

“TOUCH-TONE®”
CALLING DETECTOR TEST CIRCUIT SD-2H131-01
TESTS AND ADJUSTMENTS
NO. 2/2B ELECTRONIC SWITCHING SYSTEM

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		C. <i>Frequency Test and Adjustments:</i> This test checks the TOUCH-TONE frequencies to see that they are within limits. If not, adjustments are made to obtain the correct values.
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Not for use or disclosure outside the
Bell System except under written agreement

that the DLY timer is providing the time delay required by the stored program.

1.04 These tests should be performed on a periodic basis as prescribed by equipment test list procedures or when a malfunction in the TOUCH-TONE calling detector test circuit is suspected.

1.05 If the frequency or level requirements described in this section cannot be met, CP A157 (for T-T signals) or CP A158 (for 2000 Hz third frequency) should be changed and requirements rechecked. If changing circuit packs does not result in meeting frequency requirements, consideration should be given to the use of an oscillator trimmer capacitor (see Section III, Part 5, of CD-2H131-01) or to replacing the appropriate oscillator inductor (HB, LB, or 3F).

1.06 Reference to the output message manual OM-2H200 should be made to interpret TTY output messages relating to these tests.

1.07 For information on the trunk test panel (TTP) operation, refer to Section 232-130-301.

1.08 In this section, the transmission measuring set is referred to as TMS and the volt-ohm-milliammeter is referred to as VOM.

1.09 The keys on the TTP may be either a locking or a nonlocking type. In order to differentiate between the two types of keys, the use of a locking type key shall be identified by the words "operate" and "release" and the use of a nonlocking type key shall be identified by the word "depress" in the ACTION column.

Note: Nonlocking keys require a depression of at least one-half second to ensure system recognition.

1.10 Lettered Steps: A letter a, b, c, etc, added to step number in Part 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 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 The apparatus required for each test is given in Table A. The details of each item are covered in the paragraph indicated by the number in parentheses. Equivalent apparatus may be substituted.

TABLE A

APPARATUS	TESTS			
	A	B	C	D
Blocking Tools (2.02)	3	3	3	—
Frequency Counter (2.03)	—	—	1	—
Cord (2.04)	—	—	1	—
TMS (2.05)	—	1	—	—
Cord (2.06)	—	1	1	—
Cord (2.07)	—	4	4	—
Circuit Pack Tool (2.08)	—	—	1	1
VCM (2.09)	1	—	—	—
Test Leads (2.10)	2	—	—	—
Screwdriver (2.11)	—	1	1	1
Adapter (2.12)	—	1	1	1
Adjusting Tool (2.13)	—	1	—	—
Oscilloscope (2.14)	—	—	—	1
Cord (2.15)	—	—	—	2

2.02 Blocking tools. Use tools and apply as covered in Section 069-020-801.

2.03 Hewlett-Packard (HP) 5326A timer-counter or equivalent capable of measuring 0.5 volt peak to peak audio signals to 0.1 Hz accuracy. Also it must be capable of measuring the time interval of a 10-millisecond, 5-volt positive going pulse ± 0.5 milliseconds.

2.04 One Hewlett-Packard 10008B probe (1:1).

- 2.05 J94023D (23D) transmission measuring set (TMS).
- 2.06 Testing cord, W2C cord, 10 feet long, equipped with one 310 plug, two 360 tools, and two 624B tools.
- 2.07 Testing cord, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord), and two KS-6278 connecting clips insulated with 108 cord tips.
- 2.08 Circuit pack tool 724A for removing circuit packs from apparatus mountings.
- 2.09 KS-14510 L1 volt-ohm-milliammeter (VOM).
- 2.10 KS-14510 L3 VOM test leads.
- 2.11 Screwdriver D.
- 2.12 158A adapter extender board used to bring out circuit packs that contain controls that require adjustment.
- 2.13 KS-19355 L3 adjusting tool, used to adjust transformers.
- 2.14 Tektronix 465 oscilloscope.
- 2.15 Two Tektronix P606S 10X probes.

Caution: When making connections to terminals on test circuit terminal strip C, care should be taken to ensure that one terminal is not shorted to another.

3. PREPARATION

- 3.01 Refer to the office records to obtain the member number (MEMN) and the directed scan point number (DSP) of the TOUCH-TONE calling detector circuit to be tested. The trunk group number (TGN) for this circuit is 046.
- 3.02 Verify the information obtained from the office records as follows:

At maintenance TTY, type in:

A VY:SVC:aaa bbb!

aaa = TGN

bbb = MEMN

The system response for offices using No. 2 ESS unique (old) code is as follows:

AR VY SVC aaa bbb
 TEN nn gcsl
 PDB cxyz b
 DSP ss rrbb
 END

The system response for offices using conventional (new) code is as follows:

AR VY SVC aaa bbb
 OE nn gcsl
 PDA cxyz b

DSP ss rrbb

END

Where:

cxyz = central pulse distributor (CPD)

ss = scanner number

rr = scanner row

bb = bit in row.

Refer to the output message manual OM-2H200 for explanation of other data fields, if required.

- 3.03 Use the following procedure to make the TOUCH-TONE calling detector test circuit maintenance busy and connect the circuit to the trunk test panel (TTP).

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All Tests

STEP	ACTION	VERIFICATION
1	At maintenance TTY— Type in: A VY:SVC:aaa bbb! aaa = Trunk group number of test circuit (046). bbb = Member number of test circuit.	The desired system response is output message AR VY SVC. This message contains the CPD address of the peripheral decoder circuit which controls the circuit under test.
2	Type in: M PD:RMV:aaaa! aaaa = CPD address of the peripheral decoder circuit.	The desired system response is output message MR PD SI. This message gives the status of the circuits controlled by the peripheral decoder circuit in lines 2 through 5. If the circuits are idle, they will be removed from service. If any circuits are service busy, they will be removed from service as soon as they are idled. Do not proceed with Step 3 until the TTY output message indicates all circuits have been removed from service.
3	At the telephone set on the trunk test panel (TTP)— Operate access trunk 1 key.	Access trunk 1 lamp lighted.
4	Lift handset off-hook, or operate transfer (TRFR) key at TEL CKT on TTP.	Customer dial pulse receiver (CDPR) seized. SUPV lamp lighted on ACCESS TRUNK 1 CONTROL. Dial tone received or TRFR lamp lighted.
5	At TOUCH-TONE dial on TTP— Dial digit 1, circuit identifying digit dial 3-digit trunk group number (TGN) (046) and 3-digit member number (MEMN) of TOUCH-TONE calling detector test circuit.	
6	Dial start (ST) key.	EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P&E lamp lighted if connection was successful.
7	At telephone set on TTP— Place handset on-hook, or At TEL CKT on TTP— Release TRFR key.	If TRFR key was used— TRFR lamp extinguished.
8	At the ACCESS TRUNK 1 CONTROL— Depress XMSN key.	XMSN lamp lighted.
9	At TRANSMISSION MEASURING CONTROL— Operate TO key. (This action ensures that the tip and ring leads of the circuit under test are not loaded.)	TO lamp lighted.

STEP	ACTION	VERIFICATION
10	Refer to office records to obtain the equipment location of the peripheral decoder circuit pack (A794) associated with the circuit under test.	
11	At the peripheral decoder power panel on miscellaneous trunk frame— Locate power switch of peripheral decoder circuit which controls circuit under test and turn to vertical (off) position.	PWR OFF lamp lighted.
12	At equipment location of peripheral decoder circuit which controls the circuit under test— Remove A794 circuit pack.	
13	At peripheral decoder power panel— Turn peripheral decoder switch to horizontal (on) position.	PWR OFF lamp extinguished.

4. METHOD

A. Scan Points and State 0, Idle Test

Scan Point 00 Test

14	At VOM— Set OHMS switch to X100.	
15	At circuit under test— Make connections designated 1 as shown in Fig. 1.	
	Caution: When making connections to terminals on circuit under test terminal strip C, care should be taken to ensure that one terminal is not shorted to another.	
16	Block operate A relay.	At VOM— Meter indicates approximately 1000 ohms.
17	Remove blocking tool from A relay.	Meter indicates open circuit.
18	Block operate B relay.	Meter indicates approximately 1000 ohms.
19	Remove blocking tool from B relay.	Meter indicates open circuit.
20	Block operate C relay.	Meter indicates approximately 1000 ohms.
21	Remove blocking tool from C relay.	Meter indicates open circuit.

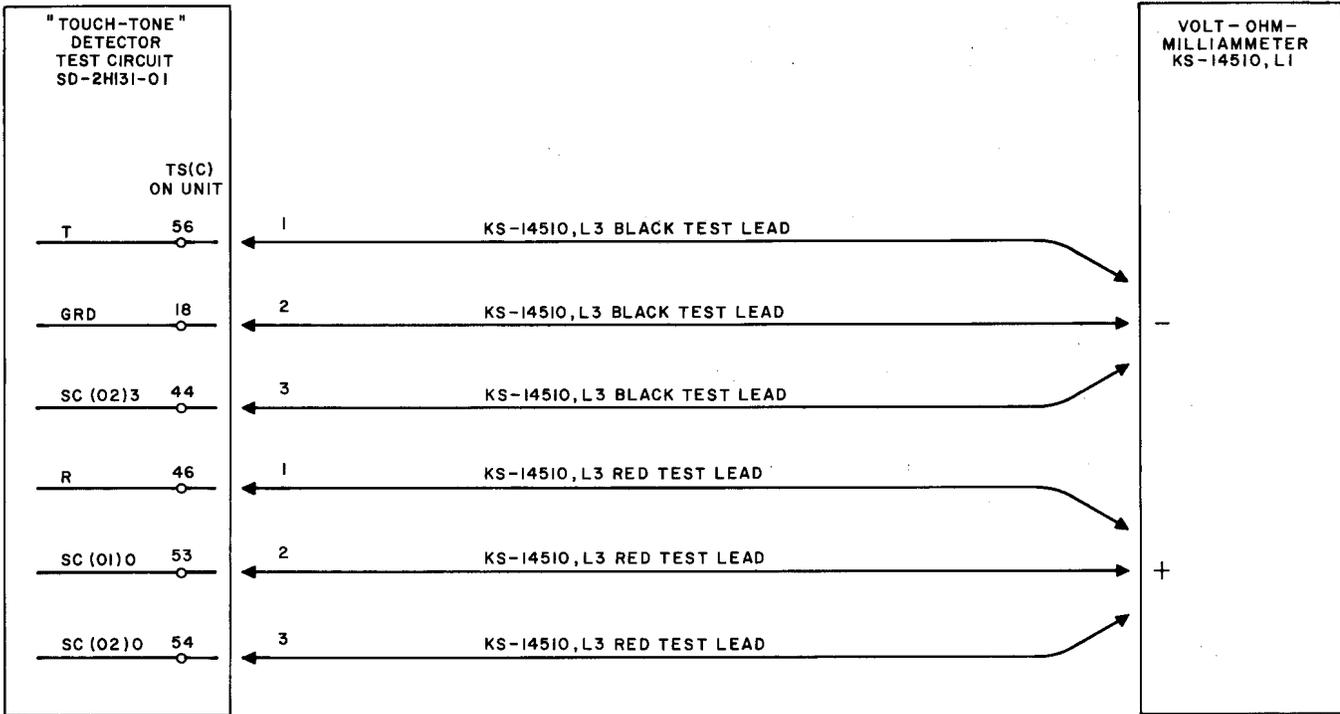


Fig. 1—Test A Connections

STEP	ACTION	VERIFICATION
Scan Point 01 Test		
22	At VOM— Set DC VOLTS switch to 60.	
23	At circuit under test— Remove connections designated 1 and make connections designated 2 as shown in Fig. 1.	
24	Block operate A relay.	Meter indicates between 10.4 and 15.5 volts dc.
25	Block operate B relay.	Relay A remains operated. Meter indicates +24 volts.
26	Remove blocking tool from A relay.	Relay B remains operated. Meter indicates between 10.4 and 15.5 volts.
27	Block operate C relay.	Relay B remains operated. Meter indicates +24 volts.

STEP	ACTION	VERIFICATION
28	Block operate A relay.	Relays B and C remain operated. Meter indicates between 10.4 and 17.4 volts dc.
29	Remove blocking tool from B relay.	Relays A and C remain operated. Meter indicates +24 volts.
30	Remove blocking tool from A relay.	Relay C remains operated. Meter indicates between 10.4 and 15.5 volts dc.
31	Remove blocking tool from C relay.	Meter indicates +24 volts.

Scan Point 02 Test

32	At VOM Set DC VOLTS switch to 3.	
33	At circuit under test— Remove connections designated 2, and make connections designated 3 as shown in Fig. 1.	
34	Block operate A relay.	Meter indicates 1.0 \pm 0.05 volts.
35	Remove blocking tool from A relay.	Meter indicates zero.
36	Block operate B relay.	Meter indicates 1.0 \pm 0.05 volts.
37	Remove blocking tool from B relay.	Meter indicates zero.
38	Block operate C relay.	Meter indicates 1.0 \pm 0.05 volts.
39	Remove blocking tool from C relay.	Meter indicates zero.
40	Remove all connections between circuit under test and VOM.	
41	At the peripheral decoder power panel on miscellaneous trunk frame— Locate power switch of peripheral decoder circuit which controls circuit under test and turn to vertical (off) position.	PWR OFF lamp lighted.
42	At equipment location of peripheral decoder circuit which controls the circuit under test— Replace A794 circuit pack.	
43	At peripheral decoder power panel— Turn peripheral decoder switch to horizontal (on) position.	PWR OFF lamp extinguished.

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STEP	ACTION	VERIFICATION
44	At TRANSMISSION MEASURING CONTROL on TTP— Release TO key.	TO lamp extinguished.
45	At ACCESS TRUNK 1 CONTROL unit on TTP— Depress RLS key.	SUPV lamp extinguished.
46	At telephone set on TTP— Operate release key.	Access trunk 1 lamp extinguished.
47a	If any service circuit or trunk circuit was removed from service during Step 2 of Preparation, restore circuit to service. Type in: M SV:RST:ggg mmm! ggg = TGN of service circuit. mmm = MEMN of service circuit. To restore a trunk to service— Type in: M TK:RST:ggg mmm! ggg = TGN of trunk. mmm = MEMN of trunk.	If system response is NG, refer to the IM-2H200 for explanation of procedure.

B. Level Measurements and Adjustments

- 14 Using 23D TMS—
Connect as shown in Fig. 2.
- 15 At TMS—
Set ADD DBM switch to 0.
- 16 Set INPUT switch to 900.

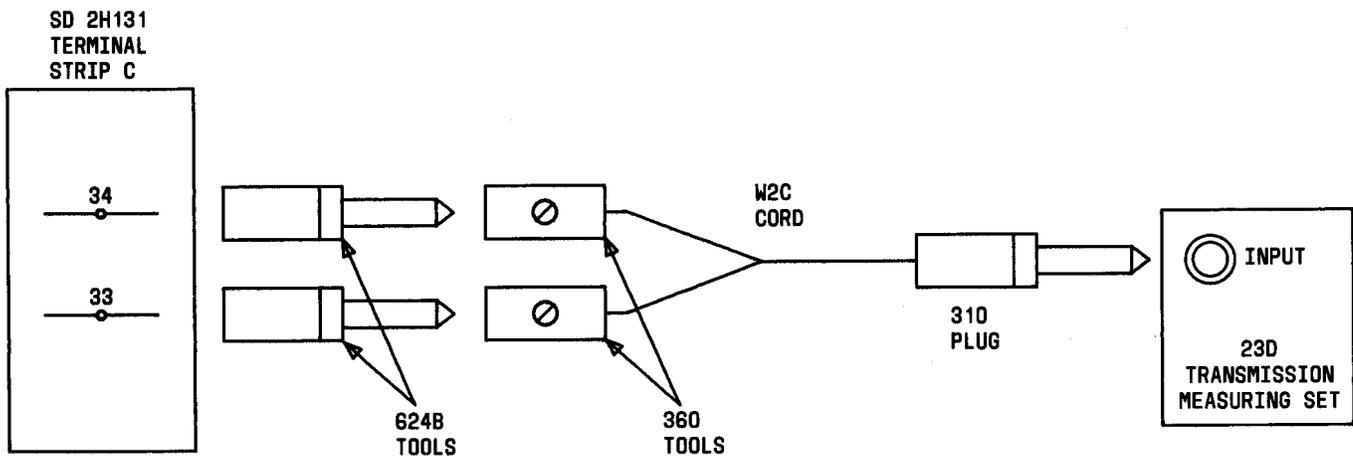


Fig. 2—Test B Connections

STEP	ACTION	VERIFICATION
17	At circuit under test— Connect terminal 23 to 18 of terminal strip C using 1W13A cord.	
18	Connect terminal 41 to 18 of terminal strip C using 1W13A cord.	
19	Connect terminal 7 to 10 of transformer HB using 1W13A cord.	
20	Operate PWR OFF key and SD-2H131 unit.	PWR OFF lamp lighted.
21	Remove circuit pack A157 (position 12), replace with 158A extender card and plug A157 pack into extender.	
22	Release PWR OFF key.	PWR OFF lamp extinguished.
23	Block operated B relay.	At TMS— Meter indicates between -0.2 and +0.2 dBm.
24c	If requirement in Step 23 is not met— Adjust R4 (Fig. 3) for a 0 dBm indication.	

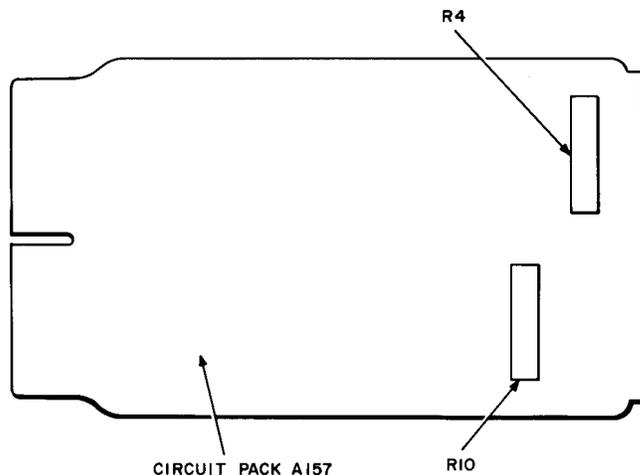


Fig. 3—Location of R4 and R10 on Circuit Pack A157

25	Remove blocking tool from relay B and block operated relay A.	At TMS— Meter indicates between -22.2 and -21.7 dBm.
26d	If requirement in Step 25 is not met— Adjust R4 for an indication between -22.2 and -21.7 dBm without exceeding limits	

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STEP	ACTION	VERIFICATION
	specified in Step 23. Move blocking tool alternately between relays A and B to check.	
27	Remove connection on transformer HB and connect terminal 7 to 10 of transformer LB.	
28	Remove blocking tool from relay A and block operated relay B.	At TMS— Meter indicates between -0.2 and +0.2 dBm.
29e	If requirement in Step 28 is not met— Adjust R10 (Fig. 3) for a 0 dBm indication.	
30	Remove blocking tool from relay B and block operated relay A.	At TMS— Meter indicates between -22.2 and -21.7 dBm.
31f	If requirement in Step 30 is not met— Adjust R10 for an indication between -22.2 and -21.9 without exceeding limits specified in Step 28. Move blocking tool alternately between relays A and B to check.	
32	Remove connection on transformer LB.	
33	Remove blocking tool from relay A and block operated relay C.	At TMS— Meter indicates between -10.3 and -9.7 dBm.
34	Block operated relay A. Leave blocking tool in relay C.	At TMS— Meter indicates between -10.3 and -9.7 dBm.
	Note: If requirements in Steps 33 and 34 are not met, see paragraph 1.05.	
35	Operate PWR OFF key.	PWR OFF lamp lighted.
36	Remove extender and replace with the A157 pack.	
37	Remove circuit pack A158 (position 10), replace with extender and plug A158 pack into extender.	
38	Release PWR OFF key.	PWR OFF lamp extinguished.
39	Connect terminals 7 to 10 of both transformers LB and HB.	
40	Block operated relay B. Leave blocking tool in relays A and C.	At TMS— Meter indicates between -10.3 and -9.7 dBm.
41g	If requirement in Step 40 is not met adjust R4 on circuit pack A158 for a -10.0 dBm indication.	

STEP	ACTION	VERIFICATION
42	Operate PWR OFF key.	PWR OFF lamp lighted.
43	Remove 158A extender and replace with A158 circuit pack.	
44	Release PWR OFF key.	PWR OFF lamp extinguished.
45	Remove cords connecting terminal 7 to 10 of both HB and LB transformers.	
46	Remove blocking tools from relays A, B, and C.	
47	Remove both connecting cords at terminal strip C.	
48	Disconnect all test equipment.	
49	At the peripheral decoder power panel on miscellaneous trunk frame— Locate power switch of peripheral decoder circuit which controls circuit under test and turn to vertical (off) position.	PWR OFF lamp lighted.
50	At equipment location of peripheral decoder circuit which controls the circuit under test— Replace A794 circuit pack.	
51	At peripheral decoder power panel— Turn peripheral decoder switch to horizontal (on) position.	PWR OFF lamp extinguished.
52	At TRANSMISSION MEASURING CONTROL on TTP— Operate TO key to release.	TO lamp extinguished.
53	At ACCESS TRUNK 1 CONTROL on TTP— Depress RLS key.	SUPV lamp extinguished.
54	At telephone set on TTP— Operate release key.	Access trunk 1 lamp extinguished.
55	If any service circuit or trunk circuit was removed from service during Preparation Step 2, restore circuit to service. To restore a service circuit to service— Type in: M SV:RST:ggg mmm! ggg = TGN of service circuit. mmm = MEMN of service circuit. To restore a trunk to service—	If system response in NG, refer to IM-2H200 for explanation of action to take.

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STEP	ACTION	VERIFICATION
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Type in:
M TK:RST:ggg mmm!
ggg = TGN of trunk.
mmm = MEMN of trunk.

C. Frequency Test and Adjustments

transformer, then a trimming capacitor may have to be added. Refer to paragraph 5.05 of CD-2H131-01 for procedure.

4.01 In the following test if the required frequencies cannot be obtained by adjusting the appropriate

STEP	ACTION	VERIFICATION
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14 At 5326A frequency counter—
Connect power cord to ac power supply.

Note: If an equivalent counter is used, condition counter to measure frequency between 500 and 1500 Hz with an accuracy of 0.1 Hz.

15 Turn power on by rotating SAMPLE RATE control clockwise.

16 Set FAST/NORM/HOLD switch to NORM.

17 Set TIME BASE/MULTIPLIER switch to 10s (Black Numbers).

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

19 Set LEVEL controls to MIDRANGE.

20 Set CHK/SEP/COM switch to SEP.

21 Set FUNCTION switch to FREQ A.

22 At circuit under test—
Connect the frequency counter channel A input jack to terminal 4 of the T transformer using a H-P 10008B probe. See Fig. 4.

23 Connect terminal 7 to 10 of transformer HB using a 1W13A cord.

24 Connect terminal 18 to 23 of terminal strip C using a 1W13A cord.

25 Connect terminal 18 to 41 of terminal strip C using a 1W13A cord.

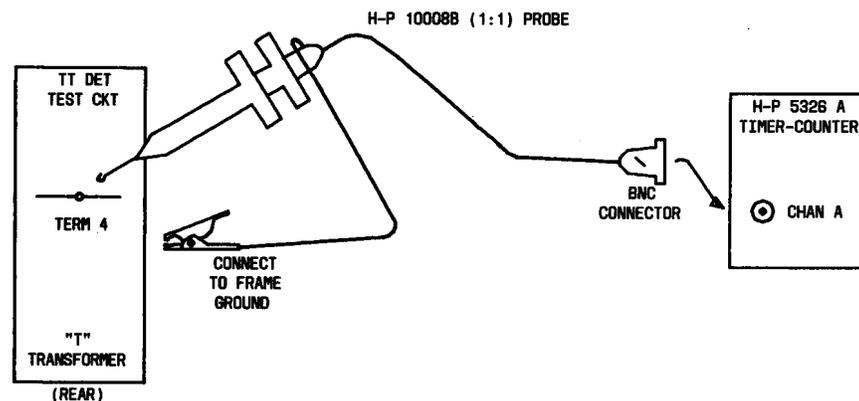


Fig. 4—Test C Connections

STEP	ACTION	VERIFICATION
26	Block operate relay B.	At frequency counter— Counter indicates between 0.6858 and 0.6872 kHz.
27a	If frequency requirement of Step 26 is not met— Adjust transformer LB to obtain a counter indication of 686.5 Hz. <i>Note:</i> Use extreme care inserting the KS-19355 L3 tool in the coil. If necessary, grind the tool slightly to obtain a smooth fit. DO NOT FORCE.	
28	Remove connection from terminal 41 of terminal strip C and connect to terminal 51.	Counter indicates between 0.7577 and 0.7592 kHz.
29b	If frequency requirement of Step 28 is not met— Adjust transformer LB core slightly to bring counter indication within limits specified in Step 28 and operate RESET key on counter. Take several readings to be sure of adjustment. <i>Note:</i> In this step and subsequent steps any adjustment of the transformer core will affect previous adjustments. Generally, little or no adjustment should be required after the initial setting is made (unless a trouble condition exists, in which case, see paragraph 1.05). If it is necessary to make slight frequency corrections, recheck all previous	

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STEP	ACTION	VERIFICATION
	requirements to be sure they remain within specified limits.	
30	Remove connection from pin 51 and connect cord to pin 22 of terminal strip C.	Counter indicates between 0.8384 and 0.8401 kHz.
31	Remove connection from pin 22 and connect cord to pin 32 of terminal strip C.	Counter indicates between 0.9259 and 0.9278 kHz.
32	Remove blocking tool from relay B and block operate relay A.	Counter indicates between 0.9542 and 0.9561 kHz.
33	Remove connection from pin 32 and connect cord to pin 22 of terminal strip C.	Counter indicates between 0.8639 and 0.8656 kHz.
34	Remove connection from pin 22 and connect cord to pin 51 of terminal strip C.	Counter indicates between 0.7808 and 0.7823 kHz.
35	Remove connection from pin 51 and connect cord to pin 41 of terminal strip C.	Counter indicates between 0.7068 and 0.7082 kHz.
36	Remove connection from pins 7 to 10 of transformer HB and connect pins 7 to 10 of LB.	Counter indicates between 1.2259 and 1.2283 kHz.
37c	If requirement of Step 36 is not met— Adjust transformer HB to obtain counter indication of 1227.1 Hz.	
38	Remove connection from pin 41 and connect cord to pin 51 of terminal strip C.	Counter indicates between 1.3547 and 1.3574 kHz.
39d	If requirement in Step 38 is not met— Adjust transformer HB slightly to bring counter indication within limits specified in Step 38. See note accompanying Step 29 and paragraph 1.05.	
40	Remove connection from pin 51 and connect cord to pin 22 of terminal strip C.	Counter indicates between 1.4976 and 1.5006 kHz.
41	Remove connection from pin 22 and connect cord to pin 32 of terminal strip C.	Counter indicates between 1.6558 and 1.6592 kHz.
42	Remove blocking tool from relay A and block operated relay B.	Counter indicates between 1.6068 and 1.6102 kHz.
43	Remove connection from pin 32 and connect cord to pin 22 of terminal strip C.	Counter indicates between 1.4534 and 1.4564 kHz.
44	Remove connection from pin 22 and connect cord to pin 51 of terminal strip C.	Counter indicates between 1.3146 and 1.3173 kHz.

STEP	ACTION	VERIFICATION
45	Remove connection from pin 51 and connect cord to pin 41 of terminal strip C.	Counter indicates between 1.1897 and 1.1921 kHz.
46	Remove connection from pins 41 and 18 of terminal strip C.	
47	Block operate relays A and C. Leave blocking tool in relay B.	
48	Connect terminals 7 to 10 of transformer HB. Leave connection on transformer LB.	Counter indicates between 1.800 and 2.200 kHz.
49	If requirement in Step 48 is not met— Adjust transformer 3F to obtain a frequency indication of 2000 Hz.	
50	Remove all test connections and blocking tools.	
51e	If no more tests are to be made— At the peripheral decoder power panel on miscellaneous trunk frame— Locate power switch of peripheral decoder circuit which controls circuit under test and turn to vertical (off) position.	PWR OFF lamp lighted.
52	At equipment location of peripheral decoder circuit which controls the circuit under test— Replace A794 circuit pack.	
53	At peripheral decoder power panel— Turn peripheral decoder switch to horizontal (on) position.	PWR OFF lamp extinguished.
54	At TRANSMISSION MEASURING CONTROL on TTP— Operate TO key to release.	TO lamp extinguished.
55	At ACCESS TRUNK 1 CONTROL on TTP— Depress RLS key.	SUPV lamp extinguished.
56	At telephone set on TTP— Operate release key.	Access trunk 1 lamp extinguished.
57f	If any service circuit or trunk circuit was removed from service during Preparation Step 2, restore circuit to service— To restore a service circuit to service— Type in: M SV:RST:ggg mmm! ggg = TGN of service circuit. mmm = MEMN of service circuit. To restore a trunk to service—	If system response is NG, refer to IM-2H200 for explanation of action to take.

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STEP	ACTION	VERIFICATION
	Type in: M TK:RST:ggg mmm! ggg = TGN of trunk. mmm = MEMN of trunk.	
D. Delay (DLY) Timer Test and Adjustment		
14	At the Tektronix 465 Oscilloscope— Connect the AC power cord to ac power near circuit under test.	
15	Rotate intensity knob fully counterclockwise.	
16	Set SOURCE switch to CH2.	
17	At VERTICAL MODE, operate CHOP key.	
18	Set TIME/DIV switch to 10 ms.	
19	Set channel 1 VOLTS/DIV switch to 10V.	
20	Set channel 2 VOLTS/DIV switch to 10V.	
21	Pull POWER switch to turn power on.	
22	Connect oscilloscope channel 1 input to pin 21 of circuit pack A8 using Tektronix P606S 10X probe.	
23	Connect oscilloscope channel 2 input to pin 23 of terminal strip C using Tektronix P606S 10X probe.	
24	From previously retained printout, determine central pulse distributor (CPD) enable number for circuit under test.	
25	At maintenance TTY— If PD pack is in the local CPD, type in: M DC:ORD:1 - 0307 xyz 000000! xyz = CPD address. If PD pack is in the supplemental CPD, type in: M DS:ORD:fg h- 0307 xyz 000000! fg = Number of supplemental CPD h = Number of CPD controller xyz = CPD address.	System response: MR DC ORD 01 0 - 0307 00000r eeeeeee System response: MR DS ORD fg h- jkpp uuuuuu vvvvvv Refer to OM-2H200 for explanation of variable fields.
26	If PD pack is in the local CPD, type in: MR DC:ORD 1 - 0307 xyz aaaaa! aaaaa = 21325 when first peripheral decoder	System response: MR DC ORD 01 0 - 0307 00000r eeeeeee

STEP	ACTION	VERIFICATION
	buffer = 0 aaaaa = 21727 when first peripheral decoder buffer = 1 If PD pack is in the supplemental CPD, type in: M DS:ORD:fg h - 0307 xyz aaaaa! fg = Supplementary CPD frame number (01-07) h = Supplementary CPD controller (0-1) xyz = CPD address aaaaa = 21325 when first peripheral decoder buffer = 0 aaaaa = 21727 when first peripheral decoder buffer = 1.	System response: MR DS ORD fg h- jkpp uuuuuu vvvvvv
27	At oscilloscope— Adjust INTENSITY control to obtain legible trace.	
28	Adjust channel 1 VERTICAL POSITION control to place channel 1 trace in top half of CRT screen.	
29	Adjust channel 2 VERTICAL POSITION control to place channel 2 trace in bottom half of CRT screen.	
30	Adjust LEVEL knob until TRIG lamp lights. Adjust HORIZONTAL POSITION control to place beginning of both traces at first graticule on left side of CRT screen.	
31	If waveforms of CRT screen are not the same as shown in Fig. 5: At maintenance TTY— For No. 2 ESS Type in: M SY:CLR! For No. 2B ESS with EF-1 generic Type in: CLR:RPT:STEP! For No. 2B ESS with EF-2 generic Type in: STOP:RPT:STEP! Repeat procedure from Step 14.	See Fig. 5.
32	At oscilloscope— Set TIME/DIV switch to 1 ms.	See Fig. 6. Pulse on channel 1 should lag negative going

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STEP	ACTION	VERIFICATION
	Note: If requirements are met, go to Step 43.	edge of pulse on channel 2 by between 9.5 and 10.5 ms.
33	At peripheral decoder power panel on the miscellaneous trunk frame— Locate power switch of the peripheral decoder which controls test circuit and turn to vertical (off) position.	PWR OFF lamp lighted.
34	Remove A174 circuit pack; replace it with 158A extender and plug A174 circuit pack into 158A extender.	
35	At peripheral decoder power panel— Turn peripheral decoder switch to horizontal (on) position.	PWR OFF lamp extinguished.
36	At maintenance TTY— If PD pack is in the local CPD, type in: M DC:ORD:1 - 0307 xyz 000000! xyz = CPD address. If PD pack is in the supplemental CPD, type in: M DS:ORD:fg h - 0307 xyz 000000! fg = Number of supplemental CPD h = Number of CPD controller xyz = CPD address.	
37	Local CPD, type in: MR DC:ORD 1 - 0307 xyz aaaaa! Supplementary CPD, type in: MR DS:ORD:fg h - 0307 xyz aaaaa! fg h xyz = same as Step 40.	
38	At A174 circuit pack— Adjust potentiometer R3 for 10-ms delay between pulse on channel 1 and pulse on channel 2.	See Fig. 6. Pulse on channel 1 should lag negative going edge of pulse on channel 2 by between 9.5 and 10.5 ms.
39	At peripheral decoder power panel— Turn peripheral decoder power switch to vertical (off) position.	
40	Remove 158A extender from socket and replace with circuit pack A174.	
41	At peripheral decoder power panel— Turn peripheral decoder power switch to horizontal (on) position.	

STEP	ACTION	VERIFICATION
42	Disconnect all test equipment.	
43	At maintenance TTY— For No. 2 ESS Type in: M SY:CLR!	
	For No. 2B ESS with EF-1 generic Type in: CLR:RPT:STEP!	
	For No. 2B ESS with EF-2 generic Type in: STOP:RPT:STEP!	
44	At test and control unit on TTP— Operate locking TO key to release.	TO key lamp extinguished.
45	At access trunk control unit on TTP— Operate RLS 1 key.	SUPV 1 lamp extinguished.
46	At telephone set on TTP— Operate release key.	Access trunk 1 key lamp extinguished.
47a	If any service circuit or trunk circuit was removed from service during Preparation Step 2, restore circuit to service. To restore a service circuit to service— Type in: M SV:RST:ggg mmm! ggg = TGN of service circuit. mmm = MEMN of service circuit. To restore a trunk circuit to service— Type in: M TK:RST:ggg mmm! ggg = TGN of trunk. mmm = MEMN of trunk.	If system response is NG, refer to GM-2H200 for explanation.

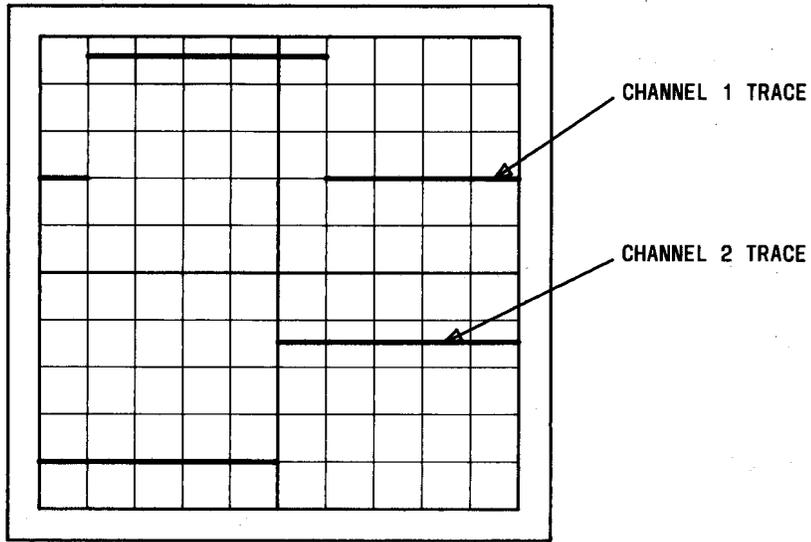


Fig. 5—Waveforms — 10 ms/div

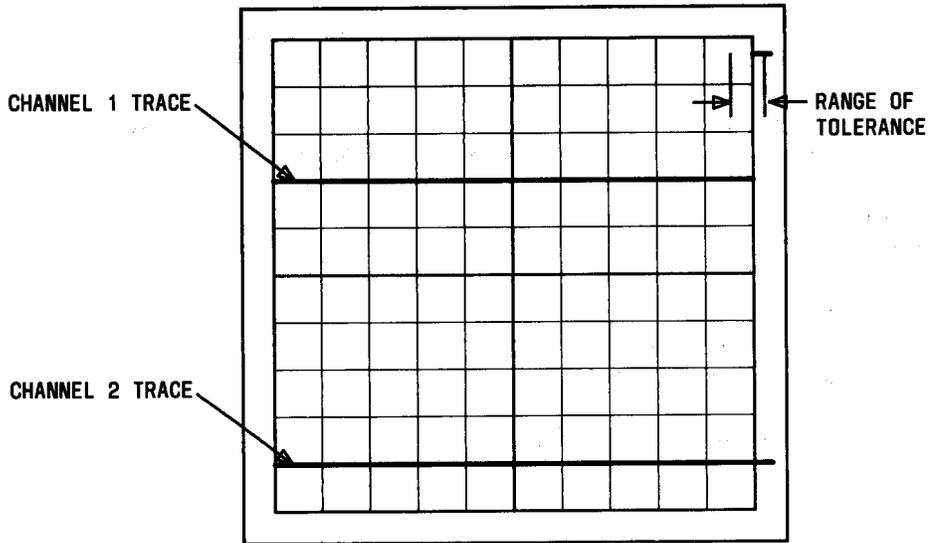


Fig. 6—Waveforms — 1 ms/div