SS-1 OR SS-1A SELECTIVE SIGNALING SYSTEM, 2-DIGIT TOUCH-TONE TO DIAL PULSE CONVERSION EQUIPMENT, DETAILED TESTS

1. GENERAL

1.01 This section provides detailed tests for the 2-digit TOUCH-TONE® to dial pulse converter and the signal digit delay and storage circuit. These circuits are used in conjunction with the 2568 HAA TOUCH-TONE telephone set, or equivalent, and the TOUCH-TONE calling receiving circuit, type C1 to enable conversion of the decimal output of a TOUCH-TONE receiver to dial pulses for SS-1 and SS-1A.

1.02 These tests should be performed prior to placing the equipment in service. Tests are performed by operating the equipment, by audible or visual observations, and by using the required test equipment.

1.03 This issue of the section is based on the following drawings:

DRAWING	TITLE
CD & SD-1G251-01	2-Digit DC to Dial Pulse Converter
CD & SD-1G249-01	Signal Delay and Digit Delay and Storage Circuit
CD & SD-67027-01	TOUCH-TONE Calling Receiving Circuit Type C

1.04 The tests covered are:

(a) ***Time-out Test:*** This test covers the 2.5-second timing feature to ensure that the digit 1 is outpulsed to clear the TOUCH-TONE receiver and the associated SS-1 and SS-1A equipment.

(b) ***Interdigital Timing Test:*** This test measures the interdigital time between pulse trains when two digits are pulsed out of the converter.

(c) ***Station Input to TOUCH-TONE Receiver Test:*** This test checks the voltage input of each TOUCH-TONE set and the proper adjustment of the attenuator which compensates for voltage differences.

(d) ***Percent Break and Pulsing Speed Test:*** This test checks the pulse generator and insures the proper registration of digits.

2. APPARATUS

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

2.02 The preliminary adjustment for the pulse checking test set is as follows:

- Operate PPS-PCB key to center position
- Turn CAL-0 potentiometer counterclockwise
- Connect –48V to the tip, and ground to the sleeve of Batt G.
- Adjust CAL-0 potentiometer for 0 percent break
- Operate SCALE 20-40 key to 20 position.

2.03 The Hewlett-Packard Model 400D vacuum tube voltmeter or equivalent is readily available from the central office. Refer to Section 100-526-101 for information on the H-P Model 400D.

2.04 The J24753A test set for timing tests provides a means for checking relay and circuit operation time intervals. Adequate signals to start and stop the intervals to be measured are provided in the circuit under test. Section 100-130-101 contains a description and application for the test set. See Fig. 3 for typical connections.

TABLE A

APPARATUS	TESTS			
	A	B	C	D
Pulse Checking Test Set J94723A (2.02)				1
Hewlett-Packard Model 400 Vacuum Tube Voltmeter (2.03)			1	
Test Set for Timing Tests J24753A (2.04)	1	1		
Hewlett-Packard Model 552B (or equivalent) Electronic Counter (2.05)	1	1		
Tools (2.06)				√

√As Required

2.05 The 522B electronic counter is an all-purpose vacuum tube model that measures frequency, period, and time interval. Readings are displayed automatically in direct-reading form—Hz, KHz, seconds, or milliseconds. Many electronic counters will work, and for this reason the operation of the counter is not covered in this section. All counters will be connected as shown in Fig. 1 and 2.

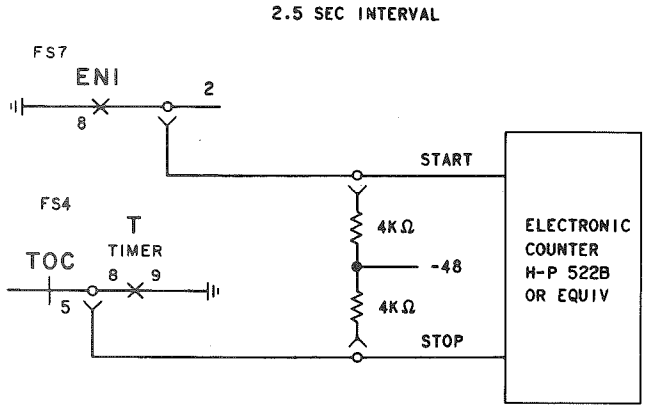

Fig. 1—Typical Connections Using Electronic Counter for Test A

2.06 Blocking and insulating tools, as required. Apply tools as covered in Section 069-020-801.

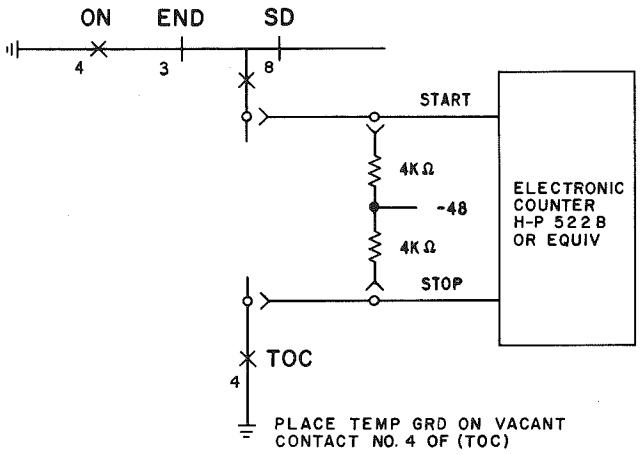

Fig. 2—Typical Connections Using Electronic Counter for Test B

3. TESTS

Tests A, B, and D must be made when the 7B timer is replaced in the field. Plug-in components are properly adjusted for installation and packaged as part of the unit.

A. Time-out Test

Note: If the J24753A test set is to be used, see paragraph 3.05.

3.01 On electronic counter, place two 4000-ohm resistors in series and connect -48Vdc to the center. Connect the other ends of the resistors to the start and stop leads of the counter. Set

the dials to display seconds. Connect the start lead to TST key terminal 2 and the stop lead to contact 8 of T timer on the J1G024A unit. See Fig. 1.

3.02 Set R8 to midpoint and T timer adjusting screw to approximately 10 degrees clockwise.

3.03 Operate TST key to enable the converter; then, release TST key. The counter will display the time from release of the TST key to operation of END relay.

3.04 Repeat 3.03, resetting the counter each time, and adjusting the T timer adjusting screw until a reading of 2.25 to 2.75 sec. is displayed on the counter.

3.05 On J24753A test set, insert W3M cord in TST 1 jack. Using top of cord, connect to 12 of T timer on J1G024A unit. Insert a 10K resistor between contacts 8 & 9 of T timer and tip of W3M cord. (See Fig. 3).

3.06 Set R8 to midpoint and T timer adjusting screw to approximately 10 degrees clockwise.

3.07 Set MIL SEC switch to 0-5000 position and REC switch to 48V GND. MCF switch to NORM and SEND switch to BK.

3.08 Operate and hold TST key on J24753A test set to CAL position and adjust CAL potentiometer to obtain full scale reading. Place TST key in OPR position.

3.09 On J1G024A unit, operate test key one time. Meter should read 50 when timer stops.

3.10 Repeat 3.09 and adjust the T timer adjusting screw until proper reading is indicated on test set.

3.11 Remove cords and secure locknut on T timer adjusting screw being careful not to move potentiometer.

B. Interdigital Timing Test

Note: If the J24753A Test Set is to be used, see Paragraph 3.16.

3.12 On electronic counter, place two 4000-ohm resistors in series and connect -48Vdc to the center. Connect the other ends of the resistors to the start and stop leads of the counter. Set the dials to display milliseconds. Connect the start lead to contact 8M of SD relay and the stop lead to vacant contact 4M of TOC relay. Connect a temporary ground on vacant stationary contact 4 of TOC relay. See Fig. 2.

3.13 On J1G024A unit, operate TST key three times in succession. This will enable the converter, and register the digit 3 twice (33) in the converter. The counter will display in milliseconds the time interval between pulse trains.

3.14 Operate reset button on electronic counter between each operation in 3.13. Adjust R8 and repeat 3.13 until a reading of 0.5 to 1.0 seconds is displayed on the counter.

3.15 Remove the counter leads and secure lock nuts on potentiometer R8 and T timer being careful not to change the position of the potentiometers.

3.16 On J24753A test set, insert W3M cord in TST1 jack. Using TIP of cord connect to 12 of T timer on J1G024A unit and contact 11 of TOC relay. (See Fig. 4). Insert a 10K resistor between 11 of TOC relay and the tip of the W3M cords.

3.17 Insulate contact 2 of ON relay and contact 8 of ENI relay on J1G024A unit.

3.18 Set MILSEC switch to 0-500 position and REC switch to 48V GND. MCF switch NORM and SEND switch to BK.

3.19 Operate and hold TST key on J24753A test set to CAL position and adjust CAL potentiometer to give one half scale reading. Place TST key in OPR position.

3.20 On J1G024A unit, operate test key three times in succession. Meter should read 75 when all digits are pulsed out.

3.21 Remove insulators and cord. Secure locknuts on potentiometer R8 and T timer being careful not to change position of the potentiometers.

C. Station Input to TOUCH-TONE Receiver Test—

3.22 On J1G024A unit, connect a high impedance ac voltmeter to TS(A) 24 and 14.

3.23 At TOUCH-TONE set, simultaneously depress the 1 and 2 dial buttons while observing reading on ac voltmeter.

3.24 Adjust R15 to obtain a reading of 0.35 to 0.70 volt.

3.25 Repeat 3.23 and 3.24 for all associated TOUCH-TONE sets. All sets must provide a reading within the requirements described in 3.24.

D. Percent Break and Pulsing Speed Test—

3.26 On J1G024A unit, connect pulse checking test set (J94723A or equivalent) to vacant contact 12M, and ground to stationary contact 12 of P relay.

3.27 Insulate 3M of ON relay. Wedge END relay nonoperated and ON and IDC relays operated.

3.28 Operate key in test set to the PPS position. Meter should read approximately 10 PPS. Strap resistors R4 and R5 for best combination to obtain requirement. Strap out resistors to increase pulsing speed. Add resistance of R4 and R5 to decrease pulsing speed.

3.29 Operate key on test set to PCB position. Meter should read 61.5 to 65.5 percent of break. Strap resistors R2 and R3 for best combination to obtain requirement. Strap out resistance to increase percent of break. Add resistance of R2 and R3 to decrease percent of break reading.

3.30 Recheck both requirements and make certain strapping of resistors is secure.

3.31 Remove wedge from ON, END, and IDC relays and remove insulator from 3M of ON relay.

3.32 Remove pulse checking test set lead from 12M of P relay and ground from stationary contact 12.

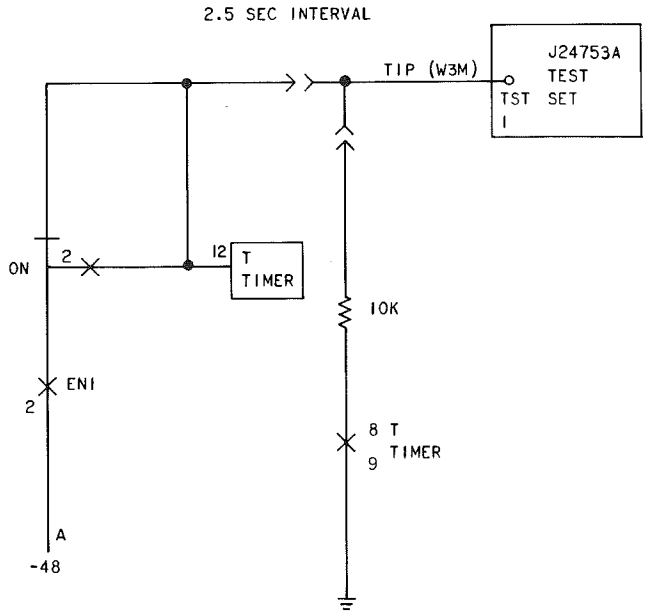

Fig. 3—Typical Connections Using J24753A Test Set for Timing Test for Test B

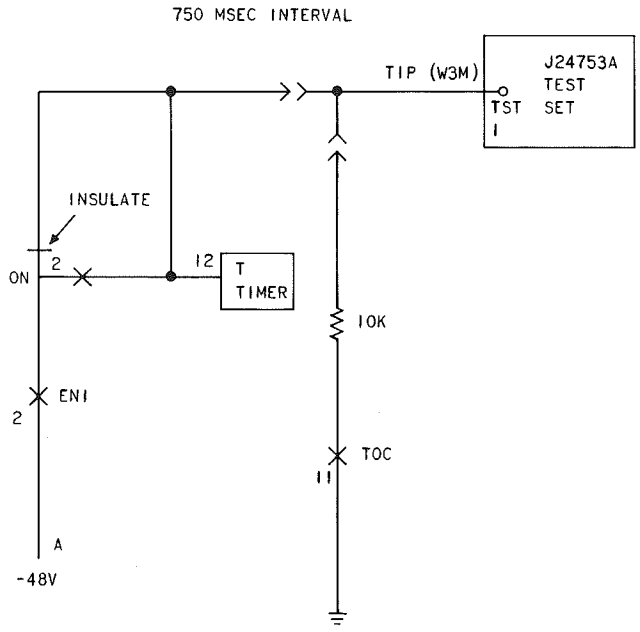

Fig. 4—Typical Connections Using J24753A Test Set for Timing Tests for Test A