

## SS-3 ORDER WIRE

### INITIAL LINEUP AND MAINTENANCE TESTS

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1.	<b>GENERAL</b>	
1.01	This section describes the procedures for testing an SS-3 order wire arrangement after installation and/or during maintenance.	
1.02	The order wire equipment is designed to provide a variety of arrangements using 2-by 28-inch panels; therefore, the arrangement at a	

given maintenance center must be known to determine which tests in this section are applicable.

**1.03** The tests include initial lineup and maintenance tests. Some of the initial lineup tests may also be scheduled on a routine basis to maintain the dependable operation of the order wire circuit.

**1.04** Preparation of the test equipment required for the tests is not covered since numerous types can be used. The test equipment, however, must be capable of generating and detecting a 1000-Hz signal within the level range of +10 and -25 dBm, must be set up for 600 ohms or have a 600-ohm impedance, and may be selected from the following:

- 21A Transmission Measuring Set, Oscillator and Detector
- 23A Transmission Measuring Set, Oscillator and Detector
- TTS-4 Transmission Test Set, Oscillator and Detector
- 236A Telephone Test Oscillator
- KS-14510 Meter
- KS-19260 Oscillator
- KS-19353 Oscillator

#### 2. INITIAL LINEUP TESTS

**2.01** The initial lineup procedures are designed to be performed before placing the order wire in service.

**Note:** Prior to performing the procedures, transmission measurements should be made to determine whether the local 4-wire facilities are satisfactory for service. The transmission tests should be made as outlined in Section 310-405-500.

**2.02** To cover the various arrangements that may be provided at an order wire installation, the initial lineup tests are divided into three groups; (1) single line-single station test, (2) 2-line cut-through switch test, and (3) 2- to 6-line cut-through switch tests.

**A. Single Line-Single Station Test**

**2.03** The single line-single station arrangement will be provided by packaged units J1G032A, L1 or L2. The packaged units consist mainly of a terminating and station unit J1G032B, L1 or L2, a TOUCH-TONE® receiver J58844C, L1, and a basic location unit J1G027A, L5. The following tests cover the various equipment that may be provided at a single line-single station arrangement:

- Terminating and Station Unit J1G032B, L1 Test
- Terminating and Station Unit J1G032B, L2 Test
- Basic Location Unit J1G027A, L5 Test
- Station Circuit Unit AR706 Test.

**Terminating and Station Unit J1G032B, L1 Test**

**2.04** Each terminating and station unit J1G032B, L1 provided at an order wire location should be adjusted as follows (Fig. 1):

- (1) Set a 600-ohm oscillator for 1000 Hz and adjust the output for 0 dBm using a 600-ohm detector.
- (2) Insert the oscillator output into the BUS IN jack and the detector input in the BUS OUT jack.
- (3) Adjust the TB amplifier to obtain a -12 dBm reading at the detector.

**Note:** At some installations, it may be necessary to arrange for assistance in performing Steps (4) and (6).

- (4) Adjust the TRMT amplifier to obtain a detector reading of -16 dBm at the carrier terminal input.
- (5) Remove the oscillator from the BUS IN jack.

- (6) With a 1000-Hz tone at +7 dBm being sent from the carrier terminal output, adjust the RCV amplifier to obtain a detector reading of -12 dBm at the BUS OUT jack.

- (7) Disconnect and remove all test equipment.

**Terminating and Station Unit J1G032B, L2 Test**

**2.05** Each terminating and station unit J1G032B, L2 provided at an order wire location should be adjusted as follows (Fig. 2):

- (1) Set an oscillator for 1000 Hz and adjust the output for 0 dBm using a 600-ohm detector.
- (2) Insert the oscillator output into the BUS IN jack and the detector input into the BUS OUT jack.
- (3) Adjust the TB amplifier to obtain a -12 dBm reading at the detector.
- (4) Move the detector input from BUS OUT jack to the LINE OUT jack.
- (5) Adjust the TRMT amplifier to obtain a +7 dBm reading at the detector.
- (6) Remove the detector from the LINE OUT jack.

**Note:** At some installations, it may be necessary to arrange for assistance in performing Step (7).

- (7) Individually adjust the GN ADJ pads for ports 2 and 3 (A and B on Fig. 2) on the 4233A network to obtain a detector reading of -16 dBm at each carrier terminal input.
- (8) Remove the oscillator from the BUS IN jack.
- (9) Adjust the oscillator output for a 1000-Hz tone at a -8 dBm using the 600-ohm detector.
- (10) Insert the oscillator output into the LINE IN jack and the detector input into the BUS OUT jack.
- (11) Adjust the RCV amplifier to obtain a -12 dBm reading at the detector.
- (12) Disconnect and remove the test equipment.

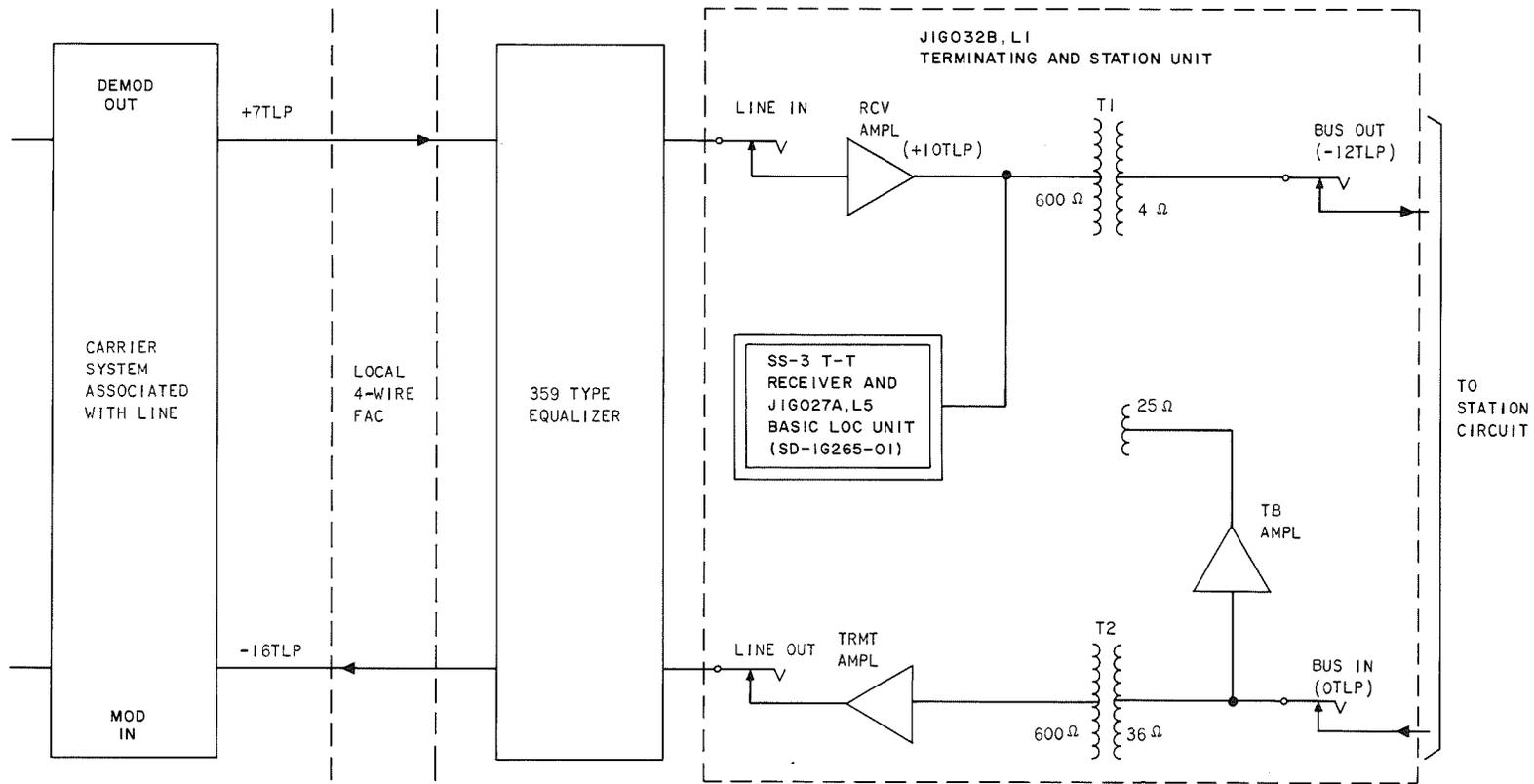


Fig. 1—Terminating and Station Unit J1G032B, L1

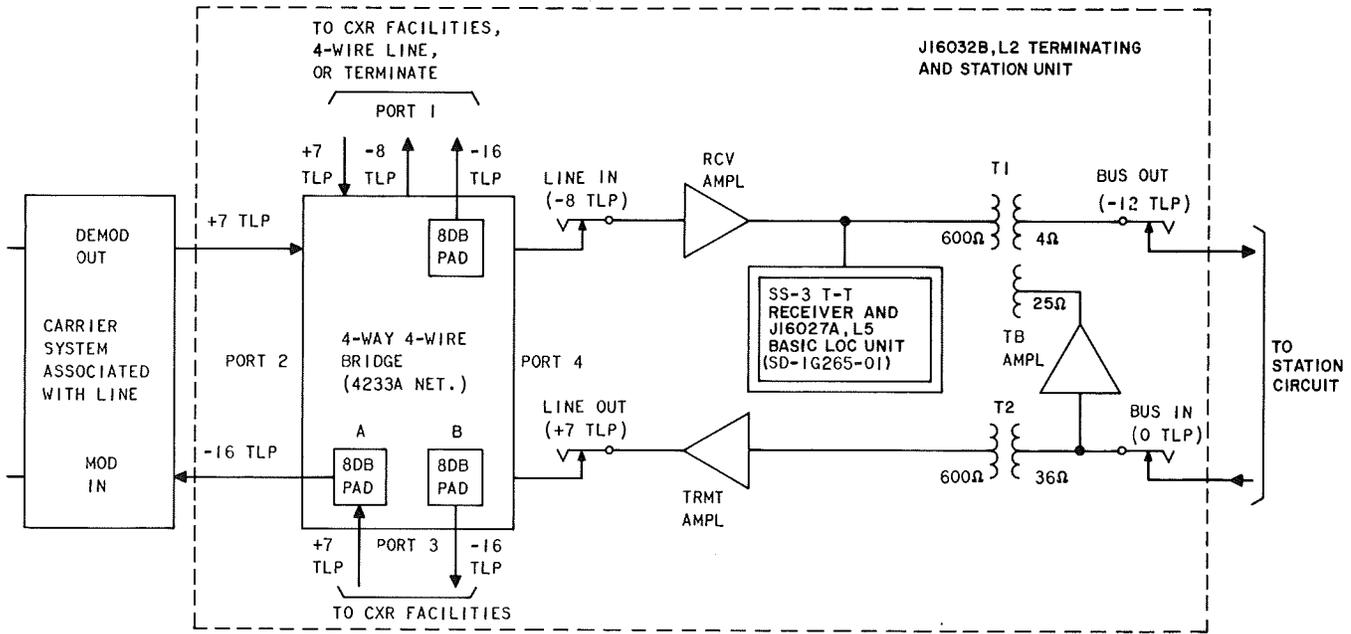


Fig. 2—Terminating and Station Unit J16032B, L2

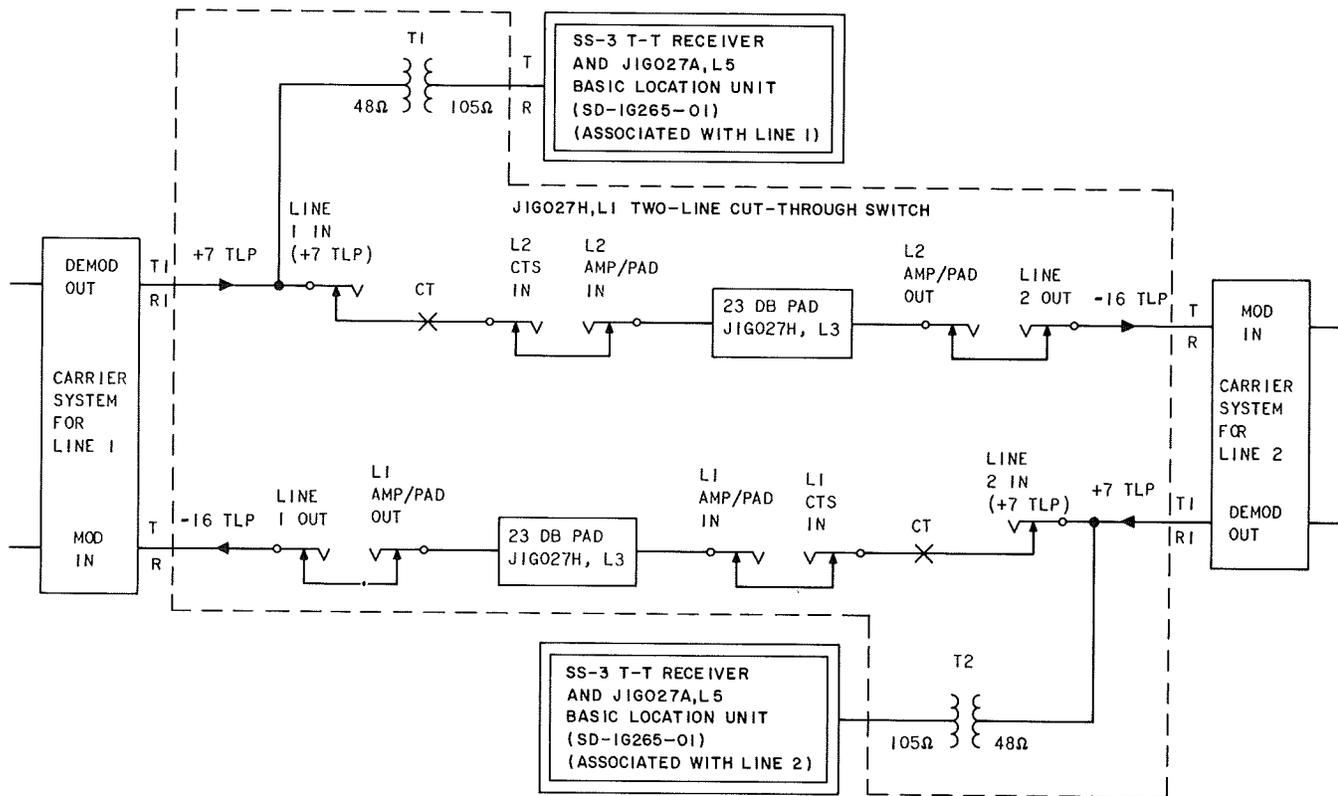


Fig. 3—Two-Line Cut-Through Switch—Without Terminating and Station Equipment

**Basic Location Unit J1G027A, L5 Test**

**2.06** Each basic location unit J1G027A, L5 that is associated with a terminating and station unit should be adjusted as follows to check the input signal to the TOUCH-TONE receiver J58844C, L1:

- (1) Connect a high impedance voltmeter across terminals 33 and 43 of TS(B) on the J1G027A, L5 unit.
- (2) Set the potentiometer (R14) on the rear of the J1G027A, L5 unit to full clockwise position.
- (3) Ensure that all associated telephone sets at the location are on hook.
- (4) Remove the handset from one of the telephones and simultaneously depress dial buttons 1 and 2 and observe meter reading. Release 1 and 2 and depress buttons 6 and 9. Again observe meter reading. Each of the two readings should be between 0.45 and 1.5 volts rms.
- (5) Perform Step (4) for each associated telephone set at the location.
- (6) Telephone sets that do not produce the required readings should be replaced.
- (7) Disconnect and remove the test equipment.

**Station Circuit Unit AR706 Test**

**2.07** Perform the following on each station circuit unit AR706 that is associated with the order wire:

**Note:** The station circuit is a component of the J1G032B, L1 and L2 units.

- (1) Remove handset from the associated telephone, verify that the order wire is idle, and dial the station code assigned to the set. The audible signal should sound.

**Note:** Procedures for cross-connecting the signaling codes are outlined in Part 3.

- (2) Momentarily depress the line switch. The audible signal should cease.
- (3) Repeat Step (1). The audible signal should sound for approximately three minutes before timing out.
- (4) When applicable, repeat Steps (1), (2), and (3) to check the group code and/or alert code assigned to the station.
- (5) Establish a talking circuit between the order wire termination and another station connected to the system.
- (6) Request the second station to signal the station code of the testing station. The audible signal should sound.
- (7) Remove handset from the telephone. The audible signal should cease.
- (8) Request the second station to repeat Step (6) to test the timeout circuit. The audible signal should sound for approximately three minutes before timing out.
- (9) When applicable, repeat Steps (5), (6), and (7) to individually check the group code and/or alert code assigned to the station.

**B. 2-Line Cut-Through Switch Test**

**2.08** The lineup procedures for a 2-line cut-through switch installation will vary depending on whether or not a terminating and station circuit is associated with the lines. The various combinations of arrangements are: (1) both lines without associated stations, (2) one line with associated stations and one line without, or (3) both lines with associated stations.

**Note:** Refer to note 403 on SD-1G265-01 for the cross-connect information on the *connect* and *disconnect* codes for the two lines associated with the cut-through switch.

**Both Lines Without Associated Stations**

**2.09** When neither of the two lines has an associated terminating and station unit, adjust the equipment as follows (Fig. 3):

- (1) Insert the input of a 600-ohm detector into the LINE 1 IN jack on the J1G027H, L1 unit.

*Note:* At some installations, it may be necessary to arrange for assistance in performing Step (2).

- (2) With a 1000-Hz tone at +7 dBm being sent from the carrier terminal output, a +7 dBm reading should be observed at the detector.

- (3) Repeat Steps (1) and (2) for line two.

- (4) Adjust the R14 potentiometer, located on the rear of the J1G027A, L5 unit, to full clockwise position for both lines.

- (5) Ensure that an 89-type resistor is installed in the 849C network (J1G027H, L3) associated with each of the two lines and located on the J1G027H, L1 unit. The proper resistor must be selected to provide the required loss between the output of one line and the input of the other line. For connections made to facilities at standard transmitting and receiving levels and no loss exists between the carrier terminals, an 89DK resistor (23 dB) should be installed in each network. Where loss exists, the pad should be reduced by the amount of the loss.

- (6) Arrange to have a station on one of the lines to dial the connect code and then dial the code assigned to a station on the other line. Verify that the two lines have been connected together.

- (7) Arrange for the originating station to dial the disconnect code. Verify that the connection is open between the two lines.

- (8) Repeat Steps (6) and (7) with the two stations reversing roles (ie, the calling station becomes the called station and vice versa).

- (9) Disconnect and remove the test equipment.

**One Line With Associated Stations and One Line Without**

**2.10** When a terminating and station circuit is associated with one line but not the other line, adjust the equipment as follows (Fig. 4):

- (1) Adjust terminating unit J1G032B, L2 as outlined in 2.05 with the exception of substituting the following for 2.05(7):

*Note:* At some installations, it may be necessary to arrange for assistance in performing Step (a).

- (a) Adjust the GN ADJ pad (A on Fig. 4) for port 2 on the 4233A network to obtain a detector reading of -16 dBm at the carrier terminal input.

- (b) Connect the detector input to the LINE 1 IN jack on the J1G027H, L1 unit.

- (c) Adjust the GN ADJ pad (B on Fig. 4) for port 3 on the 4233A network to obtain a -16 dBm reading on the detector.

- (2) Perform the procedures outlined in 2.06 for the basic location unit J1G027A, L5 associated with the terminating and station unit on line one.

- (3) Insert the input of the 600-ohm detector into the LINE 2 IN jack on the J1G027H, L1 unit.

*Note:* At some installations, it may be necessary to arrange for assistance in performing Step (4).

- (4) With a 1000-Hz tone at +7 dBm being sent from the carrier terminal output for line 2, a +7 dBm reading should be observed at the detector.

- (5) Adjust the R14 potentiometer, located on the rear of the J1G027A, L5 unit associated with line two, to the full clockwise position.

- (6) Ensure that an 89-type resistor is installed in the 849C network (J1G027H, L3) associated with each of the two lines. The proper resistor must be selected to provide the required loss between the output of one line and the input

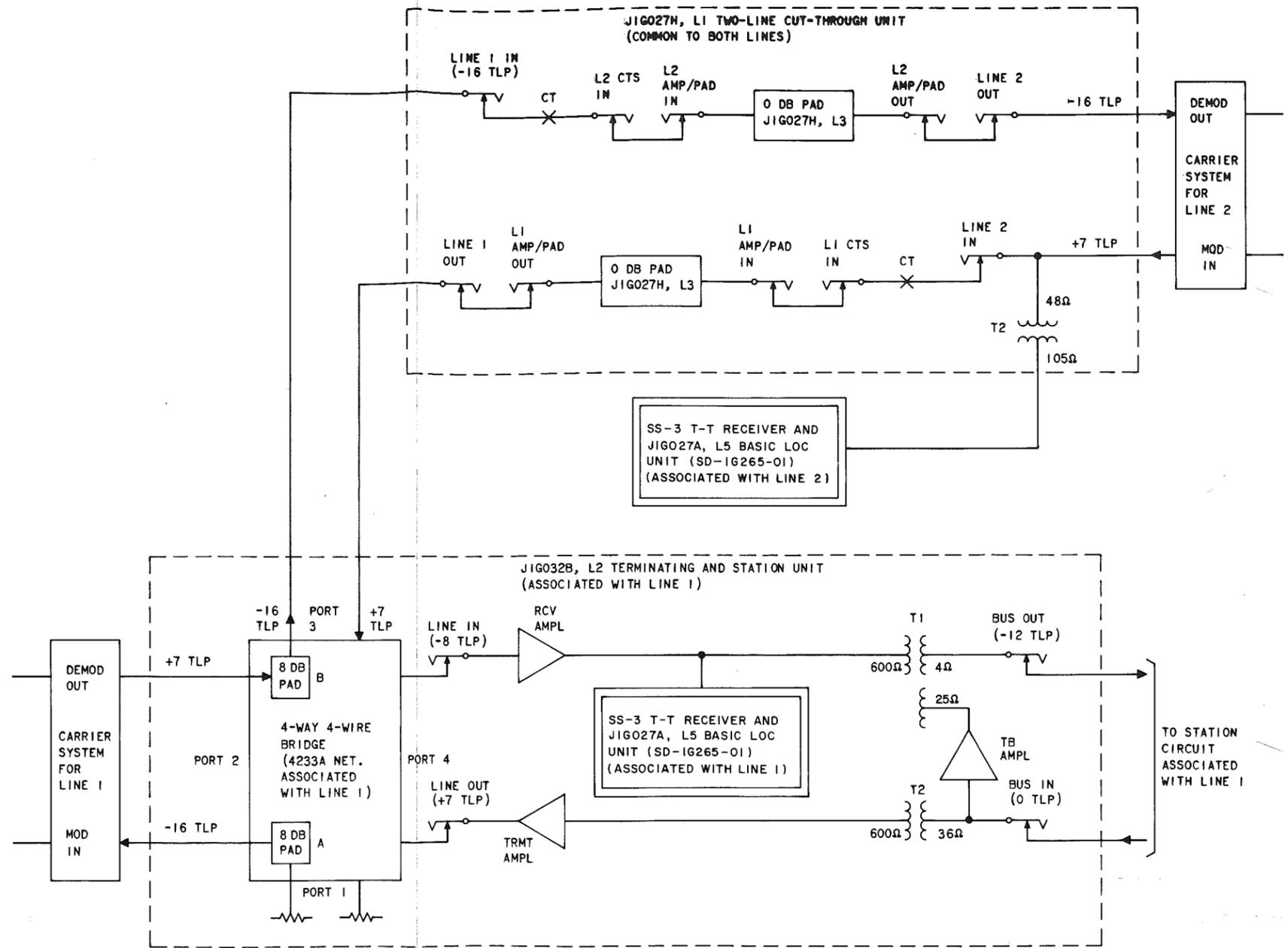


Fig. 4—Two-Line Cut-Through Switch—With Terminating and Station Equipment on One Line

of the other line. For connections made to facilities at standard transmitting and receiving levels, an 89A resistor (0 dB) should be installed in each network.

- (7) Perform the procedures outlined in 2.07 for each station circuit unit AR706 that is associated with line one.
- (8) Perform the procedures outlined in 2.09(6), (7), and (8) to verify the operation of the cut-through switch.
- (9) Disconnect and remove the test equipment.

#### Both Lines With Associated Stations

**2.11** When a terminating and station circuit is associated with each of the two lines, individually adjust the equipment on each line as follows (Fig. 5):

- (1) Adjust the terminating and station unit J1G032B, L2 associated with each line as outlined in 2.05 with the exception of substituting the following for 2.05(7):

**Note:** At some installations, it may be necessary to arrange for assistance when performing Step (a).

- (a) Adjust the GN ADJ pad (A on Fig. 5) for port 2 on the 4233A network to obtain a detector reading of  $-16$  dBm at the carrier terminal input.
  - (b) Connect the detector input to the LINE 1 (2) IN jack on the J1G027H, L1 unit.
  - (c) Adjust the GN ADJ pad (B on Fig. 5) for port 3 on the 4233A network to obtain a  $-16$  dBm reading on the detector.
- (2) Perform the procedures outlined in 2.06 for the basic location unit J1G027A, L5 associated with each line.
  - (3) Perform the following on each of the amplifiers (L1 and L2) located on the J1G027H, L1 unit:
    - (a) Set the screw switches on the amplifier for the 21-36 dB range.

- (b) Set the oscillator for 1000 Hz and adjust the output for  $-23$  dBm using a 600-ohm detector.

- (c) Insert the oscillator output into the AMP/PAD L1 (2) IN jack and the detector input into the AMP/PAD L1 (2) OUT jack.

- (d) Adjust the L1 (2) amplifier to obtain a 0 dBm reading at the detector.

- (4) Perform the procedures outlined in 2.07 for each station circuit unit AR706 that is associated with each line.

- (5) Perform the procedures outlined in 2.09(6), (7), and (8) to verify the operation of the cut-through switch.

- (6) Disconnect and remove the test equipment.

#### C. 6-Line Cut-Through Switch Test

**2.12** The lineup procedures for each line connected to the a 6-line cut-through unit depends on the equipment associated with the line. The circuit in Fig. 6 shows the two types of lines that will be connected to the 6-line unit; (1) a line with an associated station (LINE 1), and (2) a line without a station (LINE 2).

**Note:** Refer to Note 404 on SD-1G265-01 for the cross-connect information on the **disconnect** code and the **connect** codes for all lines associated with the cut-through switch.

#### Lines With Associated Stations

**2.13** For each line connected to the 6-line unit that has an associated terminating and station unit, adjust the equipment as follows (Fig. 6):

- (1) Adjust the terminating and station unit (J1G032B, L2 as outlined in 2.05 with the exception of substituting the following for 2.05 (7):

**Note:** At some installations, it may be necessary to arrange for assistance when performing Step (a).

- (a) Adjust the GN ADJ pad (A on Fig. 6) for port 2 on the 4233A network to obtain

a detector reading of  $-16$  dBm at the carrier terminal input.

- (b) Connect the detector input to the 4W BG OUT jack on the J1G027K, L1 unit associated with line 1.
- (c) Adjust the GN ADJ pad (B on Fig. 6) for port 3 on the 4233A network to obtain a  $-16$  dBm reading at the detector.
- (2) Perform the procedures outlined in 2.06 for the basic location unit J1G027A, L5 associated with the terminating and station unit.
- (3) Perform the following on each of the amplifiers (RF and TR) located on the J1G027K, L1 unit:
  - (a) Set the screw switches on the RE(TR) amplifier for the 21-36 dB range.
  - (b) Set the oscillator for 1000 Hz and adjust the output for  $-23$  dBm using a 600-ohm detector.
  - (c) Insert the oscillator output into the AMP RE(TR) IN jack and the detector input into the AMP RE(TR) OUT jack.
  - (d) Adjust the RE(TR) amplifier to obtain a 0 dBm reading at the detector.
- (4) Perform the procedures outlined in 2.07 for each station circuit unit AR706 that is associated with each line.
- (5) Arrange to have a station on one of the lines to dial the connect code assigned to the cut-through switch. The originating station should then dial the code of a station on each one of the different lines associated with switch. Verify that a proper connection has been made between all lines.
- (6) Arrange for the originating station to dial the disconnect code. Verify that the connection is open between all lines.
- (7) Arrange to have a station on each of the other lines to perform the procedures outlined in Steps (5) and (6).
- (8) Disconnect and remove the test equipment.

#### Lines Without Associated Stations

**2.14** For each line connected to the 6-line unit that does *not* have an associated terminating and station unit, adjust the equipment as follows (Fig. 6):

- (1) Insert the input of a 600-ohm detector into the LINE IN \_ jack (LINE IN 2 on Fig. 6).

**Note:** At some installations, it may be necessary to arrange for assistance when performing Step 2.

- (2) With a 1000-Hz tone at  $+7$  dBm being sent from the carrier terminal output, a  $+7$  dBm reading should be observed at the detector.
- (3) Adjust the R14 potentiometer, located on the rear of the J1G027A, L5 unit associated with the line (line 2 on Fig. 6), to the full clockwise position.
- (4) Perform the procedures outlined in 2.13(5), (6), and (7) to verify the operation of the cut-through switch.
- (5) Disconnect and remove the test equipment.

### 3. MAINTENANCE

**3.01** The maintenance procedures for an order wire installation should be limited to local tests, testing with maintenance centers, or replacing defective apparatus or printed circuit packs.

**Note:** Do not attempt individual component repair or replacement on the printed circuit packs.

**3.02** Perform a visual and mechanical inspection of the installation. Check all cords, inside wiring, etc, for disconnected or broken leads. Repair or replace any station component (such as ringer, dial, handset, loudspeaker, etc, when provided) found defective or marginal during check of the installation.

#### Code Cross-Connections

**3.03** Cross-connecting the signaling codes may be used when replacing certain components, when changing an existing code, or when adding

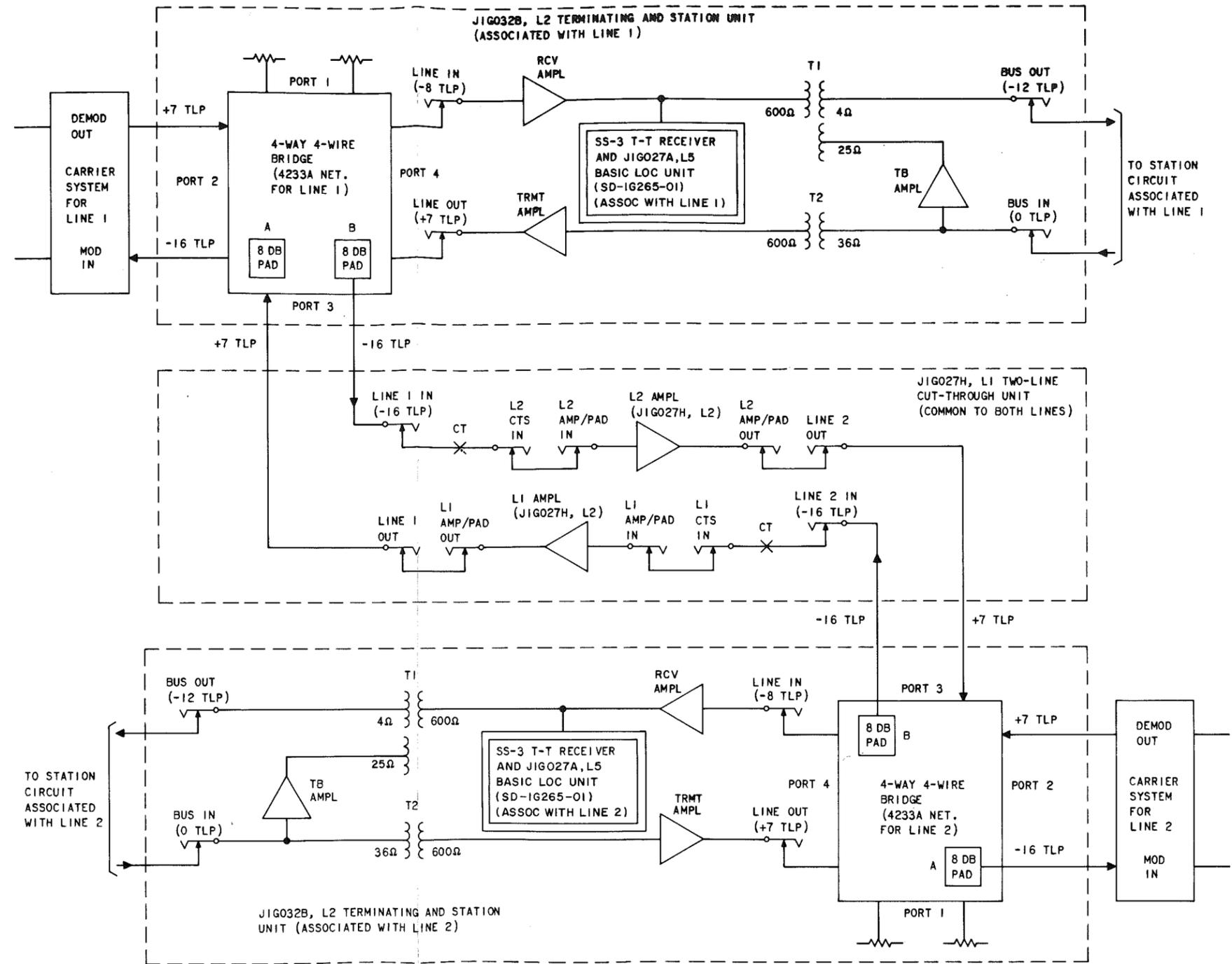


Fig. 5—Two-Line Cut-Through Switch—With Terminating and Station Equipment on Both Lines

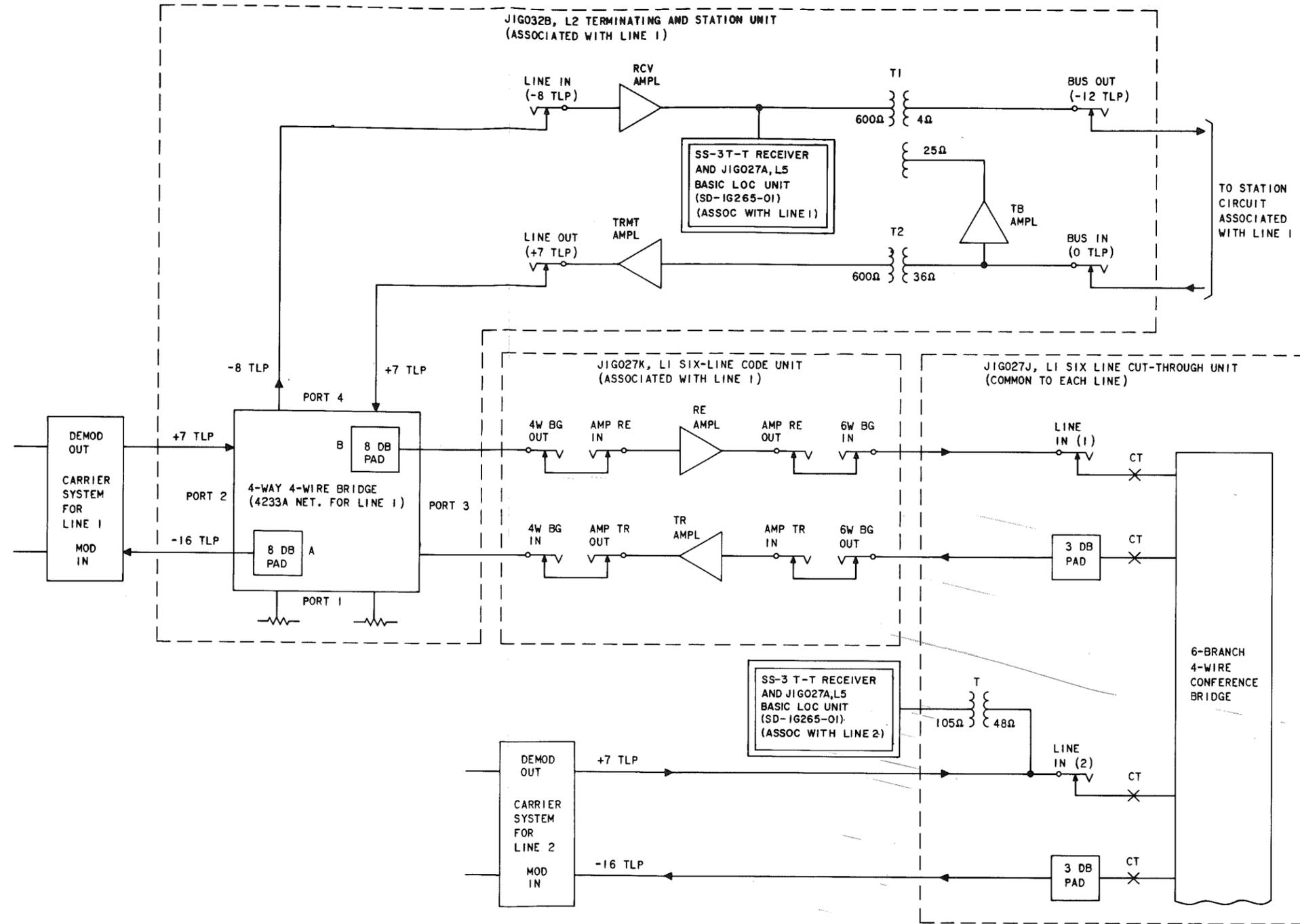
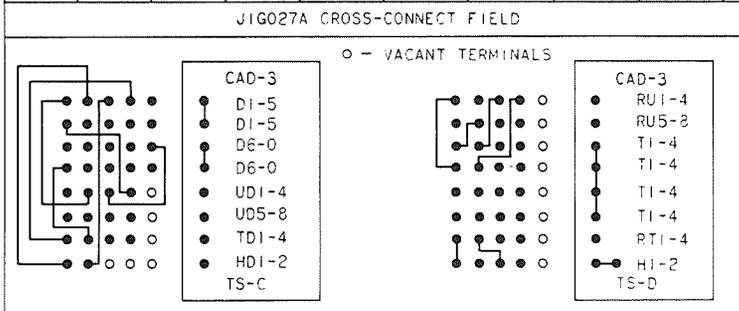


Fig. 6—Six-Line Cut-Through Switch—One Line With Terminating and Station Equipment and One Line Without

CODE				CODE CROSS-CONNECTIONS ARROWS INDICATE THE SAME NUMERICAL SUFFIXES ARE REQUIRED										1ST STATION	2ND, 4TH, STATION	3RD, 5TH STATION								
NUM ORDER OF CODE	STA CODE	ALERT CODE	GROUP CODE	JIG027A, L5										JIG032B	JIG032C, L1									
				TS(C)		TS(C)		TS(D)		TS(C)		TS(D)		TS(B)	TS(A)			TS(A)			TS(A)			
				D( )	HD( )	D( )	TD( )	H( )	RT( )	D( )	UD( )	T( )	RU( )	CRD( )	TERM.	SC	AC	GC	SC	AC	GC	SC	AC	GC
1	240			2	1	4	1	1	1	0	1	1	1	1	37	53								
2	241			2	1	4	1	1	1	1	2	1	2	2	47						17			
3		360		3	2	6	2	2	2	0	3	2	3	3	57		54							
4			361	3	2	6	2	2	2	1	4	2	4	4	18			52						
5																								
6																								
7																								
8																								



NOTES:

- NUMBERS UNDER "JIG027A, L5" HEADING ARE SUFFIX NUMBERS FOR THE LEAD DESIGNATION INDICATED AT THE TOP OF EACH COLUMN. THE NUMBERS IN THE "TERM." COLUMN INDICATE THE TERMINALS TO WHICH THE CONNECTION IS MADE (SEE TABLE A).
- NUMBERS UNDER "JIG032B" AND "JIG032C, L1" HEADINGS ARE TERMINAL NUMBERS ON TS(A) OF THE TWO J UNITS.
- THE TWO CODES 240 AND 241 HAVE THE SAME HUNDREDS AND THE TENS DIGITS, THEREFORE, D2 TO HD1, D4 TO TD1, AND H1 TO RT1 NEED ONLY BE CROSS CONNECTED ONCE. THE SAME APPLIES TO SIMILAR CONNECTIONS FOR CODES 360 AND 361.

Fig. 7—Example of Typical Signaling Codes Entered on Form

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new codes. There are 648 codes available for use by each system with the following restrictions:

- All codes will consist of three digits.
- The first digit should not be a 1 or 5.
- The middle digit must not be the same as the first or third digit.
- The first two digits of a group code or alert code should be 36.
- The following digit priorities should be observed:

Priority	Digit
1	2, 3, 6
2	4, 7, 8, 9, 0
3	1, 5

- 3.04** The hundreds control logic will respond to a maximum of two different digits (terminals HD1 and HD2).
- 3.05** The tens control logic will respond to a maximum of four different digits (terminals TD1 through TD4).
- 3.06** When more than one code has the same hundreds digit, only one HD( ), H( ) pair of terminals is required. Example: **240, 241.**
- 3.07** When more than one code has the same tens code digit *and* the same hundreds code digit, only one TD( ), RT( ) pair of terminals is required. Example: **240, 241.**
- 3.08** When two different hundreds code digits are required, two TD( ), RT( ) pairs of terminals are required. One pair to be associated with each hundreds digit. Example: **240, 360**
- 3.09** One UD( ), RU( ) pair of terminals is required for each code wired into the circuit.
- 3.10** The J1G027A basic location unit contains enough UD and RU terminals to cross-connect eight codes. When more than eight codes are required at a location, the J1G027B auxiliary code unit must be provided. The auxiliary unit contains

enough UD and RU terminals for 16 additional codes.

**3.11** To establish a new 3-digit code, a maximum of five cross-connections are required. Cross-connections are wire-wrapped on the D-type terminal strips.

*Note:* Refer to Fig. 7 for 3.12 through 3.18.

- 3.12** The cross-connection for the hundreds code digit must be made between a D(1-0) terminal and an HD (1 or 2) terminal. Example: Cross-connect D2 to HD1.
- 3.13** The cross-connection for the tens code digit must be made between a D(1-0) terminal and a TD(1-4) terminal. Example: Cross-connect D4 to TD1.
- 3.14** A cross-connection must be made to associate the hundreds code digit with the tens code digit. The H(1,2) and the RT(1-4) terminals are directly related to the HD(1,2) and the TD(1-4) terminals, respectively. Therefore, whatever arbitrary selection was made in 3.12 and 3.13 determines the corresponding numerical suffix for the H( ) and RT( ) terminals. Example: H1 to RT1.
- 3.15** To establish the units code digit, a cross-connection must be made between a D(1-0) terminal and a UD(1-8) terminal. Example: D0 to UD1.
- 3.16** A cross-connection must be made to associate the tens code digit with the units code digit. The T(1-4) and the RU(1-8) terminals are directly related to the RT(1-4) and the UD(1-8) terminals, respectively. Therefore, whatever arbitrary selection was made in 3.14 and 3.15 determines the corresponding numerical suffix for the T( ) and RU( ) terminals. Example: T1 to RU1.
- 3.17** An additional cross-connection must be made to associate the signaling code to the assigned station(s). The connections for the first eight codes are made from TS(B) on the J1G027A unit. The connections for additional codes (9-24) are made from TS(A) on the J1G027B unit. See Table A.

TABLE A  
CONNECTING TERMINALS FOR  
SIGNALING CODES

TS(B) ON J1G027A		TS(A) ON J1G027B			
LEAD	TERM.	LEAD	TERM.	LEAD	TERM.
CRD 1	37	CRD 9	55	CRD 17	37
CRD 2	47	CRD 10	16	CRD 18	47
CRD 3	57	CRD 11	26	CRD 19	57
CRD 4	18	CRD 12	36	CRD 20	18
CRD 5	28	CRD 13	46	CRD 21	28
CRD 6	38	CRD 14	56	CRD 22	38
CRD 7	48	CRD 15	17	CRD 23	48
CRD 8	58	CRD 16	27	CRD 24	58



*A CRD lead should never be connected to more than one of the three signal-input terminals (SC, AC, or GC) of a particular station—damage to the AR539 or AR540 circuit pack will result.*

**3.18** The code connections (from CRD leads in Table A) to the assigned stations should be made as shown in Table B.

TABLE B  
SIGNALING CODE CONNECTIONS TO  
ASSIGNED STATION

SIGNALING CODE	STATIONS		
	1ST	2ND, 4TH, . . .	3RD, 5TH, . . .
	TS(A) ON J1G032B, L1 OR L2	TS(A) ON J1G032C, L1	
Station (SC)	53	17	27
Alert (AC)	54	16	26
Group (GC)	52	18	28

**3.19** A group code connected to one station may be extended to additional stations by

connecting to the following terminals on the original station:

<u>TERM. NO.</u>	<u>LEAD</u>	<u>TERM. STRIP</u>
11	GC2	TS(B) on
21	GC3	J1G032B
22	GC4	or
32	GC5	TS(B) and (C) on
42	GC6	J1G032C

**3.20** Fig. 8 is intended for use in recording cross-connections, as an aid for making the required cross-connections, and should remain with the equipment as a record of code assignment.

**3.21** If trouble is suspected in the facilities, perform the lineup tests outlined in Part 2. These tests will determine if a change has occurred in the transmission parameters of the circuit. The tests may also determine if an amplifier or coupling transformer has become defective in the terminating circuit.

### ***Incoming Signaling***

**3.22** If incoming signaling problems are encountered, perform the following test on the basic location unit and the TOUCH-TONE receiver. These units provide the logic to ensure the proper reaction to a valid signal code.

- (1) Connect the negative lead of the VOM to terminal 41 and the positive lead to terminal 53 on TS (B) of the J1G027A, L5 unit. The meter should read between 4.05 and 4.95 vdc.
- (2) Should an improper reading be observed in Step (1), refer to Steps (3), (4), and (5) for the three conditions that may exist.
- (3) If an indication is not observed on the meter and the fuse on the AR381 circuit pack is not opened, replace the AR381 circuit pack.
- (4) If an indication is not observed on the meter in Step (1) and the fuse on AR381 is open, perform the following:
  - (a) Remove all the AR circuit packs from the J1G027A, L5 unit except the AR381.

(b) Replace the 3/4 amp fuse on the AR381 unit.

(c) If the fuse opens, replace the AR381 unit and plug in all circuit packs removed in Step (a).

(d) If the fuse does not open, plug in, one at a time, each AR circuit pack removed in Step (a). Replace any circuit pack which causes the fuse to open.

(5) If insufficient voltage is observed in Step (1), perform the following:

(a) Connect the negative lead of the VOM to terminal 41 and the positive lead to terminal 11 on TS(B) of the J1G027A, L5 unit. The meter should read between +19.3 and +28 vdc.

(b) If a reading is not observed or if the proper voltage is not obtained, replace the KS-20575 rectifier.

(6) Individually make the meter connections shown in Table C for each lead. Using a TOUCH-TONE dial connected to the system, dial the indicated digits and observe the voltage drop from +4.5 to a 0 vdc as each digit is depressed. When each dial button is released, the voltage should return to +4.5 vdc.

(7) If the proper voltage changes are *not* observed in Step (6), replace the AR537 circuit pack on the basic location unit and/or the high-and low-frequency circuit packs on the TOUCH-TONE receiver unit.

(8) If the proper voltage changes are observed in Step (6) and trouble still persists with incoming signaling, replace the AR539 or AR540 circuit pack on the basic location unit.



**TABLE C**  
**METER CONNECTIONS FOR CHECKING**  
**INCOMING SIGNALS**

LEAD DESIG.	METER CONNECTIONS		DIAL DIGIT	OBSERVE VOLTAGE CHANGE FROM
	POSITIVE LEAD TO TERMINAL	NEGATIVE LEAD TO TERMINAL		
DG	18 on TS(A)		(Any Digit)	+4.5 to 0 VDC
STR	12 on TS(A)		(Any Digit)	
ORD	16 on TS(A)		(12th Digit)	
D1	*D1	41 on TS(B)  on TS(C)	1	
D2	*D2		2	
D3	*D3		3	
D4	*D4		4	
D5	*D5		5	
D6	*D6		6	
D7	*D7		7	
D8	*D8		8	
D9	*D9		9	
D0	*D0		0	

\* This terminal appears twice on TS(C). Test both terminals.