

**N3 CARRIER TELEPHONE SYSTEM**  
**TERMINAL EQUIPMENT**  
**CHECK OF ALARM OPERATION**

This section covers the procedure for checking the overall operation of the terminal alarm facilities of the N3 Carrier Telephone System. This terminal equipment operates and controls the office audible and visual alarms if any of the following conditions occur:

- (a) Failure of fuses in the direct current or 20-Hz ringing power leads
- (b) Excessive output voltage deviation of the -21 volt power supply
- (c) Low output from the signaling or restoral oscillators
- (d) Removal of an alarm and restoral unit or restoral oscillator from the terminal
- (e) Failure of received carriers.

This section is reissued to include information on the alarm threshold adjustment in the alarm and restoral unit (Test M) and to add a procedure for checking the TC relays (Test N). Other minor revisions have also been made. Significant changes are indicated by arrows. This reissue affects Equipment Test Lists.

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If there is a carrier failure, whether caused by line or terminal failure, the trunk-release and make-busy circuits condition the affected trunk circuits to release subscribers, apply busy indications, and stop service charges.

The terminals of the carrier system under test do not have to be removed from service except for the check of alarm operation caused by dual signaling oscillator and carrier failures. For checking a dual signaling oscillator failure, all terminals in the double-bay frame and all associated far terminals must be out of service. When checking the alarm operation for carrier failure, both near and far terminals of the system being tested must be removed from service.

The tests in this section are based on a fully equipped 2-terminal packaged frame; however, the information given in these tests should satisfy the requirements for partially equipped 2-terminal or single-terminal frames. ♦Tests are provided for the single frequency alarm scheme used with universal wired bays in N3 and N3-L systems and the total power alarm scheme used with older bays in N3 systems only.♦

There are three types of jack panels as shown in Fig. 1A, 1B, and 1C. Use these figures to identify and locate the panel in the terminal frame under test.

**Caution:** *When the alarm and restoral unit or the restoral oscillator is removed from the terminal mounting position for any reason, it should be replaced as quickly as possible. With the alarm and restoral unit or the restoral oscillator removed, the carrier-failure indications, automatic trunk conditioning, and automatic restoral processing are disabled.*

**APPARATUS:**

- 1—Hewlett-Packard 200CD Oscillator, or equivalent
- 1—Hewlett-Packard 400-Type Vacuum-Tube Voltmeter (VTVM), or equivalent
- ♦1—KS-1894 Stopwatch, or equivalent♦
- 1—KS-14510 Volt-Ohm-Milliammeter (VOM), or equivalent
- 1—Set of KS-14510, List 8 Test Probes Used with the VOM
- 1—J99300AU N3 Switching Set
- 1—J99300AW N3 Terminal Test Stand

**APPARATUS (Cont):**

1—J99272AT Restoral Oscillator Unit

1—W1AP Cord

2—W1BB Cords

2—W1BC Cords

1—W2EB Cord

1—W2FP Cord

1—1  $\mu$ F 542D Mylar Insulation Capacitor (200 volt), or equivalent, equipped with 2 KS-19531, L1 Probes (lead length must not exceed 6 inches)

2—258C Dummy Plugs

1—265C Tool (contact burnisher)

1—266C Tool (steel music wire)

STEP	PROCEDURE
1	<p><b>A. Check of Alarm Operation for Fuse Failure</b></p> <p><b>Note:</b> In this test, the office alarms associated with the fuses on the alarm, power, and miscellaneous panel are to be tested by simulating fuse failures. (See Fig. 2 and 3A or 3B.)</p> <p>Place the 266C tool in the 265C tool and the cap over the end of the 265C tool. Insert the wire through the opening of each fuse-holder cap beside the alarm indicating plunger in such a manner that it will touch the side of the opening and head of the fuse at the same time.</p> <p><b>Note 1:</b> This action simulates a blown fuse by placing battery on the alarm bus. The local and office alarms associated with the particular fuse will operate while the contact is maintained, but the operation of the equipment in the terminal bay will not be affected.</p> <p><b>Note 2:</b> Before testing the +130 and -130 volt fuses, check to see that the feeders for these circuits are connected to their respective power sources. In some locations although the alarm, power, and miscellaneous panel may be equipped with these fuses, they are not required and therefore need not be tested.</p>
2	<p>Apply the 265C and 266C tools to the following fuses:</p> <p>(a) -48 volt PF, white, 1-1/3 ampere</p> <p>(b) +130 volt FDR, white, 1-1/3 ampere</p>

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	<p>(c) – 130 volt FDR, white, 1-1/3 ampere</p> <p><b>Requirement 1:</b> The ALM lamp lights on the alarm, power, and miscellaneous panel.</p> <p><b>Requirement 2:</b> The associated major office alarms operate.</p>
3	<p>If these requirements are not met, check relay MJ on the alarm, power, and miscellaneous panel.</p>
4	<p>Apply the 265C and 266C tools to the following fuses:</p> <p>(a) – 48 volt F1, green, 5 ampere</p> <p>(b) – 48 volt F2, green, 5 ampere</p> <p>(c) – 48 volt P1, violet, 1/4 ampere (J99300T1) or green, 5 ampere (J99300T2)</p> <p>(d) – 48 volt P2, violet, 1/4 ampere (J99300T1) or green, 5 ampere (J99300T2)</p> <p>(e) – 48 volt ALM (fuses numbered 1 through 4), green, 5 ampere</p> <p>(f) – 48 volt SU (fuses numbered 1 through 4), blue, 3 ampere (J99300T1) or green, 5 ampere (J99300T2)</p> <p>(g) – 48 volt L, violet, 1/4 ampere (J99300T1) or red, 1/2 ampere (J99300T2)</p> <p>(h) – 48 volt CS, violet, 1/4 ampere (J99300T1) or white, 1-1/3 ampere (J99300T2)</p> <p>(i) – 48 volt T, white, 1-1/3 ampere</p> <p>(j) +130 volt R1, violet, 1/4 ampere</p> <p>(k) +130 volt R2, violet, 1/4 ampere</p> <p>(l) +130 volt TC, violet, 1/4 ampere</p> <p>(m) – 130 volt R1, violet, 1/4 ampere</p> <p>(n) – 130 volt R2, violet, 1/4 ampere</p> <p><b>Requirement 1:</b> The ALM lamp lights on the alarm, power, and miscellaneous panel.</p> <p><b>Requirement 2:</b> The associated major or minor office alarms operate.</p>
5	<p>If these requirements are not met, check relay MJN on the alarm, power, and miscellaneous panel.</p>
6	<p>Apply the 265C and 266C tools to the following fuses:</p> <p>(a) – 48 volt M, red, 1/2 ampere</p>

STEP	PROCEDURE
	<p>(b) –48 volt RO, violet, 1/4 ampere</p> <p>(c) –48 volt 01, violet, 1/4 ampere</p> <p>(d) –48 volt 02, violet, 1/4 ampere</p> <p>(e) –48 volt TC, white, 1-1/3 ampere (not equipped on J99300T2)</p> <p>(f) –48 volt B, red, 1/2 ampere (not equipped on J99300T2)</p> <p>(g) –48 volt R1, violet, 1/4 ampere (not equipped on J99300T1)</p> <p>(h) –48 volt R2, violet, 1/4 ampere (not equipped on J99300T1)</p> <p>(i) –48 volt M2, white, 1-1/3 ampere (not equipped on J99300T1)</p> <p><b>Requirement 1:</b> The ALM lamp on the alarm, power, and miscellaneous panel lights.</p> <p><b>Requirement 2:</b> The associated minor office alarms operate.</p>
7	<p>If these requirements are not met, check relay MN on the alarm, power, and miscellaneous panel.</p>
	<p><b>B. Check of Alarm Operation for Failure of the 20-Hz Ringing Fuse Circuit</b></p>
1	<p>Apply the 265C and 266C tools, as in Test A, to each fuse on the 20-Hz fuse and lamp panel.</p> <p><b>Requirement 1:</b> The FA lamp on the 20-Hz fuse and lamp panel lights. (See Fig. 4 and 5).</p> <p><b>Requirement 2:</b> The ALM lamp on the alarm, power, and miscellaneous panel lights. (See Fig. 2 and 3A or 3B.)</p> <p><b>Requirement 3:</b> The associated office alarms operate.</p>
2	<p>If these requirements are not met, check relay FA on the 20-Hz fuse and lamp panel and relay MJN on the alarm, power, and miscellaneous panel.</p>
	<p><b>C. Check of Alarm Operation for Removal of Alarm and Restoral Unit</b></p>
	<p><b>Note:</b> All four alarm and restoral units (two per terminal) and the restoral oscillator unit must be installed in the bay before starting this test. If necessary, operate the SYS ALM RLS key on the alarm and restoral oscillator unit to extinguish the ALM lamp on the alarm, power, and miscellaneous panel and to cause the office alarms to cease operation.</p>
1	<p>Remove an N3 alarm and restoral unit from its terminal mounting. (See Fig. 6.)</p> <p><b>Requirement 1:</b> The ALM lamp on the alarm, power, and miscellaneous panel lights. (See Fig. 2 and 3A or 3B.)</p>

STEP	PROCEDURE
	<p><b>Requirement 2:</b> The RMV ALM lamp on the jack panel lights. (See Fig. 1A, 1B, or 1C, and 7.)</p>
	<p><b>Requirement 3:</b> The associated office alarms operate.</p>
2	<p>If these requirements are not met, check the limit switch on the terminal frame directly behind the alarm and restoral unit and relays RA, TFL, and MN on the alarm, power, and miscellaneous panel.</p>
3	<p>Operate the RMV ALM RLS key on the jack panel to the vertical position. (See Fig. 1A, 1B, or 1C, and 7.)</p>
	<p><b>Requirement 1:</b> The RMV lamp remains lighted.</p>
	<p><b>Requirement 2:</b> The ALM lamp is extinguished.</p>
	<p><b>Requirement 3:</b> The associated office alarms cease operation.</p>
4	<p>If these requirements are not met, check the RMV ALM RLS key on the jack panel and relays TFL and MN on the alarm, power, and miscellaneous panel.</p>
5	<p>Reinsert the alarm and restoral unit into the terminal mounting.</p>
	<p><b>Requirement 1:</b> The RMV ALM lamp remains lighted.</p>
	<p><b>Requirement 2:</b> The ALM lamp lights.</p>
	<p><b>Requirement 3:</b> The associated office alarms operate.</p>
6	<p>If these requirements are not met, check the limit switch on the terminal mounting directly behind the alarm and restoral unit and relays RA, TFL, and MN on the alarm, power, and miscellaneous panel.</p>
7	<p>Return the RMV ALM RLS key on the jack panel to its normal horizontal position.</p>
	<p><b>Requirement 1:</b> The RMV ALM lamp is extinguished.</p>
	<p><b>Requirement 2:</b> The ALM lamp is extinguished.</p>
	<p><b>Requirement 3:</b> The associated office alarms cease operation.</p>
8	<p>If these requirements are not met, check the RMV ALM RLS key on the jack panel and relays TFL and MN on the alarm, power, and miscellaneous panel.</p>
	<p><b>D. Check of Alarm Operation for Removal of Restoral Oscillator</b></p> <p><b>Note:</b> All four alarm and restoral units (two per terminal) and the restoral oscillator unit must be installed in the bay before starting this test. If necessary, operate the SYS ALM RLS key on the alarm and restoral oscillator unit to extinguish the ALM lamp on the alarm, power, and miscellaneous panel and to cause the office alarms to cease operation.</p>

STEP	PROCEDURE
1	<p>Remove the <u>restoral oscillator from the alarm, power, and miscellaneous panel.</u> (See Fig. 3A or 3B.)</p> <p><b>Requirement 1:</b> The ALM lamp on the alarm, power, and miscellaneous panel lights. (See Fig. 3A, or 3B, and 8.)</p> <p><b>Requirement 2:</b> The RSTL OSC FAIL and RMV ALM lamps on the jack panel light. (See Fig. 1A, 1B, or 1C, and 8.)</p> <p><b>Requirement 3:</b> The associated office alarms operate.</p>
2	<p>If these requirements are not met, check relays RA, TFL, and MN on the alarm, power, and miscellaneous panel.</p>
3	<p>Operate the RMV ALM RLS key on the jack panel to the vertical position. (See Fig. 1A, 1B, or 1C, and 8.)</p> <p><b>Requirement 1:</b> The RSTL OSC FAIL and RMV ALM lamps remain lighted.</p> <p><b>Requirement 2:</b> The ALM lamp is extinguished.</p> <p><b>Requirement 3:</b> The associated office alarms cease operation.</p>
4	<p>If these requirements are not met, check the RMV ALM RLS key on the jack panel and relays TFL and MN on the alarm, power, and miscellaneous panel.</p>
5	<p>Reinsert the restoral oscillator into its position on the alarm, power, and miscellaneous panel. (See Fig. 3A or 3B.)</p> <p><b>Requirement 1:</b> The RSTL OSC FAIL lamp is extinguished.</p> <p><b>Requirement 2:</b> The ALM lamp lights.</p> <p><b>Requirement 3:</b> The associated office alarms operate.</p>
6	<p>If these requirements are not met, check relays RA, TFL, and MN on the alarm, power, and miscellaneous panel.</p>
7	<p>Return the RMV ALM RLS key on the jack panel to its normal horizontal position.</p> <p><b>Requirement 1:</b> The RMV ALM lamp is extinguished.</p> <p><b>Requirement 2:</b> The ALM lamp is extinguished.</p> <p><b>Requirement 3:</b> The associated office alarms cease operation.</p>

STEP	PROCEDURE
	<p><b>E. Check of Alarm Operation for Restoral Oscillator Failure</b></p> <p><i>Note:</i> This test shall not be made during the period an alarm and restoral unit is operated, because the 2600-Hz restoral tone from the restoral oscillator is required to effect restoration of the faulty system. Operation of the alarm and restoral unit is indicated when the SYS ALM lamps on the unit and the jack panel light.</p> <p>1 Using a W2FP cord, connect the VTVM to the LEV jacks on the restoral oscillator on the alarm, power, and miscellaneous panel. (See Fig. 3A or 3B.) The grounded input connection of the meter should be connected to the black LEV jack on the oscillator.</p> <p>2 Adjust the LEV ADJ control for an indication of 2.05 <math>\pm</math>0.1 volts. If this indication cannot be obtained, replace the restoral oscillator unit.</p> <p>3 Adjust the LEV ADJ control on the restoral oscillator to its extreme counterclockwise position.</p> <p><b>Requirement 1:</b> The OSC ALM lamp on the restoral oscillator lights.</p> <p><b>Requirement 2:</b> The ALM lamp on the alarm, power, and miscellaneous panel lights. (See Fig. 3A or 3B.)</p> <p><b>Requirement 3:</b> The RSTL OSC FAIL lamp on the jack panel lights. (See Fig. 1A, 1B, or 1C.)</p> <p><b>Requirement 4:</b> The associated office alarms operate.</p> <p>4 If these requirements are not met, check the restoral oscillator and relays TFL and MN on the alarm, power, and miscellaneous panel. (See Fig. 2 and 9.)</p> <p>5 Operate the ACO key on the restoral oscillator to the vertical position.</p> <p><b>Requirement 1:</b> The OSC ALM and RSTL OSC FAIL lamps remain lighted.</p> <p><b>Requirement 2:</b> The ALM lamp is extinguished.</p> <p><b>Requirement 3:</b> The associated office alarm ceases operation.</p> <p>6 If these requirements are not met, check the ACO key on the restoral oscillator and relays TFL and MN on the alarm, power, and miscellaneous panel.</p> <p>7 Turn the LEV ADJ control on the restoral oscillator fully clockwise and then adjust for a VTVM reading of 2.05 volts.</p> <p><b>Requirement 1:</b> The RSTL OSC FAIL lamp is extinguished.</p> <p><b>Requirement 2:</b> The ALM lamp lights.</p> <p><b>Requirement 3:</b> The associated office alarms operate.</p>

STEP	PROCEDURE
8	If these requirements are not met, check the restoral oscillator and relays TFL and MN on the alarm, power, and miscellaneous panel.
9	<p>Remove the W2FP cord from the LEV jacks and return the ACO key on the restoral oscillator to its normal horizontal position.</p> <p><b>Requirement 1:</b> The ALM and OSC ALM lamps are extinguished.</p> <p><b>Requirement 2:</b> The associated office alarms cease operation.</p>
10	If these requirements are not met, check the ACO key on the restoral oscillator and relays TFL and MN on the alarm, power, and miscellaneous panel.
X	<p><b>F. Check of Alarm Operation for Deviation of -21 Volt Power Supply Output Voltage</b></p> <p><b>Note:</b> For this test, the output voltage of the -21 volt terminal power supply must be measured with the dc voltmeter on the N3 switching set. Accuracy of this meter (accurate to 1 percent) is necessary, because the operational limits of the power supply are only <math>\pm 1</math> volt.</p>
1	<p>On the N3 switching set, set the LOAD and VM &amp; RIPPLE switches to <u>REGULAR</u> and the ALT switch to <u>TESTS</u>. Remove one of the two connectors from TEST POWER jacks on the combining and switching unit associated with the terminal being checked. Insert plug P2 of the N3 switching set into the vacant jack. (See Fig. 6.)</p> <p><b>Caution:</b> Do not at any time remove both TEST POWER jack connectors.</p>
2	<p>Read the dc voltmeter on the N3 switching set.</p> <p><b>Requirement:</b> <math>-21 \pm 0.9</math> volts.</p>
3	<p>If this requirement is not met, slowly turn the ADJ VOLTS control to meet the requirement (see Fig. 6). If the requirement still is not met, check the -21 volt power supply per Section 362-903-501.</p> <p><b>Caution:</b> The following adjustment must be made slowly and -22.0 volts must not be exceeded.</p>
4	<p>Slowly turn the ADJ VOLTS control clockwise on the power supply in the terminal to obtain a meter reading of <u>-22.0</u> volts.</p> <p><b>Requirement 1:</b> The associated 21V ALM lamp on the jack panel lights. (See Fig. 1A, 1B, or 1C, and 10.)</p> <p><b>Requirement 2:</b> The ALM lamp on the alarm, power, and miscellaneous panel lights. (See Fig. 2 and 3A or 3B.)</p> <p><b>Requirement 3:</b> The associated office alarms operate.</p>

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5	<p>If these requirements are not met, check the -21 volt power supply as covered in Section 362-903-501, and relays TFL and MN on the alarm, power, and miscellaneous panel.</p>
6	<p>Operate the 21V ALM RLS key on the jack panel to the vertical position. (See Fig. 1A, 1B, or 1C, and 10.)</p> <p><b>Requirement 1:</b> The 21V ALM lamp remains lighted.</p> <p><b>Requirement 2:</b> The ALM lamp is extinguished. (See Fig. 2 and 3A or 3B.)</p> <p><b>Requirement 3:</b> The associated office alarms cease operation.</p>
7	<p>If these requirements are not met, check the 21V ALM RLS key on the jack panel and relays TFL and MN on the alarm, power, and miscellaneous panel.</p> <p><b>Caution:</b> <i>The following adjustment must be made slowly.</i></p>
8	<p>Slowly turn the ADJ VOLTS control counterclockwise on the power supply for a meter reading of -21.0 volts.</p> <p><b>Requirement 1:</b> The 21V ALM lamp remains lighted.</p> <p><b>Requirement 2:</b> The ALM lamp lights.</p> <p><b>Requirement 3:</b> The associated office alarms operate.</p>
9	<p>If these requirements are not met, check the -21 volt power supply, as covered in Section 362-903-501, and relays TFL and MN on the alarm, power, and miscellaneous panel.</p>
10	<p>Restore the 21V ALM RLS key on the jack panel to its normal horizontal position.</p> <p><b>Requirement 1:</b> The 21V ALM lamp is extinguished.</p> <p><b>Requirement 2:</b> The ALM lamp is extinguished.</p> <p><b>Requirement 3:</b> The associated office alarms cease operation.</p>
11	<p>If these requirements are not met, check the 21V ALM RLS key on the jack panel and relays TFL and MN on the alarm, power, and miscellaneous panel.</p> <p><b>Caution:</b> <i>The following adjustment must be made slowly and -20.0 volts must not be exceeded.</i></p>
12	<p>Slowly turn the ADJ VOLTS control counterclockwise on the power supply for a meter reading of -20.0 volts.</p> <p><b>Requirement 1:</b> The associated 21V ALM lamp on the jack panel lights.</p> <p><b>Requirement 2:</b> The ALM lamp lights.</p>

STEP	PROCEDURE
	<p><b>Requirement 3:</b> The associated office alarms operate.</p> <p>13 If these requirements are not met, check the -21 volt power supply, as covered in Section 362-903-501, and relays TFL and MN on the alarm, power, and miscellaneous panel.</p> <p>14 Operate the 21V ALM RLS key on the jack panel to the vertical position.</p> <p><b>Requirement 1:</b> The 21V ALM lamp remains lighted.</p> <p><b>Requirement 2:</b> The ALM lamp is extinguished.</p> <p><b>Requirement 3:</b> The associated office alarms cease operation.</p> <p>15 If these requirements are not met, check the 21V ALM RLS key on the jack panel and relays TFL and MN on the alarm, power, and miscellaneous panel.</p> <p><b>Caution:</b> <i>The following adjustment must be made slowly.</i></p> <p>16 Slowly turn the ADJ VOLTS control clockwise on the power supply to obtain a meter reading of -21.0 volts.</p> <p><b>Requirement 1:</b> The 21V ALM lamp remains lighted.</p> <p><b>Requirement 2:</b> The ALM lamp lights.</p> <p><b>Requirement 3:</b> The associated office alarms operate.</p> <p>17 If these requirements are not met, check the -21 volt power supply, as covered in Section 362-903-501, and relays TFL and MN on the alarm, power, and miscellaneous panel.</p> <p>18 Restore the 21V ALM RLS key on the jack panel to its normal horizontal position.</p> <p><b>Requirement 1:</b> The 21V ALM lamp is extinguished.</p> <p><b>Requirement 2:</b> The ALM lamp is extinguished. (See Fig. 2 and 3A or 3B.)</p> <p><b>Requirement 3:</b> The associated office alarms cease operation.</p> <p>19 If these requirements are not met, check the 21V ALM RLS key on the jack panel and relays TFL and MN on the alarm, power, and miscellaneous panel.</p> <p>20 Disconnect the N3 switching set from the combining and switching unit and replace the test power jack connector.</p> <p><b>G. Check of Alarm Operation for Dual Signaling Oscillator Failure</b></p> <p><b>Note:</b> In this test, the failure of signaling oscillators (a dual failure) is simulated. Since momentary interruption of the supply may occur due to a transfer, this test should be performed during periods of light traffic.</p>

STEP	PROCEDURE
1	<p><b>Caution:</b> <i>If any of the alarm lamps on the 2600-Hz supply are lighted, this test must be performed with the terminals and associated systems of the frame under test removed from service.</i></p> <p>Insert one 258C dummy plug into the EVEN TR CUR jack on the oscillator and transfer panel and another into the ODD TR CUR jack to simulate a failure of both the even and odd oscillators. When the 258C dummy plugs are inserted into the EVEN and ODD TR CUR jacks, the even and odd loads remain connected to their respective oscillators. (See Fig. 11.)</p> <p><b>Requirement 1:</b> The ODD OSC, EVEN OSC, and LOAD lamps on the oscillator and transfer panel light. (See Fig. 11 and 12.)</p> <p><b>Requirement 2:</b> The ALM lamp on the alarm, power, and miscellaneous panel lights. (See Fig. 3A or 3B, and 12.)</p> <p><b>Requirement 3:</b> The associated office alarms operate.</p>
2	<p>If these requirements are not met, check the signaling load transfer circuit as covered in Section 179-305-501 and relays TFU and MJ on the alarm, power, and miscellaneous panel.</p>
3	<p>Remove the 258C dummy plug from the ODD TR CUR jack to restore the odd oscillator. When the 258C dummy plug is removed from the odd oscillator, the even load is transferred automatically, to the odd oscillator.</p> <p><b>Requirement 1:</b> The ODD OSC and LOAD lamps are extinguished.</p> <p><b>Requirement 2:</b> The EVEN OSC lamp remains lighted.</p> <p><b>Requirement 3:</b> The ALM lamp remains lighted.</p> <p><b>Requirement 4:</b> The associated office alarms (major) cease operation.</p> <p><b>Requirement 5:</b> The associated office alarms (minor) operate.</p>
4	<p>If these requirements are not met, check the oscillator and transfer panel as covered in Section 179-305-501 and relays TFL, TFU, MJ, and MN on the alarm, power, and miscellaneous panel.</p>
5	<p>Operate the nonlocking ACO key on the oscillator and transfer panel. (See Fig. 11.)</p> <p><b>Requirement 1:</b> The GD lamp lights and the EVEN OSC lamp on the oscillator and transfer panel remains lighted.</p> <p><b>Requirement 2:</b> The ALM lamp is extinguished.</p> <p><b>Requirement 3:</b> The associated office alarms cease operation.</p>

STEP	PROCEDURE
6	If these requirements are not met, check the oscillator and transfer panel as covered in Section 179-305-501 and relays TFL and MN on the alarm, power, and miscellaneous panel.
7	<p>Remove the remaining dummy plug from the EVEN TR CUR jack and operate the associated non-locking TR RST key. (See Fig. 11.)</p> <p><b>Requirement:</b> The EVEN OSC and GD lamps are extinguished.</p>
8	<p>If this requirement is not met, check the oscillator and transfer panel as covered in Section 179-305-501.</p> <p><b>H. Check of Alarm Operation for Single Signaling Oscillator Failure</b></p>
1	<p>Insert the 258C dummy plug into the ODD TR CUR jack on the oscillator and transfer panel to simulate an odd-oscillator failure. When the 258C dummy plug is inserted into the ODD TR CUR jack, the odd load is transferred automatically to the even oscillator. (See Fig. 11.)</p> <p><b>Requirement 1:</b> The ODD OSC lamp on the oscillator and transfer panel lights. (See Fig. 11 and 13.)</p> <p><b>Requirement 2:</b> The ALM lamp on the alarm, power, and miscellaneous panel lights. (See Fig. 3A or 3B and 13.)</p> <p><b>Requirement 3:</b> The associated office alarms operate.</p>
2	If these requirements are not met, check the signaling load transfer circuit as covered in Section 179-305-501 and relays TFL and MN on the alarm, power, and miscellaneous panel.
3	<p>Operate the nonlocking ACO key on the oscillator and transfer panel. (See Fig. 11.)</p> <p><b>Requirement 1:</b> The GD lamp lights and the ODD OSC lamp remains lighted on the oscillator and transfer panel.</p> <p><b>Requirement 2:</b> The ALM lamp is extinguished. (See Fig. 3A or 3B and 13.)</p> <p><b>Requirement 3:</b> The associated office alarms cease operation.</p>
4	If these requirements are not met, check the oscillator and transfer panel as covered in Section 179-305-501 and relays TFL and MN on the alarm, power, and miscellaneous panel.
5	<p>Remove the 258C dummy plug from the ODD TR CUR jack.</p> <p><b>Requirement:</b> The ODD OSC and GD lamps on the oscillator and transfer panel are extinguished.</p>
6	If this requirement is not met, check the oscillator and transfer panel as covered in Section 179-305-501.

STEP	PROCEDURE
	<p><b>I. Check of Alarm Operation for Carrier Failure ♦On Systems Employing the Total Power Alarm Scheme♦</b></p> <p><b>Caution:</b> <i>This test must be performed with the associated 12-channel groups at each end of the system removed from service.</i></p> <p><b>Note 1:</b> ♦The total power alarm scheme is employed in N3 Systems where terminals at both ends are wired to provide an input to the alarm unit from the channel group demodulator (SD-97185-01, option M). Thus the total power of the received carriers in the channel group is monitored by the alarm unit. This bay wiring arrangement is Manufacture Discontinued.♦</p> <p><b>Note 2:</b> This test requires the coordinated action of personnel at both the near and far terminals. A communication channel established between the two terminals for coordination should not involve the channel group being tested.</p> <p><b>Note 3:</b> In this test, the relays in the alarm and restoral units at each end of the system will be checked for proper timing and sequential operation. The timing of these relays for both terminals will be performed at the near terminal. Also at the near terminal, the transmitted carrier will be purposely interrupted, and the various timing intervals will be measured as the alarm and restoral units (at each end of the system) progress through different steps in the alarming and restoral process.</p> <p><b>Note 4:</b> At the near terminal, the VTVM is used to monitor the received carrier from the far terminal. The reading on the VTVM and the lighting and extinguishing of the lamps associated with the terminal indicate the behavior of the relays in the alarm and restoral unit at the far terminal.</p> <p><b>Note 5:</b> When certain requirements of this test are not met, the recommendation is made to "try another alarm and restoral unit" at either the near or far terminal. This means that the unit is the <i>likely</i> source of trouble and should be replaced with a known good unit. After the unit is replaced, the test should be repeated to verify that the system meets requirements. If a known good unit is not available, perform the applicable maintenance test (K or L) to determine if the suspected alarm and restoral unit is the source of trouble.</p> <p><b>At Both Terminals of the System to be Checked (Near and Far)</b></p> <p>1 At each end of the system, remove the associated 12-channel groups (one channel group at each end) from service by applying make-busy operations on the individual channel trunk circuits at the appropriate location.</p> <p>2 Measure the -21 and -48 volts of the 12-channel groups with an N3 switching set and a VOM in the following manner. On the switching set, set the LOAD and VM &amp; RIPPLE switches to REGULAR and the ALT switch to TESTS as shown in Fig. 6. Remove one of the two connectors from the TEST POWER jacks on the combining and switching unit of the terminal under test and insert plug P2 on the N3 switching set into the vacant jack as shown in Fig. 6.</p>

STEP	PROCEDURE
3	<p><b>Caution: Do not at any time remove both TEST POWER jack connectors.</b></p> <p>Read the dc voltmeter on the N3 switching set. This meter is accurate to 1 percent and should always be used to measure the -21 volts.</p> <p><b>Requirement:</b> -21 <math>\pm</math>0.9 volts.</p>
4	<p>If this requirement is not met, slowly turn the ADJ VOLTS control to meet the requirement. If the requirement still is not met, check the -21 volt power supply as covered in Section 362-908-501.</p>
5	<p>Measure the -48 volts of the 12-channel groups with the VOM in the following manner. Connect the VOM to the -48V and G jacks on the N3 switching set as shown in Fig. 6. Insert the negative lead (black) of the VOM into the -48V jack. Read the VOM.</p> <p><b>Requirement:</b> -43 to -52 volts.</p>
6	<p>If this requirement is not met, check the office -48 volt power supply.</p> <p><b>At the Near Terminal</b></p>
7	<p>Connect one end of the W2FP cord to the VTVM and insert the ungrounded lead of the other end into the DEM CARR jack of the channel group modem unit of the channel group being checked and the grounded lead into DEM GRD jack on any associated channel modem unit, as shown in Fig. 6. The VTVM will indicate the loss or presence of received carrier from the far terminal.</p> <p><b>Requirement:</b> +10.0 to +11.5 dBm.</p>
8	<p>If this requirement is not met, check the channel group modem unit and the frequency-correction unit associated with the appropriate channel group as covered in Sections 362-906-501 and 362-907-501 or 362-907-502.</p> <p><b>At the Near and Far Terminals</b></p>
9	<p>Locate the following lamps and keys which must be observed and operated during the alarm and restoral process following the simulated carrier failure.</p> <p>SYS ALM lamp and RLS key on the alarm and restoral unit associated with the channel group under test. (See Fig. 6.)</p> <p>ALM OVRD lamp and key, SYS ALM lamp, and FAIL REC lamp associated with the channel group under test on the jack panel. (See Fig. 1A, 1B, or 1C.)</p> <p>REG ALM lamp and REG LP RLS on the jack panel. (See Fig. 1A, 1B, or 1C.)</p> <p>ALM lamp on the alarm, power, and miscellaneous panel. (See Fig. 3A or 3B.)</p>

STEP	PROCEDURE
10	<p>Observe that each lamp listed in Step 9 is extinguished. If any lamp is lighted, see Fig. 14 and 15 and the following.</p> <p>SYS ALM lamps: Ensure that the SYS ALM RLS key on the associated alarm and restoral unit is in the normal horizontal position. If the lamps are still lighted, remove the alarm and restoral unit for about 10 seconds and then reinsert the unit. If this does not restore alarm sequencing, try another unit.</p> <p>ALM OVRD lamp: Operate the associated ALM OVRD key to its normal horizontal position.</p> <p>REG ALM lamp: Momentarily depress the REG LP RLS key.</p> <p>ALM lamp: If the other lamps listed in Step 9 are extinguished, check the system for other alarm conditions.</p> <p><b><i>At the Near Terminal</i></b></p>
11	<p>Connect a W1BC cord to the MOD IN and MOD GRD jacks on the associated channel modem unit for channel 1 of the channel group being checked as shown in Fig. 6. This prevents the 2600-Hz test tone from being transmitted to the far terminal after a carrier failure has been simulated.</p>
12	<p>Connect one probe of the 1-<math>\mu</math>F capacitor to the GRD jack on the channel group modem associated with the channel group under test (see Fig. 6). This capacitor will be used to shunt the transmitted carrier, causing a received carrier failure toward the far terminal.</p> <p><b><i>Near and Far Terminal</i></b></p>
13	<p>Wind and reset the stopwatch to prepare for elapsed time measurements.</p>
14	<p>Connect the other probe of the 1-<math>\mu</math>F capacitor to the MOD CARR jack on the channel group modem at the <b><i>near</i></b> terminal and measure the elapsed time at <b><i>each</i></b> terminal.</p> <p><b><i>At the Near Terminal</i></b></p> <p><b><i>Requirement 1:</i></b> In approximately two seconds after the capacitor is connected, the VTVM indicates a drop of 10 dB or more.</p> <p><b><i>Requirement 2:</i></b> In approximately four seconds:</p> <ul style="list-style-type: none"> <li>(a) The SYS ALM lamps on the associated alarm and restoral unit and on the jack panel light.</li> <li>(b) The ALM lamp on the alarm, power, and miscellaneous panel lights.</li> <li>(c) The associated office alarms operate.</li> </ul>

STEP	PROCEDURE
	<p><b>Requirement 3:</b> In approximately 12 seconds, the VTVM indicates 9 to 10.5 dB.</p> <p><b>Requirement 4:</b> In approximately 14 seconds, the associated FAIL REC lamp on the jack panel lights.</p> <p><b>Requirement 5:</b> In approximately 24 seconds, the FAIL REC lamp is extinguished.</p> <p><b>Requirement 6:</b> In approximately 24 seconds, the REG ALM lamp on the jack panel lights.</p> <p><b>At the Far Terminal</b></p> <p><b>Requirement 7:</b> Approximately two seconds after the near terminal connects the capacitor:</p> <ul style="list-style-type: none"> <li>(a) The SYS ALM lamps on the associated alarm and restoral unit and on the jack panel light.</li> <li>(b) The ALM lamp on the alarm, power, and miscellaneous panel lights.</li> <li>(c) The associated office alarms operate.</li> </ul> <p><b>Requirement 8:</b> Approximately ten seconds after the SYS ALM lamps light, the FAIL REC lamp on the jack panel lights.</p>
15a	If the elapsed time for the lighting of each lamp was not observed for Requirements 1 through 8, disconnect the capacitor and W1BC cord at the <i>near</i> terminal. Allow the alarm and restoral unit at each terminal to completely time out and repeat Steps 10 through 14.
15b	<p>If Requirements 1 through 8 are not met, refer to Fig. 14 and 15 and proceed as follows.</p> <p><b>Requirements 1, 3, and 8:</b> Try another alarm and restoral unit at the far terminal.</p> <p><b>Requirements 2 and 4:</b> Try another alarm and restoral unit at the near terminal.</p> <p><b>Requirement 5:</b> Try another alarm and restoral unit at each terminal and check the 2600-Hz test tone circuit per Test N, Part 1.</p> <p><b>Requirement 6:</b> Check relay RG on the alarm, power, and miscellaneous panel.</p> <p><b>Requirement 7:</b> Try another alarm and restoral unit and check relay MJN on the alarm, power, and miscellaneous panel at the far terminal.</p>
16	<p><b>At the Near Terminal</b></p> <p>Observe message register MR1 on the trunk-release and make-busy panel. (See Fig. 17A or 17B.)</p> <p><b>Requirement:</b> Message register MR1 on the trunk-release and make-busy panel associated with the channel group being tested is cocked (on the verge of adding a digit, indicating a failure).</p>

STEP	PROCEDURE
17	If this requirement is not met, check the associated alarm and restoral unit and message register MR1 on the trunk-release and make-busy panel (see Fig. 16).
18	Disconnect the capacitor from the channel group modem unit.  <i>At the Near and Far Terminal</i>
19	Operate the ALM RLS key on the associated alarm and restoral unit to the vertical position. (See Fig. 6.)  <i>Requirement 1:</i> The ALM lamp on the alarm, power, and miscellaneous panel is extinguished.  <i>Requirement 2:</i> The SYS ALM lamps on the associated alarm and restoral unit and on the jack panel remain lighted.  <i>Requirement 3:</i> The associated office alarms cease operation.
20	If these requirements are not met, try another alarm and restoral unit and check relay MJN on the alarm, power, and miscellaneous panel.  <i>Note:</i> At this point, the near terminal has timed out on test channel 1 and is waiting on test channel 2 for the 2600-Hz test tone from the far terminal. The far terminal has not yet timed out on test channel 1 because the 2600-Hz test tone is shorted at the near terminal by the W1BC cord at the MOD IN and MOD GRD jacks on the channel modem unit for test channel 1.
21	Determine the type of trunk-release and make-busy panel being employed. (See Fig. 17A and 17B.) If a J99300BL trunk-release and make-busy panel is used, proceed to Step 22. If a J99285AP trunk-release and make-busy panel is used, proceed to Step 31.
22	Before the W1BC cord is removed from the channel 1 modem unit at the near terminal, check the relays on the associated J99300BL trunk-release and make-busy panel. (See Fig. 17A.)  <i>Requirement:</i> Relays A1, D, C, D1, S1, E1, E2, TR1, TR2, TR3, and TR4 are operated and relay S is released.
23	If this requirement is not met, try another alarm and restoral unit and check relay A1, D1, and D on the associated trunk-release and make-busy panel.
24	Operate the ALM OVRD key on the jack panel which is associated with the channel group being checked.  <i>Requirement 1:</i> The associated ALM OVRD lamp on the jack panel lights.  <i>Requirement 2:</i> Relays TR2, TR4, and E2 on the associated trunk-release and make-busy panel release.

STEP	PROCEDURE
25	If these requirements are not met, check the ALM OVRD key and relays TR2, TR4, and E2 on the trunk-release and make-busy panel.
26	<p>Restore the ALM OVRD key to its normal horizontal position.</p> <p><b>Requirement 1:</b> The associated ALM OVRD lamp on the jack panel is extinguished.</p> <p><b>Requirement 2:</b> Relays TR2, TR4, and E2 on the trunk-release and make-busy panel operate.</p>
27	If these requirements are not met, check the ALM OVRD key and relays TR2, TR4, and E2 on the trunk-release and make-busy panel.
28	<p>With the VOM set to 60 volts on the dc scale, measure at the terminal punchings between A1 (MISC) and B2 (MISC) on the associated trunk-release and make-busy panel.</p> <p><b>Note:</b> The terminal strip of the trunk-release and make-busy panel is at the rear of the frame. (See Fig. 17A.)</p> <p><b>Requirement:</b> The VOM indicates 0 volt. This measurement indicates that an alarm indication has been sent to the No. 1 Electronic Switching System (ESS) office.</p>
29	If this requirement is not met, try another alarm and restoral unit and check relay A1 on the trunk-release and make-busy panel.
30	It may be desirable at this time to check the busy conditioning of individual trunks provided by the trunk-release and make-busy panel. If so, proceed to Step 40; if not, proceed to Step 41.
31	<p>Before the W1BC cord is removed from the channel 1 modem unit at the near terminal, check the relays on the associated J99285AP trunk-release and make-busy panel. (See Fig. 17B.)</p> <p><b>Requirement:</b> Relays A1, D, C, D1, S1, E1, E2, TR1, and TR2 operate and relay S releases.</p>
32	If this requirement is not met, check the associated alarm and restoral unit as covered in Test K or L, whichever is applicable, and relays A1, D1, and D on the associated trunk-release and make-busy panel.
33	<p>Operate the ALM OVRD key associated with the channel group being checked on the jack panel.</p> <p><b>Requirement 1:</b> The associated ALM OVRD lamp on the jack panel lights.</p> <p><b>Requirement 2:</b> Relays TR2 and E2 on the associated trunk-release and make-busy panel release.</p>

STEP	PROCEDURE
34	If these requirements are not met, check the ALM OVRD key and relays TR2 and E2 on the trunk-release and make-busy panel.
35	<p>Restore the ALM OVRD key to its normal horizontal position. (See Fig. 1A, 1B, or 1C.)</p> <p><b>Requirement 1:</b> The associated ALM OVRD lamp on the jack panel is extinguished. (See Fig. 1A, 1B, or 1C.)</p> <p><b>Requirement 2:</b> Relays TR2 and E2 on the trunk-release and make-busy panel operate. (See Fig. 17B.)</p>
36	If these requirements are not met, check the ALM OVRD key and relays TR2 and E2 on the trunk-release and make-busy panel.
37	<p>With the VOM set to 60 volts on the dc scale, measure the voltage between the terminal punchings A1 (MISC) and B2 (MISC) on the associated trunk-release and make-busy panel. The terminal strip on the trunk-release and make-busy panel is at the rear of the frame. (See Fig. 17B.)</p> <p><b>Requirement:</b> The VOM indicates 0 volt. This measurement indicates that an alarm indication has been sent to the No. 1 Electronic Switching System (ESS) office.</p>
38	If this requirement is not met, first try another associated alarm and restoral unit and then check relay A1 on the trunk-release and make-busy panel.
39	It may be desirable at this time to check the busy conditioning of individual trunks provided by the trunk-release and make-busy panel. If so, proceed to Step 40; if not, proceed to Step 41.
40	<p>Taking one trunk at a time, remove the make-busy conditioning provided in Step 1 and observe that the one- and two-way outgoing trunks remain busied out as a result of the trunk-release and make-busy operation. Replace the out-of-service conditioning before proceeding to the next trunk.</p> <p><b>At the Near Terminal</b></p>
41	<p>Remove the W1BC cord from the MOD IN and MOD GRD jacks on the channel modem unit for test channel 1 as shown in Fig. 6. Note the exact time when the W1BC cord is removed and record the time the following operations occur. Measure the elapsed time for each operation and check to see that the requirements have been met. The following operations will occur in sequence and the times given are the total times from the start of the sequence.</p> <p><b>Requirement 1:</b> In approximately 10.0 seconds, the SYS ALM lamps on the associated alarm and restoral unit and on the jack panel are extinguished. (See Fig. 1A, 1B, or 1C and 15.)</p>

STEP	PROCEDURE
	<p><b>Requirement 2:</b> The REG ALM lamp on the jack panel remains lighted. (See Fig. 1A, 1B, or 1C.)</p>
42	<p>◆If Requirement 1 is not met, check the 2600-Hz test tone circuit as covered in Test N, Part 2. If Requirement 2 is not met, try another alarm unit.◆</p>
	<p><b>At the Far Terminal</b></p>
43	<p>Approximately 10.0 seconds after the W1BC cord has been removed from the channel modem unit on test channel 1 at the near terminal, the following should occur.</p>
	<p><b>Requirement 1:</b> The SYS ALM lamp on the associated alarm and restoral unit is extinguished.</p>
	<p><b>Requirement 2:</b> The SYS ALM and FAIL REC lamps on the jack panel are extinguished.</p>
44	<p>◆If these requirements are not met, check the 2600-Hz test tone circuit as covered in Test N, Part 3 (see Fig. 15 and 19).◆</p>
	<p><b>At the Near and Far Terminals</b></p>
45	<p>Approximately 10.0 seconds after the W1BC cord has been removed from the channel 1 modem unit of the near terminal, the following should occur.</p>
	<p><b>Requirement 1:</b> The ALM lamp on the alarm, power, and miscellaneous panel lights.</p>
	<p><b>Requirement 2:</b> The associated office alarms operate.</p>
	<p><b>Requirement 3:</b> All relays on the associated trunk-release and make-busy panel release. (See Fig. 17A or 17B.)</p>
	<p><b>Requirement 4:</b> The SYS ALM lamps on the associated alarm and restoral unit and on the jack panel are extinguished.</p>
46	<p>If these requirements are not met, check relay MJN on the alarm, power, and miscellaneous panel and try another alarm and restoral unit.</p>
47	<p>Restore the SYS ALM RLS key on the associated alarm and restoral unit to its normal horizontal position.</p>
	<p><b>Requirement 1:</b> The ALM lamp on the alarm, power, and miscellaneous panel is extinguished.</p>
	<p><b>Requirement 2:</b> The associated office alarms cease operation.</p>
48	<p>If these requirements are not met, check relay MJN on the alarm, power, and miscellaneous panel.</p>

STEP	PROCEDURE
49	<p><i>At the Near Terminal</i></p> <p>Observe message register MR1 on the trunk-release and make-busy panel. (See Fig. 17A or 17B.)</p> <p><b>Requirement:</b> Message register MR1 has advanced to the next digit, registering the simulated carrier failure.</p>
50	<p>Operate the REG LP RLS key on the jack panel.</p> <p><b>Requirement:</b> The REG ALM lamp on the jack panel is extinguished.</p>
51	<p>If this requirement is not met, check relay RG on the alarm, power, and miscellaneous panel. (See Fig. 18.)</p>
52	<p>Fail the transmitted carrier again using the W1BC cord and the 1-<math>\mu</math>F capacitor as in Steps 11 through 14 to permit an additional check of alarm features. (See Fig. 6.)</p>
53	<p><i>At the Near and Far Terminals</i></p> <p>Approximately 10.0 seconds after the associated office alarms operate, observe the wink-off of relay S1 in the trunk-release and make-busy panel. (See Fig. 17A or 17B.)</p> <p><b>Requirement:</b> Relay S1 operates when the office alarms operate and, approximately 10.0 seconds later, it releases and quickly reoperates. (See Fig. 17A or 17B.)</p>
54	<p>If this requirement is not met, check the associated alarm and restoral unit and the trunk-release and make-busy panel.</p>
55	<p>Silence the office alarms by operating the SYS ALM RLS key on the associated alarm and restoral unit.</p>
56	<p><i>At the Near Terminal</i></p> <p>Remove the 1-<math>\mu</math>F capacitor from the channel group modem unit. (See Fig. 6.)</p>
57	<p><i>At the Near and Far Terminals</i></p> <p>Remove the busy conditions from all trunks provided in Step 1.</p>
58	<p><i>At the Near Terminal</i></p> <p>Remove the VTVM and the WIBC cord from the channel 1 modem unit. (See Fig. 6.)</p>
59	<p><i>At the Near and Far Terminals</i></p> <p><b>Requirement:</b> The associated 12-channel groups restore automatically.</p>
59	<p>Silence the office alarms by operating the SYS ALM RLS key on the associated alarm and restoral unit to the normal horizontal position.</p>

STEP	PROCEDURE
60	<p><b><i>At the Near Terminal</i></b></p> <p>Extinguish the REG ALM lamp on the jack panel by operating the REG LP RLS key.</p> <p><b>J. Check of Alarm Operation for Carrier Failure ▶On Systems Employing the Single-Frequency Alarm Scheme◀</b></p> <p><b><i>Caution: This test must be performed with the associated 12-channel groups at each end of the system removed from service.</i></b></p> <p><b><i>Note 1:</i></b> ▶The single-frequency alarm scheme is employed in N3 Systems equipped with universal-wired terminals and in all N3-L Systems. The alarm unit monitors the level of the frequency-correction carrier which is 168 kHz for channel group 1 and 152 kHz for channel group 2. The input to the alarm unit is provided by the J99300AS frequency-correction unit. (The J99300AE frequency-correction unit does not provide this output.) The connection between the alarm and frequency-correction units is provided by option N of SD-97185-01.</p> <p><b><i>Note 2:</i></b> The alarm and restoral unit threshold level adjustment (Test M) must be completed at each end of the system prior to starting this test.▶</p> <p><b><i>Note 3:</i></b> This test requires the coordinated action of personnel at both the near and far terminals. A communication channel established between the two terminals for coordination should not involve the channel group being tested.</p> <p><b><i>Note 4:</i></b> In this test the relays in the alarm and restoral units at each end of the system will be checked for proper timing and sequential operation. The timing of these relays for both terminals will be performed at the near terminal. Also at the near terminal, the transmitted carrier will be purposely interrupted, and the various timed intervals will be measured as the alarm and restoral units (at each end of the system) progress through different steps in the alarming and restoral process.</p> <p><b><i>Note 5:</i></b> At the near terminal, the FREQ LOCK lamp on the frequency-correction unit is used to monitor the received carrier from the far terminal. Upon loss of received carrier, the FREQ LOCK lamp will be lighted. The lighting and extinguishing of the lamps associated with the terminal indicate the behavior of the relays in the alarm and restoral unit at the far terminal.</p> <p><b><i>Note 6:</i></b> When certain requirements of this test are not met, the recommendation is made to "try another alarm and restoral unit" at either the near or far terminal. This means that the unit is the <i>likely</i> source of trouble and should be replaced with a known good unit. After the unit is replaced, the test should be repeated to verify that the system meets requirements. If a known good unit is not available, perform the applicable maintenance test (K or L) to determine if the suspected alarm and restoral unit is the source of trouble.</p> <p><b><i>At Both Terminals of the System to be Checked (Near and Far)</i></b></p>
1	<p>At each end of the system, remove the associated 12-channel groups (one channel group at each end) from service by applying make-busy operations on the individual channel trunk circuits at the appropriate location.</p>

STEP	PROCEDURE
2	<p>Measure the -21 and -48 volts of the 12-channel groups with an N3 switching set and a VOM in the following manner. On the switching set, set the LOAD and VM &amp; RIPPLE switches to REGULAR and the ALT switch to TESTS as shown in Fig. 6. Remove one of the two connectors from the TEST POWER jacks on the combining and switching unit of the terminal under test and insert plug P2 on the N3 switching set into the vacant jack as shown in Fig. 6.</p> <p><b>Caution:</b> <i>Do not at any time remove both TEST POWER jack connectors.</i></p>
3	<p>Read the dc voltmeter on the N3 switching set. This meter is highly accurate to 1 percent and should always be used to measure the -21 volts.</p> <p><b>Requirement:</b> -21 <math>\pm</math>0.9 volts.</p>
4	<p>If the requirement is not met, slowly turn the ADJ VOLTS control to meet the requirement. If the requirement still is not met, check the -21 volt power supply as covered in Section 362-903-501.</p>
5	<p>Measure the -48 volts of the 12-channel groups with the VOM in the following manner. Connect the VOM to the -48V and G jacks on the N3 switching set as shown in Fig. 6. Insert the negative lead (black) of the VOM into the -48V jack. Read the VOM.</p> <p><b>Requirement:</b> -43 to -52 volts.</p>
6	<p>If this requirement is not met, check the office -48 volt power supply.</p>
7	<p>Locate the following lamps and keys which must be observed and operated during the alarm and restoral process which follows the simulated carrier failure.</p> <p>FREQ LOCK lamp on the frequency-correction unit associated with the channel group under test (see Fig. 6).</p> <p>SYS ALM lamp and RLS key on the alarm and restoral unit associated with the channel group under test (see Fig. 6).</p> <p>ALM OVRD lamp and key, SYS ALM lamp, and FAIL REC lamp associated with the channel group under test on the jack panel (see Fig. 1A, 1B, or 1C).</p> <p>REG ALM lamp and REG LP RLS on the jack panel (see Fig. 1A, 1B, or 1C).</p> <p>ALM lamp on the alarm, power, and miscellaneous panel (see Fig. 3A or 3B).</p>
8	<p>Observe that each lamp listed in Step 7 is extinguished. If any lamp is lighted, see Fig. 14 and 15 and the following.</p> <p>FREQ LOCK lamp: Refer to Section 362-907-502.</p>

STEP	PROCEDURE
	<p>SYS ALM lamps: Ensure that the SYS ALM RLS key on the associated alarm and restoral unit is in the normal horizontal position. If the lamps are still lighted, remove the alarm and restoral unit for about 10 seconds and then reinsert the unit. If this does not restore alarm sequencing, try another unit.</p> <p>ALM OVRD lamp: Operate the associated ALM OVRD key to its normal horizontal position.</p> <p>REG ALM lamp: Momentarily depress the REG LP RLS key.</p> <p>ALM lamp: If the other lamps listed in Step 7 are extinguished, check the system for other alarm conditions.</p>
	<p><b><i>At the Near Terminal</i></b></p>
9	<p>Connect a W1BC cord to the MOD IN and MOD GRD jacks on the associated channel modem unit for channel 1 of the channel group being checked as shown in Fig. 6. This prevents the 2600-Hz test tone from being transmitted to the far terminal after a carrier failure has been simulated.</p>
10	<p>Connect one probe of the 1-<math>\mu</math>F capacitor to the GRD jack on the channel group modem associated with the channel group under test. (See Fig. 6.) This capacitor will be used to shunt the transmitted carrier which will cause a received carrier failure toward the far terminal.</p>
	<p><b><i>Near and Far Terminal</i></b></p>
11	<p>Wind and reset the stopwatch to prepare for elapsed time measurements.</p>
12	<p>Connect the other probe of the 1-<math>\mu</math>F capacitor to the MOD CARR jack on the channel group modem at the <i>near</i> terminal and measure the elapsed time at <i>each</i> terminal.</p>
	<p><b><i>At the Near Terminal</i></b></p>
	<p><b><i>Requirement 1:</i></b> In approximately two seconds (first time-out at far terminal), the FREQ LOCK lamp on the associated frequency-correction unit lights indicating loss of received carrier.</p>
	<p><b><i>Requirement 2:</i></b> In approximately four seconds (first time-out at near terminal), the SYS ALM lamps on the associated alarm and restoral unit and on the jack panel light, the ALM lamp on the alarm, power, and miscellaneous panel lights and the associated office alarms operate.</p>
	<p><b><i>Requirement 3:</i></b> In approximately 14 seconds (second time-out at near terminal), the associated FAIL REC lamp on the jack panel lights.</p>
	<p><b><i>Requirement 4:</i></b> In approximately 24 seconds (third time-out at near terminal), the FAIL REC lamp is extinguished.</p>

STEP	PROCEDURE
	<p><b>Requirement 5:</b> In approximately 24 seconds, the REG ALM lamp on the jack panel lights.</p> <p><b>At the Far Terminal</b></p> <p><b>Requirement 6:</b> Immediately after the near terminal connects the capacitor, simulating a carrier failure, the FREQ LOCK lamp on the associated frequency-correction unit lights.</p> <p><b>Requirement 7:</b> Approximately two seconds after the FREQ LOCK lamp lights, the following occurs.</p> <ul style="list-style-type: none"> <li>(a) The SYS ALM lamps on the associated alarm and restoral unit and on the jack panel light.</li> <li>(b) The ALM lamp on the alarm, power, and miscellaneous panel lights.</li> <li>(c) The associated office alarms operate.</li> </ul> <p><b>Requirement 8:</b> Approximately two seconds after the SYS ALM lamps light, the FAIL REC lamp on the jack panel lights.</p>
13a	<p>If the elapsed time for the lighting of each lamp was not observed for Requirements 1 through 8, disconnect the capacitor and W1BC cord at the <i>near</i> terminal. Allow the alarm and restoral unit at each terminal to completely time out and repeat Steps 8 through 12.</p> <p><b>Note:</b> When these steps are repeated several times, the FREQ LOCK lamp at either terminal may light and extinguish intermittently due to removal of carriers from the repeated line. If this occurs, remove test connections and wait until line regulation returns to normal as indicated by an extinguished FREQ LOCK lamp.</p>
13b	<p>If Requirements 1 through 8 are not met, refer to Fig. 14 and 15 and proceed as follows.</p> <p><b>Requirement 1:</b> Try another alarm and restoral unit at the far terminal and check the frequency-correction unit at the near terminal per Section 362-907-502.</p> <p><b>Requirements 2 and 3:</b> Try another alarm and restoral unit at the near terminal.</p> <p><b>Requirement 4:</b> Try another alarm and restoral unit at each terminal and check the 2600-Hz test tone circuit per Test N, Part 1.</p> <p><b>Requirement 5:</b> Check relay RG on the alarm, power, and miscellaneous panel.</p> <p><b>Requirement 6:</b> Check the frequency-connection unit at the far terminal per Section 362-907-502.</p> <p><b>Requirements 7a and 8:</b> Try another alarm and restoral unit at the far terminal.</p> <p><b>Requirements 7b and 7c:</b> Try another alarm and restoral unit and check relay MJN on the alarm, power, and miscellaneous panel at the far terminal.</p>

STEP	PROCEDURE
	<p><b><i>At the Near Terminal</i></b></p> <p>14 Observe that the FREQ LOCK lamp on the associated frequency-correction unit is extinguished.</p> <p>15 Observe message register MR1 on the trunk-release and make-busy panel. (See Fig. 17A or 17B.)</p> <p><b><i>Requirement:</i></b> Message register MR1 on the trunk-release and make-busy panel associated with the channel group being tested is cocked (on the verge of adding a digit, indicating a failure).</p> <p>16 If this requirement is not met, try another alarm and restoral unit and check message register MR1 on the trunk-release and make-busy panel. (See Fig. 16).</p> <p><b><i>At the Near and Far Terminal</i></b></p> <p>17 Operate the SYS ALM RLS key on the alarm and restoral unit to the vertical position. (See Fig. 6.)</p> <p><b><i>Requirement 1:</i></b> The ALM lamp on the alarm, power, and miscellaneous panel is extinguished.</p> <p><b><i>Requirement 2:</i></b> The SYS ALM lamps on the associated alarm and restoral unit and on the jack panel remain lighted.</p> <p><b><i>Requirement 3:</i></b> The associated office alarms cease to operate.</p> <p>18 If these requirements are not met, try another alarm and restoral unit and check relay MJN at the terminal which does not meet requirements. (See Fig. 14 and 15.)</p> <p>19 Disconnect the capacitor from the channel group modem unit at the <i>near</i> terminal.</p> <p><b><i>Requirement:</i></b> The FREQ LOCK lamp on the associated frequency-correction unit is extinguished.</p> <p><b><i>Note 1:</i></b> The lamp may take some time to extinguish if the capacitor has been connected for a long period, shorting out the transmitted carriers. The FREQ LOCK lamp should extinguish when the carriers are restored <b><i>and</i></b> line regulation returns to normal.</p> <p><b><i>Note 2:</i></b> At this point, the near terminal has timed out on test channel 1 and is waiting on test channel 2 for the 2600-Hz test tone from the far terminal. The far terminal has not yet timed out on test channel 1 because the 2600-Hz test tone is shorted at the near terminal by the W1BC cord at the MOD IN and MOD GRD jacks on the channel modem unit for test channel 1.</p> <p>20 Determine the type of trunk-release and make-busy panel being employed. (See Fig. 17A and 17B.) If a J99300BL trunk-release and make-busy panel is used, proceed to Step 21. If a J99285AP trunk-release and make-busy panel is used, proceed to Step 30.</p>

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STEP	PROCEDURE
21	<p>Before the W1BC cord is removed from the channel modem unit at the near terminal, check the relays on the associated J99300BL trunk-release and make-busy panel. (See Fig. 17A.)</p> <p><b>Requirement:</b> Relays A1, D, C, D1, S1, E1, E2, TR1, TR2, TR3, and TR4 are operated and relay S is released.</p>
22	<p>If this requirement is not met, try another alarm and restoral unit and check relays A1, D1, and D on the associated trunk-release and make-busy panel.</p>
23	<p>Operate the ALM OVRD key on the jack panel which is associated with the channel group being checked.</p> <p><b>Requirement 1:</b> The associated ALM OVRD lamp on the jack panel lights.</p> <p><b>Requirement 2:</b> Relays TR2, TR4, and E2 on the associated trunk-release and make-busy panel release. (See Fig. 17A.)</p>
24	<p>If these requirements are not met, check the ALM OVRD key and relays TR2, TR4, and E2 on the trunk-release and make-busy panel.</p>
25	<p>Restore the ALM OVRD key to its normal horizontal position.</p> <p><b>Requirement 1:</b> The associated ALM OVRD lamp on the jack panel is extinguished.</p> <p><b>Requirement 2:</b> Relays TR2, TR4, and E2 on the trunk-release and make-busy panel operate.</p>
26	<p>If these requirements are not met, check the ALM OVRD key and relays TR2, TR4, and E2 on the trunk-release and make-busy panel.</p>
27	<p>With the VOM set to 60 volts on the dc scale, measure at the terminal punchings between A1 (MISC) and B2 (MISC) on the associated trunk-release and make-busy panel. The terminal strip of the trunk-release and make-busy panel is at the rear of the frame. (See Fig. 17A.)</p> <p><b>Requirement:</b> The VOM indicates 0 volt. This measurement indicates that an alarm indication has been sent to the No. 1 Electronic Switching System (ESS) office.</p>
28	<p>If this requirement is not met, try another associated alarm and restoral unit and check relay A1 on the trunk-release and make-busy panel.</p>
29	<p>It may be desirable at this time to check the busy conditioning of individual trunks provided by the trunk-release and make-busy panel. If so, proceed to Step 39; if not, proceed to Step 40.</p>
30	<p>Before the W1BC cord is removed from the channel modem unit at the near terminal, check the relays on the associated J99285AP trunk-release and make-busy panel. (See Fig. 17B.)</p>

STEP	PROCEDURE
	<p><b>Requirement:</b> Relays A1, D, C, D1, S1, E1, E2, TR1, and TR2 operate and relay S releases.</p>
31	<p>If this requirement is not met, check the associated alarm and restoral unit as covered in Test K or L, whichever is applicable, and relays A1, D1, and D on the associated trunk-release and make-busy panel.</p>
32	<p>Operate the ALM OVRD key associated with the channel group being checked on the jack panel. (See Fig. 1A, 1B, or 1C.)</p>
	<p><b>Requirement 1:</b> The associated ALM OVRD lamp on the jack panel lights.</p>
	<p><b>Requirement 2:</b> Relays TR2 and E2 release on the associated trunk-release and make-busy panel. (See Fig. 17B.)</p>
33	<p>If these requirements are not met, check the ALM OVRD key and relay TR2 and E2 on the trunk-release and make-busy panel.</p>
34	<p>Restore ALM OVRD key to its normal position.</p>
	<p><b>Requirement 1:</b> The associated ALM OVRD lamp on the jack panel is extinguished.</p>
	<p><b>Requirement 2:</b> Relays TR2 and E2 on the trunk-release and make-busy panel operate.</p>
35	<p>If these requirements are not met, check the ALM OVRD key and relays TR2 and E2 on the trunk-release and make-busy panel.</p>
36	<p>With the VOM set to 60 volts on the dc scale, measure the voltage between terminal punchings A1 (MISC) and B2 (MISC) on the associated trunk-release and make-busy panel. The punching strip of the trunk-release and make-busy panel is at the rear of the frame. (See Fig. 17B.)</p>
	<p><b>Requirement:</b> The VOM indicates 0 volt. This measurement indicates that an alarm indication has been sent to the No. 1 Electronic Switching System (ESS) office.</p>
37	<p>If this requirement is not met, check relay CS in the associated alarm and restoral unit and relay A1 on the trunk-release and make-busy panel.</p>
38	<p>It may be desirable at this time to check the busy conditioning of individual trunks provided by the trunk-release and make-busy panel. If so, proceed to Step 39; if not, proceed to Step 40.</p>
39	<p>Taking one trunk at a time, remove the make-busy conditioning provided in Step 1 and observe that the one- and two-way outgoing trunks remain busied out as a result of the trunk-release and make-busy operation. Replace the make-busy conditioning before proceeding to the next trunk.</p>

STEP	PROCEDURE
40	<p><b><i>At the Near Terminal</i></b></p> <p>Remove the W1BC cord from the MOD IN and MOD GRD jacks on the channel modem unit for test channel 1 as shown in Fig. 6. Note the exact time when the W1BC cord is removed and record the time the following operations occur. Measure the elapsed time (within 0.5 second) for each operation and check to see that the requirements have been met. The following operations occur in sequence and the times given are the total times from the start of the sequence.</p> <p><b><i>Requirement 1:</i></b> In approximately 10.0 seconds, the SYS ALM lamps on the associated alarm and restoral unit and on the jack panel are extinguished. (See Fig. 1A, 1B, or 1C and 15.)</p> <p><b><i>Requirement 2:</i></b> The REG ALM lamp on the jack panel remains lighted. (See Fig. 1A, 1B, or 1C.)</p>
41	<p>◆If Requirement 1 is not met, check the 2600-Hz test tone circuit as covered in Test N, Part 2. If Requirement 2 is not met, try another alarm unit.◆</p>
42	<p><b><i>At the Far Terminal</i></b></p> <p>Approximately 10.0 seconds after the near terminal W1BC cord has been removed from the channel modem unit on test channel 1, the following should occur.</p> <p><b><i>Requirement 1:</i></b> The SYS ALM lamp on the associated alarm and restoral unit is extinguished. (See Fig. 15 and 19.)</p> <p><b><i>Requirement 2:</i></b> The SYS ALM and FAIL REC lamps on the jack panel are extinguished. (See Fig. 1A, 1B, or 1C.)</p>
43	<p>◆If Requirements 1 and 2 are not met, check the 2600-Hz test tone circuit as covered in Test N, Part 3.◆</p>
44	<p><b><i>At the Near and Far Terminals</i></b></p> <p>Approximately 10.0 seconds after the W1BC cord has been removed from the channel modem unit of the near terminal of test channel 1, the following should occur.</p> <p><b><i>Requirement 1:</i></b> The ALM lamp on the alarm, power, and miscellaneous panel lights.</p> <p><b><i>Requirement 2:</i></b> The associated office alarms operate.</p> <p><b><i>Requirement 3:</i></b> All relays on the associated trunk-release and make-busy panel release.</p> <p><b><i>Requirement 4:</i></b> The SYS ALM lamps on the associated alarm and restoral unit and on the jack panel are extinguished.</p>
45	<p>If these requirements are not met, check relay MJN on the alarm, power, and miscellaneous panel and try another alarm and restoral unit.</p>

STEP	PROCEDURE
46	<p>Restore the SYS ALM RLS key on the associated alarm and restoral unit to its normal horizontal position.</p> <p><b>Requirement 1:</b> The ALM lamp on the alarm, power, and miscellaneous panel is extinguished. (See Fig. 3A or 3B and 15 and 19.)</p> <p><b>Requirement 2:</b> The associated office alarms cease operation.</p>
47	<p>If these requirements are not met, check relay MJN on the alarm, power, and miscellaneous panel.</p> <p><b>At the Near Terminal</b></p>
48	<p>Observe message register MR1 on the trunk-release and make-busy panel.</p> <p><b>Requirement:</b> Message register MR1 has advanced to the next digit, registering the simulated carrier failure.</p>
49	<p>Operate the REG LP RLS key on the jack panel.</p> <p><b>Requirement:</b> The REG ALM lamp on the panel is extinguished.</p>
50	<p>If this requirement is not met, check relay RG on the alarm, power, and miscellaneous panel (see Fig. 18).</p>
51	<p>Fail the transmitted carrier again using the W1BC cord and the 1-<math>\mu</math>F capacitor as in Steps 9, 10, and 12 to permit an additional check of alarm features. (See Fig. 6.)</p> <p><b>At the Near and Far Terminals</b></p>
52	<p>Approximately 10.0 seconds after the associated office alarms operate, observe the wink-off of relay S1 in the trunk-release and make-busy panel. (See Fig. 17A or 17B.)</p> <p><b>Requirement:</b> Relay S1 operates when the office alarms operate and, approximately 10.0 seconds later, it releases and quickly reoperates. (See Fig. 17A or 17B.)</p>
53	<p>If this requirement is not met, check the associated alarm and restoral unit and the trunk-release and make-busy panel.</p>
54	<p>Silence the office alarms by operating the SYS ALM RLS key on the associated alarm and restoral unit.</p> <p><b>At the Near Terminal</b></p>
55	<p>Remove the 1-<math>\mu</math>F capacitor from the channel group modem unit. (See Fig. 6.)</p> <p><b>At the Near and Far Terminals</b></p>
56	<p>Remove the make-busy conditions from all trunks provided in Step 1.</p>

STEP	PROCEDURE
57	<p><i>At the Near Terminal</i></p> <p>Remove the W1BC cord from the channel modem unit for test channel 1.</p>
58	<p><i>At the Near and Far Terminals</i></p> <p><b>Requirement:</b> The associated 12-channel groups restore automatically.</p> <p>Silence the office alarms by operating SYS ALM RLS key on the associated alarm and restoral unit to the normal horizontal position.</p>
59	<p><i>At the Near Terminal</i></p> <p>Extinguish the REG ALM lamp by operating the REG LP RLS key.</p>
1	<p><b>K. Maintenance Tests for the N3 Alarm and Restoral Unit J99300AK, List 1</b></p> <p><b>Note:</b> To perform a maintenance test on an N3 alarm and restoral unit, place it in the N3 terminal test stand (Fig. 20) together with a 2600-Hz restoral oscillator (J99272AT). A 1000-Hz oscillator is also required. The 1000-Hz oscillator and the 2600-Hz restoral oscillator aid in determining the proper functioning of the alarm and restoral unit during the restoral process. Three cords are used in connection with the alarm and restoral unit to prevent unnecessary delay in cycling certain relays while tests are being made.</p> <p>1 Remove one of the two TEST POWER jack connectors on the combining and switching unit as shown in Fig. 20.</p> <p>2 Connect plug P3 on the N3 terminal test stand to the vacant TEST POWER jack.</p> <p>3 On the N3 terminal test stand, set the CARR OUT switch to position 1 and the CARR SENS switch to CARR ON. Connect the VTVM to the CARR LEV jacks. (Ensure that the ground terminal of the VTVM is connected to the grounded white CARR LEV jack.)</p> <p>4 Insert a 2600-Hz restoral oscillator into jack J2 on the N3 terminal test stand.</p> <p>5 On the N3 alarm and restoral unit being checked, connect a W1AP cord from resistor R43 to ground, a W1BB cord from diode CR6 (terminal 2) to the FIN RLS jack on the N3 terminal test stand, and a W1BB cord from test point TP6 to jack 10 on the N3 terminal test stand as shown in Fig. 20.</p> <p>6 Insert the N3 alarm and restoral unit into jack J2 on the N3 terminal test stand.</p> <p>7 If the N3 alarm and restoral unit is wired for option A, proceed to Step 8; if wired for option B, proceed to Step 11; and if there is no option, proceed to Step 14. (See Fig. 20 for the location of options A and B.)</p> <p><b>Note:</b> Options A and B adjust the carrier-failure alarm threshold. Test M determines which options are required.</p>

STEP	PROCEDURE
8	<p>On the N3 terminal test stand (for option A only), adjust the CARR ADJ control for <u>-31</u> dB (or 0.0218 volt rms) on the VTVM.</p> <p><b>Requirement:</b> The CS lamp on the N3 terminal test stand lights.</p>
9	<p>Set the CARR OUT switch to position 3.</p> <p><b>Requirement 1:</b> The CS lamp is extinguished.</p> <p><b>Requirement 2:</b> The M2 lamp on the N3 terminal test stand lights.</p>
10	<p>Set the CARR OUT switch to position 2 and proceed to Step 17.</p>
11	<p>On the N3 terminal test stand (for option B only), adjust the CARR ADJ control for -31 dB (or 0.0218 volt RMS) on the VTVM.</p> <p><b>Requirement:</b> The CS lamp on the N3 terminal test stand lights.</p>
12	<p>Set the CARR OUT switch to position 2.</p> <p><b>Requirement 1:</b> The CS lamp is extinguished.</p> <p><b>Requirement 2:</b> The M2 lamp lights on the N3 terminal test stand.</p>
13	<p>Set the CARR OUT switch to position 1 and proceed to Step 17.</p>
14	<p>On the <del>N3</del> terminal test stand (for neither option A nor B), adjust the CARR ADJ control for <u>-31 dB</u> (or 0.0218 volt RMS) on the VTVM. Set the CARR OUT switch to position 3.</p> <p><b>Requirement:</b> The CS lamp on the N3 terminal test stand lights.</p>
15	<p>Set the CARR OUT switch to position 4.</p> <p><b>Requirement 1:</b> The CS lamp is extinguished.</p> <p><b>Requirement 2:</b> The M2 lamp lights on the N3 terminal test stand.</p>
16	<p>Set the CARR OUT switch to position 3.</p>
17	<p>Disconnect the VTVM from the CARR LEV jacks and connect it to the TEST FREQ LEV jacks. (Ensure that the VTVM ground terminal is connected to the grounded white TEST FREQ LEV jack.) On the N3 terminal test stand, set the 2600~ OUT switch to position 1, the CHAN TEST switch to CAL, and the TST FREQ switch to 2600~. Adjust the LEV ADJ control on the 2600-Hz restoral oscillator for a VTVM indication of -15 dB.</p>
18	<p>Connect a 1000-Hz oscillator to the 1000~ MW IN jacks on the N3 terminal test stand as shown in Fig. 20. Set the TST FREQ switch to 1000~.</p>

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STEP	PROCEDURE
19	<p>If the alarm and restoral unit is wired for option X, set the 1000~OUT switch to position 2 and adjust the 1000-Hz oscillator for a VTVM indication of -26.0 dB; if wired for option Y (normal condition,) set the 1000~ OUT switch to position 3 and adjust the 1000-Hz oscillator for a VTVM indication of -31 dB; if wired for option Z, set the 1000~ OUT switch to position 4 and adjust for a VTVM indication of -36.0 dB. (See Fig. 20 for the location of options X, Y, and Z.)</p>
20	<p>Set the CHAN TEST switch to CH1 and the TST FREQ switch to MIX. Remove the WIAP cord connecting resistor R43 to frame ground. Set the CARR SENS switch to CARR OFF and begin measuring the time which elapses for Requirements 3 and 4. Requirements 3 and 4 occur in sequence and the times given are total times from the start of the sequence.</p> <p><b>Requirement 1:</b> The CS lamp is extinguished.</p> <p><b>Requirement 2:</b> The M2 lamp lights.</p> <p><b>Requirement 3:</b> The SYS ALM lamps on the terminal test stand and on the alarm and restoral unit light between 1.5 and 2.5 seconds.</p> <p><b>Requirement 4:</b> The DS, DS1, and M1 lamps light between 11.5 and 18.0 seconds.</p>
21	<p>Set the CARR SENS switch to CARR ON.</p>
22	<p>Momentarily depress the REL RLS key on the N3 terminal test stand.</p> <p><b>Requirement:</b> The CS lamp lights.</p>
23	<p>Depress the REL RLS key for approximately 10.0 to 18.0 seconds.</p> <p><b>Requirement 1:</b> The M1 lamp is extinguished.</p> <p><b>Requirement 2:</b> The M2 lamp lights.</p> <p><b>Requirement 3:</b> The CS lamp lights during the 10- to 18-second interval and then is extinguished.</p>
24	<p>Set 1000~ OUT switch to position 1 and CHAN TEST switch to CH2.</p>
25	<p>Momentarily depress the REL RLS key.</p> <p><b>Requirement 1:</b> The SYS ALM lamps are extinguished on the terminal test stand and on the alarm and restoral unit.</p> <p><b>Requirement 2:</b> The CS lamp lights.</p>
26	<p>Release the REL RLS key. The SYS ALM lamps on the terminal test stand and on the alarm and restoral unit will be extinguished for approximately 2.0 seconds and then they will again light.</p>

STEP	PROCEDURE
27	<p>Set the CHAN TEST switch to FIN RLS and momentarily depress the REL RLS key.</p> <p><b>Requirement 1:</b> The M2, DS, DS1, and SYS ALM lamps are extinguished.</p> <p><b>Requirement 2:</b> The CS lamp lights.</p>
28	<p>Remove the W1BB cords from diode CR6, the FIN RLS jack, test point TP6, and jack 10. Remove plug P3 on the N3 terminal test stand from the terminal and replace the TEST POWER jack connector. Remove the alarm and restoral unit and restoral oscillator from the terminal test stand.</p>
29	<p>Measure the forward and reverse resistances of diodes CR5 through CR12 with the VOM (see Fig. 20). Set the VOM to OHMS x 10.</p> <p><b>Requirement 1:</b> Forward resistance is less than 200 ohms.</p> <p><b>Requirement 2:</b> Reverse resistance should be greater than 1000 ohms except for diodes CR11 and CR12 which will be greater than 100,000 ohms and diode CR6 which should be between 945 and 1155 ohms.</p>
	<p><b>L. Maintenance Tests for the N3 Alarm and Restoral Unit J99300AK, List 2 or List 3</b></p> <p><b>Note:</b> To perform a maintenance test on an N3 alarm and restoral unit, place it in the N3 terminal test stand (Fig. 21) together with a 2600-Hz restoral oscillator (J99272AT). A 1000-Hz oscillator is also required. The 1000-Hz oscillator and the 2600-Hz restoral oscillator aid in determining the proper functioning of the alarm and restoral unit during the restoral process. Three cords are used in connection with the alarm and restoral unit to prevent unnecessary delay in cycling certain relays while tests are being made.</p>
1	<p>Remove one of the two TEST POWER jack connectors on the combining and switching unit as shown in Fig. 21.</p>
2	<p>Connect plug P3 on the N3 terminal test stand to the vacant TEST POWER jack.</p>
3	<p>On the N3 terminal test stand, set the CARR OUT switch to position 1 and the CARR SENS switch to CARR ON . Connect the VTVM to the CARR LEV jacks. (Ensure that the ground terminal of the VTVM is connected to the grounded white CARR LEV jack.)</p>
4	<p>Insert a 2600-Hz restoral oscillator into jack J2 on the N3 terminal test stand.</p>
5	<p>On the N3 alarm and restoral unit being checked, connect a W1AP cord from the junction of resistors R52 and R53 to ground and a W1BB cord from test point TP6 to jack 10 on the N3 terminal test stand.</p>
6	<p>Insert the N3 alarm and restoral unit into jack J2 on the N3 terminal test stand as shown in Fig. 21.</p>

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STEP	PROCEDURE
7	<p>If the N3 alarm and restoral unit is wired for option A, proceed to Step 8; if wired for option B, proceed to Step 11; and if there is no option (normal condition), proceed to Step 14. (See Fig. 21 for the location of options A and B.)</p> <p><b>Note:</b> Options A and B adjust the carrier-failure alarm threshold. Test M determines which options are required.</p>
8	<p>On the N3 terminal test stand (for option A only), adjust the CARR ADJ control for -31 dB (or 0.0218 volt rms) on the VTVM.</p> <p><b>Requirement:</b> The CS lamp on the N3 terminal test stand lights.</p>
9	<p>Set the CARR OUT switch to position 3.</p> <p><b>Requirement:</b> The CS lamp is extinguished.</p>
10	<p>Set the CARR OUT switch to position 2 and proceed to Step 17.</p>
11	<p>On the N3 terminal test stand (for option B only), adjust the CARR ADJ control for -31 dB (or 0.0218 volt rms) on the VTVM.</p> <p><b>Requirement:</b> The CS lamp on the N3 terminal test stand lights.</p>
12	<p>Set the CARR OUT switch to position 2.</p> <p><b>Requirement:</b> The CS lamp is extinguished.</p>
13	<p>Set the CARR OUT switch to position 1 and proceed to Step 17.</p>
14	<p>On the N3 terminal test stand (for neither option A nor B), adjust the CARR ADJ control for -31 dB (or 0.218 volt rms) on the VTVM. Set the CARR OUT switch to position 3.</p> <p><b>Requirement:</b> The CS lamp lights on the N3 terminal test stand.</p>
15	<p>Set the CARR OUT switch to position 4.</p> <p><b>Requirement:</b> The CS lamp is extinguished.</p>
16	<p>Set the CARR OUT switch to position 3.</p>
17	<p>Disconnect the VTVM from the CARR LEV jacks and connect it to the TEST FREQ LEV jacks. (Ensure that the ground terminal is connected to the grounded white FREQ LEV jack.) On the N3 terminal test stand, set the 2600~ OUT switch to position 1, the CHAN TEST switch to CAL, and the TST FREQ switch to 2600~. Adjust the LEV ADJ control on the 2600-Hz restoral oscillator for a VTVM indication of -15 dB.</p>
18	<p>Connect the 1000-Hz oscillator to the 1000~ MW IN jacks on the N3 terminal test stand as shown in Fig. 21. Set the TST FREQ switch to 1000~.</p>

STEP	PROCEDURE
19	<p>If the alarm and restoral unit is wired for option X, set the 1000~ OUT switch to position 2 and adjust the 1000-Hz oscillator for a VTVM indication of <math>-26.0</math> dB; if wired for option Y (normal condition), set the 1000~ OUT switch to position 3 and adjust the 1000-Hz oscillator for a VTVM indication of <math>-31</math> dB; if wired for option Z, set the 1000~ OUT switch to position 4 and adjust for a VTVM indication of <math>-36.0</math> dB. (See Fig. 21 for the location of options X, Y, and Z.)</p>
20	<p>Set the CHAN TEST switch to CH1 and the TST FREQ switch to MIX. Remove the W1AP cord from ground and leave it disconnected, making sure it does not touch ground or other wiring. Set the CARR SENS switch to CARR OFF and begin measuring the time which elapses for Requirements 2 and 3 with a stopwatch. Requirements 2 and 3 occur in sequence, and the times given are total times from the start of the sequence.</p> <p><b>Requirement 1:</b> The CS lamp on the terminal test stand is extinguished.</p> <p><b>Requirement 2:</b> The DS and SYS ALM lamps on the terminal test stand and the SYS ALM lamp on the alarm unit light between 1.5 and 2.5 seconds.</p> <p><b>Requirement 3:</b> The DS1 and M1 lamps light between 11.5 and 18.0 seconds.</p>
21	<p>Set the CARR SENS switch to CARR ON.</p>
22	<p>Momentarily depress the REL RLS key on the N3 terminal test stand.</p> <p><b>Requirement:</b> The CS lamp lights.</p>
23	<p>Depress the REL RLS key for approximately 10 to 18 seconds.</p> <p><b>Requirement 1:</b> The M1 lamp is extinguished.</p> <p><b>Requirement 2:</b> The M2 lamp lights.</p> <p><b>Requirement 3:</b> The CS lamp lights during the 10 to 18 second interval and then is extinguished.</p>
24	<p>Set the 1000~ OUT switch to position 1 and the CHAN TEST switch to CH2. Remove the W1BB cord (connected to TP6) from jack 10 on the N3 terminal test stand and leave it disconnected, <b>making sure it does not touch ground or other wiring.</b> Taking the disconnected end of the W1BB cord that is connected to diode CR6 and connect it to jack 10 on the terminal test stand.</p>
25	<p>Momentarily depress the REL RLS key.</p> <p><b>Requirement:</b> The SYS ALM lamps are extinguished on the terminal test stand and on the alarm and restoral unit.</p>
26	<p>Release the REL RLS key; the SYS ALM lamps on the terminal test stand and on the alarm and restoral unit will be extinguished for approximately 2.0 seconds and then they will again light.</p>

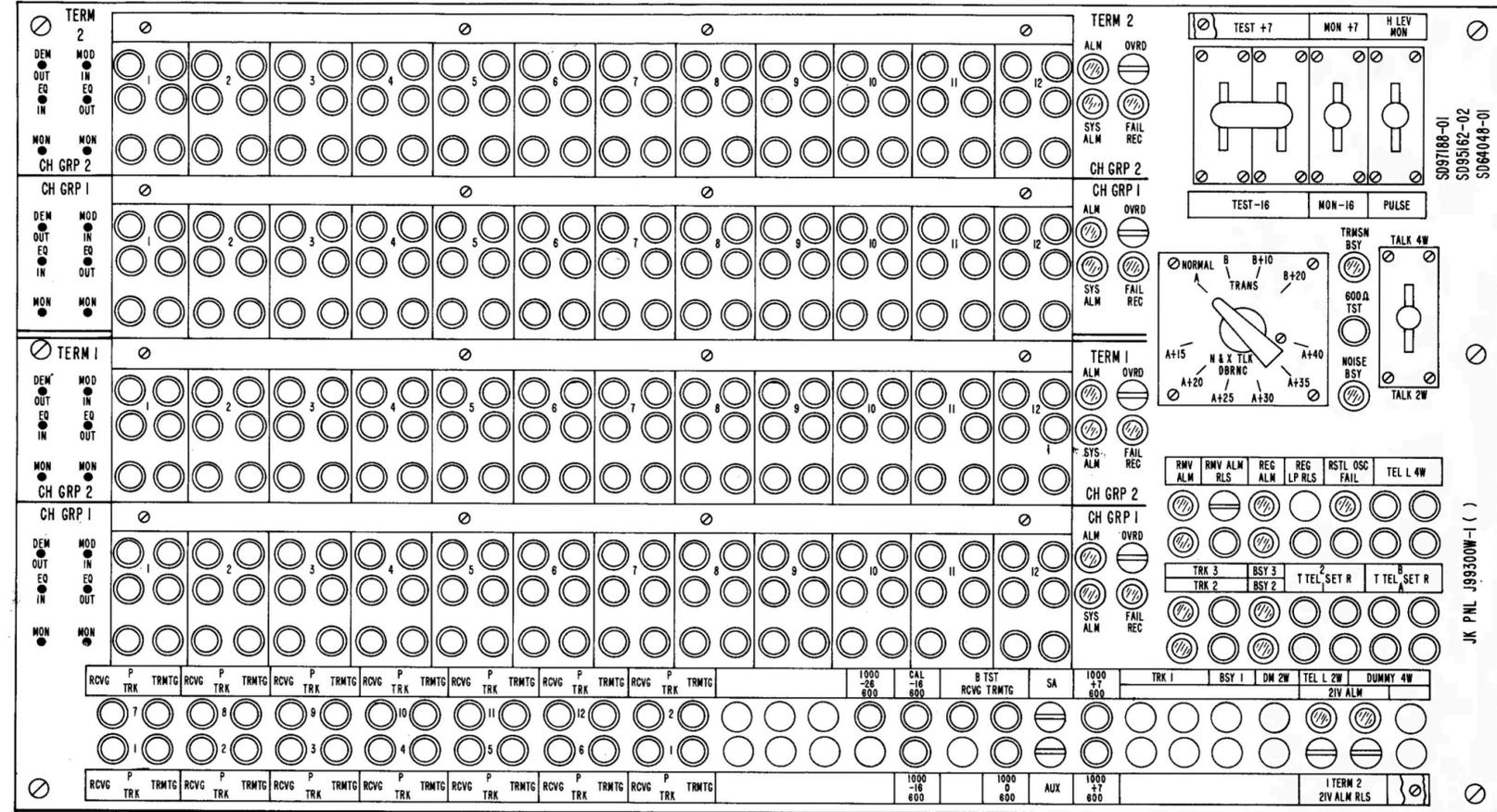
STEP	PROCEDURE
27	<p>Remove the W1BB cord from jack 10, set the CHAN TEST switch to FIN RLS, and momentarily depress the REL RLS key.</p> <p><b>Requirement:</b> The M2, DS, DS1, and SYS ALM lamps are extinguished.</p>
28	<p>Remove plug P3 on the N3 terminal test stand from the terminal and replace the TEST POWER jack. Remove the alarm and restoral unit and restoral oscillator from the terminal test stand and remove all test cords.</p>
29	<p>Measure the forward and reverse resistances of diodes CR5 through CR14 with the VOM (see Fig. 21). Set the VOM to OHMS x 10.</p> <p><b>Requirement 1:</b> Forward resistance is less than 200 ohms.</p> <p><b>Requirement 2:</b> Reverse resistance shall be greater than 1000 ohms for diodes CR5, 7, 8, 9, and 10. For diodes CR11, 12, and 14, the reverse resistance shall be greater than 100,000 ohms. For diode CR6 the reverse resistance shall be between 900 and 1200 ohms; and for diode CR13, between 28,000 and 34,000 ohms.</p> <p><b>M. Carrier-Failure Alarm Threshold Level Adjustment</b></p> <p><b>Note 1:</b> When the single-frequency alarm scheme is employed, the proper option must be selected in the alarm and restoral unit to adjust the alarming threshold (see Test J, Notes 1 and 2).</p> <p><b>Note 2:</b> Both options A and B are provided in alarm and restoral units at the factory. <u>Option B should be removed when placing new units and new systems in service.</u> If the system initiates alarms on momentary drops in carrier level, it may be desirable to remove option A at a later date. On old systems, which have exhibited satisfactory carrier failure alarm performance until a trouble developed in the alarm and restoral unit, the existing option should be duplicated in the replacement unit.</p>
1	<p>Remove the J99300AK alarm and restoral unit for the proper channel group and extinguish the resulting office alarms by operating the RMV ALM RLS key to the vertical position.</p> <p><b>Caution:</b> <i>Do not remove the alarm and restoral unit when the associated channel group is a working system that has failed. Removing this unit during a carrier failure disables the trunk-release and make-busy circuits as well as the carrier failure alarm circuit.</i></p>
2	<p>Locate options A and B in the unit. Refer to Fig. 20 for List 1 units and Fig. 21 for Lists 2 and 3 units.</p>
3	<p>On new units in new systems, remove option B by cutting the indicated strap. On old units and old systems, install or remove options as required (see Note 2).</p>
4	<p>Return the alarm unit to the bay location and operate the RMV ALM RLS key to the normal horizontal position.</p>

STEP	PROCEDURE
	<p><b>N. ↗Trouble Location for the 2600-Hz Test Tone Circuit (TC Relay Operation)↖</b></p> <p><b>Note 1:</b> This test is designed to assist in locating troubles when certain requirements are not met in the carrier-failure alarm Test I or J.</p> <p><b>Note 2:</b> Each part of this test begins with a requirement of Test I or J that cannot be met and traces the trouble in a series of measurements.</p> <p><b>Note 3:</b> Voice communication between the near and far terminals is required to determine that proper indications occur as the circuit is conditioned at each end.</p> <p><b>Note 4:</b> Minor deviations in the timing requirements of Test I or J are not covered in this test. When these deviations occur, it is suggested that deviation be verified by retesting and if a definite trouble is found, the maintenance test for the alarm unit, Test K or L, be performed.</p> <p><b>Note 5:</b> Refer to Fig. 22 for the interconnection of the 2600-Hz test tone circuit and the location of test jacks.</p> <p><b>Part 1</b></p> <p>1 If the FAIL REC lamp at the near terminal does not extinguish approximately 24 seconds after a carrier failure is simulated (Test I, Step 15b, Requirement 5 or Test J, Step 13b, Requirement 4), either the 2600-Hz test tone is not being received on channel 1 at the near terminal, or a trouble exists in the near terminal alarm and restoral circuit.</p> <p><b>At the Near and Far Terminals</b></p> <p>2 Ensure that the condition of the alarm and restoral circuit, as specified in preceding steps of Test I or J, is not altered until the trouble is isolated.</p> <p><b>At the Near Terminal</b></p> <p>3 Connect the VTVM with a W2FP cord to the DEM OUT and DEM GRD jacks on the channel 1 modem for the channel group under test (see Fig. 6). The grounded terminal of the VTVM must be connected to the DEM GRD jack.</p> <p>4 Disconnect the compandor or voice-frequency amplifier unit for channel 1 of the channel group under test by operating the latching lever.</p> <p>5 Measure the received level of the 2600-Hz test tone with the VTVM.</p> <p><b>Requirement:</b> -5.0 to -9.0 dB.</p> <p>6 If this requirement is not met, the far terminal should perform Step 10 to determine if the 2600-Hz tone is being transmitted at the proper level on channel 1.</p>

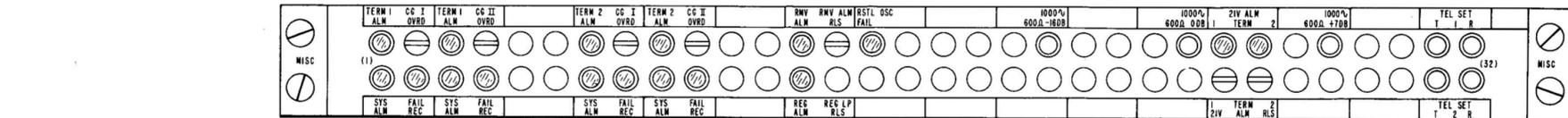
STEP	PROCEDURE
7	<p>If this requirement is met, reinsert the compandor or voice-frequency amplifier unit in its normal position in the bay.</p> <p><b>Requirement:</b> -5.0 to -9.0 dB.</p>
8	<p>If this requirement is met, the trouble is in the near terminal alarm and restoral unit. Verify the trouble by checking the alarm unit per Test K or L, whichever is applicable.</p>
9	<p>If this requirement is not met, the TC relay is not operated and the expander or voice-frequency amplifier is still connected to the output of the channel modem. The trouble can be either in the alarm and restoral unit or in the TC relay circuit (see Fig. 22).</p> <p><b>At the Far Terminal</b></p> <p><b>Note:</b> No work is required at the far terminal unless the requirement of Step 6 is not met.</p>
10	<p>Connect the VTVM with a W2FP cord to the MOD IN and MOD GRD jacks on the channel 1 modem. For the channel group under test (see Fig. 6) the grounded terminal of the VTVM must be connected to the MOD GRD jack.</p>
11	<p>Measure the level of the 2600-Hz test tone.</p> <p><b>Requirement:</b> +6.0 to 11.0 dB.</p>
12	<p>If this requirement is not met, the trouble is in the restoral oscillator circuit, the TC relay circuit, or the alarm and restoral unit. To isolate the trouble:</p> <ul style="list-style-type: none"> <li>(a) Check the restoral oscillator as covered in Test E.</li> <li>(b) Check the alarm unit as covered in Test K or L, whichever is applicable.</li> <li>(c) Check the TC relay circuit using Fig. 22 as a guide.</li> </ul>
13	<p>If this requirement is met and the requirement of Step 5 is not met, the trouble is in the channel 1 transmission circuit. Discontinue the carrier-failure test, disconnecting all cords and test equipment from the terminals and line up channel 1 per Section 362-900-505 or 362-900-510 as applicable.</p> <p><b>Part 2</b></p>
1	<p>If the SYS ALM lamps at the near terminal do not extinguish approximately 10.0 seconds after the W1BC cord is removed from the MOD IN and MOD GRD jacks of the channel 1 modem (Test I, Step 42, Requirement 1 or Test J, Step 41, Requirement 1), either of the following troubles exists.</p> <ul style="list-style-type: none"> <li>(a) The 2600-Hz test tone was not received at a proper level on test channel 2 at the near terminal.</li> </ul>

STEP	PROCEDURE
	<p>(b) A trouble exists in the near terminal alarm and restoral circuit.</p> <p><b><i>At the Near and Far Terminals</i></b></p> <p>2 Remove all test cords and connections.</p> <p>3 Restore the system, so that no alarms are operated, by removing the alarm unit for about ten seconds and reinserting the unit.</p> <p><b><i>At the Near Terminal</i></b></p> <p>4 Connect the VTVM with a W2FP cord to the DEM OUT and DEM GRD jacks on the channel 2 modem for the channel group under test. The grounded terminal of the VTVM must be connected to the DEM GRD jack.</p> <p>5 Set the VTVM to the -10 dB (.3 VOLTS) scale.</p> <p>6 Cause a simulated carrier failure by connecting the 1-<math>\mu</math>F capacitor to the MOD CARR and GRD jacks on the channel group modem for the channel group under test (see Fig. 6). Disconnect the capacitor when the SYS ALM lamps on the alarm and restoral unit and jack panel light.</p> <p><b><i>Requirement:</i></b> The VTVM indicates momentarily approximately 24 seconds after the simulated carrier failure.</p> <p><b><i>Note:</i></b> The VTVM indicates approximately 12 seconds after the simulated carrier failure. This indication is caused by the bounce of relay contacts and may be disregarded. The desired indication at 24 seconds is caused by 2600-Hz test tone transmitted from the far terminal.</p> <p>7a If this requirement is met, the trouble is in the near terminal. Try another alarm and restoral unit and check the TC relay circuit using Fig. 22 as a guide.</p> <p>7b If this requirement is not met, proceed to Step 8.</p> <p><b><i>At the Far Terminal</i></b></p> <p>8 Connect the VTVM with a W2FP cord to the MOD IN and MOD GRD jacks on the channel 2 modem for the channel group under test. The grounded terminal of the VTVM must be connected to the MOD GRD jack.</p> <p>9 Set the VTVM to the -10 dB (.3 VOLTS) scale.</p> <p>10 Request the near terminal to simulate a carrier failure per Step 6.</p> <p><b><i>Requirement:</i></b> The VTVM indicates approximately 24 seconds after the simulated carrier failure.</p>

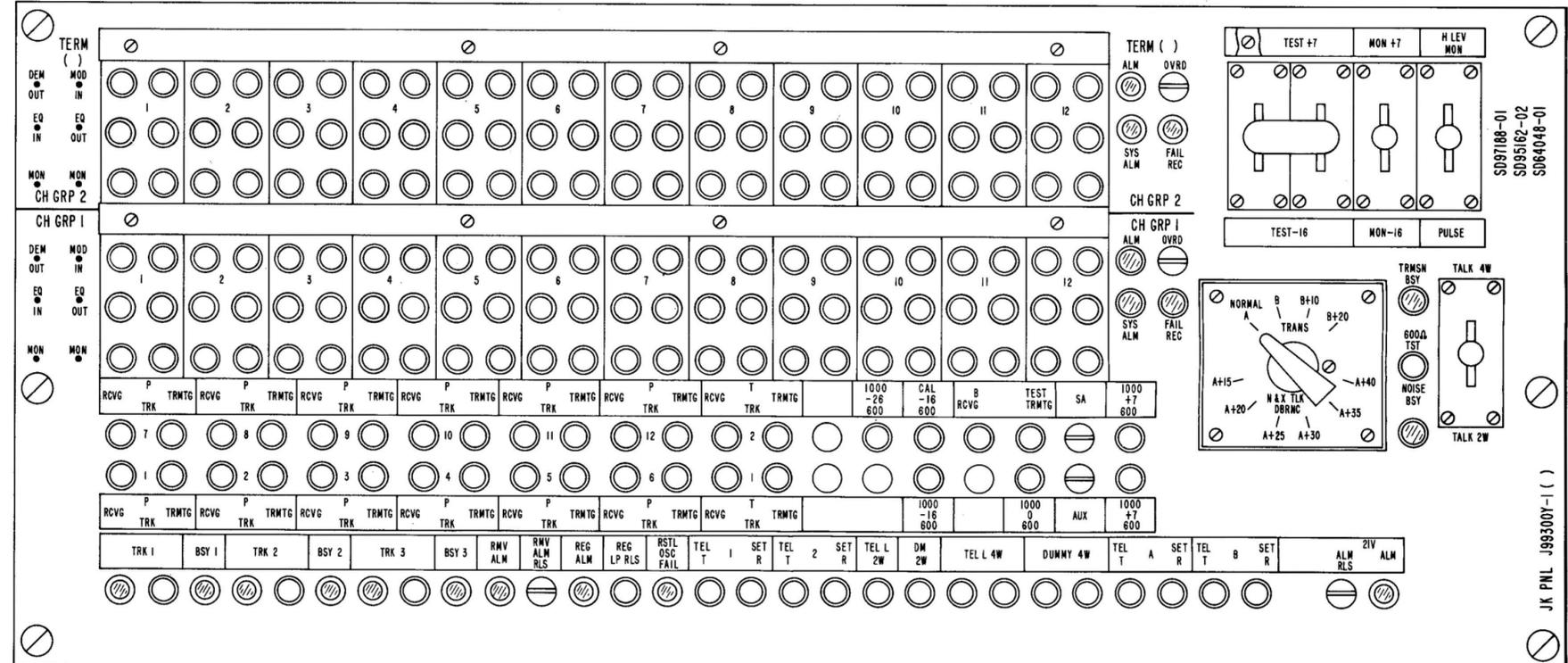
STEP	PROCEDURE
11a	If this requirement is met, the probable trouble is in the channel 2 transmission circuit. Discontinue the carrier failure test, disconnecting all cords and test equipment from the terminals and line up channel 2 per Section 362-900-505 or 362-900-510 as applicable.
11b	If this requirement is not met, proceed to Step 12.
	<b><i>At the Near and Far Terminal</i></b>
12	To locate the trouble, reverse the far and near terminal designations in Test I or J, whichever is applicable, with the far terminal becoming the near terminal and the near terminal becoming the far terminal.
13	Repeat Test I or J with the reversed terminal designations.
14	The trouble should be encountered at a different point in Test I or J and can be located as covered in these tests.
	<b>Part 3</b>
1	If the SYS ALM lamp at the near terminal extinguishes approximately 10 seconds after the WIBC cord has been removed from the channel 1 modem (Test I, Step 41, Requirement 1 or Test J, Step 40, Requirement 1), the near terminal times out, releasing the associated TC relays.
	<b><i>At the Near Terminal</i></b>
2	If the SYS ALM and FAIL REC lamps at the far terminal do not extinguish approximately 10 seconds after the WIBC cord has been removed (Test I, Step 43, Requirements 1 and 2 or Test J, Step 42, Requirements 1 and 2), the trouble is difficult to isolate since the near terminal is timed out.
3	To locate the trouble, reverse the far and near terminal designations in Test I or J, whichever is applicable, with the far terminal becoming the near terminal and the near terminal becoming the far terminal.
4	Repeat Test I or J with reversed terminal designations.
5	The trouble should be encountered at a different point in Test I or J and can be located as covered in these tests.



A J99300W FOR J99300A TERMINAL FRAMES



B ED-97266-30 FOR J99300B TERMINAL FRAMES



C J99300Y FOR J99300C AND D TERMINAL FRAMES

Fig. 1—Jack Panels for Terminal Frames

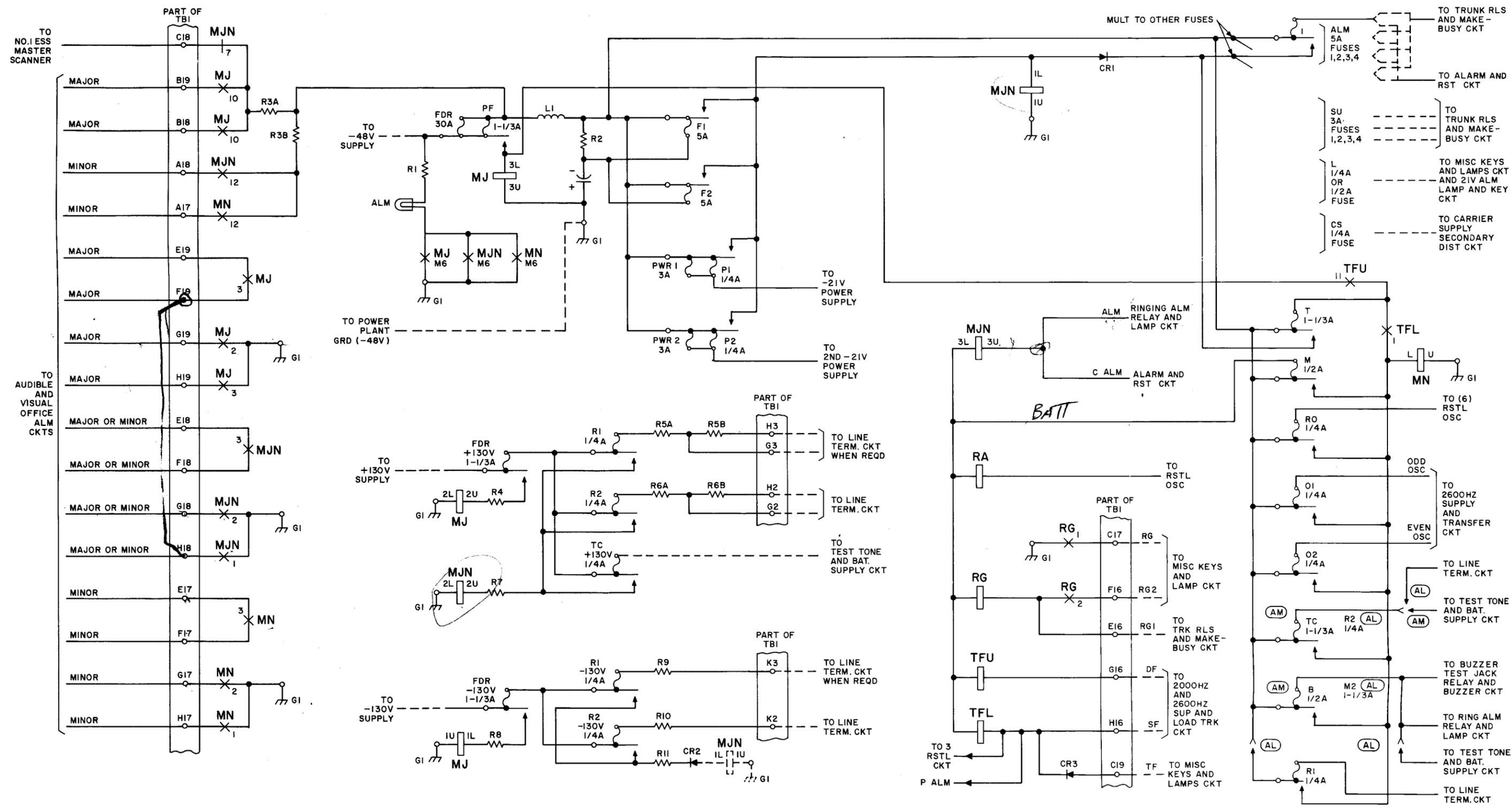
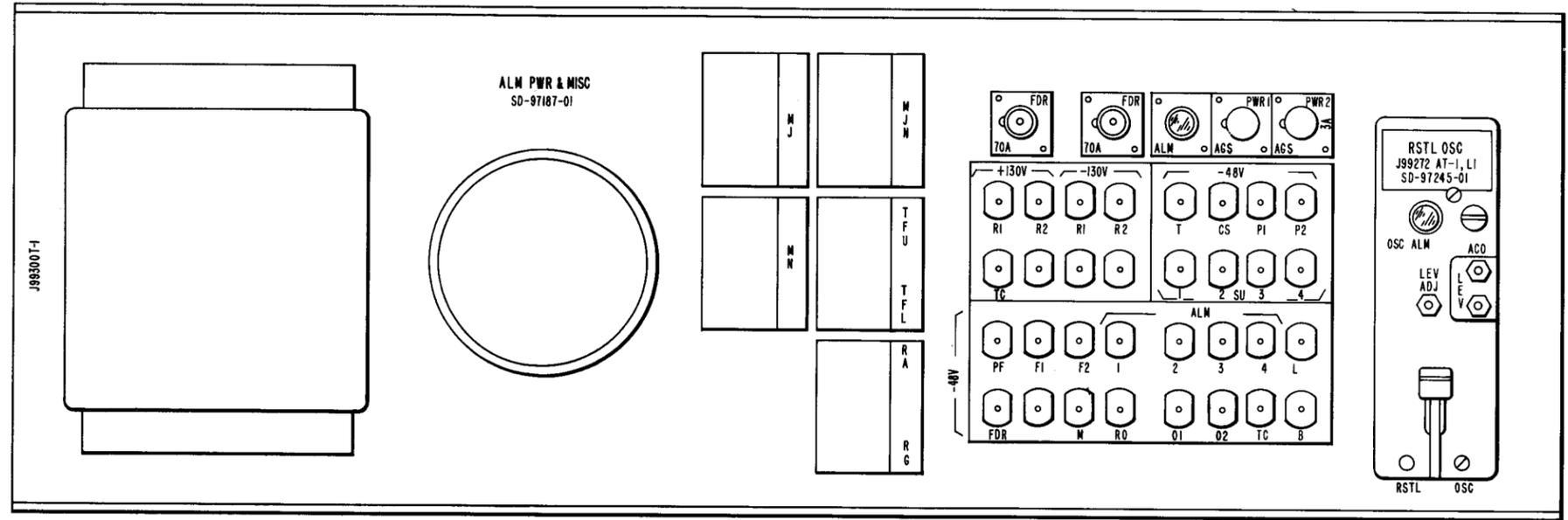
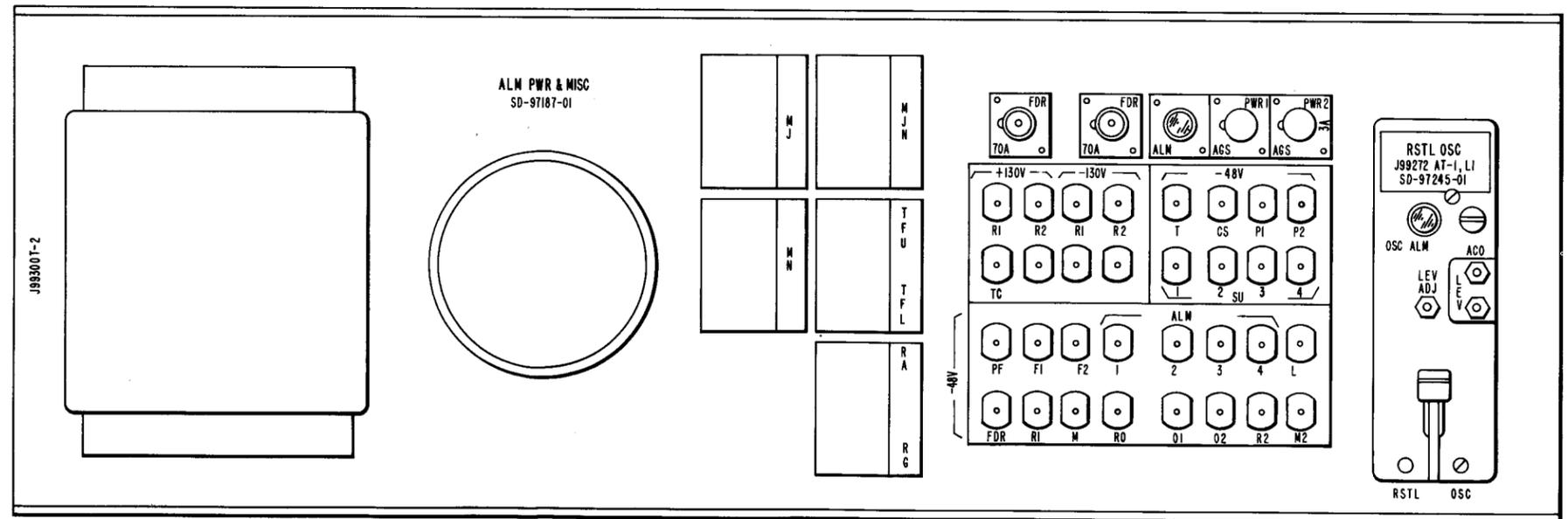


Fig. 2—Part of Alarm, Power, and Miscellaneous Panel



A-J99300T-1 AM OPTION



B-J99300T-2 AL OPTION

Fig. 3—Alarm, Power, and Miscellaneous Panels

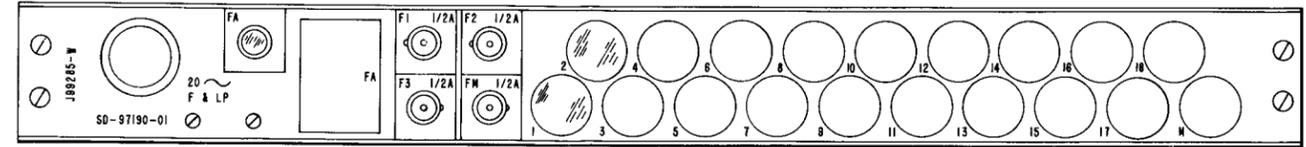


Fig. 4—20-Hertz Ringing Fuse and Lamp Panel

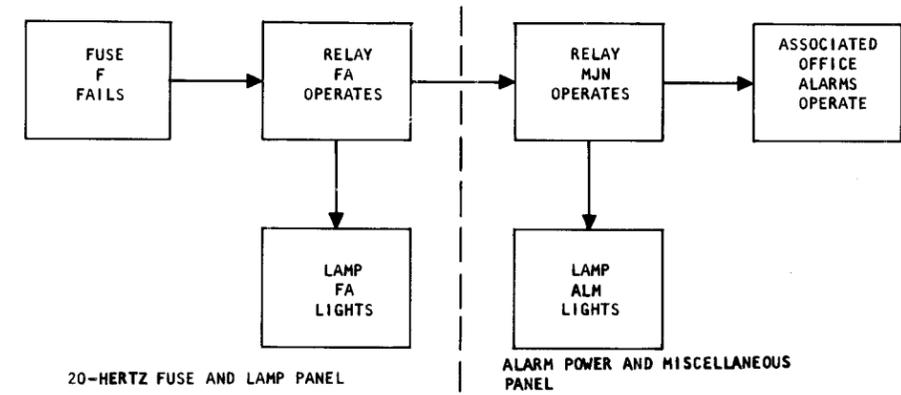


Fig. 5—Sequential Operation of Relays for Failure of 20-Hertz Ringing Fuse

NOTES:

1. THE 1UF CAPACITOR LEADS SHALL NOT EXCEED 6 IN. IN LENGTH.
2. VTVM NOT REQUIRED IF FRAME IS EQUIPPED WITH J99300AS FREQUENCY CORRECTION UNITS.
3. THE N3 FRAME MAY BE EQUIPPED WITH EITHER J99300AE OR J99300AS FREQUENCY CORRECTION UNITS.
4. THE N3 FRAME MAY BE EQUIPPED WITH EITHER J99300AB OR J99300AY CHANNEL MODEM UNITS.
5. THE N3 FRAME MAY BE EQUIPPED WITH EITHER J99300AC OR J99300CA DOUBLE-CHANNEL REGULATOR UNITS.

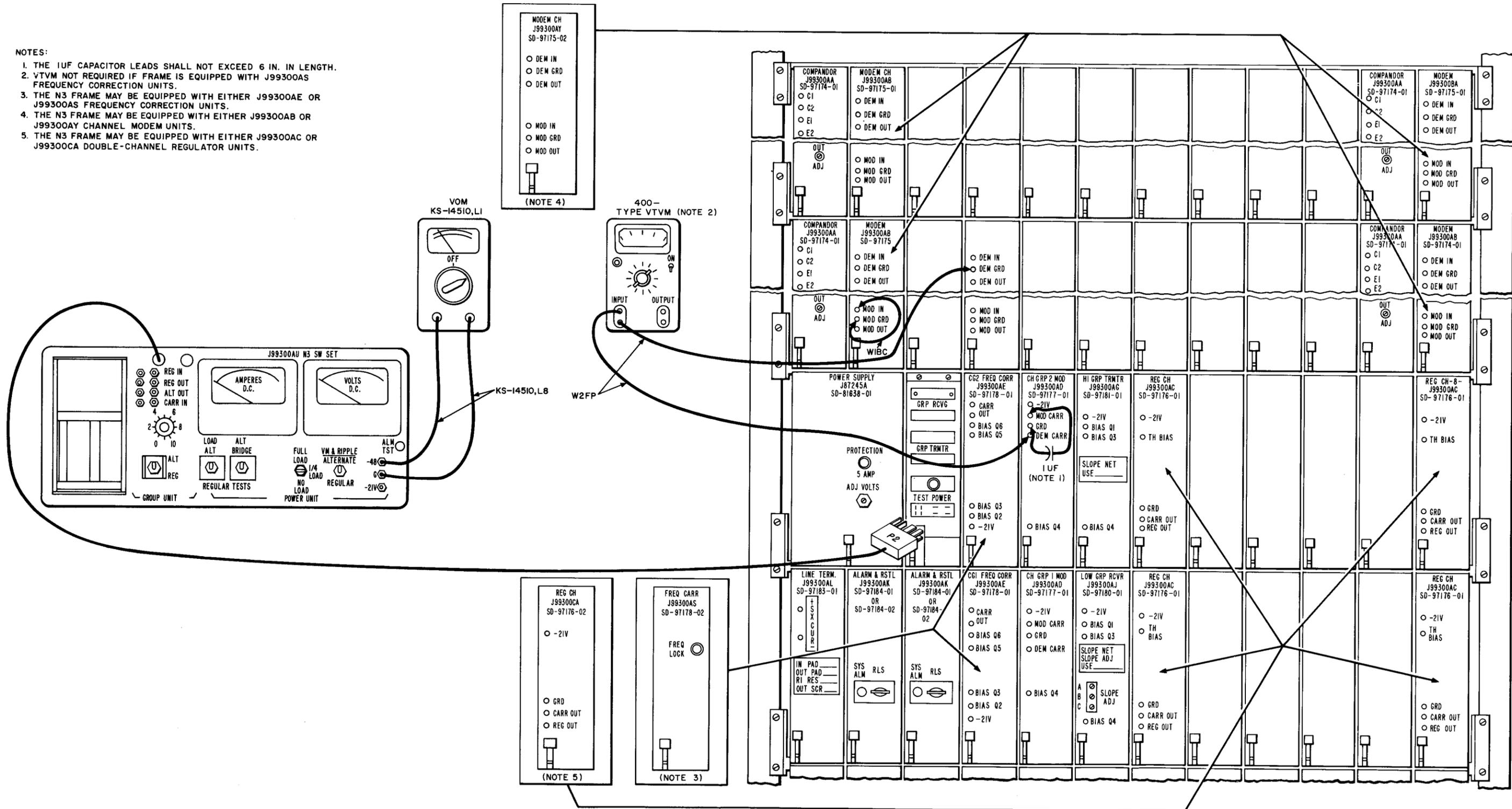


Fig. 6—Typical Arrangement of Test Equipment for Checking the Alarm Operation for Carrier Failure of an N3 Carrier System

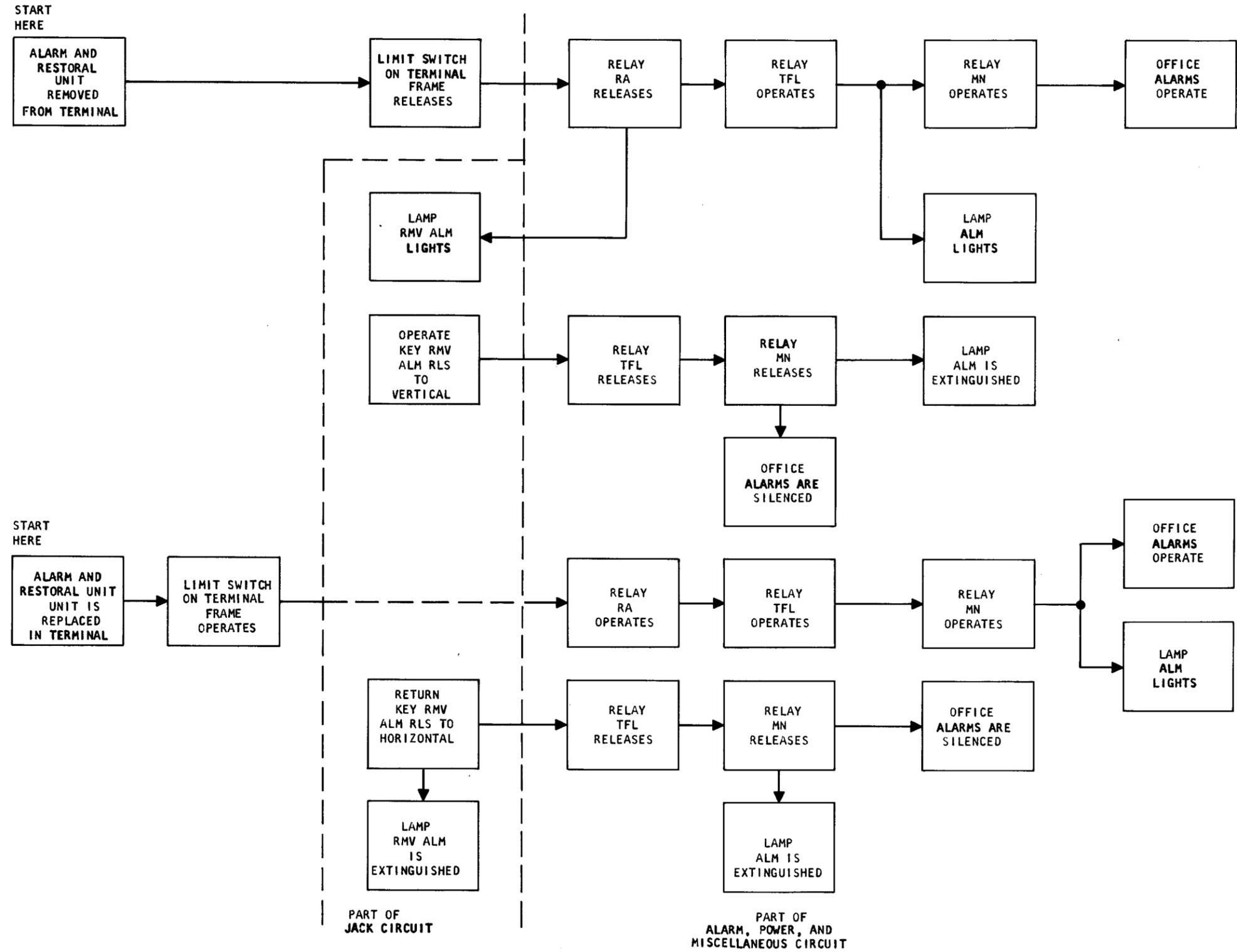


Fig. 7—Sequential Operation of Relays for Removal of Alarm and Restoral Unit

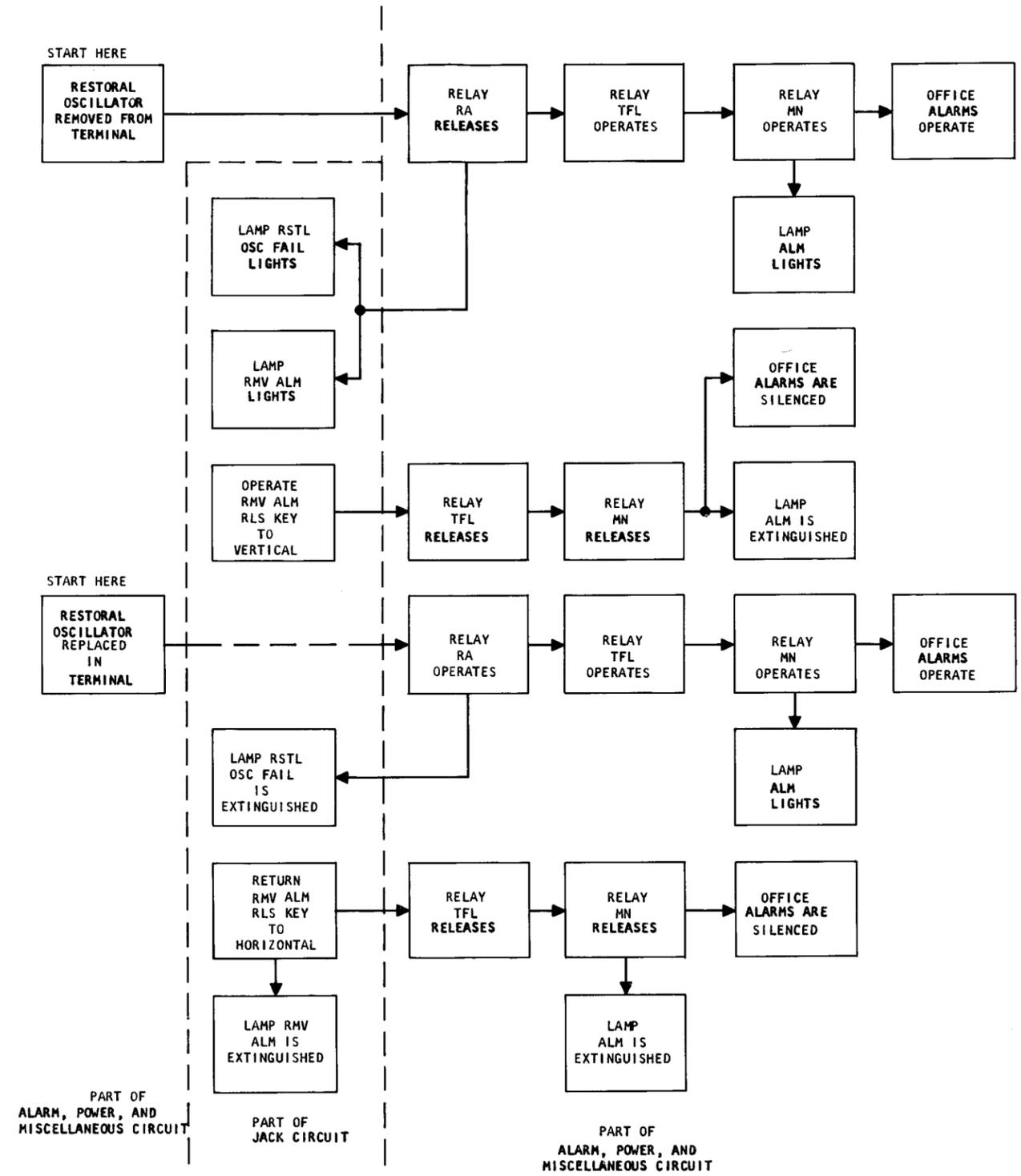


Fig. 8—Sequential Operation of Relays for Removal of Restoral Oscillator

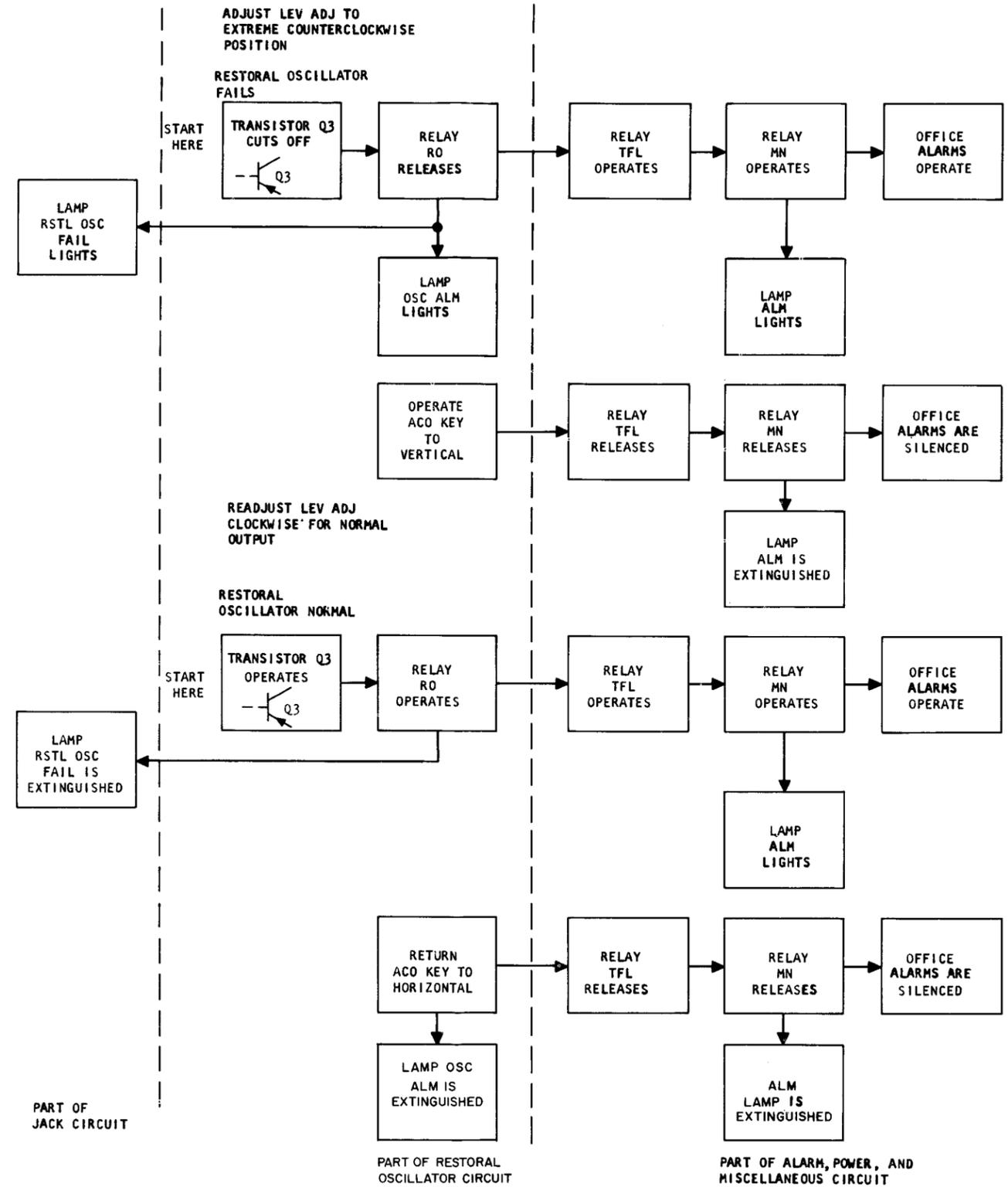


Fig. 9—Sequential Operation of Relays for Restoral Oscillator Failure

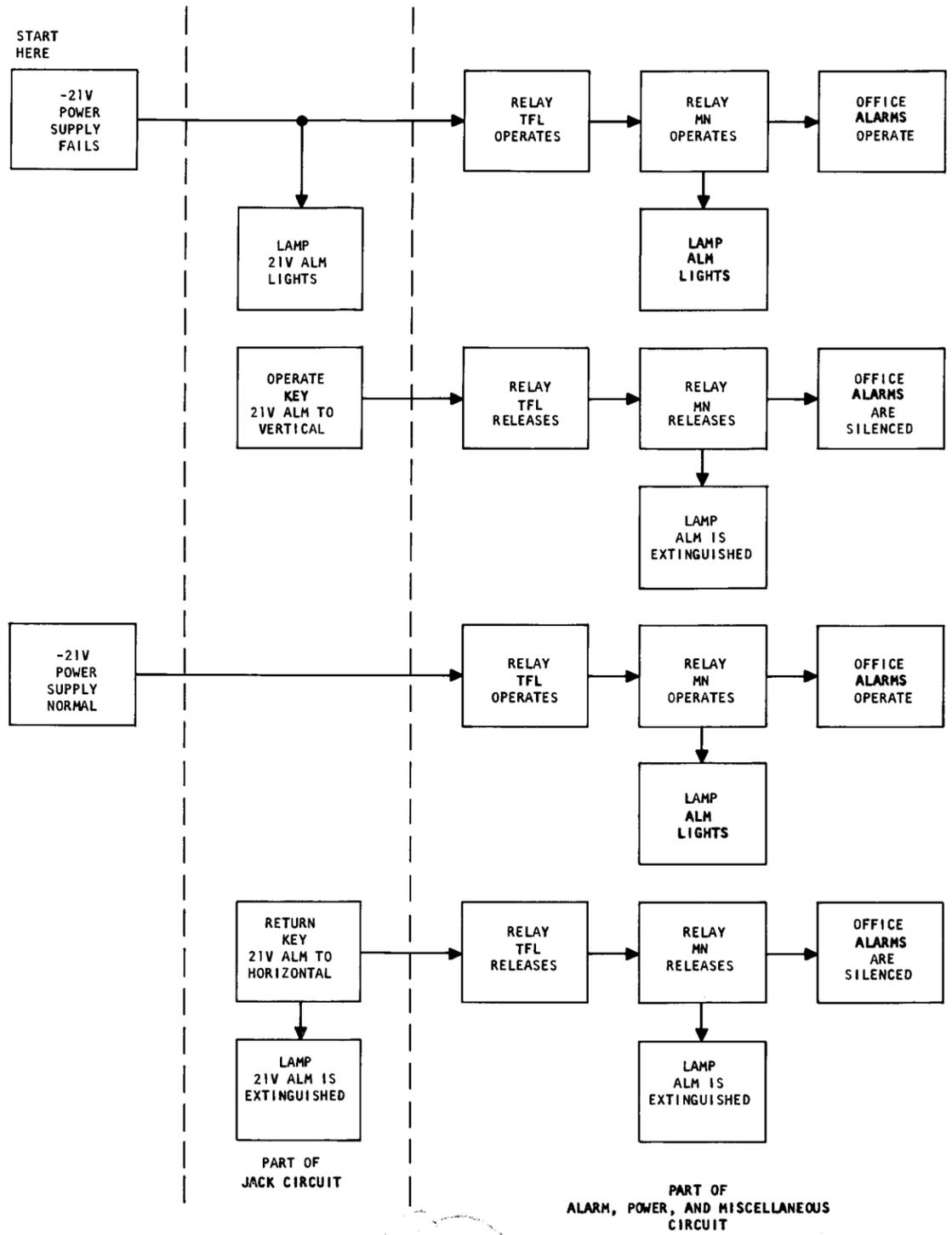


Fig. 10—Sequential Operation of Relays for Deviation of -21 Volt Power Supply Output Voltage

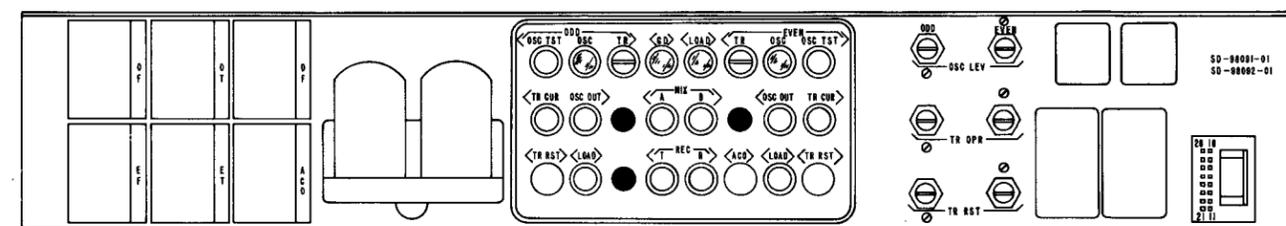


Fig. 11—J98613BU (as in use) or J98613BW 2000-, 2400-, or 2600-Hertz Oscillator and Transfer Panel

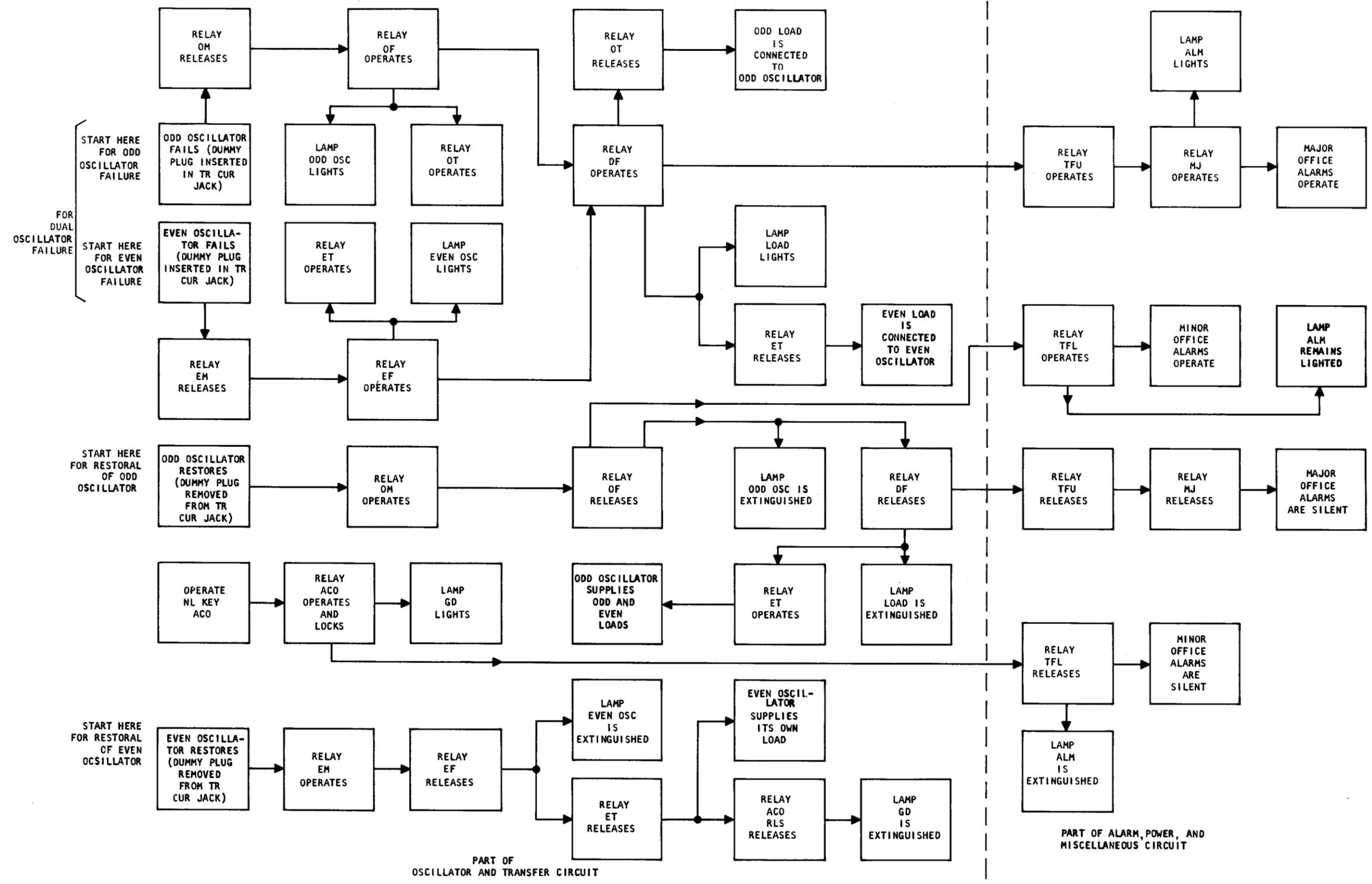


Fig. 12—Sequential Operation of Relays for Dual Failure of Signaling Oscillators

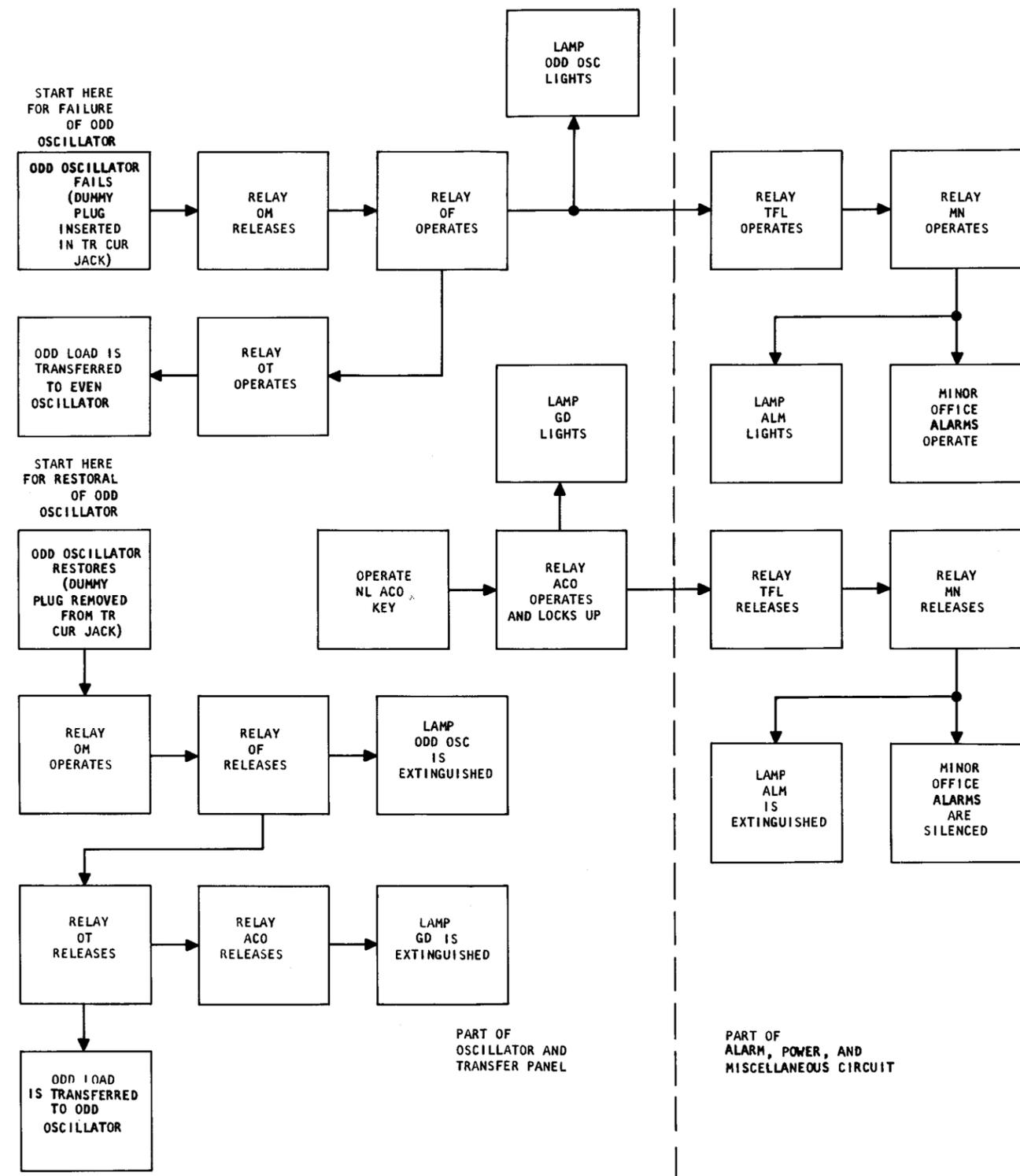


Fig. 13—Sequential Operation of Relays for Single Failure of Signaling Oscillator

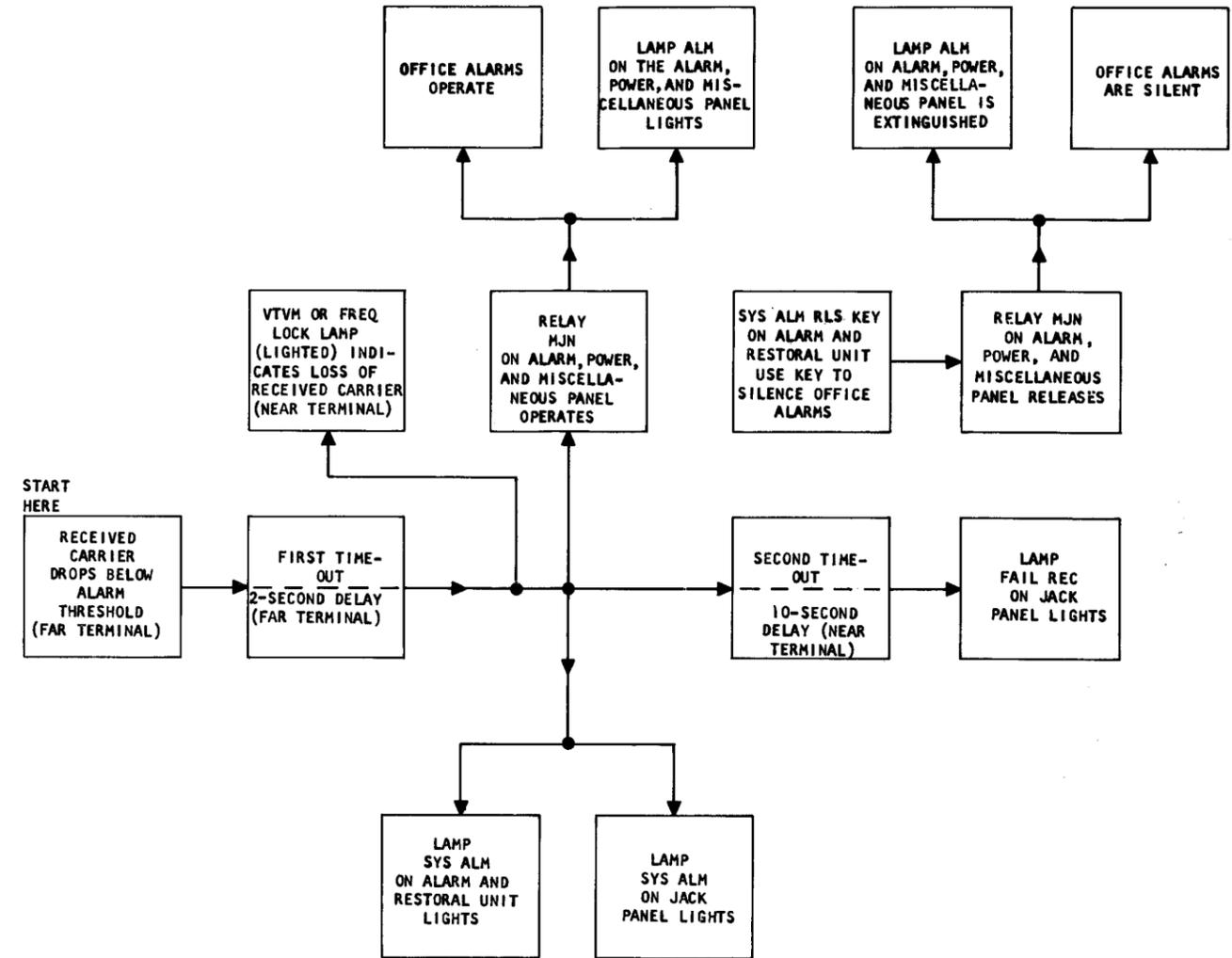
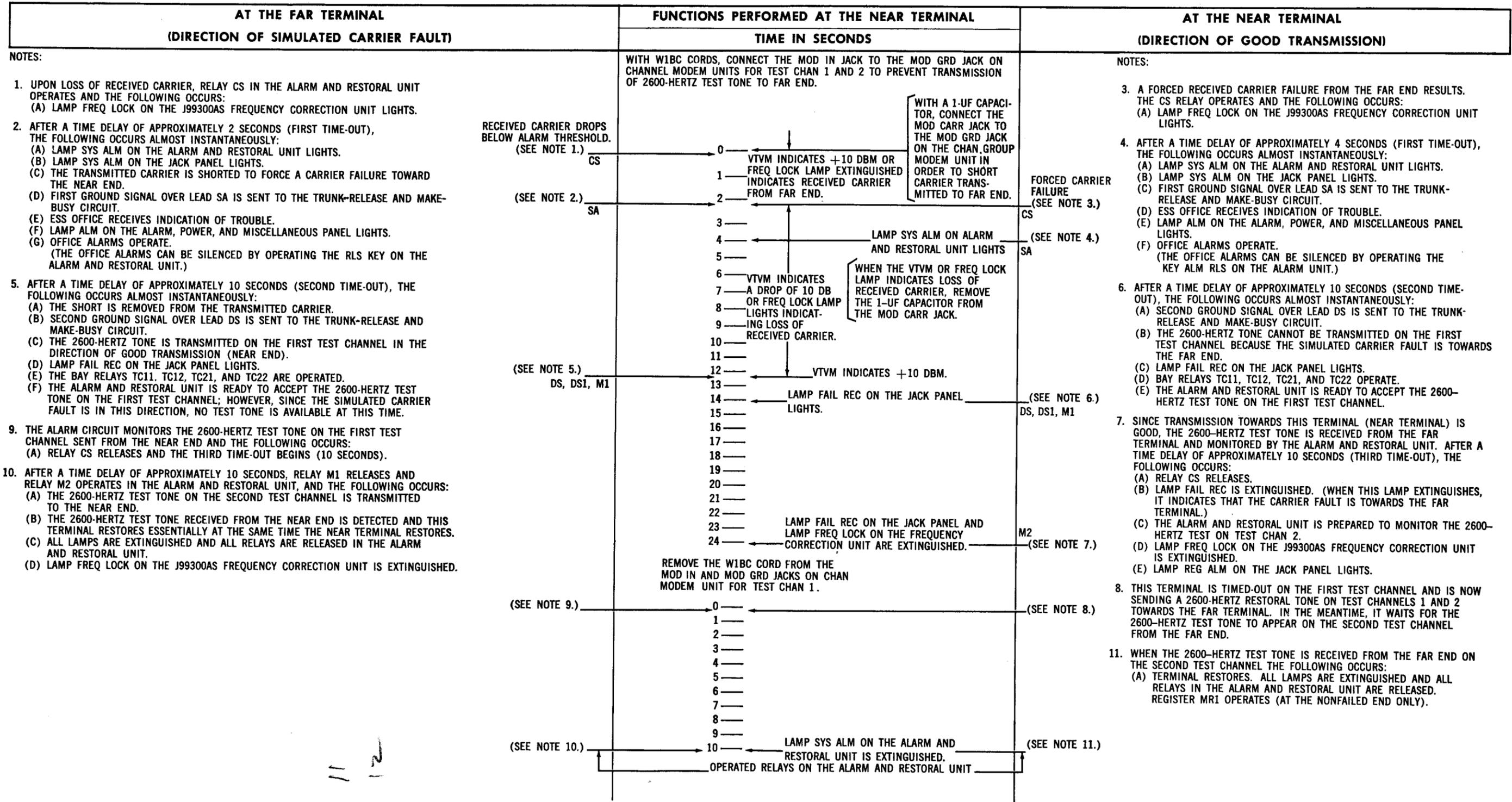


Fig. 14—Sequential Operation of Lamps for First and Second Time-Outs



TC 11  
TC 12

Fig. 15—Time Chart for Alarm Operation Due to Loss of Carrier

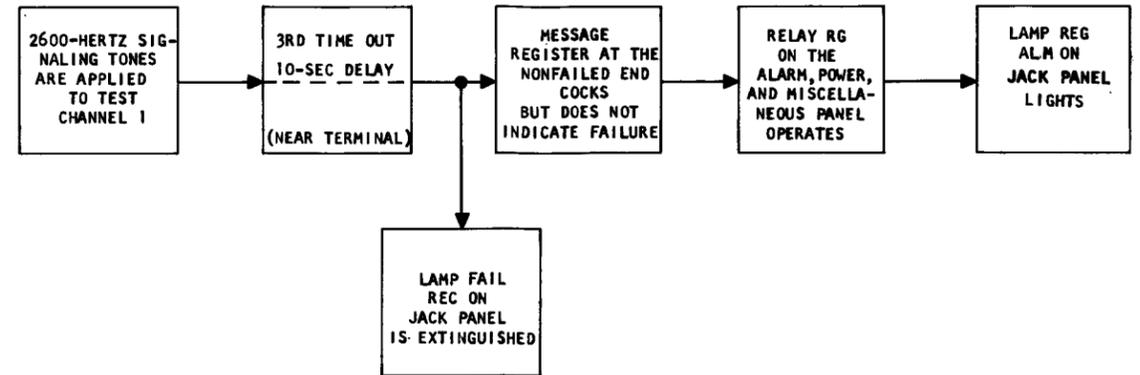
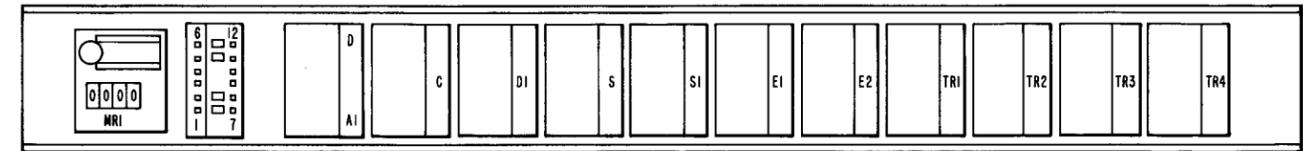
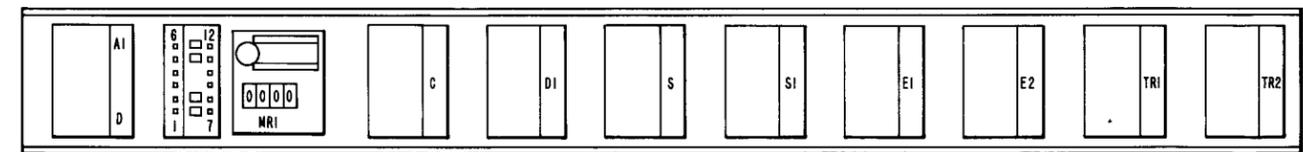


Fig. 16—Sequential Operation of Lamps for the Third Time-Out



A-J99300BL



B-J99285AP

Fig. 17—Trunk-Release and Make-Busy Panels

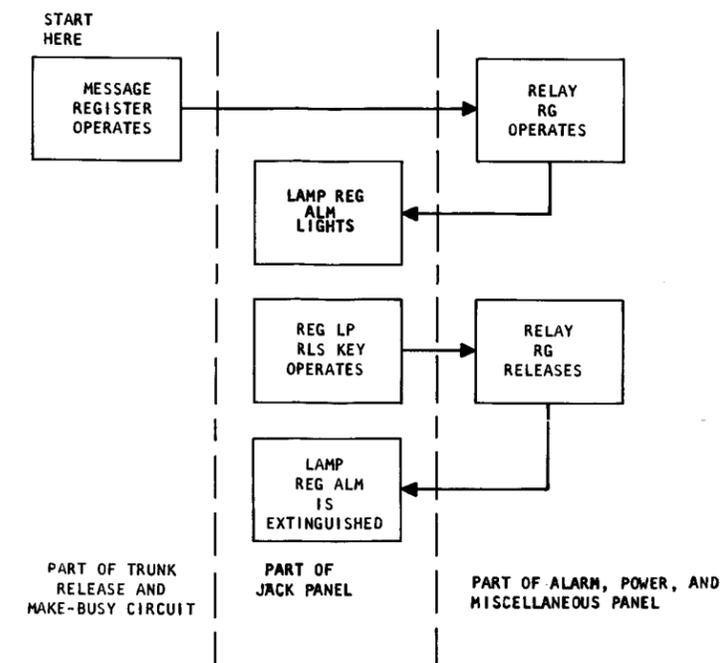


Fig. 18—Sequential Operation of Relays for Message Register

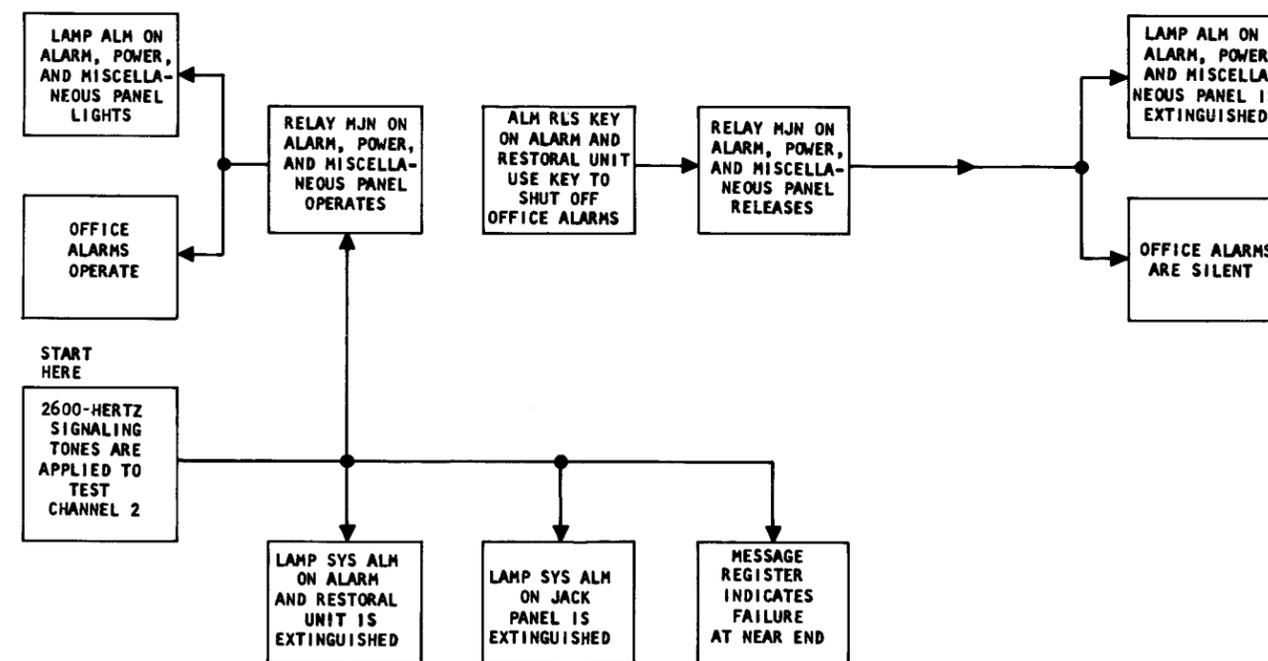


Fig. 19—Sequential Operation of Lamps for Final Restoral

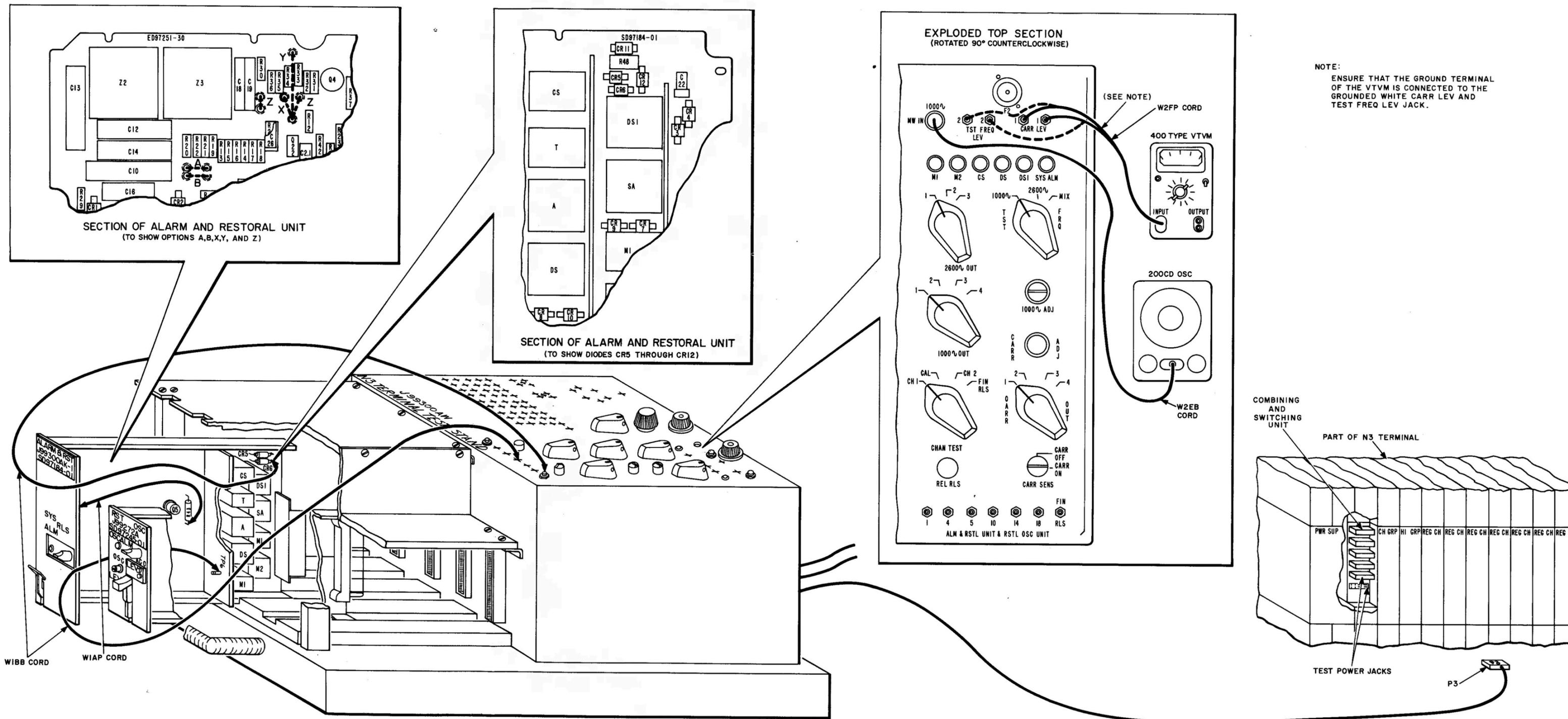


Fig. 20—Check of Alarm Operation for Alarm and Restoral Unit J99300AK, List 1

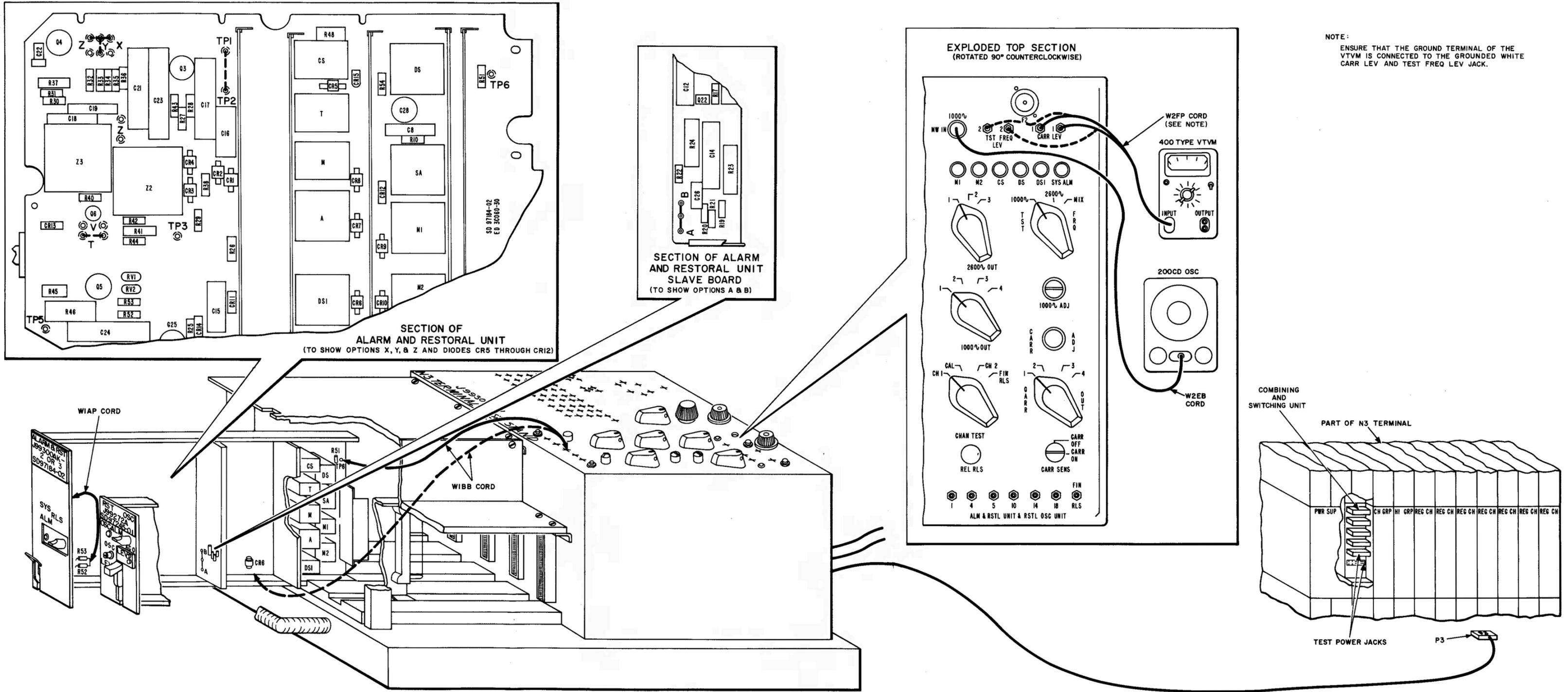


Fig. 21—Check of Alarm Operation for Alarm and Restoral Unit J99300AK, List 2 or 3

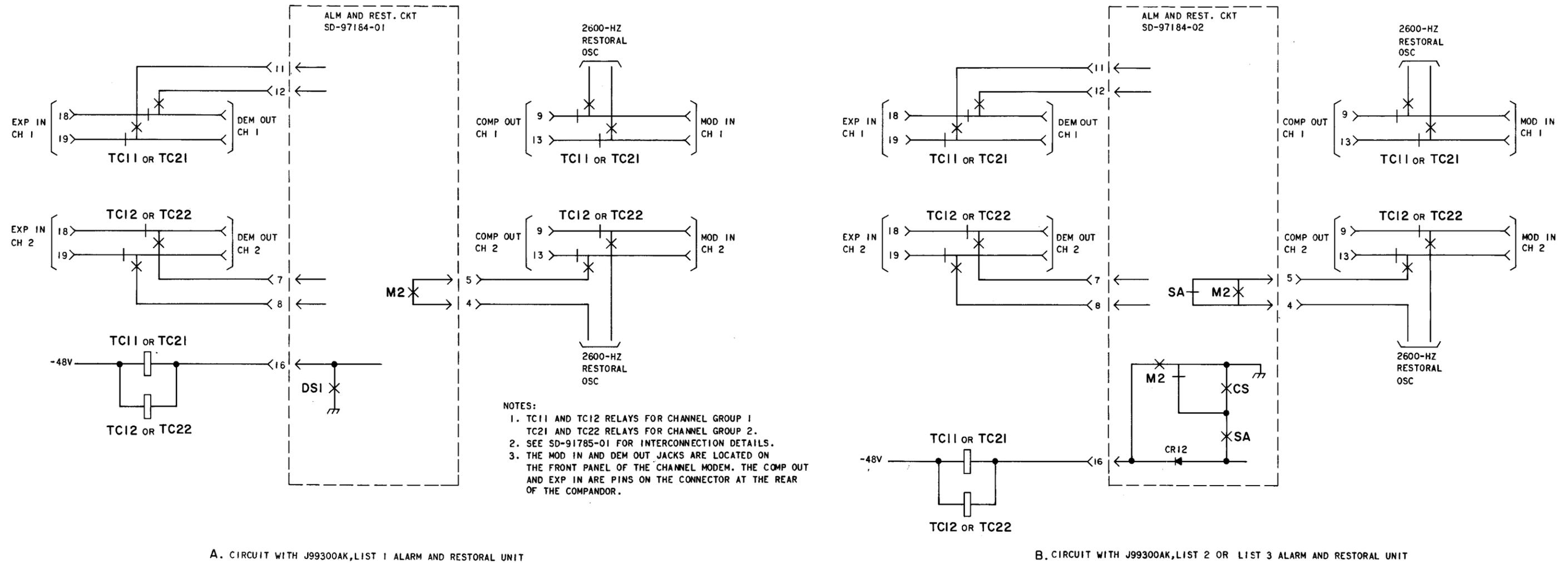


Fig. 22-Alarm and Restoral 2600-Hz Test Tone Circuit