NETWORK MANAGEMENT
SOFTWARE SUBSYSTEM DESCRIPTION
1 AND 1A "ESS* " SWITCHES

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1. GENERAL

INTRODUCTION

1.01 This section describes the functional operation of the Network Management Subsystem programs in the 1 and 1A ESS switches.

1.02 This practice is reissued to include coverage of the 1E8 and 1AE8 generic programs for 1 and 1A ESS switches. Change arrows are not used due to the large number of significant changes.

1.03 This practice provides coverage for 1E8, 1AE8, and earlier generic programs.

1.04 Part 6 provides a listing of the abbreviations and acronyms used in this section.

PURPOSE OF NETWORK MANAGEMENT SUBSYSTEM

1.05 The network management subsystem programs provide capabilities for administering network management controls. The purpose of the controls is to permit the maximum number of calls to be completed without allowing the traffic congestion to spread throughout the network. The control capabilities effective with the 1E7/1AE7 and earlier generic programs include:

(a) Code blocking

(b) Toll code blocking

(c) Trunk group controls (TGCs) (manual and automatic via receipt of dynamic overload control [DOC] signals)

(d) Generation of DOC signals

(e) Discrete machine and network status indicators

(f) Reroute control of traffic (preprogrammed controls only)

(g) Transmittal of traffic measurement data to Engineering and Administrative Data Acquisition System (EADAS) control centers

(h) Capability of EADAS/Network Management (EADAS/NM) to assign controls, poll for status of controls, and receive 5-minute data.

1.06 The following network management controls are effective with the 1E8 and 1AE8 generic programs only:

(a) Call gapping controls (replace code blocking and toll code blocking controls)

(b) TGCs (preprogrammed and flexible)

(c) Generation of DOC signals

(d) Selective incoming overload controls (SILC)

(e) Discrete machine and network status indicators

(f) Network management reroute controls (NMRR) (preprogrammed controls)

(g) Transmittal of traffic measurement data to EADAS control centers

(h) Capability of EADAS/Network Management (EADAS/NM) to assign controls, poll for status of controls, and receive 5-minute data.

1.07 The network management enhanced reroute controls (NMER) are effective with the 1AE8 generic program only.

Note: These controls are a type of flexible TGCs. Flexible TGCs are activated/deactivated via a TTY input message.

1.08 It is very important to become familiar with the network management controls and their generic program sensitivity as outlined in paragraphs 1.05 through 1.07. The generic program sensitivity of each control is not denoted every time the control appears in this practice.

SCOPE OF SECTION

1.09 This section includes:

- Brief description of network management subsystem programs
- Network management subsystem interface
- Network management overview
- Functional description of subsystem programs.

2. BRIEF DESCRIPTION OF NETWORK MANAGEMENT SUBSYSTEM PROGRAMS

2.01 The network management subsystem as described herein is comprised of thirteen programs. Table A lists these programs.

CALLING LINE IDENTIFICATION (CLID) ADMINISTRATION PROGRAM

2.02 The CLID program provides for and maintains the memory containing the code blocking controls used for controlling network traffic and directory numbers (DNs) by which incoming calls are identified. When network controls are in effect, PIDENT NMGT checks the code block slots maintained by CLID.

2.03 Effective with the 1E8/1AE8 generic program, the CLID program provides for and maintains the memory containing the CLID controls. PIDENT NMCG checks the CLID slots maintained by CLID.

NETWORK MANAGEMENT CALL GAPPING (NMCG) PROGRAM

2.04 This program is effective with the 1E8/1AE8 generic programs. The NMCG program provides the capability to block originating inter-LATA carrier traffic based on a carrier access code or destination code. Both North American numbering plan (NANP) and carrier interconnect codes can be controlled by call gapping. The call gapping controls are activated/deactivated via TTY input messages.

NETWORK MANAGEMENT SELECTIVE INCOMING OVERLOAD CONTROL (NMSC) PROGRAM

2.05 The NMSC program provides the capability to block incoming traffic that could congest the ESS switch. Selective incoming overload control signals are provided by the NMSC program to limit incoming traffic. The SILCs are activated automatically when the ESS switch machine congestion level 1 (MC1) or MC2 thresholds have been crossed. Selective incoming overload control (SILC) can limit incoming NANP and carrier interconnect codes.

NETWORK MANAGEMENT (NMGT) PROGRAM

2.06 The NMGT program maintains the control codes stored in memory by CLID (1E7/1AE7 and earlier). This program administers DOC signals to apply TGCs which are based on the percentage of attempts to the trunk group. Also, this program performs update routines on indicators associated with real-time breaks, timing, code block status, DOC information, and trunk group number (TGN) data.

NETWORK MANAGEMENT INDICATOR (NMIN) PROGRAM

2.07 The function of the NMIN program is to update the network management indicators located at the network management centers. The program provides for a printout of the trunk group no-circuit data via TTY input message.

NETWORK MANAGEMENT MAINTENANCE (NMMP) PROGRAM

2.08 The NMMP program performs the following functions:

(a) DOC transmitter schedule and demand exercise

(b) DOC transmitter maintenance universal timing

(c) DOC transmitter interrupter supervision

(d) DOC transmitter maintenance on MC3 failures

(e) DOC transmitter lamp test interface

(f) Loop restoral

(g) Central pulse distributor power restoral.

NETWORK MANAGEMENT REROUTE CONTROL (NMRR) PROGRAM

2.09 The NMRR program provides network managers the capability to reroute traffic away from congested or troubled switching facilities to other facilities having sufficient switching capacities. The rerouting controls may be applied to both local and toll calls. An audit of the control data slots in memory is performed and errors are printed via the TTY. The program provides for manual activation and deactivation of the control. Options to the reroute control are trunk hunting, percentage of blocking, type of traffic, and to trunk group (TTG) selection.

NETWORK MANAGEMENT TOLL CODE BLOCKING (NMTC) PROGRAM

2.10 The NMTC program provides the capability for blocking intertoll calls destined to congested areas having facility switching problems due to telethons, natural disasters, etc. Toll blocking applies to toll offices on a per system basis and is effective on a per call basis. The toll blocking controls are activated/deactivated via TTY input messages.

TRANSMIT DYNAMIC OVERLOAD CONTROL SIGNALS (NMTD) PROGRAM

2.11 The NMTD program detects and analyzes DOC signals received from other offices. Every 5 minutes, an exception message printout on peg and usage counts is given. During a phase 3 system operation, an audit of the T1 and T2 scan points is made. The incoming overload control lamps are set by SILC or DOC via the NMTD program.

NETWORK MANAGEMENT (NMTG) PROGRAM

2.12 The NMTG program provides the capabilities for limiting the amount of traffic leaving an office that is destined for a congested area based on the trunk group over which a call is to be routed. Two types of TGCs, ***preprogrammed*** and ***flexible***, are provided for limiting or changing the routing of outgoing traffic. Control options to these TGCs are ***cancel-to***, ***cancel-from***, and ***skip***. A ***trunk***

reservation option may be applied to the flexible TGC type.

EADAS/NM INTERFACE (NMEA) PROGRAM

2.13 The NMEA program performs the interface functions between the ESS switch and the Engineering and Administrative Data Acquisition System (EADAS) and network management (NM) center. The program administers the transmission of EADAS data over specified data links. Five types of data are channeled to the network management center which are: (1) traffic (5-minute data), (2) status and event discretes, (3) network management control status, (4) verification of H and C schedules, and (5) verification of trunk group. The program processes messages sent by EADAS/NM. This allows EADAS/NM to monitor status, activate, and deactivate network management controls.

ENGINEERING AND ADMINISTRATIVE DATA ACQUISITION INTERFACE (EDAS) PROGRAM

2.14 The EDAS program processes polls sent by the EADAS center, formats the output data, and initializes the data link circuitry which transmits the data to the EADAS center. The program routines are scheduled by the ECMP program as a class C job.

EADAS TRANSLATION VERIFICATION ROUTINES (EDVF) PROGRAM

2.15 The EDVF program verifies the EADAS data for the EDAS program.

3. NETWORK MANAGEMENT SUBSYSTEM PROGRAM INTERFACE

3.01 The network management subsystem programs interface via global entries to eighteen programs as shown in Fig. 1.

3.02 The teletypewriter program (TTIA) makes global entries into the network management subsystem programs as listed in Table B.

3.03 Table C lists the network management program entries from the Executive Control Main Program (ECMP).

3.04 The Executive Control Input/Output (ECIO) program transfers to the interface with Engineering and Administrative Data Acquisition Interface Program (EDAS) every 15 ms on the J-level at global EAXMIT which analyzes the poll received from the EADAS center.

3.05 When all digits have been dialed and the network management control is activated, the Digit Analysis Lines (ORDL) program interfaces with NMRR, NMGT or NMCG (1E8/1AE8 and later). Enter NMRR if rerouting of the call is indicated and NMGT to determine if network management control is in effect.

3.06 The Digit Analysis Trunks (ICAL) program interfaces with NMGT at global NMCBCI or with NMCG at global NMCGIC. This function is performed during the processing of tandem calls to determine if the incoming tandem call is to be network controlled.

3.07 The Digit Analysis Trunk - Revertive (ICRV) program makes a transfer to NMGT at global NMCBCI or NMCG at global NMCGIC. This function is performed during the processing of toll calls to determine if the incoming tandem revertive-trunk call is to be network controlled.

3.08 The Supervision (SSCD) program interfaces with NMGT at globals NMPPAA and NMPPAR. When SSCD detects that the received DOC signals are associated with trunk group preprogram, global NMPPAA is entered to set the T1 and T2 bits. If DOC signals associated with the preprogram control are lost, entry is made at NMPPAR to set the T2 bit to the unsaturated state.

3.09 The Receiver Attachment Delay Report (RADR) program enters NMEA at the following global subroutines.

(a) NMRDAL (loads output buffer with information indicating whether or not test calls are being allowed to determine receiver delay)

(b) NMIHNO (transmits RADR-INHIBIT NG response to EADAS center)

(c) NMIHOK (transmits RADR-INHIBIT OK response to EADAS center).

3.10 The Traffic Measurements (TFCT) program enters NMEA at global NMEATF for transmission of illegal traffic data response to the EADAS

center. Program TFCT enters EDAS at globals EADAS5 and EDAPLT for formatting and processing the poll time data.

3.11 The System Alarm (MCLM) program transfers to NMMP at global NMSPOW when the power alarm on the DOC frame indicates that power has been restored.

3.12 The Tandem Connections (TAND) program and the HILO 4-wire outpulsing (HLOP) program interface NMRR at global NMRRCT to check for rerouting of the tandem call.

3.13 The Translation Routines—Basic Trunk (TRBT) program interfaces NMRR at global NMRTAF to obtain traffic counts on cancelled calls. Program TRBT transfers to NMTG when the outgoing load control indicator in the trunk group head cell indicates TGCs are activated.

3.14 The NMGT or NMCG (1E8/1AE8 and later) program interfaces with MAUD, MCTWADMN, SADA, SADT, and SARG at the following globals:

(a) NMT1T2 (performs audits on T1 and T2 associated with DOC scan points)

(b) NMGTMSGS (provides listing of all active code blocks)

(c) NMMCTH (calculates receiver threshold values)

(d) NMAUD1 (audits trunk group controls)

(e) NMSEGA (performs audit on segment work indicators).

3.15 The intrarelationship of network management subsystem programs is summarized in Table D.

4. NETWORK MANAGEMENT SUBSYSTEM OVERVIEW

NETWORK CONTROLS

A. Code Blocking

4.01 Code blocking controls may be applied by the ESS switch which limits incoming traffic routed to congested traffic areas in order to prevent the congestion to spread throughout the switching network. The control is based upon the destination code (3-digit area code, 3-digit office code, 6-digit code, 7-digit code, 10-digit code) as determined by the local 3-digit and toll code blocking 3-digit index to NPA. The code blocked calls are routed via one of three fixed route indexes, EA1, EA2, or NCA. The control of each code is applied as percentage of call attempts. The percentages are 50, 75, 87 1/2, and 100 percent. The code blocking controls are activated and deactivated via TTY input messages. When code blocking controls are in effect, the digit analysis programs, ICAL or ICRV, transfer to the network management (NMGT) program to process the code blocking function.

B. Toll Code Blocking

4.02 The blocking of intertoll calls is processed by the NMTC program. Teletypewriter input messages, used for normal code blocking, are also used for activating and deactivating the function.

C. Call Gapping Controls

4.03 Call gapping provides manual code control of originating inter-LATA carrier traffic based on a specific carrier access code (ignoring the destination code) or based on a specific destination code (ignoring carrier access code). Call gapping sets an upper limit on the rate at which outgoing attempts to a particular code are allowed out of an ESS switch. The control of each code is provided by allowing only one call per specified time interval to leave the ESS switch. This specified time interval is called a gap interval. There are 13 gap intervals, ranging from 0.1 second to 600 seconds. See Fig. 2 for gap indexes and the associated gap interval. Both NANP and carrier interconnect codes can be controlled by call gapping. Calls affected by call gapping controls are routed to one of three fixed route indexes: NCA, EA1, or EA2.

D. Trunk Group Controls

4.04 Trunk group controls (TGCs) provide the capabilities to limit traffic to a congested area based on the trunk group over which a call is to be routed. There are two types of TGCs, preprogrammed and flexible. Preprogrammed controls are activated on prespecified trunk groups. Flexible controls can be activated on any trunk group in the ESS switch. Three control options are available for flexible TGCs (cancel-to, cancel-from, and skip). Also, there is a

trunk reservation option that can be used to limit the number of attempts offered to a trunk group when less than the specified number of trunks remains available. One of two thresholds, protectional reservation of equipment (PRE) and directional reservation of equipment (DRE), may be applied to the trunk reservation option. The threshold PRE is used in reserving facilities for the first-routed traffic. If the PRE threshold is exceeded, all traffic alternate-routed to this trunk group is inhibited from searching for an idle trunk in any trunk group and is routed to the NCA. The threshold DRE is used in reserving facilities for incoming traffic. If the DRE threshold is exceeded, all traffic to this trunk group is inhibited from searching for an idle trunk in any trunk group and is routed to the NCA.

E. Network Management Reroute Controls (Preprogrammed)

4.05 The reroute control functions are processed by the NMRR program. The reroute control feature provides network managers with the capability to insert normally inaccessible routes into a route advance chain. That is, traffic may be rerouted away from congested network areas, represented by a trunk group called the from trunk group (FTG) to areas represented by a trunk group called the to trunk group (TTG) where sufficient switching capacities are available. The options consist of FTG trunk hunt options (when the control is effective), percentage options (percentage of calls affected), and selection of the TTG.

F. Network Management Enhanced Reroute Controls

4.06 The NMER controls are a type of flexible TGCs initially available with the 1AE8 generic program only. The NMERs have the same capabilities as the NMRRs. The NMERs are activated via TTY input messages, making these controls easier to activate/deactivate if compared to preprogrammed NMRRs. Four control options are available to the NMERs: immediate single reroute, immediate spray reroute, regular single reroute, and regular spray reroute controls.

G. Dynamic Overload Control (DOC) Signals

4.07 Program NMGT provides the use of DOC signals which are sent from tandem and toll offices to connected ESS switches requesting that they limit the amount of traffic being received. The ESS switches use the DOC signaling feature when shortages exist in real time, multifrequency receivers, dial pulse receivers, revertive pulse receivers, or other call switching resources. The NMGT program processes two levels of signaling for the shortages of real time and receivers. The shortage of real time is determined indirectly from the E-E cycle time through the length of the incoming overload control queue. The shortage of receivers for each receiver type is determined by the length of the queue for that receiver type. The program checks the thresholds for real time and receiver shortage every 2 seconds. When a threshold is exceeded, the sending of DOC signals is initiated. When the shortage drops below the threshold value, the transmission of the DOC signal is stopped. The two levels of signaling for the shortage of real time and receivers are known as MC1 and MC2. The MC1 level indicates that the machine is sufficiently congested to cause substantial delays in receiver attachment. The MC2 level indicates that the machine is considerably more congested than MC1 level. The MC2 level indicates delays of 40 to 80 percent of the receiver holding time. The MC3 signal is sent when the ESS switch is incapable of processing calls. The command source for the MC3 signal is derived from either of two lamp signals on the master control center (MCC). These are: (1) emergency action phase in progress and (2) repeated time-out. In general, the transmitted DOC signal is an ON signal interrupted by an OFF signal every 30 seconds. The interruption is provided by a duplicated hardware interrupter. The interrupter is monitored by program NMMP which switches the interrupters, sounds a minor alarm, and prints a TTY output message when a fault occurs.

H. Selective Incoming Overload Control

4.08 Program NMSC provides the use of SILC controls which are activated when the ESS switch becomes congested and traffic must be limited. The two levels of signaling for the shortage of real-time and receivers are processed in the same manner as for DOC (paragraph 4.07). The SILC controls apply only to MC1 and MC2, where DOC controls apply to all three levels of congestion. When either of these thresholds are crossed, SILC is automatically activated by the ESS switch that is congested.

I. Status Indicators

4.09 A visual display indicating the current machine and network status is activated via sig-

nal distributor (SD) points by program NMIN. Every 10 seconds, an entry is made to NMIN from the main program to update the indicators. The display indicates the status of:

(a) Transmitters (multifrequency, trunk dial pulse, revertive pulse)

(b) Receivers (touch-tone customer dial pulse, trunk dial pulse, trunk revertive pulse, and trunk multifrequency)

(c) Incoming load control

(d) Incoming overload queue

(e) Matching loss

(f) Machine congestion

(g) Internal queues.

ENGINEERING AND ADMINISTRATIVE DATA ACQUISITION SYSTEM

4.10 The EADAS system provides network managers information on traffic and status of the switching facilities located within the network for which the management center is responsible. This system consists of a minicomputer located at the network management center and associated data links connected to ESS switches.

4.11 The following four types of network management data are channeled to the centers from the ESS switches and displayed via modular display boards, cathode ray tube terminals, and receive-only line printers.

(a) Traffic

(b) Status and event discretes

(c) Network management control status

(d) Verification of the H and C schedule.

4.12 Traffic data, transmitted from the traffic data converter (TDC) over baud channels, is received by an interface circuit at the central location and is temporarily buffered. The central control unit (CU) scans the input channels and transfers each new data word to a temporary buffer area in the core memory. The central processor moves the data from the buffer core area to disk facilities where counts are accumulated. This data base on disk contains the accumulated totals for each input for each TDC and serves as the data base for the real-time calculations. At scheduled intervals, the accumulated data is written on magnetic tape.

4.13 All information passed between the EADAS facility and the ESS switch is coded into 8-bit characters. The characters are transmitted in pairs; each pair forms a word. The two 8-bit characters are stored in call store blocks. The input and output buffer area of call store is addressed by word N2EADAS. The scratch area in call store for the EADAS/NM function is pointed to by word N2EADAC. Parameter word N2NMEA is used to address a call store block which varies in size from 11 to 260 words. Eleven words of this block are used as a scratch and storage area for status discretes. If 5-minute flexible trunk group measurements are to be made, the remaining 249 call store words are required.

4.14 All data received at the EADAS collection center falls into one of three types:

(a) Single-count data

(b) Accumulated data

(c) Discrete-event data.

4.15 The EADAS center requests information by sending groups of characters called polls. There are three types of polls:

(a) Traffic (three characters)

(b) Interface (four characters)

(c) Network management (multiple characters).

4.16 The polls are received one character at a time. When the transmitter and receiver input scan routines detect a character on the EADAS channel, the character is loaded in the EADAS input hopper causing a main program job flag to be set. When all characters for a poll are received, the appropriate subroutine in the EADAS programs is entered which formats the data into the EADAS output buffer and turns on the EADAS output routine to transmit the block of words. As each character of a poll is received

from EADAS, the ESS switch sends it back to EADAS. The EADAS, in turn, validates the returned poll.

4.17 The NMEA program updates a copy of the status discretes using three methods: (1) scans for machine status indicators every 2 seconds, (2) updates a discrete when an event occurs in the machine, and (3) scans the indicators after an entry from EADAS/NM when the 20-second status discrete poll is received. With the EADAS/NM feature, the ESS switch scans the machine and network status indicators every 2 seconds and sets the status discretes accordingly. Once a machine status discrete has been set to the ON state, it remains in this state until the status block is transmitted to the EADAS/NM center.

4.18 When traffic counts are requested, the EDAS program assembles the counts from the H and C schedule that are flagged for the 5-minute network management data collections. The program transmits the data via the EADAS data link to the EADAS/NM center.

4.19 When an ESS switch requests the status of active controls, EADAS/NM sends special polls that simulate TTY inputs to the EADAS computer. When the EADAS computer receives one of these polls, it loads the American standard code for information interchange (ASCII) characters received as input with the poll into a special EADAS TTY buffer for the EADAS channel. The buffer is then released to the TTY program. The TTY program handles the data essentially the same as if the ASCII characters were input on a TTY at the office. As a result of the TTY processing, the network management program gets an entry from the TTY program. The network management program processes the message normally until it is time to output a response. When the network management programs realize that the request for data was an EADAS request, the data is formatted for output to EADAS. The output formats are the buffer layouts for the data being transmitted to EADAS/NM from the 1ESS switch via EADAS. Buffer layouts include a header, the length of the buffer being transmitted, data which can identify the type of control requested, and any specifics of the control which EADAS/NM may require to understand the status of the office. After formatting, the output is loaded in the EADAS output buffer. The ESS switch EDAS program will subsequently transmit the contents of this output buffer. In addition to the EADAS/NM output transmission, the network management programs also generate conventional TTY printouts on the network management or traffic channel. These printouts consist of messages that activate, deactivate, or change network management controls in the ESS switch.

5. FUNCTIONAL DESCRIPTION OF NETWORK MANAGEMENT PROGRAMS

CALLING LINE IDENTIFICATION (CLID) ADMINISTRATION PROGRAM

A. Function

5.01 The purpose of the CLID program is to maintain, in memory, codes used for identifying calling line directory numbers via CLID controls. Whenever the digit analysis programs determine that network control is in effect, a transfer is made to the NMGT program which searches the code block/CLID slots (Fig. 3) (1E7/1AE7 and earlier generic programs) for effective codes.

5.02 Effective with the 1E8/1AE8 generic programs, CLID performs the same function as outlined in paragraph 5.01 except that CLID slots are searched instead of code blocking slots. (Fig. 4).

B. Program Description

5.03 The program contains three global subroutines, CLENTR, CLRMVE, and CLLIST, for administering the CLID list. Each is initiated by a TTY input message. Figure 5 (1E7/1AE7 and earlier generic programs only) depicts a simplified flow diagram for each subroutine.

CLID Entry

5.04 The TTY input message, CI-ENTER, is used to place a code on the CLID list. After message validation, transfer is made from the TTIA program to global CLENTR. This subroutine makes a check for available space on the CLID list and, if none is found, a TTY output message NO is printed. If space is available, transfer is made to subroutine ROOM (1E7/1AE7 and earlier) or subroutine CONVERT (1E8/1AE8 and later), which converts and formats the dialed digits. If a duplicate control is found, the priority alarm in that control is replaced. If the input message is acceptable, a TTY output message OK is

returned. The program then transfers to the main program.

CLID Removal

5.05 Global CLRMVE is entered from the TTIA program when TTY input message CI-REMOVE is typed to request that a code be removed from the CLID list. The subroutine makes a transfer to subroutine ROOM or CONVERT (1E8/1AE8) to translate and set up the data for removal of the code. If the code is removed, a TTY output message OK is returned. The subroutine CLRMVE then transfers to the main program.

CLID Listing

5.06 Subroutine CLLIST is entered from the TTIA program in response to the TTY input message CI-LIST which lists the CLID entries. The subroutine is also entered from the NMGT or NMCG program. If an entry contains a DN, the digits are converted for printing by TTY output message CT06. If the subroutine was entered via the TTIA program, transfer is made to the main program. If the subroutine was entered from NMGT or NMCG, program control is returned.

NETWORK MANAGEMENT (NMGT) PROGRAM

A. Function

5.07 The NMGT or NMCG (1E8/1AE8 and later) program performs the following functions:

(a) Activates code blocking controls (1E7/1AE7 and earlier) or call gapping controls (1E8/1AE8 and later) via TTY input message.

(b) Deactivates code blocking controls or call gapping controls via TTY input message.

(c) Clears CLID entries in memory.

(d) Administers OUTGOING LOAD CONTROL lamp.

(e) Administers DOC signals.

(f) Audits memory associated with DOC scan points.

(g) Updates indicators (real-time breaks, timing, code block status or call gapping status, DOC data, and trunk group number [TGN] data).

5.08 Table E summarizes global subroutines interfacing with both the network management subsystem programs and other system programs.

B. Program Description

Call Processing Interface

5.09 When all digits have been received on a call and a network management is activated, a program entry is made at global NMCBCO (1E7/1AE7 and earlier) or global NMCGOR (1E8/1AE8 and later) from the ORDL program. This subroutine determines if the dialed digits match the digits in any of the code block slots/call gapping slots. If not, the program transfers back to ORDL. If there is a match for code blocking or call gapping and the call is determined to be blocked, the call is routed via a fixed route index to a recorded announcement by transferring to subroutine ORSTRI in ORDL.

5.10 Tandem traffic calls, received from PIDENTS ICAL and ICRV after all digits have been analyzed and a network management recent change has been applied, are passed to NMGT1A00 at global NMCBCI or NMCG at global NMCGIC (1E8/1AE8 and later). Tandem calls are processed in the same manner as normal originating calls.

Code Blocking Controls/Call Gapping Controls

5.11 When code blocking controls are activated via the TTY, a transfer is made from the TTIA program to NMGT or NMCG. If the request is not ignored because of a previous request being processed or the recent change buffer is full, this subroutine transfers to subroutine DATA CHK for a validation of the input data. Both the prefix code and digits are checked. If an error is found, TTY output message NM05 is returned. If the test result is a success, digit data words are formatted for processing. The subroutine DIGIT CHK converts the 0 digit to 10, ASCII code to binary coded decimal, and Xs to 0s. For calls affected by code blocking controls, one of four blocking control values (50, 75, 87 1/2, or 100 percent) may be applied. For calls affected by call gapping controls, one of thirteen gap intervals (ranging from 0.1 second to 600 seconds) may be applied.

5.12 When the control is manually deactivated by the TTY input message, the TTIA program transfers to NMGT or NMCG (1E8/1AE8 and later). If the scratch area is in use, a TTY output message NM06 is printed and control is returned to the TTIA program. If the scratch area is free, a transfer is made to subroutine DATA CHK for data validation. If the data is valid, a transfer is made to subroutine NMCLDA to deactivate the code block entry. Also, each rate center which the code block or call gapping entry indicates is checked by this subroutine to see if it is set up for blocking. The digits entered in the deactivation request are compared to the code block slots. If a match is detected, the entry is deleted and a TTY output message NM06 REMOVD is printed. Program control is returned to TTIA.

5.13 The code block slots can be cleared via the TTY input message CB-CLEAR. Subroutine NMCBRA is entered to check if an activate request is in progress. If so, a NM08 NG TTY output message is printed and control is returned to the TTIA program. If not, each occupied slot is deactivated and the NM08 TTY output message is printed indicating code blocks are cleared.

5.14 The call gapping slots can be cleared via the TTY input message CG-CLR. The NM08 TTY message is printed indicating the call gapping controls are cleared.

Administration

5.15 Subroutines NMOLLS and NMOLLR administer the state of the outgoing load control lamp. These subroutines are entered from PIDENTS NMTC and NMTG or NMCG to turn on and/or off lamp. Subroutine NMOLLS determines if the lamp is on due to an outgoing load control function. If so, program control is returned; if not, the lamp is lighted red. Subroutine NMOLLR turns the lamp off unless outgoing load control is active. The lamp is lighted amber when outgoing load control is in effect.

5.16 A listing of the active code blocking controls or call gapping controls is provided by subroutine NMCBST via TTY input message CB-STATUS or CG-STATUS (1E8/1AE8 and later), respectively. The NMCBST subroutine lists each occupied slot. The code and disposition of affected calls is printed in the TTY output message NM03.

5.17 The DOC signals are administered every 2 seconds by subroutine NMSDOC. A check is made to determine what threshold values to apply (minor overload, major overload, or normal). For real time, the current DOC levels are found by comparing the length of the incoming overload control queue to the MC1 and MC2 values. For real time concerning MF receivers, the length of the queue for the receiver is checked. Figure 6 shows the procedure for calculating DOC thresholds for MC1 and MC2.

5.18 Upon receipt of the DOC signal at the scan point that is associated with a preprogrammed TGC, global NMPPAA is entered from SSCD. The T1 bit is set to accept and the T2 bit is set to saturated so that the scanner will accept the next change of state of the scan point as a loss of the DOC signal. If an MC1, MC2, or MC3 acknowledgement is received, a transfer is made to subroutine NMDCAR in program NMTD. When the DOC signal is received, transfer is made to subroutine NMPAA1 in program NMTG.

5.19 The control is automatically reset by subroutine NMPPAR upon loss of the DOC signal associated with the preprogrammed TGC. The T2 bit is set to accept (saturated) and the T1 bit is unsaturated. In the case of a lost DOC signal, a transfer is made to subroutine NMPARI in program NMTG which deactivates the preprogrammed TGC corresponding to the DOC signals.

Audits

5.20 Each time the MSN audit function in program MAUD finds the nontrunk program index (NTPI) equals 57, an entry is made at subroutine NMT1T2 to audit the T1 and T2 bits associated with the DOC scan points. If the preprogrammed TGC is manually active, T2 is set to ignore. If the preprogrammed TGC is in the automatic active state, T1 is set to saturated and T2 is set to accept. If the preprogrammed TGC is not active, T2 is set to accept and T1 is unsaturated. When the audit is completed, transfer is made to subroutine MCRAMP in program MAUD.

5.21 Every 8 to 12 minutes, subroutine NMSEGA is entered from the SARG program to check the segmented work indicators in order to prevent lockout. The subroutine checks and updates indicators for real-time breaks, error print, timing, code block status, DOC data, and TGN data. If the indica-

tor fails to be reset, a TTY output message NM09 is printed. If no error is found, program is returned to SARG.

5.22 Periodically, an entry is made at global NMAUD1 to audit the TGCs. The subroutine first makes a transfer to subroutine NMEAAU, located in program NMEA, for an audit of the block 63 data structure. The call store constants, used by the NMGT or NMCG program, are initialized. A transfer is made to subroutine NMAUD4 for an audit of the code control slots. If the slot is incorrectly in the real-time break state, it is corrected and a TTY output message SA03 is printed.

5.23 If the slot is occupied, a range check is made on all the digits. If an error is found, an appropriate TTY output message SA03 is printed.

5.24 After all slots have been checked, the active code block or call gapping count is validated. If there is an error, the correct code block or call gapping count is entered and the SA03 output message is printed.

5.25 The final function of the audit subroutine is to print the TTY output message NM09 if error is detected. System control is then transferred to subroutine MACS24 in program MACR.

NETWORK MANAGEMENT INDICATOR (NMIN) PROGRAM

A. Function

5.26 The NMIN program performs two major functions:

(a) Updates network management indicators (machine status, network status).

(b) Provides a listing of trunk group no-circuit data.

B. Program Description

5.27 The indicator update function is performed by three subroutines:

(a) NMSTST [controls SD relays in the network management indicator circuit (SD-1A335-01)]

(b) NMGPOB (hunts POB and loads orders to operate SD relays)

(c) NMPOBI (idles POB and updates the state word).

Network Management Indicator Circuit

5.28 Every 10 seconds, an entry is made from the main program to NMIN at subroutine NMSTST to perform actions on the SD relays associated with the network management indicator circuit. The purpose of this circuit is to provide the interface for the network management display located in the network management center. The states of the circuit relays indicate the current machine and network conditions. The segment indicator in the call register is checked to determine the segment (1, 2, 3, or 4) that is to be processed. The office slot indicators and TGNs are updated for segment 1 only. When all TGNs are processed, transfer is made to subroutine NMGPOB.

5.29 After either a phase 3, 4, or 5 has occurred, the SD points associated with the network management indicator circuit are released. This action is required because the call store memory that contains the states of the points was zeroed during the phase.

Peripheral Order Buffer Execution

5.30 The NMGPOB subroutine obtains the register index and program tag data from word 0 of the pseudo call register (Fig. 7) for processing the POB containing the SD order. A unit type translation is performed for unit type 56, member number 2 to obtain the MTDN to be operated for each indicator. A subtype failure 4 is associated to the MTDN and stored in item FT of the pseudo call register. The appropriate SD order is then loaded in the POB.

5.31 The NMPOBI subroutine initially makes a transfer to subroutine PQIDWL in QEPR to idle the POB. The state word associated with the SD point of the call store block of memory dedicated to the network management indicator circuit is updated.

Trunk Group No-Circuit Data

5.32 When the TTY input message TGN-DATA is entered, a transfer is made to subroutine NMSTDT. This subroutine provides a TTY output

message NM16 printout which lists the TGNs to which no-circuit indicators are assigned in the member number 2 auxiliary block. The auxiliary block (Fig. 8) is accessed by subroutine NMDASG which provides a segmented list of the TGNs via a NM16A printout. A transfer is then made to the main program.

NETWORK MANAGEMENT MAINTENANCE (NMMP) PROGRAM

A. Function

5.33 The primary purpose of the NMMP program is to perform maintenance on the DOC transmit function and applique circuitry.

B. Program Description

5.34 The NMMP1A00 program is divided into seven program units.

(a) DOC Transmitter Scheduled and Demand Exercise

(b) DOC Transmitter Maintenance Universal Timing

(c) DOC Transmitter Interrupter Supervisory

(d) DOC Transmitter Maintenance (MC3 failure actions)

(e) DOC Transmitter (MCC lamp test interface)

(f) Loop Restoral

(g) Central Pulse Distributor Power Restoral.

DOC Transmitter Scheduled and Demand Exercise

5.35 The DOC transmitter scheduled and demand exercise subroutine NMMDEX is entered either from ECMP once every 24 hours or by request via the TTY. Its function is to test the interrupter circuits and emergency action (EA) timer to determine what maintenance actions should be performed. The exercise function will be aborted if either there are no POBs available or the MCC lamp test is in progress. Actions are performed which inhibit the MCC lamp test, restoral of DOC loops, interrupter, and MC3 failure actions. The EA timers are tested to ensure correct operation and accurate timing.

Interrupter Test

5.36 Periodic and duration tests are performed on the interruption signal requirements and testing tolerances. The interrupters are tested by POB orders which change the state of both interrupter power control relays on the SD applique circuit. When the orders are executed, a return is made to the client indicating either successful execution or failure. If only one interrupter functions correctly, the minor alarm is sounded and TTY output message NM26 is printed. If neither of the interrupters functions correctly, the major alarm is sounded and TTY output message NM26 is printed.

EA Timer and MC3 Loop Test

5.37 To test the MC3 loops, orders are loaded in the POB which operate or release the MC3 loop-around relay on the SD applique circuit. The purpose of the loop-around relay is to isolate the MC3 send and acknowledgement loops from the facilities. To test that the MC3 loops are sending and that the associated timer is operating, orders are loaded in the POB to operate or release the MC3 maintenance send relay. The MC3 maintenance relay has a similar input to the MC3 circuit as is the EA phase in progress lamp or the repeated time-out lamp.

Test Failure Response

5.38 Refer to TTY Output Manual OM-6A001-01 for a detailed description of the NM26 TTY output message for each type of failure in the NM26 TTY output message.

DOC Transmitter Maintenance Universal Timing

5.39 Once every second, an entry is made from the ECMP program to subroutine NMDXTR to administer most of the timing necessary for the operation of all the NMMP subroutines. When the entry is made while the interrupter is running correctly, the counter N2D0CXFOR is incremented on every entry.

DOC Transmitter Interrupter Supervisory

5.40 In the case where the failure of the active interrupter is caused by counter overflow when no interruption is transmitted for 31 seconds, a steady on-signal is sent on the DOC loops. This invalid signal times out all of the DOC receivers. The

failing interrupter is removed from service and the standby interrupter is activated. If all activated DOC loops fail to return an acknowledgement, a second counter is incremented. This counter overflows within 4 seconds if the same failure exists. Subroutine NMSINT also resets this counter. This subroutine is entered from the NMTD PIDENT.

DOC Transmitter Maintenance (MC3 Failure Actions)

5.41 Whenever a MC3 false acknowledgement is received, an entry is made to subroutine NMDXFL from NMTD to isolate the MC3 loops from the facilities. The MC3 false acknowledgement is a hardware failure in the DOC transmitter that causes MC3 to unknowingly be transmitted. When a failure is detected, a minor alarm is sounded and TTY output message NM26 is printed.

DOC Transmitter (MCC Lamp Test Interface)

5.42 Whenever a manual request is made via the TTY to test the MCC panel lamps, an entry is made to subroutine NMMCLT. The purpose of this subroutine is to prevent the sending of MC3 signals during the lamp test. The loop-around relays are operated in such a manner that they will not cause any interference with any of the DOC maintenance actions being performed.

Loop Restoral

5.43 When TTY input message DOCX-RESTORE is received, an entry is made to subroutine NMMRST. If either a MC1 or MC2 loop is indicated in the request, the subroutine restores the loop out-of-service bit. If MC3 loop is indicated and POBs are available, the loop out-of-service bit is restored and the loop-around relay is blind-idled. If no POB is available, the response NO is returned.

Central Pulse Distributor Actions for Power Restoral

5.44 Subroutine NMSPOW is entered from PIDENT MCLM when the power alarm on the DOC frame indicates that power has been restored. Since the interface circuitry between the CPD and the interrupter selection relays does not predictably set or reset when power is removed and restored, the NMSPOW routine repulses the CPD points according to the present state circuit indicator.

NETWORK MANAGEMENT REROUTE CONTROLS

A. Function

5.45 The NMRR program provides network managers the capability to reroute traffic away from congested or trouble switching facilities to other facilities having sufficient switching capacities. The reroute control function allows traffic destined for one trunk group called the FTG to be routed to another trunk group called the TTG. The reroute control options are trunk hunting, percentage of blocking, type of traffic, and TTG selection. Trunk hunting may be either immediate or regular. Preprogram NMRRs have 5 percentage options (0, 25, 50, 75 and 100 percent) for controlling direct and/or alternate route traffic. Up to three TTGs may be selected for the rerouted traffic.

5.46 Effective with the 1AE8 generic program only, NMERs (flexible TGCs) perform the same functions as preprogrammed NMRRs. The NMERs have an additional control option called the cancel in-chain return option. The cancel in-chain return option gives the network administrator the ability to prevent the return of rerouted attempts to normal in-chain routing (trunk hunting), when all TTGs are busy at the originating office. Immediate reroutes have nine percentage options (0, 12.5, 25, 37.5, 50, 62.5, 75, 87.5 and 100 percent) for controlling direct and/or alternate routed traffic. Regular reroutes also have nine percentage options (same as the immediate reroute percentages) used for rerouting traffic that overflows the FTG. Up to seven TTGs can be selected for the rerouted traffic.

B. Program Description

Reroute Control Activation

5.47 Two methods are provided for activation of the reroute controls.

(1) TTY input message [flexible (NMERs) or preprogrammed (NMRRs)]

(2) Saturation of scan point associated with a preprogram reroute control caused by the reception of a DOC signal.

Note: Only preprogrammed NMRRs can be activated by DOC signals.

5.48 When a preprogrammed reroute control is manually activated, the outgoing load control bit in the trunk group head cell is set. Parameter word N2TGNANX points to the trunk group head cell (TGNANX). One word (reroute control slot) is required for each trunk group that can be controlled via a TGC. The reroute control slot contains a preprogrammed TGC pointer (NMPTR). This pointer indexes the TGC/activity block (TGPP). This call store block is required for each trunk group in the office that can be controlled via a preprogram TGC. The TGPP call store block is indexed by bits 1 through 7 of word 2 in the unit type 46 auxiliary block (Fig. 9) or from the TGNANX call store block. Also, for preprogrammed reroute controls to be functional, optional word R in the supplementary TGN translator auxiliary block must be built. Optional word R is required for any TGN that can be used as a FTG or a TTG.

5.49 For flexible reroute controls, TGNANX call store word indicates if a flexible reroute control is active. Bits 7 through 13 of the TGNANX word (associated to the trunk group being controlled) contains a flexible reroute control pointer (FLXPTR). The FLXPTR points to the flexible TGC block. This block contains the single or spray reroute indicator and associated reroute index. The reroute index points to one of the two reroute control tables, single reroutes (Fig. 10), or spray reroutes (Fig. 11).

5.50 The activation of a preprogrammed reroute control caused by the DOC signal results in the network management lamp on the MCC being lighted. If no reroute control slot is available, the data structure is initialized except for the reroute control slot. When a slot becomes available, the initialization is performed by the audit routine. Table F summarizes global subroutines interfacing with the network management subsystem programs.

Base Level Call Processing

5.51 When all digits have been received on a call and network management reroute control is activated, a transfer is made from the ORDL program to subroutine NMRRCO in NMRR. This subroutine checks the reroute indicator in the change-in-network (CIN) failure word. If rerouting is not indicated, program control is returned. If rerouting is indicated, digits 1, 2, and 3 are translated by subroutine TRNRCD located in program TRBD to check for reroutability of the three digit codes. If seven digits are associated with the call and the numbering plan area (NPA) of the FTG and TTG are different, the NPA of the FTG is inserted into the call register. If ten digits were dialed, the NPA digits in the call register are checked to determine if they were the same as the NPA of the TTG. If the NPA digits in the call register match those in the NPA associated to the terminating TTG, the NPA digits are deleted from the call register. After the call register digits have been set up for completion on the TTG, the route index (RI) in the call register is changed to the TTG RI and is stored in the reroute control word.

5.52 Tandem calls are passed to subroutine NMRRCT from programs TAND and HLOP. This subroutine performs the same functions as subroutine NMRRCO on local calls but returns the call with a route index tag (RIT) of 11 to the client.

Traffic Count

5.53 Traffic counts are made for preprogrammed NMRRs and flexible NMERs. A count of reroute attempts is made for both types of reroute controls. For flexible NMERs only, a traffic count is also made for successful reroutes (i.e., a rerouted call that finds an idle trunk in the TTG).

Reroute Control

TTG Rerouting

5.54 When another trunk group control is active on a TTG, an entry is made from the NMTG program to subroutine NMRRIT. This subroutine checks the RIT for a value of either 9 or 11 to determine if the call is a reroute attempt. If it is and the trunk group control is a ***to-control***, the call is cancelled and the call cancelled counter is updated. If the type of control was neither cancel-to nor skip, a check is made for immediate rerouting. If this is the condition, the call is also cancelled. If immediate rerouting is not indicated, the call is returned to base-level call processing where the reroute to the TTG occurs. Therefore, post-hunt controls are simply ignored.

Preprogrammed and Flexible Rerouting

5.55 If the control on the TTG is cancel-to, subroutine NMRRPP is entered from the NMTG program. Program control is returned to NMTG if rerouting is not indicated. However, if rerouting is indicated, the subroutine CPTGCOM is requested to

process the reroute control. The call is rerouted and the traffic counter is updated. Program control is returned to TRBT.

Regular and Immediate Reroute Control Process Routine

5.56 Subroutine CPTGCOM is used by subroutines NMRRPP and NMRRFX to process the reroute control on the TTG. For both flexible and preprogrammed reroute controls, a check is made to determine if the call is an alternate or regular reroute. If the reroute is an immediate reroute, the control percentage is obtained (for either direct or alternate-routed) and the call is rerouted accordingly. Program control is then returned to NMTG. If regular rerouting is indicated, transfer is made to the translation program.

FTG Overflow

5.57 If a preprogrammed control call overflows the FTG, an entry is made at subroutine NMRRAF. This subroutine determines if the call is within the percentage of calls to be rerouted for a regular reroute; in which case, the traffic counter is updated and program control is returned to TRBT which reroutes the call. If the call is not reroutable, a transfer is made to TRBT with this indication.

Reroute Control Slot for Manual Preprogrammed Activation

5.58 When the TTY request PP-ACT to activate preprogrammed control is received, subroutine NMPPMA of the program is entered from the TTIA program. A transfer is made from NMPPMA to subroutine NMRRSL to check for reroute control and ensure that a reroute control slot is available for manual preprogrammed reroute activation. If a slot is available, program control is returned to NMTG. If one is not available, rejection data is set up for TTY output message NM07, and transfer is made to subroutine NMFCAR in NMTG.

Reroute Control Slot Initialization

5.59 During the search for the highest priority preprogrammed control performed by subroutine PPFNDA in NMTG, a transfer is made to subroutine NMRRPA to initialize the reroute control slot for the preprogrammed activation request. The reroute control slot is initialized by information stored in the preprogram data and in the supplementary TGN auxiliary block for the FTG and TTG.

Control Slot Deactivation

5.60 During the deactivation routines, a transfer is made to subroutine NMRRFD to deactivate the associated control slot. If the control is a reroute, the associated reroute control slot is zeroed and program control is returned to NMTG. If the control is not rerouted, the flexible control word is zeroed, and a return is made to NMTG.

Reroute Control Status Printout

5.61 In response to TTY input message RR-STATUS, subroutine NMRRST is entered. The message is used only when the NM lamp is lighted. The output message NM27 lists the information concerning the call that caused the NM rerouted call cancelled lamp to light. This subroutine sets up data for printing. The data includes TTG number, FTG numbers, type of reroute control, cancellation information, peg count of rerouted cancelled calls, and activation control. Program control is returned to TTIA.

Audit

Reroute Control Slots

5.62 Subroutine NMARCS is entered from NMTG to audit the preprogrammed reroute control slots located at the N2NMRR address. If the first word of any slot is zero and all other words contain data greater than zero, the control slot is zeroed, audit 32 error 58 is printed on the TTY. If the reroute slot index being counted in slot 0 for cancelled calls is out of range, slot 0 is zeroed, audit 32 error 70 is printed. If there is any error in word 0 of any slot, the corrected data is stored in the slot and audit 32 error 60 is printed. If a slot is active but its associated preprogrammed control is not active, the slot is zeroed and audit 32 error 59 is printed. If an error is detected in word 1 of any slot, the correct data is stored in the word and audit 32 error 61 is printed. If an error is detected in any TTG information, the TTG information is corrected and audit 32 error 62 is printed. If any word in an unused TTG position is found nonzero, the TTG position is zeroed and error 63 is printed. Program control is returned to MACR.

Linkage From Preprogrammed Control Words to Reroute Control Slot

5.63 During the audit of the control and activity words associated to the TGC couplets, a transfer is made to subroutine NMRRPL to perform an audit on the reroute control items in the preprogrammed TGC words. The audit 32 error 73 is printed if the preprogrammed control is a regular reroute but the regular reroute bit is not set. If the preprogrammed control is a manual reroute and there is no linked reroute slot, audit 32 error 59 is printed and the control is deactivated. If the preprogrammed control is automatically active and no reroute slot is linked, the subroutine performs the linkage. If the reroute slot index is out of range, the control is deactivated and audit 32 error 78 is printed. If the slot used by the preprogrammed reroute control is idle, the preprogrammed control is deactivated and audit 32 error 74 is printed. Program control is returned to the NMTG program.

NETWORK MANAGEMENT TOLL CODE BLOCKING (NMTC) PROGRAM

A. Function

5.64 The NMTC program provides the capability for blocking intertoll calls destined to congested areas having facility switching problems due to telethons, natural disasters, etc. Toll blocking is applied to 1 and 1A ESS switches (local and toll) on a per system basis and is effective on a per call basis.

B. Program Description

Toll Code Blocking Controls

Activation

5.65 When toll code blocking is activated by TTY input message CB-ACT, entry is made in call store which contains the local/toll 3-digit index corresponding to the first three digits of the destination code. The rate center status translator (3-digit index) (Fig. 12) provides the toll code blocking indicator and the home NPA associated with the translator. The temporary recent change on each 3-digit translator points to the code block slot information stored in the call store block.

5.66 When toll code blocking is activated, a transfer is made to NMTC. The activation request initiates possible code blocking on 7- and 10-digit locally originating traffic. The subroutine transfers to subroutine DATA CHECK to validate the input request data. The prefix code is checked for 0 or 1. If valid, the remaining dialed digits are checked. The percentage of control, 50, 75, 87 1/2, 100 percent, is obtained and transfer is made to subroutine ACT REQUEST to activate the control.

5.67 The activation subroutine searches for an idle control slot and, if found, the slot is linked to existing slots with the same first three digits identified in the TTY input request. When the NPA of the code block entered matches an NPA in the 3-digit index to the NPA translator, two slots are required. If the toll code block request matches an active control, the control is replaced and TTY output message NM05 is printed. If the request is associated with CLID and matches an active control, the control is not replaced. If there are no idle control slots, this subroutine checks for active controls which may match and replace the existing control.

5.68 In addition to the time of activation, the following responses are given:

(a) ACTVTD (activation completed)

(b) REJCTD (request rejected because of equipment capability)

(c) ERROR (request rejected because of error in input data)

(d) IGNORD (request rejected because system was in process of executing previous CB-ACT request).

Deactivation

5.69 When the TTY input message CB-REM is entered to deactivate the code blocking control, transfer is made to subroutine NMCBOF from TTIA. If the scratch area is in use, TTY output message NM06 is printed and control is returned to TTIA. However, if the scratch area is free, a transfer is made to subroutine DATA CHECK to validate the input request data. The scratch area is set up with the request data and is used as input to this subroutine. If the input data is valid, a transfer is made to subroutine DEACT to remove the code blocking control. A TTY output message is printed indicating the

action performed. Program control is then returned to TTIA.

Removal of All Code Blocking Controls

5.70 When the TTY input message CB-CLEAR is entered, a transfer is made to subroutine NMCBRA from TTIA to remove all toll code blocking controls. Subroutine DEACT deactivates each code blocking slot. The TTY output message NM08 is printed indicating all code block controls were removed. Program control is then returned to TTIA.

Toll Blocking Status

5.71 If TTY input message CB-STATUS is entered, a transfer is made to subroutine NMCBST from TTIA to list the active toll blocking controls. The listing is printed via the TTY output message NM08.

NETWORK MANAGEMENT CALL GAPPING (NMCG) PROGRAM

A. Function

5.72 The NMCG program provides manual code control of originating inter-LATA carrier traffic based on a specific carrier access code (ignoring the destination code) or based on a specific destination code (ignoring the carrier access code). Call gapping controls are applied to 1 and 1A ESS switches (local and toll) on a per system basis and is effective on the following types of codes:

(a) 10XXX (XXX = inter-LATA carrier code)

(b) 10XXX-NPA

(c) 10XXX-NPA-NXX

(d) NPA

(e) NPA-NXX

(f) NPA-NXX-XXXX

(g) XXX (e.g., 611).

B. Program Description

Call Gapping Controls

Activation

5.73 When call gapping is activated by TTY input message CG-ACT, the 3-digit index to the NPA translator indicates the NPA of those rate centers to which call gapping controls and CLID entries are applicable. The input to the 3-digit NPA translator is a 3-digit subtranslator index (Fig. 9). The output is an indicator for call gapping and CLID with the NPA associated with the subtranslator. Call gapping and CLID have separate set cards. The call gapping control slots per office are 0 through 63. The CLID control slots per office are 0 through 31.

5.74 The activation subroutine (ACT REQUEST) searches for an idle control slot and, if found, the slot is linked to existing slots with the same first three digits in the TTY input request. If the call gapping request matches an active control, the control is replaced and TTY output message NM05 is printed. If the request is associated to the CLID entry and matches an active control, the control is not replaced. A return is made and TTY output message NM05 is printed to verify the request is on the CLID list. If there are no idle control slots, this subroutine checks for active controls which may match and replace the existing control.

5.75 In addition to the time of activation, the following responses are given:

(a) ACTVTD (activation completed)

(b) REPLACED (replaced control information is completed)

(c) INVINP (invalid input parameter)

(d) INVCOD (invalid code)

(e) NOFSL (no slots available)

(f) RCAFUL (ignored request, temporary recent change area full).

Deactivation

5.76 When the TTY input message CG-RMV is entered to deactivate the call gapping control,

transfer is made to NMCBOF from TTIA. If the scratch area is in use, TTY output message NM06 is printed and control is returned to TTIA.

Removal of All Call Gapping Controls

5.77 When the TTY input message CG-CLR is entered, a transfer is made to subroutine NMCBRA from TTIA to remove all call gapping controls. Subroutine DEACT deactivates each call gapping slot. The TTY output message NM08 is printed indicating all call gapping controls were removed. The program control is then returned to TTIA.

Call Gapping Status

5.78 If TTY input message CG-STATUS is entered, a transfer is made to subroutine NMCBST from TTIA. This subroutine lists all active call gapping controls, or a list of active call gapping controls for carrier interconnect codes only, or a list of active call gapping controls for NANP codes only. Also, the number of available call gapping control slots are displayed.

Recent Change Update

5.79 During the activation routine, all the codes that exist on a particular 3-digit NPA are linked together. The system checks the linked slots to determine if a slot identical to the requested control message already exists. If one exists, it is replaced by the requested message data. If the requested message input is unique, it is placed in the linked list according to the number of digits.

TRANSMIT DYNAMIC OVERLOAD CONTROL SIGNALS (NMTD) PROGRAM

A. Function

5.80 The NMTD program administers the transmission of DOC signals which are sent from a tandem or toll office to connected local offices requesting that they limit the amount of traffic in the network.

DOC Signal Levels

5.81 Two levels of signaling are used for identifying the shortage of real time and the shortage of receivers. These levels are called MC1 and MC2. The MC1 level is the indication that the switching machine is sufficiently congested to cause substantial delays in receiver attachment. Delays that range from 20 to 40 percent above normal receiver holding time are considered substantial. The MC2 level is the indication that the machine is considerably more congested than the MC1 level. At the MC2 level, delays that range from 40 to 80 percent above normal receiver holding time will be expected.

5.82 The MC3 level of signaling is sent when the system is incapable of processing calls. The command source for this type of signaling is derived from one of two lamp signals located on the MCC system status panel. They are: (1) emergency action phase in progress and (2) repeated time-out activated.

DOC Signal Acknowledgement

5.83 The DOC signal is an on-signal interrupted by an off-signal every 30 seconds. The duration of the off-signal is approximately 1 second. The acknowledgement, returned from the receiving office, must be identical to the transmitted signal. Acknowledgements of the DOC signal are detected at the transmitting office by supervisory scan points. For MC1 and MC2 DOC levels, the signal is removed and marked out-of-service either when an acknowledgement is not received within 2 seconds or when an acknowledgement is received without a signal having been sent. Acknowledgements of the MC3 level signal are made after recovery of the system.

B. Program Description

5.84 The NMTD program provides approximately 28 global subroutines, which allow entry by three system programs plus the network management subsystem programs. Table G lists the global subroutines and interfacing programs.

Scheduled ECMP Entries

5.85 Every 10 seconds, entry is made to subroutine NM10SC to validate the acknowledgements. A TTY output exception message is printed every 5 minutes containing information on peg and usage counts.

DOC Loop State Change

5.86 The NMGT program enters global NMSEND to check if a change of state has occurred in

any of the DOC loops or if a manual TTY request has been initiated. If a change in state is detected, the subroutine stores the RI pointer associated with the DOC loop in the client register. Subroutine NMHPOB is then entered to hunt and seize a POB and load orders to operate the SD points. Upon execution of the orders, the POB is idled by subroutine NMIPOB. Program control is then returned to the client program.

DOC Signal Acknowledgement

5.87 Whenever translations identify a unit type member number 56, a transfer is made from the NMGT program to subroutine NMDCAR. This subroutine sets an acknowledgement bit for each DOC loop and returns program control to the ECMP program.

Audit

5.88 During a phase 3 system operation, an entry is made at subroutine NMTDTT which performs an audit on the T1 and T2 scan points. The audit sets the T1 and T2 bits to the accept and unsaturated conditions.

NETWORK MANAGEMENT SELECTIVE INCOMING OVERLOAD CONTROL (NMSC) PROGRAM

A. Function

5.89 The NMSC program provides the capability of applying SILC to limit traffic when an ESS switch is in a MC1 or MC2 state. When a connecting ESS switch does not have DOC, SILC controls can be used.

B. Program Description

Assignment

5.90 Two SILC blocking percentages (P1 and P2) must be specified and stored in the carrier interconnect office options auxiliary block. These percentages determine how much of the incoming traffic is to be blocked. The recent change message, RC:PSWD, is used to enter and change the SILC blocking percentages (P1 and P2). Now, the trunk group(s) can be assigned SILC via TTY input message NMG-SILC-A (specifying the TGN). Any 1-way incoming MF or 2-way MF trunk can be assigned SILC.

One of the following responses can be outputted when assigning SILC:

(a) ACPT (activation completed)

(b) INVD (TGN invalid, request denied)

(c) NOBP (no blocking percentage for MC1 or MC2, request denied)

(d) NTFD (TGN not found, request denied)

(e) OVFL (call store table is full, request denied)

(f) DENY (SILC is not in office, cannot request)

(g) DUPL (request accepted but is a duplicate).

Two levels of congestion (MC1 and MC2) are used to identify the shortage of real time and the shortage of receivers. Blocking percentage P1 is used when the ESS switch is in MC1 state, P2 is used when the ESS switch is in MC2 state.

Activation

5.91 When the ESS switch is in MC1 or MC2 state, SILC is automatically activated.

Deactivation

5.92 When the ESS switch returns to normal processing of calls, SILC is automatically deactivated.

Removal

5.93 The TTY input message, NMG-SILC-R, is used to remove SILC control(s) from the trunk group(s). The network administrator can specify to remove SILC from one trunk group or remove SILC from all trunk groups in the ESS switch. The responses for assigning SILC also apply to the removal of SILC.

Status

5.94 The TTY input message, NMG-SILC-S, is used to obtain a list of active SILC controlled trunk groups. Also, the list includes the number of blocked calls per associated trunk group, blocking percentages, and current MC0, MC1, or MC2 state.

NETWORK MANAGEMENT (NMTG) PROGRAM

A. Function

5.95 The NMTG program provides the capabilities to apply controls which limit the amount of traffic leaving an office based on the trunk group over which a call is to be routed.

5.96 Four types of TGCs are provided:

(a) ***Cancel-to*** controls the number of call attempts offered to a trunk group. Upon encountering this control, a call which is to be affected is inhibited from searching any trunk group for an idle trunk and is routed to no-circuit announcement. Control variables are: (1) trunk group on which the control is to be activated, (2) percentage of direct-routed traffic to be affected, and (3) percentage of alternate-routed traffic to be affected.

(b) ***Cancel-from*** controls the number of call attempts overflowing a trunk group. Upon encountering this control, a call to be affected is inhibited from hunting for an idle trunk after overflowing this trunk group. Control variables include the trunk group on which the control is to be active and the percentage of overflow traffic to be affected.

(c) ***Skip*** controls the number of call attempts offered to a trunk group. Upon encountering this control, a call to be affected is inhibited from searching this trunk group for an idle trunk but is allowed to be alternately routed to the next trunk group. Control variables are: (1) trunk group on which the control is to be active, (2) percentage of direct-routed traffic to be affected, and (3) percentages of alternate-routed traffic to be affected.

(d) ***Trunk reservation*** allows the selection of a specified number of trunks in a trunk group. It limits the number of attempts offered to a trunk group when fewer than the specified number of trunks remain available. The purpose of the control is to dynamically limit the attempt when less than a specified number of trunks are idle in the trunk group at the time the control is activated. Two thresholds are provided per trunk group protectional reservation of equipment (PRE) threshold and directional reservation of equipment (DRE) threshold.

5.97 Effective with the 1AE8 generic program only, four additional TGCs are provided NMERs:

(a) ***Immediate single reroute*** controls offer traffic to only one specified TTG before it has attempted rerouting on the FTG.

(b) ***Immediate spray reroute*** controls offer traffic to a maximum of seven TTGs before it has attempted rerouting on the FTG.

(c) ***Regular single reroute*** controls offer traffic to only one specified TTG only after traffic has overflowed the FTG.

(d) ***Regular spray reroute*** controls offer traffic to a maximum of seven TTGs only after traffic has overflowed the FTG.

B. Program Description

Direct and/or Alternate Routed Traffic

5.98 During the basic trunk translations performed by the TRBT program, the outgoing load control indicator in the trunk group head cell is checked to determine if TGCs are activated. If one is activated, a transfer is made to the NMTG program at subroutine NMBEF. Upon entry, this subroutine determines if the call is to be rerouted. If the call is a reroute attempt, a transfer is made to NMRR at subroutine NMRRIT. If this is the case and the TGC indicates control, no connection is made to the no circuit announcement (NCA).

5.99 The item FLXPTR in the trunk group head cell annex (Fig. 13) is checked to determine if flexible control is active. If control is active, another check is made to determine the type of control, cancel-to, cancel-from, skip, or trunk reservation. Effective with the 1AE8 generic program only, a check is also made of the following to determine the type of control active: immediate single reroute, immediate spray reroute, regular single reroute, or regular spray reroute.

5.100 If the control is cancel-from (not cancel-to, skip, or trunk reservation), a transfer is made to NMRR at subroutine NMRRFX to check for and process the flexible reroute actions. If the controlling factor is trunk reservation, if the number of idle trunks in the trunk group is greater than the

DRE threshold value, if the number of idle trunks in the trunk group is less than the PRE threshold value, and if the call is not alternately routed, a check is made by the subroutine PP CHK to see if the preprogram control is active. If the preprogram control is found to be inactive, with both cancel-to and skip controls activated, the call is routed via the NCA. If the call is not affected, the call is completed if all the trunks are not busy. However, if all trunks are busy and neither preprogrammed controls nor flexible controls have been cancelled, the call is routed normally. If the call is percentage effective, the call is routed to the NCA.

Preprogram Trunk Controls

Automatic Activate

5.101 Automatic activation occurs upon receipt of the DOC signal at the scan point associated with a preprogrammed trunk group (unit type 56, NTPI 57). Entry is made from the supervisory signal change director (SSCD) program to NMGT at subroutine NMPPAA when the DOC signal is received. This subroutine transfers to subroutine NMPAA1 which performs the activation routines. If the preprogram is in a manual state, this subroutine returns the control to NMGT; otherwise, the preprogram number is checked for validity, the network management lamp is lighted, and the preprogram number is stored in the trunk group activity word of the trunk group control and activity block (Fig. 14). If the trunk group is not under manual control, a check is made of the control word in the block to determine if the preprogram is in control. If the preprogram is in control, a priority test is performed. Priorities are assigned as 1, 2, or 3 correlating to machine congestion levels. If the test proves to be a higher priority, program control is returned; otherwise, an automatic preprogram search is made by subroutine PPACT2.

Manual Activate

5.102 When preprogram control is manually activated by the TTY input message PP-ACT, immediate control is taken on the associated trunk group replacing any manual control currently on that trunk group and overriding any activation requests received automatically via the DOC signals. If the TTY request contains a valid preprogram number, a TTY output message NM07 is printed. If the preprogram control is already manually active, a TTY output message NM01 REQ OVERRIDES is printed. If the preprogram control is not active, the network management lamp is turned on. Program control is then returned to the TTIA program.

5.103 If the preprogram control is in the manual exclude or out-of-service state, the out-of-service condition is removed. The T2 bit for the supervisory scan point associated with the preprogram is set to zero, and its activity slot in the trunk group activity word is zeroed. If the trunk is already manually controlled, the preprogram control is removed.

Automatic Reset

5.104 Upon the loss of the DOC signal associated with the preprogram control, a transfer is made from subroutine NMPPAR in NMGT1A00 to subroutine NMPAR1. This subroutine deactivates the preprogram control corresponding to the DOC signal. If the preprogram control is valid and not in the manual state, subroutine PPDACT is requested to perform the deactivation procedures. If the preprogrammed flexible control is not active, the network management lamp is turned off. If a higher priority preprogram is in control of the trunk group, program control is returned; otherwise, a search is made for the correct preprogram to control the trunk group by subroutine PPFIND.

Manual Reset of Preprogrammed Controls

5.105 When the TTY input message PP-REM is received, subroutine NMPPMR is entered. The purpose of this subroutine is to either deactivate a preprogram control or restore a preprogram which is excluded from activation via the DOC signals. If the preprogram control is not in the manual state, a TTY output message NM07 is printed and the program transfers to the TTIA program. If the preprogram is manually active, the TTY output message NM07 is printed with the OK option and the preprogram is removed from the active state. Program control is then passed to the TTIA program. When the preprogram control is removed from the active state, the preprogram counter is decremented, and if no network management controls are left active, the network management lamp is turned off and the preprogram is taken out of the manual state. If there is a master scanner number associated with the preprogram, the T2 bit is set to the accept condition and the T1 bit is set to unsaturated. If the trunk group is manually controlled, program control is re-

turned; otherwise, a search is made for the high priority preprogram to control the trunk group by subroutine PPFNDA.

Manual Exclude

5.106 Upon receipt of the TTY input message PP-EXC, an entry is made to subroutine NMPPME. The purpose of this subroutine is to exclude the preprogram control from activation by the DOC signal. If the preprogram identity is valid, a TTY output message NM07 is printed with the OK option. If the preprogram is not in the manual or out-of-service state, the active preprogram counter is incremented, the network management lamp is turned on, and the T2 bit is set to the ignore condition. However, if the preprogram was in the reset state, program control is returned to the TTIA program. If the preprogram was not in the reset state, the preprogram is deactivated by subroutine PPDACT before the return is made to the TTIA program.

High Priority Automatic Preprogram Search

5.107 The purpose of subroutine PPFNDA is to determine which preprogram controls the trunk group that has been automatically activated. The subroutine selects the highest priority of three possible preprograms. If the trunk group activity word is zeroed, a transfer is made to subroutine UNLINK. When the preprogram of the highest priority is found, a unit type member number translation is made and checked for validity. An indirect transfer is then made to subroutine NMRRPA located in the NMRR program to check for reroute and to initialize the reroute slot. Upon return, the outgoing load control bit is set in the trunk group head cell and the network management lamp is turned on. Program control is then returned to the client program.

Remove Specific Preprogram

5.108 The subroutine UNLINK removes the linkage in the trunk group head cell and the trunk group head cell annex for a preprogrammed TGC. If a preprogram is in control, the TGC word is zeroed, the pointer in the trunk group head cell annex TGNANX is removed, and the outgoing load control bit is reset according to the status of the preprogram control.

Clear-Manual Preprogram

5.109 As a result of the TTY input message PP-CLEAR, subroutine NMPPRA is entered to deactivate all manual preprograms currently active and to restore all preprograms currently inactive via the DOC signals. After all preprograms are checked and cleared, program control is returned to the TTIA program.

Flexible Trunk Group Controls and NMERs (1AE8 Only)

Cancel-to-Activate

5.110 When the TTY input message CT-ACT is received, the subroutine NMCTAT is entered. The purpose of this routine is to activate a cancel-to control on a flexible trunk group. The TGN is placed in the flexible TGC block N2NMFLEX (Fig. 15) and both direct and alternate percentages are validated. Transfer is then made to subroutine TGN SETUP for activation.

Skip Activate

5.111 When the TTY input message SK-ACT is received, the subroutine NMSKAT is entered. Its purpose is to activate a skip control on a flexible trunk group. The control code 5 is loaded, TGN is placed in the flexible TGC block N2NMFLEX, and both direct and alternate percentages are validated. Transfer is then made to subroutine TGN SETUP for activation.

Cancel-From Activate

5.112 When the TTY input message CF-ACT is entered, a transfer is made to subroutine NMCFAT. The TTY message activates a cancel-from control on a flexible trunk group. The TGN is stored in the flexible TGC block N2NMFLEX. The overflow percentage is validated and transfer is made to subroutine TGN SETUP for activation.

Reservation Activate

5.113 As a result of TTY input message TR-ACT, the subroutine NMTRAT is entered. The purpose of this routine is to activate a trunk reservation control on a flexible trunk group. The PRE and DRE are compared with the number of equipped trunks in the specified trunk group. If the PRE threshold value is greater, all traffic alternate-routed to the trunk

group is inhibited from searching for an idle trunk in any trunk group and is routed to the NCA. If the DRE threshold value is greater, all traffic to that trunk group is inhibited from searching for an idle trunk in any trunk group and is routed to the NCA.

5.114 The following are four NMERs that are reserve active as a result of the associated TTY input messages:

(a) ***Immediate Single Reroute:*** When the TTY input message IR-ACT is entered, a transfer is made to subroutine NMIRAC. This activates an immediate single reroute on a flexible trunk group. Subroutine SINGLE-SLOTS is entered to search for a vacant 6-word slot in the single reroute table. The control code for a flexible reroute (3) is then placed in the flexible TGC block (N2NMFLEX).

(b) ***Immediate Spray Reroute:*** When the TTY input message IR-SPRAY is received, the subroutine ISPRAY is entered. The TTY message activates an immediate spray reroute on a trunk group. Subroutine SPRAY-SLOTS is entered to search for a vacant 24-word slot in the spray reroute table. The control code for a flexible reroute (3) is then placed in the flexible TGC block (N2NMFLEX). Program control is transferred to TGN-SETUP for activation.

(c) ***Regular Single Reroute:*** When the TTY input message RR-ACT is entered, a transfer is made to the subroutine NMRRAC. This activates a regular single reroute on a flexible trunk group. Subroutine SINGLE-SLOTS is entered to search for a vacant 6-word slot in the single reroute table. The control code for a flexible reroute (3) is then placed in the flexible TGC block (N2NMFLEX).

(d) ***Regular Spray Reroute:*** When the TTY input message RR-SPRAY is received, the subroutine RSPRAY is entered. The TTY message activates a regular spray reroute on a trunk group. Subroutine SPRAY-SLOTS is entered to search for a vacant 24-word slot in the spray reroute table. The control code for a flexible reroute (3) is then placed in the flexible TGC block (N2NMFLEX). Program control is transferred to TGN-SETUP for activation.

Slot Activation

5.115 The TGN slot in the flexible TGC block is activated by subroutine TGN SETUP. If the TGN is valid, the network management lamp is turned on and a TTY output message NM14 is printed. If a flexible reroute (NMER) is valid, the network management lamp is turned on and a TTY output message is printed. This TTY output message can be either NM33 for spray reroutes or NM34 for single reroutes. If there is another control on the trunk group, an override TTY output message NM21 is printed, and the old flexible control is removed. If a preprogrammed control is automatically activated, it is removed and a TTY output message NM01 is printed. The NM21 message indicates that a flexible control on a trunk group is being replaced by another manual control.

Deactivate Specific Flexible Control

5.116 If the TTY input message FLEX-DEACT is entered, transfer is made to subroutine NMFXDT. This subroutine deactivates the flexible TGC, flexible trunk group peg and overflow counter, or flexible reroute (NMER) control on a specific trunk group. If no other control is active, the network management lamp is turned off. A TTY output message NM18 is printed indicating that the flexible control, flexible trunk group peg and overflow counter, or flexible reroute (NMER) control has been deactivated.

Identification

5.117 The subroutine MESSAGE is utilized by the deactivation and activation routines via the TTY output message NM21. The TTY message identifies the type of control in the flexible TGC block slot and to load information in the scratch area.

Clear Flexible Controls

5.118 Subroutine NMFXRA is entered when the TTY input message FX-CLEAR is typed. The function of the TTY message is to remove all active flexible TGCs, flexible trunk group peg and overflow counters, and flexible reroute (NMER) controls. A TTY output message NM08 is printed indicating the requested controls were cleared.

Flexible Trunk Group Peg and Overflow Counter

Activate

5.119 As a result of the TTY input message TG-ACT, subroutine NMTGCT is entered to activate a flexible trunk group peg and overflow counter on a trunk group. A TTY output message NM14 is returned indicating the counter is activated.

Deactivate and Clear

5.120 If a counter is found active during an activate or deactivate function, a transfer is made to subroutine PEG CNTR DEACT to deactivate the counters on a specific trunk group.

Administration

Non-Reset Trunk Group Control Preprograms

5.121 As a result of the TTY input message PP-STATUS, subroutine NMPPST is entered to list all preprograms that are currently:

(a) Active automatically or manually

(b) Excluded from DOC activation

(c) Out-of-service.

The TTY output message NM02 is printed indicating each preprogrammed control state.

Trunk Group Control Preprogram Translation Data

5.122 As a result of the TTY input message PP-DATA, subroutine NMPPDT is entered to list the translation information associated with each preprogram. Each preprogram control translation block is accessed and the information is printed by NM04 TTY output message. The translation information includes the preprogram number, affected trunk group, priority, type of control, and percentage of control.

Active Flexible Trunk Group Controls and Counters

5.123 As a result of the TTY input message FX-STATUS, subroutine NMFXST is entered to list all active flexible TGCs, flexible reroute (NMER) controls, and flexible trunk group peg and overflow counters. The TTY output message NM19 is returned indicating the active flexible TGCs flexible reroute (NMER) controls, peg, and overflow counters.

Audits

Outgoing Load Control Pointer Relationship

5.124 An audit of the outgoing load control bit in the trunk group head cell and the linkage between the trunk group head cell annex and the preprogram control with activity couplets is performed by subroutine NMAUT1. Upon finding a non-zero pointer in the head cell annex, the routine checks to see that the outgoing load control bit is set, and that the translation auxiliary block pointer and the head cell annex pointer indicate the same trunk group. If they do not, a TTY output message SA03 is printed. The audit is performed in segments and if, at the end of a segment, trunk groups still remain to be audited, program control is transferred to MACR.

Preprogram Status Indicators

5.125 The preprogram control status indicators for trunk group controls are audited by subroutine NMAUD2. The preprogram control is validated and its state is determined. If it is automatically active, the TTY output message SA03 is printed providing either of the following occurs:

(a) Priority is zero.

(b) Trunk group activity word is zero.

(c) Wrong preprogram is in control of trunk group.

(d) Master scanner number is zero.

5.126 If the preprogram control is not automatically active, directed scans are performed on the master scanner numbers, and either a possible incorrect out-of-service condition is corrected or a false cross or ground condition is verified.

5.127 If the preprogram control is manually active, the TTY output message SA03 is printed providing one of the following occurs:

(a) Manual bit is not set.

(b) Control words do not match.

(c) Out-of-service bit is improperly set.

5.128 If the preprogram control is not active and is incorrectly in the ignore condition, the subroutine removes the ignore state and causes printout of the SA03 TTY output message. If an out-of-service condition is detected, the false cross or ground condition is verified. If it is not present, the preprogram control is removed and a TTY output message NM13 is printed.

5.129 If the preprogram control is in the reset state and not in control, a check is made to see which preprogram should be in control. If it is automatically controllable, the subroutine determines whether or not it should be active or whether or not there is a false cross or ground condition.

5.130 After all preprogram controls have been checked, the active preprogram control counter is compared to the actual number of preprogram controls active. If they are not in agreement, the TTY output message SA03 is printed and program control is transferred to MACR.

Control and Activity Words

5.131 The TGC and activity couplets are audited by subroutine NMAUD3. If there is a preprogram in control of the trunk group associated with the control couplet, the state of the preprogram is audited. If the preprogram is invalid, a TTY output message SA03 is printed. If the status bits of the preprogram are correct, all pointers are compared. If the pointers match, the correct preprogram remains or is put in control. If the pointers do not match, the control couplet bit is reset which causes the TTY output message SA03 to be printed. A search is then made for an automatic preprogram to control the trunk group. If there is not a preprogram control and the couplet is not equal to zero, the same message is printed.

5.132 If there is an error in the status bits and the control couplet does not indicate manual control, the activity word of the preprogram is reset. If the status bits are in error and the couplet indicates manual control, the control couplet bit is reset. The SA03 TTY output message is printed and a search is made for an automatic preprogram to control the trunk group.

5.133 If DOC signals are active on a trunk group associated with the control couplet that indicates no control, the appropriate preprogram control is automatically activated and a TTY output message SA03 is printed. The subroutine then transfers to MACR.

Flexible Trunk Group Control Block Slots

5.134 The flexible TGC block slots are audited by subroutine NMAUD5. This subroutine zeroes the TGN word when the control word is zero and the associated peg count for the previous quarter-hour is zero. If an error is detected for the PRE and DRE threshold values, the TTY output message SA03 is printed. The NMTG program then transfers to MACR.

Flexible Trunk Group Control Block Slots (1AE8 Generic Program Only)

5.135 Subroutine NMAUD5 in NMTG program is entered from MACR to audit the flexible TGC's block slots located at the N2NMFLEX address. The flexible controls consist of TGCs (cancel-to, cancel-from, skip, and trunk reservation) and NMERs (immediate reroutes and regular reroutes). Immediate and regular reroutes can be single (located at N2NMRRSG address) or spray (located at N2NMRRMG address) reroutes. Immediate and regular reroute data structures are used to handle data associated with the FTG and the TTG of a reroute. These two data structures are independent of each other. The following is a list of audit explanations and the numbers that are printed:

(a) If there is an error in the message code identifying the flexible control, the message slot is zeroed and SA03 error 43 is printed.

(b) If an error is detected for the trunk reservation PRE and/or DRE threshold values, the message slot is zeroed and SA03 error 43 and/or 44 is printed.

(c) If the message slot bits that indicate a reroute are set, a check of parameter (N2NMRRMG and N2NMRRSG) will determine if the appropriate data structure exists. If it does not exist, then SA03 error 85 is printed.

(d) If the data structure(s) exist, then the sum of reroute slots for both data structures

(N2NMRRMG and N2NMRRSG) cannot be greater than 127, otherwise SA03 error 86 is printed.

(e) The reroute slot index in the N2NMFLEX message slot should not be out of range with respect to the number of reroute data structure slots built for that office (maximum 16 for spray reroutes and 127 for single reroutes), otherwise SA03 error 79 is printed and the slot zeroed.

(f) A check for the linkage between N2NMFLEX slot and the reroute data structure is made. In the reroute data structure (N2NMRRMG/N2NMRRSG) exists the actual slot number of the N2NMFLEX message slot. This slot number (backward pointer) should match the slot index, otherwise SA03 error 80 is printed.

(g) Reroute types (immediate and regular) from the N2NMFLEX message slot and N2NMRRMG/N2NMRRSG reroute data structure must match, otherwise SA03 error 81 is printed and the message slot is zeroed.

(h) The FTGs from the N2NMFLEX message slot and N2NMRRMG/N2NMRRSG reroute data structure must match, otherwise SA03 error 82 is printed and the slot is zeroed.

(i) If the TGN is not within the range or is unequipped, then SA03 error 40 and/or 41 is printed and the TGN slot is zeroed.

(j) When the validation of all flexible control slots (N2NMFLEX) has been completed, a match on message type counts produced by the audit is made against the count of messages activated. If the counts match, the audit is complete, SA03 error 83 and/or 84 are printed and the counts are corrected.

(k) When all message slots have been validated another match on counts is made. If the counts do not match, a problem exists and the entire reroute table(s) along with the corresponding N2NMFLEX slots will be zeroed and SA03 message 84 printed. Also, the appropriate flexible pointer in N4TGNANX will be zeroed and the outgoing load control bit reset. This is done for all flexible controls (containing error) only if a link exists between N4TGNANX and N2NMFLEX data structures. Linkage exists if the flexible pointer is equal to the N2NMFLEX slot number. Program control is returned to MACR.

EADAS/NM INTERFACE (NMEA) PROGRAM

A. Function

5.136 The purpose of NMEA is to provide the means by which network management data (traffic, status, and event discretes, and control status) are accumulated and transmitted to EADAS/network management centers. The EADAS/network management center analyzes the network management data displayed via printers, cathode ray tube terminals, and display boards to obtain real-time surveillances of the various ESS switches and their traffic activity.

B. Program Description

5.137 All information transmitted between the ESS switch and the EADAS centers is coded into 8-bit characters prior to transmission over the EADAS data link. Each character is preceded by one start bit and terminated with two stop bits.

Traffic Data

5.138 Traffic data is accumulated in holding registers during traffic update routines. Traffic measurements are stored in one of four blocks of memory numbered 60, 61, 62, and 63. Blocks 60, 61, and 62 contain the H and C scheduled traffic counts and are polled every 5 minutes by the program. Block 63 is polled when flexible trunk group measurements are requested. Each block contains 250 measurements; each measurement is coded into two 8-bit characters. When a poll request has been accepted by the ESS switch and properly echoed to the EADAS center, the data block is transmitted to the EADAS center. The last character in each block of data is a checksum.

Status and Event Discretes

5.139 The program updates the status discretes via three methods:

(a) Scans machine status indicators every 2 seconds.

(b) Updates when event occurs in machine.

(c) Scans indicators when 20-second status discrete poll is received.

5.140 The machine status indicators are sent to the network management centers in response to a poll received every 20 seconds. These indicators are independent single-bit indicators representing certain network conditions. The program translates the status discretes into 8-bit words; each word represents an on or off state of a status discrete.

5.141 The function of the event discrete data is to alert the network management center to events occurring within an ESS switch concerning network traffic. After transmission of an on state discrete, the discrete is reset to the off state providing the ESS switch received a response or a request for resetting the event discretes to the off state.

Administration

5.142 Special polls are transmitted simulating TTY input requests to the ESS switch. When the ESS switch receives the poll, the poll is loaded with the associated TTY characters into a buffer and control is passed to the TTY input program. The NMEA program processes the request message and formats the requested data for transmission to the EADAS center. Refer to Table H for summarization of global subroutines which processes the EADAS data requests and various administrative functions.

ENGINEERING AND ADMINISTRATIVE DATA ACQUISITION SYSTEM (EDAS) PROGRAM

A. Function

5.143 The purpose of EDAS is to process the polls sent by the EADAS center, format the output data, and initialize the transmitter circuit which transmits the data to the EADAS center.

B. Program Description

Poll Analysis

5.144 The group of characters (polls) are received at the ESS switch from the EADAS center one character at a time. The EDAS program is entered at subroutine EDCHAR when the transmitter and receiver input scan routines load the character in the EADAS input hopper and set a main program class C job flag. When all the characters for a poll are received, the appropriate routine is entered which formats the data into the EADAS output buffer and initializes the EADAS output transmit routine. Three types of polls are processed: (1) traffic, (2) interface, and (3) network management.

5.145 Subroutine EDCHAR, upon entry from ECMP, determines if a TTY diagnostic is currently in progress on the EADAS channel (member number 23 of unit type 10). If this is the condition, the system is reinitialized to wait for a poll and control is returned to the main program.

5.146 As each character is received from the EADAS center, it is returned and checked to determine if it is the same character that was sent. If the returned character does not match, 1s are sent to the ESS switch to indicate a restart. On the other hand, if an unrecognizable poll is received at the ESS switch, 1s are returned to the EADAS center.

5.147 Every 15 minutes under normal EADAS conditions, subroutine EADAS5 is entered from the TFCT1A00 program to administer the last 15-minute poll time data. A check is also made to see if a given time period has elapsed since a poll has been received. If so, the non-EADAS mode is activated and TTY output message EAD01 is printed. If a network management control state exists, this subroutine is entered every 5 minutes. The data is formatted by subroutine EDAPLT.

EADAS TRANSLATION VERIFICATION ROUTINES (EDVF) PROGRAM

A. Function

5.148 The purpose of EDVF is to verify translation data retrieval and transmission buffer loading. The program is entered only by the EDAS program at base level class E. Each verification message has its own entry point.

B. Program Description

5.149 Upon initial entry, the EDVF program initializes call store words EASCR3 and EASCR4. Word EASCR3 is set to 1 so that TGN searching will begin at TGN 1. Word EASCR4 is initialized to the address of the first data word. The EADAS control blocking, located in the call store, is pointed to by the parameter word N2EADAC.

5.150 The program performs the translation data retrieval and transmission buffer loading functions until one of the following events occurs.

(a) Real time segments end.

(b) Transmission buffer is full.

(c) All desired translation data has been sent.

Verification of 5-Minute Schedule

5.151 The verify message for 5-minute measurements results in translation data sent for 5-minute H and C measurements, starting with the H schedule and ending with the C schedule. The 5-minute measurements are identified in the H and C traffic register translations as requested by interface poll type 2.

Verification of Active Trunk Groups

5.152 The list of all active trunk groups, beginning with TGN 1 is requested by interface poll type 7. The number of maintenance busy trunk circuits, the number of equipped trunk circuits from the trunk group auxiliary block, and the type of trunk are retrieved.

5.153 When trunk group detail information is requested for a single TGN, only one TGN record is transmitted. When trunk group detail information is requested for all TGNs in the ESS switch, the complete 500-word data buffer is transmitted.

6. ABBREVIATIONS AND ACRONYMS

CIN	Change-in-Network
CLID	Calling Line Identification
CPD	Central Pulse Distributor
CRT	Cathode Ray Tube
CU	Control Unit
DN	Directory Number
DOC	Dynamic Overload Control
DRE	Directional Reservation of Equipment
EA	Emergency Action
EADAS	Engineering and Administrative Data Acquisition System
ECIO	Executive Control Input/Output Program
ECMP	Executive Control Main Program
EDAS	Engineering and Administrative Data Acquisition Interface Program
FTG	From Trunk Group
ICAL	Digit Analysis Trunk Program
ICRV	Digit Analysis Trunks - Revertive Program
MAUD	Maintenance Audit Program
MCC	Master Control Center
NCA	No Circuit Announcement
NMEA	EADAS/NM Interface Program
NMER	Network Management Enhanced Reroute Control
NMGT	Network Management Program
NMIN	Network Management Indicator Program
NMMP	Network Management Maintenance Program
NMTC	Network Management Toll Code Blocking
NMTD	Transmit Dynamic Overload Control Signal Program
NMTG	Network Management Program
NMRR	Network Management Reroute Control

NMSC	Network Management Selective Incoming Overload Control Program
NMCG	Network Management Call Gapping Program
NPA	Numbering Plan Area
NTPI	Nontrunk Program Index
ORDL	Digit Analysis Lines Program
POB	Peripheral Order Buffer
PRE	Protectional Reservation of Equipment
RI	Route Index
RIT	Route Index Tag
SD	Signal Distributor
SILC	Selective Incoming Overload Control
TDC	Traffic Data Converter
TGN	Trunk Group Number
TTG	To Trunk Group
TTIA	Teletypewriter Program
TTY	Teletypewriter.

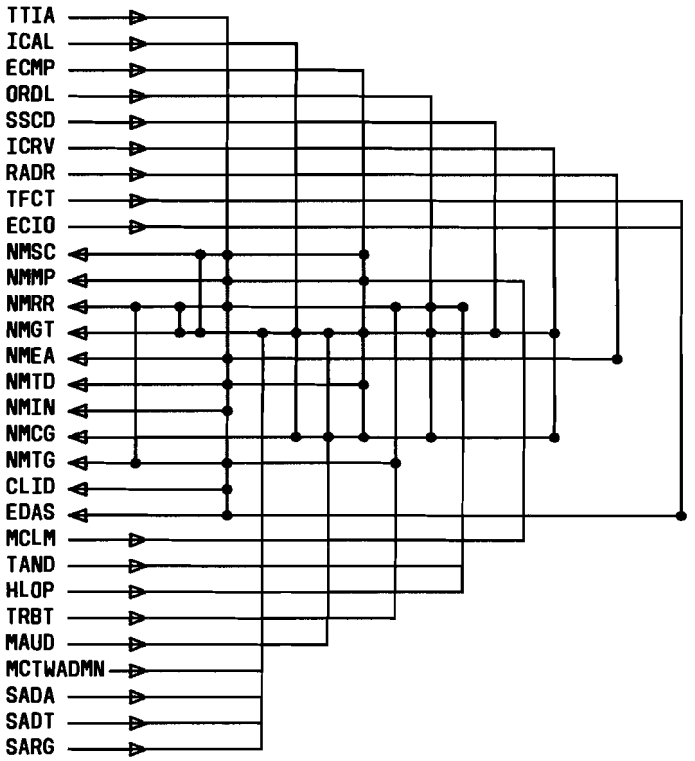
7. REFERENCES

231-045-100	Operational Software Control Structure—Software Subsystem Description
231-045-105	Call Processing—POTS—Software Subsystem Document—Description
231-045-145	Translations—Software Subsystem Description (SSD)
231-045-160	Toll/Tandem Switching—Software Subsystem Description
231-045-165	Measurement—Software Subsystem Description
231-045-215	Audit—Software Subsystem Description
231-045-245	System Performance—Software Subsystem Description.

OTHER

IM-6A001—Input Message Manual

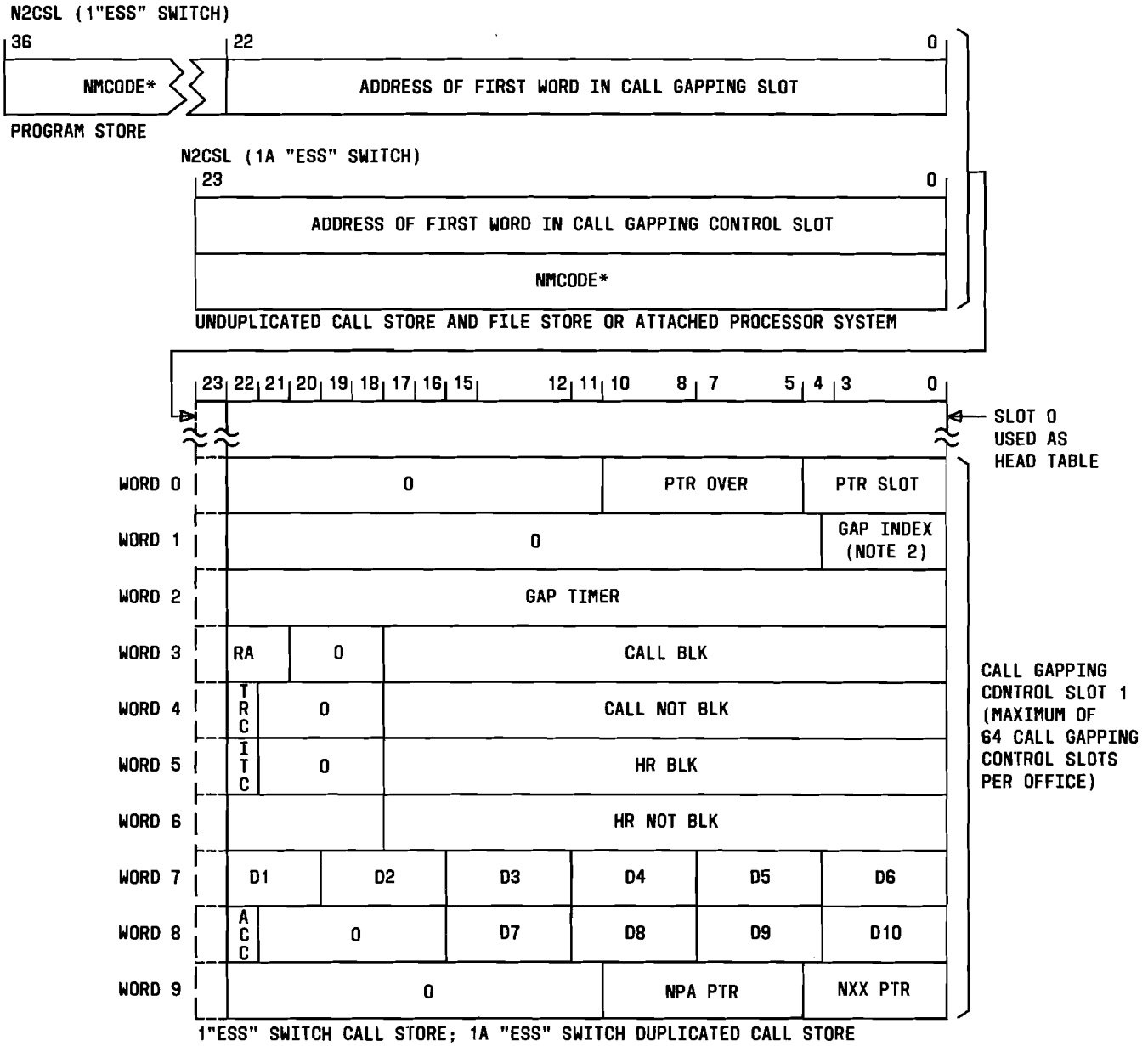
OM-6A001—Output Message Manual.



LEGEND:

CLID - CALLING LINE IDENTIFICATION LIST PROGRAM
ECIO - REFER TO 231-045-100
ECMP - REFER TO 231-045-100
EDAS - ENGINEERING AND ADMINISTRATIVE DATA ACQUISITION INTERFACE PROGRAM
HLOP - REFER TO 231-045-115
ICAL - REFER TO 231-045-105
ICRV - REFER TO 231-045-105
MAUD - REFER TO 231-310-250
MCLM - REFER TO 231-310-250
MCTWADMN - REFER TO 231-310-250
NMCG - NETWORK MANAGEMENT CALL GAPPING PROGRAM
NMEA - EADAS/NM INTERFACE PROGRAM
NMGT - NETWORK MANAGEMENT PROGRAM
NMIN - NETWORK MANAGEMENT INDICATOR PROGRAM
NMMP - NETWORK MANAGEMENT MAINTENANCE PROGRAM
NMRR - NETWORK MANAGEMENT REROUTE CONTROL PROGRAM
NMSC - TRANSMIT SILC SIGNALS
NMTD - TRANSMIT DOC SIGNALS
NMTG - NETWORK MANAGEMENT PROGRAM
ORDL - REFER TD 231-045-105
RADR - REFER TO 231-045-245
SADA - REFER TO 231-045-215
SADT - REFER TO 231-045-215
SARG - REFER TO 231-045-215
SSCD - REFER TO 231-045-105
TAND - REFER TO 231-045-160
TFCT - REFER TO 231-045-165
TRBT - REFER TO 231-045-145
TTIA - REFER TO 231-045-165.

Fig. 1—Network Management Subsystem Interface



See notes and footnote on next page.

Fig. 2—Call Gapping Control Slot Layout (Sheet 1 of 2) (Note 1)

Notes:
1. Bit 23 exists in the 1A ESS switch only.
2. See maxtrix below for gap indexes and their respective gap intervals. (Word 1 bits 0 through 3 is where this information is stored).

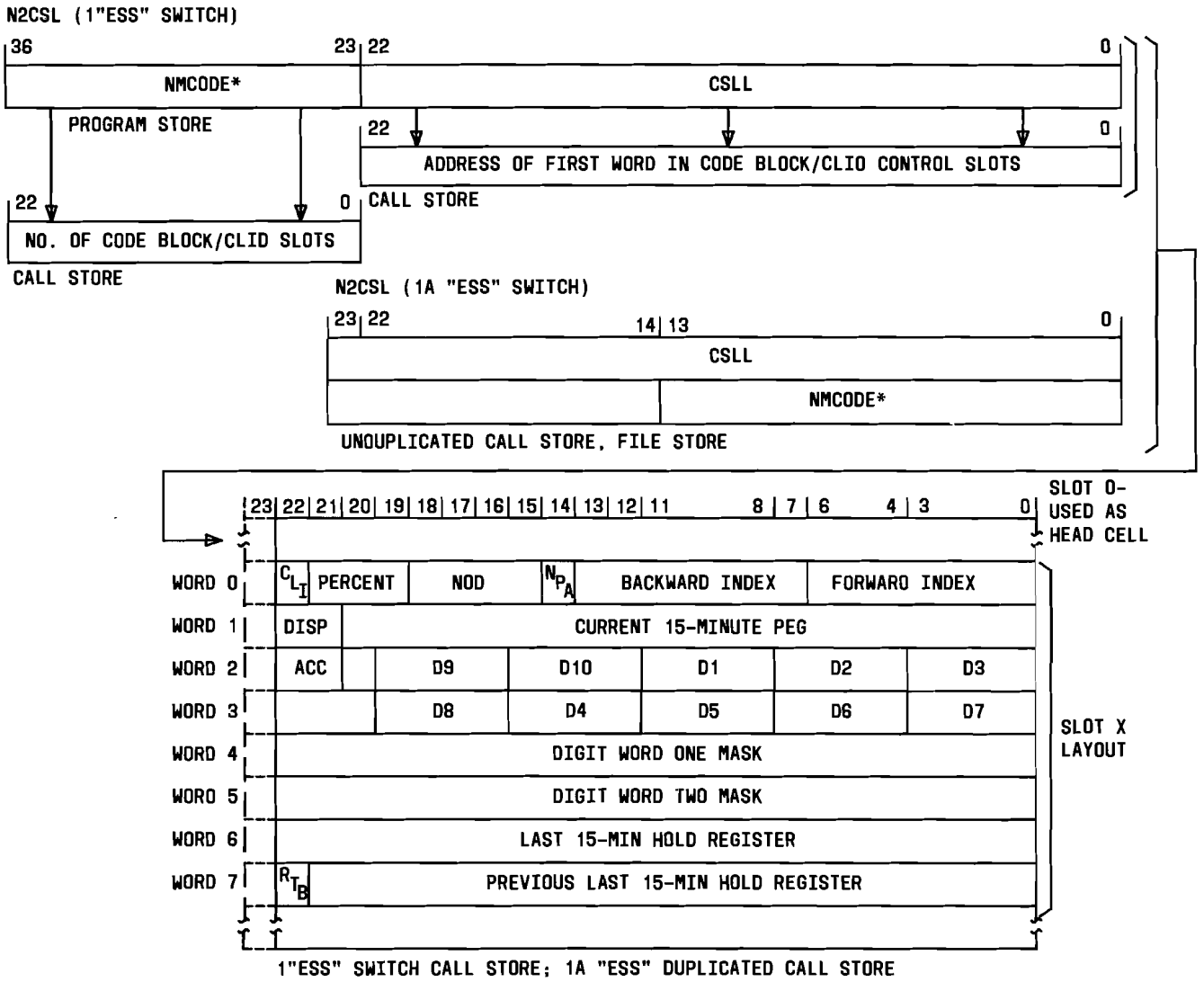
OCTAL EQUIVALENT	GAP INDEX	GAP INTERVAL (IN SECONDS)	MAXIMUM CALLS PER HOUR
0000	0	-	IN = OUT
0001	1	0	IN = OUT
0002	2	.1	36000
0003	3	.3	14400
0004	4	.5	7200
0005	5	1	3600
0006	6	2	1800
0007	7	5	720
0010	8	10	360
0011	9	15	240
0012	10	30	120
0013	11	60	60
0014	12	120	30
0015	13	300	12
0016	14	600	6
0017	15	STOPS ALL CALLS	0

* 10 X (NMCODE+1), THIS FORMULA BUILDS THE NUMBER OF SUBBLOCKS FOR THIS TA8LE

LEGEND:

```
      NMCODE - NUMBER OF CALL GAPPING CONTROL SLOTS
    PTR OVER - POINTS TO OVERLAPPING CONTROL FOR 10-DIGIT CONTROLS
    PTR SLOT - POINTS TO NEXT CONTROL SLOT OF UNIQUE CONTROL ON SAME LEVEL
               (I.E., 10-DIGIT LEVEL, 7-DIGIT LEVEL, OR 10XXX LEVEL)
   GAP INDEX - INDEXES A GAP INTERVAL
   GAP TIMER - TIME AFTER WHICH NEXT SUBSEQUENT ATTEMPT TO A CONTROLLED CODE
               DOES PROCEED UNBLDCKED
          RA - DISPOSITIDN CODE FOR BLOCKED CALLS SENT TO RECORDED ANNOUNCEMENT
               (I.E., 1 = NCA, 2 = EA1, 3 = EA2)
    CALL BLK - ACCUMULATED COUNT OF CALL ATTEMPTS SUBJECTED TO THIS CDNTROL
         TRC - INDICATES CONTROL SLOT IS POINTED TO 8Y TEMPORARY RECENT CHANGES
CALL NOT BLK - COUNT OF CALL ATTEMPTS SUBJECTED TO CALL GAPPING CONTROL WHICH
               WERE NOT BLOCKED
         ITC - INDICATES TYPE OF CONTROL (00 = INVALID, 01 = 10XXX-CARRIER INTERCONNECT,
               10 = SEVEN DIGITS, 11 = TEN DIGITS)
      HR BLK - 15-MINUTE HOLDING REGISTER FOR COUNT OF CALL ATTEMPTS SUBJECTED
               TO CALL GAPPING CONTROL
  HR NOT BLK - 15-MINUTE HOLDING REGISTER FOR COUNT OF CALL ATTEMPTS SUBJECTED
               TO CALL GAPPING CONTROL WHICH ARE NOT BLDCKED
     D1 - D6 - DIGITS 1 THROUGH 6 OF CALL GAPPING CONTROLLED CODE (NPA-XXX)
         ACC - ACCESS PREFIX DIGIT (00 = NO PREFIX, 01 = PREFIX OF 1, 10 = PREFIX OF 1,
               11 = NO PREFIX CONFLICTING DIALING PATTERN EXISTS
    D7 - D10 - DIGITS 7 THROUGH 10 OF CALL GAPPING CONTROLLED CODE (I.E., DIRECTORY NUMBER)
     NPA PTR - POINTS TO CONTROL SLOT WITH CONFLICTING NPA
     NXX PTR - POINTS TO CONTROL SLOT WITH CDNFLICTING NXX.
```

Fig. 2—Call Gapping Control Slot Layout (Sheet 2 of 2) (Note 1)



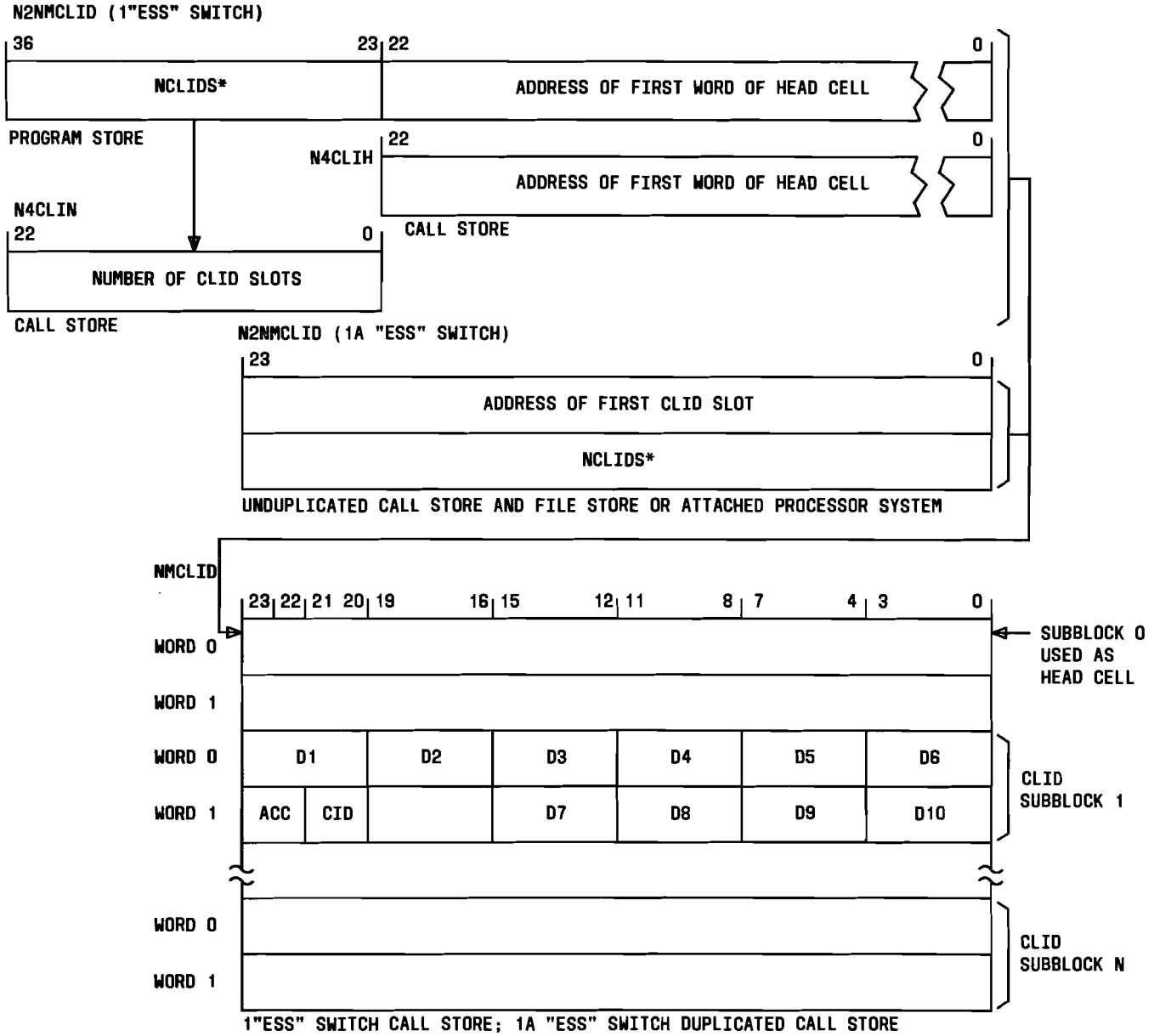
Note:
1. Bit 23 exists in the 1A ESS switch only.

* 8 X (NMCODE + 1), THIS FORMULA BUILDS THE NUMBER OF SLOTS FOR THIS TABLE.

LEGEND:

ACC - ACCESS CODE
CLI - 1 IF CLID ENTRY
0 IF CODE BLOCK ENTRY
CSLL - ADDRESS OF FIRST WORD IN CODE BLOCK/CLID CONTROL SLOTS
DISP - DISPOSITION INDEX TO NO-CIRCUIT ANNOUNCEMENT, EMERGENCY ANNOUNCEMENTS 1 OR 2
D1-D10 - BLOCKED DIGITS
INDEX - SLOT NUMBER
NMCODE - SET CARD EQUAL TO THE NUMBER OF CODE BLOCK/CLID CONTROL SLOTS
NOD - NUMBER OF DIGITS
NPA - 1 IF DIGITS D1, D2 AND D3 ARE NPA
0 IF DIGITS D1, D2 AND D3 ARE NNX
PERCENT - PERCENT OF CONTROL
RTB - REAL TIME BREAK INDICATOR FOR ACTIVATION

Fig. 3—Code Blocking/CLID Control Slot Layout



Note:
1. Bit 23 exists in the 1A ESS switch only.

* NCLIDS + 1, THIS FORMULA BUILDS THE NUMBER OF SUBBLOCKS FOR THIS TABLE

LEGEND:
NCLIDS - INDICATES NUMBER OF AVAILABLE CLID ENTRIES
D1 - D6 - NPA (D1-D3); NXX (D4-D6) ALL DIGITS ARE STORED AS BINARY CODED DECIMAL (BCD), ALL ZEROS ARE STORED AS BCD 10.
D7 - D10 - DIRECTORY NUMBER STORED AS BCD
ACC - ACCESS PREFIX (00 - NO PREFIX REQUIRED TO RESOLVE CONFLICTING DIALING PATTERN; 01 - PREFIX + 1; 10 - PREFIX + 0; 11 - NO PREFIX REQUIRED BUT CONFLICT EXISTS)
CID - CALL INDICATOR (11 - TEN DIGITS, TEMPORARY RECENT CHANGE AGAINST NPA; 10 - SEVEN DIGITS, TEMPORARY RECENT CHANGE AGAINST NXX)

Fig. 4—CLID Control Slot Layout for 1E8/1AE8 (Note 1)

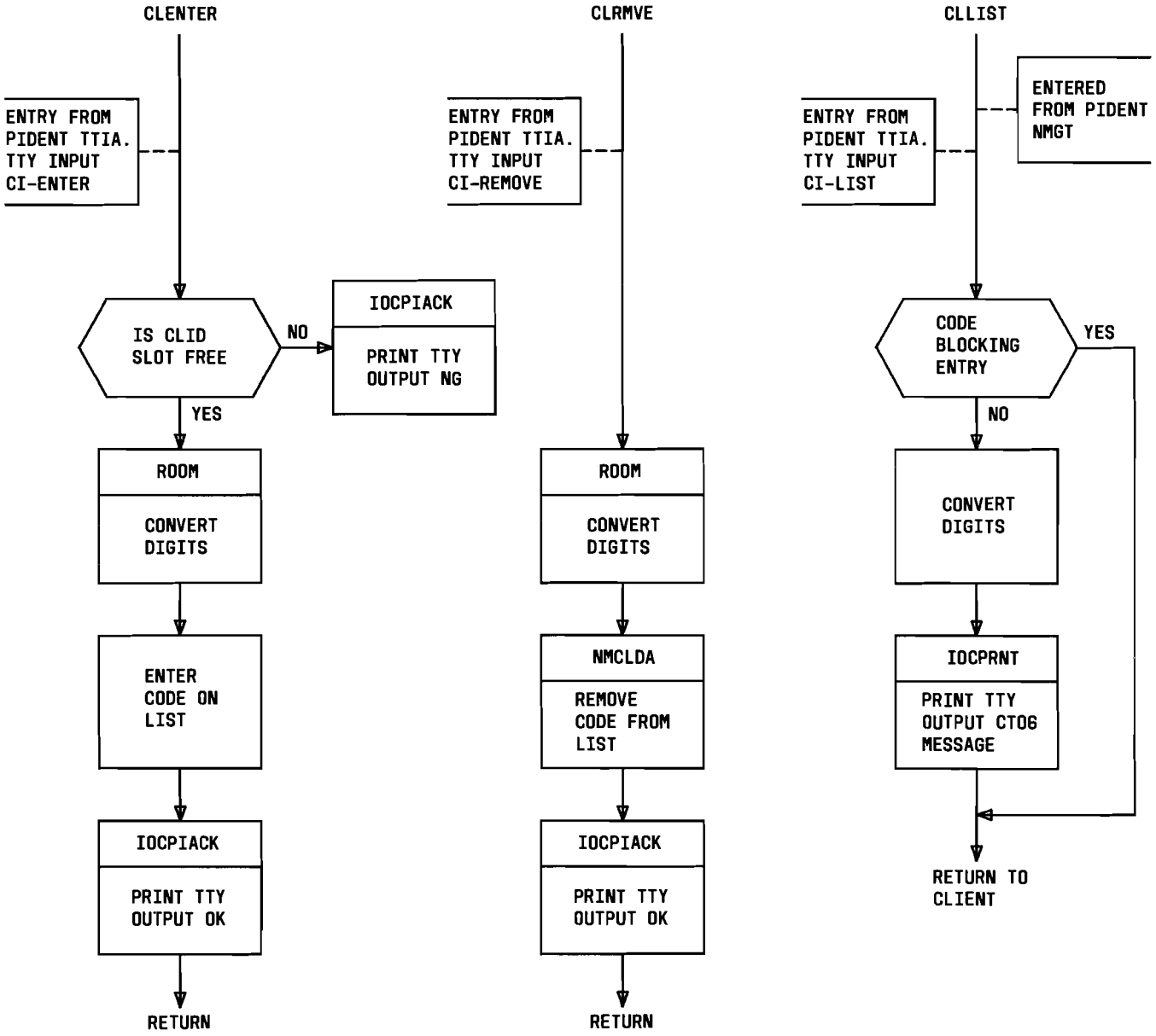


Fig. 5—CLID Flow Diagram (1E7/1AE7 and Earlier Generic Programs)

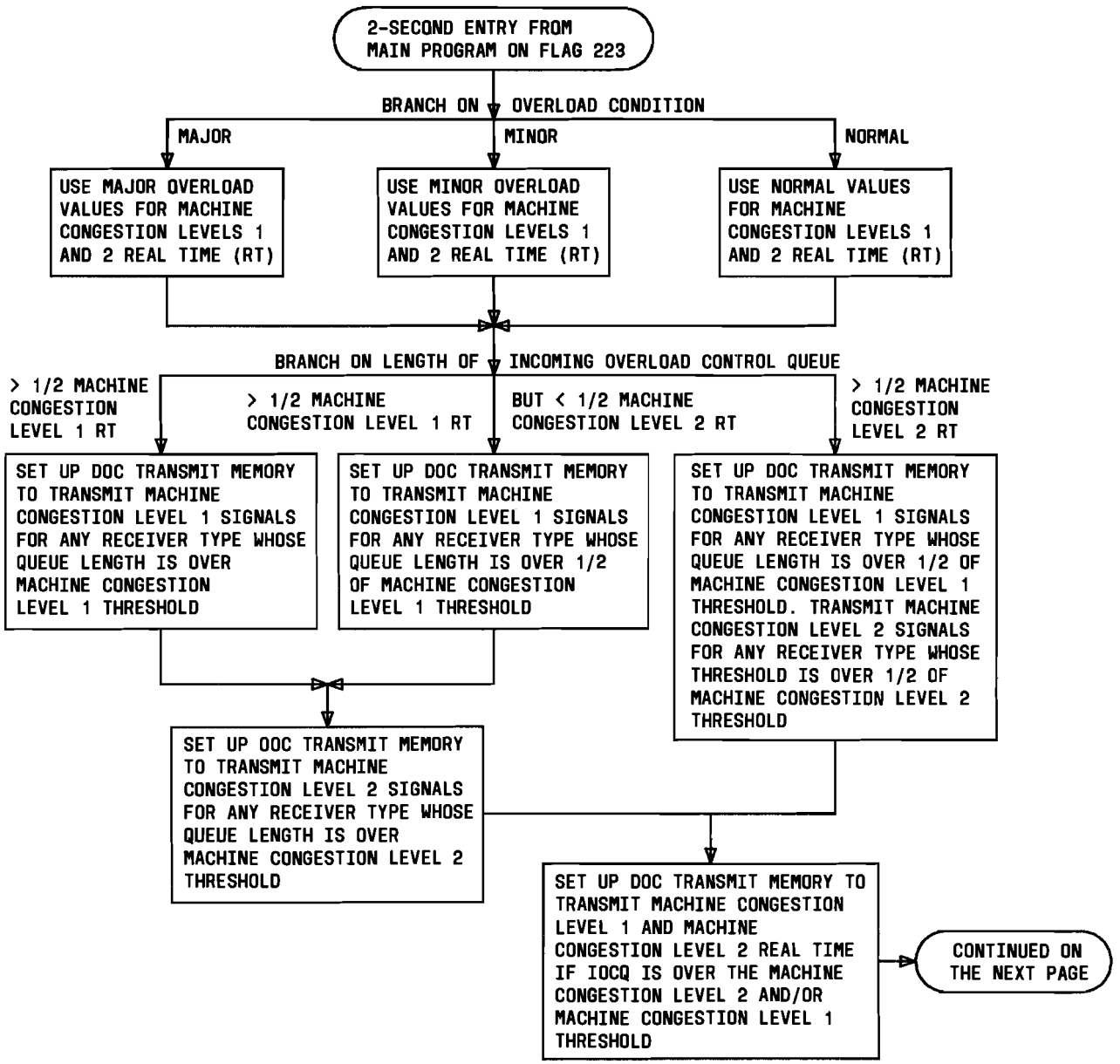


Fig. 6—Calculation of DOC Transmit Thresholds for MC1 and MC2 (Sheet 1 of 2)

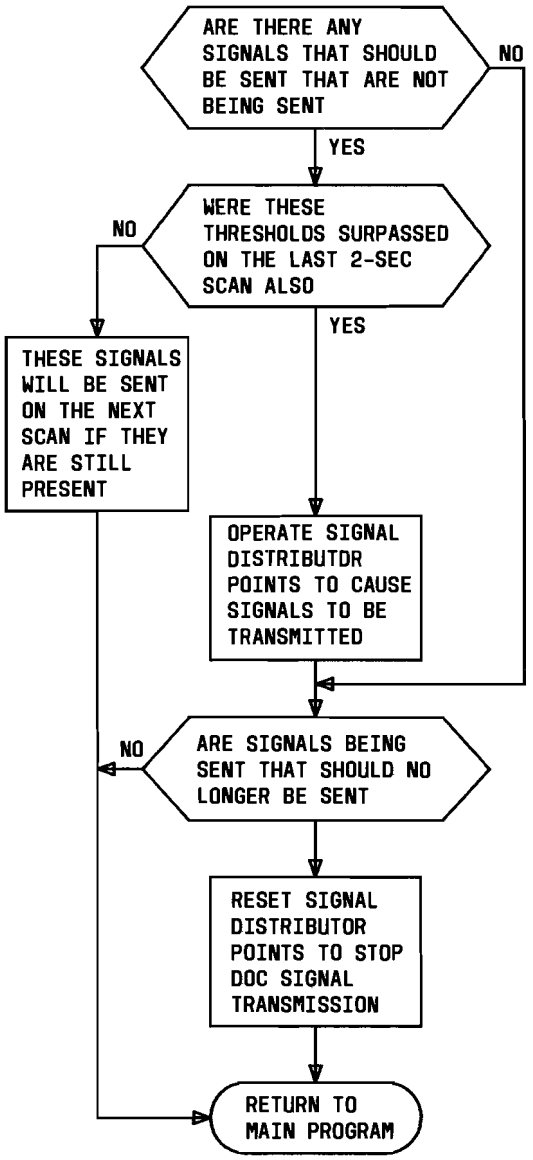
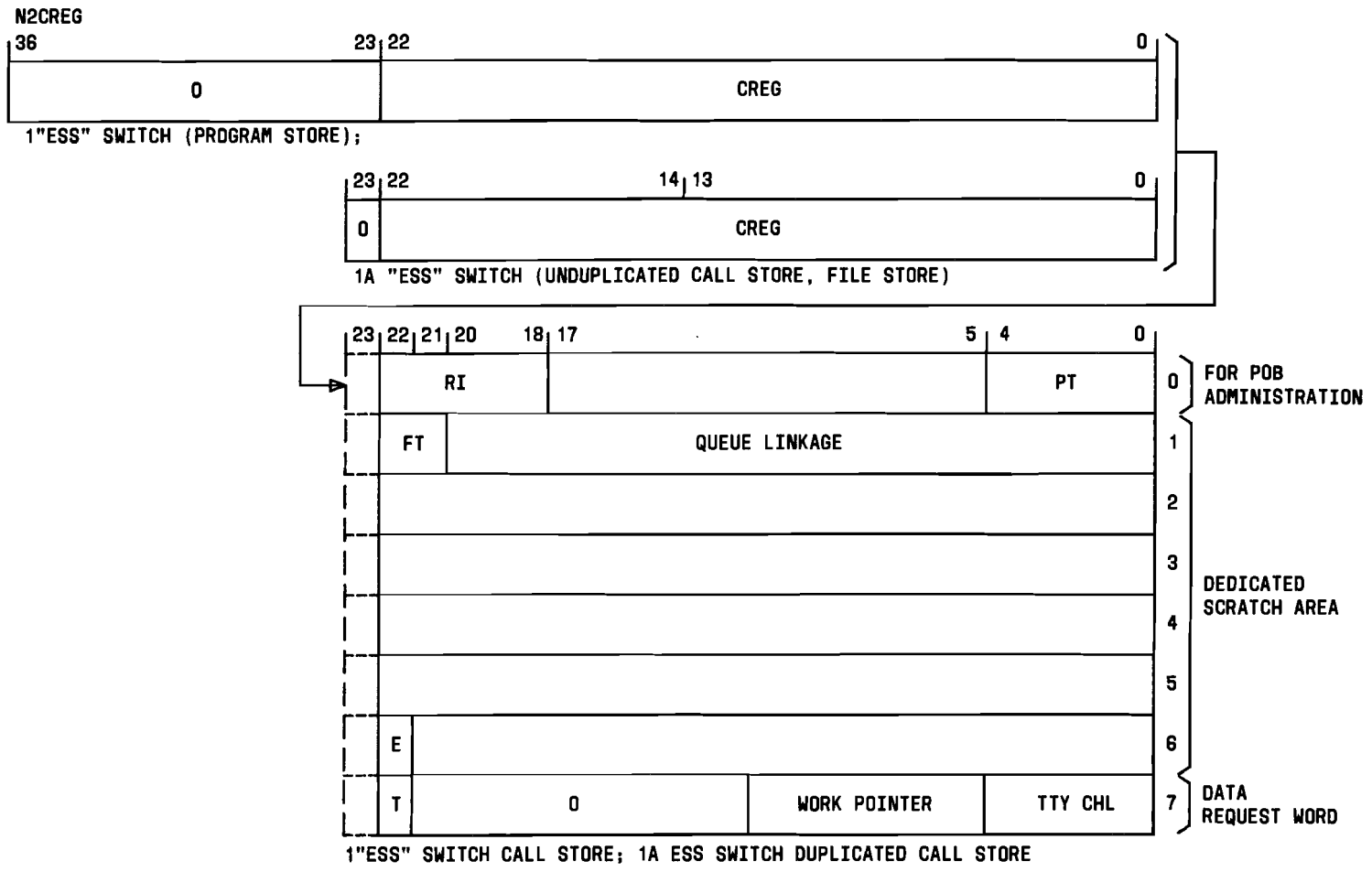


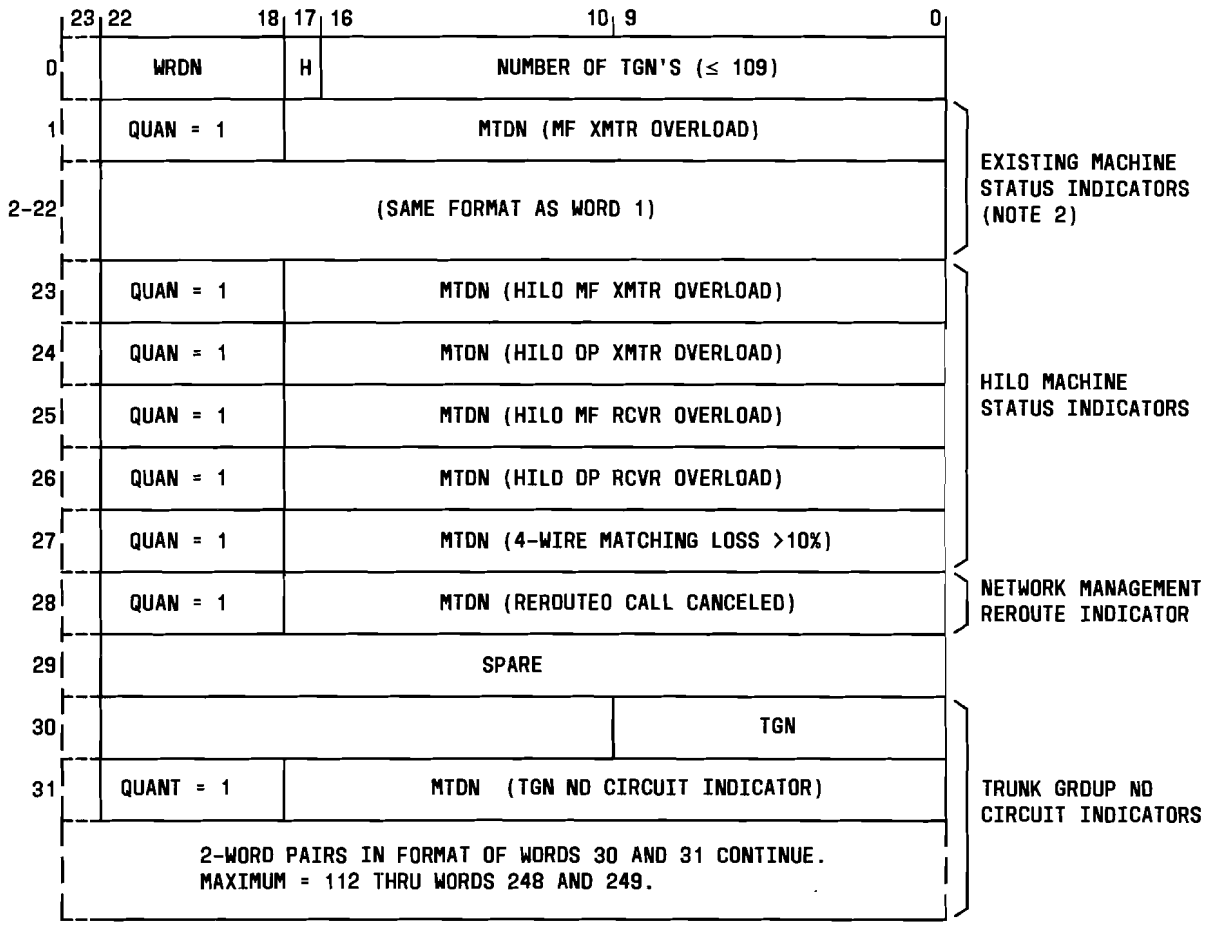
Fig. 6—Calculation of DOC Transmit Thresholds for MC1 and MC2 (Sheet 2 of 2)



Note:
1. Bit 23 exists in the 1A ESS switch only.

LEGEND:
CREG – ADDRESS OF FIRST WORD IN 8-WORD PSEUDO CALL REGISTER
E – END BIT – 1 IF ROUTINE FINISHED
FT – FAILURE TYPE
T – TIMING BIT (USED BY AUDIT)
TTY CHL – TELETYPEWRITER CHANNEL

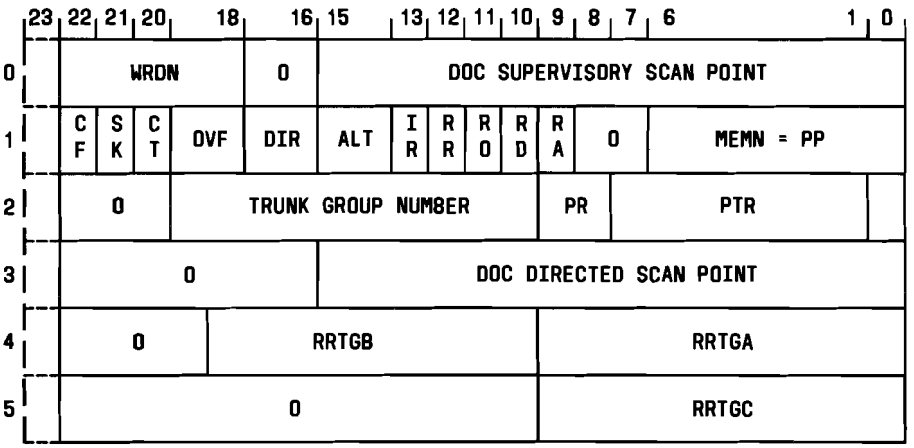
Fig. 7—Pseudo Call Register for Network Management Indicator Circuit (Note 1)



Note:
1. Bit 23 exists only in the 1A ESS switch.
2. Some existing network management indicators now reflect conditions in the 4-wire network. These indicators are machine congestion level level 1 for MF and DP receivers, machine congestion level 2 for MF and DP receivers, and MF and DP receivers being queued.

LEGEND:
DP - DIAL PULSE, MF = MULTIFREQUENCY
H - 1, IF FORMAT OF THE BLOCK IS AS SHOWN
H - 0, IF THE BLOCK IS IN THE OLD FORMAT
MF - MULTIFREQUENCY
MTDN - MISCELLANEOUS TRUNK SIGNAL DISTRIBUTOR NUMBER
TGN - TRUNK GROUP NUMBER
WRDN - WORD NUMBER.

Fig. 8—Unit Type 56, Member Number 2 Auxiliary Block (Note 1)



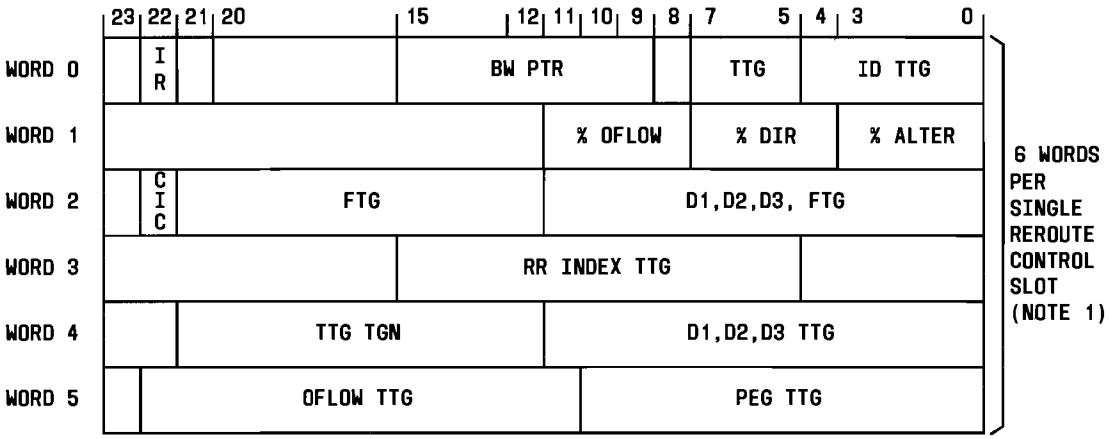
Note:
1. Bit 23 exists in the 1A ESS switch only.

LEGEND:
- ALT - PERCENTAGE OF ALTERNATE ATTEMPTS
- DIR - PERCENTAGE OF DIRECT ATTEMPTS
- OVF - PERCENTAGE OF OVERFLOW ATTEMPTS
- CT - CANCEL-TO INDICATOR
- SK - SKIP INDICATOR
- CF - CANCEL-FROM INDICATOR
- IR - 1 IF THE CONTROL IS AN IMMEDIATE REROUTE
- PR - PRIORITY EQUAL TO MACHINE CONGESTION LEVEL BINARY CONVERSIDN
- RR - 1 IF THE CONTROL IS A REGULAR REROUTE
- RO - IS USED WITH OVF TO INDICATE THE PERCENT OF OVERFLOW TRAFFIC TO REROUTE
- RD - IS USED WITH DIR TO INDICATE THE PERCENT DF DIRECT ROUTED TRAFFIC TO REROUTE
- RA - IS USED WITH ALT TO INDICATE THE PERCENT OF ALTERNATE ROUTED TRAFFIC TO REROUTE

RRTGA, RRTGB, RRTGC — 1, 2, OR 3 TGN'S CAN BE USED AS TO TRUNK GROUPS (TTG) IN A REROUTE CONTROL

WRDN = NUMBER OF WORDS IN AUXILIARY BLOCK CAN BE 4, 5, OR 6.

Fig. 9—TGC Unit Type 46 Auxiliary Block (Note 1)

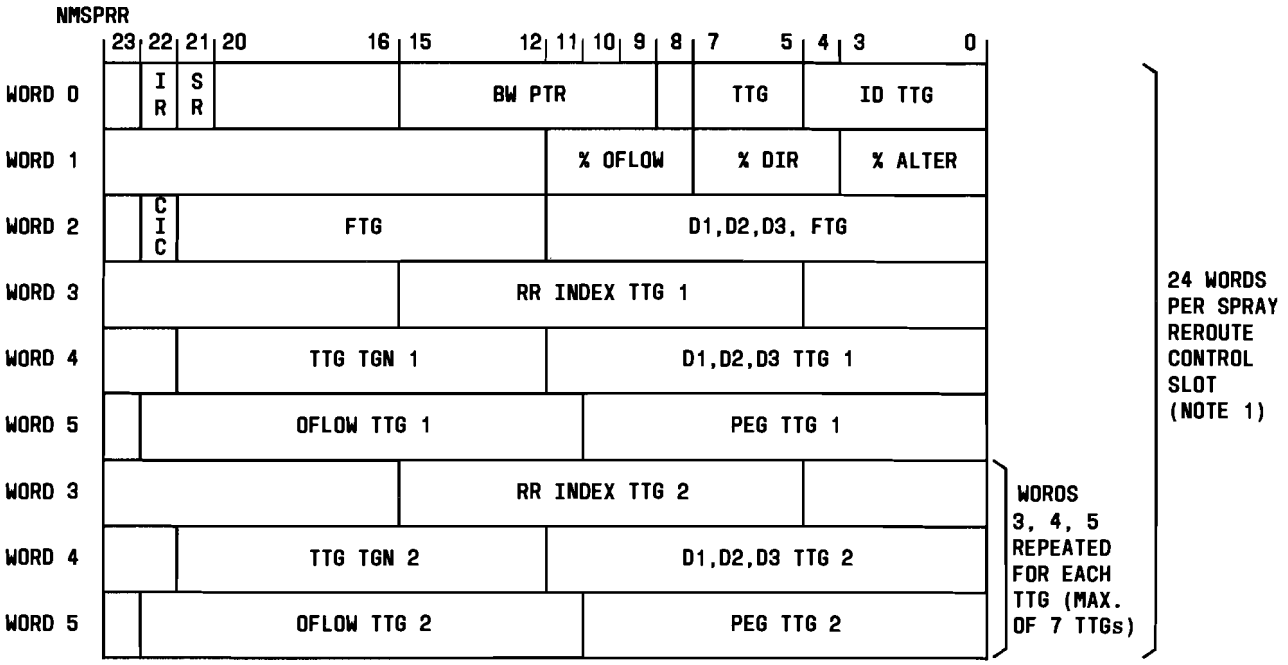


NOTE:
1. Office can have a maximum of 127 flexible single reroute controls.

LEGEND:

IR - IMMEDIATE REROUTE WHEN BIT EQUALS 1
BW PTR - BACKWARD POINTER (POINTS TO NMFLEX CALL STORE BLOCK VERIFYING THE CORRECT SPRAY REROUTE SLOT HAS BEEN INDEXED.)
TTG - NUMBER OF THE LAST "TO TRUNK GROUP" (TTG) USED
ID TTG - INDEX FOR LAST TTG USED (SLOT RELATE ADDRESS)
% OFLOW - PERCENTAGE OF OVERFLOW TRAFFIC TO BE REROUTED
% DIR - PERCENTAGE OF DIRECT TRAFFIC TO BE REROUTED
% ALTER - PERCENTAGE OF ALTERNATE ROUTED TRAFFIC TO BE REROUTED
CIC - REROUTE CANCEL-IN-CHAIN CONTROL (WHEN NO TTG IS AVAILABLE, CALL IS CANCELLED ONLY WHEN THE BIT IS SET)
FTG - "FROM TRUNK GROUP" (FTG) TRUNK GROUP NUMBER
D1-D3 FTG - DIGITS 1 THROUGH 3 (NPA) FOR FTG
RR INDEX TTG - REROUTE INDEX FOR TTG (INDEXES TRUNK GROUP HEAD CELL)
TTG TGN - TTG TGN (ONE TTG PER SINGLE REROUTE CONTROL SLOT)
D1-D3 TTG - DIGITS 1 THROUGH 3 (NPA) FOR TTG
OFLOW TTG - OVERFLOW TRAFFIC ON TTG (PRESENTLY UNUSED)
PEG TTG - PEG COUNT FOR TTG

Fig. 10—Single Reroute Control Slot Layout—NMSIRR

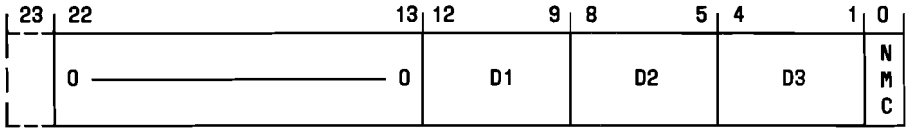


NOTE:
1. Office can have a maximum of 16 flexible spray reroutes.

LEGEND:

IR - IMMEDIATE REROUTE WHEN BIT EQUALS 1
SR - SPRAY REROUTE WHEN BIT EQUALS 1
BW PTR - BACKWARD POINTER (POINTS TO NMFLEX CALL STORE BLOCK VERIFYING THE CORRECT SPRAY REROUTE SLOT HAS BEEN INDEXED.)
TTG - NUMBER OF THE LAST "TD TRUNK GROUP" (TTG) USED
ID TTG - INDEX FOR LAST TTG USED (SLOT RELATIVE ADDRESS)
% OFLOW - PERCENTAGE OF OVERFLOW TRAFFIC TO BE REROUTED
% DIR - PERCENTAGE OF DIRECT TRAFFIC TO BE REROUTED
% ALTER - PERCENTAGE OF ALTERNATE ROUTED TRAFFIC TO BE REROUTED
CIC - REROUTE CANCEL-IN-CHAIN CONTROL (WHEN NO TTG IS AVAILABLE, CALL IS CANCELLED)
FTG - "FROM TRUNK GROUP" (FTG) TRUNK GROUP NUMBER
D1-D3 FTG - DIGITS 1 THROUGH 3 (NPA) FOR FTG
RR INDEX TTG 1 - REROUTE INDEX FOR FIRST TTG (INDEXES ROUTE INDEX EXPANSION TABLE)
TTG TGN 1 - TTG TGN FOR FIRST TTG (MAXIMUM OF SEVEN TTGs PER SLOT)
D1-D3 TTG 1 - DIGITS 1 THROUGH 3 (NPA) FOR FIRST TTG (MAXIMUM OF SEVEN TTGs PER SLOT)
OFLOW TTG 1 - OVERFLOW TRAFFIC ON TTG 1 (PRESENTLY NOT USED)
PEG TTG 1 - PEG COUNT FOR TTG 1 (PRESENTLY NOT USED)
RR INDEX TTG 2 - REROUTE INDEX FOR SECOND TTG (MAXIMUM OF SEVEN TTGs)
TTG TGN 2 - TTG TGN FOR SECOND TTG
D1-D3 TTG 2 - DIGITS 1 THROUGH 3 (NPA) FOR SECOND TTG
OFLOW TTG 2 - OVERFLOW TRAFFIC ON SECOND TTG (PRESENTLY NOT USED)
PEG TTG 2 - PEG COUNT FOR TTG 2

Fig. 11—Spray Reroute Control Slot Layout—NMSPRR

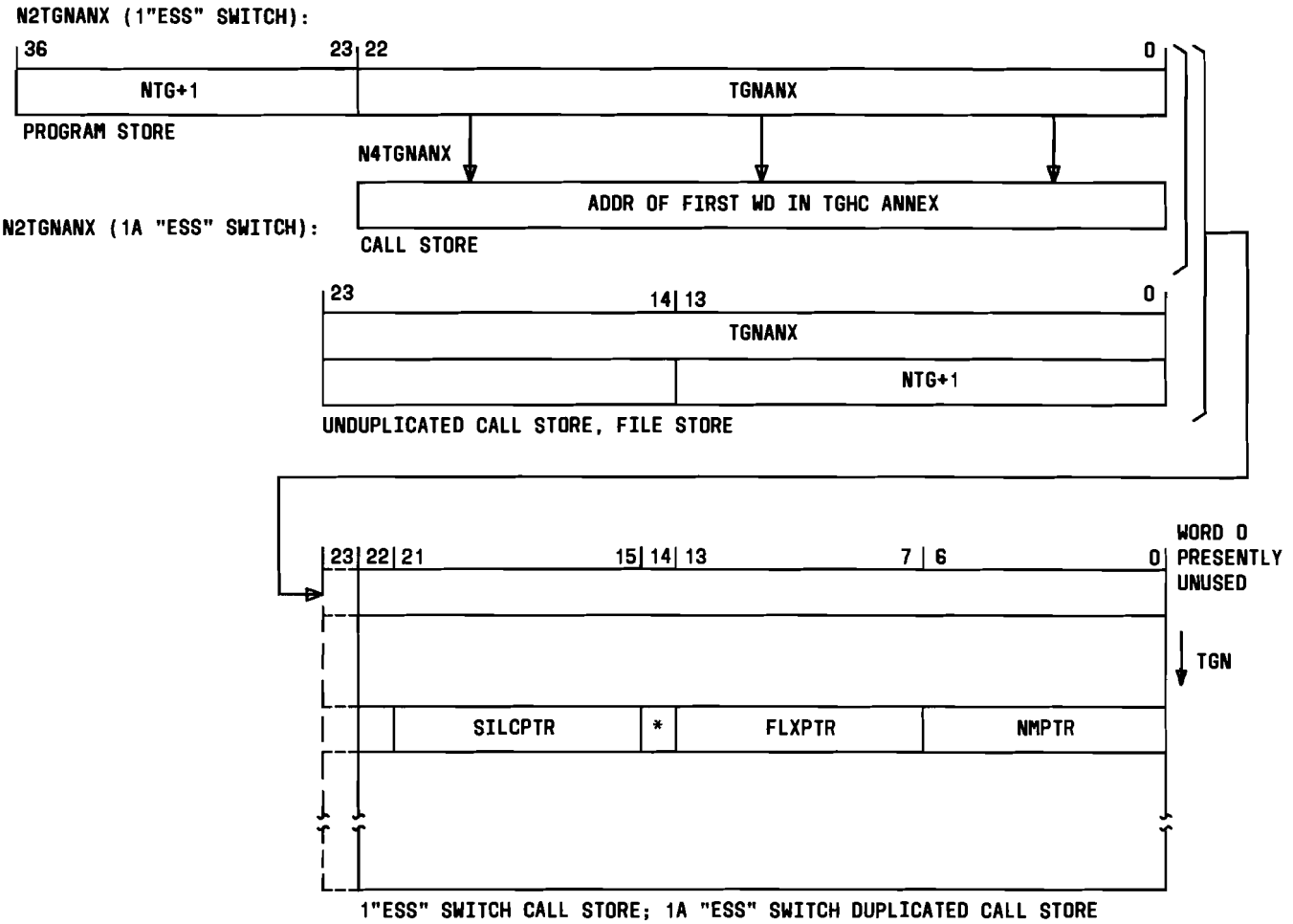


Note:
1. Bit 23 exists in the 1A ESS switch only.

LEGEND:
D1, D2, D3 = BINARY CODED DECIMAL DIGITS WITH 0 STORED AS 10. THEY ARE THE HOME NPA FOR THIS 3-DIGIT TRANSLATOR.

NMC = 1 IF TRAFFIC USING THIS 3-DIGIT TRANSLATOR MAY BE AFFECTED BY NETWORK MANAGEMENT CODE BLOCKING (1E7/1AE7 AND EARLIER) OR CALL GAPPING (1E8/1AE8 AND LATER) AND CALLING LINE IDENTIFICATION.

Fig. 12—3-Digit Index to NPA Translator (Note 1)

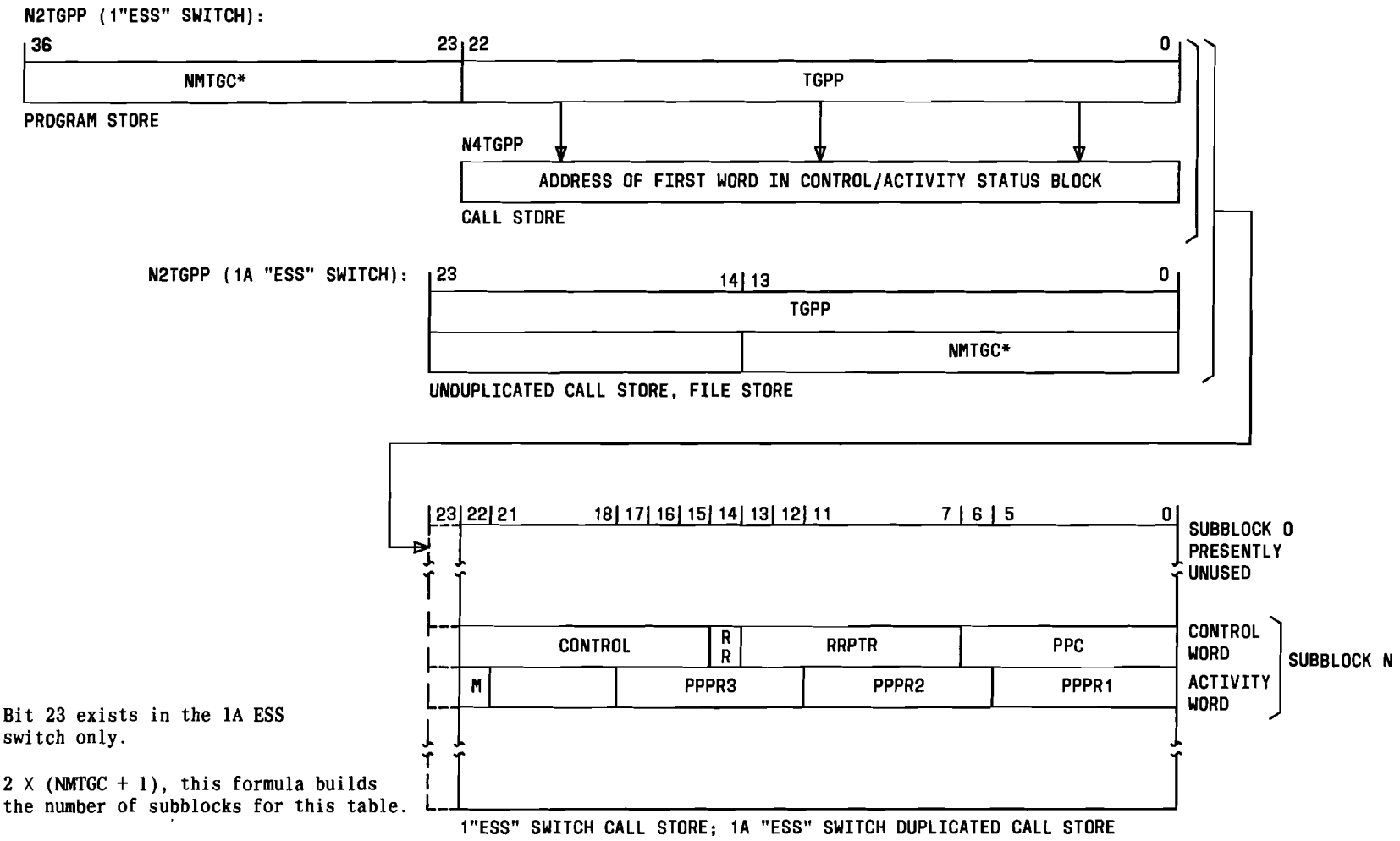


Note:
1. Bit 23 exists in the 1A ESS switch.

* TGS (SCOF)

LEGEND:
NMPTR - 0 IF PREPROGRAM NOT DEFINED FOR THIS TRUNK GROUP OR IF PREPROGRAM NOT ACTIVE FOR THIS TRUNK GROUP
FLXPTR - 0 IF FLEXIBLE CONTROL NOT ACTIVE FOR THIS TRUNK GROUP
NTG - SET CARD EQUAL TO NUMBER OF TRUNK GROUPS IN THE OFFICE
TGNANX - ADDRESS DF FIRST WORD IN TRUNK GROUP HEAO CELL ANNEX
TGS - 0 IF SELECTIVE CONTROL OF FACILITIES (SCOF) FEATURE IS NOT ACTIVE FOR THIS TRUNK GROUP
SILCPTR - SILC POINTER, 0 IF SILC NOT ASSIGNEO TO THIS TRUNK GROUP

Fig. 13—Trunk Group Head Cell Annex Layout (Note 1)

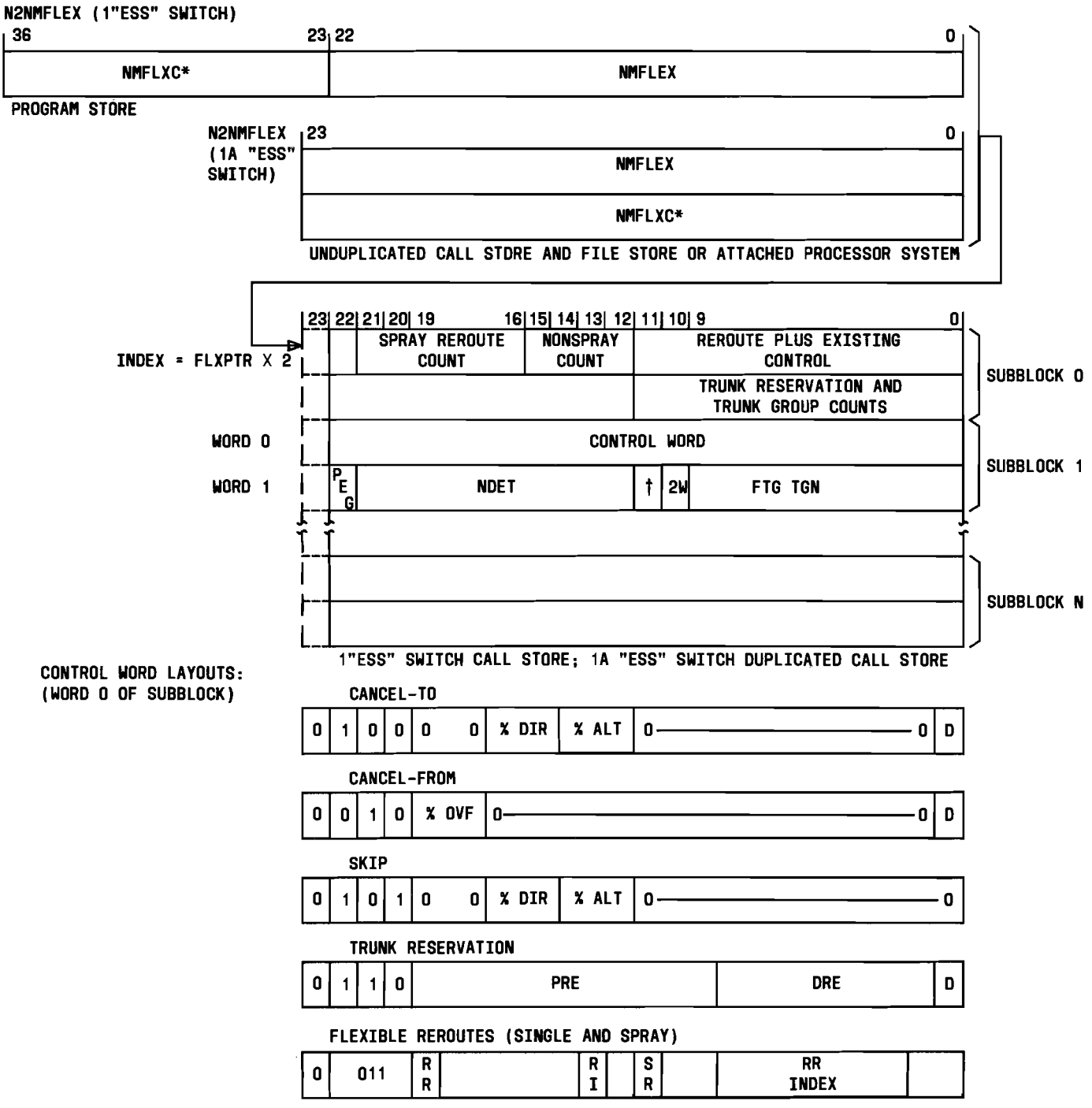


Note:
1. Bit 23 exists in the 1A ESS switch only.

* 2 X (NMTGC + 1), this formula builds the number of subblocks for this table.

LEGEND:
CONTROL - TGC OPTION AND PERCENTAGE OF CONTROL
M - 1 IF TRUNK GROUP IS CONTROLLED MANUALLY BY A PREPROGRAM; 0 OTHERWISE
NMTGC - SET CARD EQUAL TO THE NUMBER OF TRUNK GROUPS WHICH MAY BE MANAGED VIA TRUNK GROUP CONTROLS
PPC - CONTROLLING PREPROGRAM (PP) NUMBER FOR THIS TRUNK GROUP
PPPR'X' - 0 IF AUTOMATIC PREPROGRAM OF PRIORITY 'X' IS NOT ACTIVE
PP NUMBER OF AUTOMATIC PREPROGRAM OF 'X' IS ACTIVE (ACTIVE WHEN RECEIVING AUTOMATIC SELECTIVE DYNAMIC OVERLOAD CONTROL [DOC] SIGNAL)
RR - REROUTE INDICATOR
RRPTR - INDEX NUMBER OF REROUTE CONTROL SLOT USED FOR THIS REROUTE
TGPP - ADDRESS OF FIRST WORD IN TRUNK GROUP CONTROL/ACTIVITY BLOCK

Fig. 14—Trunk Group Control/Activity Block Layout (Note 1)



See note, footnotes, and legend on next page.

Fig. 15—Flexible Trunk Group Control Block Layout (Sheet 1 of 2) (Note 1)

Note:
1. See matrix to determine control percentage and associated bit code for trunk group control direct-routed, alternate-routed, or overflow traffic.

*2 X (NMFLXC+1), THIS FORMULA BUILDS THE NUMBER OF SUBBLOCKS FOR THIS TABLE

† MANUAL/AUTOMATIC INDICATOR; 0 = MANUAL, 1 = AUTOMATIC

LEGEND:

% DOR	% DIRECT-ROUTED TRAFFIC TO BE CONTROLLED
% ALT	% ALTERNATE-ROUTED TRAFFIC TO BE CONTROLLED
% OVF	% OVERFLOW TRAFFIC TO BE CONTROLLED
D	DISPOSITION OF AFFECTED CALLS
PRE,DRE	THRESHOLDS
NMFLXC	SET CARD THAT PROVIDES THE QUANTITY OF FLEXIBLE TRUNK GROUP CONTROL SLOTS
NMFLEX	ADDRESS OF FIRST WORD IN FLEXIBLE CONTRDL SLOTS BLOCK
NOET	NUMBER OF EQUIPPED TRUNKS (USED ONLY ON TR-ACT INPUT MESSAGE)
RR	REROUTE TYPE: IMMEDIATE REROUTE IF BIT = 1; REGULAR REROUTE IF BIT = Ø
RI	REROUTE INDICATOR (BIT = 1, REROUTE EFFECTIVE)
SR	SPRAY REROUTE (BIT = 1, SPRAY REROUTE EFFECTIVE)
RR INDEX	REROUTE SLOT INDEX INTO SPRAY REROUTE TABLE (NMSPRR) OR SINGLE REROUTE TABLE (NMSIRR)
PEG	TRAFFIC PEG COUNT BIT (USED ONLY FOR TRUNK GROUP CONTROLS)
2W	TWO-WAY TRUNK GROUP INDICATOR BIT
FTG TGN	"FROM TRUNK GROUP" TRUNK GROUP NUMBER

Fig. 15—Flexible Trunk Group Control Block Layout (Sheet 2 of 2) (Note 1)

TABLE A

NETWORK MANAGEMENT SUBSYSTEM PROGRAMS

PROGRAM ACRONYM	TITLE	PR-NUMBER 1"ESS"	PR-NUMBER 1A "ESS"
CLID	Calling Line Identification List Administration	PR-1A087	PR-6A087
EDAS	Engineering Administrative and Data Acquisition Interface	PR-1A091	PR-6A091
EDVF	EDAS Translation Verification Routines	PR-1A091	PR-6A880
NMEA	EADAS/NM Interface	PR-1A092	PR-6A092
NMGT	Network Management	PR-1A080	PR-6A080
NMIN	Network Management Indicators	PR-1A080	PR-6A904
NMMP	Network Management Maintenance	PR-1A052	PR-6A052
NMRR	Network Management Reroute Control	PR-1A080	PR-6A906
NMTC	Network Management Toll Code Blocking	PR-1A080	PR-6A907
NMTD	Transmit Dynamic Overload Control Signals	PR-1A080	PR-6A908
NMTG	Network Management	PR-1A080	PR-6A909
NMSC	Network Management Selective Incoming Overload Control	PR-1A1341	PR-6A1341
NMCG	Network Management Call Gapping	PR-1A1343	PR-6A1343

TABLE B

TTIA PROGRAM INTERFACE

NETWORK MANAGEMENT SUBSYSTEM		TTY INPUT MESSAGE (RESPONSE)
PROGRAM	GLOBAL	
NMMP	NMMRST	DOC-RESTORE (restores loop out-of-service bit)
	NMTDEX	DOCX-EX (executes daily exercise on DOC transmitter)
NMRR	NMRRST	RR-STATUS (lists network management preprogrammed reroute controls)
NMEA	NMDRST	DR-STATUS (lists all DOC receiver loops out-of-service)
	NMDTST	DT-STATUS (lists all DOC transmit loops out-of-service)
	NMEATA	TG-ADDCNT (adds TGN to block 63 traffic counts)
	NMEATD	TG-DEACT (removes TGN from block 63 traffic counts)
	NMTGST	TG-STATUS (lists all active block 63 traffic counts)
NMTD	NMDCME	DOC-EXC (excludes DOC signal from transmission)
	NMDCMR	DOC-REM (removes DOC signal from transmission)
	NMDCRA	DOC-CLEAR (removes all manual controls of DOC signal)
	NMDCMS	DOC-SND (sets up DOC signal data for transmission)
	NMDCST	DOC-STATUS (lists status of all DOC signals)
	NMDMC3	LST-THREE (lists MC3 signal data)
	NMDPD1	DPD-MCONE (lists MC1 trunk dial pulse receiver data)
	NMDPD2	DPD-MCTWO (lists MC2 trunk dial pulse receiver data)
	NMMFD1	MFD-MCONE (lists multifrequency receiver data)
	NMMFD2	MFD-MCTWO (lists multifrequency receiver data)
	NMRPD1	RPD-MCONE (lists MC1 revertive pulse receiver data)
	NMRPD2	RPD-MCTWO (lists MC2 revertive pulse receiver data)
	NMRTD1	RTD-MCONE (lists MC1 real time congestion data)
	NMRTD2	TRD-MCTWO (lists MC2 real time congestion data)

TABLE B (Contd)

TTIA PROGRAM INTERFACE

NETWORK MANAGEMENT SUBSYSTEM		TTY INPUT MESSAGE (RESPONSE)
PROGRAM	GLOBAL	
NMIN	NMSTDT	TGN-DATA (lists TGNs to which no-circuit indicators are assigned
NMTG	NMCFAT	CF-ACT (activates CANCEL-FROM flexible trunk group control)
	NMCTAT	CT-ACT (activates CANCEL-TO flexible trunk group control)
	NMFXDT	FLEX-DEACT (deactivates flexible trunk group control or flexible trunk group peg and overflow counter)
	NMFXRA	FLEX-CLEAR (removes all active flexible trunk group controls and flexible trunk group peg and overflow counters)
	NMFXST	FX-STATUS (lists all active flexible trunk group controls and flexible trunk group peg and overflow counters)
	NMPPDT	PP-DATA (lists translation information associated with each preprogram control)
	NMPPMA	PP-ACT (activates preprogram control)
	NMPPME	PP-EXC (excludes preprogram control from activation via DOC signal)
	NMPPMR	PP-REM (deactivates a preprogram control; restores a preprogram which is excluded from activation via DOC signals
	NMPPRA	PP-CLEAR (deactivates all preprograms currently active and restores all preprograms excluded from activation via DOC signals)
	NMSKAT	SK-ACT (activates SKIP flexible trunk group control)
	NMTGCT	TG-ACT (activates flexible trunk group peg and overflow counter on trunk group)
	NMTRAT	TR-ACT (activates TRUNK RESERVATION flexible trunk group control)
CLID	CLENTR	CI-ENTER (places directory number on CLID list)
	CLRMVE	CI-REMOVE (removes directory number from CLID list)
	CLLIST	CI-LIST (lists CLID entries)

TABLE B (Contd)

TTIA PROGRAM INTERFACE

NETWORK MANAGEMENT SUBSYSTEM		TTY INPUT MESSAGE (RESPONSE)
PROGRAM	GLOBAL	
NMSC	NMSCIM	NMG-SILC (A, R, or S) A (assign) — Assigns a trunk group control to a specified trunk group number (TGN) R (remove) — Removes one (specify TGN) or all (specify All) trunk group control(s) S (status) — Lists all (specify All) or one (specify TGN) active trunk group controls for SILC.
NMCG	CGACRQ CGRMRQ CGRARQ CGSTRQ	Activates a call gapping control Removes a call gapping control Clears all call gapping controls Status of active call gapping controls

TABLE C

ECMP PROGRAM INTERFACE

NETWORK MANAGEMENT SUBSYSTEM		ECMP INTERFACE CONDITION
PROGRAM	GLOBAL	
NMMP	NMMDEX	Entered once every 24 hours to determine what maintenance actions should be performed
NMGT	NMCBRC	Return entry after real-time break
NMTD	NM10SC	10-second entry to determine validity of acknowledgements
	NM5MIN	5-minute entry to zero machine congestion traffic and print exception message if counts are nonzero
NMIN	NMSTST	10-second entry to control SC relays in network management indicator circuit
NMSC	NMSCAC	Audit for SILC control signals

TABLE D

NETWORK MANAGEMENT SUBSYSTEM PROGRAM INTRARELATIONSHIP

PROGRAM (ENTERED)	PROGRAM (ENTERED FROM)	GLOBAL SUBROUTINE (ENTERED)
EDAS	EDVF	EDASEG EDASND EDASTG
	NMEA	EANMAN
EDVF	EDAS	EDTGNS EDVCHC EDVCRT EDVCTG EDVFYC EDVFYH EDVHC5 ED1TNG
NMEA	EDAS	NMEAAP
	NMCG	NMEAT1 NMEAT2 NMEAT3 NMEAT4 NMEAT5 NMEAT6 NMEAT44 NMEAT52
	NMSC	NMEAS0 NMEAS1 NMEAS2 NMEAS3 NMEAS4 NMEAS5 NMEAS6 NMEAS54 DISC47
	NMGT	NMEAAU NMEASC NMEAT1 NMEAT2 NMEAT3 NMEAT4 NMEAT5 NMEAT6 NMEA44 NMEA52

TABLE D (Contd)

NETWORK MANAGEMENT SUBSYSTEM PROGRAM INTRARELATIONSHIP

PROGRAM (ENTERED)	PROGRAM (ENTERED FROM)	GLOBAL SUBROUTINE (ENTERED)
NMEA (Contd)	NMIN	NMEATF
	NMMP	NMEA50
	NMTC	NMEAT1 NMEAT2
	NMTD	NMEA51 NMEA54 NMET25 NMET26 NMET27 NMET28 NME24B NME24C NME24D NME24E
	NMTG	NMEARR NMEAT7 NMET10 NMET11 NMTRS NMEAT8 NMET12 NMET13 NMET15 NMET16 NMET17 NMET18 NMET19 NMET20 NMET21 NMET22
	NMMP	NMEA50
NMGT	NMEA	NMAD4N NMCBSG NMTKNG NMTKNO NMZSLT
	NMTD	NMAUD4 NMPR08 NMTKNG NMTKNO

TABLE D (Contd)

NETWORK MANAGEMENT SUBSYSTEM PROGRAM INTRARELATIONSHIP

PROGRAM (ENTERED)	PROGRAM (ENTERED FROM)	GLOBAL SUBROUTINE (ENTERED)
NMGT (Contd)	NMTG	NMAUD6 NMOLLR NMOLLS NMPR08 NMTKNG NMTKNO
	NMRR	NMAUD6
	NMTC	NMOLLR NMOLLS NMSTCB
	NMCG	NMOLLR NMOLLS
	NMIN	NMTKNG NMTKNO
NMMP	NMTD	NMDXFL NMSINT
NMRR	NMEA	NMRT11
	NMGT	NMRRUP
	NMTG	NMARCS NMFXRR NMRCNT NMRRAF NMRRC1 NMRRPC NMRRPD NMRRPL NMRRPP
NMTC	NMGT	NMAUDE
	CLID	NMTCNG
NMTD	NMGT	NMSEND NMAUT6 NMDBP1 NMDBP3 NMDCAG NMDCAR
	NMEA	NMDDSG

TABLE D (Contd)

NETWORK MANAGEMENT SUBSYSTEM PROGRAM INTRARELATIONSHIP

PROGRAM (ENTERED)	PROGRAM (ENTERED FROM)	GLOBAL SUBROUTINE (ENTERED)
NMTG	NMGT	NMAUT1 NMPAA1 NMPAR1 NMPPST
	NMRR	NMDOUT NMFXRR NMGETT
	NMEA	NMDTSG NMFXRR
NMSC	NMGT	NMSCAC

TABLE E

NMGT GLOBAL SUBROUTINES

GLOBAL	INTERFACE PROGRAM	FUNCTION
NMAD4N	NMEA	Entry point within NMAUD4.
NMAUD1	SADT	Performs audit 32 (pointer relationship for trunk group controls) on a periodic basis.
NMAUD4	NMTD	Performs audit on calling line identification code control slots.
NMAUD6	NMTG NMRR	Performs audit on DOC call store.
NMCBCI	ICRV ICAL	Determines if dialed DN is in CLID list when RC area contains network management entry.
NMCBCO	ORDL	Determines if dialed DN is in CLID list when RC area contains network management entry.
NMCBRC	ECMP	Resets real-time break indicator and restores scratch area.
NMCBSG	NMEA	Locates EADAS code block in CLID list.
NMGTMSGS	MCTWADMN	Prints code block list status message (1A ESS switch).
NMMCTH	SADA	Performs audit 3; calculates receiver threshold values.
NMOLLR	NMTG NMTC	Turns off OUTGOING LOAD CONTROL lamp.
NMOLLS	NMTG NMTC	Turns on OUTGOING LOAD CONTROL lamp.
NMPPAA	CHGD	Activates trunk group control.
NMPPAR	CHGD	Deactivates trunk group control.
NMPRO8	NMTG NMTD	Prints TTY output message NM08.
NMSDOC	ECMP	Determines current DOC signal levels.
NMSEGA	SARG	Performs audit on segment work indicators.
NMSTCB	NMTC	Make null the current free list.
NMTKNG	NMTG NMTD NMIN NMEA	Returns NG TACK in a segment message.
NMTKNO	NMTG NMTD NMIN NMEA	Returns NO TACK if TTY program does not accept request.

TABLE E (Contd)

NMGT GLOBAL SUBROUTINES

GLOBAL	INTERFACE PROGRAM	FUNCTION
NMTYPE	NMTG	Identifies slot type.
NMT1T2	MAUD	Audits T1 and T2 bits for DOC scan points.
NMZSLT	NMEA	Sets up Z register.
NMAFT	TRBT	Entry for a call that overflows a trunk group that has a cancel-from conrol active.
NMAUT1	NMCG NMGT	Audit of NM-PT indicator relationship.
NMBEF	TRBT	Entry when outgoing load control bit is set in the trunk group head cell.
NMCKSL	CIDR	Check for flexible control slots.
NMCKTW	CIDR	Determine if truck group is 1-way or 2-way.
NMDOUT	NMRR	Segment entry point for PP-DATA message.
NMDTSG	NMEA	Segment entry point for PP-DATA message.
NMFXSG	NMEA NMRR	Segment entry point for FX-STATUS message.
NMGETT	NMRR	Entry point to obtain control type on PP-DATA message.
NMSTSG	NMEA	Segment entry point for a PP-STATUS message.
NMCGOR	ORDL	Determine if dialed DN is in call gapping or CLID list when RC area contains network management entry.
NMCGIC	ICRV ICAL	Determine if dialed DN is in call gapping or CLID list when RC area contains network management entry.
NMCGCI	ORDL ICAL	Determine if dialed 10XXX (access code) is on a call gapping list when RC area contains network managment entry.

TABLE F

NMRR GLOBAL SUBROUTINES

GLOBAL	INTERFACE PROGRAM	FUNCTION
NMFXRR (1A ESS Switch Only)	NMTG	Determine if flexible control is immediate or regular reroute.
NMRRAF	NMTG	Process a preprogrammed/flexible reroute control on a call that overflows the FTG.
NMRRCT	TAND HLOP CINM	Process network management affected tandem calls.
NMRRCO	ADPB GRDL	Process network management affected calls.
NMRRC1	NMTG	Deactivate a preprogrammed reroute slot.
NMRRIT	NMTG	Check call that has trunk group control active to determine if it is a reroute attempt.
NMRRPA	NMTG	Initialize the reroute control slot for a preprogram reroute activation.
NMRRPD	NMTG	Check for reroute on PP-DATA message.
NMRRPC	NMTG	Deactivate a preprogrammed reroute slot.
NMRRPL	NMTG	Audit reroute control items in preprogram trunk group control words.
NMRRPP	NMTG	Call processing interface for preprogrammed reroute control.
NMRRSL	NMTG	Verify a preprogram reroute slot is available for a manual activation.
NMRRUP	NMGT	Zero counter of cancelled rerouted calls if 5 minutes have passed.
NMRTAF	TRBT	Initialized peg counter of cancelled rerouted calls.

TABLE G

NMTD GLOBAL SUBROUTINES

GLOBAL	INTERFACE PROGRAM	FUNCTION
NMAUT6	NMGT	Performs audit 32.
NMDBP1	NMGT	Determines MSN DOC assignment.
NMDBP3	NMGT	Determines MSN MC3 assignment.
NMDCAG	NMGT	Entry for unit type 56 loss of MC1/MC2/MC3 acknowledgements.
NMDCAR	NMGT	Entry for unit type 56 receipt of MC1/MC2/MC3 acknowledgements.
NMDCME	TTIA	Entry for TTY input message, DOC-EXC. Causes DOC signal to be excluded from being sent.
NMDCMR	TTIA	Entry for TTY input message, DOC-REM. Causes manual control of DOC signal to be removed.
NMDCMS	TTIA	Entry for TTY input message, DOC-SND. Causes DOC signal to be sent.
NMDCRA	TTIA	Entry for TTY input message, DOC-CLEAR. Removes DOC manual control signals.
NMDCSG	NMEA	Determines DOC loop states.
NMDMC3	TTIA	Entry for TTY input message, LST-MC3.
NMDCST	TTIA	Entry for TTY input message, DOC-STATUS. Prints status of DOC loops.
NMDDSG	NMEA	Causes NM22 DOC segment printout.
NMDPD1	TTIA	Entry for TTY input message, DPD-MCONE. Causes printout of translation data identifying loops or offices to which DOC signals are sent upon crossing the threshold for machine congestion level (dial pulse receiver congestion).
NMDPD2	TTIA	Entry for TTY input message, DPD-MCTWO. Causes printout of translation data identifying loops or offices to which DOC signals are sent upon crossing the threshold for machine congestion level 2 (dial pulse receiver congestion).
NMHPOB	TNKC	Entry point for POB queueing.
NMIPOB	—	Entry point for successful POB activation.
NMMCSG	—	Prints machine congestion peg and usuage exception traffic message.
NMMFD1	TTIA	Entry for TTY input message, MFD-MCONE. (MC1 MF receiver translation).
NMMFD2	TTIA	Entry for TTY input message, MFD-MCTWO (MC2 MF receiver translation).

TABLE G (Contd)

NMTD GLOBAL SUBROUTINES

GLOBAL	INTERFACE PROGRAM	FUNCTION
NMRPD1	TTIA	Entry for TTY input message, RPD-MCONE (MC1 revertive pulse receiver translation).
NMRPD2	TTIA	Entry for TTY input message, RPD-MCTWO (MC2 revertive pulse receiver translation).
NMRTD1	TTIA	Entry for TTY input message, RTD-MCONE (MC1 real-time congestion).
NMRTD2	TTIA	Entry for TTY input message, RTD-MCTWO (MC2 real-time congestion).
NMSEND	NMGT	Determines change in state of DOC loops. Checks for change in state if the machine congestion level has changed or if a manual request has been processed.
NMTDTT	—	Audits T1 and T2 bits for DOC transmit circuit scan points during phase 3.
NM10SC	ECMP	10-second entry to determine validity of acknowledgements.
NM5MIN	ECMP	5-minute entry to zero machine congestion traffic and print exception message if counts are nonzero.

TABLE H

NMEA GLOBAL SUBROUTINES

GLOBAL	INTERFACE PROGRAM	FUNCTION
NMDRST	TTIA	Transmits response to TTY input message DR STATUS.
NMDTST	TTIA	Checks for EADAS DT STATUS request in EADAS output buffer.
NMEAAP	EDAS	Updates EADAS status discretes that are updated at the poll entry.
NMEAAU	NMGT	Audits block 63 trunk group count traffic slots.
NMEASC	NMGT	Updates status discretes on a scan basis.
NMEATA	TTIA	Adds trunk group number to block 63 traffic counts in response to TTY input message TG-ADDCNT.
NMEATD	TTIA	Removes trunk group number from block 63 traffic counts in response to TTY input message TG-DEACT.
NMEATF	TFCT RADR NMTG NMIN	Transmits illegal response to EADAS/NM.
NMEAT1	NMTC NMGT	Transmits response to TTY input message CB-ACT.
	NMCG	Transmits response to TTY input message CG-ACT.
NMEAT2	NMTC NMGT	Transmits response to TTY input message CB-REM.
	NMCG	Transmits response to TTY input message CG-RMV.
NMEAT3	NMTC NMGT	Transmits response to TTY input message CB-CLEAR, PP-CLEAR, DOC-CLEAR.
	NMCG	Transmits response to TTY input message CG-CLEAR, PP-CLEAR, DOC-CLEAR.
NMEAT4	NMGT	Generates output header for TTY input message CB-ST.
	NMCG	Generates output header for TTY input message CG-ST.
NMEAT5	NMGT	Loads segment of CB-STATUS message.
	NMCG	Loads segment of CG-STATUS message.
NMEAT6	NMGT	Transmits EADAS CB-ST message.
	NMCG	Transmits EADAS CG-ST message.
NMEAT7	NMTG	Transmits response to TTY input messages SK, CT, CF, TR-ACT.
NMEAT8	NMTG	Transmits response to TTY input message FLEX-DEACT.

TABLE H (Contd)

NMEA GLOBAL SUBROUTINES

GLOBAL	INTERFACE PROGRAM	FUNCTION
NMEA44	NMGT	Sets EADAS discrete 44 indicating audit removed code block.
NMEA45	NMTG	Set EADAS discrete 45 indicating audit removed flexible control.
NMEA50	NMMP	Sets EADAS discrete 50 indicating DOC transmit circuit has failed or has been destroyed.
NMEA51	NMTD NMMP	Sets up to insert discrete 51.
NMEA52	NMTC NMGT	Sets EADAS discrete K1 for TTY change in code blocking status.
	NMCG	Sets EADAS discrete KI for TTY change in call gapping status.
NMEA53	NMTG	Sets EADAS discrete 53 indicating TTY change in preprogram status.
NMEA54	NMTD NMSC	Sets up to insert discrete 54.
NMETR	EDAS	Determines transfer point when a continuation poll is received.
NMET10	NMTG	Transmits response to TTY input message FX-STATUS.
NMET11	NMTG	Loads segment of FX status data into EADAS output buffer.
NMET12	NMTG	Releases FX-STATUS message to EADAS.
NMET13	NMTG	Transmits response to TTY input message PP-ACT.
NMET15	NMTG	Transmits preprogram status busy message.
NMET16	NMTG	Generates output header in response to TTY input message PP-STATUS.
NMET17	NMTG	Adds segment of PP-STATUS message into EADAS output buffer.
NMET18	NMTG	Transmits PP-STATUS message data to EADAS.
NMET19	NMTG	Transmits response to TTY input message PP-DATA.
NMET20	NMTG	Loads header for PP-DATA in EADAS output buffer.
NMET21	NMTG	Loads segment of PP-DATA message into EADAS output buffer.
NMET22	NMTG	Transmits EADAS buffer containing PP-DATA message.
NMET23	NMTD	Transmits response to TTY input messages DOC-SND, DOC-EXC, DOC-REM to EADAS.

TABLE H (Contd)

NMEA GLOBAL SUBROUTINES

GLOBAL	INTERFACE PROGRAM	FUNCTION
NMET25	NMTD	Transmits response to TTY input message DOC-STATUS if call register is in use or no DOC function is in office.
NMET26	NMTD	Loads header for DOC-STATUS in EADAS output buffer if request can be processed.
NMET27	NMTD	Loads segment of DOC-STATUS message data in EADAS output buffer.
NMET28	NMTD	Transmits DOC-STATUS data to/NM. EADAS/NM.
NME24A	—	Loads header in response to TTY input messages DPD-,MFD-,RPD-,RTD-, and LST-.
NME24B	NMTD	Loads NG in EADAS output buffer in response to DOC data input message.
NME24C	NMTD	Loads header in EADAS output buffer for DOC data message.
NME24D	NMTD	Loads segment in EADAS output buffer for DOC data message.
NME24E	NMTD	Transmits DOC data message to EADAS center.
NMIHNO	RADR	Transmits RADR-INHIBIT NG response to EADAS center.
NMIHOK	RADR	Transmits RADR-INHIBIT OK message to EADAS center.
DISC47 NMEAS0 NMEAS1 NMEAS2 NMEAS3 NMEAS4 NMEAS5 NMEAS6	NMSC	Sets up to insert discrete 47.
NMRDAL	RADR	Loads output buffer with data indicating whether or not test calls are being allowed to determine receiver delay.
NMTGST	TTIA	Lists all active block 63 TGN counts.
NMT7RP	NMTG	Loads output buffer with data indicating a flexible control is being replaced.
NM13RP	NMTG	Loads output buffer with data indicating a preprogram control is being replaced.