TOUCH-TONE®
TRANSMITTER TEST CIRCUIT SD-1A369-01 AND
TOUCH-TONE TRANSMITTER CIRCUIT SD-1A375-01
TESTS AND ADJUSTMENTS
2-WIRE NO. 1 ELECTRONIC SWITCHING SYSTEM
WITH HILO 4-WIRE FEATURE

1. GENERAL

1.01 This section describes a method for testing and adjusting the TOUCH-TONE® transmitter test circuit SD-1A369-01 and the TOUCH-TONE transmitter circuit SD-1A375-01 used in the 2-Wire No. 1 Electronic Switching System (ESS).

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

This issue affects the Equipment Test List.

1.03 The tests and adjustments covered are:

A. SD-1A375-01, Test and Alignment: This test verifies that the TOUCH-TONE frequencies and power levels are as specified.

B. SD-1A369-01, Test and Adjustment: This test verifies the upper and lower passband frequencies and the circuit sensitivity.

1.04 If the frequency or level requirements described in Test A cannot be met, CP A157 or CP A158 should be changed and requirements rechecked. If changing circuit packs does not result in meeting frequency requirements, consideration should be given to replacing the appropriate oscillator inductor (HB or LB).

1.05 In Test B, the KS-21715 oscillator is referred to as OSC and the volt-ohm-milliammeter is referred to as VOM.

1.06 In Test B, the term low voltage means a range from 14.8 to 18.2 volts. The term high voltage means a range from 21.1 to 25.9 volts.

1.07 Reference to the Output Message Manual OM-1A001 should be made to interpret TTY output messages relating to these tests.

1.08 ***Lettered Steps:*** A letter a, b, c, etc, added to a step number in Part 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 governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

2. APPARATUS

2.01 Hewlett-Packard 5326A timer-counter or equivalent.

2.02 Hewlett-Packard 10008B probe (1:1).

2.03 J94023A (23A) transmission measuring set (TMS).

2.04 Testing cord, W2C cord, 10 feet long, equipped with one 310 plug and two KS-6278 connecting clips (2W6A cord), insulated with 108 cord tips.

2.05 Two testing cords, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord)

and two KS-6278 connecting clips. Insulate KS-6278 connecting clips with 108 cord tip (insulation tubing).

2.06 Screwdriver D.

2.07 Screwdriver KS-6854.

2.08 158A adapter extender board used to bring out circuit packs that contain controls that require adjustment.

2.09 KS-19355 L3 adjusting tool, used to adjust transformers.

2.10 KS-21715 L1 Oscillator (Precision).

2.11 Testing cord, W2W cord, 10 feet long, equipped with a 310 plug, 360B and 360C tools (2W17C cord).

2.12 Resistor 11,000 ohms, one-half watt.

2.13 KS-14510 L1 volt-ohm-milliammeter (VOM).

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

2.15 No. 48, combination 7/32- and 1/4-inch hex double-end socket wrench and screwdriver for adjusting 1653-type inductors.

Warning: When making connections to terminals on test circuit terminal strip, care should be taken that one terminal is not shorted to another. One method to prevent shorting is to connect a 30 Mueller Minigator clip (insulated by a 32 Mueller insulator) to the selected terminal and to make the regular connection to the other end of the 30 Mueller Minigator clip.

3. PREPARATION

3.01 Unless otherwise indicated all keys are locking keys. When the locking key is operated and released, the key remains closed until operated and released again. The nonlocking key remains closed only during the time the key is held operated.

STEP	ACTION	VERIFICATION
1	Locate the HILO interface circuit associated with the TOUCH-TONE circuit being tested.	
2	At MTTP— Operate TNN and TEST (MTL) keys.	MTL lamp lighted and dial tone heard.
3	At TOUCH-TONE set— Dial the TNN associated with the trunk circuit under test, * and #.	MTL lamp extinguished and dial tone silenced. Status lamps indicate status of circuit.
4	Release TEST key.	
5	Operate LKDO (MTL) key.	At TTY— Receive TL01 output message.
6	Repeat Steps 2 through 5 using the TNN of the other circuit associated with the SD-1A392 circuit in Step 3.	
7	At the HILO trunk frame— Remove the HILO interface circuit associated with the trunk under test.	

STEP	ACTION	VERIFICATION

4. METHOD

A. SD-1A375-01, Test and Alignment

8 At 5326A frequency counter—
Connect power cord to ac power supply.

9 Turn power on by rotating SAMPLE RATE control clockwise.

10 Set FAST/NORM/HOLD switch to NORM.

11 Set TIME BASE/MULTIPLIER switch to display a frequency range of 600 Hz to 1700 Hz.

12 Set CHANNEL A&B slide switches to SLOPE +, AC and ATTN X1.

13 Set LEVEL controls to midrange.

14 Set CHK/SEP/COM switch to SEP.

15 Set FUNCTION switch to FREQ A.

16 At TMS—
Set ADD DBM switch to -5.

17 Set INPUT switch to 600.

18 At transmitter circuit—
Establish connections as shown in Fig. 1, and remove A45 circuit packs.

19 Connect terminal 23 of component assembly A to ground using 1W13A cord.

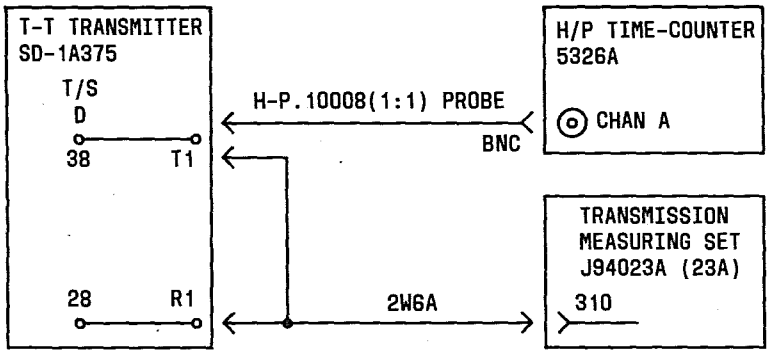


Fig. 1—Test A Connections

STEP	ACTION	VERIFICATION
20	At transmitter circuit— Using 1W13A cord, connect terminal 17 TS(E) (TP9) to ground.	
21	Using 1W13A cord, connect TP0 [terminal 31 TS(E)] to ground.	At frequency counter— Counter indicates between 690.0 and 703.9 Hz. At TMS— Meter indicates between -3.0 and -5.0 dBm.
22a	If frequency requirement of Step 21 is not met— Adjust transformer LB (2583B) to obtain frequency counter indication of 697.0 Hz.	
23b	If level requirement of Step 21 is not met— Remove circuit pack A157 from its socket; replace it with 158A adapter; plug circuit pack A157 into 158A adapter.	
24b	Adjust potentiometer R4 to obtain TMS meter indication of -4 dBm. (See Fig. 2 for location of R4.)	
25b	Remove 158A adapter from socket and replace it with circuit pack A157.	

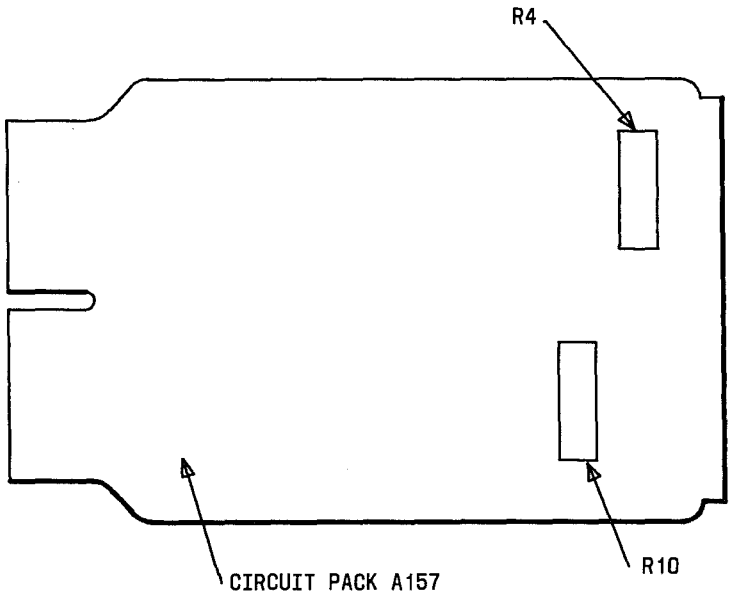


Fig. 2—Locations of R4 and R10 on Circuit Pack A157

STEP	ACTION	VERIFICATION
26	Remove 1W13A cord connection from TP0 and connect to TP1 (terminal 32, TSE).	At frequency counter— Counter indicates between 762.3 and 777.7 Hz. At TMS— Meter indicates between -3.0 and -5.0 dBm.
27c	If frequency requirement of Step 26 is not met— Adjust transformer LB (2583B) to reduce difference between 770.0 Hz and frequency counter indication in Step 26 by one-half.	
28e	If level requirement of Step 26 is not met— Remove circuit pack A157 from its socket; replace it with 158A adapter; plug circuit pack A157 into 158A adapter.	
29e	Adjust potentiometer R4 to reduce difference between -4 dBm and meter reading in Step 26 by one-half. (See Fig. 2 for location of R4.)	
30e	Remove 158A adapter from socket and replace it with circuit pack A157.	
31	Remove 1W13A cord connection from TP1 and connect to TP4 [terminal 35 TS(E)].	
32	Remove 1W13A cord connection from TP9 and connect to TP8 [terminal 18, TS(E)].	At frequency counter— Counter indicates between 1197.0 and 1221.0 Hz. At TMS— Meter indicates between -3.0 and -5.0 dBm.
33f	If frequency requirement of Step 32 is not met— Adjust transformer HB (2583A) to obtain frequency counter indication of 1209.0 Hz.	
34f	If level requirement of Step 32 is not met— Remove circuit pack A157 from its socket; replace it with 158A adapter; plug circuit pack A157 into 158A adapter.	
35g	Adjust potentiometer R10 to obtain TMS meter indication of -4 dBm. (See Fig. 2 for location of R10.)	
36g	Remove 158A adapter from socket and replace it with circuit pack A157.	
37	Remove 1W13A cord connection from TP4 and connect to TP5 [terminal 36, TS(E)].	At frequency counter— Counter indicates between 1322.7 and 1349.3

STEP	ACTION	VERIFICATION
		Hz. At TMS— Meter indicates between -3.0 and -5.0 dBm.
38h	If frequency requirement of Step 37 is not met— Adjust transformer HB (2583A) to reduce difference between 1336.0 and frequency counter indication in Step 37 by one-half.	
39i	If level requirement of Step 37 is not met— Remove circuit pack A157 from its socket; replace it with 158A adapter; plug circuit pack A157 into 158A adapter.	
40i	Adjust potentiometer R10 to reduce difference between -4 dBm and meter indication in Step 37 by one-half. (See Fig. 2 for location of R10.)	
41i	Remove 158A adapter from socket and replace it with circuit pack A157. ***Note:*** Transformers HB and LB and potentiometers R4 and R10 should now be in adjustment for the remaining portion of this test.	
42	Remove 1W13A cord connection from TP5 and connect to TP6 [terminal 37, TS(E)].	At frequency counter— Counter indicates between 1462.3 and 1491.7 Hz. At TMS— Meter indicates between -3.0 and -5.0 dBm.
43	Remove 1W13A cord connection from TP6 and connect to TP7 [terminal 38, TS(E)].	At frequency counter— Counter indicates between 1616.7 and 1649.3 Hz. At TMS— Meter indicates between -3.0 and -5.0 dBm.
44	Remove 1W13A cord connection from TP8 and connect to TP9 [terminal 17, TS(E)].	
45	Remove 1W13A cord connection from TP7 and connect to TP2 [terminal 33, TS(E)].	At frequency counter— Counter indicates between 843.5 and 860.5 Hz. At TMS— Meter indicates between -3.0 and -5.0 dBm.
46	Remove 1W13A cord connection from TP2 and connect to TP3 [terminal 34, TS(E)].	At frequency counter— Counter indicates between 931.6 and 950.4 Hz.

STEP	ACTION	VERIFICATION
		At TMS— Meter indicates between -3.0 and -5.0 dBm.
47	At transmitter circuit— Remove 1W13A cord connections, from TP3 and ground, TP9 and ground and terminal 23 of component assembly A and ground.	
48	Remount circuit packs A45 removed in Step 18 of Preparation.	
49	Remove all connections established as shown in Fig. 1.	
50	At the HILO trunk frame— Replace the HILO interface circuit removed in Step 7 of Preparation.	
51	At MTTP— Operate TEST and TNN (MTL) key.	Dial tone heard.
52	At TOUCH-TONE set— Dial the TNN associated with the trunk under test, * and #.	Dial tone silenced.
53	Release TEST (MTL) key.	
54	Operate ACT (MTL) key.	At TTY— Receive TL01 output message.
55	Release all keys.	
56	Use the above procedure, Step 51 through Step 55 to idle the other trunk (use the TNN of the other trunk circuit associated with the SD-1A392 circuit in Step 52).	
B.	**SD-1A369-01, Test and Adjustment Passband, Low-Group Check**	
8	At OSC— Operate selector switch to 600Ω Position and POWER switch to ON.	POWER ON lamp lighted.
9	At test circuit— Establish connections as shown in Fig. 3. ***Note:*** If the OVERLOAD lamp is lighted a low impedance bridge in the connecting circuit is indicated. Correct this condition before proceeding.	

STEP	ACTION	VERIFICATION

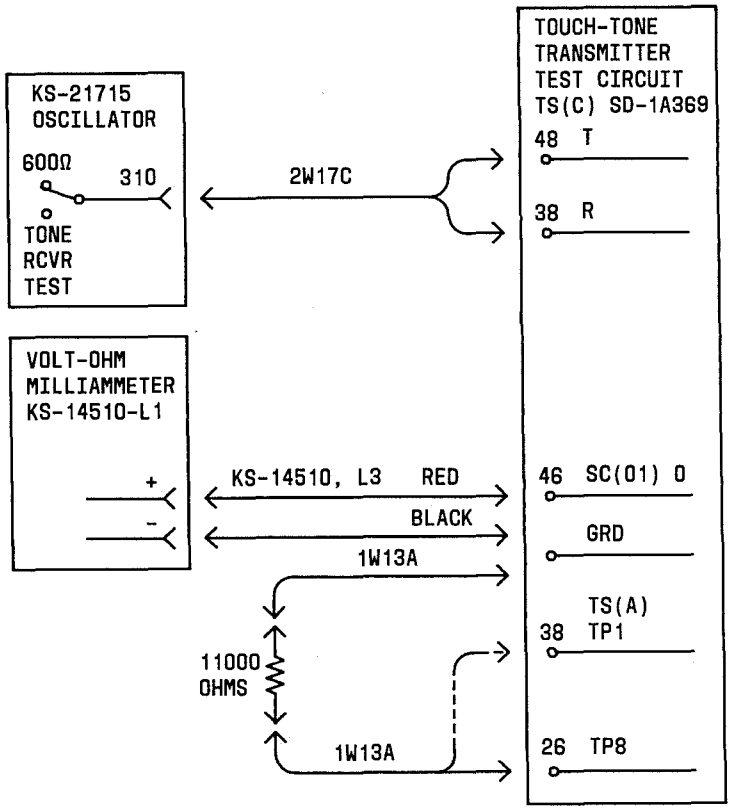


Fig. 3—Test B Connections

10	At OSC— Adjust output level to -5.0 dBm.	
11	At OSC— Adjust frequency to 697.0 Hz.	At VOM— Meter indicates high voltage.
12	At OSC— Adjust frequency to lower side of 697-Hz channel midband frequency (toward 686 Hz); adjust to point where VOM indication drops to low voltage; and then slowly adjust toward midband frequency just to point where VOM indication increases to high voltage. ***Note:*** This frequency should be determined as accurately as possible to the nearest tenth of a Hz. If necessary, repeat Step 12.	At OSC— Lower band edge frequency for 697-Hz channel is within limits given in Table A.
13a	If requirements of Step 12 are not within limits given in Table A—	

STEP	ACTION	VERIFICATION

TABLE A

LOW GROUP BAND EDGE FREQUENCY TEST LIMITS

CHANNEL	NOMINAL MIDBAND FREQUENCY Hz	LOWER BAND EDGE FREQUENCY Hz		UPPER BAND EDGE FREQUENCY Hz	
		MIN	MAX	MIN	MAX
697 Hz	697.0	685.1	687.9	706.1	708.9
770 Hz	770.0	756.9	760.0	780.0	783.1
852 Hz	852.0	837.5	840.9	863.1	866.5
941 Hz	941.0	925.0	928.8	953.2	957.0

	The 697-Hz channel must be adjusted (Steps 18 through 33).	
14	Repeat Step 12 except vary frequency to higher side of 697-Hz channel midband frequency (toward 707 Hz).	Higher band edge frequency for 697-Hz channel is within limits given in Table A.
15b	If requirements of Step 14 are not within limits given in Table A— The 697-Hz channel must be adjusted (Steps 18 through 33).	
16	Repeat Steps 11 through 15b replacing 697-Hz designation with 770-Hz, 852-Hz, and 941-Hz channels in low group. (Refer to Table A for nominal midband frequencies and for band edge frequency limits.)	Band edge frequencies are within limits given in Table A.
17c	If no channels in the low group require adjustment— Proceed to Step 34.	

Low-Group Channel Adjustment

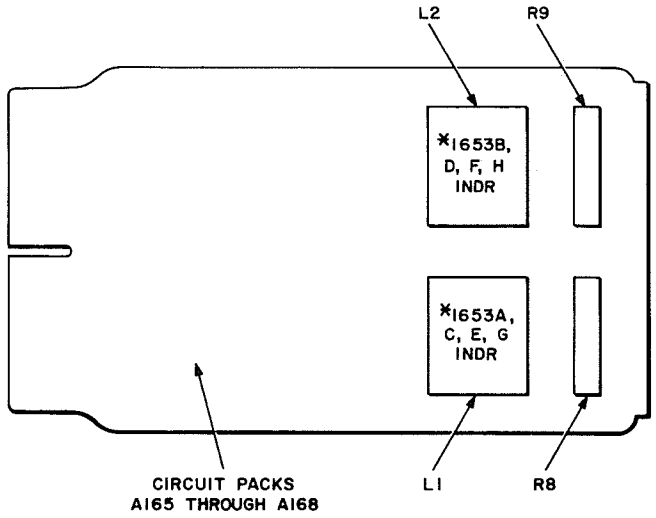
18	At OSC— Adjust frequency to nominal midband frequency for first channel in low group to be adjusted. (Refer to Table A.)	At VOM— Meter indicates high voltage.
	Note: Adjustment of band edge frequencies is made by adjusting potentiometer R8 or R9 and 1653-type inductor L1 or L2. To gain access to R8 or R9 and L1 or L2 extend the	

STEP	ACTION	VERIFICATION

selected channel circuit pack using 158A adpater extender board. Use Table B to determine potentiometer and inductor controls associated with the selected channel circuit pack. Location of R8, R9, L1, and L2 are shown in Fig. 4. Turning R8 or R9 counterclockwise increases the channel bandwidth; that is, it increases upper edge frequency and decreases lower edge frequency by approximately the same amount. Turning adjustment screw on inductor L1 or L2 clockwise raises the midband frequency and increases both the upper and lower edge frequencies by approximately the same amount.

19 At test circuit—
Extend circuit pack using 158A adapter for first channel in low group to be adjusted.

20 Determine from Table B and Fig. 4 circuit pack for selected channel in low group, location of inductor (L1 or L2), and potentiometer



*1653 INDUCTOR LOCATIONS	
INDUCTOR	CIRCUIT PACK
A AND B	A165
C AND D	A166
E AND F	A167
G AND H	A168

Fig. 4—Locations of L1, L2, R8 and R9 on Circuit Packs

STEP	ACTION	VERIFICATION
	(R8 or R9) associated with selected channel to be adjusted.	
21	At OSC— Adjust frequency to nominal value given in Table B for lower band edge frequency of first channel in low group to be adjusted.	At VOM— Meter indicates low voltage or high voltage.
22d	If VOM in Step 21 indicates low voltage— At test circuit— Slowly adjust potentiometer R8 or R9 counterclockwise just to point where VOM indicates high voltage.	
23e	If VOM in Step 21 indicates high voltage— At test circuit— Slowly adjust potentiometer R8 or R9 clockwise to point where VOM indication drops to low voltage; then slowly adjust potentiometer R8 or R9 counterclockwise just to point where VOM indicates high voltage.	
24	At OSC— Adjust frequency toward upper band edge frequency to point where VOM indicates low voltage; then slowly adjust frequency toward midband just to point where VOM indicates high voltage.	At OSC— Frequency indicated is within limits for upper band edge frequency given in Table B.
25f	If frequency indicated in Step 24 is within tolerance limits for upper band edge frequency given in Table B— Adjustment of channel passband completed.	

TABLE B

LOW GROUP BAND EDGE FREQUENCY ADJUSTMENT LIMITS

CHANNEL	CIRCUIT PACK	CONTROLS	NOMINAL MIDBAND FREQUENCY Hz	LOWER BAND EDGE FREQUENCY Hz			UPPER BAND EDGE FREQUENCY Hz		
				MIN	NOM	MAX	MIN	NOM	MAX
697 Hz	A165	R8, L1	697.0	686.3	686.5	686.7	707.3	707.5	707.7
770 Hz	A165	R9, L2	770.0	758.3	758.5	758.7	781.3	781.5	781.7
852 Hz	A166	R8, L1	852.0	838.9	839.2	839.5	864.5	864.8	865.1
941 Hz	A166	R9, L2	941.0	926.6	926.9	927.2	954.8	955.1	955.4

STEP	ACTION	VERIFICATION
26g	If frequency indicated in Step 24 is not within limits for upper band edge frequency given in Table B— Perform Steps 27g through 32g.	
27g	At OSC— Adjust frequency to half way between the actual upper band edge frequency determined in Step 24 and in its nominal value given in Table B.	
28g	At test circuit— Using No. 48 socket wrench, slowly adjust L1 or L2 just to point where VOM indicates high voltage. (See Note after Step 18.)	
29g	Adjust frequency to nominal value for upper band edge frequency given in Table B.	
30g	At test circuit— Slowly adjust potentiometer R8 or R9 just to point where VOM indicates high voltage.	
31g	Repeat Steps 24 and 25f except check lower band edge frequency. If necessary, repeat Steps 26g through 30g to adjust lower band edge frequency.	
32g	Repeat Steps 24 through 30g as many times as necessary to have both upper and lower band edge frequencies within tolerance limits given in Table B.	
33	Repeat Steps 18 through 26g for each remaining channel to be adjusted in low group using appropriate designations from Table B.	
High-Group Channel Check		
34	At test circuit— Remove 1W13A cord connection from terminal 26 on terminal strip A (Fig. 3) and connect to terminal 38.	
35	At OSC— Adjust output level to -5.0 dBm.	
36	Adjust frequency to 1209.0 Hz.	At VOM— Meter indicates high voltage.
37	At OSC— Adjust frequency to lower side of 1209-Hz	At OSC— Lower band edge frequency for 1209-Hz channel

STEP	ACTION	VERIFICATION
	channel midband frequency (toward 1190 Hz); adjust to point where VOM indication drops to low voltage; and then slowly adjust toward midband frequency just to point where VOM indication increases to high voltage. *Note:* This frequency should be determined as accurately as possible to the nearest tenth of a Hz. If necessary, repeat Step 37.	is within limits given in Table C.
38h	If requirements of Step 37 are not within limits given in Table C— Record that 1209-Hz channel requires adjustment.	
39	Repeat Step 37 except vary frequency to higher side of 1209-Hz channel midband frequency (toward 1226 Hz).	Higher band edge frequency for 1209-Hz channel is within limits given in Table C.
40i	If requirements of Step 40 are not within limits given in Table C— The 1209-Hz channel must be adjusted (Steps 42 through 58).	
41	Repeat Steps 35 through 40i replacing 1209-Hz designation with 1336-Hz, 1477-Hz, and 1633-Hz channels in high group. (Refer to Table C for nominal midband frequencies and for band edge frequency limits.)	Band edge frequencies are within limits given in Table C.
High-Group Channel Adjustment		
42	At OSC— Adjust frequency to nominal midband frequency for first channel in high group to be adjusted. (Refer to Table D.) *Note:* Adjustment of band edge frequencies is made by adjusting potentiometer R8 or R9 and 1653-type inductor L1 or L2. To gain access to R8 or R9 and L1 or L2 extend the selected channel circuit pack using 158A adapter extender board. Use Table D to determine potentiometer and inductor controls associated with the selected channel circuit pack. Location of R8, R9, L1 and L2 are shown in Fig. 4. Turning R8 or R9 counterclockwise increases the channel bandwidth; that is, it increases upper edge frequency and decreases lower edge frequency by approximately the same amount. Turning adjustment screw on inductor L1 or L2 clockwise raises the midband frequency and increases both the upper and	At VOM— Meter indicates high voltage.

STEP	ACTION	VERIFICATION
	lower edge frequencies by approximately the same amount.	
43	At test circuit— Extend circuit pack using 158A adapter for first channel in high group to be adjusted.	
44	Determine from Table D and Fig. 4 circuit pack for selected channel in high group, location of inductor (L1 or L2), and potentiometer (R8 or R9) associated with selected channel to be adjusted.	
45	At OSC— Adjust frequency to nominal value given in Table D for lower band edge frequency of first channel in high group to be adjusted.	At VOM— Meter indicates either low voltage or high voltage.

TABLE C

HIGH GROUP BAND EDGE FREQUENCY TEST LIMITS

CHANNEL	NOMINAL MIDBAND FREQUENCY Hz	LOWER BAND EDGE FREQUENCY Hz		UPPER BAND EDGE FREQUENCY Hz	
		MIN	MAX	MIN	MAX
1209 Hz	1209.0	1188.4	1193.3	1224.7	1229.6
1336 Hz	1336.0	1313.3	1318.6	1353.4	1358.7
1477 Hz	1477.0	1451.9	1457.8	1496.2	1502.1
1633 Hz	1633.0	1605.2	1611.8	1654.2	1660.8

TABLE D

HIGH GROUP BAND EDGE FREQUENCY ADJUSTMENT LIMITS

CHANNEL	CIRCUIT PACK	CONTROLS	NOMINAL MIDBAND FREQUENCY Hz	LOWER BAND EDGE FREQUENCY Hz			UPPER BAND EDGE FREQUENCY Hz		
				MIN	NOM	MAX	MIN	NOM	MAX
1209 Hz	A167	R8, L1	1209.0	1190.5	1190.9	1191.3	1226.7	1227.1	1227.5
1336 Hz	A167	R9, L2	1336.0	1315.6	1316.0	1316.4	1355.6	1356.0	1356.4
1477 Hz	A168	R8, L1	1477.0	1454.4	1454.8	1455.2	1498.8	1499.2	1499.6
1633 Hz	A168	R9, L2	1633.0	1608.0	1608.5	1609.0	1657.0	1657.5	1658.0

STEP	ACTION	VERIFICATION
46j	If VOM in Step 45 indicates low voltage— At test circuit— Slowly adjust potentiometer R8 or R9 counterclockwise just to point where VOM indicates high voltage.	
47k	If VOM in Step 45 indicates high voltage— At test circuit— Slowly adjust potentiometer R8 or R9 clockwise to point where VOM indication drops to low voltage; then slowly adjust potentiometer R8 or R9 counterclockwise just to point where VOM indicates high voltage.	
48	At OSC— Slowly adjust frequency toward upper band edge frequency to point where VOM indicates low voltage; then slowly adjust frequency toward midband just to the point where VOM indication changes to high voltage.	At OSC— Frequency indicated is within limits for upper band edge frequency given in Table D.
49l	If frequency indicated in Step 48 is within tolerance limits for upper band edge frequency— Adjustment of channel passband completed.	
50m	If frequency indicated in Step 48 is not within limits for upper band edge frequency given in Table D— Perform Steps 51n through 56n.	
51n	At OSC— Adjust frequency half way between the actual upper band edge frequency determined in Step 48 and in its nominal value given in Table D.	
52n	At test circuit— Using No. 48 socket wrench, slowly adjust L1 or L2 just to point where VOM indicates high voltage. (See Note after Step 42.)	
53n	At OSC— Adjust frequency to nominal value for upper band edge frequency given in Table D.	
54n	At test circuit— Slowly adjust potentiometer R8 or R9 just to point where VOM indicates high voltage.	
55n	Repeat Steps 48 and 49l except check lower band edge frequency. If necessary, repeat	

STEP	ACTION	VERIFICATION
	Steps 50m through 54n to adjust lower band edge frequency.	
56n	Repeat Steps 48 through 55n as many times as necessary to have both upper and lower band edge frequencies within tolerance limits given in Table D.	
57	Remove 158A adapter and restore circuit pack to service.	
58	Repeat Steps 42 through 57 for each remaining channel to be adjusted in high group using appropriate limits from Table D.	
59	At test circuit— Remove cord connection from terminal 38 on terminal strip A and connect to terminal 26.	
Sensitivity Test and Adjustment		
60	Adjust frequency to 941.0 Hz.	At VOM— Meter indicates high voltage.
61b	At OSC— Decrease output level to point where VOM indication drops from high to low value; and then slowly increase output level just to point where VOM indication increases to high value.	At OSC— Output level indicates between -22.2 and 24.2 dBm.
62c	If requirement of Step 61b is met—Proceed to Step 68.	
63d	If requirement of Step 61b is not met— At OSC— Adjust output level to 23.2 dBm.	
64d	At test circuit— Extend input amplifier circuit pack A1009, using 158A adapter.	
65d	Slowly adjust potentiometer R15 counterclockwise to point where VOM indication drops to low voltage; then slowly adjust R15 clockwise just to point where VOM indicates high voltage.	
66d	At OSC— Decrease output level to point where VOM indication drops to low voltage. Slowly increase the output level just to point where VOM indicates high voltage.	At OSC— Output level indicates between -23.1 and -23.3 dBm.

STEP	ACTION	VERIFICATION
67d	At test circuit— Restore input amplifier circuit pack A1009 to service.	
68	Remove all connections established as shown in Fig. 3.	
69	At the HILO trunk frame— Replace the HILO interface circuit removed in Step 7 of Preparation.	
70	At MTTP— Operate TEST and TNN (MTL) key.	Dial tone heard.
71	At TOUCH-TONE set— Dial the TNN associated with the trunk under test, * and #.	Dial tone silenced.
72	Release TEST (MTL) key.	
73	Operate ACT (MTL) key.	At TTY— Receive TL01 output message.
74	Release all keys.	
75	Use the above procedure, Step 70 through 74 to idle the other trunk (use the TNN of the other trunk circuit associated with the SD-1A392 circuit in Step 71).	