LINE STATUS VERIFIER

ATTENDANT TRAINING SIMULATOR

DESCRIPTION, OPERATION, AND MAINTENANCE

1. GENERAL

1.01 This section provides description, operation, and maintenance information for the attendant training console, the instructor console, and the associated equipment cabinet.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 The attendant training simulator (Fig. 1) is intended as an aid for training repair service personnel in the proper use of the line status verifier (LSV). This circuit provides a means of simulating most of the call handling conditions an LSV operator would be required to know.

1.04 The attendant training simulator (Fig. 1) is a portable piece of equipment which consists of an LSV console (attendant training console), a modified 831C telephone set (instructor console) and a cabinet which contains rack-mounted relay equipment and a self-contained power supply.
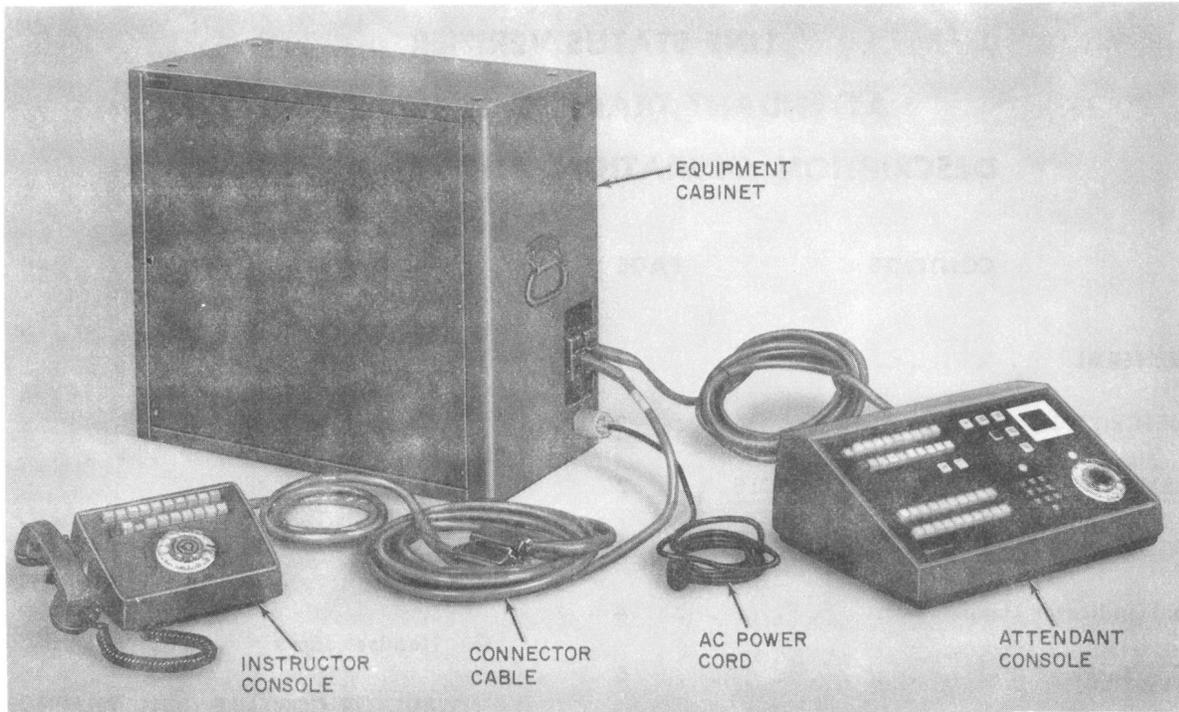
Fig. 1—Line Status Verifier Attendant Training Simulator

1.05 This issue of Section 662-502-502 is based on the following drawings:

CD- and SD-2P000-01 Issue 1 (Attendant Training Simulator)

CD- and SD-97555-01 Issue 5B (LSV Console)

840503718 Issue 2 (831C Telephone Set)

If this section is to be used with equipment or apparatus reflecting later issues of the drawings, reference should be made to the current drawings to determine the extent of the changes and the manner in which the section may be affected.

2. DESCRIPTION

LSV ATTENDANT TRAINING CONSOLE

2.01 The attendant training console (Fig. 2) has the same physical appearance as the LSV attendant console and will be operated in the same basic manner.

2.02 The attendant training console consists of the following design features:

- 17 inches wide, 12 inches deep, and 6 inches high.

- Available in moss green color.

- Vinyl faceplate with simulated black walnut finish.

- 15-foot, plug-ended mounting cord available in gray color only.

- Jack-equipped (accommodates two 52-, 53- or 60-type headsets or plug-equipped handsets).

- Rotary dial and 16-button TOUCH-TONE® dial.

- Indicator lamp associated with each dial.

- Five indicator lamps designated: PBX, LINE GOOD, LINE BAD, CALL PROG (call in progress) and SYS FAIL (system fail).
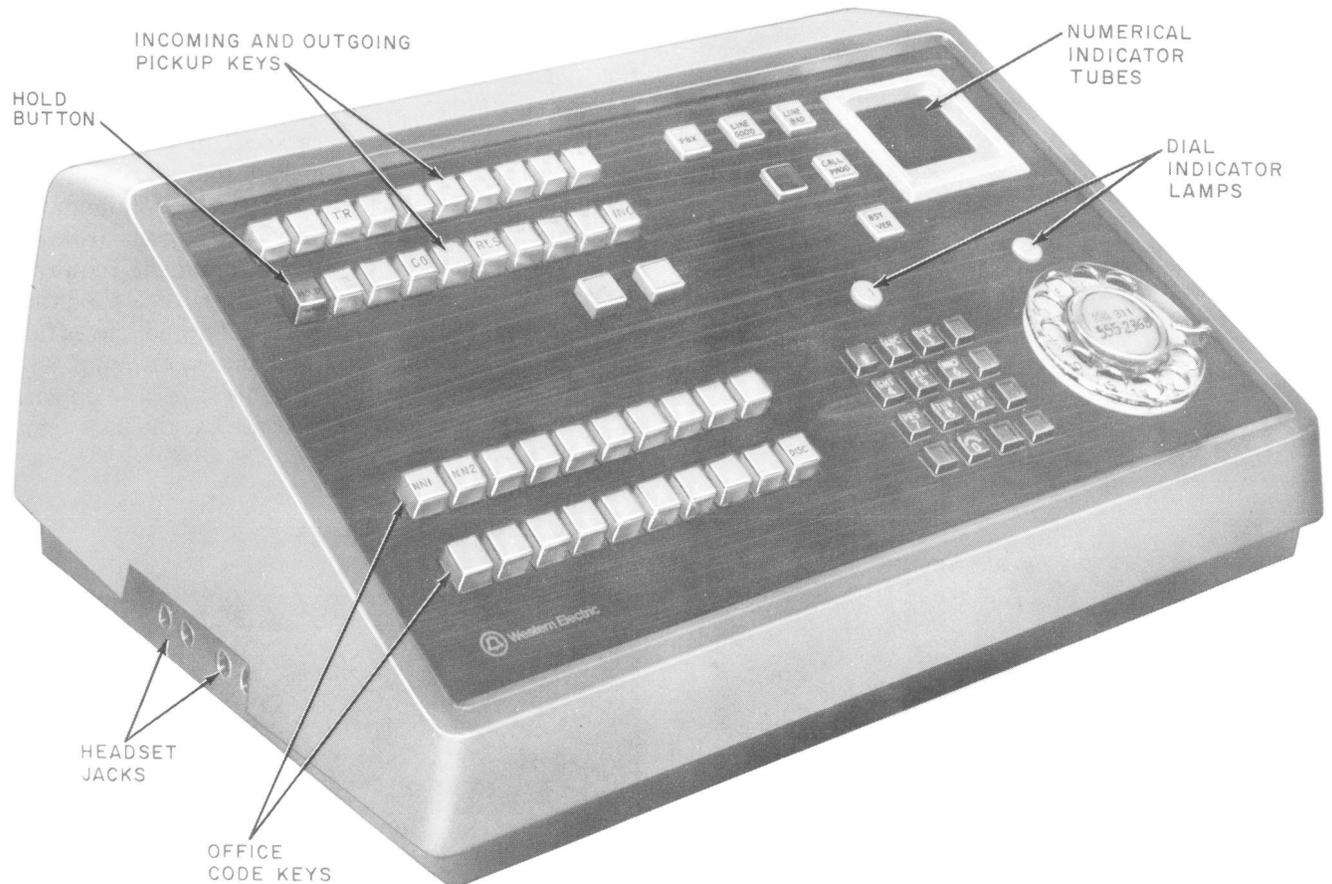
Fig. 2—Line Status Verifier Attendant Training Console

● Four 10-button 647-type key modules. One key has a HOLD button, a release button, and eight pickup buttons. One key has nine pickup buttons and a DISC (disconnect) button. The other two keys each have ten pickup buttons.

● One single-button 624-type key (nonlocking).

● Two single-button 630-type keys (push-to-operate, push-to-release).

Note: 630-type keys not activated on attendant training console.

● Two numerical indicator tubes located behind a single readout window.

A. Keys

2.03 The two 10-button key modules (Fig. 3) located at the top left side of the attendant console provide a means of answering repair service calls or may be used to originate calls. The attendant training console has only five of the buttons on the two key modules designated. These keys provide a means of originating calls to the instructor console, receiving a call from the instructor console, placing a call on hold, simulating a call being transferred to another station, and releasing a call. Part 3 of this section provides the operating feature of each key used for handling incoming and outgoing calls.

2.04 The two 10-button key modules located at the lower left side of the console are used as office code (OC) keys (Fig. 4). Office code keys
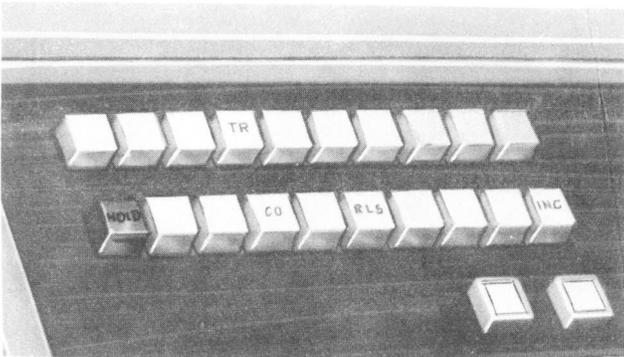
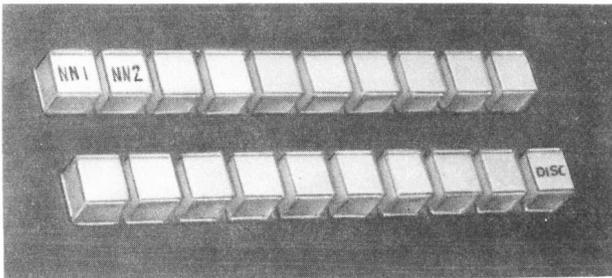**Fig. 3—Keys Used for Incoming and Outgoing Calls**

Fig. 4—Office Code Keys

are equipped with a nonlocking button which illuminates when operated. Two of the buttons on the top key module are electrically wired for use with the training console. The buttons may be designated locally with 3-digit office codes which may be familiar to the trainee. The first office code button is associated with the rotary dial (Fig. 5), and the second office code button is associated with the TOUCH-TONE dial (Fig. 5).

2.05 The BSY VER key has one nonlocking button which provides a means of bridging the headset of the attendants console on the line to be tested. The BSY VER key has a button lamp which illuminates when a line has been seized for testing while the 10A, 10B, or 10C button is depressed at the instructor console.

B. Indicator Lamps

2.06 *Dial indicators* are located above each dial (Fig. 5). A steady illuminated dial indicator simulates a condition where a circuit is established to a central office and the last four digits of the telephone number may be dialed. The illuminated dial indicator signifies which dial signals (rotary, or MF dial) the central office equipment requires. A flashing dial indicator lamp simulates a condition where a test trunk has been seized and the office equipment is busy. The dial indicator lamp will flash after dialing the last four digits of a telephone number if the FB button is operated at the instructor console.

DIAL INDICATOR LAMPS
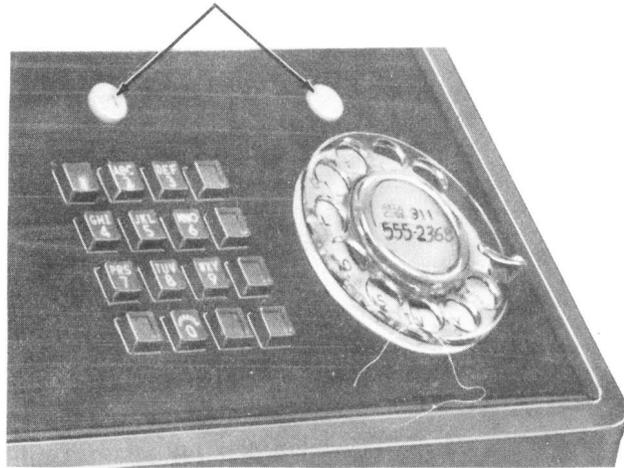
Fig. 5—Dials and Dial Indicators

2.07 *PBX indicator (Fig. 6)* illuminates when a line which provides service to a PBX is seized. The numeral 9 will appear in the numerical indicator. The PBX indicator and the numerical code 9 will illuminate when using the LSV console to verify the condition of a line while the button designated with the numeral 9 is depressed at the instructor console.

2.08 *SYS (system) FAIL indicator (Fig. 6)* provides a means of simulating a condition where both line fault detector (LFD) units or the line fault detector access switch is defective or when either of these components in an LSV system momentarily fail. The system fail indicator will illuminate when an attempt is made to verify the condition of a line after the nonlocking SYS FAIL button has been depressed and released at the instructor console.

NUMERICAL
INDICATOR
WINDOW

BUSY VERIFICATION BUTTON

Fig. 6—Busy Verification Button and Display Indicators

2.09 *CALL PROG (call-in-progress) indicator (Fig. 6)* illuminates after the last digit of the station number has been dialed. The illuminated CALL PROG indicator is intended 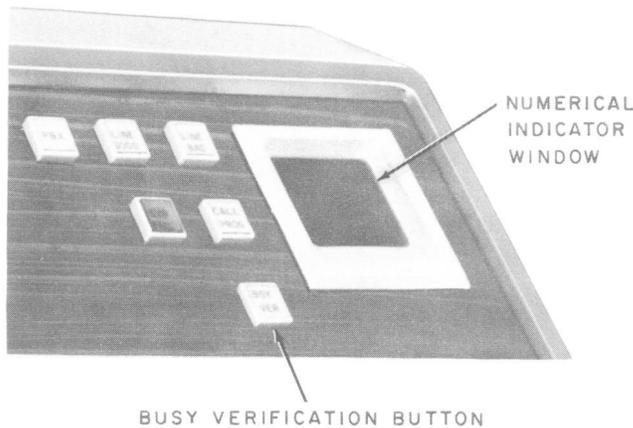to simulate the call has progressed into the central office equipment and is connected to the LSV equipment. The CALL PROG indicator and the office code button extinguish when the equipment has completed its testing functions and the results appear at the attendant training console. It takes approximately 11 seconds after the last digit of the station number is dialed before the test results are displayed. The CALL PROG button remains illuminated during the 11-second interval.

2.10 *LINE GOOD indicator (Fig. 6)* illuminates to show that the simulated customer line has passed all tests performed by an LSV system. The numerical code 0 will appear in the numerical indicator when a line appears good to the LSV equipment. The attendant training console will get the indication that a good line has been tested when the button designated with the numeral 0 is depressed at the instructor console.

2.11 *LINE BAD indicator (Fig. 6)* illuminates to verify a permanent signal or service affecting trouble has been detected on the line being verified. A numeral corresponding to the trouble verified will appear in the numerical indicator. The line bad indicator will illuminate whenever an attempt is made to verify the condition of a line while any one of the buttons designated with the numerals 1, 2, 3, 4, 10A, 10B and 10C is depressed at the instructor console.

2.12 *Two numerical indicator* tubes (Fig. 6) illuminate to form the numerals 0 thru 9 in each tube. A single digit appears on the right indicator tube and the left indicator tube is used when a 2-digit readout is required. The numerals are coded to signify a good line, PBX line, or a line with a trouble condition as follows:

0—Good line

1—Foreign EMF (tip to ring, tip to ground, or ring to ground)

2—Resistance leakage (T to R, T to GRD, or R to GRD)

3—Open inside central office

4—Open outside central office

9—PBX circuit

10—Permanent signal (potential greater than 10V DC across tip and ring leads, such as ringing or talking battery provides).

C. Jacks

2.13 Two pairs of jacks are provided along the left side of the attendant training console (Fig. 2). The jacks will accommodate two headsets or handsets equipped with a plug-ended cord. The LSV attendant training simulator or the actual LSV system does not require that a headset be plugged into the jacks on the attendant training console while verifying the condition of a line. A headset must be plugged into the attendant training console to answer calls. A headset may be unplugged while a line is on hold without losing the connection, but the headset must be plugged into the console before a connection may be released or answered.

INSTRUCTOR CONSOLE

2.14 The instructor console (Fig. 7) is a modified 831C telephone set. When ordering an LSV attendant training simulator, the 831C telephone set is not shipped with the equipment cabinet and the LSV attendant training console. The 831C telephone set must be ordered separately and modified (see Table A) when used as an instructor console for the LSV attendant training simulator.

Fig. 7—Instructor Console

2.15 The 831C telephone set has the following design features:

- 9 inches wide (less switchhook), 7 inches deep and 4 inches high.

- Modular telephone set.

- Rotary dial.

- Two 10-button 647-type key modules. One key has a HOLD button and nine pickup buttons. The other key has ten pickup buttons.

- All pickup buttons are convertible to nonlocking operation.

- Nonilluminating HOLD button (lamp not furnished in HOLD button).

- Available in eleven colors. Recommended green set is to be used to coordinate color with moss green attendant training console and equipment cabinet.

- Color coordinated faceplate.

- Plug-ended mounting cord (satin-silver color).

A. Keys

2.16 The top 10-button key module (Fig. 8) which is part of the 831C telephone set has ten locking pushbuttons which illuminate when operated. Only three of the buttons are designated for use with the attendant training simulator. The first two buttons are used to simulate a condition where all test trunks are busy or a condition where the system will time out. The lamp associated with

TABLE A

WIRING MODIFICATION FOR 831C
TELEPHONE SET

LEAD DESIGNATION	LEAD COLOR	REMOVE FROM	CONNECT TO
			TERMINAL
Buzzer Leads	Blue	14	*
		12	*
Chaining Switch	Green	F†	* or 27
Hold Button			* or 27
Strap			14)Strap(F†
Line Switch	Green	6	12
Ringer Lead	Slate Yellow	A†	6

* Insulate and store.

† Terminal on 425E Network.

the last button serves as an indicator for incoming calls. The operation of the last button may be restricted with a button stop. Except for the lamp leads, this button is not electrically connected to the circuit. The lower 10-button key module (Fig. 8) has nine locking pushbuttons and one nonlocking button. The nonlocking button releases any operated button in either key module when the nonlocking button is depressed and released. The nine locking buttons are used to simulate a customer line which is a good line, a busy line, or a line which has service affecting trouble which can be verified by the LSV training simulator.

Part 3 of this section provides information on the operating features for the individual buttons on both key modules.
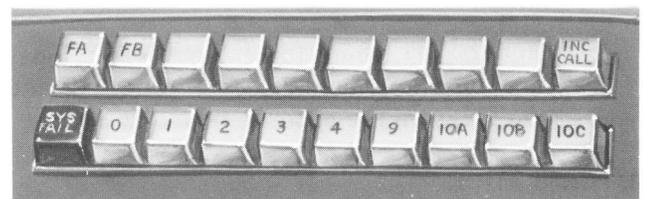

Fig. 8—Keys On Instructor Console

EQUIPMENT CABINET (Fig. 9)

- 2 feet 2 inches wide, 1 foot 11 inches high and 1 foot 1 inch deep.

- Weighs approximately 68 pounds.

- Available in moss green color.

- Equipped with seven 2-inch by 23-inch mounting plates.

- Self-contained power supply operates from standard 115V AC grounded power outlet.

- Removable side panels. Panels secured with Simmons-type fasteners.

- AC power switch on outside of equipment cabinet. Rocker-type power switch illuminates when switch is in on position.

- Four connectors (recessed in end of equipment cabinet). Connectors serve as receptacles for plugs from connector cable associated with the instructor console and mounting cord for attendant console.

- Recessed receptacle accommodates turn-locking plug from AC power cord.

ASSOCIATED EQUIPMENT SUPPLIED WITH APPARATUS CABINET

- 8-foot AC power cord

- One 50-pair connector cable, 15-feet long. Cable has two connectors on one end and two plugs on the opposite end.

3. OPERATION

A. Setting Up Procedures

3.01 The only restriction to setting up the LSV attendant training simulator is that a 115V AC grounded power outlet must be available within 8 feet of where the equipment cabinet for the training simulator is to be located.

3.02 Both the modified 831C telephone set (instructor console) and the attendant training console are equipped with plug-ended mounting cords. The plugs from the mounting cord for the
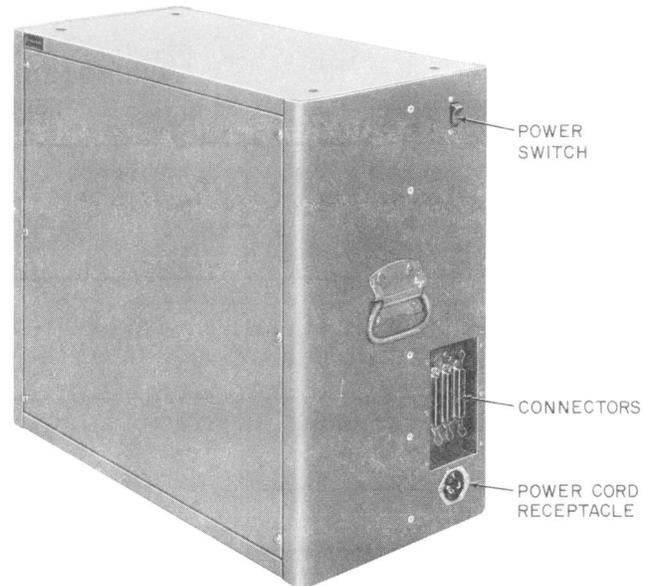

POWER SWITCH

CONNECTORS

POWER CORD RECEPTACLE

Fig. 9—Equipment Cabinet

instructor console mate with the connector end of a 50-pair connector cable. The opposite end of the connector cable is equipped with plugs which mate with connectors located in a recessed area on the end of the equipment cabinet. The plugs associated with the connector cable from the instructor console connect to the left two connectors (J1 and J2) on the equipment cabinet. The plugs from the mounting cord associated with the attendant training console connect to the right two connectors (J3 and J4) on the equipment cabinet. Spring clips are provided at the connectors to secure the plugs to the connectors. The spring clips should always be used to secure the plugs to ensure a good electrical connection and prevent the plugs from accidentally being disconnected.

3.03 The AC power cord plugs into a receptacle on the outside of the equipment cabinet. The AC receptacle is located directly below the square recessed area on the end of the equipment cabinet. The power cord has a twist-lock plug which provides a means of securing the plug to the receptacle on the equipment cabinet. The power cord should be securely connected at the equipment cabinet before it is plugged into the AC power outlet.

Caution: To prevent damage to the relay equipment, the on-off switch for the power supply should be in the off position (lower portion of switch depressed) until all equipment has been interconnected. The on-off switch is located on the right end panel of the equipment cabinet.

B. Operating Features of Keys (Attendant Training Console)

3.04 *TR (transfer) button* is used to simulate a call being transferred to another station. The transfer button is a locking-type pushbutton. The button lamp associated with the TR button has not been wired to illuminate the TR button. When the TR button is operated, audible ringing will be heard at the attendant headset. The audible ringing is intended to indicate the call is being transferred. This feature is similar to the transfer feature provided with Automatic Call Distribution (ACD) Systems used in some repair service bureaus to handle repair service calls. Since the attendant training simulator is intended only for training, the audible ringing heard by the attendant when the TR key is operated will be the extent of simulating a call being transferred. The audible ringing will be heard until the RLS (release) button or any other button in the two key modules is depressed.

3.05 *HOLD button* is a nonlocking nonilluminated pushbutton. Operating the HOLD button places a hold bridge across the connecting call. When the HOLD button is released, any operated pickup button in the two key modules is released. The HOLD button on the attendant training simulator is primarily intended to place a call associated with the INC button on hold. A connection is reestablished to the call placed on hold when the INC button associated with the line is reoperated.

3.06 *CO (callout) button* is a locking pushbutton which illuminates when operated. The CO button is used to initiate a call to the instructor console. When the CO button is operated, dial tone will be heard. Any 7-digit number may be dialed using the TOUCH-TONE dial to access the instructor console. A 7-digit telephone number, with an office code and station number which is familiar to the trainee, may be selected for accessing the instructor console.

3.07 *RLS (release) button* is a locking pushbutton which does not illuminate. The RLS button performs a function similar to a line switch in the standard telephone set. Depressing the RLS button mechanically releases an operated pickup button in either one of the two key modules. When a pickup button is mechanically released, the electrical connection established by the key will be disconnected.

3.08 *OFFICE CODE (OC) keys* (Fig. 4) are used to select a test trunk to a particular central office. Two 10-button key modules are used as office code keys. Each key is equipped with ten nonlocking pushbuttons. All pushbuttons associated with an office code illuminate when operated. The last button (DISC) on the bottom key module does not illuminate. Only two buttons are designated for selecting an office code on the attendant training console. The first button simulates an office code which requires using the rotary dial to dial pulse the last four digits of the telephone number being checked for service affecting trouble. The second button simulates an office code which requires TOUCH-TONE signals. The TOUCH-TONE dial is used to send the multifrequency signals for the last four digits of the telephone number to be checked for service affecting trouble. An office code button which flashes when depressed indicates all test trunks associated with that office code are busy. This condition will be simulated when the FA button is depressed at the instructor console. When an operated office code button flashes, the DISC button must be operated before a second attempt may be made to seize a test trunk.

3.09 *DISC button* is used to release a connection to an office code when all test trunks associated with a particular office code are busy or, for other reasons, a connection to that office is not made. The DISC button also provides a means of extinguishing all indicators which display the results of verifying the condition of a line.

3.10 *BSY VER key* provides a means of bridging the circuit for the headset jacks onto the connection of the line being tested. The BSY VER key is used to verify if a permanent signal on the line is actually caused by a busy circuit. By holding the BSY VER button depressed, it is possible to monitor the circuit to detect a conversation or other sounds which indicate a busy line or a

station with service affecting trouble. The BSY VER button, LINE BAD indicator, and numerical code 10 illuminate when a customer line is seized and a permanent signal is detected. The BSY VER button illuminates when a button designated 10A, 10B, or 10C is operated at the instructor console while attempting to verify if a line is good or in trouble.

C. Operating Features of Keys (Instructor Console)

3.11 The keys on the instructor console provide a means of controlling the results a trainee will verify at the attendant training console. Table B provides the operating features provided by each button on the instructor console. The INC CALL button is only used as an indicator to provide a visual signal for incoming calls from the attendant console. The talking circuit for an incoming call is connected to the headset jacks without any key at the instructor console being operated. The INC CALL button flashes when the trainee originates a call to the instructor console. The SYS FAIL button is a nonlocking nonilluminating button which releases any other operated button on either key module. All other buttons used to simulate the type of line condition the trainee will verify are locking pushbuttons which illuminate when operated.

D. Typical Operating Procedures for Instructor Console

Before attempting to use the attendant training simulator, ensure the power switch on the equipment cabinet is in the on position. Switch illuminates in on position.

3.12 For training purposes the instructor console will represent a customer station. The instructor console may be used to simulate conditions to which an LSV operator would be exposed. *THE BUTTON USED TO SIMULATE A SERVICE AFFECTING TROUBLE MUST BE DEPRESSED BEFORE THE TRAINEE ATTEMPTS TO VERIFY THE REPORTED TROUBLE.* The typical conditions which may be controlled or simulated from the instructor console are:

(a) Originating a talking circuit to the attendant console. *Instructor action*—remove receiver from switchhook; dial digits 611.

Note: The attendant console controls the dial tone circuit. Any time the CO or INC button is depressed at the attendant console, the instructor console will not hear dial tone.

(b) Answering a call from attendant console. *Instructor action*—Remove receiver from switchhook when INC button flashes.

(c) Simulating a condition where all test trunks to an office code are busy. *Instructor action*—operate FA button.

(d) Simulating a condition where the equipment will time out. *Instructor action*—operate FB button. The time-out feature in an actual LSV operation is caused by the LSV operator waiting too long before dialing the 4-digit station number or pausing too long between digits while dialing. The attendant training simulator times out in approximately 18 seconds when the FB button at the instructor console is depressed. A working LSV system times out in approximately 25 seconds.

(e) Simulating a condition where the LSV equipment fails to operate properly. *Instructor action*—operate SYS FAIL button.

(f) Simulating a good line, a PBX line, or any of the typical service affecting troubles which may be detected by the LSV system. *Instructor action*—operate button designated 0, 1, 2, 3, 4 or 9.

(g) Simulating a line which may be monitored and conversation may be heard at the attendant console. *Instructor action*—Operate button 10A.

Note: The instructor must provide the conversation by talking into the transmitter or holding the handset where room noise or other familiar sounds may be heard.

(h) Simulating a line which may be monitored and dial tone will be heard. *Instructor action*—operate 10B button.

(i) Simulating a line which may be monitored and a 60-hertz hum will be heard which indicates service affecting noise on the line. *Instructor action*—operate 10C button.

TABLE B

OPERATING FEATURES OF KEYS FOR INSTRUCTOR CONSOLE

BUTTON DESIGNATION	FUNCTION	INDICATION AT LSV ATTENDANT TRAINING CONSOLE
FA	Simulates a condition where all test trunks are busy.	Office Code button flashes when depressed.
FB	Simulates a condition where any attempt to verify a trouble report will cause the equipment to time out.	Flashing dial indicator lamp after last four digits of telephone number are dialed.
INC CALL	Indicator for incoming calls. Flashes when receiving a call from the attendant console.	CO button operated. Audible ringing heard after completion of dialing (TOUCH-TONE®) 7-digit telephone number for instructor console.
SYS FAIL	Simulates a condition where the equipment fails to operate properly. Releases any operated button.	SYS FAIL indicator illuminates after last four digits of telephone number are dialed.
0	Simulates a good line.	Numerical code 0 illuminates. LINE GOOD indicator illuminates.
1	Simulates a line which is crossed with a foreign EMF.	Numerical code 1 illuminates. LINE BAD indicator illuminates.
2	Simulates a line with a resistance breakdown. DC leakage between conductors or between conductor and ground.	Numerical code 2 illuminates. LINE BAD indicator illuminates.
3	Simulates a line with an open conductor inside the central office.	Numerical code 3 illuminates. LINE BAD indicator illuminates.
4	Simulates a line with an open conductor outside of the central office.	Numerical code 4 illuminates. LINE BAD indicator illuminates.
9	Simulates a PBX line.	PBX indicator illuminates. Numerical code 9 illuminates.

TABLE B (Cont)

BUTTON DESIGNATION	FUNCTION	INDICATION AT LSV ATTENDANT TRAINING CONSOLE
10A	Simulates a line with a permanent signal which may be caused by a busy line or service affecting trouble.	BSY VER button illuminates. LINE BAD indicator illuminates. Numerical code 10 illuminates.
10B	Simulates a line with dial tone.	BSY VER button illuminates. LINE BAD indicator illuminates. Numerical code 10 illuminates.
10C	Simulates a line with 60-cycle hum (noise).	BSY VER button illuminates. LINE BAD indicator illuminates. Numerical code 10 illuminates.

(j) The instructor may request the incoming call to the attendant console be transferred to another station. This action would provide a means of making the trainee familiar with the transfer feature of an ACD system.

(k) The instructor may simulate a condition which would require the trainee to release the incoming line, verify the trouble report, and call the instructor back. This condition would be simulated by informing the trainee the repair service call is being made from the same line on which the trouble is to be verified.

3.13 Once a connection has been made at the attendant console to verify a trouble report, the instructor cannot release the connection until the trainee operates the DISC button associated with the office code keys. The instructor will know the connection has not been disconnected at the attendant console when a new button is depressed and the previously operated button remains illuminated. If a button on the instructor console is mechanically released and the button lamp remains illuminated, the button lamp will extinguish when the trainee operates the DISC button.

E. Typical Operating Procedures for Attendant Console

STEP	ACTION	VERIFICATION

Answering Repair Service Call

1	Plug headset or handset into one of the jacks.	Flashing INC button indicates an incoming repair service call.
2	Operate INC button.	INC button illuminates steady.
3	Receive trouble report information.	

Note: Attempt to determine the telephone number and if the call is being made from the line affected by the trouble report as soon as possible. This information determines if the trouble may be verified while receiving additional information or if the customer must be released before the trouble is verified.

If repair service call is made from line involved in trouble report:

4a	Inform customer to hang up receiver.	

THINK *Before the customer is asked to hang up the receiver, determine if the customer can receive calls. This information determines if the customer can be called back after using the LSV to verify the trouble report.*

5a	Operate RLS button.	INC button lamp extinguished.

STEP	ACTION	VERIFICATION

Verifying a Trouble Report

Note 1: A customer may be, but does not have to be, placed on hold while trouble is being verified.

Note 2: The LSV portion of console may be operated to verify trouble reports without having a headset plugged into console jacks.

6   Depress OC (office code) button associated with first three digits of the 7-digit telephone number.

If OC button lamp and dial indicator light steadily, proceed to dial station number (Step 8).

If OC button starts flashing, immediately disconnect office code connection (Step 7b).

If OC button lamp is flashing:

7b   Depress DISC button. A second attempt should be made to establish an office connection.

OC button lamp extinguished.

8   When OC button and dial indicator lamp light steadily—
Dial last four digits of telephone number.

Note: Use dial associated with illuminated dial indicator lamp.

Call PROG indicator illuminates for approximately 11 seconds.
When CALL PROG indicator, dial indicator, and OC button lamps extinguish, numerical indicator will illuminate to reflect results of test.

If CALL PROG lamp extinguised and dial indicator flashes, disconnect office code connection (Step 7b).

9   Observe illuminated indicators.

Refer to Table C.

10   Record indicator information and operate DISC button.

All indicator lamps extinguished.

If incoming call was placed on hold:

11c   Depress INC button.

Connection reestablished to instructor console.

If instructor was requested to hang up after making trouble report:

12d   Depress CO button.

CO button lamp illuminated.
Dial tone heard.

STEP	ACTION	VERIFICATION
13d	Dial 7-digit telephone number assigned to instructor console. TOUCH-TONE dial must be used at the attendant console to simulate an outgoing call.	Audible ringing is heard in headset at attendant console.
14d	Report results verified and what action will be taken.	
15d	Depress RLS button.	Call is terminated. CO button lamp extinguished.

3.14 *Transferring incoming or outgoing calls:*
Once a connection has been established to an incoming or outgoing call, the procedures for transferring a call may be practiced. To simulate transferring the call, operate the TR button. Once the TR button is depressed, audible ringing will be heard at headset receiver of the attendant console and also in the handset of the supervisor console. The audible ringing will continue until the RLS button is depressed or until another button is operated.

4. MAINTENANCE

LSV ATTENDANT CONSOLE

4.01 The replaceable common components of the LSV attendant console are as follows:

- P-23F101 Collar

- Lamp Cap, 79B Green Light Filter

- Dial, 66H3C (TOUCH-TONE®)

- Dial 6E41 (Rotary)

- 840072664 Face Panel

- Housing, G1-51 (Moss Green)

- Jack, 234A

- Key, 647A5C

- Key, 647B5C

- Key, 624A4

- Key, 630A4

- Lamp, M1

- *840072730 Bezel

- *840072748 Lens

- *KS-19944, L1 Numerical Indicator Tube

- Network, 425K

*Components for numerical indicator.

A. Console Housing

4.02 To perform any maintenance work on the components of the LSV attendant console, the housing and face panel must be removed. To remove the housing, face the front of the console and grasp the housing along the bottom edge and toward the rear half of each side. To release the blocks on the housing (Fig. 10) from the clips on the base use the fingertips to pull out and up on the housing. After the rear clips release, tilt the housing at a slight angle toward the front of the console and lift up on the housing until the front clip releases.

4.03 To install a housing on the console, hold the housing directly over the console with the front edge lower than the back. Position the front edge on the base first. After the front of the housing is positioned properly on the base, lower the back of the housing over the base and apply downward pressure on each of the rear corners until the housing is properly secured to the base.

TABLE C

OPERATED INDICATORS AND ASSOCIATED ACTIONS

| INDICATOR DESIGNATION	NUMERAL READOUT	ACTION REQUIRED
LINE GOOD	0	Close out trouble report, if applicable.
LINE BAD	1	Make necessary trouble ticket and line card entries and route for further work.
	2	
	3	
	4	
SYS FAIL	1	Operate the DISC button and make a second attempt to verify the trouble report.
	None	Operate DISC button and proceed as follows: (1) If OC button and SYS FAIL indicator extinguish, make a second attempt to verify the trouble report. (2) If SYS FAIL indicator remains illuminated, do not attempt to verify trouble reports until all alarms are released.
PBX	9	Results verified by the LSV are not conclusive. Route for further work.
LINE BAD AND BSY VER	10	Determine if customer is using faulty line to make trouble report. (a) If No: 1. Operate BSY VER button. 2. Record results (distinguishable sounds). 3. Record readouts. 4. Operate DISC button. 5. Make commitment to the customer. 6. Operate RLS button. (b) If Yes, and it is determined customer cannot receive calls: 1. Make a commitment to customer. 2. Operate RLS button. 3. Operate LSV. 4. Record readouts. 5. Operate DISC button.. (c) If Yes, and customer can receive calls: 1. Instruct customer to hang up handset and await a call back. 2. Operate RLS button. 3. Operate DISC button. 4. Operate LSV. 5. Record readouts. 6. Operate DISC button. 7. Call back customer and make proper commitments. 8. Operate RLS button.

BLOCKS
(USED TO SECURE
HOUSING TO BASE)
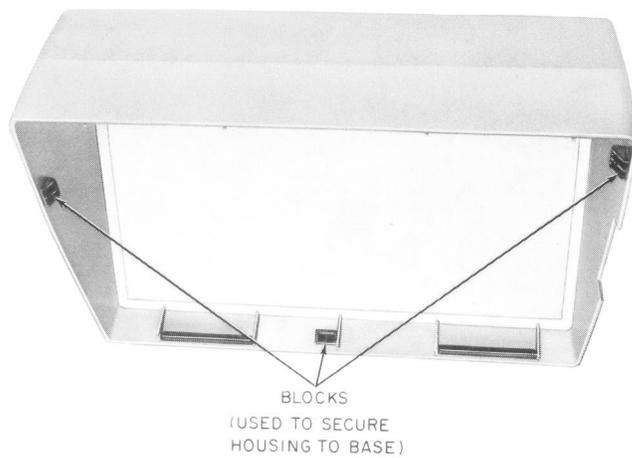
Fig. 10—Housing for Attendant Console

> **THINK** *Do not use solvents to clean the housing or any other plastic components of the attendant console. Use a damp cloth only. Replace discolored plastic parts.*

B. 647-Type Keys

4.04 To perform any maintenance on the 647-type key module, the housing and face panel must be removed. A screw on each end of the key module (Fig. 11) secures the key to the panel. Electrical connection is made to these keys through the console cable which has the station end of the conductors terminated on 508- and 509-type plugs. The plugs mate with the receptacle terminals of the key strip. Since all buttons are not used in the attendant console, only those terminals associated with working buttons will be equipped with 508-type plugs.
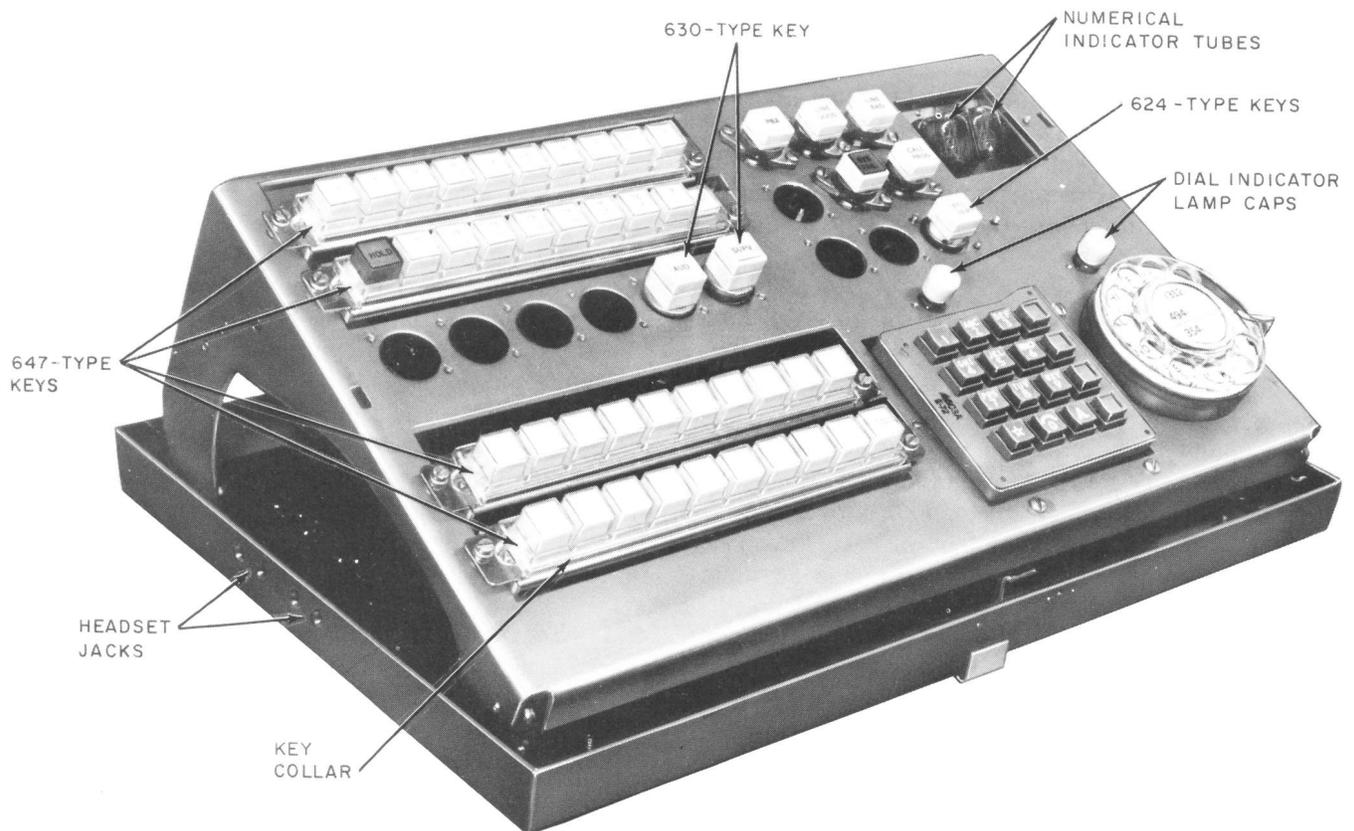

Fig. 11—Attendant Console With Housing Removed

4.05 The tip and ring are brought out of the 647-type keys through individual leads common to all pickup buttons. This connection is provided through contact strips located between the plugs and the key strip. When a key is replaced, the contact strips must be properly plugged into the key strip before the plugs are terminated on the key.

4.06 The current production 647-type keys have been modified for easy lamp replacement. A hole has been provided in the top of the button through which the lamp may be removed by using a 553-type tool. Keys equipped with the current production buttons will only require removing the lamp cap and designation tab to replace a lamp. Early production buttons required that the faceplate, key collar, and button be removed before a lamp could be replaced. Section 512-230-101 provides piece part and maintenance information for 647-type keys.

4.07 When replacing either or both of the two 647-type keys located at the top left side of the console, ensure that the pivot bar on the key is properly seated in the latch bar of the latch assembly. After a key is replaced, operate and release (using the RLS button) a locking button in each key module to ensure the latch bar is adjusted and operating properly.

4.08 When a locking button in one key module is operated and an operated button in the adjoining key module does not release, the latch assembly needs to be adjusted. To adjust the latch assembly, the two adjustment screws on the latch assembly (Fig. 12) must be loosened and the latch bar should manually be pushed to the left or right as far as the pivot bar on each key will permit. When the latch bar is positioned so that the pivot bar on both keys are evenly positioned, tighten both adjustment screws. After adjusting the latch assembly, operate and release buttons on both key modules to ensure all keys are releasing properly and only one key can be in the operated position at the same time. Then push and release the HOLD button as slowly as possible. If the HOLD button does not "hang up", the mechanism is operating properly.
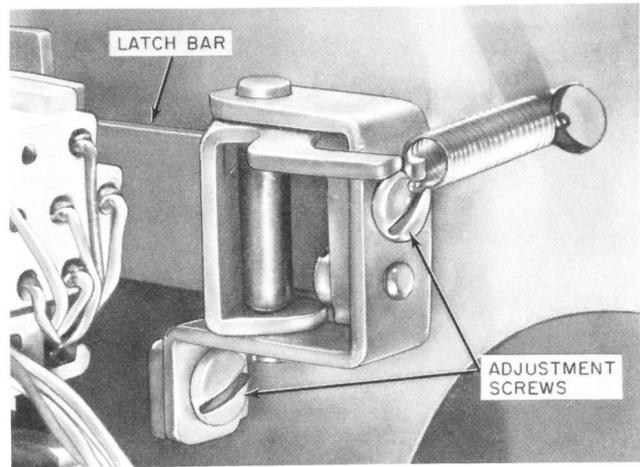

Fig. 12—Latch Assembly for Key Modules of Attendant Console

4.09 If one button should not lock operated or does not release an operated button, the locking pin associated with that button may not have been inserted properly or may have been removed.

C. 630- and 624-Type Keys

4.10 To replace the button lamp on a 630- or 624-type key, the housing and face panel must be removed from the console. The retainer cap is removed by grasping the retainer on two sides and pulling up until it is free of the button plunger. A 553-type lamp extractor must be used to replace the lamp. Install the retainer cap by positioning it properly on the button plunger and apply downward pressure.

D. Indicators

4.11 To replace a lamp in any of the five lamp sockets used as indicators (PBX, LINE GOOD, LINE BAD, SYS FAIL, or CALL PROG), the lamp cap is removed in the same manner as the retainer cap is removed on the single button keys (4.10). The lamp cap is installed on the lamp socket by positioning it properly and applying downward pressure.

4.12 The two lamp sockets used for dial indicators have a round lamp cap which may be removed by grasping the cap and pulling up. A 553-type lamp extractor is used to remove the lamp. Remove the green light filter from the lamp and install the filter on the replacement lamp before installing the lamp in its socket.

4.13 Maintenance on the numerical indicator is limited to replacement of the lens on the readout window and replacement of the numerical indicator tube. To replace a scratched or broken lens, remove the housing and face panel from the console and push on the lens retainer from the back of the face panel. The bezel, lens, and retainer will snap out of the face panel as one unit. After a new lens is placed (rough surface outward) in the retainer, place the retainer on the bezel and snap the complete unit into the front of the face panel.

4.14 When a numerical indicator tube is defective and has to be replaced, the housing and face panel must be removed from the console to gain access to the numerical indicator tubes. The tube may be removed by gripping the tube between the fingers and pulling outward with a rocking motion. When a tube is difficult to remove, raise the frame assembly to gain access to the back of the tube socket and proceed as follows:

(1) Remove the protective cover from the lamp sockets.

(2) Use a KS-6320 orange stick in the center hole of the lamp socket to push outward on the tube.

Warning: Due to the voltage applied to the tube sockets, do not use an item made of conductive material to assist in removing the numerical indicator tube. Do not touch the terminating pins on the sockets.

(3) While pushing from the back with an orange stick, grip the top of the tube with the finger tips and pull with a rocking motion.

E. Dials

4.15 When a dial becomes defective, the same type dial listed in the replaceable components part of this section must be used to replace either the rotary or TOUCH-TONE dial.

4.16 The TOUCH-TONE dial is a modular-type dial and may be replaced by loosening the two captive screws which secure it to the panel assembly and unplugging the plug associated with the dial from the connector on the panel assembly. The panel assembly must be tilted forward to gain access to screws which secure the dial. The dial must be removed from the back of the panel assembly.

4.17 The rotary dial may be replaced by removing the three screws which secure the dial to the panel assembly. The rotary dial is removed from the front of the panel assembly and is electrically connected by spade tip conductors. The standard number card used in 6-, 7-, or 8-type dials may be used in the rotary type dial.

F. Network

4.18 The network in the attendant console is secured to the base with two screws and is replaceable if the network should become defective.

G. Headset Jacks

4.19 Maintenance on the headset jacks is restricted to visually checking for loose or broken connections or cleaning contacts. The jacks may be replaced if they should become worn or defective.

INSTRUCTOR CONSOLE (831C TELEPHONE SET)

4.20 The 831C telephone set may be ordered as a modular component (831C telephone set base, Fig. 13). When an 831C telephone set base is ordered, the housing, faceplate, and handset must be ordered separately. A completely assembled telephone set may be ordered as follows:

● Set, Telephone, 831C-51

Note: When ordering a complete telephone set, the code 51 stands for a green set. The 831C telephone set is available in eleven colors, but the green set will be color coordinated with the moss green attendant console and equipment cabinet.
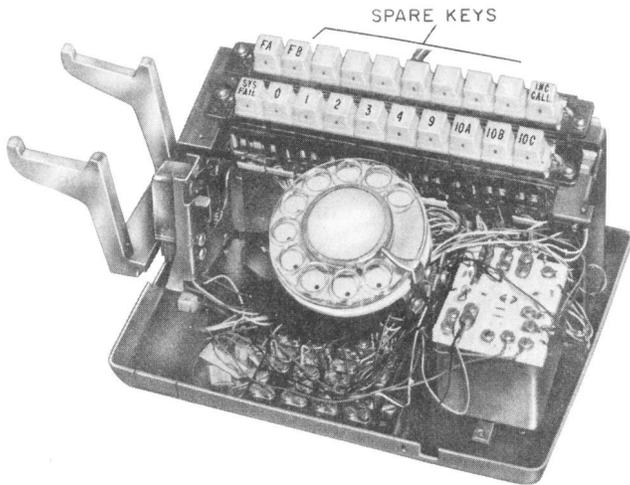
SPARE KEYS

Fig. 13—831C Telephone Set Base

4.21 The replaceable components of the 831C telephone set are:

- P1B Ringer

- 647 A5C Key

- 647B5 Key

- P-23F096 Terminal Board Assembly

- 8R-58 (White) Dial

- Lamp, 51A

- P-23F101 Collar

- P-23F156 Contact Strip Assembly

- P-23F157 Contact Strip Assembly

- Mounting Cord, D100L-87 (Satin-Silver)

- Housing, 832A-51 (See Note with 4.20.)

- Plate, Face, 831A-71 [Code 71 color coordinates faceplate with green (-51) housing.]

- Set, Hand, G3A6-51 (Code 51 color coordinates handset with green housing.)

4.22 Maintenance of the 831C telephone set should be limited to checking for loose or broken connections and replacement of items listed in 4.21 as replaceable components.

4.23 When installing or replacing the 647-type key for maintenance in the 831C telephone set, the P-28E770 latch bar spring must be removed to prevent mechanical stress on the latch bar to pivot bar action. For more detailed maintenance information on the 647-type keys, refer to Section 512-230-101.

4.24 The current production 647-type keys have been modified for easy lamp replacement. A hole has been provided in the top of the button through which the lamp may be removed by using a 553-type tool. Keys equipped with the current production buttons will only require removing the lamp cap and designation tab to replace a lamp. Keys with the early production buttons required that the faceplate, key collar, and button be removed before a lamp could be replaced.

EQUIPMENT CABINET

4.25 Maintenance to the equipment associated with the LSV attendant training simulator is limited to checking for loose or broken connections or burnishing dirty relay contacts.

4.26 Removable panels on each side of the equipment cabinet provide for easy access to the equipment (Fig. 14). The panels are secured with Simmons-type fasteners.

4.27 The circuits are fused in the equipment cabinet as shown in Table D.

Fig. 14—Equipment Cabinet With Covers Removed

TABLE D

CIRCUIT FUSES

FUSE HOLDER	TYPE FUSE
A	
B	70A (1-1/3 AMP)
C	
D	70G (1/2 AMP)
IN	LITTELFUSE TYPE 31301.5 or BUSSMAN TYPE Mox (1-1/2 AMP)