

MULTIFREQUENCY (2/6 AND 4 X 4) SIGNAL GENERATOR SD-99328-01

TESTS

1. GENERAL

1.01 This section describes methods of making measurements of the output voltage and frequency of the various transistor oscillators which make up the multifrequency (2/6 and 4x4) signal generator, SD-99328-01.

1.02 This section is reissued to:

- (a) Revise Test A to delete procedures for adjusting the oscillators output voltage.
- (b) Add Test C, Oscillator Output Voltage Adjustments.

This reissue affects the Equipment Test List.

1.03 The tests covered are:

A. Oscillator Output Voltage Test: This test verifies that the output voltage of each oscillator is within prescribed limits.

B. Frequency Test: This test verifies that the output frequency of each oscillator is within prescribed limits.

C. Oscillator Output Voltage Adjustments:
This test makes a more extensive test of the oscillators output voltage and provides a method of adjustment to meet prescribed requirements outlined in the circuit notes.♦

1.04 ♦Test C only needs to be performed after initial installation of the signal generator circuit or upon subsequent failures of Test A.♦

1.05 ♦The multifrequency signal generator shall be referred to in this section as the MF signal generator.♦

1.06 Since the multifrequency signal generator can be used in conjunction with various types of circuits, information for taking the associated

equipment out of service is not included in this section. This type of information, where applicable, is ordinarily found on the CD sheets of the associated apparatus.

Note: Taking equipment out of service does not necessarily guarantee that it is normal. It will, therefore, be necessary to verify that the circuit associated with the multifrequency signal generator under test is normal before testing.

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

2. APPARATUS

2.01 The apparatus required for each test is shown in Table A. The details of each item are covered in the paragraph indicated by the number in parentheses.

2.02 Test cord, type W1AL, 2 feet long, equipped with two P-15A864 chucks.

2.03 Test cord, type 1W13B (893 cord, 6 feet long, equipped with two 360A tools), one 624B tool, and one KS-6278 connecting clip.

2.04 Electron tube voltmeter, RCA WV-98C Senior Voltohmyst (for measuring oscillator output voltage of approximately 2.35 volts ac in the frequency range from 700 to 1700 cycles per second).

2.05 Load resistor, 19SE, or equivalent, 1100 ohms ± 1 percent.

TABLE A

APPARATUS	TESTS		
	A	B	C
Test cord (2.02)	1	1	1
Test cord (2.03)	2	2	2
Electron tube voltmeter (2.04)	1		1
Load resistor (2.05)	1	1	1
Load resistor (2.06)	1		1
Frequency meter (2.07)		1	
Test cord (2.08)		1	
Screwdriver			1

2.06 Load resistor, 19LM, or equivalent, 275 ohms ± 1 percent.

2.07 Hewlett Packard 5221B or 5321B counter or 72A frequency meter, J64072A (SD-59873-01).

2.08 Test cord, type 2W3A (P2AA cord, 3 feet long, equipped with one 241A plug), two 360A tools, and two KS-6278 connecting clips.

3. PREPARATION

STEP	ACTION	VERIFICATION
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All Tests

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| 1 | Remove MF signal generator from service as outlined in 1.06. | |
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Test A

- | | | |
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| 2 | At MF signal generator—
Using W1AL cord, connect terminal 11 to 45 on B (TS). | |
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4. METHOD

STEP	ACTION	VERIFICATION
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A. Oscillator Output Voltage Test

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|---|--|--|
| 3 | Using 1W13B cord, connect one side of 275-ohm resistor to terminal 11 of B (TS). | |
| 4 | Using 1W13B cord, connect other side of 275-ohm resistor to terminal 11 of A (TS). | |

Note: Insulate resistor so that it does not become crossed or grounded to other equipment or framework.

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|---|--|--|
| 5 | Using 5-volt scale, set voltmeter to indicate ac volts in accordance with approved procedures. | |
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STEP	ACTION	VERIFICATION
6	Connect alligator clip of test probe assembly of voltmeter (ground side) to side of 275-ohm resistor connected to terminal 11 of B (TS).	
7	Touch voltmeter probe to side of 275-ohm resistor connected to 11 of A (TS).	Voltmeter indicates a measurement of 1.5 volts ± 0.25 volts.
8	Record indication.	
9	Remove test probe from 275-ohm resistor.	
10	Remove 1W13B cord from terminal 11 of A (TS).	
11	Repeat Steps 4 through 10 to check output of each 2/6 oscillator, substituting the following terminals, in turn, for terminal 11 of A (TS) in Steps 4, 7 and 10: A21, A31, A41, A13 and A23.	Voltmeter indicates a measurement of 1.5 volts ± 0.25 volts for each oscillator tested.
12	Remove W1AL cord from terminals 11 and 45 of B (TS).	
13	Remove 1W13B cord from terminal 23 of A (TS).	
14	Repeat Steps 4 through 10 to check output of each 4/4 oscillator, connecting the 275-ohm resistor and the voltmeter to each of the following terminals: A11, A21, A31, A41, A13, A23, A33, and A43.	Voltmeter indicates a measurement of 1.5 volts ± 0.25 volts for each oscillator tested.
15	Remove all cord and meter connections.	
16a	If the output voltage of any one of the oscillators tested does not measure 1.5 volts ± 0.25 volts, proceed to Test C (see 1.04).	
17b	If no further tests are to be made— Restore MF signal generator to service.♦	

B. Frequency Test

- 2 Using 1W13B cords, connect 1100-ohm load resistor to terminal B11 and to the first terminal in Table B. The 624B tool provides means for connecting to terminals, and the KS-6278 connecting clips provide means for connecting to load resistor.
- 3 Connect input leads of HP5221B or 5321B counter across 1100-ohm load resistor.

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STEP	ACTION	VERIFICATION
4	If using 72A frequency meter— Insert 241A plug of 2W3A cord in BRDG IN jack of 72A frequency meter.	
5	Connect one KS-6278 connecting clip of 2W3A cord to each side of 1100-ohm load resistor.	
6	At MF signal generator— Using W1AL cord, connect terminal B45 to terminal B11.	
7	Measure frequency.	Frequency is within limits indicated in Table B.
8b	◆If output frequency is not within limits specified in Table B— Perform Test C and then repeat Steps 2 through 7.◆	
9c	◆If output frequency still does not fall within limits specified in Table B— Proceed as outlined in circuit notes accompanying schematic drawing.◆	
10	Move test connection to next terminal indicated in Table B.	

TABLE B

TERMINAL	OSCILLATOR OUTPUT FREQUENCY IN CYCLES PER SECOND (2/6 FREQUENCIES)	MAXIMUM PERMISSIBLE VARIATION IN CYCLES PER SECOND (±1 PERCENT)
B17	700	693 to 707
B27	900	891 to 909
B37	1100	1089 to 1111
B47	1300	1287 to 1313
B18	1500	1485 to 1515
B28	1700	1683 to 1717
	(4x4 FREQUENCIES)	
B17	697	690 to 704
B27	941	932 to 950
B47	1209	1197 to 1221
B18	1336	1323 to 1349
B28	1477	1462 to 1492
B37	1633	1617 to 1649
B38	770	762 to 778
B48	852	843 to 861

STEP	ACTION	VERIFICATION
11	Repeat Steps 7 to 10 until all 2/6 frequencies are tested.	
12	Remove W1AL cord connecting terminal B45 to B11.	
13	Repeat Steps 7 to 10 until all 4x4 frequencies are tested.	
14	Remove all test connections.	
15	Restore associated equipment to service unless other tests are to be made.	
C. ◀Oscillator Output Voltage Adjustment▶		
2	▶Using 1W13B cords, connect KS-6278 connecting clips to 275-ohm load resistor and connect 624B tools to terminals 11 of A and B (TS).	
	<i>Note:</i> Insulate load resistors so that it does not become crossed or grounded with other equipment or framework.	
3	Using 5-volt scale, set voltmeter to indicate ac volts in accordance with approved procedures.	
4	Connect alligator clip of voltmeter test probe cord assembly (ground side of meter) to terminal 11 of B (TS).	
5	Touch other voltmeter probe to terminal 11 of A (TS).	Voltmeter indicates a measurement of 1.5 volts ac.
6a	If requirement for Step 5 is not met— Loosen locking nut on P1 potentiometer and rotate potentiometer until voltmeter indicates 1.5 volts ac; retighten locking nut taking care not to change voltmeter indication.	
7	Remove probe from terminal 11 of A (TS).	
8	Remove 624B tool from terminal 11 of A (TS).	
9	Repeat Steps 2 through 8 to adjust output voltage of each of the eight oscillators substituting, in turn, for terminal 11 of A (TS) in Steps 2, 5, 7, and 8: terminals 21, 31, 41, 13, 23, 33 and 43 of A (TS). Substitute P2 to P8 potentiometer for P1 potentiometer in Step 6a as required.	

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STEP	ACTION	VERIFICATION
10	Substitute 1100-ohm load resistor for 275-ohm resistor and repeat Steps 2 through 9; record all voltmeter readings.	Voltmeter indications recorded of all oscillators should not differ by more than .15 volts.
11b	If requirement for Step 10 is not met— Raise or lower the voltage to meet requirement by removing the lead on terminal 32 of the A (TS) and connecting it to terminal on A (TS) as shown in Table C.	
12c	If requirement for Step 10 cannot be met after performing Step 11b— Replace circuit pack associated with oscillator that does not meet requirement.	

TABLE C
OUTPUT VOLTAGE CONTROL TERMINALS
[(A) TERMINAL STRIP]

OSC	REMOVE CONNECTION	TO RAISE VOLTAGE ADD CONNECTION	TO LOWER VOLTAGE ADD CONNECTION
1	32-48	47-48	27-48
2	32-38	47-38	27-38
3	32-28	47-28	27-28
4	32-18	47-18	27-18
5	32-46	47-46	27-46
6	32-36	47-36	27-36
7	32-26	47-26	27-26
8	32-16	47-16	27-16

STEP	ACTION	VERIFICATION
13	Remove all test connections.	
14	Restore MF generator circuit to service.♦	