

**CENTRALIZED AUTOMATIC MESSAGE ACCOUNTING-COMPUTERIZED (CAMA-C)
REMOTE TELETYPEWRITER
DESCRIPTION, OPERATION, AND MAINTENANCE
4A, 4M TOLL AND CROSSBAR TANDEM OFFICES**

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C. Remote Terminals	5	1.02 This section is reissued to include information for mechanized evaluation of call completion anomalies (MECCA) feature, Generic 3. Revision arrows are used to emphasize the more significant changes. The following are the specific reasons for reissue:	
SOFTWARE	5	(a) To update paragraph 1.07 for MECCA feature	
A. General	5	(b) To update paragraph 2.23 for MECCA feature	
B. Software Programs	5	(c) To add paragraph 4.03	
OPERATION	7	(d) To add Step 8c to paragraph 4.07 for MECCA feature	
3. REMOTE TTY LOG-ON, INPUT REQUESTS, AND LOG-OFF PROCEDURES	7	(e) The title has been changed to reflect 4A, 4M toll and crossbar tandem offices	
A. Log-On	7	(f) To generally update this section.	
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NOTICE

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1.04 Since CAMA-C monitors circuits in the 4A and crossbar tandem switching offices, it has the ability to assemble information indicating possible office troubles, office performance (with regard to toll billing), network signaling irregularities, and other office parameters. Most of the compiled information is used by (1) maintenance centers, (2) traffic study groups, and (3) security forces. Remote TTY operation provides access to the CAMA-C computer for these users for input/output message generation.

1.05 The remote TTY feature provides the hardware for a maximum of eight 110 baud, 10 characters-per-second asynchronous communications data ports at the CAMA-C primary machine (see Fig. 1). When these ports are equipped with the appropriate data sets, they have the capability to transmit a restricted set of CAMA-C messages to remote terminals at any desired location over the DDD or a private line network. The remote TTY feature also includes computer software that provides all the required timing, buffering, distribution, checking, receiving of input commands and data, and the transmitting of the output messages to the CAMA-C primary 5028 operator station (TTY) and to the eight data terminals.

1.06 In order to provide some order in the message distribution arrangement, and to define the capabilities of various types of ports, all CAMA-C input and output messages have been grouped into classes. These classes, as defined in Table A, reflect a functional organization. For example, all commands and messages concerning the starting and stopping of the AMA7 program are grouped in the same class, and that class is permanently assigned to the 5028 operator station. Other classes of messages are assignable to ports, as indicated in Table A, and these assignments are entered into the CAMA-C data base using recent change procedure CHG(15). Refer to Section 201-902-303 for recent change procedures. Table B contains a suggested functional set of remote terminal types.

1.07 The types of TTY ports as shown in Table B can be arranged (per recent change procedures) to receive the classes of TTY messages listed in Table A. A typical arrangement for a CAMA-C System listed by terminal name (Table B) is as follows:

5028:

- Permanently assigned message class 00

- Permanently restricted from receiving message class 01 and class 07
- Will receive, by default, message classes 02, 03, 04, 05, and 06, unless they are deleted from assignment to the 5028
- Can receive, by assignment, message classes 02, 03, 04, 05, and 06, even if these classes are assigned to other ports.

SEC (When MECCA Feature [Generic 3] is Not Provided):

- Permanently assigned to receive message class 01
- Permanently restricted from message class 00
- Can be assigned any other class if local practice combines the security function with other functions.

SEC/MECCA (When MECCA Feature [Generic 3] is Provided):

- Permanently assigned to receive message class 07 and modified messages from class 01
- Permanently restricted from all other message classes.

MTC:

- Permanently restricted from message classes 00 and 01
- Can be assigned message classes 02, 03, 04, 05, and 06, to provide local printout of switching-related trouble and administrative data in the maintenance center if the CAMA-C System is remotely located.

ECT:

- Permanently restricted from message classes 00 and 01.
- Can be assigned message classes 02 and 06 to provide statistical analysis printout of network troubles.

RT1-RT5:

- Permanently restricted from message classes 00 and 01
- Can be assigned all other classes to meet local requirements.

1.08 All output messages, except some class 07 messages, which are generated by the CAMA-C machine are preceded with "Priority of Action" character(s). The "Priority of Action" character(s) are described in Table C.

1.09 Typical operation with the remote terminal feature would start with the distant user establishing a connection with the required data set at the CAMA-C System location, either over the switched network or a private line arrangement. After the connection is established, the CAMA-C machine would request the user to log-on by identifying the terminal name and supplying a password and user identification. As messages assigned to this port are generated by the CAMA-C System, they will be routed and printed at the users remote terminal. There are certain priorities and restrictions associated with the command interpreter to provide for the most efficient distribution of input and output data with a minimum of complexity and blockage of output messages. Some of the more important restrictions are as follows:

- Remote data terminals can only request data to be printed. They *cannot* change the data base or alter the CAMA-C System operation.
- An input request can be made at any time, but it will not be serviced until the message currently being printed, if any, is completed.
- Once an input request is made, only a limited period of time will be allowed to complete entry of the input data.
- Only input commands permitted for the assigned class will be acted on when issued by that terminal. Other input commands will result in an error message being printed at the issuing terminal.

Note: Before using the remote terminal feature for the first time after loading the

Generic 2 (or later) software, the feature must be enabled through the use of the CHG(4) command. Then the CAMA-C must be restarted to properly initialize the remote terminal hardware. If a SEC/MECCA port is used, its port number must also be assigned using the CHG(4) command.

1.10 Before an input message can be entered, the carriage return key must be momentarily depressed.

1.11 There are three editing characters which can be used at a remote TTY. Depending on the type of keyboard used, the characters will differ. For this reason, the different characters for each function are shown in parentheses. Select the appropriate character.

BACKSPACE (\ or Uppercase L): The backslash character is used to correct a single character which was incorrectly entered.

CANCEL LINE (_ or Uppercase O): The cancel line character is used to correct an input request command which was falsely entered. The new input request is entered following the cancel line character.

CANCEL ENTRY (^ or Uppercase N): The cancel entry character is used to completely cancel an input request.

1.12 Table D shows a typical remote TTY printout for a TTY session. Examples of the editing characters described in paragraph 1.11 are illustrated in Table D.

1.13 Part 4, Subpart B, of this section provides trouble locating information. The flowchart shown is usually accessed because of a test failure. However, should a failure occur during normal operation, the flowchart can also be used to isolate trouble conditions.

1.14 Bold printing is used throughout this section for messages (input or output) that are actually entered or printed out on either the remote TTY or CAMA-C 5028 operators station.

1.15 Refer to IM-5P001-01, IM-5P002-01, and OM-5P001-01, OM-5P002-01 for explanation of the input/output messages used for CAMA-C.

1.16 Lettered Steps: A letter a, b, c, etc, added to a step number in Parts 3 and 4 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

2. DESCRIPTION

EQUIPMENT ELEMENTS

A. General

2.01 The principal hardware components of the remote TTY feature are: (1) data terminal equipment interface cards, (2) digital input and digital output points with associated interconnecting cards, (3) a cable assembly, and, (4) private line or DDD data sets. This hardware, when interconnected with the other equipment already present in the CAMA-C primary machine, provides for the eight remote data ports. Fig. 1 shows a block diagram of the remote terminal hardware.

B. Hardware

2.02 CAMA-C central unit hardware provided for remote TTY operation consists of:

- Data terminal interfaces
- Data sets and data mountings
- Interconnecting cable.

Data Terminal Interface

2.03 The data terminal interface consists of two identical printed wiring boards which are mounted in the 5026 enclosure of the primary machine. Each data terminal interface provides the circuitry to allow digital data outputs from the computer to be converted for data set operation and vice versa). A data terminal interface serves a maximum of four data sets. Thus, the two interface boards allow for a system capacity of eight data sets serving eight remote TTYs.

2.04 Each data terminal interface card contains four line drivers, four line receivers, a power supply, and a interrupt timer. Fig. 2 shows a functional layout for a data terminal interface card. The basic functions of the cards are to:

- (1) Generate interruptions to the processor to indicate to the program when to sample the remote terminal input lines and when to transmit output character bits.
- (2) Convert computer digital output signals to those specified by Electronic Industries Association (EIA) RS-232 standard.
- (3) Convert the signals received from the remote terminals (specified by EIA RS-232) to one compatible to the digital input of the computer.
- (4) Connect the data terminal "ready" leads to the data sets. (These leads indicate to the associated data set that the computer is on).
- (5) Provide the necessary ground leads.

One card is used to interface to the first four (0 through 3) data ports and the second card performs an identical function for ports 4 through 7. Only one interrupt timer is required for all eight remote ports.

Data Sets and Data Mountings

2.05 Data sets located at the CAMA-C site are arranged to provide both private line and switched network low speed (0-300 baud) full duplex asynchronous serial transmission service. They are equipped for unattended operation (ie, auto-answer on switched network sets) and provide the following EIA RS-232 interface leads:

- Protective ground and signal ground
- Transmitted data
- Received data
- Clear to send (indicates that the data set has established a connection with the far-end data set and is ready to transmit and receive)

- Data terminal ready (indicates to the data set at the CAMA-C site that the computer is on).

2.06 Data is transmitted and received at 10 character/sec using ASCII, 8 level, 11 unit (1 start bit, 7 data bits, 1 parity bit, and 2 stop bits) code arranged for even parity. The remote data sets and terminals must be equipped to be compatible with these specifications.

2.07 Private line applications for remote TTY operation utilize 108E (or equivalent) data sets. These data sets are normally installed in 830A data mountings. For dial-up (DDD) applications where DATA-PHONE® service is utilized, 103A3 (or equivalent) data sets (which do not require data mountings) can be used. A 32A1 data mounting can be used to serve 113B data sets (or equivalent) where multiple applications of dial-up data sets is desired.

Interconnecting Cable

2.08 A cable provides the necessary connections between the hardware in the computer I/O (input-output) module and the data sets. The cable is terminated on one end with ring terminals which connect to the data terminal interface cards (that plug into the computer I/O module) and the other end terminates in eight EIA RS-232 standard 25 pin-hooded connectors that plug into the data sets. A block diagram showing the connections required for one remote TTY is shown in Fig. 3.

C. Remote Terminals

2.09 A remote terminal can be any terminal device (such as Teletype® Corporation Models 33 or 35, or Texas Instrument Silent 700) which transmits and/or receives standard TTY codes. The user must consider the specific application of the remote TTY to determine which terminal would best serve the needs. Some of the contributing factors for determining which terminal to use are as follows:

- Is motor control required?
- Is dedicated (private line) connection required?
- Is dial-up connection desired?
- Cost

- Noise level of terminal.

SOFTWARE

A. General

2.10 The software consists of an input command interpreter, an output message distributor, an input and output data handler, and an on-line test program. This software provides all the required timing, buffering, distribution, checking, receiving, and transmitting of the input and output messages to the CAMA-C primary operators station TTY and remote TTYs.

B. Software Programs

2.11 For normal operation, there are five primary programs which provide for system operation. They are as follows:

- Input Command Interpreter
- Output Message Distributor
- Input Data Handler
- Output Data Handler
- Test Program

A description of each of these programs is provided in paragraphs 2.12 through 2.23.

2.12 Input Command Interpreter (ICI):

The ICI program performs the following basic functions: (1) log-on and log-off for remote users, (2) screening remote terminal input commands for proper authorization and format, (3) measuring the time it takes for a remote user to enter a command and aborting the input if the time exceeds 30 seconds, and (4) routing all input commands and input data to the part of the CAMA-C program that is the ultimate user.

2.13 When a user logs on to the system, the user enters a 4-character code that defines the users terminal name (ie, maintenance port, security port, etc). The port code is then used to direct messages assigned to the users type of port (see Table B), to the data set, and ultimately the terminal being used. When the user logs off or disconnects the terminal from the system, the reference between the type of port and the actual

port to which the user is connected is deleted. The only action that can take place at the terminal from this point on is to reenter the log-on command.

2.14 In addition to the 4-digit type of port code, a 6-digit password and a 3-digit user identification are entered and checked by the ICI program to determine if the user is authorized to use the requested type of port. If the user is *not* authorized, a message indicating that a remote user made an unauthorized request is printed at the CAMA-C 5028 operator station.

2.15 There are certain priorities and restrictions associated within the ICI program to provide for the most efficient distribution of input and output data with a minimum of complexity and blockage of output messages and to protect the billing integrity of the CAMA-C System. Some of the more important ones are described in paragraph 1.09.

2.16 *Output Message Distributor (OMD):*

The OMD program intercepts messages generated by other CAMA-C programs. It uses the class and priority assignments to append the priority of action characters to the message. The OMD program causes the message to be transmitted via the output data handler program to the remote terminals (and/or 5028 operator station) that have been enabled to receive the message. The priority of action characters are described in paragraph 1.08 and Table C. After a message has been completed, the OMD program indicates to the program that issued the message that the message has been completed and then checks to see if there are other messages to be printed. If there are other messages, they are printed in the order that they were generated by the CAMA-C System.

2.17 The OMD program has one additional feature in that it will send an all-zero ASCII character, that is nonprintable and does not appear on the printout preceding the message to be printed. This character is used to start the motors on terminals equipped with idle line motor controllers. An idle line motor controller is a device which monitors the receive data lead of a data terminal and turns the motor off after a predetermined time if there is no activity. When data is detected on the receive data lead, the motor is turned back on.

2.18 *Input Data Handler (IDH):* The IDH program scans the input data leads of each

remote terminal that is in the process of inputting data. Each lead is sampled every 3.03 msec, which corresponds to 1/3 the bit rate, so that every bit is sampled three times. The input data on the eight input data leads is not in synchronism; thus, a sampling rate greater than once per bit is required to reproduce the input data at the computer.

2.19 The IDH program stores the input samples of every active remote terminal separately until a bit is sampled three times, then it stores the majority sampled polarity in a bit collector. After 11 bits have been collected they are checked for the proper start, stop, and parity bits and then packed and stored as an 8-bit ASCII character in an input buffer assigned to the active terminal. Input characters are also screened to see if they are one of the editing characters (backspace, cancel line, or cancel entry). If they are, the appropriate action is taken. Upon receipt of a carriage return character, the input is terminated and a signal is given to the input command interpreter indicating that there is a complete message in the ports buffer that is ready to process. The number of input characters is also checked against a maximum (set by the type of input expected) and if it is exceeded, the input is terminated.

2.20 *Output Data Handler (ODH):* The

ODH program receives the location of the input-output list (IOLT) of the message to be printed from the output message distributor. It then stores it along with a flag. The flag indicates that a new message is to be printed in an output control block which is set aside for each remote port.

Note: The IOLT is a standard software list that describes the message to be printed.

2.21 The ODH program interrogates each control block every 9.09 msec (timing is provided by the interrupt timer) and determines if a port is active. If a port is active, the state in the output sequence is determined and the appropriate action is taken. For example, if a new message is to be printed, the ODH program uses the information stored in the IOLT to determine: (1) the location of the text to be transmitted, (2) the message length, and, (3) whether or not a carriage return and line feed is to be appended to the end of the message. After this information is stored in the appropriate control block, the ODH program then transmits the first character. If a new

character is to be transmitted, the start and stop bits are appended to the character and the ODH program transmits the first bit. If it is in the middle of a character, it selects and transmits the next bit. If the message is complete, it gives an end of transmission indication to the output distributor software.

2.22 After all eight control blocks (maximum number corresponding to remote TTYs) have been acted upon, the bits associated with the active remote port are assembled into a digital output word, which is then transferred to the data terminal equipment interface card. This card converts the digital data output word into the proper signals and sends them to the appropriate remote terminal.

2.23 Test Program: The test program provides the capability to: (1) transmit a primary TTY defined message to all or any selected remote terminal(s) that have established a data set connection with the CAMA-C System, (2) receive a message from a selected remote terminal and print both the received message and the raw received bit data (before it is converted into ASCII characters) at the 5028 operator station, (3) indicate which remote ports have a connection established between remote users and the CAMA-C System, and (4) to automatically send and receive a predetermined test message to the MECCA central processor to test the MECCA link. The data terminal equipment interface cards are equipped with transmit, receive, and interrupt timer indicator lamps which, when used in conjunction with the on-line testing program, can give an indication as to which part of the remote terminal equipment is faulty. This can be useful if there are problems communicating between the CAMA-C System and remote users. An additional benefit of the feature is that general information messages such as system availability can be broadcasted to all or any selected remote users. A complete description of the testing feature is described in Part 4.

OPERATION

2.24 Fig. 3 shows a simplified drawing of the hardware required to communicate with one remote terminal. In a typical operation, the computer would be supplying the data terminal "ready" signal to the data set at the CAMA-C site

and the near-end and far-end data sets would have established a connection and given the "clear to send" signal to the computer. To derive the correct timing for both sampling input lines and sending out transmit bits, the interrupt timer on the data terminal interface card generates an 87 usec pulse every 3.03 msec which is detected by a digital input point and indicates to the data handlers that it is time to do an input or an output operation.

2.25 To transmit a character, the output data handler program writes the correct sequence of digital output bits (1s and 0s) to the data terminal interface card which converts it to an EIA RS-232 signal and passes it on through the cable assembly to the data set. The data set sends the signal over the telephone network to the remote data set where it is eventually printed on the remote terminal.

2.26 A received signal from the remote terminal, after passing through the data link, is converted from an EIA RS-232 signal to one compatible with the System/7 digital input. It is then sensed by a digital input point and passed to the input data handler program.

2.27 Typical operation of the remote terminal feature would start with the remote user establishing a connection between the terminal and the data set at the CAMA-C System location. After the connection is established, the CAMA-C machine would request the user to log-on by identifying the type of port, and supplying the password and user identification codes. Then as messages assigned to this port are generated by the CAMA-C System, they will be routed and printed at the users remote terminal. Input commands can be entered by first typing a carriage return. After the CAMA-C System responds, an **OR1:** message will be printed. The user can then enter the desired input message.

3. REMOTE TTY LOG-ON, INPUT REQUESTS, AND LOG-OFF PROCEDURES

A. Log-On

3.01 For a remote user to receive output messages or enter input commands, the TTY operator must first log-on to the CAMA-C System by entering the terminal name, password, and user identification.

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The terminal name (ie, MTC) defines the set of input and output message classes that are to be enabled at the port logging on. The password is checked to determine the validity of the user and the three identification characters are included in

a message printed at the 5028 operator station to identify the remote user.

3.02 The following procedure is used by a remote TTY to log-on the CAMA-C System:

STEP	ACTION	VERIFICATION
1	At remote TTY— Prepare TTY for operation.	
2	Establish a connection (dial-up TTY terminals) between the remote TTY and the CAMA-C machine.	
3	Momentarily depress RETURN key.	Remote TTY prints: M LOG-ON
4	Type: #aaa/bbbb/ccc ◆Depress RETURN key.◆	Remote TTY prints: M LOG-ON COMPLETE
	<i>Note 1:</i> aaa represents terminal name (SEC, MTC, ECT, or RT1-RT5), bbbb represents remote TTY password, ccc represents remote TTY user identification code.	
	<i>Note 2:</i> The # (pound) character and / (slashes) must be entered as indicated.	

B. Input Request

3.03 The following procedure is used to request data (output messages) from the CAMA-C System:

STEP	ACTION	VERIFICATION
1	At remote TTY keyboard— Perform log-on procedure.	
2	◆At TTY keyboard— Depress RETURN key.◆	Remote TTY prints: M OR1:
3	◆At remote TTY keyboard— Type: aaa Depress RETURN key. aaa = three character input command.◆	Remote TTY responds to input request. <i>Example:</i> If CIP was entered, remote TTY would print: M DDD HH:MM:SST CIP=xxxx
	<i>Note:</i> An example is CIP.	<i>Note:</i> DDD represents Julian calendar day, HH represents hour, MM represents minute, SST represents seconds and tenths of seconds, and xxxx represents the number of calls in progress in the CAMA-C primary machine.

C. Log-Off

3.04 The following procedure is used to terminate a remote TTY session:

STEP	ACTION	VERIFICATION
1	At remote TTY keyboard— ◆Depress RETURN key.◆	Remote TTY prints: M OR1:
2	Type: #LF Depress RETURN key.	Remote TTY prints: M LOG-OFF COMPLETE
3	Restore data link connection to normal (dial-up remote TTYs).	

4. TESTING AND LOCATING REMOTE TERMINAL TROUBLES—FROM CAMA-C

port, messages cannot be sent or received to that port.

A. Testing Remote TTY

4.01 The TRT (Testing Remote TTY) input command used in conjunction with the indicator lights on the data terminal equipment interface cards (located in digital output group 2 on the IBM* side of the 5013 module) are used for on-line testing of the remote terminal interface ports.

4.03 ◆If the remote port that has been selected is the SEC/MECCA port, a predetermined test message is sent to the MECCA central processor which in turn returns a predetermined test message. The messages are checked at the MECCA central unit and the appropriate CAMA-C for errors. A message is printed at the 5028 operator station indicating the success or failure of the test. A failure also causes the received data, prior to being converted to ASCII characters, to be printed.◆

4.02 The remote TTY test feature checks the ability to: (1) transmit a user-defined message to all ports or any selected remote port ◆except the SEC/MECCA port◆ that has established a connection with the CAMA-C System, and (2) receive a message from a selected remote port and print both the received message and the received data, before it is converted to ASCII characters, at the CAMA-C 5028 operator station. An indication of the remote terminals that have established a connection with the CAMA-C machine is indicated by the message **PORTS WITH CLEAR TO SEND BITS ON = x, x,...x.** x represents the port number as shown on the EIA connector that plugs into the data sets. If the clear-to-send bit is not on for a

4.04 The three indicator lights on each interface card are connected to the transmit data, receive data, and interrupt timer outputs. The top light on card 1 (see Fig. 4) when lighted or blinking is an indication that data is being transmitted to ports 0, 1, 2, or 3; likewise the middle light indicates that data is being received from ports 0, 1, 2, or 3 and the bottom light, when lighted, indicates that the interrupt timer is running. The interrupt timer indicates to the computer when to send output characters, or to sample input characters. Data cannot be transmitted or received if the timer is not operating. Card 2 performs an identical function for ports 4, 5, 6, and 7, with the exception that the timer lamp is not used.

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4.05 Examples of the use of the TRT command are shown in Fig. 5.

4.06 If the test described in this part of the section fails, refer to Subpart B, Trouble Analysis, for further analysis of trouble conditions.

4.07 The following procedure is used to test remote TTYs from the CAMA-C primary TTY:

- | STEP | ACTION |
|------|--|
| 1 | At CAMA-C 5028 operator station—
Ensure that power is on and in remote mode. |
| 2 | Momentarily depress REQUEST pushbutton. |
| 3 | At TTY keyboard—
Type: TRT
Depress RETURN key. |
| 4a | At TTY keyboard—
Type: x
Depress RETURN key.¶

<i>Note 1:</i> x represents remote TTY selected for test.

<i>Note 2:</i> Remote TTY selected must have been printed out in Step 3. |
| 5a | At TTY keyboard—
Type: 0 or 1 (as appropriate, see verification for Step 4a).
Depress RETURN key.¶ |
| 6a | At TTY keyboard—
Type: aaaa bbbb
Depress RETURN key.
aaaa bbbb = Any character not to exceed 70 characters.¶ |

Example: TEST PORT **x**

Note: **x** represents remote TTY port selected for test.

VERIFICATION

POWER and REMOTE lamps lighted.

TTY prints:
OR1:

TTY prints:
M PORTS WITH CLEAR TO SEND BITS ON = x,x,x

Note: **x,x,x** represents remote TTYs that are logged on the CAMA-C System.

Then TTY prints:
M ENTER PORT NUMBER (0-7 OR ALL) TO WHICH MESSAGE IS TO BE TRANSMITTED

TTY prints:
M IS A RESPONSE FROM REMOTE TTY REQUIRED (0=NO, 1=YES)

TTY prints:
M ENTER MESSAGE TO BE TRANSMITTED

Message transmitted to the remote port selected. At interface card associated with remote TTY under test—
TRANSMIT lamp blinks as message is being transmitted (see Fig. 4). At remote TTY selected for test—
Message is printed.

Note: If remote TTY selected for test is going to return a message to the CAMA-C

STEP	ACTION	VERIFICATION
7b	<p>If remote TTY is going to return a message to the CAMA-C primary TTY— At remote TTY keyboard where message M ENTER DATA was printed— ♦Type: aaaa bbbb Depress RETURN key.♦ aaaa bbbb = same message as typed in Step 6a.</p> <p>Note: Message must be entered within 30 seconds.</p>	<p>primary TTY, the message M ENTER DATA will also be printed out at the remote TTY.</p> <p>At remote TTY interface card (see Fig. 4)— RECEIVE lamp blinks as message data is received. After RETURN key is operated at remote TTY. - Message transmitted from remote TTY is printed on CAMA-C 5028 operator station. First 20 characters of message is printed in hexadecimal notation.</p> <p>Example: If the message received from the remote TTY was M TEST RECEIVED FROM PORT 1, the hexadecimal characters would be:</p> <pre>D4C5 53D4 A0D2 C5C3 C5C9 56C5 A0C6 D2CF 40A0 50CF</pre>
8c	<p>♦If selected port is the SEC/MECCA port— At TTY keyboard— Type: x Depress RETURN key. x = number assigned to SEC/MECCA port.</p>	<p>After hexadecimal characters are printed— 5028 operator station prints: REMOTE TERMINAL TEST TERMINATED.</p> <p>Note: Refer to Table E for conversion data for converting ASCII characters to hexadecimal and vice versa.</p> <p>The test message is sent <i>to</i> the MECCA central processor <i>from</i> CAMA-C. TTY prints: M THE TEST OF THE MECCA CHANNEL HAS STARTED</p> <p>The test message is sent <i>from</i> the MECCA central processor <i>to</i> CAMA-C. TTY prints: M MECCA CHANNEL TEST SUCCESSFUL M REMOTE TERMINAL TEST TERMINATED</p> <p>Note: If the channel test was unsuccessful, the following message will be printed:</p> <pre>M MECCA CHANNEL TEST FAILED aaaa aaaa = where the channel is bad. M MECCA xxxx xxxx M REMOTE TERMINAL TEST TERMINATED♦</pre>
9d	<p>If other remote TTY ports are to be tested— Repeat Steps 2 through 7b, substituting desired</p>	

STEP

ACTION

VERIFICATION

remote TTY to be tested for **x** in Steps 4a and 6a.

- 10e If a message is to be transmitted to all remote TTYs at the same time—
Repeat Steps 3 through 7b, substituting the word **ALL** for **x** in Steps 4a and 6a.

B. Trouble Analysis

4.08 The remote TTY trouble analysis flowchart (Fig. 6) can be used to isolate trouble conditions associated with the normal operation of the remote TTYs. The flowchart can also be used when the remote terminal test has failed.

5. INPUT/OUTPUT MESSAGES

A. Input Messages

5.01 A list of all of the messages that are authorized inputs to the CAMA-C System from remote terminal users are listed in Table G. Refer to **IM-5P001-01** or **IM-5P002-01** for an explanation of each message. The input messages shown in Table G are listed alphabetically in accordance with the message class assignments outlined in Table A. The TTY operator is only allowed to enter a message that is applicable to the TTY class assignments. Class assignments are entered and updated per local instructions using

the recent change procedure routine. Class 01 messages have been intentionally omitted for security purposes.

B. Output Messages

5.02 A list of all of the messages that can be received at a remote TTY is provided in Table H. Refer to **OM-5P001-01** or **OM-5P002-01** for an explanation of the messages.

5.03 Output messages are distributed to remote TTYs in accordance with the classes of messages. The classes of messages are outlined in Table A. Therefore, not all remote TTY locations will receive all output messages. The classes of messages are assigned to the remote TTYs per local instructions using recent change procedures. The output messages listed in Table G are listed alphabetically in accordance with each message class. Class 01 messages have been omitted for security purposes.

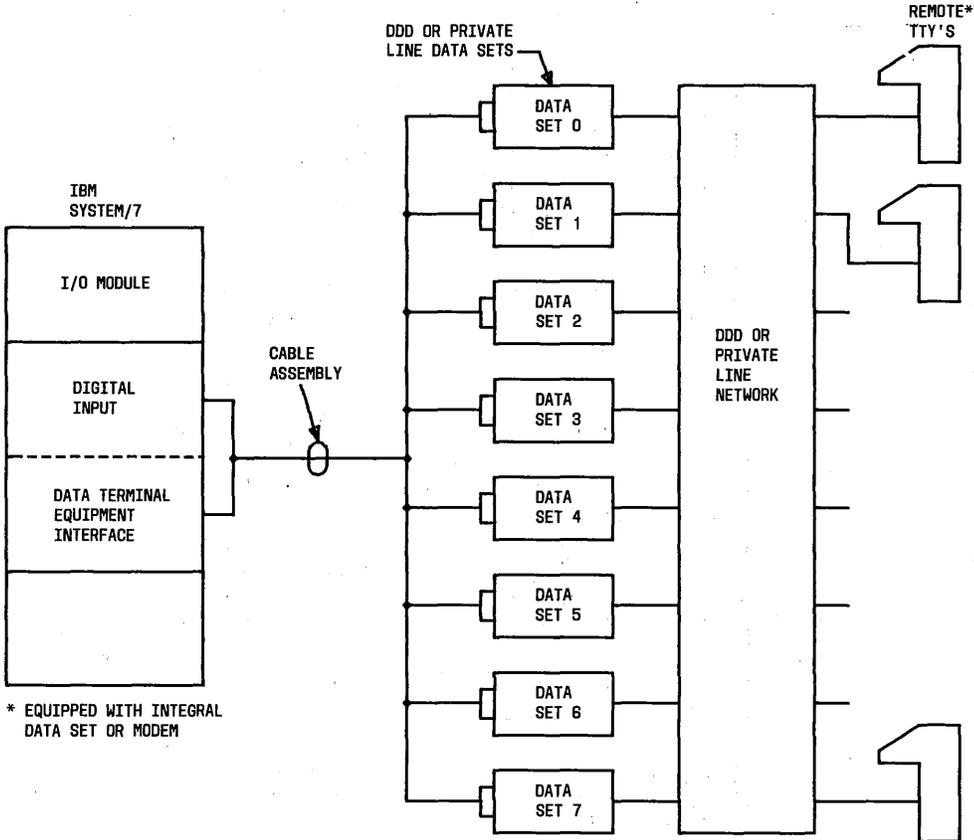


Fig. 1—CAMA-C Remote Terminal Configuration

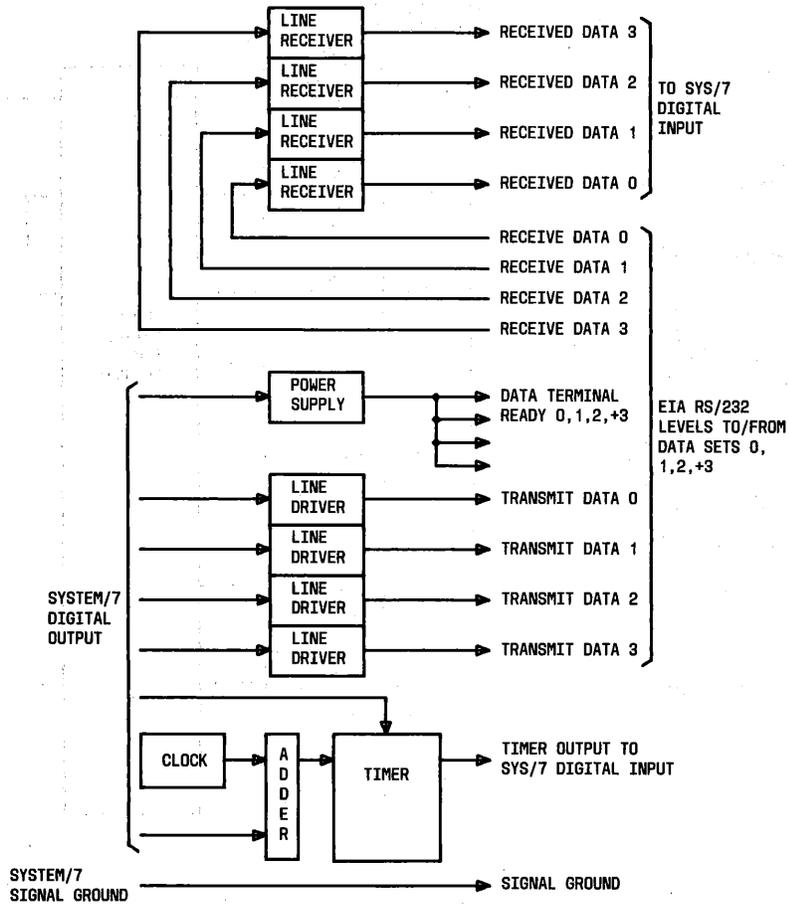


Fig. 2—Data Terminal Equipment Interface Card

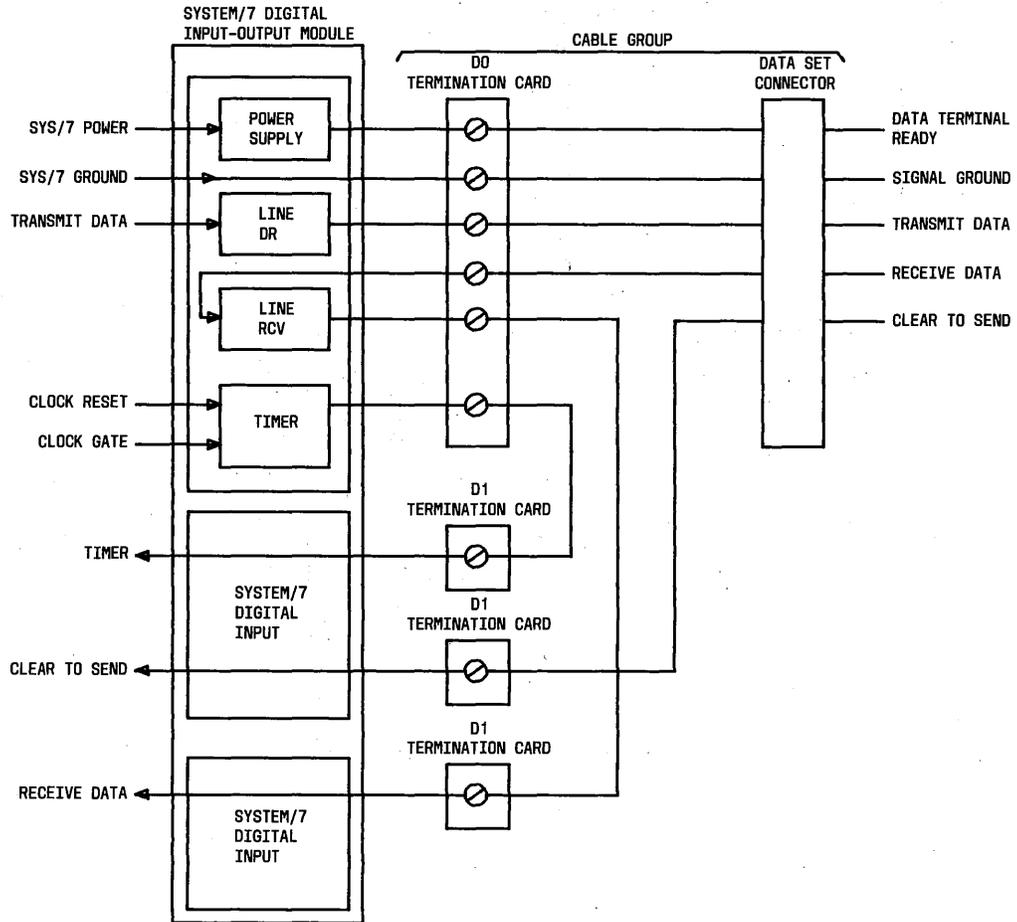


Fig. 3—Cable Configuration for a Remote Port

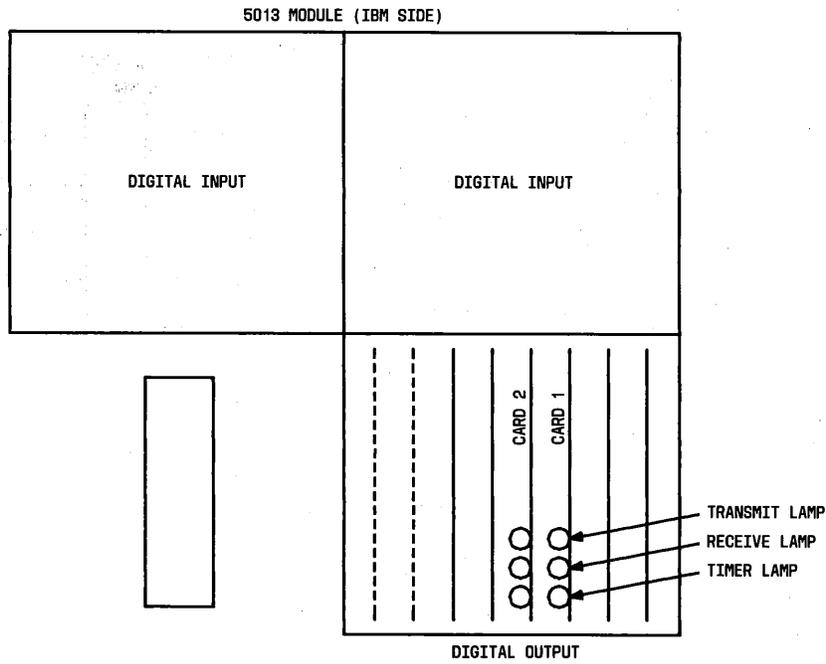


Fig. 4—Remote TTY Interface Cards

EXAMPLE	SEQUENCE OF INPUT/OUTPUT MESSAGES AT 5028 OPERATOR STATION	REMARKS
[1] No clear to send bits on when 5028 operators station input message TRT is entered.	(I) OR1:TRT (O) M NO PORTS HAVE CLEAR TO SEND BITS ON (O) M 265 14:16:439 REMOTE TERMINAL TEST TERMINATED	This message only occurs on 5028 Operators Station
[2] Test receive and transmit of remote teletypewriter when TRT message is entered and at least one remote TTY has a clear to send bit on.	(I) OR1:TRT (O) M PORTS WITH CLEAR TO SEND BITS ON= 1,7 (O) M ENTER PORT NUMBER (0-7 OR ALL) TO WHICH MESSAGE IS TO BE TRANSMITTED (I) 7 (O) M IS A RESPONSE FROM REMOTE TTY REQUIRED (0=NO,1=YES) (I) 1 (O) M ENTER MESSAGE TO BE TRANSMITTED (I) TEST TRANSMIT FUNCTION OF PORT 7. (O) M TEST RECEIVE FUNCTION OF PORT 7. (O) M DATA D4C5 53D4 A0D2 C5C3 C5C9 56C5 A0C6 554E C3D4 C9CF (O) M 265 14:18:395 REMOTE TERMINAL TEST TERMINATED	Remote Terminal messages: (O) M TEST TRANSMIT FUNCTION OF PORT 7. (O) M ENTER DATA (I) TEST RECEIVE FUNCTION OF PORT 7.
[3] Send a message to all remote TTYs which are enabled.	(I) OR1:TRT (O) M PORTS WITH CLEAR TO SEND BITS ON= 1,7 (O) M ENTER PORT NUMBER (0-7 OR ALL) TO WHICH MESSAGE IS TO BE TRANSMITTED (I) ALL (O) M ENTER MESSAGE TO BE TRANSMITTED (I) CAMA-C MACHINE WILL NOT BE AVAILABLE FROM 14:00 TO 16:00 TODAY (O) M 265 14:19:591 REMOTE TERMINAL TEST TERMINATED	Remote Terminal message: (O) M CAMA-C MACHINE WILL NOT BE AVAILABLE FROM 14:00 TO 16:00 TODAY.
[4] Send a message to a selected remote TTY port.	(I) OR1:TRT (O) M PORTS WITH CLEAR TO SEND BITS ON= 1,7 (O) M ENTER PORT NUMBER (0-7 OR ALL) TO WHICH MESSAGE IS TO BE TRANSMITTED (I) 3 (O) M CLEAR TO SEND NOT ON FOR REQUESTED PORT (O) M ENTER PORT NUMBER (0-7 OR ALL) TO WHICH MESSAGE IS TO BE TRANSMITTED (I) 7 (O) M IS A RESPONSE FROM REMOTE TTY REQUIRED (0=NO,1=YES) (I) 0 (O) M ENTER MESSAGE TO BE TRANSMITTED (I) CLASS 5 MESSAGES HAVE BEEN ASSIGNED TO YOUR PORT. (O) M 265 14:21:327 REMOTE TERMINAL TEST TERMINATED	Remote Terminal message: (O) M CLASS 5 MESSAGES HAVE BEEN ASSIGNED TO YOUR PORT.
<i>Note:</i> For the above messages, (I) = Input message and (O) = Output message		

Fig. 5—Examples of Remote Terminal Testing

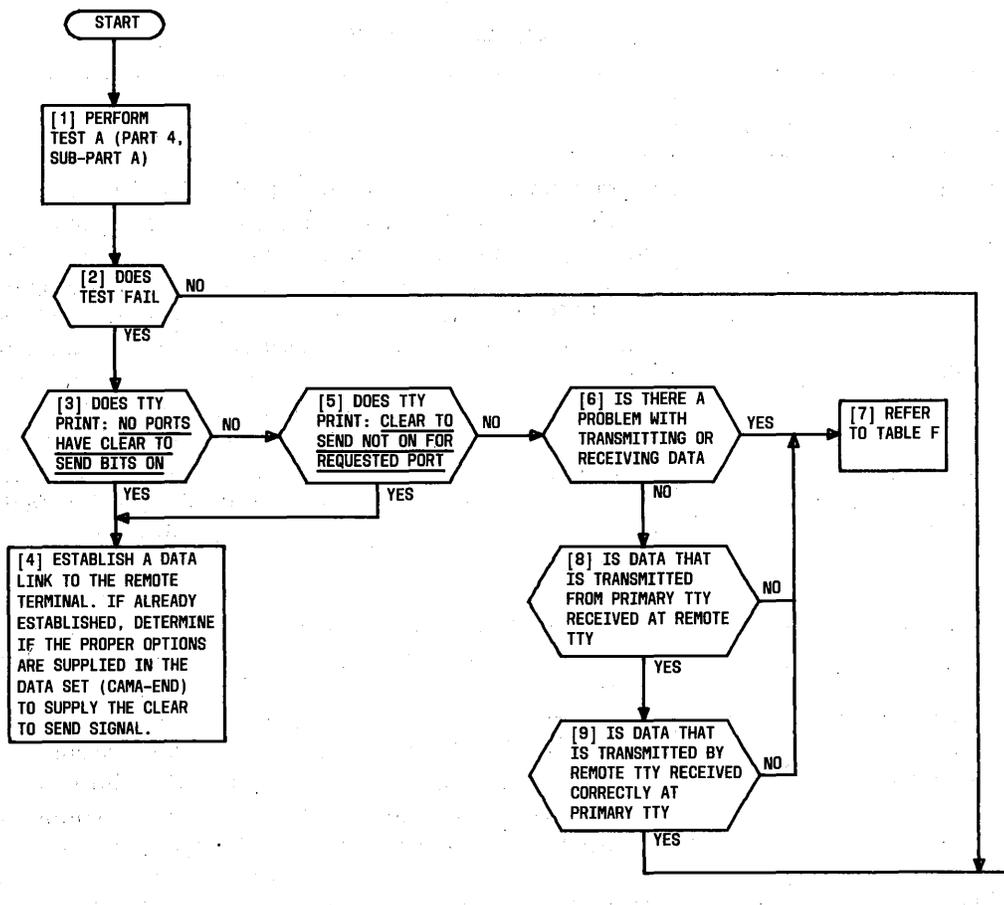


Fig. 6—Remote TTY Trouble Analysis

TABLE A

CAMA-C MESSAGE CLASSES

CLASS NAME	CLASS NUMBER	EXPLANATION OF CLASS
CAMA-C Primary System	00	Permanently assigned to only the CAMA-C Primary 5028 Operator Station (TTY)—This class includes system start up and stop, tape drive control, system trouble messages, data base and time change functions, broadcast warning change notice capability, and the ability to initiate the recorder test program. These functions cannot be removed. (<i>Input and Output Messages</i>)
Analysis of Irregular Network Signaling (ANIS) Messages and Other Security Related Messages	01	Permanently assigned to <i>only</i> the designated SEC/MECCA port—This class includes the messages generated by the network irregular signaling feature. It also includes messages relating to the ANIS2 feature and complaint observation feature. These functions cannot be delegated to any other terminal. (<i>Output Messages only</i>)
Statistical Reports	02	Assignable to any port—This class includes messages generated by the trunk maintenance reports of CAMA-C. (<i>Output Messages only</i>)
Electromechanical Circuit Maintenance	03	Assignable to any port—This class includes exception report type messages generated by CAMA-C and the ability to operate the existing trunk monitoring and sender test printout function of CAMA-C. (<i>Input and Output Messages</i>)
Primary CAMA-C System Status	04	Assignable to any port—This class includes messages indicating the operating state of the CAMA-C primary and backup, as seen from the primary machine. (<i>Output Messages only</i>)
Primary CAMA-C System Summary	05	Assignable to any port—This class includes the ability to print both the CAMA-C data base and the internal machine counters for the primary machine. (<i>Input and Output Messages</i>)
Miscellaneous System Status	06	Assignable to any port—This class includes the CIP (calls in progress) command so a remote user can determine if the CAMA-C System is running. (<i>Input and Output Messages</i>)
◆ Mechanized Evaluation of Call Completions Anomalies (MECCA)	07	Permanently assigned to the SEC/ MECCA port. The class is assigned only if the MECCA feature is provided and the MECCA central processor has logged on. This class includes messages generated by the MECCA feature. Since the MECCA central processor acts as a security port consolidator, all class 1 messages are automatically assigned to class 7 when the MECCA feature is provided. (<i>Output Messages only</i>) ◆

TABLE A (Contd)

CAMA-C MESSAGE CLASSES

CLASS NAME	CLASS NUMBER	EXPLANATION OF CLASS
Special System Status	13	Automatically assigned to all ports which have established a data link to the CAMA-C System. A remote port does not have to be logged onto the system to get Class 13 messages—This class includes a status message to indicate when the CAMA-C System is brought back on-line after being down.
Internal Messages	15	Automatically assigned by the CAMA-C System as required.
Remote Users	17	Automatically assigned to all remote users.

TABLE B

SUGGESTED ASSIGNMENTS FOR TERMINAL NAME

TERMINAL NAME	TERMINAL	REMARKS
5028 Operators Station (5028)	CAMA-C Computer Site	This is the basic CAMA-C system terminal. It is used to control and operate the CAMA-C system and to do all CAMA-C operations which do not lend themselves to a remote location.
Security (SEC)	Chief Special Agent	This type of port would be used for a remote terminal which would receive the message associated with CAMA-C analysis of network irregular signaling and other security related features. It is required that this remote terminal be connected to the CAMA-C System through a private line connection.
Maintenance Center (MTC)	No. 4 Crossbar or Crossbar Tandem Maintenance Center	This type of port would be used for a remote terminal located in a maintenance center and would receive messages which would relate to AMA circuit failures, including recorders and trunks.
EBAC or DDD Center (ECT)	EBAC or DDD Center	This type of port would be used for a remote terminal in the EBAC or DDD center and would receive data of a statistical nature from CAMA-C.
Other Ports (RT1 through RT5)	Any desired location	Any remaining CAMA-C ports, up to a total of 4 or 8, may be designated by the local telephone company, for use with remote terminals, as required. Port types as shown above may be duplicated for message distribution to multiple locations, or new port types can be designated to satisfy local requirements.

TABLE C

OUTPUT MESSAGE PRIORITY

PRIORITY ACTION CHARACTER (S)	MEANING
Two asterisks (**)	Immediate Action; should result in critical or major alarm.
One asterisk and space (*)	Action; should result in minor alarm.
Letter M and space (M)	Results of manual action
Letter A and space (A)	Action (message automatically generated)
Double space ()	Information (message automatically generated)

Note: The priority-of-action field is two print characters in length and denotes five separate levels of priority for action by the craftsperson (program priority for printing or messages is not intended).

TABLE D

SAMPLE REMOTE TTY PRINTOUT

INPUT/OUTPUT MESSAGE	REMARKS
**AMA/7 ON LINE GENERIC 2 ISSUE B M LOG-ON:#MTC/5555/SCM M LOG-ON FAILED	INVALID PASSWORD
M LOG-ON:#MTC/1234/BBBBB M OR99	TOO MANY CHARACTERS
M LOG-ON:#MTC/1233/SCM M LOG-ON COMPLETE	VALID LOG-ON
M OR1:CIP M 223 08:53:256 CIP=0000	VALID INPUT REQUEST
M OR1:LMT M OR2:ALL=? M ATT LMT = 0100 M MSG LMT = 0100 M SZR LMT = 0100 M HS1 LMT = 75 M HS2 LMT = 90 M HS3 LMT = 10 M HS4 LMT = 10 SECS = 012 M HS6 LMT = 10 M DS2 LMT = 50	VALID INPUT REQUEST REQUIRING DATA
M OR1:INV M OR99	INVALID INPUT COMMAND
M OR1:CK\IP M 223 08:54:151 CIP=0000	EXAMPLE OF BACKSPACE
M OR1:INV_CIP M 223 08:54:276 CIP=0000	EXAMPLE OF CANCEL LINE
M OR1:^	EXAMPLE OF CANCEL ENTRY
M OR1:#LF M LOG-OFF COMPLETE	VALID LOG-OFF

TABLE E

ASCII CHARACTER TO HEXADECIMAL EQUIVALENTS

CHAR	HEX	CHAR	HEX	CHAR	HEX	CHAR	HEX
0	30	0	CF	%	A5	EOT	84
1	B1	P	50	UNDERSCORE	5F	ETB	17
2	B2	Q	D1	>	BE	ETX	03
3	33	R	D2	?	3F	FF	0C
4	B4	S	53	:	3A	FS	9C
5	35	T	D4	#	A3	HT	09
6	36	U	55	@	C0	LF	0A
7	B7	V	56	'	27	NAK	95
8	B8	W	D7	=	BD	RS	1E
9	39	X	D8	"	22	SI	0F
SPACE	A0	Y	59	[	7B/DB	SO	8E
A	41	Z	5A	]	7D/DD	SOH	81
B	42	PERIOD	2E	↑	7E/DE	STX	82
C	C3	<	3C	BACKSPACE	88	SUB	9A
D	44	(	28	ACK	06	SYN	96
E	C5	+	2B	BEL	87	VT	8B
F	C6	&	A6	CAN	18		
G	47	!	21	CR	8D		
H	48	\$	24	DC1	11		
I	C9	*	AA	DC2	12		
J	CA	)	A9	DC4	14		
K	4B	;	BB	DEL	FF		
L	CC	—	2D	DLE	90		
M	4D	/	AF	EM	99		
N	4E	'	AC	ENQ	05		

TABLE F

TROUBLE LOCATING INFORMATION

SYMPTOM	TIMER LAMP	CTS BITS	TRANSMIT LAMP	RECEIVE LAMP	PROBABLE CAUSE
Cannot transmit or receive.	OFF	NA	NA	NA	(1) Timer failure. (2) Bad interface cable. (3) Bad PI point—Group 1, bit 8.
	ON	OFF	NA	NA	(1) No connection established between data set at CAMA-C site and remote location. (2) Data set failure. (3) Bad PI point—Group 1, bits 0-7. (4) Bad interface cable.
Transmitted data not printed at remote location.	ON	ON	OFF	NA	(1) Bad interface card. (2) Bad interface cable (shorted transmit data leads).
	ON	ON	ON	NA	(1) Remote terminal inoperative. (2) Data sets (either remote or local) not functioning correctly. (3) Bad interface cable.
Data entered at remote terminal is not received by computer correctly.	ON	ON	NA	OFF	(1) Remote terminal inoperative. (2) Data sets (either remote or local) not functioning correctly. (3) Bad interface card. (4) Bad interface cable.
	ON	ON	NA	ON	(1) Bad DI Point-Group 2, bits 8-15. (2) Bad interface cable.

TABLE G
INPUT MESSAGES

CLASS OF MESSAGE	MESSAGE
00	(CLASS ZERO (0) INPUT MESSAGES OMITTED BECAUSE THEY CANNOT BE ASSIGNED TO REMOTE TERMINAL USERS)
01	(OMITTED FOR SECURITY PURPOSES)
02	ALL = ? <LMT> AN*? <TGX> LMT NNX?TGN <TGX> TGX TKG*NNN <TGX> TRK?TGN <TGX> UNS* <TGX> UNU* <TGX>
03	CIE MON N <SDT> SDT TEST <MONITOR TEST TRUNKS — MON> TRC TTTT <TRUNK FOR MONITORING — MON> Y <SDT>
04	MSG
05	12 <CHG> 13 <CHG> CHG
06	CIP
07	None
15	AMF
17	#AAA/BBBB/CCC <RESPONSE TO M LOG-ON:> #LF <REMOTE TTY LOG-OFF> ^ <CANCEL ENTRY = UPPER N = CIRCUMFLEX = DE> — <CANCEL LINE = UPPER O = UNDERSCORE = 5F> \ <BACKSPACE = UPPER L = BACKSLASH = 5C>

Note: Refer to IM-5P001-01 or IM-5P002-01 for explanation of message.

TABLE H
OUTPUT MESSAGES

MESSAGE CLASS	MESSAGE
00	(Class Zero (0) Output Messages omitted because they cannot be assigned to remote terminal users.)
01	(Omitted for security purposes.)
02	<p>A DS1: tttt tgn xxxx <MONDAYS ONLY> A DS1: tttt NONE <MONDAYS ONLY> A DS2: tgn xxxx yyyyy zzzzz pp A DS2: NONE yyyyy zzzzz pp A ddd hh:mm:sss HOURLY STATUS REPORTS A<HS 1,2,3,4>: tttt tgn xxxx yyy zzz pp hhh A<HS 1,2,3,4>: tttt NONE yyy zzz pp hhh A HS5:rr aaa bbb ccc ddd eee fff ggg iii jjj kkk xxxxx yyyyy pp hh A HS6: tgn xxxx yyyyy zzzzz pp A HS7: tgn xxxx yyyyy zzzzz pp A ddd hh:mm:sss MR00 STATS CANCELED BY TAPE DUMP A ddd hh:mm:sss MR01 A ddd hh:mm:sss MR02 A ddd hh:mm:sss MR03 A ddd hh:mm:sss MR04 A ddd hh:mm:sss MR05 A ddd hh:mm:sss MR0B A ddd hh:mm:sss MR10 STAT CANCELED-MAINT ALREADY RUNNING A ddd hh:mm:sss MRED A ddd hh:mm:sss MREH A MRP1 tttt tgn(nnn) TO tgn(nnn) A MRP2 TRUNK tttt: NNX nnn INVALID A MRP2 TRUNK tttt: NNX nnn NO XREF ddd hh:mm:sss APOLOGY rr 287x00 *ddd hh:mm:sss BAD PAC OR CK REC rr *ddd hh:mm:sss CC00 CK BIT ERRORS xxx *ddd hh:mm:sss CHGRD R=xx <PRIMARY> *ddd hh:mm:sss CHGRD R=xx, I=xx <BACKUP> A CIC aaaa bbb aaaa bbbb A ddd hh:mm:sss CONNECT FOR MORE THAN aa HOURS ON bbbb TRUNKS: (TRNK HR) *ddd hh:mm:sss CSCF tttt <CONN-SEIZE-CONN>40 SECS FOUND> *ddd hh:mm:sss CTM 0 TRUNK=tttt <PRIMARY> *ddd hh:mm:sss CTM T TRUNK=tttt <BACKUP> *ddd hh:mm:sss CTM U TRUNK=tttt *ddd hh:mm:sss CTM X TRUNK=tttt <PRIMARY> **ddd hh:mm:sss EMER 00 <IE ACTIVITY ON UNASSIGNED SPARE RCRD> **ddd hh:mm:sss EMR NOT ON LINE ddd hh:mm:sss EMR OFF LINE *ddd hh:mm:sss ETL1 tttt hh:mm:sss <UP TO 4 TIME OCCURENCES> *ddd hh:mm:sss ETL1 tttt hh:mm:sss HH:MM:SSS HH:MM:SSS HH:MM:SSS ##</p>

Note: Refer to OM-5P001-01 or OM-5P002-01 for explanation of messages.

TABLE H (Contd)
OUTPUT MESSAGES

MESSAGE CLASS	MESSAGE
03	<p>A ddd hh:mm:ss EW ON EMER REC **ddd hh:mm:ss HI QR <NO BUFFERS FOR TIME LINES - BU ONLY> **ddd hh:mm:ss HI QR <HI QUEUE REFUSED> *ddd hh:mm:ss ICP x TRUNK=tttt *ddd hh:mm:ss INSF xx <INSUFFICIENT LINES> *ddd hh:mm:ss INV CO1 rgrn cc *ddd hh:mm:ss INV MB1 xx *ddd hh:mm:ss INV MB1 xx TSP *ddd hh:mm:ss IVDS tttt <INV TRK CHG - DISC TO SZE> *ddd hh:mm:ss IVIC tttt <INV TRK CHG - IDLE TO CONN> *ddd hh:mm:ss IVID tttt <INV TRK CHG - IDLE TO DISC> *ddd hh:mm:ss IVNF tttt <POSTED CODE WAS SUPPOSED TO BE 27004 - ICP CODE> *ddd hh:mm:ss IVSD tttt <INV TRK CHG - SZE TO DISC> *ddd hh:mm:ss IVS1 tttt <INV TRK CHG - TRK SET INV> A ddd hh:mm:ss MUTLC rr L xxxxxx Y=xxxxx Z=xxxxx A ddd hh:mm:ss MUTLN rr L xxxxxx Y=xxxxx Z=xxxxx *ddd hh:mm:ss NO CK ON REC xx **ddd hh:mm:ss NULL xx <INVALID LOGICAL RECORDER PASSED> **ddd hh:mm:ss ORUN xx <RECORDER OVER RUN - NO DISK QUEUES> *ddd hh:mm:ss OVFL xx <TOO MANY LINES IN IE FOR B DIGIT> A ddd hh:mm:ss RSL RCDR #aa TV #bb; LINE c[,c,c] OF d LINE ENTRY REPEATED *ddd hh:mm:ss SHRT xx <INITIAL ENTRY WITH SHORT LINE COUNT> *ddd hh:mm:ss STL tttt <SINGLE TIME LINE> A SZOR tttt tttt tttt tttt ...<UP TO 10 TRNKS - HOURLY> A ddd hh:mm:ss TNR BIT ON REC rr A TRD tttt cc tttt cc ... <UP TO 5 TRNKS> *ddd hh:mm:ss TRDF tttt <TRD FAILED TO OCCUR IN 32 SECS> *ddd hh:mm:ss TSP1 <TSP TRUNK OVER 1999> *ddd hh:mm:ss TT02 xxxxxxxx *ddd hh:mm:ss TT03 xxxxxxxx *ddd hh:mm:ss XCII xx <CII NOT 00-99></p>
04	<p>ddd hh:mm:ss ALARM CUTOFF **AMA 7 NOT RUNNING - DUPLEX SWITCH IS NOT OPERATED **AMA7 B ONLINE GENERIC x ISSUE x **ddd hh:mm:ss BACKUP DOWN <ON PRIMARY, BACKUP DUPLEX SW DOWN> **ddd hh:mm:ss BACKUP DUPLEX SWITCH DOWN **ddd hh:mm:ss BACKUP ENABLED, PRIMARY STOPPED **ddd hh:mm:ss BACKUP SYSTEM DOWN **ddd hh:mm:ss BACKUP TROUBLE WITH BACKUP DUPLEX SWITCH **ddd hh:mm:ss BACKUP TROUBLE WITH PRIMARY DUPLEX SWITCH **ddd hh:mm:ss BACKUP TTY DOWN *ddd hh:mm:ss BCNS *ddd hh:mm:ss BELL TEST FAILED *ddd hh:mm:ss BU MPXR BD= xx, ROW a, BIT= xx **ddd hh:mm:ss DATA BUS FROM BACKUP NOT WORKING **ddd hh:mm:ss DATA BUS FROM PRIMARY NOT WORKING **ddd hh:mm:ss DUPLEX SWITCH DOWN **ddd hh:mm:ss DUPLICATE BILLING ***** ENCODER CHECK NOT ENABLED *** →(GENERIC 2 ONLY)←</p>

Note: Refer to OM-5P001-01 or OM-5P002-01 for explanation of messages.

TABLE H (Contd)

OUTPUT MESSAGES

MESSAGE CLASS	MESSAGE
04	<p>A ddd hh:mm:sss ID = nnn mm xxxx yyyy **NEGT aaaa bbbb cccc dddd *ddd hh:mm:sss PADDLE BOARD TBL abed efgh **ddd hh:mm:sss PRIMARY/BACKUP DISAGREE ON BACKUP DUPLEX SWITCH **ddd hh:mm:sss PRIMARY/BACKUP DISAGREE ON PRIMARY DUPLEX SWITCH **ddd hh:mm:sss PRIMARY/BACKUP SYSTEMS DOWN **ddd hh:mm:sss PRIMARY DOWN **ddd hh:mm:sss PRIMARY SYSTEM DOWN **ddd hh:mm:sss PRIMARY TROUBLE — PRIMARY DUPLEX SWITCH DID NOT FALL **ddd hh:mm:sss PRIMARY TROUBLE WITH BACKUP DUPLEX SWITCH **ddd hh:mm:sss PRIMARY TROUBLE WITH PRIMARY DUPLEX SWITCH **ddd hh:mm:sss PRIMARY TTY DOWN **ddd hh:mm:sss PRIORITY x STATUS=xxxx, T1xx xx, T2xx xx, PHxx xx **PROC aaaa bbbb cccc dddd **ddd hh:mm:sss PS-x DI/DO EVEN CKTBKR OFF **ddd hh:mm:sss PS-x DI/DO ODD CKTBKR OFF **ddd hh:mm:sss PS-x DI/DO FUSE BACK MPXR PWR EVEN OPEN **ddd hh:mm:sss PS-x DI/DO FUSE BACK MPXR PWR ODD OPEN **ddd hh:mm:sss PS-x DI/DO FUSE PRIM MPXR PWR EVEN OPEN **ddd hh:mm:sss PS-x DI/DO FUSE PRIM MPXR PWR ODD OPEN *ddd hh:mm:sss PS-x, MPXR BD= BB, ROW A, BIT= DD **ddd hh:mm:sss PS-x RECORDER XX CKTBKR OFF **ddd hh:mm:sss PS-x RECORDER XX FUSE X OPEN **ddd hh:mm:sss PS-x RECORDER XX GROUND MISSING **** ddd hh:mm:sss RESET DUPLEX SWITCH** **ddd hh:mm:sss RESTART PRIMARY OR BACKUP WITH A NO RESTART TO PREVENT FURTHER DUPLICATE BILLING **SEQ FILE END NOT FOUND **ddd hh:mm:sss SYSTEM TIME ERROR *ddd hh:mm:sss TAPE NOT RDY <EVERY 10 MINUTES> **ddd hh:mm:sss TP RESTART — AMA SUSPENDED M ddd hh:mm:sss TRBZ **ddd hh:mm:sss TT01 tttt *** WARNING * CALLS ARE NOT BEING COLLECTED A ddd hh:mm:sss ID = nnnn mm xxxx xxxx</p>
06	M ddd hh:mm:sss CIP=xxxx
07	Messages are not in ASCII (readable) format

Note: Refer to OM-5P001-01 or OM-5P002-01 for explanation of messages.

TABLE H (Contd)

OUTPUT MESSAGES

MESSAGE CLASS	MESSAGE
13	<p>**ddd hh:mm:sss AMA/7 ON LINE GENERIC x ISSUE y M ddd hh:mm:sss T2BZ xxx ACTIVE ON 5028 M ddd hh:mm:sss T2BZ xxx ACTIVE ON PORT x M x xxx xxxx <VARIABLE MSG TO ALL REMOTE TTYS></p>
15	<p>M ddd hh:mm:sss AMFS: ANIS (xxxxxxx); MECCA (xxxxxxx) M ATT LMT = xxxx M ddd hh:mm:sss BACK-UP CAMA-C MACHINE COUNTS <FOLLOWED BY DCXX DATA> M CALLED NUMBERS FOR IDENTIFICATION AT TERMINALS WITH MSG CLASS yy xxx xxxx xxx xxxx M ddd hh:mm:sss COMMAND NOT ALLOWED DCxx xxxx xxxx xxxx <XX=00-22, MACHINE COUNTS, NOT DC18> M DS2 LMT = nn M ENTER A, B, C (1=ENABLE,O=DISABLE) M A=CE ERROR LOG M B=3410 COUNTS M C=MISC COUNTS M ENTER DATA <REQUEST TO REMOTE TTY> M ENTER NNX, LLLL, NNX, LLLL ENTER O FOR LAST NNX AND LLLL IF ONLY ONE NUMBER IS USED M ddd hh:mm:sss ENTER RECENT CHANGE OPTION NUMBER (xx) M ENTER TRK # (xxxx) M ENTER TRUNK NUMBER xxxx <TRNK MONITOR — MON> M ddd hh:mm:sss ENTER TWO CALLED #S FOR IDENTIFICATION MSG M FOLLOWING ACTIVE TRUNKS HAVE NO TRUNK GROUP ASSIGNMENT M FOLLOWING NNXS ARE DEFINED AS BELONGING TO MORE THAN ONE TRUNK GROUP M FOLLOWING NNXS ARE IN TRUNK GROUP XXX: M FOLLOWING TRUNKS ARE IN TRUNK GROUP XXX: M FOLLOWING TRUNKS HAVE HAD NO SEIZURES: M ddd hh:mm:sss GENERIC X ISSUE Y.Z OFFICE NNNMM DATA BASE FROM CAMA-C XXXXX SYSTEM/7 M HS1 LMT = xx M HS2 LMT = xx M HS3 LMT = xx M HS4 LMT = xx SECS = xxx M HS6 LMT = xx M INPUT ERROR—TERMINATED ddd hh:mm:sss INVALID <TO REMOTES> M INVALID COMMAND M INVALID COMMAND M INVALID ENTRY <SDT — SENDER TEST CALLS> M ddd hh:mm:sss INVALID ENTRY, PLEASE REPEAT <T7GEN — ENTER CHG></p>

Note: Refer to OM-5P001-01 or OM-5P002-01 for explanation of messages.

TABLE H (Contd)
OUTPUT MESSAGES

MESSAGE CLASS	MESSAGE
15	<p>M MSG LMT = xxxx M NNX xxx HAS NO XREF ddd hh:mm:sss NO CHANGE MADE M NO QUEUE—TERMINATE M ddd hh:mm:sss OFFICE DATA BASE PRINTOUT — CHG(12) CANCELED M ddd hh:mm:sss PRIMARY CAMA-C MACHINE COUNTS <FOLLOWED BY DCXX DATA> M ddd hh:mm:sss RECENT CHANGE ROUTINE TERMINATED M ddd hh:mm:sss REQUEST DENIED M SENDER TEST CALL PRINTING INACTIVE M ddd hh:mm:sss STOO rn rglr rc mm re w npa nnx xxxx naa n a xx M SZR LMT = xxxx M TIMEOUT—TERMINATED M TOTAL = xxxx NNXS M TOTAL = xxxx TRUNKS M TRC tttt xxx aaa aaa-aaaa ccc bbb bbb-bbbb y hh:mm:sss pqr www vvvz M ddd hh:mm:sss tttt x 270xx xx <FROM TRUNK MON> M ddd hh:mm:sss tttt x 270xx nnx-xxxx <FROM TRUNK MON> M ddd hh:mm:sss tttt x hhmmssss xx <FROM TRUNK MON> M ddd hh:mm:sss tttt x hhmmssss nnx-xxxx <FROM TRUNK MON> M x xxx xxxx <VARIABLE MSG TO A REMOTE TTY></p>
17	<p>M CLASS NOT ENABLED <REMOTE TTY> M LOG-ON <REMOTE TTY> M LOG-ON COMPLETE <REMOTE TTY> M LOG-ON FAILED <REMOTE TTY> M LOG-OFF COMPLETE <REMOTE TTY> M OR1: <REMOTE TTY> M OR2: <REMOTE TTY> M OR96 <REMOTE TTY> M OR98 <REMOTE TTY> M OR99 <REMOTE TTY></p>

Note: Refer to OM-5P001-01 or OM-5P002-01 for explanation of messages.