

SINGLE-FREQUENCY SIGNALING SYSTEM
SIGNALING TESTS
TYPES E AND F
USING 2B SIGNALING TEST SET (J64730)

1. GENERAL

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1.01 This section describes procedures for making pulsing and supervisory tests on single-frequency (SF) signaling systems using the 2B or 2B-1 signaling test set SD-56134-02 (J64730) and its associated pulse-repeating (loop) adapter circuit. This section also provides the terminating end procedures required (using the 2B test set) when assisting the originating end performing Tests A, B, and C.

test checks pulsing of SF signaling systems when the SF signaling unit at the originating end requires loop pulsing and the desired input test values can be obtained from the signaling test set.

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1.02 This section is reissued to make the section compatible with 179-302-502, to cover all arrangements using a 2B signaling test set at one end and a 4A signaling test set at the other end. Part 5, Terminating End Procedures AA, AB, and AC are added.

A2. Loop-Pulsing With Adapter at Originating End—Method 2: This test checks pulsing of SF signaling systems when the SF signaling unit at the originating end requires loop pulsing and the desired input test values are more than can be achieved using Method 1.

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This reissue does not affect the Equipment Test List.

B1. Pulsing on M Lead at Originating End—Method 1: This test checks pulsing of SF signaling systems when the SF signaling unit at the originating end requires M lead pulsing and the desired input test values can be obtained from the signaling test set.

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1.03 Two methods of procedure are given for performing Tests A and B. **Method 1** is based on the usual manner of connecting and operating the signaling test equipment at the originating end. This method should be used for all tests except where input percent break values are too high to be obtained from the test set. In this case Method 2 should be used. **Method 2** should be used if the desired input test value is greater than 75 percent break and, as sometimes happens with some test sets, cannot be obtained from the test set by Method 1. The percent break of the pulses applied to the circuit under test is the same in both methods if other conditions are the same.

B2. Pulsing on M Lead at Originating End—Method 2: This test checks pulsing of SF signaling systems when the SF signaling unit at the originating end requires M lead pulsing and the desired input test values are more than can be achieved using Method 1.

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1.04 The tests covered are:

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A1. Loop-Pulsing With Adapter at Originating End—Method 1: This

C. Supervisory and Miscellaneous Tests—E&M Units Only: This test checks the supervision during the idle, seizure, answer, and pulsing conditions. It also checks miscellaneous functions of the SF units. This test is intended to be made at the signaling unit location.

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◆Terminating end procedures:	
AA. Receiving On Loop:	13
AB. Receiving On E Lead:	14
AC. Supervisory and Miscellaneous Tests—E&M Units Only: ◆	14

1.05 ◆Tests A, B, and C in this section require assistance at the terminating end. Since it is possible to use either the 2B or the 4A signaling test set at the terminating end and the procedures for connecting and setting up the two test sets are quite different, no attempt is made to provide terminating end connection procedures in Tests A, B, and C. These terminating end procedures are written separately as AA, AB, and AC in this section if the 2B test set is used and as AA, AB, and AC in Section 179-302-502 if the 4A test set is used at the terminating end. The assistant at the terminating end should obtain the proper section to make the initial set-up. From that point on the test is under the control of the originating end as provided in Tests A, B, and C.◆

1.06 ◆Table A contains minimum and maximum input and output test limits applicable to various combinations of SF units for 8 and 12 pulses-per-second. The values listed may be used with any combination of test sets—that is, originating 4A and terminating 2B or originating 2B and terminating 4A or originating 2B and terminating 2B.◆

1.07 The single-frequency signaling circuit is referred to in this section as an SF unit.

1.08 The 2B-1 set is a 2B set modified for use with the adapter. Either the 2B or 2B-1 may be used without the adapter. Only the 2B-1 set should be used when the adapter is required, since the combination of the adapter and the unmodified 2B set may give incorrect values.◆Where a test specifies the use of the 2B set, the 2B or 2B-1 set may be used.◆

1.09 Percent break adjustments of the 2B test set should be made slowly to prevent pulsing out incorrect values. Incorrect values will be indicated if the rate of vibration of the PERCENT BREAK meter pointer is not the same as that of

the PULSES PER SECOND meter pointer. To restore correct percent break values, turn the ADJ % BK control counterclockwise until both pointers are vibrating at the same rate; then turn the control more slowly clockwise until the desired percent break value is obtained. It may also be necessary to change the coarse ADJ % BK switch from S, M, or L setting to obtain desired range on the PERCENT BREAK meter.

1.10 The resistance of the E and M lead connections between the SF unit and the signaling test set should not exceed 25 ohms for E-type units because of M lead limitations. For type F units the M lead limitation is a maximum of 1000 ohms.

1.11 Perform Test C without application of the 1000-Hz tone if -16 dBm 600Ω is not available. These tone values are for application at the SF unit location.

1.12 Test C can be performed only on E and M signaling units.

1.13 The test of the cross-control cut in Test C cannot be performed on E1A or E1B units unless these units are equipped with transmission path cut circuit SD-99778-01.

1.14 The connections required at the originating and terminating ends of the SF system for each type SF unit are given in the figures in this section.

1.15 To make certain that service will not be interrupted, monitor the originating and terminating SF units by means of a high-impedance bridged monitoring arrangement before removing either unit from its in-service position or making any other test connection to it. For an E-type SF unit, use bay-mounted monitoring circuit SD-96519-02 per Section 179-314-501. For Type F SF unit, use a 1023A headset equipped with a 354A plug and connect it to the LINE RCV and LINE TRMT pin jacks on the face of the SF unit.

1.16 All tests in this section assume that the transmission requirements of the trunk are satisfied.

1.17 A signaling link over which all pulsing is MF only requires tests at 8pps only (Tests *c* and *d* in Table A).

1.18 Lettered Steps: A letter a, b, c, etc, added to a step number in Part 3 or 4 of this section indicates an action which may or may not be required depending upon local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

2. APPARATUS

2.01 Monitoring circuit per SD-96519-02 and operators headset (E-type SF units) or a 1023A headset equipped with a 345A plug (Type F SF units); see 1.15.

3. PREPARATION

STEP

ACTION

VERIFICATION

Note: Good measurements depend upon the accuracy of the following pretest adjustments and upon the internal calibration of the 2B or 2B-1 test set. See Section 100-263-501 for calibration procedure.

All Tests

Note: Set-up procedures for the terminating end are found in AA, AB, and AC of this section for the 2B test set and Section 179-302-502 for the 4A test set.

- 1 Make busy the circuit associated with SF unit to be tested.

Note: If testing on an E1R unit normally arranged for A and B lead control, the loop must be open to assure proper testing over the M lead, as provided in this section.

- 2 At 2B or 2B-1 test set—
Set all keys to normal position.
- 3 Set SCALE SEL switch to PPS.
- 4 Connect 2B test set to TST BAT jacks.
- 5 Operate CONT PLS key to DIAL PLS.

2.02 2B or 2B-1 signaling test set (SD-56134-02).

2.03 258D (dummy) plug.

2.04 Pulse repeating adapter (SD-56134-02).

2.05 E-type extender (SD-99384-01).

2.06 Type F extender (SD-1C241-01 for FWA units only or SD-1C241-02 for any Type F unit)

2.07 Test C only: Source of 1000-Hz tone -16 dBm or lower level.

2.08 Patching and testing cords as required per Fig. 1 through 6.

PERCENT BREAK meter indicates 0 on *black* scale.
See Step 6a.

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STEP	ACTION	VERIFICATION
6a	If requirement of Step 5 is not met— Adjust pointer adjustment screw of PERCENT BREAK meter to obtain 0 indication.	
7	Insert 258D plug into P jack.	PERCENT BREAK meter indicates 100 on <i>black</i> scale. See Step 8b.
8b	If requirement of Step 7 is not met— Unlock CAL % BK control, adjust to obtain reading of 100, and relock control taking care not to change 100 reading.	
9	Remove 258D plug. <i>Note:</i> Repeat Steps 7 through 9 if test extends beyond 30 minutes.	
10	Restore CONT PLS key to normal.	

Tests A1, A2, B1, and B2

- 11 Make test connections as shown on the appropriate figures.
- 12 At 2B or 2B-1 test set—
Set ADJ % BK switch to M.
- 13 Operate OG-BG key to BG.

4. METHOD

STEP	ACTION	VERIFICATION
A1. Loop Pulsing With Adapter—Method 1 (Fig. 1)		
	<i>Note:</i> See 1.03.	
14	At adapter— Operate FUNCTION switch to P/C; turn ADJ REC LOOP potentiometer fully counterclockwise to OUT; set LEAK switch to SF1; and operate all SEND LOOP keys to OUT.	
15	At 2B-1 test set— Adjust ADJ PPS control to 12 pps on PULSES PER SECOND meter (0 to 20 scale).	
16	Operate TWD L key to OFF HK.	
17	Operate PLS and MEAS % BK keys to LINE.	

STEP	ACTION	VERIFICATION
18	Adjust ADJ % BK control fully counterclockwise.	
19	Adjust ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value given in Table A, sub-test <i>a</i> under heading of INPUT TEST VALUES. It may be necessary to switch coarse ADJ % BK switch of 2B-1 test set to "S" or "L" to obtain desired percent break values. <i>Note:</i> The percent break adjustment of the 2B-1 test set is now compensated for any distortion that may be present in the adapter. Do not change this adjustment without repeating Steps 16 through 21.	
20	At adapter— Set FUNCTION switch to LP1.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or greater than the value given in Table A, sub-test <i>a</i> under heading of OUTPUT TEST LIMIT.
21	Set FUNCTION switch to P/C position; set LEAK switch to OUT; and operate 100, 200, 400, and 800 SEND LOOP keys to IN.	
22	At 2B-1 test set— Adjust ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value given in Table A, sub-test <i>b</i> under heading of INPUT TEST VALUES. <i>Note:</i> The percent break adjustment of the 2B-1 test set is now compensated for any distortion that may be present in the adapter. Do not change this adjustment without repeating Steps 16 through 21.	
23	At adapter— Set FUNCTION switch to LP1.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or less than the value given in Table A, sub-test <i>b</i> under heading of OUTPUT TEST LIMIT.
24	Set FUNCTION switch to P/C; set LEAK switch to SF1; and operate all SEND LOOP keys to OUT.	
25	At 2B-1 test set— Adjust ADJ PPS control to 8 pps on PULSES PER SECOND meter.	

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STEP	ACTION	VERIFICATION
26	Adjust ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value given in Table A, sub-test <i>c</i> under heading of INPUT TEST VALUES.	
27	At adapter— Set FUNCTION switch to LP1.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or greater than the value given in Table A, sub-test <i>c</i> under heading of OUTPUT TEST LIMIT.
28	Set FUNCTION switch to P/C; set LEAK switch to OUT; and operate 100, 200, 400, and 800 SEND LOOP keys to IN.	
29	At 2B-1 test set— Adjust the ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value given in Table A, sub-test <i>d</i> under heading of INPUT TEST VALUES.	
30	At adapter— Set FUNCTION switch to LP1.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or less than the value given in Table A, sub-test <i>d</i> under heading of OUTPUT TEST LIMIT.
31c	If no further tests are to be made— Remove all cords, restore all keys and return trunk to service.	

A2. Loop Pulsing With Adapter—Method 2 (Fig. 2)

Note: See 1.03.

- 14 At adapter—
Operate FUNCTION switch to P/C; turn ADJ REC LOOP potentiometer fully counterclockwise to OUT; set LEAK switch to SF1; and operate all SEND LOOP keys to OUT.
- 15 At 2B-1 test set—
Adjust ADJ PPS control to 12 pps on PULSES PER SECOND meter (0 to 20 scale).
- 16 Operate TWD D key to OFF HK.
- 17 Operate PLS and MEAS % BK keys to DROP.
- 18 Adjust ADJ % BK control fully counterclockwise.

STEP	ACTION	VERIFICATION
19	Adjust ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value given in Table A, sub-test <i>a</i> under heading of INPUT TEST VALUES. <i>Note:</i> It may be necessary to switch coarse ADJ % BK switch of 2B-1 test set to "S" or "L" to obtain desired percent break values. The percent break adjustment of the 2B-1 test set is now compensated for any distortion that may be present in the adapter. Do not change this adjustment without repeating Steps 16 through 21.	
20	At adapter— Set FUNCTION switch to LP1. <i>Note:</i> If requirement of this step is not met, momentarily operate TWD D key to ON HK then restore to OFF HK.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or greater than the value given in Table A, sub-test <i>a</i> under heading of OUTPUT TEST LIMIT.
21	Set FUNCTION switch to P/C; set LEAK switch to OUT; and operate 100, 200, 400, and 800 SEND LOOP keys to IN.	
22	At 2B-1 test set— Adjust ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value given in Table A, sub-test <i>b</i> under heading of INPUT TEST VALUES.	
23	At adapter— Set FUNCTION switch to LP1.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or less than the value given in Table A, sub-test <i>b</i> under heading of OUTPUT TEST LIMIT.
24	Set FUNCTION switch to P/C; set LEAK switch to SF1; and operate all SEND LOOP keys to OUT.	
25	At 2B-1 test set— Adjust ADJ PPS control to 8 pps on PULSES PER SECOND meter.	
26	Adjust ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value given in Table A, sub-test <i>c</i> under heading of INPUT TEST VALUES.	
27	At adapter— Set FUNCTION switch to LP1.	At terminating end— PERCENT BREAK indication on <i>red</i> scale

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STEP	ACTION	VERIFICATION
28	Set FUNCTION switch to P/C; set LEAK switch to OUT; and operate 100, 200, 400, and 800 SEND LOOP keys to IN.	equal to or greater than the value given in Table A, sub-test <i>c</i> under heading of OUTPUT TEST LIMIT.
29	At 2B-1 test set— Adjust ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value given in Table A, sub-test <i>d</i> under heading INPUT TEST VALUES.	
30	At adapter— Set FUNCTION switch to LP1.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or less than the value given in Table A, sub-test <i>d</i> under heading of OUTPUT TEST LIMIT.
31c	If no further tests are to be made— Remove all cords, restore all keys and return trunk to service.	
B1. Pulsing on M Lead—Method 1 (Fig. 3)		
<i>Note:</i> See 1.03.		
14	At 2B or 2B-1 test set— Adjust ADJ PPS to 12 pps on PULSES PER SECOND meter (0 to 20 scale).	
15	Adjust ADJ % BK control fully counterclockwise.	
16	Adjust ADJ % BK control to obtain on <i>black</i> scale of PERCENT BREAK meter the percent break value given in Table B, sub-test <i>a</i> under heading of INPUT TEST VALUES.	
<i>Note:</i> It may be necessary to switch coarse ADJ % BK switch to S or L position to obtain desired percent break values.		
17	Operate TWD L key to OFF HK and PLS key to LINE.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or greater than the value given in Table B, sub-test <i>a</i> under heading of OUTPUT TEST LIMIT.
18	Restore PLS key to normal.	

STEP	ACTION	VERIFICATION
19	Adjust ADJ % BREAK meter the percent break value given in Table B sub-test <i>b</i> under heading of INPUT TEST VALUES.	
20	Operate PLS key to LINE.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or less than the value given in Table B, sub-test <i>b</i> under heading of OUTPUT TEST LIMIT.
21	Restore PLS key to normal.	
22	Adjust ADJ PPS control to 8 pps on PULSES PER SECOND meter.	
23	Adjust ADJ % BK control to obtain on <i>black</i> scale of PERCENT BREAK meter the percent break value given in Table B, sub-test <i>c</i> under heading of INPUT TEST VALUES.	
24	Operate PLS key to LINE.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or greater than the value given in Table B, sub-test <i>c</i> under heading of OUTPUT TEST LIMIT.
25	Restore PLS key to normal.	
26	Adjust ADJ % BK control to obtain on <i>black</i> scale of PERCENT BREAK meter the percent break value as given in Table B, sub-test <i>d</i> under heading of INPUT TEST VALUES.	
27	Operate PLS key to LINE.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or less than the value given in Table B, sub-test <i>d</i> under heading of OUTPUT TEST LIMIT.
28	Restore PLS key to normal.	
29c	If no further tests are to be made— Remove all cords, restore all keys, and return trunk to service.	

B2. Pulsing on M Lead—Method 2 (Fig. 4)

Note: See 1.03.

- 14 At 2B or 2B-1 test set—
Adjust ADJ PPS to 12 pps on PULSES PER SECOND meter (0 to 20 scale).

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STEP	ACTION	VERIFICATION
15	Adjust ADJ % BK control fully counterclockwise.	
16	Adjust ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value given in Table B, sub-test <i>a</i> under heading of INPUT TEST VALUES. <i>Note:</i> It may be necessary to switch coarse ADJ % BK switch to "S" or "L" position to obtain desired percent break values.	
17	Operate TWD D key to OFF HK and PLS key to DROP.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or greater than the value given in Table B, sub-test <i>a</i> under heading of OUTPUT TEST LIMIT.
18	Restore PLS key to normal.	
19	Adjust ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value given in Table B, sub-test <i>b</i> under heading of INPUT TEST VALUES.	
20	Operate PLS key to DROP.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or less than the value given in Table B, sub-test <i>b</i> under heading of OUTPUT TEST LIMIT.
21	Restore PLS key to normal.	
22	Adjust ADJ PPS control to 8 pps on PULSES PER SECOND meter.	
23	Adjust ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value given in Table B, sub-test <i>c</i> under heading of INPUT TEST VALUES.	
24	Operate PLS key to DROP.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or greater than the value given in Table B, sub-test <i>c</i> under heading of OUTPUT TEST LIMIT.
25	Restore PLS key to normal.	
26	Adjust ADJ % BK control to obtain on <i>red</i> scale of PERCENT BREAK meter the percent break value as given in Table B, sub-test <i>d</i> under heading of INPUT TEST VALUES.	

STEP	ACTION	VERIFICATION
27	Operate PLS key to DROP.	At terminating end— PERCENT BREAK indication on <i>red</i> scale equal to or less than the value given in Table B, sub-test <i>d</i> under heading of OUTPUT TEST LIMIT.
28	Restore PLS key to normal.	
29c	If no further tests are to be made— Remove all cords, restore all keys, and return trunk to service.	

C. Supervisory and Miscellaneous Tests (Fig. 3 or 4)—E&M Units Only

Supervision

14	At originating 2B or 2B-1 test set— Place all keys in normal position.	At terminating end— L lamp lighted (2B test set) or LINE lamp lighted (4A test set).
15	At originating 2B or 2B-1 test set— Operate TWD L key to OFF HK.	At terminating end— L lamp extinguished (2B test set) on LINE lamp extinguished (4A test set).
16	At originating 2B or 2B-1 test set— Restore all keys to normal position.	At terminating end— L lamp lighted (2 B test set) or LINE lamp lighted (4A test set).

High Level Tone and Transmission Cut Circuits

Note: See 1.11 through 1.13 and 1.15.

17	At SF unit— Connect 1000-Hz tone to SF-ET jack (type F) or SF-ET/2W jack (E-type) of test extender.	
18c	For E-type signaling— Connect operators headset through monitoring circuit to monitor LINE XMT jack.	
19d	For type F signaling— Connect 1023A headset to LINE TRMT pin jacks of SF unit.	
20	At originating and terminating test sets— Operate TWD L key (or TWD LINE key on 4A test set) to OFF HK.	On test receiver or headset at originating end— 1000-Hz tone heard.
21	At originating 2B or 2B-1 test set— Operate TWD L key to ON HK.	On test receiver or headset at originating end— 1000-Hz tone cut off and 2600-Hz tone comes

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STEP	ACTION	VERIFICATION
		on at high level. After about 1/2 second, 2600-Hz tone drops to normal low level and 1000-Hz tone is restored.
22	At terminating test set— Operate TWD L key (or TWD LINE key on 4A test set) to ON HK.	On test receiver or headset at originating end— 1000-Hz tone cut off, then either remains cut off or is restored after about 1/2 second. 2600-Hz remains at low level throughout.
23	At SF unit— Remove test receiver or headset monitoring connections.	

Terminating End Broadbanding

24	At originating and terminating test sets— Operate TWD L key (or TWD LINE key on 4A test set) to OFF HK.	On test receiver or headset at terminating end— 1000-Hz tone heard. At terminating end— L lamp (2B test set) or LINE lamp (4A test set) extinguished.
25	At originating 2B or 2B-1 test set— Operate TWD L key to ON HK.	On test receiver or headset at terminating end— 1000-Hz tone cut off and high level spurt of 2600-Hz tone heard. 1000-Hz tone restored after about 1/2 second. 2600-Hz tone remains cut off or at very low level after initial high level spurt. At terminating test set— L lamp (2B test set) or LINE lamp (4A test set) lighted and remains lighted.
26	At originating end— Remove 1000-Hz tone.	
27	At terminating end— Remove monitoring circuit connections or 1023A headset.	

Flashing and Rering Test (for circuits that provide flashing and rering)

28	At originating 2B or 2B-1 test set— Operate ADJ % BK switch to M.	
29	Operate ADJ PPS control to 5 PPS on meter (0 to 20 scale).	

STEP	ACTION	VERIFICATION
30	Operate AJD % BK control fully counterclockwise, then clockwise until percent break meter indicates 50 on <i>black</i> scale.	
31	Operate TWD L key to OFF HK and PLS key to LINE.	At terminating end— PERCENT BREAK indication on <i>red</i> scale between 40 and 60.
32e	If no further tests are to be made— Remove all cords, restore all keys and return trunk to service.	

5. TERMINATING END PROCEDURES

Procedures AA, AB, and AC

Note: These procedures AA, AB, and AC are required when the user of this section is requested to provide assistance in performing overall pulsing tests that are being originated at the distant end using Tests A, B, or C of either this section or Section 179-302-502. Procedures AA, AB, and AC provide the terminating end set-up for Tests A, B, and C, respectively.

- 1 Make busy the circuit associated with SF unit to be tested.

Note: If testing on an E1R unit normally arranged for A and B lead control, the loop must be open to assure proper testing over the M lead, as provided in this section.

- 2 At 2B test set—
Place all keys in normal position.
- 3 Connect 2B test set to TST BAT power jacks.
- 4 Unplug SF signaling unit associated with circuit to be tested from bay jack.
- 5 Insert proper extender between SF signaling unit and bay jack.

AA. Receiving on Loop

- 6 Connect E jack of 2B or 2B-1 to adapter E1 jack and adapter R jack to extender per Fig. 5.

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STEP	ACTION	VERIFICATION
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7	At adapter— Set FUNCTION switch to LP2.	
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8	At 2B or 2B-1 test set— Operate MEAS % BK key to LINE.	
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Note: The percent break of the pulses received on the loop can now be measured. Line supervision can be observed by restoring the MEAS % BK key to normal.

9	After tests are completed— Restore all circuits to normal.	
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AB. Receiving on E Lead

6	Connect L jack or E jack of 2B or 2B-1 to circuit under test per Fig. 6.	
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7	At 2B test set— Operate MEAS % BK key to LINE.	
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Note: The percent break of the pulses received on the E lead can now be measured. Line supervision can be observed by restoring the MEAS % BK key to normal.

8	After tests are completed— Restore all circuits to normal.	
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AC. Supervisory and Miscellaneous Tests—E&M Units Only

6	Connect L jack or E jack of 2B or 2B-1 to circuit under test per Fig. 6.	
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7a	For E-type signaling units— Connect head telephone set to MON OUT TEL SET jacks of monitoring circuit (SD-96519).	
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8a	Using a 3P7A cord, patch from LINE REC jack to AMPL IN jack on monitoring circuit.	
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9a	Using P8E monitoring cord, patch from S1 connector of monitoring circuit to the S connector of the SF unit under test.	
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10b	For type F signaling units— Connect 1023A headset to LINE RCV pin jack of SF unit under test.	
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STEP	ACTION	VERIFICATION
11c	For measuring pulses on E lead— Operate MEAS % BK key to LINE.	
12d	For observing line supervision via L lamp— Operate MEAS % BK key to center position.	
13	After tests are completed, restore all circuits to normal.	

TABLE A

TYPE OF UNIT			TEST	ORIGINATING SF UNIT INPUT TEST VALUES			TERMINATING SF UNIT OUTPUT TEST LIMITS IN % BK	
ORIG	TERM	PPS		% BREAK ON M LEAD	% BREAK ON LOOP	ON E LEAD	ON LOOP	
1.	E () B E1A	E () B E1A	a	12	58		51	
			b	12	67		71	
			c	8	40		33	
			d	8	74		74	
2.	E () B E1A	E2D E4D E5D	a	12	54			56
			b	12	73			82
			c	8	41			38
			d	8	83			82
3.	E () B	E2L	a	12	57			56
			b	12	73			87
			c	8	41			35
			d	8	83			88
4.	E () B	E1P (3)	a	12	53		44	
			b	12	73		55	
			c	8	36		45	
			d	8	81		57	
5.	E () B E1A	FWA FA () FB ()	a	12	53		52	
			b	12	70		84	
			c	8	36		34	
			d	8	78		92	
6.	E () B E1A	FDA	a	12	53			49
			b	12	72			95
			c	8	36			32
			d	8	72			95
7.	E () B E1A	FDB FL () FPA	a	12	53		50*	47
			b	12	73		62*	72
			c	8	36		51*	49
			d	8	81		61*	71

* These values apply only to the E1R, E1P, FRA, and FPA units. When testing these units, measurements should be made on their E leads and pulsing applied to their M leads. A and B lead operation with the 2B loop adapter is not recommended.

TABLE A (Cont)

TYPE OF UNIT			TEST	ORIGINATING SF UNIT INPUT TEST VALUES			TERMINATING SF UNIT OUTPUT TEST LIMITS IN % BK	
ORIG	TERM	PPS		% BREAK ON M LEAD	% BREAK ON LOOP	ON E LEAD	ON LOOP	
8.	E2C E4C	E () B E1A	a	12		42	51	
			b	12		70	71	
			c	8		31	33	
			d	8		77	74	
9.	E2C E4C	E2D E4D E5D	a	12		42		56
			b	12		70		82
			c	8		31		36
			d	8		77		82
10.	E2C E4C E2S	FWA FA () FB ()	a	12		42	52	
			b	12		70	77	
			c	8		31	34	
			d	8		77	87	
11.	E2C E4C	FDA	a	12		42		49
			b	12		70		89
			c	8		31		32
			d	8		73		95
12.	E2C	FDB	a	12		42		47
			b	12		70		72
			c	8		31		49
			d	8		77		71
13.	E2S	E2L	a	12		42		56
			b	12		70		87
			c	8		31		35
			d	8		77		88
14.	E2S	E1P	a	12		42	44	
			b	12		70	55	
			c	8		31	45	
			d	8		77	57	

TABLE A (Cont)

TYPE OF UNIT			TEST	ORIGINATING SF UNIT INPUT TEST VALUES			TERMINATING SF UNIT OUTPUT TEST LIMITS IN % BK	
ORIG	TERM	PPS		% BREAK ON M LEAD	% BREAK ON LOOP	ON E LEAD	ON LOOP	
15.	E2S	FL () FPA	a	12		42	50*	47
			b	12		70	62*	72
			c	8		31	51*	49
			d	8		77	61*	71
16.	E1R FS () FRA	E2L	a	12	28*	32		56
			b	12	75*	72		87
			c	8	28*	32		35
			d	8	83*	82		88
17.	E1R FS () FRA	E1P	a	12	28*	32	44	
			b	12	75*	72	55	
			c	8	28*	32	45	
			d	8	83*	82	57*	
18.	E1R FS () FRA	FWA FA () FB ()	a	12	28*	32	52	
			b	12	75*	72	84	
			c	8	28*	32	34	
			d	8	83*	82	92	
19.	E1R FS () FRA	FL () FPA	a	12	28*	32	50*	47
			b	12	75*	72	62*	72
			c	8	28*	32	51*	49
			d	8	85*	82	61*	71
20.	FWA FWB	E () B E1A	a	12	56		51	
			b	12	69		71	
			c	8	38		33	
			d	8	76		74	
21.	FWA FWB	E2D E4D E5D	a	12	52			56
			b	12	71			80
			c	8	39			38
			d	8	79			80

* These values apply only to the E1R, E1P, FRA, and FPA units. When testing these units, measurements should be made on their E leads and pulsing applied to their M leads. A and B lead operation with the 2B loop adapter is not recommended.

TABLE A (Cont)

TYPE OF UNIT			TEST	ORIGINATING SF UNIT INPUT TEST VALUES			TERMINATING SF UNIT OUTPUT TEST LIMITS IN % BK	
ORIG	TERM	PPS		% BREAK ON M LEAD	% BREAK ON LOOP	ON E LEAD	ON LOOP	
22.	FWA FWB	E2L	a	12	57			56
			b	12	71			87
			c	8	41			35
			d	8	79			88
23.	FWA FWB	E1P	a	12	53		44	
			b	12	71		55	
			c	8	36		45	
			d	8	79		57	
24.	FWA FWB	FWA FA () FB ()	a	12	53		52	
			b	12	71		80	
			c	8	36		34	
			d	8	79		88	
25.	FWA FWB	FDA	a	12	53			49
			b	12	71			92
			c	8	36			32
			d	8	74			95
26.	FWA FWB	FDB FL () FPA	a	12	53		50*	47
			b	12	71		62*	72
			c	8	36		51*	49
			d	8	79		61*	71
27.	E () B, E1A, FW () with MPC; FA (), FB ()	E () B E1A	a	12	25		51	
			b	12	81		71	
			c	8	25		33	
			d	8	86		74	
28.	E () B, E1A, FW () with MPC; FA (), FB ()	E2D E4D E5D	a	12	25			56
			b	12	81			82
			c	8	25			38
			d	8	86			82

* These values apply only to the E1R, E1P, FRA, and FPA units. When testing these units, measurements should be made on their E leads and pulsing applied to their M leads. A and B lead operation with the 2B loop adapter is not recommended.

TABLE A (Cont)

TYPE OF UNIT			TEST	ORIGINATING SF UNIT INPUT TEST VALUES			TERMINATING SF UNIT OUTPUT TEST LIMITS IN % BK	
ORIG	TERM	PPS		% BREAK ON M LEAD	% BREAK ON LOOP	ON E LEAD	ON LOOP	
29.	E () B, FW () with MPC; FA (), FB ()	E2L	a	12	25		56	
			b	12	81		87	
			c	8	25		35	
			d	8	86		88	
30.	E () B, FW () with MPC; FA (), FB ()	E1P	a	12	25		44	
			b	12	81		55	
			c	8	25		45	
			d	8	86		57	
31.	E () B, E1A, FW () with MPC; FA (), FB ()	FWA FA () FB ()	a	12	25		52	
			b	12	81		80	
			c	8	25		34	
			d	8	86		88	
32.	E () B, E1A, FW () with MPC; FA (), FB ()	FDA	a	12	25		49	
			b	12	81		92	
			c	8	25		32	
			d	8	86		95	
33.	F () B, FW () with MPC, FA (), FB ()	FDB FL () FPA	a	12	25		50*	
			b	12	81		62*	
			c	8	25		51*	
			d	8	86		61*	
34.	FCA	E () B E1A	a	12		36	51	
			b	12		72	75	
			c	8		26	33	
			d	8		74	73	
35.	FCA	E2D E4D E5D	a	12		36	56	
			b	12		72	81	
			c	8		26	38	
			d	8		80	83	

* These values apply only to the E1R, E1P, FRA, and FPA units. When testing these units, measurements should be made on their E leads and pulsing applied to their M leads. A and B lead operation with the 2B loop adapter is not recommended.

TABLE A (Cont)

TYPE OF UNIT			TEST	ORIGINATING SF UNIT INPUT TEST VALUES			TERMINATING SF UNIT OUTPUT TEST LIMITS IN % BK	
ORIG	TERM	PPS		% BREAK ON M LEAD	% BREAK ON LOOP	% BREAK ON E LEAD	% BREAK ON LOOP	
36.	FCA	FWA	a	12		36	52	
		FA ()	b	12		72	82	
		FB ()	c	8		26	34	
			d	8		80	92	
37.	FCA	FDA	a	12		36		49
			b	12		72		94
			c	8		26		32
			d	8		71		95
38.	FCA	FDB	a	12		36		47
			b	12		72		72
			c	8		26		49
			d	8		80		71
39.	FS () FRA	FL () FPA	a	12	25*	30	50*	47
			b	12	76*	73	62*	72
			c	8	18*	30	51*	49
			d	8	85*	82	61*	71
40.	E1J FWB	E1J FWB	a	5	50		42 min 58 max	

* These values apply only to the E1R, E1P, FRA, and FPA units. When testing these units, measurements should be made on their E leads and pulsing applied to their M leads. A and B lead operation with the 2B loop adapter is not recommended.

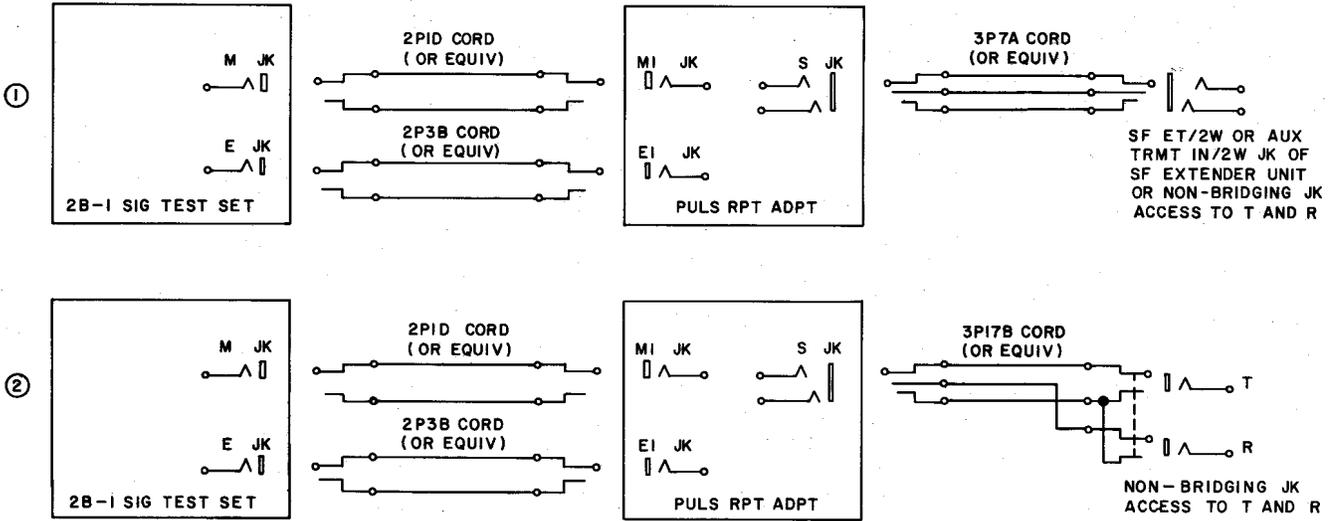


Fig. 1—Test A1—Sending On Loop

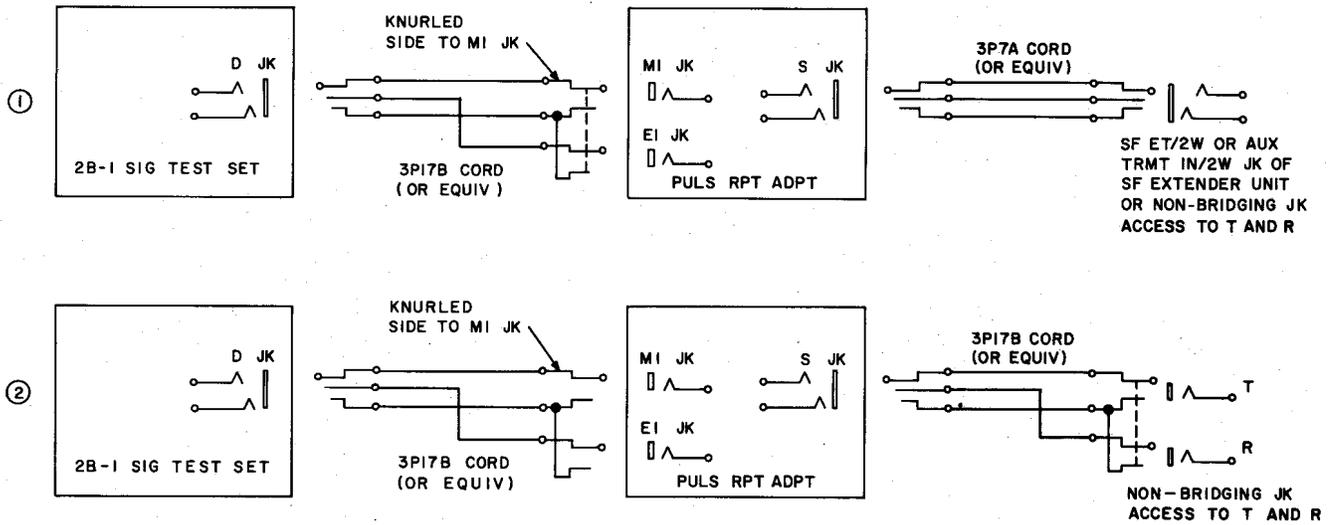


Fig. 2—Test A2—Sending On Loop

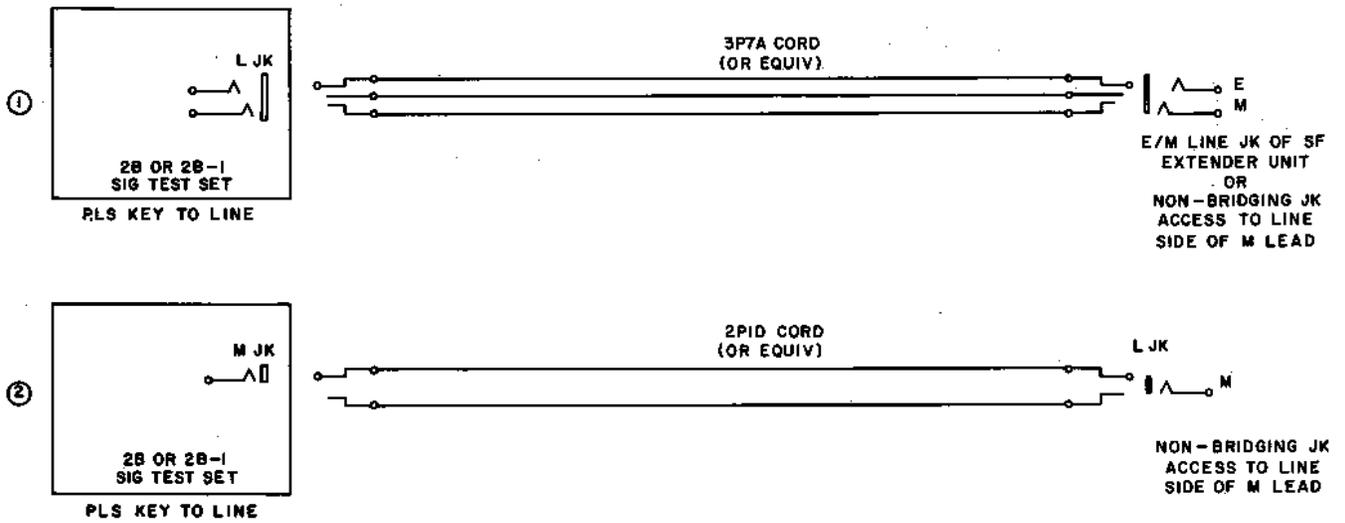


Fig. 3—Tests B1 and C—Sending on M Lead

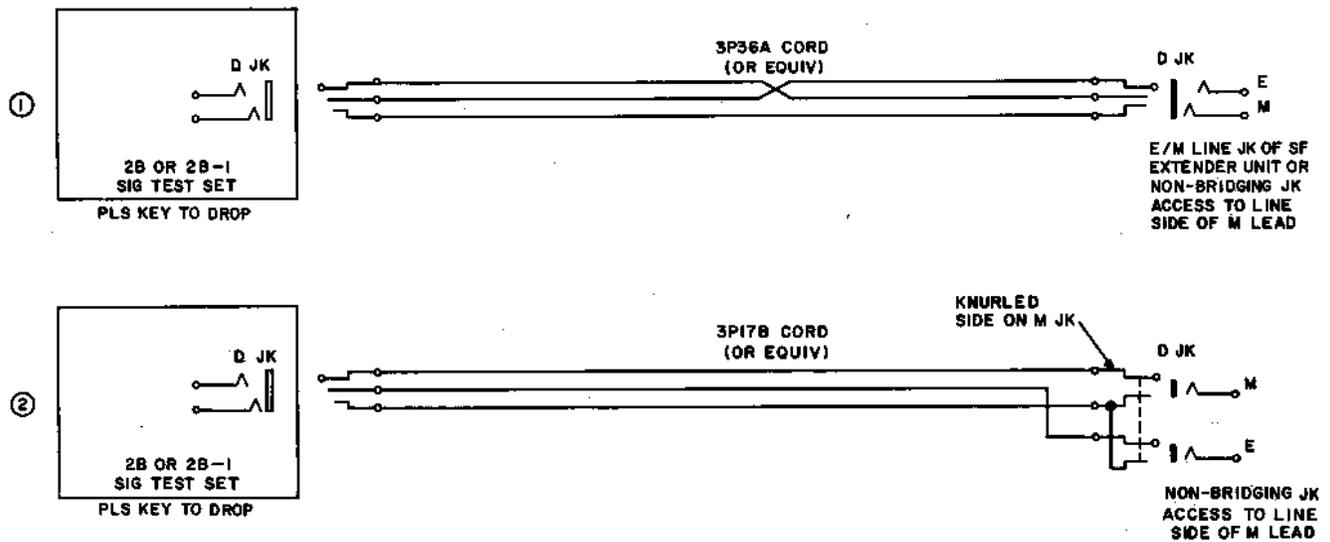


Fig. 4—Tests B2—Sending on M Lead

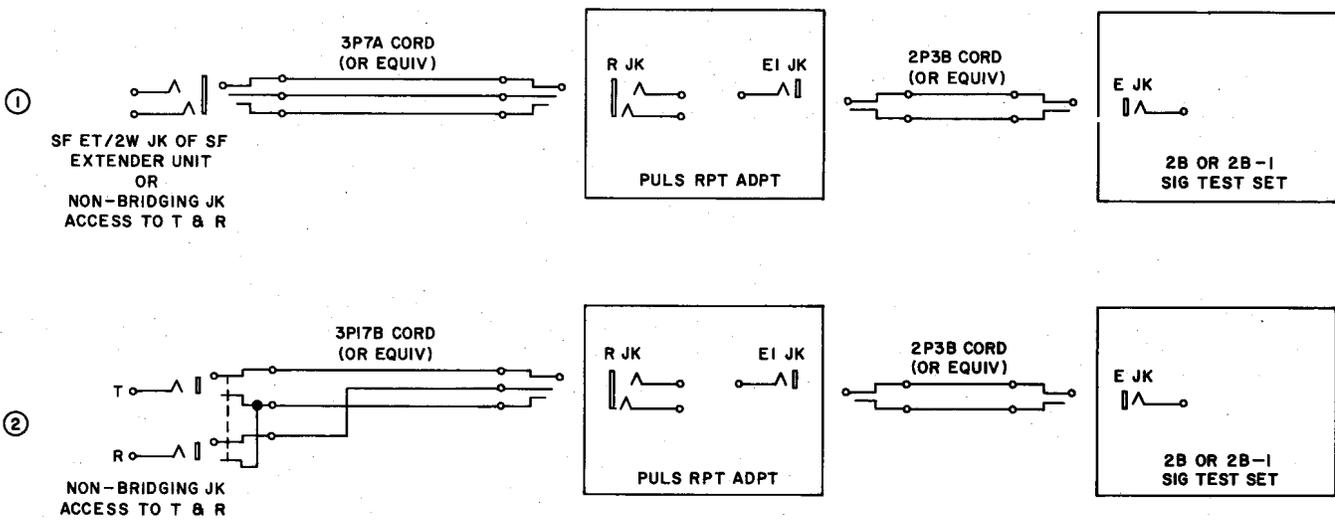


Fig. 5—Test AA Receiving On Loop

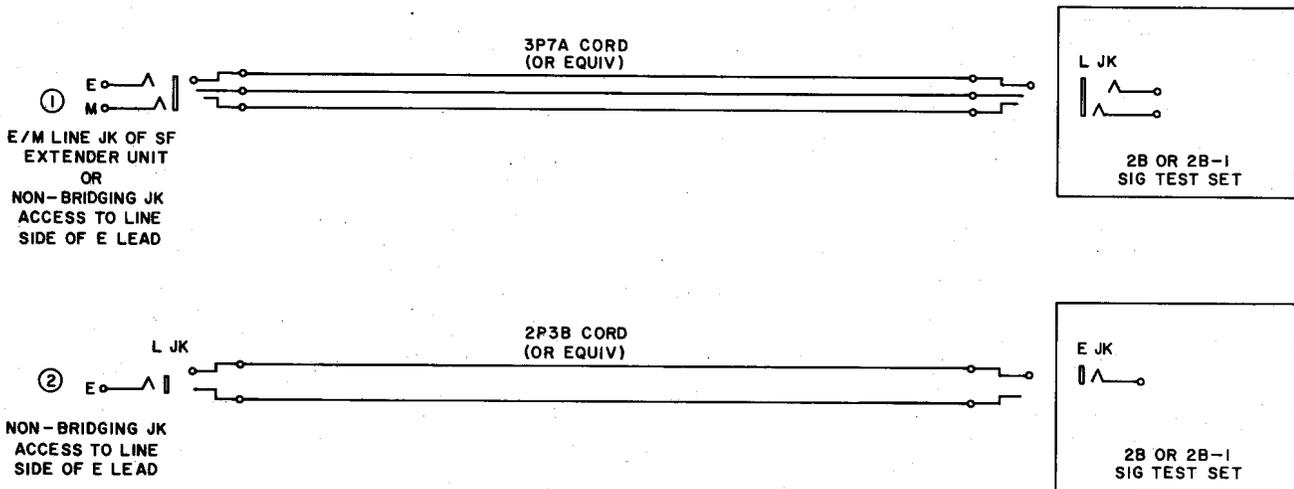


Fig. 6—Tests AB and AC—Receiving on E Lead