

SAGE-AUTOVON ACCESS LINE TEST POSITION

DESCRIPTION

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1. GENERAL

1.01 This section describes the SAGE-AUTOVON Access Line Test Position.

1.02 The SAGE-AUTOVON Access Line Test Position (SAALTP) is a testboard arrangement comprised of 6-wire, voice-frequency patching bay equipment and 309 Switching System equipment. Its purpose is to provide Telephone Company maintenance personnel at SAGE locations with test access to the 4-wire transmission paths and E and M signaling paths of the AUTOVON access lines terminated in a Dial Restoration Panel (DRP) and other equipment at Direction Centers, Long Range Radar Sites, and NORAD Control Centers. The SAALTP equipment is arranged to provide plant maintenance personnel with the capability of performing Multilevel Precedence-Preemption calling (MLPP)

operational tests and some transmission tests on the AUTOVON access lines.

1.03 The SAALTP is located in the Telephone Company equipment room at Direction Centers and in the Telephone Equipment Building at Long Range Radar Sites. Electrically, it is located between the single-frequency (SF) units and the DRP's as illustrated in Fig. 1. Transmission levels at the SAALTP are nominally +7 db receiving and -16 db transmitting.

1.04 Information for identification, installation, and connections of the SAALTP is provided in Section 310-270-200. Additional descriptive information on the 309 Switching System is provided in the 981- series of practices, and installation and operational test information is provided in the 480- series. For more detailed information on the voice-frequency patch bay (VFPB), refer to SD-59329-01 and associated drawings.

2. EQUIPMENT DESCRIPTION

2.01 At a given location, the equipment which comprises the SAALTP depends on the number of AUTOVON access lines for which test access is required. Table A shows the recommended equipment based on the number of AUTOVON access lines.

TABLE A

SAGE-AUTOVON ACCESS LINE TEST POSITION

RECOMMENDED EQUIPMENT

TEST POSITION EQUIPMENT UNITS	NUMBER OF AUTOVON ACCESS LINES			
	1 TO 72	73 TO 144	145 TO 216	217 TO 288
6-Wire VFPB	1 bay		2 bays required	
TOUCH-TONE Tel Set	1		add 2nd telephone set	
4-Wire C.O. Line Ckt	2	add 3rd	add 4th	add 5th
Common Audible	1			add 2nd
404F Tone Gen	1			

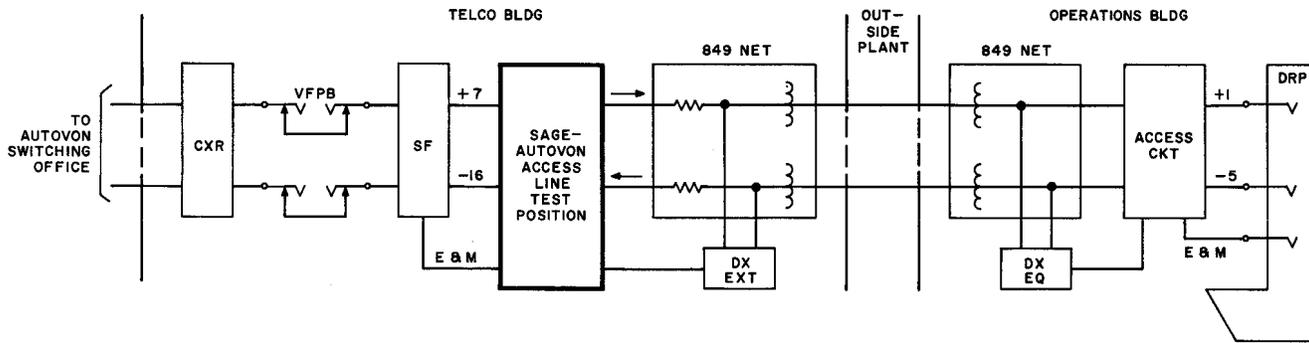


FIG. 1A SAGE RADIO SITE

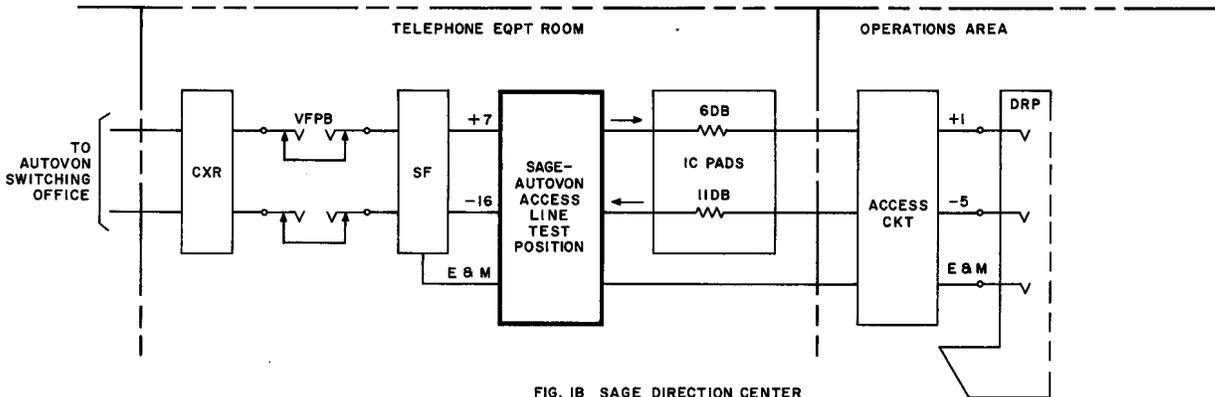


FIG. 1B SAGE DIRECTION CENTER

Fig. 1 — SAGE-AUTOVON Access Line Test Position — Location at Typical SAGE Facilities

2.02 As shown in Table A, the 6-wire VFPB provides 6-wire jacks (test access) for from 36 to a maximum of 144 AUTOVON access lines and access test circuits. Generally, a single VFPB is sufficient for Long Range Radar Sites. Direction Centers may require an additional bay, a second key telephone set, and additional 4-wire central office line circuit equipment.

2.03 Fig. 2 is a block diagram of the SAALTP for a minimum installation consisting of one 6-wire, voice-frequency patching bay, one key telephone set, two 4-wire central office line circuit units, a common audible unit, and a tone generator.

2.04 At a given SAGE location, the 6-wire VFPB(s) is located in the same general area with other patch bays and testboards. The 4-wire central office line circuit equipment is placed at a convenient location on 23-inch miscellaneous equipment bays or equipment cabinets. The 6-wire patching jacks are intermediate distri-

bution frame (IDF) terminated and are cross connected via the IDF to the AUTOVON access lines and test access circuits are required. The 4-wire central office line circuit test access leads are IDF terminated and cross connected to two 6-wire patching jacks in tandem. Transmission and control leads from the 4-wire central office line circuit units are cabled to the key telephone set which is normally located on the writing shelf of the 6-wire VFPB.

A. 6-Wire VFPB

2.05 The 6-wire VFPB is of the type normally used with N and O carrier systems. It consists of a bay framework 11 feet, 6 inches high equipped with a telephone set, piling rail, writing shelf, signal test set battery supply, and from 36 to a maximum of 144 six-wire patching and monitoring jacks. In addition, the bay is equipped with a monitoring and talking equipment panel and a signal and test jack equipment panel required to enable the use of portable test equipment for testing on the access line circuits.

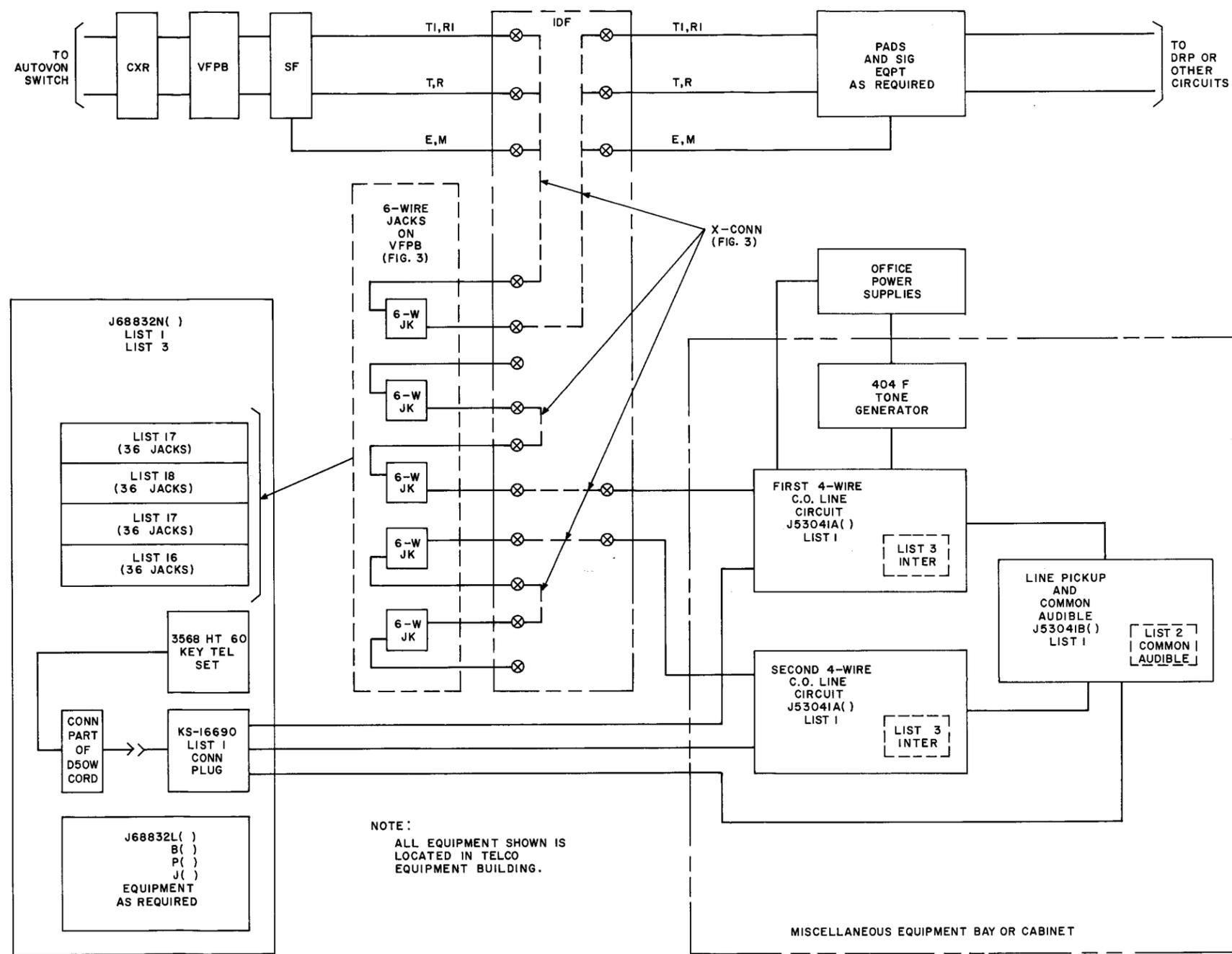


Fig. 2 — SAGE-AUTOVON Access Line Test Position— Block Diagram

B. Test Access Circuits

2.06 To provide the SAALTP with Multilevel Precedence-Preemption (MLPP) calling capability, an adaptation of the 309 Switching System is used. The equipment includes 4-wire central office line circuit units, a common audible circuit unit, a tone generator, and a desk-type telephone set equipped with a 16-button TOUCH-TONE dial.

2.07 The 4-wire central office line unit provides a means for terminating the test access circuit in the primary key telephone set and for talking, holding, and signaling on the AUTOVON access lines. The line circuit operates on E and M lead supervisory signaling and is arranged to detect and respond to ROUTINE, Precedence, and Preemption incoming call signals from the central office. The apparatus and wiring which make up the 4-wire central office line circuit unit are mounted on a 4- by 23-inch mounting plate. The line circuit unit is equipped with a second line pickup circuit when the test access line is terminated in two key telephone sets. A plug-in interrupter unit is also mounted on the line circuit unit mounting plate. The interrupter is required to provide proper interruptions of the visual and audible signals to the telephone set.

2.08 Three 1C pad sockets for adjusting transmission levels are provided on the rear of the 4-wire central office line circuit unit. For the SAALTP installation, the pad sockets are equipped with 89-type resistors as follows:

PAD	PLUG-IN RESISTOR	LOSS
T	89CA	20 db
RA	89BL	15 db
RB	89AE	6 db

2.09 The line pickup and common audible unit is required for the SAALTP to provide essential wiring and mounting for the common audible units. The line pickup circuit portion of this unit is not used. The common audible circuit unit is arranged to collect ROUTINE, Preemption, and Precedence ringing signals from up to four AUTOVON access lines and routes the most important signal to the interrupter and to the ringer of the key telephone set. The apparatus and circuitry is contained on a 2- by 23-inch mounting

plate. Two common audible units may be mounted on this plate.

2.10 The 404F tone generator provides confirmed ringing audible tone to the calling party. The apparatus and wiring is assembled on a 2- by 23-inch mounting plate.

2.11 The 3568HT-60 telephone set is a desk-type key-telephone set equipped with a 16-button TOUCH-TONE dial, a hold key, and five line pickup or signal keys. The telephone set circuits are terminated in a D50W plug ended cord.

2.12 Power requirements for the test access circuit equipment include the following:

10-volt, 60-cycle ac

105-volt ringing generator (20-cycle)

24-volt signal battery

48-volt signal battery

48-volt talking battery

3. FUNCTIONAL DESCRIPTION

3.01 Test access to a given AUTOVON access line is obtained by patching, at the VFPP, from the test access circuit to the AUTOVON access line. Fig. 3 illustrates a typical patching arrangement for an AUTOVON access line under test and also shows the cross connections at the IDF of the 6-wire patching jacks to the AUTOVON access lines and test access circuits. As shown in Fig. 3, each test access circuit (4-wire central office line circuit) is terminated at the IDF and is cross connected to two 6-wire jacks in tandem. One of the 6-wire jacks (TEST ACCESS JK) is used to patch the test access circuit to an AUTOVON access line, while the other jack (TEST EQ JK) is used to associate the desired test equipment with the AUTOVON access line as required. This arrangement enables a connection to be established and held while a test is being conducted.

3.02 In the 6-wire jack assembly (see Fig. 3), monitor jacks are bridged across the transmit and receive pairs. This enables transmission monitoring on the line.

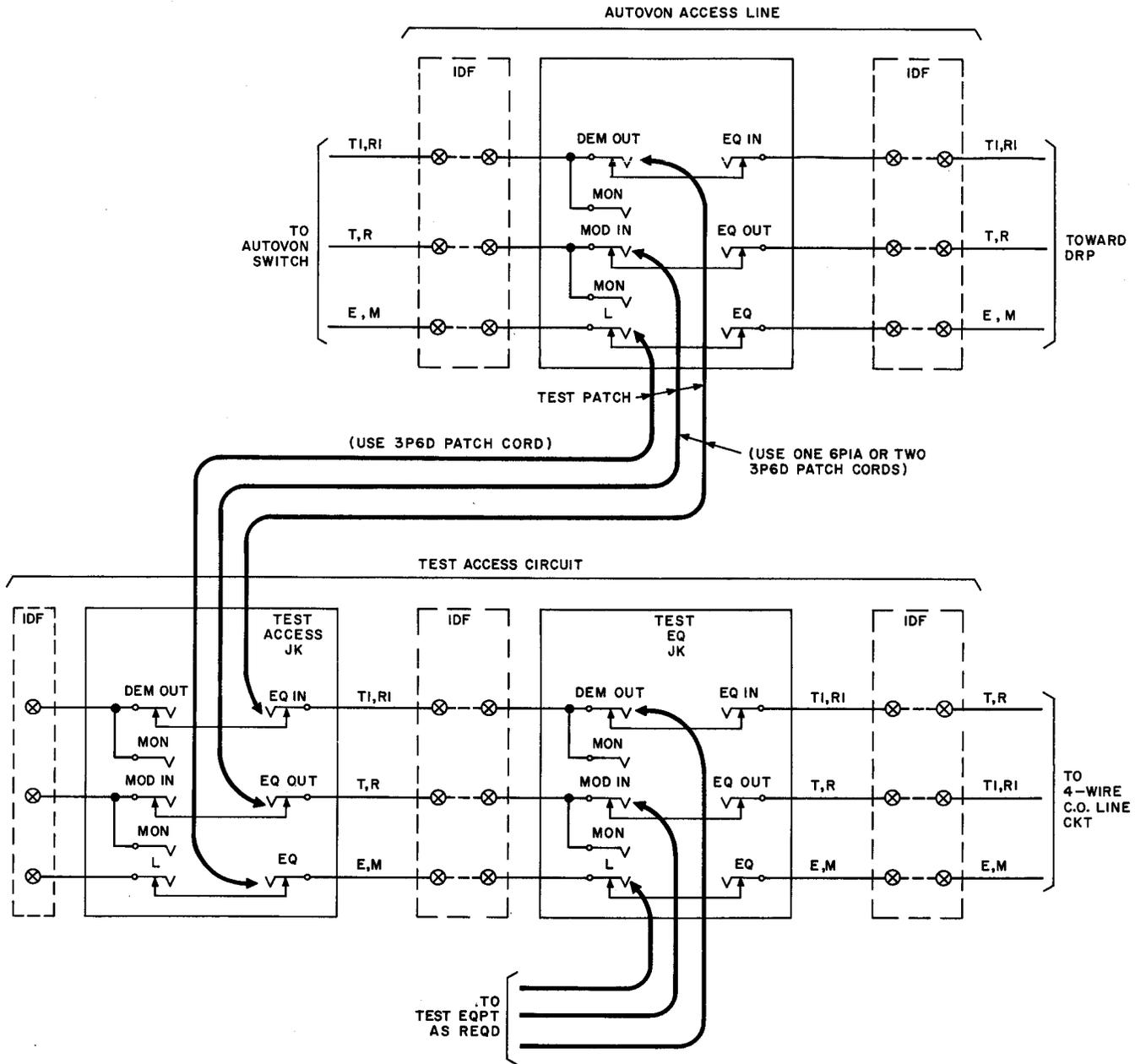


Fig. 3 — SAGE-AUTOVON Access Line Test Position — Patching Arrangements with the 4-Wire Central Office Line Circuit Connected to Two 6-Wire Patching Jacks in Tandem

A. Operational Test Capabilities

3.03 With the test access circuit patched to an AUTOVON access line, the TOUCH-TONE dial key telephone set, in conjunction with the 4-wire central office line circuit equipment, en-

ables ROUTINE and Precedence calls to be placed to the serving office over the AUTOVON line. It also enables ROUTINE and Precedence calls to be received from the central office against an on-hook condition, and preemption notification to be received against an off-hook condition. Operational procedures are briefly described as follows.

Outgoing Calls

3.04 ROUTINE: To make a ROUTINE outgoing call, the test access line is selected by depressing the proper line key on the telephone set and taking the handset off-hook. The line key lamp of the test access circuit selected lights steadily. An off-hook signal is sent to the central office. After dial tone is heard, the desired number is TOUCH-TONE dialed. When the call is completed and the handset is placed on-hook, the line key lamp is extinguished and the test access circuit returns to normal idle condition.

3.05 Precedence: To make an outgoing Precedence call the procedure is the same as for a ROUTINE call except that one of the four TOUCH-TONE Precedence keys is momentarily operated prior to dialing the address. Then the procedure is the same as for a ROUTINE call.

Incoming Calls

3.06 ROUTINE: The test position is alerted to a ROUTINE incoming call by ringing of the telephone bell and flashing of the line key lamp. (The ringing interval is 1 second on and 3 seconds off; the line key lamp flashes at 60 IPM.) The call is answered by first depressing the flashing line key and then taking the handset off-hook. When the call is answered the line key lamp lights steadily and the bell is silenced. When the established call is terminated and the handset is placed on-hook or another line is selected, the line key lamp will be extinguished.

3.07 Precedence Call: An incoming Precedence call is indicated by the ringing of the bell and the flashing of the line key lamp at the telephone set. (The ringing and flashing rate is approximately 1.650 seconds on and 0.350 seconds off.) The Precedence call is answered in the same manner as a ROUTINE call. Upon depressing the flashing line key and taking the handset off-hook, the bell is silenced and the line key lamp lights steadily.

3.08 Preemption: When an established call is preempted, the bell in the key telephone set will ring steadily and the line key lamp will flash at a 120-IPM rate (0.25 seconds on and 0.25 seconds off). Also, a 44/620-cycle tone is heard in the receiver. These signals continue until the telephone handset is placed on-hook.

3.09 Holding: An established call, either ROUTINE or Precedence, may be placed on hold by momentarily depressing the hold key. The release of the hold key also releases the line key. The line key lamp of the line placed on hold will wink at a 120-IPM rate to indicate a hold condition. The telephone set is released for use elsewhere. When the line is reselected, the hold condition will be released. The hold condition may also be released by a disconnect signal from the central office. If the line is preempted for reuse, the ringer will sound steadily and the test desk must manually release the line quickly.

B. Transmission Test Capabilities

3.10 The patching arrangements described in 3.01 and 3.02 and illustrated in Fig. 3 enable the connection of the test equipment to the AUTOVON access line circuit as required. This arrangement will mainly apply to sectionalizing transmission troubles. Noise, delay, attenuation distortion, and other transmission tests must be made over the entire access line to assure satisfactory performance.

3.11 Multiple Pickup Capability: At a given SAALTP, the test access circuits provided may be patched to separate AUTOVON access lines at the same time. This feature enables tests to be made on two or more AUTOVON access lines simultaneously. At installations with one key telephone set, one line may be placed on hold for transmission tests or other reasons, while a second line is selected for operational tests. At larger installations with two key telephone sets, each test access circuit is terminated in both key telephone sets. Thus tests may be conducted via either test access circuit from either telephone set.