TYPE N3 CARRIER TELEPHONE SYSTEM

CARRIER-FREQUENCY SUPPLY

POWER OUTPUT, FREQUENCY ACCURACY, AND PHASE LOCK TESTS

This section provides tests for determining the operating condition of the N3 primary carrier-frequency supply. The purposes of the tests, which may be made on an in-service basis, are as follows:

(a) To measure the power of the external 4-kHz primary frequency source when the J99300BA, List 1 or List 3 4-kHz generator unit is used

(b) To measure the power of the 4-kHz primary frequency at the harmonic generator input

(c) To measure the level and purity of the carrier frequencies at the output of the harmonic generator and carrier filter panel

(d) To measure the carrier-frequency power output at each of the primary distribution cards

(e) To measure the accuracy of the carrier supply primary frequency and make necessary adjustments when an internal 4-kHz oscillator is used

(f) To check phase lock between the 4-kHz generator output signal and the 64-kHz reference frequency from the external synchronization supply circuit.

This section is reissued to add a set of minimum requirements for the frequency counter used in Chart 5 measurements. The list of recommended frequency counters has been updated to include currently available models. Arrows normally used to indicate changes have been omitted. This reissue affects the Equipment Test List.

The N3 primary carrier-frequency supply furnishes 16 carrier frequencies for up to 26 N3 terminals. The 16 carrier frequencies are derived from a precise 4-kHz signal which is obtained either from a source external to the carrier supply or internally from a 4-kHz oscillator. The 4-kHz signal is amplified and applied to a harmonic generator. The output of the harmonic generator contains all the wanted harmonics of 4 kHz and many unwanted harmonics. Fifteen of the wanted carrier frequencies are selected from the output of the harmonic generator by narrowband crystal filters. The output from the 152-kHz crystal filter is fed to the doubler-amplifier unit. The 152-kHz signal is divided between a limiting amplifier and frequency doubler to provide separate outputs of 152 and 304 kHz for delivery to the primary distribution circuit. The remaining 14 frequencies are selected by crystal filters and fed to dual amplifier units which amplify and regulate the carrier frequencies to the levels required for the primary distribution circuits. The primary distribution panel accepts the carrier frequencies from the dual- and doubler-amplifier units and, by means of dividing networks, connects the outputs of each of the 16 carrier frequencies for delivery to the secondary carrier distribution unit in the N3 carrier terminal bay.

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CHART 1

MEASUREMENT OF EXTERNAL 4-KHZ PRIMARY FREQUENCY SOURCE

APPARATUS:

1—Hewlett-Packard Model 400H or L Vacuum Tube Voltmeter (VTVM) or equivalent

1—Hewlett-Packard 60A or 11004A Line Matching Transformer (LMT)

1—W2DW Cord with alligator clips

STEP	PROCEDURE
	Note: The procedures in this test apply only when the J99300BA-1, List 1 or List 3 , 4 KC GEN plug-in unit is used in the carrier-frequency supply bay.
1	Energize the VTVM. Set the range selector switch to O DB.
2	Set the 600Ω-BRIDGING switch on the LMT to the BRIDGING position.
3	Insert the banana plugs of the LMT into the VTVM INPUT terminals (see Fig. 1).
4	Plug the meter end of the W2DW cord into 600Ω terminals on the LMT.
5	At the carrier supply regular 4 KC GEN unit, connect the W2DW cord alligator clips to pins 2 and 3 of connector J2. (See Fig. 1).
	Caution: In making test connections, do not short terminals to each other, to adjacent terminals, or to ground.

CHART 1 (Cont)

STEP	PROCEDURE
6	Measure the 4-kHz voltage applied to the regular 4 KC GEN unit. Reset the VTVM range selector switch as required to obtain an on-scale meter indication as close as possible to 0 DECIBELS. ***Requirement:*** Between -7.0 and -3.0 dBm.
7	Disconnect the alligator clips from pins 2 and 3 of J2.
8	Connect the alligator clips to pins 2 and 3 of J1 (alternate 4 KC GEN unit).
9	Measure the 4-kHz voltage applied to the alternate 4 KC GEN unit. ***Requirement:*** Between -7.0 and -3.0 dBm.
10	If the requirements of Steps 6 and 9 are met, proceed to Step 12. If the requirements are not met, measure and, if necessary, adjust the output power of the external 4-kHz distribution circuit per Section 356-151-504, 354-105-506, or 354-102-506.
11	If the requirements of Steps 6 and 9 still are not met, the trouble is probably in the N3 carrier supply bay. Check the bay wiring for circuit continuity between TB1 and the 903A connector jack associated with the 4-kHz generator unit. Also check circuit continuity through the 4-kHz generator unit by replacing the existing unit with a spare unit. If the 4 KC GEN unit under test is in service, transfer the load to the other generator by manually operating the REG/ALT key to the appropriate position. At this time, inspect the 903A connector jack for bent or broken pins.
12	When the test requirements of Steps 6 and 9 are met, remove all test connections.

CHART 2

MEASUREMENT OF 4-KHZ INPUT VOLTAGE TO HARMONIC GENERATOR

APPARATUS:

Same as for Chart 1.

STEP	PROCEDURE
1	Energize the VTVM. Set the range selector switch to +20 DB.

CHART 2 (Cont)

STEP	PROCEDURE
2	Set the 600Ω-BRIDGING switch on the LMT to the BRIDGING position.
3	Insert the banana plugs of the LMT into the VTVM INPUT terminals (see Fig. 2).
4	Plug the meter end of the W2DW cord into the 600Ω terminals on the LMT.
5	At the carrier supply shelf, check that J99300BA 4 KC GEN plug-in units are installed in the regular (REG) and alternate (ALT) shelf positions.
6	At the carrier supply SW & ALM panel, check that the 4 KC GEN key switch is in the REG position and the 4 KC GEN REG and ALT lamps are not lighted (see Fig. 3).
7	At the carrier supply HRM GEN & CARR FLT panel, connect the W2DW cord alligator clips to terminals 58 and 60 of TB1 (see Fig. 2). ***Caution: In making test connections, do not short terminals to each other, to adjacent terminals, or to ground.***
8	Reset the VTVM range selector switch as required to obtain an on-scale meter indication as close as possible to 0 decibels. Measure the 4-kHz voltage applied to the harmonic generator (see example). **Example:** VTVM Selector Switch Setting (DB) +20 +20 VTVM Meter Indication (DECIBELS) -3 -6 Measured Signal Power (dBm) +17 +14 ***Requirement:*** See Table A
9	If the requirement of Step 8 is met, proceed to Step 11. If it is not met, measure the output current of the REG 4 KC GEN per Section 362-901-502.
10	If the output current of the 4-kHz generator meets the requirement of Section 362-901-502, the trouble is either in the bay wiring to the 307A harmonic generator, including transfer relay K1, or in a faulty 307A harmonic generator.
11	At the carrier supply SW & ALM panel, set the 4 KC GEN key switch to the ALT position.
12	Repeat Steps 8 through 10 as applicable for the ALT 4 KC GEN unit.
13	When the requirement of Step 8 is met for the REG and ALT 4 KC GEN units, restore the 4 KC GEN key switch to the REG position and remove all test connections.

CHART 2 (Cont)

STEP	PROCEDURE
14	Check that the 4 KC GEN REG and ALT lamps are not lighted.

CHART 3

MEASUREMENT OF CARRIER-FREQUENCY VOLTAGE AT OUTPUTS OF HARMONIC GENERATOR AND CARRIER FILTER PANEL

APPARATUS:

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

1—W2DW Cord with alligator clips

STEP	PROCEDURE
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	On the CFVM, connect the ground strap from ground terminal to adjacent input binding post (see Fig. 4).
4	Set the SELECTOR switch to 135Ω BRG on List 4 or to INPUT on List 5 or 5A.
5	Set the FUNCTION switch to SEL 250 ~ on List 4 or to OPER 135Ω on List 5 or 5A.
6	Set the ATTENUATOR switch to 0 DBM.

CHART 3 (Cont)

STEP	PROCEDURE
7	Connect the meter end of the W2DW cord to CFVM INPUT binding posts. Observe meter polarity.
8	At the carrier supply HRM GEN & CARR FLT panel, connect the W2DW cord black test connector (ground terminal of the CFVM) to terminal 1 and the red test connector to terminal 3 of TB1 (see Fig. 4). ***Caution: In making test connections, do not short terminals to each other, to adjacent terminals, or to ground.***
9	Tune the CFVM for maximum indication at 280 kHz. Peak the FINE tuning control for maximum output meter indication.
10	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. ***Note:*** Maximum indication on the CFVM meter probably will not be exactly at 280 kHz on the frequency dial, but do not tune more than two small scale divisions either side of 280.
11	Determine the power of the 280-kHz signal (see example). **Example:** ATTENUATOR Switch Setting (DBM) -10.0 0 Meter Indication (DECIBELS) +2.0 -3.0 Measured Signal Power (dBm) -8.0 -3.0 ***Requirement:*** Between -10.0 and -2.0 dBm.
12	If the requirement of Step 11 is met, proceed to Step 13. If it is not met, perform trouble location tests in Step 26.
13	Record the power of the 280-kHz signal in Table B, column 1.
14	Add -52 dB to the power recorded at 280 kHz and enter the sum in Table B, column 2 for 272 kHz (see example). **Example:** Value Recorded at 280 kHz (DECIBELS) -4.0 Add -52 dB -52.0 Sum Entered -56.0

CHART 3 (Cont)

STEP	PROCEDURE
15	Add -60 to the power recorded at 280 kHz and enter the sum in Table B, column 2 for each frequency listed ***except*** 272 and 280 kHz. ***Note:*** As the CFVM is detuned from 280 kHz towards 263 kHz, the meter indication should decrease to less than -80 dBm corresponding to the internal noise level of the CFVM.
16	On the CFVM, set the main TUNING dial to 263 kHz.
17	Tune the CFVM for maximum meter indication at each frequency listed in Table B except 280 kHz. As tuning is varied, a sharp increase in the meter indication shows the presence of an unwanted frequency component in the output waveform. Measure and record the power of each signal in column 1 of Table B. ***Requirement:*** The power recorded at each frequency is less than the value in column 2 for that frequency (see example). Example: A meter indication of -75 dBm is less than -60 dBm.
18	If the requirement of Step 17 is met, proceed to Step 19. If the requirement is not met, perform trouble location procedures in Step 27.
19	Set the CFVM ATTENUATOR switch to 0 DBM.
20	At TB1 disconnect the W2DW cord from terminals 1 and 3.
21	See Table C. Connect the black test connector to terminal 4 and the red connector to terminal 6.
22	Tune the CFVM for maximum indication at 256 kHz.
23	Measure the power of the 256-kHz signal. ***Requirement:*** Between -10.0 and 0.0 dBm.
24	Repeat Steps 21 through 23 for each frequency listed in Table C.
25	If the requirement of Step 23 is met for each frequency, remove all test connections. If it is not met, perform trouble location procedures in Step 26.
26	If the measurements in Steps 11 and 23 do not meet requirements for one or two of the carrier frequencies under test, check the associated filter in the harmonic generator and carrier filter panel. Failure to meet requirements for more than two of the carrier frequencies indicates a fault in the 307A harmonic generator or in the 4-kHz generator unit (see Section 362-901-502).

CHART 3 (Cont)

STEP	PROCEDURE
27	If the measurements in Step 17 do not meet requirements, the trouble can be analyzed as follows. (a) If unwanted components are too strong at 268, 276, 284, and/or 292 kHz, the fault is due to a failure in the 307A harmonic generator or to excessive unbalance in the 4-kHz generator unit. (b) If unwanted components are too strong at 264, 272, 288, and/or 296 kHz, the fault is either in the crystal filter or the 307A harmonic generator. (c) If strong unwanted components appear at frequencies other than harmonics of 4 kHz, the trouble is due to excessive noise in the -21 volt power supply unit or wiring errors, particularly in the ground circuits of the bay wiring.

CHART 4

MEASUREMENT OF CARRIER-FREQUENCY POWER AT PRIMARY DISTRIBUTION OUTPUT TERMINALS

APPARATUS:

1—Hewlett-Packard Model 400H or L Vacuum Tube Voltmeter (VTVM) or equivalent

1—Hewlett Packard Model 60A or 11004A Line Matching Transformer (LMT)

1—W2DW Cord with alligator clips

STEP	PROCEDURE
	Turnup and Maintenance Tests
1	Energize the VTVM and set the range selector switch to +10 DB.
2	Set the 600Ω BRIDGING switch on the LMT to the BRIDGING position.
3	Insert the banana plugs on the LMT into the VTVM INPUT terminals (see Fig. 5).
4	Plug the meter end of the W2DW cord into 600Ω terminals on the LMT.

CHART 4 (Cont)

STEP	PROCEDURE
5	At the primary carrier supply, check that J99300BD DUAL AMPL and J99300BE DBLR AMPL plug-in units are installed in the regular (REG) and alternate (ALT) shelf positions.
6	At the carrier supply SW & ALM panel (Fig. 3), check that the respective REG and ALT lamps are not lighted and that each associated key switch is in the REG position.
7	At the carrier supply bay PRI DIST panel, release the spring-loaded latch on each side of the front cover.
8	Disconnect the chains and remove the primary distribution panel cover. ***Caution: Do not short terminals to each other, to adjacent terminals, or to ground.***
9	Check that each pair of output terminals on the primary distribution cards is connected to a dummy load resistor or to a properly terminated secondary distribution circuit at the carrier terminal bay (see Section 362-915-501 or 362-915-502). ***Note 1:*** The pins on the distribution card are paired input and output terminals. The bottom two pins are paired input terminals; the remaining pins are paired output terminals. ***Note 2:*** If the first pair of output pins on the 256-kHz distribution card is connected to an ED-3C172-30 or ED-3C416-30 secondary carrier distribution shelf (plug-in type), that outlet will be unterminated unless the 256-kHz distribution amplifier is installed (N3-L junctions only). If the distribution amplifier is not installed, a 115-ohm load resistor must be connected across the first pair of output terminals on the 256-kHz distribution card.
10	At the primary distribution panel, locate the distribution card for 148 kHz (see Fig. 5). Connect the W2DW cord alligator clips to the bottom two ***output*** terminals. ***Caution: In making test connections, do not short terminals to each other, to adjacent terminals, or to ground.***
11	Measure and record the power of the 148-kHz signal. Reset the VTVM range selector switch as required to obtain an on-scale meter indication as close as possible to 0 DECIBELS (see example). **Example:** VTVM Selector Switch Setting (DB) +10 0.0 VTVM Meter Indication (DECIBELS) -6 +1.0 Measured Signal Power (dBm) +4 +1.0 ***Requirement:*** See Table D.
12	Disconnect the alligator clips from the 148-kHz distribution board.

CHART 4 (Cont)

STEP	PROCEDURE
13	For initial installation tests, repeat Steps 10 through 12 for each of the remaining paired 148-kHz output terminals. For maintenance tests, measurements need be made only on the bottom pair of output terminals.
14	Repeat Steps 10 through 13 for 180-kHz carrier frequency.
15	At the SW & ALM panel, operate the 148/180 KC key switch to the ALT position.
16	Repeat Steps 10 through 14 for 148- and 180-kHz carrier frequencies.
17	If the requirements in Table D are met for the 148/180-kHz REG and ALT amplifiers, remove the alligator clips from the 180-kHz distribution board and set the 148/180 KC key switch to the REG position. If the requirements are not met, perform trouble location tests in Steps 21 and 22.
18	Repeat Steps 10 through 17 for each of the 152- to 304-kHz distribution cards and associated regular and alternate amplifier units. ***Note:*** There are two distribution cards for each of 232-, 280-, and 304-kHz frequencies when connected to terminal bays equipped with J99300E secondary distribution panels. ***Requirement:*** See Table D.
19	If the requirements of Table D are met, remove all test connections. Replace the primary distribution panel cover, connect chains, and secure cover latches.
20	Check that each of the dual-doubler amplifier REG and ALT lamps is not lighted.
	Trouble Location Tests
21	If part of the readings for a given carrier frequency does not meet the requirements in Table D, the trouble may be caused by the following: (a) Double termination caused by the 115-ohm dummy load resistor not being removed when secondary distribution circuit was connected, (b) Absence of 115-ohm dummy load resistor or wrong value resistor connected to unassigned output terminals, (c) An improperly terminated secondary distribution circuit at the carrier terminal bay (see Section 362-915-501 or 362-915-502).
22	If the measurements for all output taps for a given carrier frequency do not meet the requirements in Table D, the associated dual or doubler amplifier unit should be investigated. Perform maintenance tests per Section 362-901-503.

CHART 5

PRIMARY CARRIER SUPPLY CIRCUIT ADJUSTMENT AND CHECK OF FREQUENCY ACCURACY

APPARATUS:

1—Hewlett-Packard Frequency Counter, Model 5232A, 5532A, or 5216A (all Mfr Disc.) 5381A, 5382A E/W option 001, 5383A E/W option 001, 5300B main frame E/W option 001 and counter module 5301A, or any frequency counter which meets the following ***minimum*** requirements:

(1) Frequency range of 50 Hz to 350 kHz

(2) Accuracy of 1 count in 1,000,000 (1 in 10^6)

(3) Sensitivity of 0.1 volt (100 mV)

(4) Input impedance of 10KΩ (minimum).

1—Hewlett-Packard Model 60A or 11004A Line Matching Transformer (LMT).

1—Hewlett-Packard Model 10110A Adapter or equivalent (banana plug to BNC connector)

1—W2DW Test Cord with alligator clips

1—Nonmetallic Adjusting Tool with 1/8-inch blade or insulated screwdriver.

STEP	PROCEDURE
	Note: When the carrier supply is equipped with J99300BA, List 2 or List 4 4 KC GEN units, allow at least 30 minutes for the units to stabilize prior to making the following tests.
1	Energize the frequency counter and allow the proper warm-up period according to the manufacturer's instructions before performing tests.
2	Check the counter for maximum accuracy capabilities in accordance with the specifications and procedures of the manufacturer.
3	At the primary carrier supply, check that J99300BA 4 KC GEN plug-in units are installed in the regular (REG) and alternate (ALT) shelf positions.
4	At the carrier supply SW & ALM panel (Fig. 3), check that the 4 KC GEN REG and ALT lamps are not lighted and that the key switch is in the REG position.
5	Connect the BNC connector of the adapter to the counter INPUT (see Fig. 6).

CHART 5 (Cont)

STEP	PROCEDURE
6	Set the 600Ω BRIDGING switch on the LMT to BRIDGING.
7	Insert the LMT banana plug into the adapter. Observe polarity in making test connections.
8	Plug the meter end of the W2DW cord into 135Ω terminals on the LMT.
9	At the carrier supply bay PRI DIST panel, open the spring-loaded latch on each side of the front cover.
10	Disconnect chains and remove the primary distribution panel cover.
	Caution: Do not short the protruding distribution card terminal pins to each other, to adjacent terminals, or to ground.
11	Connect the alligator clips of the W2DW cord to the bottom pair of output terminals on the 304-kHz distribution card.
	Note: The pins on the distribution card are paired input and output terminals. The bottom two pins are paired input terminals; the remaining pins are paired output terminals.
12	Set the function selector switch on the counter to indicate frequency with 10-second interval counting.
	Note 1: Display is in kHz, and decimal point is positioned by the function selector.
	Note 2: Accuracy of measurement is as shown in Table E.
13	Set the SENSITIVITY switch to the highest setting that will give a constant count. Set the DISPLAY control for a convenient display time between counts.
14	Read the counter display tube readout to the closest 0.1-Hz per second.
	Requirement 1: The readout for initial installation or turnup tests must indicate between 303.9997 and 304.0003 kHz (see note).
	Requirement 2: The readout for maintenance tests must indicate between 303.998 and 304.002 kHz.
	Note: With the function selector switch in the 10 position, the readout display on some counters will be limited to six digits, thus dropping the 3; ie, 303.9998 will display as 03.9998.
15	If the requirement of Step 14 is met, proceed to Step 19. If it is not met and the 4 KC GEN unit is J99300BA, List 2, adjust the internal 61A OSC TUN (see Fig. 7) to meet Requirement 1 of Step 14. Adjust the control approximately one turn clockwise to decrease

CHART 5 (Cont)

STEP	PROCEDURE
	or one turn counterclockwise to increase the frequency. The counter display must indicate the same frequency for at least four consecutive readings.
	Caution: Do not short the OSC TUN control to the metal faceplate. Use a nonmetallic adjusting tool with 1/8-inch blade or a small insulated screwdriver.
16	If the requirement of Step 14 is not met and the 4 KC GEN unit is J99300BA, List 1, measure and if necessary adjust the power of the external 4-kHz primary frequency source per Chart 1 of this section.
17	If the requirement of Step 14 is still not met, check the associated 152/304-kHz doubler-amplifier unit per Section 362-901-503.
18	When the requirement of Step 14 is met, proceed to Step 19.
19	At the carrier supply SW & ALM panel, set the 4 KC GEN key switch to the ALT position.
20	Repeat Steps 14 through 16 as applicable for the ALT 4 KC GEN UNIT.
21	When the requirement of Step 14 is met for the ALT 4 KC GEN unit, set the 4 KC GEN key switch to REG.
22	Disconnect the test cord alligator clips from the 302-kHz distribution card terminals.
23	Replace the primary distribution panel cover, connect chains, and secure cover latches.
24	Check that the 4 KC GEN REG and ALT lamps are not lighted.

CHART 6

PRIMARY CARRIER SUPPLY CIRCUIT CHECK OF PHASE LOCK

APPARATUS:

1—Hewlett-Packard Model 400D Vacuum Tube Voltmeter (VTVM) or equivalent

2—Hewlett-Packard 60A or 11004A Line Matching Transformer (LMT)

1—Oscilloscope, Tektronix 400 Series or equivalent

1—W2DW Cord

CHART 6 (Cont)

APPARATUS(Cont):

1—W2DW Cord (modified per Fig. 8)

1—POMONA 2BB-BNC-36 (male BNC connector to double banana plug)

1—Hewlett-Packard 10110A Adapter (male BNC to binding post)

STEP	PROCEDURE
1	Energize the VTVM and set the range selector switch to DB-50.
2	Energize the oscilloscope.
3	Set the 600Ω BRIDGING switch on LMT #1 and #2 to the BRIDGING position.
4	Insert the banana plugs of LMT #1 into the VTVM INPUT terminals (see Fig. 9).
5	Plug the meter end of the modified W2DW cord into the 600Ω terminals of LMT #1.
6	At the 64-kHz sync panel, insert the plug end of the modified W2DW cord into the TST & RSTN jack.
7	Using a cord equipped with a male BNC connector and double banana plug (POMONA 2BB-BNC-36), connect the VTVM OUTPUT jacks to the oscilloscope vertical input connector.
8	Connect the male BNC to double binding post adapter (Hewlett-Packard 10110A) to the oscilloscope horizontal input connector.
9	Insert the banana plugs of LMT #2 into the adapter.
10	Plug the meter end of a W2DW cord into the 600Ω terminals of LMT #2.
11	At the rear of the hormonic generator and carrier filter panel (primary carrier-frequency supply), locate terminal board TB-1.
12	Connect the alligator clips of the W2DW cord to terminals 10 and 12 of TB-1 (192 kHz).
13	Set the oscilloscope gain and sweep controls to obtain a 3:1 representation similar to that shown in Fig. 10. Observe the waveform pattern. ***Note:*** Readjustment of the VTVM range switch may be required to obtain a suitable display. ***Requirement:*** The display pattern shall remain in a stationary plane without vertical or horizontal shift. A continually changing pattern indicates lack of phase lock.

CHART 6 (Cont)

STEP	PROCEDURE
14	If the requirement of Step 13 is met, proceed to Step 15. If it is not met, measure the power of the 64-kHz signal at the sync supply panel (Section 362-901-506). If the power of the 64-kHz signal is satisfactory, replace the regular 4-kHz generator unit (Section 362-901-504). Repeat Step 13.
15	Remove the plug from the TST & RSTN jack.
16	Remove all test connections.

TABLE A

4KC GEN KEY SWITCH SETTING	J99300BA 4-KHZ GENERATOR UNIT USED (LIST)	REQUIREMENT
REG	L-1 L-2 L-3 L-4	Between +13.5 and +17.5 dBm
	L-5	Between +17.8 and +21.8 dBm
ALT	L-1 L-2 L-3 L-4	Between +13.5 and +17.5 dBm

TABLE B

FREQ (kHz)	1 POWER (dBm)	2 MAX. POWER (dBm)
264		
268		
272		
276		
280		
284		
288		
292		
296		

TABLE C

FREQ (kHz)	CONNECT TEST CORD TO TB1	
	BLACK TO TERMINAL	RED TO TERMINAL
280	1	3
256	4	6
232	7	9
192	10	12
188	13	15
184	16	18
180	19	21
176	22	24
172	25	27
168	28	30
164	31	33
160	34	36
156	37	39
152	40	42
148	43	45

TABLE D

CARRIER FREQ (kHz)	VTVM READING (SEE NOTE)			
	INITIAL INSTALLATION		MAINTENANCE	
	MIN (dBm)	MAX. (dBm)	MIN (dBm)	MAX. (dBm)
148 to 192	+3.0	+4.2	+2.5	+4.4
256	+3.0	+4.2	+2.5	+4.4
232	0.0	+1.2	—0.5	+1.4
280	0.0	+1.2	—0.5	+1.4
304	0.0	+1.2	—0.5	+1.4

Note: The above requirements assume a load impedance of 115 ohms.

TABLE E

MEASUREMENT ACCURACY	FUNCTION SELECTOR SWITCH POSITION (COUNT TIME SEC)	READOUT DISPLAY
±0.1 kHz (±100 Hz)	.01	00000.0
±0.01kHz (±10 Hz)	.1	00000.0
±0.001 kHz (±1 Hz)	1	000.000
± 0.0001 kHz (±0.1 Hz)	10	00.0000

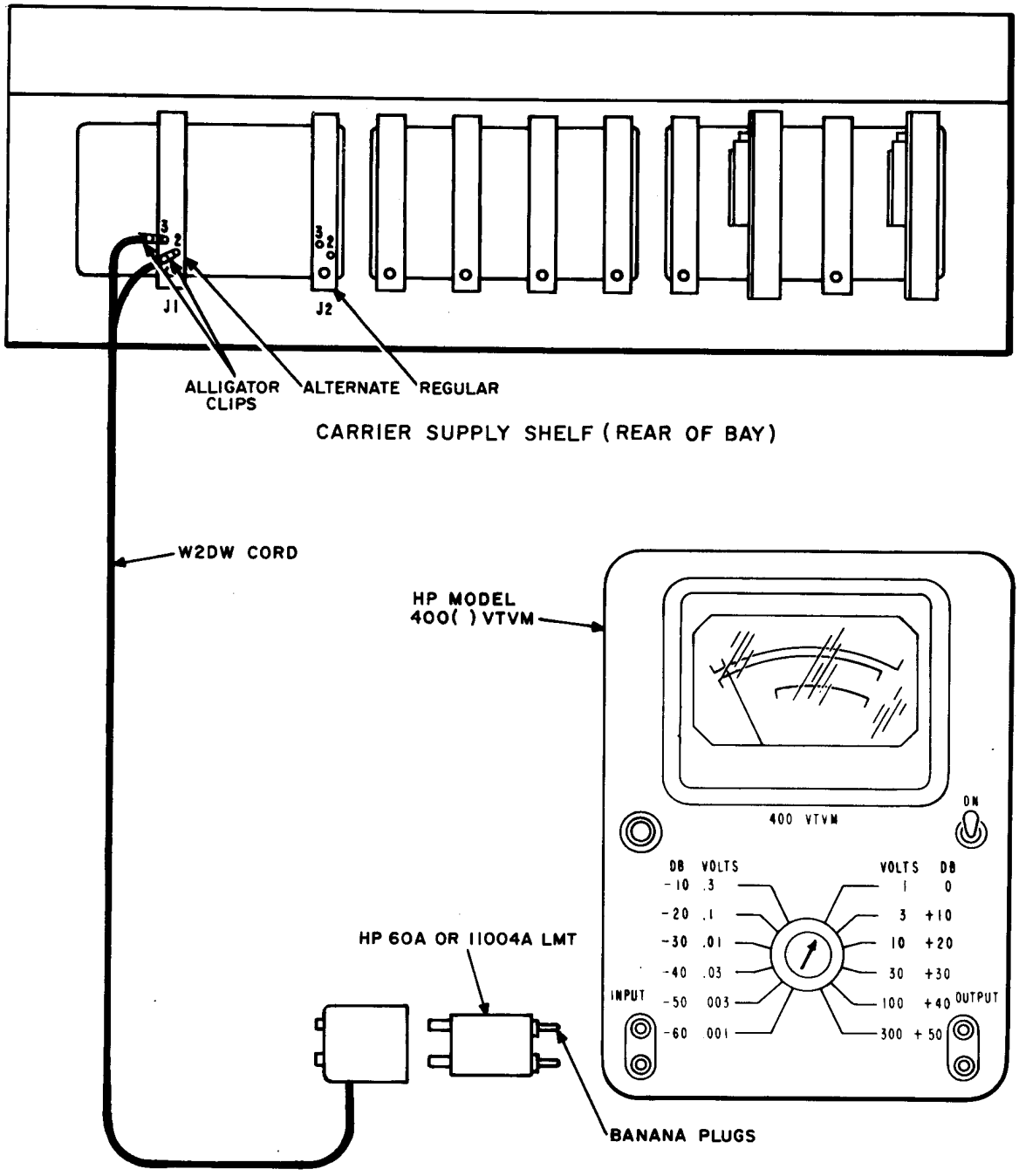

Fig. 1—Measurement of 4-kHz Primary Frequency Source—Test Setup

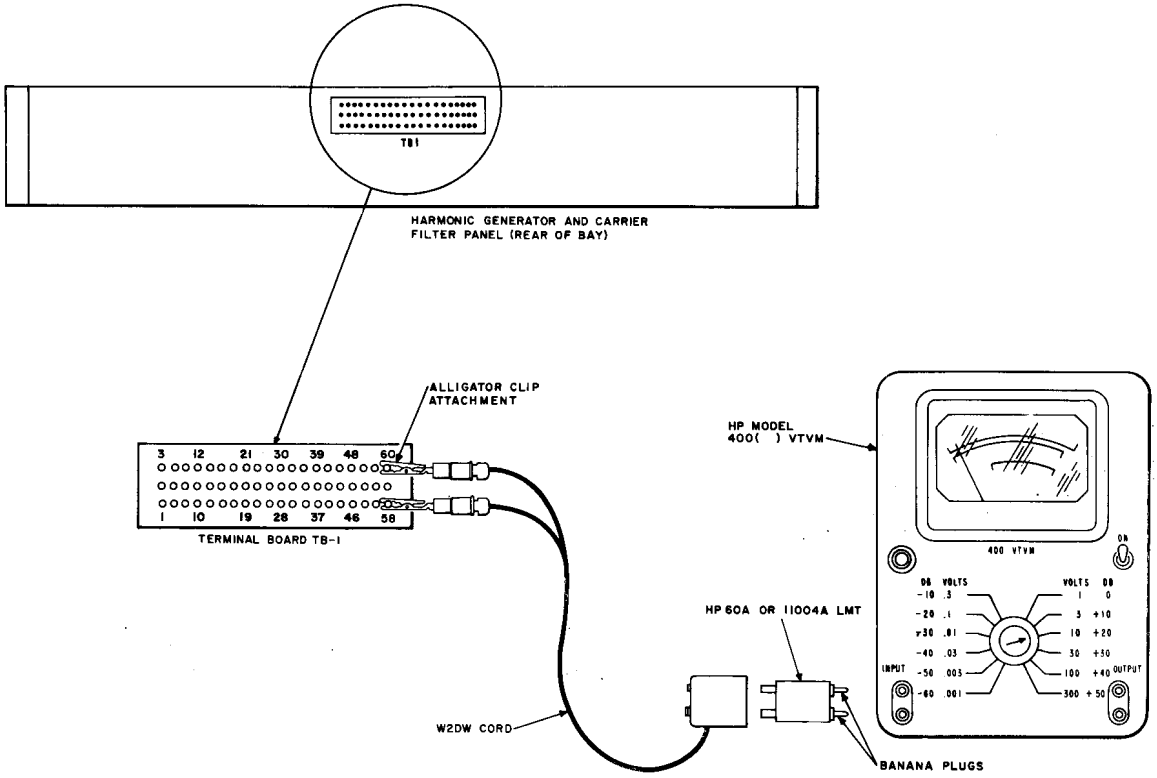

Fig. 2—Measurement of 4-kHz Input Voltage to Harmonic Generator—Test Setup

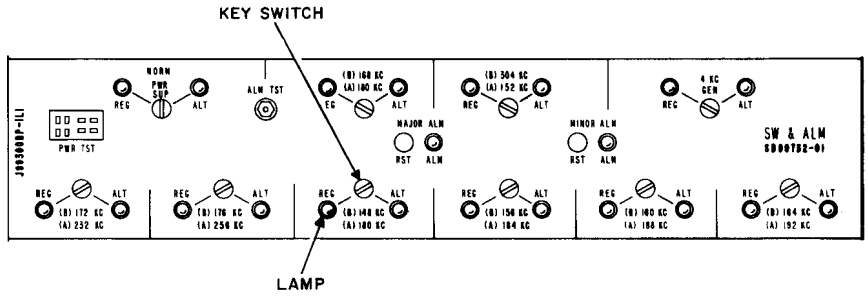

Fig. 3—Primary Supply Switch and Alarm Panel

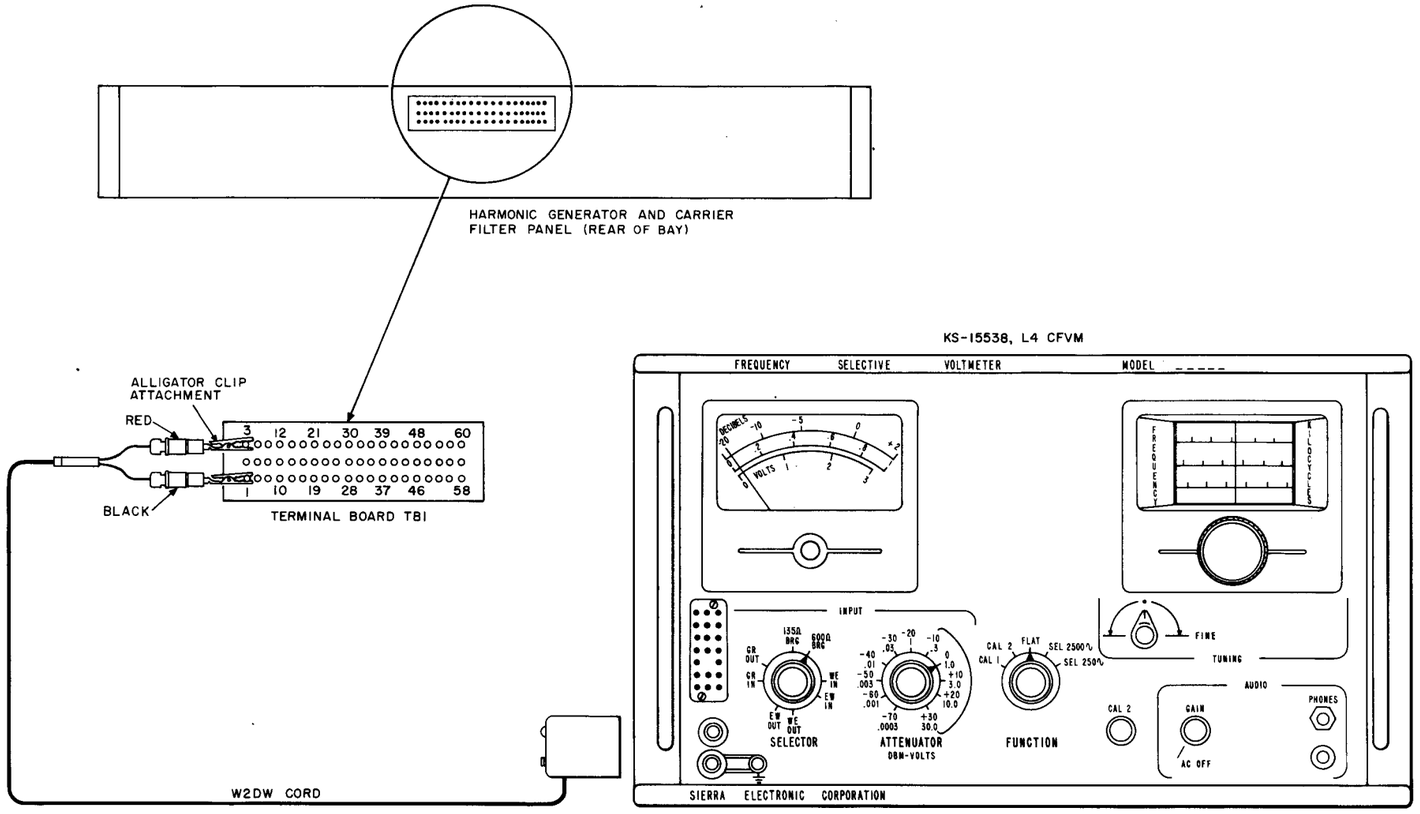

Fig. 4—Measurement of Carrier-Frequency Output Voltage at Harmonic Generator Carrier Filter Panel—Test Setup

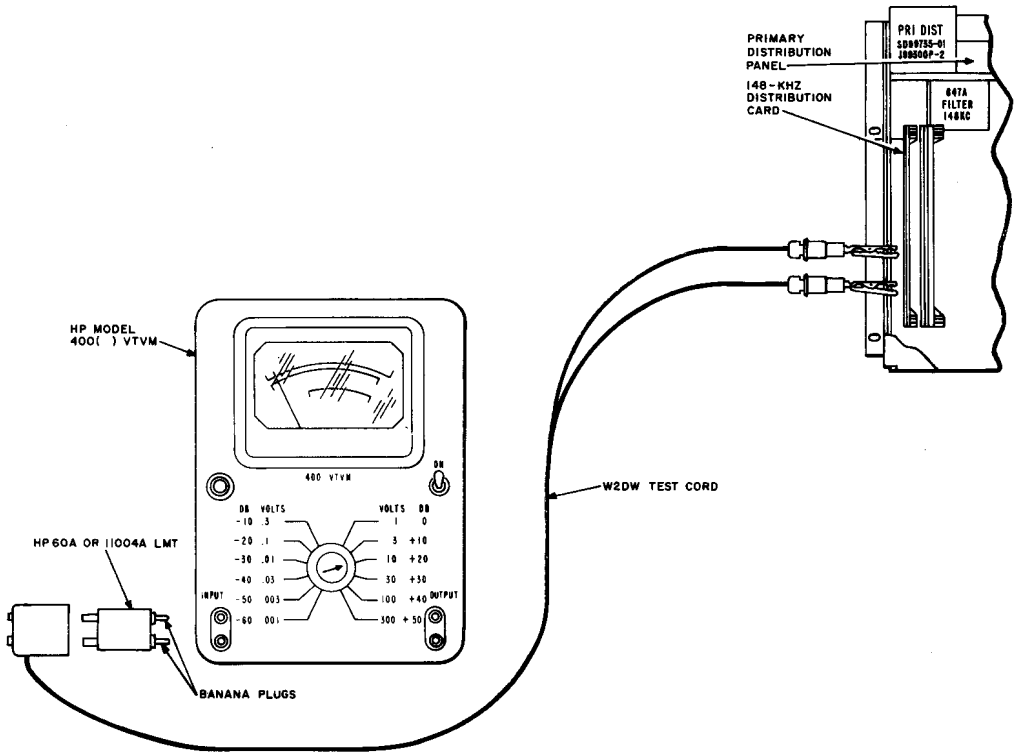

Fig. 5—Measurement of Carrier-Frequency Power at Primary Distribution Output Terminals—Test Setup

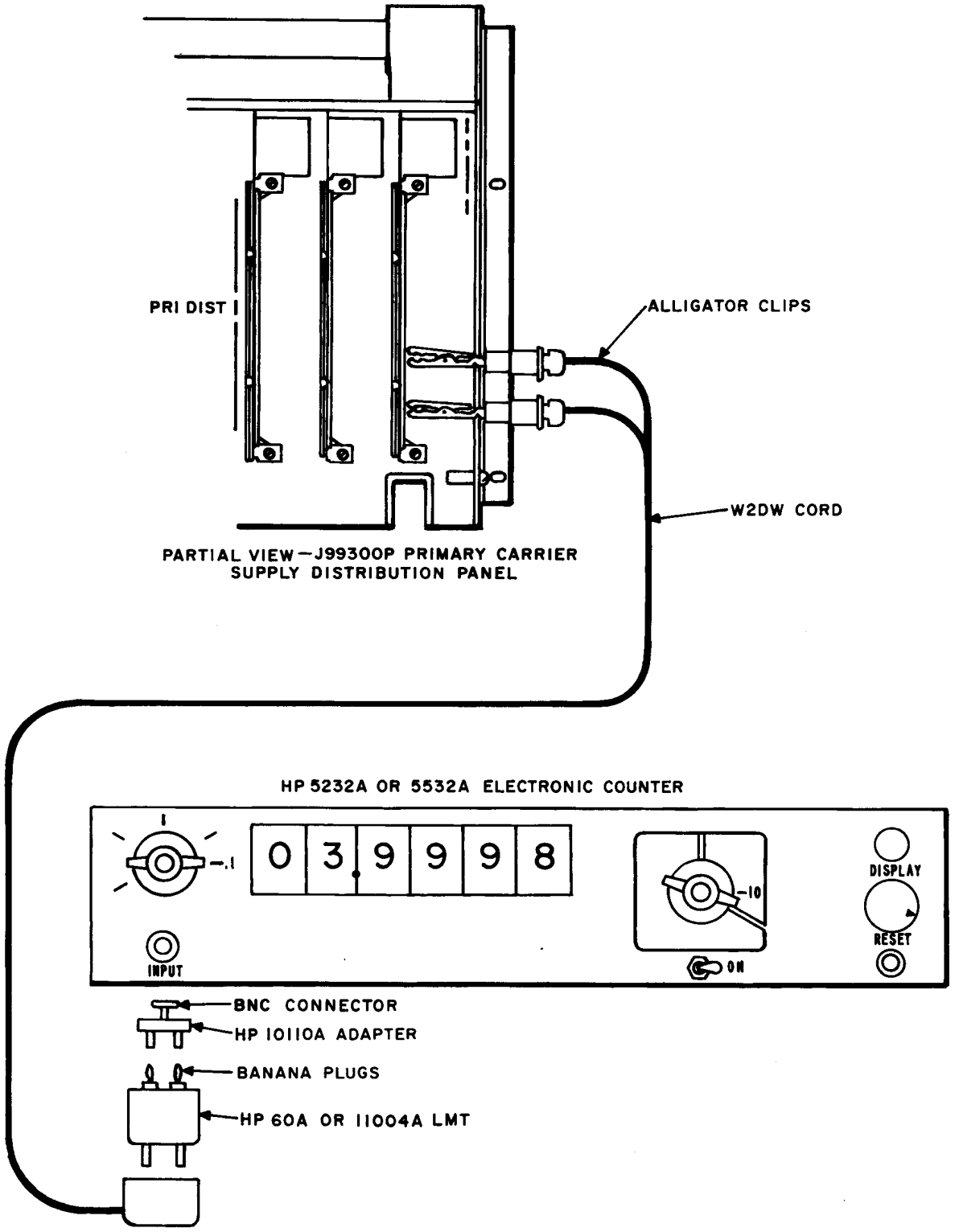

Fig. 6—Primary Carrier Supply Adjustment and Check of Frequency Accuracy—Test Setup

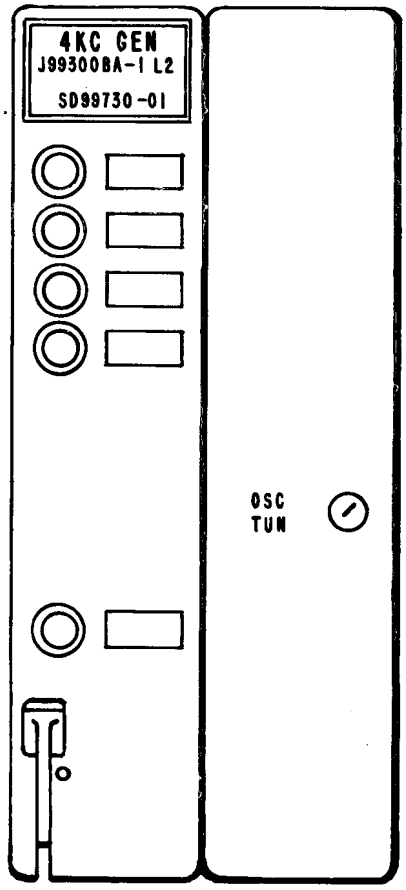

Fig. 7—J99300BA, List 2, 4-KC Generator Unit

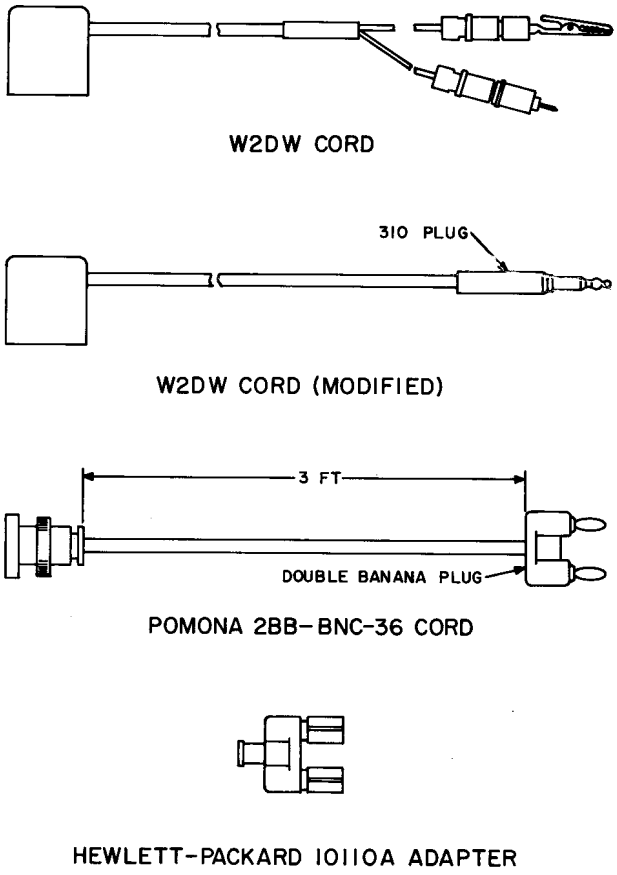

Fig. 8—Miscellaneous Cords and Adapters Used for Phase Lock Test

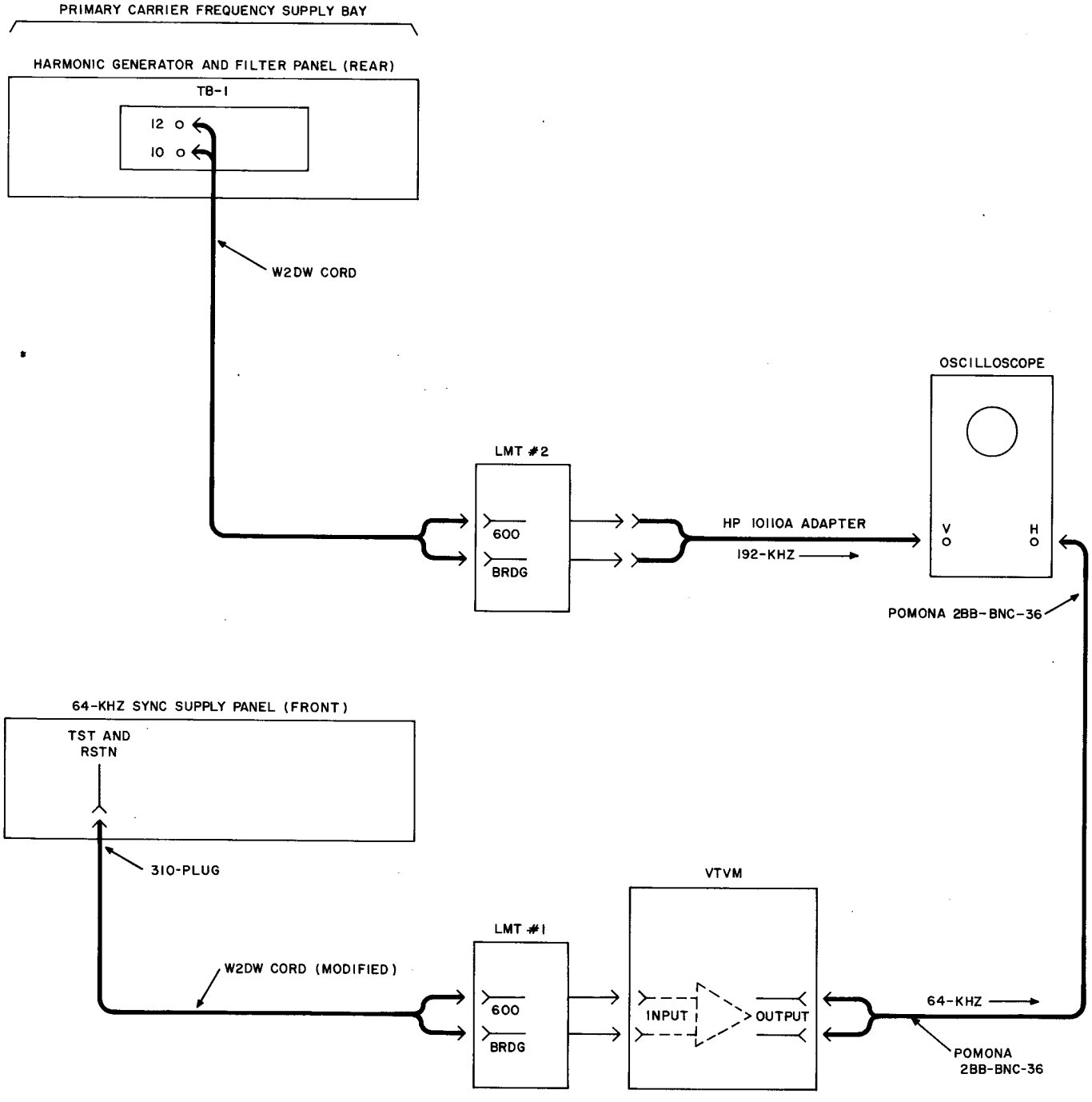

Fig. 9—Check of Phase Lock—Test Setup

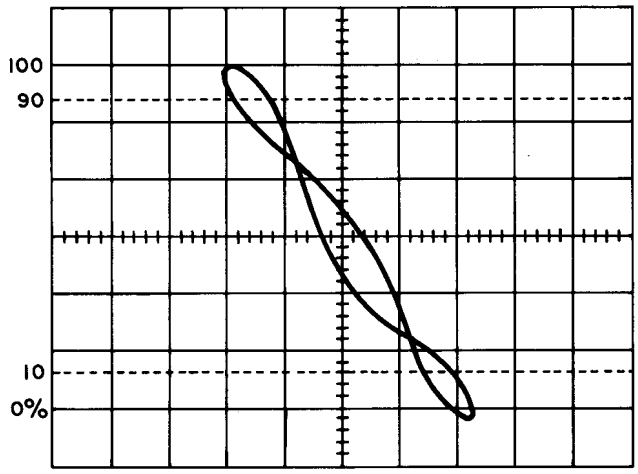

Fig. 10—64/192-kHz Display—Typical Pattern