

N3 CARRIER TELEPHONE SYSTEM
CARRIER-FREQUENCY SUPPLY
64-KHZ SYNC SUPPLY
RESTORATION AND TEST

CONTENTS	PAGE
1. GENERAL	1
2. RESTORATION CONSIDERATIONS	1
3. FEATURES OF TESTS	1
4. APPARATUS	2
5. TESTS	2
A. 64-kHz Power Output	2
B. Trouble Locating	4
C. Alarm Check	4

1. GENERAL

1.01 This section describes the maintenance of the 64-kHz sync supply panel which is located in the N3 primary carrier-frequency supply bay. Information is also included for restoration patching between sync supply panels.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 This section supplements Section 362-901-501 which provides test and maintenance procedures for the N3 primary carrier-frequency supply.

1.04 The J99300BS sync supply panel (Fig. 1) provides a reference 64-kHz signal input to the J99300BA 4-kHz generator unit in the primary carrier-frequency supply. A block diagram is shown in Fig. 2. Two phase-locked transmitted carriers, 152 kHz and 184 kHz from the distant terminal, are received at the associated N3 carrier terminal and applied to the 64-kHz sync supply panel. A modulator derives the difference frequency of 32 kHz which in turn is doubled and filtered to

produce a pure 64-kHz sync signal. This signal is fed to a hybrid network which provides two equal level outputs. One is used to provide the reference frequency input for the regular 4-kHz generator unit in the primary carrier-frequency supply. Therefore, the signal output from the 4-kHz generator unit is phase-locked to the 64-kHz input synchronizing signal. The second output is jack-terminated for testing and restoration purposes.

1.05 Jack access is also provided to an alarm lock-up lead from the N3 terminal alarm and restoral unit to the primary carrier-frequency supply 4-kHz generator unit. The FAIL REC CARR lamp provides visual indication whenever the receiving carrier direction of the associated N3 terminal fails.

2. RESTORATION CONSIDERATIONS

2.01 The J99300BS sync supply panel provides a common point for patching between primary frequency supplies for sync restoration. The panel contains jacks for level tests or restoration access with another 64-kHz sync panel.

2.02 Figure 3 shows a typical application of tandem patching to restore sync from an alternate supply panel when the regular source has failed. Patches should be made in the order indicated. When restoring service to the regular supply, the patch cords should, in turn, be removed from the regular supply panel and then from the alternate supply panel.

3. FEATURES OF TESTS

3.01 Operation of the sync circuit is checked in Test A by measuring the 64-kHz signal level at the hybrid outputs. In the initial lineup, the level is measured at each leg of the hybrid. For the maintenance test, the level is measured at the test and restoration jack of the hybrid.

SECTION 362-901-506

3.02 If the levels at the hybrid outputs are not satisfactory, additional measurements at the carrier inputs are specified in Test B to locate the trouble. Input measurements are made by attaching clip leads to terminal block pins at the rear of the sync panel.

3.03 The jacks and terminal pins involved in each test should be located prior to energizing the carrier-frequency voltmeter so that the voltmeter may be placed in a convenient position for connecting leads and observing the meter indication.

3.04 Operation of the alarm circuit is checked in Test C to ensure proper alarm lamp indications at the sync panel and carrier-terminal bay. This test is made in the initial lineup.

4. APPARATUS

4.01 The following apparatus is required to perform the tests in this section:

1—KS-15538, List 4, 5, or 5A Carrier-Frequency Voltmeter (CFVM), or equivalent

1—135-ohm Terminating Plug (POMONA HS210 Double Banana Plug equipped with 135Ω Resistor)

1—W2DW Cord (modified per Fig. 4)

1—P1M Cord

5. TESTS

STEP	PROCEDURE
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A. 64-kHz Power Output

Note: If this test is performed on a working panel, it must first be removed from service.

- 1 Energize the CFVM and allow time for the set to stabilize.
- 2 Calibrate the CFVM according to the applicable section for this meter.

CFVM	SECTION
KS-15538, List 4	103-400-104
KS-15538, List 5	103-400-105
KS-15538, List 5A	103-400-106

- 3 Disconnect the ground strap between the ground terminal and adjacent bottom input binding post (see Fig. 4).
- 4 Set the SELECTOR switch to 135Ω BRG on List 4 CFVM or to INPUT on List 5 or 5A CFVM.
- 5 Set the FUNCTION switch to SEL 250~ on List 4 CFVM or to OPER 135Ω on List 5 or 5A CFVM.
- 6 Set the ATTENUATOR switch to -40 dBm.
- 7 Insert the 135Ω terminating plug (Fig. 4) into the CFVM input binding posts.
- 8 Plug the meter end of a modified W2DW cord (Fig. 4) into the 135Ω terminating plug.

STEP	PROCEDURE						
9	At the 64-kHz sync panel, insert the plug end of the W2DW cord into the SYNC OUT jack.						
10	Tune the CFVM for an output meter indication at 64-kHz. Peak the FINE tuning control for maximum meter indication. <i>Note:</i> Maximum indication on the output meter probably will not be exactly at 64-kHz on the frequency dial, but should occur within two small scale divisions either side of 64 kHz.						
11	Reset the ATTENUATOR switch as required to maintain an on-scale meter indication as close as possible to 0 decibels. Note the setting of the ATTENUATOR switch and the meter indication.						
12	Measure the power of the 64-kHz signal at the SYNC OUT jack (see example). Example: <table data-bbox="496 909 1096 1066"> <tr> <td data-bbox="496 909 948 940">ATTENUATOR switch setting (dBm)</td> <td data-bbox="997 909 1049 940">-40</td> </tr> <tr> <td data-bbox="496 972 857 1003">Meter indication (DECIBELS)</td> <td data-bbox="997 972 1068 1003">- 3.0</td> </tr> <tr> <td data-bbox="496 1035 857 1066">Measured signal power (dBm)</td> <td data-bbox="997 1035 1068 1066"><u>-43.0</u></td> </tr> </table>	ATTENUATOR switch setting (dBm)	-40	Meter indication (DECIBELS)	- 3.0	Measured signal power (dBm)	<u>-43.0</u>
ATTENUATOR switch setting (dBm)	-40						
Meter indication (DECIBELS)	- 3.0						
Measured signal power (dBm)	<u>-43.0</u>						
	Requirement: Between -42.0 and -46.0 dBm						
13	If the requirement of Step 12 is met, proceed to Step 14. If it is not met, perform trouble-locating tests in Test C.						
14	Remove the W2DW cord from the SYNC OUT jack.						
15	Insert the plug end of the W2DW cord into the TST & RSTN jack.						
16	Measure the power of the 64-kHz signal at the TST & RSTN jack. Requirement: Between -42.0 and -46.0 dBm						
17	If the requirement of Step 16 is met, proceed to Step 18. If it is not met, perform trouble-locating tests in Test C.						
18	Set the CFVM main tuning dial to 30-kHz and the ATTENUATOR switch to -70. Slowly sweep the frequency range from 30-kHz through 200-kHz. As the tuning is varied, any increase in the meter indication (excluding 64-kHz) shows the presence of an unwanted frequency component in the output signal. Measure and note the power of the unwanted components. Requirement: The power of any spurious signal should not exceed -72 dBm Note: A meter indication of -65 dBm is greater than -72 dBm.						

STEP

PROCEDURE

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- 19 If the requirement of Step 18 is met, proceed to Step 20. If it is not met, replace the 593AB bandpass filter in the sync supply panel and repeat Steps 1 through 18 as required.
 - 20 Disconnect the CFVM from the TST & RSTN jack.
 - 21 Remove all test connections.

B. Alarm Check

- 1 At the rear of the associated carrier terminal feeding the 64-kHz sync panel, locate jack J26 (alarm and restoral unit, carrier group 1).
- 2 Connect one end of the P1M cord to ground and connect the other end to terminal 19 of J26.

Caution: *Pin 10 of J26 has –48 volts present. Care should be taken not to ground this terminal.*

- 3 At the associated carrier terminal alarm panel, observe the CH GRP 1 FAIL REC lamp.

Requirement: The FAIL REC lamp is lighted.

- 4 At the 64-kHz sync panel, observe the RCV CARR SYNC FAIL lamp.

Requirement: The RCV CARR SYNC FAIL lamp is lighted.

- 5 Disconnect the P1M cord from pin 19 of J26 and ground. Observe the CH GRP 1 FAIL REC and RCV CARR SYNC FAIL lamps.

Requirement: The FAIL REC and RCV CARR SYNC FAIL lamps are extinguished.

C. Trouble Locating

- 1 If the measurements in Test A, Steps 12 and 16, do not meet requirements, proceed as follows.

- (a) Condition the CFVM for a 135-ohm bridging measurement. Measure the power of the 152-kHz signal at terminals 7 and 8, and the 184-kHz signal at terminals 4 and 5 of TB1 on the 64-kHz sync supply panel.

Requirement: Between –7.2 and –10.5 dBm

STEP	PROCEDURE
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(b) If the requirement of (a) is not met, the trouble is in the carrier terminal feeding the 64-kHz sync panel. Check the double-channel regulator in position 1 (152-kHz), and position 5 (184-kHz) according to Section 362-909-502 (J99300AC) or Section 362-909-503 (J99300CA). If the requirement of (a) is met, the trouble is in the 64-kHz sync modulator circuit board or the 593AB bandpass filter.

(c) Connect the CFVM (135-ohm bridging) to terminals 1 and 2 of the 593AB filter. Measure the power of the 64-kHz signal.

Requirement: Between -38.8 and -42.8 dBm

(d) If the requirement of (c) is not met, the trouble is in the sync modulator circuit board (SD-3C181-01). If it is met, connect the CFVM (135-ohm bridging) to terminals 3 and 4 of the 593AB filter. Measure the power of the 64-kHz signal.

Requirement: Between -39.0 and -43.0 dBm

(e) If the requirement of (d) is not met, the 593AB filter should be replaced. If it is met, check the 4030B hybrid network (SD-3C181-01).

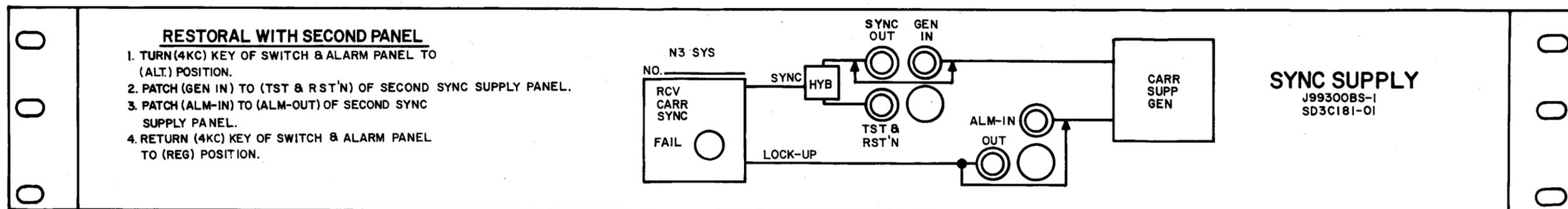


Fig. 1—J99300BS 64-kHz Sync Supply Panel

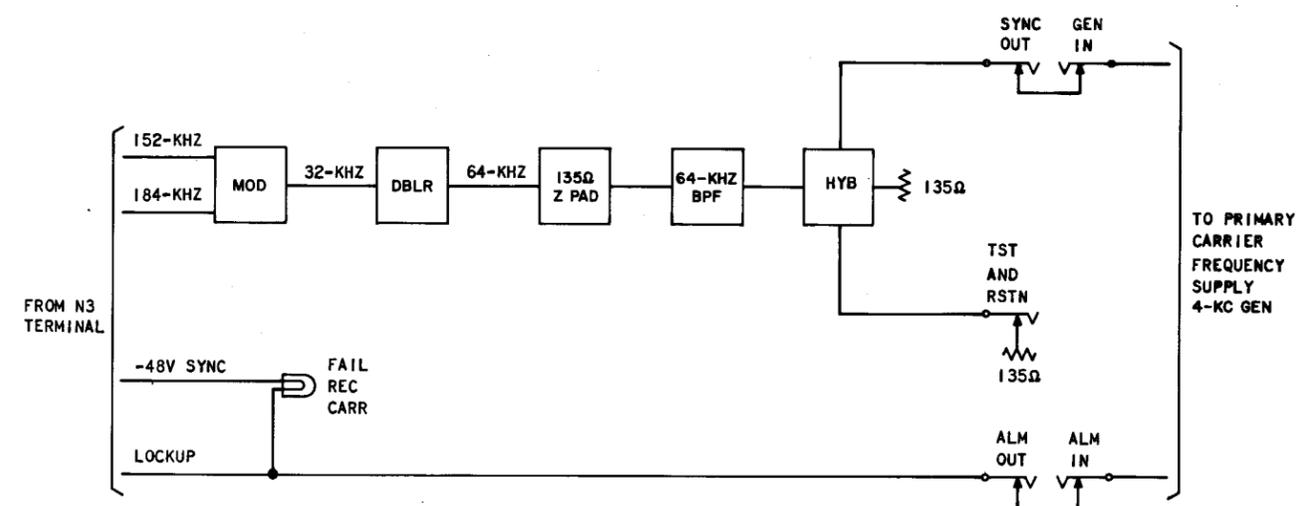
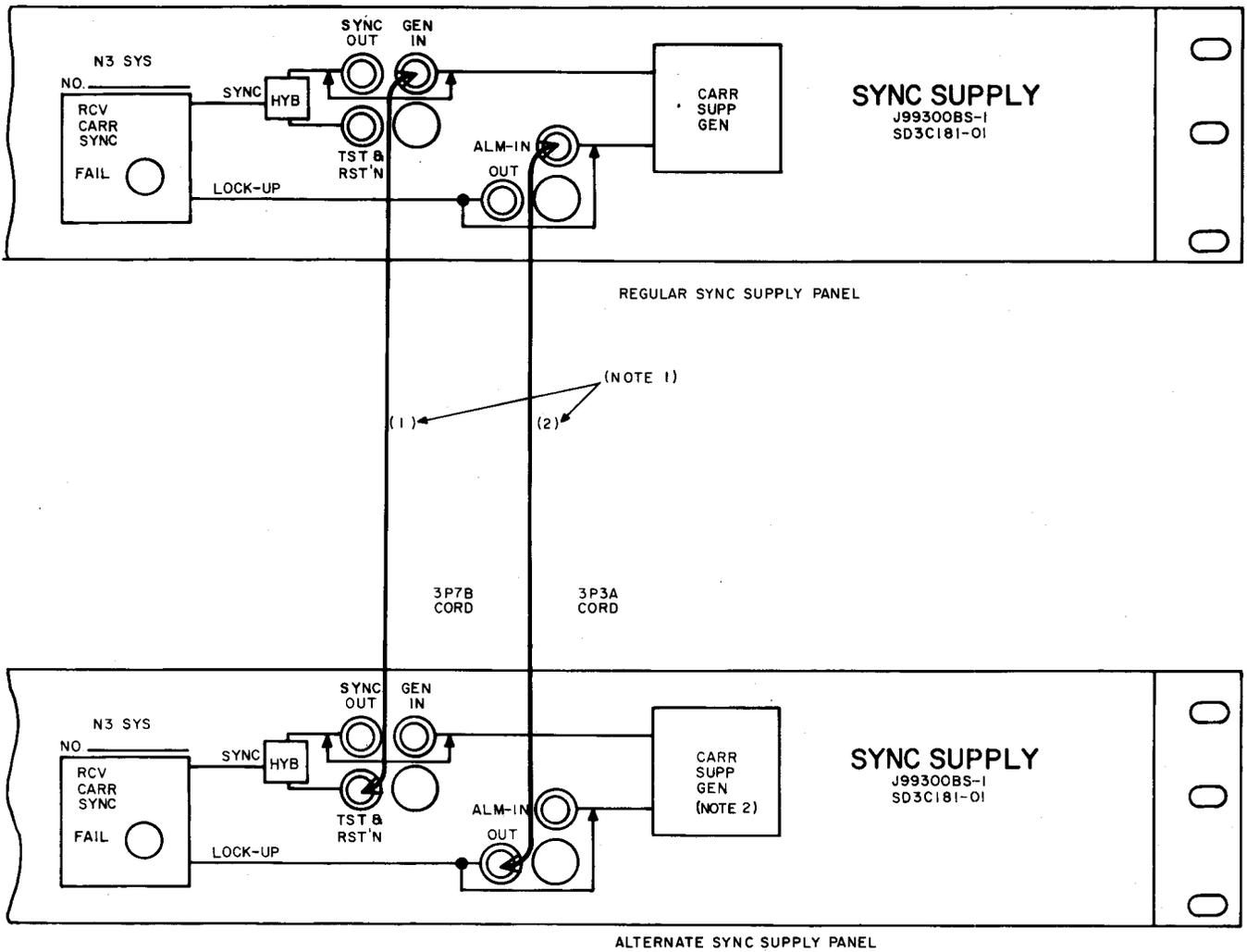


Fig. 2—Block Diagram—64-kHz Sync Supply



- NOTES:
1. MAKE PATCHES IN THE ORDER INDICATED.
 2. CARRIER SUPPLY GENERATOR LEADS NOT CONNECTED TO THE ALTERNATE PANEL.

Fig. 3—Restoration Patching to Restore Sync Supply

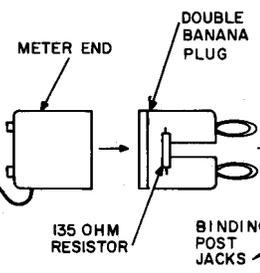
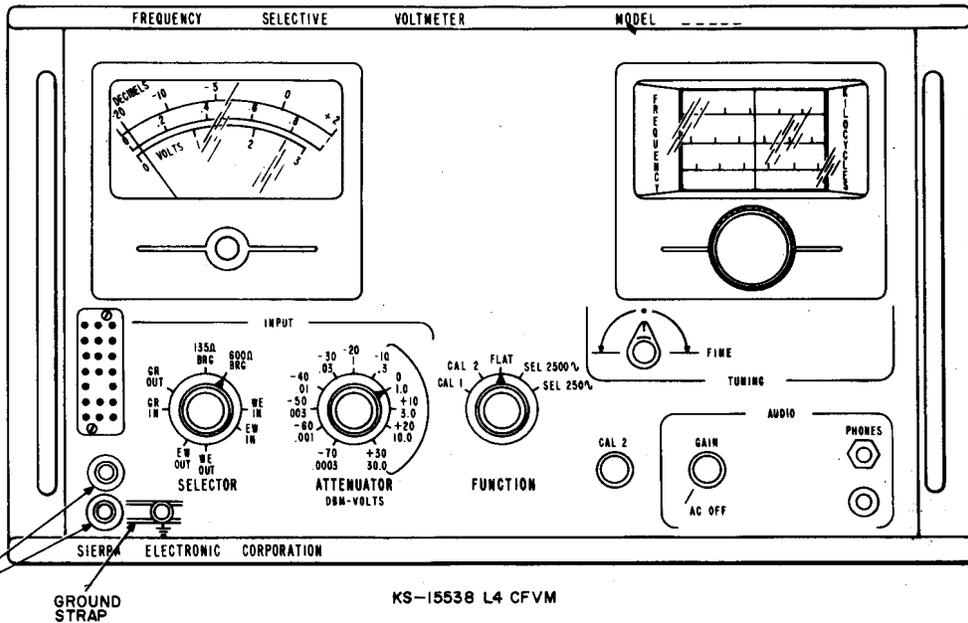
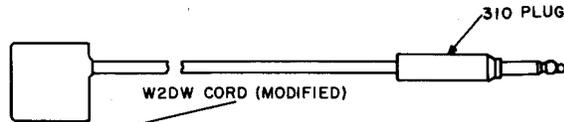
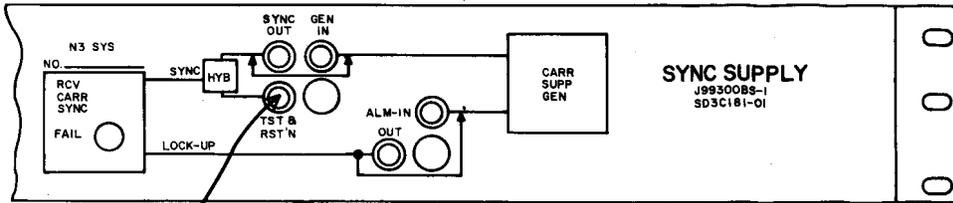


Fig. 4—64-kHz Power Output Check—Test Setup