N3 CARRIER TELEPHONE SYSTEM

DOUBLE-CHANNEL REGULATOR UNIT

J99300CA

LINEUP AND MAINTENANCE TEST

The purpose of this section is to provide in-service tests for determining the operating condition of the J99300CA double-channel regulator unit. These tests consist of measuring the dc voltage (Test A) and the output carrier and demodulating carrier levels (Test B). Figure 1 shows the circuit locations of test jacks in the regulator circuit, and Fig. 2 and 3 show the test arrangements.

This section is reissued to include data on the List 9 and 10 double-channel regulator unit. Since the revision is of a general nature, arrows ordinarily used to indicate changes have been omitted. This reissue does not affect the Equipment Test List.

The J99300CA double-channel regulator compensates for variations in the received carrier signal from the channel group modem unit, thereby providing nearly constant signal levels to the associated channel demodulators. Since the N3 Carrier Telephone System transmits only the even-numbered channel carriers, adjacent odd- and even-numbered channels are regulated by the even-numbered carrier. This carrier is selected by a 659-type crystal pick-off filter. Any one of six pick-off filters may be used in the double-channel regulator. The choice of filters depends upon which pair of channels is to be regulated. In addition to regulated signal outputs, the double-channel regulator provides the carrier for demodulating the even-numbered channel.

APPARATUS:

1—KS-14510, List 1 Volt-Ohm-Milliammeter (VOM), or equivalent, equipped with List 8 Test Leads

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

1—W2FP Cord

STEP	PROCEDURE
	A. −21 Volt Power Supply—In-Service Measurement
1	Set the VOM range switch to the DC VOLTS 60 position.
2	Connect the red VOM test lead (+) to the GRD jack and the black lead (−) to the −21V jack of the double-channel regulator under test. (See Fig. 2.)

STEP	PROCEDURE

3 Read the VOM indication.

Requirement: Between −20.2 and −21.8 volts.

4 If the requirement of Step 3 is met, proceed to Step 5. If it is not met, adjust the voltage output of the −21 volt power supply unit to meet the requirements of Section 362-903-501 before continuing with Step 5.

5 Disconnect the VOM test leads from the regulator unit.

B. Output Carrier and Demodulating Carrier—In-Service Measurements

Note: The steps in this procedure assume that the CFVM has previously been calibrated and meets the requirements of the section covering the specific meter used.

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

6 Energize the CFVM and allow sufficient time for the set to stabilize.

7 Set the FUNCTION switch of the CFVM (Fig. 3) to SEL 250~, the SELECTOR switch to 600Ω BRG on List 2 through 4; or set the FUNCTION switch to 600Ω and the SELECTOR switch to INPUT on List 5 or 5A.

8 Verify that the ground strap is connected to the bottom INPUT binding post. This conditions the CFVM for unbalanced measurement.

9 Insert the meter end of the W2FP cord into the INPUT binding posts (Fig. 3). Observe meter and test cord polarities in making this connection.

10 At the channel regulator unit, connect the black plug of the W2FP cord to the GRD jack and the red plug to the REG OUT jack.

Note: When replacing a channel regulator unit, allow 45 seconds for the unit to regulate before making the measurements in Steps 11 and 15.

11 Referring to Table A, adjust the CFVM tuning dial for maximum indication on the output meter at the selected carrier frequency for the channel regulator position. Peak the output meter with the FINE tuning control and set the ATTENUATOR switch as required to obtain an on-scale indication as close to 0 as possible. To determine signal power in dB, algebraically add (or subtract) the ATTENUATOR switch setting to (or from) the output meter indication.

STEP	PROCEDURE

Requirement: Between −8.3 and −11.3 dB.

TABLE A

SELECTED CARRIER FREQUENCY FOR CHANNEL REGULATOR POSITIONS

CHANNEL REGULATOR POSITION	SELECTED CARRIER (kHz)
1	152
2 (See Note)	160
3	168
4	176
5	184
6	192

Note: The J99300CA, List 2 or 10 double-channel regulator in position 2 of N3-L systems is used only to supply the even-numbered channel demodulating carrier to channel modem 4. When checking the carrier level at the REG OUT jack, a fluctuating indication may be observed. Since this regulator does not supply the signal input to channel modems 3 and 4, this fluctuation should be disregarded.

12 If the requirement of Step 11 is met, proceed to Step 13. If it is not met, check the power of the selected carrier at the channel group modem output (Section 362-906-501). This is the input signal to the double-channel regulator unit. An input signal within limits and a regulator output level out of limits indicates a defective regulator unit. Proceed to Fig. 4 to determine whether the 659-type filter or the regulator unit, or both, should be replaced.

13 Disconnect the red plug of the W2FP cord from the REG OUT jack and connect it to the CARR OUT jack (Fig. 3).

14 Set the CFVM ATTENUATOR switch to DBM +15.

15 Measure the power of the demodulator carrier signal, using the procedure of Step 11.

Requirement: Between +12.5 and +15.5 dB.

16 If the requirement of Step 15 is met, proceed to Step 17. If it is not met, proceed to Fig. 4 to determine whether the 659-type filter or the regulator unit, or both, should be replaced.

Caution: The 659-type filter is a fragile, crystal filter and should be handled with care to avoid damage.

17 Disconnect the CFVM from the regulator unit.

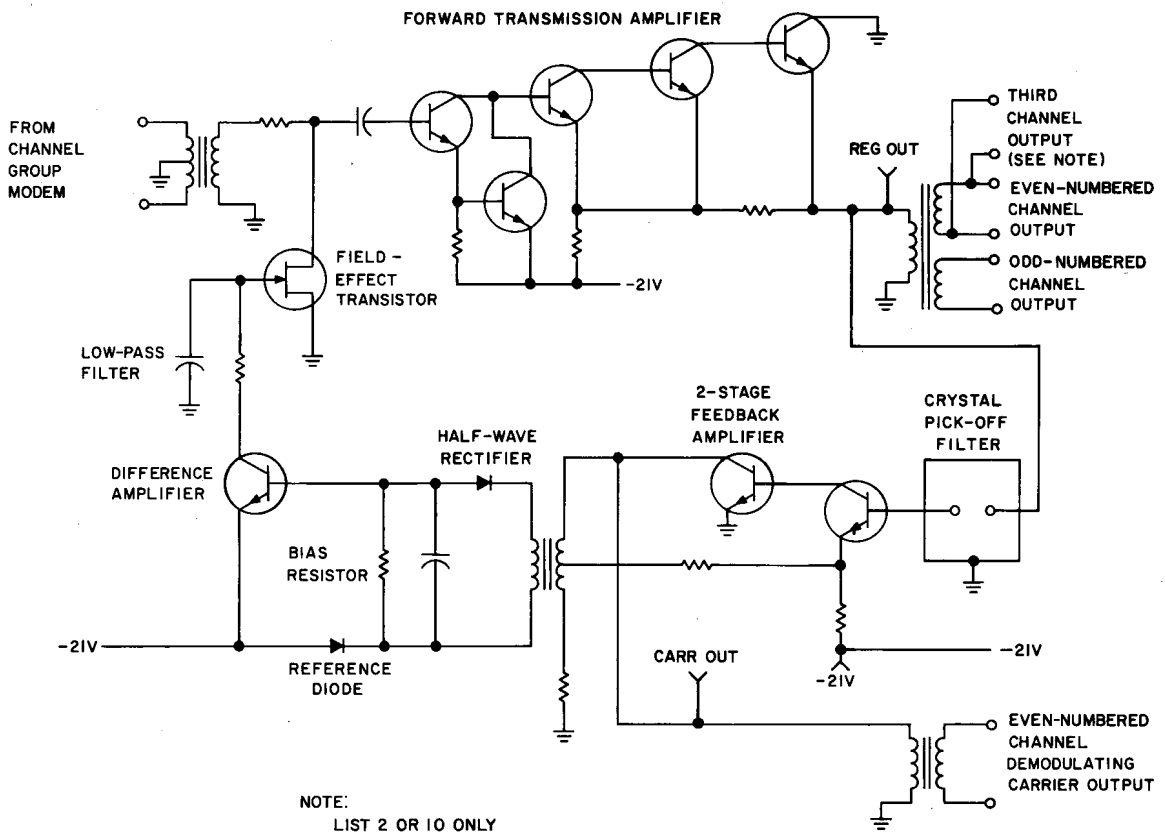

Fig. 1—J99300CA Double-Channel Regulator Circuit—Test Jack Locations

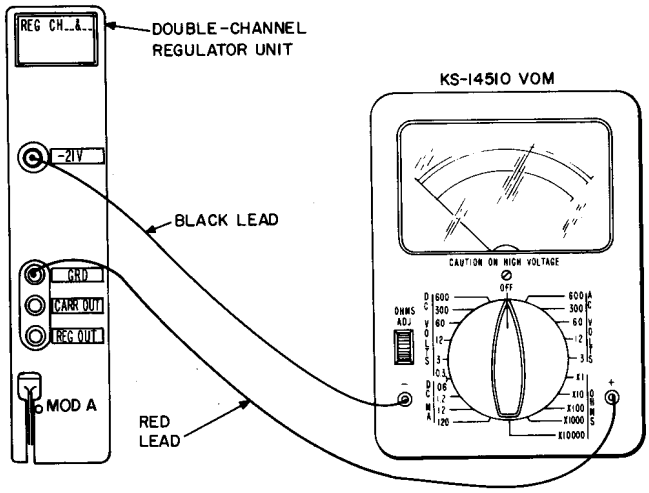

Fig. 2—Measure −21 Volts—Test Setup

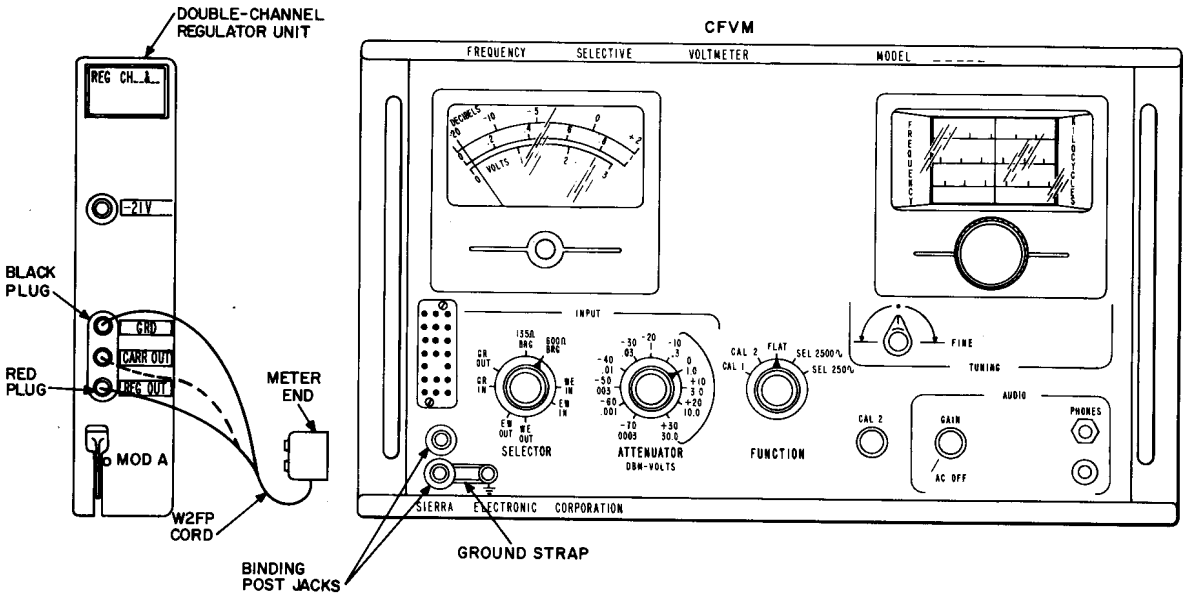

Fig. 3—Measure Output Carrier and Demodulating Carrier Power—Test Setup

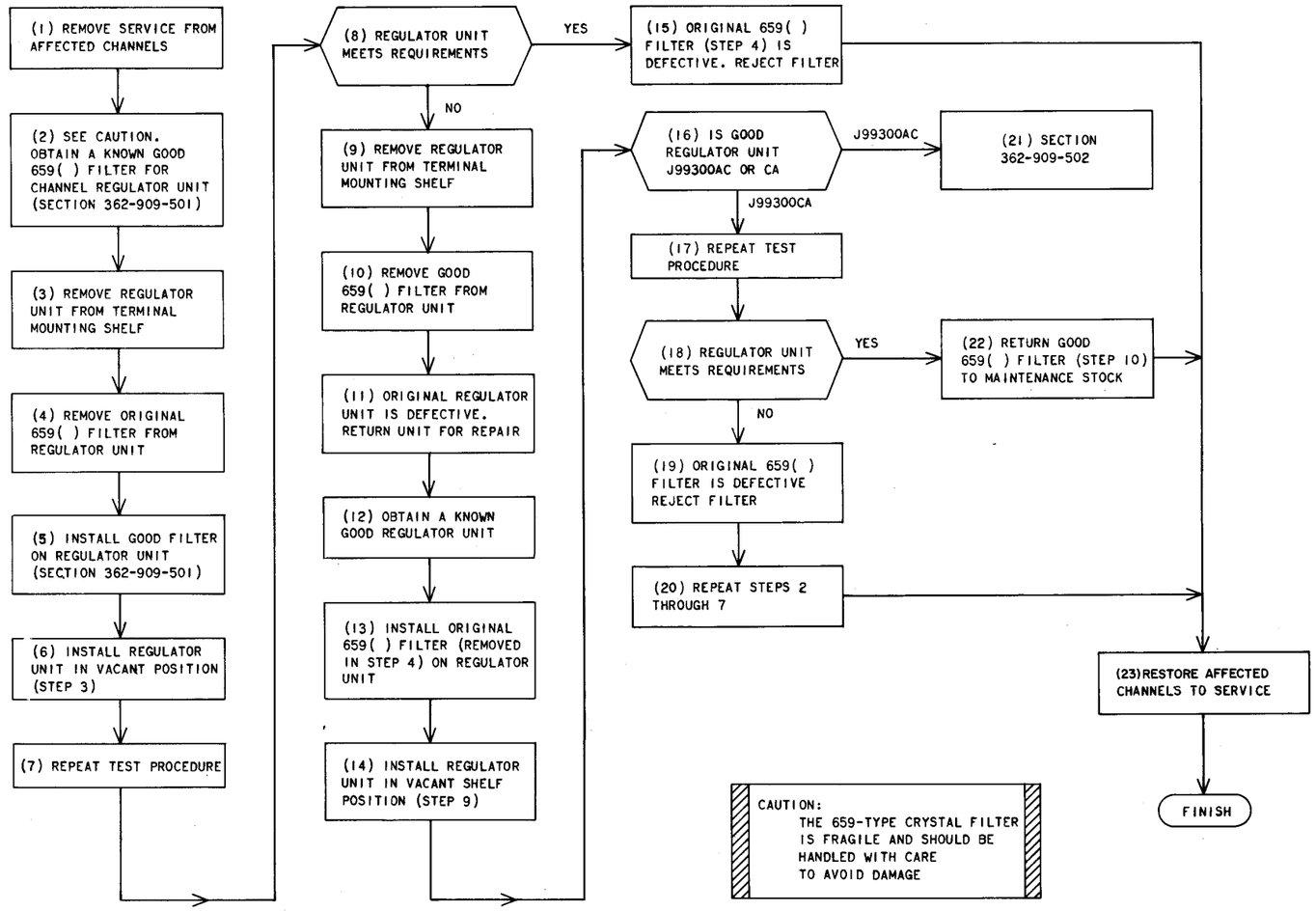

Fig. 4—Trouble-Locating Diagram—Double-Channel Regulator Unit