OPERATIONS

CONTENTS

1. INTRODUCTION

1.01 This section contains normal operating procedures for the ITS System. Normal operating procedures include the following:

(a) Loading program tape

(b) Manual system transfer

(c) Setting date and time

(d) Setting traffic report interval

(e) Interpreting traffic reports

(f) Changing billing tapes

(g) Copying billing tapes

1.02 For other procedures, such as emergency operation, office data administration, line administration, on-line or off-line maintenance, troubleshooting, call tracing, or trunk maintenance procedures, refer to the master numerical index, Section 290-000-000.

2. CONTROLS AND INDICATORS

2.01 Figure 1 identifies the assemblies of the Integrated Transmission and Switching (ITS) System that contain controls and/or indicators that are used during normal system operation. The assemblies are:

(a) Maintenance panel

(b) CRT and keyboard

(c) Printer

(d) Magnetic tape recorder (MTR)

(e) Magnetic tape cartridge (MTC) units

(f) Bootstrap loader circuit pack, IM7 or IM7A

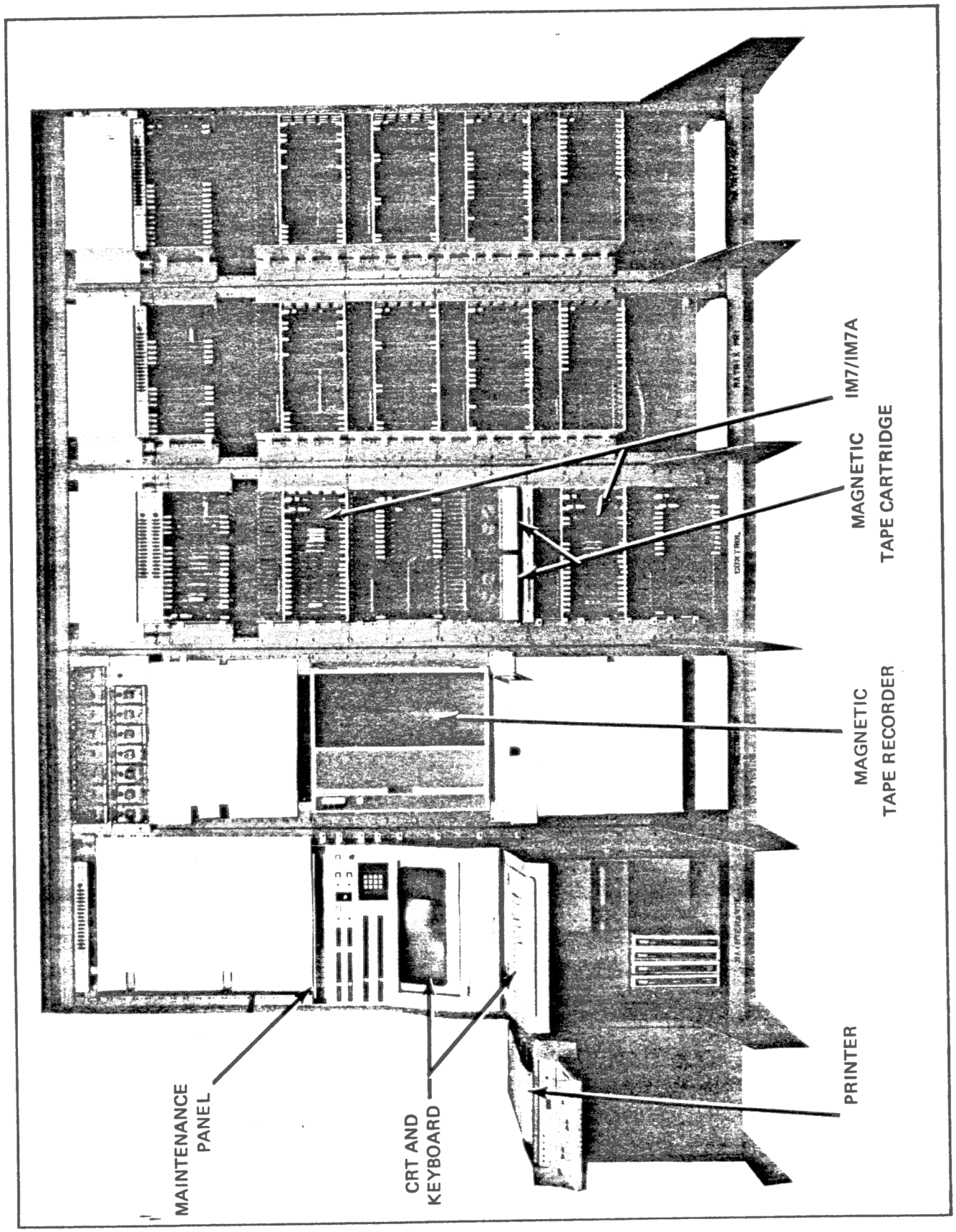


Figure 1. Operator Equipment Locations, Integrated Transmission and Switching (ITS) System

Maintenance Panel

2.02 The maintenance panel contains indicators that display the operational status of the ITS System and contain the controls required for trunk maintenance, system switching, and alarm control. Controls and indicators of the maintenance panel are illustrated in Figure 2 and explained in Table 1.

CRT and Keyboard

2.03 The CRT and keyboard assembly provides operator interface for the primary ITS System. Commands and data are entered on the keyboard by the operator. The CRT displays all data entered on the keyboard, abbreviated traffic reports, error codes, and controller messages. Controls and indicators of the CRT and keyboard are illustrated in Figure 3. Switch settings are listed in Table 2.

Printer

2.04 The printer provides operator interface for the secondary ITS System. Commands and data are entered on the keyboard by the operator. The printer provides a hard copy of all data entered on the keyboard and the main traffic report. In addition, the printer duplicates all error messages displayed on the CRT. Controls and indicators of the printer are illustrated in Figure 4. Switch settings are listed in Table 3.

NOTE: The printer described in 2.04 is the GE terminet 300, which is normally supplied with the ITS System. If a different type of printer has been specified by the customer, refer to the operating manual for that printer.

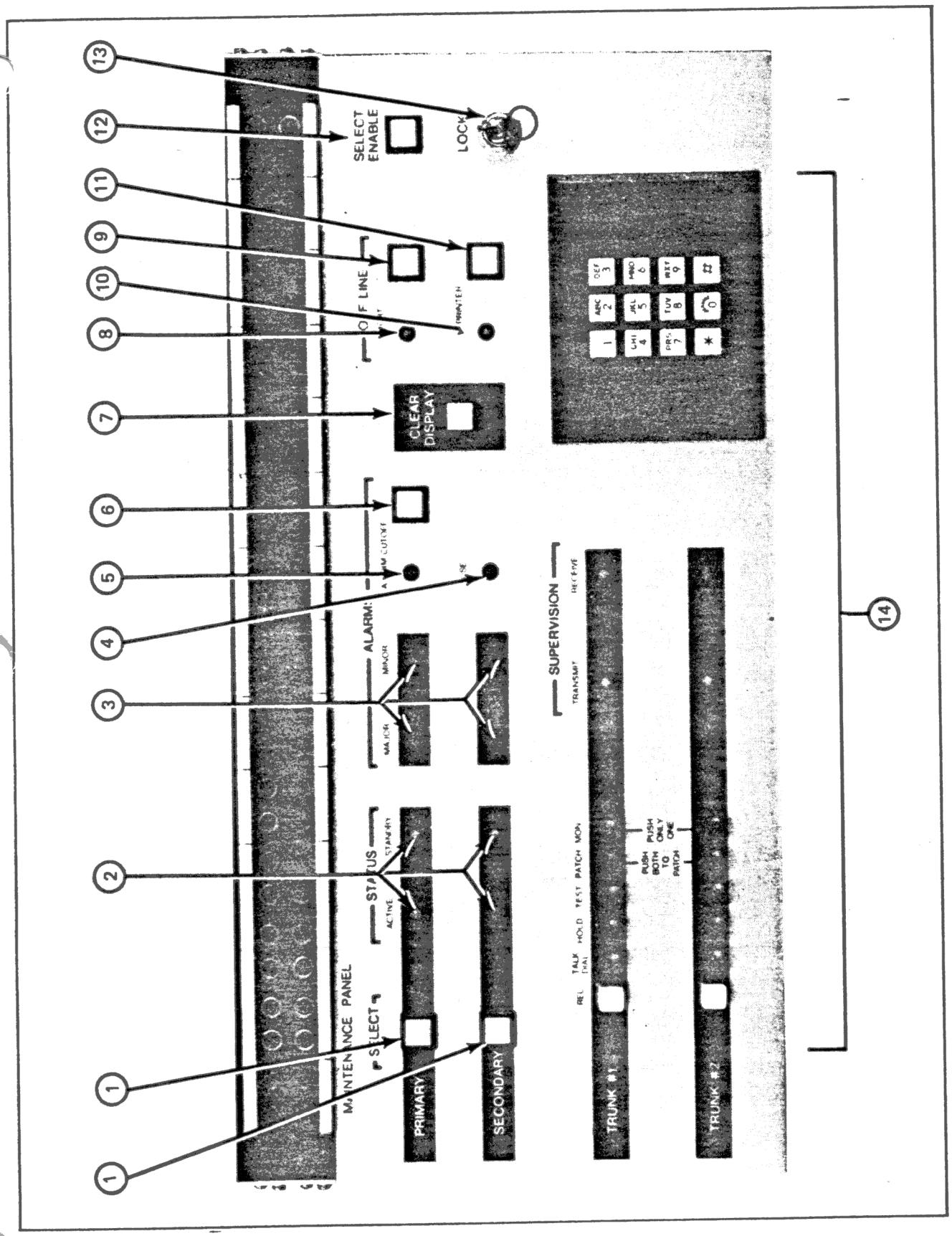


Figure 2. Maintenance Panel Controls and Indicators

Table 1. Maintenance Panel Controls and Indicators

INDEX, FIGURE 2	LABEL	TYPE	FUNCTION
1	SELECT - PRIMARY/ SECONDARY	Pushbutton switches	When operated in conjunction with LOCK keyswitch and SELECT ENABLE switch, select either PRIMARY or SECONDARY system for ACTIVE status.
2	STATUS - ACTIVE/ STANDBY	LEDs	Indicates whether PRIMARY or SECONDARY system is ACTIVE. Normally, PRIMARY is ACTIVE, SECONDARY is STANDBY. If both ACTIVE and STANDBY LEDs are out, indicates system (either PRIMARY or SECONDARY) is off-line.
3	ALARMS - MAJOR/ MINOR	LEDs	Indicates MAJOR, MINOR, or both alarm conditions exist in PRIMARY or SECONDARY systems. Will remain lit until CLEAR DISPLAY switch is pressed.
4	FUSE	LED	Indicates that one or more base switch fuses have blown. Each equipment rack has a fuse panel at the top with additional blown fuse indicators.
5	ALARM CUTOFF	LED	Indicates that ALARM CUTOFF switch has been operated. Reset by system controller every hour.
6	ALARM CUTOFF	Pushbutton switch	When pressed, lights ALARM CUTOFF LED and disables remote alarm devices. Pressing a second time will enable remote alarms and extinguish LED.
7	CLEAR DISPLAY	Pushbutton switch	When pressed, will extinguish ALARMS LEDs and remote alarm devices, providing source of alarm has been corrected. If alarm condition still exists, CLEAR DISPLAY has no effect.

Table 1. Maintenance Panel Controls and Indicators (Cont)

INDEX, FIGURE 2	LABEL	TYPE	FUNCTION
8	CRT OFF LINE	LED	Indicates CRT OFF LINE switch has been pressed.
9	CRT OFF LINE	Pushbutton switch	When operated in conjunction with LOCK keyswitch, lights CRT OFF LINE LED and cuts off input/output to CRT. Pressing a second time restores CRT on-line. NOTE: When placed off-line, up to 16 error code messages are stored for output when restored to on-line status. All other messages are inhibited until CRT is returned to on-line status.
10	PRINTER OFF LINE	LED	Indicates PRINTER OFF LINE switch has been pressed.
11	PRINTER OFF LINE	Pushbutton switch	Same as index 9, but controls printer.
12	SELECT ENABLE	Pushbutton switch	When LOCK keyswitch is on, holding SELECT ENABLE switch down enables PRIMARY/SECONDARY SELECT and CRT/PRINTER OFF LINE switches.
13	LOCK	Keyswitch	Allows authorized personnel to lock/unlock all other controls on the maintenance panel except the printer and CRT off-line controls and test trunk controls. The unlock position is clockwise and the lock position is counterclockwise. While in the locked position, the keyboards are not accessible and clearing the display on the CRT is prohibited.
14	Trunk Maintenance Controls	--	Trunk maintenance controls are used for making calls on the test trunks. Refer to Section 290-000-508, Trunk Maintenance Testing.

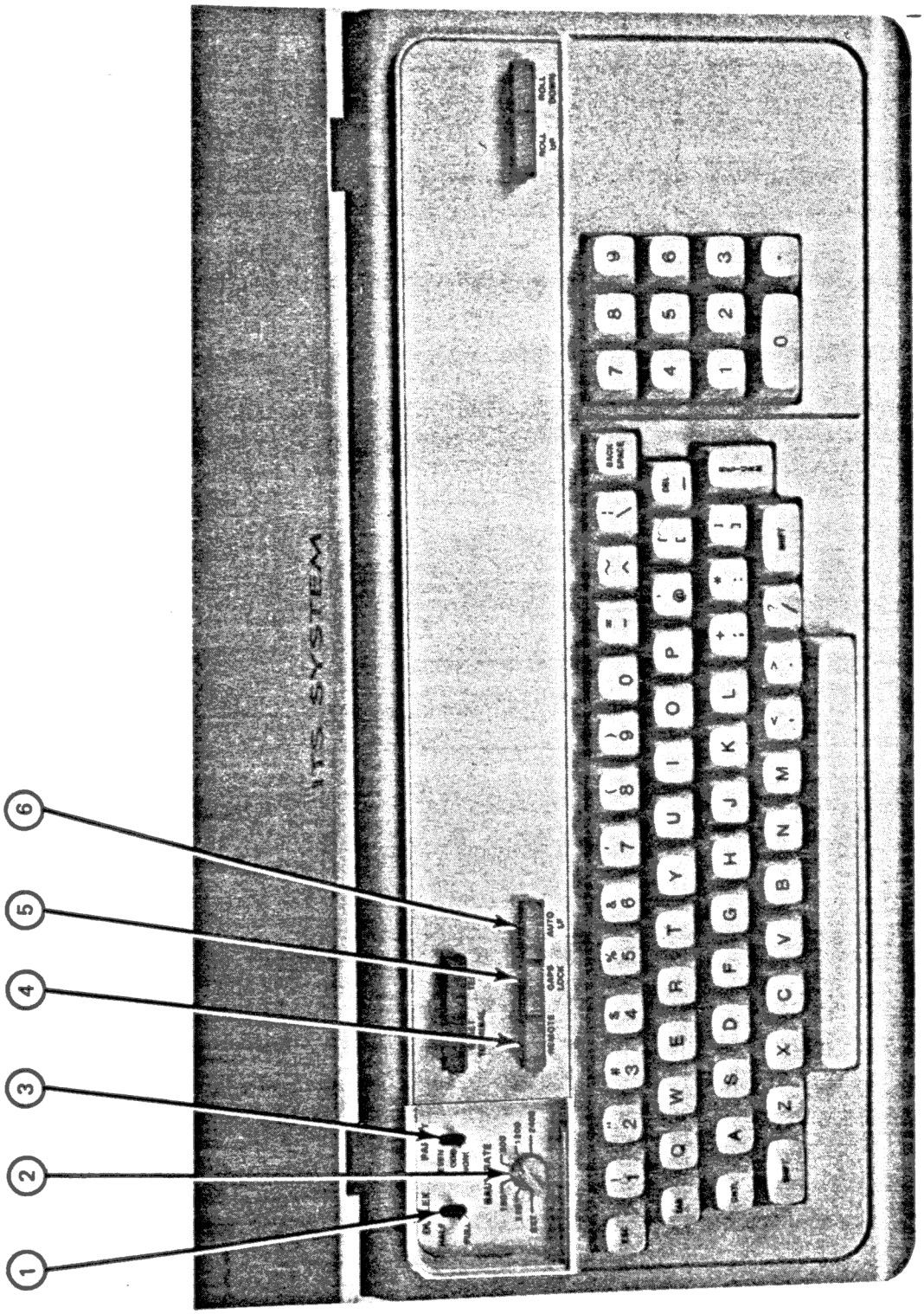


Figure 3. CRT and Keyboard, Controls and Indicators

Table 2. CRT Keyboard Switch Settings

INDEX, FIGURE 3	LABEL	TYPE	SETTING
1	DUPLEX HALF/FULL	Toggle switch	FULL
2	BAUD RATE	Rotary switch	1200
3	PARITY EVEN/ODD/NONE	Toggle switch	NONE
4	REMOTE	Alternate action pushbutton switch	In
5	CAPS LOCK	Alternate action pushbutton switch	In
6	AUTO LF	Alternate action pushbutton switch	Out

NOTE: Refer to Hewlett Packard operating instructions, model HP2649, for further information.

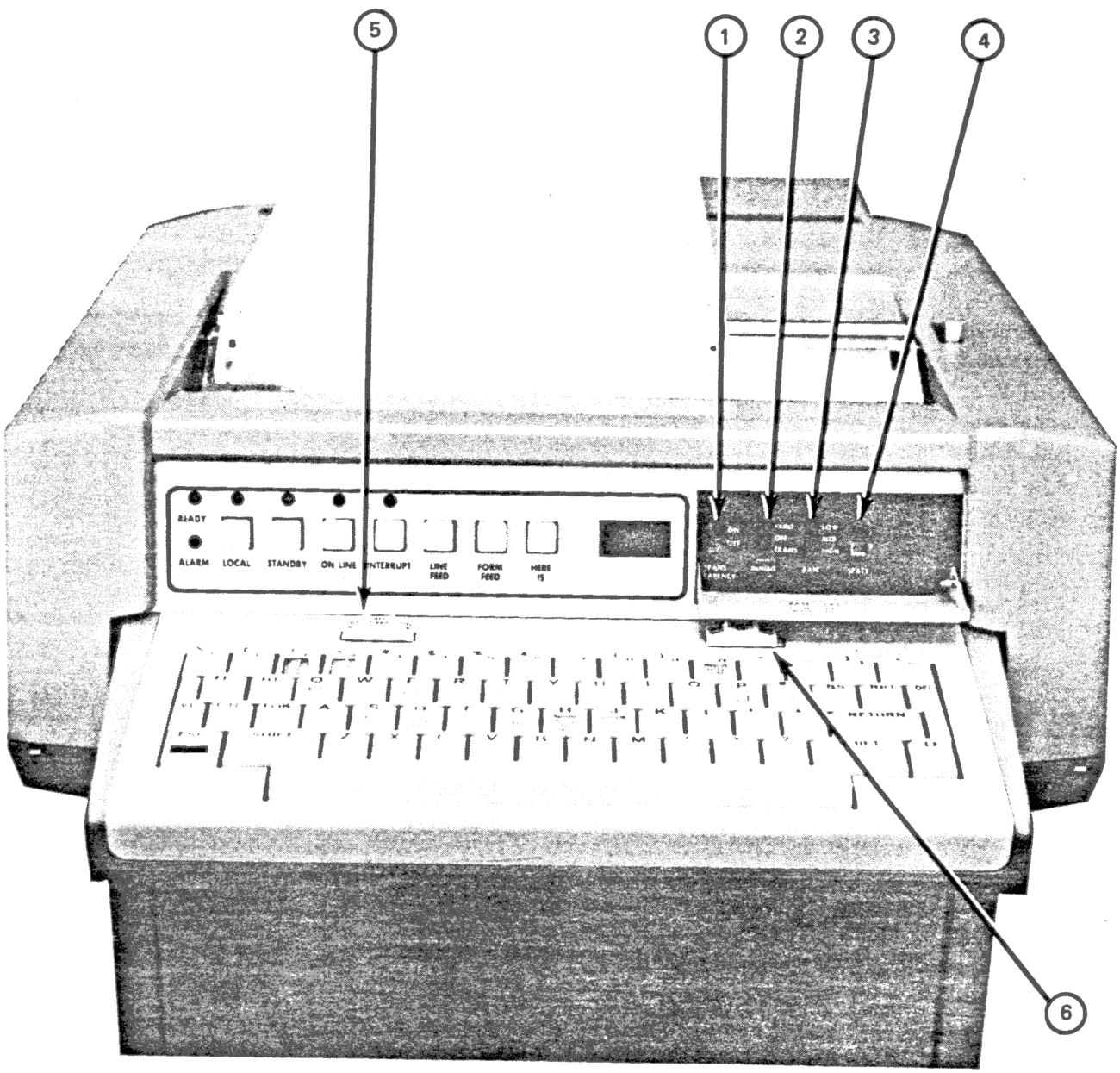


Figure 4. Printer, Controls and Indicators

Table 3. Printer Switch Settings

INDEX, FIGURE 4	LABEL	TYPE	SETTING
1	TRANSPARENCY ON/OFF	Slide switch	OFF
2	INHIBIT PRINT/OFF/TRANS	Slide switch	PRINT
3	RATE LOW/MED/HIGH	Slide switch	HIGH
4	SPACE 1/2	Slide switch	1
5	ALL CAPS OFF/ON	Slide switch	ON
6	AUTO LF OFF/ON	Slide switch	OFF

NOTE: Refer to General Electric operating instructions, Terminet 300, for further information.

Magnetic Tape Recorder (MTR)

2.05 An ITS System may be equipped with one, two, or no MTRs. When equipped, the MTR is used to record billing data for calls processed by the ITS System. Controls and indicators are illustrated in Figure 5 and explained in Table 4.

Magnetic Tape Cartridge (MTC) Units

2.06 Each ITS System is equipped with two MTC units, one for the primary system and one for the secondary. The MTCs are used for loading programs and also may be used to record billing data in the event of an MTR failure. There are no operator controls or indicators on the MTCs.

Bootstrap Loader Circuit Pack, IM7 or IM7A

2.07 Each ITS System is equipped with two IM7 or IM7A circuit packs, one for the primary system and one for the secondary. The IM7 and IM7A circuit packs contain controls for loading system programs via the MTC units. Controls and indicators of the IM7 are illustrated in Figure 6 and explained in Table 5. Controls and indicators of the IM7A are illustrated in Figure 7 and explained in Table 6.

NOTE: Most ITS Systems are equipped with an IM7A circuit pack, which is a later version of the IM7.

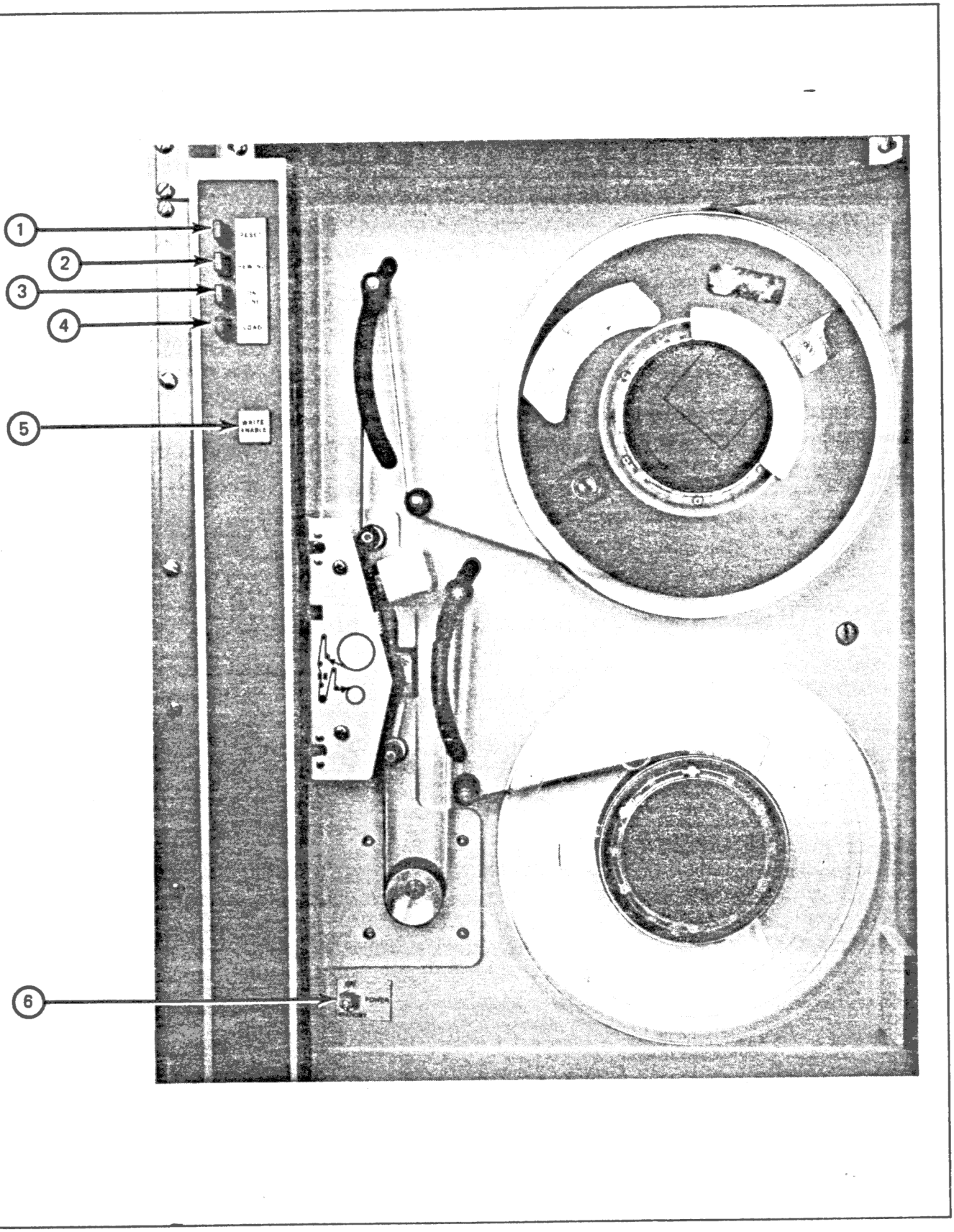


Figure 5. MTR, Controls and Indicators

Table 4. MTR Controls and Indicators

INDEX, FIGURE 5	LABEL	TYPE	FUNCTION
1	RESET	Pushbutton switch and indicator lamp	RESET switch stops tape travel in any mode, places MTR in off-line condition. RESET lamp lights when switch is pressed or upon initial powerup.
2	REWIND	Pushbutton switch and indicator lamp	If RESET lamp is lit, pressing REWIND switch causes tape to rewind at 160 ips until beginning-of-tape (BOT) reflective strip on tape is sensed. If pressed while the tape is at load point (stopped at BOT strip), will cause tape to rewind until supply reel is empty. REWIND lamp lights when tape is in reverse motion.
3	ON LINE	Pushbutton switch and indicator lamp	If RESET lamp is lit, ON LINE switch will place MTR under control of the base switch. ON LINE lamp lights when switch is pressed while RESET lamp is lit. If switch is pressed during REWIND or LOAD operation, ON LINE lamp lights when BOT is sensed.
4	LOAD	Pushbutton switch and indicator lamp	If RESET lamp is lit, pressing LOAD switch causes MTR to apply tension to tape and initiate a forward search for BOT. LOAD lamp lights when tape is at BOT.
5	WRITE ENABLE	Indicator lamp	Lights whenever MTR is loaded with a supply reel that has a write enable ring installed.
6	POWER ON/ STANDBY	Toggle switch	Selects either normal or standby power. Place in ON position for normal operation.
None	ON/OFF (not shown)	Circuit breaker	Primary power protection. Located behind transport. Place in ON position for normal operation.

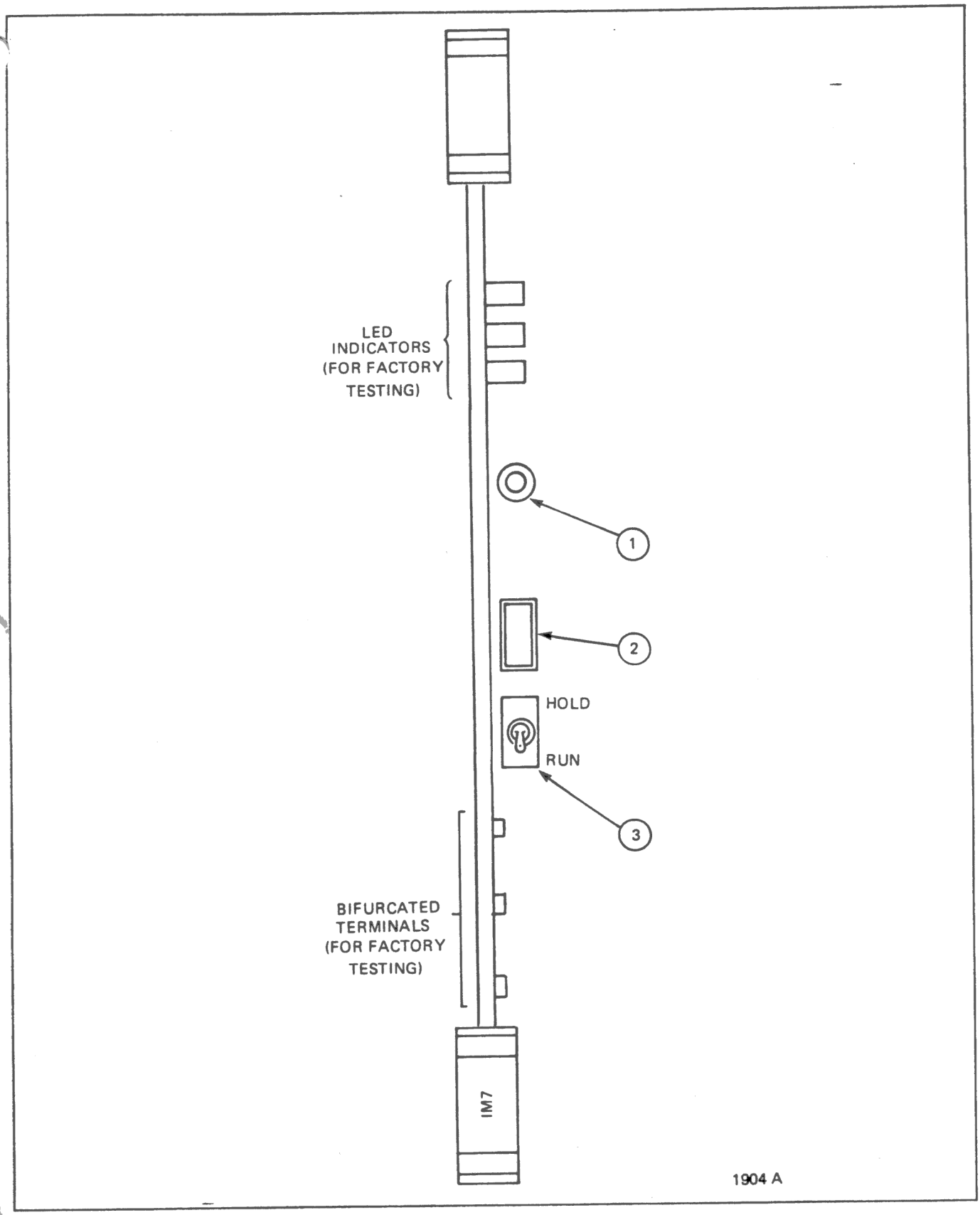


Figure 6. IM7 Circuit Pack, Controls and Indicators

Table 5. Bootstrap Loader Circuit Pack IM7, Controls and Indicators

INDEX, FIGURE 6	LABEL	TYPE	FUNCTION
1	Reset (not labeled)	Pushbutton switch	If enable switch is activated (appears yellow), pressing reset switch causes system memory to be cleared, MTC tape to rewind and attempt to reload. If enable switch is deactivated (appears black), pressing reset switch has no effect.
2	Enable (not labeled)	Alternate action indicating pushbutton switch	Enables or disables reset and run-hold switches. Appears yellow when activated, black when deactivated. Press to change state.
3	Run-hold (not labeled)	Toggle switch	If enable switch is activated, controls MTC motion. Used for maintenance only. Place in RUN position for normal operation.

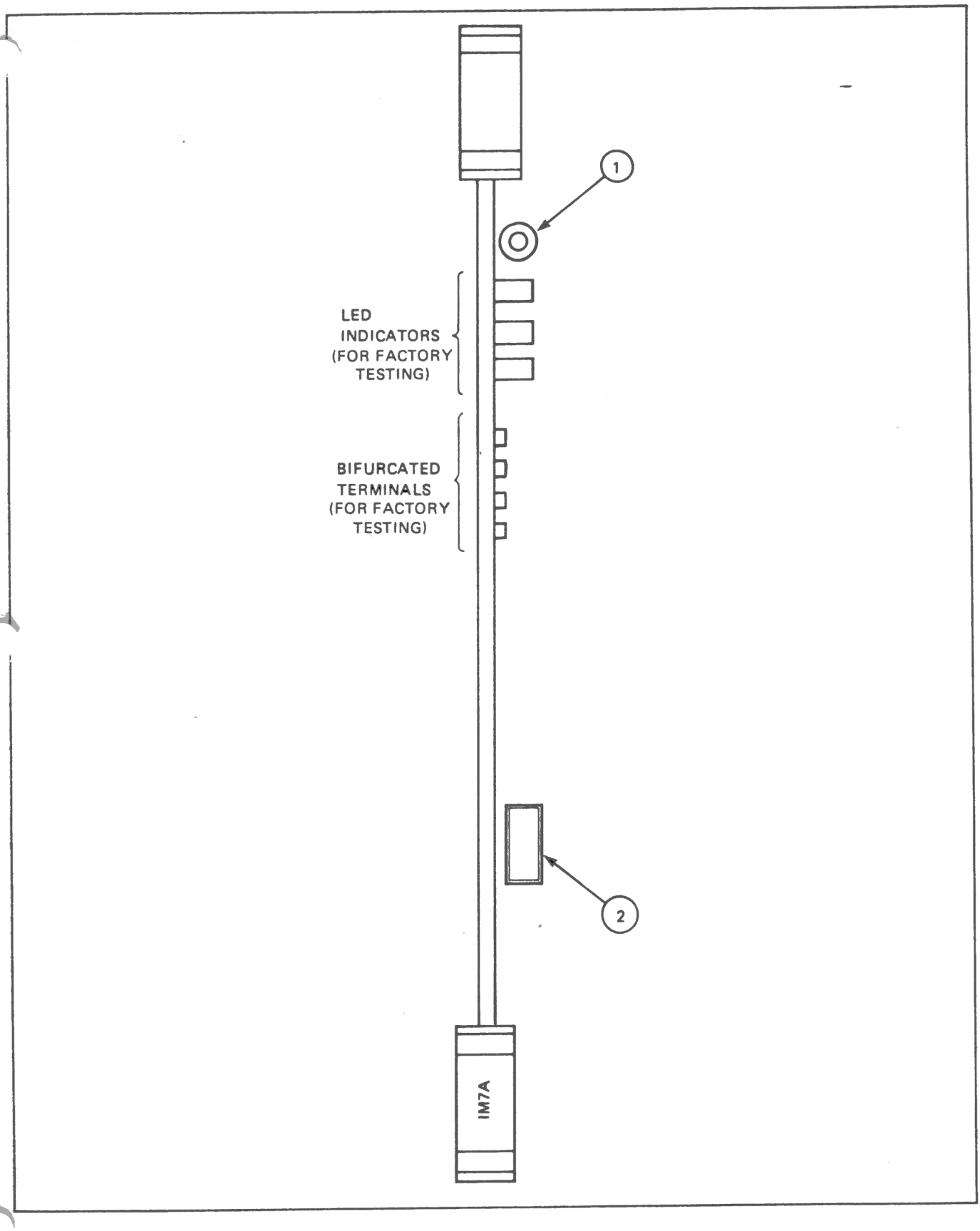


Figure 7. IM7A Circuit Pack, Controls and Indicators

Table 6. Bootstrap Loader Circuit Pack IM7A, Controls and Indicators

INDEX, FIGURE 7	LABEL	TYPE	FUNCTION
1	Reset (not labeled)	Pushbutton switch	If enable switch is activated (appears yellow), pressing reset switch causes system memory to be cleared, MTC tape to rewind and reload. If enable switch is deactivated (appears black), pressing reset switch has no effect
2	Enable (not labeled)	Alternate action indicating push-button switch	Enables or disables reset switch. Appears yellow when activated, black when deactivated. Press to change state.

3. SYSTEM INITIALIZATION

3.01 The ITS switch consists of a primary and a secondary system. Each system can be in one of the following conditions: active, standby, or off-line. Normally, the primary system is active and the secondary system is in standby. Both systems cannot be active or in standby at the same time. The following procedure assumes that either the primary or the secondary system has been off-line for maintenance and must be reinitialized in order to return to a standby condition. System initialization from a cold start (power off) is performed as a part of installation and is not a part of normal operating procedures.

Loading Operational Program

3.02 The off-line system is initialized and returned to standby by resetting the system and loading in the operational program. To load the operational program, proceed as follows:

(a) Open off-line system MTC door and remove test tape cartridge, if any (Figure 8).

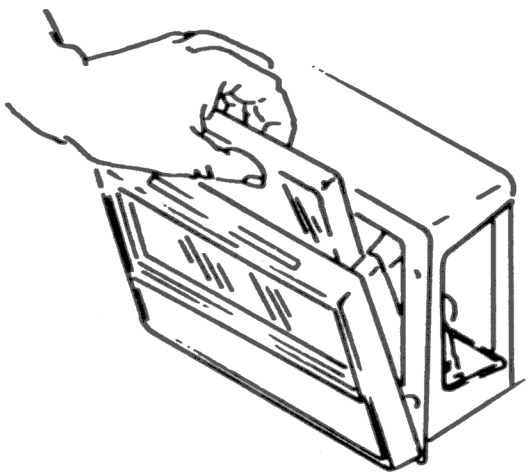
(b) Locate operational program tape cartridge and load into MTC.

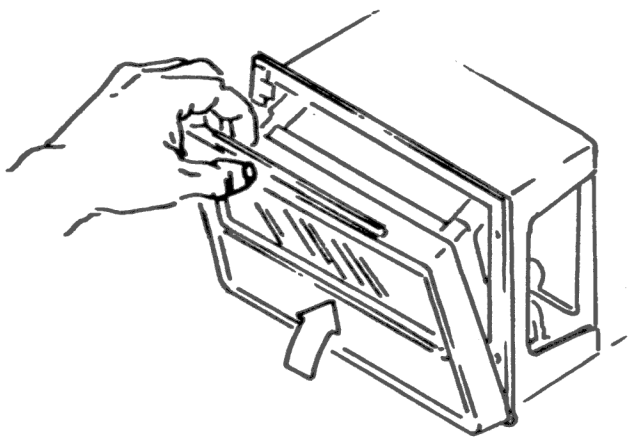
(c) Close MTC door.

NOTE: If the system uses an IM7 bootstrap loader circuit pack, place the IM7 RUN/HOLD switch in the RUN position (Figure 6).

(d) On the IM7 or IM7A bootstrap loader, press the ENABLE switch. Verify that the switch face appears yellow, indicating the ENABLE position.

(e) Verify that the CRT and PRINTER OFF LINE LEDs on the maintenance panel are off. Press the OFF LINE switch if either LED is lit and verify that it goes off.





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NOTES:
1. CASSETTE WILL ONLY FIT ONE WAY , TAPE EDGE DOWN.
2. ENSURE DOOR IS COMPLETELY CLOSED.
3. ENSURE LAMP INSIDE ASSEMBLY IS ON.

Figure 8. MTC Tape Loading

(f) On the IM7 or IM7A bootstrap loader, press the RESET switch.

NOTES: 1. The following indications will appear on the CRT if the primary system is being loaded or on the printer if the secondary system is being loaded.

2. NNN = any 3-digit octal number.

(g) On the CRT or printer, the following message will appear:

REG 171 NNN

(h) In the MTC, the program tape will rewind (if required) and begin to load.

(i) On the CRT or printer, the following message will appear:

READING OFFICE DATA

NNN NNN NNN NNN NNN NNN

(j) After the program tape loads, the following message will appear on the CRT or printer:

NNN

000 002 004 006 010 012 014 016 020 022 024 026 030 032 034 036

INITIALIZATION COMPLETE

NOTE: Last number (036) may not appear on some systems.

(k) On the maintenance panel, the reloaded system STATDBY STATUS LED will light.

(l) If the primary system is in standby, perform the manual system transfer as described in the following paragraph.

4. MANUAL SYSTEM TRANSFER

4.01 A system transfer causes the operational status of the primary and secondary systems to be reversed. That is, the active system becomes standby and the standby system becomes active. An automatic system transfer will occur in the event of a

failure in the active system. However, a manual system transfer may be performed at any time, either to verify secondary system operation or as a part of preventive maintenance procedures. To perform a manual system transfer, proceed as follows:

NOTE: Perform the following steps on the maintenance panel.

(a) Verify that the standby system (either primary or secondary) is operational (STANDBY LED on, MAJOR ALARMS LED off).

(b) Turn LOCK keyswitch to the clockwise position.

(c) Press ALARM CUTOFF switch. Verify that ALARM CUTOFF LED lights.

(d) Press and hold SELECT ENABLE switch, then press standby SELECT switch. Verify that the selected system ACTIVE STATUS LED lights and that the STANDBY STATUS LED goes off. Verify that the opposite system ACTIVE STATUS LED goes off and that MAJOR and MINOR ALARMS LEDs light.

(e) Verify that the formerly active system MTC program tape rewinds and reloads. The CRT or printer will display initialization messages as described in 3.02.

(f) Verify that the reloaded system STANDBY STATUS LED lights.

(g) Press the CLEAR DISPLAY switch. Verify that the MAJOR and MINOR ALARMS LEDs go off.

5. SETTING DATE AND TIME

5.01 System date and time is initially set after installation, but they may be changed at any time. The only change normally required is for daylight saving time.

NOTE: Enter daylight saving time changes after 1 AM (0100 hours) to prevent errors in billing tape.

5.02 The system uses a standard military 24-hour time clock (1 AM = 0100 hours; 1 PM = 1300 hours). Accurate time may be obtained by calling the National Bureau of Standards, Boulder, Colorado, (303) 499-7111. To set the time, proceed as follows:

NOTES: 1. Time and date should be set on the standby system. The following procedure assumes that the primary system is active.

2. (CR) = carriage return.

(a) On the printer, press (CR). The printer motor will turn on and respond with an asterisk (*).

(b) On the printer, enter the correct time:

TTHH,MM,SS

NOTE: TT = Command

HH = Hour

MM = Minute

SS = Second

EXAMPLE: TT01,00,00

Do not press (CR).

(c) Obtain the accurate time. When the time exactly equals the time entered in Step (b), press (CR).

(d) Verify the time by entering TY on the printer and pressing (CR).

(e) The printer will display the date and time as follows:

MM-DD-YY HH:MM:SS

EXAMPLE: 03-17-77 01:01:19

(f) If the time and date are correct, transfer the date and time to the primary system by entering TX on the printer, followed by a (CR).

(g) Verify that the date and time have transferred correctly to the primary system by entering the following commands on the CRT keyboard:

(CR)

TY (CR)

Verify that the correct date and time are displayed on the CRT.

5.03 To set the date, proceed as follows:

(a) On the printer, press (CR). The printer motor will turn on and respond with an asterisk (*).

(b) On the printer, enter the correct date:

TDMM,DD,YY (CR)

NOTE: TD = Command

MM = Month

DD = Day

YY = Year

EXAMPLE: TD01,02,78

(c) Verify the correct date as in 5.02.

NOTE: The date and time may be entered at the same time. For example:

TD03,17,77,TT01,00,00 (CR)

6. TRAFFIC REPORTS

6.01 The ITS System generates two types of traffic reports. A master traffic report is printed out every four hours, and an abbreviated traffic report is displayed on the CRT every five seconds. The time interval for the master

traffic report may be changed according to central office requirements. Available intervals are 1, 2, 4, 8, 12, or 24 hours. To change traffic report intervals, proceed as follows:

(a) On the CRT keyboard, press CR. The CRT will respond with an asterisk (*).

(b) On the CRT keyboard, enter the following:

NTH (CR)

NOTE: N = 1, 2, 4, 8, 12, or 24.

(c) Repeat Steps (a) and (b) on the printer.

6.02 Master traffic reports are always output on the printer. Refer to Section 290-000-307 for detailed information on master traffic reports.

6.03 Abbreviated traffic reports are displayed on the CRT every five seconds, as follows:

X MM-DD-YY HH:MM:SS 7DA NN 7DC NN 10DA NN 10DC NN

NOTE: X = P or S
MM = Month
DD = Day
YY = Year
HH = Hour
MM = Minute
SS = Second
7DA = 7-digit calls attempted
7DC = 7-digit calls completed
10DA = 10-digit calls attempted

10DC = 10-digit calls completed

NN = Number

EXAMPLE: P 10-10-78 16:25:00 7DA 4290 7DC 3623 10DA 2911 10DC 2210

7. CHANGING BILLING TAPES

7.01 Billing tapes (MTR) are changed and sent to accounting according to a schedule set by individual telephone companies. To change billing tapes, perform the procedure listed in Table 7.

NOTE: When loading a billing tape, make sure that the tape is new or bulk-erased.

8. COPYING BILLING TAPES

8.01 Billing tapes may be copied only on systems with two MTRs. To copy billing tapes, perform the procedure listed in Table 8.

Table 7. Changing Billing Tapes

NOTE: System status at the beginning of this procedure: Primary system ACTIVE
Secondary system STANDBY

STEP	PROCEDURE	RESPONSE
1	On CRT, press (CR)	*
2	Transfer billing data from primary MTC to billing tape On CRT, enter CC (CR)	CART TO TAPE COPY DN ^ NOTE: If FAIL CART TO TAPE DN appears, repeat this step.
3	On CRT, press (CR)	*
4	Unload primary cartridge On CRT, enter CU (CR)	UNLOAD CART Y-YES, N-NO
5	Respond On CRT, enter Y (CR) NOTE: N aborts operation.	CHANGE CART ^ NOTE: Wait for cartridge to finish rewind.
6	Remove cartridge from primary MTC	
7	On printer, press (CR)	*
8	Unload secondary cartridge On printer, enter CU (CR)	UNLOAD CART Y-YES, N-NO
9	Respond. On printer, press (CR)	CHANGE CART ^
10	Remove cartridge from secondary MTC	
11	Interchange primary and secondary MTC tapes	

Table 7. Changing Billing Tapes (Cont)

STEP	PROCEDURE	RESPONSE
12	On CRT, press (CR)	*
13	Load cartridge on primary MTC On CRT, enter CL (CR)	 ^
14	On printer, press (CR)	*
15	Load cartridge on secondary MTC On printer, enter CL (CR)	 ^
16	On CRT, press (CR)	*
17	Transfer billing data from primary MTC On CRT, enter CC (CR)	CART TO TAPE COPY DN ^ NOTE: If FAIL CART TO TAPE DN appears, repeat this step.
18	On CRT, press (CR)	*
19	Unload billing MTR On CRT, enter MU (CR)	 UNLOAD TAPE? Y-YES, N-NO
20	Respond On CRT, enter Y (CR) NOTE: N aborts operation. Wait for MTR to rewind before proceeding	^
21	Remove billing tape from MTR	
22	Clean MTR tape path according to 290-000-509 (less frequent intervals may be specified by the telephone company)	
23	Place blank tape on MTR and thread as shown in Figure 5. Make sure write enable ring is in place.	

Table 7. Changing Billing Tapes (Cont)

STEP	PROCEDURE	RESPONSE
24	On MTR, press LOAD switch When LOAD lamp lights, press ON-LINE switch	WRITE/ENABLE lamp lights LOAD lamp lights ON-LINE lamp lights
25	On CRT, press (CR) CAUTION: Do not perform both Steps 26 and 27. Do one or the other.	*
26	If the tape has good data which must not be lost, to to Step 27. If blank tape, complete this step, then go to Step 28. On CRT, enter ML (CR)	Tape moves, LOAD lamp goes out
27	On CRT, enter MS (CR)	Tape moves, LOAD lamp goes out
28	On CRT, press (CR)	*
29	Transfer billing data from primary MTC On CRT, enter CC (CR)	CART TO TAPE COPY DN NOTE: If FAIL CART TO TAPE DN appears, repeat this step.
	NOTE: On systems with two MTRs, repeat Steps 18 through 27 on the printer instead of the CRT.	

Table 8. Copying Billing Tapes

STEP	PROCEDURE	RESPONSE
1	Place blank tape on secondary MTR and thread as shown in Figure 5 Make sure write enable ring is in place	
2	On secondary MTR, press LOAD switch When LOAD lamp lights, press ON-LINE switch	WRITE ENABLE lamp lights LOAD lamp lights ON-LINE lamp lights
3	Place tape to be copied on primary MTR and thread as shown in Figure 5 DO NOT install write enable ring	
4	On primary MTR, press LOAD switch When LOAD lamp lights, press ON-LINE switch	LOAD lamp lights ON-LINE lamp lights
5	On CRT, press (CR)	*
6	On CRT, enter MC (CR)	Tapes move, LOAD lamps go out (both MTRs)
7	When tapes stop, press REWIND switch (both MTRs)	Tapes rewind REWIND lamps light (both MTRs) When rewind is complete, tapes stop REWIND lamps go out LOAD lamps light
8	Remove tapes from MTRs	
9	Perform Steps 23 through 29, Table 7	