OUTGOING TEST TRUNK CIRCUIT
FOR BOARD-TO-BOARD TESTING SD-1A320-01
TEST AND ADJUSTMENTS
2-WIRE NO.1 ELECTRONIC SWITCHING SYSTEM

1. GENERAL

1.01 This section describes a method of testing and adjusting the SD-1A320-01 outgoing test trunk circuit for board-to-board testing used in a 2-Wire No. 1 *Electronic Switching System (ESS).*

1.02 This section is reissued for the following reasons:

(a) To add reference to W1BC patch cord in part 2

(b) To add Note to step 13

(c) To remove Fig. 1 and change references

(d) To update former Fig. 2.

1.03 The tests and adjustments covered are:

- ***Tone Detection Level:*** This test is used to adjust the GAIN control of the KS-19220 L2 amplifier to its proper setting.

- ***Detector Networks (Circuit Pack A378):*** This test checks the input signal with the output signal for correct phase and amplitude.

The test and adjustments should be made at a test bench or near a +24 volt and −48 volt, power source. Tests should be performed anytime that the outgoing test trunk circuits are moved to a different location. It is recommended that the circuit not be plugged into the universal trunk frame for these tests and adjustments.

1.04 ***Lettered Steps:*** A letter a, b, c, etc, added to a step number in Part 3 of this section indicates an action which may or may not be required depending on local conditions.

1.05 The voltages at the circuit packs should be checked to make sure they are within the limits. (Refer to SD-1A320-01 for correct voltage measurements.)

2. APPARATUS

2.01 Resistor, 200 ohms (type 18BT).

2.02 Two resistors, 600 ohms (type 18AE).

2.03 Resistor, 10,000 ohms (type 18JW).

2.04 KS-14510 L1 volt-ohm-milliammeter (VOM) or equivalent.

2.05 KS-14510 L3 test leads (one red and one black), each test lead equipped with an alligator clip at one end and a connector at the other end. Insulate alligator clip with 108 cord tip insulated tubing.

2.06 KS-19353 L1 oscillator (OSC) or equivalent (Section 103-302-105).

2.07 Hewlett-Packard 3400A RMS voltmeter (VM) and two Hewlett-Packard 11002A cable assemblies or equivalent.

2.08 Five testing cords, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord) and two KS-6278 clips. Insulate KS-6278 connecting clips with 108 cord tip insulated tubing.

2.09 Hewlett-Packard E09-180A oscilloscope and two Hewlett-Packard 10005A probe assemblies or equivalent.

2.10 J94732A (3A) pulse-generating test set or equivalent.

2.11 Blocking tools (508A) as required. Use tools and apply as covered in Section 069-020-801.

2.12 905A or 905B connector assembly.

2.13 ▶Two W1BC patch cords.◀

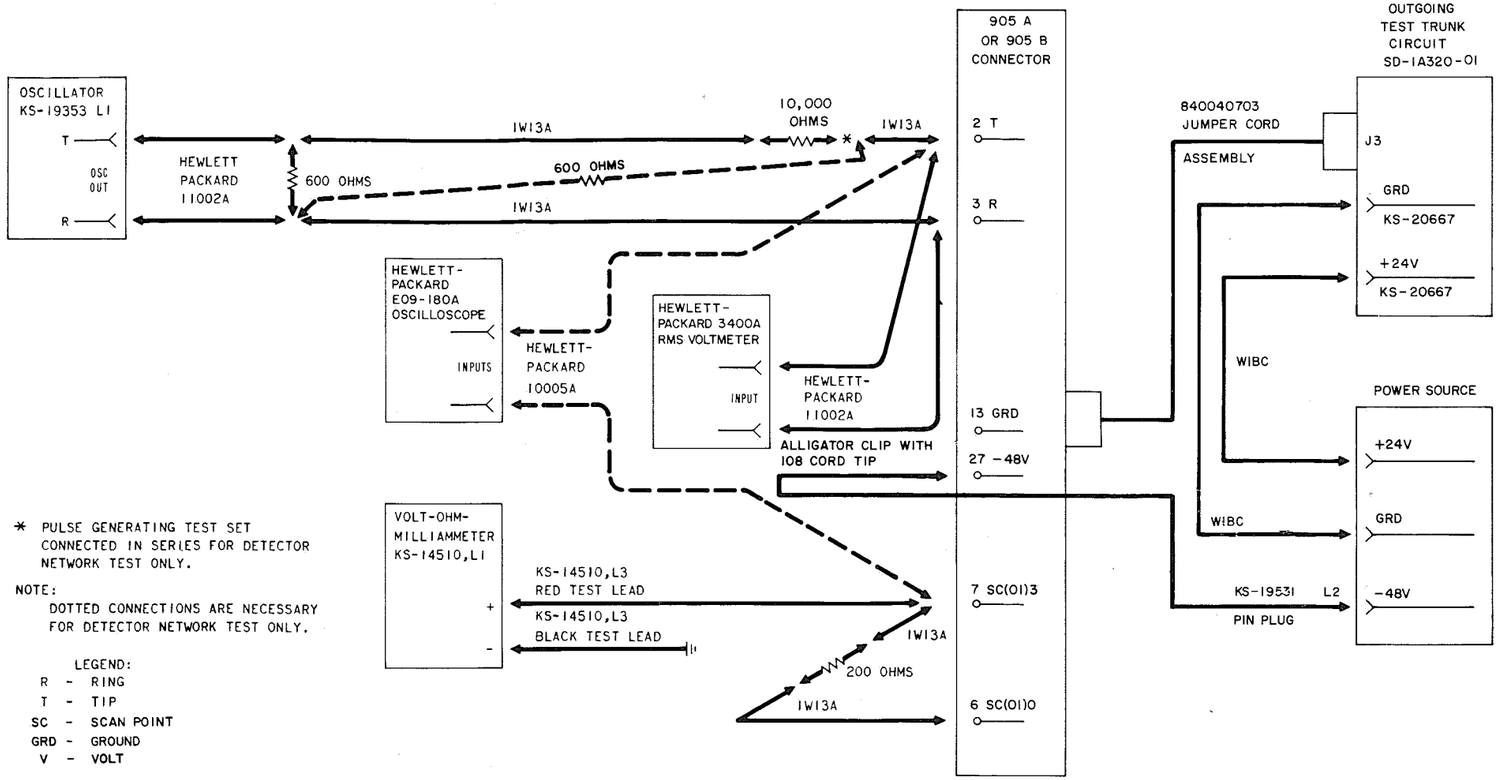
2.14 One patch cord, 22-gage insulated wire 6 feet long, equipped with one KS-19531 L2 pin plug and an alligator clip with 108 cord tip insulated tubing. Used for applying −48-volt battery to test connector.

3. METHOD

STEP	ACTION	VERIFICATION
1	At OSC— Connect power cord to ac power supply if not using battery power; set POWER switch to ON; set FREQ RANGE switch to X10; adjust for a frequency of 1000 Hz ±100 Hz; and allow at least 5 minutes for equipment to warm up.	
2	At VM— Connect power cord to ac power supply; operate POWER switch to ON; set RANGE switch to .1 volt; and allow at least 5 minutes for equipment to warm up.	LINE lamp lighted.
3	At VOM— Operate RANGE switch to DC volts 60.	
4	At test circuit— Remove circuit cover and unit from case so that the SD-1A320 circuitry is exposed. Connect the jumper cord assembly with 905A or 905B connector in place to the KS-16786 connector. Also connect the +24 volt and the −48 volt supplies and ground as required. Set the TYPE OF OFFICE switch to NON SXS and establish other connections as shown in Fig. 1.	
Tone Detection Level		
5	Block relays A, C, and E operated and relay B released.	
6	At OSC— Obtain a frequency of 1000 Hz ±100 Hz and an output of 0.030 ±0.001 volts rms.	At VM— Meter should indicate 0.030 ±0.001 volts rms.
7	At amplifier KS-19220,— Starting with GAIN control in a counterclockwise position, adjust GAIN control clockwise until the dc voltage at terminal 7 is below +10 volts.	At VOM— Meter should indicate decrease from above +19 volts to below +10 volts.

STEP	ACTION	VERIFICATION
8	At OSC— Obtain an output of 0.027 ±0.001 volts rms.	At VM— Meter should indicate 0.027 ±0.001 volts rms. At VOM— Meter should indicate increase to above −+19 volts.
9a	If the voltage conditions at terminal 7 are within the limit— Proceed to next test.	
10b	If the voltage conditions at terminal 7 are not within the limit— Repeat Steps 5 through 9a.	
	Detector Network (Circuit pack A378)	
11	Block relays A, C, and E operated and relay B released.	
12	At OSC— Obtain a frequency of 1000 Hz ±100 Hz and an output of 0.030 ±0.001 volts rms.	At VM— Meter should indicate above +0.030 volts rms. ***Note:*** When the path to the tone source is opened, the tip and ring towards the tone detector (terminals 2 and 3) should be terminated with 600 ohms. (This is to prevent the amplifier from going into self-oscillation).
13	At board-to-board circuit— Open connection of oscillator that is in series with 10,000-ohm resistor to terminal 2 and insert, in series, nonprotected contacts of pulse generator. Also insert a 600-ohm resistor between the tip and ring (terminals 2 and 3) as shown in Fig. 1.	
14	Connect oscilloscope by use of two 10005A probes to compare input signal between terminal 2 and output signal at terminal 7. (See Fig. 1.)	
15	At pulse generator— Obtain a periodically interrupted input signal composed of a 100 ±4 millisecond period of a 1000-Hz signal followed by a 300-millisecond minimum period of no signal.	At oscilloscope— Verify that input signal is composed of a 100 ±4 millisecond period of 1000-Hz signal followed by a 300-millisecond minimum period of no signal. At VOM— Meter indicates a constant voltage above +19 volts for the output signal.

STEP	ACTION	VERIFICATION
16	At pulse generator— Obtain a periodically interrupted input signal composed of a 190 ±4 millisecond period of a 1000-Hz signal followed by a 300-millisecond minimum period of no signal.	At oscilloscope— Verify that input signal is composed of a 190 ±4 millisecond period of 1000-Hz signal followed by a 300millisecond minimum period of no signal. The output signal decreases from above +19 volts to below +10 volts, 145 ±35 milliseconds after the start of the signal period. At VOM— Meter indicates a decrease from above +19 volts to below +10 volts for the output signal.
17	Record time found in Step 16.	
18	At pulse generator— Obtain a periodically interrupted input signal composed of a 400-millisecond minimum period of 1000-Hz signal followed by an 80 ±10 millisecond period of no signal.	At oscilloscope— Verify that input signal is compsed of a 400-millisecond minimum period of 1000-Hz signal followed by an 80 ±10 millisecond period of no signal. The output signal increases from below +10 volts to above +19 volts, 160 +50 milliseconds after the start of the no signal period. Then the output signal decreases to below +10 volts in a time equal to that recorded in Step 17 plus 20 to 50 milliseconds. At VOM— Meter indicates below +10 volts.
19	Remove all connections established as shown in Fig. 1.	



* PULSE GENERATING TEST SET CONNECTED IN SERIES FOR DETECTOR NETWORK TEST ONLY.

NOTE:
DOTTED CONNECTIONS ARE NECESSARY FOR DETECTOR NETWORK TEST ONLY.

LEGEND:
R - RING
T - TIP
SC - SCAN POINT
GRD - GROUND
V - VOLT

Fig. 1—Test Connections