SS-3 TOUCH-TONE® SELECTIVE SIGNALING SYSTEM IDENTIFICATION, INSTALLATION, CONNECTIONS, OPERATIONAL TESTS AND MAINTENANCE

CONTENTS PAGE

1. GENERAL

1.01 This section contains identification, installation, connections and operational tests for the SS-3 Selective Signaling System. This type of private line service can be used by airlines, utilities, truck lines and other companies whose operations require frequent communications between separate locations.

1.02 The SS-3 Selective Signaling System uses TOUCH-TONE frequencies to provide a method of selectively signaling a maximum of 648 3-digit codes over one 4-wire facility. Optional wiring provides two different modes of operation, the privacy mode Fig. 1, (only called stations participate in the conversation) or nonprivate mode, Fig. 2 (party line operation).

1.03 Additional features will be available at a later date. These features are to include PBX access and data transmission capability.

1.04 This issue of the section is based on the following drawings

SD-69566-01 Issue 3B

SD-1G265-01 Issue 1

SD-67027-01 Issue 6B

SD-1G282-01 Issue 1

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

2. IDENTIFICATION

2.01 The SS-3 system is made up of varied combinations of 2" by 23" mounting plates as follows:

- Basic Location Unit J1G027A
- Auxiliary Code Unit J1G027B
- Privacy Station Unit J1G027C
- Privacy Location Unit J1G027D
- Automatic Clear Unit J1G027E

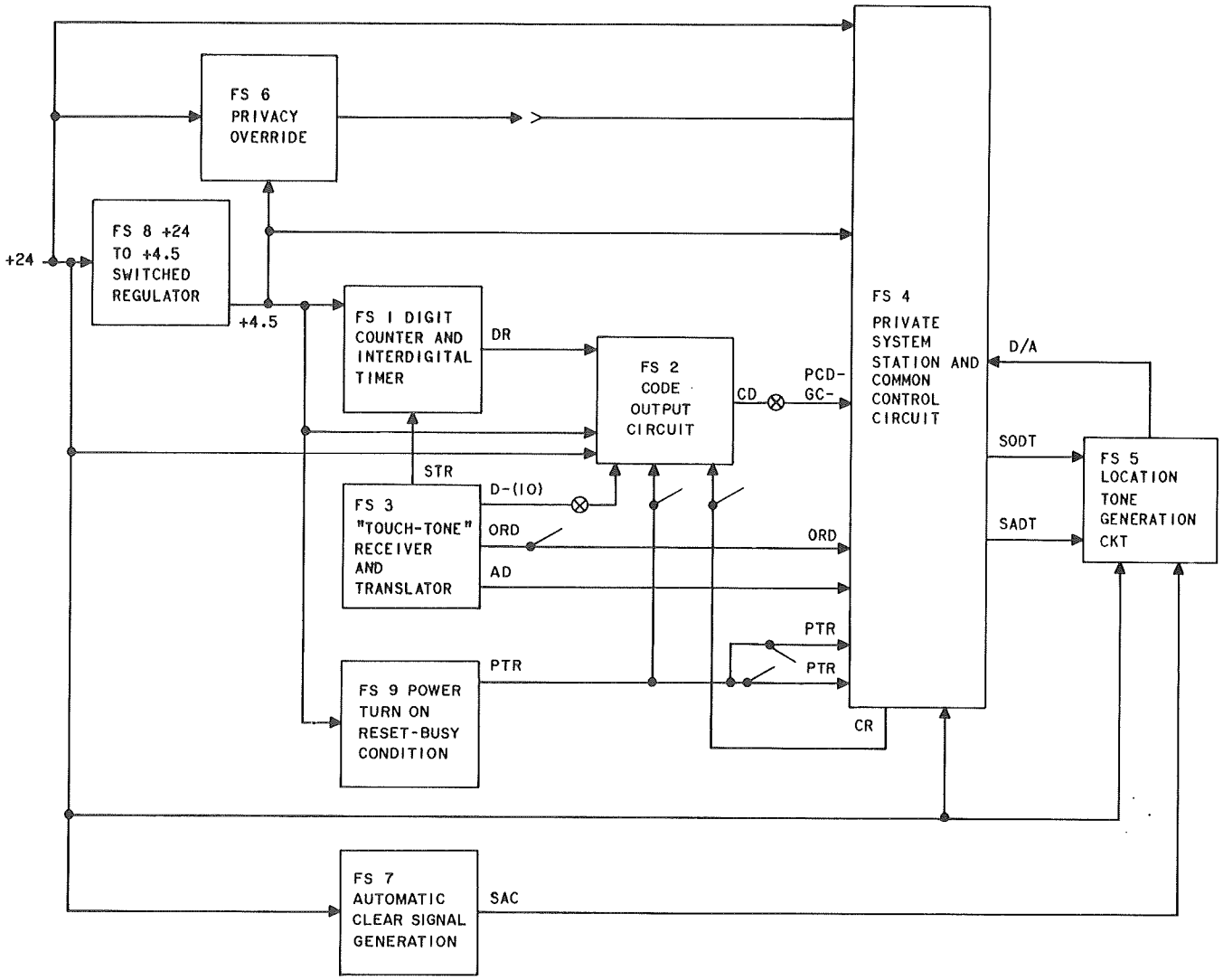


Fig. 1—Block Diagram of SS-3 Private System (SD-1G265-01)

2.02 Additional 4-wire private line terminating (J53045-) units are required, plus a J58844C3 TOUCH-TONE receiver unit. Two packaged SS-3 units are available as J1G028- units. These versions are complete four station packages in either the nonprivate (J1G028A) or private (J1G028B) SS-3 systems. See Fig. 3 and 4.

2.03 The ***J1G027A*** unit provides location and station logic for a maximum of eight codes. One J1G027A unit is furnished for each location and is equipped with three connectors for inserting circuit packs. Connector J1 receives either the AR537 circuit pack for nonprivate or AR538 circuit pack for private systems. Connector J2 receives circuit packs AR539 for four codes or less or AR540 for more than four codes. Connector J3 receives circuit pack AR381 which supplies the power necessary for codes one through eight.

2.04 The ***J1G027B*** unit extends the code capability to a maximum of 24. One J1G027B unit is furnished at each location having more than eight codes and is equipped with two connectors for inserting circuit packs. Connector J1A receives circuit pack AR539 (four codes per circuit pack or AR540 (eight codes per circuit pack). Connector J2A receives circuit pack AR539 or AR540 dependent upon 12 or 16 additional codes required.

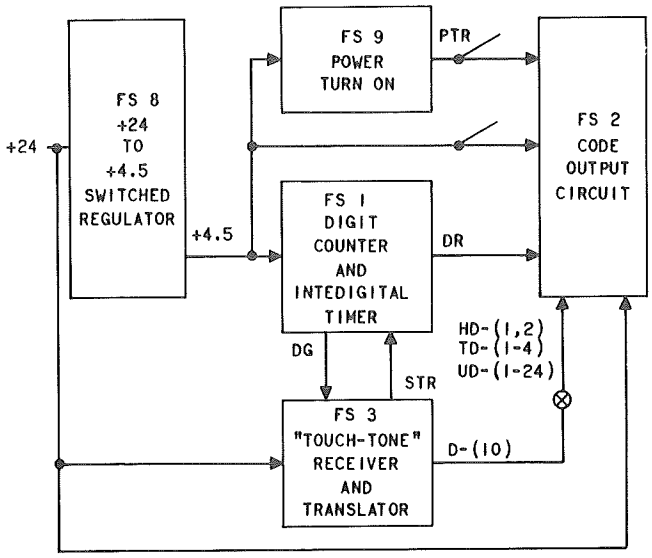


Fig. 2—Block Diagram of SS-3 Nonprivate System (SD-1G265-01)

KS-20575 RECTIFIER	20C2 POWER UNIT WITH POWER CORD	TIMEOUT AND INTERRUPTER UNIT J53045L	GROUP CODE UNIT J53045H
4-WIRE PRIVATE LINE TERMINATING UNIT J53045A			
"TOUCH-TONE" CALLING RECEIVER J58844C			
BASIC LOCATION UNIT J1G027A			

SELECTIVE SIGNALING RECEIVE UNIT J53045F	SELECTIVE SIGNALING RECEIVE UNIT J53045F	STATION AND PU RELAY UNIT J53045D	STATION AND PU RELAY UNIT J53045D	STATION AND PU RELAY UNIT J53045D	STATION AND PU RELAY UNIT J53045D

Fig. 3—J1G028A SS-3 Four Station Nonprivate Packaged Unit

2.05 The privacy system requires two units to supplement the J1G027A Basic Location Unit. The ***J1G027C*** unit(s) provide the logic required to provide privacy for up to 24 stations. Each unit is equipped with three connectors and each provides privacy for eight stations. Connector J1B receives circuit pack AR541 for the first four stations and J2B receives circuit pack AR541 for the second four stations. Connector J3B receives circuit pack AR381 on the second J1G027C unit only. This circuit pack supplies the additional power that is required for stations 9 through 24.

KS-20575 RECTIFIER	20C2 POWER UNIT WITH POWER CORD	TIMEOUT AND INTERRUPTER UNIT J53045L	GROUP CODE UNIT J53045H
4-WIRE PRIVATE LINE TERMINATING UNIT J53045A			
"TOUCH-TONE" CALLING RECEIVER J58844C			
BASIC LOCATION UNIT J1G027A			

SELECTIVE SIGNALING RECEIVE UNIT J53045F	SELECTIVE SIGNALING RECEIVE UNIT J53045F	STATION AND PU RELAY UNIT J53045D	STATION AND PU RELAY UNIT J53045D	STATION AND PU RELAY UNIT J53045D	STATION AND PU RELAY UNIT J53045D
PRIVACY INTERFACE UNIT J53045K					
PRIVACY STATION UNIT J1G027C					
PRIVACY LOCATION UNIT J1G027D					

Fig. 4—J1G028B SS-3 Four Station Private Packaged Unit

2.06 The Privacy Location Unit ***J1G027D*** provides the busy-tone and TOUCH-TONE generators and the relay connectors for these generators. The J1G027D unit is equipped with three connectors. Connectors J1C, J2C and J3C are always equipped with circuit pack assemblies ED-1G194, ED-69496 and A-959 respectively. A plug-in 227D amplifier is provided if stations are equipped with the privacy override option.

2.07 The Automatic Clear Unit ***J1G027E*** contains a 234B voice-controlled switch and two 7B timers. This unit is required on a one per system basis for privacy.

3. CONNECTIONS

3.01 Connections for the Nonprivate system are shown in Fig. 5. The Private system is shown in Fig. 6.

3.02 When four codes or less are required, the packaged version J1G028 (SD-1G282-01) is recommended.

4. CODE CROSS CONNECTING

4.01 The SS-3 system uses 3-digit codes in which the middle (tens) digit must not be the same as either the first (hundreds) digit or third (units) digit. This restriction must be observed to ensure the decoder circuit functions properly.

4.02 Coding restrictions are as follows:

- All codes consist of three digits.

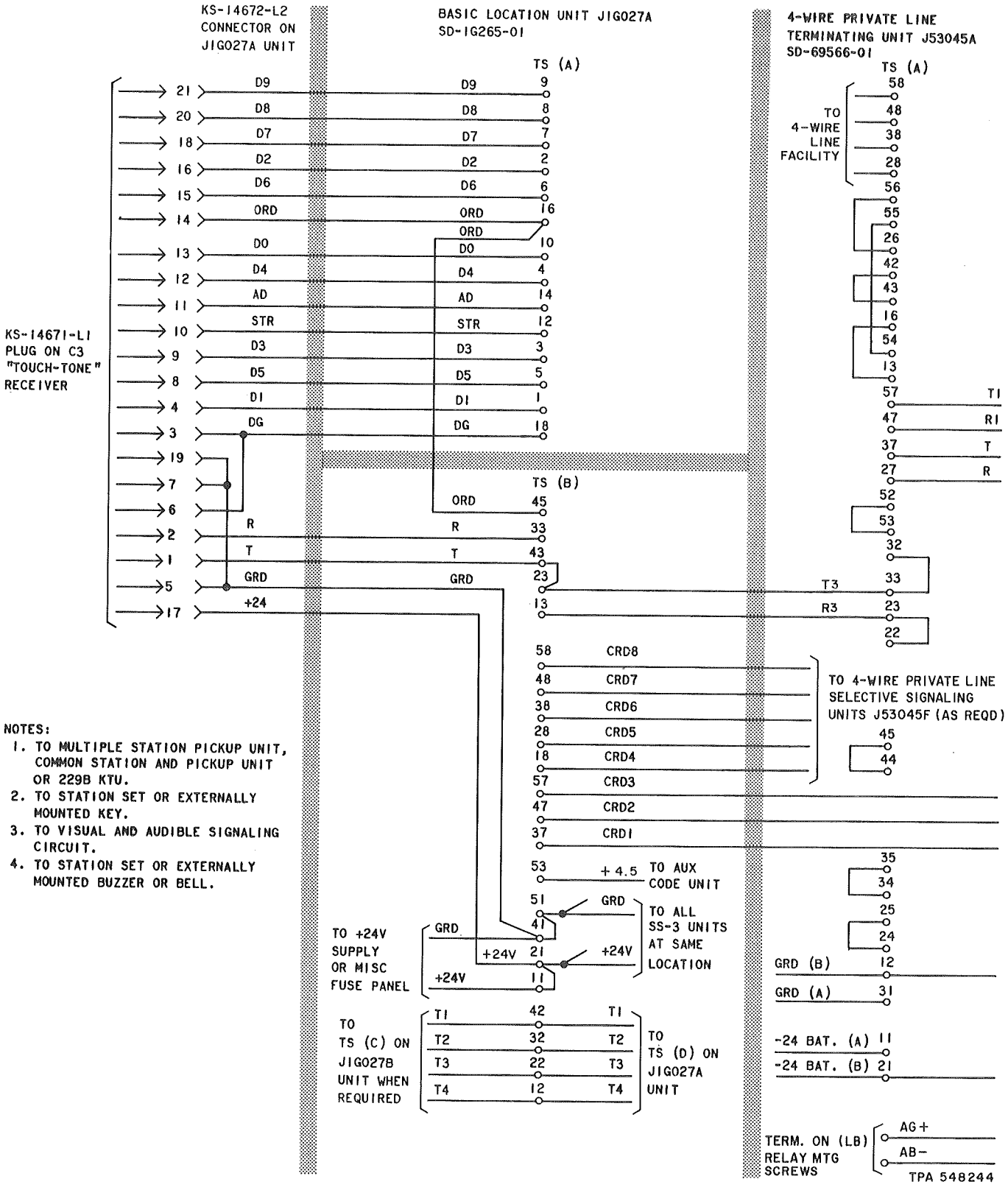


Fig. 5—Typical Connections Using SS-3 Selective Signaling (Nonprivate)

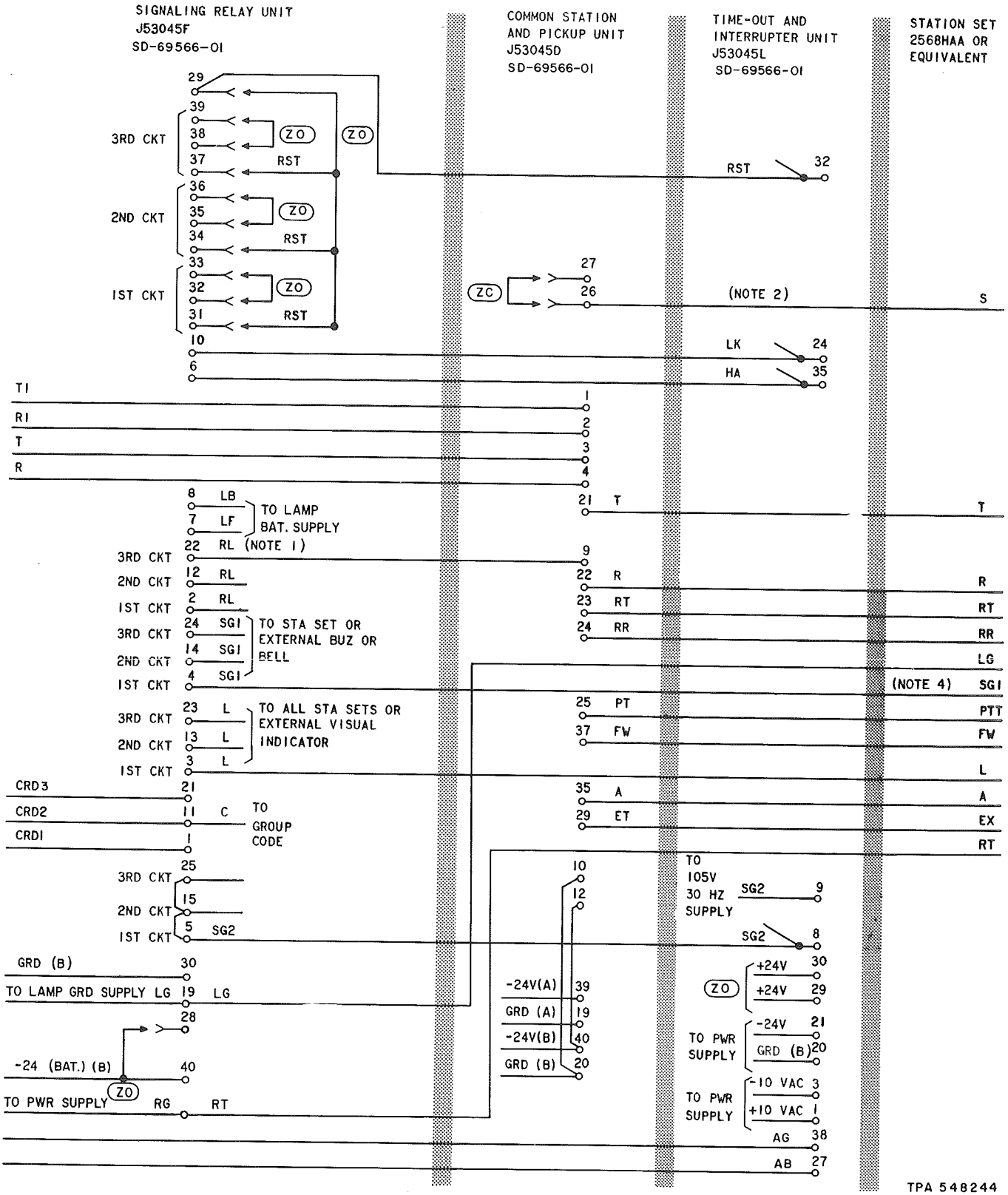


Fig. 5—Typical Connections Using SS-3 Selective Signaling (Nonprivate) (Cont)

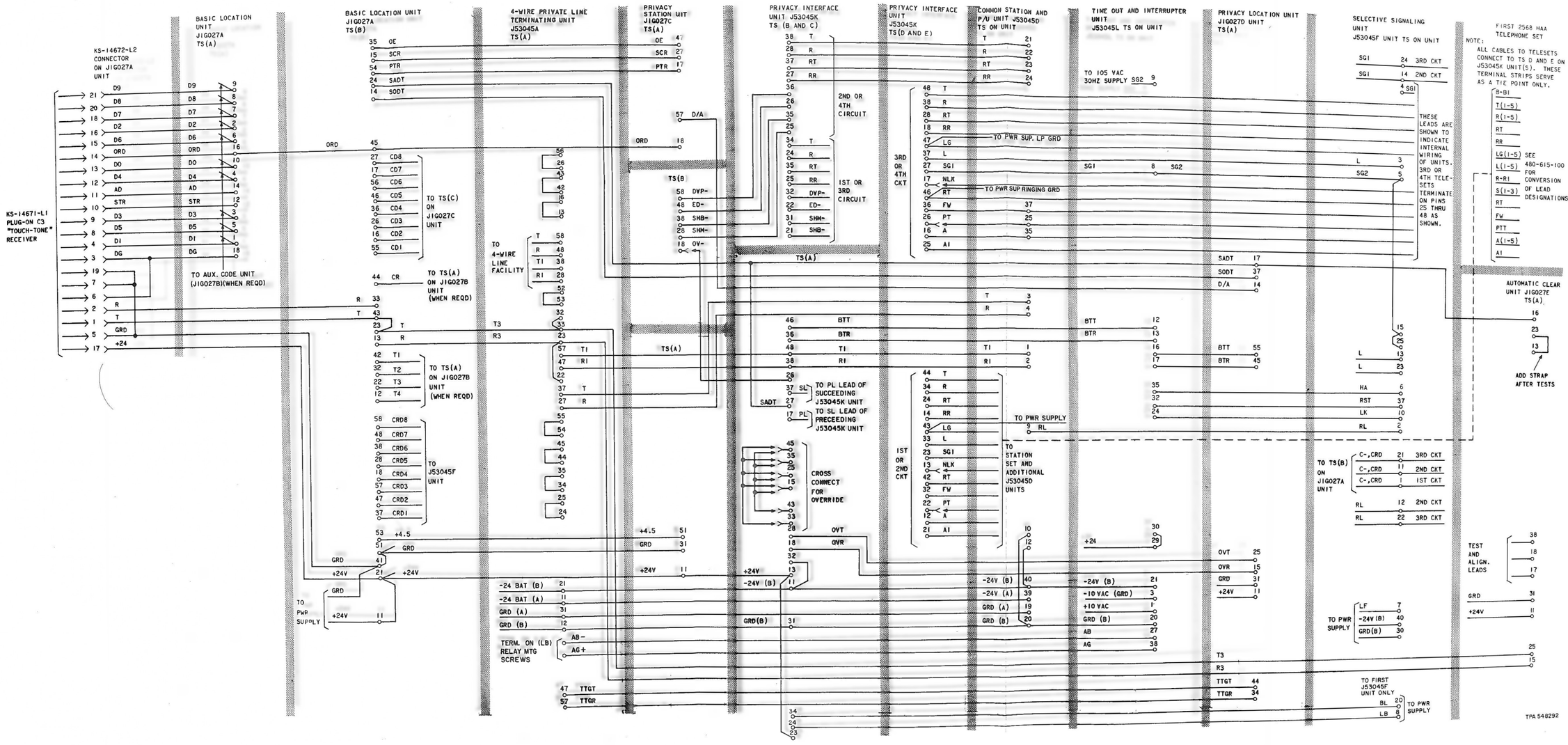


Fig. 6—Typical Connections Using SS-3 Selective Signaling (Private)

- No code can contain two identical adjacent digits.
- The first digit of a code should not be one or five.
- The first two digits of a group code are 36.
- The following digit priorities should be observed.

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

4.03 The Hundreds control logic may respond to a maximum of two different digits (terminals HD1 and HD2).

4.04 The tens control logic may respond to a maximum of four different digits (terminals TD1 through TD4).

4.05 Only one HD( ), H( ) pair of terminals is required when more than one code has the same hundreds digit, for example, (2)42, (2)43.

4.06 Only one TD( ) to RT( ) pair of terminals is required when more than one code has the same tens code digit and all those codes have the same hundreds code digit, for example, (24)2 and (24)3.

4.07 When two different hundreds code digits are required, two TD( ) to RT( ) pairs of terminals are required, for example, (2)42 and (3)43.

4.08 One UD( ) to RU( ) pair of terminals is required for each code wired into the circuit.

4.09 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 furnished. This unit contains enough UD and RU terminals for 16 additional codes.

4.10 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. ***Refer to Fig. 7 for 4.11 through 4.15.***

4.11 To establish the hundreds code digit, a cross connection must be made between a D(0 to 9) terminal and the HD (1 or 2) terminal, for example, cross connect D(2) to HD(1).

4.12 To establish the required tens code digit, a cross connection must be made between a D (0 to 9) terminal and a TD (1-4) terminal, for example, cross connect D(4) to TD(1).

4.13 A cross connection must be made to associate the hundreds code digit with the tens code digit. The H1 and H2 terminals are directly related to the HD1 and HD2 terminals. The RT(1-4) terminals are directly related to the TD(1-4) terminals, therefore, whatever arbitrary selection was made in 4.11 and 4.12, the corresponding numerical value is used for H( ) and RT( ) to determine where to place this cross connection; for example, cross connect H(1) to RT(1).

4.14 To establish the units code digit, a cross connection must be made between a D (0 to 9) terminal and the UD (1 to 8) terminal, for example, cross connect D(0) to UD(1).

4.15 A cross connection must be made to associate the tens code digit with the units code digit. The T (1 to 4) terminals are directly related to the RT (1 to 4) terminals. The UD (1 to 8) are directly related to the RU (1 to 8) terminals; therefore, whatever arbitrary selection was made in 4.13 and 4.14 determines where to place this cross connection, for example, T(1) to RU(1).

4.16 Figure 10 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 assignments.

4.17 The station control cross connect field is located on the J1G027C unit. These cross connections associate a station set with its station code or group code.

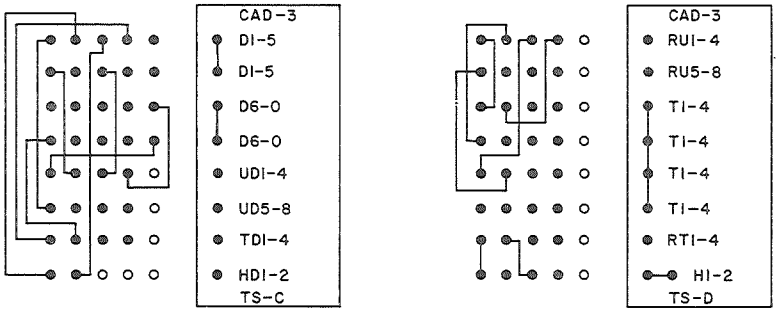
4.18 A single station set can be assigned a maximum of three group codes. The PCD( ) wire terminals designate the ***Station*** order of installation. For example, the third ***station set*** installed at a location would have PCD(3) lead cross connected on TS(C) on the J1G027C unit. The CD( ) wire terminals designate the ***code*** order of installation, for example, the third ***code*** assigned would have CD(3) lead cross connected on TS(C).

CODE			CODE CROSS CONNECTIONS ARROWS INDICATE THE SAME NUMERICAL VALUES ARE REQUIRED				
			JIG027A UNIT				
NUMERICAL ORDER OF CODE	STATION CODE	GROUP CODE	TSC D( ) HD( )	TSC D( ) TD( )	TSD H(▼) RT(▲)	TSC D( ) UD( )	TSD T(▼) RU(▲)
1	240		2—1	4—1	1—1	0—1	1—1
2	241		2—1	4—1	1—1	1—2	1—2
3	243		2—1	4—1	1—1	3—3	1—3
4		360	3—2	6—2	2—2	0—4	2—4
5		361	3—2	6—2	2—2	1—5	2—5
6							
7							
8							

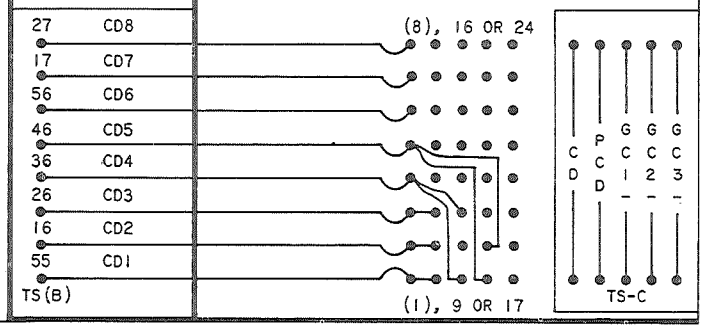
NUMERICAL ORDER OF STATION	STATION SET TO STATION CODE	STATION SET TO GROUP CODE 1	STATION SET TO GROUP CODE 2	STATION SET TO GROUP CODE 3
	JIG027C UNIT			
	TSC PCD( ) CD( )	TSC CD( ) GC1-( )	TSC CD( ) GC2-( )	TSC CD( ) GC3-( )
1	1—1	4—1	5—1	1
2	2—2	2	5—2	2
3	3—3	4—3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8

JIG027A CROSS CONNECT FIELD

O=VACANT TERMINALS



P/O JIG027A UNIT CAD-2



NOTES:
1. ASSUME YOU HAVE CODE ASSIGNMENTS OF 240, 241, AND 243.
2. 240 AND 243 ARE TO RESPOND TO GROUP CODE 360
3. 240 AND 241 ARE TO RESPOND TO GROUP CODE 361
4. THE THREE CODES (240,241 AND 243) HAVE THE SAME HUNDREDS AND TENS DIGITS; THEREFORE D2 TO HDI, D4 TO TDI AND HI TO RTI NEED ONLY BE CROSS CONNECTED ONCE.

TPA 550325

Fig. 7—Example of Typical Codes Entered in Table

4.19 A PCD( ) wire terminal which is cross connected to a CD( ) terminal does not have to correspond numerically. For example, PCD(3) could require a cross connection to a CD(7) terminal.

4.20 Terminals designated GC have the following meaning:

GC1-1 First group code associated with station Set 1

GC2-1 Second group code associated with Station Set 1

GC3-1 Third group code associated with Station Set 1, etc.

5. OPERATIONAL TESTS

5.01 The line up procedures are designed to be performed prior to placing the 4-wire private line in service. To perform operational transmission tests, the equipment should be taken out of service according to local procedures.

5.02 The following list of test equipment is suitable for use when performing the line up.

21A Transmission Measuring Set, Detector

23A Transmission Measuring Set, Oscillator & Detector

TTS-4 Transmission Test Set, Oscillator & Detector

TTS-15 Transmission Test Set, Oscillator & Detector

3555B Transmission & Noise Measuring Set, Detector

236A Telephone Test Oscillator

KS-19353 Oscillator

KS-19260 Oscillator.

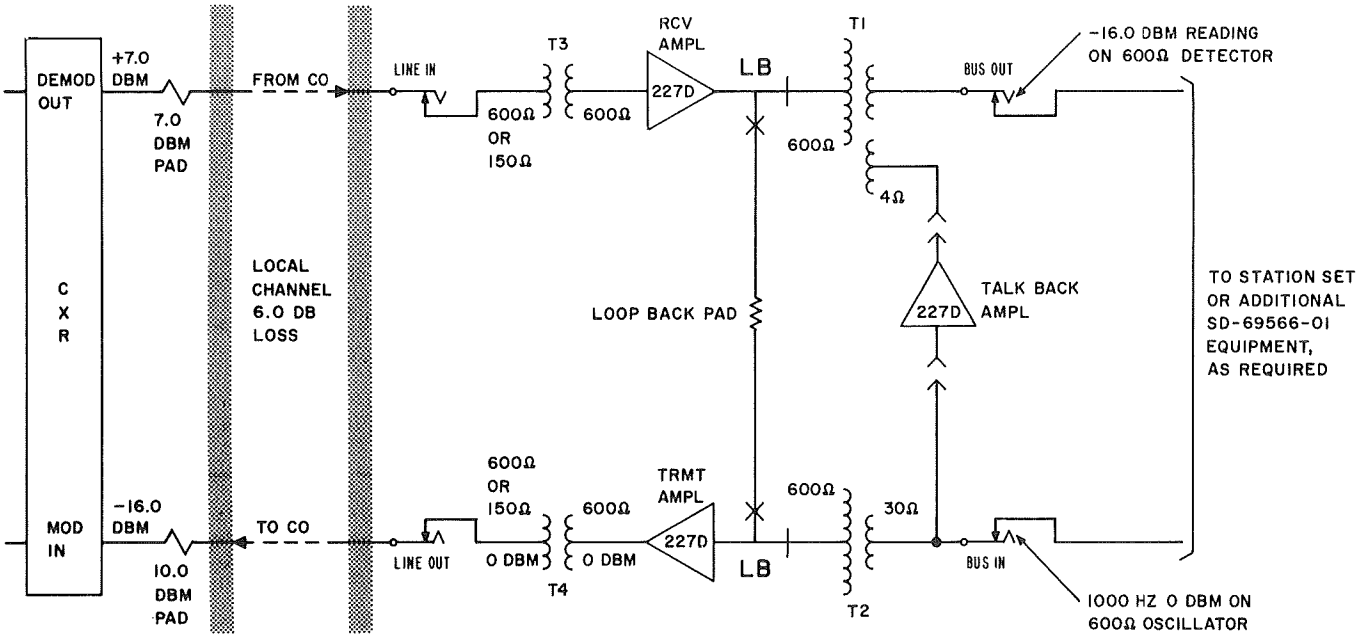
5.03 Numerous types of test equipment can be used and, therefore, preparation of the test equipment is not covered. The test equipment selected must be set up for 600 ohms or have a 600-ohm impedance. See Fig. 8.

5.04 Bare loop transmission measurements should be made from the terminating unit "Line In" and "Line Out" jacks to determine whether the four-wire facilities are satisfactory for service. These tests should be made in accordance with the standard procedures in Section 310-405-500.

- A talking circuit should be established between the customer location and the serving office before line up procedures are started.
- Set oscillator for 1000 Hz and adjust output for 0 dBm using a 600-ohm detector.
- Insert the oscillator output into the "BUS IN" jack. Insert the detector input into the "BUS OUT" jack.
- Adjust the TB amplifier to obtain a −16 dBm reading at the detector.
- Adjust the TRMT amplifier until the serving central office receives the level indicated on the circuit layout card.
- Remove oscillator from the "BUS IN" jack.
- Request the serving central office to send the required 1000 Hz level and adjust the RCV amplifier until the detector in the "BUS OUT" jack reads −16 dBm.
- Remove all test equipment prior to placing the equipment in service.

5.05 The signal input to TOUCH-TONE receiver is adjusted as follows:

- Adjust 600Ω oscillator for 1000 Hz and set output for −0.5 dBm using a 600Ω detector.
- Insert oscillator in "BUS IN" jack of J53045A unit.
- Connect high impedance voltmeter across terminals 33 and 43 of TS(B) on J1G027A unit.
- Adjust R14 on J1G027A unit to indicate 1.33 to 1.37v on detector.
- Remove oscillator from "BUS IN" jack.



NOTE:
IN SERVICE, THE INPUT POWER TO THE RCV AMPLIFIER IS NOT FIXED. THE GAIN OF THE RCV AMPLIFIER IS ADJUSTED TO GIVE -16 DBM AT THE "BUS OUT" REGARDLESS OF THE INPUT POWER.

Fig. 8—Typical Transmission Lineup Diagram for SD-69566-01

- Simultaneously depress dial buttons 1 and 2 of a telephone set at that location.
- Detector should indicate 0.28 to 1.35v.
- Release dial buttons 1 and 2.
- Simultaneously depress dial buttons 6 and 9.
- Verify detector again reads 0.28 to 1.35v.
- Perform these same operations for each TOUCH-TONE set.
- Telephone sets that do not produce the required level should be replaced.

5.06 The privacy override lineup is required when one or more stations are equipped with privacy override at a location.

- Insert a 600Ω detector into the "BUS OUT" jack of SD-69566-01.
- Block any OV relay operated.
- Adjust the 227 amplifier on J1G027D unit to obtain a reading of −46 dBm on the detector.
- Unblocked the OV relay.
- Remove detector.

5.07 All stations on the entire system must be on-hook to perform the automatic clear lineup procedures.

- Adjust a 600Ω oscillator for 1000 Hz and set output for −40 dBm.
- Insert oscillator in "BUS IN" jack of SD-69566-01.
- On J1G027E unit set the TD and SENS potentiometer to the full counterclockwise position. The TD potentiometer remains in this position for normal operation.

- Place a buzzer (continuity checker) between ground and terminal 18 of TS(A).
- Turn SENS control clockwise until buzzer sounds.
- Remove oscillator from "BUS IN" jack.
- Buzzer silenced. If buzzer still sounds, repeat procedures.
- If buzzer does cease, reinsert oscillator in "BUS IN" jack and remove the buzzer from terminal 18.
- Turn the adjusting screw of the VT and TT timers on J1G027E unit fully counterclockwise.
- Turn adjusting screw on VT timer approximately 1/2 turn clockwise.
- Place buzzer between ground and terminal 17 of TS(A).
- Observe a clock with a sweep second hand and place a ground on terminal 38 on TS(A).
- Buzzer should sound 12±1 seconds after placing ground on TS(A) 38.
- If buzzer does not sound at the proper time, remove ground from TS(A) 38 and adjust control on VT.
- Continue placing ground on TS(A) 38 and adjusting VT until proper delay is obtained.
- Remove ground from TS(A) 38.
- Turn adjusting screw on TT timer approximately 1/4 turn clockwise.
- Observe clock and manually operate the lower half of the VAD relay on J1G027E unit.
- The buzzer will sound and the VAD relay will lock operated.
- The buzzer silenced 4±1 seconds after the manual operation of VAD relay.
- If the buzzer does not cease at the proper time, adjust the TT timer and J1G027E unit.
- Continue operating the relay and adjusting the TT timer until the proper time is obtained.
- Remove buzzer from TS(A) 17.
- Remove oscillator from "BUS IN" jack.
- Place a permanent strap from TS(A) terminals 13 to 23.

6. MAINTENANCE

6.01 The following test procedures are used to isolate a defective circuit pack when a trouble condition exists on the SS-3 System.

Insert 258-type plugs in the LINE IN and LINE OUT jacks of the J53045A unit before making any tests. This will prevent any interference of normal operation at the other locations.

6.02 Before performing any circuit pack tests, check the following:

- See Part 5 to test the transmit, receive and talk back amplifiers on J53045A unit.
- Depress a TOUCH-TONE button and visually observe a High and Low relay operate in the C3 receiver. See Fig. 9.
- Verify all required options and installer wiring is connected properly.

6.03 The following apparatus is required to perform the tests:

- KS-14510 VOM (or equivalent)
- 748A Tool (remove circuit packs)
- 3/4 amp GBA fuse Bussman Mfg. company (Fuse used in AR381 circuit pack)
- 1W13A cord consisting of No. 893 cord, 3 feet long E/W two No. 360A tools

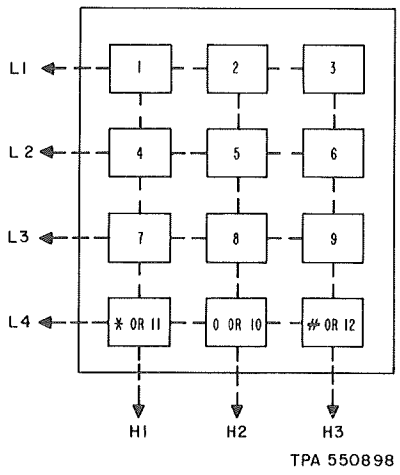


Fig. 9—Low and High Frequency Relays in the C-Type Receiver Associated With the 12-Button TOUCH-TONE Dial

- 624B Tool (Place on D5-type wire terminals)
- KS-6279 connecting clip (alligator clip)
- KS-16887,L1 Wedge (Block wire spring relays)
- 67C Set test E/W 2 ea. 624B Tool (Monitor tone tests)

The frame ground is applied for three seconds following each test (on privacy system only) to manually generate Automatic Disconnect tone which restores the circuit to normal.

6.04 ***DC to DC Converter Test:*** This test checks the 4.5 VDC output of the AR381 circuit pack. ***This test should be performed first for any troubles reported by the customer.***

(a) Using VOM place negative meter lead on frame ground and positive meter lead on pin 11 of the J3 connector on J1G027A unit.

(b) Meter should read in the range of 4.05 to 4.95 VDC.

(c) If proper reading is observed, proceed to the test procedure for the trouble indicated by the customer.

(d) If no indication is observed on meter and fuse is good, replace AR381 circuit pack.

(e) If fuse is open, see 6.06 before replacing fuse.

(f) If insufficient voltage is observed, see 6.05.

6.05 ***KS-20575 24VDC output test:***

(a) Using VOM place negative meter lead on frame ground and positive meter lead on pin one of J3 connector on J1G027A unit.

(b) Meter should read between 19.3 and 28 VDC.

(c) If proper reading is observed, proceed to test related to the trouble indicated by customer.

(d) If insufficient or no reading is observed, repair or replace KS-20575 rectifier.

6.06 ***Operated fuse on AR381 circuit pack:*** This test is used to determine if the AR381 circuit pack is defective or a problem exists in another circuit pack.

(a) Remove all AR circuit packs except the AR381.

(b) Replace fuse in the AR381 circuit pack.

(c) If fuse operates, replace AR381 and replace all AR circuit packs removed in step ***a.***

(d) If fuse does not operate, replace AR circuit packs one at a time. The circuit pack that causes the fuse to operate should be replaced.

6.07 ***Code relay Test:*** This test checks the circuit packs that provide the signal to operate the C relays on the J53045F unit.

A. C RELAY STAYS OPERATED

(a) Insulate 5 make contact of that *C* relay.

(b) Momentarily place frame ground on the RU lead associated with the operated C relay. (The RU leads are on the J1G027A TS(D) unit for the first eight stations and TS(C) of the J1G027B unit for 9 through 24).

(c) If the code relay releases, replace the associated AR537 (Non-Privacy) or AR538 (Privacy) circuit pack and remove insulator.

(d) If the C relay remains operated, replace the AR539 or AR540 circuit pack that is associated with the RU lead mentioned in step ***b.***

(e) Remove insulator from 5 make contact ***C*** relay.

(f) Place frame ground on pin 14 TS(A) on J1G027A unit for three seconds (privacy only).

6.08 ***Code relay will not operate:***

(a) Remove circuit pack AR537 (NONPRIVACY) or AR538 (PRIVACY).

(b) Momentarily place frame ground on the UD lead associated with the C relay that will not operate. (The UD leads are on the J1G027A TS(C) unit for the first eight stations and TS(B) of the J1G027B unit for 9 thru 24).

(c) If C relay on J53045F unit does not operate, replace circuit pack AR539 or AR540 connected to the UD lead in step ***b.***

(d) If C relay operates, replace circuit pack AR537 (NONPRIVACY) or AR538 (PRIVACY).

(e) Place frame ground on pin 14 TS(A) on J1G027A unit for a minimum of three seconds (privacy only).

6.09 ***DVP relay:*** This test checks the circuit packs which control the DVP relay on the privacy interface unit (J53045K).

A. DVP RELAY WILL NOT OPERATE

(a) Remove the AR539 or AR540 circuit pack(s) associated with leads PCD and GC used to control DVP relay.

(b) Remove circuit pack AR538.

(c) Place a momentary frame ground on SCR lead, pin 15 TS(B) on J1G027A unit.

(d) Place momentary frame ground on the ORD lead, pin 45 TS(B) on J1G027A unit.

(e) Manually operate the AP relay that is associated with the DVP relay.

(f) If the DVP relay does not operate, replace circuit pack AR541 associated with that DVP relay.

(g) If DVP relay operates

- Insert one AR539 or AR540 circuit pack removed in step ***a***.
- Place momentary frame ground sequentially on pin 15 TS(B) on J1G027A unit—Pin 44 TS(B) and pin 45 TS(B).

(h) Manually operate the AP relay associated with the DVP relay.

(i) If DVP relay does not operate, replace the AR539 or AR540 last inserted.

(j) Repeat steps ***g*** through ***i*** for remaining AR539 or AR540 circuit packs.

(k) If DVP relay operates each time step ***j*** is performed, replace circuit pack AR538, removed in step ***b.***

B. DVP RELAY OPERATED WHEN IT SHOULD BE RELEASED

(l) Perform steps ***a*** through ***c*** in Part A.

(m) Manually operate the AP relay that is associated with that DVP relay.

(n) If DVP relay operates, replace circuit pack AR541 associated with that DVP relay.

(o) If DVP relay does not operate,

- Insert one AR539 or AR540 circuit pack removed in step ***a.***
- Place momentary frame ground sequentially on pin 15 TS(B) on J1G027A unit—pin 45 TS(B) and the pin for UD lead associated with the station and that DVP relay.

(p) Manually operate the AP relay associated with that DVP relay.

(q) Repeat steps ***n*** through ***p*** for remaining AR539 or AR540 circuit packs.

(r) If DVP relay operates, replace AR539 or AR540 circuit pack last inserted in step ***o.***

(s) If DVP does not operate each time steps ***o*** through ***q*** are performed, replace AR538 circuit pack removed in section A step ***b.***

6.10 ***ORD tone test:*** This test checks the circuit packs that control the Originator Disconnect (ORD) tone.

A. ORD TONE IS NOT GENERATED BY ONE STATION

Note: Place 67C test set on pins 27 and 37 TS(A) on J53045A unit.

(a) If no tone is audible, replace circuit pack AR541 associated with that station.

B. ORD TONE GENERATED CONTINUOUSLY

(a) Remove circuit pack AR538.

(b) If ORD tone ceases, replace AR538.

(c) If tone is still audible, replace CP1 on J1G027D unit.

C. ORD TONE NOT TRANSMITTED WHEN ANY ORIGINATOR STATION GOES OFF-HOOK

(a) Observe ORD relay on CP1 on J1G027D unit.

(b) Manually operate one AP relay on J53045K unit.

(c) If ORD relay operates, replace CP2 on J1G027D unit.

(d) If ORD relay does not operate, place momentary frame ground on SODT lead pin 37 TS(A) on J1G027D unit.

(e) If ORD relay does not operate, replace CP1.

(f) If ORD relay operates:

- Remove all AR541 circuit packs.
- Place ground on OE lead, pin 35 of TS(B) on J1G027A unit.

(g) If ORD relay does not operate, replace circuit pack AR538.

(h) If ORD relay operates:

- Replace circuit pack AR541 (If more than one AR541, continue with step ***i).***

(i) Reinsert one AR541 circuit pack removed in step ***f.***

(j) Place a momentary frame ground on SCR lead, pin 27 TS(A) on J1G027C unit.

(k) Remove ground on SCR lead.

- Observe ORD relay on CP1.
- Operate each AP relay, one at a time, associated with that AR541 reinserted in step ***i.***
- Release AP relay for at least five seconds, and manually reoperate that AP relay.

(l) If the ORD relay does not operate each time the AP relay is operated in step ***k,*** replace that AR541 last inserted.

6.11 ***AD tone test:*** This test checks the circuit packs that generate the Automatic Disconnect (AD) tone.

Note: Place 67C test set on pins 27 and 37 TS(A) on J54045A unit.

A. AD TONE IS GENERATED CONTINUOUSLY

(a) Remove circuit pack AR538.

(b) If tone ceases, replace circuit pack AR538.

(c) If tone continues, replace CP1 on J1G027D unit.

(d) Reinsert AR538 removed in step ***b.***

B. AD TONE IS NOT GENERATED WHEN SOME STATIONS GO ON-HOOK BUT IS GENERATED BY OTHER STATIONS AT THAT LOCATION

(a) Replace circuit pack AR541 associated with station not generating AD tone.

C. AD TONE IS NOT GENERATED BY ANY ORIGINATING STATION AT A LOCATION

(a) While observing the AD relay on CP1 on J1G027D unit:

- Manually operate and release one AP relay associated with a station. The AP relay must be held operated a minimum of two seconds and remain unoperated for approximately five seconds.

(b) If AD relay operates, replace CP2 on J1G027D unit.

(c) If AD relay does not operate, place momentary frame ground on SADT lead pin 17, TS(A) of J1G027D unit.

(d) If AD relay does not operate, replace CP1.

(e) If AD relay operates:

- Remove all AR541 circuit packs.
- Place frame ground on OE lead pin 35, TS(B) (J1G027A unit) for approximately two seconds.

DO NOT REAPPLY FRAME GROUND ON THE OE LEAD FOR AT LEAST FIVE SECONDS.

(f) If AD relay does not operate, replace AR538 circuit pack.

(g) If AD relay operates, replace circuit pack AR541. See step ***h*** if there is more than one AR541.

(h) Reinsert one AR541 circuit pack removed in step ***e:***

- Place a momentary frame ground on SCR lead, pin 27 TS(A) on J1G027C unit.
- While observing the AD relay on CP1, manually operate and release each AP relay associated with the AR541 circuit pack inserted in step ***h.*** The AP relay should be operated for at least two seconds and remain unoperated for approximately five seconds. Manually operate each AP relay a minimum of two times.

(i) If the AD relay does not operate each time the AP relay is released in step ***h,*** replace the AR541 last inserted.

(j) Repeat step ***h*** for each remaining AR541 circuit pack.

6.12 ***ED relay test:*** This test checks the circuit packs that control the Enable Dial (ED) relay.

A. ED RELAY OPERATED CONTINUOUSLY OR DOES NOT OPERATE WHEN A STATION ASSOCIATED WITH THAT RELAY IS THE ORIGINATOR

(a) The DVP relay associated with the same station as the ED relay is functioning properly.

(b) If statement ***a*** is true, replace AR541 circuit pack.

(c) If statement ***a*** is false, perform steps in 6.09.

6.13 ***Busy and subdued tone test:*** This test checks the circuit pack that generates busy tone and subdued tone when override is used at a location.

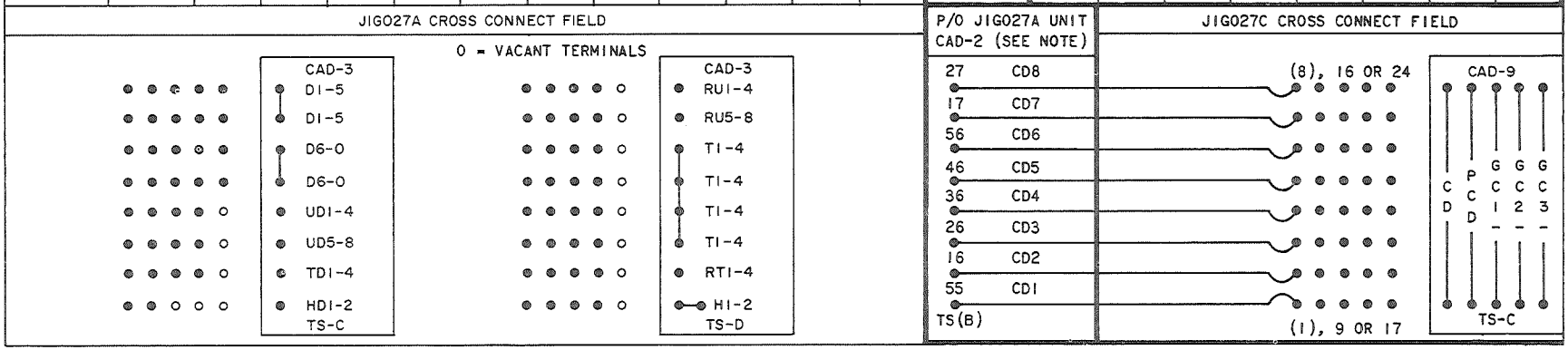
Note: Place 67C test set on pins 27 and 37 TS(A) on J53045A unit.

A. NO BUSY TONE AND/OR SUBDUED TONE WHEN ONE STATION OVERRIDES ANOTHER STATION

(a) Replace circuit pack A959 on J1G027D unit.

CODE			CODE CROSS CONNECTIONS ARROWS INDICATE THE SAME NUMERICAL VALUES ARE REQUIRED									
			JIG027A UNIT									
			TSC		TSC		TSD		TSC		TSD	
NUMERICAL ORDER OF CODE COLUMN Y	STATION CODE	GROUP CODE	D( )	HD( )	D( )	TD( )	H( )	RT( )	D ( )	UD( )	T( )	RU( )
1												
2												
3												
4												
5												
6												
7												
8												

NUMERICAL ORDER OF STATION COLUMN X	STATION SET TO STATION CODE		STATION SET TO GROUP CODE 1		STATION SET TO GROUP CODE 2		STATION SET TO GROUP CODE 3	
	JIG027C UNIT							
	TSC		TSC		TSC		TSC	
	PCD( )	CD( )	CD( )	GC1( )	CD( )	GC2( )	CD( )	GC3( )
1	1			1		1		1
2	2			2		2		2
3	3			3		3		3
4	4			4		4		4
5	5			5		5		5
6	6			6		6		6
7	7			7		7		7
8	8			8		8		8



NOTE:
THE CD LEADS MUST BE EXTENDED FROM CAD-2 TO CAD-9 WHEN PRIVACY IS REQUIRED. WHEN MORE THAN 8 CODES ARE REQUIRED, THE ADDITIONAL CD LEADS ARE RUN FROM CAD-5 TO ADDITIONAL CAD-9'S.

A. CODE CROSS CONNECTIONS (STATION OR GROUP)
(1) ESTABLISH THE DESIRED "HUNDREDS" CODE
CONNECT D(*) TO HD(1 OR 2)
* THE DESIRED "HUNDREDS" DIGIT
(2) ESTABLISH THE DESIRED "TENS" CODE
CONNECT D(*) TO TD(1,2,3, OR 4)
* THE DESIRED "TENS" DIGIT
(3) ASSOCIATE "HUNDREDS" CODE WITH THE "TENS" CODE
CONNECT H(1 OR 2)* TO RT(1,2,3, OR 4)**
* USE SAME NUMBER CHOSEN FOR HD( ) IN STEP 1
** USE SAME NUMBER CHOSEN FOR TD( ) IN STEP 2
(4) ESTABLISH THE DESIRED "UNITS" CODE
CONNECT D(*) TO UD(1,2,3,4,5,6,7, OR 8)
* THE DESIRED "UNITS" DIGIT
(5) ASSOCIATE "UNITS" CODE WITH THE DESIRED "HUNDREDS" AND "TENS" CODE
CONNECT T(1,2,3, OR 4)*TO RU(1,2,3,4, 5,6,7, OR 8)**
* USE SAME NUMBER CHOSEN FOR TD( ) IN STEP 2
** USE SAME NUMBER CHOSEN FOR UD( ) IN STEP 4

B. CROSS CONNECT STATION SET TO STATION CODE
(1) ASSOCIATE STATION SET WITH PROPER STATION CODE
CONNECT PCD(*) TO CD(**)
* NUMERICAL ORDER OF ASSIGNMENT OF STATION (COLUMN X)
** NUMERICAL ORDER OF ASSIGNMENT OF CODE (COLUMN Y)

C. CROSS CONNECT STATION SET TO STATION GROUP CODE
(1) ASSOCIATE STATION SET WITH PROPER GROUP CODE
CONNECT CD(*) TO GC(**-***)
* NUMERICAL ORDER OF CODE ASSIGNMENTS AT LOCATION
** ASSIGNMENT OF GROUP CODE 1,2, OR 3 ASSIGNED TO THIS STATION
*** NUMERICAL ORDER OF ASSIGNMENT OF STATION (SAME AS PCD(*)).

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Fig. 10—Cross Connection Table