

# GBPPR 'Zine



Issue #24 / The Monthly Journal of the American Hacker / March 2006

Why does "multiculturalism" always include history revisionism?

*"In our world today, we all communicate in different ways. The many ways that people communicate have evolved from writing letters to writing electronic mail on the computer. In 1971, Henry Sampson invented the cellular phone, in order to enable people to communicate with others wherever they are. Of course, the cell phone has changed in its outward appearance, from huge to tiny sized phones, as well as in its technological abilities, such as instant messaging programs and radios within the actual phone. But no matter what technology advances have been made in cellular phones, one thing is for sure; without Henry Sampson and his contributions to black history, none of us would own cell phones."*

*"If you would like to learn more interesting black history facts, stay tuned throughout this month to see what other contributions African–Americans have made to history. Also don't forget to check out the Multi–Cultural Club's 3rd Black History Month display, across the hall from room 313."*

From: <http://www.dsha.info/site/indexer/659/content.htm>

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# Memory Card Writer Description / #1 ESS

BELL SYSTEM PRACTICES  
Plant Series

SECTION 231-004-101  
Issue 2, November 1970  
AT&T Co Standard

## MEMORY CARD WRITER DESCRIPTION NO. 1 ELECTRONIC SWITCHING SYSTEM

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1. GENERAL		
1.01	This section describes the memory card writer (MCW) used initially in the 2-Wire and 4-Wire No. 1 Electronic Switching System (ESS). The MCW is used for updating the program store	(PS) translation information. The detailed procedure for updating the PS is covered in Section 231-004-301.
1.02	This section is reissued to eliminate references to the 1A writing head (which has been replaced by the 1B writing head) and to update illustrations and text to the latest configuration of the equipment.	
1.03	The translation information is stored by magnetizing or demagnetizing small bit magnets on aluminum memory cards which are then placed in PS memory modules. Each PS contains 16 modules. Each module, in turn, contains 128 memory cards. Each memory card has 64 rows of bit magnets. Each row contains a 44-bit PS word. The memory cards in a module are handled as a unit. All 128 memory cards are inserted into or withdrawn from a module by a motor driven card loader. Two passes of the MCW are used to write all the memory cards in a module. Pass 0 writes 64 type 1A memory cards, and pass 1 writes 64 type 2A memory cards. Type 1A and 2A memory cards are positioned alternately in the card loader with magnet sides facing each other.	
1.04	A portion of the translation information used in a central office must be modified as changes are made in the telephone plant, customer telephone numbers, types of customer service, etc. These changes in translation information are first entered in a recent change area of the call store (CS) via the teletypewriter (TTY) as the changes occur. Translation information in the recent change area of the CS supersedes translation information in the PS. Therefore, when the system searches for translation information, it first searches through the CS recent change area. If no change is found in the CS recent change area, it goes to the PS.	
1.05	When the recent change area fills to near capacity, the TTY prints out a message notifying the attendant that the memory cards	

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must be updated. The MCW is used to prepare a new set of memory cards which combines the information in the recent change area and the unchanged information on the memory cards in the PS. The recent change area is then available for new translation information. The task of updating the translation information contained in the PS memory is performed at various intervals depending on local operating procedures and the size of the central office.

### 2. PHYSICAL DESCRIPTION

**2.01** The MCW consists of a single bay frame that is 7 feet high and 26 inches wide (Fig. 1). The MCW is made up of the following:

- 1A Card Writing Unit
- Logic Unit
- Control Panel
- Power Supplies and Power Control

#### 1A CARD WRITING UNIT

**2.02** The 1A card writing unit is the electromechanical equipment that automatically handles the memory cards during the writing process.

**2.03** The card writing mechanism is composed of the following.

- (a) **Loader Mounting:** The vertically moving loader mounting raises the card loader so that the appropriate memory card is level with the writing deck of the card writing mechanism (Fig. 2 and 3).
- (b) **Card Moving Fingers:** The fingers slide the memory card out of the card loader onto the writing deck and back into the card loader.
- (c) **1B Card Writing Head:** The 1B card writing head (Fig. 4) is composed of 45-bit writing heads (00 to 44), 2 initialization electromagnets (0 and 1), and 2 position sensing heads (0 and 1). The initialization electromagnets are mounted directly in front of the position sensing heads and are in line over the memory cards initialization magnet rows 0 and 1, respectively. The 00 to 44 bit writing heads

track over the 45-bit magnets in each word row on the memory card. As the writing head travels from left to right (as viewed from the front of the MCW), it magnetizes the memory card's initialization magnets. The writing head then generates signals in the position sensing heads which are used to sense the moment when the head is properly positioned to write each word.

**(d) Mechanical Sequence Control Unit:** The mechanical sequence control unit, consisting of a group of relays, controls the mechanical functions of the 1A card writing unit, polarity of writing, and the inhibit and enable signals for the logic sequence control.

#### LOGIC UNIT

**2.04** The logic unit receives the writing information from the central processor via the peripheral unit address bus. The logic unit is made up of several circuit packs which process the writing information as follows.

- (a) Register circuit packs temporarily store the words to be written.
- (b) Write control circuit packs provide writing currents to the 1B writing head.
- (c) Logic sequence control circuit packs generate the write gate, count, word request, word delivery checks, register reset, etc. ♦The register and write control circuit packs are under the control of the logic sequence control circuit packs.♦

#### CONTROL PANEL

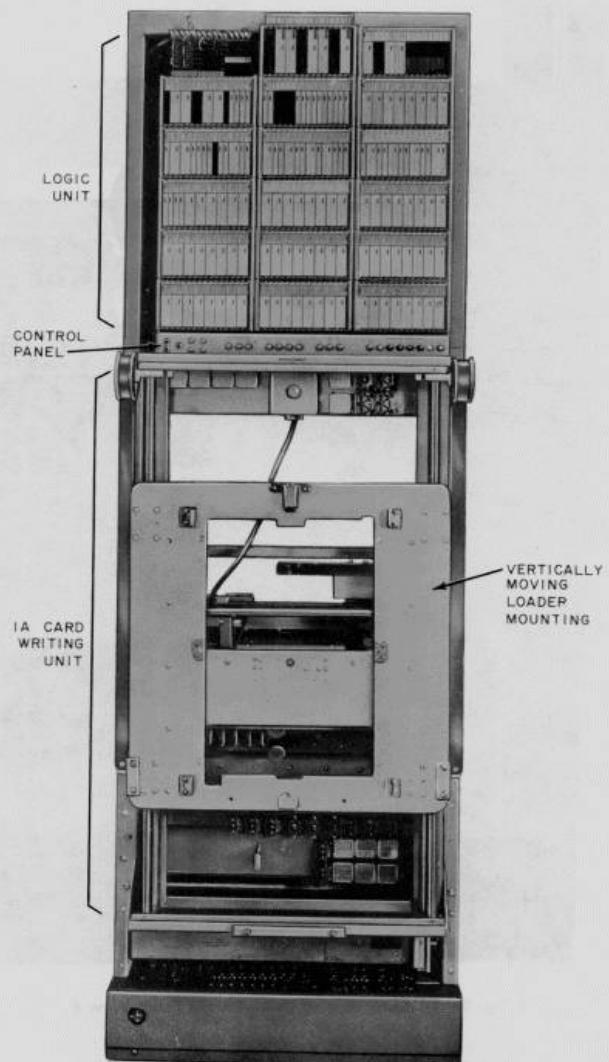
**2.05** The control panel (Fig. 5) contains pushbutton keys, lamps, and some miscellaneous circuit apparatus. The pushbutton keys provide control for the mechanical operation of the 1A card writing unit as well as control of power and alarm tests. The lamps are used to indicate power status, trouble conditions, and various operating conditions of the MCW.

#### POWER SUPPLIES AND POWER CONTROL

**2.06** The system central office battery supply, +24 volts and -48 volts, are connected to the MCW circuit, +24 volt filter and -48 volt filter. These filters keep bus current changes to less than 0.1 amp per microsecond during changing

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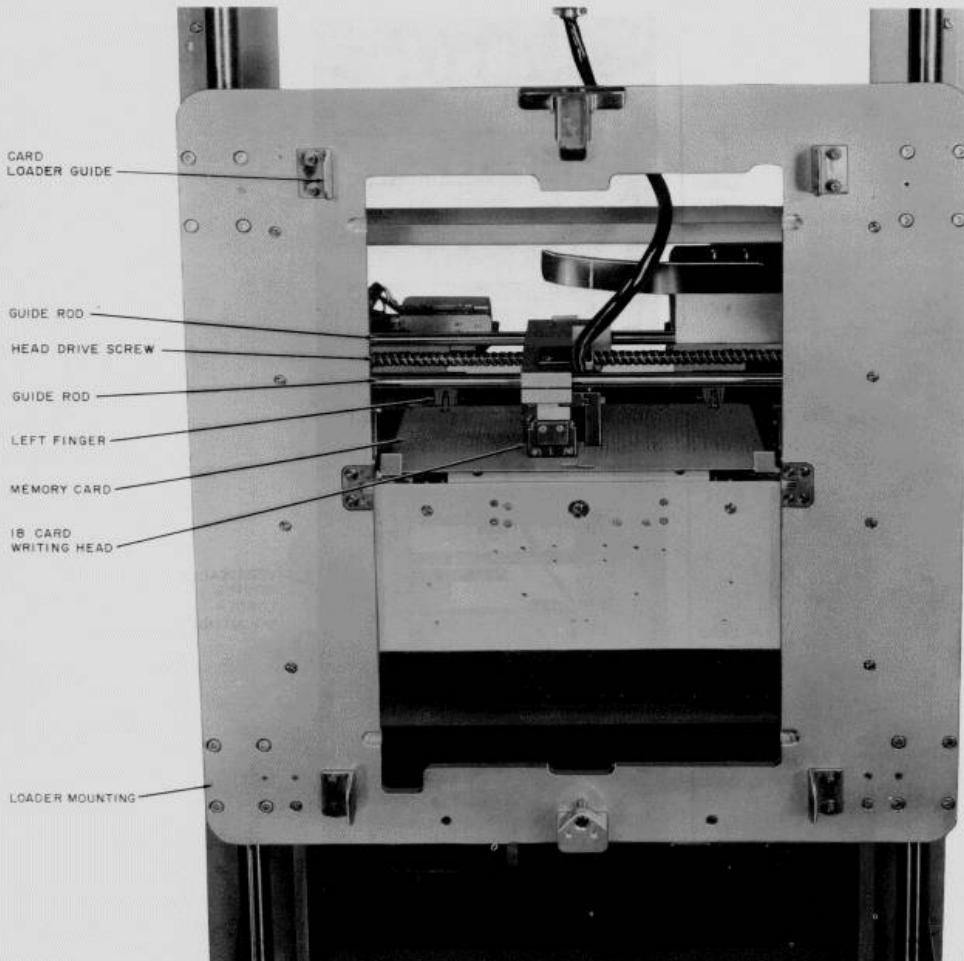


♦ Fig. 1—Memory Card Writer Frame ♦

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♦ Fig. 2—1A Card Writing Unit—Partial Front View ♦

load conditions. Power is fed from the filters where required. The power control circuits provide power switching, fusing, monitoring, and alarm functions of the MCW. The regulated power supply circuit packs are mounted on the frame with the logic unit circuit packs.

## 1A CARD LOADER

**2.07** The 1A card loader is used at the PS and the spare card storage units to remove or insert a whole module of 128 memory cards, and it is used at the MCW to hold the module of

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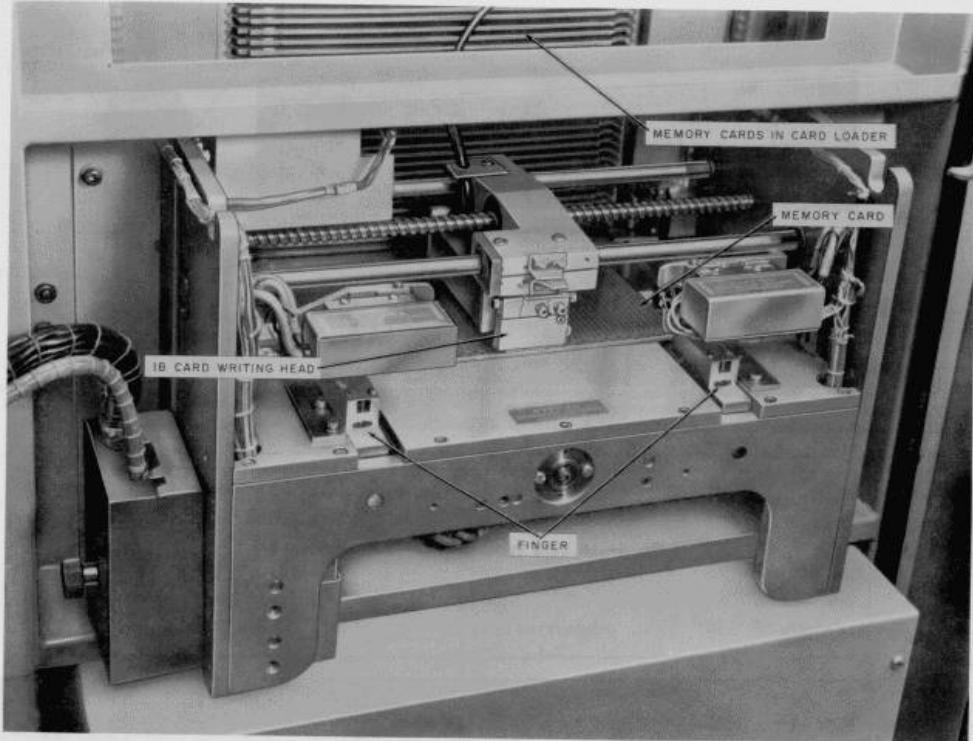


Fig. 3-1A Card Writing Unit—Partial Rear View With Loader Attached and Bar Removed

memory cards being updated. The spare card storage units may be either rack mounted or in a portable cart. All 128 memory cards are simultaneously inserted or drawn from a PS module or spare card storage unit by a motor driven arrangement in the card loader. The card loader has a variable indicator that can be set to identify the particular PS module with which the 128 memory cards are associated. The card loader weighs about 40 pounds when full and about 22-1/2 pounds when empty. The card loader can be moved from one location to another, using the cart containing the spare card storage unit.

## MEMORY CARDS

**2.08** The memory card (Fig. 6) is a rectangular aluminum card 11-1/4 by 6-5/8 by 0.016 inches. There are two types of memory cards used: type 1A used in pass 0 and type 2A used in pass 1. The type 1A and type 2A memory cards are physically different and can be recognized by the location of a card positioning slot which is used to position the memory cards in the PS. If the memory cards are held with the slot for the card loader at the bottom, type 1A cards are notched

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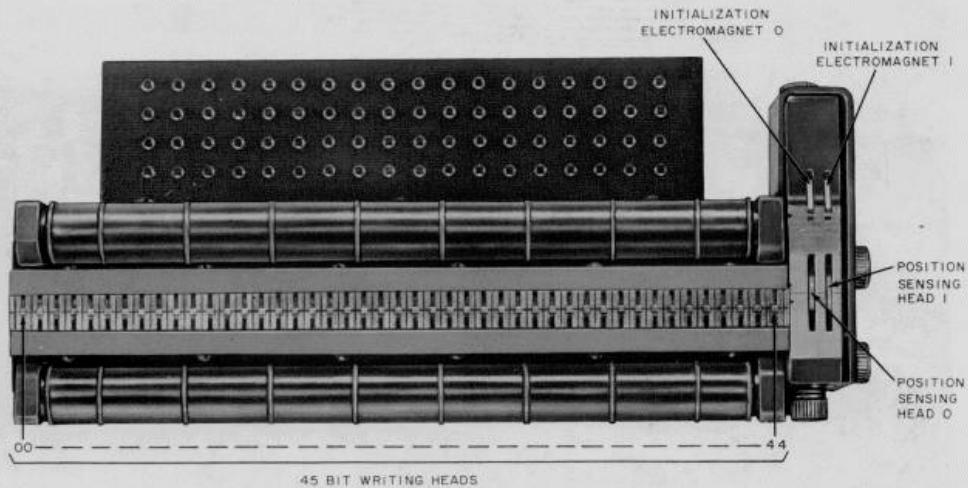


Fig. 4-1B Card Writing Head—Bottom View ♦

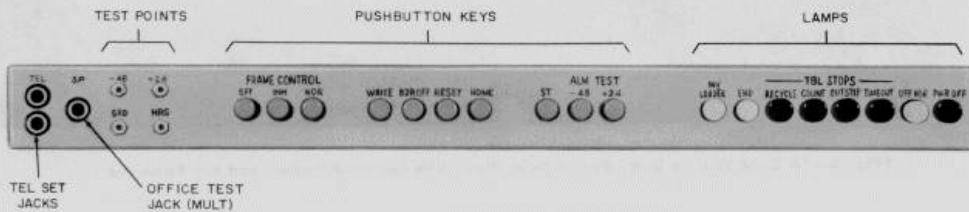


Fig. 5—MCW Control Panel

on the left top edge and type 2A cards are notched on the right top edge.

**2.09** The memory cards contain 65 initialization magnets and 64 rows of word bit magnets. These 65 initialization magnets are alternately placed in two adjacent rows (0 and 1) along the length of the card. Row 0 has 33 magnets and row 1, which is nearest the finger slots, has 32 magnets. The initialization magnets provide a means for determining the position of the writing head in

the MCW. In addition, when the memory card is being placed in a PS module, the initialization magnets establish buffer magnetic fields in the section of twistor wire between word rows. This reduces interference between adjacent words on the memory card. Each row of bit magnets is centered on a line that passes between the associated initialization magnets. Each row contains 45-bit magnets designated 00 to 44 (bit 44 is closest to the initialization magnets). Bits 00 to 43 are used to store a 44-bit word. Bit 44 is always magnetized

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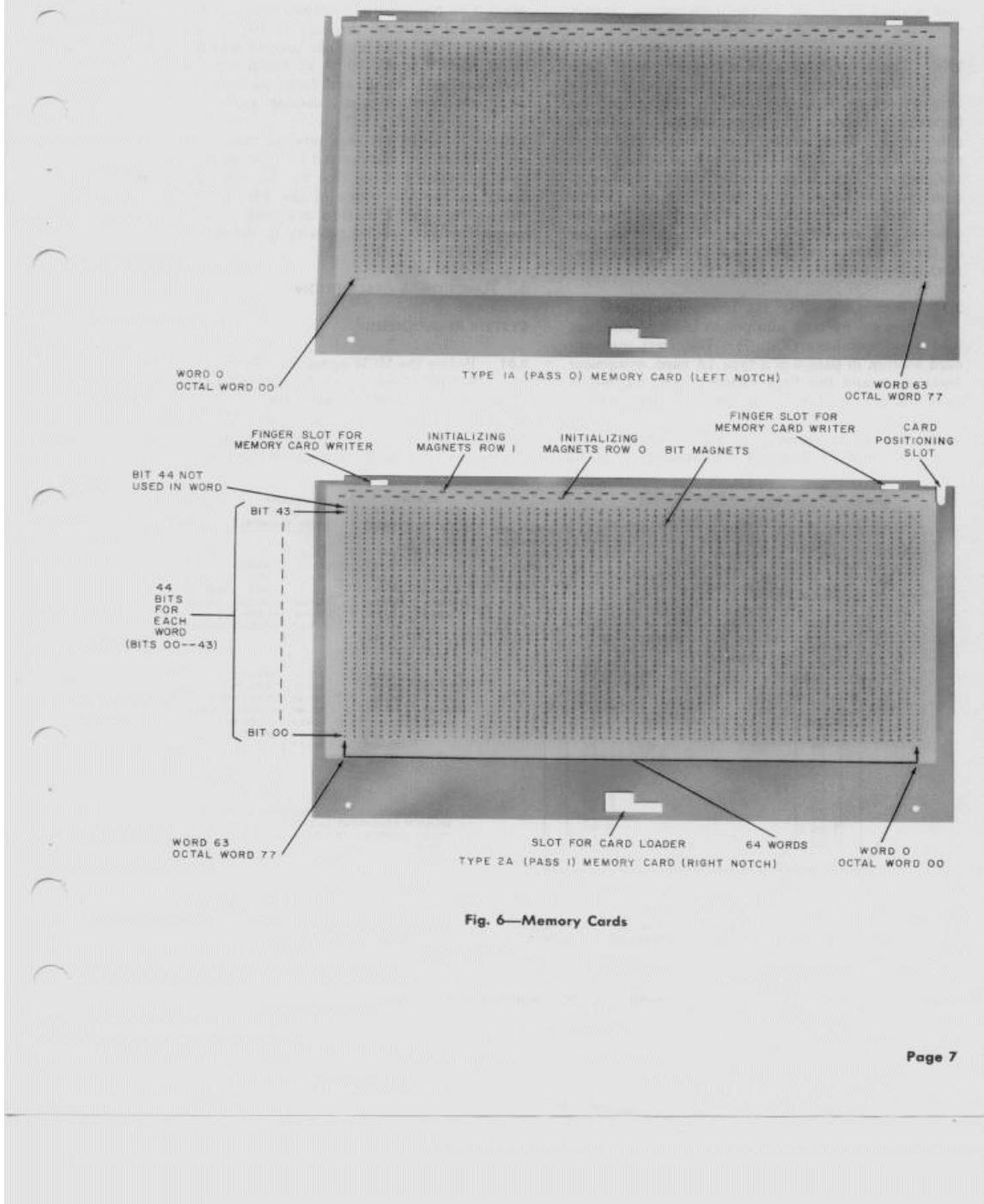


Fig. 6—Memory Cards

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and is used as an aid to the initialization magnet when the memory card is inserted into the PS.

**2.10** The bit magnets on a memory card store information in binary form by being either magnetized or demagnetized. A magnetized bit indicates a binary 0 and a demagnetized bit indicates a binary 1. Thus, each bit position of the 44-bit stored word is either a binary 0 or a 1. When the memory card is in place in the PS module, a demagnetized bit allows the switching of a twistor wire, indicating that a 1 is stored in that bit position. A magnetized bit inhibits the switching of the twistor wire, indicating that a 0 is stored in that bit position.

**2.11** Within a module the 128 memory cards are known by both equipment location numbers and octal numbers (Fig. 7). The first memory card written in pass 0 is a type 1A card, equipment location 0; and the first memory card written in pass 1 is a type 2A card, equipment location 64.

**2.12** On the memory card (Fig. 6) the 64 rows of word bit magnets are numbered 0 to 63

(word 0 on the notched end) and also are numbered in an octal basis 00 through 77 (word 00 on the notched end). The system passes words to the MCW from 0 to 63 (00 to 77 octal) when writing pass 0 memory cards and from 63 to 0 (77 to 00 octal) when writing pass 1 memory cards.

**2.13** The word bit magnets on pass 0 memory cards are magnetized in opposite polarity to pass 1 memory cards due to the memory cards being on opposite sides of the PS interrogating solenoids. Initialization magnets are always magnetized in opposite polarity to the bit magnets on the memory card.

## 3. FUNCTIONAL DESCRIPTION

### SYSTEM RELATIONSHIP

**3.01** Before the MCW operation (Fig. 8) is initiated, a TTY message exchange is sent via the CC-peripheral unit bus between the central processor and the maintenance TTY. The TTY message requests the central processor to supply a list of the modules in the PS for which there are entries

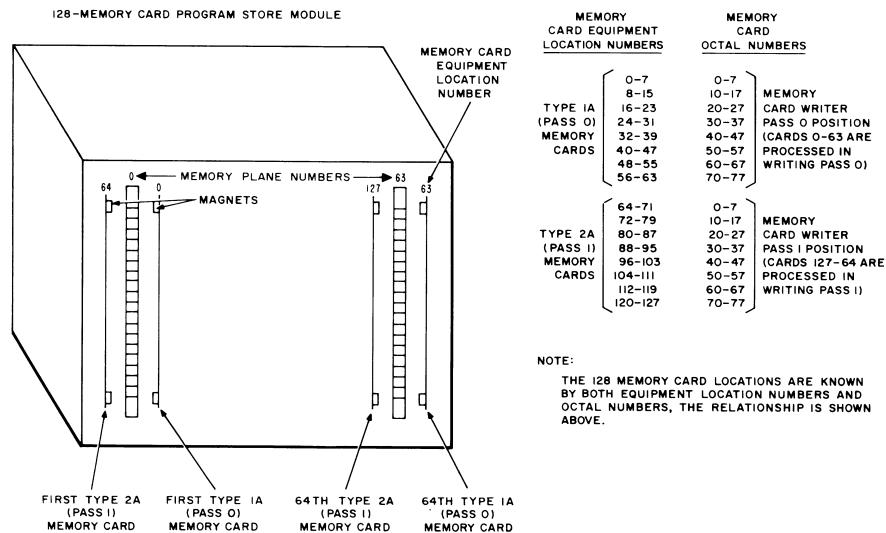


Fig. 7—Memory Card Locations in PS Module

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in the recent change area of the CS. [This list will not be supplied by the central processor in small No. 1 ESS offices where all translations are contained in a few modules that are readily identified and all updated at the same time (refer to PD-1A083 Recent Change Update and Control Programs).] The operating personnel, upon deciding that a module should be rewritten, informs the central processor of its identity via the TTY. Another TTY message requests the central processor to initiate a program which will furnish stored information to the MCW as it requests words while writing memory cards. (TTY messages that are pertinent to the MCW operation are covered in Part 4.)

**3.02** The central processor, via the peripheral unit address bus and through the signal distributor and applique circuits, sets up the MCW to write cards in pass 0. A TTY message to the attendant indicates that the system is ready to write memory cards. The system insures that the card loader is mounted in the pass 0 orientation when the WRITE key on the control panel is depressed. If the state set up in the MCW and the orientation of the card loader do not agree, the MCW will not start and the INV LOADER lamp will light.

**3.03** The central processor then forms a card image, in the CS memory, of the information that is to be sent to the MCW. The card image information is obtained from the updated information in the recent change area of the CS memory and the unchanged information from the corresponding memory card in the PS.

**3.04** The MCW starts writing cards when the WRITE key is depressed after the system has indicated via the TTY that this action should be taken. After the WRITE key is depressed, the MCW removes a memory card, with the bit magnets facing upward, from the card loader and positions it on the writing surface of the MCW. The MCW then sends a word request signal to the master scanner. The central processor detects the word request signal via the peripheral unit answer bus from the master scanner. The central processor then sends the information contained in the card image via the peripheral unit address bus to encode the bit magnets on the memory card in the MCW. The MCW is enabled by the central processor via the central control-central pulse distributor (CC-CPD) bus and the CPD. A verify signal from the MCW to the central processor, via

the CPD and the CC-CPD bus, indicates that the MCW is enabled.

**3.05** When the central processor sends the 44-bit word to the MCW, the word is stored temporarily in a register in the MCW. The contents of this register are used to control the 44-bit writing heads. The words on the memory card are written one at a time as the 44-bit writing heads pass over the 44-bit magnets on the memory card. Each word that is to be written is preceded by a word request signal sent from the MCW to the central processor. After the memory card has been completely written, the MCW returns it to the card loader, indexes the card loader up to the next memory card level, removes the next memory card, and repeats the writing process until 64 memory cards are written. Upon completion of writing the 64 memory cards associated with pass 0, the MCW sounds a buzzer, lights the INV LOADER (invert loader) lamp on the control panel to indicate the completion of pass 0, and returns the carriage to the original level. The attendant now inverts the card loader to process the 64 pass 1 memory cards.

**3.06** The central processor via the peripheral unit address bus and through the signal distributor and applique circuits now sets up the MCW to write pass 1. The system insures that the card loader is mounted in the correct pass 1 orientation when the WRITE key on the control panel is depressed. If the state set up the MCW and the orientation of the card loader do not agree, the MCW will not start and the INV LOADER lamp will light. The WRITE key is depressed and the 64 memory cards associated with pass 1 are written. At the end of pass 1, the MCW sounds a buzzer, lights the END lamp, and again returns the carriage to the original level.

**3.07** Between each memory card writing operation, the system assembles the information for the next memory card. There is no check on the accuracy of the information written until the memory cards are verified in the PS. Some troubles, such as failure to receive a word when requested, cause the MCW to repeat the writing of a memory card. If three tries fail to write a memory card successfully, the process is stopped and an alarm sounded. Other troubles, mechanical or electrical, cause the process to stop immediately.

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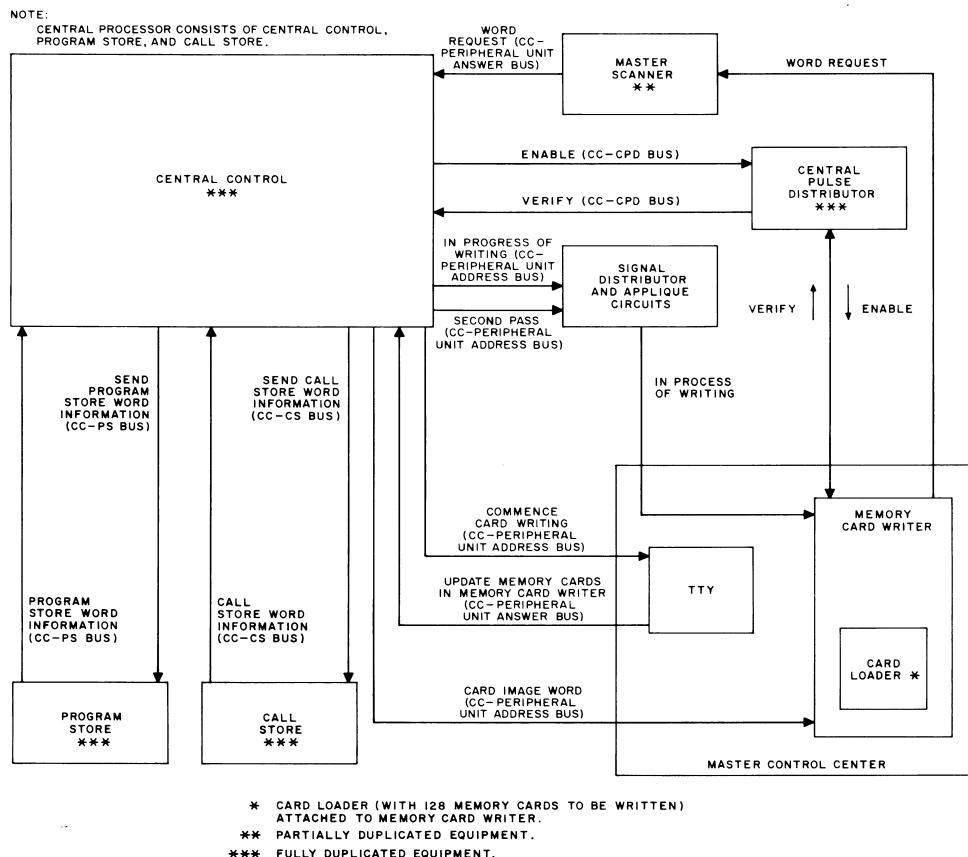


Fig. 8—Relation of MCW to System

**3.08** It takes about 4.5 seconds for the MCW to index the card loader up, withdraw a memory card, write the information, and reinsert the memory card into the card loader. The time required for processing one pass of 64 memory cards is approximately 5 minutes. The time required for processing a complete module of 128 memory cards is approximately 12 minutes. These 12 minutes include attaching, inverting, and removing the card loader from the MCW.

**3.09** After the MCW has completed the updating, a verification of the newly written module of memory cards is required. The PS, in which the updated module is to be placed, is taken out of service by operation of the REQ INH (request inhibit) key on the PS control panel. On signal that the PS is out of service, the memory cards are removed from this module by means of a second card loader and are immediately replaced with the updated memory cards from the MCW. Upon

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receiving a request of verification via the VER (verify) key on the PS control panel, the system compares the newly written memory cards in the out-of-service PS with the duplicate module in the PS that is yet to be updated and the recent change area of the CS. The system types out TTY messages indicating that the memory cards have been successfully written or the nature of the errors or troubles encountered in the writing process. Upon a signal that the new memory cards are written correctly, the out-of-service PS is automatically returned to service.

**3.10** After all PS module pairs requiring updating have been written and verified, the recent change area of the CS is updated via a TTY message.♦

## MODES OF OPERATION

**3.11** The MCW has seven different modes of operation. These modes are controlled by keys and indicated by lamps located on the MCW control panel (Fig. 5). The modes of operation are as follows:

- Off Mode
- Normal Mode
- Inhibit Write Mode
- Start Mode
- Write Mode
- Home Mode
- Trouble Stop Mode

(a) **Off Mode:** Depression of the OFF key places the MCW in the off mode. The PWR OFF (power off) and OFF NOR (off normal) lamps are lighted. In this mode, power is removed from the MCW frame except for alarm relays and control panel lamps. The OFF, NOR, and INH (inhibit) keys are mechanically interlocked so that only one key can be operated at a time.

(b) **Normal Mode:** Depression of the NOR key places the MCW in the normal mode. The PWR OFF and OFF NOR lamps are extinguished. In this mode, the MCW circuits are set for normal communication with the system.

(c) **Inhibit Write Mode:** Depression of the INH key places the MCW in the inhibit write mode. The OFF NOR lamp is lighted and the PWR OFF lamp is extinguished. In this mode, the MCW circuits are inhibited from communication with the system. This prevents interference while testing or repairing the MCW. During testing or repairing, the recycle and trouble stop features are disabled permitting operation and test of the trouble checking circuits without stopping the sequence. The circuit automatically restores to the start mode at the end of a pass. Since there is no communication with the system, each of the memory card bit magnets in a word is written as a binary 0 (magnetized).

(d) **Start Mode:** The MCW is normally left in start mode. The start mode is a partially powered standby state which keeps the MCW ready for immediate use with a minimum of current drain. The MCW can be placed in the start mode by one of the following methods.

(1) **ST Key:** If the NOR or INH key has been depressed placing the MCW in the normal or inhibit mode, depress the ST key.

(2) **RESET Key:** If the INV LOADER or END lamp is lighted following a normal writing operation or if a control panel lamp is lighted during an alarm or trouble stop condition, depress the RESET key.

(e) **Write Mode:** Depression of the WRITE key places the MCW in the write mode. No lamp is lighted to indicate the start of the write mode. The write mode is the power state used for actually writing memory cards. If the MCW is in the normal or inhibit write mode and if the proper starting conditions described below are met, the MCW will start writing when the WRITE key is depressed.

(1) The 1A card writing head is in its left-most position as viewed from the front of the MCW. All switches that are operated by the 1A card writing head in that position are actuated.

(2) All switches that are operated by the fingers in the median position are actuated.

(3) Card loader is in the home position.

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(f) **Home Mode:** Depression of the HOME key places the MCW in the home mode. No lamp is lighted to indicate the start of the home mode. The home mode sequences the card loader, fingers, and 1A card writing head back to the starting positions. The home mode is used when a trouble stop or power failure condition stops the memory card writing sequence or when the parts have been moved with the power off for test or adjustment purposes. As in the inhibit write mode, the MCW does not communicate with the system and the trouble stop feature does not operate. When the card writer has been restored to the home position, the power is removed and the circuit is left in the start mode. If the MCW is sequencing in the write mode, depression of the HOME key causes the MCW to terminate its normal processing sequence, return the card loader to its home position, and to reset to the start mode. If for some reason the card loader mounting is away from its home position and the MCW is in the start mode, depression of the HOME key will automatically put the MCW into the write mode long enough to return the card loader to its home position.

(g) **Trouble Stop Mode:** If a memory card sequence has begun with the NOR key depressed and the MCW detects a noncorrectable condition, the MCW goes into the trouble stop mode. All mechanical motion stops, and the cause of the stoppage is indicated by the appropriate control panel lamp. To simplify trouble diagnosis, only one trouble stop condition can occur and one lamp can be lighted at the same time. Depression of the RESET key extinguishes the lamp and restores the MCW to the start mode, thus enabling the HOME key, when depressed, to sequence the parts back to the home position. When the MCW is in the trouble stop mode, a signal is transmitted to the system and writing of the module cannot resume until the system is again prepared via the TTY.

### 1A CARD WRITING UNIT

**3.12** The 1A card writing unit is the electromechanical equipment that automatically handles the memory cards during the writing process. The 1A card writing unit automatically performs the following.

- (a) Removes a memory card from the card loader.
- (b) Writes the information on the memory card.
- (c) Returns the memory card to the card loader.
- (d) Indexes the card loader up to the next memory card level.
- (e) Removes the next memory card to be written.
- (f) Repeats the process until all 64 memory cards in pass 0 are written.
- (g) The attendant inverts the card loader and the process is repeated until all 64 memory cards in pass 1 are written.

### LOGIC SEQUENCE CONTROL

**3.13** The logic sequence control enables the writing sequence only when the #1B writing head passes over the memory card from left to right. From signals generated in the position sensing heads of the #1B writing head, the logic sequence control performs the following.

- (a) Senses that instant when the head is properly positioned to write each word, and then orders the write control circuits to operate accordingly.
- (b) Requests the system for word information and checks that each word is delivered in time to be properly written. Failing this check, it stops further word requests, tells the system of the word delivery failure, and recycles the memory card for another try.
- (c) Issues requests for a new word immediately after each word has been written and resets the complete word register at the same time.
- (d) Counts the number of initialization magnets that were sensed on the memory card; and if none were sensed, recycles the memory card on the assumption that the fingers had failed to pull a memory card from the card loader and that a second try will be successful.
- (e) Counts recycle conditions; and if the third try (second recycle) to write a card is

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unsuccessful, it lights the RECYCLE lamp and operates the trouble stop feature.

- (f) Lights the COUNT lamp and operates the trouble stop feature if the counter registers other than 65 when the #1B writing head has passed the last initialization magnet on the card.

## BLOCK DIAGRAM ANALYSIS

**3.14** When a new PS module needs to be written, the system is prepared for writing via the TTY. The NOR key on the control panel is then depressed extinguishing the PWR OFF and OFF NOR lamps. This removes the MCW from the off mode and places it in the normal mode. The ST key is then depressed to place the MCW in the start mode. A card loader containing a spare set of 128 memory cards is then clamped on the MCW in the pass 0 orientation.

**3.15** The central processor, via the signal distributor applique circuit, applies an in process (IP) signal to the mechanical sequence control circuits (Fig. 9). This signal causes two relays (IP and SP) in the mechanical sequence control circuits to be set in the pass 0 state. The purpose of these relays is to indicate to the MCW that the system is ready and to insure that the card loader is mounted in the pass 0 orientation when the MCW is started. If the state of the relays and the orientation of the card loader do not agree, the MCW will not start when its WRITE key is depressed, and the INV LOADER lamp will light indicating that the orientation is not correct.

**3.16** The WRITE key on the control panel is depressed to place the MCW in the write mode. The mechanical sequence control circuits signal the logic sequence control circuits to reset the register. The card loader brings the first memory card to a position level with the writing deck.

**3.17** The mechanical sequence control circuits then operate the fingers in the card writing mechanism which remove the memory card from the card loader (Fig. 10). The fingers are spring-tensioned downward against a stop surface. The front ends are hooked and tapered so that as the fingers are driven toward the memory card, the tapered ends ride up over the edge of the memory card and the hooks drop into the finger slots in the memory card. Then the fingers are

driven backward drawing the memory card onto the writing deck and against fixed back stops. The fingers are spring-tensioned in a longitudinal direction to prevent excessive strain on the card and on the fingers when the card strikes the back stops. This tension also serves to hold the card firmly against the stops. The motion of the fingers is stopped by switching the control circuit which brakes the finger motor to a stop. The card is now positioned on the writing deck in line with the #1B card writing head. The mechanical sequence control circuits (Fig. 9) then operate the head motor. The head motor turns the head drive screw which drives the writing head over the card.

**3.18** When the writing head passes over the card traveling from left to right, its initialization electromagnets 0 and 1 magnetize the alternately spaced initializing magnets in rows 0 and 1 on the card. When position sensing heads 0 and 1 pass over the initializing magnets, the position sensing heads produce and send position sensing signals to the logic sequence control circuits. The position sensing signals are used to indicate when the bit writing heads are in a position to write a word on the bit magnets of the card.

**3.19** If the logic sequence control circuits do not receive a position sensing signal from the writing head, it causes the mechanical sequence control circuits to recycle the card. The card is recycled on the assumption that the fingers had failed to pull a card from the card loader and will be successful on the next try. When the writing head gets to the right side of the writing deck, a relay is operated which causes the indexing operation of the card loader at the end of cycle to be bypassed so that the same card is processed on the next cycle for the second try. If a position sensing signal is not received on the third try (second recycle), the RECYCLE lamp on the control panel is lighted and the trouble stop feature is operated.

**3.20** The position sensing signals occur alternately in the position sensing heads at approximately 12.5-millisecond intervals due to the alternate placement of the initializing magnets in rows 0 and 1. The position sensing heads are positioned so that the detection of the position sensing signal occurs when the bit writing heads are located before the center of the bit magnets. When position sensing head 0 is located over the first initializing magnet in row 0, the bit writing heads are positioned

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one word space before the first word row of bit magnets. When position sensing head 1 is located over the first initializing magnet in row 1, the bit writing heads are positioned to write the first word on the memory card.

**3.21** When the logic sequence control circuits receive a position sensing signal from the writing head, it sends a word request signal to the master scanner. The central processor detects the word request signal from the master scanner and then sends a 44-bit word via the peripheral unit address bus to the receivers in the MCW in two bursts (23 bits in the first burst and 21 bits in the second burst). An enable signal timed to arrive with the first burst is sent from the central processor via the CPD to the EN0 enable and verify circuits. The EN0 enable signal gates the first burst of 23 bits through the pulse directors into the register. The EN0 enable and verify circuits send a verify signal to the central processor via the CPD to indicate that the enable signal for the first burst of 23 bits has been received. The central processor then sends a second enable signal timed to arrive with the second burst of 21 bits via the CPD to the EN1 enable and verify circuits. This enable signal gates the second burst of 21 bits through the pulse directors into the register. The EN1 enable and verify second burst circuits send a verify signal to the central processor via the CPD to indicate that the enable signal for the second burst of 21 bits which completes the word has been received. In addition, the EN1 enable and verify circuits signal the logic sequence control circuits that the word has been delivered. Then logic sequence control circuits remove the word request signal to the master scanner.

**3.22** If the logic sequence control circuits do not receive a signal that the word has been delivered, a word delivery failure signal is sent to the master scanner. The delivery failure signal causes the system to retain the same card image in the CS. The logic sequence control circuits then cause the mechanical sequence control circuits to recycle the card. If the word is not delivered on the third try (second recycle), the RECYCLE lamp on the control panel is lighted and the trouble stop feature is operated.

**3.23** The 44 outputs from the register are sent to the write control circuits. The write control signal from the logic sequence control circuits controls the gating of the 44 outputs from the

write control circuits to the 44-bit writing heads (00 through 43). Bit writing head 44 is not used in writing. When the bit writing heads 00 through 43 are positioned over bit magnets 00 through 43 in the first row, the bit magnets are magnetized or erased individually in accordance with the registered information from the central processor. The sequence is repeated until all 64 words are completely written.

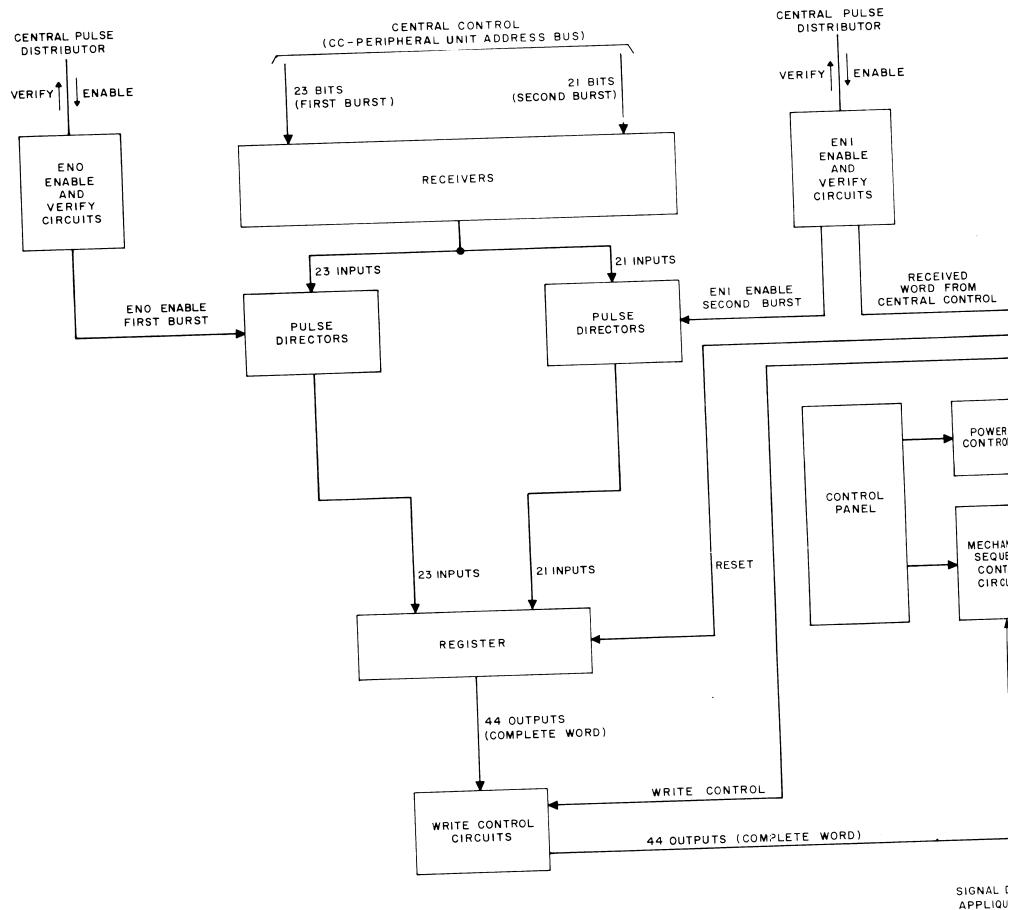
**3.24** After all 64 words have been written on the card, the fingers in the card writing unit return the card to the card loader. The fingers move back from the card loader to the clear position and the card loader indexes up to the next card level. The fingers move forward to remove the next card to be written, and the process is repeated until the 64 cards in pass 0 are written. After pass 0 has been written and the last card has been returned to the card loader, the system changes the state of the IP and SP relays in the logic sequence control circuits to indicate that it has delivered all the word information for pass 0. The MCW then sounds a buzzer, lights the INV LOADER lamp on the control panel, and returns the card loader to its home position. The buzzer can be turned off by depressing the BZR OFF (buzzer off) key on the control panel.

**3.25** The central processor, via the signal distributor applique circuit, applies a second pass (SP) signal to the mechanical sequence control circuits. This signal changes the state of the IP and SP relays in the mechanical sequence control circuits from the pass 0 to the pass 1 state. These relays indicate to the MCW that the system is ready for pass 1. In addition, these relays detect whether the card loader is mounted in the pass 1 orientation.

**3.26** If the state of the relays and the orientation of the card loader do not agree, the INV LOADER lamp will not extinguish when the RESET key is depressed and the MCW will not start when the WRITE key is depressed. The card loader is then manually inverted to the pass 1 orientation. The RESET key is then depressed to extinguish the INV LOADER lamp and turn off the buzzer if not turned off previously and to place the MCW in the start mode. The RESET key is not in the circuit until the card loader has returned to its home position.

**3.27** After the card loader returns to its home position, the WRITE key is depressed and

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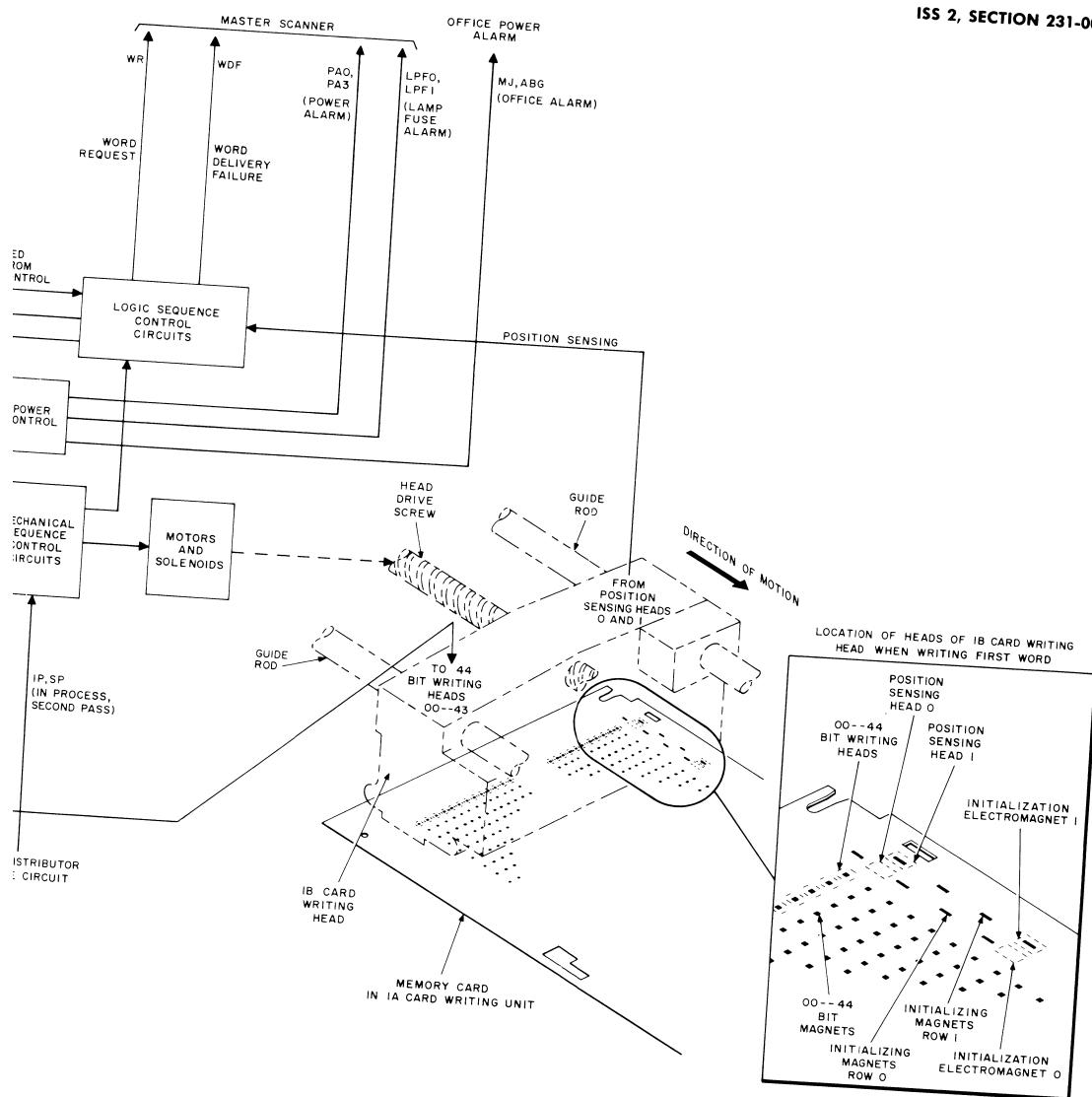
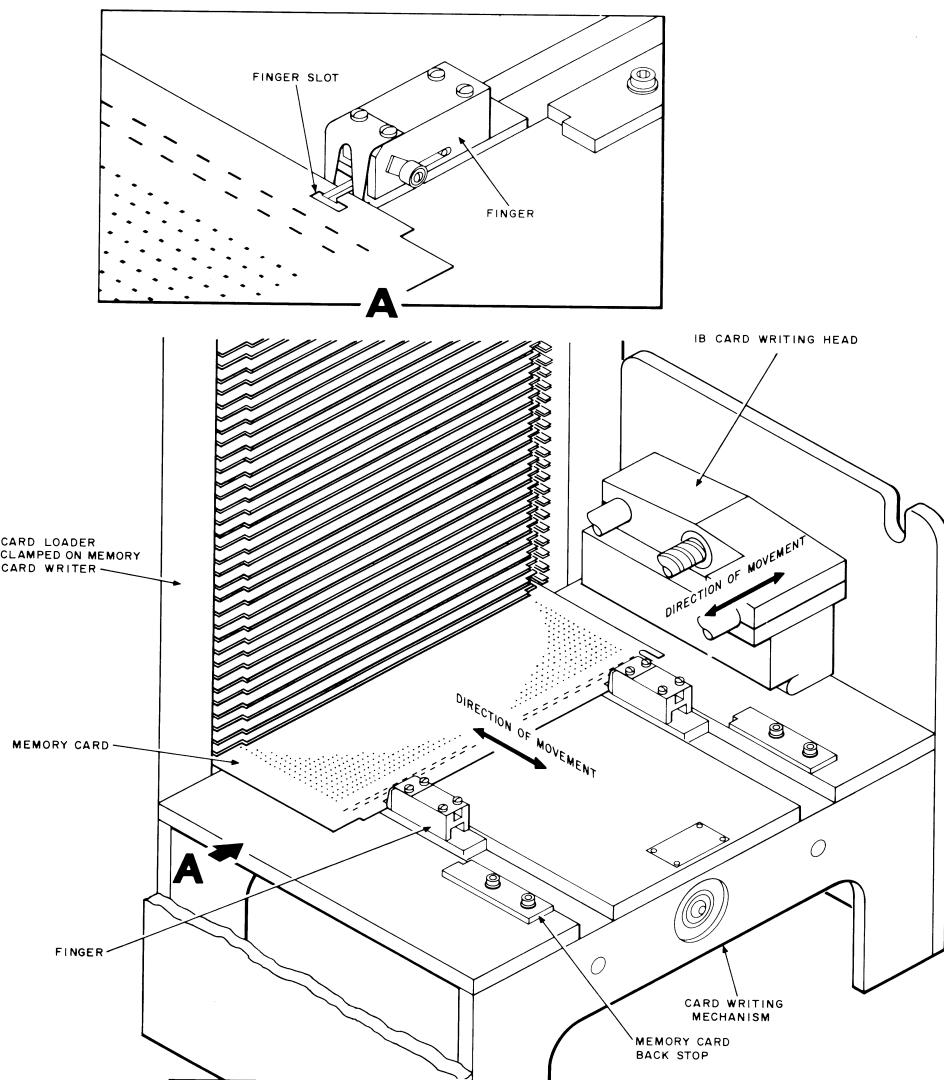


Fig. 9—MCW—Functional Diagram

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♦ Fig. 10—Removing Memory Card From Card Loader ♦

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the 64 cards associated with pass 1 are written. At the end of pass 1, the system releases the IP and SP relays to indicate it has delivered all the words for pass 1. The MCW sounds the buzzer, lights the END lamp, and again returns the card loader to its home position. The RESET key is depressed to extinguish the END lamp, to turn off the buzzer, and to place the MCW in the start mode. After the MCW has completed the writing of all the cards and returned them to the card loader, the card loader is removed from the MCW.

**3.28** The power condition of the MCW is communicated from the power control to the master scanner and office power alarm over three pairs of leads. These leads are the PA0 and PA3 (power alarm) leads, LPF0 and LPF1 (lamp fuse alarm) leads, and the MJ and ABG (office alarm) leads. Loss of battery on the PA0 lead to the master scanner indicates that power is off. Loss of battery on the LPF0 lead to the master scanner indicates that lamp fuse FT1 has failed. Closing the MJ and ABG lead loop due to the release of normally operated PA (power alarm) relay indicates a major power alarm to the office power alarm. When the power alarm relay is released, the PWR OFF lamp on the control panel lights indicating that power is down except during alarm tests.

### TROUBLE STOP CONDITIONS

**3.29** There are four trouble stop checking circuits which monitor the card writing process. These checking circuits are as follows:

- Out of Step
- Time-Out
- Recycle
- Count

If one of the troubles occurs, memory card writing is stopped and power is removed from the motors and solenoids. This stops all mechanical motion and leaves the sequence operated at the point where the trouble occurred. To simplify trouble diagnosis, only one of the trouble stop checking circuits can effect a trouble stop at any given time. In addition, the MCW lights a lamp on the control panel to identify the trouble. The MCW also informs the system of the trouble stop via

the word request and word delivery failure leads to the master scanner. The system stops scanning for word requests, sounds an alarm, and prints a TTY message. Also the system leaves unchanged the state of the IP and SP relays in the MCW logic sequence control circuits so that a correct trouble diagnosis can be made. Depression of the RESET key will extinguish the control panel lamp, restore the MCW to the start mode, and enable the HOME key when depressed to sequence the parts back to the home position. Writing of the module cannot start until the system is again prepared via the TTY.

(a) **Out of Step:** The out-of-step circuits operate if the MCW and the system are out of step in locating words. If the system fails to send the last of the 4096 words at the same time that the MCW is prepared to write the 64th word on the 64th memory card of a pass, the system and the MCW are out of step. To detect the out-of-step condition, system controlled relays in the MCW logic sequence control circuits are checked before writing each memory card and at the end of each pass. If this condition occurs, the OUTSTEP lamp on the control panel is lighted.

(b) **Time-Out:** The time-out circuits operate if a mechanical or electrical trouble stops the sequence of writing for a minimum of 40 seconds. If this condition occurs, the TIMEOUT lamp on the control panel is lighted.

(c) **Recycle:** Memory cards are recycled whenever a word delivery failure occurs. The recycle circuits operate if a recycled memory card fails on the third try (second recycle). If this occurs, the RECYCLE lamp on the control panel is lighted.

(d) **Count:** The count circuits operate if the position sense counter registers an incorrect count after writing a memory card. If this occurs, the COUNT lamp on the control panel is lighted.

### ALARMS

**3.30** Depression of either the -48 or the +24 key on the control panel will simulate a fuse alarm failure. This tests the ability of the -48 or +24 test key to produce a power alarm. The test can be made with the circuit in the start mode or

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the write mode without changing the mode. The successful operation of the test of either -48 or +24 key is indicated by lighting the PWR OFF lamp.

- 3.31** The loss of +24 or -48 volts to the circuit through the power distribution circuit or a

tripped 208-volt ac circuit breaker will cause a major power alarm. The circuit automatically turns the power off and lights the PWR OFF lamp on the control panel. The audible power alarm is retired by depressing the OFF key.

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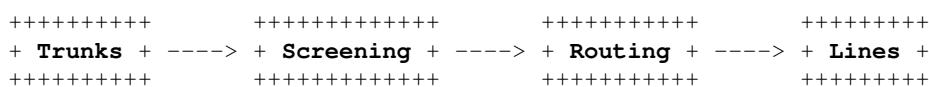
# Nortel DMS-100 Trunk-to-Line Translations

## Description

When a call originates on an incoming trunk, the appropriate trunk tables are used. The call then enters the screening tables where digit analysis begins. After some general pre-screening or pre-translation is performed, the call may progress into more detailed screening based on NPA/NXX digits to determine the path into the designated routing tables for defining the final destination, or termination of the call.

## Operation

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



The *trunks* tables contain detailed information about trunks originating and terminating in the switch. Each trunk connected to the office is represented by entries in the trunk tables. These tables include information about the following:

- Type of trunk group.
- Type of signaling.
- Hardware location of each trunk.
- Screening information for incoming call from trunks to define the next logical step in translation.

The *screening* tables contain the information used to analyze the digits that the DMS-100 receives. This screening process tests the digits dialed prior to 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 calls to their final destination. The information found in these tables dictates how and where a call will be completed, or if the call will route to a recorded announcement or treatment.

The *lines* tables contain information about the terminating line. These tables have two 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.

## **Translations Table Flow for Trunk-to-Line Translations**

The call originates from a particular hardware location on an incoming trunk member listed in table TRKMEM. Signaling information is obtained from table TRKSGRP.

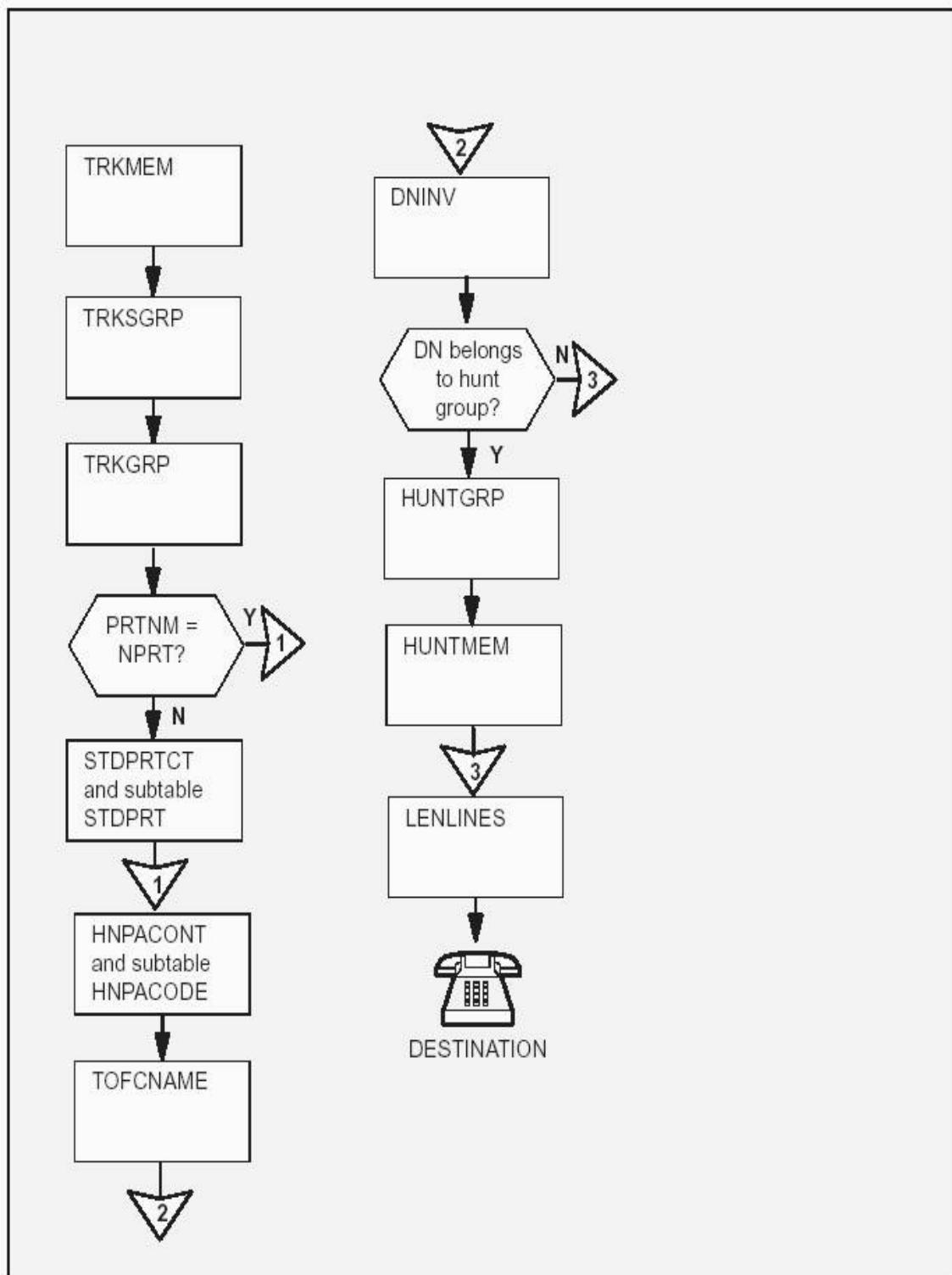
For an incoming trunk, table TRKGRP lists the Serving Numbering Plan Area (SNPA) in subfield SNPA and the pre-translator subtable name in subfield PRTNM.

If a pre-translator subtable name is specified, translation continues with table STDPRTCT and its subtable STDPRT. If no pre-translator is specified, the entry in subfield PRTNM is NPRT and the call routes to table HNPACONT and its subtable HNPACODE.

Table TOFCNAME defines all the terminating offices in the switch and they are identified by area code and office code. Table DNINV contains the data for all assigned and unassigned Directory Numbers (DN). If the DN belongs to a hunt group, tables HUNTPRT and HUNTMEM will be accessed.

The trunk-to-line translations process is shown in the flowchart that follows.

### Table Flow for a Trunk-to-Line Translation



The following table lists the datafill content used in the flowchart. In this example, the terminating line belongs to a hunt group:

**Trunk** : F514T13TISIT048  
**Terminating SNPA** : 514  
**Terminating DN** : 5462225

---

**Datafill Example for Trunk-to-Line Translations**

<b>Datafill Table</b>	<b>Example Data</b>
CLLI	F514T13TISIT048 1527 1 SSP5_TACISUP_TRAF_TRUNKS
TRKMEM	F514T13TISIT048 1 0 DTC 13 19 24
TRKSGRP	F514T13TISIT048 0 DS1SIG C7UP 2W N N UNEQ NONE Q764 2W 2W 0 TATSTAC \$ TACTIMER CIC
TRKGRP	F514T13TISIT048 IT 0 NPDGP NCIT 2W NIL MIDL 514 NPRT NSCR 514 000 Y N \$
HNPACONT	514 98 0 ( 72) ( 1) ( 24) ( 0)
subtable HNPACODE	546 546 DN 514 546
TOFCNAME	514 546
DNINV	514 546 2225 H 57 0
HUNTGRP	57 514 5462225 DNH N N N RCVD N N N N N N 4 \$
HUNTMEM	57 0 N D 5462225 N
LENLINES	HOST 05 0 16 17 S 0 5462225 DT 108 \$

---

The following table lists the datafill content used in the flowchart. In this example, a pre-translator is specified in table TRKGRP:

```
Trunk : S5AAA807IPTLA
Pre-translator : P807
Terminating SNPA : 807
Terminating DN : 5663000
```

---

***Datafill Example for Trunk-to-Line Translations Using a Pre-translator***

<b>Datafill Table</b>	<b>Example Data</b>
CLLI	S5AAA807IPTLA 346 40 S5AAA_TO_S5807_IC PTS_LAMA
TRKMEM	S5AAA807IPTLA 0 0 DTC 5 1 1
TRKSGRP	S5AAA807IPTLA 0 DS1SIG STD IC DP WK N 10 10 NO NO N N Y M UNEQ
TRKGRP	S5AAA807IPTLA IT 0 NPDGP NCRT IC DD MIDL 000 P807 NSCR 807 000 N N \$
STDPRCTC	P807 (1) (65021)
subtable STDPRT	807 807 N DD 3 NA
HNPACONT	807 201 1 ( 31) ( 1) ( 14) ( 0)
subtable HNPACODE	457 457 DN 807 566
TOFCNAME	807 566
DNINV	807 566 3000 L HOST 04 0 00 19
LENLINES	HOST 04 0 00 19 S 0 5663000 DT 8 \$

## **Datafilling Office Parameters**

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

---

### ***Office Parameters Used by Trunk-to-Line Translations***

<b>Table Name</b>	<b>Parameter Name</b>	<b>Explanation and Action</b>
OFCENG	ACTIVE_DN_SYSTEM	This parameter specifies the type of DNs that can be used in an office. If this parameter is set to "NORTH_AMERICAN", the directory number must use the form NPA-NXX-XXXX. If this parameter is set to "UNIVERSAL", the directory number may vary in length.
	AIN_ACTIVE	This parameter controls the activation of the Advanced Intelligent Network (AIN). Enter "Y" to activate AIN software. Enter "N" to deactivate AIN software. If this parameter is set to "N", parameter AIN_OFFICE_TRIGGRP in table OFCVAR is disregarded.
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".

## **Datafill Sequence**

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

---

### ***Datafill Tables Required for Trunk-to-Line Translations for the Trunk***

<b>Table</b>	<b>Purpose of Table</b>
CLLI	The common language location identifier table lists the name that uniquely identifies each trunk group, tone, or announcement.
TRKGRP	The trunk group table contains customer-defined data associated with each trunk group.
TRKSGRP	The trunk subgroup table specifies supplementary information for each trunk group.
TRKMEM	The trunk member table gives the physical location of each trunk assigned to one of the trunk groups.

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

---

**Datafill Tables Required for Trunk-to-Line Translations**

Table	Purpose of Table
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.
STDPRCTCT	The standard pre-translator table lists the names of the standard pre-translator subtables.
subtable STDPRCT	The standard pre-translator subtable determines the next stage of translation, based on the range of leading digits.
TOFCNAME	The terminating office name table defines all terminating offices in the switch.
DNINV	The directory number inventory table is a read-only table that contains data for all assigned and unassigned DNs.
HUNTPGRP	The hunt group table lists data assignments for each hunt group in the switching unit.
HUNTMEM	The hunt member table lists the members assigned to the hunt groups.
LENLINES	The line assignment table contains the DN, hardware location, and options associated with the calling line.

---

### **Datafilling Table CLLI**

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

---

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

CLLI	ADNUM	TRKGRSIZ	ADMININF
F514T13TISIT048	1527	1	SSP5_TACISUP_TRAF_TRUNKS
S5AAA807IPTLA	346	40	S5AAA_TO_S5807_IC_PTS_LAMA

## **Datafilling Table TRKGRP**

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

---

### ***Datafilling Table TRKGRP***

<b>Field</b>	<b>Subfield or Refinement</b>	<b>Entry</b>	<b>Explanation and Action</b>
GRPKEY		See subfield	<i>Group Key</i> This field consists of subfield CLLI.
CLLI		Alphanumeric (1 to 16 characters)	<i>Common Language Location Identifier</i> Enter the CLLI code assigned to the trunk group in table CLLI.

---

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

GRPKEY	GRPINFO
F514T13TISIT048	IT 0 NPDGP NCIT 2W NIL MIDL 514 NPRT NSCR 514 000 Y N \$
S5AAA807IPTLA	IT 0 NPDGP NCRT IC DD MIDL 000 P807 NSCR 807 000 N N \$

## **Datafilling Table TRKSGRP**

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

---

### ***Datafilling Table TRKSGRP***

<b>Field</b>	<b>Subfield or Refinement</b>	<b>Entry</b>	<b>Explanation and Action</b>
SGRPKEY		See subfields	<i>Subgroup Key</i> This field consists of subfields CLLI and SGRP.
CLLI		Alphanumeric (1 to 16 characters)	<i>Common Language Location Identifier</i> Enter the code that is assigned in table CLLI to the trunk group to which the subgroup belongs.
SGRP		0 or 1	<i>Subgroup Number</i> Enter the number assigned to the trunk subgroup.

---

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

SGRPKEY	CARDCODE	SGRPVAR
F514T13TISIT048 0	DS1SIG	C7UP 2W N N UNEQ NONE Q764 2W 2W 0 TATSTAC \$ TACTIMER CIC
S5AAA807IPTLA 0	DS1SIG	STD IC DP WK N 10 10 NO NO N N Y M UNEQ

### Datafilling Table TRKMEM

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

#### *Datafilling Table TRKMEM*

Field	Subfield or Refinement	Entry	Explanation and Action
CLLI		Alphanumeric (1 to 16 characters)	<i>Common Language Location Identifier</i> Enter the CLLI code that is assigned to the trunk group of which the trunk is a member. This CLLI code is assigned in table CLLI.
EXTRKNM		0 to 9,999	<i>External Trunk Number</i> Enter the external trunk number that is assigned to the trunk. For members of trunk groups using the AIOD option, the external trunk number must be unique over all trunks and lines using the same AIOD group.
MEMVAR		See subfield	<i>Variable Data for Members</i> This field consists of subfield PMTYPE and refinements.
PMTYPE		DTC	<i>Peripheral Module Type</i> Enter the Peripheral Module (PM) type on which the trunk is mounted and datafill the refinements associated with this entry value.
			Enter DTC for a digital trunk controller and complete subfields DTCNO, DTCCCKTNO, and DTCCCKTTS.
DTCNO		0 to 511	<i>Digital Trunk Controller Number</i> Enter the number of the DTC to which the trunk group member is assigned.
DTCCCKTNO		0 to 19	<i>Digital Trunk Controller Circuit Number</i> Enter the number of the DTC circuit card to which the trunk group member is assigned.
DTCCCKTTS		1 to 24	<i>Digital Trunk Controller Circuit Time-Slot</i> Enter the number of the circuit card DS-1 time-slot to which the trunk group member is assigned.

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

CLLI	EXTRKNM	SGRP	MEMVAR
F514T13TISIT048	1	0	DTC 13 19 24
S5AAA807IPTLA	0	0	DTC 5 1 1

### Datafilling Table STDPRTCT

The following table shows the datafill specific to trunk-to-line translations for table STDPRTCT. Only those fields that apply directly to trunk-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 Pre-Translator Name</i> Enter the key defined by the operating company to represent the standard pre-translator subtable.
STDPRT		See note	<i>Standard Pre-Translator</i> The field is an index into subtable STDPRT.  <b>Note:</b> This field does not accept any input.

---

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

EXPRTNM	STDPRT	AMAPRT
P807	(1)	(65021)

### Datafilling Subtable STDPRTCT.STDPRT

The following table shows the datafill specific to trunk-to-line translations for subtable STDPRTCT.STDPRT. Only those fields that apply directly to trunk-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>Pre-Translation Route</i> This field consists of subfield PRERTSEL and its refinements, TYPECALL, NOPREDIG, TRANSYS, and POS.
PRERTSEL	N	<i>Pre-Translator Route Selector</i> Enter "N".
TYPECALL	DD, OA, NP, or NL	<i>Type of Call</i> Enter the type of call: DD (Direct Dial), NP (No Prefix), OA (Operator Assisted), 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.
NOPREDIG	0 to 7	<i>Number of Prefix Digits</i> Enter the number of digits that are to be interpreted as prefix digits.
TRANSYS	IN, IP, or NA	<i>Translation System</i> Enter "IN" if the translation routes to international translations (on a local and toll combined switching unit only).
		Enter "IP" if the translation routes to international partitioned translations (DMS-250 only).
		Enter "NA" if the translation routes to national translations.

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

FROMDIGS	TODIGS	PRETRTE
807	807	N DD 3 NA

### Datafilling Table HNPACONT

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

**Datafilling Table HNPACONT**

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

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

STS	NORTREFS	NOAMBIGC	RTEREF	HNPACODE	ATTRIB	RTEMAP
514	98	0	( 72)	( 1)	( 24)	( 0)
807	201	1	( 31)	( 1)	( 14)	( 0)

**Datafilling Subtable HNPACONT.HNPACODE**

The following table shows the datafill specific to trunk-to-line translations for subtable HNPACONT.HNPACODE. Only those fields that apply directly to trunk-to-line 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	DN		<i>Code Type</i> Enter DN for terminating office code and datafill refinements SNPA and NXX.
SNPA		Numeric (3 digits)	<i>Terminating Serving Numbering Plan Area</i> Enter the SNPA of the called terminating line DN. If the operating company uses screening to intraswitch SNPAs, translation of the dialed digits proceeds to table TOFCNAME, using SNPA and NXX as the key.

NXX	Numeric (3 digits)	<i>Terminating NXX</i> Enter three digits for the NXX code of the called terminating line DN.
-----	-----------------------	--

---

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

FROMDIGS	TODIGS	CDRRTMT
546	546	DN 514 546
457	457	DN 807 566

### Datafilling Table TOFCNAME

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

#### *Datafilling Table TOFCNAME*

Field	Subfield or Refinement	Entry	Explanation and Action
AREACODE		0 to 9,999,999	<p><i>Area Code</i> The area code identifies a major geographical area served by the switch. This field can contain one to seven digits. In a North American office, the area code must be three digits in length.</p> <p>Enter an area code that has been defined in table SNPANAME or table HNPACONT.</p>
OFCCODE		0 to 9,999,999 or \$	<p><i>Office Code</i> The office code is a subregion of the area code. It can have zero to seven digits. In a North American office, the office code must be three digits in length.</p>

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

AREACODE	OFCCODE
514	546
807	566

### Datafilling Table DNINV

Table DNINV contains the data for all assigned and unassigned DNs. Table DNINV is a read-only table. Information is added to it as DNs are assigned or used in other tables such as LENLINES.

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

**Datafilling Table DNINV**

Field	Subfield or Refinement	Entry	Explanation and Action
AREACODE		0 to 9,999,999 (1 to 7 digits)	<i>Area Code</i> The area code identifies a major geographical area served by the switch. If office parameter ACTIVE_DN_SYSTEM in table OFCENG is set to North American, the area code must be three digits long.
OFCCODE		0 to 9,999,999 (1 to 7 digits)	<i>Office Code Digit Register</i> The office code is a subregion of the area code. If office parameter ACTIVE_DN_SYSTEM in table OFCENG is set to North American, the area code must be three digits long.
STNCODE		0 to 99,999,999 (1 to 8 digits)	The office code must be specified in table TOFCNAME.
			<i>Station Code</i> The station code identifies a unique station within the terminating office. If office parameter ACTIVE_DN_SYSTEM in table OFCENG is set to North American, the area code must be one or four digits in length. If one digit is entered, it is treated as a D-digit, where the D-digit represents the fourth digit in the format ABC-DEFG.

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

AREACODE	OFCCODE	STNCODE	DNRESULT
514	546	2225	H 57 0
807	566	3000	L HOST 04 0 00

**Datafilling Table HUNTGRP**

Table HUNTGRP is datafilled if the called line belongs to a hunt group.

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

---

***Datafilling Table HUNTPRG***

<b>Field</b>	<b>Subfield or Refinement</b>	<b>Entry</b>	<b>Explanation and Action</b>
HTGRP		0 to 8,191	<i>Hunt Group Number</i> Enter the hunt group number assigned to the hunt group.
DN		Numeric (up to 15 digits)	<i>Directory Number</i> Enter the listed DN of the hunt group.
GRPTYP		DNH	<i>Hunt Group Type</i> Enter DNH and datafill refinement TRMOPT.
GRPDATA	TRMBOPT	Y or N	<i>Terminating Billing Option</i> If the optional terminator software package is provided, and if a record is generated for each call to a member of the hunt group, enter "Y". Otherwise, enter "N".

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

HTGRP	SNPA	DN	GRPTYP	GRPDATA
57	514	5462225	DNH	N N N RCVD N N N N N N 4 \$

**Datafilling Table HUNTMEM**

Table HUNTMEM is datafilled if the called line belongs to a hunt group.

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

---

***Datafilling Table HUNTMEM***

<b>Field</b>	<b>Subfield or Refinement</b>	<b>Entry</b>	<b>Explanation and Action</b>
HTGRP		0 to 8,191	<i>Hunt Group Number Key</i> Enter the hunt group number to which the member belongs.
HTMDATA		See subfield SEL	<i>Hunt Member Data</i> This field consists of subfield SEL.
SEL		B, D, L, or P	<i>Select Hunt Group Type</i> Enter one of the following: <ul style="list-style-type: none"><li>* B - Bridged Night Number</li><li>* D - Directory Number</li><li>* L - Multiline or Distributed Line</li><li>* P - Multiple Position</li></ul>

If the entry in this field is "D", complete subfields DN and BNNDAT.

DN	Numeric (up to 15 digits)	<i>Directory Number</i> Enter the DN assigned to the hunt group sequence number.
----	------------------------------	---

---

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

HTGRP	SEQNO	INSERT	HTMDATA
57	0	N	D 5462225 N

### **Datafilling Table LENLINES**

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

#### ***Datafilling Table LENLINES***

Field	Subfield or Refinement	Entry	Explanation and Action
LEN		See note	<p><i>Line Equipment Number</i> This field defines the physical location of the equipment that is connected to a specific telephone line.</p> <p><b>Note:</b> Field LEN consists of subfields SITE, FRAME, UNIT, DRAWER or LSG, SHELF, SLOT, and CIRCUIT.</p>
PTY		R1 to R5, T1 to T5, or S	<p><i>Party and Ringing Combination</i> If the line is assigned to a two-, four-, eight-, or ten-party line, enter the party, R1 to R5 or T1 to T5, of the DN assigned to the line. If the line is assigned to an individual line, enter "S" for single party.</p>
LNATTRIDX		0 to 2,047	<p><i>Line Attribute Index</i> Enter the index into table LINEATTR.</p>

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

LEN	PTY	RINGCODE	DN	SIGTYPE	LNATTRIDX	OPTLIST
HOST 05 0 16 17	S	0	5462225	DT	108	\$
HOST 04 0 00 19	S	0	5663000	DT	8	\$

## **Translation Verification Tools**

The following example shows the output from TRAVER when it is used to verify trunk-to-line translations. No pre-translator is specified.

```
>TRAVER tr S5AAA807IISLA 5663000 b
TABLE TRKGRP
S5AAA807IISLA IT 0 NPDGP NCRT IC DD MIDL 000 P807 NSCR 807 000 N N $
TABLE OFCVAR
AIN_OFFICE_TRIGGRP NIL
TABLE STDPRTCT
P807 ( 1) (65021) 0
. SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
. 807 807 N DD 3 NA
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
TABLE HNPACONT
807 201 1 ( 31) ( 1) ( 14) ( 0) 0
. SUBTABLE HNPACODE
. 457 457 DN 807 566
AIN Info Collected TDP: no subscribed trigger.
AIN Info Analyzed TDP: no subscribed trigger.
TABLE TOFCNAME
807 566
TABLE DNINV
807 566 3000 L HOST 04 0 00 19
AIN Term Attempt TDP: no subscribed trigger.
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
TUPLE NOT FOUND

+++ TRAVER: SUCCESSFUL CALL TRACE ***
DIGIT TRANSLATION ROUTES

1 LINE 8075663000 ST

TREATMENT ROUTES. TREATMENT IS: GNCT
1 120T0

+++ TRAVER: SUCCESSFUL CALL TRACE ***
```

# **Nortel DMS-100 Trunk Group Table (TRKGRP)**

## **Table Name**

Trunk Group Table

## **Functional Description of Table TRKGRP**

Table TRKGRP contains operating company-defined data associated with each trunk group that exists in the switching unit. Entries in this table consist of the following information:

- A unique Common Language Location Identifier (CLLI) associated with each trunk group entry.
- The group type of the trunk group.
- The traffic separation number associated with the trunk group.
- The pad group assigned to the trunk group.
- The Operational Measurements (OM) no-circuit class associated with the trunk group.
- Additional refinements dependent on the group type.

The titles of the documentation section associated with each of the trunk group types available in table TRKGRP are listed in the table below:

---

### ***Trunk Group Type***

Type	Title
A5	Two-Way or Outgoing from Local to N.E.
AI	Automatic Intercept System
AN	Automatic Number Announcement
ANI	Automatic Number Identification
ATC	Access Tandem to Carrier
CA	Come-Again Signaling
CELL	Cellular
CISANI	Commonwealth of Independent States Automatic Number Identification
DA	Directory Assistance Charging
DS0	Digital Signal Level 0
E911	Enhanced 911 Emergency Service
ES	Outgoing to Emergency Service Bureau
GER2W	Two-way 1TR7 ISUP
GERIC	Incoming 1TR7 ISUP
GEROG	Outgoing 1TR7 ISUP
GTRK	Global Trunks
GW	Gateway Trunks
IBNTI	IBN Incoming
IBNT2	IBN Two-Way
IBNTO	IBN Outgoing
IET	Interexchange
INT101	International 101 Test
IR	Outgoing No Outpulsing
IS	Tandem Switching No Digits Incoming
IT	Intertoll
ITL2	International 102 Test
ITOPS	International TOPS
LOOPA	Line Loop Test Unit
LP4W	Four-wire Digital Loop Test Line
LPBK	Loopback
MAINT	Maintenance
MTR	International
NFA	Network Facility Access

NU	Nailed-Up Connection
OC	OG/2W from Local to CAMA
OI	Operator Incoming
OP	OG/2W from Local or Toll to TOPS or TSPS
OPR	International Operator (No Metering)
OS	Outgoing from Toll
P2	Two-Way PBX DID/DOD
PRA	ISDN Primary Rate Access
PRIVLN	Private Line
PX	Two-way Digital PBX
RC	Recording Completing
RONI	TOPS Remote Operator Number Identification
ROTL	Remote Office Test Line
SC	2W/IC from North AMR5 or CAMA
SOCKT	Short or Open Circuit Test Line (SCKT or SCKT)
SPC	Semi-Permanent Connections
T101	101 Communication Test Line
T105	Terminating 105 Test Line
T2	Two-Way End Office
TD	Incoming and Outgoing Test Desk
TDDO	Tandem Two-Stage Direct-Dial Overseas
TI	Incoming End Office
TL	CCIS Transmission Link
TO	Outgoing End Office
TOPS	TOPS Trunk Groups
TOPSARU	TOPS External Audio Response Unit
TOPSVL	TOPS Voice Link
TPS101	International 101 Test Line
TTL2	Terminating 102 Test Line
UT	Utility Telemetry
VR	Operator Verification
X75	X75
ZI	0+ or 0- Tandem to TSPS or TOPS

---

-End-

### **Description of Trunk Group Types**

The set of trunk group types available for use in a specific office is a function of the hardware and software features and feature packages installed in that office. Some trunk group types that are available in an office have fields that are subject to the presence of a feature.

The structure of the DMS software in an end office can be legacy, Generic Services Framework (GSF), or both. Legacy and GSF structures can be used at the same time on the same DMS switch.

Before attempting to datafill table TRKGRP (or any other data schema table) a trunking diagram or equivalent, reflecting the hardware and software features and feature packages ordered for the office, must be at hand.

The trunk group type descriptions listed in the following table are useful as a general guide only and should not be used as a definitive statement of the trunk group types available for use in any specific office.

### **Trunk Group Type Descriptions**

Type	Description
AI	<i>Automatic Intercept System</i> In a DMS office, outgoing trunk group type AI interfaces with an Automatic Intercept System (AIS). An information digit that is sent to the AIS selects the recorded announcement that is returned to the originator of the call.
AN	<i>Automatic Number Announcement</i> In a DMS end office, outgoing trunk group type AN interfaces with an Automatic Number Announcement (ANA) system. ANI spill consisting of the actual calling number is sent to ANA, which returns a recorded voice announcement of the calling number.
ANI	<i>International Automatic Number Identification</i> In an international DMS office, two-way, incoming, or outgoing trunk group type ANI interfaces with another international office for applications that require Automatic Number Identification (ANI) information.  In a DMS International Centralized Automatic Message Accounting (ICAMA) toll office, two-way, or incoming trunk group type ANI interfaces with an international office for calls requiring ICAMA services.  Trunk group type ANI handles ANI signaling. A sample trunking configuration for this trunk group type is shown in <i>Figure 3</i> .
ANINTL	<i>ANI International</i> This option has three subfields RECEIVE, CAINMSG, and CPNLBLK to support different functionality for processing the CPN for calls originating on SS7 FGD trunks. When the ANIINTL.RECEIVE option is set to "Y", the CPN will not undergo ANI screening or be processed as an ANI for billing purposes and the CPN will not be populated in the ANISP (ANI Spill) field of the CDR273 record. This also ensures that the call will not go to ADBF (ANI Database Failure) treatment.
ATC	<i>Access Tandem to Carrier</i> In a DMS access tandem or a DMS equal-access end office, two-way trunk group type ATC interfaces with an interexchange carrier to carry equal-access traffic. A sample trunking configuration for trunk group type ATC is shown in <i>Figure 7</i> .
A5	<i>Toll From North Electric AMR5</i> In a DMS end office, outgoing trunk group type A5 interfaces with an AMR5 toll office to handle Automatic Message Accounting (AMA) and operator assisted calls that use AMR5 signaling.  Two-way trunk group type A5, in addition to the outgoing trunk functions, can be set up for the following incoming trunk functions: <ul style="list-style-type: none"><li>* Dedicated to toll completing</li><li>* Dedicated to verification</li><li>* Combined toll completing and verification</li></ul>
CA	<i>Siemens ADDS Come-Again Signaling</i> In a DMS end office, outgoing trunk group type CA interfaces with a Siemens ADDS switch for one-plus (1+), zero-plus (0+) and zero-minus (0-) calls, each identified by a distinct ID digit that is prefixed to the called number. Coin and non-coin calls are routed using separate trunk groups.
CELL	<i>Cellular</i> Outgoing, incoming, or two-way trunk group type CELL allows a Bellcore type 2A interconnection between an Access Tandem (AT) DMS-200 switch and a Cellular Mobile Carrier (CMC) switch. A sample trunking configuration for trunk group type CELL is shown in <i>Figure 8</i> .

CISANI	<i>Commonwealth of Independent States Automatic Number Identification</i> Trunk group type CISANI is used to distinguish toll ANI trunks from local and local tandem trunks in the Commonwealth of Independent States (CIS) telephony network. This trunk group is used by the international DMS for ICAMA calls.
CPNLBLK	<i>Calling Party Numbers Line Block</i> The CPNLBLK option for ISUP IMT trunks will be supported in table TRKGRP. When the CPNLBLK is present for the SS7 IMT terminator, the CPN is not included OPTIONAL PART of the outgoing IAM message.
DA	<i>Directory Assistance Charging</i> In a DMS end office, outgoing trunk group type DA interfaces with a directory assistance charging system. ANI spill can be output pulsed provided the call type is Operator Assisted (OA).
DS0	<i>Digital Signal Level 0</i> In a DMS Service Switching Point (SSP) office, trunk group type DS0 has the capability of Common Channel Signaling 7 (CCS7) link access to a Signal Transfer Point (STP) node. The DS0 link is a single channel 64 kbit/s link.
ES	<i>Emergency Service Bureau</i> In a DMS end office, outgoing trunk group type ES interfaces with an Emergency Service Bureau (ESB) system.  Depending on the ESB setup, the trunk group can have ANI spill of the calling number in addition to output pulsing of the called number (for example, 911). Alternately, the trunk group can be set up to have no ANI spill (independent of whether the called number is output pulsed).
E911	<i>Enhanced 911 Emergency Service</i> In a DMS E911 tandem (DMS-100 or 100/200 with the Enhanced 911 Emergency Service feature), incoming trunk group type E911, together with tables E911PSAP and E911ESN, provides selective routing to the applicable Public Safety Answering Point (PSAP) using the Emergency Service Number (ESN) corresponding to the Emergency Service Zone (EZM) of the originator of the 911 call.
FWDXMT	<i>Forward Transmit</i> Enter FWDXMT to control the voice path setup of trunk agencies. The DXMT option can be datafiled with one of three values: STD, IMM, ANS for SS7 FGD, SS7 IMT. For PTS FGD, the FWDXMT option can be datafiled with one of two values: STD and ANS. For 4-wire DAL-TIE, the FWDXMT option can be added without the option values.
GERIC	<i>Incoming 1TR7 ISUP</i>
GEROG	<i>Outgoing 1TR7 ISUP</i>
GER2W	<i>Two-Way 1TR7 ISUP</i> Trunk group type GERIC, GEROG, and GER2W are required for the German Intelligent Network field trial in order to handle the requirements of 1TR7 ISUP signaling when the direction of the trunk group is incoming, outgoing, or two-way, respectively.
GTRK	<i>Global Trunk</i> In an DMS Global-100 end office, trunk group type GTRK provides a single trunk type for two-way call processing.
GW	<i>International Gateway</i> In a DMS international gateway office, two-way, incoming, or outgoing trunk group type GW is used as follows:  <ul style="list-style-type: none"> <li>* Gateway R1 and R1-5 Hybrid Signaling interfaces with the North American switching network.</li> <li>* Gateway CCITT 5 Signaling interfaces with the international switching network.</li> <li>* Gateway CCITT 6 Signaling interfaces with the international switching network.</li> </ul>

IBNT2	<i>Two-Way Integrated Business Network</i>
IBNTI	<i>Incoming Integrated Business Network</i>
IBNTO	<i>Outgoing Integrated Business Network</i> In a DMS Integrated Business Network (IBN) end office, two-way trunk group type IBNT2, incoming trunk group type IBNTI, and outgoing trunk group type IBNTO interface with an IBN end office as tie trunk groups and FX trunk groups that provide one or two-way access between IBN customer groups on different switching units, or access to the same customer group when the customer group is assigned to two or more switching units.
IET	<i>Interexchange</i> IET is a general purpose tandem trunk type used in the setup of trunks that operate with Send-Receive Multifrequency (SRMF) signaling.
IMTFGD	<i>IFD Trunk Agencies</i> Enter IMTFGD to identify IFD trunk agencies. This option can be datafilled on SS7 FGD trunk agencies.
INT101	<i>International 101 Test</i> In a DMS gateway office, incoming or outgoing trunk group type INT101 is used for the international 101 test.
IR	<i>Intercept, Information, or Repair with No Outpulsing</i> In a DMS-100 end office, outgoing trunk group type IR interfaces with an intercept, information, or repair desk. No digits are outpulsed.
IS	<i>Tandem Switching No Digits Incoming</i> In a DMS toll or end office, incoming trunk group type IS can route a call (upon seizure) through table OFRT to an outgoing trunk group at the route index specified for the trunk group. Table OFRT permits digit prefixing where appropriate. Calls from a number of incoming trunk groups can be datafilled to go out on a common trunk group.
ISUPIDX	ISUPIDX enumerated range is expanded to include RSVD.
IT	<i>Toll Connecting</i> In a DMS toll or end office, two-way, incoming, or outgoing trunk group type IT interfaces with a toll or end office to carry toll connecting traffic including toll access, toll completing, and toll tandem. Overlap outpulsing is possible on incoming or two-way Dial Pulse (DP) trunk groups provided field OVLP in table TRKSGRP is set to "Y" (yes). In offices without the ROTL software package (without trunk group type T105), the 105 test line can be datafilled as trunk group type IT. A sample trunking configuration for trunk group type IT is shown in <i>Figure 7</i> .
ITL2	<i>International 102 Test</i> In a DMS office, trunk group type ITL2 is used for the international 102 test.
ITOPS	<i>International Traffic Operator Position System</i> In a DMS international office, outgoing trunk group type ITOPS interfaces with an International Traffic Operator Position System (ITOPS) office for calls requiring the services of an ITOPS operator. In a DMS international TOPS office, incoming trunk group type ITOPS interfaces with a DMS international office for calls requiring the services of an ITOPS operator. In both cases, the signaling format meets the following international TOPS requirements:

\* Operator control of disconnect, which is used on outgoing trunks from the local end office to a toll office with ITOPS positions, allows ITOPS operators to have control of the calling and the called parties involved in a call. When the calling party disconnects (on-hook signal sent from end office to toll office), the end office does not initiate disconnect until it receives an on-hook signal from the toll office. This on-hook signal is under ITOPS operator control.

- \* The Ring Forward (RFG) wink signal is used by an ITOPS operator at the originating toll office to recall the ITOPS operator at the terminating toll office for a previously established connection.
- \* The Ring Back (RGB) wink signal is used by an ITOPS operator at the terminating toll office to recall the ITOPS operator at the originating toll office for a previously established connection. This signal is also used by an ITOPS operator to ring a calling party that has been disconnected.

To meet ITOPS requirements, the line signaling system can support either delay-dial start or wink start. Trunk group type ITOPS software handles ANI. A sample trunking configuration for trunk group type ITOPS is shown in *Figures 4, 5, and 6*.

LOOPA	<i>Loop-Around Test</i> In a DMS office, trunk group type LOOPA is used for the loop-around test.
LPBK	<i>Loopback Trunk</i> In a DMS ISDN office, incoming and outgoing trunk group type LPBK provides a means of connecting two agents in the same office when a call between the two agents is not possible using other loopback facilities. The call between the two agents is split into two legs: <ul style="list-style-type: none"> <li>* The first leg of the call selects an outgoing LPBK trunk to terminate the original call. The outgoing trunk loops back to the same office to come in as an incoming trunk of trunk group type LPBK.</li> <li>* The second leg of the call connects the incoming LPBK trunk to the terminating agent.</li> </ul>
LP4W	<i>Four-Wire Digital Loop Test</i> The four-wire digital loop test line trunk group is used for performing terminating and originating loop-around tests on CCITT 7 ISUP trunks in a DMS-300 switching unit.
MAINT	<i>Maintenance Tests</i> In a DMS office, trunk group type MAINT is used for the following maintenance support items and tests: <ul style="list-style-type: none"> <li>* Dialable Cable Locator Tone</li> <li>* Digital Test Unit</li> <li>* Emergency Stand-Alone</li> <li>* Position Head Set</li> <li>* Position Jack</li> <li>* Line Test Unit and LTU Talk &amp; Monitor</li> <li>* Metallic Test Unit</li> <li>* 108 Test line</li> <li>* Trunk Test Transmission</li> <li>* Terminating Transmission Test</li> </ul>
MTR	<i>International with Metering</i> In a DMS international office, two-way, incoming, or outgoing trunk group type MTR interfaces with other international offices for local or national traffic. Metering is available as an option; calls that do not require metering can also use MTR trunks.  Metering (MTR) type trunk groups handle the majority of call types. A normal call requiring no operator and no ICAMA applications goes through the network on MTR trunks. Sample trunking configurations for trunk group type MTR are shown in <i>Figures 1, 3, 4, 5, and 6</i> .
NFA	<i>Network Facility Access</i> Trunk group type NFA is used for the assignment of Network Facility Access (NFA) trunks that connect a subscriber line to an Intelligent Peripheral Processor (IP). These connections provide subscribers with direct access to services provided directly by the IP.

NODELAY	<i>No Delay</i> The NODELAY option only supports incoming and two-way PX trunks with IPULSTYP of DT and ISTARTSG of WK. When the NODELAY option is present on an incoming or two-way PX trunk, the four second post dial delay will not be present for 1+10 digit calls using the AMBI TIM selector. When the NODELAY option is not present on an incoming or two-way PX trunk, the four second post dial delay will be present for 1+10 digit calls using the AMBI TIM selector.
NU	<i>Nailed-Up Connection</i> In a toll, end, or international gateway office, a trunk of incoming trunk group type NU can be permanently connected (nailed-up) to a trunk of outgoing trunk group type NU. Table NLUPCLLI lists each nailed up connection that consists of an incoming trunk group type NU trunk and an outgoing trunk group type NU trunk.
OC	<i>Local ANI to Toll CAMA</i> In a DMS end office, outgoing trunk group type OC interfaces with a toll office to carry non-coin subscriber dialed chargeable calls (TOPS operator assistance not required) recorded by CAMA in the toll office (calls are not recorded by LAMA in end office). Signaling formats include the CAMA ANI pulsing format, which is used for CAMA offices that do not use Traffic Service Position Systems (TSPS). If the far-end toll office is a DMS switch, the far-end of trunk group type OC enters the far-end DMS toll office as trunk group type SC.  In a DMS end office, two-way trunk group type OC interfaces with a toll office to carry, in addition to the outgoing trunk traffic, the following incoming trunk traffic:  <ul style="list-style-type: none"><li>* Dedicated to toll completing</li><li>* Dedicated to verification</li><li>* Combined toll completing and verification</li></ul>
	In a DMS Equal Access End Office (EAEO) or an access tandem office, two-way trunk group type OC interfaces with Feature Group B (FGB) Equal Access (EA) carriers.
	In a DMS toll or TOPS office, outgoing trunk group type OC can tandem a call to another toll office as a CAMA call, outpulsing ANI when required.
	A sample trunking configuration for trunk group type OC is shown in <i>Figure 7</i> .
OI	<i>Incoming Operator Verification</i> In a DMS office, incoming trunk group type OI interfaces with an operator switchboard or a TOPS office to carry one of the following traffic options:  <ul style="list-style-type: none"><li>* Dedicated to toll completing</li><li>* Dedicated to verification</li><li>* Combined toll completing and verification</li></ul>
	Refer to trunk group type VR for additional information on verification calls.
OP	<i>Local TSPS Pulsing to TOPS</i> In a DMS end office, outgoing trunk group type OP interfaces with a TOPS or TSPS office and can be set up to carry any or all of the following types of traffic:  <ul style="list-style-type: none"><li>* Non-coin subscriber dialed chargeable calls recorded by CAMA in the TOPS office using ANI or ONI (provided they are not recorded by LAMA in the end office).</li></ul> <b>Note:</b> This function is similar to the function of trunk group type OC. TOPS operator assistance is not required.
	 <ul style="list-style-type: none"><li>* Coin and non-coin, TOPS operator assisted calls that can be recorded by CAMA in the TOPS office using ANI or ONI.</li></ul>

Signaling formats include the pulsing format for TSPS from local office. If the far-end switch is a DMS TOPS office, the far-end of trunk group type OP enters the DMS TOPS office as trunk group type TOPS.

In a DMS end office, two-way trunk group type OP can be set up for the following incoming trunk functions (in addition to the outgoing trunk functions):

- \* Dedicated to toll completing
- \* Dedicated to verification
- \* Combined toll completing and verification

A sample trunking configuration for trunk group type OP is shown in *Figure 7*.

OPR	<i>International with Operator</i> In a DMS international office, two-way, incoming, or outgoing trunk group type OPR interfaces with other international offices for local or national traffic involving an operator. Metering is not available.
	Operator (OPR) trunks are used to connect BA-1 switchboard operators to the DMS, and to connect two DMS switches for calls from one BA-1 switchboard operator to another office (possibly to another BA-1 switchboard operator). A sample trunking configuration for trunk group type OPR is shown in <i>Figure 2</i> .
OS	<i>Toll Completing Joint Hold</i> In a DMS toll office equipped with feature package NTX193AA (4X Operation-AMR 5 Format ANI), outgoing trunk group type OS is used for toll completing and toll tandem calls requiring the joint hold feature.
PRA	<i>Primary Rate Access</i> Trunk group type PRA is used by the ISDN Primary Rate Access feature.
PRIVLN	<i>Gateway Private Line</i> Incoming or outgoing trunk group type PRIVLN is used for private lines in a DMS gateway office.
PX	<i>DID/DOD PBX Digital</i> In a DMS end office, two-way, incoming, or outgoing trunk group type PX interfaces with a digital Private Branch Exchange (PBX) for Direct Inward Dialing (DID), Direct Outward Dialing (DOD), or both.
P2	<i>DID/DOD PBX</i> In a DMS end office, two-way, incoming, or outgoing trunk group type P2 connects with a PBX for DID, DOD, or both.
RC	<i>Recording Completing</i> In a DMS office, trunk group type RC interfaces to a 3CL switchboard with an audible class of service tone forwarded to the operator.
RESETBLK	<i>Reset Dial Block</i> When this new option is assigned, reset dialing will not be allowed for calls on that trunk.
RONI	<i>Remote ONI</i> In a TOPS office, trunk group type RONI is part of a feature that records ONI calls (using LAMA or CAMA) in an office with no CAMA positions in operation. ANI fail and ONI calls are routed to a TOPS office where they come in on a trunk group of type RONI. The remote TOPS operator communicates by voice with the originator of the call and keys in the calling number, which is sent back to the original office where the call is recorded by LAMA or CAMA.
ROTL	<i>Remote Office Test Line</i> Trunk group type ROTL is used in a DMS office that is equipped with feature BR0069.

SC	<i>Incoming/Two-Way CAMA</i> In a DMS toll office, and under certain conditions in a DMS TOPS office, incoming trunk group type SC interfaces with an end office to carry non-coin subscriber dialed chargeable calls (TOPS operator assistance not required) recorded by CAMA in the toll office (the calls are not recorded by LAMA in the far-end office). Signaling formats include the CAMA ANI pulsing format (non-TSPS CAMA office). ANI calls are recorded by CAMA automatically. In-band coin control is possible.
	ANI fail and ONI calls are handled by the CAMA operator who enters the calling number manually to enable the recording of the call by CAMA. The call is then sent on for toll completion.
	If the 4X feature is present, operator assisted traffic (0+ and 0-) can tandem through the switch to a switching unit with TOPS or TSPS using outgoing trunk group type OP. If the far-end is a DMS switch, the far-end of trunk group type SC leaves the far-end DMS switch as trunk group type OC.
	In a DMS toll office, two-way trunk group type SC can be set up for the following outgoing trunk functions (in addition to the incoming trunk functions):
	* Dedicated to toll completing * Dedicated to verification * Combined toll completing and verification
	A sample trunking configuration for trunk group type SC is shown in <i>Figure 7</i> . Refer to trunk group type VR for additional information on verification calls.
SOCKT	<i>Transmission Test</i> In a DMS office, trunk group type SOCKT is used for transmission tests.
SPC	<i>Semi-Permanent Connection</i> In an international office, a trunk of an outgoing trunk group type SPC can be connected semipermanently to:
	* A trunk of an outgoing trunk group type SPC * A line of line class code SPC
	Table SPCCON has a tuple for each semipermanent connection to identify the two members of the connection.
TD	<i>Test Desk</i> In a DMS end office, incoming and outgoing trunk group type TD interfaces with a test desk (for example, #14 LTD or #3 LTC).
TDDO	<i>Two-Stage Direct Dial Overseas</i> In a DMS toll office, outgoing trunk group type TDDO interfaces with an international originating toll center for tandem switching of two-stage calls.
TI, TO, T2	<i>Incoming End Office, Outgoing End Office, Two-Way End Office</i> In a DMS office, incoming, outgoing, or two-way trunk group type TI, TO, or T2 interfaces with an end or toll office for local, direct, or tandem switching.
TL	<i>CCIS Transmission Link</i> In a DMS office capable of Common Channel Interoffice Signaling (CCIS), two-way trunk group type TL interfaces with another office capable of CCIS to transmit and receive signals between the two offices. Call processing functions are not supported.
TOPS	<i>Traffic Operator Position System</i> In a DMS TOPS office, incoming trunk group type TOPS interfaces with an end office and can be set up to carry any or all of the following types of traffic:
	* Non-coin subscriber dialed chargeable calls recorded by CAMA in the TOPS office using ANI or ONI.

**Note:** This function is similar to the function of trunk group type SC. TOPS operator assistance is not required.

- \* Coin and non-coin TOPS operator assisted calls that can be recorded by CAMA in the TOPS office using ANI or ONI.

Signaling formats include the pulsing format for Traffic Service Position System (TSPS) from local office. If the far-end is a DMS switch, the far-end of trunk group type TOPS leaves the far-end DMS office as trunk group type OP.

In a DMS toll office, two-way trunk group type TOPS can be set up for the following outgoing trunk functions (in addition to the incoming trunk functions):

- \* Dedicated to toll completing
- \* Dedicated to verification
- \* Combined toll completing and verification

A sample trunking configuration for trunk group type TOPS is shown in *Figure 7*. Refer to trunk group type VR for additional information on verification calls.

TOPSAU	<i>TOPS External Audio Response Unit</i> In a DMS TOPS office, outgoing trunk group type TOPSARU interfaces with a Directory Assistance System (DAS) external Audio Response Unit (ARU) to provide an announcement in response to an operator request. No outpulsing is done.
TOPSVL	<i>TOPS Voice Link</i> In a DMS TOPS office, outgoing trunk group type TOPSVL interfaces with a Voice Service Node (VSN), enabling the use of the Automated Alternate Billing Service (AABS). No outpulsing is done.
TPS101	<i>International 101 Test Line</i> In a DMS international office, trunk group type TPS101 is used as the international 101 test line.
TTL2	<i>Carrier Milliwatt Test</i> In a DMS office, trunk group type TTL2 is used for the carrier milliwatt supply and balance termination test.
T101	<i>101 Test Line</i> In a DMS office, incoming and outgoing trunk group type T101 is used for the type 101 test.
T105	<i>105 Test Line</i> In a DMS office, trunk group type T105 is used for the terminating 105 test line provided the ROTL software package is present in the office. In offices without the ROTL package (without trunk group type T105), the terminating 105 test line can be datafilled as a trunk group of type IT.
UT	<i>Utility Telemetry</i> In a DMS office, incoming trunk group type UT connects to a Central Office Service Unit (COSU). The COSU initiates and controls telemetry calls to Telemetry Interface Units (TIU) on subscriber lines. The DMS office translates the digits received from the COSU and attempts to establish a no-ring connection to a subscriber's line. The UT trunk returns the appropriate treatment to the COSU if the line is not idle.  If the line is idle, the COSU is cut through to the TIU and the telemetry session proceeds. When the telemetry session is completed or the subscriber goes off-hook, the COSU instructs the DMS office to take down the call.
VR	<i>Verification</i> In a DMS end office, outgoing trunk group type VR interfaces with a minibar switch to provide metallic path access to a call in progress between two other parties.

The need for metallic path access arises when an authorized operator originated verification call attempts to terminate on a line that is busy.

A call is a verification call when it originates on a trunk group type A5, OC, OP, OI, or TD and one of the following three groups of conditions is satisfied:

- \* The type of call is Operator Assisted (OA)
- \* The trunk group is dedicated to verification (MODE VF)
- \* The trunk group is dedicated to both toll completing and verification (MODE CV)

X75

X75

Trunk group type X75 allows the connection of DMS trunking facilities to a DMS packet handler (which uses X.75 protocol).

ZI

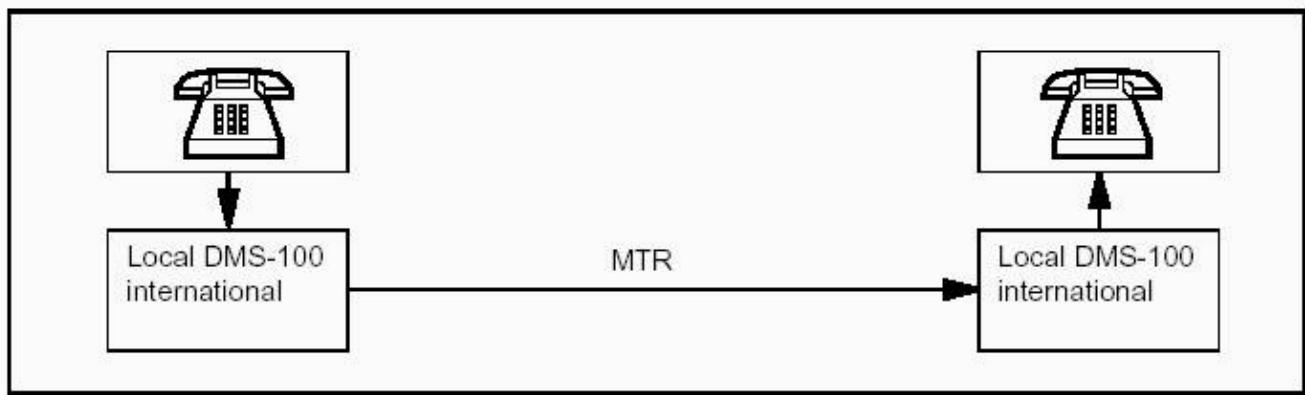
Tandem 0+ and 0- to TOPS

In a DMS toll office, incoming trunk group type ZI can tandem zero-plus (0+) and zero-minus (0-) traffic to TOPS over outgoing trunk group type OP. If the far-end switch is a DMS switch, the far-end of trunk group type ZI leaves the far-end DMS office as trunk group type OP.

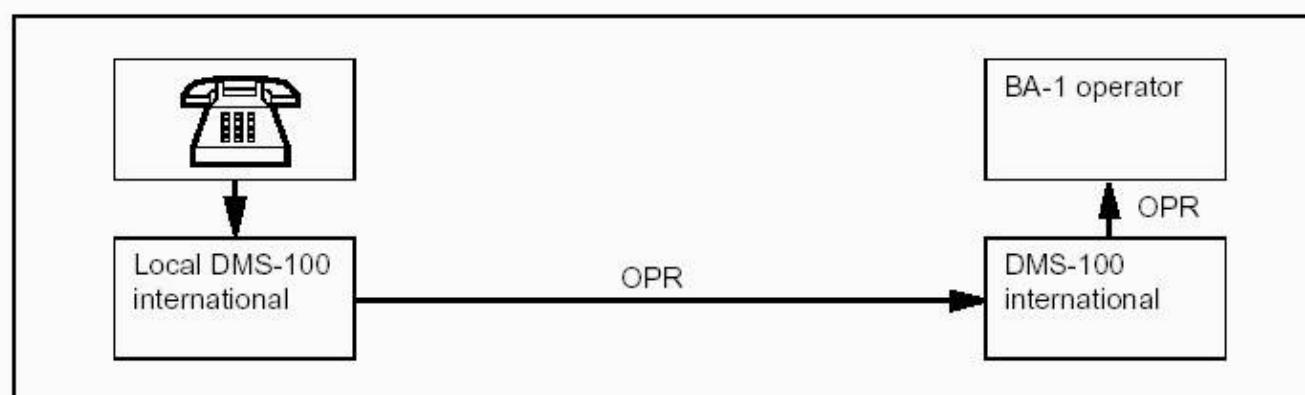
-End-

### **Sample Trunking Configurations**

Sample trunking configurations for a number of typical applications are shown below. The arrows in each figure denote the direction of call progression, and in the case of trunks, indicate the connection from an outgoing trunk on one switch to an incoming trunk on the subsequent switch.



**Figure 1: Inter-Office Local Call (DMS International)**



**Figure 2: Subscriber to BA-1 Board Operator Call (DMS International)**

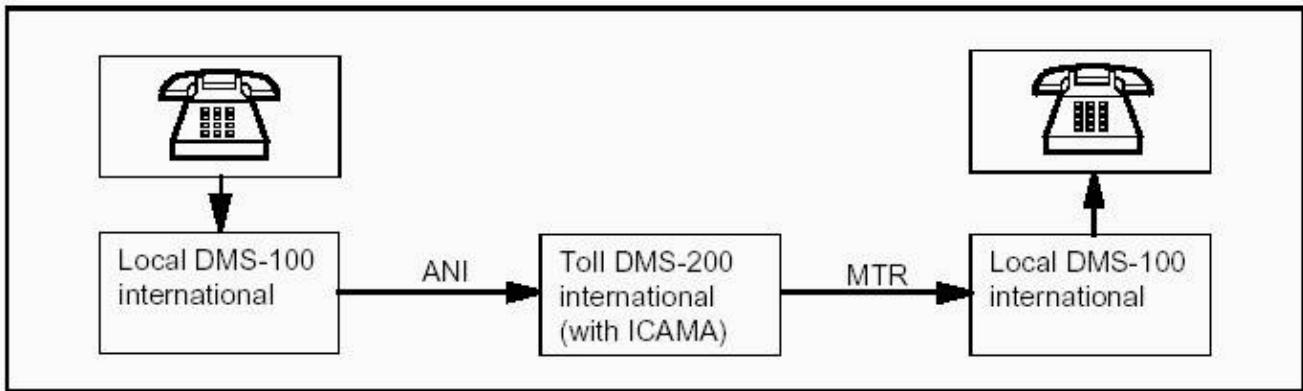


Figure 3: Subscriber-Originated Call Through ICAMA (DMS International)

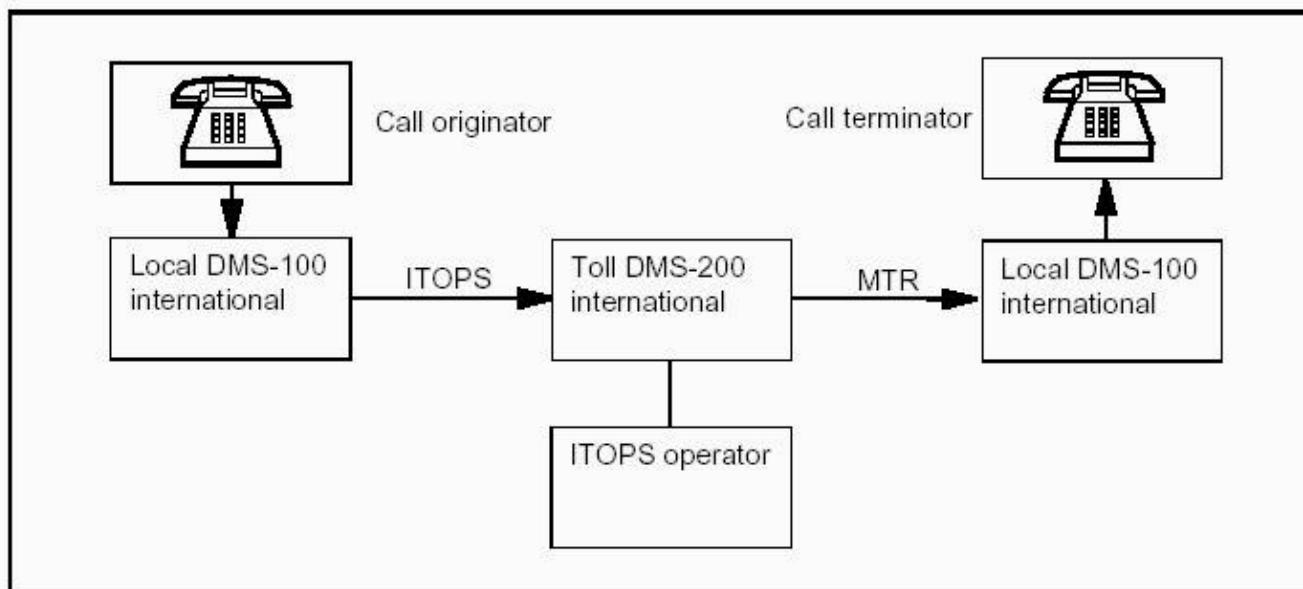


Figure 4: Subscriber-Originated Call Through ITOPS (DMS International)

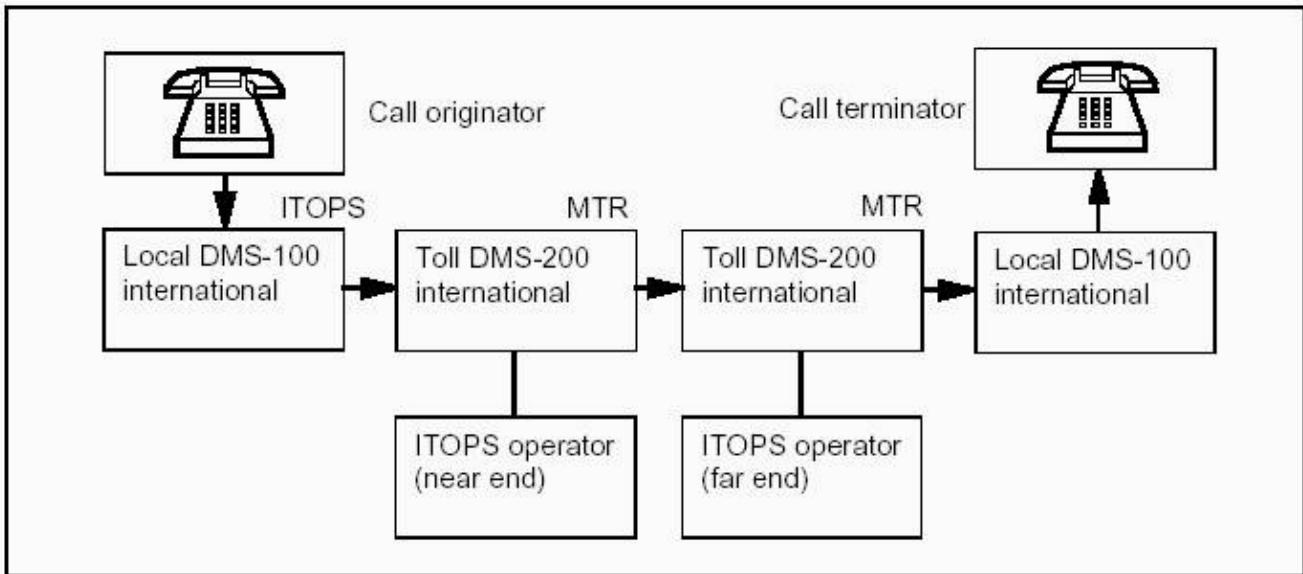


Figure 5: Subscriber-Originated Call Through ITOPS Operators (DMS International)

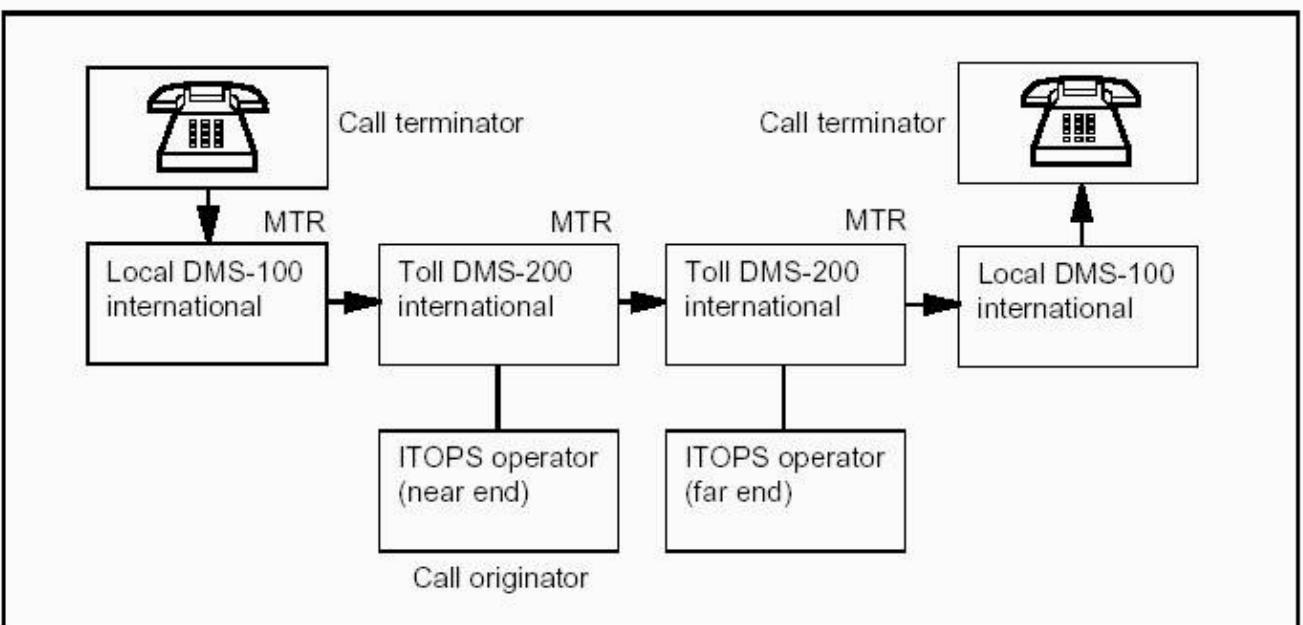


Figure 6: ITOPS Operator-Originated Call (DMS International)

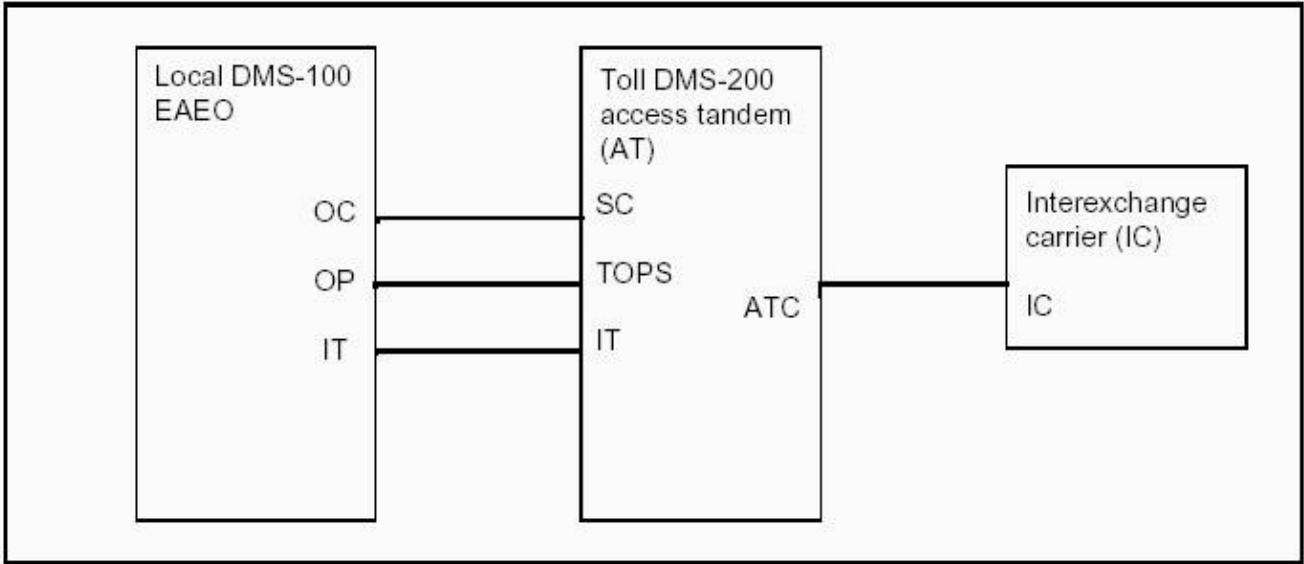


Figure 7: Access Tandem Environment (DMS AT & EAEO)

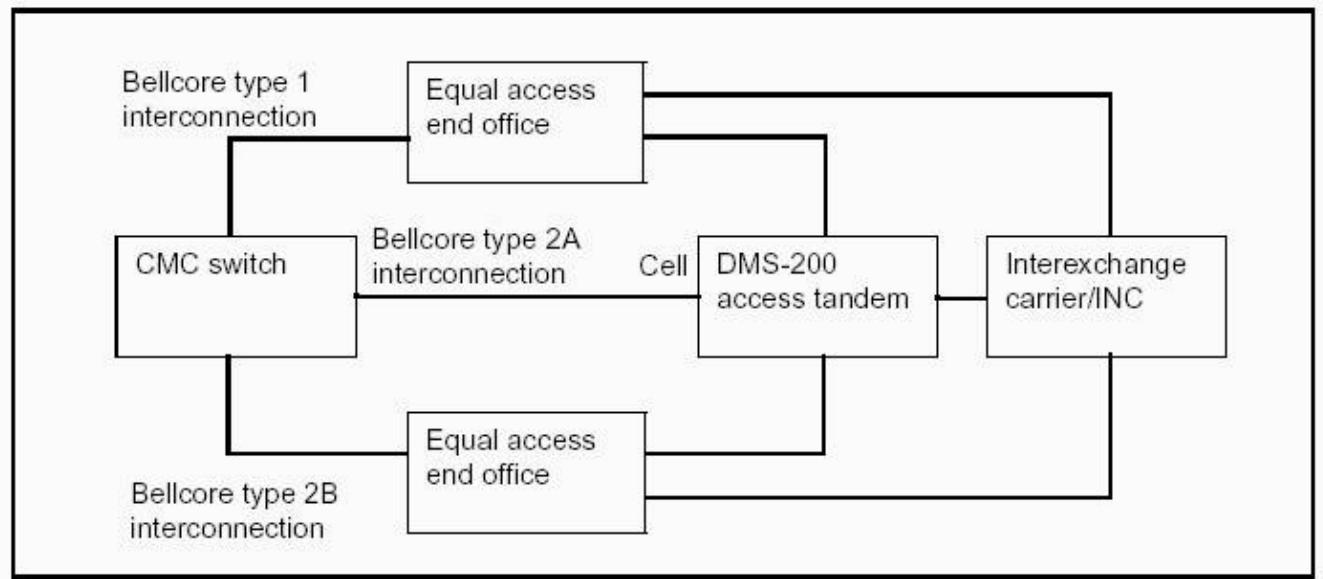


Figure 8: Cellular Mobile Carrier (CMC) Interconnection

### Datafill Sequence and Implications

Table CLLI must be datafilled prior to table TRKGRP.

The following tables may also require datafilling prior to table TRKGRP, depending on the group type.

- ANNMEMS (Announcement Members Table)
- BCDEF (Bearer Capability Definition Table)
- C7RTESET (CCS7 Routeset Table)
- DEFDATA (Default Data Table)
- DGHEAD (Digit Analysis Head Table)
- E911NPD (Enhanced 911 Numbering Plan Digit Table)

- LCASCRCN (Local Calling Area Screening Control Table)
- NCOS (Network Class of Service Table)
- PADDATA (Pad Data Table)
- POSNAME (List of Position Names Table)
- PXHEAD (Prefix Code Head Table)
- SNPANAME (Serving Numbering Plan Area Name Table)
- STDPRTCT.AMAPRT (Automatic Message Accounting Pretranslator Subtable)
- TRIGGRP (TRIGGRP Trigger Group Table)
- TSTLCONT (Test Line Control Table)

## Table Size

Field SIZE in table DATASIZE specifies the total number of trunk groups that can be datafilled in table TRKGRP. The table length can be extended by changing the value of this field and performing a cold restart. The maximum number of trunk groups that can be datafilled is 8,191. Each tuple in table TRKGRP requires 49 words of data store.

**Note:** If the NORESTARTSWACT utility is available on your switch, you can activate data changes without interrupting service. Refer to NORESTARTSWACT User's Guide, NTP 297-1001-546.

ASEQ/DSEQ selection sequences should be limited to the following trunk group size:

- In DMS offices with NT40 processors, a maximum of 175 members.

Exceeding this recommended limit may significantly increase call completion time.

## General Field Information

General field information that is common to most field types is included in this section of the document. For detailed information specific to a particular trunk group type, refer to the TRKGRP documentation section that deals with that trunk group type.

## **GRPINFO and Related Fields**

While the default structure of table TRKGRP is set up as two fields, GRPKEY (which contains the key to the table) and GRPINFO (which contains all of the other fields), this structure may be modified if table CUSTFLDS is datafilled with an entry for table TRKGRP. The modified structure generally consists of fields GRPKEY, GRPTYP, TRAFSNO, PADGRP, NCCLS, and GRPINFO.

In the modified structure, fields GRPTYP, TRAFNSO, PADGRP, and NCCLS become separate fields rather than subfields of GRPINFO, however the datafill sequence for entry values remains unchanged. The documentation for table TRKGRP is based on the two field (default) structure, since this is the most common.

## **Traffic Class (Field TRAFCLS)**

This field is provided for the convenience of operating companies that associate their own traffic class code with each trunk group. The following table shows some sample traffic class codes. DMS software does not use most of the data in field TRAFCLS.

**Note:** Class code BLV, for busy-line verification, is an exception. To enable Local Number Portability (LNP) for an incoming trunk from a TOPS scrambler circuit, set the traffic class field for that trunk to BLV. Trunks with traffic class set to BLV must be dedicated to BLV calls.

---

**Examples of Traffic Class Codes**

Traffic Class	Usage
AL	Alarm
AN	Announcement
BLV	Busy Line Verify
CA	CAMA
CB	Coin Box
CD	Customer Dial Instruction
CP	CAMA Office to CAMA Operator Desk
CS	Coin Supervision
DA	Directory Assistance
DD	DDD Access
DS	Dial Tone Speed
IA	Intraoffice
IE	Interoffice
IN	Information
IR	Intercept
IT	Intertoll
LW	Leave Word
MA	Manual Assistance
MB	Mobile Radio
MI	Miscellaneous
MN	Manual
MT	Intertandem
NT	No Test
OA	Operator Assistance
OF	Official
OW	Order Wire
PS	Permanent Signal
RC	Recording Completing
RR	Rate and Route
RS	Repair Service
SC	Service Code
SO	Service Observing
SP	TSPS or TOPS
TA	Toll Station
TC	Toll Completing
TE	End Office Toll
TG	Tandem Completing
TI	Time
TK	Test Disk
TM	Toll Completing and Toll Switching Combined
TO	Tandem Originating
TP	TOPS or TSPS Unit to TOPS or TSPS Position
TS	Toll Switching
TT	Toll Tandem
TW	TWX Switching Plan
VC	Vacant Code
VR	Verification
WE	Weather

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## **Traffic Separation Numbers (Field TRANSNO)**

If the switching unit has feature package NTX085AA (Traffic Separation Peg Count), the range of values for the incoming and outgoing traffic separation numbers are dependent upon the value of office parameters TFAN\_IN\_MAX\_NUMBER and TFAN\_OUT\_MAX\_NUMBER in table OFCENG.

For switching units without feature package NTX085AA, the range of values for the traffic separation numbers is 0 to 15.

Incoming and outgoing traffic separation numbers 1 to 9 are reserved for generic traffic separation numbers. See table TFANINT for the assignment of incoming to outgoing traffic separation numbers.

With the traffic separation feature, a peg count of all calls, by type of call, Direct Dial (DD), Operator Assisted (OA), or No Prefix (NP), can be accumulated between an originating source (incoming trunk or an originating line attribute) and a terminating destination (outgoing trunk, terminating line attribute, tone, or announcement).

### **Pad Groups (Field PADGRP)**

Field PADGRP contains the name of the pad group in table PADDATA that lists the value of the pad circuits that can be switched into the network when one of the members of the group is involved in a call.

Different values for the pad circuits can be specified when the circuit connects to an agent with a different pad group.

Network pad switching is only applicable when a new circuit is connected to the public switching network.

### **Operational Measurement No-Circuit Classes (Field NCCLS)**

Table TRKGRP field NCCLS specifies the Operational Measurement (OM) register that is incremented when treatment GNCT occurs. Refer to the *Operational Measurements Reference Manual* for information on DMS OMAs.

Treatment GNCT occurs when a trunk group is the last route in a route list and an "All Trunks Busy" condition is encountered on this list.

OM react to treatment GNCT by incrementing register OFZ2 to record the number of times the GNCT treatment is invoked and by incrementing one of the registers listed below to indicate which type of facility was unavailable, as defined by the entry in table TRKGRP field NCCLS.

If a trunk group is incoming, no-circuit class is not required. Enter NCRT to satisfy the table editor.

For outgoing or the outgoing side of a two-way trunk group, the operating company can assign any of the no-circuit classes listed in the following table.

---

#### **No-Circuit Classes**

<b>Field NCCLS Entry</b>	<b>Register Name</b>	<b>Register Description</b>
NCBN	OFZNCBN	No-circuit business network (IBN trunks)
NCID	OFZNID	No-circuit inward dial (2W DID/DOD trunks)
NCIM	OFZNCIM	No-circuit intermachine
NCIT	OFZNCIT	No-circuit intertoll
NCLT	OFZNCLT	No-circuit local tandem
NCOF	OFZNCOF	No-circuit offnet trunk (ONAL, ONAT, DOL, or DOT)
NCON	OFZNCON	No-circuit onnet trunk (DAL, MTX)

NCOT	OFZNCOT	No-circuit other trunk (test lines, test desk, or maintenance trunks)
NCRT	OFZNCRT	No-circuit (0+/0- tandem to TOPS, outgoing to AMR5 or CAMA, outgoing local, recording completing outgoing, TOPS outgoing)
NCTC	OFZNCTC	No-circuit toll completing
NCSC	OFZNOSC	No-service circuit (AN or AI trunks)

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## Trunk Selection Problems

Two main problems currently exist with Central Office (CO) trunk selection:

**Problem 1: Killer Trunks** A killer trunk is one that has any of the characteristics listed below:

- A *repeatedly seized trunk* is repeatedly seized, but due to a malfunction is held for a very short time. Within a trunk group, these trunks have a higher than average attempt rate.
- A *slow release trunk* has a low attempt rate along with fairly high usage.
- An *always busy trunk* has a usage of 36.0 hundred call seconds (CCS), or one erlang, and zero attempts.
- An *always idle trunk* has a usage of zero CCS and zero attempts.

**Problem 2: Glare** Glare occurs if two COs try to seize the same trunk at the same time.

## Trunk Selection Algorithms

The trunk selection algorithms for two-way trunk groups in a DMS office are datafilled in field SELSEQ. The following selection algorithms are available:

- Most Idle/Least Idle (MIDL/LIDL)
- Control Odd/Control Even (CNTLODD/CNTLEVN)
- Ascending Sequential/Descending Sequential (ASEQ/DSEQ)
- Clockwise Circular Trunk Hunt/Counterclockwise Circular Trunk Hunt (CWCTH/CCWCTH)

**Note:** CNTLODD and CNTLEVN are used for JPN ISUP only.

A summary of the problems and relative merits of the various trunk selection schemes follows.

### Select Sequence – MIDL/LIDL

The MIDL/LIDL process is based on the length of time a trunk member is idle. One central office selects from a trunk group the trunk that is idle for the longest period of time. The opposite end central office selects from a trunk group the trunk that is idle for the shortest period of time. The selection order of trunks is not fixed.

### MIDL/LIDL and Killer Trunks

In a LIDL office, some types of killer trunks move to the head of the list. When one does, it becomes the least idle trunk and is repeatedly seized. All calls routed to this killer trunk fail to complete.

## **MIDL/LIDL and Glare**

MIDL/LIDL minimizes glare by preventing the possibility of simultaneous seizure prior to the seizure of the last idle trunk in the trunk group.

### **Select Sequence – CNTLODD/CNTLEVN**

The CNTLODD/CNTLEVN selection sequence method logically divides trunk groups into a controlling group and a non-controlling group on the basis of odd or even Circuit Identification Codes (CIC). When an outgoing trunk is required, the controlling group circuit that has been released the longest (most idle) is selected. If all circuits in the controlling group are busy, the latest released circuit (least idle) in the non-controlling group is selected instead.

If a select sequence (field SELSEQ value) of CNTLODD is assigned, the controlling group is the set of odd numbered CICs. If a select sequence of CNTLEVN is assigned, the controlling group is the set of even numbered CICs.

### **CNTLODD/CNTLEVN and Glare**

CNTLODD/CNTLEVN trunk selection minimizes the occurrence of glare.

### **Select Sequence – ASEQ/DSEQ**

Sequential trunk selection minimizes the occurrence of glare and reduces reseizure of killer trunks encountered with the MIDL/LIDL trunk selection method when used for two-way trunks. In sequential trunk selection, the trunk selection order and selection starting point are fixed. The beginning of the list for one CO is the end of the list for the opposite end CO. This list is searched sequentially by each CO, starting from the beginning of the list, for the first idle trunk. One CO selects the first idle trunk, searching the list in ascending order. The opposite end CO selects the first idle trunk, searching the list in descending order.

***Caution:*** *It is recommended that ASEQ/DSEQ selection sequences should be limited to a maximum of 175 trunk members in DMS offices with NT40 processors. Exceeding this recommended limit may significantly increase call completion time.*

### **ASEQ/DSEQ and Killer Trunks**

The position of a killer trunk in the sequential list determines its impact on trunk selection. A killer trunk in the middle of the list has minimal impact but one near either end has significant impact. This is due to all searches starting at one end or the other of the trunk member list. If the traffic is such that an idle trunk is found near the end of the list for most searches, then a killer trunk will be seized more often than a killer trunk in the middle of the list.

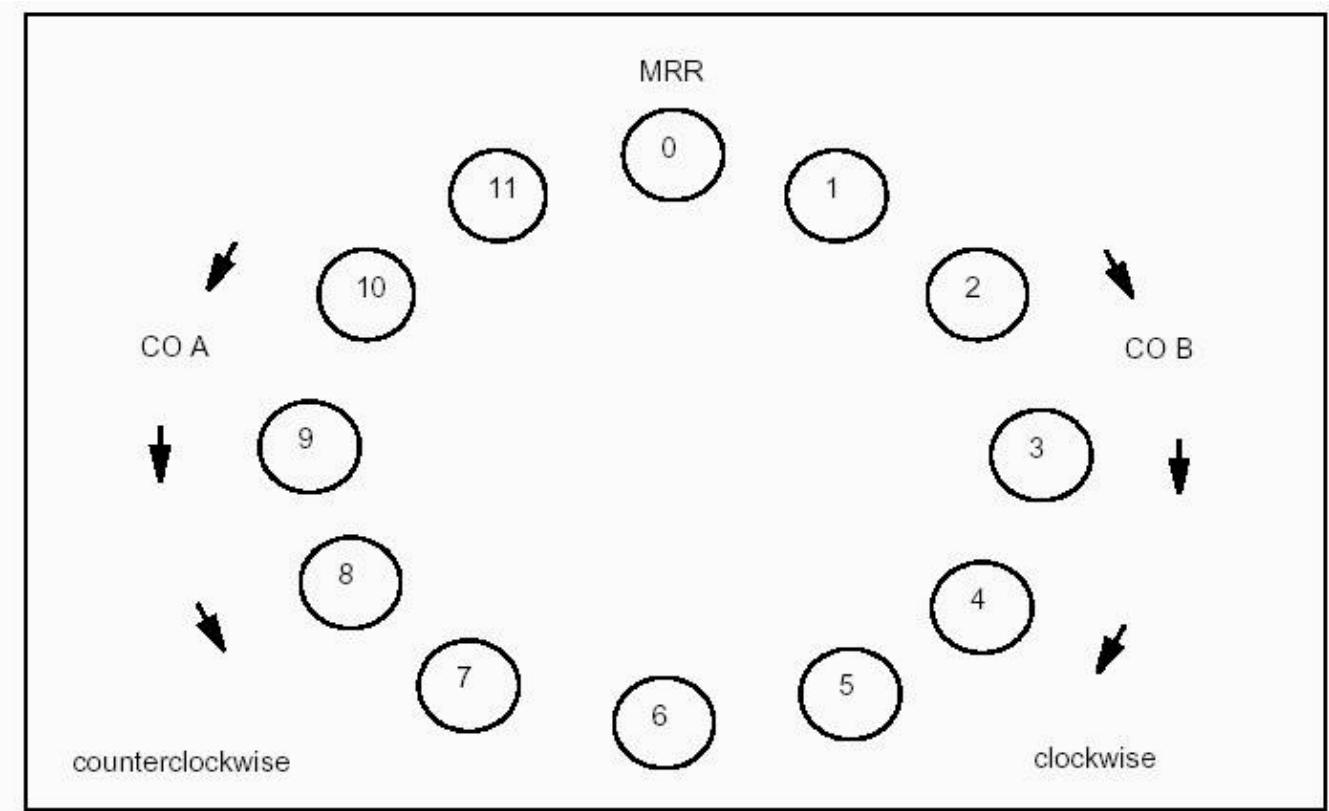
### **ASEQ/DSEQ and Glare**

ASEQ/DSEQ minimizes glare by preventing simultaneous seizure prior to the seizure of the last idle trunk in the trunk group.

## Select Sequence – CWCTH/CCWCTH

Like ASEQ/DSEQ, the circular trunk selection strategy is based on a fixed ordered list of trunks. The two COs search the list in opposite directions, similar to the ASEQ/DSEQ method. The trunk selected is the first idle trunk found in a search starting after the Most Recently Released (MRR) trunk in the trunk group.

For an analogy, use a clock to denote the list of trunks with the hours representing the trunks. In a two-way trunk group, one CO searches the list of trunks clockwise from a common reference point. The other CO searches the list of trunks counterclockwise from the same reference point as the first CO. The common reference point is the MRR trunk in the group. The reference point is updated each time a trunk is released.



Circular Trunk Group Selection

### CWCTH/CCWCTH and Killer Trunks

Circular Trunk Hunting (CTH) substantially reduces the impact of killer trunks. Repeatedly seized killer trunks are not reseized as often under the CTH selection method as with the MIDL/LIDL and ASEQ/DSEQ selection methods, in two-way trunk groups. In the CTH selection method, the selection starting point changes each time a trunk is released (the MRR trunk). If the MRR trunk is a killer trunk, the next trunk seized is a trunk to either side of the killer trunk. CTH has no effect on the other types of killer trunks.

## **CWCTH/CCWCTH, Killer Trunks, and Operational Measurements**

The killer trunk feature gathers usage and peg counts for each trunk, over a specified interval of time, to detect killer trunks. The count is updated upon seizure of a trunk, when the trunk changes from a "Not Call Processing Busy" state to a "Call Processing Busy" state. CTH reduces the number of times a killer trunk is seized. Therefore, CTH lowers the threshold used in determining whether a trunk has killer trunk characteristics.

### **CWCTH/CCWCTH and Glare**

Glare occurs when one or two idle trunks are left in the trunk group. CTH does not affect the occurrence of glare. Glare occurrence during CTH is the same as glare occurrence during the two other trunk selection methods.

### **Choosing a Trunk Selection Method and Sequence**

Field SELSEQ defines the trunk selection method and sequence for the two-way trunk group. The trunk selection method for a two-way trunk group in a DMS office must be compatible with the switching office equipment at the far-end of the trunk group. This requirement is outlined below.

If the trunk group is two-way and the far-end is a link list switcher, enter one of the following select sequences. The link list switcher is a method of call processing that determines trunk selection based on a dynamically linked list of trunk members.

**LIDL** Enter LIDL (Least Idle) if far-end is a link list switcher with MIDL (Most Idle) select sequence.

**MIDL** Enter MIDL (Most Idle) if far-end is a link list switcher with LIDL (Least Idle) select sequence.

### **Far-End Not Link List Switcher**

If sequential selection (feature package NTX244AB, Enhanced Sequential Trunk Hunting) is present, the trunk group is two-way, the far-end is not a link list switcher, and sequential selection is required, enter one of the following selection sequences:

**ASEQ** Enter ASEQ for Ascending Sequential selection based on the order of trunk members in table TRKMEM, if the far-end is descending sequential selection.

**DSEQ** Enter DSEQ for Descending Sequential selection based on the order of trunk members in table TRKMEM, if the far-end is ascending sequential selection.

**CWCTH** Enter CWCTH for Clockwise Circular Trunk Hunting from the MRR trunk in the trunk group, based on the order of trunk members in table TRKMEM, if the far-end is counterclockwise circular trunk hunting.

**CCWCTH** Enter CCWCTH for Counterclockwise Circular Trunk Hunting from the MRR trunk in the trunk group, based on the order of trunk members in table TRKMEM, if the far-end is clockwise circular trunk hunting.

## **Far-End Not Link List**

If the trunk group is two-way, the far-end is not a link list switcher, and sequential selection does not apply, enter MIDL (to satisfy the table editor).

## **Changing Trunk Selection Method and Sequence**

A trunk group trunk selection method cannot be changed. If such a change is required, create a new trunk group that has the required trunk selection method, then delete the individual trunks from the old trunk group and add them to the new trunk group.

For an existing trunk group, the selection sequence can be changed to ASEQ from DSEQ or from DSEQ to ASEQ if all the members are Installation Busy (INB) or unequipped.

## **Software Structure**

Trunk groups belonging to legacy and Generic Services Framework (GSF) software structures can be datafilled in table TRKGRP. Each structure uses different tables as shown below:

---

### ***Mapping of Legacy Tables to GSF Tables***

Legacy Table	GSF Table
TRKGRP	TRKGRP
ISUPDEST	TRKSERV
TRKSGRP	TRKSIGPF
TRKMEM	TRKBCHNL
C7TRKMEM	TRKBCHNL
FAILMSG	FAILMAP
TMMAP	TRKTRMT

---

## **Legacy Software Structure**

This section contains information about datafilling tables for the legacy software structure.

### **Table TRKGRP – Additional Information in Other Tables**

Additional information about table TRKGRP is defined in other tables as shown in the following table:

---

### ***Recommended Entry in Table CUSTPROT***

TABNAME	READPROT	UPDTPROT	ALLPROT
TRKGRP	15	20	30

---

## **Define Table Size in Table DATASIZE**

The total number of trunk groups for which memory is allocated in table TRKGRP is equal to the value of field SIZE in table DATASIZE. The length of the table can be extended by changing the value of SIZE in table DATASIZE and doing a cold restart. The maximum number of trunk groups is 8,191.

## **Define Trunk Subgroups in Table TRKSGRP**

Each of the trunk groups in table TRKGRP is assigned a maximum of two subgroups. Subgroups are provided so that the trunk group can have a mixture of analog and digital trunks or a mixture of analog card types (maximum two).

## **Define Trunk Group Members in Table TRKMEM**

The trunk number in a group, and the physical location of all analog or digital trunks assigned to the trunk groups, are listed in table TRKMEM.

## **Define Trunk Group Billing Code in Table BILLCODE**

The billing code data for each of the incoming or two-way CAMA or AMR5 trunk groups is listed in table BILLCODE.

## **Generic Services Framework Structure**

This section contains information about datafilling tables for the GSF software structure.

## **Define Trunk Subgroups in Table TRKSIGPF**

Each of the trunk groups in table TRKGRP is assigned a maximum of two subgroups. Subgroups are provided so that the trunk group can have a mixture of analog and digital trunks or a mixture of analog card types (maximum two).

## **Define Trunk Group Members in Table TRKBCHNL**

The trunk number in a group, and the physical location of all analog or digital trunks assigned to the trunk groups, are listed in table TRKBCHNL.

## **Define CCS7 Trunk Members in Table TRKBCHNL**

The CCS7 Circuit Identification Code (CIC) for each CCS7 trunk member is listed in table TRKBCHNL.

## **Miscellaneous Notes**

### **Trunking Diagram**

Before datafilling various trunk group type forms, an office trunking diagram or equivalent must be available.

### **Synchronous Clock Table SYNCLK**

For central office synchronization, two DS-1 channels must be assigned as synchronization timing links. Refer to the description of table SYNCLK for further details.

### **Restoration of Original Datafill After Testing**

Once installation tests are completed, the original trunk translations are restored to original datafill.

## **Equal Access for DMS-100 Wireless**

When datafilling Equal Access (EA) on the DMS-100 Wireless switch, the wireless portion of an ISUP Integrated Service Link (ISL) trunk must be datafilled as a DID trunk group type with refinement RTEVIAAT set to "Y". The wireline portion of the ISUP ISL trunk must be datafilled as an IT trunk type. Option CELL must be set to "2A" to support North American EA ISL terminations. A distinct billable number must be designated for option BILLNO for the downstream processor to distinguish the AMA records generated by the wireless DID ISL and non-ISL trunks.

### **Memory Allocation**

Tuples are allocated in blocks of 32, with each tuple consuming 100 bytes:

$$32 * 100 = 3,200 \text{ bytes}$$

Each time a new group is added, an additional 64 bytes is allocated.

The following is an example calculation for 32 tuples:

$$(32 * 100) + (32 * 64) = 5,248 \text{ bytes}$$

### **Datafill Examples**

The following is an example MAP display of an EANT trunk type using the ANIINTL option with subfields RECEIVE, CAINMSG, and CPNLBLK:

GRPKEY	GRPTYP	TRAFSNO	PADGRP
		NCCLS	GRP INFO
250TEANT2WS7	EANT 0 NPDGP NCOF UCS 0 2W 250PRETT LIDL 16 7 16 16 16 ANIPRETT		
	4 4 619 UCS2EAE0 NIL 619 7 NONE 0 NONE 0 0 3_1KHZ 160		
	(ANIDIGS)		(TMANIDLV ALWAYS)
	(CICSIZE 4DIGS)		(ANIINTL N N Y) \$

The following is an example of a IMT trunk using the CPNLBLK option:

GRPKEY	GRPTYP	TRAFSNO	PADGRP
		NCCLS	GRP INFO
250_OG_RLT_RTPC	IMT 0 NPDGP NCIT UCS 0 OG NPRT MIDL 16 16 16 16 16 UCS2UCS NIL		
	C N NONE 4 ALWAYS ADDR 1 1 INTER N SPEECH NONE 4 160 619 0		
	(RLT V1 N)		(TMCICBLK BLK_TNS)
	(CICSIZE 4DIGS)		(CPNLBLK ) \$

The following is an example of a PX trunk using the NODELAY option:

GRPKEY	GRPIINFO
RCC20PX	PX 0 ELO NCRT IC NIL MIDL N POT1 NSCR 619 619 LCL NONE NONE NLCA N N 32 NIL 5400002 DIALTN N N N (NODELAY) \$
RCC0PX	PX 0 ELO NCRT 2W NIL MIDL N POT1 NSCR 619 619 LCL NONE NONE NLCA N N 32 NIL 5400002 DIALTN N N N (NODELAY) \$

The following example shows TRKGRP tuple with the RESETBLK option:

GRPKEY	GRPTYP	TRAFSNO	PADGRP
		NCCLS	GRP INFO
DAL228TWDTLS	DAL 127 NPDGP NCON 0 2W DAL MIDL 16 7 16 16 S 10 NIL DL 0 5 111 MANUAL 214 0 6112211 NONE 0 VOICE_DATA Y 1 N Y NONE 00 160 (MCCS ) (OHQTERM ) (CAIN ) (RESETBLK) \$		

### **Datafill Warnings**

If an attempt is made to datafill the option on an outgoing PX trunk, the following error message is displayed:

NODELAY option allowed on IC or 2W trunks only.

# Testing and Ventilating Manholes

AT & TCo Standard

SECTION 620-140-501  
Issue 10, June 1976

## TESTING AND VENTILATING MANHOLES

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### 1. GENERAL

**1.01** This section describes the methods of testing with a hot filament-type gas indicator for the presence of combustible gas in manholes, unventilated cable entrance facilities, and unattended offices or buildings with underground cable entrances. Included in the section are the requirements for power ventilation before entry and during occupancy

of conventional manholes, offset access manholes, deep neck manholes, and irregular shaped manholes of sizes up to 10,000 cubic feet. *The use of power ventilation does not preclude the necessity of testing for the presence of combustible gas.*

**1.02** This section is reissued to revise purging time requirements. The revised requirements are based on the manhole size and **effective blower capacities**. Since this is a general revision, arrows used to show changes have been omitted.

**1.03** A routine for reporting suspected gas leaks should be established within each operating area. Telephone numbers of the gas company department or personnel responsible for investigating the reports shall be available so the proper people can be informed and measures taken to repair the leak.

**1.04** If petroleum products (gasoline, diesel fuel, etc) are found in a manhole, proceed as outlined in Section 620-145-010.

### 2. PRECAUTIONS

**2.01** Manhole guards and warning devices shall be set up at the manhole in accordance with Sections 620-135-010 and 620-135-100 before the manhole cover is removed.

**2.02** *Never enter a manhole, even momentarily, until it has been tested for combustible gas and then power ventilated (purged) with the blower operating at a maximum rated speed for the times specified in this section.*

**2.03** Where a tent is placed over a manhole opening before initial ventilation begins, roll up and tie the skirts of the tent at least 1 foot above the ground to provide an open area around the bottom of the tent for adequate air circulation and for dissipation of possible gas accumulations. Opening the tent entrance flaps alone will not provide sufficient movement of air and may cause "pocketing of gases" inside the tent. When a

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manhole shield is being used, raise the tent skirts at least 1 foot above the top of the shield to provide an area for ventilation. ***When a tent is in place during the purge, increase the purge time by 5 minutes.*** After purging, the tent skirts may be lowered, but the tent must be arranged to permit unrestricted air circulation from the tent. ***The tent shall not be fully closed at any time.***

**2.04** The blower must remain in operation during the entire time anyone is in the manhole. Do not operate the blower in any type of enclosure such as a tent, vehicle (except Electro-van and similar trucks), trailer, tool cart, etc. Locate the blower in an unconfined space with the blower intake away from traffic and the blower exhaust away from the manhole opening. The blower should be located a minimum of 5 feet from the manhole opening to avoid returning purged air into the manhole.

**2.05** ***Care should be taken when setting up the blower hose to prevent unnecessary bends or restrictions.*** Bends or restrictions should be kept to a minimum as this will reduce the air output at the end of the blower hose to below the certified rate. During purging (hose in dropped position) the hose end should extend into the manhole a minimum of 1 foot below the ceiling and shall be at least 2 feet above the floor level.

**2.06** No open flame, torch, lighted cigar, cigarette, or pipe shall be brought near an open manhole, into a covering or tent over an open manhole, nor taken into a manhole. ***Under no circumstances shall a cigarette lighter, match, or other item that produces a hot spark be operated or ignited in a manhole.***

**2.07** The propane furnace and other open flames should be kept as far from an open manhole as practical and away from the blower air intake.

**2.08** Only approved lighting and heating equipment shall be used. Connections and disconnections to electric lighting, equipment, etc, shall be made outside the manhole. Storage batteries shall not be brought into a manhole.

**2.09** Hazardous gases most likely to be found in underground structures are those used for household fuel. However, gases generated in the soil, liquid fuels that occasionally escape into conduit and manholes, and oxygen deficiency can occur and can cause hazardous conditions. ***Since the gas indicator used to test for the presence of gas will detect combustible gas only, and since other hazardous gases can be present or there can be an oxygen deficiency, the requirements for purging and continuous ventilation covered in this section must be carried out to assure a safe working atmosphere. In manholes where toxic gases are likely to occur, increase the purge times given in this section by 50 percent.***

## **3. INTERPRETING GAS INDICATOR READINGS**

**3.01** Two types of gas indicators are available; the hand aspirated indicator and the continuous gas monitor. The continuous gas monitor description and use is covered in Section 081-700-110. The hand aspirated indicator is a hot filament-type gas indicator (B, C, E, F, or G gas indicator) which, when properly used, will indicate the percentage of the lower explosive limit (LEL) of combustible gas present in the atmosphere being tested. A gas indicator reading showing a gas concentration above the 10 percent LEL in a manhole, cable entrance facility, or building indicates an unsafe atmosphere. An indicator reading showing a gas concentration below the 10 percent LEL indicates a nonexplosive atmosphere. ***However, the meter indication of a nonexplosive manhole atmosphere does not eliminate the necessity of purging for the prescribed times and maintaining continuous ventilation during occupancy.***

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**3.02** All new gas indicators and modified existing gas indicators have a meter scale with a green band from 0 to 10 or 0 to 0.1, which represents zero to 10 percent LEL, and a red band above 10 or 0.1, which represents values above 10 percent LEL. A reading of 100 percent LEL

indicates a concentration of gas in air that will explode or continue to burn when ignited. When using the gas indicator, observe the guidelines in Table A to determine if explosive gas is present and to prevent meter damage if gas concentrations are high.

TABLE A  
INTERPRETATION OF GAS INDICATOR READINGS

SCALE READING	TYPE OF INDICATOR	INTERPRETATION
0 to 10	B, F, and G Gas Indicators	Satisfactory; however, purge before entering and ventilate while working in manhole.
0 to 0.1		
Above 10 to 100	C and E Gas Indicators	Hazardous Condition — Purge for required time and retest.
Above 0.1 to 1.0		
Needle moves to right end of scale and either remains there or returns to some point on scale, zero, or below	B, C, E, F, and G Gas Indicators	Hazardous Condition — Concentration of gas may be in explosive range. Purge for required time and retest.

\* New and modified meters

**3.03** If, when using the gas indicator in any area, the meter pointer moves to 100 percent, or the top of the scale, and stops there, it indicates a hazardous gas concentration near or above the LEL. When this occurs, turn the instrument off and purge it with fresh air, by removing the hose and squeezing the bulb about five times, to prevent meter damage.

**3.04** If, when using the gas indicator in any area, the meter pointer moves rapidly to the top of the scale and then returns to some point on the scale, or to zero or below, it indicates a gas concentration above the LEL, possibly a very heavy concentration of gas. When this occurs, turn the instrument off immediately and purge with fresh air to prevent damage to the meter. Also recheck the instrument with the gas test kit, as the high gas concentration may have burned out the meter filament.

## 4. BLOWER CAPACITIES

**4.01** Manhole ventilation with forced air is necessary first, to expel hazardous gases that may be present in the manhole atmosphere and second, to maintain an adequate supply of oxygen. To determine initial ventilation (purge) times, the effective blower capacity and manhole volume must be known.

**4.02** The effective blower capacity is defined as the actual blower air output in cubic feet per minute (CFM) delivered at the end of the standard blower hose (AT-8418). Effective blower capacity, as stated by the blower manufacturer, must have been determined by precision airflow chamber tests performed by independent testing laboratories. The tests are made with one 90 degree bend (purging position) in the blower hose and with two 90 degree bends (continuous ventilation

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position) in the blower hose, and the results are certified by the testing laboratory.

**4.03** Newly purchased blowers will have the certified capacity displayed on the nameplate. Blowers in service must be equipped with a metal tag or other permanent label or marked with a paint stencil to show the effective blower capacity.

### **5. BLOWER MAINTENANCE**

**5.01** All blower units need to be cleaned and checked periodically to be sure they are operating at rated capacity. Improper blower operation can cause a reduction in blower motor speed and thus a reduction in air delivery.

**5.02** Air delivery of electrically powered blowers generally will not vary from the norm if line voltage and frequency are held at the value for which the motor is designed and there is no damage to the blower components. Air delivery of blowers powered by internal combustion engines will vary appreciably if the engine is not properly maintained and adjusted to operate at the governed engine speed per the manufacturer's specifications.

**5.03** Blower hoses shall be in good condition. Hoses with leaks, tears, or other damage can cause a marked reduction in air delivery and, therefore, must be repaired or replaced as required.

### **6. SETUPS FOR TESTING AND PURGING MANHOLES**

**6.01** Initially, test for combustible gas with the end of the sampling tube at about head height in the manhole. If this cannot be accomplished by lowering the tube directly into the manhole, a permanent installation of gas sampling tubing extending into the manhole should be provided. The tubing should be installed with one end at or near the middle of one side wall and at about head height away from the direct output of the blower. The other end should terminate in the manhole entrance and be accessible from a position outside the manhole collar. The end in the manhole entrance should be equipped with a capped end fitting for attaching the gas indicator hose and a valve for connecting an air chuck to clear the tubing of any residual gas, dirt, or water.

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## **CONVENTIONAL MANHOLES**

**6.02** Conventional manholes are rectangular in shape with access through the manhole roof and with the collar height short enough so the standard blower hose is adequate in length for purging and for continuous ventilation. Manholes that are smaller than 1000 cubic feet are purged

by opening one manhole cover and dropping the end of the blower hose into the manhole (one 90 degree bend in the blower hose). Conventional manholes larger than 1000 cubic feet are purged with two manhole covers removed, at opposite ends of the manhole. The purge times are specified in Part 7 of this section. A typical setup is shown in Fig. 1.

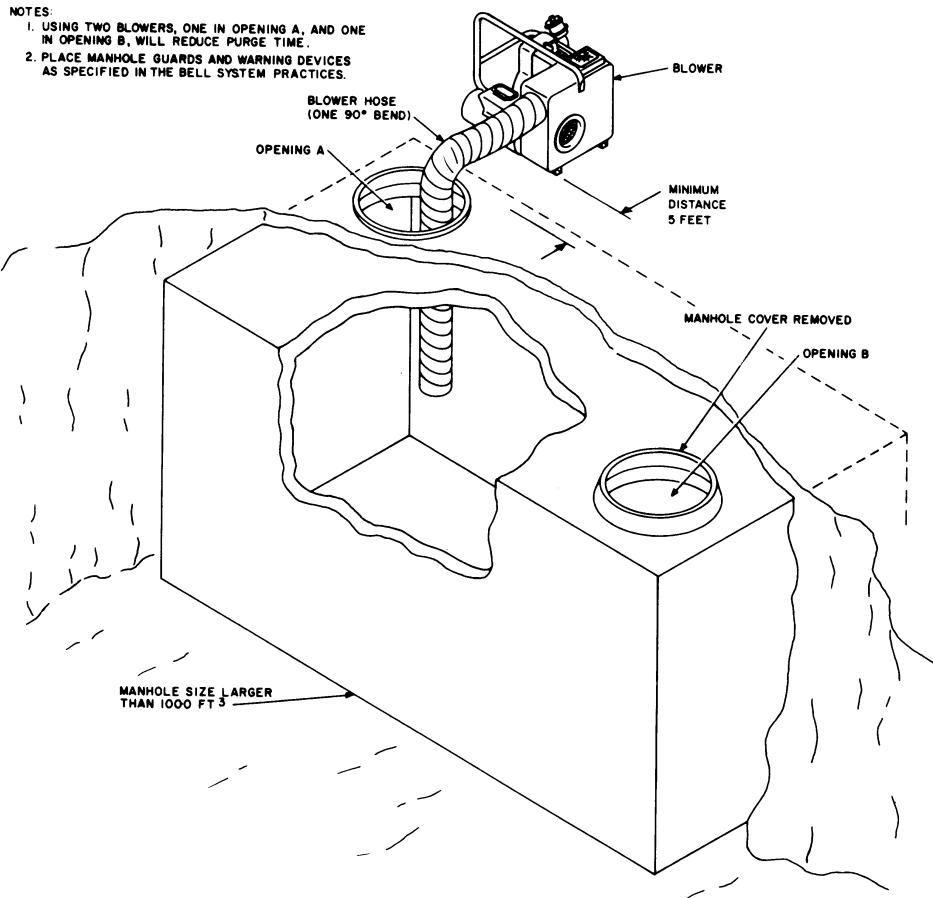


Fig. 1—Typical Setup for Purging Large Conventional Manholes

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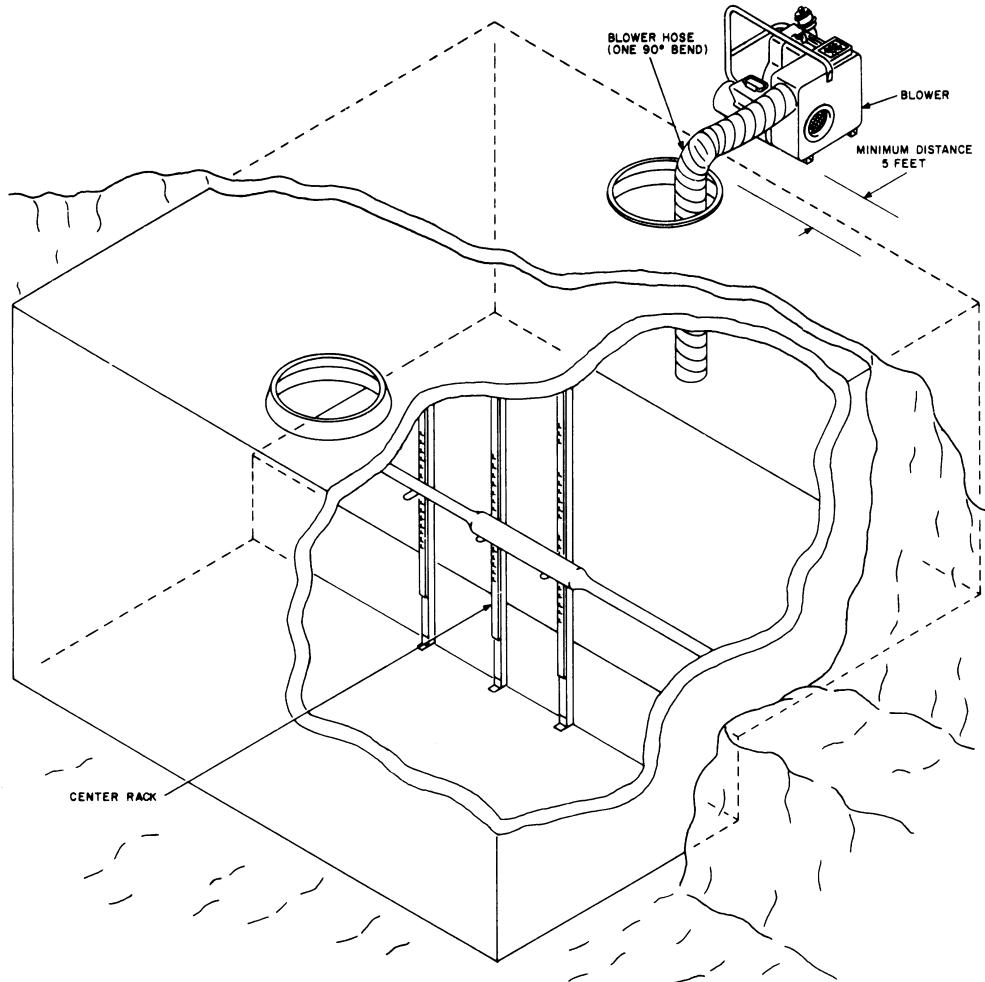
### **IRREGULAR SHAPE MANHOLES**

**6.03** Irregular shape manholes often result from enlarging an existing manhole. A typical example is shown in Fig. 2. If the manhole has

two floor levels or if it is congested so that air flow is restricted, purge time should be based on the effective blower capacity with two 90 degree bends in the hose. Purge by dropping the blower hose into the manhole (one 90 degree bend in blower hose).

#### **NOTES:**

1. BASE PURGE TIME ON EFFECTIVE BLOWER CAPACITY WITH TWO 90° BENDS IN BLOWER HOSE.
2. PLACE MANHOLE GUARDS AND WARNING DEVICES AS SPECIFIED IN THE BELL SYSTEM PRACTICES.



**Fig. 2—Typical Setup for Purging Irregular Shape Manholes**

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## OFFSET ACCESS MANHOLES

**6.04** Offset access manholes are those manholes situated so entry must be made through either an access opening several feet from the manhole or an adjacent manhole and a connecting

horizontal passageway. Adequate purging and ventilation for these manholes can be achieved only through permanently installed ventilating ducts that will introduce air directly into the offset access manhole. Examples of ventilating duct locations are shown in Fig. 3 and 4.

### NOTES:

1. BASE PURGE TIME ON EFFECTIVE BLOWER CAPACITY WITH ONE 90° BEND IN BLOWER HOSE.
2. PLACE MANHOLE GUARDS AND WARNING DEVICES AS SPECIFIED IN THE BELL SYSTEM PRACTICES.

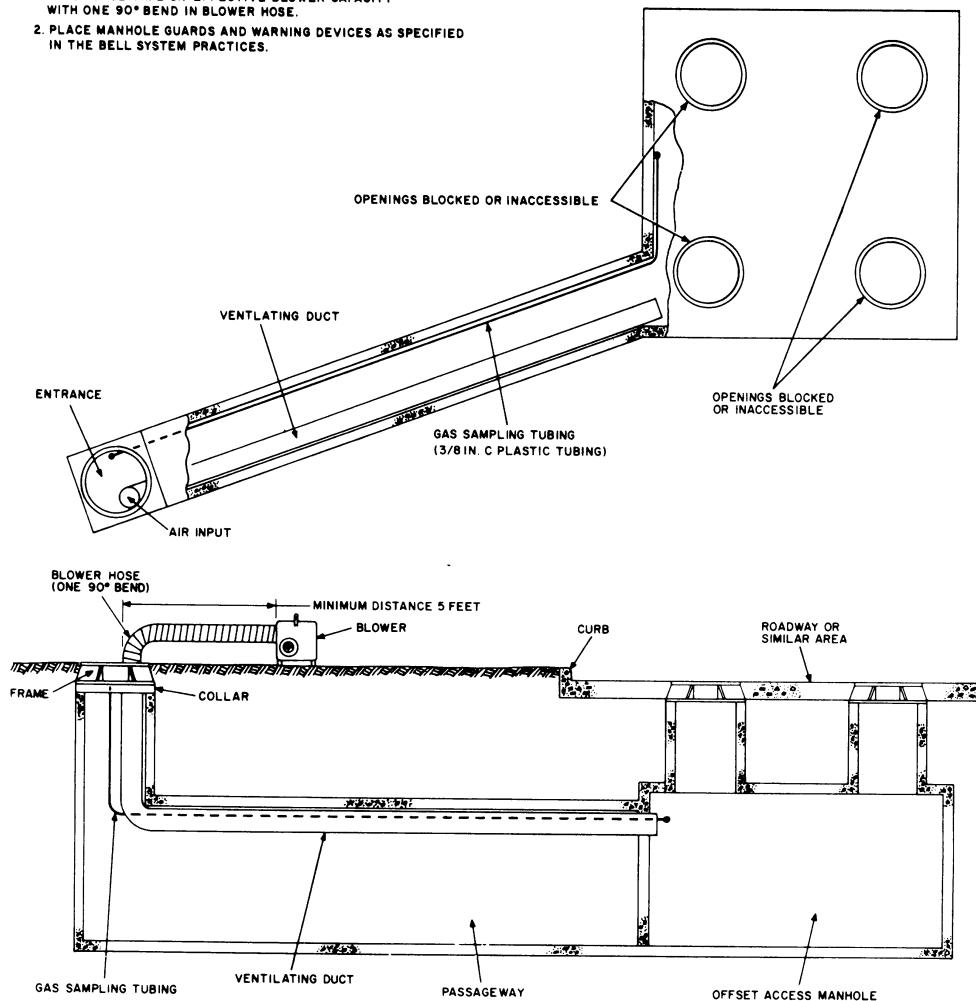


Fig. 3—Typical Setup for Purging Offset Access Manhole With No Entrance Manhole

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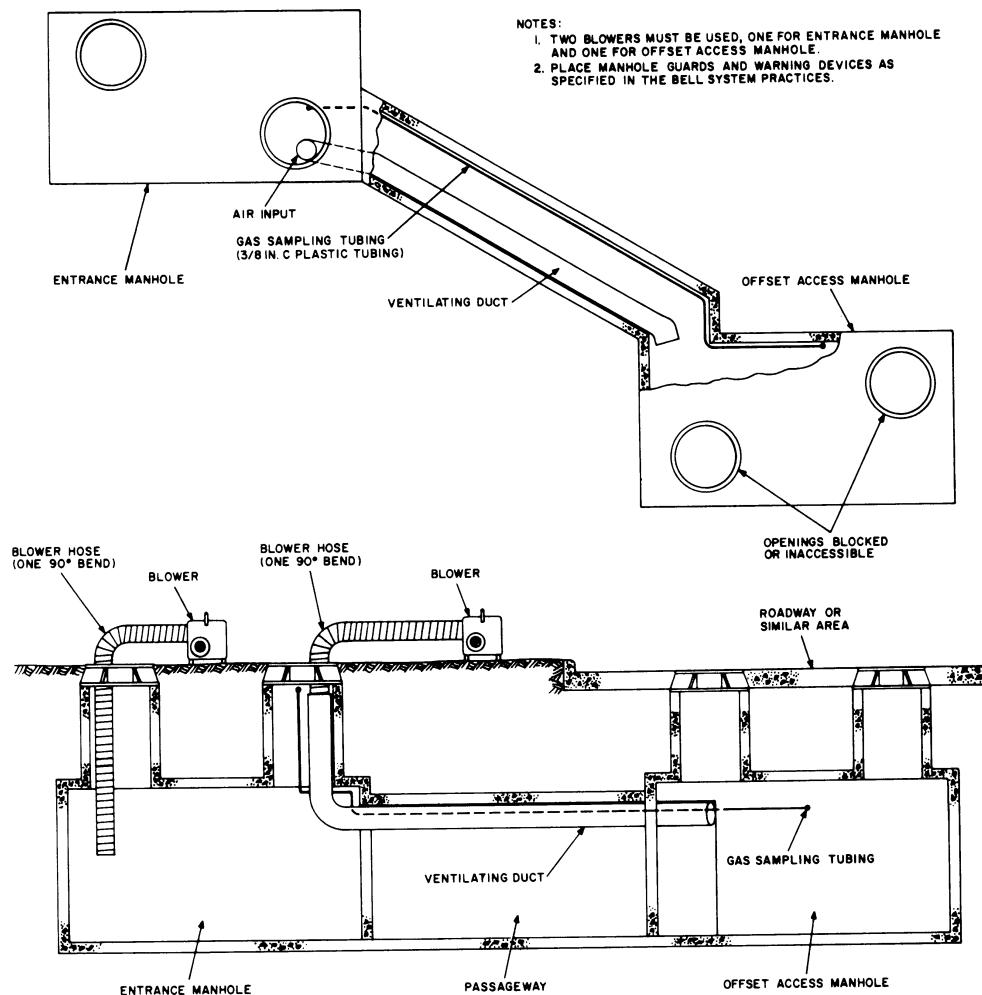


Fig. 4—Typical Setup for Purging Offset Access Manhole With Entrance Manhole

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**6.05** Purging and ventilation of offset access manholes is accomplished by inserting the end of the blower hose into the upper end of the permanently installed ventilating duct. When inserting the blower hose, be sure its end is several inches above any 90 degree elbow in the duct so airflow will not be impeded.

**6.06** Purge times for offset access manholes are determined using the effective blower capacity with one 90 degree bend in the blower hose and the sum of the volumes of the manhole and the passageway. When entry into the offset access manhole is through an adjacent manhole and a passageway, both the entrance manhole and the offset access manhole must be ventilated any time work is done in either one or both of the manholes. Each manhole is ventilated independently (two blowers, hoses, gas tests, etc), however, purge

time for each manhole will be the same and will be the purge time determined for the larger of the two manholes. The volume of the passageway added to the volume of the offset access manhole is considered as the total volume of the offset access manhole.

### **DEEP NECK MANHOLES**

**6.07** For the purposes of this section, deep neck manholes are defined as those manholes with entry through the roof and with a long collar height so that one 15-foot blower hose is not adequate in length for purging and for continuous ventilation. Deep neck manholes may be purged and ventilated by coupling two standard blower hoses together (Fig. 5) or by utilizing permanent ventilating duct installed either in the collar (Fig. 6) or adjacent to the manhole (Fig. 7).

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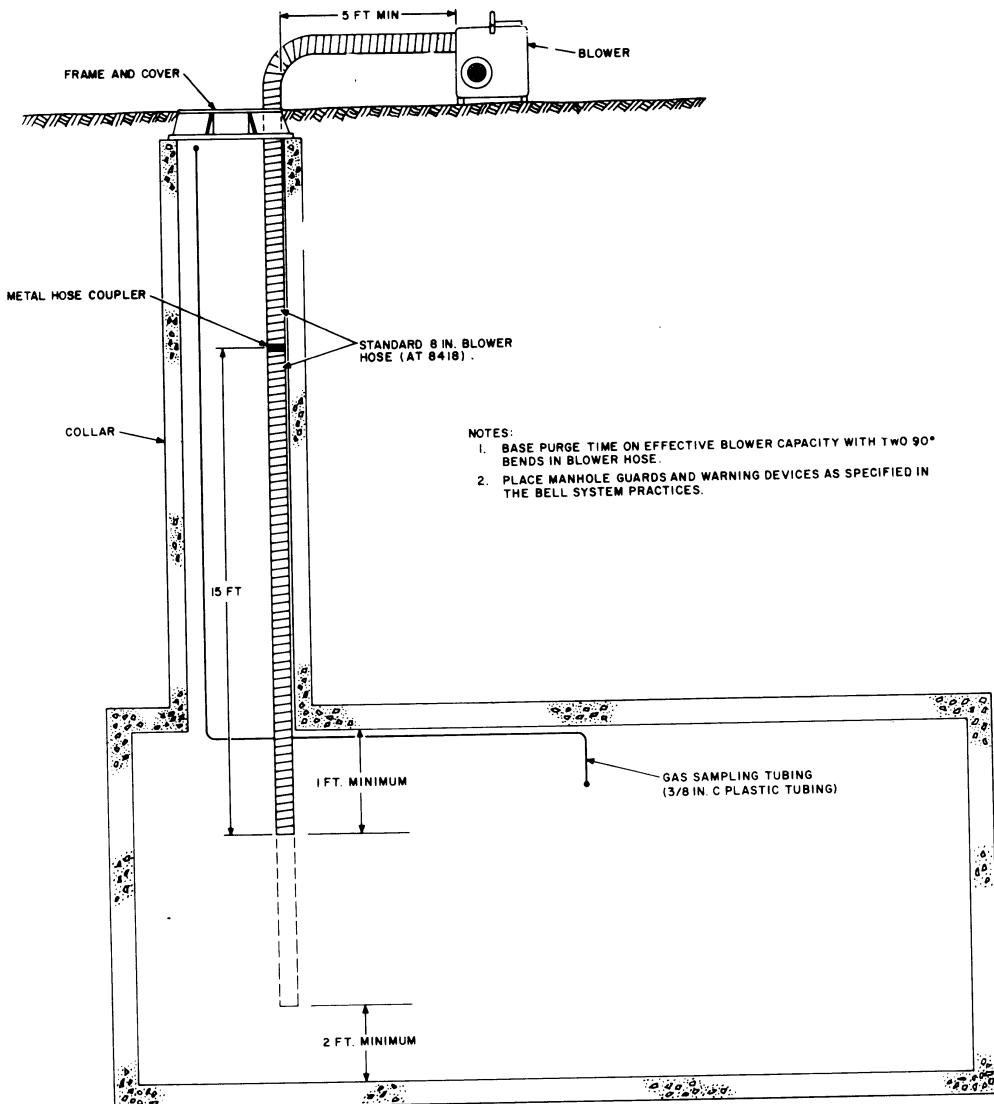


Fig. 5—Deep Neck Manhole Ventilated by Coupling Two Blower Hoses

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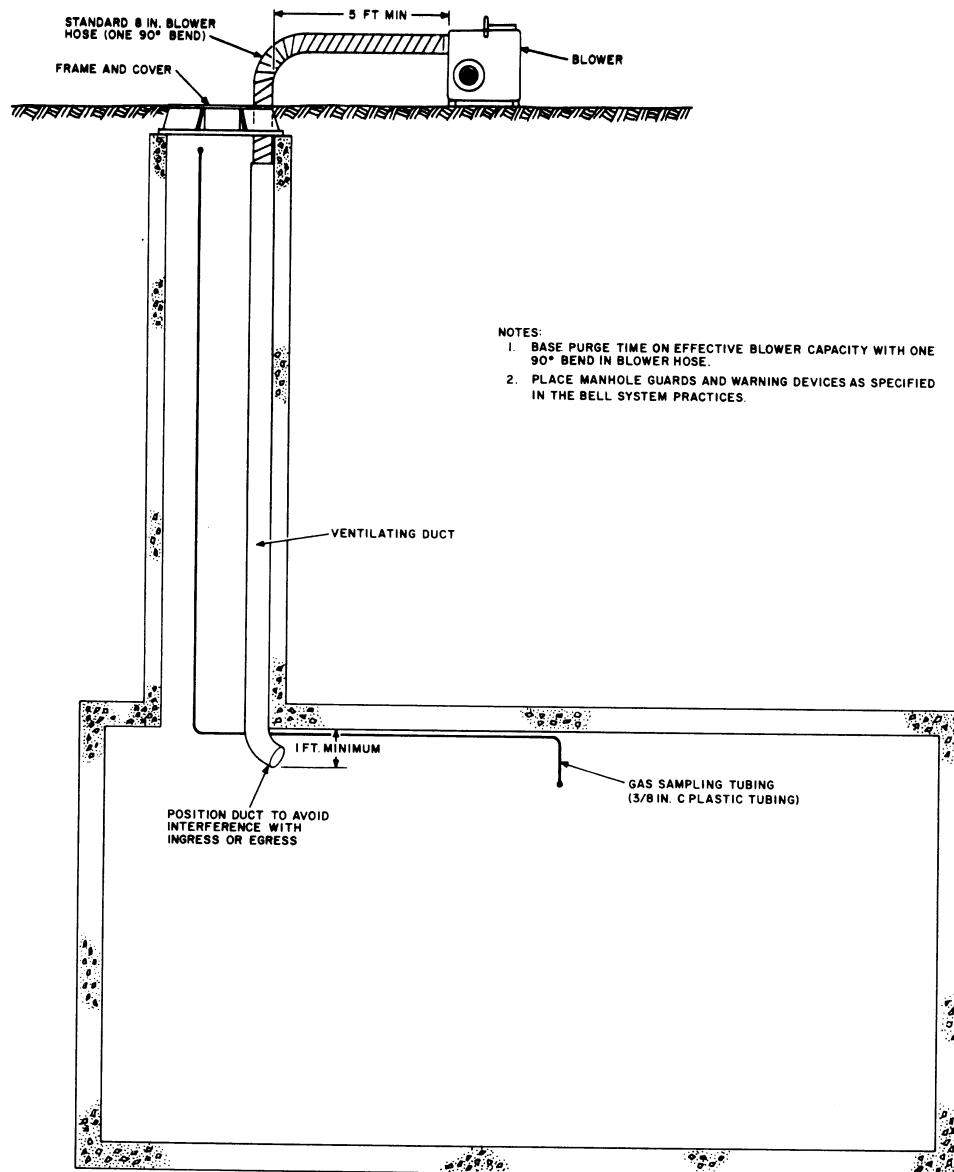


Fig. 6—Deep Neck Manhole Ventilated With Permanent Ventilating Duct Installed in Collar

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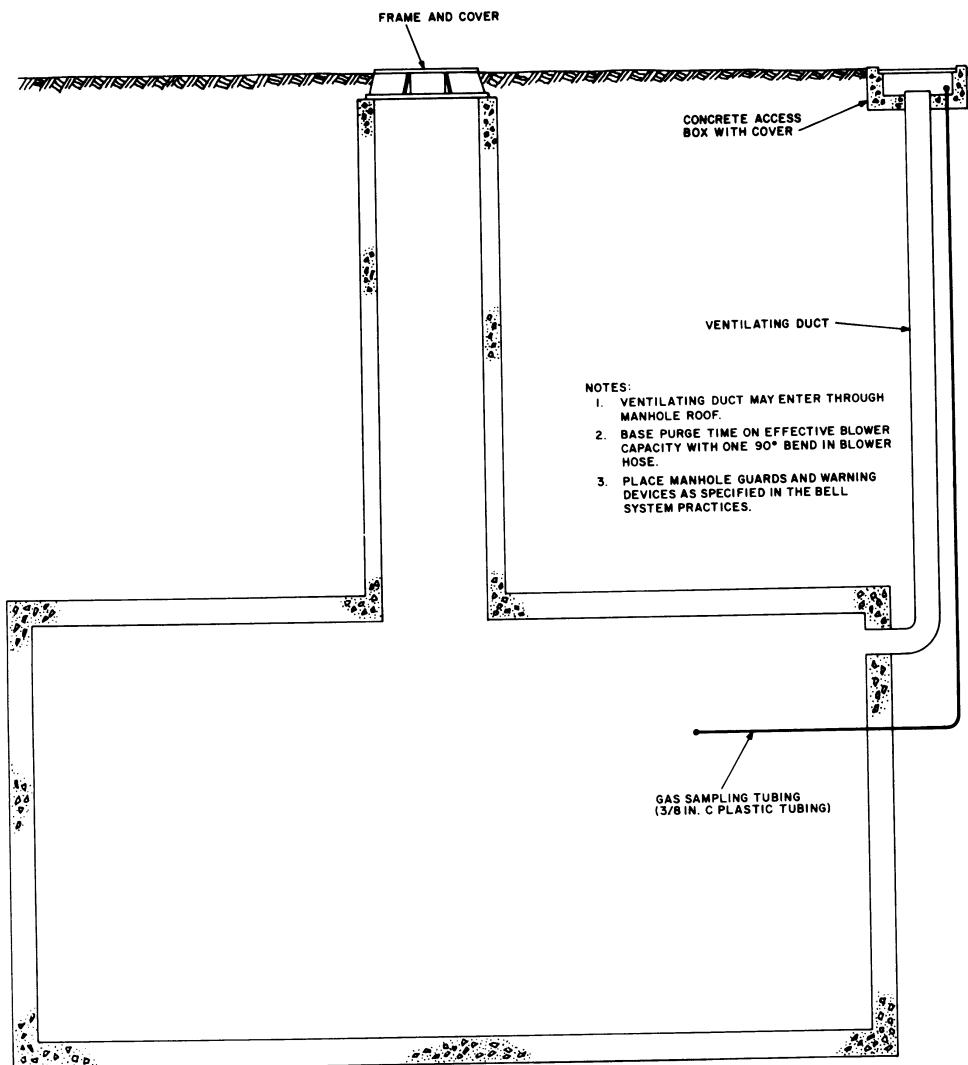


Fig. 7—Deep Neck Manhole With Permanent Ventilating Duct Installed Adjacent to Manhole

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**6.08** If the collar height is greater than 5 feet, the volume of the collar must be added to the volume of the manhole for determining purge time.

**6.09** When purging with the coupled hose, purge time should be based on the effective blower capacity with two 90 degree bends in the standard blower hose to compensate for pressure drop in the longer hose.

**6.10** Where permanent ventilating duct is installed, the effective blower capacity with one 90 degree bend in the blower hose is used to determine purge time. Ventilating ducts should be placed to avoid interference with winch lines, suction hoses

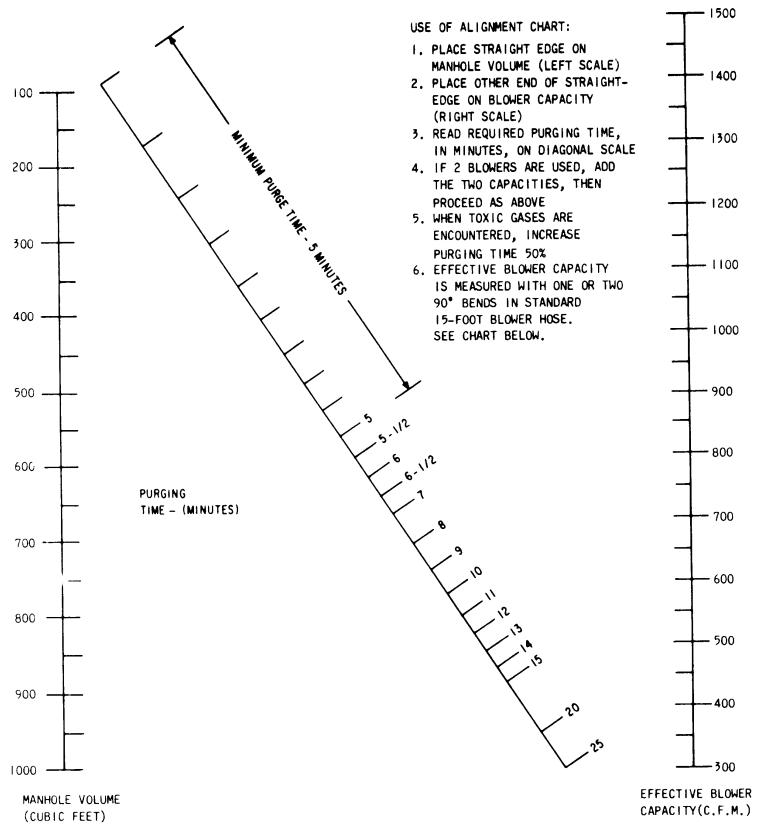
used for pumping water, etc, and to direct the airflow either diagonally across the manhole or along a long dimension of the manhole. A cap or cover should be provided for the upper end of the ventilating duct when it is not in use. Ventilate by inserting blower hose into ventilating duct.

### **7. DETERMINING PURGE TIMES**

**7.01** Purge times specified in the alignment charts (Fig. 8 and 9) are based upon 10 percent LEL for a combustible gas. When toxic commercial or soil gases are presumed to be present or detected by odor in the manhole, the purge time determined by using the alignment charts should be increased by 50 percent.

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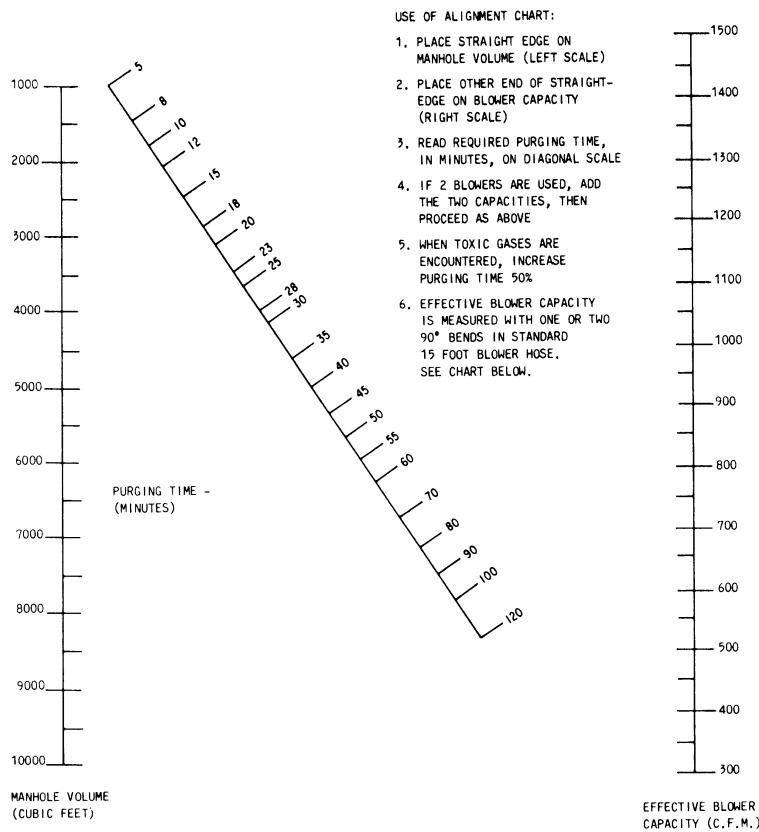
EFFECTIVE BLOWER CAPACITY (CFM) WITH:	CONVENTIONAL MANHOLE (TO 1000 FT <sup>3</sup> )	OFFSET ACCESS MANHOLE (WITH PERMANENT VENTILATING DUCT)	DEEP NECK MANHOLE		IRREGULAR SHAPE MANHOLE	
			PERMANENT VENTILATING DUCT	COUPLED HOSE	UNCONGESTED	CONGESTED
ONE 90° BEND	✓	✓	✓		✓	
TWO 90° BENDS				✓*		✓

\* USE BLOWER CAPACITY WITH TWO 90° BENDS UNLESS BLOWER HAS BEEN CERTIFIED WITH COUPLED HOSE WITH ONE 90° BEND.

Fig. 8—Alignment Chart—Side 1

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EFFECTIVE BLOWER CAPACITY (CFM)	CONVENTIONAL MANHOLE (1000 TO 10,000 FT <sup>3</sup> )	OFFSET ACCESS MANHOLE (WITH PERMANENT VENTILATING DUCT)	DEEP NECK MANHOLE		IRREGULAR SHAPE MANHOLE	
			PERMANENT VENTILATING DUCT	COUPLED HOSE	UNCONGESTED	CONGESTED
ONE 90° BEND	✓	✓	✓		✓	
TWO 90° BENDS				*✓		✓

\* USE BLOWER CAPACITY WITH TWO 90° BENDS UNLESS BLOWER HAS BEEN CERTIFIED WITH COUPLED HOSE WITH ONE 90° BEND.

**Fig. 9—Alignment Chart—Side 2**

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**7.02** Accurate purge times can be determined from the alignment charts if effective blower capacity and manhole volume are known. **Minimum purge time shall be 5 minutes.** For large manholes, purge times may be reduced by using two blowers, if the manhole has two access openings. When using two blowers the sum of the blower capacities is used as the effective blower capacity on the alignment chart. Only one blower hose may be placed in any manhole access opening if the opening is to be used for ingress and egress.

**7.03** Each manhole with a volume greater than 500 cubic feet, or other volume designated by the company as the cut-off size, should have its volume in cubic feet recorded on a permanent plastic or metal tag that is secured in the manhole collar on a patch of high visibility paint. The tag must be clearly visible without having to enter the manhole. One method of recording the manhole volume is to use the Manhole Marking Kit 1379 available from General Machine Products, Trevose, Pennsylvania. The kit consists of a 1-inch by 4-inch orange plastic strip, which can be marked on with a "permanent" felt-tip marker, and a masonry nail for mounting the plastic strip in the manhole collar. The purge times for all manholes of a size equal to or smaller than the 500 cubic foot cut-off size are:

- 10 minutes with 400 CFM blower
- 8 minutes with 500 CFM blower
- 5 minutes with 800 CFM blower

If a different cut-off size is adopted or blower capacities differ, purge times must be established from the alignment charts. Minimum purge times shall be 5 minutes.

**7.04** To determine purge times for a manhole that has not been tagged or has the tag missing, as indicated by a paint patch but no tag, obtain the manhole volume from work prints or other records. If the manhole volume is not recorded, estimate the volume. When the purge time will be based on estimated manhole volume, double the purge time indicated on the alignment chart to compensate for possible errors in the estimate. After testing, purging, and ventilating, as covered in Part 8, measure the manhole, apply the patch of high visibility paint, and install a tag on which the manhole volume has been recorded.

Notify the person responsible for maintaining records of manhole sizes so the volume of the manhole will be placed on the records.

**7.05** Continuous ventilation is required after purging to assure a safe working atmosphere. A blower operating with an effective blower capacity of no less than 345 CFM at the end of the blower hose with two 90 degree bends will maintain a safe working atmosphere in manholes of the sizes and configurations covered in this section, provided no additional contaminates enter the manhole (see 8.09) and air from the blower is introduced directly into the manhole via the blower hose or permanent ventilating ducts.

## **8. TESTING FOR COMBUSTIBLE GAS AND VENTILATING MANHOLES**

**8.01** The person making a gas test should set up in a position that will cause a minimum interference with traffic. Plan the work so a minimum amount of time is spent in the traffic area.

**8.02** Every manhole opened after having been closed for any period of time shall be tested for the presence of combustible gas and purged. The initial test shall be made immediately after the manhole cover is removed and before the manhole is purged.

**8.03** The approved gas test kit (081 Division of the Bell System Practices) shall be used to test the gas indicator. The gas indicator should be tested for proper operation each day before the first manhole test is made, at each change of work shift, if dropped, or if exposed to a high concentration of gas. Never test the operation of a gas indicator by sampling fumes from a tank or can containing gasoline, because the high concentration of gas could damage the meter.

**8.04** The initial test for combustible gas **using the hand aspirated indicator** shall be made as follows:

- (1) Hold the instrument securely or place it on a firm support during the test to prevent the instrument from falling.
- (2) Position the free end of the hose at the height where a person's head will be when working in the manhole (see note). Additional

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lengths of hose may be used to test the lower portions of deep manholes or permanently installed gas sampling tubing can be provided. If water in the manhole is above head height, hold the sampling hose 1 foot above the water.

**Note:** Use permanently installed sampling tubing in offset access manholes. Any water in the manholes equipped with permanently installed gas sampling tubing must be pumped out to a level at least 1 foot below the end of the tubing. Blow air through the tubing to clear it of water.

- (3) Draw a sample of the manhole atmosphere through the gas indicator, compressing and releasing the aspirator bulb about five times plus one squeeze for each 5 feet of hose. **The meter pointer must be observed continuously from the first squeeze of the bulb until the test is completed.** Keep aspirating until the highest reading is obtained. The needle will fluctuate slightly at each aspiration, showing that the indicator is functioning properly.

**Warning:** All users of combustible gas indicators must be aware that the rise and fall of the indicating needle is generally extremely rapid, and as a result the operator may not see the initial up-scale deflection unless the meter is continuously observed. If a very heavy concentration of gas is present, the pointer will move rapidly to the top of the scale and then return to some point above zero, zero, or below zero. If not seen, this could lead to the erroneous assumption that the atmosphere being tested is safe when actually a very dangerous condition exists. This is the reason for stressing continuous observation of the pointer from the first squeeze of the bulb until the test is complete.

- 8.05** After completing the initial test, purge the manhole for the appropriate time specified in the alignment chart.

**Note:** Removal of water from a manhole may permit gas to flow from the ducts into the manhole; therefore, after purging and before entering the manhole, an additional test shall be made after the manhole has been pumped or a minimum water level has been reached with continuous pumping.

(a) **If the initial test indicated an unsatisfactory atmosphere** in the manhole, make a second test after the blower has operated for the specified purge time. Make the test with the sampling hose away from the direct output of the blower. If this test indicates an unsatisfactory atmosphere, operate the blower for an additional 10 minutes and repeat the test. If any gas is detected at this time, do not enter the manhole. Report the condition to the supervisor. If the manhole atmosphere is satisfactory, the manhole may be entered. (See following Note.) The blower must be in continuous operation while anyone is in the manhole.

(b) **If the initial test indicated a satisfactory atmosphere**, the manhole may be entered after purging has been completed. (See following Note.) The blower must be in continuous operation while anyone is in the manhole.

**Note:** Before entering a deep neck or an offset access manhole, or any manhole equipped with gas sampling tubing, test the atmosphere in the collar area just below the manhole cover location. Make this test with the blower(s) operating. This test is required in addition to the test of the manhole atmosphere and even though the manhole atmosphere tests clear.

- 8.06** Enter the manhole with the gas indicator, and where possible, place the blower hose in a horizontal position along a sidewall approximately midway between the floor (or platform) and the manhole roof. Direct the blower hose outlet toward an end wall, preferably away from the work area. Next, make tests for gas by probing in the area of all duct entrances, in corners, crevices, etc, and then generally throughout the manhole. To purge the gas indicator while in the manhole, detach the sampling hose and hold the gas indicator in the fresh air near the end of the blower hose or ventilating duct.

- 8.07** For offset access manholes; upon entry into the entrance manhole, test for gas at the duct entrances and in the corners, test for gas in the passageway, and finally test for gas at the duct entrances and in the corners of the offset access manhole.

- 8.08** If the tests in the manhole are satisfactory proceed with the work operation. If gas is

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detected, leave the manhole at once. Purge the manhole for an additional 10 minutes. Retest the manhole atmosphere from street level. If gas is detected, do not enter. Notify supervisor. If atmosphere is clear, reenter the manhole and repeat the tests in the manhole. If gas is detected after reentering, leave the manhole at once and notify the supervisor. If the atmosphere is clear, proceed with the work operation.

**8.09** After the work in any manhole has begun, additional tests must be made as follows:

- (a) If duct plugs are removed, immediately test for combustible gas at the ducts that were opened. If gas is detected, leave manhole at once. Purge for 10 minutes and retest manhole from street level. If gas is detected, notify supervisor. If atmosphere is clear, reenter the manhole and repeat tests. If gas is detected, leave manhole at once and notify supervisor. If atmosphere is clear, continue the work operation.
- (b) When each crew begins work repeat tests at ducts and throughout manhole. If gas is detected leave manhole at once. Report the condition to the supervisor.
- (c) At intervals of not more than two hours, every hour if gas was detected initially (shorten intervals to one-half these times if a tent is being used), repeat tests at ducts and

throughout manhole. If gas is detected, leave manhole at once. Report the condition to the supervisor.

**8.10** *Continuous gas monitors* utilize a dual filament gas detector designed to continuously test the working atmosphere. This type of gas detector eliminates the need to make periodic tests while the manhole is occupied. It can provide an extra measure of security in a manhole that has a history of combustible gas occurrences. The monitor is factory set to trigger an audible and a visual alarm when the gas concentration exceeds 10 percent LEL. After work in the manhole has begun and the monitor is in use, leave the manhole at once if the alarm should operate. Follow procedures in 8.09(a) when removing duct plugs.

**8.11** If the blower should stop, leave the manhole at once. Remove the blower hose from the manhole. The blower hose shall be kept out of the manhole while the blower is not operating. When the blower is again operating, purge the hose. While purging hose, test the manhole atmosphere. If satisfactory, replace the blower hose and reenter the manhole. If the test is not satisfactory, purge the manhole for 10 minutes and retest the manhole atmosphere from street level. If atmosphere tests clear, reenter the manhole and repeat tests in manhole. If gas is detected, leave manhole at once and notify supervisor. If atmosphere tests clear, continue the work operation.

# **Testing and Ventilating Manholes**

**ISS 10, SECTION 620-140-501**

**8.12** Figure 10 is a brief summary of the manhole testing and ventilating procedures. Read the complete section thoroughly to be sure the procedures are understood.

## **9. TESTING CABLE ENTRANCE FACILITIES (CEF) FOR COMBUSTIBLE GAS**

**9.01** *The testing of cable entrance facilities shall be in accordance with local building practices. If the responsible building supervisor has determined that the CEF is adequately ventilated, no testing is required.* In the absence of any local practices or requirements, cable entrance facilities shall be tested for gas in accordance with the procedures in the following paragraphs.

**9.02** In some buildings, tubes or pipes have been placed between the cable entrance facility and some location outside the facility to facilitate testing. When such tubes or pipes have been placed, specific instructions indicating the number of tubes and the location where the tests can be made shall be posted on or adjacent to the CEF door. It is recommended that the length of each tube be indicated at the various test points. These tubes or pipes shall be considered as an extension of the sampling hose and should be aspirated accordingly when making tests.

**9.03** If no tubes, pipes, etc, are provided to facilitate testing for gas, open the CEF door just enough to lay the free end of the hose of the gas indicator on the floor and into the CEF. Perform the test for gas. If no gas is detected at floor level, lay the free end of the hose over the top of the door. Close the door as much as is possible without constricting the hose and test for gas.

**9.04** If gas is detected during the tests do not enter. Withdraw the hose, close the door, and notify the supervisor. If no gas is found, enter the CEF and test for gas in the area of the conduit entrance and generally throughout the CEF. If gas is found in the CEF, leave immediately, close the door, and immediately inform the supervisor and the person in charge of the building.

**9.05** If gas is found, the person in charge of the building must arrange for ventilation and any other steps necessary to prevent ignition of the gas. Care should be exercised to ensure that the method of ventilating does not force gas from the CEF into other parts of the building.

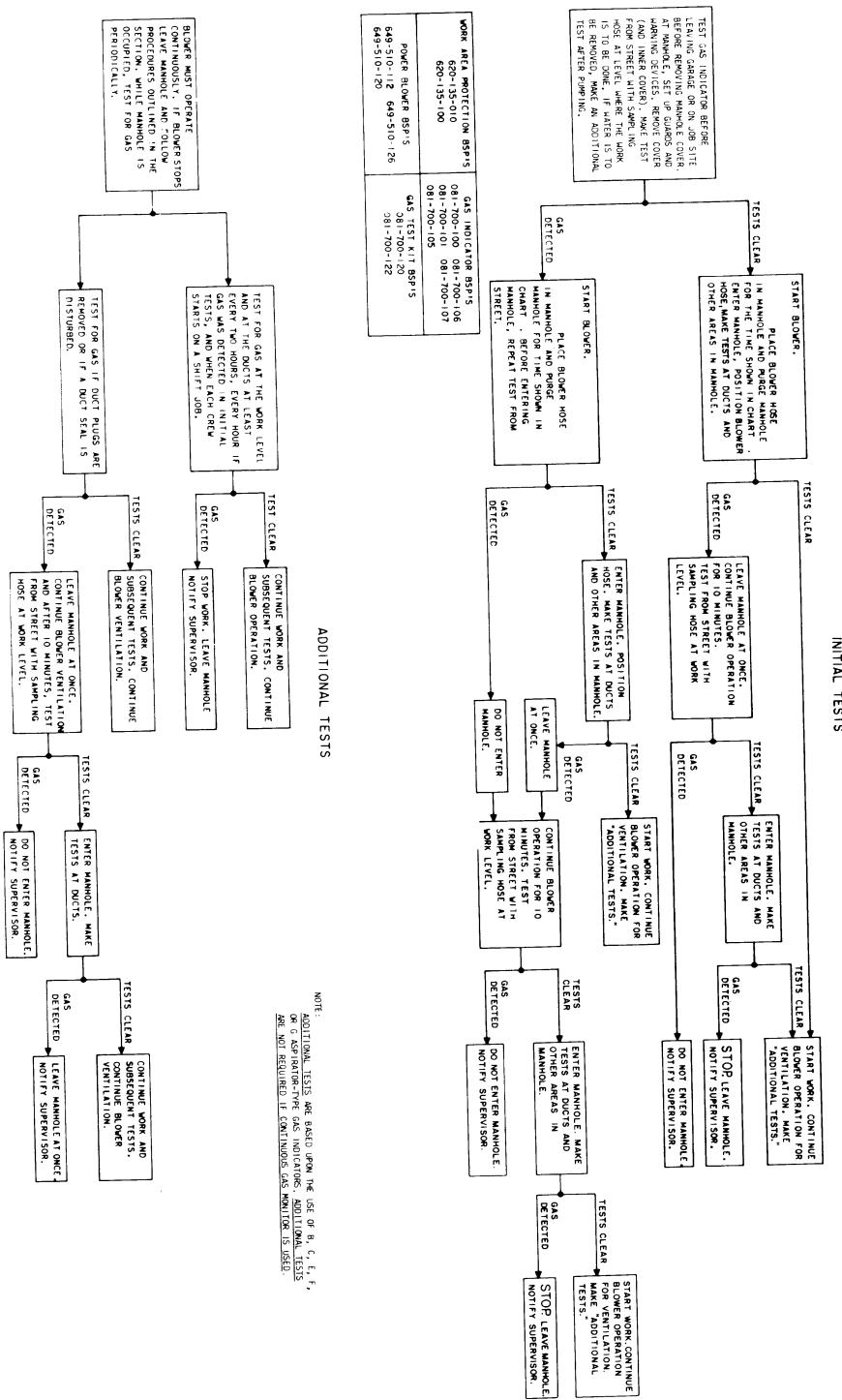
**9.06** After each operation involving the duct plugs or duct seals in the office manhole and CEF, the ducts should be resealed to minimize the possibility of gas entering through these ducts.

**9.07** Cable entrance facilities are considered to be central office equipment spaces and, therefore, no open flame, torch, lighted cigar, cigarette, or pipe shall be brought into such areas. Under no circumstances shall a cigarette lighter, match, or other device that produces a hot spark be operated or ignited in a CEF.

## **10. TESTING UNATTENDED BUILDINGS FOR COMBUSTIBLE GAS**

**10.01** When entering an unattended building having an underground cable entrance, the test for gas may be omitted if so posted or covered by local instructions. Otherwise, the area above and around the cable ducts entering the building shall be tested with the gas indicator. If gas is detected, ventilate by opening windows and doors. Notify the supervisor and the gas company and/or local authority in accordance with local routine.

## ***Testing and Ventilating Manholes***



**Fig. 10—Summary of Manhole Testing and Ventilating Procedures**

# **Simple Hidden Camera Detector**

## **Overview**

A device referred to as the *SpyFinder* has recently hit the personal hidden camera locator market. This device is nothing more than a slightly modified flashlight which will locate a hidden camera via the "glint" reflected off the camera's lens. You can view the website for the *SpyFinder*'s main distributor here: [www.thespyfinder.com](http://www.thespyfinder.com). It sells for \$115. Really. It works by emitting an intense, pulsed beam of light from a series of red LEDs. When viewing this pulsed light source through the *SpyFinder*'s built-in view finder, a hidden camera will show up as a pulsed reflection of light (glint) coming from the lens. That's the idea at least. It *really does* work, just that you'll get *alot* of false triggers, as anything reflective will glint. Also, modern CCD lens are getting to be *very* small in physical size, and it is possible to miss them if you "sweep" the area too quickly. But... If you need to quickly scan the walls in the men's bathroom during a horny old pedophiles conference, and one of the room's tiles winks back at you, you know Emmanuel Goldstein (Orwell's Big Brother Freedom Fighter) is watching you poop.

## **How it Works & Operation**

Excerpt from: <http://www.thespyfinder.com/how.asp>

### **Operating Principle**

The *SpyFinder* hidden camera detector/locator is the most reliable and easy to use technology on the market for making sure that your private actions are not being watched. Its function is based on the principle of optical augmentation. This technical jargon refers to the phenomenon where light reflected from a focused optical system, such as a video camera, is reflected along the same path as the incident light. This means that if a hidden camera is illuminated and viewed with the *SpyFinder* technology, then a strong reflection from the target camera will reveal its position to the user. The *SpyFinder* exploits this phenomenon by using a ring of ultra-bright LEDs arranged around a viewing port. When a user scans a room looking through the viewing port, a hidden camera appearing in the field of view will brightly reflect the light from the LEDs.

### **Operation**

While the equivalent of rocket scientists thought up the *SpyFinder* technology, operating it is not rocket science. Simply look through the viewing port (see photo) and depress the button to activate the LEDs. Slowly scan areas where hidden cameras are suspected and look for bright reflected spots. Remember, most hidden video cameras use pinhole camera lenses, so the spot you are looking for could be small.

If you see a suspected camera, move your vantage point slightly. If the location of the reflection moves as you move, then this is not a camera. If the location of the reflection does not move, then it is highly likely that you have discovered the optics of a hidden camera.

For example, consider a wall clock that has a domed plastic cover and a pinhole camera concealed under the numeral six on the clock face. When the *SpyFinder* is

used to scan the clock, a reflection will be noted where the camera is located beneath the six and a reflection will also be noted from the plastic cover. However if you move your vantage point just a little, you will notice that the location of the false positive reflection point from the plastic cover will move, while the reflection from the camera remains under the numeral six on the clock face.



### **Construction**

This version of the *SpyFinder* is just a simple modification to a toy "Mini Spy Scope" which is included in the *Undercover Girls – Mini Spy Gadgets* kit by Wild Planet Toys. I found it at a thrift store for \$3. Your mileage may vary.

The modification consists of adding a 555-timer "pulse" circuit to the Mini Spy Scope's internal red LED. The 555-timer will pulse the red LED on and off at around six times a second (6 Hz). Also, the current to the Mini Spy Scope's LED will be *decreased* to around 50 mA. This will slightly decrease the LED's output optical power, but will preserve the LED's lifespan. The final modification is to remove the Mini Spy Scope's magnified viewer. The stock Mini Spy Scope had a cheap telescope-type optical viewer. It works, but since then lenses are made from plastic, the image quality is *horrible*, and it will drive you crazy after awhile. Another (optional) modification is the addition of a red Plexiglass filter over the eyepiece. This will help to enhance the reflected red light.

### **Other Camera Detection Ideas**

It is also possible to detect *some* hidden cameras from the RF signals they accidentally emit.

The most common frequency is 15.75 kHz, which is the horizontal synchronization frequency for a standard NTSC video signal. Use a simple Very Low Frequency (VLF) up-converter to convert the low-frequency signal up to one a simple communication receiver (AOR AR-8000 or equiv.) can receive. Use a tuned, resonant loop antenna at around 16 kHz and then highly amplify and bandpass filter the incoming signals. Detect the 15.75 kHz signal with a LM567 tone decoder (or something more fancy). Another trick to detect *wireless* video cameras, is to position a flashing light beacon in the room to be checked. You'd then scan the airwaves with a spectrum analyzer looking (or listening) for a video raster buzz in sync with the flashing light beacon. This method works very well.

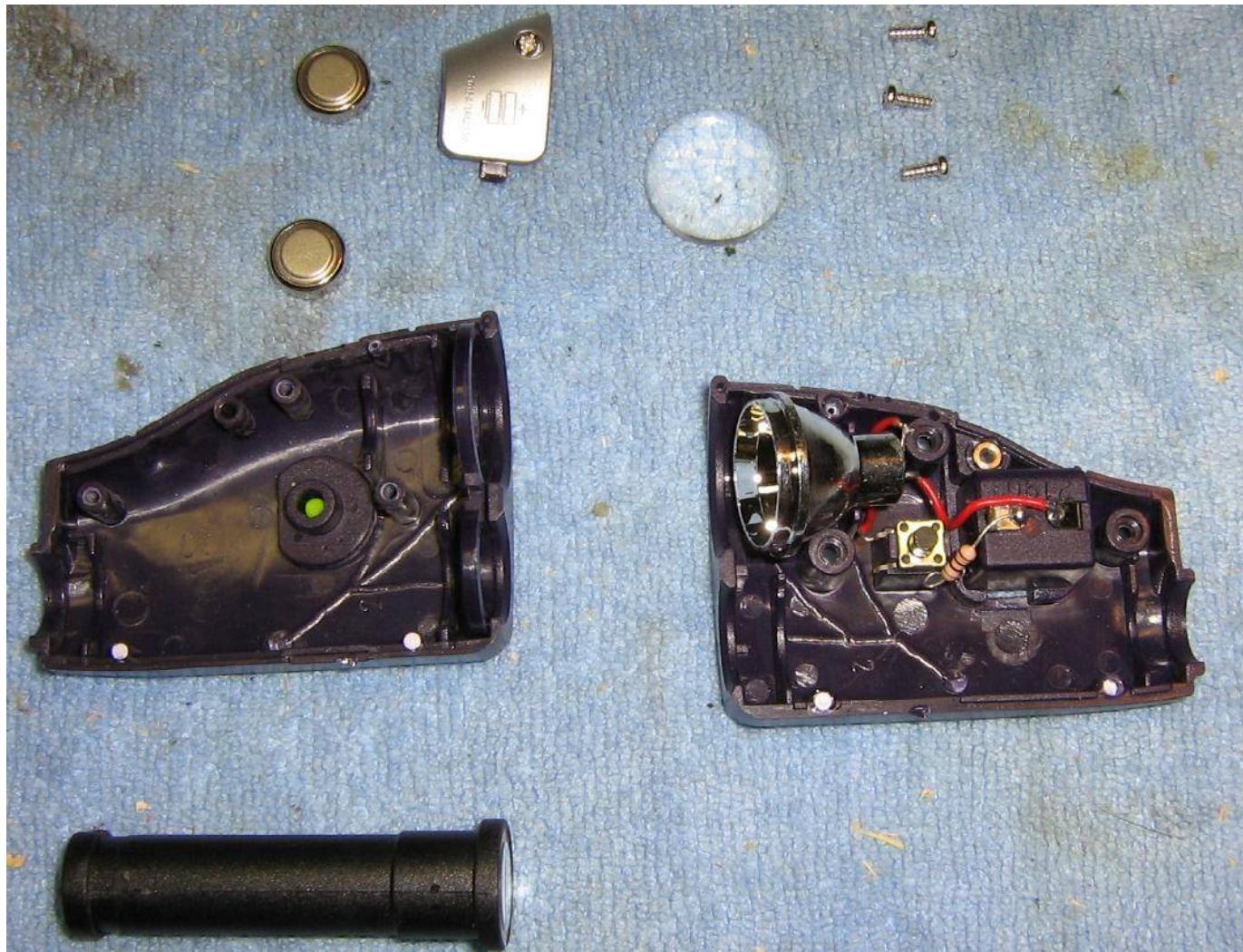
Pictures



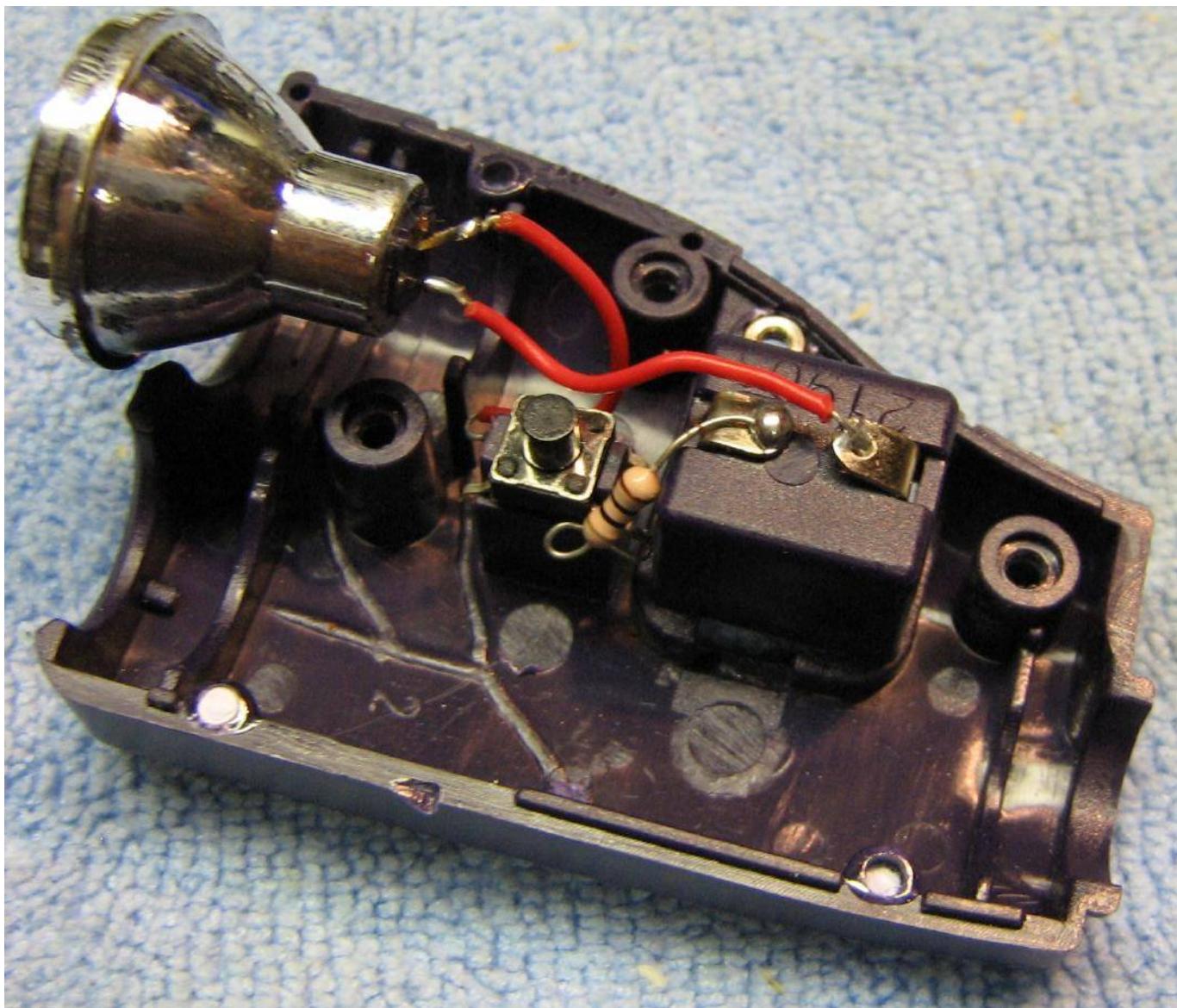
The box for the toy you'll need to look for. The unmodified "Mini Spy Scope" is shown on the right.



Mini Spy Scope closeup. The green button activates a red LED. The large optical lens focuses the red light into a fairly tight beam. It is powered by two 1.5V "button cell" batteries.



Internal view. The two batteries are on the top left. The telescope-type optical viewer is on the bottom. The main components are on the right.



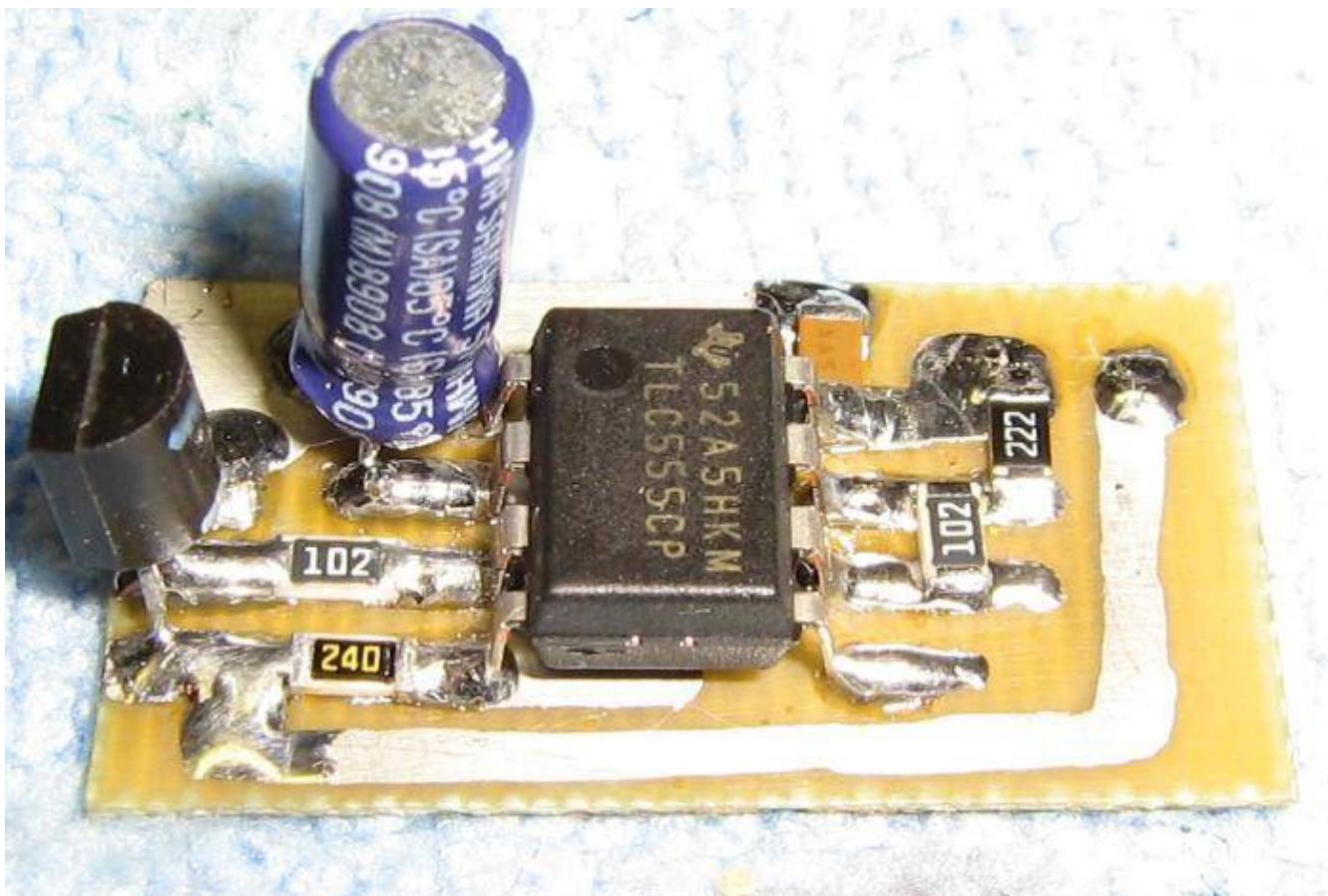
Closeup internal view. The two batteries supply +3 VDC through a series 10 ohm resistor and a push-button switch. It then goes to a red LED mounted inside a reflector cone. The stock setup ran 130 mA into the LED, which was probably designed to burn out the LED quickly so mommy or daddy would have to buy a new one. We'll drop it down to a pulsed 50 mA for this project.



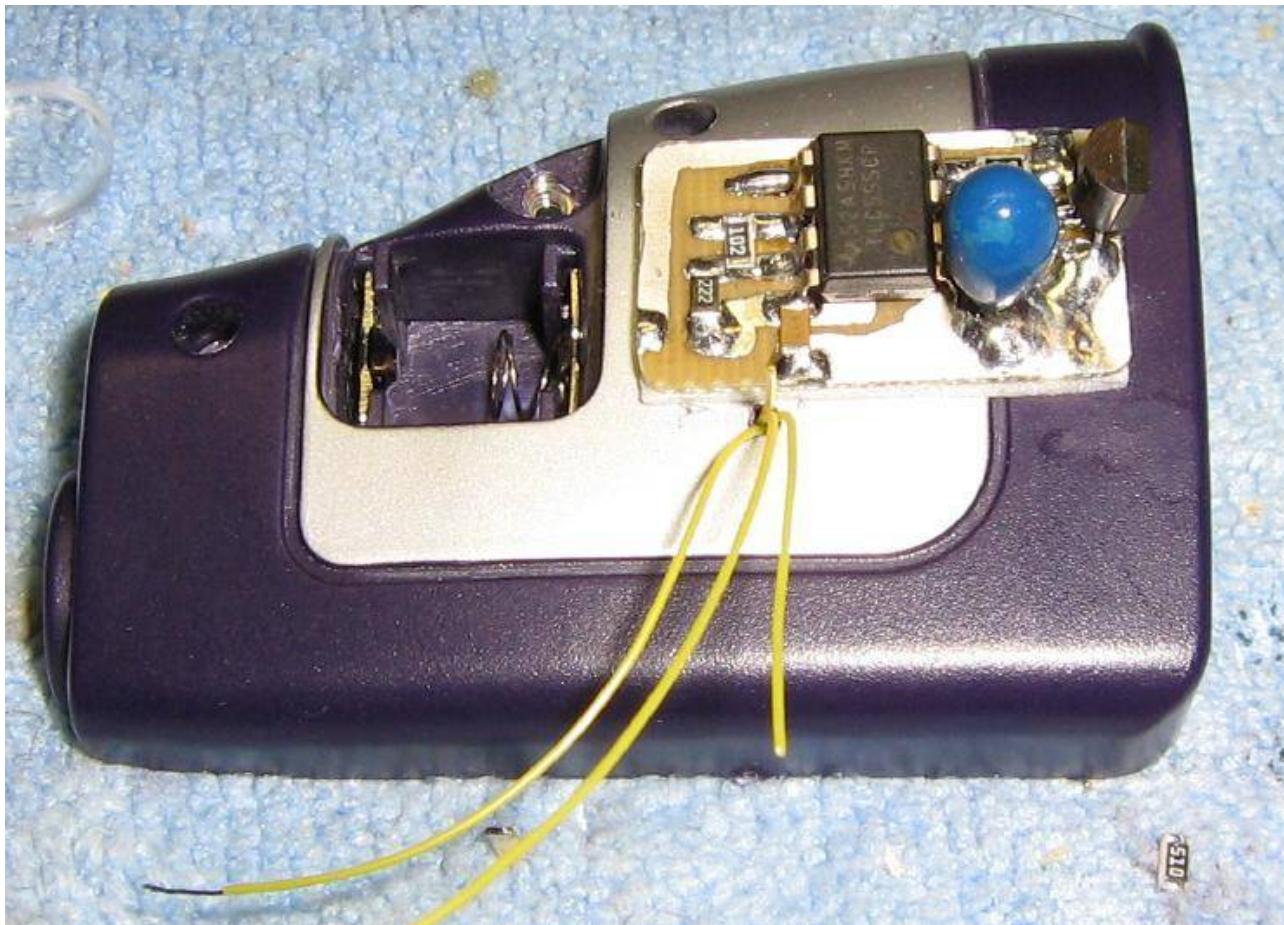
The stock telescope-type optical viewer. This thing is more useless than a \$2600 subscriber. Pop out the two plastic lenses, and use just the tube as the view finder.



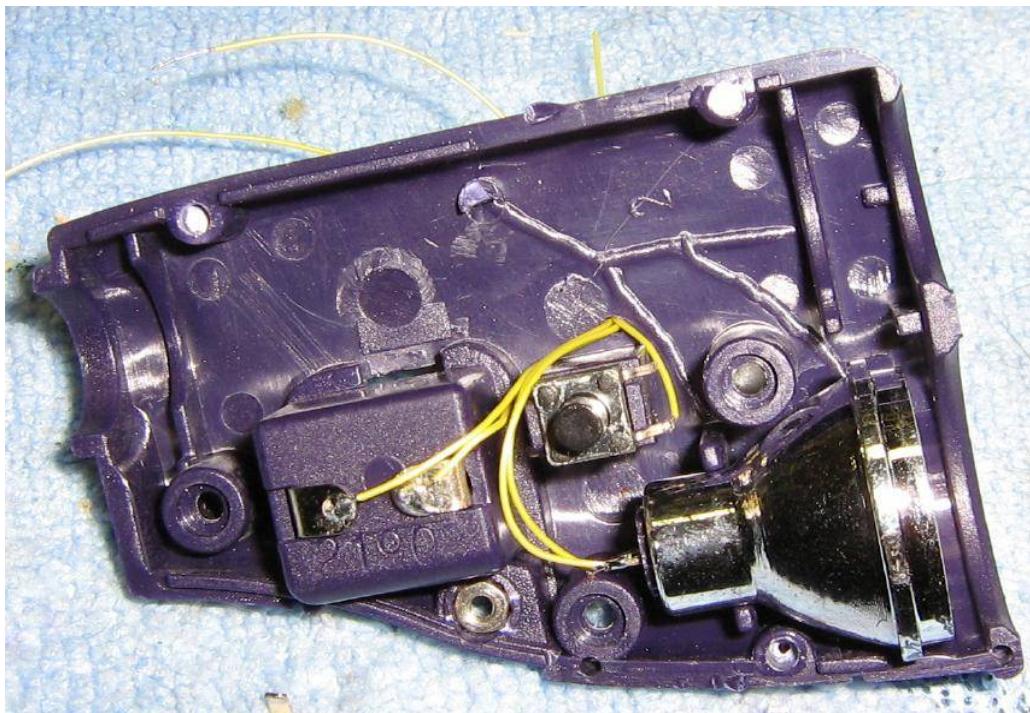
Removing the components. Be sure to remember how everything goes back together. You may also want to write down which pin is cathode (-) and anode (+) on the LED. The LED pin with only the wire is the cathode (-).



555-timer circuit you'll need to build. Be sure to use a CMOS 555-timer, as these will operate down to +2 VDC. CMOS 555-timers are available from Radio Shack (Part # 276-1718).



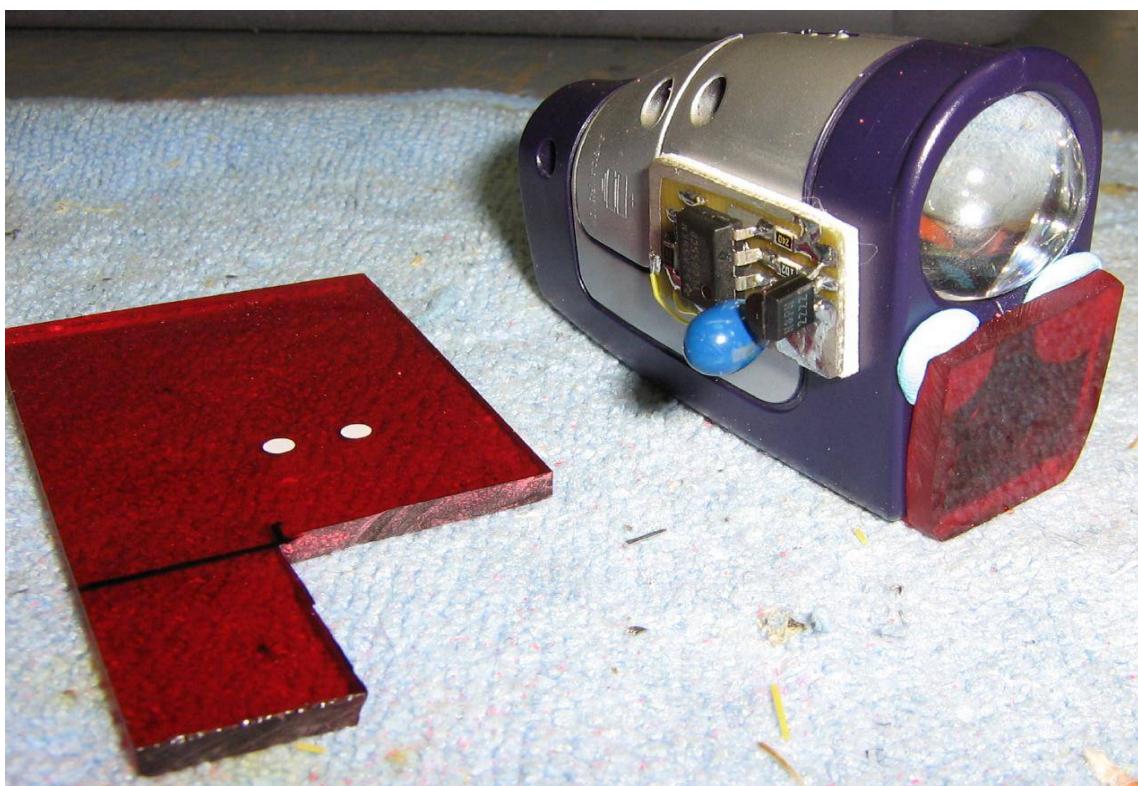
Timer circuit board mounted on the outside of the Mini Spy Scope with some double-sided foam tape. The  $47 \mu\text{F}$  electrolytic capacitor was replaced with a tantalum one for reduced height.



Internal wiring view.

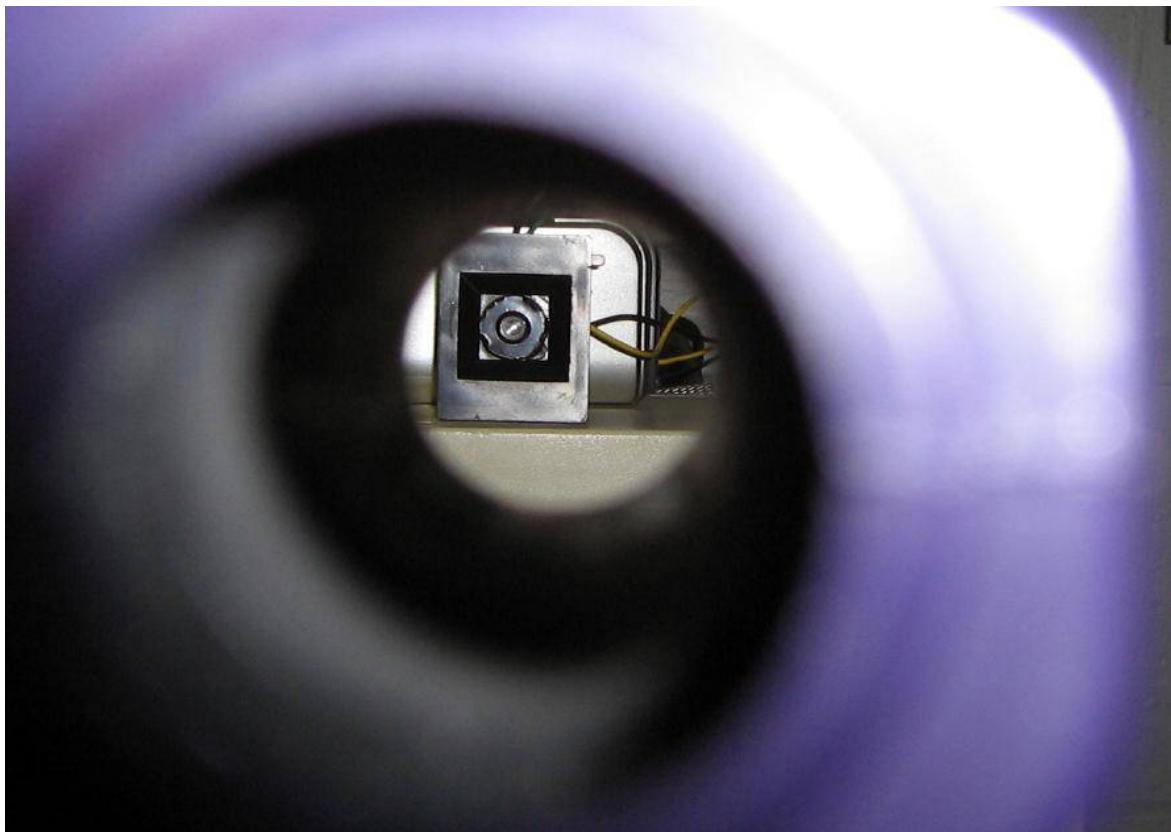


Outside finished view. The removed lenses from the telescope optical viewer are on the left.

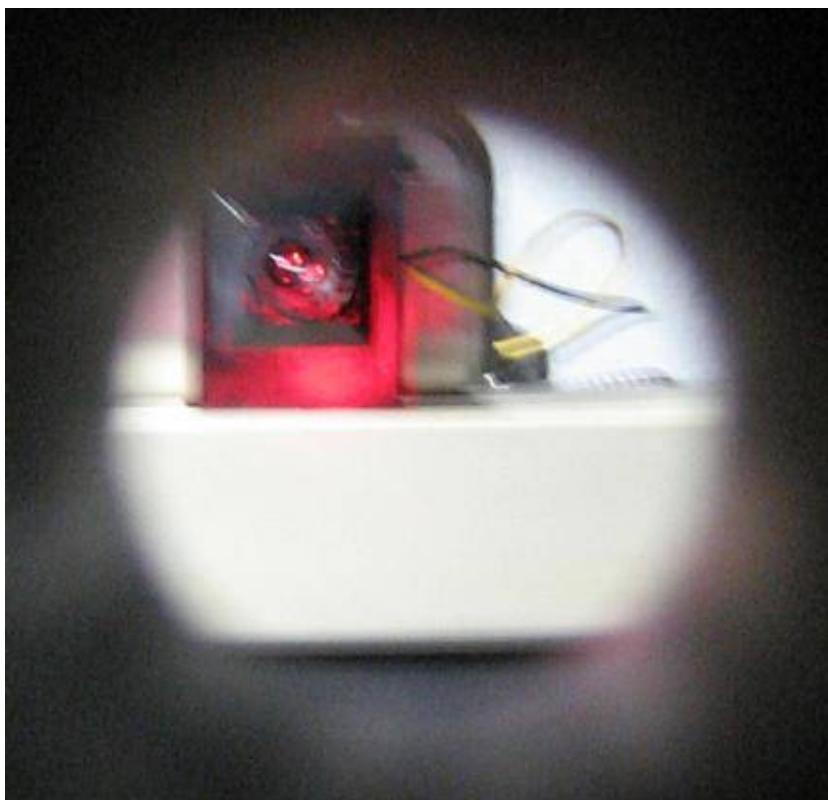


Optional red filter installed. You can find red plastic filters included with some flashlights or from the red plastic used in LED clocks. Install it using some Blu-Tac or similar poster hanging removable adhesive. This will let you quickly remove or change the filter.

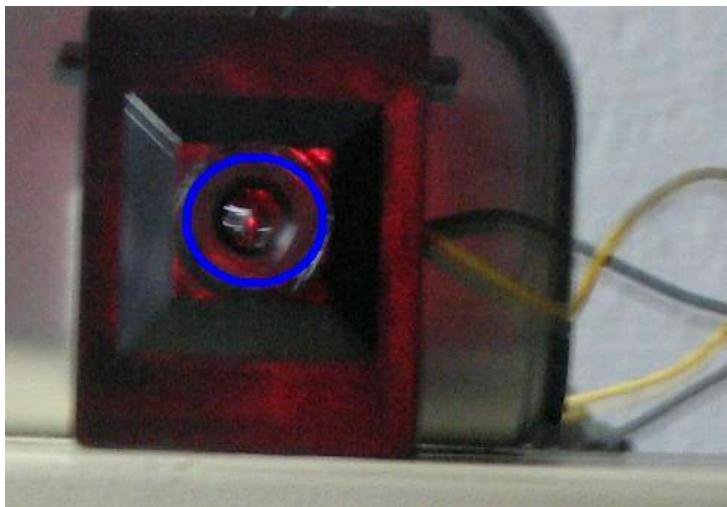
Experimenters might want to look into using different polarization filters on the transmit and receive ports. Light reflected from a camera lens may change polarization. Also, you could add a PIN photodiode and automate or record the findings.



Looking through the view finder at a small video camera.



In operation. The maximum useable range is only about ten feet.



Note the tiny red pin-point. *That's* what you are trying to look for. It does stand out, if the background is not very reflective. Tilt your head from side-to-side to weed out false reflections. To defeat this method of camera detection, place an infrared bandpass filter ahead of your camera lens. The resulting video will not be as sharp, and you may need to use infrared LED illumination, but your camera shouldn't be detected.

To defeat that method of anti-camera detection, change the red LED in the Mini Spy Scope to an infrared LED, and view the returned pulses via a small CCD camera and TV monitor.

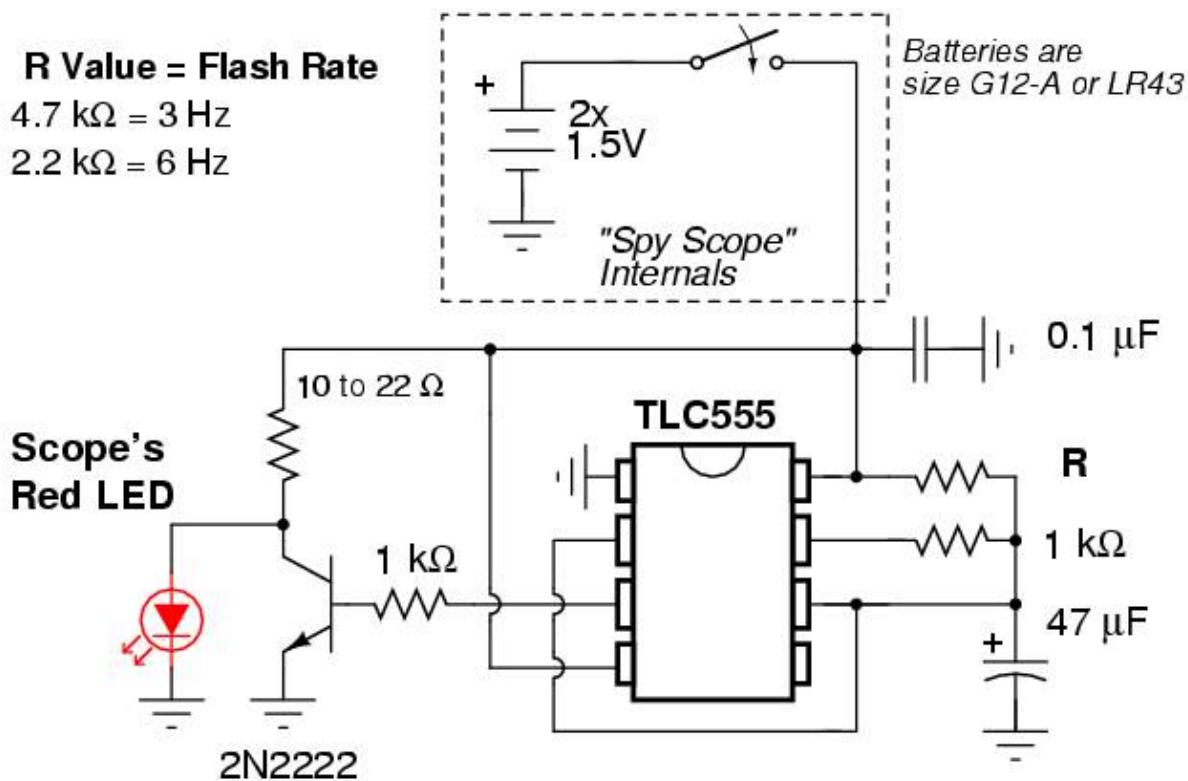
## Schematic

# **Simple Hidden Camera Detector**

### *Using an Undercover Girl "Mini Spy Scope"*

**R Value = Flash Rate**

$$2.2 \text{ k}\Omega = 6 \text{ Hz}$$

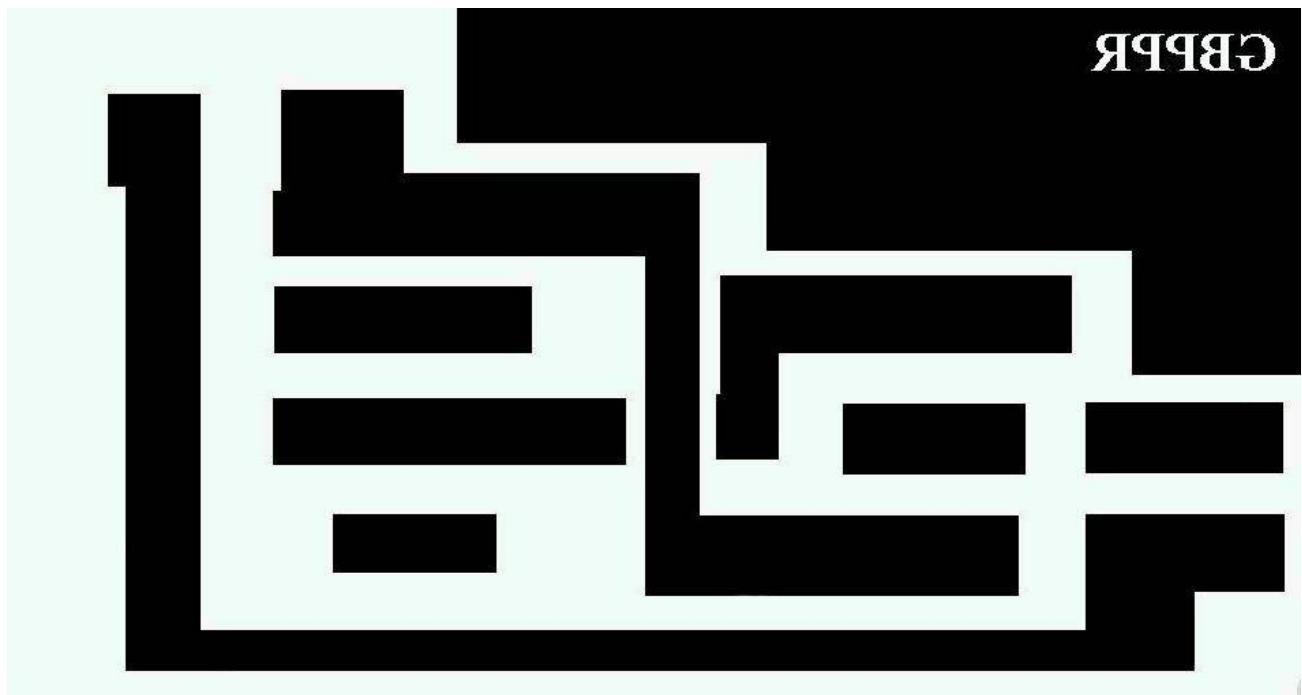


## PC Board Pattern

Length = 1.0 inch

Width = 0.5 inch

Material = FR-4, 1/32 inch



## **Eye Spy Product Review**

*From Eye Spy Magazine, Volume 5, No. 35*

**E**ver had the feeling you are being watched? Well the answer is probably yes, but locating covert video cameras can be very difficult, not least because they are getting smaller and easier to conceal. In the United States in 2004, \$74m was spent on covert cameras.

The SpyFinder hidden camera detector/locator must rank as the most reliable and easy to use technology on the market for making sure you are not being watched. Its function is based on the principle of optical augmentation. This refers to the phenomenon where light reflected from a focused optical system, such as a video camera, is reflected along the same path as the incident light. This means that if a hidden camera is illuminated and viewed with the SpyFinder technology, then a strong reflection from the target camera will reveal its position to the user.

The SpyFinder exploits this phenomenon by using a ring of ultra-bright LEDs arranged around a viewing port. When a user scans a room looking through the viewing port, a hidden camera appearing in the field of view will brightly reflect the light from the LEDs.

Although designed by scientists, operating the SpyFinder is easy. Simply look through the viewing port (see photo) and depress the button to activate the LEDs. Slowly scan areas where hidden cameras are suspected and look for bright reflected spots.

Remember, most hidden video cameras use pinhole camera lenses, so the spot you are looking for could be small.

If you see a suspected camera, move your vantage point slightly. If the

from the plastic cover. However, if you move your vantage point just a little, you will notice that the location of the false positive reflection point from the plastic cover will move, while the reflection from the camera remains under the numeral six on the clock face.

We tested SpyFinder in an office fitted with six concealed cameras. All were identified in a matter of seconds. The device located a variety of cameras - even tiny pinhole units - from a distance of 30 metres. SpyFinder will also identify wired or wireless cameras both active and dead.

### **A PRODUCT FOR EVERYONE**

The unit is an absolute must for any counter-surveillance operative or persons who have been tasked with searching for covert cameras. The size of the unit means it is easily transportable and a quick scan will soon ascertain if a camera has been installed in a conference room, hotel, rest room, changing room or even your home. The SpyFinder is an ideal personal security item.



Peter Jenkins

This excellent battery-operated device is highly recommended by Eye Spy. We will even provide a free spy camera to ensure readers can test the device.

Eye Spy surveillance editor Peter Jenkins recently used SpyFinder. He says that it performed brilliantly. "I located spy cameras from a distance of 30 metres," he said. It is a very professional piece of kit."

**REF: ES/SF1 UK £125.00 USA \$250.00  
ROW £135.00**



location of the reflection moves as you move, then this is not a camera. If the location of the reflection does not move, then it is highly likely that you have

discovered the optics of a hidden camera. A covert camera is revealed by a constant pulsating light.

For example, consider a wall clock that has a domed plastic cover and a pinhole camera concealed under the numeral six on the clock face. When the SpyFinder is used to scan the clock, a reflection will be noted where the camera is located beneath the six and a reflection will also be noted

# THE MOST DANGEROUS MAN IN AMERICA

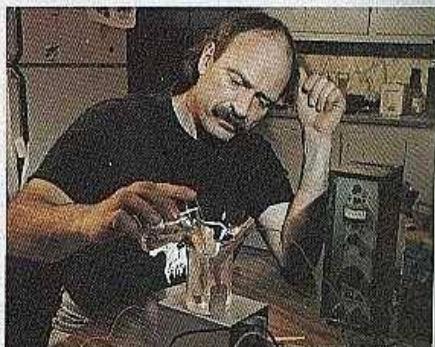
PHOTOGRAPHS BY LARRY SULTAN

Uncle Fester cranks out best-sellers on how to make bombs, poisonous gases, and crystal meth for crackpots like Timothy McVeigh. He's a mad scientist who's wreaking havoc and driving the feds mad. *By Rene Chun*

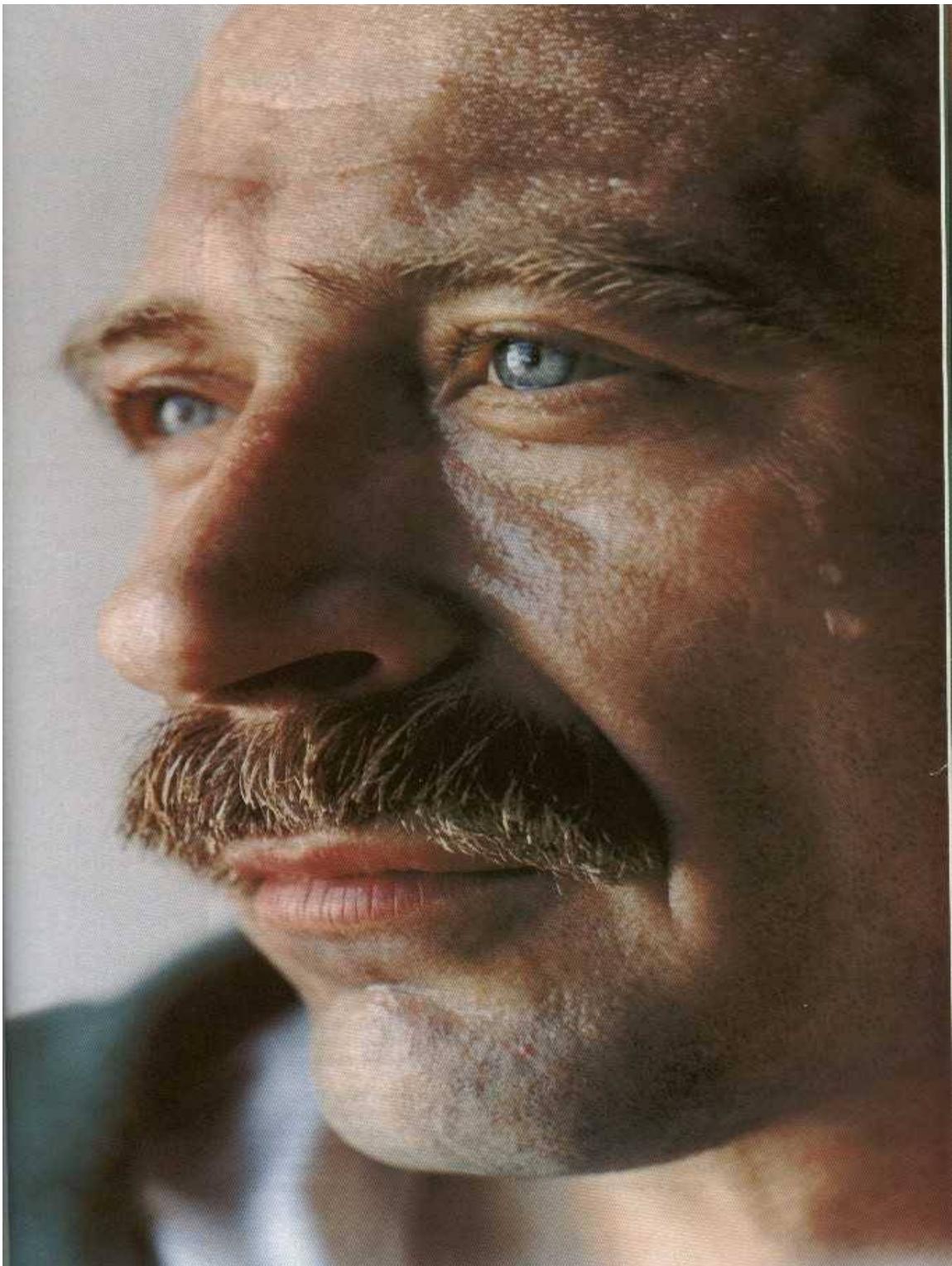
After reading *The Cobra Event*, Richard Preston's thriller about a catastrophic bio-warfare attack on New York City, Bill Clinton was so shaken that he instructed his intelligence experts to assess its credibility and sent a copy to former House Speaker Newt Gingrich. When told that such a scenario was indeed plausible, Clinton and his National Security Council discussed how they might respond to terrorists armed with weapons of mass destruction. Six months later, Clinton asked Congress to tack on \$2.8 billion to the 1999 budget to prevent such a catastrophe from ever occurring.

As harrowing a piece of fiction as *The Cobra Event* is, if the president is looking for a truly bone-chilling read, he should pick up *Silent Death*, written by an industrial chemist named Uncle Fester. This no-nonsense how-to manual is a real-life thriller, packed with enough mass-murder and mayhem recipes to keep even the most jaded terrorist riveted. Topics run the gamut from chapter 4, "Nerve Gas: The Poor Man's Atom Bomb," to chapter 10, "Ricin: Kitchen-Improvised Devastation" (ricin is a biochemical agent 6,000 times more toxic than cyanide).

"I'm on a mission," declares **Uncle Fester** (above, concocting some Fester Formula in his kitchen). "I'm going to show this drug right up the government's ass. Everybody will be cooking their own meth. You work quickly, clean up after yourself, and leave no evidence."



What makes *Silent Death* particularly unnerving is that Uncle Fester doesn't just regurgitate formulas cribbed from patent literature and technical journals. The text is accessible, almost entertaining. It is "a celebration of that ancient and fine art of poisoning," Fester writes. "Instead of the quiet dignity of an effective poison, those with a homicidal intent impulsively reach for a gun, knife, or club. What are we, swamp animals or technological warriors?"



## HE'S BEEN CALLED THE DEVASTATOR OF TOKYO EVER SINCE

THE CULT BEHIND THE NERVE

Even more disturbing is the blatant appeal to extremists who subscribe to the Timothy McVeigh school of do-it-yourself terrorism: "Many other strongholds of the power system (yes, those places!) are equally vulnerable to the kind of insidious attack that is possible with phosgene.... Why this idea has not been put into practice before, I cannot imagine."

Phosgene is a nasty poison gas used to great effect during World War I. Death is slow and painful; victims eventually drown in the fluid that seeps from their lung tissue. It's covered in chapter 3: "War Gases." Uncle Fester also includes pointers on how to deliver the goods to the target successfully. The preferred nerve-gas delivery system, for instance, is a homemade, one-seater airplane (ordered in kit form from the back of *Popular Mechanics*): "A very satisfactory altitude is 1,000 feet... high enough for the safety of the pilot yet low enough that errors in the height of bomb detonation will be kept to a minimum." For millennium cultists on a budget, the Roman candle "blast dispersion" method provides considerable bang for the buck.

Don't be fooled by Fester's droll pseudonym. *Silent Death* is very real. According to Bill Patrick, the country's foremost authority on biological weapons, the book is so real it may constitute a breach of national security. "I was surprised," Patrick says incredulously. "Fester has the details down." Patrick isn't easily impressed. He pioneered America's secret biowar program in the '50s and '60s and continues to work as a consultant for the government. Scanning *Silent Death's* lethal recipes, Patrick finds little to fault. "Not bad," he says, flipping through the pulpy pages at a rapid clip. "He has a credible outline for producing botulism, and the ricin formula would yield a decent product." Patrick pauses to study some especially troubling nomenclature. "No doubt about it," he concludes. "There's enough in here to cause some real problems."

To put it mildly. The Aum Shinrikyo cult used *Silent Death* as a blueprint for its nerve-gas attack on the Tokyo subway in March 1995. The book's detailed instructions on how to make and disperse sarin gas were followed to the letter by cult members. Although the job was botched (Uncle Fester gives low marks to the "fruit-loop cult" for its poor planning, shoddy execution, and lack of creativity), 12 people died and 5,000 more were hospitalized.

Uncle Fester is like a mutating Pokémon in Japan. Prior to the Shinrikyo strike, "Fester-san" appeared on TV Asahi and gave the Japanese a crash course in Nerve Gases 101. While newscasters waved copies of *Silent Death* in front of a shell-shocked television audience, the flamboyant author, covered head to toe in a bright-yellow rubberized plastic suit, simulated sarin production on his kitchen table. After screening his taped appearance, Fester's drinking buddies dubbed him the Devastator of Tokyo.

*Silent Death* is a cult classic here too. Nine months after the Tokyo incident, Thomas Levy, a 54-year-old Arkansas farmer, was arrested and charged with possession of 130 grams of ricin. Customs agents seized four guns, 20,000 rounds of ammunition, and \$89,000 in cash. Rather than offer a lame explanation, like any true-blue militiaman, Levy hanged himself while he was being detained. When investigators searched Levy's farm, they found a dog-eared copy of *Silent Death*.

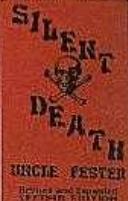
Stephen Charles Preisler lives a quiet life in Green Bay, Wisconsin, where he works as an industrial chemist in an electroplating factory. Slouched on a leather sofa in front of a console television, watching his beloved Packers, this 41-year-old single parent looks less like the mad scientist bent on world destruction than the ESPN junkie bent on draining a six-pack before halftime. His compact, muscular

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### FESTER'S GREATEST HITS

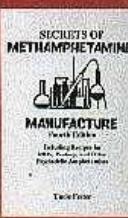
#### SILENT DEATH

The only how-to book on the market that's devoted to weapons of mass destruction. The Japanese cult Aum Shinrikyo used this collector's item to make the sarin gas necessary for its deadly Tokyo subway attack.



#### SECRETS OF METHAMPHETAMINE MANUFACTURE

It may not look sinister, but this is the most insidious drug book ever written. One DEA agent predicts it will end up in mom-and-pop meth labs to sprout up around the country like Starbucks.



#### HOME WORKSHOP EXPLOSIVES

Although many of the bomb-making recipes contained in this anarchist primer are grist for hate group Web sites, Fester regards it as the least dangerous title in his "murder-and-mayhem" anthology.



#### VEST-BUSTERS

"Cop-killer" books were banned in 1986, which makes this ballistics manual required reading for everyone from French Cartel groups to drug dealers. It's considered his most controversial work, but Preisler is quick to point out that if David Koresh had made *Vest-Busters* required reading for his Branch Davidians, the Waco massacre wouldn't have been such a turkey shoot.



## GAS ATTACK ON THE TOKYO SUBWAY USED FESTER'S *SILENT DEATH* AS A BLUEPRINT.

frame, the result of endless hours of pumping iron, is concealed under a baggy pair of Tommy Hilfiger jeans and a voluminous sweatshirt. Whenever the Packers make a bad play, he tugs the hairs of his neatly trimmed mustache and grimaces.

Preschool detritus is scattered around the room like day-old confetti: an open box of Cap'n Crunch, stray Crayolas, an Elmo poster, Happy Meal toys. Preisler may be an expert in bio-war terrorism, but he is no Martha Stewart. Dirty dishes cascade over the sink, food stains dot the kitchen floor like Rorschach blots. Over the televised roar of the crowd, the family's St. Bernard, Bud Lite, can be heard lapping water from a toilet bowl.

It is a rare day of relaxation for Preisler. His five-year-old son, Casey, and two-year-old daughter, Alyssa, are away for the weekend with Doris, Preisler's ex, whom he refers to simply as "the lunatic." Which may not be far from the truth, considering that the judge granted partial custody to Preisler—a convicted felon who writes death manuals under a comic book alias—rather than the children's natural mother.

This particular Sunday is an especially busy day on the Green Bay social calendar. The Pack is at war with the Minnesota Vikings, but it's also opening day of deer-hunting season. The streets are deserted: Everyone is either watching football or stalking bucks. Given a choice, Preisler always chooses football. For him, the game is not just entertainment, it's a source of inspiration.

"I got the idea for one of the dissemination methods in *Silent Death* while watching a football game," he says between quaffs of Budweiser. "On the sidelines, they have what's known as the cool zone, which is basically a spray of water shot into the back of a big fan. The fan aerosolizes the particles, and you get the cooling effect of evaporation." His piercing blue eyes suddenly become animated. "I thought to myself, That would make a mighty fine mist!" Preisler's loud laughter fills the room, as if discovering a better way to kill people were the funniest thing in the world.

Preisler is constantly thinking of

more efficient ways to move toxic fumes and droplets through the atmosphere. "Stephen's genius lies in his willingness to consider anything," says Jim Hogshire, a friend and fellow underground author. "I put him in the same league with Werner von Braun, the guy that invented the rocket. He's open-minded and has a very flexible brain."

Others are less enthusiastic about the plasticity of Preisler's gray matter. "Uncle Fester is the dark side of Yankee ingenuity," mutters John Sopko, a former member of the U.S. Senate Permanent Subcommittee on Investigations. In a hearing subtitled "A Case Study on the Aum Shinrikyo," Sopko presented evidence in the Senate that highlighted Preisler's sarin recipe. According to Sopko, *Silent Death* has raised a number of unchartered policy issues: "How much money should we spend on chem-bio defense? How does this affect the Bill of Rights? What about monitoring the Internet? Should the FBI be allowed to go into chat rooms? Uncle Fester has made us address all these questions. The man is a menace to society."

The legitimate publishing world also condemns Preisler's work. "Uncle Fester is a very sick puppy," writes book critic Alan Bisbort in *The Hartford Advocate*, one of the few mainstream publications ever to review his work. Bisbort compares Fester to the Unabomber and Tim McVeigh. Preisler's writings "grow from the same seed that spawned the right fringe's bible, *Mein Kampf*." Not exactly a scathing indictment when one considers Uncle Fester's demographics, which are skewed toward skinheads, bikers, white supremacists, and other assorted malcontents.

Preisler goes to great lengths to distance himself from the politics of his readership. He claims to be a social libertarian and an economic nationalist (he voted for Ross Perot in the last two elections). But his library reflects a far more radical political agenda. On his bookshelf sits a copy of Dr. William Pierce's anarchist manifesto, *The Turner Diaries*, and back issues of *The Spotlight* are stacked on the kitchen counter (McVeigh and Terry Nichols were both regular readers of this far-right, extremist tabloid). Peppered throughout Preisler's conversation are oblique references to racism (he believes in an "ethnically homogenous population"), Holocaust revisionism (he insists more Jews died working in factories than in gas chambers), and Pierce, an icon on the white-supremacist circuit (he listens to Pierce's short-wave radio show on Saturday mornings).

Preisler vehemently denies any affiliation with extremist groups. But according to former neo-Nazi Frank Mieenk, the underground author is connected with notorious hate-group leader Ryan Wilson. "Of course, Fester and Wilson know each other," Mieenk says. "They're associates. It's Fester's bomb-making recipes that are on the Alpha HQ Web site. They write to each other." Preisler says he has never heard of Wilson. He conceded that he might have received a "fan letter" from Wilson, but he receives hundreds of letters from readers and answers every one. He pulls an envelope from a shoe box and begins reading: "Dear Uncle Fester: I need to write to somebody I can trust. I need to get my hands on some ricin. I want it mixed up in cold cream. It's got to be the really strong, pure stuff. Not the weak stuff.—The Salty Dog." Like most writers, Preisler craves attention. "I live for that stuff," he says merrily. "All readers, no matter how wacko, are greatly appreciated."

**S**ilent Death is just one dimension of Preisler's Yankee ingenuity. The Uncle Fester oeuvre has something to offend everyone. Even First Amendment advocates concede that *Vest-Busters* strains our hallowed freedom of speech. Cherished by hate groups and privately condemned by law enforcement officials, this ballistics treatise shows readers how to make Teflon-coated projectiles—so-called

CONTINUED ON PAGE 125

## THE MOST DANGEROUS MAN IN AMERICA

CONTINUED FROM PAGE 119 CCP killer bullets—that will penetrate Kevlar vests, which police officers use to protect themselves. "It's an act of insurrection when you shoot a police officer," howls ex-coop Bill Brierley, the founder of the DuPont Kevlar Survivors' Club, an organization devoted to police officers whose Kevlar vests have stopped bullets in the line of duty. "Somebody ought to throw a net over Uncle Fester."

A dragnet is more like it. The self-explanatory *Home Workshop Explosives*, a do-it-yourself guide to concocting nitroglycerin, nitrolycerol, nitromannitol, and PETN (an explosive used in plastic bombs), is a modern-day *Joy of Cooking* for unhinged castaways. Fester not only provides the recipes, but also the editorial vitriol to incite massive destruction. "How, in an unfree [sic] heavily surveilled [sic] country, where the citizens are trained from infancy to be informers for the state," Fester writes, "does one obtain explosive materials without being arrested or killed?"

Of all his writings, Preisler is best known for his popular drug books, including such underground classics as *Practical LSD Manufacture* as well as the awkwardly titled *Advanced Techniques of Clandestine Psychedelic and Amphetamine Manufacture*. The most infamous one, though, the one that made him a legend on the crank scene and has sold more than 40,000 copies

ment of danger (before *SMM*, meth labs tended to spontaneously combust). Using Preisler's techniques, not only was the turnaround time fast, but the stuff was exceedingly pure. "Fester gets a qualitative yield of nearly 100 percent," explains one meth cook. "In organic chemistry, if you get one-third of your product out of the precursor, you're doing okay. Fifty percent is considered good. It's rare to get a reaction that will yield more than 80 percent. Fester is getting meth that's just as pure as the stuff coming out of a pharmaceutical lab!"

Preisler scrupulously revises the text every couple of years to keep readers abreast of his latest breakthroughs and one step ahead of the law. For instance, when the feds designated several basic meth ingredients as illegal "listed precursor chemicals," Preisler instructed readers how to synthesize their own precursors by using inconspicuous, uncontaminated materials. The new, fifth edition of *SMM* includes the long-awaited Fester Formula, a revolutionary meth-making technique, powered by flashlight batteries, that turns Sudafed into pharmaceutical-grade speed. It's practically foolproof. "Easier than setting a digital watch," raves one satisfied customer.

In the wake of the book's publication, narcotics agents are bracing themselves for the second meth boom. "We're all familiar with Uncle Fester," says Perri Williams, the former director of operations at the North Central Missouri Drug Task Force. "We know he's trying to outsmart us, and generally he does. It's a frustrating situation. We've dealt with organizations and gangs—a group of people, you can handle that. But we've got one guy out there who is a loaded weapon. That's pretty scary."

Uncle Fester chuckles when he hears this. Nothing gives him more pleasure than to jerk the feds around. It was the feds, after all, who put him behind bars. And they must pay. "I'm on a mission," Preisler says matter-of-factly. "I'm going to stick this drug right up the government's ass." Thus far, he's succeeding. Meth labs are multiplying exponentially in the United States. According to DEA statistics, 317 meth labs were busted in 1991. The 1998 figure stands at 1,623. Ironically, the DEA is one of Preisler's best customers. *SMM* is an unofficial DEA textbook, required reading for every agent who's serious about keeping up with what's going on in the field.

Preisler claims that his books—seven

titles and counting—are payback for a petty-drug conviction for which he ended up doing time. But for all his rhetoric about Big Brother, narco swine, and government mind control, he's mainly in it for the money, which amounts to about \$30,000 a year. Raising two young children can be costly. "If I didn't get my 15 percent royalty, I wouldn't bother to turn out the books," he says sheepishly. "On the other hand, my writing is also a fame vehicle and an effective soapbox, so I can do my favorite rant of the day."

By all accounts, Preisler is a devoted and loving father. Indeed, he spends so much of his spare time with his kids (camping trips are a favorite diversion) that there is little time left for his writing. Out of necessity, he cranks out his transgressive manuscripts during his spare time at work. Hunched over an ancient Smith Corona 110 typewriter in his office cubicle, he pecks out a few hundred words a day. "They ought to be charging me rent," he says with glee. "Maybe I'll dedicate my next book to my employer." Preisler's voice drips with sarcasm. Preisler doesn't trust the people he works for. He's convinced they are in cahoots with the DEA, helping it monitor his every move. He's also convinced that his phone line is tapped.

Preisler says he isn't being paranoid, just cautious. With two drug convictions in a three-strikes-you're-out state, he's living on the edge. He retrieves a Pyrex flask from his office to illustrate his point. He points to several minute symmetrical lines scratched on the interior surface. "They've etched my glass," he whispers under his breath, as if someone might be listening in the next room. "Trying to find incriminating chemical residue." A pained expression wrinkles his features. "They must think I'm really stupid."

**G**rowing up on a farm in Heronville, Wisconsin, 40 miles outside Green Bay, Preisler gave little indication that he would eventually become public enemy No. 1. Like his five siblings, Preisler was a good kid who kept out of trouble. It was an idyllic but uneventful life. Up at five to milk the cows. At school by eight. More chores in the evening. "One day exactly like the next," Preisler recalls. "The usual farmboy existence." His only eccentricity was his insatiable appetite for reading. "Stephen's nose was always in a book,"

**The guy is a loaded weapon," says drug agent Perri Williams.**

(a blockbuster in the micromedia world of underground publishing), is *Secrets of Methamphetamine Manufacture* (known colloquially as *SMM*). This unholy tome made meth, as the Clinton administration has frequently pointed out, "the crack cocaine of the '90s."

With *SMM*, Preisler did away with many of the noxious and volatile chemicals usually associated with meth production, practically eliminating the ele-

## THE MOST DANGEROUS MAN IN AMERICA

his mother, Julia, recalls. "He wore out our set of *Encyclopedia Britannica*."

By the time Preisler reached Hortonville High School, he was a walking database. Teachers marveled at the seemingly limitless font of information he dispensed on a daily basis. "Stephen

heard gunshots, would arrive on the scene to frisk him, only to leave moments later scratching their heads.

Finding it difficult to study late after a lifetime of five o'clock rooster calls, Preisler started to experiment with methamphetamine formulas. Even then, his meth was considered extraordinary. "A dose the size of a match head would keep me up for 36 hours," recalls Preisler's cousin, Willy Nussbaum. "I'd drink like a fish to try to sleep, but the alcohol would have absolutely no effect."

Uncle Fester Crank became the stimulant of choice on the Marquette campus, especially during final exams. Michael McKinney, a Marquette chemistry professor, says Preisler was a difficult student who looked like "he was on something. He struck me as a rather unstable person."

Preisler graduated from Marquette with a chemistry and biology degree in 1981. Two years later, he was arrested for methamphetamine possession. Because it was his first offense, he was sentenced to probation. But when he got busted on a meth charge again in 1984, he ended up in the Waupun Correctional Institution. After two years of "quiet time," Preisler was transferred to the Winnebago State Farm. In total, he ended up serving three and a half years of a five-year sentence. "It's probably the most disastrous petty bust in law enforcement history," Fester says. "If I hadn't been arrested, I'd probably be Joe Blow walking down the street, blending into the crowd. Nobody would even know I existed."

Instead, he found himself in a 6-by-12-foot cell, watching Barbara Walters demand an end to all the bomb-making books that were being marketed by underground publishers. It was a life-defining moment. Outraged, Preisler immediately borrowed a typewriter from a fellow inmate and began writing the manuscript that would eventually become *Secrets of Methamphetamine Manufacture*.

The crude manuscript Preisler sent to Loompanics Unlimited over the transom was typed on onion-skin paper using several different colored ribbons. *SMM* was an immediate success and has evolved into a cash cow for the Port Townsend, Washington, publisher. This year, *SMM* ranked No. 3 in sales on the Loompanics best-seller list, behind *Secrets of a Superhacker* and *How to Live Without Electricity and Like It*. Asked to explain the book's phenomenal success

and evergreen quality, former Loompanics editor Vanessa McGrady replies, "When it comes to drugs, Uncle Fester is like Mister Rogers: Everybody trusts him."

But the Loompanics empire is under siege. In 1983, Paladin Press, a renegade publishing house that specializes in "action publishing," published Rex Feral's *Hit Man*, a sort of *Assassination for Dummies* manual. *Hit Man*'s thesis is straightforward: Teach readers how to be killers for hire. In 1993, Lawrence Horn allegedly contracted convicted felon James Perry to knock off Horn's ex-wife and son. In order to bone up for the multiple murder, Perry read *Hit Man*. In 1996, the victim's relatives filed suit against Paladin.

The U.S. Fourth Circuit Court of Appeals ruled in 1997 that *Hit Man* enjoyed no First Amendment protection because the book's content could amount to the "aiding and abetting of criminal conduct." Just before the Horn case was ready to go to trial, Paladin panicked, shelled out a \$5 million settlement, and pulled *Hit Man* from its catalog.

As if this legal precedent weren't bad enough for business, the government recently enacted a law that makes it illegal to "teach or demonstrate the making or use of an explosive or a weapon of mass destruction or to distribute information about such weapons with the intent of furthering criminal acts." Violators could be slapped with a 20-year prison term. A bill pending in the Senate would prohibit distribution "by any means" of information about "the manufacture or use of a controlled substance" and would carry a maximum prison sentence of 10 years.

The double whammy of the *Hit Man* lawsuit and the new bill has had a decidedly chilling effect on Loompanics. It recently dropped both *Silent Death* and *Home Workshop Explosives* from its inventory. Additional Uncle Fester titles are sure to be axed. "*Vest-Busters* is the next book to be eighty-sixed," claims a company insider. "It's a lawsuit just waiting to happen." Needless to say, if the new law is enforced, Loompanics won't be carrying any Uncle Fester titles. "This is ludicrous," says Loompanics publisher Mike Hoy. "It would make as much sense to sue General Motors because a killer made his getaway in a Chevrolet."

Preisler is unfazed by this latest legislative salvo. He's going multimedia. His debut videotape, *Cookin' Crank with Uncle Fester*, is now available for \$35 from a slightly more adventurous action pub-

**"When it comes to drugs, Fester is like Mister Rogers. Everybody trusts him," says a fan.**

was a terribly bright boy," recalls Jim Fitzpatrick, Preisler's biology teacher. "He had an extremely inquiring mind and understood a lot of very deep scientific concepts." But he was hardly class president material. "He was a strange boy," Fitzpatrick adds. "He didn't fit in. He was an A-student outsider."

Sally Elben, a former classmate and now a receptionist at Hortonville High, says the label *outsider* doesn't begin to describe Preisler's adolescent persona. "Oh my God!" exclaims Elben. "Steve was different. Do you know what his nickname was? Psycho!" Preisler was saddled with this colorful moniker after he bit an opponent's chest during a varsity wrestling match. When he spat the bloody flesh onto the mat, his psychotic reputation was forever sealed. Preisler shrugs off the bizarre incident, dismissing it as if it were a harmless prank. "I took a chunk out of his ribs," he says almost nostalgically. "I guess I always had a penchant for entertaining."

Preisler continued his education at Marquette University, where he majored in chemistry and developed an inordinate interest in explosives, earning him his current nickname. Wishing to conduct some big-boom experiments off-campus, he set up an extensive lab in his dorm room. One of his favorite stunts was to drip nitroglycerin on wads of toilet paper and whack it with a hammer. Police, convinced they had

lisher. He has already purchased his recently banned overstock and is selling the books himself on the Internet. "It just means more money for me," he cackles.

**B**y halftime, Preisler's beer supply is depleted. Motivated, he hops into his Jeep and heads to his favorite sports bar to catch the rest of the game. On the way, he stops at the local gas station. Mike, the clerk behind the counter, greets him warmly. Pierced and tattooed, Mike is a part-time rock musician and, according to Preisler, a full-time "closet white supremacist."

Mike is well versed in Preisler's body of work, but has particular interest in *Home Workshop Explosives*. As Preisler pays for his gas, Mike pumps him for specific bomb-making information. Preisler indulges him, suggesting that Mike reread the chapter in his book on the nitroglycerin explosive. As Preisler walks out the door, Mike strikes an I'm-not-worthy pose and exclaims, "Uncle Fester is God!" In the car, Preisler reveals that Mike has plans to blow up a local bar that caters to an African-American clientele. "But don't worry," Preisler says reassuringly. "The guy's harmless. He's too stupid to do any real damage." Then again, Tim McVeigh is no rocket scientist. Preisler nods in agreement. "That's true," he replies. The next moment, he is hunched over the steering wheel, laughing uncontrollably.

In the meantime, the antihero forges ahead undaunted, his private jihad against Big Brother in full swing. Preisler bristles at the thought that he is in any way responsible for the ac-

**"All readers, no matter how wacko, are greatly appreciated," Fester says.**

tions of his readers. "Responsible consumption of the product lies with the individual," says Fester, sounding like a Hollywood studio chief defending *Fight Club*. "People have to use sound judgment. It's not like I can go out and baby-sit the whole country." ■

## ***End of Issue #24***



**Any Questions?**

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### **Editorial and Rants**

*A long, long time ago there used to be this nice Canadian... Not so today.*

#### **The Americans**

June 5, 1973 – From: "Let's Be Personal" – CFRB, Toronto, Ontario

By Gordon Sinclair

The United States dollar took another pounding on German, French and British exchanges this morning, hitting the lowest point ever known in West Germany. It has declined there by 41% since 1971 and this Canadian thinks it is time to speak up for the Americans as the most generous and possibly the least-appreciated people in all the earth.

As long as sixty years ago, when I first started to read newspapers, I read of floods on the Yellow River and the Yangtse. Who rushed in with men and money to help? The Americans did.

They have helped control floods on the Nile, the Amazon, the Ganges and the Niger. Today, the rich bottom land of the Mississippi is under water and no foreign land has sent a dollar to help. Germany, Japan and, to a lesser extent, Britain and Italy, were lifted out of the debris of war by the Americans who poured in billions of dollars and forgave other billions in debts. None of those countries is today paying even the interest on its remaining debts to the United States.

When the franc was in danger of collapsing in 1956, it was the Americans who propped it up and their reward was to be insulted and swindled on the streets of Paris. I was there. I saw it.

When distant cities are hit by earthquakes, it is the United States that hurries into help... Managua Nicaragua is one of the most recent examples. So far this spring, 59 American communities have been flattened by tornadoes. Nobody has helped.

The Marshall Plan .. the Truman Policy .. all pumped billions upon billions of dollars into discouraged countries. Now, newspapers in those countries are writing about the decadent war-mongering Americans.

I'd like to see one of those countries that is gloating over the erosion of the United States dollar build its own airplanes.

Come on... let's hear it! Does any other country in the world have a plane to equal the Boeing Jumbo Jet, the Lockheed Tristar or the Douglas 107? If so, why don't they fly them? Why do all international lines except Russia fly American planes? Why does no other land on earth even consider putting a man or women on the moon?

You talk about Japanese technocracy and you get radios. You talk about German technocracy and you get automobiles. You talk about American technocracy and you find men on the moon, not once, but several times ... and safely home again. You talk about scandals and the Americans put theirs right in the store window for everyone to look at. Even the draft dodgers are not pursued and hounded. They are here on our streets, most of them ... unless they are breaking Canadian laws .. are getting American dollars from Ma and Pa at home to spend here.

When the Americans get out of this bind ... as they will... who could blame them if they said 'the hell with the rest of the world'. Let someone else buy the Israel bonds. Let someone else build or repair foreign dams or design foreign buildings that won't shake apart in earthquakes.

When the railways of France, Germany and India were breaking down through age, it was the Americans who rebuilt them. When the Pennsylvania Railroad and the New York Central went broke, nobody loaned them an old caboose. Both are still broke. I can name to you 5,000 times when the Americans raced to the help of other people in trouble.

Can you name me even one time when someone else raced to the Americans in trouble? I don't think there was outside help even during the San Francisco earthquake.

Our neighbours have faced it alone and I am one Canadian who is damned tired of hearing them kicked around. They will come out of this thing with their flag high. And when they do, they are entitled to thumb their nose at the lands that are gloating over their present troubles.

I hope Canada is not one of these. But there are many smug, self-righteous Canadians. And finally, the American Red Cross was told at its 48th Annual meeting in New Orleans this morning that it was broke.

This year's disasters .. with the year less than half-over... has taken it all and nobody...but nobody... has helped.

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*This can't be true! Eurosavages are morally superior! A rich, clueless movie star told me that!*

## **France Rapped Over Human Rights**

February 12, 2006 – From: [news.bbc.co.uk](http://news.bbc.co.uk)

France's law enforcement and prison system have been sharply criticised by Europe's human rights watchdog.

The Council of Europe found prisons were overcrowded and police operated with a sense of impunity, according to excerpts from a report due next week.

The council's human rights commissioner Alvaro Gil-Robles said there was a "widening gap" between the "text of law and what is actually practiced".

The report comes months after many French cities were rocked by riots.

The report makes 50 recommendations to improve France's record.

They include faster and more effective access to legal assistance for detainees, separating convicts and people awaiting trial and shortening the maximum allowed 45-day solitary confinement.

Details of the report were leaked to Le Parisien newspaper, and confirmed by Mr Gil-Robles.

## **System of Justice**

The findings are based on Mr Gil-Robles inspection of seven prisons and five police precincts last September.

He said France "has a relatively complete legal arsenal offering a high level of human rights protection" but "does not always give itself sufficient means to put it into application".

He found prisons were overcrowded and dirty, jail cells in police stations were in a terrible state and the justice system was too slow.

He criticised the treatment of minors in prisons and warned that a "hardening of immigration policies... risks violating the rights of genuine asylum seekers".

He said there was a weak reaction to anti-Semitic and racist crimes and called on France to fight against all forms of police brutality and violence.

"What is most important for me is that the penitentiary system is not a system of vengeance but a system of justice – for punishing criminals and, afterwards, permitting them to reintegrate into society," Mr Gil-Robles told France-Info radio.

"Today, this is not possible given the current state" of the French system.

The Council of Europe is intended as the guardian of human rights, democracy and the rule of law in all its 46-member states.

*Unbelievable. Your tax money at work. I'm sure the ACLU will be out there screaming "separation of church and state!" No? They're not? Heh. I wish we had schools where being a fucking idiot was illegal.*

## The Art of Compromise

February 17, 2006 – From: [www.twincities.com](http://www.twincities.com)

By Doug Belden

As violent protests over caricatures of the Prophet Muhammad continue around the world, a St. Paul charter school is quietly negotiating the delicate question of how to teach art to Muslims.

Any depiction of God and his prophets is considered offensive under Islam, and disrespectful representations are even worse, as the recent worldwide outrage over the Danish cartoons has shown. But some Muslims also refrain from producing images of ordinary human beings and animals, citing Islamic teaching.

That presented a challenge for Higher Ground Academy, a K-12 school just west of Central High School on Marshall Avenue that has about 450 students. About 70 percent of them are Muslim immigrants from eastern Africa.

Executive Director Bill Wilson said he had concerns for some time about how to reconcile the school's art curriculum with the views of Muslim families, but the departure of the art teacher at the end of last school year gave him a window to act.

This fall, he hired ArtStart, a St. Paul-based nonprofit organization, to offer more options for about 150 kindergartners through second-graders, including visual arts and drumming. But parents were still upset that their children were drawing figures, Wilson said, and some pulled their children out of art class altogether.

Wilson then sat down with teacher and parent liaison Abdirahman Sheikh Omar Ahmad, who also is the imam at an Islamic center in Minneapolis, to work with ArtStart in determining how to meet state standards without running afoul of Muslim doctrine.

"We said, 'Look, we can do better than this,'" Wilson said.

## No Human Images

Out the window right away went masks, puppets and that classic of elementary school art class, the self-portrait, said Sara Langworthy, an artist with ArtStart. Revamping the curriculum "definitely require stepping outside of the normal instincts that you fall back on," she said.

In their place came nature scenes and geometric forms and patterns, said Carol Sirrine, ArtStart's executive director. This week, the class was cutting out shapes to make into cardboard pouches. Another project involved taking photographs and mapping the neighborhood around the school.

The conversation about what is appropriate is still open.

In a meeting this week, Langworthy asked Ahmad whether the students can do silhouettes of hands. That's fine, he said.

Ahmad's involvement has put many parents' minds at ease, said Said Jama, father of kindergartner Suhyr Ali Jama. Wilson said Muslim enrollment in art has rebounded since the changes were introduced.

Langworthy said she and fellow teacher Katie Tuma don't police what the students draw, but they do have conversations with students who are drawing figures to make sure it's really OK.

Not that the children are always the most reliable sources. Langworthy said early on a few told her it was all right to draw animals as long as they didn't give them noses.

Second-grader Hawi Muhammed said her parents don't mind if she draws people once in a while, but "God ... doesn't like people to draw a lot," she said.

Her parents prefer to see things like "gardens (or) a house," Hawi said. "That's what they like me to do."

Pictures of people and animals aren't banned in the school, and the religious teachings don't strictly prohibit viewing drawings made by someone else. For example, body tracings that students had cut out and decorated under the previous art curriculum still hang in a main hallway.

But projects that would naturally lead to figure drawing are no longer assigned, Langworthy said, which isn't a huge loss when it comes to meeting the state standards.

The relevant state requirement for grades K–3 is that students "understand the elements of visual art, including color, line, shape, form, texture, and space."

Accomplishing those objectives without having students draw people and animals just takes a little extra thought, Langworthy said. "There's a billion ways to solve the problem," she said. "So if you're limited to only 700,000, I can live with that."

As Sirrine put it, "In a sense, it's narrowing. But then within that, you can find the depth."

### **Example For Others**

Conflicts between religious beliefs and art curriculum aren't unheard of elsewhere in St. Paul or around the state, but they aren't widespread, say education officials.

Abdisalam Adam, an English as a Second Language resource teacher in the St. Paul school district, said issues like the one at Higher Ground have come up a few times, but "it is not very common." (Charter schools are public institutions that operate independently of the districts in which they are located. In Higher Ground's case, St. Paul Public Schools is the sponsoring organization, which means it has some general oversight responsibility.)

Michael Hiatt, director of professional development and research at the Perpich Center for Arts Education -- the state agency that offers training and support for arts curriculum -- said there was a religious group a few years ago that wanted to modify the dance curriculum offered in one district, but "I don't see it growing. I don't see an increasing number of requests."

At Higher Ground, Wilson said he plans to use ArtStart -- which is typically hired for one- or two-week residencies rather than long-term relationships with schools -- to expand the art curriculum to grades three through five this fall.

And he said once the program is fine-tuned, "we'd like to be able to export this" to any school that is interested.

Wilson said Higher Ground has experience in mediating cultural conflicts because of tensions that have arisen between its majority African population and the rest of the student body, almost all of whom are African American.

Certain forms of hip-hop dance performed by African-American students at school talent shows are offensive to some Muslim students, for example, but "we've always accommodated that with lots of discussion," Wilson said.

That openness to cultural compromise served the school well in the case of the art classes, he said, laying a foundation of understanding with Muslim parents before the cartoon furor of the past few weeks hit.

"If we pay attention to cultural diversity and cultural competency, those kinds of issues shouldn't emerge," he said. "We got it right before this whole thing busted open in Europe."

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*More political correctness to destroy our schools. So much for working hard. Celebrate diversity!*

### **'Gifted' Label Takes a Vacation in Diversity Quest**

February 22, 2006 – From: [www.washingtonpost.com](http://www.washingtonpost.com) or [www.amren.com](http://www.amren.com) (no reg)

By Lori Aratani

Middle school magnet programs in Montgomery County have traditionally operated as schools within schools, offering specialized curriculum to a few select students—who have been mostly Asian and white.

But this fall, educators decided to try a different approach. Instead of selecting a few hundred students for traditional school magnets, officials opened magnet programs at three middle schools to everyone.

In doing so, county educators—like officials of a growing number of school systems across the country—are trying to find a more diverse pool of students. They are experimenting with new ways to reach out to students who might have special abilities but may not have been recognized through traditional screening methods.

"In the future, where we want to move is where it's not so much identifying children as gifted and talented so much as getting them the services they need to reach their potential," said Martin Creel, director of the accelerated enriched instruction division.

In Fairfax County, educators have created the Young Scholars Program, aimed at identifying kindergartners from underrepresented populations who have potential but might need extra support. The school system also has added expanded honors classes at its middle schools in hopes of giving a broader spectrum of students more opportunities, said Carol Horn, coordinator of gifted programs for the school system.

"We've changed from labeling children to labeling services," Horn said. "It's not whether you're gifted, it's what's appropriate for you."

The approach has its critics--those who fear that curriculum will be watered down because too many kids with varying abilities are being thrown together. But Montgomery and Fairfax officials--like those undertaking similar efforts across the country--insist that the quality of education will not be diminished. Key to the task is offering high-quality training that helps educators understand how to reach all students, Creel said.

{snip}

During the spring, Montgomery officials came under fire from a group of black parents who were concerned about the low numbers of blacks and Hispanics who were being admitted to middle school magnet programs. They were also alarmed by how few of them were being labeled "gifted and talented" by the school system's second-grade screening process, which uses a variety of yardsticks. School officials said they were working diligently to narrow the gap between students but acknowledged that they have more work to do.

But it is just this concern--that too many students are being shut out of elite programs for reasons difficult to pin down--that is fueling the school system's push for better access to special programs and less emphasis on labels to determine into which reading or math group a student is placed.

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### **The Queer Muhammad: An Experiment in Tolerance**

February 13, 2006 – *From: [www.townhall.com](http://www.townhall.com)*

By Mike S. Adams

Dear (NEA Chairman) Dana Gioia:

I write to you today, not with a request, but with a demand. I've been sitting back patiently while the NEA has been promoting anti-Christian "art" for a number of years. In fact, one could say that I have been supporting it, too, given that my tax dollars have been spent on this garbage. And maybe I've been supporting it in another way by refusing to write you to express my frustration. That is, until now.

In the spirit of the "separation of church and state," my demand is that you commission a painting – fully funded with tax dollars – that has one intention and one intention only: To offend Muslims everywhere.

This new painting will help the NEA avoid any accusations of state sponsorship of religion by insulting some religion other than Christianity. In the past, you've supported the "Piss Christ" and the "Elephant Dung Mary." Now, I'm asking you to fund the "Queer Muhammad."

For this painting, I want the artist to put the Prophet Muhammad in a pink bathrobe. I also want him holding a little toy poodle. Finally, I would like you to feature him reading a copy of "Playgirl" magazine. If you want to get daring, you can also feature him French-kissing Salmon Rushdie. Or better yet, feature him French-kissing Jacques Chirac.

Regardless of the precise form it takes, I want five million reproductions of the "Queer Muhammad" in poster form. It may sound like a large order for a first printing. But here's what I intend to do with them:

First, I'm going to staple a "Queer Muhammad" on the door of Barbara Streisand. She's been a real pain in the ass throughout this whole War on Terror. I want to see whether she gains some respect

for George W. Bush after Islamic fascists torch her Southern California estate – all for expecting adherents to the "religion of peace" to be as tolerant of homosexuality as Hollywood liberals.

And, then, I'm heading to the Upper West Side to place a "Queer Muhammad" on the door of Michael Moore. That fat joker will be begging Charlton Heston for a gun by the time the New York City Muslims throw their first Molotov cocktail.

Next, we're off to Colorado to the home of Ward Churchill. After I place a "Queer Muhammad" on his home, I'll put one on his office door at the university. And, while I'm at it, I'll hit the office doors of every anti-war professor in America.

I also plan to visit all those professors who have "Darwin fish" on their university office doors. For years, they've been desecrating a sacred Christian symbol with impunity. Come to think of it, many have been desecrating an Old Testament religious symbol by using rainbows as a backdrop for those "celebrate diversity" bumper stickers. When they place those on their office doors, they do more than just promote acceptance of sodomy. They ridicule a covenant between God and Noah.

Maybe after the Muslim Student Associations begin ripping down the "Queer Muhammad" posters – always leaving the Darwin fish intact – some of these professors will begin to realize that white Christian heterosexual males really aren't so bad after all. And maybe some will realize that young Muslim males are the most dangerous demographic group on the face of the planet.

But the professors and the movie stars won't be the only ones included in my little experiment in tolerance and diversity. I want to make sure to include members of the gay community, too. That's why the "Queer Muhammad" will be posted on the door of every gay bar in San Francisco.

Under my plan, when California Muslims attack these businesses, the gay political lobby will finally have some use for politically correct and seldom-used "hate crimes" legislation. It will also give that large segment of the gay population – the ones who always need something to whine about – something legitimate to whine about. And it will give Christians a break from the gay mission to invade and pervert the Christian clergy.

That will leave me with about four million "Queer Muhammad" posters for the most ambitious aspect of my plan. This involves hanging posters on the doors of every active member of the National Rifle Association. When the Islamic fascists begin hurling stones at the houses of NRA members, many of my brothers (and sisters)-in-arms will start heading for the nearest gun safe. I know I will.

Maybe a few of these violent Muslims will survive their attack on the First Amendment, after it is thwarted by the Second Amendment. If so, I have a special plan for the Islamic fascist survivors. This plan was inspired by my realization that so many members of the anti-war movement are also members of the pro-gay movement. Here it is, in all its leftist-inspired brilliance:

The NRA members whose homes were attacked will all petition local Democratic prosecutors, the media, and even their Democratic legislators to charge the fascists with hate crimes for attacking the image of the "Queer Muhammad." This will draw a line in the sand for these Democrats. Will they side with the Muslims against the gays? Or will they side with the gays against the Muslims?

If things work according to my plan, we will be able to kill off a lot of these Muslim terrorists and simply claim self-defense. Even better, we'll cause significant division and strife among the American Left. After it all goes down, I'll head to my refrigerator instead of my gun safe.

Then I'll drink a nice, cold Carlsberg. Bottled and brewed by our allies in Denmark.

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*If other countries don't like how Gitmo is run, why don't they take in the terror suspects? After all... they are all innocent! LOL!*

### **Some Gitmo Prisoners Don't Want to Go Home**

March 6, 2006 – From: [www.breitbart.com](http://www.breitbart.com)

By Ben Fox

Fearing militants or even their own governments, some prisoners at Guantanamo Bay from China, Saudi Arabia and other nations do not want to go home, according to transcripts of hearings at the U.S. prison in Cuba.

Uzbekistan, Yemen, Algeria and Syria are also among the countries to which detainees do not want to return. The inmates have told military tribunals that they or their families could be tortured or killed if they are sent back.

President Bush has said the United States transfers detainees to other countries only when it receives assurances that they will not be tortured. Critics say such assurances are useless. The U.S. has released or transferred 267 prisoners and has announced plans to do the same with at least 123 more in the future.

Inmates have told military tribunals they worry about reprisals from militants who will suspect them of cooperating with U.S. authorities in its war on terror. Others say their own governments may target them for reasons that have nothing to do with why they were taken to Guantanamo Bay in the first place.

A man from Syria who was detained along with his father pleaded with the tribunal for help getting them political asylum in any country that will take them.

"You've been saying 'terrorists, terrorists.' If we return, whether we did something or not, there's no such things as human rights. We will be killed immediately," he said. "You know this very well."

It is impossible to know how many of the detainees, most held for years now without being charged, fear going home. The U.S. military does not comment on individual cases, and the detainees generally are not in a position to offer any evidence of persecution as they plead their cases before the tribunals.

A Saudi identified only as Yasim, who said he attended an al-Qaida training camp in Afghanistan and was jailed in his country for selling drugs, told the tribunal that after being repeatedly interrogated at Guantanamo, he fears his fellow prisoners as well as others back in Saudi Arabia.

"I can't go back to my country. I have been threatened to be killed by many people," he said, according to the transcripts, which the Pentagon released Friday in response to a Freedom of Information Act Lawsuit filed by The Associated Press.

A detainee from Uzbekistan told the tribunals in December 2004 that his father and uncles were jailed for their Muslim faith in his native country and said he fears the rest of his family would be tortured if he returned.

The prisoner shrugged off the threat to his own safety in Uzbekistan, where the government has clamped down on Islamic groups which are not sanctioned by the state.

"I'm not afraid to die. We all belong to Allah and we shall return to him," he said.

This Uzbek's fate is unknown, as is that of almost every other detainee whose names are no longer blacked out when they appear in the hearing transcripts. The Bush administration has not said who has been held in the prison it opened in January 2002, and does not announce when or where individual detainees are released.

What the Pentagon has said is that 187 prisoners have been released, and 80 others have been transferred to prisons in more than a dozen countries, including Saudi Arabia, Morocco, Russia, Bahrain and Pakistan. An unknown number of these prisoners were later released but many languish in other jails, again without charges, let alone trials.

"We have no authority to tell another government what they are going to do with a detainee," Pentagon spokesman Lt. Cmdr. Flex Plexico told the AP a year ago when asked about dozens of Pakistani prisoners transferred home for continued detention.

The personal threats that detainees may face after leaving Guantanamo Bay pose a human rights challenge to the United States, which has stopped bringing new prisoners to the camp and is under international pressure to close it altogether.

"This policy of handing over prisoners to countries that the U.S. challenges on their human rights abuses is a sham and it opens the United States to charges of hypocrisy around the world," said Rep. Edward Markey, a Massachusetts Democrat who has sought passage of a bill that would ban the U.S. from sending prisoners to other countries to face torture.

In the case of one group of prisoners, Muslims from western China known as Uighurs, the U.S. has struggled to find a solution.

A military tribunal has determined that five are "no longer enemy combatants" and can be released from Guantanamo Bay. The U.S. agrees they could face persecution back in China but so far has not found a third country to take them.

For now, the Uighurs are being kept at Camp Iguana, a privileged section of the prison with televisions, stereos and a view of the Caribbean.

A Uighur told a military tribunal that he feared going back to China so much, he considered trying to convince the panel that he was guilty, according to a hearing transcript.

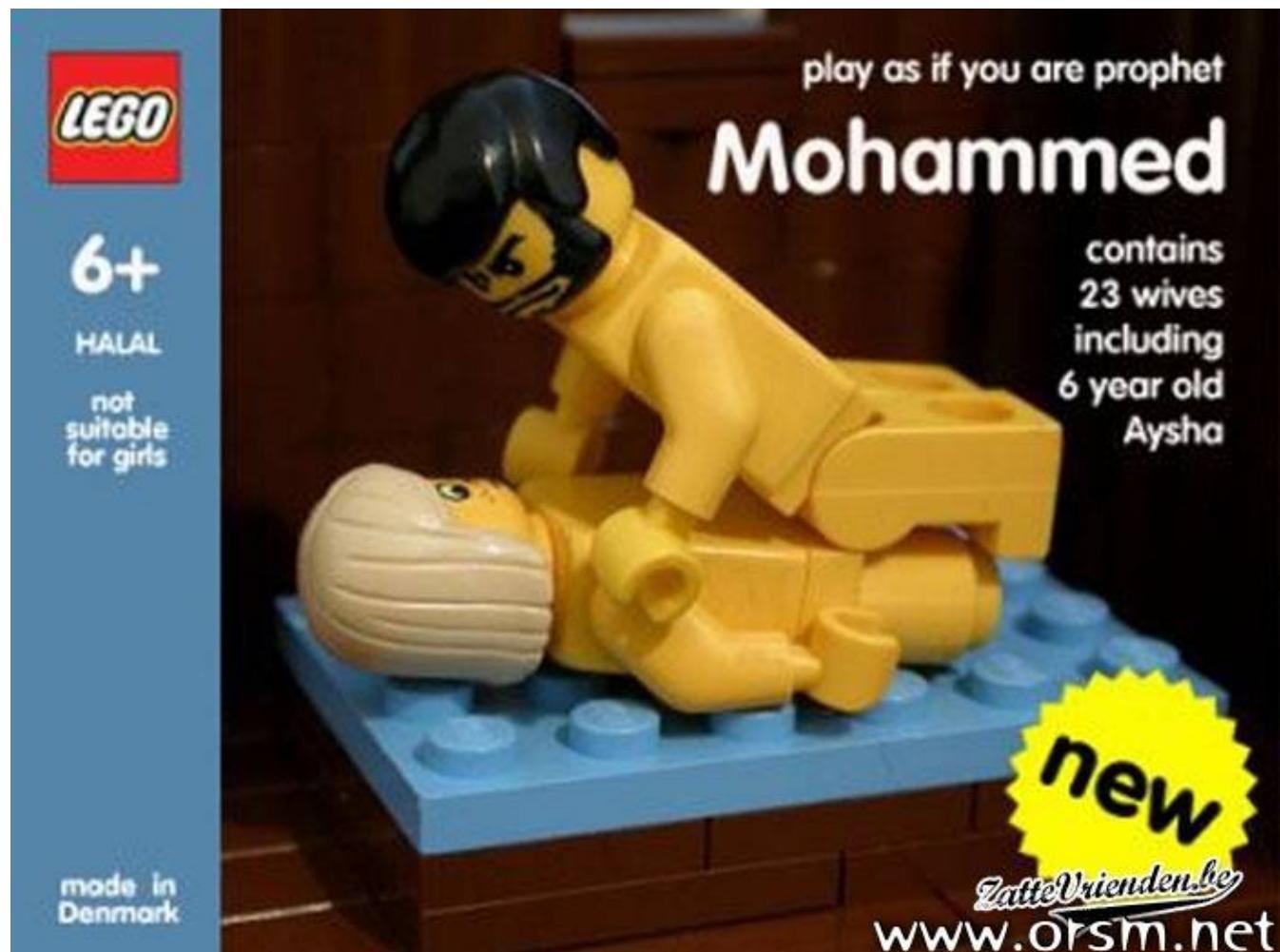
"If I am sent back to China, they will torture me really bad," said the man, whose name did not appear in the transcript. "They will use dogs. They will pull out my nails."

Two of the Uighurs are appealing a federal judge's rejection of their request to be released in the United States, where a family in the Washington suburbs has offered to take them in.

"Home is China, and in China you disappear into a dungeon and no one ever hears from you

again," said their lawyer, Sabin Willett. "These guys are not a risk to anyone. They should be released here."

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# The passing of a legend

*The man credited with inventing mobile radio, pagers and cell phones passes away too soon.*

By Roger Lesser,  
Editor

*For those of you who receive the RF Design Newsletter, you've read an edited version of this. But, I wanted to make sure all our readers had the opportunity to learn about Al.*  
Roger

You may have heard a lot about who may have invented the communications devices that we depend on as an afterthought today. Well, if there is any question as to who that was, let me settle it here. His name was Al Gross.

I first heard from Al following an article I had written about government communications. The focus was mostly on military communications and that's what got Al's attention. He called me after reading the article to just talk about it. I didn't know who he was and thought he was just a design engineer and a reader. That is until he began to tell me about Joan and Eleanor.

Prior to World War II, while most designers concentrated on frequencies under 100 MHz, Al was looking at higher frequencies. He demonstrated it was possible to develop miniaturized components and built a number of battery-powered hand-held transceivers. Some devices operated at 300 MHz and had a range of up to 30 miles.

Then WW II came. The Office of Strategic Services (OSS) (the forerunner of today's CIA) became aware of Al's work and invited him to join them. The OSS was in desperate need of a way for their agents working in occupied Europe to communicate without being caught by the Gestapo. That's when Al came to the table with a two-way radio system he called "Joan and Eleanor." The system allowed agents to transmit a signal up to high-flying aircraft without spreading the signal out. This kept the Nazis from using triangulation to pinpoint the agents' location. As head of the project, Al made the system a reality by developing a miniaturized receiver circuit. Yet, it wasn't until 1976 that the public became aware of the system when documents from the era were declassified.

Al was a visionary. Following the war, Al's energies focused on personal communications. In 1949 he developed the pager and in the 1950s wireless mobile telephony. But, as he told me, the world was not ready for such devices.

But they were ready for one of his futuristic concepts. In 1948 Chester Gould, the cartoonist of Dick Tracy, came across Al's wristwatch transmitter. He asked Al for permission to use the concept in Dick Tracy cartoons. Al gave his permission, and the rest is cartoon history.

Al was very much an amateur radio buff (W8PAL, SK) and

member of the National Association for Amateur Radio. According to Fred Maia's *The W5YI Report*, Al's interest in radio began when he was only 12 (when he turned his parents' basement into an amateur radio station). To show just how much of an innovator Al was, the equipment he used came from a junkyard.

Of course, Al won a number of awards. These included a presidential commendation from President Reagan in 1981, the IEEE's Century of Honor Medal in 1984, and the Marconi Gold Medal in 1995. The first time we talked, he mentioned he had just won the 2000 Lemelson-MIT lifetime achievement award and recognition from the FCC for his life's work. It goes without saying there were a number of other honors.

Al and I only talked a few times, but I was so impressed by his open-mindedness and insights concerning today's technological advances, that I invited him to join the *RF Design* editorial board. He accepted, but before we could make it a reality he passed away on Dec. 21, 2000, at the age of 82.

I've been fortunate enough to meet a number of heroes. They range from Douglas Campbell (WWI ace) and Jimmy Doolittle (Medal of Honor winner and the first to demonstrate instrument flying) to Mercury astronauts Alan Shepard and Wally Shirra to Fred Link (communications pioneer) and Chuck Yeager (WWII ace and first man to break the sound barrier). These men shared one thing in common—they were humble about their achievements. When I met Doolittle, I was so awestruck that I couldn't even say

hello. He reached out for my hand and said, "Hi, my name is Jimmy." When I received the call from Al, he said, "Hi, my name is Al. I'd like to talk to you about your article." No pomp. No assumed spin on their achievements. They were just men who did what they did best and made the rest of us thankful for their coming into our lives, even if we didn't know it. Without Jimmy, we wouldn't have instrument flying and avionics today. Without Al, we'd still be talking on the "long line."

And we probably haven't heard the last about Al's advances in design. Don Bishop, editorial director for *RF Design*, said to me there are probably other things he designed that are still classified. I hadn't thought of it, but I bet he is right. Joan and Eleanor are probably just the tip of the communications tower in his designs.

So the next time you check your pager, use your cell phone or use a mobile radio, do me a favor and just give a nod toward heaven as a way of saying, "Thanks, Al."

Finally, in honor of his contributions and as *RF Design's* way of saying thanks, Al's name will appear in our editorial board lineup for the remainder of the year.

