

GBPPR 'Zine



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- PPRB specifies the number of simultaneous requests to the PDSP for E911 data.
- PPMC specifies the control data block for the PDSP.
- PPMB specifies the number of message blocks for PDSP communications.

4.02 Each PSAP must have one or more attendant positions and E911 customer premises equipment must be available or installed if ANI display, ALI display, and/or central office transfer services are to be provided. For detailed information regarding E911 customer premises equipment planning, installation, and testing, refer to Part 6 A(2) through A(4).

4.03 Dedicated E911 incoming trunks (or message network trunks) from each local office in the E911 service area must be equipped and assigned. Dedicated E911 outgoing trunks to each PSAP must be equipped and assigned. Trunk circuits for an E911 network are discussed in paragraphs 3.02 through 3.05. For detailed information regarding the SD-1A165, SD-1A163, and SD-1A237 trunk circuits, refer to Part 6 B(29). Refer to Part 6 A(23), A(24), A(47), and B(16) for recent change procedures for equipping and assigning trunks.

4.04 If a PDSP is used to store the selective routing translations, the PIU feature package 9FPIU is required in the generic program. A processor interface frame and a 3A PDSP must be available or installed. For information regarding the processor interface frame and PDSP, refer to Part 6 A(19) and A(21).

4.05 Recent change procedures for adding, changing, or deleting E911 service without a PDSP are provided in Part 6 A(25). Recent change procedures and data base generation for PDSP E911 data are provided in Part 6 A(20). Recent change messages for E911 service are listed in Table I.

TRANSLATION FORMS

4.06 Translation forms used for the E911 feature are as follows:

- (a) **ESS 1101—Directory Number Record:** Each PSAP DN has the assigned route index, program index (PIND=3), ringing code, and terminating major class (TMAJ=3) data recorded on ESS 1101 form. The assigned route index is also entered on the ESS 1303C form.

Note: If a PSAP is provided central office transfer service, the dedicated PSAP trunk group must be a centrex tie trunk group with a screening LEN recorded on both the ESS 1101 and ESS 1208 forms. The PSAP also requires entries on the ESS 1109 form indicating CTI and CTU. The centrex tie trunk group also requires an entry on ESS 1107 form for the TDT service.

(b) **ESS 1107A—Supplementary Information Record:** Entries are recorded for PSAP DNs having night service and/or traffic busy forwarding. An entry is also recorded for a PSAP having central office transfer service.

(c) **ESS 1109—Centrex Group Record:** PSAPs with central office transfer service require entries for the CTI and CTU options. All PSAPs having such service(s) may be part of the same centrex group excluding any special dialing patterns. The access code(s) used for the selective and/or fixed transfer service options are also recorded.

(d) **ESS 1204—Trunk Class Code Record:** The trunk class data for the dedicated E911 incoming and outgoing trunks used for E911 service is entered on ESS 1204 form. Other standard forms used to record trunk data include the ESS 1201, ESS 1202, and ESS 1203 forms.

(e) **ESS 1209A—Trunk Group Tandem Record:** An entry is recorded for dedicated E911 incoming trunks.

(f) **ESS 1216A—Trunk Group Supplementary Record:** A type 17 entry is required for dedicated E911 incoming trunks and is optional for other trunks associated with E911. Any other trunk group that may have incoming E911 calls for which an ESCO number different from the ESCO on the ESS 1305 form is desired, must also have a type 17 entry.

(g) **ESS 1303B1—Trunk and Service Circuit Record:** Option number 4 is specified in this form for route index number 0112. This specifies an interrupted high tone for this RI. RI 0112 is the preferred next route index for route index number 0107.

(h) **ESS 1303C—Trunk and Service Circuit Route Index Record:** Entries are recorded for the dedicated E911 outgoing trunks to the PSAPs. The NXTRID, TGN, TROK, XMTYP, DEL NO, and

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prefix digit entries are also recorded. If the ANI display service is provided, MF is entered for the transmitter type.

(i) **ESS 1304—Rate and Route Chart:** Call type 22 is entered for E911 service. Regular routing (REGL) and charging (CHG=000) are entered for the chart and column assigned for 911 calls.

(j) **ESS 1305—Rate and Route Pattern Record:** The ESCO number for the E911 tandem office, the call type 22, and screening codes that result in a free or intercepted call are recorded on this form.

(k) **ESS 1313—Expanded 911 Emergency Service Central Office Record:** Entries are made on this record to associate an ESCO with an ESN. Entries recorded include the ESCO, NPD, NXX, 1000's digit, ESN, PDSP, and default ESN data.

(l) **ESS 1314 A/B—Expanded 911 Abbreviated Emergency Service Number Record:** Entries on this form are required when a PDSP is not used for E911 service and an entire thousands group is not served by the same PSAP. Entries are made for each DN in the thousands group to associate each individual DN with the proper ESN.

(m) **ESS 1315—Expanded 911 Primary Emergency Service Number Record:** Entries are made on this form to associate a 7-digit DN with each primary ESN. All PSAP DNs defined are recorded on the ESS switch 1101 form. Entries are also made for the ANI display and selective transfer options for each ESN.

(n) **ESS 1316—Expanded 911 Secondary Emergency Service Number Record:** Entries are made on this form to record and assign ETD (emergency transfer digits) for secondary PSAPs. Each primary PSAP DN with selective transfer can have up to six secondary PSAP DNs associated.

(o) **ESS 1500D—Office Option Record:** The maximum number of simultaneous intraoffice 911 call originations allowed for the E911 tandem office is entered on this form.

RECENT CHANGES

4.07 Standard recent change messages are used for E911 service to build the translations required for the trunks, trunk class codes, chart column, RI

expansion, rate and route pattern, and DN translations. No new messages are required for these standard types of recent changes. Unique RC messages are used for the E911 feature to build data for the ESCO translator, DN-to-ESN translator, and ESN translator. RC messages for E911 service are listed in Table I.

4.08 The ESN expansion for a 1A ESS switch with 1AE6 and later generic programs uses two new keywords (ESNLM and THGRP) for RC:TNESN. ESNLM is used to specify the ESN limit per number group. See Table G. THGRP specifies the office code and thousands group (number group) for which the ESN limit is to be increased. For detailed RC procedures, refer to Part 6 A(51).

4.09 Detailed RC procedures for E911 service using a 1 ESS switch are given in Part 6 A(25). Detailed RC procedures for E911 service using a 1A ESS switch are given in Part 6 A(32) and A(51). Detailed RC procedures and data base generation for E911 selective routing translations stored in a PDSP are given in Part 6 A(20). The RC procedures for the RC messages listed in Table I are described in Part 6 A(23) through A(36) and A(47) through A(53).

Testing

4.10 No special tests are used to verify that the E911 feature, per se, has been properly assigned. Recent change messages used to enter the various translation data are verified using the appropriate input messages as specified in the RC procedures referenced in Part 6A.

4.11 For E911 trunks, trunk maintenance test calls can be made to verify the dedicated E911 incoming and outgoing trunks as discussed in paragraphs 3.93 through 3.99.

4.12 After installation is complete, 911 calls can be made to assure proper routing to the various PSAPs and to verify optional PSAP services provided.

Other Planning Topics

4.13 The planning required for 911 service depends on the type of 911 service, B911 or E911, and the options required or desired by the 911 customer. General considerations for 911 service are discussed in paragraphs 2.27 through 2.52.

4.14 Special planning is required for the E911 feature since a DMS must be used to build and maintain

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the selective routing data base. The initial planning also includes consideration of the type of E911 tandem office arrangement to utilize. Telephone company considerations for the E911 network, DMS, and PDSP are discussed in paragraphs 2.81 through 2.96. Developing the DMS data base can require an extensive amount of effort and time. Therefore, the DMS should be considered a long lead-time item. E911 customer premises equipment and the PDSP should also be considered long lead-time items if they are to be provided.

4.15 Close coordination and cooperation are necessary between the telephone company and the E911 customer to establish and provide the services required for an E911 customer.

4.16 Customer training may be required for the use of the customer premises equipment and for attendant call handling.

4.17 The type of trunks to utilize from local offices to the E911 tandem office requires careful planning and close coordination to develop the desired E911 network. The types of trunks to utilize depends on each particular type of local office in the E911 service area and whether or not selective routing is to be provided.

4.18 If the E911 tandem office otherwise serves as a local office only, it is likely that the tandem reorder tone or announcement (fixed RI 184) is not assigned. For the E911 feature, fixed RI 184 should be assigned to an appropriate tone or announcement trunk group since incoming 911 calls to a busy PSAP without alternate routing will route to fixed RI 184.

4.19 Interrupted high-tone should be available for the E911 feature. Fixed RI 112 must route to a trunk group to the ringing and tone plant which supplies interrupted high-tone. Two or three trunks should be sufficient for this trunk group.

4.20 The PSAP E911 customer premises equipment provides for two E911 trunk circuits on one circuit board. Thus, if a circuit board fails, two dedicated E911 PSAP trunks may fail. If a trunk member fails, the E911 tandem office tries the call again using the next trunk member number. Therefore, the dedicated E911 PSAP trunk members should not be assigned consecutively.

4.21 At the E911 tandem office, 911 calls from facilities outside the E911 service area (for example,

FX lines) may be routed to an announcement, a regular station, or other desired termination. This can be accomplished by assigning an ESN in the selective routing translations (for all such FX lines). The ESN leads to a DN with an RI which routes to an announcement, station set, B911 PSAP, E911 PSAP, or other types of terminating facilities desired for such 911 calls.

4.22 Chart column screening can be used for local offices to restrict those lines which are not in the E911 service area, but which are served by a local office that is part of the E911 network. 911 calls from such restricted lines may be routed by the local office to an announcement, overflow tone, or intercept.

5. ADMINISTRATION

MEASUREMENTS

5.01 Standard trunk group measurements are available for trunks used for E911 service. Traffic and error counts are made for E911 trunks. Peg and usage counts are compiled for each dedicated E911 incoming trunk group on a per trunk group basis. Peg, usage, and overflow counts are compiled for each dedicated E911 outgoing trunk group on a per trunk group basis.

5.02 Office counts, available on the hourly H and C schedules and selected quarter hour DA15 and the S1, S2, S3 schedules, are compiled for the following types of ANI failures on dedicated E911 incoming trunks. The type measurement code for these measurements is 005.

(a) *Office Count 429—911 ANI Failure Digit Peg Count:* This count equals the number of times the ANI information digit is received indicating an ANI failure.

(b) *Office Count 430—911 ANI Time-Out Peg Count:* This count equals the number of times an 8-second time-out occurs prior to the reception of complete ANI information.

(c) *Office Count 431—911 ANI Format Failure Peg Count:* This count equals the number of times the received ANI information does not satisfy ANI format requirements.

(d) *Office Count 498—E911 Intraoffice Overflow:* This count is incremented by one each time an E911 tandem office locally originated 911

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call cannot be completed because the number of such calls exceeds the E911 intraoffice call limit as specified in the office options table.

(e) *Office Count 499—E911 Intraoffice Peg Count:*—This count is incremented by one each time a 911 call is originated locally at the E911 tandem office.

5.03 E911 traffic and error information is available via TTY output messages. The EN01 and EN02 output messages provide E911 error information. The EN03 output message provides E911 traffic information. These output messages may be selectively turned on or off from the maintenance TTY. Input and output messages are discussed in paragraphs 2.51 through 2.65. For detailed information concerning input and output messages, refer to Part 6 B(19) through B(22). Detailed information for traffic counts is provided in Part 6 B(23).

AUTOMATIC MESSAGE ACCOUNTING

5.04 With E911 service, a 911 call originated within the 911 service area is established without charge to the originating line, both coin and noncoin.

5.05 For central office transfer, standard billing to the PSAP billing TN is done for any E911 transfer call to the DDD network.

USOC (UNIFORM SERVICE ORDER CODES)

5.06 The E911 tariff contains two major groups of rate elements which are:

- (a) The five service offerings
- (b) The PSAP terminal equipment.

Table J lists the USOC codes for the service offerings. Table K lists the USOC codes for the PSAP terminal equipment. For tariff and pricing guidelines, refer to Part 6 B(13).

5.07 The E911 service offerings are available under a "network access" tariff structure with rates applicable per thousand main and equivalent main telephones within the E911 exchange area. Table L is a matrix providing a check list of the components used in developing the rate structure for the E911 service offerings.

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6. SUPPLEMENTARY INFORMATION

GLOSSARY

Attendant—A person, situated at a position (usually a console) on a customer's premises, who serves customer calls.

Attendant position—The equipment, usually a console from which calls requiring assistance can be answered and completed by the attendant.

CIL (Call indicator lamp)—An attendant console may be equipped with one or more CILs. A CIL is used to indicate to the attendant the nature or source of an attendant call. CILs may be optionally assigned according to customer requirements.

DMS (Data Management System)—The DMS is a system of manual procedures and computer programs used to create, store, and update the data required for selective routing.

Default routing—Default routing is provided when a 911 call cannot be selectively routed due to an ANI failure, garbled digits, or other causes which may prevent selective routing. Such 911 calls are routed to a default PSAP. Each E911 incoming trunk group is associated with a default PSAP.

ESN (Emergency Service Number)—The emergency service number is a number that defines the set of emergency services (e.g., police, fire, hospital) within a particular district or zone. An ESN is associated with a primary PSAP and possibly one or more secondary PSAPs.

Fixed transfer—Fixed transfer is an optional transfer service which enables a PSAP attendant to transfer a 911 call to a particular secondary PSAP by operating the button assigned on the 10A1-50 selector console for that particular secondary PSAP.

Forced disconnect—Forced disconnect is a standard service with the 911 feature which allows a PSAP attendant to release a 911 call even though the calling party has not hung up. This service is provided to prevent dedicated 911 PSAP trunks from being tied up.

FCLD (flash calling line display)—The FCLD is an optional arrangement for an ESN that will cause the ANI display to be flashed to indicate to the attendant

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that special attention (additional handling) may be required for the 911 call.

Incoming trunk—A trunk facility which is used to receive incoming calls from another switching location.

Municipality—A municipality is primarily an urban political unit having corporate or other recognized status with the power of self-government. As used within this document, a municipality may be a town, city, county, or any other recognized community, area, or district having certain governmental powers and authority.

Number group—A number group is a group of one thousand telephone numbers available in an office. The term "number group" is synonymous with the term "thousand group".

NPA (numbering plan area)—The NPA is the established area code for a particular area.

NPD (numbering plan digit)—The NPD (value from 0 to 3) specifies the NPA or area code. If nonzero, it is also the first digit displayed on the ANI display when provided.

Outgoing trunk—A trunk facility which is used to complete outgoing calls to another location or facility.

PSAP (public safety answering point)—A PSAP is an agency or facility designated by a municipality to receive and handle emergency 911 calls. A PSAP may be designated as primary or secondary, which refers to the order in which calls are directed for answer. Primary PSAPs receive 911 calls first; secondary PSAPs receive calls on a transfer basis only. PSAPs have also been generally referred to as ESBs (emergency service bureaus).

Selective routing—Selective routing ensures that a 911 call is routed to the correct primary PSAP which is designated to serve the calling station location. Selective routing is done at the E911 tandem office based on the DN of the calling station. Selective routing may be provided on a per office code, per number group, or per complete 7-digit DN basis.

Selective transfer—Selective transfer is an optional transfer service which allows a PSAP attendant to transfer a 911 call to the correct secondary PSAP by operating the button assigned on the 10A1-50 selector console for the particular type of secondary PSAP

desired. The E911 tandem office selectively transfers the call to the correct secondary PSAP assigned for the calling station.

REFERENCES

A. AT&T Practices

- (1) 231-090-287—Feature Document Universal Emergency Service Number 911 Feature Basic 911 Service
- (2) TOP (Task Oriented Practice) 533-400-001—E911 System Answering Point—Installation, Test, and Trouble Locating Procedures
- (3) 533-400-101—E911 System Answering Point—System Description Customer Premises System
- (4) 533-400-301—E911 System Answering Point Preinstallation and Planning Information Customer Premises System
- (5) 254-300-100—3A Processor Description—Common Systems
- (6) 254-300-110—3A Central Control (3A CC) Description—Common Systems
- (7) 254-300-120—3A Central Control (3A CC) Theory of Operation—Common Systems
- (8) 254-300-130—I/O Interfaces—Common Systems
- (9) 254-300-150—Main Store and Supplementary Store Description and Theory of Operation—Common Systems
- (10) 254-300-170—Tape Data Controller Description and Theory of Operation—Common Systems
- (11) 254-300-200—Programmed Magnetic Tape System Description and Theory of Operation—Common Systems
- (12) 231-144-005—Processor Interface Frame Description for Peripheral Data Storage Processor (PDSP)

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- (13) 231-144-101—Peripheral Data Storage Processor (PDSP) Initialization Description
- (14) 231-144-103—Processor Interface Unit Software
- (15) 231-144-301—System Initialization and Recovery Procedures—Peripheral Data Storage Processor (PDSP)
- (16) 231-144-303—Data Base Reallocation Procedures—Peripheral Data Storage Processor (PDSP)
- (17) 231-144-304—Updating Generic Program—Peripheral Data Storage Processor (PDSP)
- (18) 231-144-305—Tape Data Facility Operating Procedures—Peripheral Data Storage Processor (PDSP)
- (19) 231-144-306—System Growth Procedures—Peripheral Data Storage Processor (PDSP)
- (20) 231-144-360—Recent Change Procedures and Data Base Generation for E911—Peripheral Data Storage Processor (PDSP) and Data Base Description
- (21) 231-190-136—Feature Document —Interface With the Peripheral Data Storage Processor Feature
- (22) 231-090-079—Feature Document—Call Transfer Features
- (23) 231-118-323—Trunk Translation Recent Change Procedures for TG, TGBVT, TRK, and CFTRK, and TGMEM (CTX-6 Through 1E5 Generic Programs)
- (24) 231-318-303—Trunk Translation Recent Change Procedures for TG, TGBVT, TRK, CFTRK, and TGMEM (Through 1AE5 Generic Program)
- (25) 231-118-342—Recent Change Procedures for Expanded 911 (E911) Service, 1E5 Generic Program
- (26) 231-118-324—Rate and Route Translation Recent Change Procedures for NOCNOG, DNHT, NOGRAC, RATPAT, DIGTRN, TOLDIG, CCOL, RI, CHRGX, DITABS, TNDM, IDDD, and TDXD (CTX-6 Through 1E5 Generic Programs)
- (27) 231-118-325—RC Procedures for PSWD, GENT, PSBLK, SUBTRAN, (CTX-6 Through 1E5 Generic Programs)
- (28) 231-318-304—Rate and Route Translation Recent Change Procedures for NOCNOG, DNHT, NOGRAC, RATPAT, DIGTRN, TOLDIG, CCOL, RI, CHRGX, DITABS, TNDM, IDDD, and TDXD (Through 1AE5 Generic Program)
- (29) 231-318-305—RC Procedures for PSWD, PSBLK, SUBTRAN, and GENT (Through 1AE5 Generic Program)
- (30) 231-118-321—General Recent Change Information (CTX-6 Through 1E5 Generic Programs)
- (31) 231-318-301—General Recent Change Information and Rollback Procedures
- (32) 231-318-308—RC Procedures for DALNK, DAMBI, DAMSK, DATER, ESCO, ESN, and TNESN (Through 1AE5 Generic Program)
- (33) 231-118-335—Line Recent Change Procedures for LINE, TWOPTY, MPTY, SCLIST, MLHG, ACT, and CFV—CTX-7, CTX-8, 1E4, and 1E5 Generic Programs
- (34) 231-318-302—Line Recent Change Procedures for LINE, TWOPTY, MPTY, SCLIST, MLHG, ACT, and CFV (Through 1AE5 Generic Program)
- (35) 231-118-331—Centrex/CO ESSX-1 Recent Change Procedures for CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS (CTX-6 Through 1E5 Generic Programs)
- (36) 231-318-309—Centrex CO Recent Change Procedures for CTXCB, CTXCI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS (Through 1AE5 Generic Programs)
- (37) 231-120-301—Traffic Measurements
- (38) 780-402-210—Basic Trunk Tables —Wilkinson B and B Tables, Trunk Engineering, Network Operations Methods

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- (39) 231-061-210—Service Circuits—Network Design
 - (40) 231-062-210—Service Circuits—Network Design
 - (41) 476-270-001—2B ACD Business Services Traffic Engineering Automatic Call Distributing System
 - (42) 255-500-100—Data Management System (DMS) and Automatic Location Identification (ALI) System Used With Emergency 911 (E911), Description
 - (43) 255-500-101—Data Management System (DMS) and Automatic Location Identification (ALI) System Used With Enhanced 911 (E911), DMS/ALI Computer Operating Procedures
 - (44) 255-500-102—Data Management System (DMS) and Automatic Location Identification (ALI) System Used With Enhanced 911 (E911), DMS Operating Procedures
 - (45) 255-500-103—Data Management System (DMS) and Automatic Location Identification (ALI) System Used With Enhanced 911 (E911), ALI Operating Procedures
 - (46) 255-500-104—Data Management System (DMS) and Automatic Location Identification (ALI) System Used With Enhanced 911 (E911), DMS/ALI Acceptance Tests
 - (47) 231-048-303—Trunk Translation Recent Change Formats for TG, TGBVT, TRK, CFTRK, TGMEM, CCIS, and TKCONV (1E6 and 1AE6 Generic Programs)
 - (48) 231-048-304—Rate and Route Translation Recent Change Formats for NOCNOG, DNHT, NOGRAC, RATPAT, DIGTRN, CCOL, RI, CHRGX, DITABS, TNDM, IDDD, TDXD, and RLST (1E6 and 1AE6 Generic Programs)
 - (49) 231-048-305—RC Formats for PSWD, PSBLK, SUBTRAN and GENT (1E6 and 1AE6 Generic Programs)
 - (50) 231-048-307—Traffic Measurement Recent Change Formats for DIGTRN, TRFSLB, TRFLCU, TRFHC, TNCTX, CTRF, and NUTS (1E6 and 1AE6 Generic Programs)
 - (51) 231-048-308—RC Formats for AC, ACTABL, CUSTCB, DALNK, DAMBI, DAMSK, DATER, ESCO, ESN, SAC, TCM and TNESN (1E6 and 1AE6 Generic Programs)
 - (52) 231-048-309—Centrex-CO/ESSX-1 Recent Change Formats for CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS (1E6 and 1AE6 Generic Programs)
 - (53) 231-048-310—Recent Change Formats for ANIDL, CAMA, CFG, CPD, JUNCT, MSN, NMTGC, PLM, ROTL, SIMFAC, TMBCGA, CLAM, PUC, RSP, RSSCB, RCHAN, and LRE (1E6 and 1AE6 Generic Programs)
 - (54) 533-400-600—Engineering Considerations Business Services Traffic Engineering Enhanced 911 System.
 - (55) 231-390-385—E911 Bulk Recent Change Capability—Feature Document
 - (56) 231-302-301—E911 Bulk Recent Change Capability—Implementation and Maintenance Procedures.
- B. Other Documentation**
- (1) GL 73-04-203—Office of Telecommunications (OTP) National Policy for Emergency Telephone Number 911
 - (2) GL 73-05-121—Rate Considerations Involved In Providing Basic 911 Service
 - (3) GL 73-09-013—1 ESS Switch—Development of New Features for Universal Emergency Service Number 911
 - (4) GL 73-10-060—911 Emergency Service Recommended Rate Treatment of the 911 Emergency Service Trunk
 - (5) GL 74-04-149—1 ESS Switch—Development of New Features for Universal Emergency Service Number 911
 - (6) GL 74-12-121—911 Emergency Service—Additional Information on 911 CO Equipment Including No. 2 ESS Switch and Crossbar Tandem

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- (7) GL 75-05-039—8A Key Telephone System for Basic 911 Service
- (8) GL 76-03-292—Marketing of 911 Emergency Service
- (9) GL 76-09-034—Rate & Tariff Guidelines for the 8A Key Telephone System for Use With Basic 911 Service
- (10) GL 77-07-045—Operating Instruction Manual for 8A Key Attendant's Position
- (11) GL 77-09-023—Illustrative Tariff for Universal Emergency Number Service (Basic 911)
- (12) GL 77-09-171—Expanded 911 Emergency Service—System Description
- (13) SL 79-10-344—E911 (Enhanced 911) Service—Tariff and Pricing Guidelines
- (14) GL 77-11-200—Detailed Information on Conversion of Traffic Facilities Practices and Dial Facilities Practices to the Bell System Practices Series
- (15) GL 78-03-243—1/1A ESS Switch—Traffic Counts on 3-Ports
- (16) GL 78-09-279—Expanded Universal E911 (Emergency Number 911) System—Description and Ordering Guide
- (17) IL 80-04-346—Network Trunk Forecasting and Servicing Guidelines for E911 (Enhanced 911) Service
- (18) IL 80-08-367—E911 Network Planning Guidelines
- (19) Output Message Manual OM-1A001
- (20) Output Message Manual OM-6A001
- (21) Input Message Manual IM-1A001
- (22) Input Message Manual IM-6A001
- (23) Translation Guide TG-1A
- (24) Translation Output Configuration PA-591003
- (25) Translation Output Configuration PA-6A002
- (26) Office Parameter Specification PA-591001
- (27) Office Parameter Specification PA-6A001
- (28) Parameter Guide PG-1
- (29) Trunk and Service Circuit Engineering Specification J1A063A-1
- (30) Parameter Guide PG-1A
- (31) NPA-03510-02—Automatic Location Identification/Data Management System User Manual
- (32) NPA-03510-03—Data Management System Administrative Reference Manual
- (33) NPO-03510-01—Data Management System Operations Manual.

7. COMMENT FORM

7.01 A comment form is located at the back of this practice to provide a communications channel from the user to the writer.

8. ISSUING ORGANIZATION

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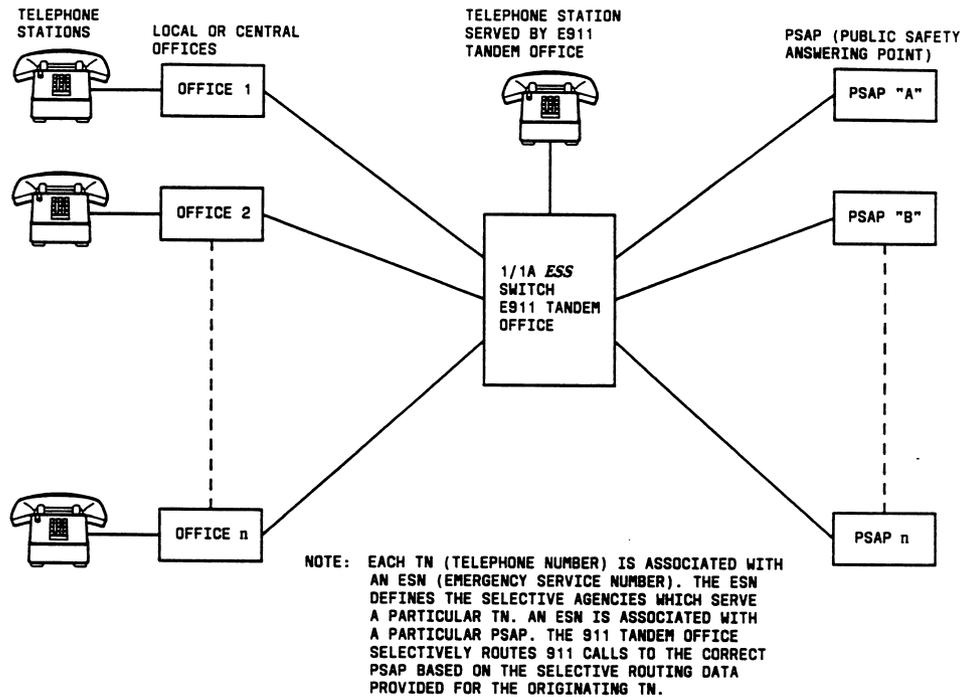


Figure 1—E911 Network Diagram

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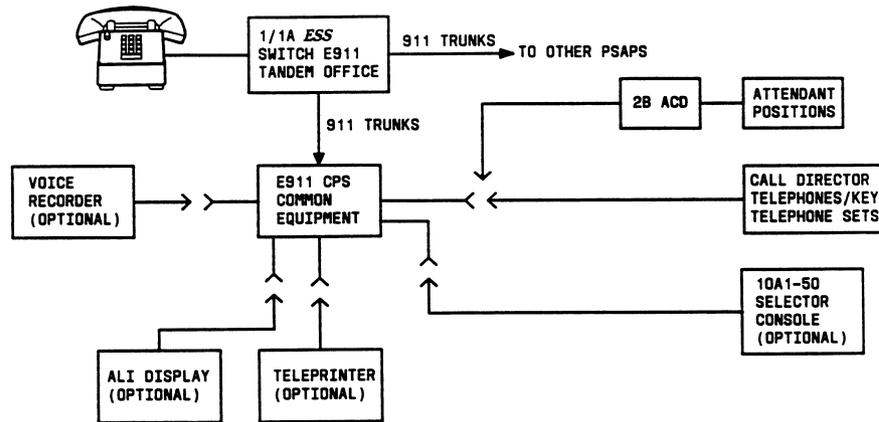


Figure 2—E911 Customer Premises System Interfaces

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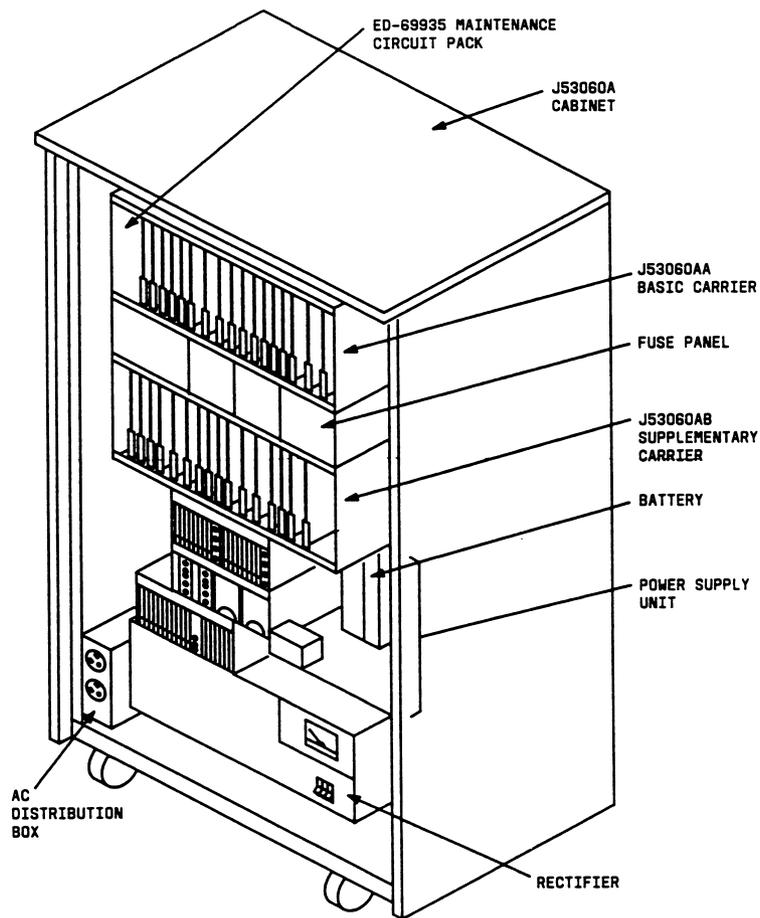


Figure 3—J53060A Equipment Cabinet

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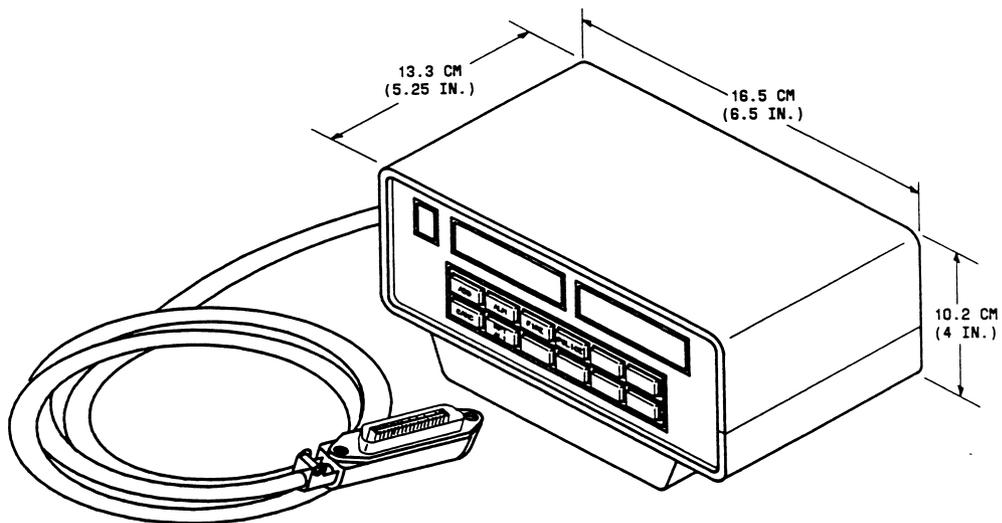
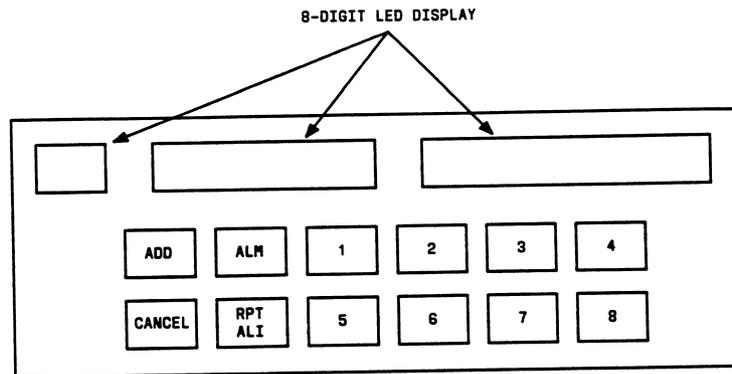


Figure 4—10A1-50 Selector Console

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KEY DESIGNATIONS/USES

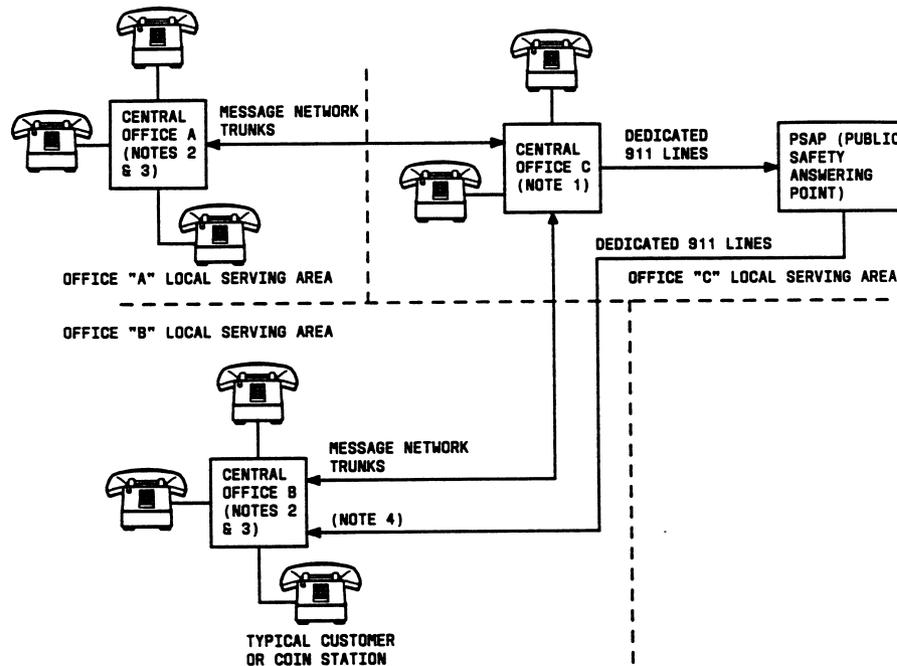
- ADD – USED TO REQUEST DIAL TONE FOR A MANUALLY DIALED TRANSFER USING TOUCH-TONE KEYS
- CANCEL – USED TO CANCEL A TRANSFER CALL
- ALM – USED TO RETIRE (TURN OFF) AN AUDIBLE ALARM WHICH SOUNDS WHEN CERTAIN E911 CPS TROUBLE CONDITIONS OCCUR.
- TRANSFER KEYS – THE EIGHT TRANSFER KEYS (SHOWN BY DIGITS 1 THROUGH 8) ARE ACTUALLY PLACARDED ACCORDING TO USE. FOR EXAMPLE, SELECTIVE TRANSFER KEYS ARE PLACARDED ACCORDING TO THE TYPE OF AGENCY (i.e. FIRE OR POLICE). FIXED TRANSFER KEYS ARE PLACARDED ACCORDING TO THE SPECIFIC AGENCY (i.e. FIRE A, FIRE B, POLICE A). ANY OF THE EIGHT TRANSFER KEYS MAY BE ASSIGNED AS EITHER SELECTIVE OR FIXED TRANSFER KEYS.
- RPT ALI – THE REPEAT AUTOMATIC LOCATION IDENTIFICATION KEY IS USED TO REGENERATE A REQUEST FOR ALI INFORMATION.

Figure 5—10A1-50 Selector Console Display and Key Arrangement

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NOTES:

1. CENTRAL OFFICE "C" MAY PROVIDE BASIC 911 EMERGENCY SERVICE FOR OFFICE "C" CUSTOMERS AND MAY ALSO SERVE AS A TANDEM SWITCHING CENTER FOR OTHER CENTRAL OFFICES PROVIDING 911 SERVICE WITHOUT DIRECT LINES TRUNKS TO THE PSAP.
2. CENTRAL OFFICES "A" AND "B" MAY PROVIDE BASIC 911 EMERGENCY SERVICE FOR THEIR CUSTOMERS BY EITHER PROVIDING DIRECT (DEDICATED) 911 LINES TO THE PSAP OR VIA MESSAGE NETWORK TRUNKS TO AN OFFICE PROVIDING TANDEM SWITCHING TO THE PSAP.
3. IF TANDEM SWITCHING IS PROVIDED FOR BASIC 911 PSAP ACCESS, CALLED PARTY HOLD, SWITCHHOOK STATUS AND EMERGENCY RINGBACK FEATURES CANNOT BE PROVIDED THE PSAP FOR THOSE CUSTOMERS SERVED BY TANDEM CONNECTIONS. THESE FEATURES CAN ONLY BE PROVIDED USING DIRECT (DEDICATED) 911 LINES.
4. CENTRAL OFFICE "B" MAY COMPLETE 911 CALLS VIA EITHER MESSAGE NETWORK TRUNKS OR DEDICATED 911 LINES (BUT NOT BOTH). THE TWO FACILITIES ARE SHOWN FOR COMPARISON ONLY.

Figure 6—Basic 911 Service

Universal Emergency Service Number 911 / #1A ESS

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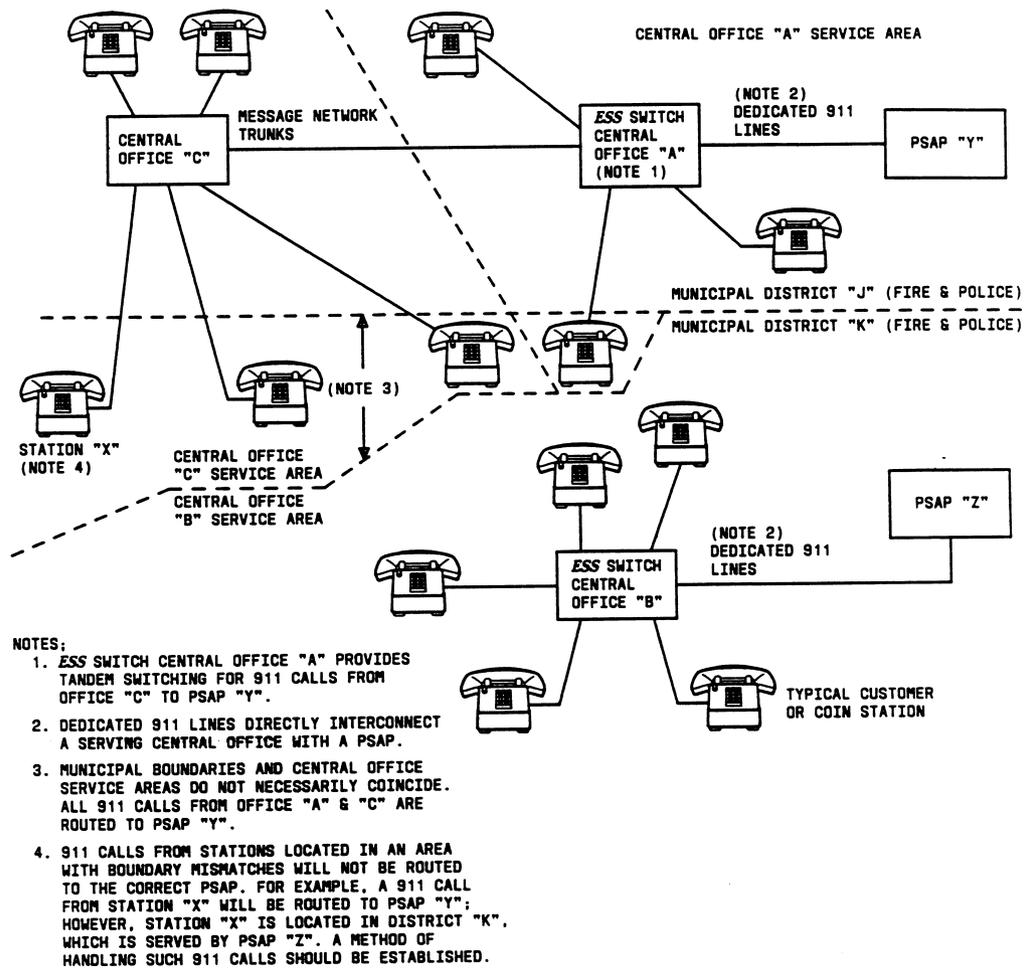


Figure 7—911 Emergency Service Boundary Considerations

Universal Emergency Service Number 911 / #1A ESS

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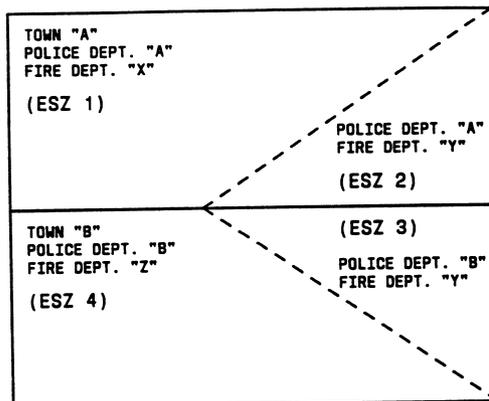
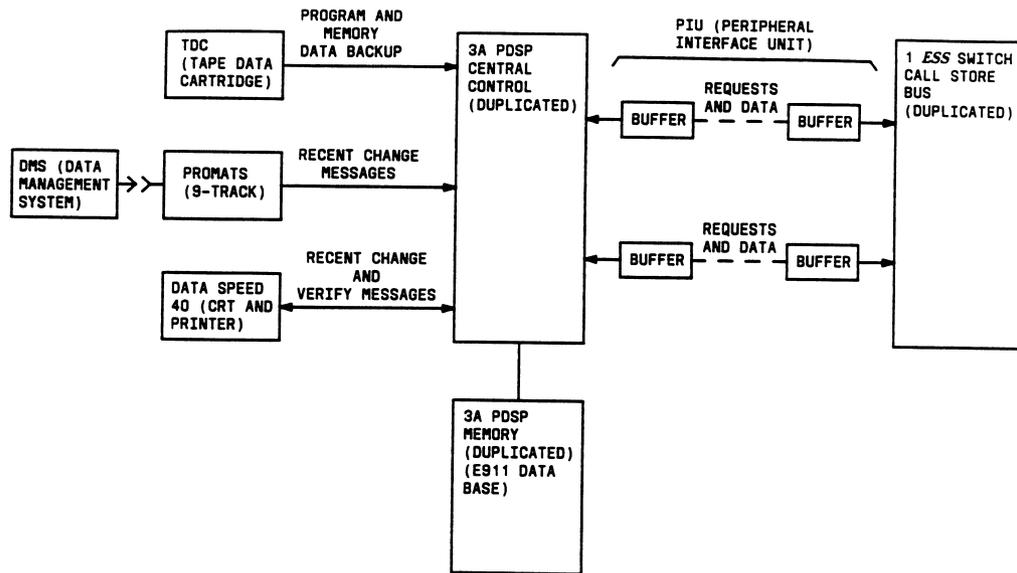


Figure 8—Emergency Service Zones

Universal Emergency Service Number 911 / #1A ESS

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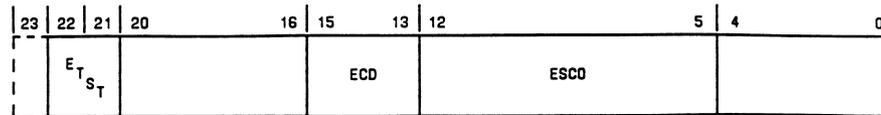
Note: The 3A data link capability is not used for E911 Service.

Figure 9—3A PDSP Interfaces

Universal Emergency Service Number 911 / #1A ESS

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NOTE: BIT 23 EXISTS IN 1A ESS SWITCH ONLY.

ETST – E911 TRUNK TEST CODE

- 0 = NO TEST CODES
- 1 = TEST CODE NOT FOLLOWED BY ANI
- 2 = TEST CODE ACCOMPANIED BY ANI
- 3 = UNASSIGNED

ECD – EMERGENCY CALL DIGITS

- 0 = UNASSIGNABLE
- 1 = DIGIT "1" FOLLOWED BY ANI
- 2 = DIGITS "11" FOLLOWED BY ANI
- 3 = DIGITS "911" FOLLOWED BY ANI
- 4 = ANI ONLY
- 5 = NO DIGITS AND NO ANI (I.E., MANUAL SEIZURE)
- 6-7 = UNASSIGNED

ESCO – EMERGENCY SERVICE CENTRAL OFFICE

Figure 11—Supplementary TGN Auxiliary Block Option Word Q

Universal Emergency Service Number 911 / #1A ESS

Enhanced 911 Service – Part 3

AT&T 231-090-288

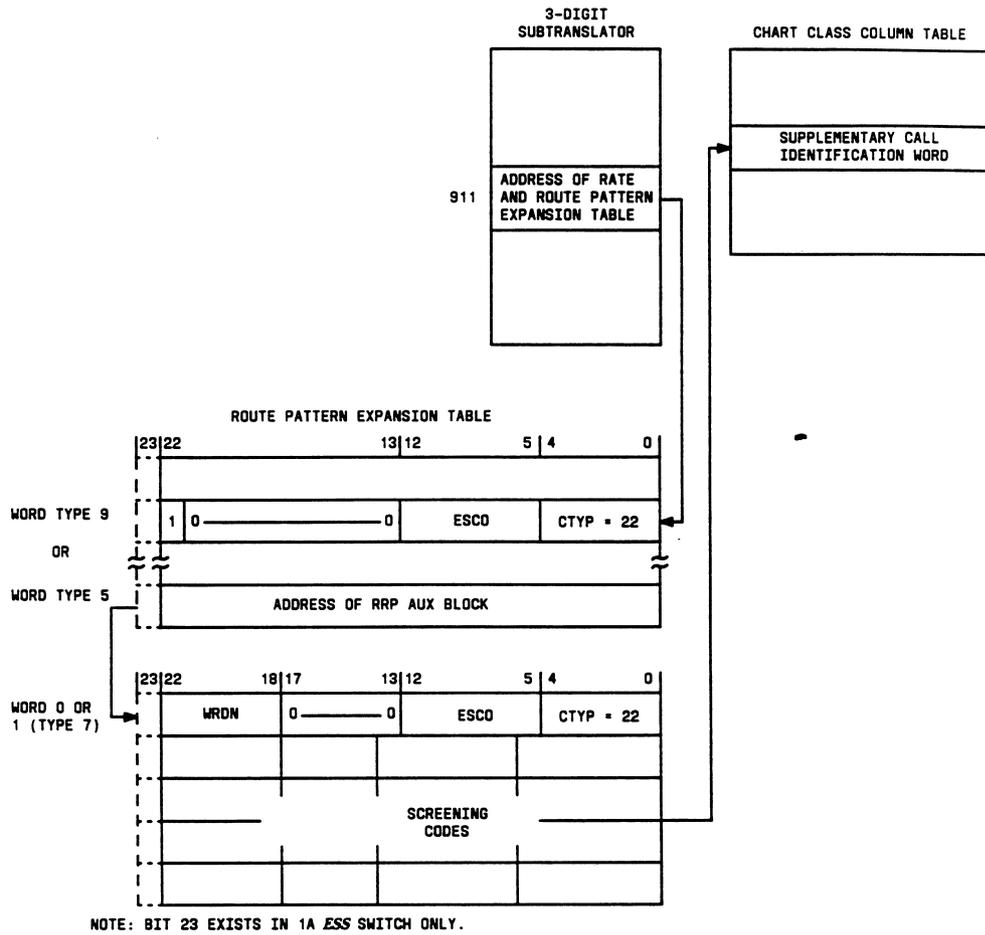
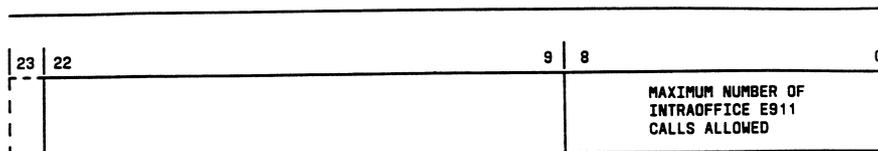


Figure 12—E911 Tandem Office 3-Digit Translation for 911

Universal Emergency Service Number 911 / #1A ESS

Enhanced 911 Service – Part 3

ISS 3, AT&T 231-090-288



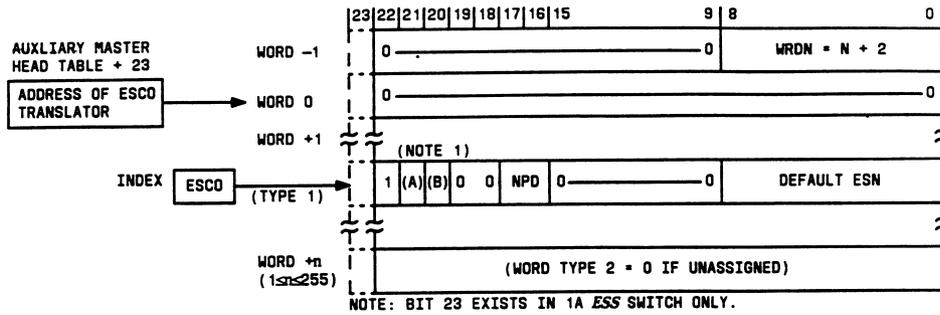
NOTE: BIT 23 EXISTS IN 1A ESS SWITCH ONLY.

Figure 13—E911 Intraoffice Choke Mechanism (Office Option Table Word 2)

Universal Emergency Service Number 911 / #1A ESS

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NOTES:

1. (A) EQUALS EPOSP ITEM.
(B) EQUALS ENO1 ITEM.
2. FCLD DATA IS CONTAINED IN THE ESN TRANSLATOR.

WORD -1 WRDN - NUMBER OF WORDS IN THE TRANSLATOR WHERE $1 \leq n \leq 255$.

WORD 0 - WORD 0 IS ALWAYS BUILT AS ALL ZEROS.

WORD 1 EPOSP - EMERGENCY PERIPHERAL DATA STORAGE THROUGH PROCESSOR ITEM IS SET (-1) IF A POSP IS USED FOR TN-TO-ESN TRANSLATIONS.

(TYPE 1) ENO1 - WHEN SET, ENO1 INDICATES FURTHER TRANSLATIONS ARE STORED IN THE 1 ESS SWITCH.

DEFAULT ESN - DEFAULT ESN ASSOCIATED WITH THE ESCO.

NPD - NUMBERING PLAN DIGIT ASSOCIATED WITH THE ESCO. THE FIRST DIGIT SENT TO A PSAP INDICATES NPD AND FCLD DATA AS FOLLOWS.

FIRST DIGIT SENT TO PSAP	NPD	(NOTE 2)
		FCLD
0	0	0
1	1	0
2	2	0
3	3	0
4	0	1
5	1	1
6	2	1
7	3	1
8	(FOR MAINTENANCE TEST CALLS)	

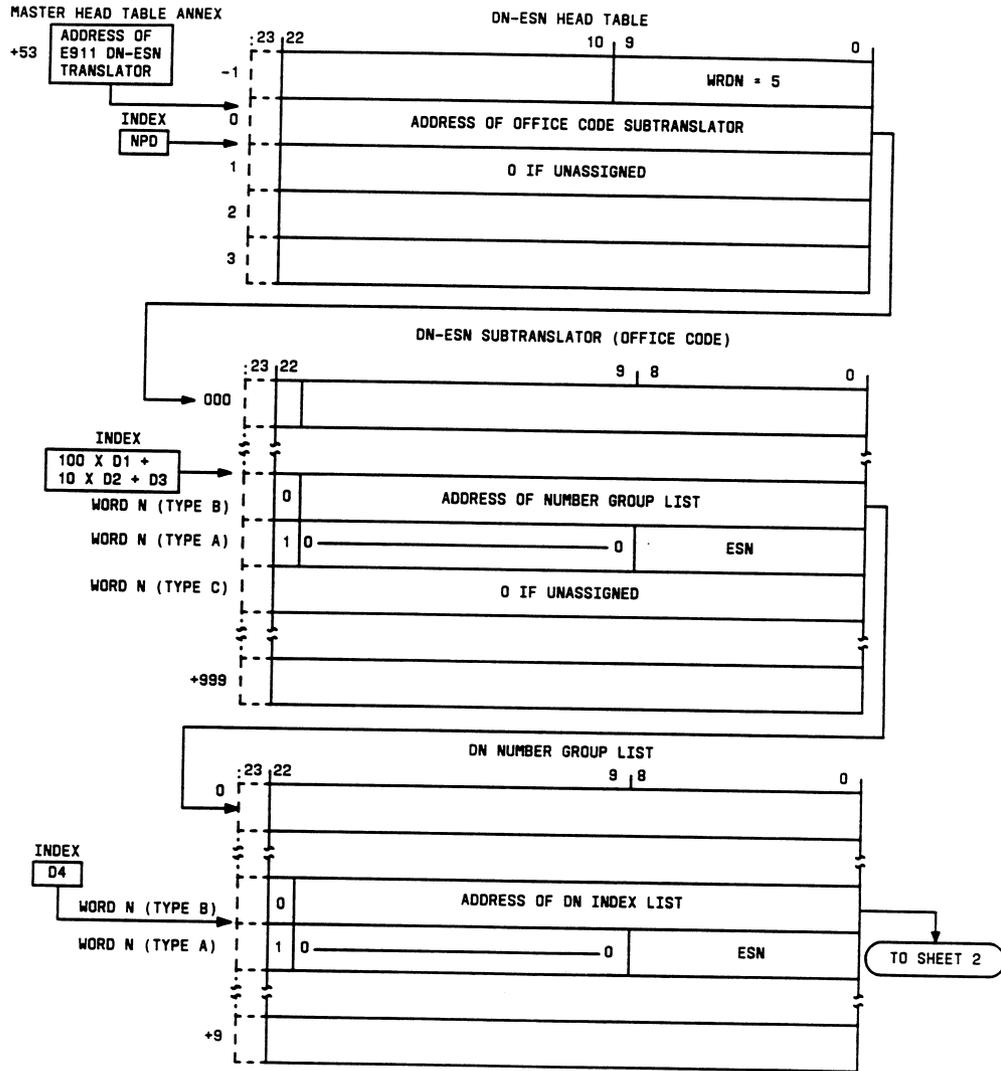
WORD n (TYPE 2) - TYPE 2 IS BUILT AS ALL ZEROS FOR ALL UNASSIGNED ESCOs.

Figure 14—ESCO Translator

Universal Emergency Service Number 911 / #1A ESS

Enhanced 911 Service – Part 3

ISS 3, AT&T 231-090-288



SEE NOTES AND LEGEND AT END OF FIGURE.

Figure 15—DN-ESN Translator (Sheet 1 of 3)

GBPPR Telephone Induction Tap

Overview

An inductive telephone tap is a device to surreptitiously intercept the audio on an analog telephone line without the need for any direct physical connection. This makes detection fairly difficult.

For instance, lets say you want to monitor a telephone line at the corporate office of *\$2600 Magazine* to make sure they are staying away from little boys...

You'd first locate their telephone line pair within a wiring closet, outside network interface, or in a terminal box somewhere downstream. Next, you'd slip the ferrite pick-up coil over only one of the two wires making up the telephone line pair. It can be either ring or tip, it doesn't matter. The reason you can only use one wire is that a telephone line pair is a *balanced* transmission line. This means that if the two wires where to pass through the same ferrite core, the out-of-phase signals would cancel each other! Now, due to real-world conditions, telephone lines are not perfectly balanced, but always try for a proper pick-up connection.

Wait for them to use the phone. When they do, the audio should be crystal clear. The *GBPPR Telephone Induction Tap* uses proper pick-up coil impedance matching and low and high pass filters to remove any static or hum from the audio signal.

Get your goods on Golddigger and then cancel that subscription. Free Kevin? No thanks...

Circuit Operation

This induction tap circuit varies dramatically from other common designs which appear on the Internet. The first major change is that the split-core ferrite pick-up coil is designed for an approximate 8 ohms impedance (@ 1 kHz). This is done by wrapping one side of the split-core ferrite with enameled 30-gauge magnet wire (Radio Shack part # 278-1345) until the inductance value measures approximately 1.3 μ H. Try to keep the wrapped wire "flush" with the inside of the ferrite core. If you don't have an inductance meter, try just wrapping about 100 turns or so. The exact model of the split-core ferrite can be quite critical. All Electronics, <http://www.allelectronics.com>, carries several varieties of "ferrite split beads with snap sleeves." Part numbers FB-53 or FB-48 look like they could work and those "suction cup" pick-up coils will work in a pinch. The ferrite pick-up core's output is wired as a balanced connection. You'll need to use a shielded two-line wire to connect it back to the audio preamplifier. Balanced microphone wire works wonderfully. Only connect the wire's shield to ground on the audio preamplifier side.

Next, that signal is fed into a 8 ohm to 1,000 ohm impedance matching transformer. This is designed to "step-up" the low-impedance of the pick-up coil for better matching to the first LM833 op-amp in the low-noise preamplifier circuit. Surprisingly, that impedance matching transformer is available from Radio Shack, part # 273-1380. The transformer's **RED** and **WHITE** wires are on the the "8 ohm" side and the **GREEN** and **BLUE** wires form the "1,000 ohm" side. The **BLACK** center tap wire is not used and should be cut off. The second op-amp of the LM833 is wired as a DC bias generator. This allows the LM833 to operate without the need for a negative voltage, which can add excess switching noise. A 100 kohm potentiometer controls the gain of the LM833, up to around 40 dB. The 220 pF capacitor rolls-off the LM833's high-frequency response.

After amplification, the signal is sent through a simple high-pass filter consisting of a series 0.1 μ F cap and shunt 5.6 kohm resistor. The signal is then sent to a Maxim MAX295 8th-order, low-pass

switched capacitor filter. The MAX295 is wired as a variable cut-off, low-pass filter with a maximum frequency of approximately 6 kHz. The MAX295 also naturally attenuates any 50/60 Hz induced hum. The MAX295's output routes through a 10 kHz low-pass filter to attenuate any high-frequency clock noise. A CMOS 555-timer (Radio Shack part # 276-1718) generates the MAX295's needed clock signals. The 555-timer should be CMOS for the best and most stable performance. A 10 kohm potentiometer controls the frequency of the 555's clock signals. They'll vary from about 30 kHz to up around 500 kHz. This corresponds to a variable low-pass frequency cut-off in the MAX295 from around 600 Hz to 10 kHz. Fiddle with the 555's 1000 pF timing capacitor to change the clock frequency.

The signal is then fed to a TL071 op-amp configured as a 300 Hz high-pass filter. This further attenuates any 50/60 Hz hum and any other low-frequency rumbles.

Finally, the signal is fed to a LM386 audio amplifier (Radio Shack part # 276-1731). The LM386 is only designed to drive low-impedance (8, 16 or 32 ohm) headphones or speakers. The 10 μ F capacitor across pins 1 & 8 of the LM386 is not needed if you only use headphones. To connect the audio output to a tape recorder, get another 8 ohm to 1,000 ohm impedance matching transformer and wire the 8 ohm side to the LM386's audio output and the 1,000 ohm side to the tape recorder input. Or tap the wiper of the 10 kohm volume pot directly, if you're so inclined.

Power is provided via a standard 9 volt battery. +5 VDC regulation is taken through a 78L05. -5 VDC is generated via a Maxim MAX660 voltage inverter. The MAX660 can source a higher output current and has a higher switching frequency, which is useful for this circuit.

Try to use 1% tolerance, metal-film resistors throughout the circuit. They offer the highest stability and lowest noise. Audio coupling capacitors and capacitors in the filters should be of film (polystyrene, mylar, etc.) dielectric. These are the "quietest" as they are not microphonic. Build the entire circuit into a metal box and always use a new, fresh 9 volt alkaline battery. Twist the wire leads from the potentiometers and audio output to reduce noise pick-up. Use a printed circuit board with a large ground plane and try to keep the input and outputs separated to avoid feedback oscillations.

Detecting an Inductive Phone Tap

Yes, you can detect an inductive phone tap. Physical inspection is always the best, but a device called a Time Domain Reflectometer (TDR) can also be used. This is a device which sends a series of fast-rising (picosecond) pulses down a wire, then monitors their reflection on an oscilloscope. Sort of like a hard-wired radar. Since the ferrite pick-up core is an inductor, the returned signal will be distorted, as some of the energy of the transmitted pulse is "absorbed" into the ferrite. To counter a TDR, place the tap after a loading coil placed on the telephone wire pair or use a *very small* ferrite pick-up core. Also, you can place a tone (milliwatt, tone sweep generator, etc.) on your telephone line and probe around the terminal box looking for the tone to show up on another pair or any other suspicious wires. If you were to call your local milliwatt plant test number and you heard that 1,004 Hz tone while scanning the airwaves with your Radio Shack scanner... well... that wouldn't be good.

Induction Coil from <http://www.militaryradio.com/spyradio/tsd.html>

This device, marked "F-371 IndCoil", is an audio wire tap, most likely intended for telephone lines. It is an inductive pickup, so does not require any direct connection to the signal wire. This makes it much more difficult to detect, and does not interfere with telephone operation in any way.

When clipped over the red wire on a traditional telephone line, and connected to a suitable preamp, it can efficiently monitor a conversation. Note that it is necessary to tap only one of the two signal wires – if both wires pass through the device, the signal is cancelled. The tap includes a square, closed armature that is opened by pushing a spring-loaded button. Two sides of the square have fine wire coils wound on them, connected in series.

Although this item formerly belonged to a CIA Technical Services Division (TSD) employee, veterans of TSD that were contacted do not recognize this particular model as a "stock" item. It may be a sample or prototype.

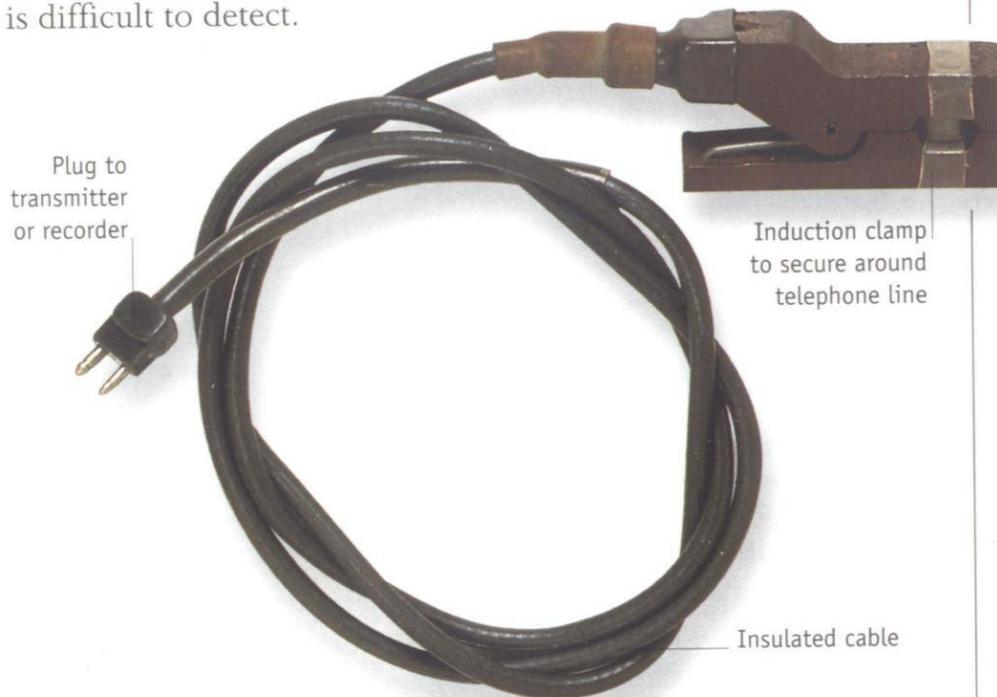


The wire-tapping device. Pushing the black button on the right side causes the armature to open so that it can be clipped over a wire. The oblong aluminum portion is a separate impedance matching transformer, marked "3.2" (ohms) on the input, and "1200" on the output. It has a 1/8" plug on the input side, and a matching jack on the output side.

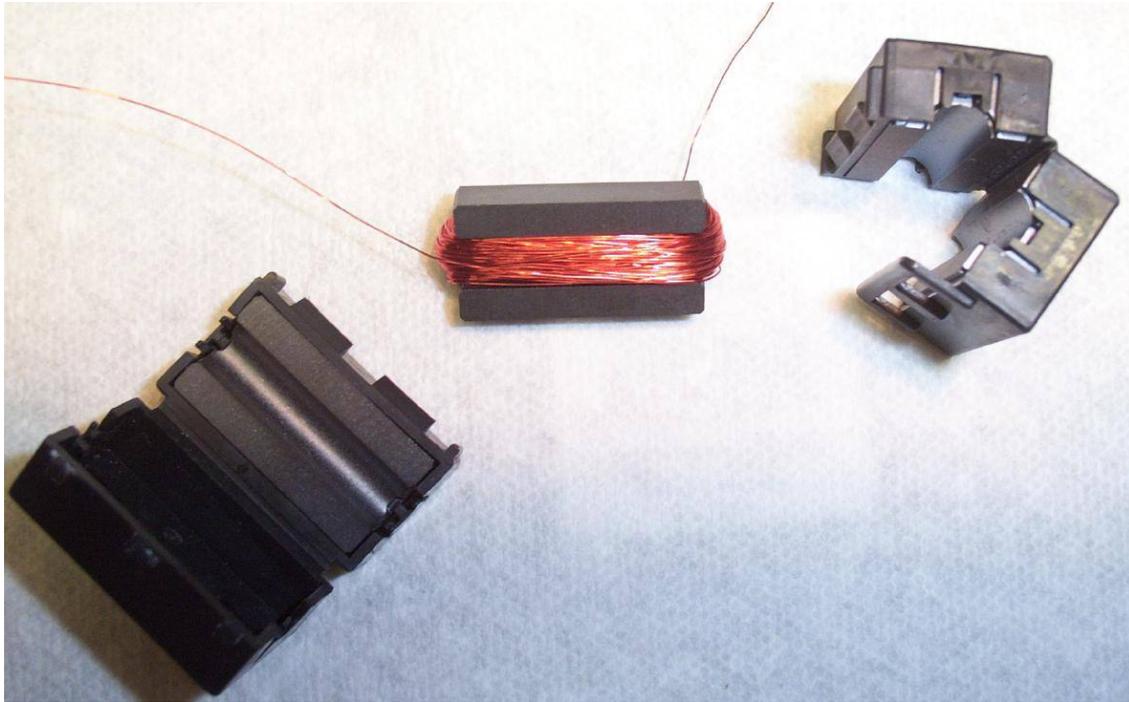
Induction Telephone Tap from H. Keith Melton's Ultimate Spy

Induction telephone tap

This device can be clamped onto any single-line external telephone cable and connected either to a transmitter or tape recorder. Both sides of the conversation can be received clearly. With no physical connection to the wire inside the telephone cable, the tap is difficult to detect.



Pictures



Examples of split-core ferrites. Center ferrite shows the necessary winding of the 30-gauge enameled wire. It measures approximately $1.3 \mu\text{H}$.



Test version. Each side of the ferrite core is epoxied to an arm of an adjustable clamp. The wiring routes along the sides of the clamp to a RCA jack.



Working version. The RCA jack was replaced with a piece of microphone wire connected to a 1/4-inch stereo plug. The 30-gauge windings go to the ring and tip of the 1/4-inch plug and the shield to the sleeve.



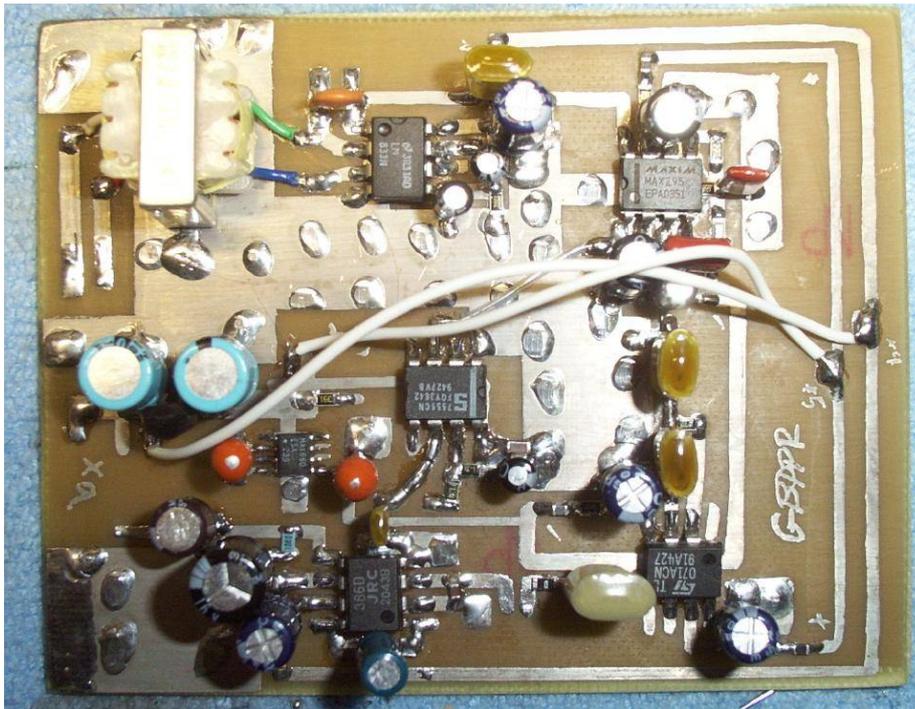
Closeup picture. Several layers of epoxy are used to build up and protect the wiring. The top ferrite core is epoxied directly to the clamp's arm, so it can't move.



Top, side view. Note the 30-gauge wire embedded in the epoxy.



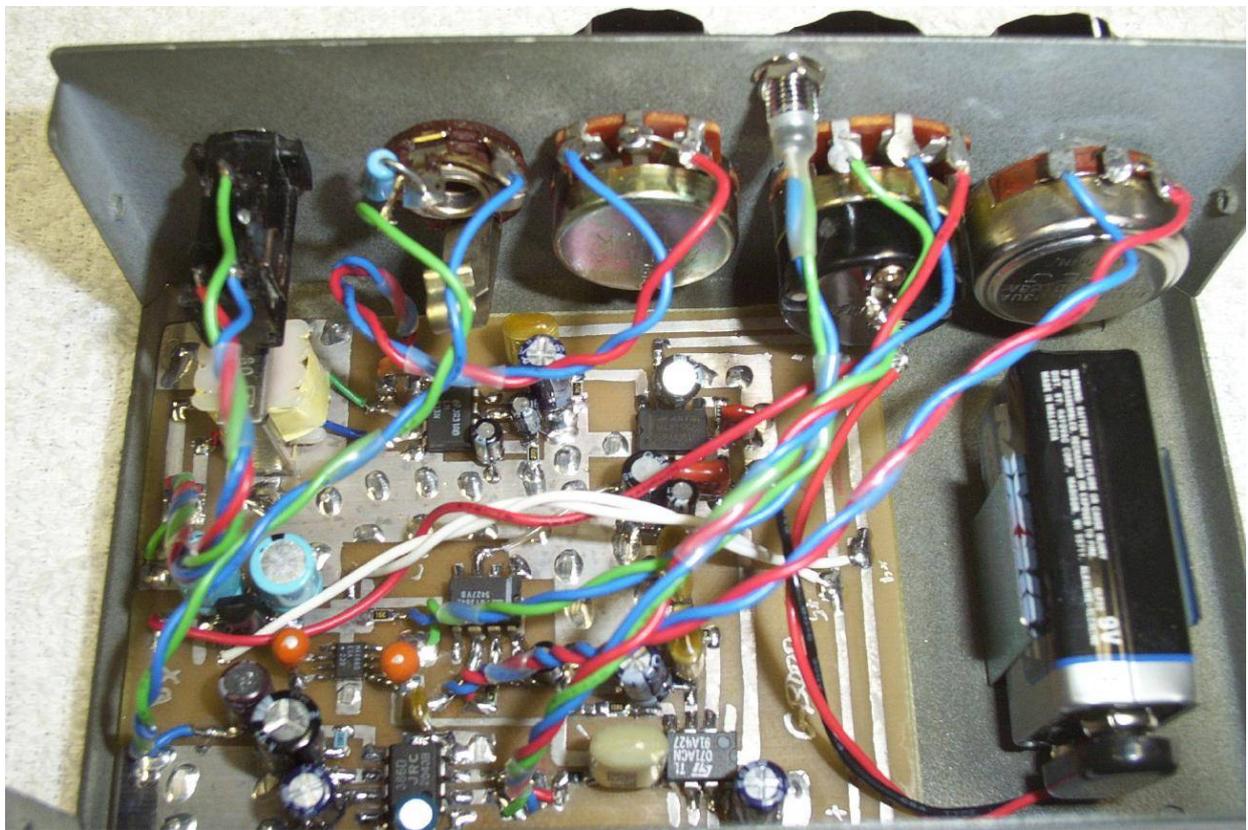
Closeup picture of the ferrite cores. The one on the left is adjustable, the one on the right is fixed. The white stuff on the 30-gauge wiring is Q-Dope to secure and protect the enameled wire.



Picture of the audio amplifier and filtering board. The impedance matching transformer is on the upper left, LM833 is to the right of the transformer. The MAX295 is then to the right of the LM833. Below the MAX295 is the TL071 op-amp. The large, yellow capacitors are polystyrene. To the left of the TL071 is the LM386. Above the LM386 is the CMOS 555-timer. The little IC to the left of the 555 is the MAX660. Inbetween the two blue electrolytic caps is the 78L05.



Front panel overview. It's an old printer switch case and is a tad too small, but works. **Fc** is the MAX295 frequency cut-off control, **VOL** is the volume control with an integrated on/off power switch, **GAIN** is the LM833's gain control pot. **OUT** is a 1/4-inch mono jack and **IN** is a 1/4-inch stereo jack. I have no idea what the green thing that looks like an LED is.



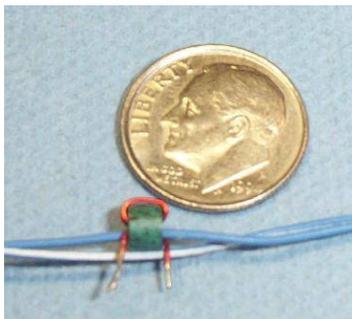
Internal view with everything connected. Use double-sided foam tape to mount the PC board. The normally closed contact on the 1/4-inch output jack has a 100 ohm resistor wired to ground. This prevents any circuit oscillation in case headphones are not connected while powered. Twist the wires to reduce noise pickup.



Test setup.



Test setup pick-up connection. Only one wire of the telephone line pair passes through the ferrite core. The adjustable clamp was spray painted for camouflage.



Yes Sparky... they get even smaller.

Lucent #5 ESS Routine Operations and Maintenance Procedures

Purpose

This *Routine Operations and Maintenance Manual* contains both descriptive material and detailed procedures for routine operations and maintenance of the Lucent #5 ESS switch. This manual covers the 5E2(2) through 5E8 software releases. As the #5 ESS switch continues to evolve, this manual will be reissued to cover future software releases.

This manual is primarily intended for telephone company personnel who schedule or perform routine maintenance for the #5 ESS switch.

Alarm System Management

General

The alarm system management is used to set or clear manual or automatic alarm release, to assign level and labels on scan points, and to provide alarm control.

Alarm Release

The critical and major alarms in an exchange can be released manually or automatically. When the alarm mode is manual, the alarms have to be released by pressing the **ALM RLS** function key at the Master Control Center (MCC) video terminal. If the alarm mode is set to automatic release, the alarms will be released in 5 seconds by the system.

Automatic or manual alarm release can also be activated by means of the menu commands 800 and 801 at the MCC Pages 105/106 – BLDG/POWER & ALARM CNTRLS. Minor alarms will be released automatically all the time, independent of the alarm release mode.

Alarm Level and Label Assignments

Alarm level and label assignments can be given to building or miscellaneous alarms. The assignments are shown at the MCC Pages 105/106 – BLDG/POWER & ALARM CNTRLS and Page 119 – MISCELLANEOUS ALARMS. The alarm level can be major or minor.

The label can consist of a maximum of nine upper-case characters, that is, letters, digits, spaces, plus, or minus signs. When a label has been assigned, the report data will show the old and new label. Once level and label are filled in, they are protected from loss when the system is booted.

Alarm Controls

Some alarms can be inhibited or allowed manually from alarm reporting. These alarms are as follows:

- Building power alarms
- External sanity power alarm
- Fan or fuse alarms of the Time Multiplex Switch (TMS) or the Message Switch (MSGS)
- Miscellaneous alarms

When a building power alarm is inhibited, the respective indicator at the MCC Page 105/106 will show the abbreviation "INH" in reverse video. Also the words "BLDG INH" in the SUMMARY

STATUS AREA will be backlighted. To inhibit or allow building power alarms, one can use the appropriate input message or the menu command (shown at the MCC Page 105/106).

The external sanity monitor power alarm indicator is shown at the MCC Page 116 – MISCELLANEOUS. Once the alarm is inhibited, the "INHIBIT" indicator will be in reverse video. Also this alarm can be inhibited or allowed by either the input message or the menu command at the appropriate MCC page.

The MSGS, TMS, and ONTC fan or fan fuse alarms can be inhibited by the system. When such an alarm is inhibited, this is shown at MCC Page 115 – COMMUNICATION MODULE SUMMARY. The reason an alarm will be inhibited is because the respective scan point is chattering. After solving the problem, the alarm can be allowed again by entering the input message:

If Man–Machine Language (MML):

```
ALW: ALM, MSGS=b;  
or  
ALW: ALM, TMS=b;  
or  
ALW: ALM, ONTC=b;
```

If Program Documentation Standard (PDS):

```
ALW: ALM, MSGS b!  
or  
ALW: ALM, TMS b!  
or  
ALW: ALM, ONTC b!
```

Where: **b** = Unit Number **0** or **1**.

The miscellaneous alarms can be allowed or inhibited manually by means of the appropriate input message or the menu command at the MCC Page 119 – MISCELLANEOUS ALARMS. When the alarm is inhibited, the "INH" indicator will backlight. Also the "INHIBIT" indicator of MISCELLANEOUS ALARMS at MCC Page 116 will be in reverse video. The miscellaneous frame fuse alarm can be inhibited by the system once the scan point is chattering. After solving the problem, the alarm can be allowed by entering the following input message:

If MML:

```
ALW: ALM, MFFUSE=b;
```

If PDS:

```
ALW: ALM, MFFUSE b!
```

Where: **b** = Miscellaneous Frame Fuse Unit Number **0** or **1**.

When this alarm is inhibited, the abbreviation "INH" is displayed in reverse video at the right of MISC FRAME FUSE ALARM.

File and File System Management

Introduction

Maintaining the file system includes the following:

- Checking the file system resources
- Manipulating files
- Using the file system audits
- File system corruption detection [System Integrity Verification (SIV)]
- Backing up and restoring file systems

General

This subject lists and briefly describes the input messages and reports used in managing files and the file system. These messages and responses are used in performing various actions such as reporting the contents of a file or directory and copying a file from an active disk to an offline or out-of-service disk.

The input/output messages are categorized according to the function performed on the file or file system and how they are used (type). The different functions and the corresponding tables are as follows:

- File System Control – *Table A*
- File Modification and Retrieval – *Table B*
- File Transfer and Backup – *Table C*
- Maintenance Tools – *Table D*

The three types of input/output messages are routine, troubleshooting, and permanent. Routine messages are used periodically to determine actual or potential troubles in the system. The troubleshooting messages are used to clear troubles and will not cause permanent changes to the system. The messages labeled permanent can cause permanent changes in the file structure or process structure of the system. Permanent messages should be used upon concurrence with the local technical assistance organization or as directed in a software update.

A detailed description of these input messages can be found in AT&T 235-600-700 (formerly, IM-5D000-01) and a detailed description of these output messages can be found in AT&T 235-600-750 (formerly, OM-5D000-01).

Checking File System Resources

The **REPT FS** output message warns that a file system is about to run out of space. Immediate action must be taken to provide more space in the file system. Contact your technical assistance organization to determine the files that can be removed to provide file system space (for example, software update history).

File system free space can be monitored and action can be taken before the free space is used up. The command **OP : STATUS : FREEDISK** reports the free space and free i-nodes in the mounted file systems. Monitor these numbers regularly to determine if space or i-nodes are being depleted.

Running the file system block audit may increase the free space in a file system if the audit finds lost resources that it can recover. Note that no error is reported when lost free disk blocks are recovered.

The allocation of disk space to contiguous files is limited to the size of the largest set of contiguous free disk blocks in the file system. In a fragmented file system, this may be considerably less than total free space. The compaction audit can be used to increase the size of the contiguous free disk space.

 File System Control - Table A

Message/Response Name	Type	Description
ALW:FSYS-ACCESS	Permanent	Changes access permissions of files.
ALW:FSYS-MOUNT	Permanent	Mounts an unmounted file system so that the system can access files in the file system.
CLR:FSYS-OWNER	Permanent	Changes the owner of a file. All operating system files are owned by root.
CLR:FSYS-DIR	Permanent	Removes a directory from the file system.
CLR:FSYS-FILE	Permanent	Removes a file from the file system.
COPY:FSYS-CFILE	Permanent	Copies a file to a contiguous area of the disk. Contiguous files are transferred from disk to main memory more quickly than regular files.
COPY:FSYS-FILE	Permanent	Makes another copy of a file in a different directory. The copied file has the same name as the original file.
IN:FSYS-DIR	Permanent	Creates a new directory in the file system.
OP:ST-DISKUSE	Troubleshooting	Reports the number of blocks contained in all files and directories within each specified directory or file name.
OP:ST-FILESYS	Routine	Lists all currently mounted file systems, the directory under which they are mounted, and the time they were mounted.
OP:ST-FREEDISK	Routine	Lists the mounted file systems with the number of free blocks and free i-nodes. Used to determine if file system space is being depleted.
OP:ST-LISTDIR	Routine	Reports the contents of a specific directory or file.
REPT:FILESYS	Troubleshooting	This autonomous report warns that a file system within the central processor is about to run out of space.

Note: The message/response names as presented in these tables are not intended to be typed into the system. These names are provided so the user can reference these messages in AT&T 235-600-700, *Input Message Manual*, and AT&T 235-600-750, *Output Message Manual*, for the correct syntax.

 -End-

File Modification and Retrieval - Table B

Message/Response Name	Type	Description
IN:F-APND-A	Permanent	Appends a line to an ASCII file.
IN:F-DEL	Permanent	Deletes one or more lines from an ASCII file.
IN:F-REPL	Permanent	Replaces lines in an ASCII file with user supplied lines.
DUMP:F-ALL	Troubleshooting	Prints the contents of an ASCII file on the Receive-Only Printer (ROP).
DUMP:F-DATA	Troubleshooting	Prints the contents of a file in the specified format.
DUMP:F-PARTL	Troubleshooting	Prints one or more lines of an ASCII file.

-End-

File Transfer and Backup - Table C

Message/Response Name	Type	Description
COPY:ACTDISK	Permanent	Copies a file from an active disk to an offline or out-of-service disk.
COPY:CPOOSF	Permanent	Copies a file from an out-of-service disk to an active disk.
COPY:CPSPDISK	Permanent	Copies a specific partition or a list of partitions from one of the system disks to an active spare disk.
COPY:PTN:ALL	Permanent	Copies one set of partitions into a corresponding set of partitions. This message is used to recover mutilated disk partitions from backup disk partitions and to generate partition backup copies.
COPY:TAPE-IN	Permanent	Copies files from a magnetic tape containing full or relative pathnames and header information, and places them in their respective directories. The message can also print a table of contents of the tape.
COPY:TAPE-OUT	Permanent	Copies one or more files to a magnetic tape along with relative pathnames and header information.

-End-

Message/Response Name	Type	Description
OP:ST-SUM	Routine	Calculates a checksum for a given file and prints the number of blocks in the file.
VFY:TAPE	Routine	Verifies the readability of information on system tapes and the consistency of corresponding hash sums.

 -End-

Copying Files to Nonactive Disks – Utility Requirements

The active/nonactive disk copy utility copies a file from an active to a nonactive disk. The file can be a regular file, a contiguous file (type C or x), or a block device file (type b which consists of a partition or a file system).

The use this facility, the user needs to specify the following:

- **The number of the destination disk:** This disk must be Out-of-Service (OOS) or Offline (OFL) and does not have to be a mate of the Active (ACT) disk.
- **The full pathname of the source file that exists on an ACT disk:** If the source is a regular or contiguous file, then this file must exist on a mounted file system.
- **The full pathname or number of the destination partition on the nonactive disk:** If a name is specified, then it must exist as a special device file on the active disk. If the source is a regular or contiguous file, then this partition must be a file system.
- **The pathname on the destination partition where the file is to be written:** If the destination pathname is not specified, then the pathname of the source file will be used. If the destination pathname starts with a "/", then the mount point will be excluded from it (destination pathname). It is not required that all directories in the pathname specified exist.

Emergency Dump

On disk, a partition is reserved for emergency dump. When there has been data written in this partition, an autonomous report (REPT EMERGENCY DUMP PARTITION FULL) will be printed. When data has been written in the emergency dump partition, the emergency dump status flag will be set. Due to the status flag, the previously mentioned report will be printed periodically. When the flag has been set, no other emergency dump can be written within the next 12 hours. Therefore, an input message is present to clear the status flag. This message must only be used when the dumped data has been saved. As soon as the status flag has been cleared, the emergency dump partition is marked empty. The message to clear the status flag is **CLR:EMERDUMP;**. Before saving the data, the status has to be investigated. This is done by means of the input message **OP:EMERSTAT;**. This will result in a report indicating on which disk, MHD 0 or 1, the data has been dumped, how many bytes have been written, and the hexadecimal address of each segment written. To save the dumped data, an emergency dump and be performed.

Log File Handling

General

Hardware and software errors will generate error reports. These reports will either be printed on the ROP, collected in the log file, or both. The message class of the report is decisive whether a report will either be logged, printed or both.

In software release 5E2(1), when there are reports of a certain message class, which are normally logged, the user can change the log option to log and print. This can be done by means of the input message **SET : LPS**. If there are reports of a message class, which have only the print option, the user can change those reports to print and log with the same message previously mentioned. To change the options to their original value, the input message **CLR : LPS , MSGCLS=ALL;** can be used. It is not possible to change a message class from the original print option to a log-only option or vice versa.

In software releases 5E2(2) through 5E7, the user can change the log or print option with the input message **CHG : LPS?**. This will direct the output to the DAYLOG file or print the data at the devices specified in the Equipment Configuration Database (ECD) for that message class. The **OP : LPS?** message can be used to determine the current log and print status of a message class.

On MCC display Page 110 – **SYSTEM INHIBITS**, the poke command 411 can be entered to set all applicable message classes to log and print.

Log files can be used to do the following:

- **Detect and correct transient errors:** Correctable memory errors can occur at an increasing rate over many days. This problem can be detected by studying the log file entries.
- **Determine a chronological order of events:** This can be done by putting entries from several log files together.

Log files are determined in the classdef and device forms in the ECD. All log files are located in the directory `/etc/log`, if 5E2(2) through 5E5, or `/var/log`, if 5E6 or later. The pathname for each log file is defined in the particular device form.

Size of Log Files

To prevent a file system overflow, the files are limited in size. When a log file is first created, the file will be called `XXXXX1`, where `XXXXX` stands for the log filename. When half of the disk space is used, the contents of `XXXXX1` is copied into `XXXXX0`, and the most recent information will be stored in `XXXXX1` again. When all disk space is used, the "1-part" is again copied into the "0-part" which will overwrite the old information by then and the "1-part" will be filled again with the most recent information. Each log file entry has time of day information, real-time clock values, and sequence numbers.

The log files must be dumped at regular intervals to avoid losing the contents of the files. It is advisable to dump the files once a day.

The available space in the log file for operations on recent change data, RCLOG, can be obtained by using the **OP : AVAILLOG;** input message.

Types of Log Files

There are several log files present in the exchange. Most of them are related to the Administrative Module (AM). *Table E* shows the log files related to the AM. *Table F* shows the log files related to recent change and equipment data an input messages.

Review of the Log Files Related to the AM - Table E

Log File	Description
CONFLOG	Configuration management log file. This file contains a record of each error detected in a hardware unit. Activation of storing the information in CONFLOG is done by the ALW:CNFLG message.
ERLOG	Error interrupt log file. This file contains Control Unit (CU) error interrupts, except memory related ones.
MEMLOG	Memory history log file. This file contains the supplementary data for memory error interrupts. This log file will be used to locate transient memory failures.
IODRVLOG	Input/output driver log file. This file contains the error reports associated with the input/output driver and disk driver.
PMLOG	Postmortem log file. This file contains the postmortem dumps.
SPLLOG	Spooler output log file. This file contains the Spooler Output Process (SOP) failure printouts.
SIMLOG	System integrity monitor log file. This file contains errors detected by the system integrity monitor, usually dealing with resource overload conditions.
CMONLOG	Maintenance monitor log file. This file contains a record of terminated and restarted maintenance interface processes.
DAYLOG	Daylog file. This file contains output messages from the AM as well as Switching Module (SM), Communication Module (CM), and other areas of the switch. It is used to debug software faults and has detailed information that is not required for routine office operation. This file is a binary file in 5E2(2) through 5E5, and an ASCII file in 5E6 and later. The method used to dump the file is dependent upon the software release.

-End-

Log File	Description
RCLOG	Operations on Recent Change (RC) log files. This files contains the changes made by operations on RC data. When an insert is made, the log file will contain the new data. When a deletion has taken place, the old data will be stored in the log file. To inhibit logging of operations on RC data, the command 612 at the MCC, Page 110 - SYSTEM INHIBITS, must be keyed in. Note that unlogged operations on RC data will be lost after a boot. When a RC log file reaches 100% in use, the major alarm will be set off and the LOG FILE FULL message will be printed on the ROP, indicating that the RC/Vs are locked out until a backup is done.
ECDLOG	Equipment configuration data log file. This file contains all the changes made in the equipment configuration database. The old as well as the new data will be kept.
CMDLOG	Command log file. This file contains all the input messages entered in the exchange together with the dialogue number and the person identity or the teletype number (dependent on the kind of authority chosen).

-End-

Log File Dumps

To preserve the log file information for later use, the contents of log files can be dumped. This can be done by using the **OP : LOG?** input message. With this input message, several options are provided to print a particular part of a log file instead of the whole log file. The keyword option or the type option can be used to look for transient errors. For example, if the maintenance person wants to retrieve only the error reports from the CONFLOG, the input message will be:

```
OP : LOG ; LG="CONFLOG" : TYPE=0291 , DEVICE="xxx" ;
```

If only the fault reports are required:

```
OP : LOG ; LG="CONFLOG" : TYPE=0801 , DEVICE="xxx" ;
```

must be entered. The **xxx** means the logical output device to which the output should be routed (for example, `rop0`). Refer to AT&T 235-600-700, *Input Message Manual*, for complete information about the **OP : LOG** command.

To dump the contents of the MEMLOG file, the input message **OP : MEMERRS** must be entered.

An entire log file can be dumped on tape for later investigation. This can be achieved by using the input message: **OP : LOG?**

Use of the Day Log File

The day log file is kept for the manufacturer to locate severe software faults. The contents of this log file have a hexadecimal format in 5E2(2) through 5E5 software releases, and an ASCII format in 5E6 and later software releases. The maintenance person in the exchange can make a dump of this log file, if necessary, by using the appropriate input message for the software release installed.

Dump of Day Log File – 5E2(2) through 5E5: A dump of this log file can be made using the **DUMP : DAYLOG?** input message for the day log file of the AM or for a particular switching module.

The size of the day log file is such that in normal operations the log file will be able to contain all logged information for that day. When an entry is overwriting another entry which is less than 24 hours old, a minor alarm will be generated. This alarm is also called the 24 hour log lost alarm. The day log file can be inhibited by means of command 608 on MCC Page 110 – **SYSTEM INHIBITS**. If this command is used, no 24 hour log lost alarm will be generated when an entry is overwritten within 24 hours.

When an entry is made, an autonomous report will indicate how many and what kind of reports are entering the file.

Dump of Day Log File – 5E6 and Later: A dump of the day log file can be made using the **OP : LOG?** input message described previously in the "Log File Dumps" section.

Hourly Plant Reports

The hourly plant report contains data regarding originating, incoming, terminating and outgoing calls, call connect setup troubles, and reflects the maintenance effect on traffic during the past hour.

If enabled, the hourly plant report is automatically printed. It can be enabled by using the **ALW : PLNTHR** input message. It can also be requested at any time. The **OP : PLNTHR** input message can be used to print the last complete hourly plant report. The **INH : PLNTHR** input message can be used to inhibit the printing of the hourly plant report.

The report is sent to the MCC, the SCCS, and the SCCS/NAC channel.

For more detailed information on the hourly plant report, refer to AT&T 235–070–100.

24 Hour Plant Report

The 24 hour plant report contains data regarding originating, incoming, terminating and outgoing calls, call connect setup troubles, and reflects the maintenance effect on traffic during the past 24 hours.

The 24 hour plant report is generated and issued by the #5 ESS switch once–a–day at 02:00:00 or 02:07:00 [software release 5E2(2)]. The report is sent to the MCC, the SCCS, and the SCCS/NAC channel and is saved for the next 24 hours to fulfill requests.

For more detailed information on the 24 hour plant report, refer to AT&T 235–070–100.

Program Update

Program update is the process of activating orderly program changes in the switching equipment software. The changes are made to a particular software release and/or software release issue to solve a system problem.

The types of program updates available are as follows:

- Software Update
- Emergency Fix

Software Update

General

In-service offices receive most official software changes in the form of software updates. The software update originates as a fix for a problem within the software release.

Four external interfaces are employed to provide for the generation, distribution, and activation of software updates. These interfaces (*Figure 1*) are as follows:

Programmer Support System (PSS): The PSS originates software updates. After a software update has been assembled, tested, and approved at the PSS, a software update identification number is assigned. The software update is then transmitted to the Software Change Administration and Notification System (SCANS) for distribution.

SCANS: The SCANS is an AT&T time-shared computer system for orderly software update distribution. Maintenance personnel who subscribe to SCANS may access SCANS daily to receive and record the software updates. The SCANS also lists any software updates that have been canceled or changed. Refer to AT&T 190-306-010 and PA-591152 for SCANS procedures. For Switching Control Center System (SCCS) application, see PA-1P139, Section 12.

SCCS: Using a 1200-baud dial-up terminal, the SCCS has the capability of remote software update activation. The SCCS accesses SCANS and triggers the delivery of a software update using the program update subsystem. Then the received software update is remotely activated from the SCCS via the maintenance channel.

CSCANS: Another external interface which provides for the distribution of software updates only in offices that are so equipped is the Customer Service Computer Access Network System (CSCANS) interface. The CSCANS is a Regional Bell Operating Company (RBOC) owned and operated computer system for automated software update distribution. Subscribing offices may access CSCANS to receive software updates.

Under normal operating conditions, the software update distribution point is SCANS. However, in an emergency (such as a SCANS outage), a software update can be transmitted from the PSS over a data link directly to an office. Maintenance personnel at the SCCS or local office must make a verbal request to the Regional Technical Assistance Center (RTAC). The field update coordinator then sets up an emergency data link from the PSS to the switch and manually transmits the software update (after maintenance personnel have primed the switch for reception of the software update files). Procedures for activating the software update are not altered.

The software update activation responsibility between AT&T and the Operating Telephone Company (OTC) is as follows:

- During preturnover (new office), retrofit, and restart intervals, the installer is responsible for obtaining and activating all applicable software updates which apply to that office.
- At all other times in a working office (when not in a retrofit or restart mode), the OTC is responsible for obtaining and activating all applicable software updates.

Software Update Format

The software update format, illustrated in *Figure 2*, consists of at least four files:

Header File: The header file contains the necessary information for maintaining the integrity of the software update. The information consists of the software update number, software release(s) affected, sequence number, name, size, and checksum of each file in the software update. This information is used by the verification process to verify each software update before activation.

Message File: The message file contains the commands necessary to install the software update, plus any special instructions required. *Figure 3* shows an example of a PDS message file.

Binary Update File(s): The binary update file contains the binary data for a file targeted for the update. For nonkillable processes, these take the form of minimal object (.m) files. For killable processes, these are updated object files for target processes.

The SCANS Information File: The SCANS information file contains the software update number, software release(s) affected, general descriptive information, name, and size of each file to be updated, associated software update(s), Customer Assistance Request (CAR) numbers, and the name of the person to contact in case of trouble.

SCCS and Master Control Center Interface

The software updates are normally activated remotely by the SCCS. Communication between the SCCS and the program update subsystem is over the maintenance channel. The local office can be unattended.

Software updates may also be activated locally at the Master Control Center (MCC) video terminal. If the software updates are to be requested from SCANS by the local office, a 1200–baud terminal [other than the Maintenance Cathode Ray Terminal (MCRT)] must be present. The terminal must be full duplex, capable of printing at least 80 characters per line and must have a 212A–type data set. If the software updates are to be loaded into the switch from a tape, the 1200–baud terminal is not needed.

General Format for Activation of Software Updates Received from SCANS

Reception from SCANS

To receive software updates, first a dial–up link must be established with SCANS. When the dial–up link is completed, the proper login, password, and subpassword is used to gain access to the SCANS database. When access is obtained, a listing is requested of all items from SCANS. This listing is reviewed, and all applicable software updates are stored.

The office storage space required for each software update binary data package is provided in the software change size section of the software update. Prior to data transmission, it must be determined that sufficient file space is available in the directory on disk where the software updates are to be stored. If file space is insufficient, memory audit and space reclamation techniques are used to create space, or the software updates are requested in stages (one or two at a time) as space allows.

When enough file space is available, the office is primed for binary data package delivery by using the **IN:REMOTE:START!** message. During priming, file space is reserved and a transaction identifier (ID) is established. This transaction ID provides additional security at the application level in the file transfer process.

The office will receive data from SCANS for up to 24 hours after it is printed unless the data session

is manually terminated using the **IN:REMOTE:STOP!** message. If the SCANS does not begin to send data within the 24 hour period, the data session times out and an `IN REMOTE ERROR` message is displayed at the SCCS (or MCC). After a time-out, the office will need to be primed again.

After priming, a delivery request is made to SCANS for the binary data packages. This request, which is usually made from a dial-up terminal between SCANS and the SCC, issues a Binary Overwrite (BOW) command to SCANS. The BOW command includes the #5 ESS switch office name, the identification of the software update, and a transaction ID.

As soon as a port is available, SCANS sets up a 4-wire dial-up link to the target office. This link is used for delivery of the binary data packages. Assuming no equipment failures or unusually high demand, SCANS will establish this link within 24 hours of the delivery request.

Using the access login and the transaction ID, SCANS accesses the AT&T 3B20 computer. The SCANS then establishes a 4800-b/s BX.25 data link to the target office. The binary update files, along with the header and message files, are then transmitted to the target office to be placed on disk in the software update directory (`/etc/bwm`) of a storage partition.

Upon successful reception of the binary overwrite files, the `IN REMOTE STOPPED` message is dumped at the SCCS workstation and/or MCC video terminal to indicate that the binary files have been received and loaded into `/etc/bwm`.

Assuming that the binary update files have been received and verified, the BX.25 datalink is automatically terminated.

The software updates received from SCANS are the same software updates generated at the PSS. The SCANS does not alter the internal structure or format of any software update. The SCANS information file is not required by the program update subsystem. If this file is sent along with the BOW, it is ignored.

Reception from CSCANS

To receive software updates from CSCANS, a dial-up link must first be established with CSCANS. When the dial-up link is completed, the proper login and passwords must be used to gain access to the CSCANS database, for those offices that are so equipped. For subscribing offices, follow local CSCANS procedures for accessing the CSCANS database and requesting applicable software updates.

The office storage space required for each software update binary data package is provided in the software change size section of the software. Prior to data transmission, it must be determined that sufficient file space is available in the directory on disk where the software updates are to be stored. If the file space is insufficient, memory audit and space reclamation techniques are used to create space, or the software updates are requested in stages (one or two at a time) as space allows.

The office will receive data from CSCANS at any time after it is primed and the CSCANS database is updated. Note that the office will normally not need to be primed again. The office may be primed again, if desired for security or other reasons, through use of the **UPD:INITPW:PASSWD="xxxxxx",KEY="yy"!** message. It is important to note that the CSCANS database must also be updated accordingly with the newly chosen password and key.

After priming, a delivery request is made to CSCANS for the binary data packages. Follow local CSCANS procedures for requesting a binary data package.

Upon successful reception of the binary overwrite files, a **UPD : CSCANS** message is dumped at the SCCS workstation and/or MCC video terminals to indicate that the binary files have been received and loaded into `/etc/bwm`.

Assuming that the binary update files have been received and verified, the BX.25 data link is automatically terminated.

Verification

A process is provided by the program update subsystem to verify software updates before overwriting the resident software release. When the system receives the verification command, a check is made to confirm the existence and correctness of all files and associated checksums.

If a software update error is detected through verification, the software update in question should be requested again from SCANS. If the software update fails verification a second time, the Electronic Switching Assistance Center (ESAC) and the AT&T RTAC should be notified.

Activation

Note: This section is a general description of a software update activation. Except as noted, the description was written for the 5E2(2) specific software release. Later software releases allowed for enhanced program update capabilities through the use of a menu-driven craft interface.

After the software updates have been successfully verified, an executable message file for a specific software update is created. The message file contains an instruction set for activating a particular software update. The **UPD : BWMNO "a" !** message contains a software update number that corresponds to a specific message file and the pathname of the message file. Only one executable message file can be executed in the system at any one time. The previous executable message file is overwritten each time the **UPD : BWMO "a" !** message is input.

Note: The software updates must be activated in sequential order.

The executable message file contains four user accessible sections. Only three sections are used for normal installation. The fourth section is used for emergency backout. Once an executable message file has been created for a specific software update, that software update can be installed by entering forms of the **UPD : EXEC "a" !** message as follows:

Apply: The APPLY section is used to place an update into a temporary mode. It is executed by entering the **UPD : EXEC "a" ; CMD APPLY !** message.

Soak: The SOAK section contains the recommended soak interval for a software update. A soak interval is a period of time when the software update is tested and observed for proper operation. Although it is possible to execute the SOAK section by using the **UPD : EXEC "a" ; CMD : SOAK !** message, each step of the SOAK section, where applicable, should be performed on a manual basis to allow close observation of the soak interval.

Official: The OFFICIAL section is used to make the temporary update permanent following successful completion of the soak interval. It is executed by entering the **UPD : EXEC "a" ; CMD OFFICIAL !** message.

Backout: The BACKOUT section is used only when it becomes necessary to back out of a temporary software update. It is executed by entering the `UPD:EXEC"a";CMD BKOUT!` message. Before software release 5E5, when an update had been made permanent, it could not be backed out. The 5E5 software release allowed for just the last official software update to be backed out. With the 5E6 software release, this was enhanced to allow for up to three official software updates to be backed out.

The APPLY, OFFICIAL, and BACKOUT sections each contain one or more executable messages. The SOAK section may or may not contain messages. A copy of the current executable message file may be obtained by using the `UPD:BWMNO"b";LIST ALL!` message.

The normal progression for software update activation is to execute the APPLY section first, followed by the SOAK section, and finally the OFFICIAL section.

If the system is rebooted when temporary updates are in place (other than switching module updates), the temporary disk file is thrown away, and the system boots from the official file, effectively backing out the update(s).

When a temporary update is made permanent, an updated version of the file is built in the same directory as the original version. A windowless move then takes place to effectively make the new version official. The in-core memory is not touched when an update is made official since the update has already been installed there.

The software updates can also be activated by maintenance personnel at the SCCS or MCC by printing the message file of the applicable software updates and manually installing the required messages.

Backout

During the soak interval, the temporary software update is observed to ensure proper performance. If the software update does not perform properly at any time during the soak interval, it should be backed out using the `UPD:EXEC"a";CMD BKOUT!` message. The BACKOUT section backs out the designated change, plus any subsequently installed temporary changes; that is, the backout process can only delete changes in the exact reverse order of application. A sequential list of changes that are in the temporary states may be obtained using the `UPD:DISPLAY;TEMP!` message.

Emergency Fix

General

Regular program updates are performed in a timely and orderly fashion through software updates. Unexpected problems with the software release can occur that require immediate correction, not allowing time for the normal software update development and issue processes. These immediate corrections are known as emergency fixes. Emergency fixes are accomplished on a word-by-word basis under the direction of the AT&T Product Engineering Control Center.

Emergency fixes are assigned a sequential craft number similar to the software update number. The program update subsystems provides emergency fixes with the same status and processes as software updates (that is, make temporary, backout, make permanent). Emergency fixes specify the address to be changed, the new data to be inserted, and the old data to be

matched. Emergency fixes are also known as address data couplets.

SCCS and MCC Interface

As with software updates, most emergency fixes are activated remotely by the SCCS. Communication between the SCCS and the program update subsystem is via the maintenance channel. The local office can be unattended during the activation of the fix. Emergency fixes may also be activated locally through the MCC.

General Format for Emergency Fix Activation

Activation

The **LOAD:UPNM. . . !** message causes a temporary change to be made at the specified location. After a suitable test and soak period, the **UPD:UPNM. . . ;OFC!** message makes the change permanent, and normal backout procedures can no longer be used.

Backout

Normal backout can be accomplished only while the fix is in a temporary state. The backout procedure can be implemented using the **UPD:BKOUT;UPNM a!** message. This message backs out the designated change, plus any subsequently installed changes, because the backout process can only delete changes in the exact reverse order of application. The **UPD:DISPLAY;TEMP!** message provides a sequential list of changes that are in a temporary state.

Note: The **UPD:BKOUT;UPNM a!** message only restores the words specified in the change. If memory other than that specified is this change is mutilated, a system BOOT may be required to restore the switching system to normal.

Space Reclamation

Reclaim Space in Software Update Storage Directory /etc/bwm

As software updates are brought into /etc/bwm and activated, the space available in /etc/bwm for future software update storage is gradually reduced. To avoid running out of space, the file space occupied by software updates which have been made permanent should be cleared. Such space in /etc/bwm is cleared using the **CLR:BWM:"b"!** message. A listing of permanent updates should be obtained using the **UPD:DISPLAY;OFC!** message and compared to the contents of /etc/bwm using the **OP:STATUS:LISTDIR,DN "/etc/bwm"!** message.

Reclaim Patch Space

Update functions are installed in patch space. After an update has been soaked and made permanent, the old functions and decision functions are normally no longer needed. These should be removed from execution, and the space reclamation is accomplished through the use of the **UPD:AUD!** message. From 5E4 to 5E6, the space reclamation is accomplished through the use of the **UPD:RECLAIM!** message. In 5E7 and later software releases, the space reclamation is performed automatically when the update is made permanent.

Error Conditions

Error Table 1 and *Error Table 2* contain listings of possible error conditions that may be

encountered during file transfer. Should any error conditions arise during update activation that are not listed in the table, refer to the error condition listing in AT&T 235–600–700, *Input Message Manual*, or AT&T 235–600–750, *Output Message Manual*, for the particular message in question.

Enhanced Program Update Capabilities

Release 2 of the 5E2(2) software release provides enhanced program update capabilities through the use of a menu–driven craft interface. This interface provides a user friendly program update procedure which simplifies software update installation. These enhancements eliminate the need for lengthy input messages that must be entered precisely.

When a software update package is received, four types of files are included. One or more update files are included which contain modified or new functions in the form of an object file to fix a process. A message file (*Figure 3*) is included which contains a set of craft commands required to install a given software update. A header file is included which is used to verify the software update on site. This file contains information such as target software release issue, file size, and checksum for all files in the software update. Finally, a SCANS file contains a description of the problem being corrected and administrative information used by the SCANS to determine to which offices the software update should be sent.

The message file provides commands and instructions used by an automated display mechanism to guide the craft through the process of installing the associated software update. This process reduces the amount of time required for and the potential errors associated with manual message inputs. The craft may examine the contents of the message file and monitor the status of an update transaction via video display pages.

The menu–driven craft interface provides software update installation menu pages and program update pages (*Figure 4* through *Figure 9*). Numbered commands, called *pokes*, are entered from these display pages to perform the desired procedures. Refer to the *Memory Alteration Procedures* for detailed procedures using the menu–driven craft interface.

Software Update Installation

Warning: In 5E6 and later software releases, Craft Interface Recovery Features (CIRF) provides the capability to recover the craft interface from craft lockout without affecting the call processing. This feature will kill UNIX system processes including program–update processes; therefore, it should be used with great care. IT IS STRONGLY RECOMMENDED NOT TO USE THIS FEATURE WHILE SOFTWARE UPDATE IS IN PROGRESS because this feature may cause software update application in a state which cannot be recovered by any means.

Note: Starting with the 5E5 software release (or 5E4 software release if software update 880080 is installed), MCC Display Page 1940 – EASY BWM INSTALLATION (*Figure 10*) provides a simplified alternate method of installing software updates. With this method, the user is required to enter a minimum number of pokes manually and is not required to constantly monitor the software update progress. In the 5E6 software release, poke 9870 was changed from simply turning on the Stop After Soak (SAS) feature to allowing the user to toggle the SAS feature between being ON (so as to stop after the soak section) or OFF (so it will continue all the way to OFC). Refer to AT&T 235–105–110 for details on how to use MCC Display Page 1940. The MCC Display Page 1960 is still the standard method to load or backout software updates.

The craft can install a software update through the use of the software update installation menu

(Figure 4 and Figure 5). This menu is on MCC Display Page 1960. The craft interface simplifies the task of installing a software update by directing the craft through the installation process. The upper part of the display provides a list of menu items, each of which is identified by a poke number. The lower part of the menu page provides a display window for sections of the message file. The current section of the message file, called the working section, is displayed so it may be examined by the craft before execution. If the working section does not fit the designated window, the craft can scroll forward and backward using the NEXT and PREVIOUS window pokes. The message file may be printed on the MCC printer by entering the PRINT poke provided on the menu page. A RESPONSE line is provided on the software update installation page to provide response messages to the craft during software update installation. Sequencing checks are made between software updates to ensure proper sequencing for all software updates in a #5 ESS switch.

To select a particular software update, the START software update poke is entered along with the desired software update number. The menu page then displays the current status of the requested software update and sets the "BWM =" indicator to the requested software update name.

Prior to 5E5 software release, the message file is in a combined Program Documentation Standard (PDS) and Man-Machine Language (MML) format so it can be used in all #5 ESS switches. The VERIFY poke automatically deletes messages from the message file which are not in the language format required for the specific office. For 5E5 and later software releases, the PSD format is not used. The necessary tool changes have been made in the 5E6 software release to provide only MML format in the message file. Additionally, this poke checks the message file integrity. The VERIFY poke must be executed before the software update can be applied to the system. When this poke is completed successfully, an indicator is provided on the display to notify the craft that the software update was successfully verified. The VERIFY poke may be executed as many times as desired. However, if there was no change to the message file since the last VERIFY poke was executed and the VERIFY flag is set to COMPLETED, subsequent VERIFY commands are rejected.

When the software update has been successfully verified, the contents of the APPLY section of the message file are automatically displayed. The action indicators (DISPLAY, PRINT, EXEC ALL, and EXEC NEXT) are then used in conjunction with the section indicators (APPLY, SOAK, OFC, BKOUT, and FILE) to perform the desired software update installation functions. A single poke number is used to represent the action desired and the section of the message file to be acted upon. The first two digits represent the action and the second two digits represent the section.

To apply the selected software update, the 9310 poke (EXEC ALL, APPLY) is used. This poke causes all commands in the APPLY section of the message file to be executed automatically and in sequential order. These commands may be executed one at a time using the 9410 (EXEC NEXT, APPLY) poke. The 9410 poke must be used repetitively to execute all the commands in the APPLY section. The 9310 poke may be used at any time after a 9410 poke in order to cause the execution of all remaining command lines in the APPLY section of the message file.

Subsequent to an EXEC poke, the RESET LINE poke may be used to reset the current command to be executed. This poke is entered followed by a comma and a line number to which the execution pointer should be reset. The specified line is then highlighted and may be executed again. If the requested line number is in the next or previous display window, the RESET LINE poke causes the display window to be adjusted.

If an error occurs during the execution of a command line, a summary of the error is displayed on the RESPONSE line of the menu page. The command line causing the error is displayed, and a detailed error message is printed on the MCC printer. If the 9310 poke is being used when the error

occurs, execution of the next command line (if any are still remaining) is automatically stopped.

The STOP EXEC poke (9560) may be used subsequent to the EXEC ALL poke to stop execution of the next command line in the section.

Updates intended for switching modules are automatically propagated to all operational switching modules. Any switching modules which are isolated at the time of the update do not get updated.

When all command lines in the section are successfully executed, a "CMPL" indicator associated with the APPLY status is displayed, and the content of the SOAK section is automatically displayed. This guides the user to the next step of the software update installation process. This section of the message file contains the procedures required to test the software update and the required soak interval.

The DISPLAY poke (91XX) may be used to display selected sections of the message file. The first ten lines of the section are displayed in the display window. If more than ten lines exist for the selected section, the NEXT WINDOW and PREV WINDOW pokes may be used to scroll forward and backward through the section. These pokes do not affect the execution of commands and may be used only after a DISPLAY or EXEC poke has been entered for a given software update.

The PRINT FILE F poke (9260), added in 5E4, can be used to print out any ASCII files associated with the currently installed software update.

If a failure occurs during the SOAK procedures, the software update must be backed out. The BKOUT section of the message file is displayed by using the 9140 (DISPLAY, BKOUT) poke. This section provides information to the craft and commands required to back out the given software update. The 9340 (EXEC ALL, BKOUT) poke automatically executes all commands in the BKOUT section of the message file, one by one, and in sequence. When the execution of these commands is completed successfully, the content of the APPLY section is again automatically displayed on the menu page.

When the software update has been successfully tested, it may be made official. This means that the software release file in the official disk partition is updated. Thus, the update can be saved across system bootstraps. However, reloading the system from the backup disk partition will destroy the update unless the updated software release file is copied to the backup partition. The 9330 (EXEC ALL, OFC) poke is used to make the software update official. This poke cannot complete until all command lines in the APPLY section have been completed successfully, and soak section is completed and timer is expired.

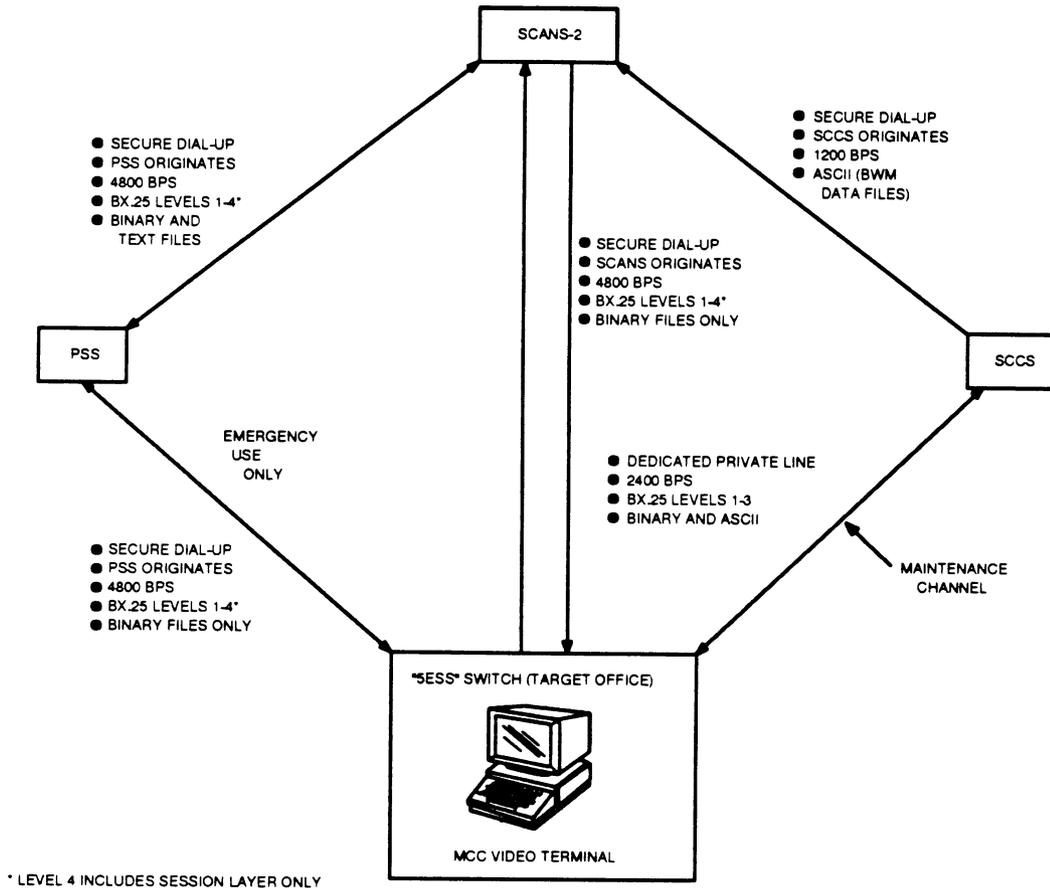


Figure 1 – Program Update Distribution

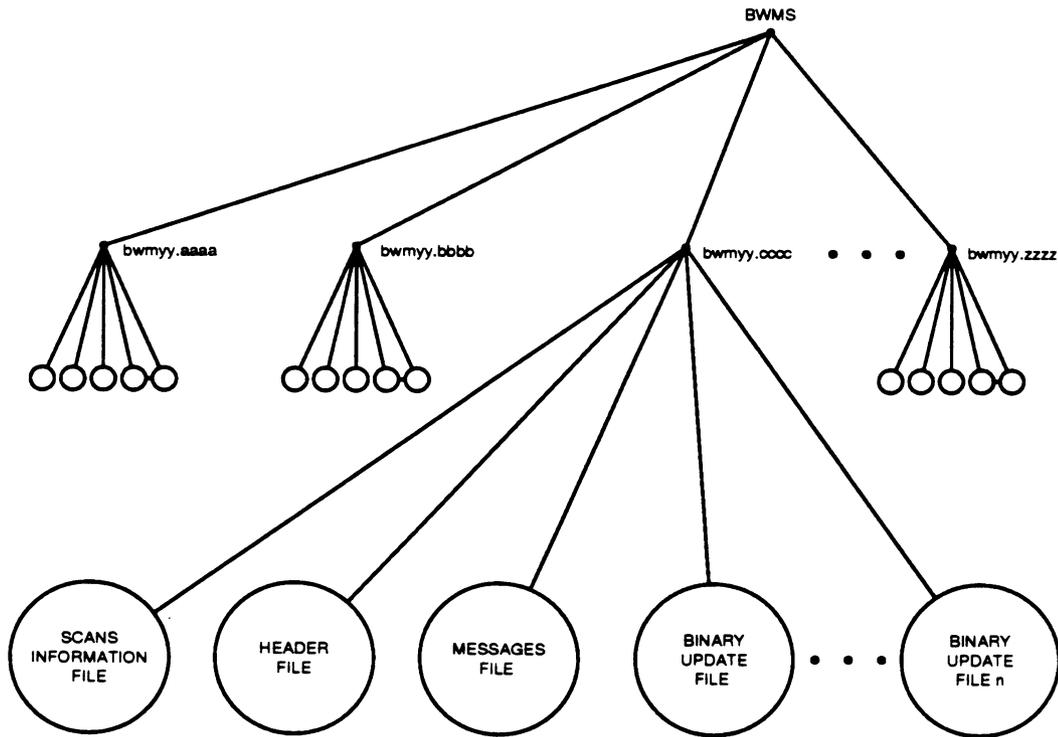


Figure 2 – Software Update Structure

```

"BEGIN BWM81-0241
"
"APPLY.*****"
"
UPD:UPNM BWM81-0241:FN"/im/sysgeneric.o".DF"/imnbrl/sysgenhs.out":UF/etc/bwm/81
0241/JBterm.m"!
"
"SOAK.*****"
"
"           This BWM should soak for 0 days, 1 hours, 0 minutes
"           before being made official.
"           The following instructions should be executed during this
"           interval and yield the expected results.
"
" run a call volume with PROCALL and observe that there are no power
" ring failures.
"
"
"BKOUT.*****"
"
"           If during the installation of this BWM, or at any time
"           during the SOAK period, you feel that the applied updates
"           should be backed out of the system, enter the following
"           command(s):
"
UPD:BKOUT:UPNM:BWM81-1241!
"
"OFFICIAL.*****"
"
"           To make the updates applied in this BWM official, wait the
"           prescribed SOAK interval and then enter sequentially the
"           following command(s).
"
UPD:UPNM BWM81-0241;OFC!
"
"END BWM81-0241

```

Figure 3 – Example of a Message File (5E3)

```

SYS EMER   CRITICAL   MAJOR   MINOR   BLDG/PWR   BLDG INH   CKT LIM   SYS NORM
OVERLOAD  SYS INH     AM      AM PERPH OS LINKS   SM        CM        MISC

CMD:
1960 - BWM INSTALLATION
      BWM = BWM83-0001
9000,Y START BWM Y  9570 NEXT WINDOW      91xx DISPLAY  (xx = 10 APPLY
9010  VERIFY Cmpl  9575 PREV WINDOW      92xx PRINT    20 SOAK 30 OFC
9560  STOP EXC    (Y = 10 CHAR BWM NAME)  93xx EXEC ALL 40 BKOUT 50 FILE)
9565,Z RESET LINE Z (Z = 3 DIGIT LINE NO)  94xx EXEC NEXT

SECTION EXECUTION STATUS
APPLY Cmpl      SOAK Cmpl      OFC INPG      BKOUT
RESPONSE:
11 "
12 "OFFICIAL-----"
13 "
14 "To make the update applied in this BWM official, wait the
15 "prescribed SOAK interval and then enter sequentially the
16 "following command(s):
17 "
18 UPD:UPNM="BWM83-0001":OFC;
19 "
20 UPD:AUD;

```

Figure 4 – BWM Installation Menu Page 1960 (5E3 and Earlier)

```

SYS EMER   CRITICAL   MAJOR   MINOR   BLDG/PWR   BLDG INH   CKT LIM   SYS NORM
OVERLOAD  SYS INH     AM      AM PERPH OS LINKS   SM        CM        MISC

1960 - BWM INSTALLATION BWM = BWM89-0001
9000,Y START BWM Y  9570 NEXT WINDOW      91xx DISPLAY  (xx = 10 APPLY
9010  VERIFY Cmpl  9575 PREV WINDOW      92xx PRINT    20 SOAK 30 OFC
9560  STOP EXC    (Y = 10 CHAR BWM NAME)  93xx EXEC ALL 40 BKOUT 50 FILE)
9565,Z RESET LINE Z (Z = 3 DIGIT LINE NO)  94xx EXEC NEXT
      (F = FILENAME IN BWM)  9260,F PRINT FILE F

SECTION EXECUTION STATUS
APPLY Cmpl      SOAK Cmpl      OFC INPG      BKOUT
RESPONSE:
21 "
22 "OFFICIAL-----"
23 "To make the update applied in this BWM official, wait the
24 "prescribed SOAK interval and then enter sequentially the
25 "following command(s):
26 "
27 UPD:OFC:DATA, UPNM="BWM89-0001";
28 "
29 UPD:RECLAIM:DATA, ALL;
30"END BWM89-0001

```

Figure 5 – BWM Installation Menu Page 1960 (5E4 and Later)

```

SYS EMER CRITICAL MAJOR   MINOR  BLDG/PWR  BLDG INH CKT LIM  SYS NORM
OVERLOAD SYS INH  AM      AM PERPH OS LINKS   SM          CM          MISC
-----
CMD:                      _____1950 - PROGRAM UPDATE MAINTENANCE

                                BWM = BWM83-0001

DISPLAY BWM HISTORY
9101,Y  BWM Y      COMPLETED      9200  VERIFY INCONSISTANCY
9102    OFC                               9300  RECOVER FORWARD
9103    TEMP                               9400  RECOVER BACKWARD
9104    ALL                                9500  RECLAIM PATCH SPACE
                                           9600,Y CLEAR BWM Y

(Y = 10 CHAR BWM NAME)

```

Figure 6 – Program Update Menu Page 1950 (5E2 and Earlier)

```

SYS EMER CRITICAL MAJOR   MINOR  BLDG/PWR  BLDG INH CKT LIM  SYS NORM
OVERLOAD SYS INH  AM      AM PERPH OS LINKS   SM          CM          MISC
-----
_____1950 - PROGRAM UPDATE MAINTENANCE

DISPLAY BWM HISTORY
9101,Y  BWM Y      COMPLETED      9200  VERIFY INCONSISTANCY
9102    OFC                               9300  RECOVER FORWARD
9103    TEMP                               9400  RECOVER BACKWARD
9104    ALL                                9500  RECLAIM PATCH SPACE
                                           9600,Y CLEAR BWM Y

                                SOAK TIMER FOR BWM =
                                9700,HH,MM RESET TIMER      COMPLETED
                                9710      PRINT TIMER INFO
                                9720      ABORT SOAK TIMER

                                _____
                                (5E5 only)  9900  BACKOUT LAST OFC BWM  IN PROGRESS

(Y = 10 CHAR BWM NAME)      (HH = HOURS)      (MM = MINUTES)

```

Figure 7 – Program Update Menu Page 1950 (5E3 through 5E5)

```

SYS EMER CRITICAL MAJOR   MINOR  BLDG/PWR  BLDG INH CKT LIM  SYS NORM
OVERLOAD SYS INH  AM      AM PERPH OS LINKS   SM          CM          MISC
-----
                               1950 - PROGRAM UPDATE MAINTENANCE

DISPLAY BWM HISTORY
9101,Y  BWM Y              9200  VERIFY INCONSISTANCY
9102   OFC                 9300  RECOVER FORWARD
9103   TEMP                9400  RECOVER BACKWARD
9104   ALL                 9500  RECLAIM PATCH SPACE
                               9600,Y CLEAR BWM Y

LAST OFC BWM      BWM89-0067      SOAK TIMER FOR BWM = NONE
2nd FROM TOP     BWM89-0051      9700,HH,MM RESET TIMER   COMPLETED
3rd FROM TOP     BWM89-0045      9710  PRINT TIMER INFO
9900 BACKOUT OFC                               9720  ABORT SOAK TIMER

(Y = 10 CHAR BWM NAME)          (HH = HOURS)          (MM = MINUTES)

```

Figure 8 – Program Update Menu Page 1950 (5E6)

```

SYS EMER CRITICAL MAJOR   MINOR  BLDG/PWR  BLDG INH CKT LIM  SYS NORM
OVERLOAD SYS INH  AM      AM PERPH OS LINKS   SM          CM          MISC
-----
                               1950 - PROGRAM UPDATE MAINTENANCE

DISPLAY BWM HISTORY
9101,Y  BWM Y              9200  VERIFY INCONSISTANCY
9102   OFC                 9300  RECOVER FORWARD
9103   TEMP                9400  RECOVER BACKWARD
9104   ALL                 9600,Y CLEAR BWM Y
                               9650,X EXPAND BWM

LAST OFC BWM      BWM89-0067      SOAK TIMER FOR BWM = NONE
2nd FROM TOP     BWM89-0051      9700,HH,MM RESET TIMER   COMPLETED
3rd FROM TOP     BWM89-0045      9710  PRINT TIMER INFO
9900 BACKOUT OFC                               9720  ABORT SOAK TIMER

(X = Y OR STOP) (Y = 10 CHAR BWM NAME) (HH = HOURS) (MM = MINUTES)

```

Figure 9 – Program Update Menu Page 1950 (5E7)

SYS EMER CRITICAL MAJOR MINOR BLDG/PWR BLDG INH CKT LIM SYS NORM
OVERLOAD SYS INH AM AM PERPH OS LINKS SM CM MISC

CMD: _____ 1940 Easy BWM Installation

9800 Start Execution 9850,F Dump Inst BWM File
9810,[Y] Change Install BWM Name 9860 Stop Execution
9820,[Y] Change Back Out BWM Name 9870 Stop After Soak OFF
9830,[Y] Change Apply BWM Name
9840,HH,MM Change BWM Soak Interval Timer

(Y = 10 Character BWM Name or NONE for no BWM, HH = Hours, MM = Minutes,
F = Filename)

RESPONSE: EASY BWM IS IDLE

Install BWM Name BWM89-0050
Back out BWM Name BWM89-6082
Apply BWM Name NONE
BWM Soak Interval Timer 24-00

Figure 10 – Easy BWM Installation Page 1940

CAUSE	EFFECT	ACTION TO BE TAKEN
Insufficient space for incoming file (Initial size for directory /etc/bwm is 5 MB).	File transfer session terminated.	<ol style="list-style-type: none"> (1) Verify and install applicable software updates received from SCANS-2. (2) Clear directory /etc/bwm after updates have been made "permanent." (3) Enter second request for remaining software updates.
Incoming file length exceeds maximum file length permitted (2 MB max.).	File transfer continues with next file.	<ol style="list-style-type: none"> (1) Invalid software update. Contact ESAC and PECC.
File with identical pathname already exists.	File transfer continues with next file.	<ol style="list-style-type: none"> (1) Verify all software updates at completion of session. (2) Clear those software updates in which verification was unsuccessful. (3) Enter second request for any remaining software updates.
Incoming file interrupted by sending process.	File transfer session will be terminated if three consecutive files are interrupted.	<ol style="list-style-type: none"> (1) Enter second request for affected software updates. (2) If problem persists, contact field update administrator.
Sending process is unable to continue and aborts session.	File transfer session terminated.	<ol style="list-style-type: none"> (1) Verify and install applicable software updates received from SCANS. (2) Enter second request for transmission of remaining software updates. (3) If problem persists, contact SCANS administrator.
Unrecoverable conditions detected by the retrieve process.	File transfer session terminated.	<ol style="list-style-type: none"> (1) Verify and install applicable software updates received from SCANS-2. (2) Enter second request for transmission of remaining software updates. (3) If problem persists, contact PECC.

Error Table 1 – File Transfer Error Conditions (SCANS Interface)

CAUSE	EFFECT	ACTION TO BE TAKEN
Insufficient space for incoming file (Initial size for directory /etc/bwm is 5 MB).	File transfer session terminated.	<ol style="list-style-type: none"> (1) Verify and install applicable software updates received from CSCANS. (2) Clear directory /etc/bwm after updates have been made "permanent." (3) Enter second request for remaining software updates.
Incoming file length exceeds maximum file length permitted (2 MB max.).	File transfer continues with next file.	<ol style="list-style-type: none"> (1) Invalid software update. Contact ESAC and PECC.
File with identical pathname already exists.	File transfer continues with next file.	<ol style="list-style-type: none"> (1) Verify all software updates at completion of session. (2) Clear those software updates in which verification was unsuccessful. (3) Enter second request for any remaining software updates.
Incoming file interrupted by sending process.	File transfer session will be terminated if three consecutive files are interrupted.	<ol style="list-style-type: none"> (1) Enter second request for affected software updates. (2) If problem persists, contact field update administrator.
Sending process is unable to continue and aborts session.	File transfer session terminated.	<ol style="list-style-type: none"> (1) Verify and install applicable software updates received from CSCANS. (2) Enter second request for transmission of remaining software updates. (3) If problem persists, contact CSCANS administrator.
Unrecoverable conditions detected by the retrieve process.	File transfer session terminated.	<ol style="list-style-type: none"> (1) Verify and install applicable software updates received from CSCANS. (2) Enter second request for transmission of remaining software updates. (3) If problem persists, contact PECC.

Error Table 2 – File Transfer Error Conditions (CSCANS Interface)

Nortel DMS-100 Line-to-Treatment Translations

Description

When a call originates from a line, the associated line tables are read and interpreted. The call then enters the screening tables where digit analysis begins. If the call cannot be completed, the call routes to treatment.

A call is routed to treatment under the following conditions:

- The operating company explicitly routes this call to treatment.
- The DMS-100 switch detects certain conditions that result in treatment.

Operation

Line-to-treatment translations can be traced using a simplified block diagram, representing the major functions within the translation process, as shown in the following figure:



The *lines* tables contain information about the originator of the call in a DMS-100 switch. These tables have three primary functions:

- Establish the hardware function and specify the hardware location for each line.
- Indicate the type of ringing codes used or options and features assigned to each line.
- Provide the next logical step in translation.

The *screening* tables contain the information used to analyze the digits that the DMS-100 switch receives. This screening process tests the digits dialed before continuing to the next routing stage, to determine, for example, whether this call is local or non-local.

The screening tables establish the call type based on the digits received. The three basic call types are:

- Operator Assisted (OA)
- Direct Dial (DD)
- No Prefix (NP)

The *routing* tables route the call to its final destination. If the call cannot be completed, it will route to a recorded announcement or treatment.

Translations Table Flow for Line-to-Treatment Translations

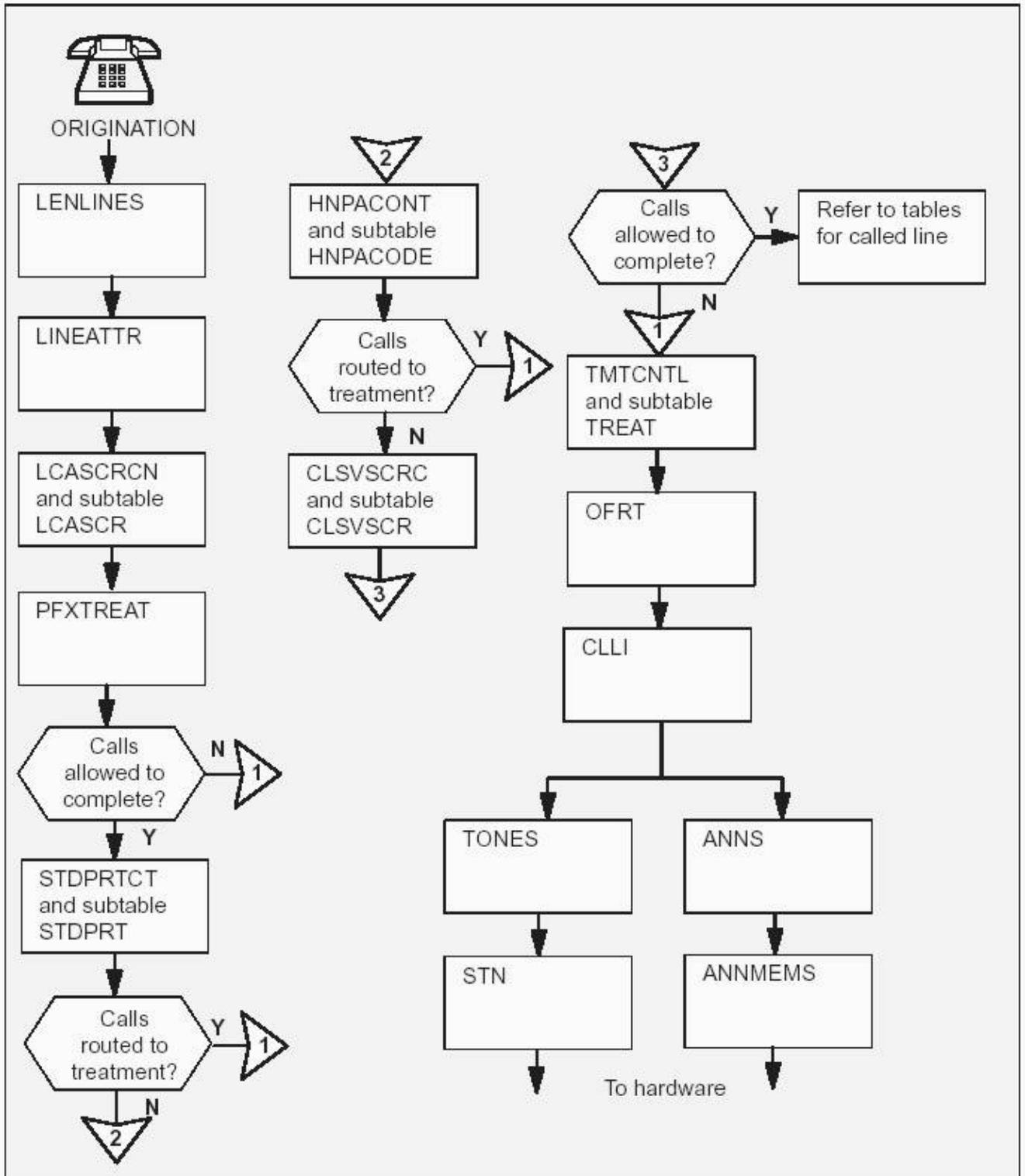
The line-to-treatment translation tables are described in the following list:

- Table LENLINES contains the site name assigned to the remote location (for remote lines), the Line Equipment Number (LEN), the party to which the Directory Number (DN) is assigned, the DN, the signal type, the index into table LINEATTR, and any options assigned to the line.
- Table LINEATTR defines the line attributes by indexes to other tables, as follows:

- ◆ The standard pretranslator to route to in table STDPRTCT , if applicable.
 - ◆ The index into table LCASCRCN and its subtable LCASCR for local call screening.
 - ◆ The Serving Numbering Plan Area (SNPA) to access in table HNPACONT (Home NPA Code).
 - ◆ The index into table CLSVSCRC and its subtable CLSVSCR for class of service screening.
- Table STDPRTCT lists the standard pretranslator names.
 - Subtable STDPRTCT.STDPRT is the first table indexed by received leading digits provided that the originating line attribute specifies a pretranslator name.
 - Table HNPACONT lists the home NPA code subtables.
 - Subtable HNPACONT.HNPACODE defines the route and treatments for each NPA.
 - Table LCASCRCN is the control table for local calling area screening. It verifies the call type and screens the DN again, if applicable.
 - Subtable LCASCRCN.LCASCR verifies the call type and screens the DN again, if applicable.
 - Table CLSVSCRC is the control table for class of service screening, if applicable.
 - Subtable CLSVSCRC.CLSVSCR screens by class of service, if applicable.
 - Table PFXTREAT determines the call treatment to which a call is routed, based on the prefix selector from table LCASCRCN, the type of call from the standard pretranslator, and the local calling area status (local or toll) from subtable LCASCRCN.LCASCR.
 - Table TMTCNTL is the control table for treatments (routes) applied to uncompleted calls.
 - Subtable TMTCNTL.TREAT defines the tones, announcements, or states that are to be returned when a specified treatment code is encountered.
 - Table OFRT lists the office routes for additional routing, if necessary.
 - Table CLLI uniquely identifies the far-end of each announcement, tone, trunk group, test trunk, national milliwatt test line, and service circuit. Each treatment CLLI, except for fixed treatment CLLIs IDLE, LKOUT (Lockout), and COPP (Cutoff on Permanent Signal and Partial Dial), is also defined in tables TONES, STN, ANNS, and ANNMEMS.
 - Table STN contains data for special tones.
 - Table TONES lists specific tones and identifies the type, pattern, and duration of each tone.
 - Table ANNS identifies the type, maximum number of simultaneous connections, and maximum length of each announcement.
 - Table ANNMEMS identifies the hardware location for the announcement. The hardware can be a Digital Recorded Announcement Machine (DRAM) located on a Maintenance Trunk Module (MTM), or an Audichron located on a Trunk Module (TM).

The line-to-treatment translations process is shown in the flowchart that follows:

Table Flow for a Line-to-Treatment Call



The following table lists the example datafill content used in the flowchart:

Datafill Table	Example Data
LENLINES	HOST 02 0 05 08 R1 1 5703055 DT 71 \$
LINEATTR	71 2FR NONE NT 807B 1 807 P570 P570 RTE3 10 NIL NILSFC NILATA 0 NIL NIL 00 N \$
STDPRTCT	P570 (1) (65021)
subtable STDPRT	8 910 D VACT
HNPACONT	418 128 0 (68) (1) (2) (0)
subtable HNPACODE	225 225 VCT BUSY
LCASCRCN	807 P570 (1) MAND N
subtable LCASCR	570 570
CLSVSCRC	418 P225 NP 2 D BUSY (0)
subtable CLSVSCR	344 345 D VACT
PFXTREAT	MAND DD N DD UNDT
TMTCNTL	LNT (47)
subtable TREAT	VACT Y T OFRT 66
OFRT	66 (S D VCA) (S D *OFLO) (S D LKOUT) \$
CLLI	VCA 94 10 XX
STN	CWT 0 MTM 6 17 3X68AC 127 0
TONES	*BUSY 21 50 101010 LO 40 30
ANNS	VCA STND 25 30 14 1
ANNMEMS	VCA 0 DRAM DRA (0 MTM 2 4) \$

-End-

Datafilling Office Parameters

The following table shows the office parameters used by line-to-treatment translations. For more information about office parameters, refer to the *DMS-100 Office Parameters Reference Manual*, NTP 297-8021-855:

<i>Office Parameters Used by Line-to-Treatment Translations</i>		
Table Name	Parameter Name	Explanation and Action
OFCENG	NCCBS	Enter a number from 0 to 65,535 to specify the number of Call Condense Blocks (CCB) required for the switching unit. A CCB is a software register associated with a call throughout its duration, containing information such as the

identity of the calling and called appearances. The default value is 80.

MAX_PROGRAMMERS		This parameter is required for a switching unit with the Call Forwarding Remote Access (CFRA) feature. It specifies the maximum number of users that can simultaneously perform a remote programming action of CFRA.
NUMCPWAKE		This parameter is required in all switching units and specifies the maximum number of call process wakeups in the system.
TFAN_OUT_MAX_NUMBER		This parameter specifies the maximum number of Destination Traffic Separation Numbers (DTSN) that can be assigned to: <ul style="list-style-type: none">* Outgoing and two-way trunk groups in table TRKGRP* Lines in table LINEATTR* Network class of service numbers in table NCOS* Announcements in table ANNS* Tones in table TONES* Special tones in table STN This parameter can be assigned values SIZE_15, SIZE_31, SIZE_64, or SIZE_127.
TOPS_ACTS		This parameter specifies whether the TOPS Automatic Coin Toll Service (ACTS) feature is active in the office.

OFCVAR	AIN_OFFICE_TRIGGRP	This parameter is used to subscribe trigger behaviors on an office-wide basis. The entry in field AINGRP in table TRIGGRP is entered here. The default value is "NIL".
	CWT_TONE_LENGTH	This parameter specifies the length of a solid burst of Call Waiting (CWT) tone, in 100 ms intervals.
	DIST_CWT_TONE	This parameter specifies the on-off durations for the special CWT distinctive cadence, in 10 ms intervals. The default value is 25 (250 ms) on and 10 (100 ms) off.

-End-

Table Datafill Sequence

The following table lists the tables that require datafill to implement line-to-treatment translations. The tables are listed in the order in which they are to be datafilled:

Datafill Tables Required for Line-to-Treatment Translations

Table	Purpose of Table
LENLINES	The line assignment table contains the Directory Number (DN), hardware location, and options associated with the calling line.
LINEATTR	The line attribute table provides pointers to screening and billing tables and assigns line attributes for digit analysis.
STDPRTCT	The standard pretranslator table lists the names of the standard pretranslator subtables.
subtable STDPRT	The standard pretranslator subtable determines the next stage of translation, based on the range of leading digits.
HNPACONT	The home numbering plan area control table lists all the home or serving area NPAs for a particular area.
subtable HNPACODE	The home numbering plan area code subtable lists the route treatment or table to which the translation routes for each of the assigned NPAs.
LCASCRCN	The local calling area screening control table lists the NPA code and local calling area name and its prefix selector.
subtable LCASCR	The local calling area screening code subtable determines from the dialed digits if the call is local or non-local.
CLSVSCRC	The class of service control table lists the serving NPA of the screening class, the screening class name, and the type of call to which screening is applicable.
subtable CLSVSCR	The class of service subtable determines, for specific digits dialed, if the call will maintain the route specified in subtable HNPACONT.HNPACODE or route to treatment.
PFXTREAT	The prefix treatment table determines the call treatment to which a call is routed.
TMTCNTL	The treatment control table defines all treatments.
subtable TREAT	The treatment subtable defines the tones, announcements, and states to be returned to the originator of the call when a specified treatment code is encountered during call translation.
OFRT	The office route table lists the sequence of tones, announcements, and states to be returned to the originator of the call when a specified treatment code is encountered during call translation.
CLLI	The common language location identifier table defines the CLLI of each tone and announcement.
STN	The special tone table lists the physical location and the maximum number of connections that can be made to each special tone.
TONES	The tones table defines tones generated at the line or trunk peripheral.
ANNS	The announcement table contains data for each analog and digital announcement assigned in the switching unit.

SCRNCL	Alphanumeric (up to 4 characters or NSCR)	<i>Class of Service Screening Subtable Name</i> If screening by class of service is required, enter the name of the class of service subtable assigned to the line attribute index. If screening by class of service is not required, enter "NSCR".
STS	Numeric (3 digits)	<i>Serving Translation Scheme</i> Enter the SNPA assigned to the line attribute index. The STS of an existing tuple cannot be changed.
PRTNM	Alphanumeric (up to 4 characters or NPRT)	<i>Standard Pretranslator Subtable Name</i> If pretranslation of digits is required, enter the name of the standard pretranslator subtable assigned to the line attribute index. If standard pretranslation is not required, enter "NPRT".
LCANAME	Alphanumeric (up to 4 characters or NLCA)	<i>Local Calling Area Screening Subtable Name</i> If screening of local central office codes (NNX) is required, enter the name of the local calling area subtable assigned to the line attribute index. If screening of local NNX codes is not required, enter "NLCA".

-End-

The following example MAP display shows sample datafill for table LINEATTR:

LNATTIDX	LCC	CHGCLSS	COST	SCRNCL	LTG	STS	PRTNM	LCANAME	ZEROMPOS
TRAFSNO	MRSA	SFC	LATANM	MDI	IXNAME	DGCLNAME	FANIDIGS		
RESINF	OPTIONS								
71	2FR	NONE	NT	807B	1	807	P570	P570	RTE3
10	NIL	NILSFC	NILLATA	0	NIL	NIL	00		
N	\$								

Datafilling Table STDPRTCT

The following table shows the datafill specific to line-to-treatment translations for table STDPRTCT. Only those fields that apply directly to line-to-line translations are shown:

Datafilling Table STDPRTCT

Field	Subfield or Refinement	Entry	Explanation and Action
EXPRTNM		Alphanumeric (up to 8 characters)	<i>External Standard Pretranslator Subtable Name</i> Enter the name defined by the operating company to represent the standard pre- translator.
STDPRT		See note	<i>Standard Pretranslator</i> The field is an index into subtable STDPRT. Note: This field does not accept any input.

-End-

The following example MAP display shows sample datafill for table STDPRTCT:

EXPRTNM	STDPRT	AMAPRT
P570	(1)	(65021)

Datafilling Subtable STDPRTCT.STDPRT

The following table shows the datafill specific to line-to-treatment translations for subtable STDPRTCT.STDPRT. Only those fields that apply directly to line-to-line translations are shown:

Datafilling Subtable STDPRTCT.STDPRT

Field	Subfield or Refinement	Entry	Explanation and Action
FROMDIGS		Numeric (up to 18 digits)	<i>From Digits</i> Enter the digit or digits to be translated. If the entry represents a block of consecutive numbers, enter the first number in the block.
TODIGS		Numeric (up to 18 digits)	<i>To Digits</i> If field FROMDIGS represents a block of consecutive numbers, enter the last number in the block.
PRETRTE		See subfield	<i>Pretranslation Route</i> This field consists of subfield PRERTSEL and its refinements TYPECALL, NOPREDIG, TRANSYS, and POS.
	PRERTSEL	D	<i>Pretranslator Route Selector</i> Enter "D" to route directly to a treatment.
	TREAT	Alphanumeric (4 characters)	<i>Treatment</i> Enter the treatment that is the route of the translation.

 -End-

The following example MAP display shows sample datafill for subtable STDPRTCT.STDPRT:

FROMDIGS	TODIGS	PRETRTE
8	910	D VACT

Datafilling Table HNPACONT

The following table shows the datafill specific to line-to-treatment translations for table HNPACONT. Only those fields that apply directly to line-to-treatment translations are shown:

 Datafilling Table HNPACONT

Field	Subfield or Refinement	Entry	Explanation and Action
STS		0 to 9,999,999	<i>Serving Numbering Plan Area</i> Enter a Serving Numbering Plan Area (SNPA) or STS code.
HNPACODE			<i>Home Numbering Plan Area Code</i> This field is an index into subtable HNPACODE. Note: This field does not accept any input.

 -End-

The following example MAP display shows sample datafill for table HNPACONT:

STS	NORTREFS	NOAMBIGC	RTEREF	HNPACODE	ATTRIB	RTEMAP
418	128	0	(68)	(1)	(2)	(0)

Datafilling Subtable HNPACONT.HNPACODE

The following table shows the datafill specific to line-to-treatment translations for subtable HNPACONT.HNPACODE. Only those fields that apply directly to line-to-treatment translations are shown:

 Datafilling Subtable HNPACONT.HNPACODE

Field	Subfield or Refinement	Entry	Explanation and Action
FROMDIGS		Numeric (3 digits)	<i>From Digits</i> Enter the number representing a single code or the first in a block of consecutive codes that have the same input data.
TODIGS		Numeric (3 digits)	<i>To Digits</i> If field FROMDIGS represents a single code, enter the same single code as in field FROMDIGS. If field FROMDIGS represents the first number of a block of consecutive numbers, enter the last number in the block.
CDRRTMT		See subfield	<i>Code Type, Route Reference, or Treatment</i> This field consists of subfield CD.
	CD	VCT	<i>Code Type</i> Enter "VCT" to route a call to treatment specified in refinement TMT.
	TMT	Alphanumeric (up to 4 characters)	<i>Treatment</i> Enter the treatment that is used to index subtable TMCNTL.TREAT.

 -End-

The following example MAP display shows sample datafill for subtable HNPACONT.HNPACODE:

FROMDIGS	TODIGS	CDRRTMT
225	225	VCT BUSY

Datafilling Table LCASCRCN

The following table shows the datafill specific to line-to-treatment translations for table LCASCRCN. Only those fields that apply directly to line-to-treatment translations are shown:

Datafilling Table LCASCRCN

Field	Subfield or Refinement	Entry	Explanation and Action
NPALOCNM		See subfields	<i>NPA Local Calling Area Subtable Name</i> This field consists of subfields STS and LCANAME.
	STS	Numeric (3 digits)	<i>Serving Translation Scheme</i> Enter an SNPA code for the trunk group.
	LCANAME	Alphanumeric (up to 4 characters)	<i>Local Calling Area Name</i> Enter the key to subtable LCASCRCN.LCASCRCN.
LCASCRCN			<i>Local Calling Area Screening</i> This field is an index into subtable LCASCRCN. Note: This field does not accept any input.
PFXSELEC		OPTL, MAND, or Alphanumeric (up to 4 characters)	<i>Prefix Selector</i> Enter the name of the prefix selector that is assigned to subtable LCASCRCN.

 -End-

The following example MAP display shows sample datafill for table LCASCRCN:

NPALOCNM	LCASCRCN	PFXSELEC	PFSFOR10
807	P570	(1)	MAND N

Datafilling Subtable LCASCRCN.LCASCRCN

The following table shows the datafill specific to line-to-treatment translations for subtable LCASCRCN.LCASCRCN. Only those fields that apply directly to line-to-treatment translations are shown:

 Datafilling Subtable LCASCRCN.LCASCRC

Field	Subfield or Refinement	Entry	Explanation and Action
FROMDIGS		Numeric (3 digits)	<i>From Digits</i> Enter the three-digit local NNX code to be screened. This number represents a single code or the first in a block of consecutive local NNX codes.
TODIGS		Numeric (3 digits)	<i>To Digits</i> If field FROMDIGS represents the first number of a block of consecutive local NNX codes, enter the last NNX code in the block to be screened. If field FROMDIGS represents a single local NNX code, enter the NNX code entered in FROMDIGS.

 -End-

The following example MAP display shows sample datafill for table LCASCRCN.LCASCRC:

FROMDIGS	TODIGS
570	570

Datafilling Table CLSVSCRC

The following table shows the datafill specific to line-to-treatment translations for table CLSVSCRC. Only those fields that apply directly to line-to-treatment translations are shown:

 Datafilling Table CLSVSCRC

Field	Subfield or Refinement	Entry	Explanation and Action
NPASCTYP		See subfields	<i>NPA Screening Class Type</i> This field consists of subfields STS, SCRNL, and TYPCALL.
	STS	Numeric (3 digits)	<i>Serving Translation Scheme</i> Enter the SNPA for a given trunk group or line attribute.
	SCRNL	Alphanumeric (1 to 4 digits)	<i>Screening Class</i> Enter the class of service screening subtable name assigned to the trunk group, line attribute, or CAMA or AMR5 billing code.
	TYPCALL	DD, OA, NP, or NL	<i>Type of Call</i> Enter the type of call, "DD" (Direct Dial), "OA" (Operator Assisted), "NP" (No Prefix), or "NL" (Nil). For Traffic Operator Position System (TOPS) calls, there can be a mixture of 0 and 1 (OA and DD) call types. Enter "NL" for these cases.

NORSLTS	0 to 255	<i>Number of Results</i> Enter the number of results required.
TMTOFRT	See subfields	<i>Treatment or Office Route</i> This field consists of subfields SCRNSEL and RTEREFIX.
SCRNSEL	T or D	<i>Screening Selector</i> Enter the screening selector "T" if translation routes to table OFRT. Datafill subfield RTEREFIX. Enter the screening selector "D" if translation routes to one of the treatments in table TREAT. Datafill subfield TREAT.
RTEREFIX	See subfields	<i>Route Reference Index</i> This field consists of subfields OFC_RTE and RTE_ID.
OFC_RTE	OFRT, OFR2, OFR3, OFR4	<i>Office Route Table Name</i> Enter the office route table name to which the translations are directed.
RTE_ID	0 to 1,023	<i>Route Reference Table Index</i> Enter the route index in table OFRT to which the translation routes.
TREAT	Alphanumeric (up to 4 characters)	<i>Treatment</i> Enter the treatment in table TREAT to which translation routes.

-End-

The following example MAP display shows sample datafill for table CLSVSCRC:

NPASCTYP	NORSLTS	TMTOFRT	CLSVSC
418 P225 NP	2	D BUSY	(0)

Datafilling Subtable CLSVSCRC.CLSVSCR

The following table shows the datafill specific to line-to-treatment translations for subtable CLSVSCRC.CLSVSCR. Only those fields that apply directly to line-to-treatment translations are shown:

Datafilling Subtable CLSVSCRC.CLSVSCR

Field	Subfield or Refinement	Entry	Explanation and Action
FROMDIGS		Numeric (up to 18 digits)	<i>From Digits</i> Enter the single code or the first in a block of consecutive codes that have the same screening route.

TODIGS	Numeric (up to 18 digits)	<i>To Digits</i> If field FROMDIGS represents a single code, the entry in this field is the same as the entry in field FROMDIGS. If the field FROMDIGS represents the first number in a block of consecutive codes, the entry in this field is equal to the last number in the block.

TMTOFRT	See subfields	<i>Treatment or Office Route</i> This field consists of subfields INPA and SCRNSEL.
INPA	I or blank	<i>Interchangeable Numbering Plan Area</i> Enter "I" if INPA codes require separate routes for seven and ten dialed digits. If "I" is entered, two routes are required. The first route is used for calls with seven dialed digits, and the second route is used for calls with ten dialed digits.
SCRNSEL	T or D	<i>Screening Selector</i> Enter the screening selector "T" if translation routes to table OFRT. Datafill subfield RTEREFIX. Enter the screening selector "D" if translation routes to one of the treatments in table TREAT. Datafill subfield TREAT.
RTEREFIX	See subfields	<i>Route Reference Index</i> This field consists of subfields OFC_RTE and RTE_ID.
OFC_RTE	OFRT, OFR2, OFR3, or OFR4	<i>Office Route Table Name</i> Enter the office route table name to which the translations are directed. If the INPA selector "I" is entered in subfield INPA, two office route table names must be entered. The first office route table handles seven-digit calls and the second office route table handles ten-digit calls.
RTE_ID	0 to 1,023	<i>Route Reference Table Index</i> Enter the route index in table OFRT to which the translation routes. If the INPA selector "I" is entered in subfield INPA, two route reference indices must be entered. The first index applies to the first office route table entered in subfield OFC_RTE, and the second index applies to the second office route table entered in subfield OFC_RTE.
TREAT	Alphanumeric	<i>Treatment</i> Enter the treatment in table TREAT to which translation routes. If the INPA selector "I" is entered in

subfield INPA, two treatments must be entered. The first treatment handles seven-digit calls, and the second treatment handles ten-digit calls.

-End-

The following example MAP display shows sample datafill for subtable CLSVSCRC.CLSVSCR:

FROMDIGS	TODIGS	TMTOFRT
344	345	D VACT

Datafilling Table PFXTREAT

The following table shows the datafill specific to line-to-treatment translations for table PFXTREAT. Only those fields that apply directly to line-to-treatment translations are shown:

Datafilling Table PFXTREAT

Field	Subfield or Refinement	Entry	Explanation and Action
TYPLCLCD		See subfields	<i>Type of Call and Local Code</i> This field consists of subfields PFXSELEC and TYPCALL.
	PFXSELEC	OPTL, MAND, or Alphanumeric (up to 4 characters)	<i>Prefix Selector</i> Enter the prefix selector assigned to the prefix treatment.
	TYPCALL	DD, NP, OA, or NL	<i>Type of Call</i> Enter either "DD" (Direct Dial), "NP" (No Prefix), "OA" (Operator Assisted), or "NL" (Nil) for the type of call. For Traffic Operator Position System (TOPS) calls, there can be a mixture of 0 and 1 (OA and DD) call types. Enter "NL" for these cases.
TREAT		Alphanumeric (up to 4 characters)	<i>Treatment</i> Enter the treatment that is the route of the translation.

-End-

The following example MAP display shows sample datafill for table PFXTREAT:

TYPLCLCD	UPDTYPCA	TREAT
MAND DD N	DD	UNDT

Datafilling Table TMCNTL

The following table shows the datafill specific to line-to-treatment translations for table TMCNTL. Only those fields that apply directly to line-to-treatment translations are shown:

Datafilling Table TMCNTL

Field	Subfield or Refinement	Entry	Explanation and Action
EXTTMTNM		LNT	<i>Extended Treatment Name</i> Enter "LNT".

 -End-

The following example MAP display shows sample datafill for table TMCNTL:

```

EXTTMTNM   TREAT
-----
LNT         ( 47)
  
```

Datafilling Subtable TMCNTL.TREAT

The following table shows the datafill specific to line-to-treatment translations for subtable TMCNTL.TREAT. Only those fields that apply directly to line-to-treatment translations are shown:

Datafilling Subtable TMCNTL.TREAT

Field	Subfield or Refinement	Entry	Explanation and Action
TREATMT		Alphanumeric (1 to 4 characters)	<i>Treatment</i> Enter the treatment name.
LOG		Y or N	<i>Log</i> Enter "Y" for a trunk or line message 138 printout each time translation is routed to a treatment. Otherwise enter "N".
FSTRTE		See subfields	<i>First Route</i> This field consists of subfields FSTRTSEL, CLLI, TABID, and KEY.
	FSTRTSEL	S or T	<i>First Route Selector</i> Enter "S" if the treatment routes to a CLLI listed in table TONES, and datafill subfield CLLI. Enter "T" if the treatment routes to table OFRT. Datafill subfields TABID and KEY.
	CLLI	Alphanumeric (1 to 16 characters)	<i>Common Language Location Identifier</i> Enter the CLLI of the tone to which translation is routed.
	TABID	OFRT, OFR2, OFR3, or OFR4	<i>Table Name</i> Enter the office route table name.

The following example MAP display shows sample datafill for table OFRT:

RTE	RTELIST
66	(S D VCA) (S D *OFLO) (S D LKOUT) \$

Datafilling Table CLLI

The following table shows the datafill specific to line-to-treatment translations for table CLLI. Only those fields that apply directly to line-to-treatment translations are shown:

Datafilling Table CLLI

Field	Subfield or Refinement	Entry	Explanation and Action
CLLI		Alphanumeric (1 to 16 characters)	<i>Common Language Location Identifier</i> Enter a CLLI code to uniquely identify the far end of each announcement, tone, or trunk group.

 -End-

The following example MAP display shows sample datafill for table CLLI:

CLLI	ADNUM	TRKGRSIZ	ADMININF
VCA	94	10	XX
BUSY	149	0	BUSY_TONE

Datafilling Table STN

The following table shows the datafill specific to line-to-treatment translations for table STN. Only those fields that apply directly to line-to-treatment translations are shown:

Datafilling Table STN

Field	Subfield or Refinement	Entry	Explanation and Action
SK		See subfields	<i>Special Tone Key</i> This field consists of subfields TONE and MEMBER.
	TONE	Alphanumeric (1 to 16 characters)	<i>Tone</i> Enter the fixed code (TONE_INDEX) assigned to the tone trunk circuit in table CLLI.
	MEMBER	0 to 999	<i>Member Number</i> Enter the tone trunk circuit member number.
MAXCONN		0 to 255	<i>Maximum Connections</i> Enter the maximum number of simultaneous connections that are allowed to be made to the tone trunk circuit.

 -End-

The following example MAP display shows sample datafill for table STN:

SK	TMTYPE	TMNO	TMCKTNO	CARDCODE	MAXCONN	TRAFSNO
CWT 0	MTM	6	17	3X68AC	127	0

Datafilling Table TONES

The following table shows the datafill specific to line-to-treatment translations for table TONES. Only those fields that apply directly to line-to-treatment translations are shown:

Datafilling Table TONES

Field	Subfield or Refinement	Entry	Explanation and Action
CLLI		Alphanumeric (1 to 16 characters)	<i>Common Language Location Identifier</i> Enter the code assigned to the tone in table CLLI.
TRAFSNO		0 to 127	<i>Traffic Separation Number</i> If the switching unit has the optional Traffic Separation software feature, enter the outgoing traffic separation number assigned to the tone. If traffic separation is not required, enter "0". The range of values for the outgoing traffic separation number depends on office parameter TFAN_OUT_MAX_NUMBER in table OFCENG.
SEGTIME		10 to 100	<i>Segment Time</i> Enter the duration of one segment of tone specified in multiples of 10 ms (for example: 25 = 250 ms).
TONEPATT		Numeric (up to 16 digits)	<i>Tone Pattern</i> Enter a string of up to 16 digits of 0s and 1s. Each digit corresponds to one segment of tone pattern and represents the binary state on the tone, where: * 0 = Tone off * 1 = Tone on
TONETYP		HI, HZ400_5DB, or LO	<i>Tone Type</i> Enter the type of tone generator required. Since some of the tone generators listed are mutually exclusive, only a subset of these tone generators can be found in a given software load. Tone generator types other than those described are not valid entries. Enter "HI" for high tone. Enter "HZ400_5DB" for a tone generated at 400 Hz at -5 dBm. Enter "LO" for low tone.

```

-----
MAXDURN                1 to 255                Maximum Duration
Enter the maximum time in seconds that a
call condense block can be attached.

The maximum time duration for silent tone
is 10 seconds.
-----

```

-End-

The following example MAP display shows sample datafill for table TONES:

CLLI	TRAFSNO	SEGTIME	TONEPATT	TONETYP	MAXDURN	MAXCONN
*BUSY	21	50	101010	LO	40	30

Datafilling Table ANNS

The following table shows the datafill specific to line-to-treatment translations for table ANNS. Only those fields that apply directly to line-to-treatment translations are shown:

Datafilling Table ANNS

Field	Subfield or Refinement	Entry	Explanation and Action
CLLI		Alphanumeric (1 to 16 characters)	<i>Common Language Location Identifier</i> Enter the code assigned to the tone in table CLLI.
ANTYPE		ACTS, AIN, AIS, AOSSVR, CFRA, CLASS, CNAL, CNALT, CNAT, DMCT, MCCS, NFRA, SLEENG, SLEFRE, SPP, STND, SACB, or TOPSVR	<i>Announcement Type</i> Enter the announcement type as follows: * ACTS for Automatic Coin Toll Service. * AIN for a given DMS-100 switch user interface for each customer group. * AIS for Automatic Intercept System announcement if the switch has the AIS feature. * AOSSVR for AOSS Voice Response. * CFRA for Call Forwarding Remote Access announcement. * CLASS for Custom Local Area Signaling Services announcement. * CNAL for Calling Number Announcement playback to a line. * CNALT for Calling Number Announcement playback to a line and over a trunk to a loudspeaker. * CNAT for Calling Number Announcement playback over a trunk to a loudspeaker.

- * DMCT for Denied Malicious Call Termination.
- * MCCA for Mechanized Calling Card announcement.
- * NFRA for Network facility Remote Access.
- * SLEENG for Screening List Editing English.
- * SLEFRE for Screening List Editing French.
- * SPP for Station Programmable PIN (Personal Identification Number).
- * STND for Standard announcement.
- * SACB for Subscriber Activated Call Blocking.
- * TOPSVR for TOPS Voice Response.

Note: Office parameter TOPS_ACTS must be set to "Y" in table OFCENG.

MAXCONN	1 to 255	<i>Maximum Connections</i> Enter the maximum number of simultaneous connections that are permitted on the announcement.
---------	----------	--

CYTIME	1 to 18 or 0	<i>Cycle Times</i> Enter the time, in seconds, for one announcement cycle on one channel.
--------	--------------	--

Note 1: If your office is equipped with a Cook or equivalent announcement machine and table AUDIO is datafilled as ANNS, field CYTIME is changed to 0. This allows flexible announcement timing.

Note 2: The cycle time for an Audichron is 0 due to the variable length announcement feature on Audichron. By setting the value of this field to 0, the length of the announcement is always matched.

MAXCYC	1 to 255	<i>Maximum Cycles</i> Enter the maximum number of times the complete announcement is heard before the call is advanced to the next route in the route list.
--------	----------	--

-End-

The following example MAP display shows sample datafill for table ANNS:

CLLI	ANTYPE	TRAFSNO	MAXCONN	CYTIME	MAXCYC
VCA	STND	25	30	14	1

Datfilling Table ANNSMEMS

The following table shows the datafill specific to line-to-treatment translations for table ANNSMEMS. Only those fields that apply directly to line-to-treatment translations are shown:

 Datfilling Table ANNSMEMS

Field	Subfield or Refinement	Entry	Explanation and Action
ANNMEM		See subfields	<i>Announcement Member Key</i> This field consists of subfields ANN and MEMBER.
	ANN	Alphanumeric (1 to 16 characters)	<i>Announcement</i> Enter the code that represents the announcement group in table CLLI.
	MEMBER	0 to 255	<i>Member</i> If the trunk circuit is the first in the trunk list for the announcement member, enter the number assigned to the member. If digital, each announcement member can be assigned up to eight trunk circuits. If analog, each announcement can be assigned up to two trunk circuits.
HDWTYPE		AUDICHRON or DRAM	<i>Hardware Type</i> Enter "AUDICHRON" if the first entry for the member and hardware type is analog. Enter "DRAM" if the recorded announcement member is digital.

 -End-

The following example MAP display shows sample datafill for table ANNSMEMS:

ANNMEM	HDWTYPE	CARD	MEMINFO
VCA 0	DRAM	DRA	(0 MTM 2 4) \$

Translation Verification Tools

The following example shows the output from the TRAVER command when it is used to verify line-to-treatment translations between DNs (807) 570-3055 to (819) 450-6666:

 >TRAVER 1 5703055 8194506666 b
 TABLE LINEATTR
 71 2FR NONE NT 807B 1 807 P570 P570 RTE3 10 NIL NILSFC NILLATA 0 NIL NIL 00 N \$
 LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
 TABLE DNATTRS
 TUPLE NOT FOUND
 TABLE DNGRPS
 TUPLE NOT FOUND
 Originator is not an AIN agent, therefore AIN info is not processed.

TABLE STDPRTCT
P570 (1) (65021) 0
. SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING.
CALL TYPE DEFAULT IS NP. PLEASE REFER TO DOCUMENTATION.
. 8 910 D VACT
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N

TABLE TMTCNTL
LNT (47)
. SUBTABLE TREAT
. VACT Y T OFRT 66
. TABLE OFRT
. 66 S D VCA
. S D *OFLO
. S D LKOUT
. EXIT TABLE OFRT

+++ TRAVER: SUCCESSFUL CALL TRACE +++

TREATMENT ROUTES. TREATMENT IS: VACT
1 VCA
2 *OFLO
3 LKOUT

+++ TRAVER: SUCCESSFUL CALL TRACE +++

-End-

Nortel DMS-100 Command Screening Table (CMDS)

Table Name

Command Screening Table.

Functional Description of Table CMDS

Command screening table CMDS is part of the enhanced security feature. Office parameter ENHANCED_COMMAND_SCREENING, in table OFCOPT (Office Options), determines if the feature is active. You set office parameter ENHANCED_COMMAND_SCREENING to **Y** if you purchased the feature or **N** if you did not purchase the feature. You cannot set office parameter ENHANCED_COMMAND_SCREENING after the first datafill. This prevention stops any person from overriding security.

Each command that has between one and thirty-one command classes appears in table CMDS.

You can assign any set of up to 31 classes to a command. For more information, refer to the description of table TERMDEV (Terminal Devices) in the data schema section of *Translations Guide*. Command screening ensures that the command classes of the user match the classes of the commands the user wants to use. You must datafill each command for the directory in which you intend to use the command. For example, if you want the Force Release (FRLS) command to be accessible at the Line Test Position (LTP) level of the Maintenance and Administration Position (MAP), you must make a FRLS entry in table CMDS for the LTP directory.

The `PRIVCLAS` command allows multiple command classes to be set.

Fields LOGONUSE, USEALARM, LOGABUSE, and ALRMABUS determine if the system generates a log or alarm for command use or abuse.

The system automatically inserts tuples in this table with default values.

Datafill Sequence

You do not need to enter data in other tables before you enter data in table CMDS.

Table Size

The system dynamically allocates memory for this table. The initial size of the table is 100 entries. The system automatically expands the table size when necessary.

Datafill

The following table describes datafill for table CMDS:

 Field Descriptions

Field	Subfield	Entry	Explanation and Action
CMDINCR		See subfields	Command and Increment. This field has the subfields CMDNAME and INCRNAME.
	CMDNAME	Alphanumeric (1 to 16 characters)	Command Name. Enter the command name.
	INCRNAME	Alphanumeric (1 to 16 characters) or \$	Increment Name. Enter the increment name. If the command is not part of an increment, enter "\$".
DUMPSAFE		NOTSAFE, DSPS, or PS	Command Availability. The default value NOTSAFE makes the command not available during Data Store (DS) dump and Program Store (PS) dump. Enter "DSPS" if you want the command available during both DS dump and PS dump. Enter "PS" if want want the command available only during PS (after DS is complete).
LOGONUUSE		Y or N	Command Use Log Status. Enter "Y" if you want a log report for each use of the command. Enter "N" if you do not want a log report for each use of the command. The default value is "N".
USEALARM		CR, MJ, MN, or NA	Command Use Alarm Status. Enter one of the following values: * CR if you want a critical alarm for command use. * MJ if you want a major alarm for command use. * MN if you want a minor alarm for command use. * NA if you want no alarm for command use. The default value is "NA".
LOGABUSE		Y or N	Command Abuse Log Status. Enter "Y" if you want a log report when a user with the wrong command set tries to use the command. Enter "N" if you do not want a log report when a user with the wrong command set tries to use the command. The default value is "N".

 -continued-

 Field Descriptions (continued)

Field	Subfield	Entry	Explanation and Action
ALRMABUS		CR, MJ, MN, or NA	<p>Command Abuse Alarm Status. Enter one of the following values:</p> <ul style="list-style-type: none"> * CR if you want a critical alarm for command abuse. * MJ if you want a major alarm for command abuse. * MN if you want a minor alarm for command abuse. * NA if you want no alarm for command abuse. <p>The default value is "NA".</p>
PRIVSET		0 to 30, ALL, or (NONE)	<p>Privileged Set. Enter the set of command classes that correspond to the specified command.</p> <p>The default value is "(NONE)".</p> <p>The system defaults an incorrect entry to "(NONE)".</p>

 -End-

Datafill Example

The following example shows sample datafill for table CMDS.

Datafill Example for Table CMDS

Example of a MAP display:

	CMDINCR	DUMPSAFE	LOGONUSe	USEALARM	LOGABUSE	ALRMABUS	PRIVSET
DUMP	\$	DSPS	N	NA	N	NA	ALL
STOPDUMP	\$	DSPS	N	NA	N	NA	ALL
HPDUMP	\$	DSPS	N	NA	N	NA	ALL
JFFREEZE	\$	DSPS	N	NA	N	NA	ALL
DCN	\$	DSPS	N	NA	N	NA	ALL
TABLE	\$	PS	N	NA	N	NA	ALL
DMOPRO	\$	PS	N	NA	N	NA	ALL
SERVORD	\$	PS	N	NA	N	NA	ALL
RESTART	\$	NOTSAFE	N	NA	N	NA	30

Nortel DMS–100 Calling Line Identification Table (CLIDN)

Table Name

Calling Line Identification Table.

Functional Description of Table CLIDN

Table CLIDN contains the ten–digit Directory Numbers (DN) for which Calling Line Identification (CLI) is available. These DNs are external to the switching unit. The ten–digit DNs include an area code + office code + directory number.

In a local switching unit, the Number Planning Area (NPA – area code) must be the same NPA as the originating subscriber to produce log report TRK163.

The Trunk Maintenance (TRK) log subsystem generates TRK163 when the system routes a local line call over a trunk to a line in a distant office. This office receives a CLI request.

In a toll switching unit, the NPA must be the same as the serving NPA of the incoming trunk to produce log report TRK164.

The Trunk Maintenance (TRK) log subsystem generates TRK164 when the system routes a call that originates from an external line through the office to a line in a distant office. This office has a CLI.

To generate a TRK164 log for Feature Group D (FGD) calls with two–stage outpulsing, include SNPA+0ZZ+XXX in table CLIDN. If this event does not occur, the system does not generate a TRK164 log.

The letter N must prefix service codes like 411, 911, and 0 to make the total digit count equal to 10. The system internally translates the letter N to 0. This condition requires two entries. One entry, NPANNNN911, has the Serving NPA (SNPA) of the trunk. The other entry, NNNNNNN911, does not have the SNPA of the trunk.

For CLI numbers internal to the switching unit, see feature CLI in table LENFEAT (Line Equipment Number Features).

Use feature CLI in a local, toll or local/toll switching unit.

If a local line calls an external DN that table CLIDN identifies for calling line identification, the system generates log report TRK163. Log report TRK163 contains the following:

- The DN of the calling party.
- The outgoing trunk number.
- The DN of the called party.
- The date and the time.

If the system cannot identify the calling DN, the Line Equipment Number (LEN) and tip–and–ring side identification replace the number. The tip–and–ring side identification must be available.

An incoming trunk can receive a call for an external DN that table CLIDN identifies for CLI. When this event occurs the system generates log report TRK164. Log report TRK164 contains:

- The incoming trunk number.
- The outgoing trunk number.
- The DN of called party.
- The date and time.

An incoming Signaling System 7 (SS7) trunk on a tandem switch can receive a call for an external DN that table CLIDN identifies for CLI. When this event occurs the system generates log report TRK605. Log report TRK605 contains:

- The incoming trunk number.
- The outgoing trunk number.
- The DN of the called number.
- The DN of the originating number.
- The date and time.

The TRK605 log is used in a tandem switch to identify the origination number when the called number is being traced. It is generated when the called number is datafilled in table CLIDN in the tandem switch and the call came in on a SS7 trunk. To generate this log when the line being traced is a remote call forwarded line, simply datafill the DN in table RCFCLI (Remote Call Forwarding Calling Line Identification) in the same terminating End Office (EO) in which the Remote Call Forward (RCF) line exists.

United Kingdom

In the UK market, log TRK164 cannot trace the origin of a call. Log report TRK602 replaces TRK164 in this market for PCM30 Digital Trunk Controller (PDTC) MEL and Digital Private Network Signaling System No. 1 (DPNSS) calls to BTUP. The BTUP is the UK variant of national user part.

The TRK602 contains the same information as log TRK164 and a default CLI in table TRKMEM (Trunk Member).

Datafill Sequence

You do not need to enter data in other tables before you enter data in table CLIDN.

Table Size

67 tuples.

Datafill

The following table describes datafill for table CLIDN:

Field Descriptions

Field	Subfield	Entry	Explanation and Action
DIGITS		Numeric and N	<i>Digits.</i> The entry is equal to the ten-digit DN of a line external to the switching unit. * The letter "N" must prefix service codes like 411, 911, and 0. This action makes the total digit count equal to 10. The system translates the letter "N" internally to 0. This condition requires two entries. One entry, NPANNN911, has the NPA. One entry, NNNNNNN911, does not have the NPA. * To produce log report TRK163 in a local switching unit, the NPA must be the same NPA as the originating subscriber. * You can produce log report TRK164 in a toll switching unit. The NPA must be the same NPA as the serving NPA of the incoming trunk. * Log report TRK602 replaces log TRK164 in the UK market. This log report contains the same information, and a default CLI.

-End-

Datafill Example

An example of datafill for table CLIDN appears in the following table. The example contains two lines in NPA 613 with assigned DNs 224-4579 and 238-2378. These DNs appear for CLI in table CLIDN.

Datafill Example for Table CLIDN

Example of a MAP display:

```
DIGITS
-----
6132244579
6132382378
-----
```

Bonus

Overseas Careers

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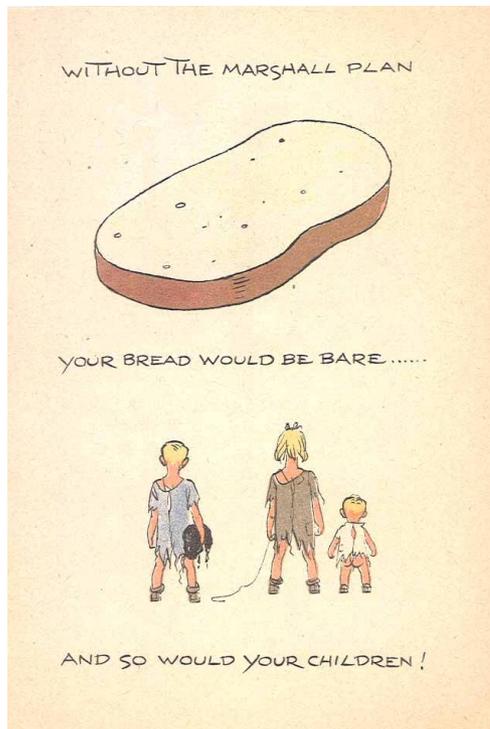
End of Issue #19



Any Questions?

Editorial and Rants

Here are some old political cartoons which are, not surprisingly, still relevant today.



Step on it, Doc!



Roy Justus. *The Minneapolis Star*, 1947.

If a Eurosavage ever asks you for money – shoot him in the face.

"I'll carry the bar . . ."



Robert Graysmith, *San Francisco Chronicle*, 1971.

The only good Eurosavage is a dead Eurosavage.

“It’s From Europe. They’re Thinking About Having A ‘Year Of The United States.’”



Herbert L. Block. *The Washington Post*, 1974.
Copyright 1974 by Herblock in *The Washington Post*

What was a good thing about Hitler? He killed lots of Eurosavages.

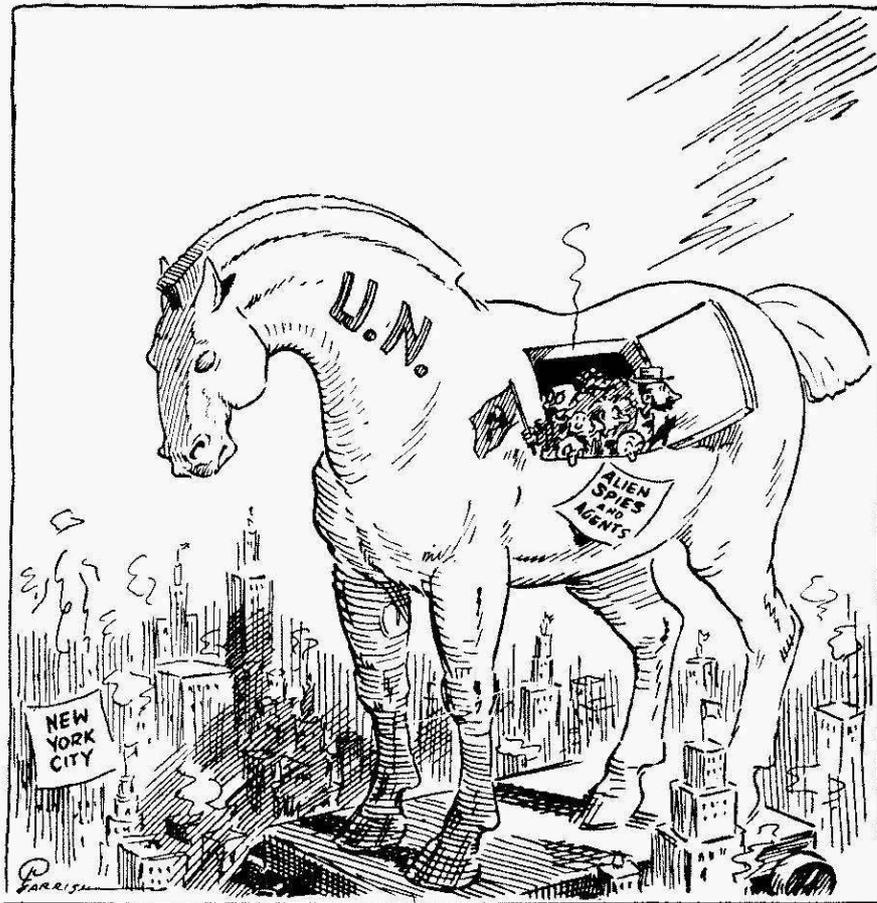
“Now that dollars are worth less, we'll need more of them.”



Bill Mauldin. *The Sun-Times* (Chicago), 1971.
Copyright 1971—Chicago Sun-Times. Reproduced by courtesy of
Wil-Jo Associates, Inc., and Bill Mauldin.

If a Eurosavage ever asks you for money – kill their entire family.

Trojan Horse



Joseph Parrish. *The Tribune* (Chicago), 1949.

Don't let the Eurosavages and United Nations steal our Internet.