represent 48 digits entered). The user then presses the HOLD button to enter the message and confirmation tone will be heard.

To cancel the message the station dials the Code [633] + [00] and hangs up.

---

**MESSAGES – CUSTOM (cont'd)****Conditions**

1. The actual Alpha-Numeric characters will be displayed as the digits are being entered while programming the messages.
2. The attendant must go idle after programming a message before another message may be programmed.
3. The telephone receiving the message must be a display telephone.
4. Both key telephones and SLT can leave the message. SLT's are notified that they have left a message with a warning tone when going off-hook.
5. Incoming and outgoing calls are not inhibited in any way with a message displayed.
6. When a message is displayed by a key telephone, the DND button LED flashes at the 15 ipm rate.
7. When DND is invoked on the telephone, the message is canceled.
8. Message Access (with a desired message) may be assigned to a flex button.
9. Messages may be entered while off-hook on a call and an intercom call has camped-on to the station. This will cause the station calling to see the message.
10. Message status is stored in battery protected area of memory for retention across a power failure or system reset (soft or hard).
11. The called station may press a flex button programmed as a message Access button [633#], then enter the desired message number on the dial pad. DTMF digits will not be heard by either party.

**Programming**

1. The first programmed attendant is the only station that may program these custom messages.
2. The function of Message Access is assigned to a station flexible button in database admin.
3. A station user may store any of the available messages under a flexible button assigned as a Message Access button.

MESSAGES – CUSTOM (cont'd)

LCD Display

- The attendant will receive the following display after entering the Custom Message Program code [694].

123456789012345678901234

ENTER MSG NO (21-30)
MM/DD/YY            HH:MM am

- Then the following display will be shown after the bin # has been entered:

123456789012345678901234

mmmmmmmmmm
ENTER MSG:

- The ten (10) Custom Messages will be displayed in a similar fashion as the "Canned" messages. The idle station display will show the message that has been activated at the station and a calling station will receive the STA XXX or name-in-display followed by the programmed custom messages as follows:

123456789012345678901234

mmmmmmmmmmmmmmmm
MM/DD/YY            HH:MM pm

123456789012345678901234

STA XXX mmmmmmmmm
YY/MM/DD            HH:MM pm

**TEXT MESSAGING (Silent Response)**

**Description**

This allows a station user to use text messages to respond to a caller that has either Camped-On or has used the Off-Hook Voice Over feature to alert a busy station user of a waiting call or message. The "camped-on" station may respond to the caller via the canned, custom, and silent response text (LCD) messages. The text messages appear on the calling party LCD Display.

**Operation**

A station receiving a Camp-On or OHVO call may respond to the caller via a text message.

- While receiving Camp-On, or OHVO, the called party may press a flexible button programmed for message access [633], then dial the desired two-digit message response code (or press a pre-programmed flex button for a particular message). Example : [633] + [38] means that the message "WHO IS IT?" will be sent to the calling station.

The additional messages (with their codes) listed below can also be sent as a text response:

- 31 I WILL TAKE CALL
- 32 TAKE MESSAGE
- 33 TRANSFER TO SECRETARY
- 34 PUT CALL ON HOLD
- 35 CALL BACK
- 36 ONE MOMENT PLEASE
- 37 I WILL CALL BACK
- 38 WHO IS IT?
- 39 IS IT LONG DISTANCE?
- 40 IS IT PERSONAL?
- 41 IS IT AN EMERGENCY?
- 42 IS IT IMPORTANT?
- 43 IS IT URGENT?
- 44 SEND CALL TO VOICE MAIL
- 45 PARK CALL
- 46 OUT OF OFFICE
- 47 PUT CALL THROUGH
- 48 I AM BUSY
- 49 OK
- 50 NO
- 51 YES

*set sof key for (633) then user enters message*

*Park " hold n user enters code.*

*Wait exclusive hold and connects intercom.*

---

**TEXT MESSAGING (cont'd)**

- If the station receiving the text message response was doing a Camp-on, he will first receive a short burst of tone on the speaker, then the display will show the message that has been activated by the called station.
- If the station receiving the text message response is on an OHVO call, no tone will be received.

**Conditions**

1. All canned and custom messages may be used to respond to a calling party.
2. Text response messages will automatically clear when the calling station (station receiving the messages) goes on-hook.
3. A station can receive only one message at a time.
4. Text messages may be chained (i.e. multiple messages sent to one caller).
5. Text message responses may only be activated by key stations and the receiving station must be a Digital Display telephone.
6. The text message responses will appear on both the calling station and the called station (station activating text responses) LCD displays.
7. One Time DND may also be used as a response to a call (i.e. the DND display will appear on the calling station).
8. The called station may press a flex button programmed as Message Access button ([633#]), then enter the desired message on the dial pad. DTMF digits will not be heard by either party.
9. When silent messaging is used to respond to a call, the existing call of the called station will not be disconnected while the messages are being sent to the calling station.
10. If the called station responds with a text message, the text message will appear on the LCD.
11. LED's will follow that of the CAMP-ON or OHVO.
12. Each individual message may be programmed onto a flexible button including a flex button on a DSS/BLF console.

**Programming**

None

**Hardware**

The calling station must be a digital display telephone and the called station must be a keyset.

TEXT MESSAGING (cont'd)

LCD Display

The LCD displays will be consistent with the Canned messages and Custom messages defined in their respective specification.

The additional displays described in this section will appear as follows:

- |      |                                                  |      |                                                    |
|------|--------------------------------------------------|------|----------------------------------------------------|
|      | 123456789012345678901234                         |      | 123456789012345678901234                           |
| [31] | I WILL TAKE CALL<br>(existing call display)      | [32] | TAKE MESSAGE<br>(existing call display)            |
|      | 123456789012345678901234                         |      | 123456789012345678901234                           |
| [33] | TRANSFER TO SECRETARY<br>(existing call display) | [34] | PUT CALL ON HOLD<br>(existing call display)        |
|      | 123456789012345678901234                         |      | 123456789012345678901234                           |
| [35] | CALL BACK<br>(existing call display)             | [36] | ONE MOMENT PLEASE<br>(existing call display)       |
|      | 123456789012345678901234                         |      | 123456789012345678901234                           |
| [37] | I WILL CALL BACK<br>(existing call display)      | [38] | WHO IS IT?<br>(existing call display)              |
|      | 123456789012345678901234                         |      | 123456789012345678901234                           |
| [39] | IS IT LONG DISTANCE?<br>(existing call display)  | [40] | IS IT PERSONAL?<br>(existing call display)         |
|      | 123456789012345678901234                         |      | 123456789012345678901234                           |
| [41] | IS IT AN EMERGENCY?<br>(existing call display)   | [42] | IS IT IMPORTANT?<br>(existing call display)        |
|      | 123456789012345678901234                         |      | 123456789012345678901234                           |
| [43] | IS IT URGENT?<br>(existing call display)         | [44] | SEND CALL TO VOICE MAIL<br>(existing call display) |
|      | 123456789012345678901234                         |      | 123456789012345678901234                           |
| [45] | PARK CALL<br>(existing call display)             | [46] | OUT OF OFFICE<br>(existing call display)           |

TEXT MESSAGING (cont'd)

123456789012345678901234  
[47] PUT CALL THROUGH  
(existing call display)

123456789012345678901234  
[48] I AM BUSY  
(existing call display)

123456789012345678901234  
[49] OK  
(existing call display)

123456789012345678901234  
[50] NO  
(existing call display)

123456789012345678901234  
[51] YES  
(existing call display)

**DISTINCTIVE RINGING**

**Description**

The tone ring signal used to notify stations of an incoming call can be changed by each station user to provide distinctive ringing among a group of stations. Each station user may select a distinctive ringing tone that will be used to ring their station. The system provides 81 different ring patterns that each station user may select from.

**Condition**

To select a distinctive ring tone for a station:

1. Dial the Tone Ring program code [695] followed by two-digit entry. The telephone speaker will sound a steady tone that correlates to the two-digit entry.
2. When the desired tone is selected, press the SPEED button to save this as the tone to be presented when the station is tone rung. Confirmation tone will be heard. This tone will be presented as a result of an incoming CO or intercom call, recalling CO line or Transferred CO line or at any other time the station is tone rung (refer to condition 5).

**Conditions**

1. The 81 ringing choices are as follows:

TONE #	TONE FREQUENCY	TONE DURATION
00	1209/1477	50ms/50ms
01	697/770	50ms/50ms
02	697/852	50ms/50ms
03	697/941	50ms/50ms
04	697/1209	50ms/50ms
05	697/1336	50ms/50ms
06	697/1477	50ms/50ms
07	697/1633	50ms/50ms
08	697/OFF	burst
10	770/697	50ms/50ms
11	770/770	50ms/50ms
12	770/852	50ms/50ms
13	770/941	50ms/50ms
14	770/1209	50ms/50ms
15	770/1336	50ms/50ms

STONE #	STONE FREQUENCY	STONE DURATION
16	770/1477	50ms/50ms
17	770/1633	50ms/50ms
18	770/OFF	burst
20	852/697	50ms/50ms
21	852/770	50ms/50ms
22	852/852	50ms/50ms
23	852/941	50ms/50ms
24	852/1209	50ms/50ms
25	852/1336	50ms/50ms
26	852/1477	50ms/50ms
27	852/1633	50ms/50ms
28	852/OFF	burst
30	941/697	50ms/50ms
31	941/770	50ms/50ms
32	941/852	50ms/50ms
33	941/941	50ms/50ms
34	941/1209	50ms/50ms
35	941/1336	50ms/50ms
36	941/1477	50ms/50ms
37	941/1633	50ms/50ms
38	941/OFF	burst
40	1209/697	50ms/50ms
41	1209/770	50ms/50ms
42	1209/852	50ms/50ms
43	1209/941	50ms/50ms
44	1209/1209	50ms/50ms
45	1209/1336	50ms/50ms
46	1209/1477	50ms/50ms
47	1209/1633	50ms/50ms

TONE #	TONE FREQUENCY	TONE DURATION
48	1209/OFF	burst
50	1336/697	50ms/50ms
51	1336/770	50ms/50ms
52	1336/852	50ms/50ms
53	1336/941	50ms/50ms
54	1336/1209	50ms/50ms
55	1336/1336	50ms/50ms
56	1336/1477	50ms/50ms
57	1336/1633	50ms/50ms
58	1336/OFF	burst
60	1477/697	50ms/50ms
61	1477/770	50ms/50ms
62	1477/852	50ms/50ms
63	1477/941	50ms/50ms
64	1477/1209	50ms/50ms
65	1477/1336	50ms/50ms
66	1477/1477	50ms/50ms
67	1477/1633	50ms/50ms
68	1477/OFF	burst
70	1633/697	50ms/50ms
71	1633/770	50ms/50ms
72	1633/852	50ms/50ms
73	1633/941	50ms/50ms
74	1633/1209	50ms/50ms
75	1633/1336	50ms/50ms
76	1633/1477	50ms/50ms
77	1633/1633	50ms/50ms
78	1633/OFF	burst
80	OFF/697	50ms/50ms
81	OFF/770	50ms/50ms

TONE #	TONE FREQUENCY	TONE DURATION
82	OFF/852	50ms/50ms
83	OFF/941	50ms/50ms
84	OFF/1209	50ms/50ms
85	OFF/1336	50ms/50ms
86	OFF/1477	50ms/50ms
87	OFF/1633	50ms/50ms
88	No ring	No ring

2. Station users may listen to all tones by dialing the two-digit codes one after another. The tone that is sounding when the SPEED button is pressed will be saved as that station's tone ringing selection.
3. A station's tone ringing selection will be maintained in a battery protected area of memory. Therefore if a system experiences a power failure, or a soft or hard restart, a station's tone ringing selection will be restored.
4. The tone selected will be used to provide "TONE" ringing normal or muted to the station whenever the station is commanded to tone ring. (i.e. this does not apply to camp-on tone programming confirmation tone or other specific tones that are not considered "TONE" ringing.)
5. The selected tone will be used to notify the station in the following cases:
  - Incoming CO Call
  - Transferred CO Line
  - Call Back Notification
  - All types of forwarded calls
  - Message Wait Reminder Tone
  - Line Queue Call Back
  - Incoming Intercom Call
  - Recalling CO Line
  - Message Wait Call Back
  - Executive/Secretary calls
  - Alarm/Reminder Signalling
  - LCR Queue Call Back

**Programming**

See operation paragraph above for user programming procedures.

**LCD Display**

When programming the tone ringing option on a digital display set the following display will be shown:

123456789012345678901234

ENTER RING TONE 00-88 PRESS SPEED TO SAVE
----------------------------------------------

---

## GROUP LISTENING

### Description

All digital key stations have built in speakerphones. Station users may use the speaker to monitor a call while using the handset to converse with the outside party. This enables other people in the room to listen to both parties in the conversation.

### Operation

While conversing, on the handset, press the ON/OFF button. Both parties of the conversation can then be heard on the digital station's speaker. The speakerphone microphone will be muted while the handset is off-hook.

To deactivate Group Listening while off-hook, the ON/OFF button must be depressed.

### Conditions

1. While talking using the speaker phone, then lifting the handset will turn off of the speakerphone. To activate group listening, the ON/OFF button must be pressed (to ON) while the handset is off-hook.
2. While in group listening mode, pressing the MUTE button will cause the transmit from the handset to be muted (the speakerphone microphone is already muted). However the distant end can still be heard over both the handset receiver and the station speaker.
3. If full speakerphone operation is desired while in group listening mode, simply set the handset on-hook.
4. Group listening is not available when the station is in headset mode.
5. When placing the handset on-hook to go to full speakerphone operation, it is normal for a "squeal" caused by audio feedback to be heard.

### Programming

By default, Group listening is disabled. To enable, System Attributes, Flash 05, Button 9.

**FLEX BUTTON PROGRAMMING**

**Description**

If you have buttons on your telephone which have NOT been assigned as CO lines, Pooled Group, or Loop buttons, you may program them to suit your own individual needs. There are five functions you may assign to these buttons: DSS/BLF, FEATURES, SPEED DIAL, POOLED GROUP ACCESS, and LOOP.

As an added feature, LCR may now be added to a flex button.

In earlier versions of software, the Do Not Disturb (DND), Call Forward (FWD), Camp-On, Available/Unavailable, Personal Park, Voice Mail, Headset Mode features were able to be programmed onto DSS Console Flexible buttons. however, the LED associated with those features did not light or flash. Therefore, in this version of software, the above mentioned features are not allowed to be programmed onto DSS Console flexible buttons. These features can however, still be programmed onto keyset flexible buttons.

**IDLE SPEAKER MODE**

**Description**

This feature allows the system to determine whether the first digit dialed is heard over the digital key terminal speaker. This feature can be allowed or denied on a system-wide basis in programming.

**Programming**

Idle Speaker Mode is programmed as part of System Features, Flash 05, Button #10. By default, Idle Speaker Mode is disabled.

**MUSIC ON HOLD**

**Description**

A music source, when connected to the system, provides music to all lines on hold, parked calls, transferred calls and calls waiting to be answered by Uniform Call Distribution (UCD). This feature can be allowed or denied on a system-wide basis in programming.

**Programming**

Music On Hold is programmed as part of System Features, Flash 05, Button #12. By default, Music On Hold is enabled for all CO lines.

---

**SMDR CALL QUALIFICATION TIMER**

**Description**

This timer determines the length of time that is needed to determine a valid SMDR call for SMDR reporting purposes.

**Programming**

1. Press FLASH and dial [01]. The following message is shown on the display phone:

123456789012345678901234

SYSTEM TIMERS  
ENTER BUTTON NUMBER

To make a change to the SMDR Call Qualification Timer:

2. Press the SMDR CALL QUAL TIMER flexible button (Button #16). The following message is shown on the display phone:

123456789012345678901234

SMDR CALL QUAL 00-60  
30

3. Enter the three-digit value on the dial pad which corresponds to 00-60 seconds. By default, this timer is set to 30 seconds.
4. Press HOLD button. Display will now update. Confirmation tone is heard and the display will now update.

**AUTOMATIC CALL BACK TIMER**

**Description**

This feature invokes a call back request anytime a user listens to busy tone for a preset period of time.

**Programming**

1. Press FLASH and dial [01]. The following message is shown on the display phone:

123456789012345678901234

SYSTEM TIMERS  
ENTER BUTTON NUMBER

To make a change to the Automatic Call Back Timer:

2. Press the AUTO CALL BACK TIMER flexible button (Button #17). The following message is shown on the display phone:

123456789012345678901234

AUTO CALL BACK 00-99  
00

3. Enter the three-digit value on the dial pad which corresponds to 00-99 seconds. By default, the timer is disabled with a 00 entry.
4. Press HOLD button. Display will now update.

---

**EXECUTIVE OVERRIDE****Description:**

Allows stations designated as "Executive" the ability to override and "barge-in" on other keysets engaged in conversation

**Operation:**

If you call a busy station:

- a. Press the pre-programmed EXECUTIVE OVERRIDE button. Executive station will be bridged onto the CO line conversation in progress at the called station. Optional warning tone is heard and presented to all parties prior to cut-thru.
- b. Replace handset at Executive station to terminate the override.

*NOTE: A change in volume may occur on the CO line or intercom call after the barge-in occurs.*

**Conditions:**

1. An error tone will occur:
  - if the called party is in a conference
  - if the called party is already on an OHVO call.
  - if the called party already has a Camp-On at his station.
2. If the Executive joins a call and one of the members does a hook-flash or depresses his transfer button, the Executive will be dropped.
3. If the Executive does a hook-flash or depresses his transfer button, it will be ignored.
4. When the Executive jumps in on an intercom call or CO call and the Executive is not in a mute condition, and any member of the party hangs up, the call will be converted to a two-party conversation.
5. When the Executive jumps in on an intercom call or CO call and the Executive is in the mute condition and either of the two parties in the intercom call hang up, the call will be dropped. If the Executive hangs up, the call will remain as a two-party conversation.

**Programming:**

A separate condition has been added to Station programming, Page A, Button 13 which will allow or disallow an Executive to override an extension. Station display for Executive override has been changed from blank or EO to A or D, or EA or ED; where A= allow override, D= disallow override, E= Enable override capability.

---

## UCD FEATURE SECTION

Eight Uniform Call Distribution (UCD) groups can be programmed, each containing up to eight three-digit station numbers. Each group is assigned a pilot number. When this number is dialed, the first available agent in that group is rung. Calls are routed to the station that has been on-hook for the longest period of time.

Enhanced Calls in Queue Display  
No-Answer Retry Timer  
Expansion of Recorded Announcements to 8

**ENHANCED CALLS IN QUEUE DISPLAY**

The Agent Queue Status feature provides a means for an agent and a UCD supervisor to view the status of their UCD group. This display is an idle state display and will prompt a supervisor that a group is having problems answering all their calls. The display will tell the agent and his supervisor how many calls are in queue, how many agents are available or logged into the group, and the length of time in minutes that the oldest call has been in queue. The agent will receive the calls in queue display whenever there is a call in queue.

**Operation**

There are two methods of viewing UCD Group call queue status.

- 1. In-service UCD agents and the assigned overflow station will see the quantity of calls in queue on the LCD of their station for the UCD group of which they are a member. If every member of a UCD group is busy and calls are in queue, the following message will be seen at all UCD members of that group.

123456789012345678901234

55X	CIQ:XX	AL:XX	OC:MMM
MM/DD/YY	HH:MM/SS		

55X	UCD Group
CIQ:XX	Calls in Queue
AL:XX	Available Agents
OC:MMM	Oldest call in minutes

*NOTE: If a UCD member is taken out of the group (i.e. DND, Call Forward, Unavailable, etc.) they will not receive calls in queue information.*

- 2. Any station not assigned in a UCD group can view the number of calls in queue for any given UCD Group. To view the number of calls in queue, the station user dials the Calls In Queue code [567], or press a programmed FLEX button, then enter the desired UCD group. The LCD will display, on a real time basis, the number of calls in queue for that group.

---

**NO-ANSWER RETRY TIMER**

**Description**

After a UCD call rings to an agent, this timer takes effect. If the agent does not answer the call before this timer expires, then that agent is set to "Out-Of-Service (OOS)" and the call is routed back to the UCD group for another available agent or queue.

The timer is variable from 000-300 seconds.

**Programming**

1. Press FLASH and dial [60]. The following message is shown on the display phone:

123456789012345678901234

UCD TIMERS  
ENTER BUTTON NUMBER

2. The top left button in the flexible button field will be lit for programming the ACD Ring Timer To change to a different UCD Timer, press the appropriate flexible button and perform the following procedures.

To make a change to the UCD No-Answer Retry Timer:

3. Press the NO-ANSWER RETRY TIMER flexible button (Button #6). The following message is shown on the display phone:

123456789012345678901234

NO ANSWER RETRY000-999  
300

4. Enter the three-digit value on the dial pad which corresponds to 000-300 seconds.
5. Press HOLD button. Display will now update.

**EXPANSION OF RECORDED ANNOUNCEMENTS TO 8**

**Description**

Determines the type, index (port) number and message length for the eight available Recorded Announcements (RAN). There are eight RAN tables that can be programmed. A table can be the answer port for unanswered incoming calls to a UCD group, while another table can provide the secondary message.

The type can be either a CO line port, or a SLT port. The index number specifies which circuit for the type of interface.

**Operation**

The message length is used to match the maximum length of the message to the device that is used.

**Example:**

To program a table for a CO line port:

- a. Press the TABLE "X" flexible button (Buttons 1-8).
- b. Dial [1] for CO port interface.
- c. Dial [01 to 28] for CO line used.
- d. Enter message duration (000-300 sec.)

**Example**

To program a table for an SLT port:

- a. Press the TABLE "X" flexible button (Buttons 1-8).
- b. Dial [2] for SLT port interface.
- c. Dial [100 to 155] for SLT station used.
- d. Enter Message duration (000-300 sec.)

**Programming**

If Recorded Announcement devices are installed to operate with UCD, these tables must be programmed:

- a. Press FLASH and dial [62]. The following message is shown on the display phone:

123456789012345678901234

ANNOUNCEMENT TABLE 1
TYPE # INDX ## TIME ###

**EXPANSION OF RECORDED ANNOUNCEMENTS TO 8 (cont'd)**

b. The top left button in the flexible button field will be lit for programming UCD RAN Announcement Table 1. To change to UCD RAN Announcement Table 2, press flexible button #2. Repeat above for Tables 3 through Tables 8.

c. Enter a string of six, or seven digits on the dial pad. The order of data entry will be:

Type number:

1 = CO Port interface

2 = SLT Port interface

Index (port) Number:

01 - 28 = CO Line Port

100-155 = SLT Station Port

Message Time:

000-300 seconds

d. Press HOLD button.

*NOTE: When a CO port is designated as a RAN port, a relay and/or sensor should be programmed as a RAN start for Announcement Table 1 through 8.*

**VOICE MAIL**

Voice Mail Transfer with ID

**VOICE MAIL TRANSFER WITH ID**

**Description**

This feature provides an Attendant or station user a way to transfer a caller directly into a voice mail box. This allows the station identification digits to be entered by the transferring party. Using this feature, a caller can be transferred to a voice mail box when 1) a station user on the system is not forwarded to VM or 2) the destination Voice Mail Box owner is not a station user.

**Operation:**

When a caller wishes to be transferred into a user's Voice Mail box and the desired user's station is not forwarded into voice mail, then the attendant or a station user may initiate a Voice Mail Transfer by performing the following:

While on a call and the distant end wishes to leave a Voice Message for a VM user:

1. The initiating station presses the TRANfer button.
2. Dial a Voice Mail Group number, or press a Voice Mail group button. Dial tone is returned.
3. Dial the VMID (Mail Box location) of the desired party and go on-hook. The system will then make the connection to an available Voice Mail port and send the Leave Mail Prefix (if any) + the digits dialed as the VM ID number + then the Leave Mail Suffix digits (if any). The system will then cut through the transferred caller.

**Conditions**

1. CO Trunks and Internal Calls may be transferred into Voice Mail using this feature.
2. If no VM ID digits are dialed by the transferring station, then the identification digits of the transferring station will be sent to the VM.

**LCD Display:**

When a station transfers a call to a Voice Mail Group the following display will prompt the user to enter the Voice Mail Box #:

123456789012345678901234

ENTER VM ID:
MM/DD/YY      HH:MM am

When the user enters the VM ID the digits will be displayed as shown:

123456789012345678901234

ENTER VM ID: YYYY
EXT NNNN      HH:MM am

## LCD ENHANCEMENT SECTION

CO Line Identification Display

**CO LINE IDENTIFICATION DISPLAY**

**Description**

This feature allows a name to be entered into the database programming for each individual line (trunk) connected to the system. Once entered into the database, LCD phones including the attendant stations will receive the programmed line "name" in place of the default "LINE XX" message. This applies to all line call processing conditions where the current "LINE XX" message appears.

SMDR will continue to print out the line number in place of the programmed name. If the line name has not been programmed, then the current "LINE XX" display will be used as the default. A programmable data field is available for each line in the system. Line names may be programmed using the range programming.

**Programming**

1. Press FLASH and dial [40]. The following message is shown on the display phone:

123456789012345678901234  
 CO LINE ATTRIBUTES  
 SELECT A CO LINE RANGE

2. Enter a four-digit number for the range of lines being programmed. If only one line is being programmed, enter that number twice (0101).
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update. Flexible button #20 (New Range) will be lit. The following message is shown on the display phone to indicate current programming of that line or group of lines.

123456789012345678901234  
 CO XX-XX DT CO UNA C P  
 LS0 DSA FL10 GRP1 COS1

Where:

XX-XX = The CO Line Range being programmed. (01-28)

**CO LINE IDENTIFICATION DISPLAY (cont'd)**

Each CO line in the system can be programmed to have a name associated to it in database programming.

- Press the CO LINE IDENTIFICATION flexible button (Button #12). The display will show the following information:

123456789012345678901234



- Enter the name by using keys on the dial pad as follows. Valid alpha-numeric characters are: A-Z, 0-9, \*,#, - [spaces] and other ASCII characters as listed below. The name may be entered in any combination up to 12 characters in length (this will represent 24 digits entered).

A = 21	M = 61	1 = 1#	" = 01
B = 22	N = 62	2 = 2#	, = 02
C = 23	O = 63	3 = 3#	? = 04
D = 31	P = 71	4 = 4#	/ = 04
E = 32	Q = 74	5 = 5#	! = *1
F = 33	R = 72	6 = 6#	\$ = *2
G = 41	S = 73	7 = 7#	% = *3
H = 42	T = 81	8 = 8#	& = *4
I = 43	U = 82	9 = 9#	* = *#
J = 51	V = 83	0 = 0#	( = #1
K = 52	W = 91	SPACE=11	) = #2
L = 53	X = 92	: = 12	+ = #3
	Y = 93	- = 13	= = #4
	Z = 94	' = 14	# = ##

*NOTE: When programming from a terminal using a keyboard, the CO line name may be entered directly from the keyboard.*

- Press the HOLD button. Confirmation tone will be heard and the display will update.

---

CO LINE IDENTIFICATION DISPLAY (cont'd)

LCD Display

A message similar to the following will be used for all CO line displays when a name has been programmed for a CO line.

123456789012345678901234

LINE RINGING
nnnnnnnnnnnn HH:MM am

## PROGRAMMING FEATURES

Station Relocation  
Flexible Station and CO Port Assignments

---

**STATION RELOCATION FEATURE****Description**

The Station Relocation Feature will provide a means to allow a user to unplug their station and plug it in at another location. Then by dialing a simple code followed by his old station number, bring all the station attributes including extension number, button mapping, speed dial, and class of service to the new location.

**Operation**

A station can be relocated by unplugging it and then plugging it in at a new location. Then dial [636] followed by the extension number of the station being relocated. Once this is done, all station attributes are copied to the current station.

*NOTE: If a station is assigned to a specific port and that user unplugs their station and plugs it in at another location, the database administration programming will be updated to reflect the new port change.*

**Conditions**

1. The station number that is dialed as the relocated station must be currently out of service.
2. The relocated station will be given the station attributes of the station doing the relocating. The two stations have traded station numbers and station attributes.
3. If a keyset is plugged into the relocated position it will have all the station attributes of the relocating station.
4. This feature only is applicable to keysets.
5. If a call is on hold at the relocating station or the relocated station is in service, error tone will be received.

---

**FLEXIBLE PORT ASSIGNMENT FEATURE****Description**

The Flexible Port Assignment Feature will provide a means to assign stations and CO line numbers to any station or CO line port in the system. This provides complete flexibility in determining station and CO line numbers within the system as long as they stay within the system numbering plan. Therefore, a station can be assigned any number between 100 and 155 on a 2856 system and any station number between 100 and 127 on a 1428 system. A CO line can be assigned any number between 01 and 28 on a 2856 system and any CO Line number between 01 and 14 on a 1428 system. This restriction is required to minimize memory requirements on the smaller system.

**Conditions**

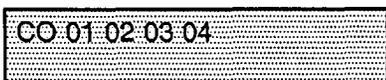
1. All the station and CO Line numbers entered are stored in a temporary database area which is uploaded to main database when the system is reset.
2. System reset can be accomplished in ADMIN by entering "FLASH" 80, Button #20, and "HOLD".
3. Station and CO Line numbers are restricted to the system numbering plan.
4. To return the stations and CO line back to their default condition, enter "FLASH" 80, Button #4 and press "HOLD".
5. To print the station and CO line port assignments, enter "FLASH" 85, Button #4 and press "HOLD".

**Programming - CO**

If the CO Line numbers need to be relocated to different ports:

- a. Press FLASH and dial [42]. The following message is shown on the display phone:

123456789012345678901234



- b. The buttons 1 through 7 indicate cards 1 through 7. When the relocation program is initially entered, Button #1 will be lit indicating the user is programming the CO Line numbers on the first card (CO Ports 1 through 4). The LCD will display the CO Line numbers presently assigned to the first 4 ports.

To change the CO Line number assigned to any port:

- a. Dial the position number on the display (01 through 04), followed by the CO Line numbered desired. For example: if 0103 were dialed, the CO line number of the first entry on the display would be changed to 03. In addition, since 03 was shown as the third entry on the display, that entry would be blank (##).

**FLEXIBLE PORT ASSIGNMENT (cont'd)**

To select another card in the system:

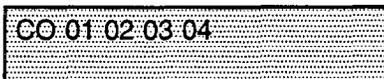
- a. Press the button associated with that card. For example, if button #3 were pressed (CO Ports 9 through 12), the CO Line numbers assigned to the third card would be displayed. CO Line numbers on the third card are changed in the same manner by entering the position number (01 through 04), followed by the CO Line number desired.

*When all the CO line numbers desired have been programmed, the system will have to reset to update the data. This is done so that the programming of CO Lines can be done while the system is in use.*

**LCD Display**

After dialing the CO Line flexible port programming code (FLASH 42), the ADMIN station will receive the following display:

123456789012345678901234

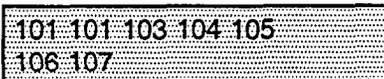


**Programming - Station**

If the Station numbers need to be relocated to different ports:

- a. Press FLASH and dial [52]. The following message is shown on the display phone:

123456789012345678901234



- b. The buttons 1 through 7 indicate cards 1 through 7. When the relocation program is initially entered, Button #1 will be lit indicating the user is programming the station numbers on the first card (Station Ports 1 through 8). The LCD will display the station numbers presently assigned to the first 8 ports.

To change the Station number assigned to any port:

- a. Dial the position number on the display (01 through 08), followed by the Station number desired. For example: if 01105 were dialed, the station number of the first entry on the display would be changed to 105. In addition, since 105 was shown as the sixth entry on the display, that entry would be blank (###).

---

**FLEXIBLE PORT ASSIGNMENT (cont'd)**

To select another card in the system:

- a. Press the button associated with that card. For example, if button #3 were pressed (Station Ports 17 through 24), the station numbers assigned to the third card would be displayed. Station numbers on the third card are changed in the same manner by entering the position number (01 through 08), followed by the station number desired.

*When all the station numbers desired have been programmed, the system will have to reset to update the data. This is done so that the programming of station numbers can be done while the system is in use.*

**LCD Display**

After dialing the station flexible port programming code (FLASH 52), the ADMIN station will receive the following display:

123456789012345678901234

100	101	102	103	104	105
106	107				

## HARDWARE FEATURES

Digital Data Interface Unit (DDIU)  
Keypad Self Test

---

**DIGITAL DATA INTERFACE UNIT (DDIU)****Description**

The Data Feature is a time division switched, point to point data transmission capability which permits simultaneous voice and data communications (same system but not same port). The Data Feature offers the ability to transmit data information between personal computers, printers, plotters, modems, CRT terminals, and main frame computer ports. To establish a Data call a Digital Data Interface Unit (DDIU) is required to be connected to each data communications device. Data information can be switched through the system at speeds of 300, 1200, 2400, 4800, 9600, 19.2K and 38.4K baud asynchronous.

**Installation**

The Digital Data Interface Unit (DDIU) is wired to the Starplus 1428 and Starplus 2856 like a digital telephone, and requires one station port.

All connections to the DDIU are made on the back panel. The back panel has a modular jack and a DB-25 type connector. The modular jack, labeled KSU, is used to connect the DDIU to the station port of the system. The DB-25 connector supports an RS-232 connection and is used to connect the data device to the system.

A green LED lights to indicate the DDIU is properly wired to the system.

DIGITAL DATA INTERFACE UNIT (DDIU) (cont'd)

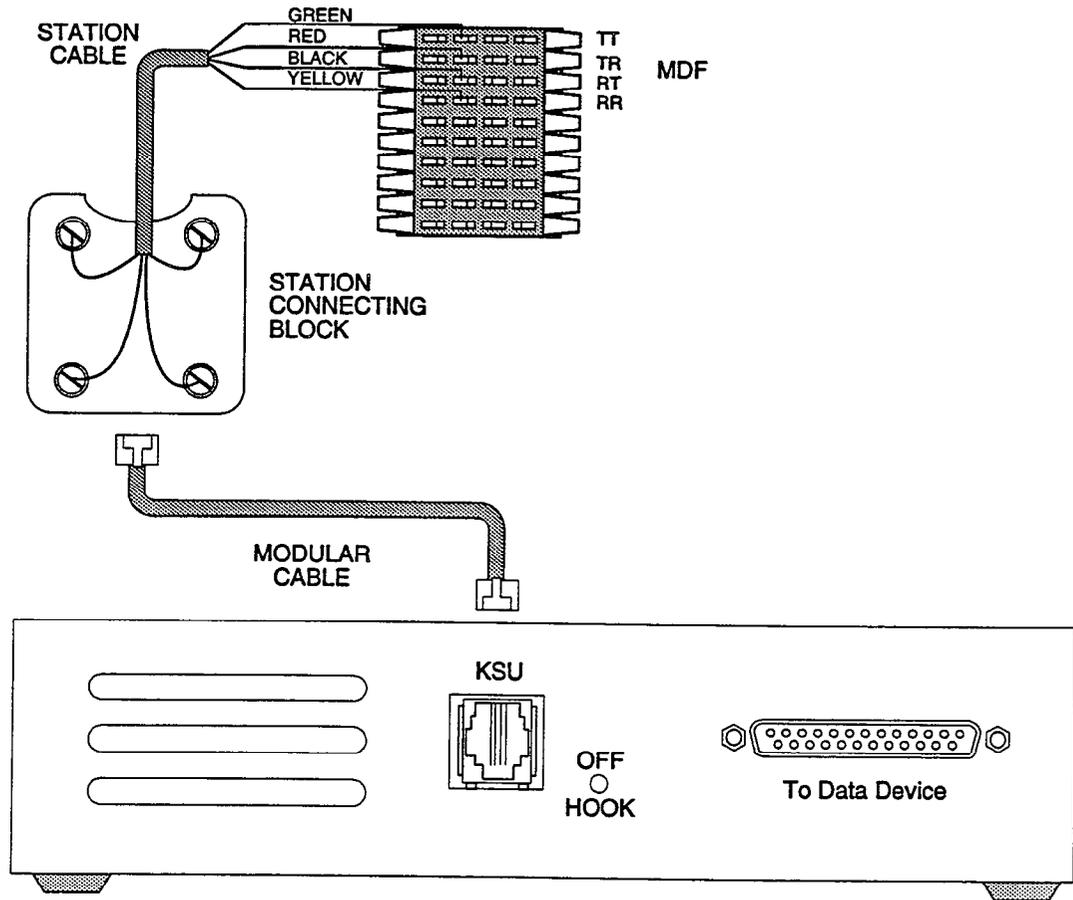


Figure 2 - Digital Data Interface Wiring

**DIGITAL DATA INTERFACE UNIT (DDIU) (Cont'd)**

Connection of the individual data communication devices requires that the installer be familiar with data communications terms, and has access to the appropriate information for connecting the variety of data communications devices that may be encountered. This information consists of, but is not limited to:

1. Is the device configured as data terminal equipment (DTE), or data communications equipment (DCE).
2. What pin on the RS-232 type connector performs what function?
3. What signal leads are required to make the device operate?

When planning the installation of the data feature, use a digital display phone at any location that is to originate a data connection. A DDIU can only be called; it cannot originate a connection. A digital display phone would typically be connected to a CRT terminal, or personal computer. A DDIU would typically be connected to a printer, or a MODEM.

The station wiring for a digital display phone and a DDIU are identical.

The data connector of the Digital Data Interface Unit (DDIU) is a 25 pin, type D connector which is configured as Data Communications Equipment with the following pin configurations.

Pin	Use	Direction
2	Receive Data	into telephone (or DDIU)
3	Transmit Data	out of telephone (or DDIU)
4	Request To Send	into telephone (or DDIU)
5	Clear To Send	out of telephone (or DDIU)
6	Data Set Ready	out of telephone (or DDIU)
7	Signal Ground	
8	Data Carrier Detect	out of telephone (or DDIU)
11	unassigned	into telephone (or DDIU)
12	Secondary DCD	out of telephone (or DDIU)
15	Transmit Clock	out of telephone (or DDIU)
17	Receive Clock	out of telephone (or DDIU)
19	Secondary RTS	into telephone (or DDIU)
20	Data Terminal Ready	into telephone (or DDIU)
22	Ring Indicator	out of telephone (or DDIU)

DIGITAL DATA INTERFACE UNIT (DDIU) (cont'd)

The following diagram will aid in the design of cables to connect the many different configurations of data communications devices.

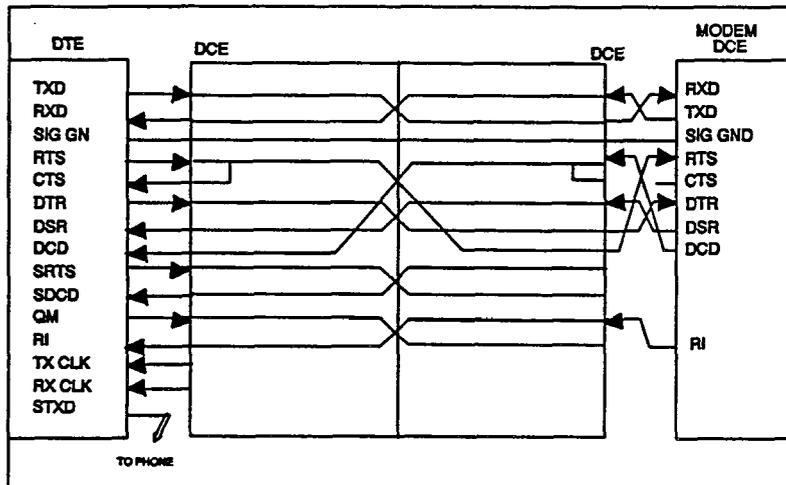


Figure 3 - STARPLUS 1428 AND 2856 Data Switching

DIGITAL DATA INTERFACE UNIT (DDIU) (Cont'd)

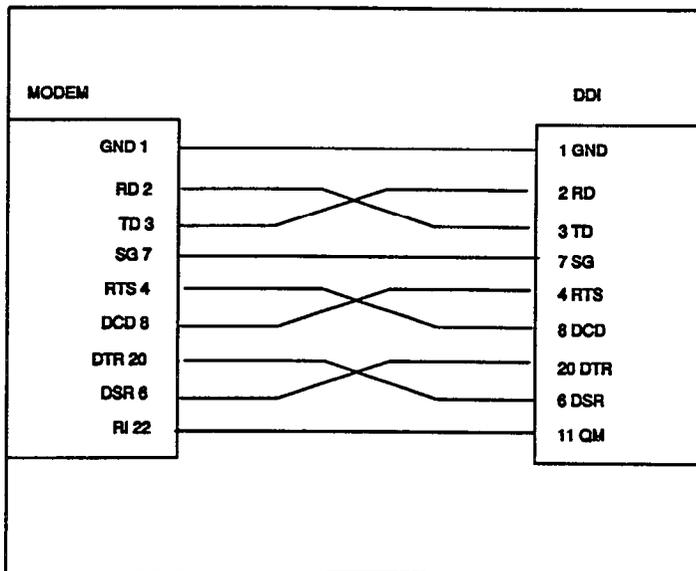


Figure 4 - MODEM to DDIU Cable

---

**DIGITAL DATA INTERFACE UNIT (DDIU) (cont'd)****Operation**

To establish a connection to any idle data port, a user with an associated DDIU dials the station number of the DDIU or the group access number of the groups that the DDIU has been inserted into or depresses a DSS button representing the DDIU. The key system will then determine the baud rate setting for the called DDIU and convert the user's associated DDIU to the same baud rate. The system will then complete the connection.

A second method to establish a connection between two DDIU is done by the first attendant. The first attendant dials the extension number of one data unit. Dial tone is received and the display will show the BAUD RATE. Then the first attendant dials the station number of the second data unit, confirmation tone is heard. This connection will be maintained until the first attendant dials the station number of one DDIU followed by pressing the FLASH button.

To break down an established connection the user should dial his associated DDIU number or depress the DSS button for the associated DDIU followed by depressing the "FLASH" button.

A station user can configure his associated DDIU by:

1. The station user dials the DDIU access code [637] on the dial pad.
2. Enter the three-digit extension number of the DDIU. The display will show the BAUD rate setting, the data length (8 or 9), and the number of stop bits (1 or 2).

To change the baud rate:

1. Press the "HOLD" button. Then enter the one-digit baud rate desired. Press the 'SPEED' button to save any changes made.

1 = 300  
2 = 1200  
3 = 2400  
4 = 4800  
5 = 9600  
6 = 19.2K  
7 = 38.4K

To change the character length:

1. Press the "TRAN" button. Then enter the one-digit character length desired, either 8 or 9. Press the 'SPEED' button to save any changes made.

To change the number of stop bits:

1. Press the "MUTE" button. Then enter the one-digit stop bit desired. Press the 'SPEED' button save any changes made.

---

**DIGITAL DATA INTERFACE UNIT (DDIU) (Cont'd)**

**Programming**

In ADMIN, enter station programming (Flash 50) Page B, Button #1 and enter an ID of 7 followed by the associated station number or [###] in the case of a DDIU without an associated station.

The Digital Data Interface Units (DDIU) in the system can be configured in ADMIN by:

1. Press the FLASH button and dial [51] on the dial pad.
2. Enter the three-digit extension number of the DDIU and depress the "HOLD" button. The display will show the present settings for the DDIU.

To change the BAUD rate:

1. Press the BAUD RATE flexible button (Button #1).
2. Enter the one-digit baud rate desired.

- 1 = 300
- 2 = 1200
- 3 = 2400
- 4 = 4800
- 5 = 9600
- 6 = 19.2K
- 7 = 38.4K

3. Press the 'HOLD' button to save any changes made.

To change the character length.

1. Press the CHARACTER LENGTH flexible button (Button #2).
2. Enter the one-digit character length desired, either 8 or 9.
3. Press the 'HOLD' button to save any changes made.

To change the stop bits:

1. Press the STOP BIT flexible button (Button #3).
2. Enter the one-digit stop bit desired.
3. Press the HOLD button save any changes made.

To select a different Data unit press button #20 and enter a new data unit station number.

---

**DIGITAL DATA INTERFACE UNIT (DDIU) (Cont'd)**

**Conditions**

1. The System is transparent to the devices being connected. Therefore each DDIU must be configured with a specific baud rate, number of data bits and number of stop bits. This configuration will be done by the first attendant or in the case of an associated data unit can be configured by the user.
2. Data switching is accomplished using the same wiring the telephone station uses for voice switching.
3. Data ports can be arranged in UCD Groups or Hunt Groups.
4. Data ports do not have to be associated with a keyset, however to connect two DDIU devices one of them must be associated with a keyset unless the connection is made by the first attendant.
5. When the data connection has been completed, the baud rate used in the connection will be displayed on the keyset.
6. Non associated DDIU connections can be broken down by the first attendant.
7. A DDIU has a DCE interface. Therefore a straight through RS232 cable can be used connect to a DTE device (printer, PC, etc.).
8. Each DDIU requires a digital terminal port.

**LCD Display**

A station after dialing an associated DDIU will receive the following display:

123456789012345678901234

CALL TO DATA PORT XXX  
BAUD = 4800

A station after dialing the programming code will receive the following display:

123456789012345678901234

DATA-BOX-BAUD-DATA-STOP  
105 19.2K 8 1

---

## KEYSET SELF TEST

### Description

The Starplus Digital Key Systems contain a test mode feature that supports the offline testing of Digital keysets and DSS units. The term offline means that the unit under test is disconnected from the switch during the test operation. Keysets not under test continue to operate in the normal manner. Tests are provided to verify the keyset and DSS LED, LCD, and keyboard button operations.

### Operation

The test mode is entered by taking a keyset's handset off hook and by dialing SPEED 7#. This keystroke sequence disconnects the keyset from the system and brings up the Test Mode Menu on the keyset's LCD. The test mode is exited by putting the handset back on hook. This reconnects the keyset to the system.

### Test Mode Menu

The menu allows the operator to select a test mode by pressing the mode number at the dial pad.

#### Modes:

- 1) Keyset LCD/LED Test
- 2) Keyset Button Test
- 3) DSS LED/Button Test

The operator can always return to the main test menu by pressing ##.

#### 1) Keyset LCD/LED Test

This test outputs a series of continuously repeated LCD string messages to LCD lines 1 and 2. The set of strings consists of the letters 'A' through 'X' and 'a' through 'x'. The next set of strings are:

```
"PICKUP TRUCK SPEED ZONE!"  
**** STANDING BACK ****
```

The strings are alternately displayed on lines 1 and 2 of the LCD display.

In addition all the LEDs are flashed at the rate of 15 IPM.

#### 2) Keyset BUTTON Test

- a) Pressing a keyset key turns on the LED and displays an LCD message identifying the key number. In addition switching the HTP switch from one position to another will cause the letter "H\_POS", "T\_POS", or "P\_POS" to be displayed.
- b) Pressing dial pad keys displays an LCD message that indicates which digit was pressed.
- c) LEDs can be tested independently of the KEYS by pressing the flex LED number at the dial pad. For example, LED 10 is turned on by pressing dial pad digits "1" "0". As each set of new numbers is entered the previously lit LED is turned off and the new LED is

turned on. Invalid flex values (ex. 00,99) turn off currently lit LED.

3) DSS LED/BUTTON Test

When the DSS test is selected and a DSS test is invoked ALL DSSs associated with the keyset running the test are placed in test mode. If no DSS unit is associated with the keyset, the keyset display will indicate "NO DSS". The DSS LED test will cause all the LEDs to flash at a 15 IPM rate. Once started the DSS LED test will continue until a DSS flex button is depressed. Pressing a DSS flex button turns on the flex key LED and displays an LCD message on the associated keyset identifying the flex key number (01 to 48). In addition, it turns off the previously selected flex LED.

Conditions

- 1. Test mode disrupts the normal operation of a keyset or DSS.

LCD Display:

The Main Test mode menu is as follows:

123456789012345678901234

```

SELECTED 1:LCDLED 2:KEYBTN
3:DSSBTN

```

The Keyset BUTTON Test mode menu is as follows:

123456789012345678901234

```

PRESS KEYSET BUTTONS
*****

```

The DSS BUTTON Test mode menu is as follows:

123456789012345678901234

```

PRESS DSS BUTTONS
*****

```

# TECHNICAL FACT NOTICE



2.3 software

STARPLUS® Digital Systems  
TF NO: 43  
2/17/94

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## ADDITIONAL FEATURES - STARPLUS® SPD 1428/2856 Digital Systems Issue 1, November 1991

A Key Station Features matrix is included in this techfact to identify the new software packages for the Starplus Digital Systems. The following list of new features are available with software version 2.3 or higher. The SPD 1428 KSU must have IRS level "S" or later, and the SPD 2856 CPB board must have IRS level "H" or later in order for these features to operate properly.

### CUSTOMER DATABASE PROGRAMMING

Upload/Download Routine

### SYSTEM TIMERS

Reminder Ring Timer (Button 18)  
Release Guard Timer (Button 19)

### SYSTEM FEATURES

Call Cost Display (Button 11)  
Handset Volume Adjustment (Button 13)  
Call Qualifier Tone (Button 14)  
Privacy Release Tone Option (Flash 06, Button 1)  
Flash Rates (Programmable) (Flash 07, Buttons 1-4)

### CO LINE ATTRIBUTES

DISA Programming Options (Button 7)  
Trunk Direction (Button 13)  
Ring Delay Timer (Button 14)

### STATION ATTRIBUTES

CO Line Ringing Options (Reminder Ring) (Button 13)

### ICLID FEATURES *(Features available with optional software)*

Caller Entered ICLID digits  
Expanded ICLID Ringing Assignments (Flash 43, Button 1)

### ACD FEATURES *(Features available with optional software)*

ACD Group Expansion to 16 Groups/16 Members (Flash 60, Flash 64)  
Guaranteed Message Announcement (Flash 60, Button 11)  
ACD Event Trace (Flash 63, Buttons 1 & 2)

### UCD FEATURES

UCD Station Assignments (Flash 60, Page B, Buttons 1 thru 8)

### VOICE MAIL FEATURES *(Features available with optional software)*

Enhanced Voice Mail Integration (Flash 65)



A to Z KELLATRONICS, Inc.

Tel: 800.766.3425  
email: [info@kellatronics.com](mailto:info@kellatronics.com) Fax: 818.773.8899

*Voice Mail*

**Key Station Features/2.3 Software Packages**

FEATURE	STANDARD FEATURES	ENHANCED FEATURES	CALL PROCESSING FEATURES	NETWORK & TRUNKING	COMBINATION PKG	ADDITIONAL EQUIPMENT REQUIRED
<b>A</b>						
Account Codes		•	•	•	•	N
Attendant Recall	•	•	•	•	•	N
Automatic Call Back Timer	•	•	•	•	•	N
Automatic Call Distribution (ACD)			•		•	N
Agent Positions			•		•	N
Alternate ACD Group Assignments			•		•	N
Group Member Status			•		•	N
Guaranteed Message Announcement			•		•	RAN Device(s)
Incoming CO Direct Ringing			•		•	N
No-Answer Recall Timer			•		•	N
No-Answer Retry Timer			•		•	N
Overflow Station Assignments			•		•	N
ACD Event Trace			•		•	PC/Terminal/Printer
Recorded Announcements (RAN)			•		•	RAN Device(s)
Supervisor Positions			•		•	N
Supervisor/Agent Calls in Queue Display			•		•	N
Automatic Line Access	•	•	•	•	•	N
Automatic Night Service	•	•	•	•	•	N
Automatic Pause Insertion w/Speed Dial	•	•	•	•	•	N
Automatic Privacy	•	•	•	•	•	N
Automatic Selection	•	•	•	•	•	N
<b>B</b>						
Background Music	•	•	•	•	•	Music Source
Battery Back-up (Memory)	•	•	•	•	•	N
Busy Lamp Field (BLF)	•	•	•	•	•	N

N=No additional hardware required

**Key Station Features/2.3 Software Packages**

FEATURE	STANDARD FEATURES	ENHANCED FEATURES	CALL PROCESSING FEATURES	NETWORK & TRUNKING	COMBINATION PKG	ADDITIONAL EQUIPMENT REQUIRED
<b>C</b>						
Call Announce - Privacy	•	•	•	•	•	N
Call Back	•	•	•	•	•	N
Call Cost Display Feature				•	•	N
Call Forward: Preset	•	•	•	•	•	N
ACD Groups			•		•	N
Hunt Groups	•	•	•	•	•	N
Off-Net	•	•	•	•	•	N
Stations	•	•	•	•	•	N
UCD Groups	•	•	•	•	•	N
VM Groups		•	•	•	•	VM System
Call Forward: Station	•	•	•	•	•	N
All Calls	•	•	•	•	•	N
Busy	•	•	•	•	•	N
Busy/No Answer	•	•	•	•	•	N
No Answer	•	•	•	•	•	N
Off-Net	•	•	•	•	•	N
Call Park	•	•	•	•	•	N
Call Pick-up	•	•	•	•	•	N
Directed Call Pick-up	•	•	•	•	•	N
Group Pick-up	•	•	•	•	•	N
Call Transfer	•	•	•	•	•	N
Caller Entered ICLID Digits			•		•	N
Calling Station Tone Mode Option	•	•	•	•	•	N
Camp-On	•	•	•	•	•	N
Camp-On Recall	•	•	•	•	•	N
Canned Toll Restriction	•	•	•	•	•	N
Centrex Compatibility	•	•	•	•	•	N

N=No additional hardware required

**Key Station Features/2.3 Software Packages**

FEATURE	STANDARD FEATURES	ENHANCED FEATURES	CALL PROCESSING FEATURES	NETWORK & TRUNKING	COMBINATION PKG	ADDITIONAL EQUIPMENT REQUIRED
Flex Button Programming	•	•	•	•	•	N
Off-Hook Preference	•	•	•	•	•	N
Private Line Appearance	•	•	•	•	•	N
Programmable Flash Timer	•	•	•	•	•	N
Programming *, #, and Hook-Flashes into Speed Dial	•	•	•	•	•	N
Centrex/PBX Transfer	•	•	•	•	•	N
Chaining Speed Bins	•	•	•	•	•	N
CO Line Access	•	•	•	•	•	N
CO Line Class of Service	•	•	•	•	•	N
CO Line Control (Contact)	•	•	•	•	•	Gen & Bells
CO Line Groups	•	•	•	•	•	N
CO Line Identification	•	•	•	•	•	N
CO Line Incoming Ringing Assignment	•	•	•	•	•	N
CO Line Loop Supervision	•	•	•	•	•	N
CO Line Queue	•	•	•	•	•	N
CO Line Ringing Options	•	•	•	•	•	N
CO Ring Detect	•	•	•	•	•	N
Conference	•	•	•	•	•	N
Add-On Conference	•	•	•	•	•	N
Multi-Line Conference	•	•	•	•	•	N
Unsupervised Conference	•	•	•	•	•	N
Conference Enable/Disable	•	•	•	•	•	N
<b>D</b>						
Data Feature	•	•	•	•	•	PC/Terminal
DataBase Printout (Dump)	•	•	•	•	•	Printer/Terminal
Database Upload/Download	•	•	•	•	•	Printer/Terminal
Day/Night Class of Service (COS)	•	•	•	•	•	N

N=No additional hardware required

### Key Station Features/2.3 Software Packages

FEATURE	STANDARD FEATURES	ENHANCED FEATURES	CALL PROCESSING FEATURES	NETWORK & TRUNKING	COMBINATION PKG	ADDITIONAL EQUIPMENT REQUIRED
Default Button Mapping	•	•	•	•	•	N
Dial By Name	•	•	•	•	•	N
Dial Pulse Sending	•	•	•	•	•	N
Dialing Privileges	•	•	•	•	•	N
Direct Inward System Access (DISA)	•	•	•	•	•	DTMF Rcvr
CO Line Group Access	•	•	•	•	•	N
DISA Call Forwarding	•	•	•	•	•	N
Programmable Access	•	•	•	•	•	N
Station Access	•	•	•	•	•	N
Trunk-to-Trunk	•	•	•	•	•	N
Direct Station Selection	•	•	•	•	•	N
Directed Call Pick-up	•	•	•	•	•	N
Call Pick-up - Station	•	•	•	•	•	N
Call Pick-up - UCD Groups	•	•	•	•	•	N
Directory Dialing	•	•	•	•	•	N
Disable Outgoing CO Line Access	•	•	•	•	•	N
Distinctive Ringing (User Selectable)	•	•	•	•	•	N
Do Not Disturb (DND)	•	•	•	•	•	N
One-Time Do Not Disturb (DND)	•	•	•	•	•	N
DTMF Sending	•	•	•	•	•	N
<b>E</b>						
Emergency Transfer	•	•	•	•	•	OPX/48v supply PFTU/12v supply
End to End Signalling	•	•	•	•	•	N
Exclusive Hold	•	•	•	•	•	N
Executive Override	•	•	•	•	•	N
Executive/Secretary Transfer	•	•	•	•	•	N
External Night Ringing	•	•	•	•	•	Paging Equipment

N=No additional hardware required

**Key Station Features/2.3 Software Packages**

FEATURE	STANDARD FEATURES	ENHANCED FEATURES	CALL PROCESSING FEATURES	NETWORK & TRUNKING	COMBINATION PKG	ADDITIONAL EQUIPMENT REQUIRED
<b>F</b>						
Flash	•	•	•	•	•	N
Flash On Intercom	•	•	•	•	•	N
Flash Rates (Programmable)	•	•	•	•	•	N
Flash with Speed Dial	•	•	•	•	•	N
Flexible Attendant	•	•	•	•	•	N
Flexible Button Assignment	•	•	•	•	•	34-Btn/14-Btn
Flexible Port Assignments	•	•	•	•	•	N
Forced Account Codes		•	•	•	•	N
Forced Least Cost Routing (LCR)				•	•	N
<b>G</b>						
Group Call Pick-up	•	•	•	•	•	N
Group Listening	•	•	•	•	•	N
<b>H</b>						
Handset Receiver Gain	•	•	•	•	•	N
Headset Compatibility	•	•	•	•	•	Headset
Headset Mode	•	•	•	•	•	Headset
Hearing Aid Compatible	•	•	•	•	•	N
Hold Preference	•	•	•	•	•	N
Hold Recall	•	•	•	•	•	N
Hot Line/Ring Down	•	•	•	•	•	N
Hunt Groups	•	•	•	•	•	N
Hunt Group Chaining	•	•	•	•	•	N
Pilot Hunting	•	•	•	•	•	N
Station Hunting	•	•	•	•	•	N
<b>I</b>						
ICLID Feature			•		•	ICLID Keypad
Calling Number/Name Display			•		•	ICLID Keypad

N=No additional hardware required

**Key Station Features/2.3 Software Packages**

FEATURE	STANDARD FEATURES	ENHANCED FEATURES	CALL PROCESSING FEATURES	NETWORK & TRUNKING	COMBINATION PKG	ADDITIONAL EQUIPMENT REQUIRED
Incoming Number/Name for SMDR Records			•		•	ICLID Keypad
Unanswered Call Management			•		•	ICLID Keypad
Idle Speaker Mode	•	•	•	•	•	N
Incoming CO Lines Off-Net Forward via Speed Dial	•	•	•	•	•	N
Intercom Calling	•	•	•	•	•	N
Intercom Signaling Select	•	•	•	•	•	N
<b>K</b>						
Keypad Self Test	•	•	•	•	•	34-Btn keypad
<b>L</b>						
Last Number Redial (LNR)	•	•	•	•	•	N
LCD Interactive Display	•	•	•	•	•	Exec Keypad
Least Cost Routing (LCR)				•	•	N
6-Digit Table				•	•	N
Daily Start Time Tables				•	•	N
Default LCR Data Base				•	•	N
Exception Tables				•	•	N
Insert/Delete Tables				•	•	N
LCR Routing for Toll Information				•	•	N
Route List Tables				•	•	N
Weekly Time Tables				•	•	N
3-Digit Table				•	•	N
Local Number/Name Translation Table	•	•	•	•	•	N
Loop Button CO Line Access	•	•	•	•	•	N
<b>M</b>						
Meet Me Page	•	•	•	•	•	N
Message Waiting	•	•	•	•	•	N
Message Waiting Reminder Tone	•	•	•	•	•	N
Messages - Personalized	•	•	•	•	•	N

N=No additional hardware required

### Key Station Features/2.3 Software Packages

FEATURE	STANDARD FEATURES	ENHANCED FEATURES	CALL PROCESSING FEATURES	NETWORK & TRUNKING	COMBINATION PKG	ADDITIONAL EQUIPMENT REQUIRED
Custom Messages	•	•	•	•	•	N
Date and Time Entry to Personalized Message(s)	•	•	•	•	•	N
Message Code on a Flex Key	•	•	•	•	•	N
Music On Hold	•	•	•	•	•	Music Source
Mute Key	•	•	•	•	•	N
<b>N</b>						
Name in Display	•	•	•	•	•	Exec Keypad
Night Service Feature	•	•	•	•	•	N
Night Service Mode	•	•	•	•	•	N
Automatic Night Mode Operation	•	•	•	•	•	N
External Night Ringing	•	•	•	•	•	N
Manual Operation	•	•	•	•	•	N
Night Class of Service (COS)	•	•	•	•	•	N
Night Ringing Assignments	•	•	•	•	•	N
Universal Night Answer (UNA)	•	•	•	•	•	N
Weekly Night Mode Schedule	•	•	•	•	•	N
<b>O</b>						
Off Hook Voice Over (OHVO)	•	•	•	•	•	OHVO Keypad
Off-Hook Preference	•	•	•	•	•	N
Auto Feature Access	•	•	•	•	•	N
Auto Line Access	•	•	•	•	•	N
Hot Line/Ring Down	•	•	•	•	•	N
Intercom Access	•	•	•	•	•	N
User Programmable Preference	•	•	•	•	•	N
Off-Hook Signalling	•	•	•	•	•	N
Off-Premise Extensions (OPX)	•	•	•	•	•	SLA/OPX/48v

N=No additional hardware required

### Key Station Features/2.3 Software Packages

FEATURE	STANDARD FEATURES	ENHANCED FEATURES	CALL PROCESSING FEATURES	NETWORK & TRUNKING	COMBINATION PKG	ADDITIONAL EQUIPMENT REQUIRED
On Hook Dialing	•	•	•	•	•	N
On Line Programming	•	•	•	•	•	N
<b>P</b>						
Page/Relay Control	•	•	•	•	•	Relay/Sensor unit
Paging	•	•	•	•	•	Paging Equipment
External Paging	•	•	•	•	•	Paging Equipment
Internal Paging	•	•	•	•	•	Paging Equipment
Paging Access Restriction	•	•	•	•	•	N
Pause Timer	•	•	•	•	•	N
PBX Dialing Codes	•	•	•	•	•	N
Pool Button Operation	•	•	•	•	•	N
Preferred Line Answer	•	•	•	•	•	N
Privacy Release	•	•	•	•	•	N
Per CO Line Option	•	•	•	•	•	N
Per Station Option	•	•	•	•	•	N
Private Line	•	•	•	•	•	N
Pulse-To-Tone Switchover	•	•	•	•	•	N
<b>R</b>						
Range Programming	•	•	•	•	•	N
Release Key	•	•	•	•	•	N
Remote Administration	•	•	•	•	•	PC/Term/Modem
Database Upload/Download	•	•	•	•	•	PC/Term/Modem
Remote System Monitor & Maintenance	•	•	•	•	•	PC/Term/Modem
Remote System Maintenance	•	•	•	•	•	PC/Term/Modem
Remote System Monitor	•	•	•	•	•	PC/Term/Modem
<b>S</b>						
Save Number Redial (SNR)	•	•	•	•	•	N
Single Line Telephone (SLT) Compatibility*	•	•	•	•	•	2500 type

N=No additional hardware required

### Key Station Features/2.3 Software Packages

FEATURE	STANDARD FEATURES	ENHANCED FEATURES	CALL PROCESSING FEATURES	NETWORK & TRUNKING	COMBINATION PKG	ADDITIONAL EQUIPMENT REQUIRED
*A Single Line Telephone board (SL12), or Single Line Adapter (OPX) w/48v supply can be used for SLT operations						
Speakerphone	•	•	•	•	•	34-Btn/14-Btn
Station Class of Service (COS)	•	•	•	•	•	N
Station Message Detailed Recording		•	•	•	•	Printer/Terminal
Station Relocation Feature	•	•	•	•	•	N
Station Speed Dial	•	•	•	•	•	N
System Capacity	•	•	•	•	•	N
Up to 48x96 Configuration	•	•	•	•	•	N
System Hold	•	•	•	•	•	N
System Speed Dial	•	•	•	•	•	N
<b>T</b>						
Text Messaging (Silent Response)	•	•	•	•	•	Exec Keypad
Toll Restriction (Table Driven)	•	•	•	•	•	N
Transfer Recall	•	•	•	•	•	N
<b>U</b>						
Uniform Call Distribution (UCD)	•	•	•	•	•	N
Agent Queue Status Display	•	•	•	•	•	N
Alternate UCD Group Assignments	•	•	•	•	•	N
Auto Wrap-Up w/Timer	•	•	•	•	•	N
Available/Unavailable Mode	•	•	•	•	•	N
Incoming CO Direct Ringing	•	•	•	•	•	N
No-Answer Recall Timer	•	•	•	•	•	N
No-Answer Retry Timer	•	•	•	•	•	N
Overflow Station Assignments	•	•	•	•	•	N
Recorded Announcements (RAN)	•	•	•	•	•	RAN Device(s)
Universal Night Answer (UNA)	•	•	•	•	•	N

N=No additional hardware required

**Key Station Features/2.3 Software Packages**

FEATURE	STANDARD FEATURES	ENHANCED FEATURES	CALL PROCESSING FEATURES	NETWORK & TRUNKING	COMBINATION PKG	ADDITIONAL EQUIPMENT REQUIRED
<b>V</b>						
Voice Mail Groups (VM)		•	•	•	•	VM System
In-Band Signaling Integration		•	•	•	•	VM System
Message Waiting Indication		•	•	•	•	VM System
Tone Mode Calling Option		•	•	•	•	VM System
Transfer/Forward		•	•	•	•	VM System
VM Disconnect Signal		•	•	•	•	VM System
VM Transfer with ID Digits		•	•	•	•	VM System
Volume Controls	•	•	•	•	•	N

N=No additional hardware required

## CUSTOMER DATABASE PROGRAMMING

Upload/Download Routine

**DATABASE UPLOAD/DOWNLOAD ROUTINE**

**Description:**

The Database Upload/Download database feature provides a maintenance facility which permits the user to download the database to a PC, when a software change is made or when the system needs to be initialized and re-programmed. In addition, the routine will facilitate the programming of a database on an in-house system which can be downloaded to a PC and then uploaded to a system in the field. After the system maintenance is completed, the file saved in the PC can then be uploaded to the system.

*NOTE: All trace modes (SMDR, ICLID Event, Maintenance Event Traces, etc.) MUST be turned off before any download is performed!*

**Operation:**

Using the PC to Upload/Download thru Remote Administration

A Personal Computer must be connected to the RS-232C port on the SPD 1428 Main Key Service Board or on the SPD 2856 System Central Processor Board (CPB) can be used for database programming.

When entering the system remotely via a Personal Computer, access to the on-board modem is accomplished by accessing Port [199] either through a direct ringing assignment or through DISA or by being transferred to Port [199] by any internal station.

1. Connect one end of an RS-232C Serial cable from the RS-232C connector on the SPD 1428 Main Key Service Board to the desired Comm Port on the PC, or connect one end of an RS-232C Serial cable from the RS-232C connector on the Central Processor Board of the SPD 2856 System to the desired Comm Port on the Personal Computer.

*NOTE: Pins 2 & 3 on the Personal Computer end of the RS-232C serial cable MUST be reversed. Pins 6 & 20 MUST be jumpered together for proper operating of the upload/download routing .*

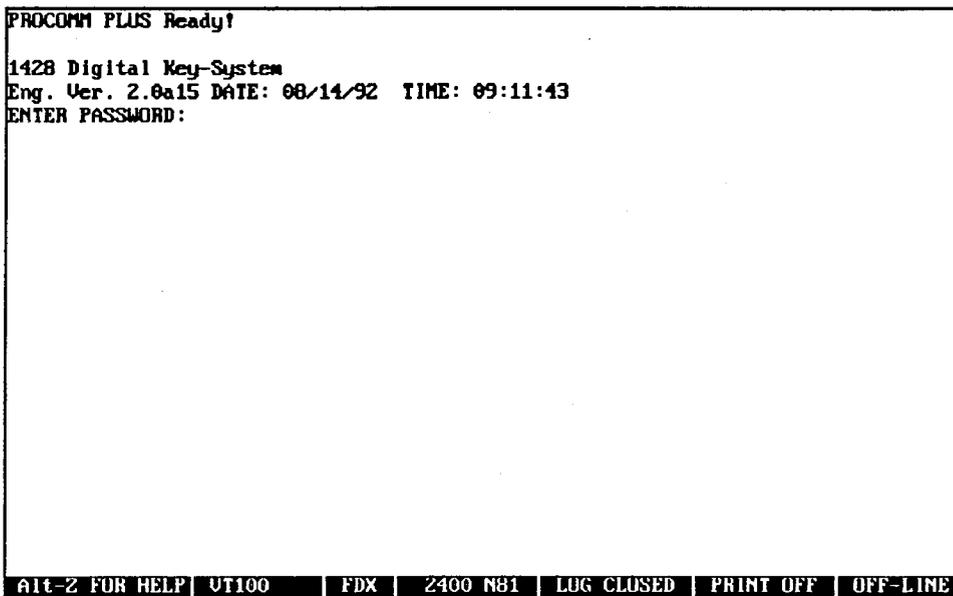
2. Load a communication software package (i.e. Procomm) into the Personal Computer. Make the necessary changes to the following areas of the communications package. Save these permanent settings.

ITEMS TO CHANGE	CHANGE
Parameters: [Alt] + [P]	
Baud Rate	2400 Baud ,N for Parity,8 Bits,1 Stop Bit
SETUP OPTIONS: [Alt] + [S]	
Terminal Options:	
Item C: Soft flow ctrl (XON/XOFF)	ON
Protocol Options:	
Item A: Echo Locally	OFF
Item D: Character Pacing	0

Item E: Line Pacing	0
Item F: Pace Character	0
Item I: CR Translation (upload)	None
Item J: LF Translation (upload)	None
Item K: CR Translation (download)	None
Item L: LF Translation (download)	None
<b>PROTOCOL OPTIONS</b>	
<b>General Protocol Options:</b>	
Item C: Abort xfer if CD lost	NO

NOTE: Item C appears in Procomm Plus Version 2.01 or higher

- Press the  key on the PC. The following display will be seen on the Personal Computer monitor.



- Enter the password [VODAVI], and press the  key again. Proper entry of the password will result in the ADM> prompt. Proceed with programming referring to Figure 600-1 in the Starplus Technical Manual for terminal characters that represent the keyset buttons. By entering a [?] from the terminal, a HELP screen will appear.

5. Enter the information on the following capture

```

PROCOMM PLUS Ready!

1428 Digital Key-System
Eng. Ver. 2.0a15 DATE: 06/14/92 TIME: 14:17:12
ENTER PASSWORD:
ada>,
    ENTER PROGRAM NO
ada>86
LOAD DATABASE ROUTINE
ENTER BUTION NUMBER
ada>w
DOWNLOAD DATABASE
PRESS HOLD
ada>

Alt-2 FOR HELP | UT100 | FDx | 2400 N81 | LOG CLOSED | PRINT OFF | OFF-LINE
    
```

6. Press the **[Alt] + [F1]** keys. This will bring up the log screen on the PC monitor. Enter a path for the database file to be sent to or press **[Enter]** and the database file will be sent to the destination shown in the communications package default settings area.

```

Enter log filename (CR for default):

Alt-2 FOR HELP | UT100 | FDx | 2400 N81 | LOG CLOSED | PRINT OFF | OFF-LINE
    
```

**NOTE:** The downloaded database can not be changed in the PC. The Upload/download routine is only a method to save an existing database. Any database changes can be made using the remote admin capabilities.

7. On the PC, press the **[Enter]** key to begin the downloading routine. Confirmation tone will be heard when the database is completely downloaded.
8. On the PC, press the **[Alt] + [F1]** keys again to turn the log file off.

The download file will contain a series of ASCII strings which will contain a checksum at the end of the string. The checksum will be verified when the system receives the string back. An error in the checksum will result in rejection of the string. In addition an error message will be sent to the PC when a string is received with an error. When transmission of the download file is complete, a confirmation tone will be heard.

The following is a list of strings and the order that they will be received in:

1.	DB_VERSION
2.	SYS_TIMERS
3.	DB_VERSION
4.	RELAY_BOX (1 thru 7)
5.	NIGHT_MODE
6.	HUNT_GROUP (330 thru 337)
7.	CO_LINE (1 thru 28)
8.	STATION (100 thru 155)
9.	KEYSET_BUTTONS (100 thru 155) where equipped
10.	DSS_BUTTONS (100 thru 155) where equipped
11.	UCD_GRP (550 thru 557)
12.	UCD_TIMERS
13.	VOICE_MAIL_GRP (440 thru 447)
14.	VOICE_MAIL_OUTPULSE
15.	ALLOW_TABLE_A
16.	ALLOW_TABLE_B
17.	DENY_TABLE_A
18.	DENY_TABLE_B
19.	OFFICE_CODE_TABLE
20.	AREA_CODE_TABLE
21.	3_DIGIT_ROUTE_TABLE
22.	6_DIGIT_ROUTE_TABLE (table entry)
23.	EXCEPTION_CODE_TABLE
24.	ROUTE_LIST_TABLE (table entry)
25.	INS/DEL_TABLE (table entry)
26.	DAILY_START_TABLE
27.	WEEKLY_START_TABLE
28.	ROUTE_FOR_555-1212
29.	SYSTEM_SPEED_BIN
30.	STA_SPEED_BIN (station 100 thru 155)
31.	SPEED_DIR (directory entry)
32.	ICLID_TRANS_TABLE (trans table entry)
33.	ICLID_UAC_TABLE (uac table entry)
34.	SPECIAL_TABLE
35.	PORT_TO_STATION
36.	PORT_TO_CO_LINE

37.	STATUS_REQUEST
38.	END_OF_FILE

Forward and backward compatibility will be maintained. If the file being uploaded from the PC contains less information in a string than is required by the system database, the system will maintain default information in the area not covered by the string. If the file being uploaded from the PC contains more information in a string than is required by the system database, the system will ignore the additional information.

To upload a database file:

1. On the PC, enter the following information after the first ADM> prompt. Then press the  key.

```

PROCOMM PLUS Ready!
1428 Digital Key-System
Eng. Ver. 2.0a15 DATE: 08/14/92 TIME: 16:11:06
ENTER PASSWORD:
adm>
ENTER PROGRAM NO
adm>86
LOAD DATABASE ROUTINE
ENTER BUTTON NUMBER
adm>g
UPLOAD DATABASE
PRESS HOLD
adm>
    
```

ALL-2 FOR HELP | 0T100 | FDX | 2400 N81 | LOG CLOSED | PRINT OFF | OFF-LINE

2. On the PC, press the  + [C] keys to clear the screen. Press the  key to bring up the upload screen. Enter an "A" to set the upload as an ASCII upload file.
3. This will bring up the ASCII upload file screen on the PC monitor.

```

Upload Protocols
X) XMODEM          A) ASCII
Z) ZMODEM          R) RAW ASCII
Y) YMODEM (Batch) T) TELINK
G) YMODEM-G (Batch) M) MODEM7
O) 1K-XMODEM      W) WMODEM
E) 1K-XMODEM-G    I) IMODEM
C) COMUSERVE B+   L) TEXT 11
K) KERMIT          J) TEXT 21
S) SEALINK        3) TEXT 31

Your Selection: (press ENTER for ASCII)
    
```

ALL-2 FOR HELP | 0T100 | FDX | 2400 N81 | LOG CLOSED | PRINT OFF | OFF-LINE

4. Enter the path for the file to be uploaded to the system and press the  key. The file will now be uploaded to the system. Confirmation tone will be heard at the completion of the upload routine. If the  key was

pressed during the download routine without a filename entered, the default filename will be: PCPLUS.LOG.

*NOTE: If the PCPLUS.LOG file is not re-named or deleted before the next download routine is performed, the downloaded information will append the existing LOG file instead of over-writing it.*

5. After the file is uploaded to the system, the ADM> prompt will be returned to the PC monitor. Enter an "M" at the prompt and press the  key.

```
ENTER PROGRAM NO
adm>
exiting admin...

DATE: 08/14/92 TIME: 16:24:53
exiting maintenance utility...

Alt-2 FOR HELP | UT100 | FDX | 2400 N81 | LOG CLOSED | PRINT OFF | OFF-LINE
```

6. On the PC, press the  + [X] keys. Press the  key to exit Procomm and return to the DOS prompt.
7. After the upload procedure is completed, the system **MUST** be reset for full activation of the database programming to take effect.

---

**SYSTEM TIMERS**

Reminder Ring Timer

Release Guard Timer

### A. REMINDER RING TIMER

**Description:**

When a CO line rings at a busy station, the call rings at the station using a muted ring (default) signal. The CO Ringing Option feature allows a user to receive reminder ring at his station instead of muted ring. This timer provides a reminder ring every time the timer expires, as long as the incoming CO call has not hung up.

If the user continues his present conversation and the CO party does not hang up, the Reminder Ring timer will expire and the user will receive another burst of ring. When the keyset user hangs up on his existing call, the ringing for the CO call will revert to normal ringing.

**Programming:**

If any System Timers are to be changed:

1. Press FLASH and dial [01]. The following message is shown on the display phone:

```
SYSTEM TIMERS
ENTER BUTTON NUMBER
```

2. Press the REMINDER RING flexible button (Button #18). The following message is shown on the display phone:

```
REMINDER RING      00-99
                   00
```

3. Enter a two-digit timer value on the dial pad which corresponds to 00-99 seconds in 1 sec. increments. A value of 00 disables the timer, therefore the user will only receive one burst of ring at the beginning of the call.
4. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the Reminder Ring Timer is set to 00 sec. and is variable from 00 to 99 seconds in 1 sec. increments.

---

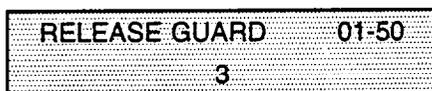
**SYSTEM TIMERS (Cont'd)****B. Release Guard Timer****Description:**

The Release Guard Timer is designed for the CO Line loop interface to accommodate the variations found from one Central Office to another. The timer is started whenever a CO line is released. If a user attempts to access a CO line before the Release Guard timer expires, his LED will illuminate indicating the CO line has been seized, however the CO line will not be seized until the timer expires. The user WILL NOT receive busy tone, but may get delayed CO dial tone if the timer is set to a large value.

**Programming:**

If any System Timers are to be changed:

1. Press the RELEASE GUARD TIMER flexible button (Button #19). The following message is shown on the display phone:



RELEASE GUARD 01-50  
3

2. Enter a two-digit timer value on the dial pad which corresponds to 01-50 (0.1 sec. to 5.0 sec.)
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the Release Guard timer is set for 3 for 300 milliseconds, and is variable from 100 milliseconds to 5 seconds.

---

## SYSTEM FEATURES

Call Cost Display (Available with optional software)

Handset Volume Adjustment

Call Qualifier Tone

Privacy Release Tone Option

Flash Rates (Programmable)

---

**CALL COST DISPLAY**
**Description:**

The Call Cost Display Feature provides a means for a user to view the approximate cost of each call made. This approximate cost will also be printed as part of the SMDR record.

The Call Cost Display will replace the call duration display when a call is made using LCR. This display is enabled in programming.

The cost information is programmable by selecting one of the 16 route list tables and one of the four time periods. This allows the user to program four separate costs based on the time of day for each of 16 routes. The costs entered in the tables will be a cost for one minute, however, costs are calculated using a 1/10th of a minute value. These costs are rounded down and are based on the start time of the call, even if the call extends into a different time period. The SMDR printout will contain a cost calculated using a 1/10th of a minute increment, however the station display will update approximately every 30 seconds. The user must use LCR to get the call cost display.

**Programming:**

If any System Features are to be changed:

1. Press FLASH and dial [05]. The following message is shown on the display phone:

```
SYS_FEAT AD SY ENR EO PW
BGM LCR AC G S CC MH V Q
```

If Call Cost Display Feature is to be enabled:

2. Press the CALL COST DISPLAY flexible button (Button #11). This feature will toggle on and off with each depression, and the display will update with each depression.

- LED on = Call Cost Display is enabled
- LED off = Call Cost Display is disabled

3. Press the HOLD button to save the entry. Confirmation tone is heard.

The following message will be shown on the display for the LCR Route List table when the Call Cost display feature is enabled:

```
ROUTE LIST TABLE
ENTER RR T CCC G DD L HOLD
```

Where: RR=Route List Table number 00-15; T=Time Period; CCC=Cost for one minute \$0.00-\$9.99; G= CO Line Group; DD= Insert/Delete Table reference 00-19; (## for none); L= LCR Class of Service

**Default:** By default, the Call Cost Display Feature is disabled.

---

## HANDSET VOLUME ADJUSTMENT

### Description:

This feature provides the user with a flexible button that can be programmed on their keyset. When programmed, allows the keyset or SLT user to increase/decrease the handset receiver gain while on a CO call or intercom call. This volume setting will be stored on a per station basis until changed.

### A. Keyset Operation:

While on a CO call:

1. Press pre-programmed\* Handset Receiver Gain flex button to enter the volume adjustment mode.
2. Dial a one-digit entry [0] through [9] (0=lowest, 9=highest) on the dial pad, or press the [#] to increase or [\*] to decrease the gain, one level at a time. (Default: 7 = 0db) The LCD will display the settings as they occur if a flex button has been programmed using the code [638]+[0].
3. Press pre-programmed\* Handset Receiver Gain flex button again to exit the volume adjustment mode.

*NOTE: When the above procedure is used, your transmit path is momentarily interrupted as the dial pad button is depressed.*

A flex button can be programmed to decrease the Handset Receiver Gain using the code [638]+[\*]. Another flex button can be programmed to increase the Handset Receiver Gain using the code [638]+[#]. A flex button can also be programmed to have a certain volume setting using the code [638]+[1 thru 9].

\*A Flex button must be programmed for this feature to operate using the code [638]+[0].

### B. SLT Operation:

While on a CO or intercom call:

1. Hookflash and dial the Handset Receiver Gain code [638] on the dial pad.
2. Dial a one-digit entry [0] through [9] (0=lowest, 9=highest) on the dial pad, or Press the [#] to increase or [\*] to decrease the gain, one level at a time. (Default: 7 = 0db)
3. Hookflash again to return to call.
4. Repeat above procedures, if necessary.
5. Replace the handset to end the call.

### Programming:

In System Features programming, Handset Receiver Gain feature must be enabled, Flash 05, Button #13.

---

**CALL QUALIFIER TONE****Description:**

This feature provides a means for an agent to enter codes on ACD type calls that identify the call. This feature provides up to four digits for the ACD SMDR reporting function which are compatible with the Basic ACD software package. This feature will permit up to 12-digits to be entered, however, only the first four digits are provided for in the SMDR record.

**Programming:**

If any System Features are to be changed:

1. Press FLASH and dial [05]. The following message is shown on the display phone:

SYS FEAT AD SY ENR EO PW
BGM LCR AC G S CC MH V Q

If the Call Qualifier Confirmation Tone is to be enabled:

1. Press the CALL QUALIFIER TONE OPTION flexible button (Button #14). This feature will toggle on and off with each depression, and the display will update with each depression.
  - LED on = Confirmation tone is enabled
  - LED off = Confirmation tone is disabled
2. Press the HOLD button to save the entry. Confirmation tone is heard.

**Default:** By default, the Call Qualification Confirmation tone is disabled.

## PRIVACY RELEASE TONE OPTION

### Description:

Privacy is insured on all communications in the system. If desired, the customer may elect to disable the Automatic Privacy feature, thus allowing up to three other stations to join in on an existing CO Line conversations.

*NOTE: Disabling of the privacy feature may be limited by federal, state or local law, so check the relevant laws in your area before disabling privacy.*

#### • Per CO Line Option:

This feature allows each CO line to be individually programmed for privacy. This feature is useful for maintaining security on such lines as Data lines, Private lines, or special circuits requiring privacy. If privacy is disabled on a CO line then, while in use, another station may enter the conversation simply by pressing the CO line button. A programmable warning tone is presented to all parties prior to actual cut-thru. The station attempting to enter the conversation must also have privacy disabled.

#### • Per Station Option

Each station may be programmed to give the station the capability to join an existing conversation simply by pressing the CO line button that is in use. A programmable warning tone is presented to all parties when the station enters the conversation. The CO line must also have privacy disabled to allow the cut-thru.

*NOTE: Display stations will continue to receive the "CONFERENCE" display regardless of the warning tone setting.*

### Programming:

If the Privacy Release Tone needs to be changed:

1. Press FLASH and dial [06]. The following message is shown on the display phone:

```
SYSTEM FEATURES
ENTER BUTTON NUMBER
```

2. Press the BARGE IN WARNING TONE flexible button (Button #1). The following message is shown on the display phone:

```
BARGE IN WARN TONE 0-1
ENABLED
```

3. Enter a one-digit value on the dial pad to enable or disable the conference tone.

[0] = Disabling of Conference tone  
[1] = Enabling of Conference tone

4. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the Privacy Release Tone is enabled.

---

**FLASH RATES (Programmable)****Description:**

The flash rates for the following features can now be programmed to 16 different options in admin programming:

- Incoming CO line ringing: defaults to 30 ipm flash
- Incoming intercom ringing: defaults to 120 ipm flutter
- Call Forward: defaults to 30 ipm flash
- Message Waiting: defaults to 15 ipm flash

All other flash rates in the system are fixed at the rates shown in Table 400-13 DSS/BLF Button Visual Indicators, Table 400-14 CO Line Button Visual Indicators, and Table 400-15 Function Button Visual Indicators in the Starplus Digital Systems Technical Manual, Issue 1, November 1991.

**Programming:**

If the flash rates need to be changed:

1. Press FLASH and dial [07]. The following message is shown on the display phone:

SYSTEM FLASH RATES  
ENTER BUTTON NUMBER

The available flash rates are as follows:

- 00 = Off
- 01 = Steady On
- 02 = 30 ipm flash
- 03 = 60 ipm flash
- 04 = 240 ipm double wink
- 05 = 240 ipm flash
- 06 = 240 ipm flutter
- 07 = 480 ipm flash
- 08 = 480 ipm flutter
- 09 = 15 ipm flash
- 10 = 120 ipm flash
- 11 = 120 ipm flutter
- 12 = 480 ipm wink
- 13 = 240 ipm wink
- 14 = 240 ipm quad wink
- 15 = 480 ipm triple wink

---

**Flash Rates (Cont'd)****A. Incoming CO Line Ringing:**

1. Press the INCOMING CO RINGING flexible button (Button #1). The following message is shown on the display phone:

INC CO RING	00-15
30 IPM FLASH	

2. Enter a two-digit value on the dial pad to correspond to one of the 16 available options.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the Incoming CO Ringing is set for a 30 ipm flash.

**B. Incoming Intercom Ringing:**

1. Press the INCOMING ICM RINGING flexible button (Button #2). The following message is shown on the display phone:

INC ICM RING	00-15
120 IPM FLUTTER	

2. Enter a two-digit value on the dial pad to correspond to one of the 16 available options.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the Incoming Intercom Ringing is set for 120 ipm flutter.

**C. Call Forwarding:**

1. Press the CALL FORWARD flexible button (Button #3). The following message is shown on the display phone:

CALL FORWARD	00-15
30 IPM FLASH	

2. Enter a two-digit value on the dial pad to correspond to one of the 16 available options.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the Call Forward is set for a 30 ipm flash.

**Flash Rates (Cont'd)**

**D. Message Waiting:**

1. Press the MESSAGE WAITING flexible button (Button #4. The following message is shown on the display phone:



- 2. Enter a two-digit value on the dial pad to correspond to one of the 16 available options.
- 3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the Message Waiting is set for a 15 ipm flash.

## CO LINE ATTRIBUTES

DISA Programming Options (Button #7)

Trunk Direction (Button #13)

Ring Delay Timer (Button #14)

**DISA PROGRAMMING OPTIONS**

**Description:**

A line can be assigned as a DISA line during night service only or on a 24- hour basis. Additionally, a DISA line is allowed to follow station forwarding during night service only or on a 24-hour basis.

An unlimited number of DISA lines can be programmed into the system. A DISA access code can also be programmed. Incoming DISA callers may dial any valid internal station or access outside line groups. A CO line ringing at a station will follow preset forward or no-answer call forward using the preset forward timer the same as an initially ringing CO call does. It will follow direct forward and busy forward the same as an initially ringing CO call. If the preset forward timer is set to 00, the first forward of the DISA ringing call at a station will take 15 seconds. DISA callers will be subjected to the Class of Service placed on the line accessed for outdialing. It is recommended that Loop Supervision be enabled when setting up DISA line(s).

Refer to the following Sections in the Starplus Digital Technical Manual. Sec. 610.1, System Timers, Conference/DISA Timer allows the system administrator to control the length of time a DISA caller is allowed after establishing a "Trunk-to-Trunk" call. After expiration of the Conference Timer, a tone will be presented to both DISA parties, then one minute later the system will automatically release both trunks. The Conference Timer does not affect or control a DISA-to-Station call.

**Programming:**

If any CO line features are to be changed:

1. Press FLASH and dial [40]. The following message is shown on the display phone:

```

CO LINE ATTRIBUTES
SELECT A CO LINE RANGE
    
```

2. Enter a four-digit number for the range of lines being programmed. If only one line is being programmed, enter that number twice (0101).
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update. Flexible button #20 (New Range) will be lit. The following message is shown on the display phone to indicate current programming of that line or group of lines.

```

CO XX-XX DT CO UNA C P
LSX DSX FL10 GRPX COSX
    
```

Where:

- XX-XX = CO Line Range (01-48)
- DT = DTMF or Dial Pulse
- CO = Line Type, CO or PBX
- UNA = Universal Night Answer enabled
- C = DISA/Trk-to-Trk enabled
- P = Privacy feature enabled
- LSX = Loop Supervision
- DSX = Type of DISA options
- FLXX = Flash Timer; GRPX = CO Line Group
- COSX =CO Line Class of Service

**DISA Programming Options (Cont'd)**

4. Press the DISA flexible button (Button #7).
5. Enter a one-digit value on the dial pad to indicate type of DISA desired.

[0] = No DISA (disable DISA)

[1] = 24-Hour DISA

[2] = Night DISA only

[3] = 24-Hour DISA with forwarding

[4] = Night DISA only with forwarding

6. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, there are no outside lines assigned as DISA lines.

---

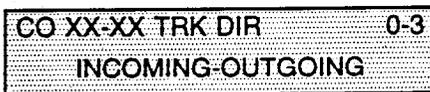
**TRUNK DIRECTION****Description:**

CO Lines can be programmed on a per CO Line basis for the type of CO Line desired: Incoming, Outgoing, or Both incoming and outgoing.

- Incoming: Restricts the CO Line for incoming calls only: Users cannot press a CO line button or dial CO line access code to access a CO line. Users can answer a CO call and then transfer the call. Users can place call on hold, park the call, and other stations can pick-up the call.
- Outgoing restricts the CO Line to outgoing calls only. Users can press a CO line button or dial CO line access code to access a CO line. Users can place call on hold, park the call, and other stations can pick-up the call. Incoming calls to this CO type are ignored. Callers receive ringback, no answer.
- Both incoming and outgoing type allows calls to be received or dialed out.

**Programming:**

1. Press the TRUNK DIRECTION flexible button. (Button #13). The following message is shown on the display phone:



CO XX-XX TRK DIR 0-3  
INCOMING-OUTGOING

2. Enter a one-digit value on the dial pad which corresponds to the desired trunk type:

- [0] = Out-of-Service (OOS)
- [1] = Incoming only
- [2] = Outgoing only
- [3] = Both Incoming and Outgoing

3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, all CO lines default to both incoming & outgoing type.

---

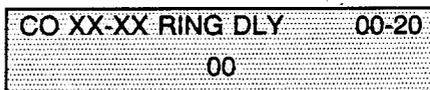
**RING DELAY TIMER****Description:**

The Ring Delay timer has been added to the Starplus Digital Systems to accommodate ICLID interface requirements.

The Ring Delay timer is started whenever a CO Line detects incoming ringing. When the timer expires, CO line ringing will be detected by digital terminals and Single Line telephones. The purpose of this timer is to wait until after the first ring cycle to be detected by the digital system in order for ICLID information to be passed down the CO line prior to being answered.

**Programming:**

1. Press the RING DELAY TIMER flexible button (Button #14). The following message is shown on the display phone:



CO XX-XX RING DLY 00-20  
00

2. Enter a two-digit timer value on the dial pad between 00-20 which corresponds to 00 seconds to 20 seconds.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the Ring Delay timer is set at 00 (disabled) and is variable from 00 to 20 seconds.

---

## STATION ATTRIBUTES

CO Line Ringing Options

## CO LINE RINGING OPTIONS

### Description:

When a CO call rings at a busy station, the call rings at the station using a muted ring (default) signal. This option allows a user to receive a reminder ring at his busy station, instead of muted ring. In addition, a reminder ring timer has also been added to the system to provide the reminder ring every time the timer expires, as long as the incoming CO line remains connected.

When the reminder ring option is used, the type of reminder ring tone is determined by the Tone Ring Option code [695] programmed on that keyset. It is also possible that this tone or a portion of this tone could be heard in the handset, depending on the keyset ring volume setting.

### Programming:

If station features are to be changed:

1. Press FLASH and dial [50]. The following message is shown on the display phone:

```
STATION ATTRIBUTES
SELECT A STATION RANGE
```

2. Enter a six-digit number (100-155) for station range being programmed. If only one station is being programmed, enter that number twice. (i.e. 100100)
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update. Flexible button #20 (New Range) will be lit. The display updates to current programming for Page A:

```
XXX-XXX A PA DD CF _A PR
SP QU PL OH FW LC SB M
```

Where:

XXX= Station Range  
 A= Page "A" Features  
 PA= Paging Access is allowed  
 DD= Do Not Disturb is allowed  
 CF= Conference is allowed  
 \_A= Executive Override is disabled, Exec Override Blocking is allowed  
 PR= Privacy is enabled  
 SP=System Speed Dial is allowed  
 QU= Queuing is allowed  
 PL= Preferred Line Answer is enabled  
 OH= Off-Hook Voice Over is allowed  
 FW=Call Forward is allowed  
 LC= Forced LCR Enabled  
 SB = ACD Supervisor Barge-in\*  
 M= CO Ringing option is muted

\*Feature available with optional software

**Station Features - (Cont'd)****CO LINE RINGING OPTIONS (Cont'd)**

4. Press the RINGING OPTIONS flexible button (Page A, Button #14). This feature will toggle on and off with each depression, and the display will update with each depression.
  - LED on = Reminder Ring is allowed
  - LED off= Muted Ringing is allowed
5. Press the HOLD button to save the entry. Confirmation tone is heard.

**Default:** By default, Muted Ringing is allowed at all stations.

**Related Programming:** Refer to Reminder Ring Timer, Flash 01, Button #18.

## ICLID FEATURES (Optional Software)

Caller Entered ICLID Digits (Guaranteed Message announcement) (Flash 60, Button #11)

Expanded ICLID Ringing Assignments (Flash 43, Button #1)

---

**ICLID FEATURES****A. Caller Entered ICLID Digits (Guaranteed Message Announcement)****Description:**

The Guaranteed Message announcement provides a means to force incoming callers to an announcement before being placed into an ACD Queue or routed to an agent. The outside callers are presented with a message before being routed to the ACD Group. Agents in an ACD Group with a Guaranteed Message enabled will receive incoming callers only after the caller has heard the designated recorded announcement in its entirety, or after the incoming caller dials up to 14 digits followed by a # (pound) key. These dialed digits will be inserted as ICLID incoming number identification.

**Operation:**

If the Guaranteed Message announcement is programmed in Admin, incoming ACD calls will be routed to the Guaranteed Message RAN before going to the ACD Group. If the ICLID option is selected, digits received before the announcement time-out will be captured and inserted as incoming ICLID number information. When the ICLID option is selected, a [#] will be recognized as a termination of the announcement and a [\*] will be recognized as an entry error. An entry error will cause the ICLID number to be removed and the incoming caller can re-enter his phone number.

**Programming:**

1. Press FLASH and dial [60]. The following message is shown on the display phone:

ACD 5XX A ALT OVR AN SUPV AAA BBB CCC DDD
----------------------------------------------

**Where:**

- XX= ACD Group Number (550-557)
- A= Page A Parameters
- AAA= Alternate ACD Group Assignment
- BBB= ACD Overflow Assignment
- CCC= ACD Announcement Tables
- DDD= ACD Supervisor Programming

**To program a Recorded Announcement:**

1. Press the ANNOUNCEMENT TBLS flexible button (Button #11).
2. Enter a three-digit sequence:
  - 1st Digit = Guaranteed Message. (forces incoming calls to an announcement before being placed in an ACD Group or routing to an agent.
  - 2nd Digit = RAN port specified for primary message.
  - 3rd Digit = RAN port specified for secondary message.
3. Press the pound (#) once as the 1st digit if no guaranteed message is desired.

---

**Example:**

- an entry of #,2,3 = No Guaranteed Message will be heard, Port 2 will provide a primary message and Port 3 will provide a secondary message.
  - an entry of 1,2,3 = Port 1 will provide the Guaranteed Message upon initially answering the call, Port 2 will provide a primary message and Port 3 will provide a secondary message.
  - an entry of 8,1,2 = Port 8 will provide the Guaranteed Message upon initially answering the call, Port 1 will provide a primary message and Port 2 will provide a secondary message.
4. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

To erase Recorded Announcement(s), press the pound key three times [###] and press HOLD.

**Related Programming:** Refer to Guaranteed Message timer, Flash 61, Button #7, Page 40 of this techfact. Refer to Techfact Notice #31, dated 5/26/93 for further programming information regarding each RAN Table. Also refer to Techfact Notice #30, dated 5/26/93 to enable the ICLID features.

**Conditions:**

- A Guaranteed Message may be specified for each ACD Group.
- When a caller is routed to a recorded announcement that is programmed as a Guaranteed Message, the caller will not be pulled from the message if an agent becomes available. The caller will be allowed to listen to the announcement in its entirety.
- The RAN timers will control the length of the announcement.
- A Guaranteed Message timer is used to specify the delay time before the guaranteed message RAN will answer the incoming call. This timer is defaulted to 5 seconds.
- Enabling ICLID will permit incoming callers to enter digits during the Guaranteed Message RAN announcement. If a caller enters digits, the ICLID information received will be replaced with the caller inserted information.
- If a caller enters digits while in the Guaranteed Message announcement, an interdigit time-out is set. This interdigit time-out defaults to 10 seconds. An entry of a [#] or an interdigit time-out will terminate the Guaranteed Message announcement and route the call.
- Incoming ACD calls without ICLID enabled will route to the Guaranteed Message first. From there, they will be routed to the ACD Group that the call rang into. If the group is busy, the call will be routed per normal routing procedures.
- Incoming ACD calls with ICLID enabled are checked against the ICLID route first and routed per the ICLID number. If a number is not found in the ICLID route table, the call will be sent to the Guaranteed Message first. If ICLID digits are entered while in the Guaranteed Message, those digits will be compared with the ICLID route tables. If the digits entered are found, the call will be routed per the ICLID route table. If no match is found, the call will be routed per the normal ACD routing procedures.
- Calls will only be routed to the Guaranteed Message one time.

- Transferred calls to the group will not be routed to a Guaranteed Message.
- The telephone number in the Local Number/Name translation table must be programmed with dashes included if it is a 10 or 11 digit ICLID number. (i.e.: 1-602-998-2200) This is not necessary for ICLID digits entered during the Guaranteed Message announcement.

---

**ICLID FEATURES (Cont'd)****B. Expanded ICLID Ringing Assignments****Description:**

ICLID Ringing Assignments will provide a means to change the ring assignment based on the incoming number received. This feature permits the user to select one of 200 ringing routes for each entry in the name to number translation table. For example, this feature could be used to re-route selected customers to a specific ACD or UCD group and bypass the general attendant.

**Valid three-digit destinations are:**

- 020-099 = System Speed Bins 20-99, for off-net ringing.
- 100-155 = Station extension Numbers
- 199 = Direct Ringing to Modem
- 330-337 = Hunt Groups 1-8
- 440-447 = Voice Mail Groups 1-8
- 550-565 = ACD Groups 1-16
- 550-557 = UCD Groups 1-8

**Valid Ring types are:**

- 0 = unassigned (to delete a station)
- 1 = Day Ringing
- 2 = Night Ringing
- 3 = Day & Night Ringing

Keysets designated to ring on an incoming CO line but not designated to ring on the ICLID ring, may receive a ring cycle before the call is moved. The same ringing restrictions applied to CO line ringing will be applied to ICLID ringing.

**Default:** By default, no destinations or ringing assignments exist.

**Programming:**

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. Refer to 600.2, Program Mode Entry (Key Station) in the Starplus Digital Technical Manual.

If ICLID Ringing Assignments need to be assigned or changed:

1. Press FLASH and dial [43]. The following message is shown on the display phone:

ROUTE 000 XXXY

Where:

- 000= ICLID Route Number 000-199  
000-009 = SPD 1428; 000-199 SPD 2856
- XXX= ICLID Ringing Destination
- Y= Ringing Type

2. Press the RING ASSIGNMENT flexible button (Button #1). LED #1 is lit indicating Route 000 is ready for programming.

3. Enter the three-digit destination (XXX) and the one-digit ring type (Y) followed by the HOLD button. Confirmation tone is heard and the display will now update.
4. Press Button #17 to display ring assignments. Assignments will be displayed in sets of 8 up to the number programmed. Press Button #17 additional times to cycle to the next group of 8 ring assignments.

The following format is used to display the assignments:

DDDR DDDR DDDR DDDR
DDDR DDDR DDDR DDDR

Where:

- DDD= Destination
- R= D for Day, N = Night, B = Both Day & Night.

Deleting a station (entering a 0 for ring type) only removes that station from the ring assignment.

Multiple station assignments are accomplished by assigning another destination with ring status, DDDR, and pressing the HOLD button. This can be done for up to the maximum number of stations on the system.

## ACD FEATURES (Optional Software)

ACD Group Expansion to 16 Groups/16 Members (Flash 60, Flash 64)

Guaranteed Message Announcement (Flash 60, Button #11)

ACD Event Trace (Flash 63, Buttons 1 & 2)

**AUTOMATIC CALL DISTRIBUTION**

**ACD Group Expansion - Groups 550-557**

**Description:**

This feature is available with optional software. There can be 16 ACD groups of no more than 16 stations each (up to the system station maximum). The ACD groups use a pilot hunting technique. If the pilot number is dialed, the assigned stations in that ACD group are searched for the station which has been in an idle condition for the longest period of time.

Each ACD Group may have an assigned Alternate ACD Group, an Overflow station and up to 16 stations as ACD members. The eight system RAN ports (tables) may also be referenced on a per ACD group basis.

The buttons on the digital terminal are defined as shown below when entering the ACD Group(s) programming area:

1	ACD GROUP 1 550	ANNOUNCEMENT TABLES	11
2	ACD GROUP 2 551	ACD SUPV PRGMNG	12
3	ACD GROUP 3 552		13
4	ACD GROUP 4 553		14
5	ACD GROUP 5 554		15
6	ACD GROUP 6 555		16
7	ACD GROUP 7 556		17
8	ACD GROUP 8 557		18
9	ALTERNATE ACD GROUP		19
10	ACD OVERFLOW ASSIGN		20

**Programming:**

1. Press FLASH and dial [60]. The following message is shown on the display phone:

```

ACD 5XX A ALT OVR AN SUPV
      AAA BBB CCC DDD
    
```

**Where:**

- XX= ACD Group Number (550-557)
- A= Page A Parameters
- AAA= Alternate ACD Group Assignment
- BBB= ACD Overflow Assignment
- CCC= ACD Announcement Tables
- DDD= ACD Supervisor Programming

**AUTOMATIC CALL DISTRIBUTION (Cont'd)**

2. The top left button in the flexible button field will be lit for programming ACD group 1 (550). To change ACD groups or enter additional ACD groups (550 to 557), press the appropriate flexible button and perform the following procedures for ACD Recorded Announcement Assignments (RAN) and Guaranteed Message Timer.

**Default:** By default, ACD Group Tables are empty.

**Related Programming:** Refer to Techfact Notice #31, dated 5/26/93 for programming the ACD Ring Timer, ACD Message Interval Timer, ACD Overflow Timer, ACD No-Answer Recall Timer, ACD No-Answer Retry Timer; Also refer to the same Techfact Notice for assigning RAN device ports and message times.

---

**AUTOMATIC CALL DISTRIBUTION (Cont'd)****A. ACD Recorded Announcement Assignment(s) (RAN)****Description:**

Optional Recorded Announcement device(s) may be connected to the system to provide an announcement if all stations in an ACD group are busy. Up to eight ports in the system may be assigned to provide a path to Recorded Announcement devices.

Incoming CO Callers will only be answered and routed to the Overflow assignment if a RAN Table is assigned.

The Guaranteed Message announcement provides a means to force incoming callers to an announcement before being placed into an ACD Queue or routed to an agent. The outside callers are presented with a message before being routed to the ACD Group. Agents in an ACD Group with a Guaranteed Message enabled will receive incoming callers only after the caller has heard the designated recorded announcement in its entirety, or after the incoming caller dials up to 14 digits followed by a [#] pound. These dialed digits can be inserted as ICLID incoming number identification.

**Operation:**

If the Guaranteed Message announcement is programmed in Admin, incoming ACD calls will be routed to the Guaranteed Message RAN before going to the ACD Group. If the ICLID option is selected, digits received before the announcement time-out will be captured and inserted as incoming ICLID number information. When the ICLID option is selected, a [#] will be recognized as a termination of the announcement and a [\*] will be recognized as an entry error. An entry error will cause the ICLID number to be removed and the incoming caller can re-enter his phone number.

**Programming:**

To program a Recorded Announcement:

1. Press the ANNOUNCEMENT TBLS flexible button (Button #11).
2. Enter a three-digit sequence:
  - 1st Digit = Guaranteed Message. (forces incoming calls to an announcement before being placed in an ACD Group or routing to an agent)
  - 2nd Digit = RAN port specified for primary message.
  - 3rd Digit = RAN port specified for secondary message.
3. If no guaranteed message is desired, press the pound (#) key once as the 1st digit.

**Example:**

- an entry of #,2,3 = No Guaranteed Message will be heard. Port 2 will provide a primary message and Port 3 will provide a secondary message.
- an entry of 1,2,3 = Port 1 will provide the Guaranteed Message upon initially answering the call. Port 2 will

---

provide a primary message and Port 3 will provide a secondary message.

- an entry of 8,1,2 = Port 8 will provide the Guaranteed Message upon initially answering the call. Port 1 will provide a primary message and Port 2 will provide a secondary message.

4. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

To erase Recorded Announcement(s), press the pound key three times [###] and press HOLD.

**Conditions:**

- A Guaranteed Message may be specified for each ACD Group.
- When a caller is routed to a recorded announcement that is programmed as a Guaranteed Message, the caller will not be pulled from the message if an agent becomes available. The caller will be allowed to listen to the announcement in its entirety.
- The RAN timers will control the length of the announcement.
- A Guaranteed Message timer is used to specify the delay time before the guaranteed message RAN will answer the incoming call. This timer is defaulted to 5 seconds.
- Enabling ICLID will permit incoming callers to enter digits during the Guaranteed Message RAN announcement. If a caller enters digits, the ICLID information received will be replaced with the caller inserted information.
- If a caller enters digits while in the Guaranteed Message announcement, an interdigit time-out is set. This interdigit time-out defaults to 10 seconds. An entry of a [#] or an interdigit time-out will terminate the Guaranteed Message announcement and route the call.
- Incoming ACD calls without ICLID enabled will route to the Guaranteed Message first. From there, they will be routed to the ACD Group that the call rang into. If the group is busy, the call will be routed per normal routing procedures.
- Incoming ACD calls with ICLID enabled are checked against the ICLID route first and routed per the ICLID number. If a number is not found in the ICLID route table, the call will be sent to the Guaranteed Message first. If ICLID digits are entered while in the Guaranteed Message, those digits will be compared with the ICLID route tables. If the digits entered are found, the call will be routed per the ICLID route table. If no match is found, the call will be routed per the normal ACD routing procedures.
- Calls will only be routed to the Guaranteed Message one time.
- Transferred calls will not be routed to a Guaranteed Message.

**Related Programming:** Refer to Guaranteed Message timer, Flash 61, Button #7. Refer to Techfact Notice #31, dated 5/26/93 for further information regarding each RAN Table.

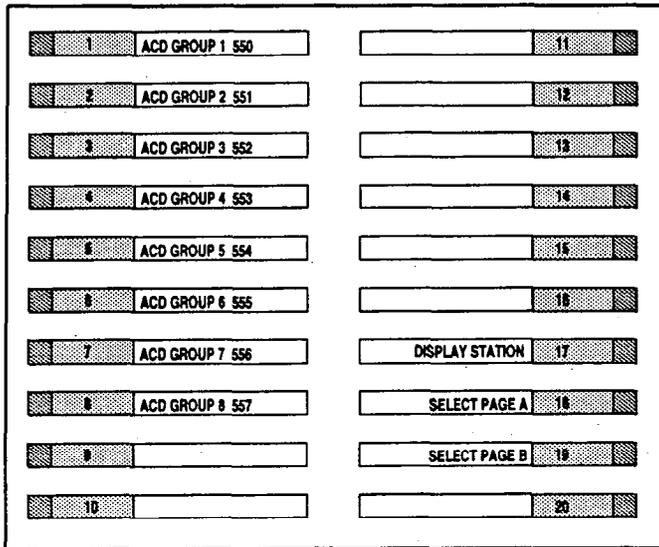
**AUTOMATIC CALL DISTRIBUTION (Cont'd)**

**B. ACD Station Assignment(s)**

**Description:**

Any type of station (excluding DSS/DLS Consoles) may be entered as valid ACD stations. Calls will be routed to stations in the order they are entered for the first round of calls only. After that the calls are routed to stations based on On-Hook time. The station with the longest On-Hook time will receive the next call. If a specific station number is dialed, only that station is rung; no distribution will be done if that station is busy.

The buttons on the digital terminal are defined as shown below when entering the ACD Station Assignments programming area:



Any time a display of the 2nd group of ACD Station assignments (default or changed) is needed, press the DISPLAY STATIONS button (Button #17). It will display the 2nd group of station assignments up to eight stations at a time. Button #19 will always shown the 1st eight stations programmed in the ACD Group. Button #17 will always display the 2nd group of eight stations programmed in the same group.

To erase all stations, press the pound key three times [###] and press HOLD.

*NOTE: If an ACD member is assigned to a specific ACD group and uses the login-logout codes to enter and exit an ACD group other than his own assigned group, the database programming for ACD stations will be automatically changed to reflect the different group.*

**AUTOMATIC CALL DISTRIBUTION (Cont'd)****ACD Station Assignment(s) (Cont'd)****Programming:**

To program stations into a ACD group:

1. Press the Page "B" flexible button (Button #19). The following message is shown on the display phone.



```

ACD 5XX B ### ##
### ##
  
```

Where:

- XX= ACD Group Number (550-557)
  - B= Page "B" parameters
  - ###= ACD Station assignments
2. The top left button in the flexible button field will be lit for programming ACD group 1 (550). To change ACD groups or enter further ACD groups (550 to 557), press the appropriate flexible button and perform the following procedures.
  3. Enter the three-digit station numbers of the stations in the ACD group in the order in which they will be checked. The order is only relevant for the first call. After that, the rule is oldest idle. A maximum of 16 stations may be entered.
  4. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

If ACD Station assignments in the 2nd Group of eight (Stations 9 thru 16) are to be viewed:

1. Press the DISPLAY STATIONS flexible button (Page B, Button #17). The 2nd group of station assignments will be displayed. If no additional stations are assigned, beyond the 1st eight station, the display will show pound signs (#) instead of station assignments. Press the Page "B" flexible button (Button #19) again to return and view the 1st group of group of eight stations in the same ACD group.

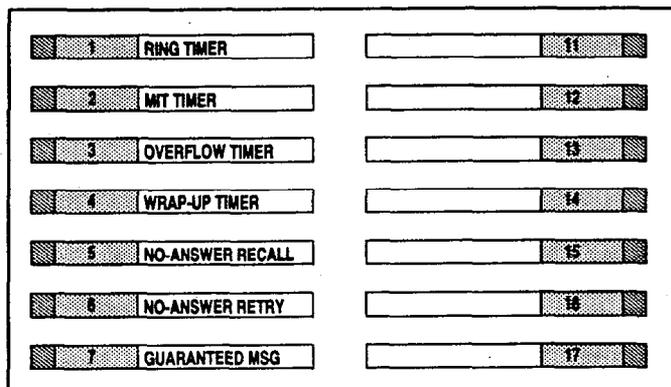
**AUTOMATIC CALL DISTRIBUTION (Cont'd)**

**ACD TIMERS**

**Description:**

Seven timers for ACD operation are programmable on a system-wide basis. The ACD timers include: A Ring Timer, Message Interval Timer, an Overflow Timer, an Auto Wrap-Up Timer, a No/Answer Recall Timer, a No/Answer Retry Timer, and a Guaranteed Message Timer.

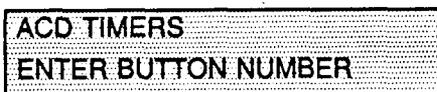
The buttons on the digital terminal are defined as shown below when entering the ACD Timers programming area.



**Programming:**

If ACD timers are to be changed:

1. Press FLASH and dial [61]. The following message is shown on the display phone:



**A. Guaranteed Message Timer**

**Description:**

This timer determines how long a call rings before being answered by Guaranteed Message RAN when the Guaranteed Message RAN feature is added to an ACD Group.

**Programming:**

To make a change to the ACD Guaranteed Message Timer:

1. Press the GUARANTEED MESSAGE TIMER flexible button (Button #7). The following message is shown on the display phone.

GUARANTEED MSG	000-300
005	

2. Enter the three-digit value on the dial pad which corresponds to 000-300 seconds.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the Guaranteed Message Timer is set for 5 sec. and is variable from 000 to 300 seconds.

**AUTOMATIC CALL DISTRIBUTION (Cont'd)**

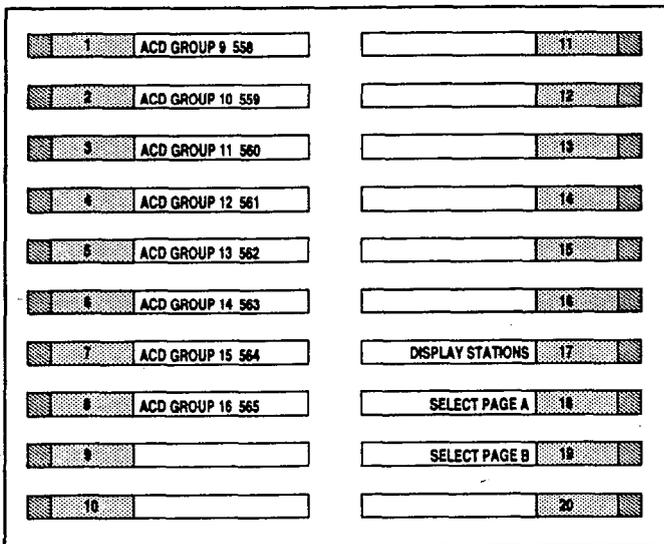
**C. ACD Group Expansion - Groups 558-565**

**Description:**

This feature is available with optional software. There can be 16 ACD groups of no more than 16 stations each (up to the system station maximum). The ACD groups use a pilot hunting technique. If the pilot number is dialed, the assigned stations in that ACD group are searched for the station which has been in an idle condition for the longest period of time.

Each ACD Group may have an assigned Alternate ACD Group, an Overflow station and up to 16 stations as ACD members. The eight system RAN ports (tables) may also be referenced on a per ACD group basis.

The buttons on the digital terminal are defined as shown below when entering the ACD Group(s) programming area:



**Programming:**

1. Press FLASH and dial [64]. The following message is shown on the display phone:

```

ACD 5XX A ALT OVR AN SUPV
      AAA BBB CCC DDD
    
```

**Where:**

- XX= ACD Group Number (558-565)
- A= Page A Parameters
- AAA= Alternate ACD Group Assignment
- BBB= ACD Overflow Assignment
- CCC= ACD Announcement Tables
- DDD= ACD Supervisor Programming

**AUTOMATIC CALL DISTRIBUTION (Cont'd)**

2. The top left button in the flexible button field will be lit for programming ACD group 9 (558). To change ACD groups or enter additional ACD groups (558 to 565), press the appropriate flexible button and perform the following procedures for ACD Recorded Announcement Assignments (RAN) and Guaranteed Message Timer.

**Default:** By default, ACD Group Tables are empty.

**Related Programming:** Refer to Techfact Notice #31, dated 5/26/93 for programming the ACD Ring Timer, ACD Message Interval Timer, ACD Overflow Timer, ACD No-Answer Recall Timer, ACD No-Answer Retry Timer; Also refer to the same Techfact Notice for assigning RAN device ports and message times.

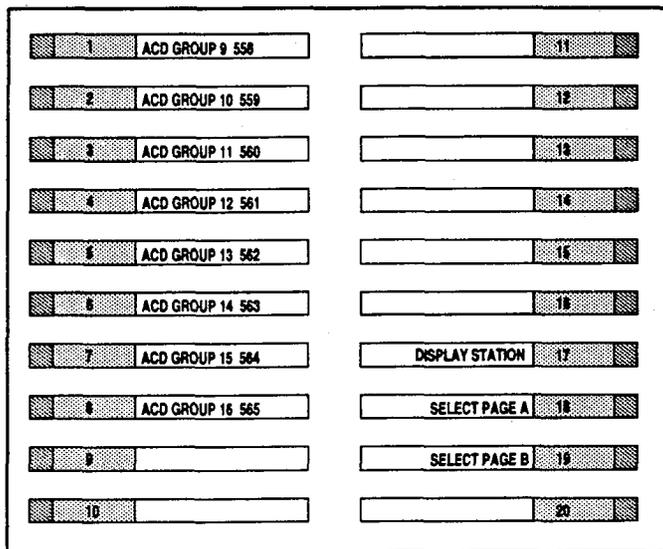
**AUTOMATIC CALL DISTRIBUTION (Cont'd)**

**B. ACD Station Assignment(s)**

**Description:**

Any type of station (excluding DSS/DLS Consoles) may be entered as valid ACD stations. Calls will be routed to stations in the order they are entered for the first round of calls only. After that the calls are routed to stations based on On-Hook time. The station with the longest On-Hook time will receive the next call. If a specific station number is dialed, only that station is rung; no distribution will be done if that station is busy.

The buttons on the digital terminal are defined as shown below when entering the ACD Station Assignments programming area:



Any time a display of the 2nd group of ACD Station assignments (default or changed) is needed, press the DISPLAY STATIONS button (Button #17). It will display the 2nd group of station assignments up to eight stations at a time. Button #19 will always shown the 1st eight stations programmed in the ACD Group. Button #17 will always display the 2nd group of eight stations programmed in the same group.

To erase all stations, press the pound key three times [###] and press HOLD.

*NOTE: If an ACD member is assigned to a specific ACD group and uses the login-logout codes to enter and exit an ACD group other than his own assigned group, the database programming for ACD stations will be automatically changed to reflect the different group.*

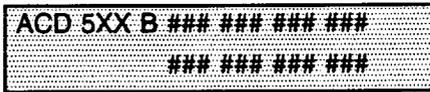
**AUTOMATIC CALL DISTRIBUTION (Cont'd)**

**ACD Station Assignment(s) (Cont'd)**

**Programming:**

To program stations into a ACD group:

1. Press the Page "B" flexible button (Button #19). The following message is shown on the display phone.



Where:

- XX= ACD Group Number (558-565)
  - B= Page "B" parameters
  - ###= ACD Station assignments
2. The top left button in the flexible button field will be lit for programming ACD group 9 (558). To change ACD groups or enter further ACD groups (558 to 565), press the appropriate flexible button and perform the following procedures.
  3. Enter the three-digit station numbers of the stations in the ACD group in the order in which they will be checked. The order is only relevant for the first call. After that, the rule is oldest idle. A maximum of 16 stations may be entered.
  4. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

If ACD Station assignments in the 2nd Group of eight (Stations 9 thru 16) are to be viewed:

1. Press the DISPLAY STATIONS flexible button (Page B, Button #17). The 2nd group of station assignments will be displayed. If no additional stations are assigned, beyond the 1st eight station, the display will show pound signs (#) instead of station assignments. Press the Page "B" flexible button (Button #19) again to return and view the 1st group of group of eight stations in the same ACD group.

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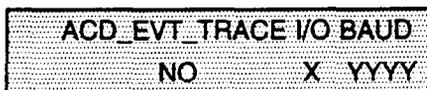
**AUTOMATIC CALL DISTRIBUTION (Cont'd)****C. ACD EVENT TRACE****Description:**

The ACD Event Trace feature provides an event trace output which interfaces with a customer-developed ACD Reporting package

**Programming:**

To enable ACD Event Trace options:

1. Press FLASH and dial [63]. The following message will be shown on the display phone:



ACD\_EVT\_TRACE I/O BAUD  
NO X YYY

**Where:**

X= Port for ACD Event Trace  
YYYY= Baud Rate of desired port.

To Enable/Disable the ACD Event Trace:

1. Press the ACD EVENT TRACE flexible button (Button #1). It will toggle on and off with each depression.
  - LED on = Event trace is enabled
  - LED off = Event trace is disabled
2. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the ACD Event Trace is disabled.

To Identify the Trace Port Assignment:

1. Press the ACD PRINT PORT flexible button (Button #2) to determine which port is to be used for the ACD Event Trace.
2. Enter a one-digit number for the ACD Event Trace Port number:
  - [1] = Port #1 ("On-Board" RS-232C)
  - [2] = Port #2 ("On-Board" Modem)
  - [3] = Port #3 (I/O Expander Module RS-232C)
  - [4] = Port #4 (I/O Expander Module RS-422)

The LCD displays the current baud rate based on which Port number is assigned to the ACD SMDR Port number.

3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**AUTOMATIC CALL DISTRIBUTION (Cont'd)**

---

**ACD EVENT TRACE (Cont'd)**

To determine the Baud Rate:

The ACD Port Baud Rate is programmed using Flash 15 Baud Rate Assignments. The LCD displays the current baud rate based on which Port number is assigned to the ACD SMDR Port number.

## UCD FEATURES

UCD Station Assignments

**UNIFORM CALL DISTRIBUTION (UCD)**

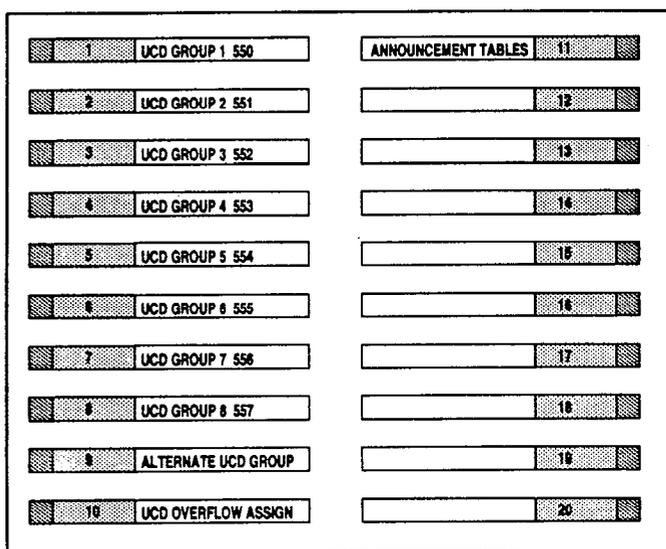
The following feature is available with software version 2.0 or higher.

**Description:**

There can be eight UCD groups of no more than eight stations each. The UCD groups use a pilot hunting technique. If the pilot number is dialed, the assigned stations in that UCD group are searched for the station which has been in an idle condition for the longest period of time.

Each UCD Group may have an assigned Alternate UCD Group, an Overflow station and up to eight stations as UCD members. The two system RAN ports (tables) may also be referenced on a per UCD group basis.

The buttons on the digital terminal are defined as shown below when entering the UCD Group(s) programming area:

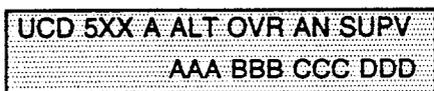


**Programming:**

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode. Refer to Sec. 600.2, Program Mode Entry (Key Station) in the Starplus Digital Technical Manual.

If UCD Groups are to be assigned:

1. Press FLASH and dial [60]. The following message is shown on the display phone:



Where:

- XX= UCD Group Number (550-557)
- A= Page A Parameters
- AAA= Alternate UCD Group Assignment
- BBB= UCD Overflow Assignment
- CC= UCD Announcement Tables

2. The top left button in the flexible button field will be lit for programming UCD group 1 (550). To change UCD groups or enter further UCD groups (550 to 557), press the appropriate flexible button and perform the following procedures.

**Default:** By default, UCD Group Tables are empty.

**Related Programming:** In the Starplus Digital Manual, refer to Sec. 640.2, UCD Timers for setting the UCD Ring Timer, UCD Message Interval Timer, UCD Overflow Timer, UCD Answer Recall Timer, and UCD No-Answer Retry Timer; Also refer to Sec. 640.3, UCD RAN Announcement Tables for assigning RAN device ports and message times.

**UNIFORM CALL DISTRIBUTION (Cont'd)****A. UCD Station Assignment(s):****Description:**

Any type of station (excluding DSS/DLS Consoles) may be entered as valid UCD stations. Calls will be routed to station in the order they are entered for the first round of calls only. After that the calls are routed to stations based on On-Hook time. The station with the longest On-Hook time will receive the next call.

If a specific station number is dialed, only that station is rung; no distribution will be done if that station is busy. The buttons on the digital terminal are defined as shown below when entering the UCD Station Assignment(s) programming area.

To erase all stations, press the pound key three times [###] and press HOLD.

**Programming:**

To program stations into a UCD group:

1. Press the Page "B" flexible button (Page A, Button #19). The following message is shown on the display phone.

```
UCD 5XX B ### ### ### ###
### ### ### ###
```

Where:

- XX= UCD Group Number (550-557)
  - B= Page "B" parameters
  - ###= UCD Station assignments
2. The top left button in the flexible button field will be lit for programming UCD group 1 (550). To change UCD groups or enter further UCD groups (550 to 557), press the appropriate flexible button and perform the following procedures.
  3. Enter the three-digit station numbers of the stations in the UCD group in the order in which they will be checked. A maximum of eight stations may be entered.
  4. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

## VOICE MAIL (Optional Software)

Enhanced Voice Mail Integration

**VOICE MAIL GROUPS**

**Enhanced Voice Mail Integration**

**Description:**

To better accommodate Voice Mail systems, a Busy/No-Answer feature has been added to the system software. This feature provides a busy or no/answer message from the voice mail system when a device is forwarded to voice mail via a keyset or single line which has a busy, no-answer or a busy/no-answer forward to voice mail. This is accomplished via additional leave table entries per voice mail group. These tables control what "in-band" information is sent to the voice mail system under a busy or no-answer condition.

An externally provided Voice Mail system or Auto Attendant must be connected to the Starplus Digital Key Telephone System for Voice Mail or Auto Attendant operation. Voice Mail automatically handles unanswered calls. Station users can then retrieve messages left at their stations. Auto Attendants can handle incoming calls and route callers to station users without intervention from the systems attendant.

Direct incoming ring to Voice Mail/Auto Attendant groups can be done directly through CO Line Ringing Assignments.

The buttons on the digital terminal are defined as shown below when entering the Voice Mail programming area:

1	VM GROUP 1 440	R (RETRIEVE)	11
2	VM GROUP 2 441	VM STATION PGMNG	12
3	VM GROUP 3 442		13
4	VM GROUP 4 443		14
5	VM GROUP 5 444		15
6	VM GROUP 6 445		16
7	VM GROUP 7 446		17
8	VM GROUP 8 447		18
9	ALTERNATE VM GROUP		19
10	L (LEAVE)		20

**NOTE:** By default, all Voice Mail stations are placed into Pickup Group 1. You may need to change the default setting.

**Operation:**

If a user forwards his extension busy, no-answer, or busy/no-answer to voice mail and a call rings at the busy extension, the call will be forwarded to voice mail with the digits programmed in the busy leave table. With the additional digits, the voice mail system can provide a busy greeting to the caller. If a call rings at the user extension and he does not answer, the call will be forwarded to voice mail with the digits programmed in the No-Answer leave table. With the additional digits, the voice mail system can provide a no-answer greeting to the caller.

In addition, to support voice mail systems that do not have supervised transfer, a recall from a station that was transferred from a voice mail port will recall to the attendant.

**Programming:**

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode.

If Voice Mail Groups are to be programmed:

1. Press FLASH and dial [65]. The following message is shown on the display phone.



VM 44G AAA LLL R XXX XXX  
XXX XXX XXX XXX XXX XXX

Where:

- G = Voice Mail group number (0-7)
  - AAA = Alternate group (440-447)
  - LLL = "Leave" mail index.
  - R = "Retrieve" mail index from outpulsing table for retrieving messages (0-7)
  - XXX = Voice Mail station numbers (ports).(up to 8 max.)
2. The top left button in the flexible button field will be lit for programming voice mail group 440. To change Voice Mail groups or enter further Voice Mail groups, press the appropriate flexible button 1-8 (440-447) and perform the following procedures.

*NOTE: Certain programming will be required in the Voice Mail system connected to the Starplus Digital Key Telephone System for proper operation. 1. Mail Box numbers must match Starplus Digital Key Telephone System station extension numbers. (100-155) 2. Tone Mode Calling option (6#) must be programmed as leading digits in transfer sequence(s) to force tone ringing to key telephones in the handsfree mode.*

**Conditions:**

- If no table entries are programmed under button #10 for the no-answer leave table, the standard leave table programmed under button #10 is used.
- If no table entries are programmed under button #10 for the busy leave table, the standard leave table programmed under button #10 is used.
- If a call transferred by a voice mail port is recalling and there is no attendant programmed in the system, the call will continue to ring at the original station for three recall times and then be dropped.

---

**VOICE MAIL GROUPS (Cont'd)****A. "Leave" Mail Index Entry****Description:**

The "Leave" mail index specifies the outpulsing Table where the "in-band" digits required to connect a caller, forwarded into Voice Mail, to the called stations mail box are stored. Refer to Sec. 645.2 for programming entries into an outpulsing table.

To delete a "Leave" mail index entry, enter one pound [#] in the desired location on the keypad and press the HOLD button.(i.e.: Tables 1,2,3 entered. To delete only Table 2, enter 1,#,3 and press HOLD).

**Operation:**

None

**Programming:**

To specify the "Leave" mail index (outpulsing table) to be accessed by a Voice Mail group:

1. Press the LEAVE flexible button (Button #10).
2. Enter the three-digit "Leave" mail index on the dial pad.
  - 1st Digit = Standard Leave Table number (0-7).
  - 2nd Digit = Leave Table to utilize when station is forwarded to VM in a "No-Answer" condition.
  - 3rd Digit = Leave Table to utilize when station is forwarded to VM in a "Busy" condition.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

VM 44G AAA LLL R XXX XXX
XXX XXX XXX XXX XXX XXX

# TECHNICAL FACT NOTICE



Starplus Digital Systems

TF NO: 33

2/1/93

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## 2x4 SLT Expander Module

### Description:

The 2x4 SLT Expander Module is a two CO by four single line telephone Interface module that plugs onto the main key service board of the Basic KSU or the main key service board of the Expansion KSU through the use of two ribbon cables. This module is a combination board that contains the necessary circuitry to connect two CO/Centrex/PBX loop start lines and four single line telephones to the system. This card also contains a connector for adding one application module (i.e. DTMF Receiver) to the system.

Message Waiting capability comes installed on the 2x4 SLT Expander Module. This circuitry provides message waiting voltage to single line telephones equipped with message waiting lamps, and supports up to four single line telephones message waiting lamps at 90V dc typically across tip and ring.

**LEDs & Indicators:** Two green LEDs indicate the presence of +5V & -5V dc. An extinguished LED indicates the absence of the associated voltage.

**CO Line/Station Interfaces:** The 2x4 SLT Expander Module provides the interface for two Central Office, Centrex or PBX loop start, lines. The protection circuitry necessary to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). The module design also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA C22.2 No. 225 standards. CO lines are connected to the system via RJ-11 modular connectors mounted on the bottom edge of the board.

The 2x4 SLT Expander module also provides the interface for four standard on-premise single line telephones (2500 type). Four 36V dc single line circuits are provided on the printed circuit board. These single line telephones can be equipped with a standard message waiting lamp (90V T&R) that operate on the "tip" and "ring" leads. Additionally, each circuit may be individually optioned (software controlled) to provide a loop interrupt to the connected SLT or device. The card will support single line telephones up to 2000 feet from the Basic KSU. On-premise single line telephones should present a load to the port totaling a maximum ringer equivalence of 2.5.

A molex connector (J4) is located on the 2x4 SLT Expander Module to provide ring generator capabilities. It is recommended that the Tellabs 8101, 30 Hz, 90VAC Ring Generator be used with this board.



A to Z KELLATRONICS, Inc.

Tel: 800.766.3425  
email: [info@kellatronics.com](mailto:info@kellatronics.com) Fax: 818.773.8899

2 X 4 SLT EXPANDER MODULES (cont'd)

**CO Lines Connections:** CO Lines are connected to the system via modular RJ-11 connectors mounted on the 2x4 SLT Expander Module and accessed on the bottom of the Basic KSU. The 2x4 SLT Expander Module connects CO Line ports 5 and 6 (when installed on the Basic KSU) or ports 13 and 14 (when installed in the Expansion KSU) to the system through modular connectors J21 and J22 respectively. The pinouts of the modular connector are as follows.

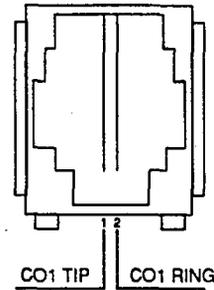


Figure 1 - CO Lines Connections

**NOTE:** Currently ALL CO Line modular cables must pass through a 1.2" thick,, 2-3/8" diameter,, round ferrite core three times prior to exiting the KSU in order to comply with FCC regulations. Up to five cables can be wrapped around one ferrite core.

	CO PORTS	STATION PORTS	SYSTEM CONFIGURATION				
			4x8	6x12	8x16	12x24	14x28
Basic KSU	1-4	1-8	✓	✓	✓	✓	✓
2x4 Station/SLT Expander Module	5-6*	9-12*		✓			✓
Expansion KSU	7-10	13-20			✓	✓	✓
4x8 Expander Module	11-14	21-28				✓	✓

\*If the 2x4 Station or SLT Expander Module is NOT installed in the Basic KSU and an Expansion KSU is part of the system configuration, CO Ports 5-6 and Station Ports 9-12 can be re-assigned. Refer to Techfact Notice #TFN 27A for Flexible Port Assignment features.

**Stations Connections:** The station ports of the 2x4 SLT Expander Module are wired to the main distribution frame via a 25-pair, (50-pin) male amphenol-type connector located on the main key service board or expansion key service board, connector J11. A 25-pair cable with a 50-pin female amphenol-type connector is required to extend the station ports to the main distribution frame. The pinouts for the stations on the 2x4 SLT Expander Module activate ports 009 through 012 on connector J11 as shown in Table 1 when installed on the main key service board in the Basic KSU. Also refer to Table 1 Basic KSU J11 Station Connections.

Table 1 - 2 x 4 SLT Expander Module J11 BKSU Connections

PAIR	PIN	COLOR	DESIG
17	42	YL/OR	Port 009 SLT Tip SLT Ring
	17	OR/YL	
18	43	YL/GN	Port 010 SLT Tip SLT Ring
	18	GN/YL	
19	44	YL/BN	Port 011 SLT Tip SLT Ring
	19	BN/YL	
20	45	YL/SL	Port 012 SLT Tip SLT Ring
	20	SL/YL	
21	46	VI/BL	External Page Tip External Page Ring
	21	BL/VI	
22	47	VI/OR	
	22	OR/VI	
23	48	VI/GN	
	23	GN/VI	
24	49	VI/BN	
	24	BN/VI	
25	50	VI/SL	
	25	SL/VI	

**2 x 4 SLT EXPANDER MODULE (cont'd)**

The pinouts for the stations on the 2x4 SLT Expander Module activate ports 025 through 028 on connector J11 are shown in Table 2 2x4 SLT Expander Module J11 EKSU Connections when installed on the main key service board in the Expansion KSU. Also refer to Table 2 Expansion KSU J11 Station Connections. Only the Xmit Tip (SLT Tip) and Xmit Ring (SLT Ring) leads are used when connecting SLT stations to the 2x4 SLT Expansion Module.

**Table 2 - 2 x 4 SLT Expander Module J11 EKSU Connections**

PAIR	PIN	COLOR	DESIG
17	42	YL/OR	Port 021 SLT Tip SLT Ring
	17	OR/YL	
18	43	YL/GN	Port 022 SLT Tip SLT Ring
	18	GN/YL	
19	44	YL/BN	Port 023 SLT Tip SLT Ring
	19	BN/YL	
20	45	YL/SL	Port 024 SLT Tip SLT Ring
	20	SL/YL	
21	46	VI/BL	External Page Tip External Page Ring
	21	BL/VI	
22	47	VI/OR	
	22	OR/VI	
23	48	VI/GN	
	23	GN/VI	
24	49	VI/BN	
	24	BN/VI	
25	50	VI/SL	
	25	SL/VI	

**Application Module(s) Connections:** The J1 connector on the 2x4 SLT Expander Module allows the installation of one application module (i.e. DTMF receiver) to the system. Refer to Application Module(s) Installation for a description of the available application modules.

**Installation:**

1. Remove power from both the Basic KSU and Expansion KSU, if installed.
2. Locate the Message Waiting Module and remove the two screws holding it to the 2x4 SLT Expander Module. Remove the Message Waiting Module to expose the hold down screw underneath.
3. Locate the J9 connector on the main service board of the Basic KSU or main key service board of the Expansion KSU and the P1 connector on the 2x4 SLT Expander Module. Refer to Figure 2 Basic KSU Application Card Locations.
4. Gently push the cable from the P1 connector on the 2x4 SLT Expander Module onto the J9 connector on the main key service board of the Basic KSU or main key service board of the Expansion KSU.
5. Locate the J10 connector on the main key service board of the Basic KSU or main key service board of the Expansion KSU and the P2 connector on the 2x4 SLT Expander Module. Refer to Figure 500-18 Basic KSU Application Card Locations.
6. Gently push the cable from the P2 connector on the 2x4 SLT Expander Module onto the J10 connector on the main key service board of the Basic KSU or main key service board of the Expansion KSU.
7. Secure the four screws attached to the 2x4 SLT Expander module to the main key service board of the Basic KSU or main key service board of the Expansion KSU.
8. Re-install the Message Waiting Module and secure it with the two mounting screws.
9. Restore power to both the Basic KSU and Expansion KSU, if installed.

*connect  
to Tel Labs  
Ring generator*

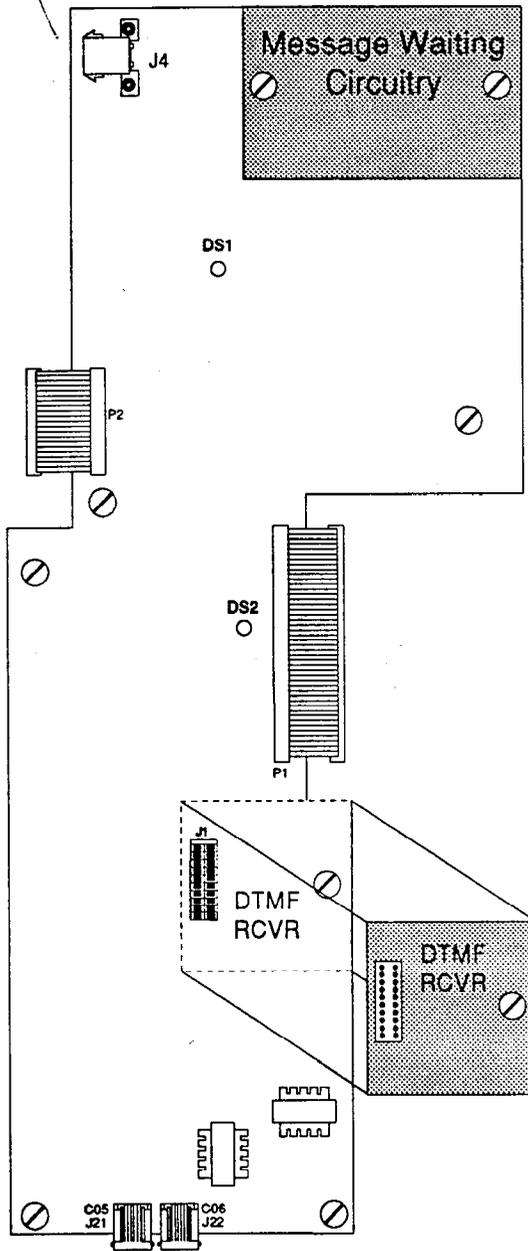


Figure 2 - 2 x 4 SLT Expander Module

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## 4x8 SLT Interface Board (CSB)

### Description:

The 4x8 SLT Interface Board (CSB) is a four CO Line by eight single line telephone interface board. The card is a combination card that contains the necessary circuitry to connect four CO/Centrex/PBX loop start lines and eight standard on-premise single line telephones (2500 type) to the system. This card also contains one additional voice (transmit) path for external paging and a connector for adding one application module (i.e. DTMF Receiver or Dual DTMF/Talk-Back Page Module) to the system. The 4x8 SLT Interface Board can be removed or inserted with power on the KSU. Refer to Figure 5 Basic KSU Equipment Cabinet for component layout and location of connectors.

A molex connector is located on the 4x8 SLT Interface Board (CSB) to provide ring generator capabilities. It is recommended that the Tellabs 8101, 30 Hz, 90VAC Ring Generator be used with this board.

*NOTE: Only one Ring Generator is required per system. At least one DTMF Receiver MUST be installed in the system.*

Message Waiting capability is installed onto the 4x8 SLT Interface Board. This circuitry provides message waiting lamps to single line telephones equipped with message waiting lamps, and supports up to eight single line telephone Message Waiting lamps at 90V ac typically across tip and ring.

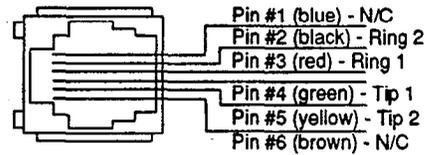
**LEDs & Indicators:** Five red LEDs are located along the front edge of the 4x8 SLT Interface Board, one for each CO Line to indicate when it is in use and one LED that monitors the contact operation of the multi use relay located on the board. Two green LEDs also located along the front edge of the 4x8 SLT Interface Board (CSB) indicate the presence of +5V & -5V dc.

**CO Line/Station Interfaces:** The 4x8 SLT Interface Board (CSB) provides the interface for four Central Office, Centrex or PBX loop start, lines. The protection circuitry necessary to allow the system to be classified as a fully protected system are located on the card for each CO circuit. The CO circuits are equipped with current sensing circuitry that identifies distant end disconnect (loop supervision). The card also provides proper fusing or protection to comply with the requirements of UL 1459 Second Edition and CSA C22.2 No. 225 standards. The 4x8 SLT Interface Board does not support data devices for data switching.

The 4x8 SLT Interface Board (CSB) provides the control and interface for eight standard single line telephones (2500 type). Eight 36V dc single line circuits are provided on the printed circuit board. These single line telephones can be equipped with a standard Message Waiting Lamp (90V T & R) that operate on the "tip" and "ring" leads. Additionally each circuit may be individually "optioned" (software controlled) to provide a loop interrupt to the connected SLT or device. The card will support single line telephones up to 2000 feet from the Basic KSU cabinet. On-premise single line telephones should present a load to the port totaling a maximum ringer equivalence of 2.5.

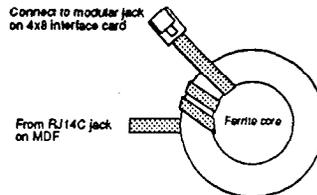
**4 x 8 SLT EXPANDER MODULES (cont'd)**

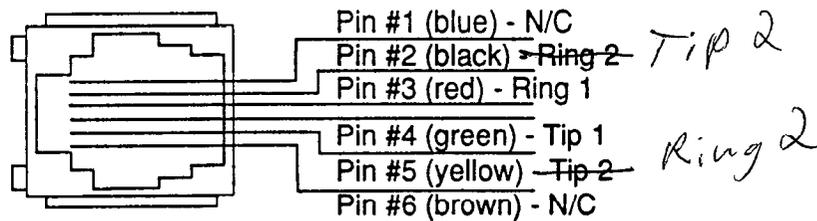
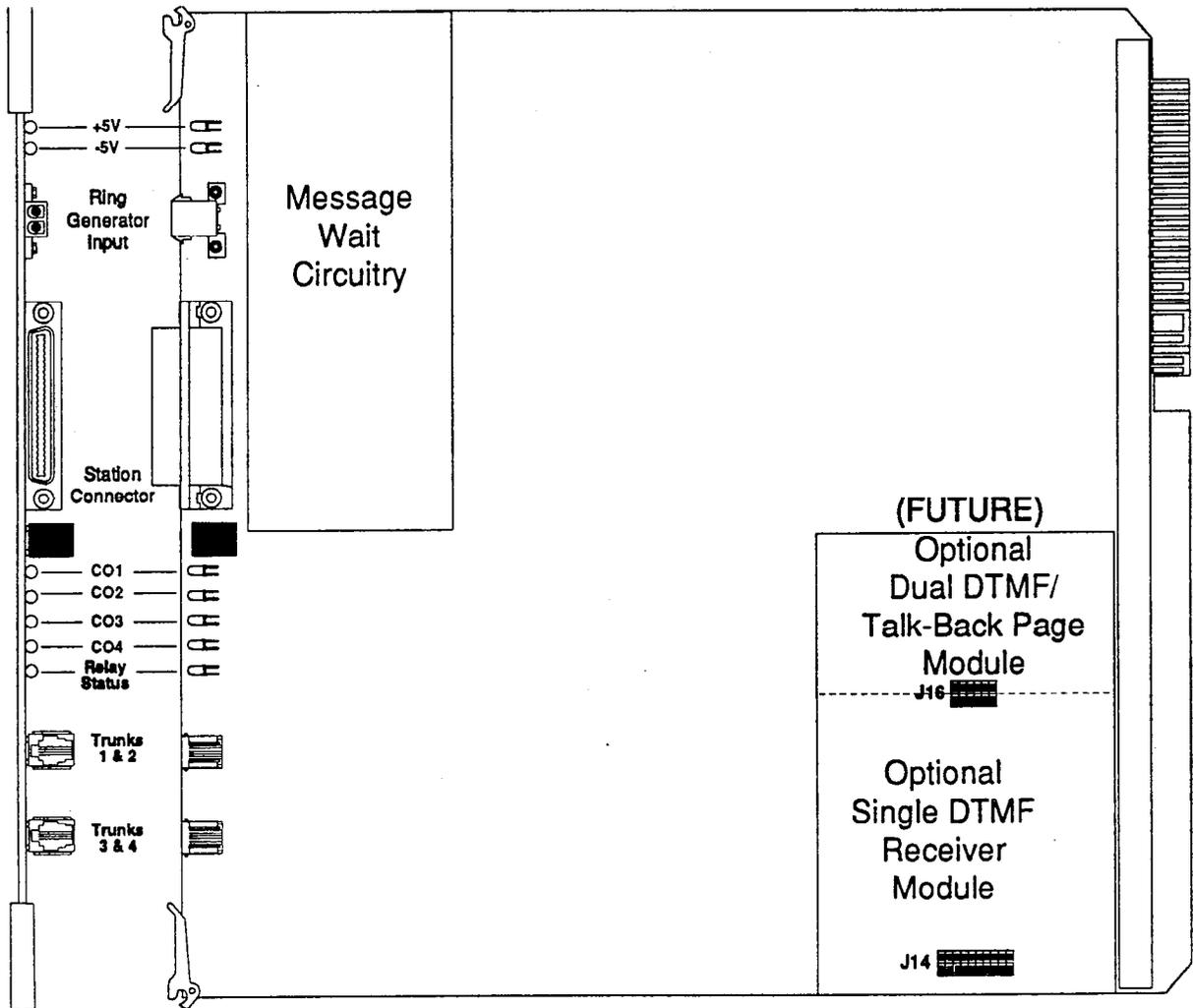
**CO Lines Connections:** CO Lines are connected to the system via modular RJ-14 connectors mounted to the front edge of the 4x8 SLT Interface Board and accessed through the bottom of the Basic KSU cabinet. Each 4x8 SLT Interface Board connects four CO Line ports to the system through modular connectors J2 and J3 found on each card. The pinouts of the modular connector are as follows:



4x8 SLT Interface Board (CSB) RJ-14 Modular Jack Pinout  
**Figure 3 - 4 x 8 SLT Interface Board (CSB) RJ-14 Modular Jack Pinout**

**NOTE:** Currently ALL CO Line modular cables must pass through a 1.2" thick,, 2-3/8" diameter,, round ferrite core three times prior to exiting the KSU in order to comply with FCC regulations. Up to five cables can be wrapped around one ferrite core.





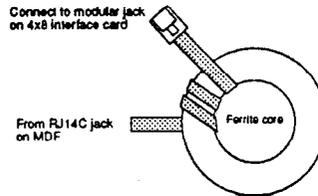
4x8 SLT Interface Board RJ-14 Modular Jack Pinouts

Figure 5 - 4 x 8 SLT Interface Board (CSB)

**4 x 8 SLT EXPANDER MODULE (cont'd)**

**Stations Connections:** The station ports of the 4x8 SLT Interface Board (CSB) are wired to the main distribution frame via a 25-pair, (50-pin) female amphenol type connector located on the front edge of the board, connector J1. A 25-pair cable with a 50-pin male amphenol-type connector is required to extend the station ports to the main distribution frame. The pinouts are shown in Figure 3 Basic KSU Equipment Cabinet.

*NOTE: Currently the 25-pair cable (supplied with the 4x8 SLT Interface Board) used to extend the stations to the MDF must be shielded,, with the exposed end of the shield closest to the Basic KSU cabinet. This cable must be used to comply with FCC Part 15 regulations. In addition the 25-pair cable must pass through a ferrite core before exiting the Basic KSU cabinet again to comply with FCC Part 15 regulations. Refer to Shielded Cable Terminations figure.*



**External Paging Connections:** The 4x8 SLT Interface Board will provide an external two-way page port when the Dual DTMF/Talk-Back Page Module (future) is installed. When this module is installed onto the 4x8 SLT Interface Board, it is wired to the J1 connector (50-pin male amphenol-type connector) on the Violet/Slate, Slate/Violet pair of wires (pin's 50 and 25). Refer to Table 500-9 4x8 SLT Interface Board (CSB) for wiring information.

**Miscellaneous Relay Connections:** Each 4x8 SLT Interface Board contains a miscellaneous relay (K1) that can be used for Loud Bell, CO Line control, Power Fail, RAN, and other functions as software will allow. The relay provides both an Open and a Closed loop upon activation. Therefore, each relay may be used for various applications. The relay provides a dry output and is rated for 1 AMP at 24V dc. The relay is wired to the MDF via the J1 connector (50-pin male amphenol-type connector) on the Violet/Orange, Violet/Green and Brown/Violet wires (pin's 47, 48 and 24). Refer to Table 3 4x8 SLT Interface Board (CSB) for wiring information.

**Application Module(s) Connections:** The J14 connector on the 4x8 SLT Interface Board allows for the installation of one application module (i.e. Single DTMF receiver or the Dual DTMF/Talk-Back Page Module) to the system. Refer to Application Module(s) Installation for a description of the available application modules.

Table 3 - 4 x 8 SLT Interface Board (CSB)

PAIR	PIN	COLOR	DESIGN
1	26	WH/BL	Port 001 SLT Tip SLT Ring
	1	BL/WH	
2	27	WH/OR	Port 002 SLT Tip SLT Ring
	2	OR/WH	
3	28	WH/GN	Port 003 SLT Tip SLT Ring
	3	GN/WH	
4	29	WH/BN	Port 004 SLT Tip SLT Ring
	4	BN/WH	
5	30	WH/SL	Port 005 SLT Tip SLT Ring
	5	SL/WH	
6	31	RD/BL	Port 006 SLT Tip SLT Ring
	6	BL/RD	
7	32	RD/OR	Port 007 SLT Tip SLT Ring
	7	OR/RD	
8	33	RD/GN	Port 008 SLT Tip SLT Ring
	8	GN/RD	
9	34	RB/BN	Misc. Relay N.C.
	9	BN/RD	
10	35	RD/SL	Misc. Relay N.O.
	10	SL/RD	
11	36	BK/BL	Misc. Relay Common
	11	BL/BK	
12	37	BK/OR	*External Page Tip
	12	OR/BK	
13	38	BK/GN	*External Page Ring
	13	GN/BK	
14	39	BK/BN	
	14	BN/BK	
15	40	BK/SL	
	15	SL/BK	
16	41	YL/BL	
	16	BL/YL	
17	42	YL/OR	
	17	OR/YL	
18	43	YL/GN	
	18	GN/YL	
19	44	YL/BN	
	19	BN/YL	
20	45	YL/SL	
	20	SL/YL	
21	46	VI/BL	
	21	BL/VI	
22	47	VI/OR	
	22	OR/VI	
23	48	VI/GN	
	23	GN/VI	
24	49	VI/BN	
	24	BN/VI	
25	50	VI/BN	
	25	VI/SL	

\*Active only when the Dual DTMF/Talk-Back Page Module (future) is installed.

# TECHNICAL FACT NOTICE



Starplus Digital Systems  
TF NO: 31  
5/26/93

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## AUTOMATIC CALL DISTRIBUTION (ACD)

### Description:

The Basic ACD Software package is an optional software package available for the *Starplus* Digital Systems. When purchased, Uniform Call Distribution (UCD) is not used and is replaced by the ACD functions identified in the following. Eight Automatic Call Distribution (ACD) groups can be programmed, each containing up to eight three-digit station numbers. Each group is assigned a pilot number. When this number is dialed, the first available agent in that group is rung. Calls are routed to the station that has been on-hook for the longest period of time.

### 1. Agent Positions

- A. Agent Login/Logout w/Agent ID Feature
- B. Agent Available/Unavailable Mode
- C. Agent Help Request
- D. Agent Call Qualification
- E. Group Member Status

### 2. Supervisor Positions

- A. Supervisor Login/Logout Feature
- B. Supervisor Help Request and Station Assignment Feature
- C. Supervisor Monitor w/Barge-In Feature
- D. Supervisor/Agent Calls in Queue Display

### 3. ACD Programming

### 4. ACD Timers

### 5. ACD RAN Announcement Tables

### 6. Modified SMDR Output for ACD Reporting



A to Z KELLATRONICS, Inc.

Tel: 800.766.3425  
email: [info@kellatronics.com](mailto:info@kellatronics.com) Fax: 818.773.8899

**1. Agent Positions****A. Agent Login/Logout w/Agent ID Feature:****Description:**

The Agent Login/Logout Feature provides a means for an agent to log into one of the ACD groups and receive calls. The Agent ID entered in the login process identifies the agent and places that agent in the available agent list for the ACD group specified in the login process. This feature allows an agent to log into any ACD group from any station in the system and receive calls. Each ACD Agent has a unique Agent ID code (0000-9999) which he uses during login and logout procedures. This unique ID code is not verified or stored as part of the system database.

**Operation:**

The agent logs in by performing the following steps:

1. Dial the LOGIN CODE [572] on the dial pad, followed by the ACD group number (55x) that the agent is going to log into.  
or  
Press a pre-programmed\* LOGIN flex button.
2. The agent enters his unique AGENT ID code (0000-9999). The LOGIN flex button LED will be lit steady. Confirmation tone is heard and the agent is logged onto the ACD group. The ON/OFF LED will extinguish if the agent started the sequence in the handsfree mode. When the agent logs in, an ACD login event sent to the SMDR port, if active.

*NOTE: The ACD Agent Log-in LED will only light for the ACD group that is assigned to that button. If a member is assigned to a specific ACD group and uses the login-logout codes to enter and exit an ACD group other than his assigned group, the database is changed to reflect the different group.*

For an agent to remove himself as an active agent from the ACD group:

1. Dial the LOGOUT CODE [571] on the dial pad,  
or  
Press a pre-programmed\* LOGOUT flex button. The LOGIN flex button LED will extinguish. When the agent logs out and removes himself from the ACD group, an ACD logout event is sent to the SMDR port, if active.

**Conditions:**

- If an agent logs into an ACD group from a station that is logged into another ACD group, the station will be automatically removed from the previous ACD group.
- An agent may log out, while in wrap-up, or unavailable.
- An agent logging in will first be placed in wrap-up mode before receiving an ACD call.
- If an agent attempts to log into an ACD group that already has eight members, that agent will receive error tone.
- The *Starplus* digital system will not verify agent's ID codes, other than requiring four digits to be entered.

\*Refer to FLEX Button programming in the Starplus Manual.

**Agent Positions (cont'd)****B. Agent Available / Unavailable Mode:****Description:**

Stations programmed into a ACD group may log off and on to their assigned ACD group by dialing an Available/Unavailable code. When an agent is in the Available mode, that agent will receive ACD calls in the normal manner. When an agent is in the Unavailable mode, that agent will no longer receive ACD type calls. However, the agent may receive non-ACD calls. Agents that have logged off by going Unavailable will receive a visual reminder that they are logged off with a flashing LED and/or an LCD display message.

**Operation:****To go Available:**

1. Dial [566] on the dial pad,  
or  
Press the pre-programmed\* Available/Unavailable button. You may now receive calls.

**To go Unavailable:**

1. Dial [566] on the dial pad  
or  
Press the pre-programmed\* Available/Unavailable button. You are now blocked from receiving ACD calls.

\*Refer to FLEX Button programming in the Starplus Manual.

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**Agent Positions (cont'd)****C. Agent Help Request:****Description:**

This feature provides a means for an ACD agent to signal his assigned supervisor for assistance. While on a call, the agent can press the HELP button to signal the assigned supervisor. The supervisor may then respond by using his HELP button and his ACD Barge-In feature.

**Operation:**

While on a call in progress, the agent:

1. Presses his pre-programmed\* HELP flex button. Confirmation tone will be heard by the agent. The agent will see his HELP button illuminate if a supervisor is logged into his ACD group. If no supervisor is logged in, the agent will receive a burst of error tone and his help button will not illuminate. The ACD supervisor station receives a "HELP" message if a member of one of the ACD groups he is assigned to. The help function also sends a Camp-On tone to the speaker of the supervisors keyset. The help message takes precedence over any other message and can be cleared by the supervisor by pressing his help button. At the time the supervisor receives a help request, he can press his help flex button followed by his override feature button to bridge onto the ACD group members call. The help button will place an intercom call to the station requesting help. The help message will be cleared after the supervisor's help button is depressed. In addition, the HELP message will be cleared if the agent was on a call and went back on hook before the supervisor could respond. In this case, the HELP message will be converted to a message wait indication. The agent can also clear the HELP request by hitting his HELP button a second time.

**Conditions:**

- Up to five messages can be left at any supervisor station.
- The supervisor can cancel the HELP request signal by depressing his flashing HELP button. In addition, a call will be placed to the agent requesting HELP. If the agent is on a call, the supervisor can press his Barge-In button to monitor the call or give assistance on the call.
- The HELP feature access code will permit a single line telephone to access the HELP feature. While on a call, the SLT after doing a hook-flash can dial the HELP code [574] to leave the HELP message. After the code is dialed, the SLT will be returned to his call.

*NOTE: Only digital terminals can activate this feature.*

\*Refer to FLEX Button programming in the Starplus Manual.

**Agent Positions (cont'd)****D. Agent Call Qualification:****Description:**

This feature provides a means for an Agent to enter codes on ACD type calls that identify the call. This feature permits up to 12-digits to be entered, however only the first four digits are provided for in the SMDR record.

**Operation:**

While on a call, the agent:

1. Press the pre-programmed\* CALL QUALIFY flex button, followed by the four-digit qualify code. Enter a [\*] to complete the sequence.

The QUALIFY button is programmed using flex code [570#]. If the agent wishes to enter his qualify code in a speed bin, he can do so using the standard speed bin programming sequence. Then when he programs his flex button, he can enter 570 followed by the bin number. This will provide an agent with a series of buttons with qualify codes under them.

**Conditions:**

- Only digital key stations can operate this feature as it requires a flex button programmed as a qualify button.
- The outside party will not hear the (qualify code) account code being entered.
- The qualify code uses the first 4-digits of the account code. Therefore the account code record in the SMDR will contain the qualify code in the first 4-digits.
- The qualify code must be entered during CO talk state.
- A # can be entered in the qualify code, however it will not be recognized by the ACD reporting package.
- Speed dial entries can contain all digits including the \*, which will terminate the entry and return the UCD agent to his CO party.

\*Refer to FLEX Button programming in the Starplus Manual.

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**Agent Positions (Cont'd)****E. Group Member Status:****Description:**

This feature provides a means for an ACD supervisor to view the status of each of the eight ACD groups in the system individually. This display will tell the supervisor which stations are logged into the group, and if the station logged in is available, unavailable, out of service, in DND, or busy on a call. The supervisor can use this display to determine why there are a lot of queued calls in a specific group.

**Operation:**

The supervisor station logged onto the ACD group can bring up the group members display by:

1. Dial the supervisors group members display code [573] on the dial pad,  
or  
Press the pre-programmed\* flex button followed by the ACD group number (55x).
2. Dial an [\*] on the dial pad to scroll up to the next ACD Group,  
or  
Dial a [#] on the dial pad to scroll down to the previous ACD Group. To return to an idle display the supervisor returns to on-hook condition.

**Conditions:**

- To receive the supervisors group members status display the station must be logged in as a supervisor one of the ACD groups.
- ACD supervisors will receive the members status display updated at the time they dial the code.
- The status of the ACD agent will be displayed with a letter following the station number that the agent is logged in at. The status will be displayed with the following priority:
  - (N) = Not Equipped
  - (D) = Do not Disturb
  - (O) = Out of service
  - (U) = Unavailable
  - (B) = Busy on a call
  - (A) = Available

i.e: If an agent made a call while out of service his status would be out of service, not busy.

ACD 55X	110A	111A	112A
113O	114U	115D	116B 117N

**2. Supervisor Positions****A. Supervisor Login/Logout Feature:****Description:**

This feature provides a means for a supervisor to log into one of the ACD groups. The Supervisor ID entered in the login process identifies the supervisor for the specific ACD group he is assigned to. This feature allows a supervisor to log into any ACD group from any station in the system. However, to have the Supervisor Monitor w/Barge-In feature, the supervisor must log in at a station with monitor barge-in capability. Each ACD Supervisor has a unique Supervisor ID code (0000-9999) which he uses during login and logout procedures. This unique ID code is not verified or stored as part of the system database.

**Operation:**

The supervisor logs in by performing the following steps:

1. Dial the LOGIN CODE [576] on the dial pad, followed by the ACD group number (55x) that the agent is going to log into  
or  
Press a pre-programmed\* LOGIN flex button. (Flex button must have 576+55x programmed onto it.)
2. The supervisor enters his unique SUPERVISOR ID code (0000-9999). The LOGIN flex button LED will be lit steady. Confirmation tone is heard and the agent is logged onto the ACD group. The ON/OFF LED will extinguish if the supervisor started the sequence in the handsfree mode. When the supervisor logs in, an ACD login event is sent to the SMDR port, if active.

For a supervisor to remove himself as an active supervisor from the ACD group:

1. Dial the LOGOUT CODE [575] on the dial pad,  
or  
Press a pre-programmed\* LOGOUT flex button. The LOGIN flex button LED will extinguish. When the supervisor logs out and removes himself from the ACD group, an ACD logout event is sent to the SMDR port, if active.

**Conditions:**

- If a supervisor logs into an ACD group from a station that is logged into another ACD group, the station will be automatically removed from the previous ACD group.
- A supervisor may log out, while in wrap-up, or unavailable.
- A supervisor logging in will first be placed in wrap-up mode before receiving an ACD call.
- If a supervisor attempts to log into an ACD group that already has eight members, that supervisor will receive error tone.
- The Starplus digital system will not verify supervisor's ID codes, other than requiring four digits to be entered.

\*Refer to FLEX Button programming in the Starplus Manual.

**Supervisor Positions (cont'd)****B. Supervisor Help Request and Station Assignment:****Description:**

The HELP feature provides a means for an ACD agent to signal his assigned supervisor for assistance. The agent while on a call can press the HELP button to signal the assigned supervisor. The supervisor may respond by use of his HELP button and his ACD Barge-In feature. The ACD Supervisor Station Assignment feature provides a means to assign a supervisor to each ACD group. This supervisor station can receive the calls in queue display in real time, receives No Answer/Out of Service, receives "HELP" displays from the groups that the supervisor is assigned to and can barge in on active calls in his ACD group or groups.

**Operation:**

The ACD supervisor's station logged in can receive the calls in queue display from any group he desires by:

1. Dial the calls in queue code [577] on the dial pad,  
or  
Press the pre-programmed\* CALLS IN QUEUE flex button, followed by the ACD group number (55x) that the supervisor is going to monitor.

The ACD supervisor station logged in will also receive a station out of service (OOS) message for any member of the ACD group that does not answer a call directed to his station by the ACD group. This message is displayed in real time and can be removed by reactivating the calls in queue display.

In addition, the ACD supervisor station will receive a "HELP" message if a member of one of the ACD groups he is assigned to presses his programmable help button. The help function will also send an announce tone to the speaker of the supervisors keyset. The help message will take precedence over any other message and can only be cleared by the supervisor pressing his HELP flex button. At the time the supervisor receives a help request, he can press his help flex button followed by his barge-in feature button to bridge onto the ACD group members call. The help button will place an intercom call to the station requesting help. The barge-in feature is activated by pressing the help response button or dialing the station number of the ACD member requesting help and hitting the barge-in button. The help message will be cleared after the help button is depressed. When the supervisor barges in his mute button will be lit indicating that the parties he is monitoring can not hear him. If the supervisor wishes to talk he must hit his mute button.

\*Refer to FLEX Button programming in the Starplus Manual.

**Supervisor Positions (cont'd)****B. Supervisor Help Request and Station Assignment (cont'd)****Conditions:**

- A supervisor can be assigned in ADMIN to a group or groups to receive the help request and out of service (OOS) message. If a supervisor station is assigned in ADMIN, it is considered logged in. In addition, a supervisor can dial a supervisor login code (576) followed by the ACD group that the supervisor is logging into and his four-digit ID number.
- A supervisor can only barge into a call from a member of one of the groups to which he is logged into.
- Out of Service (OOS) and Help displays will take priority over normal call processing displays. However, Help displays will be the highest priority.
- An agent requesting help will receive confirmation tone if a supervisor is logged in at a station. He will receive programming error tone if there isn't any supervisor logged in.
- Up to five HELP messages can be left at any supervisor station.
- A supervisor may be logged on to more than one group at a time.
- A station does not receive ACD calls when programmed as a supervisor, however a supervisor can log on as a ACD agent and receive ACD calls.
- Only one supervisor is permitted per ACD group.
- To remove the warning tone from barge-in, use the yes/no option for Executive warning tone (FLASH 05, button 4).

**Supervisor Positions (cont'd)****C. Supervisor Monitor w/Barge-In Feature:****Description:**

The Supervisor Monitor with Barge-In feature provides a means for an ACD supervisor to monitor an agent's call in progress or provide assistance in training ACD personnel. When used, a supervisor may intrude onto an agent's call in a listen only mode or in a true conference mode. This feature is available with or without a warning tone.

**Operation:**

The ACD supervisor can intrude on an agent's call in the listen only mode by:

1. Dial the three-digit station number of the agent's station. Upon hearing busy tone, press the pre-programmed\* Barge-In flex button. The Executive Over-ride Code [625] is used to program Supv Monitor with barge-in feature onto a flex button. The conversation in progress will be heard by the supervisor on the handset receiver and the supervisor's Mute LED will be lit indicating that the supervisor's transmit is muted.
2. If the supervisor wishes to participate in the conversation in a true conference mode, he can depress his Mute button which removes mute.

*NOTE: The use of silent monitor and barge-in is limited by federal law and may also be limited or prohibited by state or local law, so check the relevant laws in your area before employing these features.*

**Conditions:**

- Supervisors are granted the barge-in option if they log in at a station with the Supervisor Barge-In flag enabled.
- Supervisors can only barge-in on calls of members of the ACD that they are logged into.
- Warning tone is enabled and disabled using the Executive Override warning tone option (FLASH 05, button 4).
- A digital key or SLT may be intruded using this feature.
- Supervisor stations must be digital keysets.

\*Refer to FLEX Button programming in the Starplus Manual.

**Supervisor Positions (cont'd)****D. Supervisor Queue Status Display****Description:**

This feature provides a means for an agent and ACD supervisor to view the status of their ACD group. This display is an idle state display and will prompt a supervisor that his agents in the group are having problems answering all their calls. The display will tell the agent and his supervisor how many calls are in queue, how many agents are logged into the ACD group, and the length of time in minutes that the oldest call has been in queue.

**Operation:**

The supervisor station logged onto the ACD group can obtain the calls in queue display by:

1. Dial the CALLS IN QUEUE code [577] on the dial pad,  
or  
Press the pre-programmed\* CALLS IN QUEUE flex button, followed by the ACD group number the supervisor wants to observe (55x).

If the supervisor wants to change the display to a different group:

1. Dials the CALLS IN QUEUE code [577] on the dial pad,  
or  
Presses the pre-programmed\* CALLS IN QUEUE flex button followed by the ACD group that he wishes to display.

**Conditions:**

- To receive the Supervisor's Queue Status Display, the station must be logged in as a supervisor and dial the flex code for the appropriate group.
- ACD supervisors will receive the Queue Status Display in real time.
- The Queue Status Display is only given when the ACD group member or supervisors station is not receiving a higher priority display, such as help or out of service, or other applicable off hook events are taking place at the station.
- The supervisors Queue Status Display is saved in battery backed memory.
- When a supervisor logs out of the group he is presently displaying, he must enter a new request for Queue Status Display.
- The Supervisor's Queue Status Display can be updated by dialing the flex code followed by the group being observed. Dialing a different group will change the Queue Status Display to a different group.
- The Queue Status Display will give the following information:
  - 55y = ACD Group (550-557)
  - CIQ:xx = Calls in queue
  - AL:xx = Agents logged in
  - OC:mmm = Oldest call in minutes

\*Refer to FLEX Button programming in the Starplus Manual.

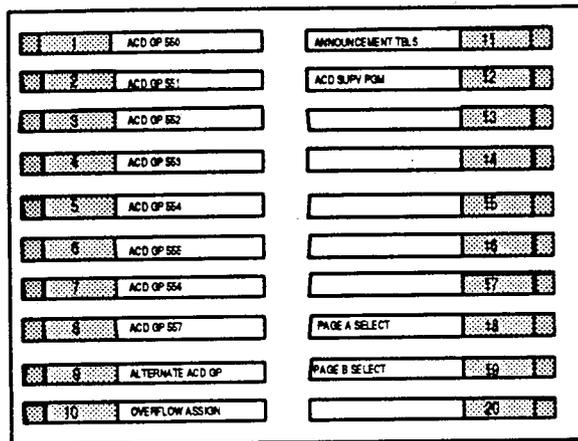
**3. ACD GROUP PROGRAMMING**

**Description:**

This feature is ONLY available when the Basic ACD Software Package is purchased separately. There can be eight ACD groups of no more than eight stations each. The ACD groups use a pilot hunting technique. If the pilot number is dialed, the assigned stations in that ACD group are searched for the station which has been in an idle condition for the longest period of time.

Each ACD Group may have an assigned Alternate ACD Group, an Overflow station and up to eight stations as ACD members. The two system RAN ports (tables) may also be referenced on a per ACD group basis.

The buttons on the digital terminal are defined as shown below when entering the ACD Group(s) programming area:

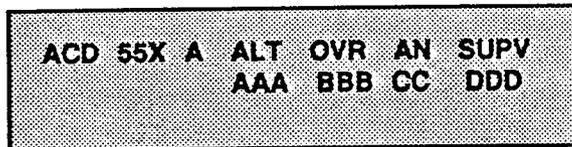


**Programming:**

If the system is in the programming mode, continue using the program codes. If starting to program here, enter the programming mode.

If ACD Groups are to be assigned:

1. Press FLASH and dial [60]. The following message is shown on the display phone:



Where:

- X= ACD Group Number (0-7)
- A= Page A Parameters
- AAA= Alternate ACD Group Assignment
- BBB= ACD Overflow Assignment
- CC= ACD Announcement Tables

DDD= ACD Supervisor Programming

2. The top left button in the flexible button field will be lit for programming ACD group 0 (550). To change ACD groups or enter further ACD groups (550 to 557), press the appropriate flexible button and perform the following procedures.

**A. Alternate ACD Group Assignment**

**Description:**

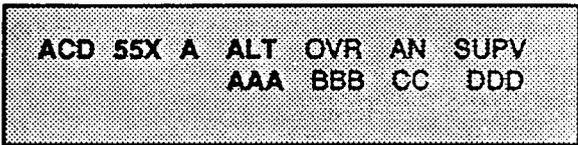
An alternate ACD group can be programmed so that if no station in one group is available, the alternate group will be checked for an available station. This provides a means to chain or link ACD groups together.

**Programming:**

To program an alternate group:

1. Press the ALTERNATE ACD GP flexible button (Button #9).
2. Enter the three-digit pilot number (550 to 557) of the desired alternate ACD group.

3. Press the HOLD button



to save the entry. Confirmation tone is heard and the display will now update.

To delete an Alternate ACD Group, press the pound key three times [###] and press the HOLD button.

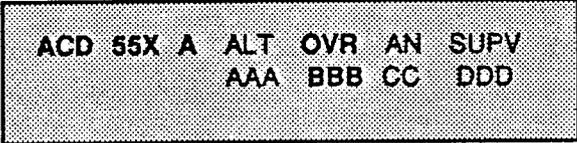
**B. ACD Overflow Station Assignment****Description:**

An overflow station may be assigned to route callers in queue to a designated station after a specified time. The Overflow station may remove themselves from their assigned group by dialing the Overflow Available/Unavailable code. When the Overflow station is in the available mode, that station will receive ACD calls in the normal manner. When the Overflow station is in the Unavailable mode, that station will no longer receive ACD type calls, however they may receive non-ACD calls. The Overflow station that has gone Unavailable will receive a visual reminder with a flashing LED and/or an LCD display message. The overflow station may not be one of the ACD group stations. Only CO calls transferred to a ACD group will overflow to the overflow station when RAN tables have not been assigned.

**Programming:**

To program ACD Overflow station:

1. Press the OVERFLOW ASSIGN flexible button (Button #10).
2. Enter the three-digit station number (100 to 155) to designate the ACD Groups Overflow station.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.



ACD 55X A ALT OVR AN SUPV  
AAA BBB CC DDD

To delete an Overflow Station, press the pound key three times [###] and press the HOLD button.

**Operation:**

To go Available:

1. Dial [578] on the dial pad,  
or  
Press the pre-programmed\* Available/Unavailable button. You may now receive ACD calls.

To go Unavailable:

1. Dial [578] on the dial pad,  
or  
Press the pre-programmed\* Available/Unavailable button. You are now blocked from receiving ACD calls.

\*Refer to FLEX Button Programming

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**C. ACD Recorded Announcement Assignment(s) (RAN)****Description:**

Optional Recorded Announcement (RAN) device(s) may be connected to the system to provide an announcement(s) if all stations in a ACD group are busy. Up to eight ports in the system may be assigned to provide a path to the Recorded Announcement devices.

Incoming CO Callers will only be answered and routed to the Overflow assignment if a RAN Table is assigned.

**Programming:**

To program a Recorded Announcement:

1. Press the ANNOUNCEMENT TBLs flexible button (Button #11).
2. Enter one of the following digit sequences:  
1# = RAN port specified in Table 1 will be used.  
through  
8# = RAN port specified in Table 8 will be used.

**Example:**

an entry of 1,2 = Port 1 will answer the call; port 2 will provide a subsequent message.

an entry of 8,1 = Port 8 will answer the call; port 1 will provide a subsequent message.

3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

ACD	55X	A	ALT	OVR	AN	SUPV
		AAA	BBB	CC	DDD	

To erase Recorded Announcement(s), press the pound key two times [##] and press HOLD.

**D. ACD Supervisor Programming****Description:**

The ACD Supervisor Station assignment feature provides a means to assign each ACD group a supervisor. This Supervisor Station can receive the calls in queue display in real time, receives No Answer/Out of Service conditions, "HELP" displays from the groups that the supervisor is assigned to and can barge-in on active calls in his ACD Group or groups.

A supervisor can be assigned in ADMIN to a group or groups to receive the help request and out of service (OOS) messages. If a supervisor station is assigned in ADMIN, it is considered logged in. In addition, a supervisor can dial a supervisor login code followed by the ACD group that the supervisor is logging into and his four-digit ID number.

**Programming:**

To program an ACD Supervisor:

1. Press the ACD SUPV flexible button (Button #12).
2. Enter the three-digit station number of the desired ACD Supervisor station.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

ACD 55X A ALT OVR AN SUPV
AAA BBB CC DDD

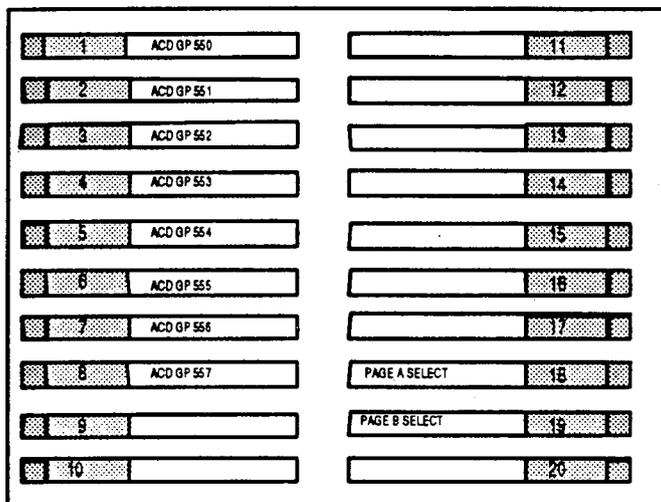
**E. ACD Station Assignment(s)**

Description:

Any type of station (excluding DSS/DLS Consoles) may be entered as valid ACD stations. Calls will be routed to the station in the order they are entered for the first round of calls only. After that, the calls are routed to stations based on On-Hook time. The station with the longest On-Hook time will receive the next call.

If a specific station number is dialed, only that station is rung; no distribution will be done if that station is busy.

The buttons on the digital terminal are defined as shown below when entering the ACD Station Assignments programming area:



To erase all stations, press the pound key three times [###] and press HOLD.

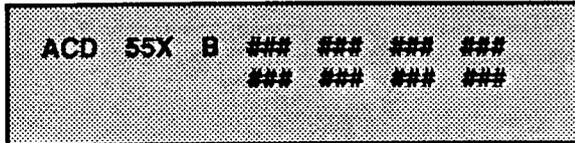
*Note: If an ACD member is assigned to a specific ACD group and uses the login-logout codes to enter and exit an ACD group other than his own assigned group, the database programming for ACD stations will be automatically changed to reflect the difference.*

**ACD Station Assignment(s) (cont'd)**

**Programming:**

To program stations into a ACD group:

1. Press the Page "B" flexible button (Page A, Button #19). The following message is shown on the display phone.



Where:

X= ACD Group Number (0-7)  
B= Page "B" parameters  
###= ACD Station assignments

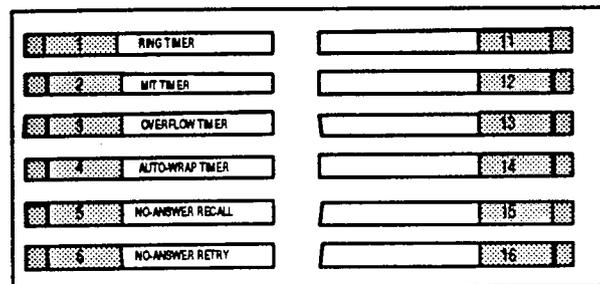
2. The top left button in the flexible button field will be lit for programming ACD group 0 (550). To change ACD groups or enter further ACD groups (550 to 557), press the appropriate flexible button and perform the following procedures.
3. Enter the three digit station numbers of the stations in the ACD group in the order in which they will be checked. A maximum of eight stations may be entered.
4. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**4. ACD TIMERS**

**Description:**

Six timers for ACD operation are programmable on a system-wide basis. The ACD timers include: A Ring Timer, Message Interval Timer, an Overflow Timer, a Auto Wrap-Up Timer, a No/Answer Recall Timer, and a No/Answer Retry Timer.

The buttons on the digital terminal are defined as shown below when entering the ACD Timers programming area.



**Programming:**

If ACD timers are to be changed:

1. Press FLASH and dial [61]. The following message is shown on the display phone:

**ACD TIMERS  
ENTER BUTTON NUMBER**

**A. ACD Ring Timer****Description:**

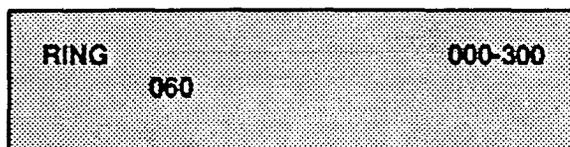
The ACD Ring Timer determines how long a call will ring into a busy ACD group before being presented to the first recorded announcement.

*NOTE: A RAN Table must be specified in ACD programming for the ring timer to be in effect. If a RAN Table is NOT specified, incoming CO callers will not be answered but will continue to receive ringback.*

**Programming:**

To make a change to the ACD Ring Timer:

1. Press the RING TIMER flexible button (Button #1). The following message is shown on the display phone:



2. Enter the three-digit timer value on the dial pad which corresponds to 000-300 seconds.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the ACD Ring Timer is set for 60 seconds, and is variable from 000 to 300 seconds.

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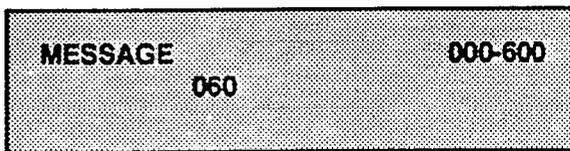
**B. ACD Message Interval Timer****Description:**

The ACD Message Interval Timer (MIT) determines the length of time a caller remains in queue (listening to MOH, if provided) between recorded announcements.

**Programming:**

To make a change to the ACD Message Interval Timer:

1. Press the MIT TIMER flexible button (Button #2). The following message is shown on the display phone:



2. Enter the three-digit timer value on the dial pad which corresponds to 000-600 seconds.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

*NOTE: The ACD Ring and Message Interval Timers only apply when RAN ports have been specified. If RAN ports are not specified, incoming callers will continue to receive ringback tone.*

**Default:** By default, the ACD Message Interval Timer is set for 60 seconds and is variable from 000 to 600 seconds.

**C. ACD Overflow Timer**

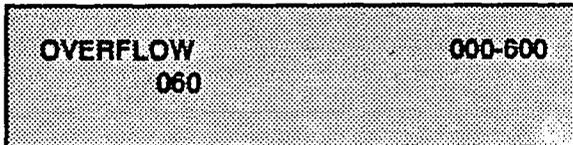
**Description:**

The ACD Overflow Timer determines the total length of time a caller will remain in queue for a particular ACD group. When the timer expires, the caller will be routed to the designated overflow station. The timer starts when an incoming call is answered and presented to the first recorded announcement. Transferred CO callers will overflow at the expiration of the Overflow Timer.

**Programming:**

To make a change to the ACD Overflow Timer:

1. Press the OVERFLOW TIMER flexible button (Button #3). The following message is shown on the display phone:



2. Enter the three-digit value on the dial pad which corresponds to 000-600 seconds.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the ACD Overflow Timer is set for 60 seconds and is variable from 000 to 600 seconds.

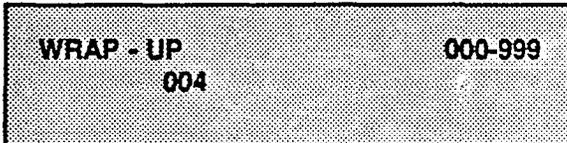
**D. ACD Auto Wrap-Up Timer****Description:**

After completion of a ACD call (on-hook) the agent will not be subjected to another ACD call for the duration of the Auto Wrap-Up timer allowing the agent to finish call related work or access other facilities. This will allow agents to remove themselves from the group (ie. DND, Call Forward) or originate another call.

**Programming:**

To make a change to the ACD Auto Wrap-up Timer:

1. Press the AUTO-WRAP TIMER flexible button (Button #4). The following message is shown on the display phone:



2. Enter the three-digit value on the dial pad which corresponds to 000-999 seconds.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the ACD Auto Wrap-Up Timer is set for 04 seconds and is variable from 000 to 999 seconds.

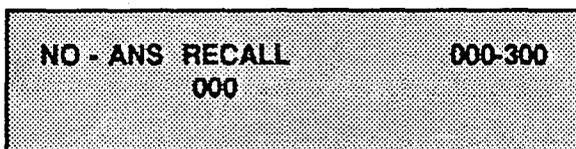
**E. ACD No-Answer Recall Timer****Description:**

If a call routed to a station via ACD is not answered by the ACD Agent/Station before the No-Answer Recall timer expires, the call will be returned to the ACD Queue with the highest priority. In addition, the station that failed to answer the ringing ACD call will be placed into an Out-Of-Service (OOS) state.

**Programming:**

To make a change to the ACD No-Answer Recall Timer:

1. Press the NO-ANSWER RECALL TIMER flexible button (Button #5). The following message is shown on the display phone:



NO - ANS RECALL                      000-300  
000

2. Enter the three-digit value on the dial pad which corresponds to 000-300 seconds.
3. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

**Default:** By default, the ACD No-Answer Timer is at 000 (disabled) and is variable from 000 to 600 seconds.

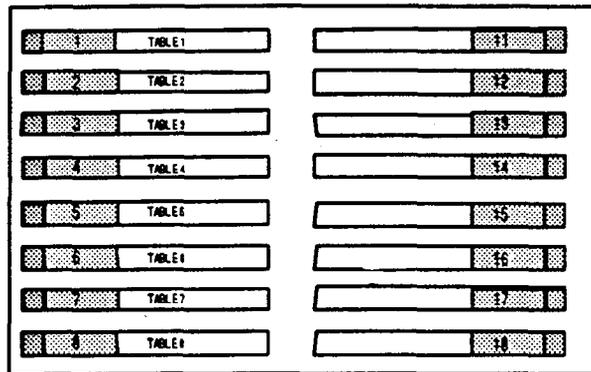


**5. ACD RAN ANNOUNCEMENT TABLES**

**Description:**

Determines the type, index (port) number and message length for the eight available Recorded Announcements (RAN). There are eight RAN tables that can be programmed. Table 1 can be the answer port for unanswered incoming calls to a ACD group. Table 8 can provide the secondary message or vice versa.

The buttons on the digital terminal are defined as shown below when entering the ACD RAN Announcement Tables programming area:



The type can be either a CO line port, or a SLT port. The index number specifies which circuit for the type of interface.

The message length is used to match the maximum length of the message to the device that is used.

**Example:**

To program a table for CO line port:

1. Press the TABLE X flexible button (Buttons 1-8).
2. Dial [1] for CO port interface.
3. Dial [01 to 28] for CO line used.
4. Enter message duration (000-300 sec.)

**Example:**

To program a table for an SLT port:

1. Press the TABLE X flexible button (Buttons 1-8).
2. Dial [2] for SLT port interface.
3. Dial [100 to 155] for SLT station used.
4. Enter Message duration (000-300 sec.)

To clear entries in a Table, press the pound key once [#] followed by the HOLD button.

ACD RAN Announcement Tables (cont'd)

Programming:

If Recorded Announcement devices are installed to operate with ACD, these tables must be programmed:

a. Press FLASH and dial [62]. The following message is shown on the display phone:

ANNOUNCEMENT TABLE 1		
TYPE #	INDX ##	TIME ###

b. The top left button in the flexible button field will be lit for programming ACD RAN Announcemnt Table 1. To change to ACD RAN Announcement Table 2, press flexible button #2. Repeat above for Tables 3 through 8.

c. Enter a string of six, or seven digits on the dial pad. The order of data entry will be:

Type Number:

- 1 = CO Port interface
- 2 = SLT Port interface

Index (port) Number:

- 01-28 = CO Line Port
- 100-155 = SLT Station Port

Message Time:

000-300 seconds

d. Press the HOLD button to save the entry. Confirmation tone is heard and the display will now update.

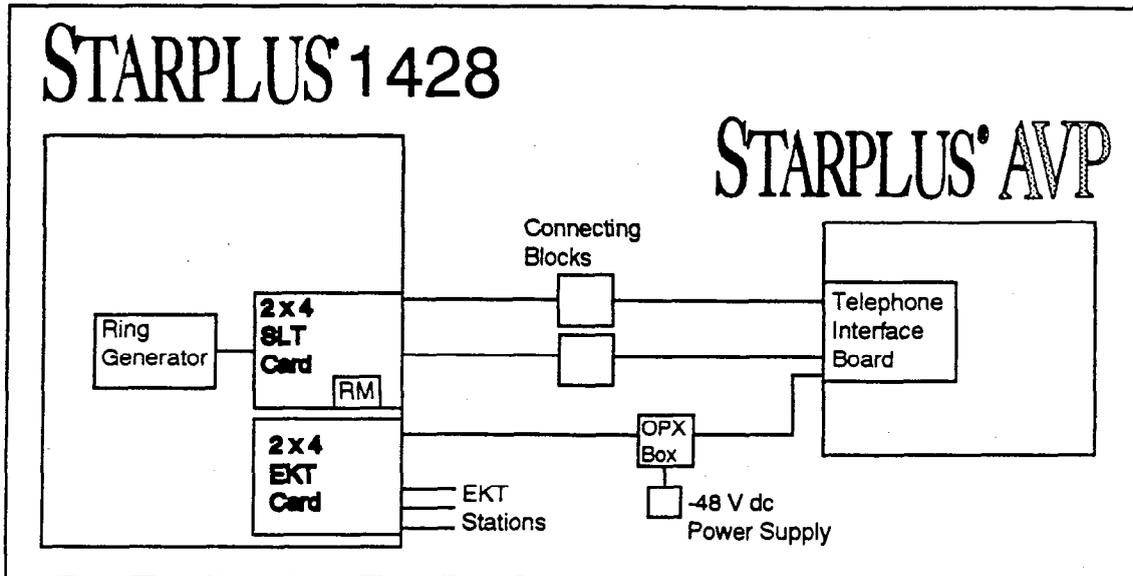
*Note: When a CO port is designated as a RAN port, a relay and/or sensor should be programmed as a RAN start for Announcement Table 1 through 8.*

**6. SMDR ENHANCEMENTS**

**Description:**

The SMDR output has been enhanced to replace the "I" (incoming) and "T" (transferred) call types with an "A" designation to capture ACD call records. This modified SMDR output is only available with the ACD system software.

# Starplus<sup>®</sup> 1428 In-Band Integration



## 1428 HARDWARE REQUIREMENTS

- One 2 x 4 SLT expander card, each card provides 4 SLT circuits. Or one OPX box per VM port can be used. Each OPX box decreases EKT ports by one.
- One RM (DTMF receiver module) installed on the 2 x 4 SLT card. This will provide two (2) DTMF receivers total on the system. If the system has an expansion KSU and 2 x 4 or 4 x 8 card installed, an additional two (2) RM can be installed on these. This would bring the system total to four (4) DTMF receivers. OPX boxes contain their own DTMF receiver internally.
- One ring generator unit is needed when using the 2 x 4 SLT board. The Tri-Output power supply can also be used for this function. One 48 volt power supply is needed if using the OPX box to connect to the AVP. Each OPX box draws 500 ma of current.

## SUPPORTED FEATURES

- Station forward to a personal greeting.
- Message waiting on/off LED's.
- Stations can transfer a caller directly to a mailbox without supervising the call.
- Outdial (to pager or specific number)
- Multiple Return to Operator



A to Z KELLATRONICS, Inc.

Tel: 800.766.3425  
email: info@kellatronics.com Fax: 818.773.8899

## CONFIGURING THE 1428 WITH THE Starplus AVP

1. On the single line telephone ports that are to be assigned to the VM group disable the conference feature. Flash 50 XXX-XXX, button 3, LED should be OFF. Where XXX-XXX are the SLT extension range numbers to be assigned to the VM group. *If you are using the supervised transfer feature, leave conference enabled on these ports.*
2. Enter the VM group programming for VM group 1 (440). Flash 65, button 1. This button should be lit for Steps 3-4.
3. Enter the single line telephone ports into a VM group (440-447). Flash 65, button 12.
4. Enter the desired leave and retrieve tables for the VM group. Flash 65, button 10 is the leave table and button 11 is the retrieve table. Program the leave table as table 0, program the retrieve table as table 1.

Steps 5-6 are accomplished in the Flash 66 programming field.

5. Leave Table Programming:  
Press button 1 (Table 0). Enter a 0, then press the [TRAN] button. Where 0 indicates a prefix digit, and TRAN button represents a pause based on the system pause timer. Press the HOLD button to update.

Retrieve Table Programming:

Press button 2 (Table 1). Enter a 0 [TRAN] on the keypad. Where 0 indicates a prefix digit, and TRAN button represents a pause based on the system pause timer. Press the HOLD button to update.

Press button 2 (Table 1). Enter a 1 [\*] on the keypad. Where 1 indicates a suffix digit, and \* is the digit that inform the AVP that this is a subscriber. Press the HOLD button to update.

6. Press button 9 (disconnect table) Enter: 999999999 where 999999999 is the disconnect code used by the AVP. Press the HOLD button to update.
7. Assign VM flexible buttons (440) on the stations. At each station perform the following:
  - Press the SPEED button twice.
  - Press the desired flexible button to be programmed.
  - Dial 440 on the keypad.
  - Press the ON/OFF button.

## CONFIGURING THE Starplus AVP

The system must be taken off line to program. To do this press [SHIFT] + [F10] at the same time. (You should be returned to the VODAVI menu.)

### GENERAL SET UP

1. Type [3] at the VODAVI menu and press the [ENTER] key to go to the UTILITY menu.
2. Type [I] and press the [ENTER] key to load Starplus 1428 settings.  
*If settings are already loaded you will be asked to override the current settings!*
3. Type [X] and press the [ENTER] key to return to the VODAVI menu.
4. Type [2] and press the [ENTER] key to go to maintenance programming.
5. Highlight the CONFIGURATION menu item and press the [DOWN ARROW] key to pull down the menu.
6. Highlight the ENVIRONMENT menu item and press the [ENTER] key.
7. Highlight the PHONE SYSTEM menu item and press the [ENTER] key.
8. Highlight the LOAD PHONE SETTINGS menu item and press the [ENTER] key.

## CONFIGURING THE Starplus AVP Cont'd

9. From the Phone Sys list select 1428.PBX and press the [ENTER] key.
10. Press the [ESC] key until the highlight bar is on the CONFIGURATION menu item.

The ten step procedure above has loaded the following configuration parameters:

- Dialing Prefixes
  - Local Call = 9, (, = Pause)
  - Long Distance = 9,1
- Feature Prefixes
  - Transfer Start = &,6# (& = hookflash)
  - Set Message Wait = 420@ (@ = extension number)
  - Clear Message Wait = 421@ (@ = extension number)
  - Abort a Busy/No-Answer & ,
  - Reject a Caller = & ,
  - \*Transfer Connect = &
- Mailboxes 100-127 and a disconnect mailbox of 999
- Extensions 100-127

*\* This feature prefix is not programmed by default. You should program this prefix if you are using the supervised transfer feature.*

## CALL OUT LINES

The next step is to setup the lines that will be used to light message lights or perform outdial/notification functions. To do this

1. Highlight the CONFIGURATION menu item and press the [DOWN ARROW] key to pulldown the menu.
2. Highlight the SYSTEM menu item and press the [ENTER] key.
3. Highlight the CALL OUT LINES menu item and press the [ENTER] key.
4. To make a line active, highlight the line and enter a single digit value of 1-9.

When assigning lines as call out types, please note the following:

- The number you enter (1-9) corresponds to the EVENT HANDLER TO USE setting in the Class of Service programming
- To reduce glare, assign call out lines from the last line in the system and work towards the first line. Ex: In a four line system, assign line 4 as the call out line. If you need more call out lines, then assign line 3, etc.

## **CONFIGURING THE Starplus AVP    Cont'd**

### **EVENT HANDLER**

This item is in the COS menu and is used to match certain COS with specific call out lines. For example, mailboxes 100-127 could have a COS with event handler 1. Their message light and notification functions would be performed on the call out lines marked with a 1. To program this function:

1.     Highlight the MODULES menu item and press the [DOWN ARROW] key to pulldown the menu.
2.     Highlight the GLOBAL SETTINGS menu item and press the [ENTER] key.
3.     Highlight the CLASS OF SERVICE menu item and press the [ENTER] key.
4.     Select the COS to program from the list presented by using the [UP/DOWN ARROW] keys to highlight the desired COS and press the [ENTER] key. Page 1 of 4 will be presented.
5.     Press the [PGDN] key twice to go to Page 3. (Page 3 of 4)
6.     Use the [DOWN ARROW] key to highlight the last item on the page EVENT HANDLER TO USE.
7.     Enter a one digit value [1-9] for the event handler item.
8.     Press the [ESC] key three (3) times and then the [F10] key to exit programming.

### **VM PORT ASSIGNMENTS**

The Starplus AVP ships with all ports defaulted to perform Voice Messaging for all time periods (24 hours a day).

To change the port configurations, perform the following:

1.     Highlight the MODULES menu item and press the [DOWN ARROW] key to pulldown the menu.
2.     Highlight the GLOBAL SETTINGS menu item and press the [ENTER] key.
3.     Highlight the INITIATE CHANNELS menu item and press the [ENTER] key.
4.     Highlight the DAYTIME SETTINGS and press the [ENTER] key.

At this point the port assignment screen will be presented. The screen should reflect the number of ports in your system with a default field at the top. The default field should be highlighted and should show Voice Messaging.

The choices for port assignments are, Voice Messaging, Auto Attendant, and Menu Routing. The Other Modules function is not used and the Clear Line merely removes any function assigned to the port.

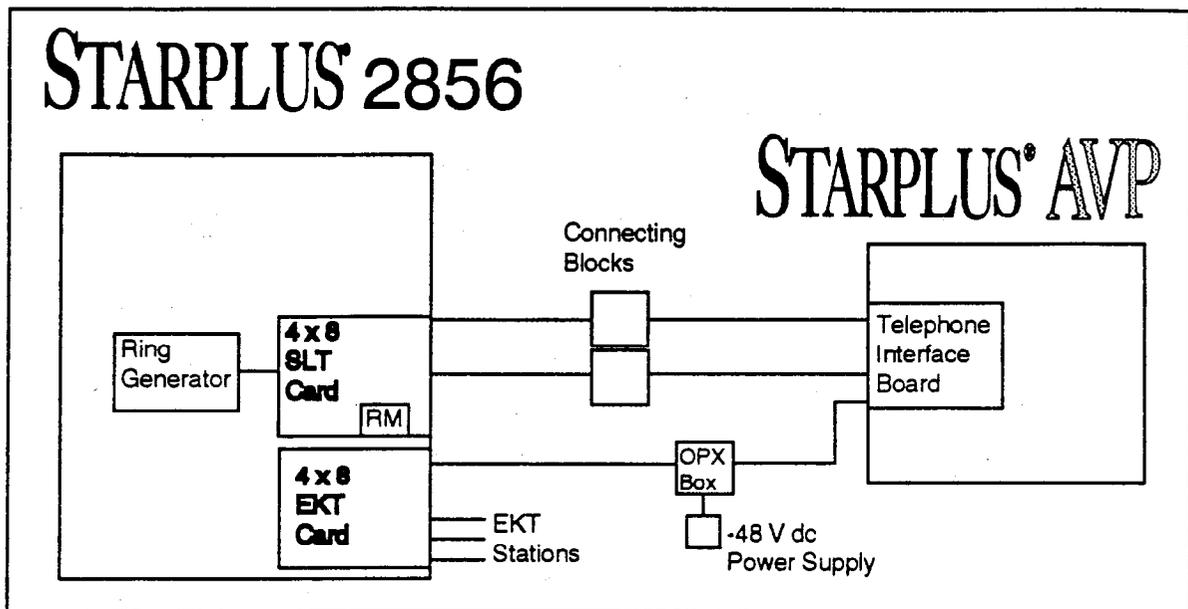
5.     Move the highlight bar by pressing the [DOWN ARROW] to the first port. Press the [ENTER] key when the first port is highlighted. (The list of functions will appear.)
6.     Highlight the desired function with the [UP/DOWN ARROW] keys and press the [ENTER] key at the desired function.

For a detailed description of each function please refer to the Starplus AVP manual. The appropriate sections are:

Voice Messaging	Page 620-12
Auto Attendant	Page 620-34
Menu Routing	Page 620-56

# Starplus<sup>®</sup> 2856 In-Band Integration

## 2856 HARDWARE REQUIREMENTS



- One 4 x 8 SLT expander card, each card provides 8 SLT circuits. Or one OPX box per VM port can be used. Each OPX box decreases EKT ports by one.
- One RM (DTMF receiver module) installed on the 4 x 8 SLT card. This will provide one (1) DTMF receiver per 4 X 8 board. This can be increased to a maximum of seven (7) total on the system. These receivers do not have to be installed on SLT cards, they may be installed on EKT cards also. OPX boxes contain their own DTMF receiver internally.
- One ring generator unit is needed when using the 2 x 4 or 4 x 8 SLT cards. The Tri-Output power supply can also be used for this function. A 48 volt power supply is needed when using the OPX box to connect to the AVP system. Each OPX box draws 500 ma of current.

### SUPPORTED FEATURES

- Station forward to a personal greeting.
- Message waiting on/off LED's.
- Stations can transfer a caller directly to a mailbox without supervising the call.
- Outdial (to a pager or specific number)
- Multiple Return to Operator

## CONFIGURING THE 2856 WITH THE Starplus AVP

1. On the single line telephone ports that are to be assigned to the VM group disable the conference feature. Flash 50 XXX-XXX, button 3, LED should be OFF. Where XXX-XXX are the SLT extension range numbers to be assigned to the VM group. *If you are using the supervised transfer feature, leave conference enabled on these ports.*
2. Enter the VM group programming for VM group 1 (440). Flash 65, button 1. This button should be lit for Steps 3-4.
3. Enter the single line telephone ports into a VM group (440-447). Flash 65, button 12.
4. Enter the desired leave and retrieve tables for the VM group. Flash 65, buttons 10 and 11. Program the leave table as table 0, program the retrieve table as table 1.

Steps 5-6 are accomplished in the Flash 66 programming field.

5. Leave Table Programming:  
Press button 1 (Table 0). Enter a 0, then press the [TRAN] button. Where 0 indicates a prefix digit, and TRAN button represents a pause based on the system pause timer. Press the HOLD button to update.  
Retrieve Table Programming:  
Press button 2 (Table 1). Enter a 0 [TRAN] on the keypad. Where 0 indicates a prefix digit, and TRAN button represents a pause based on the system pause timer. Press the HOLD button to update.  
Press button 2 (Table 1). Enter a 1 [\*] on the keypad. Where 1 indicates a suffix digit, and \* is the digit that inform the AVP that this is a subscriber. Press the HOLD button to update.
6. Press button 9 (disconnect table) Enter: 9999999999 where 9999999999 is the disconnect code used by the AVP. Press the HOLD button to update.
7. Assign VM flexible buttons (440) on the stations. At each station perform the following:
  - Press the SPEED button twice.
  - Press the desired flexible button to be programmed.
  - Dial 440 on the keypad.
  - Press the ON/OFF button.

## CONFIGURING THE Starplus AVP

The system must be taken off line to program. To do this press [SHIFT] + [F10] at the same time. (You should be returned to the VODAVI menu.)

### GENERAL SET UP

1. Type [3] at the VODAVI menu and press the [ENTER] key to go to the UTILITY menu.
2. Type [J] and press the [ENTER] key to load Starplus 2856 settings.  
*If settings are already loaded you will be asked to override the current settings!*
3. Type [X] and press the [ENTER] key to return to the VODAVI menu.
4. Type [2] and press the [ENTER] key to go to maintenance programming.
5. Highlight the CONFIGURATION menu item and press the [DOWN ARROW] key to pulldown the menu.
6. Highlight the ENVIRONMENT menu item and press the [ENTER] key.
7. Highlight the PHONE SYSTEM menu item and press the [ENTER] key.
8. Highlight the LOAD PHONE SETTINGS menu item and press the [ENTER] key.
9. From the Phone Sys list select 2856.PBX and press the [ENTER] key.
10. Press the [ESC] key until the highlight bar is on the CONFIGURATION menu item.

## CONFIGURING THE Starplus AVP Cont'd

The ten step procedure above has loaded the following configuration parameters:

- **Dialing Prefixes**
  - Local Call = 9, (, = Pause)
  - Long Distance = 9,1
  
- **Feature Prefixes**
  - Transfer Start = &,6# (& = hookflash)
  - Set Message Wait = 420@ (@ = extension number)
  - Clear Message Wait = 421@ (@ = extension number)
  - Abort a Busy/No-Answer & ,
  - Reject a Caller = & ,
  - \* Transfer Connect &
  
- **Mailboxes** 100-155 and a disconnect mailbox of 999
  
- **Extensions** 100-155

*\* This feature prefix is not programmed by default. You should program this prefix if you are using the supervised transfer feature.*

## CALL OUT LINES

The next step is to setup the lines that will be used to light message lights or perform outdial/notification functions. To do this

1. Highlight the CONFIGURATION menu item and press the [DOWN ARROW] key to pulldown the menu.
2. Highlight the SYSTEM menu item and press the [ENTER] key.
3. Highlight the CALL OUT LINES menu item and press the [ENTER] key.
4. To make a line active, highlight the line and enter a single digit value of 1-9.

When assigning lines as call out types, please note the following:

- The number you enter (1-9) corresponds to the EVENT HANDLER TO USE setting in the Class of Service programming
  
- To reduce glare, assign call out lines from the last line in the system and work towards the first line. Ex: In a four line system, assign line 4 as the call out line. If you need more call out lines, then assign line 3, etc.

## **CONFIGURING THE Starplus AVP    Cont'd**

### **EVENT HANDLER**

This item is in the COS menu and is used to match certain COS with specific call out lines. For example, mailboxes 100-155 could have a COS with event handler 1. Their message light and notification functions would be performed on the call out lines marked with a 1. To program this function:

1.     Highlight the **MODULES** menu item and press the **[DOWN ARROW]** key to pulldown the menu.
2.     Highlight the **GLOBAL SETTINGS** menu item and press the **[ENTER]** key.
3.     Highlight the **CLASS OF SERVICE** menu item and press the **[ENTER]** key.
4.     Select the **COS** to program from the list presented by using the **[UP/DOWN ARROW]** keys to highlight the desired **COS** and press the **[ENTER]** key. Page 1 of 4 will be presented.
5.     Press the **[PGDN]** key twice to go to Page 3. (Page 3 of 4)
6.     Use the **[DOWN ARROW]** key to highlight the last item on the page **EVENT HANDLER TO USE**.
7.     Enter a one digit value **[1-9]** for the **COS**.

### **VM PORT ASSIGNMENTS**

The Starplus AVP ships with all ports defaulted to perform Voice Messaging for all time periods (24 hours a day).

To change the port configurations, perform the following:

1.     Highlight the **MODULES** menu item and press the **[DOWN ARROW]** key to pulldown the menu.
2.     Highlight the **GLOBAL SETTINGS** menu item and press the **[ENTER]** key.
3.     Highlight the **INITIATE CHANNELS** menu item and press the **[ENTER]** key.
4.     Highlight the **DAYTIME SETTINGS** and press the **[ENTER]** key.

At this point the port assignment screen will be presented. The screen should reflect the number of ports in your system with a default field at the top. The default field should be highlighted and should show Voice Messaging.

The choices for port assignments are, Voice Messaging, Auto Attendant, and Menu Routing. The Other Modules function is not used and the Clear Line merely removes any function assigned to the port.

5.     Move the highlight bar by pressing the **[DOWN ARROW]** to the first port. Press the **[ENTER]** key when the first port is highlighted. (The list of functions will appear.)
6.     Highlight the desired function with the **[UP/DOWN ARROW]** keys and press the **[ENTER]** key at the desired function.

For a detailed description of each function please refer to the Starplus AVP manual. The appropriate sections are:

Voice Messaging	Page 620-12
Auto Attendant	Page 620-34
Menu Routing	Page 620-56

# STARPLUS Digital Systems Technical Training

## I. Class Schedule

1. We start at 8:00 am and end at approximately 5:00 pm.
2. One 15 minute break in the morning, one in the afternoon.
3. One hour for lunch.

## II. Objective

To introduce the student to the hardware components, system installation, and programming maintenance of the Starplus Digital 1428 and 2856 Key Telephone Systems.

## III. Introduce the Manual

1. Quick Reference Table of Content
2. List of Figures
3. List of Tables
4. Issue Control Sheet
5. Section 100 - Introduction
6. Section 200 - Key Station Feature Description\*
7. Section 210 - Single Line Telephone Feature Description\*
8. Section 220 - Attendant Feature Description\*
9. Section 300 - Station Feature Operation\*
10. Section 310 - SLT Feature Operation\*
11. Section 320 - Attendant Feature Operation\*
12. Section 330 - LCD Displays\*
13. Section 400 - General Description
14. Section 500 - Installation
15. Section 600 - Customer Database Programming
16. Section 610 - System Parameters Programming
17. Section 620 - CO Lines Attributes Programming
18. Section 630 - Station Attributes Programming



A to Z KELLATRONICS, Inc.

email: [info@kellatronics.com](mailto:info@kellatronics.com) Tel: 800.766.3425 Fax: 818.773.8899

19. Section 640 - Uniform Call Distribution (UCD)
20. Section 750 - ICLID Programming
21. Section 645 - Voice Mail Programming
22. Section 650 - Exception Tables Programming
23. Section 665 - Least Cost Routing (LCR) Programming
24. Section 660 - Initialize Database Parameters
25. Section 665 - Printing System Database Parameters
26. Section 700 - System Checkout
27. Section 800 - Maintenance and Troubleshooting
28. Customer Database Programming Worksheets
29. Digital Systems Part Numbers
30. ICLID General Descriptions

\*Feature and feature operation questions may be addressed to the trainer, as time permits, prior to class, during breaks, and after class. This will help to insure the objective of the class is met.

#### **IV. Section 100 Introduction**

1. Regulatory Information
  - A. Telephone Company Notification
  - B. Ringer Equivalence Number (1.9 )
  - C. Universal System Ordering Code (USOC) RJ21X
  - D. FCC Registration Numbers 1428
    - a. Key System ( direct button appearances ) DLPHKG-65152-KF-E
    - b. Hybrid ( dial access codes ) DLPHKG-65153-MF-E
  - E. FCC Registration Numbers 2856
    - a. Key System ( direct button appearances) DLPHKG-65102-KF-E
    - b. Hybrid ( dial access codes) DLPHKG-65101-MF-E
  - F. Incidence of Harm
    - a. If the telephone company determines that the customer provided equipment is causing harm to the telephone network, the equipment must be removed from the network until repairs are made.
  - G. Changes in Service.

- a. The local telephone company must notify the user of system affecting changes in service.
- H. Maintenance Limitations.
  - a. Warranty will be voided if field repairs are attempted.
- I. Notice of Compliance.
  - a. Class A Computing Device which complies with FCC part 15.
  - b. Caution Statement
    - 1) Equipment generates RF energy.
    - 2) Any interference corrections are the users responsibility.
- J. Hearing Aid Compatibility.
  - a. All Keysets designed to operate on the system are hearing aid compatible.
- K. OPX Circuit.
  - a. OL13C network circuit and RJ11C/W interface.
- L. Canadian Regulatory Information.
- M. UL/CSA Safety Compliance

## **V. General Description**

- 1. The STARPLUS Family of Digital Key Telephone Systems
  - A. The 1428 - Flat Pack Design
    - a. Satisfies configurations from 4x8 to 14x28.
  - B. The 2856 - Card Cage
    - a. Satisfies configurations from 4x8 to 28x56.
  - C. BOTH use the same terminal devices (Keysets, Relay Sensor Module, Digital Data Interface Unit, and SLA/OPX Module).
  - D. BOTH may use standard 2500-type telephones.
  - E. BOTH Utilize PCM/TDM Digital Switching Technique.
    - a. Non-blocking systems
    - b. Time Slots
  - F. CO interfaces
    - a. ALL CO interfaces are transform protected, classified as fully protected.
  - G. On-line programming changes, no interruptions of communications (exceptions: flexible port assignment).
    - a. Call processing continues as database is updated.

- b. Programming changes may be made from PORT 01 using a Keyset or from a I/O Port using a PC.
- c. Programming Changes may be made from On-board 300 Baud Modem.

## **VI. Common Equipment for the 1428 .**

1. Basic KSU with Power Supply.
  - A. Wall Mountable "Flat Pack" Cabinet.
  - B. Contains Key Service Board.
    - a. 68000 Microprocessor.
    - b. Controls all PCM/TDM circuitry.
    - c. All control, switching, and interface circuitry are contained on KSB.
  - C. Capable of supporting 4 CO/PBX/Centrex Lines and 8 Digital Key Terminals ( 4x8 system in the basic configuration ).
  - D. Reset Halt Switch.
  - E. Grounding Lug ( P3 ).
  - F. Provides One DTMF Receiver.
  - G. Provides One RS-232C I/O Port (DB-25)
  - H. Provides One Input Channel for Background Music and Music On Hold with volume adjustment.
  - I. Provides an On-Board 300 Baud Modem.
  - J. One External Page Path ( all Page paths are one-way in the DVX family ).
  - K. Contains additional interface connections for:
    - a. Optional 1200 Baud Modem Module.
    - b. 2x4 Expander Module or 2x4 SLT Expander Module.
    - c. Optional I/O Expander Module ( ONE - RS-232C DB25, and ONE RS-422 RJ-14 ).
    - d. Expansion KSU Interface Connections.
  - L. Power Supply.
    - a. Requires 117V ac  $\pm 10\%$  input voltage.
    - b. Requires a Dedicated AC Circuit!
    - c. Provides a filtered and regulated +12V dc and - 12V dc to the main Key Service Board.
    - d. Protected by a 1.5 Amp Slow-blo fuse.
    - e. Complies with UL 1459 Second Edition.

**M. CPU and Memory.**

- a. Responsible for all system tones, system timing, stations status control, real time clock, watch dog timer and recovery, PCB status and presence/absence of modules for automatic software configuration setup, backup of customer database via a "super cap".
- b. EPROM Memory contains system programming code.
- c. RAM Memory contains Customer Database.

**N. LEDs and Indicators:**

- a. Four Green LEDs.
  - 1) DS1 and DS5 - Presence of +12V dc to four stations each.
  - 2) DS2 and DS3 - Presence of +5V dc and -5V dc.
- b. One Red Led
  - 1) DS4 - Indicates "Heart-Beat" ( system is processing ).
    - i) Blinks at a steady rate during normal system activity.

**O. CO/Station Interfaces**

- a. Four CO Interfaces
  - 1) RJ-11 Modular Jacks
  - 2) Current Sensing Circuitry for distant end disconnect (Loop Supervision, enabled on a per CO Line basis)
- b. Eight Station Interfaces
  - 1) Two Channel 64K arrangement
  - 2) Minimum Two Twisted Pair required per Station ( four pair recommended ).
  - 3) Stations Interface to BKSU Via 25-Pair Male Amphenol Connector.

**2. Expansion KSU with power supply.**

- A. Provides additional circuitry for four CO/PBX/Centrex Lines and Eight Digital Key Terminals (4x8).
- B. Interfaces to the BKSU via Two ribbon cables ( mounts immediately to the right of the BKSU ).
- C. Allows connection of ONE additional Expander Module.
  - a. 2x4 Expander Module
  - b. 2x4 SLT Expander Module.
  - c. 4x8 Expander Module.
- D. One External Page Path.
- E. Provides interface for the connection of ONE additional DTMF Receiver Module.
- F. Power Supply

- a. Requires 117V  $\pm$ 10% input voltage.
  - b. Provides a filtered and regulated +12V dc and - 12V dc to the Expansion Key Service Board.
  - c. Protected by a 1.5 Amp Slow-blo fuse.
  - d. Complies with UL 1459 Second Edition.
- G. LEDs and Indicators:
- a. Four Green LEDs.
    - 1) DS1 and DS5 - Presence of +12V dc to four stations each.
    - 2) DS2 and DS3 - Presence of +5V dc and -5V dc.
- H. CO/Station Interfaces
- a. Four CO Interfaces
    - 1) RJ-11 Modular Jacks
    - 2) Current Sensing Circuitry for distant end disconnect (Loop Supervision, enabled on a per CO Line basis)
  - b. Eight Station Interfaces
    - 1) Two Channel 64K arrangement
    - 2) Minimum Two Twisted Pair required per Station ( four pair recommended ).
    - 3) Stations Interface to BKSU Via 25-Pair Male Amphenol Connector.
3. 2x4 Expander Module
- A. 2 CO Line by 4 Digital Key Terminal Module
    - a. Installs in the Basic KSU or the Expansion KSU
  - B. LEDs and Indicators
    - a. DS1 indicates presence of +12V dc to key stations
    - b. DS2 and DS3 indicate the presence of -5V dc and +5V dc.
  - C. Provides Interface Circuitry for an additional DTMF Receiver module.
4. 2x4 SLT Expander Module
- A. Two (2) CO Line by Four (4) 2500 type Single Line Station.
  - B. Installs in the Basic KSU or the Expansion KSU.
  - C. LEDs and Indicators.
    - a. DS1 indicates presence of +12V dc to key stations.
    - b. DS2 and DS3 indicate the presence of -5V dc and +5V dc.
  - D. Supports 2500-type Single line Telephones with message wait ( standard ).
  - E. 36 Volt Circuits.

- F. Loop Interrupt is passed to SLT ports when enabled and received from telco ( 700 ms ).
  - G. Requires Ring generator for operation.
  - H. Provides Interface Circuitry for an additional DTMF Receiver module.
5. 4x8 Expander Module.
- A. 4 CO Lines by 8 Digital Key Terminals
  - B. Installs Only in the Expansion KSU.
  - C. Provides Interface Circuitry for an additional DTMF Receiver module.
    - a. Four Green LEDs.
      - 1) DS1 and DS2 - Presence of +12V dc to four stations each.
      - 2) DS3 and DS4 - Presence of +5V dc and -5V dc.
  - D. 25-Pair Amphenol Cable Provided for Interface to MDF.

## **VII. Common Equipment for the 2856**

- 1. Components Necessary to Operate the System.
  - A. Equipment Cabinet with Power Supply (KSU)
  - B. Central Processing Board ( CPB )
  - C. 4x8 Key Interface Board (CKB)
  - D. 4x8 SLT Interface Board (CSB)
- 2. 2856 Main Cabinet
  - A. Contains Eight Card Slots
  - B. Dedicated CPU Slot
  - C. Contains Power Supply
  - D. Cable Raceway
  - E. Grounding Lug.
- 3. Power Supply.
  - A. Provides filtered/unregulated 12V dc to all system cards.
  - B. Provides -5V dc to backplane.
  - C. Requires a 117V ac  $\pm 10\%$  dedicated AC outlet.
  - D. On/Off Switch.
  - E. 5 Amp Slow-blo fuse protected.

4. Central Processor Board ( CPB )
  - A. 68000 Microprocessor.
    - a. Controls all PCM/TDM circuitry.
    - b. All control, switching, and interface circuitry are contained on CPB.
  - B. Reset Halt Switch.
  - C. Contains No DTMF Receivers ( optionally provided ).
  - D. Provides One RS-232C I/O Port ( RJ-45 )
  - E. Provides One Input Channel for Background Music and Music On Hold with volume adjustment.
  - F. Provides an On-Board 300 Baud Modem.
  - G. Contains additional interface connections for:
    - a. Optional 1200 Baud Modem Module.
    - b. Optional I/O Expander Module ( ONE - RS-232C, RJ-45, and ONE RS-422, RJ-14 ).
  - H. LEDs and Indications
    - a. Two Green LEDs
      - 1) Indicate the presence of -5V dc and + 5V dc.
    - b. Red LED
      - 1) Indicates system "Heart Beat" ( system is processing ).
  - I. J3 Jumper
    - a. Enables Battery Back-up of system database.
    - b. Must be in "on" position for proper system operation.
5. 4x8 Key Interface Board
  - A. 4 CO Lines by 8 Digital Key Terminals.
  - B. One External Page path.
  - C. Provides Interface Circuitry for an additional DTMF Receiver module.
  - D. LEDs and Indicators.
    - a. Five Red LEDs.
      - 1) Top four Indicate CO in Use.
      - 2) Bottom LED Indicates Relay Status.
    - b. Two Green LEDs Indicate presence of +5V dc and - 5V dc.
  - E. 25-Pair Amphenol Cable Provided for Interface to MDF.
    - a. Split Ferrite blocks Required for FCC part 15 Compliance.

- F. Two RJ-14's provide CO interface.
  - a. Two CO's per Jack.
  - b. Ferrite Core Required for FCC part 15 Compliance.
- 6. 4x8 SLT Interface Board
  - A. 4 CO Lines by Eight 2500 Type telephones.
  - B. NO External Page path ( current ).
  - C. Provides Interface Circuitry for an additional DTMF Receiver module.
  - D. LEDs and Indicators.
    - a. Five Red LEDs.
      - 1) Top four Indicate CO in Use.
      - 2) Bottom LED Indicates Relay Status.
    - b. Two Green LEDs Indicate presence of +5V dc and - 5V dc.
  - E. 25-Pair Amphenol Cable Provided for Interface to MDF.
    - a. Split Ferrite blocks Required for FCC part 15 Compliance.
  - F. Two RJ-14's provide CO interface.
    - a. Two CO's per Jack.
    - b. Ferrite Core Required for FCC part 15 Compliance.
  - G. Requires Ring Generator for Operation.
  - H. Provides Message Wait Circuitry.
    - a. Supports Standard 90V dc message wait indication.
  - I. Loop Interrupt is passed to SLT ports when enabled and received from telco ( 700 ms ).

## **VIII. Additional Modules**

- 1. I/O Modules
  - A. 1428 - I/O Module
    - a. One RS-232C DB 25
    - b. One RS-422 RJ-14
  - B. 2856 - I/O Module
    - a. One RS-232C RJ-45
    - b. One RS-422 RJ-14
- 2. 1200 Baud Modem Module
- 3. DTMF Receiver Module

## **IX. Digital Terminal Description**

### **1. 34-Button Terminal**

#### **A. Three Different Models**

- a. 34-Button Executive Terminal has a 48 Character LCD display
- b. 34-Button Enhanced Terminal has NO display.
- c. 34-button Executive/PC Terminal has a 48 Character LCD Display and a RS-232 Output for ICLID information interface to a Personal Computer.

#### **B. Digital Terminals Require Two-pair to operate.**

#### **C. The LCD Display is Divided into Three Fields.**

- a. Field One - Current Status (top line, 24 characters).
- b. Field Two - Date (left half of bottom line, 12 characters).
- c. Field Three - Time of Day (right half of bottom line, twelve characters).

#### **D. Buttons and LEDs**

- a. Super-Bright LEDs on all keys, except the Dial Pad.
- b. Button Definitions
  - 1) 12 Dial Key Pad
  - 2) 28 Flexible Buttons
  - 3) On/Off button (fixed)
  - 4) Mute button (fixed)
  - 5) Speed button (fixed)
  - 6) Flash button (fixed)
  - 7) Transfer button (fixed)
  - 8) Hold button (fixed)

#### **E. Speakerphone Description**

- a. Handsfree two way conversation.
- b. Mute.
- c. Terminate call with the On/Off button.
- d. Automatic Pre-selection allows the speakerphone to be enabled by pressing a button (i.e.. DSS, CO Line, Page.....etc..)
- e. Programmable options allow for full speakerphone or monitor/on-hook dialing capabilities and no speakerphone operation.

#### **F. Volume controls.**

- a. Slide switches provide the ability to adjust the ring volume and the speaker volume.

- 1) Speaker volume adjusts all voice signals sent to the speaker (i.e., Speakerphone Conversations, Background Music, Page announcements).
  - 2) Ring Volume adjusts all tone signals sent to the speaker.
    - i) Muted ringing will be proportionately quieter than normal ringing based on the volume setting.
- G. H-T-P Switch - Three position slide switch which controls the method of receiving intercom calls.
- a. Handsfree (H) Position - Upon hearing a tone burst and voice announcement over the speaker the User can reply handsfree.
  - b. Privacy (P) Position - The station user receives a tone burst and a vice announcement over the speaker. the microphone is deactivated for privacy, the user must either go off-hook or press the Mute key to reply.
  - c. Tone (T) Position - Standard tone ring notifies of an incoming call and the user answers by going off-hook or pressing the On/Off button for speakerphone operation.
  - d. Switch selection may be overridden by use of the Forced Tone Ring option.
- H. Directory Tray
- I. Wall Mountable
2. 34-Button Digital Terminal (Enhanced)
- A. Information About Executive Terminal Applies Except No LCD Display.
3. 34-Button Executive/PC Interface Terminal (ICLID)
- A. Information About Executive Terminal Applies.
  - B. Equipped with RS232C I/O channel.
    - a. 2400bps, No-Parity, 8 Data Bits, 1 Stop Bit.
  - C. A Personal Computer May Be Interfaced with the Terminal To Receive ICLID information, via Vodavi Call Tracker Software.
  - D. A program which runs on a PC may control key actions on the terminal and also receive ICLID information. Would Require Software Development By Independent Programmer.
4. 14-Button Digital Terminal
- A. Digital Terminals Require Two-pair to operate.
  - B. Buttons and LEDs
    - a. Super-Bright LEDs on all keys except the Dial Pad.
    - b. Button Definitions
      - 1) 12 Dial Key Pad
      - 2) 8 Flexible Buttons

- 3) On/Off button (fixed))
  - 4) Mute button (fixed)
  - 5) Speed button (fixed)
  - 6) Flash (fixed)
  - 7) Transfer button (fixed)
  - 8) Hold button (fixed)
- C. Speakerphone Description
- a. Handsfree intercom two-way conversation.
  - b. Terminate call with the On/Off button.
  - c. Automatic Pre-selection allows the speakerphone to be enabled by pressing a button (i.e.. DSS, CO Line, Page.....etc..)
- D. Volume controls.
- E. H-T-P Switch - Three position slide switch which controls the method of receiving intercom calls.
- a. Handsfree (H) Position - Upon hearing a tone burst and voice announcement over the speaker, the User can reply handsfree.
  - b. Privacy (P) Position - The station user receives a tone burst and a one-way announcement over the speaker. The speakerphone microphone is deactivated for privacy, the user must either go off-hook or press the Mute key to reply.
  - c. Tone (T) Position - Standard tone ring notifies of an incoming call and the user answers by going off-hook or pressing the On/Off button for speakerphone operation.
  - d. Switch selection may be overridden by use of the Forced Tone Ring option.
- F. Directory Tray
- G. Wall Mountable
5. Digital Direct Station Selector/ Direct Line Selector (DSS/DLS) Console
- A. 48 Buttons (3 columns by 16 rows), each have an associated Super Bright LED for status indication.
  - B. Three Maps - 1428 and 2856
    - a. Map 1 - CO Lines 1-14, Stations 100-127, and Release Key, Attendant Override key, All Page key and the first three Call Park locations (supports a 14x28 configuration).
    - b. Map 2 - CO Lines 1-28, Stations 100-113, and first three park locations, release key, Attendant Override key, and All Call page (supports a 28x12 configuration).
    - c. Map 3 - Stations 114-155 and internal page zones one, two, and three (Last 42 Stations).
  - C. Read this Important NOTE concerning flexible buttons programmed for features.

- a. **NOTE: The following features are not allowed to be programmed onto DSS/DLS Console flexible buttons: ACD Agent or Supervisor Login, Do Not Disturb, Call Forward, Camp-on, Available/Unavailable, Personal Park, Voice Mail, and Headset Mode. The features may still be programmed onto the keyset flexible buttons.**

D. ~~Up to three DSS/DLS Consoles may be associated with a station. NO Duplicate Maps 1 and 2 permitted, more than one Map 3 may be associated with a station.~~

6. **SLT Adapter / Off-Premise Extension Module**

- A. **Uses a Digital Terminal Port**
- B. **Requires -48 Volts DC, 500 ma of Power from separately provided Power Supply.**
- C. **Uses a "Precise" tone plan.**
- D. **Provides one Power Fail transfer circuit.**
- E. **DTMF only, does not support pulse dialing.**

7. **Relay / Sensor Interface Module**

- A. **Uses a Digital Terminal Port**
- B. **Provides Three Programmable Dry Relay Contacts.**
  - a. **Programmable Options**
    - 1) **External Page**
    - 2) **RAN Start**
    - 3) **Power Fail Transfer**
    - 4) **Loud Bell Control**
    - 5) **CO Line Control**

C. **Provides Three Sensing Circuits.**

- a. **Programmable Options**
  - 1) **RAN End**

8. **DDIU - Digital Data Interface Unit**

- A. **Uses a Digital Terminal Port**
- B. **Works in conjunction with a Station (like DSS/DLS Console).**
- C. **Used to establish a Serial Data Connection between two Serial devices (Data Intercom).**
  - a. **Modem Sharing.**
  - b. **Printer Sharing**
  - c. **May be used to extend the range of SMDR Printer further away from the KSU.**
    - 1) **RS232 recommends cables shorter than 50ft.**

**9. PFTU - Power Fail Transfer Unit**

- A. Provides the relay transfer circuits for up to 12 CO Lines in the event of a Power Failure.**
- B. Controlled by a Relay Sensor Module Programmed for Power Fail Transfer.**
- C. A customer provided 12 Volt DC Power Supply is required to operate the unit.**

# System Check-Out

## I. Installation Check-Out List

### 1. Power REQUIREMENTS.

#### A. The System requires a Dedicated Branch Circuit.

- a. A good definition of the circuit is the use of a constant, separately fused, dedicated only to providing power to the KSUs power supplies, 117 volt plus or minus 5%, 15 Ampere, Single Phase, 3-wire (parallel blade with ground) power outlet located within 5 feet of the KSU. **KEEP THE POWER DEDICATED TO THE SYSTEM.**

### 2. Preliminary Procedures

#### A. Test System Ground

- a. Ground System in accordance with the installation instructions (**DO NOT PLUG SYSTEM IN**).
- b. Using a DVM set for DC Ohms, place one lead on the backplane ground lug, place the opposite lead on the ground of the power outlet. The reading should be no higher than 5 ohms. Switch the meter to AC Volts and take a reading at the same two ground points. The reading should be no higher than .5Vac. If either reading is out of tolerance, have the AC Outlet tested and inspect the point to which the KSU is grounded to insure that it has nothing which could inhibit the flow of current to ground.

#### B. Make sure that the NICAD battery on the CPU is strapped in the on position ( Super Cap has no enable strap on 1428 ).

#### C. Inspect all socketed integrated circuits on the CPU and peripheral cards for proper seating.

#### D. Inspect the MDF for shorted wiring.

#### E. Make sure all cards are properly seated in the proper slots and that all amphenol connectors are securely in place.

#### F. When all of the above requirements are met proceed to the Power Up Sequence.

### 3. Power Up Sequence

#### A. Plug in the system power cord.

#### B. Turn on the power supply.

#### C. Observe the Heart-Beat LED(s) on the CPU, look for a continuous pattern of flashing.

#### D. Press and Hold the RESET Button located on the CPU for five seconds. Release the Button.

205  
Times

- E. After the LEDs return to their pattern, enter the programming mode either from Station 100 or via the RS232 communications port on the CPU and INITIALIZE the DATABASE (Flash 80, button 8, Hold).
- F. The System is now ready for programming.

# Customer Database Programming

## I. Introduction

1. Flexible Programming allows the system to be tailored to the customers needs.
2. No interruptions in call processing while programming the database.
  - A. Exception is flexible port assignment. Requires a reset so system can assign time slots.
3. Methods of Programming.
  - A. From Station 100 (port 01) using a Executive Display Terminal.
    - a. Enter the programming mode by dialing \*\*3226.
    - b. The On/Off Key on the terminal is lit.
    - c. The System is ready to program.
    - d. Refer to Figure 600-3 Programming Button Mapping for Terminal layout while in programming mode.
  - B. From an ASCII terminal.
    - a. May be either on-site via direct connection to the RS-232C port on the CPB (RS232C may be configured for 300, 1200, 2400, or 4800 Baud) or Remotely via the on-board 300 baud modem (1200 Baud if the optional 1200 Baud Modem Module is installed).
    - b. Terminal Device must be configured for Selected Baud Rate, 8 data bits, 1 stop bit, and no parity ( xxxx,8,N,1).
    - c. When purchasing a cable, buy one with pins that are not fixed but can be configured.
    - d. Program Mode Entry.
      - 1) Once connected to the system hit the Return Key.
      - 2) Prompt will appear.
        - i) The Prompt shows the System time and date, and the Software Version. This is the best way to find out the software version without interrupting service.
      - 3) Enter the password.
      - 4) The System is ready to program.
      - 5) Refer to Figure 600-1 - Data Terminal Codes Cross Reference, the table provides a one to one cross reference of keystrokes, allowing digital terminal programming to be emulated on the ASCII terminal.
        - i) Plus (+) and Minus (-) proceeding the terminal entry may be used to toggle on/off enable/disable features.

ii) While in programming entering a question mark (?) will return the Remote Administration Key Definitions.

4. Data Base Programming Structure and Indications

A. Once the database is entered programming of attributes is facilitated using Data Field (FLASH or Program Codes) codes.

a. Data Fields are used as a method of Dividing the Database into Sections of Related Attributes, much like drawers within a file cabinet. Related items are grouped together and then an individual item is changed by making the proper program entry, much like accessing a file within the drawer and modifying some of the information within the file.

B. The Hold Key on the terminal is used to save programming entries.

a. Pressing hold writes information to the database and saves it. You have accessed your file in the cabinet, changed the data in the file, and now you are returning the file to its location in the cabinet and closing the drawer. The data is saved at that location until it is ready to be modified again.

b. If an error is made in data entry, do not press the Hold Key, simply re-enter the Data Field code or press the On/Off key or hang the terminal up.

C. Confirmations Tone

a. Confirmation tone is issued when a valid entry is made in the database programming mode.

b. Confirmation Tone has a frequency of 1471 Hertz and lasts a duration of 1.4 seconds, sounding only once.

D. Error Tone

a. Programming Error Tone is provided when an invalid entry is made while in the programming mode.

b. Programming Error Tone has a frequency of 1471 Hertz and a cadence of 0.2 seconds on / 0.2 seconds off repeated six times.

5. Beginning to Program.

A. Once the program mode has been entered.

a. Press the Flash button.

b. Enter the two-digit field number.

c. Enter customer Data.

d. Press hold and listen for either conformation tone or error tone.

e. Repeat the steps until all data is entered.

6. Initialization.

A. SYSTEM DATABASE MUST BE INITIALIZED WHEN THE SYSTEM IS INSTALLED OR WHEN THE DATABASE HAS BEEN CORRUPTED.

B. Do a Flash 80, Press Flexible Button Eight (8), and Press Hold. System will initialize and reset.

C. Customer Data Worksheets

- a. Prepare the worksheets prior to attempting programming.
- b. Save the sheets and update each time programming changes are made.
- c. Useful when programming because it contains most of the information necessary to program the entire system (Program Code, Button Map, Function, Format of Entry, Default Value). Very little supplemental information necessary to move around the system.

7. Database Upload/Download

A. System may be saved (downloaded) on a Personal Computer if a the database needs to be initialized due to corrupt data, a restore (upload) may performed.

a. As a suggestion, also do a Database Printout to a *log file* in the PC.

- 1) This is accomplished much in the same way as the database download. Instead of using *COMMA 86 W* from the terminal substitute a different log file name and use a *COMMA 85 I* instead.

B. The Parameters given are from Procomm Plus, Version 2.01 or higher (available from a software retailer). Other communications packages may be used, but it is important the they program is capable of having the parameters set to the listed values.

C. Communications Parameters

Items to Change	Change
<b>Parameters: Alt + P</b>	
Baud Rate	2400 Baud, N for Parity, 8 Bits, 1 Stop Bit
<b>Setup Options: Alt + S</b>	
<b>Terminal Options:</b>	
Item C: Soft Flow Control (XON/XOFF)	ON
<b>Protocol Options:</b>	
Item A: Echo Locally	OFF
Item D: Character Pacing	0
Item E: Line Pacing	0
Item F: Pace Character	0
Item I: CR Translation (Upload)	None
Item J: LF Translation (Upload)	None
Item K: CR Translation (Download)	None
Item L: LF Translation (Download)	None
<b>Protocol Options</b>	
<b>General Protocol Options</b>	
Item C: Abort xfer if CD Lost	NO
Note: Item C appears in Proccom Plus Versions 2.01 or Higher.	

**E. Download Instructions**

- a. Connect an RS232-C Serial Cable from the computer to an I/O port on the System.
- b. Load the Procomm Plus software on the computer. Update the parameters in Procomm Plus to the settings given above.
- c. Press the *ENTER* key on the computer. A prompt will display, requesting the system password be entered. Type the word *VODAVI* and press *ENTER*.
- d. On the keyboard press *COMMA 86 W*.
- e. On the keyboard press *ALT and then F1* key simultaneously. This will open a log file in Procmm Plus.
- f. Name the database and press enter.
- g. Press the *ENTER* key again to begin the download process.
- h. After the database is downloaded from the system, press the *ALT and then F1* key simultaneously. This will close the Log File.
- i. Enter *M* on the key board.
- j. Press *ALT and then X* key simultaneously to exit Procomm Plus.

**F. Upload Instructions**

- a. Connect an RS232-C Serial Cable from the computer to an I/O port on the System.
- b. Load the Procomm Plus software on the computer. Update the parameters in Procomm Plus to the settings given above.
- c. Press the *ENTER* key on the computer. A prompt will display, requesting the system password be entered. Type the word *VODAVI* and press *ENTER*.
- d. On the keyboard press *COMMA 86 Q*.
- e. Press *ENTER* on the key board.
- f. Press the *PGUP* key on the keyboard.
- g. Press the *A* key on the key board (selection of ASCII as the filetype).
- h. Type in the filename of the database which was downloaded and press *ENTER*.
- i. After the file upload has been completed press *M* and *ENTER*.
- j. Press the *ALT and then X* keys simultaneously, and press *ENTER*.
- k. After the Upload is completed the system **MUST** be reset for full activation.

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## STARPLUS 1428 Configuration

<u><b>BASIC KSU</b></u>
4X8
300 BAUD MODEM
1 DTMF RECEIVER
1 RS 232C I/O PORT
1 EXTERNAL PAGE PORT (1-WAY)
MUSIC ON HOLD INPUT
MUSIC ON HOLD ADJUSTMENT POT (R40)
SUPER CAPACITOR RAM BACKUP
POWER SUPPLY
1.5 AMP, 250 VAC SLO-BLOW FUSE
SYSTEM HEARTBEAT INDICATION (RED LED)
GROUNDING LUG (P3)
RESET BUTTON

<u><b>EXPANSION KSU</b></u>
4X8
1 EXTERNAL PAGE PORT (1-WAY)
POWER SUPPLY
1.5 AMP, 250 VAC SLO-BLOW FUSE
GROUNDING LUG (P3)

**Installs in the Basic KSU**

2x4 Expander Module OR  
 2x4 SLT Expander Module  
 Expansion I/O Module  
 1200 Baud Modem

**Installs in the Expansion KSU**

2x4 Expander Module OR  
 2x4 SLT Expander Module OR  
 4x8 Expander Module  
 1-DTMF Receiver Module

	CO PORTS	STATION PORTS	SYSTEM CONFIGURATIONS						
			4X8	6X12	8X16	10X20	12X24	12x24	14X28
Basic KSU	1-4	1-8	☒	☒	☒	☒	☒	☒	☒
2x4 Station or SLT Expander Module	5-6*	9-12*		☒		☒		☒☒	☒
Expansion KSU	7-10	13-20			☒	☒	☒	☒	☒
4x8 Expander Module	11-14	21-28					☒		☒

\* The ☒ indicates an installed component. If the 2x4 Station or SLT Expander Module is not installed in the Basic KSU and an Expansion KSU is installed, CO Ports 5-6 and Station Ports 9-12 can be re-assigned using flexible port assignment.

<u><b>2x4 SLT EXPANDER MODULE</b></u>
2 CO/CENTREX/PBX LINES (LOOP START)
FOUR STANDARD SINGLE LINE TELEPHONE (2500) PORTS
<u>NO EXTERNAL PAGE ZONE</u>
+ 5 VOLT DC AND -5VOLT DC INDICATIONS (GREEN LEDs)
RING GENERATOR INPUT (CABLE PROVIDED)
STANDARD MESSAGE WAITING INDICATION

**4x8 EXPANDER MODULE**

4 CO/CENTREX/PBX LINES (LOOP START)  
EIGHT DIGITAL STATION PORTS  
1 EXTERNAL PAGE ZONE PER CARD (1-WAY)  
+ 5 VOLT DC AND -5VOLT DC INDICATIONS (GREEN LEDs)  
TWO +12 VOLTS DC INDICATIONS (GREEN LEDs)  
GROUND WIRE (CONNECT TO LUG IN EXPANSION KSU)  
**ONLY** MOUNTS IN THE EXPANSION KSU

**2x4 EXPANDER MODULE**

2 CO/CENTREX/PBX LINES (LOOP START)  
FOUR DIGITAL STATION PORTS  
1 EXTERNAL PAGE ZONE PER CARD (1-WAY) (J2)  
+ 5 VOLT DC AND -5VOLT DC INDICATIONS (GREEN LEDs)  
+12 VOLTS DC INDICATION (GREEN LED)

**DTMF RECEIVER MODULE**

**(RM)**

PROVIDES ONE DTMF RECEIVER  
ONE MAY BE ADDED TO ANY 4X8 EXPANSION MODULE, 2X4 EXPANDER MODULE, OR  
2x4 SLT EXPANDER MODULE  
ONE RECEIVER WILL SUPPORT EIGHT SLTs WITH LIGHT TO MODERATE TRAFFIC  
INCREASE RECEIVERS WHEN VOICE MAIL OR AUTO ATTENDANT IS INSTALLED

**EXPANSION I/O MODULE FOR THE 1428**

**(IOM)**

MOUNTS IN THE BASIC KSU  
1 RS-232C I/O PORT (DB-25)  
1 RS-422 I/O PORT (RJ-14)  
♦ PROGRAMABLE OPTIONS  
300, 1200, 2400, 4800, 9600 BAUD

**1200 BAUD MODEM MODULE**

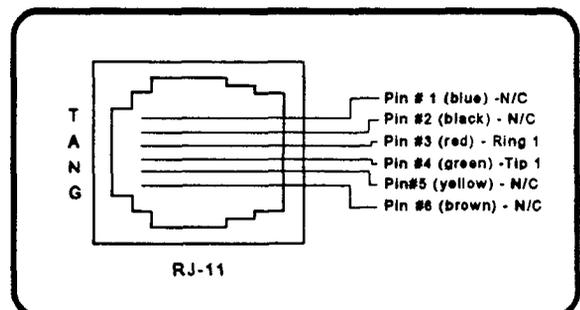
**(MM)**

MOUNTS IN THE BASIC KSU  
PROVIDES ENHANCED MODEM SPEED OF 1200 BAUD

## STARPLUS 1428 CONFIGURATION NOTES

### NOTES:

1. The Expansion KSU, 2x4 Expander Module, 2x4 SLT Expander Module, and the 4x8 Expander Module each may have one additional DTMF Receiver Module installed on the module, this yields a maximum system capacity of 4.
2. The Basic KSU, Expansion KSU, 2x4 Expander Module, 2x4 SLT Expander Module, and the 4x8 Expander Module each have Green LED indicators for +5 Volts DC and -5 Volts DC.
3. The Basic KSU, Expansion KSU, 2x4 Expander Module, and the 4x8 Expander Module each have Green LED indicators for +12 Volts DC (One per four Digital Key terminals).
4. The 2x4 and 4x8 Expander Modules have an External Page Port, this yields a maximum system capacity of 4 external page zones. All External Page Zones Are 1-Way! The 2x4 SLT Expander Module provides NO External Page capability.
5. All External Paging requires customer provided page amplifier, speakers and power supply for operation.
6. If a 2x4 SLT Expander Module is installed in the system it requires a Ring Generator (Tellabs 8101) be provided.
7. If Off Premise Extension (OPX) Modules are installed a -48 Volt DC Power Supply is required. Each OPX module consumes 500ma of current. To arrive at a current rating for a power supply Multiply the Number of OPX Modules by 0.5, this will equal the current rating, in Amps, of the -48 Volt dc power supply required.
8. If Relay Closure is Required for any application, an optional Relay Sensor Module (RSM) is required. The unit provides three relays and three sensing circuits. Relays are rated at 24 Vdc, 1 amp and require customer provided power supply.
9. Each OPX Module, RSM, or Digital Data Interface Unit requires one Digital Key Station Port for connection.
10. Additional I/O ports may be added using the IOM (1 RS-232C DB25, 1 RS-422 RJ-14 ).
11. If enhanced modem speed is required a 1200 Baud Modem Module may be added to the Basic KSU.
12. The Basic KSU, Expansion KSU, 2x4 Expander Module, 2x4 SLT Expander Module, and the 4x8 Expander Module each use RJ-11 Jacks for CO interface. The pinout is shown in the inset.
13. If Loop Supervision is provided by telco, and Loop Supervision is enabled on a CO Line which is engaged in conversation with an SLT Port, and the outside party disconnects the call. A Loop Supervision signal of 700ms duration will be provided to the connected SLT or device.



**STARPLUS 2856 CONFIGURATION**

**COMPONENTS NECESSARY FOR SYSTEM OPERATION**

Equipment Cabinet with Power Supply (KSU)  
Central Processing Board  
4x8 Key Station Interface Board **OR**  
4x8 SLT Interface Board

**ADDITIONAL SYSTEM COMPONENTS**

DTMF Receiver Module (RM)  
1200 Baud Modem Module  
Expansion I/O Module

**EQUIPMENT CABINET WITH POWER SUPPLY**

(KSU)

POWER SUPPLY  
ON/OFF SWITCH  
EIGHT CARDSLOT BACKPLANE  
GROUNDING LUG  
FERRITE KIT  
5AMP 250 VAC SLO-BLOW FUSE

**CENTRAL PROCESSING BOARD**

(CPB)

300 BAUD MODEM  
BATTERY FOR BACK-UP OF RAM MEMORY (J3)  
RESET BUTTON  
SYSTEM HEARTBEAT INDICATION (RED LED)  
+ 5 VOLT DC AND -5VOLT DC INDICATIONS (GREEN LEDs)  
MUSIC ON HOLD INPUT (RCA JACK)  
MUSIC ON HOLD ADJUSTMENT POT (R5)  
RS-232C INPUT/OUTPUT PORT (RJ-45)  
NO DTMF RECEIVERS ON CPB

**4x8 KEY INTERFACE BOARD**

(CKB)

4 CO/CENTREX/PBX LINES (LOOP START)  
EIGHT DIGITAL STATION PORTS  
1 EXTERNAL PAGE ZONE PER CARD (1-WAY)  
1 PROGRAMMABLE MULTI USE RELAY PER CARD  
RELAY STATUS LED INDICATOR  
CO LINE IN USE LED INDICATOR  
+ 5 VOLT DC AND -5VOLT DC INDICATIONS (GREEN LEDs)  
1 25 PAIR SHIELDED CABLE CURRENTLY PROVIDED

**4x8 SLT INTERFACE BOARD**

**(CSB)**

4 CO/CENTREX/PBX LINES (LOOP START)  
EIGHT STANDARD SINGLE LINE TELEPHONE (2500) PORTS  
**NO** EXTERNAL PAGE ZONE  
1 PROGRAMMABLE MULTI USE RELAY PER CARD  
RELAY STATUS LED INDICATOR  
CO LINE IN USE LED INDICATOR  
+ 5 VOLT DC AND -5VOLT DC INDICATIONS (GREEN LEDs)  
1 25 PAIR SHIELDED CABLE CURRENTLY PROVIDED  
RING GENERATOR INPUT  
STANDARD MESSAGE WAITING INDICATION

**DTMF RECEIVER MODULE**

**(RM)**

PROVIDES ONE DTMF RECEIVER  
ONE MAY BE ADDED TO ANY 4X8 CARD  
REQUIRED FOR DISA  
REQUIRED FOR SINGLE LINE TELEPHONES  
ONE RECEIVER WILL SUPPORT EIGHT SLTs WITH LIGHT TO MODERATE TRAFFIC  
INCREASE RECEIVERS WHEN VOICE MAIL OR AUTO ATTENDANT IS INSTALLED  
**NO** DTMF RECEIVERS ARE PRESENT UNTIL YOU ADD THEM

**EXPANSION I/O MODULE FOR THE 2856**

**(IOM)**

MOUNTS ON THE CPB  
1 RS-232C I/O PORT (RJ-45)  
1 RS-422 I/O PORT (RJ-14)  
♦ PROGRAMABLE OPTIONS  
300, 1200, 2400, 4800, 9600 BAUD

**1200 BAUD MODEM MODULE**

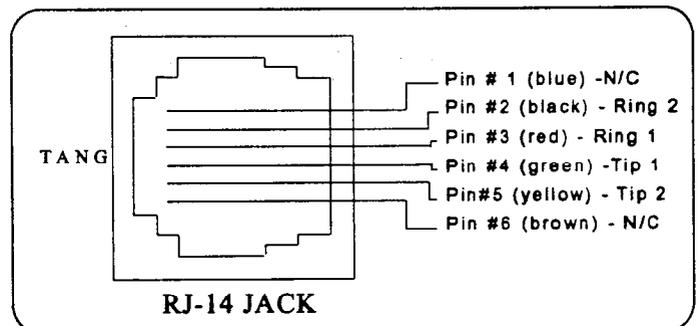
**(MM)**

MOUNTS ON THE CPB  
PROVIDES ENHANCED MODEM SPEED OF 1200 BAUD

## STARPLUS 2856 CONFIGURATION NOTES

### NOTES:

1. If the 4x8 SLT Interface Board (CSB) is used, at least one DTMF Receiver Module (RM) must be installed in the system. One module will support up to eight SLTs with light to moderate traffic.
2. If DISA is used at least one DTMF Receiver Module (RM) must be installed in the system.
3. The 4x8 SLT Interface Board (CSB) requires a ring generator be used with the board, a Tellabs 8101, 30Hz, 90 Vac Ring Generator may be used. Only one ring generator per system is required.
4. When using more than one 4x8 SLT Interface Board (CSB) in a system, make sure that both ring generator cables have identical polarity. Use a DVM to continuity check the cables to identify proper polarity.
5. The ferrite kit which comes with the KSU will support upto a 16x32 configuration (four 4x8 Cards), beyond this configuration an additional ferrite kit must be used.
6. The Ferrite kit must be properly installed to comply with FCC regulations (see installation manual for detatils).
7. There are two RJ-14s located on the front edge of each CKB and CSB they are used to interface the CO Lines to the system. The Pinouts for the jacks are shown in the inset .
8. Installation of the battery strap (J3) on the CPB is required for proper system operation.
9. If Off Premise Extension (OPX) Modules are installed, a -48 V DC Power Supply is required. Each OPX Module consumes 500ma of current. To arrive at a current rating for the power supply Multiply the Number of OPX Modules by 0.5, this will equal the current rating, in Amps, of the -48 volt DC power supply required.
10. Each OPX Module , RSM, or Digital Data Interface unit requires one Digital Key Station Port for connection.
11. If Loop Supervision is provided by telco, and Loop Supervision is enabled on a CO Line which is engaged in conversation with an SLT Port, and the outside party disconnects the call. A Loop Supervision signal of 700ms duration will be provided to the connected SLT or device.



## **STARPLUS DIGITAL SYSTEMS TERMINAL DEVICES**

### **DIGITAL TERMINAL DEVICES**

Enhanced Digital Terminal  
Executive Digital Display Terminal  
Basic Digital Terminal  
Digital Direct Station Selector/Direct Line Selector Console (DSS/DLS)  
SLT Adapter/Off Premise Extension Module (OPX)  
Relay Sensor Module (RSM)  
Digital Data Interface Unit (DDIU)

### **ADDITIONAL SYSTEM COMPONENTS**

Power Fail Transfer Unit (PFTU)

### **EXECUTIVE DIGITAL DISPLAY TERMINAL**

34 BUTTONS  
48 CHARACTER LCD DISPLAY  
12 DIAL KEY PAD  
28 FLEXIBLE BUTTONS\*  
ON/OFF BUTTON\*  
MUTE BUTTON\*  
SPEED BUTTON\*  
FLASH BUTTON\*  
TRANSFER BUTTON\*  
HOLD BUTTON\*  
SPEAKERPHONE  
SPEAKER VOLUME CONTROL  
RING VOLUME CONTROL  
H-T-P SWITCH  
DIRECTORY TRAY  
WALL MOUNTABLE  
K-STYLE HANDSET  
\*EACH HAVE A SUPER BRIGHT LED

**ENHANCED DIGITAL TERMINAL**

34 BUTTONS  
12 DIAL KEY PAD  
28 FLEXIBLE BUTTONS\*  
ON/OFF BUTTON\*  
MUTE BUTTON\*  
SPEED BUTTON\*  
FLASH BUTTON\*  
TRANSFER BUTTON\*  
HOLD BUTTON\*  
SPEAKERPHONE  
SPEAKER VOLUME CONTROL  
RING VOLUME CONTROL  
H-T-P SWITCH  
DIRECTORY TRAY  
WALL MOUNTABLE  
K-STYLE HANDSET

**BASIC DIGITAL TERMINAL**

12 DIAL KEY PAD  
8 FLEXIBLE BUTTONS\*  
ON/OFF BUTTON\*  
MUTE BUTTON\*  
SPEED BUTTON\*  
FLASH BUTTON\*  
TRANSFER BUTTON\*  
HOLD BUTTON\*  
HANDSFREE INTERCOM  
ON-HOOK MONITOR DIALING  
SPEAKER VOLUME CONTROL  
RING VOLUME CONTROL  
H-T-P SWITCH  
DIRECTORY TRAY  
WALL MOUNTABLE  
K-STYLE HANDSET  
\*EACH HAVE A SUPER BRIGHT LED

**DIGITAL DSS/DLS CONSOLE**

48 BUTTONS

EXPANDABLE TO 96 BUTTONS

WALL MOUNTABLE

EACH DSS/DLS REQUIRES A KEY STATION PORT FOR OPERATION

- **THREE MAPPING OPTIONS**

**MAP 1\*** - FIRST 14 CO LINES, 28 STATIONS, FIRST THREE CALL PARK LOCATIONS, RELEASE, ATTENDANT OVERRIDE, AND ALL CALL PAGE BUTTON.

**MAP 2\*** - 28 CO LINES, FIRST 14 STATIONS, FIRST THREE CALL PARK LOCATIONS, ATTENDANT OVERRIDE, AND ALL CALL PAGE BUTTON

**MAP 3\*** - STATIONS 114-155, CALL PARK LOCATIONS 223-225, INTERNAL PAGE ZONES 1-3

\*ALL BUTTONS EXCEPT CO LINE KEYS AND RELEASE KEYS ARE USER PROGRAMMABLE. PROGRAMMING USER KEYS WHICH REQUIRE LAMPING ONTO A DSS/DLS CONSOLE IS NOT PERMITTED.

**SLT / OFF PREMISE EXTENSION MODULES**

(OPX)

PROVIDES ONE LONG LOOP EXTENSION

REQUIRES A -48 VOLT DC POWER SUPPLY

INTERNALLY EQUIPPED WITH A DTMF RECEIVER

REQUIRES ONE DIGITAL TERMINAL PORT FOR OPERATION

PROVIDES ONE POWER FAIL TRANSFER CIRCUIT

**RELAY SENSOR MODULE**

(RSM)

**PROVIDES THREE PROGRAMMABLE RELAYS**

- LOUD BELL CONTROL, CO LINE CONTROL CONTACTS, RAN START CONTACTS, PAGE RELAY, POWER FAIL CONTACT

**PROVIDES THREE SENSING CIRCUITS**

- RAN STOP

REQUIRES ONE DIGITAL TERMINAL PORT FOR OPERATION

REQUIRES EXTERNAL POWER SOURCE TO DRIVE

EQUIPMENT OPERATED BY RELAYS

RELAY RATINGS ARE 24 VOLT DC, 1 AMP

**DIGITAL DATA INTERFACE UNIT**

**(DDIU)**

POINT TO POINT INTERNAL DATA TRANSMISSION  
(DATA INTERCOM)

**APPLICATIONS**

- ♦ **PRINTER SHARING, MODEM SHARING, EXTENDING SMDR  
OUTPUT OVER 50 FEET FROM THE KSU, SMALL FILE  
TRANSFERS**

**PROGRAMMABLE DATA RATES**

- ♦ **300, 1200, 2400, 4800, 9600, 19.2K, 38.4K BAUD  
DB-25 FEMALE SERIAL PORT**

**REQUIRES ONE DIGITAL TERMINAL PORT FOR OPERATION**

**POWER FAIL TRANSFER UNIT**

**(PFTU)**

12 TRANSFER CIRCUITS

- ♦ **WILL TRANSFER TIP AND RING OF TWELVE CO LINES TO  
TIP AND RING OF TWELVE SLT's IN THE EVENT OF A POWER  
OUTAGE, CO ARE RESTORED TO THE SYSTEM WHEN  
POWER RETURNS**

**REQUIRES 12 VOLT POWER SUPPLY FOR OPERATION  
TEST SWITCH**



**A to Z KELLATRONICS, Inc.**

**Tel: 800.766.3425**  
**email: info@kellatronics.com Fax: 818.773.8899**

# STARPLUS DIGITAL TERMINAL OPERATIONS

*CO Key*  
*CO Line*

## OPERATIONS

Flexible Button Programming  
H-T-P Switch  
Volume Controls

### FLEXIBLE BUTTON PROGRAMMING

♦ IF YOU HAVE BUTTONS ON YOUR TELEPHONE WHICH HAVE NOT BEEN ASSIGNED IN DATABASE ADMINISTRATION PROGRAMMING AS CO LINES, POOL GROUP, OR LOOP BUTTONS, THEY MAY BE USER PROGRAMMED AT THE TELEPHONE AS A FEATURE OR SPEED DIAL BUTTON. IF THE BUTTON WHICH YOU WISH TO CHANGE IS DESIGNATED AS A CO LINE POOL OR LOOP BUTTON, IT MUST FIRST BE MARKED AS A MULTI-FUNCTION BUTTON IN DATABASE ADMINISTRATION PROGRAMMING.

TO PROGRAM FLEXIBLE BUTTONS:

1. PRESS THE *SPEED* BUTTON TWICE.
2. PRESS THE ASSIGNED BUTTON TO BE PROGRAMMED.
3. DIAL THE DESIRED FLEXIBLE BUTTON PROGRAMMING CODE.
4. PRESS THE *ON/OFF* KEY TO END OR REPEAT STEPS TWO AND THREE TO CONTINUE PROGRAMMING ADDITIONAL BUTTONS.

TO ERASE FLEXIBLE BUTTONS:

1. PRESS THE *SPEED* BUTTON TWICE.
2. PRESS THE BUTTON TO BE ERASED.
3. PRESS THE *FLASH* BUTTON.
4. PRESS THE *ON/OFF* KEY TO END.

*Loopkey?*  
*Direct inco*  
*CO or CO G*  
*Transfer*  
*CO*  
*Pool Key*

### FLEXIBLE BUTTON PROGRAMMING CODES

100-155 STATION INTERCOM NUMBERS 22[C] CALL PARK LOCATION (system) 228 PERSONAL PARK 33[H] HUNT GROUP PILOT NUMBERS 0-7 44[V] VOICE MAIL GROUP PILOT NUMBERS 0-7 55[U] ACD/UCD GROUP PILOT NUMBERS 0-7 566 ACD/UCD AVAILABLE/UNAVAILABLE 567 ACD/UCD CALLS IN QUEUE DISPLAY 571 ACD AGENT LOGOUT 572 55[U] ACD AGENT LOGIN 573 ACD GROUP MEMBER STATUS 574 ACD AGENT HELP 575 ACD SUPERVISOR LOGOUT 576 55[U] ACD SUPERVISOR LOGIN 577 55[U] ACD SUPERVISOR QUEUE STATUS 601 ATTENDANT OVERRIDE 602 ATTENDANT DISABLE CO LINE ACCESS 603 CO LINE OFF-NET FORWARD 604 NIGHT SERVICE 620 CAMP-ON 621 LINE QUEUE 623 MESSAGE WAIT 624 CONFERENCE 625 EXECUTIVE OVERRIDE 626 LCR LINE QUEUE CANCEL 627 ACCOUNT CODE ENTER 628 OHVO 631 DO NOT DISTURB 632 BACKGROUND MUSIC 633[ZZ] PERSONALIZED MESSAGES 633 00 CLEAR PERSONALIZED MESSAGES	634 HEADSET MODE 635 ICLID DISPLAY (UNANSWERED CALLS) 640 ALL CALL FORWARD 695 DISTINCTIVE RING 70 ALL CALL PAGE (INTERNAL & EXTERNAL) 71 INTERNAL PAGE ZONE 1 72 INTERNAL PAGE ZONE 2 73 INTERNAL PAGE ZONE 3 74 INTERNAL PAGE ZONE 4 75 INTERNAL ALL CALL PAGE 760 EXTERNAL ALL CALL PAGE 76[O] EXTERNAL PAGE ZONE 1-7 76[P] EXTERNAL PAGE 1-7 77 MEET-ME PAGE ANSWER 9 LEAST COST ROUTING ACCESS #0 GROUP CALL PICK-UP #3 UNIVERSAL NIGHT ANSWER (UNA) [SPEED] YY SPEED DIAL ACCESS (STATION 00-19) (20-99 SYSTEM) [SPEED]+[*] SAVE NUMBER REDIAL [SPEED]+[#] LAST NUMBER REDIAL	YY = SPEED DIAL BIN NUMBERS ZZ = PERSONALIZED MESSAGES U = UCD/ACD GROUP NUMBER 0-7 C = CALL PARK LOCATION 0-7 H = HUNT GROUP NUMBER 0-7 V = VOICE MAIL GROUP NUMBER 0-7 P = EXTERNAL PAGE ZONE NUMBER 1-7
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*Group for outgoing only*  
*Assigned*  
*Key?*  
*Does not*

*Must be assigned as one of these 4 or it is user programmable*

### H-T-P SWITCH

♦ USERS MAY SELECT THE METHOD BY WHICH THEY RECEIVE INTERCOM CALLS AND SIGNALS.

#### OPERATION

♦ HANDSFREE (H) (LEFT POSITION ) - THE STATION USER, UPON HEARING A TONE BURST AND A VOICE ANNOUNCEMENT MAY REPLY HANDSFREE.

♦ TONE RINGING (T) (CENTER POSITION) - A STANDARD TONE RING NOTIFIES THE PARTY OF AN INCOMING INTERCOM CALL. THE CALLED PARTY ANSWERS BY LIFTING THE HANDSET OR MOVING THE SWITCH TO THE HANDSFREE POSITION OR PRESSING THE ON/OFF BUTTON.

♦ PRIVACY (P) (RIGHT POSITION) - THE STATION USER RECEIVES A BURST OF TONE AND A VOICE ANNOUNCEMENT OVER THE SPEAKER. THE MICROPHONE IS DEACTIVATED FOR PRIVACY. THE CALLED PARTY MUST LIFT THE HANDSET OR PRESS THE MUTE BUTTON TO REPLY.

AN OVERRIDE OF THE H AND P SWITCH POSITIONS IS PROVIDED FOR VOICE MAIL OR AUTO ATTENDANT TRANSFERS. TONE MODE RINGING BY BE FORCED BY DIALING 6# AND THE CALLED PARTIES EXTENSION NUMBER.

### VOLUME CONTROLS

♦ SEPARATE SLIDE SWITCHES ARE LOCATED ON THE FRONT OF THE DIGITAL TERMINALS TO CONTROL THE VOLUME OF VOICE AND TONE SIGNALS PRESENTED TO THE TERMINAL SPEAKER.

♦ THE SPEAKER VOLUME CONTROLS ALL VOICE SIGNALS PRESENTED TO THE SPEAKER I.E. SPEAKERPHONE CONVERSATION, BACKGROUND MUSIC, AND PAGE ANNOUNCEMENTS.

♦ THE RINGING VOLUME CONTROLS ALL TONE SIGNALS PRESENTED TO THE SPEAKER I.E. RINGING, CAMP-ON. MUTED RINGING WILL BE PROPORTIONATELY QUIETER THAN NORMAL RINGING, BASED ON THE SWITCH SETTING.