8A AND 8B TONE DETECTORS
(J94008A) (J94008B)
SD-99551-01 TESTS AND ADJUSTMENTS
COMMON SYSTEMS

1. GENERAL

1.01 This section describes methods of making miscellaneous tests and adjustments to the 8A and 8B tone detectors. The 8A tone detector is intended for use with the expanded remote office test lines (ROTL) designed for electromechanical and electronic switching system (ESS) offices. The 8B tone detector is intended for use with the Outgoing Trunk Testing System (OTTS) designed for the No. 4 crossbar office.

1.02 This section is reissued to add the testing and adjustments for circuit packs 6 and 7 that directly replace manufacture discontinued circuit packs 2 and 4. Revision arrows are used to emphasize the more significant changes. This reissue affects the Equipment Test List.

1.03 Before performing the tests and adjustments, the following is assumed:

(a) That a set of replacement circuit packs for List 1 (8B), List 3 (8A)*, and List 2 detectors is available.

(b) That the telephone number of 1000 Hz, 2225 Hz, and call disposition tones (busy, reorder, ringing, etc) test lines is also available.

*List 1 of the 8A tone detector has been rated Manufacture Discontinued and has been replaced by the List 3 which is electrically identical; so whatever applies to List 3 (8A) also applies to existing List 1 (8A).

1.04 The List 1 or List 3** portion of the J94008A and J94008B detector detects 1000 Hz, 2225 Hz, and call disposition tones (dial tone, reorder, busy, audible ring, and voice) signals. It is intended to be used to detect the signals that are received from the far end of a trunk to be tested and causes the expanded ROTL or OTTS to repeat them or their envelopes back to the control location. The List 1 of the tone detector also provides the means for preventing unauthorized use of the capability of ROTL to place calls.

**List 1 of the 8B has twice the amount of circuit packs that comprise List 3 of the 8A (excluding the DC-DC converter).

1.05 The List 2 portion of the J94008A and J94008B detectors detects 1300-Hz signals. It is intended to be used in association with an input port of the expanded ROTL or OTTS to detect commands (recycle, drop-access trunk, and rering) received from a control location.

1.06 The following tests are covered:

LIST 1 OR LIST 3 DETECTOR (8A OR 8B)

PAGE

1.07 The following adjustment procedures are covered.

1.08 ***Lettered Steps:*** A letter a, b, c, etc, added to a 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 and adjustment procedure is shown in Table A.

The details of each item are covered in the paragraph indicated in parentheses.

2.02 Oscillator or signal source capable of 2500 Hz ±15 Hz (600 ohms impedance).

2.03 Volt-ohm-milliammeter (VOM), KS-14510 or equivalent. Any common-type VOM may be used. (Used for verifying open and closed conditions on lead pairs.)

2.04 5A attenuator or equivalent apparatus capable of providing as much as -40 dBm ±2 dB attenuation.

2.05 Oscilloscope or frequency counter (capable of measuring interval) which is capable of measuring the following intervals ▶and frequency:◀

- 4 seconds ±20 ms
- 110 ms ±5 ms
- 600 ms ±10 ms
- 750 ms ±10 ms
- 700 ms ±10 ms
- ▶1000 ±10 Hz.◀

TABLE A

APPARATUS	TESTS				ADJUSTMENTS							
	A	B	C	D	A	B	C	D	E	F	G	H
Oscillator or signal source (2.02)	1	1	1	1								
Volt-ohm-milliameter or equivalent (2.03)	2	2	2	3	1	1	1	1	1	1		
5A Attenuator or equivalent (2.04)	✓	✓	✓	✓								
Oscilloscope or frequency counter (2.05)					1	1	1	1	1	1	1	1
Extender card (2.06)					1	1	1	1	1	1	1	1
Switching or keying means (2.07)	1	1	1	1								
Telephone set or equivalent (2.08)	1	1	1									
Clip lead (2.09)	2	2	2									
Testing cord (2.10)	1	1	1	1	1	1	1	1	1	1		
Connecting clip (2.11)					1	1	1	1	1	1		
Screwdriver (2.12)					✓	✓	✓	✓	✓	✓	✓	✓
1.96 μf capacitors (2.13)			2	2								

✓As required

2.06 Extender circuit pack ED-2C160( ) used in adjustment procedures for obtaining access to single-shot circuit packs for potentiometer adjustments as required.

2.07 Switching means or keying means capable of opening and closing the circuit between the signal supply and the tone detector for the intervals prescribed in the tests.

2.08 A telephone set or equivalent to be used to dial the test lines needed for testing the List 1 detector.

2.09 Two clip leads or equivalent to be used to connect the T and R of the telephone set (2.08) to T( ) and R( ) of the List 1 or List 3 detector. The distance between the telephone set and the tone detector determines how long these clip leads should be.

2.10 Testing cord, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord), used for shorting purposes; therefore, a longer cord or equivalent means may be used.

2.11 KS-6278 connector clip or equivalent used in conjunction with 1W13A cord for connecting to ground straps or posts.

2.12 3-inch C screwdriver or means for adjusting the potentiometers, as required, on the single-shot circuit packs.

2.13 Two 1.96 μf capacitors to be used to block dc voltage.

3. METHOD

STEP	ACTION	VERIFICATION
	LIST 1 OR LIST 3 DETECTOR (8A OR 8B)	
	A. 1000-Hz Tone Detection	
1	Remove ROTL or OTTS from service (make busy).	
2	After removing ROTL or OTTS from service and using KS-14510 VOM or equivalent, check that no closure remains on ON( ), ONG( ) leads at terminals 16 and 11 on CP2 ▶or CP6.◀ (For position number, see table in Fig. 1.) With meter on dc 12-volt scale, connect for voltage-no voltage indication across ON( ), ONG( ) leads.	Meter connected across ON( ), ONG( ) leads indicates between 3 and 5 volts. ***Note:*** If meter indicates approximately 0 volts, verify that ROTL or OTTS is not providing closure. If not, check wiring for a short on ON( ), ONG( ) leads. If there is no short, replace CP2 ▶or CP6.◀ To further investigate the problem if it continues, use of schematic diagrams and circuit descriptions is required.
3	Connect telephone set to an office tip and ring. (See Fig. 1.)	
4	Using pair of clip leads or similar means of connection, connect tip and ring of the telephone set to the T( ) and R( ) leads at terminals 19 and 20, respectively, on CP3.	
5	Using KS-14510 VOM or equivalent, connect for closure-no closure indication across MW( ), MWG( ) leads at terminals 13 and 8, respectively, on CP2 ▶or CP6.◀ (For position number, see	

STEP	ACTION	VERIFICATION
	table in Fig. 1 and see Table B for range setting on the VOM.)	
6	Using KS-14510 VOM or equivalent, connect for closure-no closure indication across CT( ), CTG( ) leads at terminals 2 and 1, respectively, on CP2 ▸or CP6.◂ (For position number, see table in Fig. 1 and see Table B for range setting on the VOM.)	
7	Dial 1000-Hz test line. Using 1W13A cord or similar means of connection, connect ON( ), ONG( ) leads together at terminals 16 and 11, respectively, on CP2 ▸or CP6.◂ (For position number, see Fig. 1.)	While observing meters connected to MW( ), MWG( ) leads and CT( ), CTG( ) leads, listen to incoming signal. (See Fig. 1A.) Meter connected across MW( ), MWG( ) leads at terminals 8 and 13 activated for approximately 600 ms, then released. Meter connected across CT( ), CTG( ) leads at terminals 1 and 2 activated when meter connected across MW( ), MWG( ) leads released. Now place telephone set on hook. ***Note:*** Meter connected across CT( ), CTG( ) leads should stay activated until the connection across ON( ), ONG( ) leads is removed (Step 8). (For position number, see table in Fig. 1.)

Trouble Isolation

If closure-no closure indications of meter do not occur in the described manner (Fig. 1A), disconnect connection across ON( ), ONG( ) leads (at terminals 16 and 11 on CP2 ▸or CP6◂) and replace CP2 ▸or CP6◂ (for position number, see table in Fig. 1); then repeat Step 7. If problem persists after replacing CP2 ▸or CP6,◂ disconnect ON( ), ONG( ) leads and replace CP3; repeat Step 7. Do the same for FL1, FL2, and CP1 (pos 01) if problem remains. (Always disconnect ON( ), ONG( ) leads, replace circuit pack, and then perform Step 7.)

If problem persists after replacing all circuit packs, check backplane wiring. If wiring is found in good condition, it can be assumed that fault is in ROTL or OTTS circuitry.

STEP	ACTION	VERIFICATION
8	Remove connection across ON( ), ONG( ) leads at terminals 16 and 11 on CP2 ▸or CP6.◂ (For position number, see table in Fig. 1.)	Meters connected across CT( ), CTG( ) leads at terminals 2 and 1 on CP2 ▸or CP6◂ released. (See Fig. 1A.)

Trouble Isolation

If meter across CT( ), CTG( ) leads does not release, replace CP2 ▸or CP6◂ and perform Steps 7 and 8. If problem remains, replace CP3 and perform Steps 7 and 8. If problem still remains, check backplane wiring. If wiring is found in good condition, it can be assumed that fault is in ROTL or OTTS circuitry.

STEP	ACTION	VERIFICATION
9	With connection removed across ON( ), ONG( ) leads at terminals 16 and 11 on CP2 ▸or CP6,◂ repeat Step 7, but follow verification for this step. (For position number, see Fig. 1.) ***Note:*** To perform Step 9, ignore in Step 7 the part to connect ON( ), ONG( ) leads together.	Meters connected across MW( ), MWG( ) leads at terminals 13 and 8 and CT( ), CTG( ) leads at terminals 2 and 1 do not activate.

Trouble Isolation

If meters connected across MW( ), MWG( ) leads and CT( ), CTG( ) leads activate while performing Step 9, replace following circuit packs one at a time: CP2 ▸or CP6◂ and CP3. After replacing each circuit pack, repeat Step 9. If problem persists, check backplane wiring and then repeat Step 2. If troubles persist, replacement circuit packs and/or backplane wiring may be at fault.

STEP	ACTION	VERIFICATION
10a	If no further tests are to be performed— Remove all test cords and equipment; restore all circuits to normal.	

B. 2225-Hz Tone Detection (See Fig. 2.)

1	Remove ROTL or OTTS from service (make busy).	
2	After removing the ROTL or OTTS from service and using KS-14510 VOM or equivalent, check that no closure remains on ON( ), ONG( ) leads at terminals 16 and 11 on CP2 ▸or CP6.◂ (For position number, see Fig. 1.) With meter on dc 12-volt scale, connect for voltage-no voltage indication across ON( ), ONG( ) leads.	Meter connected across ON( ), ONG( ) leads should read between 3 and 5 volts. ***Note:*** If meter reads approximately 0 volts, verify that the ROTL or the OTTS is not providing a closure. If it is not, check wiring for a short on ON( ), ONG( ) leads. If there is no short, replace CP2 ▸or CP6.◂ To further investigate the problem if it continues, use of schematic diagrams and circuit descriptions is required.
3	Connect telephone set to tip and ring of an office line. (See Fig. 2.)	
4	Using pair of clip leads or similar means of connection, connect tip and ring of telephone set to T( ) and R( ) leads at terminals 19 and 20, respectively, on CP3. (See Fig. 2.)	
5	Using KS-14510 VOM or equivalent, connect for closure-no closure indication across TPT( ), TPTG( ) leads at terminals 4 and 3, respectively, on CP2 ▸or CP6.◂ (For position number, see	

STEP	ACTION	VERIFICATION
	table in Fig. 1 and Table B for range setting of the VOM.)	
6	Using KS-14510 VOM or equivalent, connect for closure-no closure indication across CT( ), CTG( ) leads at terminals 2 and 1, respectively, on CP2 ▸or CP6.◂ (For position number, see table in Fig. 1 and Table B for range setting of the VOM.)	
7	Dial 2225-Hz test line. Using 1W13A cord or similar means of connecting, connect ON( ), ONG( ) leads together at terminals 16 and 11, respectively, on CP2 ▸or CP6.◂ (See Fig. 2.) Make ON( ), ONG( ) connection as soon as possible after dialing and before receiving 2225-Hz burst.	While observing meters connected across TPT( ), TPTG( ) leads and CT( ), CTG( ) leads, listen to incoming signal. (See Fig. 2A.) Meter connected across TPT( ), TPTG( ) leads at terminals 4 and 3 activated as long as 2225-Hz signal is present on T( ) and R( ), then released. Meter connected across CT( ), CTG( ) leads at terminals 2 and 1 activated when meter connected across TPT( ), TPTG( ) leads released. Now place telephone set on hook. ***Note:*** If 2225-Hz signal is present across T( ) and R( ) of the List 1 or List 3 detector for more than 2 seconds, place phone on hook. After this is done, the CT( ), CTG( ) leads will be activated as explained. (See Fig. 2A.) Meter connected across CT( ), CTG( ) leads should stay activated until connection across ON( ), ONG( ) leads at terminals 16 and 11 on CP3 is removed (Step 8).

Trouble Isolation

If closure-no closure indications of meter do not occur in described manner (Fig. 2A), disconnect connection across ON( ), ONG( ) leads at terminals 16 and 11 on CP2 ▸or CP6◂ and replace CP2 ▸or CP6;◂ then repeat Step 7.

If problem persists after replacing CP2 ▸or CP6,◂ disconnect ON( ), ONG( ) leads and replace CP3; repeat Step 7. If problem persists, repeat the same procedure for FL1, FL2, and CP1 (pos 01). (Always disconnect ON( ), ONG( ) leads, replace circuit pack, and then perform Step 7.) If problem remains after replacing all circuit packs, check backplane wiring. If wiring is found in good condition, it can be assumed that fault is in ROTL or OTTS circuitry. (For position numbers, see table in Fig. 1.)

STEP	ACTION	VERIFICATION
8	Remove connection across ON( ), ONG( ) leads at terminals 16 and 11 on CP2 ▸or CP6.◂ (For position number, see table in Fig. 1.)	Meter connected across CT( ), CTG( ) leads at terminals 2 and 1 on CP2 ▸or CP6◂ released. (See Fig. 2A.)

Trouble Isolation

If meter across CT( ), CTG( ) leads does not release, replace CP2 ▶or CP6◀ and repeat Steps 7 and 8. If problem remains, replace CP3, and repeat Steps 7 and 8.

If problem still remains, check backplane wiring. If wiring is found in good condition, it can be assumed that fault is in ROTL or OTTS circuitry.

STEP	ACTION	VERIFICATION
9	With connection removed across ON( ), ONG( ) leads at terminals 16 and 11 on CP2 ▶or CP6,◀ repeat Step 7, but follow verification for this step. ***Note:*** To perform Step 9, ignore in Step 7 the part to connect ON( ), ONG( ) leads together.	Meter connected across TPT( ), TPTG( ) leads at terminals 4 and 3 and CT( ), CTG( ) leads at terminals 2 and 1 on CP2 ▶or CP6◀ do not activate. (For position number, see table in Fig. 1.)

Trouble Isolation

If meters connected across TPT( ), TPTG( ) leads and CT( ), CTG( ) leads activate while performing Step 9, replace following circuit packs one at a time: CP2 ▶or CP6◀ and CP3. After replacing each circuit pack, repeat Step 9.

If problem persists, check backplane wiring, and then repeat Step 2. If problem still persists, replacement circuit packs and/or backplane wiring may be at fault.

STEP	ACTION	VERIFICATION
10a	If no further tests are to be performed— Remove all test cords and equipment; restore all circuits to normal.	

C. Call Disposition Tones Detection (See Fig. 3.)

1	Remove ROTL or OTTS from service (make busy).	
2	After removing ROTL or OTTS from service and using KS-14510 VOM or equivalent, check that no closure remains on ON( ), ONG( ) leads at terminals 16 and 11 on CP2 ▶or CP6.◀ With meter on dc 12-volt scale, connect for voltage-no voltage indication across ON( ), ONG( ) leads. (For position number, see table in Fig. 1.)	Meter connected across ON( ), ONG( ) leads should read between 3 and 5 volts. ***Note:*** If meter reads approximately 0 volts, verify that ROTL or OTTS is not providing a closure. If it is not, check wiring for a short on ON( ), ONG( ) leads. If there is no short, replce CP2 ▶or CP6.◀ To further investigate the problem if it continues, use of schematic diagrams and circuit descriptions is required.
3	Connect telephone set to an office tip and ring. (See Fig. 3.)	

STEP	ACTION	VERIFICATION
4	Using a pair of clip leads or similar means of connection, connect tip and ring of telephone set to T( ) and R( ) leads at terminals 19 and 20, respectively, on CP3 of List 1 or List 3 detector. (See Fig. 3.)	
5	Using KS-14510 VOM or equivalent, connect for closure-no closure indication across LT( ), LTG( ) leads at terminals 15 and 6, respectively, on CP2 ▶or CP6.◀ (See Table B for range setting, and for position number, see table in Fig. 1.)	
6	Using 1W13A cord or similar means of connections, connect ON( ), ONG( ) leads together at terminals 16 and 11, respectively, on CP2 ▶or CP6.◀ (See Fig. 3).	
7	Place telephone set off hook and listen for dial tone signal. (See Fig. 3A.)	Meter connected across LT( ), LTG( ) leads at terminals 15 and 6 on CP2 ▶or CP6◀ activated for as long as the telephone set is off hook and the signal is present on leads T( ) and R( ). Meter connected across LT( ), LTG( ) released when telephone set is placed on hook.

Trouble Isolation

If closure-no closure indications of meter do not occur in described manner (Fig. 3A), remove connections across ON( ), ONG( ) leads and replace CP2 ▶or CP6;◀ then repeat Steps 6 and 7.

If problem persists after replacing CP2 ▶or CP6,◀ disconnect ON( ), ONG( ) leads, and this time replace CP3; repeat Steps 6 and 7. If problem remains, repeat the same procedure for FL1, FL2, and CP1 (pos 1). (Always disconnect ON( ), ONG( ) leads, replace circuit pack, and perform Steps 6 and 7.)

If problem remains after replacing all circuit packs, check backplane wiring. If wiring is found in good condition, it can be assumed that fault is in ROTL or OTTS circuitry.

STEP	ACTION	VERIFICATION
8	Remove connection across ON( ), ONG( ) leads at terminals 16 and 11 on CP2 ▶or CP6.◀	
9	With connection removed across ON( ), ONG( ) leads at terminals 16 and 11 on CP2 ▶or CP6,◀ repeat Step 7, but follow verification under this step. (For position number, see table in Fig. 1.)	Meter connected across LT( ), LTG( ) leads at terminals 15 and 6 on CP2 ▶or CP6◀ not activated.

Trouble Isolation

If meter connected across LT( ), LTG( ) leads activates while performing Step 9, replace following circuit packs one by one: CP2 ▶or CP6◀ and CP3. After replacing each circuit pack, repeat Step 9.

If problem persists check backplane wiring and then perform Step 2. If problem still persists, replacement circuit packs and/or backplane wiring may be at fault.

STEP	ACTION	VERIFICATION
10	Using telephone set, dial test line that provides busy tones.	
11	Connect ON( ), ONG( ) leads together at terminals 16 and 11, respectively, on CP2 ▶or CP6.◀ (See Fig. 3.)	While observing meter connected across LT( ), LTG( ) leads, listen to incoming signal. (See Fig. 3B.) Meter connected across LT( ), LTG( ) leads at terminals 15 and 6 activated every time busy burst is present. This meter should activate about four times within 4 seconds and then stop. (See Fig. 3B.) This is approximately 4 seconds after first busy burst started. (See Fig. 3B.) Place telephone set on hook.

Trouble Isolation

If meter connected across LT( ), LTG( ) leads is activated five or more times (five or more complete busy bursts) or only one, two, or three times (one, two, or three busy bursts), perform A—Timer (4 Seconds) Single-Shot under Part 4; ADJUSTMENT PROCEDURES ▶if CP2 is used; if CP6 is used, perform G-1000-Hz OSCILLATOR ADJUSTMENT.◀

If problem persists after performing adjustment, remove connection across ON( ), ONG( ) leads and replace CP2 ▶or CP6;◀ then repeat Steps 10 and 11. (For position number, see table in Fig. 1.)◀

If problem persists after replacing CP2 ▶or CP6,◀ disconnect ON( ), ONG( ) leads and replace CP3; repeat Steps 10 and 11. If problem remains, repeat the same procedure for FL1, FL2, and CP1 (pos 01). (Always disconnect ON( ), ONG( ) leads, replace circuit pack, and then perform Steps 10 and 11.)

If problem is not cleared after replacing all circuit packs, check backplane wiring. After this, if problem remains and backplane wiring is in good condition, refer to schematic diagrams and circuit descriptions for further checks.

If closure-no closure indications of meter do not occur at all, or one does, but not the other, remove circuit packs CP2 ▶or CP6,◀ CP3, FL1, FL2, and CP1, as previously described, and repeat Steps 10 and 11.

If problem remains after replacing all circuit packs, check backplane wiring. If wiring is found in good condition, it can be assumed that fault is in ROTL or OTTS circuitry.

STEP	ACTION	VERIFICATION
12	Using telephone set, dial test line that provides reorder tones (fast busy).	

STEP	ACTION	VERIFICATION
13	Connect ON( ), ONG( ) leads together at terminals 16 and 11, respectively, on CP2 ▸or CP6.◂ (See Fig. 3.)	While observing meter connected across LT( ), LTG( ) leads, listen to incoming signal. (See Fig. 3C.) Meter connected across LT( ), LTG( ) leads at terminals 15 and 6 on CP2 ▸or CP6◂ activated every time reorder burst present. This meter should activate about eight times within 4 seconds and then stop. (See Fig. 3C.) Place telephone set on hook.

Trouble Isolation

If meter connected across LT( ), LTG( ) leads is activated less than seven times (seven complete reorder bursts) or over nine times (nine or more complete reorder bursts), perform A—Timer (4 Seconds) Single-Shot under Part 4, ADJUSTMENT PROCEDURES ▸if CP2 is used; if CP6 is used perform G-1000-Hz OSCILLATOR ADJUSTMENT.◂

If problem persists after performing adjustment, remove connection across ON( ), ONG( ) leads and replace CP2 ▸or CP6;◂ then repeat Steps 12 and 13.

If problem remains after replacing CP2 ▸or CP6,◂ disconnect ON( ), ONG( ) leads and replace CP3; repeat Steps 12 and 13. If problem remains, repeat the same procedure for FL1, FL2, and CP1 (pos 01). (Always disconnect ON( ), ONG( ) leads, replace circuit pack, and then perform Steps 12 and 13.)

If problem persists after replacing all circuit packs, check backplane wiring. After this, if problem remains and backplane wiring is in good condition, refer to schematic diagrams and circuit descriptions for further checks.

If closure-no closure indications of meter do not occur at all, or one does, but not the other, remove circuit packs CP2 ▸or CP6,◂ CP3, FL1, FL2, and CP1, as previously described, and repeat Steps 12 and 13. (For position number, see table in Fig. 1.)

If problem remains after replacing all circuit packs, check backplane wiring. If wiring is found in good condition, it can be assumed that fault is in ROTL or OTTS circuitry.

STEP	ACTION	VERIFICATION
14	Using telephone set, dial test line that provides audible ringing tones or call another telephone number and allow to ring about 20 times.	
15	Connect ON( ), ONG( ) leads together at terminals 16 and 11, respectively, on CP2 ▸or CP6.◂ (See Fig. 3.)	While observing meter connected across LT( ), LTG( ) leads, listen to incoming signal. (See Fig. 3D.) Meter connected across LT( ), LTG( ) leads at terminals 15 and 6 on CP2 ▸or CP6◂ activated every time that audible ring burst is present. This meter should activate 15 times and then stop. (See Fig. 3D.) Place telephone set on hook.

Trouble Isolation

If meter connected across LT( ), LTG( ) leads is activated only ***once*** (about one audible ring burst) perform A—Timer (4 Seconds) Single-Shot under Part 4, ADJUSTMENT PROCEDURES ▶if CP2 is used; if CP6 is used perform G-1000-Hz OSCILLATOR ADJUSTMENT.◀

If problem persists after performing adjustment, remove connection across ON( ), ONG( ) leads and replace CP2 ▶or CP6;◀ then repeat Steps 14 and 15.

If problem remains after replacing CP2 ▶or CP6,◀ disconnect ON( ), ONG( ) leads and replace CP3; repeat Steps 14 and 15. If problem remains repeat the same procedure for FL1, FL2, and CP1 (pos 01). (Always disconnect ON( ), ONG( ) leads, replace circuit pack, and then perform Steps 14 and 15.)

If problem persists after replacing all circuit packs, check backplane wiring.

After this, if problem remains and backplane wiring is in good condition, refer to schematic diagrams and circuit descriptions for further checks.

If closure-no closure indications of meter do not occur at all, or one does, but not the other, or more or less than 15 closures occur, remove circuit packs CP2 ▶or CP6,◀ CP3, FL1, FL2, and CP1, as previously described, and perform Steps 14 and 15.

If problem remains after replacing all circuit packs, check backplane wiring. If wiring is found in good condition, it can be assumed that fault is in ROTL or OTTS circuitry.

STEP	ACTION	VERIFICATION
16a	If additional set of circuit packs that comprise List 1 for the 8B tone detector is to be tested—Repeat Tests A, B, and C.	
17b	If no further tests are to be performed—Remove all test cords and equipment; restore all circuits to normal.	

LIST 2 DETECTOR (8A OR 8B)

D. 1300-Hz Tone Detection (See Fig. 4.)

1	Remove ROTL or OTTS from service (make busy).	
2	After removing ROTL or OTTS from service and using KS-14510 VOM or equivalent, check that no closure remains on RSET( ), RSETG( ) leads at terminals 14 and 11, respectively, on CP4 ▶or CP7.◀ (For position number, see table in Fig. 4.)	
3	Using an oscillator or any signal source with 600 ohms output impedance and capable of providing 1300 Hz ±15 Hz, connect output of oscillator through two blocking capacitors (C1 and C2, 1.96 μf each) and switching means	

STEP	ACTION	VERIFICATION
	to RT( ), RR( ) leads at terminals 20 and 19 on CP4 ▸or CP7◂ (for position number, see Fig. 4) to provide 1300 Hz (±15 Hz) at -20 dBm (±5 dB). (See Fig. 4.)	
	Note: If a level of -25 dBm is not obtainable from signal source used, a 5A attenuator or equivalent may be used in conjunction with signal source to obtain desired level (-20 dBm ±5 dB). The signal may need to be as high as -15 dBm before tone detector responds.	
4	Using KS-14510 VOM or equivalent (see Table B for range setting) connect for closure-no closure indication across RCY( ), RCYG( ) leads at terminals 2 and 1, respectively, on CP4 ▸or CP7.◂ (For position number, see Fig. 4.)	
5	Using KS-14510 VOM or equivalent (see Table B for range setting), connect for closure-no closure indication across DAT( ), DATG( ) leads at terminals 4 and 3, respectively, on CP4 ▸or CP7.◂ (For position number, see Fig. 4.)	
6	Using KS-14510 VOM or equivalent (see Table B for range setting), connect for closure-no closure indication across RRING( ), RRINGG( ) leads at terminals 7 and 6, respectively, on CP4 ▸or CP7.◂ (For position number, see Fig. 4.)	
7	Using 1W13A cord or similar means of connection, connect RSET( ), RSETG( ) leads together at terminals 14 and 11, respectively, on CP4 ▸or CP7.◂ (For position number, see Fig. 4.)	
8	While observing meters connected to RCY( ), RCYG( ) leads, DAT( ), DATG( ) leads, and RRING( ), RRINGG( ) leads, momentarily operate switch S1 to on position for approximately 1.1 seconds. (See Fig. 4A.) ***Note:*** To expedite means of establishing connection of switch S1 to on position for approximately 1.1 seconds, the following timing method could be used. Operate switch S1 and time by saying aloud, "ONE THOUSAND ONE"; then deactivate switch S1. This timing process should be repeated, if necessary, but	Meter connected across RRING( ), RRINGG( ) leads at terminals 7 and 6 on CP4 ▸or CP7◂ (for position number, see Fig. 4) activated for time that switch S1 operated. Meter released upon release of switch S1. (See Fig. 4A.) When meter connected across RRING( ), RRINGG( ) leads released, meter connected across RCY( ), RCYG( ) leads at terminals 2 and 1 on CP4 ▸or CP7◂ (for position number, see Fig. 4) activated. Meter connected across DAT( ), DATG( ) leads at terminals 4 and 3 on CP4 ▸or CP7◂ (for position number, see Fig. 4) does not activate.

STEP	ACTION	VERIFICATION
	with more or less speed in order to obtain proper verification. (See Fig. 4A.)	***Note:*** Meter connected across RCY( ), RCYG( ) leads remains activated until connection across RSET( ), RSETG( ) leads is removed (Step 8).

Trouble Isolation

If closure-no closure indications of meter do not occur in described manner (Fig. 4A), remove connection across RSET( ), RSETG( ) leads and replace CP4 ◗or CP7◖ (for position number, see Fig. 4); then repeat Steps 6 and 7.

If problem persists after the replacing CP4 ◗or CP7,◖ disconnect RSET( ), RSETG( ) leads and then replace CP5 (for position number, see Fig. 4); repeat Steps 6 and 7. If problem remains, repeat the same procedure for FL3 (for position number, see Fig. 4) and CP1 (pos 01). (Always disconnect RSET( ), RSETG( ), replace circuit pack, and perform Steps 6 and 7.)

If problem remains after replacing all circuit packs, check backplane wiring. If wiring is found in good condition, it can be assumed that fault is in ROTL or OTTS circuitry.

STEP	ACTION	VERIFICATION
9	Remove connection across RSET( ), RSETG( ) leads at terminals 14 and 11 on CP4 ◗or CP7.◖ (For position number, see Fig. 4.)	Meter connected across RCY( ), RCYG( ) leads at terminals 2 and 1 on CP4 ◗or CP7◖ (for position number, see Fig. 4) released. (See Fig. 4A.)

Trouble Isolation

If meter across RCY( ), RCYG( ) leads does not release, replace CP4 ◗CP7◖ and repeat Steps 6, 7, and 8.

If problem remains, check backplane wiring. If found in good condition, it can be assumed that fault is in ROTL or OTTS circuitry.

STEP	ACTION	VERIFICATION
10	With connection removed across RSET( ), RSETG( ) leads at terminals 14 and 11 on CP4 ◗or CP7◖ (for position number, see Fig. 4), perform Step 7, but follow verification under this step.	Meters connected across RRING( ), RRINGG( ) leads at terminals 7 and 6 on CP4 ◗or CP7◖ (for position number, see Fig. 4) and RCY( ), RCYG( ) leads at terminals 2 and 1 on CP4 ◗or CP7◖ (for position number, see Fig. 4) do not activate.

Trouble Isolation

If meters connected across RRING( ), RRINGG( ) leads and RCY( ), RCYG( ) leads activate while performing Step 9, replace following circuit packs; CP4 ◗or CP7◖ and CP5. After replacing each circuit pack, repeat Step 9.

If problem persists, check backplane wiring. If found in good condition, perform Step 2 of Test D (1300-Hz detection). If trouble persists, replacement circuit packs and/or backplane wiring may be at fault.

STEP	ACTION	VERIFICATION
11	Connect RSET( ), RSETG( ) leads together at terminals 14 and 11, respectively, on CP4 ▸or CP7.◂ (For position number, see Fig. 4.)	
12	While observing meters connected to RCY( ), RCYG( ) leads, DAT( ), DATG( ) leads, and RRING( ), RRINGG( ) leads, momentarily operate switch S1 to on position for approximately 2.1 seconds. (See Fig. 4B.) ***Note:*** To expedite means of establishing connection of switch S1 to on position for approximately 2.1 seconds, the following timing method could be used. Operate switch S1 and time by saying aloud, "ONE THOUSAND ONE, ONE THOUSAND TWO"; deactivate switch S1. This timing process should be repeated, if necessary, but with more or less speed in order to obtain proper verification. (See Fig. 4B.)	Meter connected across RRING( ), RRINGG( ) leads at terminals 7 and 6 on CP4 ▸or CP7◂ (for position number, see Fig. 4) activated for time that switch S1 is operated. Meter released upon release of switch S1. (See Fig. 4B.) When meter connected across RRING( ), RRINGG( ) leads released, meter connected across DAT( ), DATG( ) leads at terminals 4 and 3 on CP4 ▸or CP7◂ (for position number, see Fig. 4) activated. Meter connected across RCY( ), RCYG( ) leads at terminals 2 and 1 on CP4 ▸or CP7◂ (for position number, see Fig. 4) does not activate. ***Note:*** Meter connected across DAT( ), DATG( ) leads remains activated until connection across RSET( ), RSETG( ) leads is removed (Step 13).

Trouble Isolation

If closure-no closure indications of meter do not occur in described manner (Fig. 4B), remove connection across RSET( ), RSETG( ) leads and replace CP4 ▸or CP7◂ (for position number, see Fig. 4); then repeat Steps 10 and 11.

If problem persists after replacing CP4 ▸or CP7;◂ disconnect RSET( ), RSETG( ) leads and then replace CP5 (for position number, see Fig. 4); repeat Steps 10 and 11. If problem remains, repeat the same procedure for FL3 (for position number, see Fig. 4) and CP1 (pos 01). (Always disconnect RSET( ), RSETG( ), replace circuit pack, and perform Steps 10 and 11.)

If problem remains after replacing all circuit packs, check backplane wiring. If wiring found in good condition, it can be assumed fault is in ROTL or OTTS circuitry.

STEP	ACTION	VERIFICATION
13	Remove connection across RSET( ), RSETG( ) leads at terminals 14 and 11 on CP4 ▸or CP7.◂ (For position number, see Fig. 4).	Meter connected across DAT( ), DATG( ) leads at terminals 4 and 3 on CP4 ▸or CP7◂ (for position number, see Fig. 4) released. (See Fig. 4B.)

Trouble Isolation

If meter across DAT( ), DATG( ) leads does not release, replace CP4 ▸or CP7,◂ and perform Steps 10, 11, and 12.

If problem remains, check backplane wiring. If found in good condition, it can be assumed that fault is in ROTL or OTTS circuitry.

STEP	ACTION	VERIFICATION
14	With connection removed across RSET( ), RSETG( ) leads at terminals 14 and 11 on CP4 ▶or CP7◀ (for position number, see Fig. 4), perform Step 11, but follow verification under this step.	Meters connected across RRING( ), RRINGG( ) leads at terminals 7 and 6 on CP4 ▶or CP7◀ (for position number, see Fig. 4) and DAT( ), DATG( ) leads at terminals 4 and 3 on CP4 ▶or CP7◀ (for position number, see Fig. 4) do not activate.

Trouble Isolation

If meters connected across RRING( ), RRINGG( ) leads and DAT( ), DATG( ) leads activate while performing Step 14, replace following circuit packs: CP4 ▶or CP7◀ and CP5. After replacing each circuit pack, repeat Step 14.

If problem persists, check backplane wiring. If found in good condition, perform Step 2 of Test D (1300-Hz Detection). If trouble persists, replacement circuit packs and/or backplane wiring may be at fault.

STEP	ACTION	VERIFICATION
15a	If additional List 2 detectors are to be tested, perform Steps 1 through 14.	
16b	If no further tests are to be performed— Remove all test cords and equipment; restore all circuits to normal.	

4. ADJUSTMENT PROCEDURES

4.01 ***These adjustments are to be performed only if List 1 (8B) or List 3 (8A) and/or List 2 are inoperative but not on a routine basis.***

4.02 If any of these adjustments cannot be performed, replace CP2 ▶or CP6,◀ CP3, FL1, FL2, and CP1 and repeat adjustments after every change. If problem persists, check backplane wiring.

ADJUSTMENT ON CP2 [LIST 1 (8B) OR LIST 3 (8A)] ▶(MANUFACTURE DISCONTINUED)◀

STEP	ACTION	VERIFICATION
A. Timer (4 Seconds) Single-Shot		
1	Remove ROTL or OTTS from service.	
2	Using extender circuit pack, remove CP2 from pos( ); attach to extender circuit pack; and replace in position. ***Note:*** The position of CP2 depends upon the detector being checked (8A or 8B). (For position number, see table in Fig. 1.)	
3	At pos( ), CP2 of tone detector— Using 1W13A cord or a means of connection, connect ON( ), ONG( ) leads together at terminals 16 and 11, respectively.	

STEP	ACTION	VERIFICATION
4	Remove and reconnect ON( ), ONG( ) leads at terminals 16 and 11, respectively.	
5	Using an oscilloscope (or frequency counter that can measure intervals), connect probe to TP1 of CP2 at pos( ) and a ground between oscilloscope and tone detector.	
6	Set oscilloscope or frequency counter to be triggered by a positive going pulse (0 volts to +5 volts).	
7	Using a means of connection, momentarily connect TP11 of CP2 at pos( ) to ground. ***Note:*** ***Momentarily*** in this case means to apply a ground to the test point until single-shot has triggered and then to remove it.	Single-shot triggers causing TP1 to go to about +5 volts and remain for 4 seconds ±20 ms. At the end of this time, TP1 returns to 0 volts.
8a	If verification of Step 7 is not obtained— Adjust resistor R5 and repeat Steps 4 and 7 until verification is obtained, momentarily grounding TP11 with each trial.	
9b	If no further adjustments are to be performed— Remove all test cords and equipment; restore all circuits to normal.	

B. LT Single-Shot (110 ms)

1	Remove ROTL or OTTS from service.	
2	Using extender circuit pack, remove CP2 from pos( ); attach to extender circuit pack; and replace in position. ***Note:*** The position of CP2 depends upon the detector being checked (8A or 8B). (For position number, see table in Fig. 1.)	
3	Assure that no closure exists on lead pair ON( ), ONG( ) (terminals 16 and 11, respectively).	
4	Using an oscilloscope (or frequency counter that can measure intervals), connect probe to TP7 of CP2 at pos( ) and a ground between scope (or counter) and tone detector.	
5	Set oscilloscope or frequency counter to be triggered by a positive going pulse (0 volts to +5 volts).	

STEP	ACTION	VERIFICATION
6	Using a means of connection, momentarily connect TP11 of CP2 at pos 19 to ground. ***Note:*** ***Momentarily*** in this case means to apply a ground to the test point and then to remove it. The single-shot might trigger when the ground is first applied because of bounce. If this happens, do not remove the ground until a reading has been obtained; otherwise, the single-shot will be retriggered and a longer than normal reading will be obtained. If the single-shot does not trigger when the ground is first applied, it will do so when it is removed.	Single-shot triggers causing TP7 to go to about +5 volts and remain for 110 ms +5 ms. At the end of this time, TP7 returns to 0 volts.
7a	If verification of Step 6 is not obtained— Adjust resistor R17 until verification is obtained, momentarily grounding TP11 with each trial.	
8b	If no further adjustments are to be performed— Remove all test cords and equipment; restore all circuits to normal.	

C. TPT Single-Shot (110 ms)

1	Remove ROTL or OTTS from service.	
2	Using extender circuit pack, remove CP2 from pos( ); attach to extender circuit pack; and replace in position. ***Note:*** The position of CP2 depends upon the detector being checked (8A or 8B). (For position number, see table in Fig. 1.)	
3	Assure that no closure exists on lead pair ON( ), ONG( ) (terminals 16 and 11, respectively).	
4	Using an oscilloscope (or frequency counter that can measure interval), connect probe to TP3 of CP2 at pos( ) and a ground between scope (or counter) and tone detector.	
5	Set oscilloscope or frequency counter to be triggered by a positive going pulse (0 volts to +5 volts).	
6	Using a means of connection, momentarily connect TP10 of CP2 at pos( ) to ground. ***Note:*** ***Momentarily*** in this case means to apply a ground to the test point and then to	When ground is removed, single-shot is triggered causing TP3 to go to about +5 volts and remain for 110 ms ±5 ms. At the end of this time, TP3 returns to 0 volts.

STEP	ACTION	VERIFICATION
	remove it. The single-shot might trigger when the ground is first applied because of bounce. If this happens, do not remove the ground until a reading has been obtained; otherwise, the single-shot will be retriggered and a longer than normal reading will be obtained. If the single-shot does not trigger when the ground is first applied, it will do so when it is removed.	
7a	If verification of Step 6 is not obtained— Adjust resistor R9 until verification is obtained, momentarily grounding TP10 with each trial.	
8b	If no further adjustments are to be performed— Remove all test cords and equipment; restore all circuits to normal.	

D. MW Single-Shot (600 ms)

1	Remove ROTL or OTTS from service.	
2	Using extender circuit pack, remove CP2 from pos( ); attach to extender circuit pack; and replace in position. ***Note:*** The position of CP2 depends upon the detector being checked (8A or 8B). (For position number, see table in Fig. 1.)	
3	Assure that no closure exists on lead pair ON( ), ONG( ) (terminals 16 and 11, respectively).	
4	Using an oscilloscope (or frequency counter that can measure interval), connect probe to TP5 of CP2 at pos( ) and a ground between scope (or counter) and tone detector.	
5	Set oscilloscope or frequency counter to be triggered by a positive going pulse (0 volts to +5 volts).	
6	Using a means of connection, momentarily connect TP9 of CP2 at pos( ) to ground. ***Note:*** ***Momentarily*** in this case means to apply a ground to the test point until the single-shot has triggered and then to remove it.	Single-shot triggers causing TP5 to go to about +5 volts and remain for 600 ms ±10 ms. At the end of this time, TP5 returns to 0 volts.

STEP	ACTION	VERIFICATION
7a	If verification of Step 6 is not obtained— Adjust resistor R13 until verification is obtained, momentarily grounding TP9 with each trial.	
8b	If no further adjustments are to be performed— Remove all test cords and equipment; restore all circuits to normal.	

ADJUSTMENTS ON CP4 (LIST 2) ▶(MANUFACTURE DISCONTINUED)◀

E. 750-Milliseconds Single-Shot

1	Remove ROTL or OTTS from service.	
2	Using extender circuit pack, remove CP4 from pos( ); attach to extender circuit pack; and replace in position. ***Note:*** The position of CP4 is dependent upon the number of List 2 detectors associated with the tone detector. (See Fig. 4.)	
3	Assure that no closure exists on lead pair RSET( ), RSETG( ) (terminals 14 and 11, respectively).	
4	Using an oscilloscope (or frequency counter that can measure interval), connect probe to TP1 of CP4 at pos( ) and a ground between scope (or counter) and tone detector.	
5	Set oscilloscope or frequency counter to be triggered by a positive going pulse (0 volts to +5 volts).	
6	Using a means of connection, momentarily connect TP5 of CP4 at pos( ) to ground. ***Note:*** ***Momentarily*** in this case means to apply a ground to the test point until the single-shot has triggered and then to remove it.	Single-shot triggers, causing TP1 to go to about +5 volts and remain for 750 ms ±10 ms. At the end of this time, TP1 returns to 0 volts.
7a	If verification of Step 6 is not obtained— Adjust resistor R5 until verification is obtained, momentarily grounding TP5 with each trial.	
8b	If additional List 2 detectors are available and are to be adjusted— Repeat Steps 1 through 7a for remaining List 2 detectors to be adjusted.	

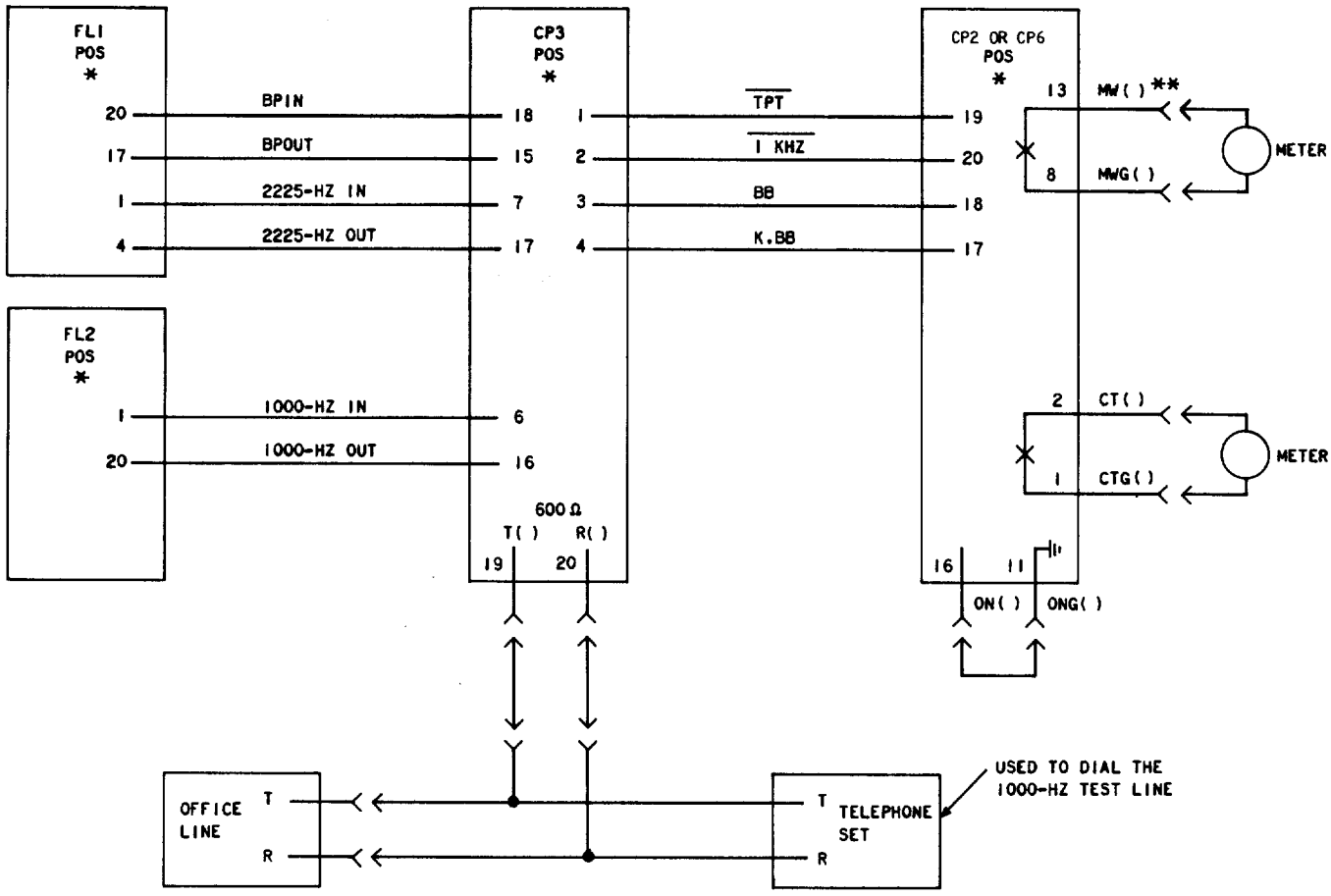
STEP	ACTION	VERIFICATION
9c	If no further adjustments are to be performed— Remove all test cords and equipment; restore all circuits to normal.	

F. 700-Milliseconds Single-Shot

1	Remove ROTL or OTTS from service.	
2	Using extender circuit pack, remove CP4 from pos( ); attach to extender circuit pack; and replace in position. ***Note:*** The position of CP4 is dependent upon the number of List 2 detectors associated with the tone detector. (See Fig. 4.)	
3	Assure that no closure exists on lead pair RSET( ), RSETG( ) (terminals 14 and 11, respectively).	
4	Using an oscilloscope (or frequency counter that can measure interval), connect probe to TP3 of CP4 at pos( ) and a ground between scope (or counter) and tone detector.	
5	Set oscilloscope or frequency counter to be triggered by a positive going pulse (0 volts to +5 volts).	
6	Using a means of connection, momentarily connect TP5 of CP4 at pos( ) to ground. ***Note:*** ***Momentarily*** in this case means to apply a ground to the test point until the single-shot has triggered and then to remove it.	750-milliseconds single-shot triggers at the end of 750 ms ±10 ms; the 700-millisecond single-shot triggers causing TP3 to go to about +5 volts and remains for 700 ms ±10 ms. At the end of this time, TP3 returns to 0 volts.
7a	If verification of Step 6 is not obtained— Adjust resistor R8 until verification is obtained, momentarily grounding TP5 with each trial.	
8b	If additional List 2 detectors are available and are to be adjusted— Repeat Steps 1 through 7a for remaining List 2 detectors to be adjusted.	
9c	If no further adjustments are to be performed— Remove all test cords and equipment; restore all circuits to normal.	

STEP	ACTION	VERIFICATION
	ADJUSTMENT ON CP6 [LIST 1 (8B) OR LIST 3 (8A)]	
	G. 1000-Hz Oscillator	
1	Remove ROTL or OTTS from service.	
2	Using extender circuit pack, remove CP6 from pos( ); attach to extender circuit pack; and replace in position. ***Note:*** The position of CP6 depends upon the detector being checked (8A or 8B). (For position number, see table in Fig. 1).	
3	Using an oscilloscope (or frequency counter that can measure a square wave), connect probe to TP1 of CP6 at pos( ) and a ground between scope (or counter) and tone detector.	
4	Set the frequencey counter or oscilloscope to measure 1000-Hz square wave.	Counter or oscilloscope reads 1000 ±10 Hz.
5a	If verification of Step 4 is not obtained— Adjust resistor R3 until verification is obtained.	
6b	If no further adjustments are to be performed— Remove equipment; restore all circuit packs to normal.	
	ADJUSTMENT ON CP7 [LIST 2]	
	H. 1000-Hz Oscillator	
1	Remove ROTL or OTTS from service.	
2	Using extender circuit pack, remove CP7 from pos( ); attach to extender circuit pack; and replace in position. ***Note:*** The position of CP7 depends upon the number of List 2 detectors associated with the tone detector. (See Fig. 4.)	
3	Using an oscilloscope (or frequency counter that can measure a square wave), connect probe to TP1 of CP7 at pos( ) and a ground between scope (or counter) and tone detector.	
4	Set the frequency counter or oscilloscope to measure 1000-Hz square ware.	Counter or oscilloscope reads 1000 ±10 Hz.

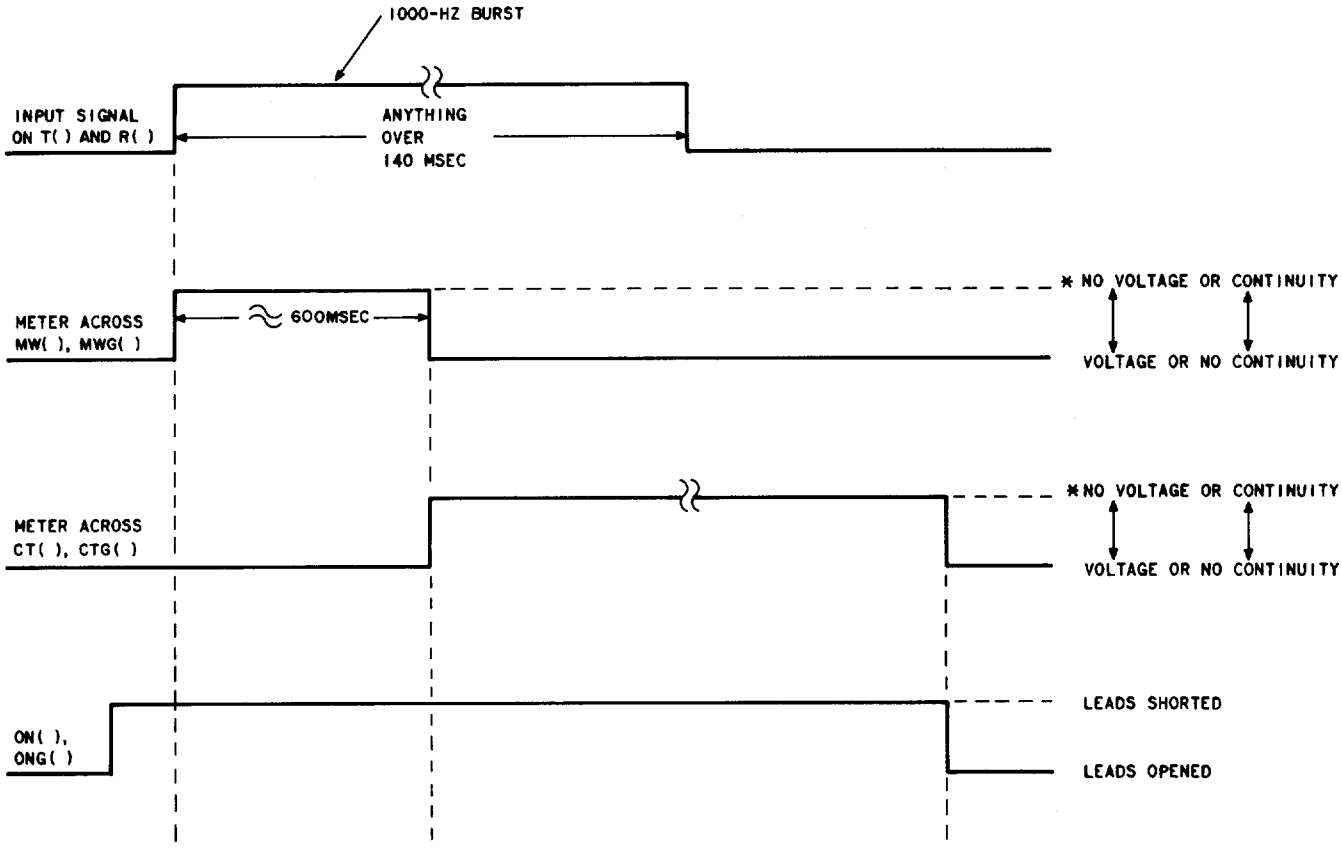
STEP	ACTION	VERIFICATION
5a	If verification of Step 4 is not obtained— Adjust resistor R3 until verification is obtained.	
6b	If no further adjustments are to be performed— Remove equipment; restore all circuit packs to normal.◆	



*	SYSTEM	
	ROTL (8A)	OTTS (8B)
1ST SET OF CKT PACKS	EQ. LOCATION	EQ. LOCATION
FL1	08	08
FL2	12	12
CP3	16	16
CP2 OR CP6	19	19
2ND SET OF CKT PACKS		
FL1		24
FL2		28
CP3		32
CP2 OR CP6		35

** SHALL BE 1 OR 2 FOR FIRST AND SECOND SET OF CIRCUIT PACKS COMPRISING THE LIST 1 FOR THE 8B.

Fig. 1—Setup for 1000-Hz Detection



* IN SOME CASES A VOLTAGE, NO VOLTAGE INDICATION WILL APPEAR ACROSS THE LEADS AND IN OTHER CASES CONTINUITY, NO CONTINUITY. (SEE TABLE B).

Fig. 1A—1000-Hz Tone Detection

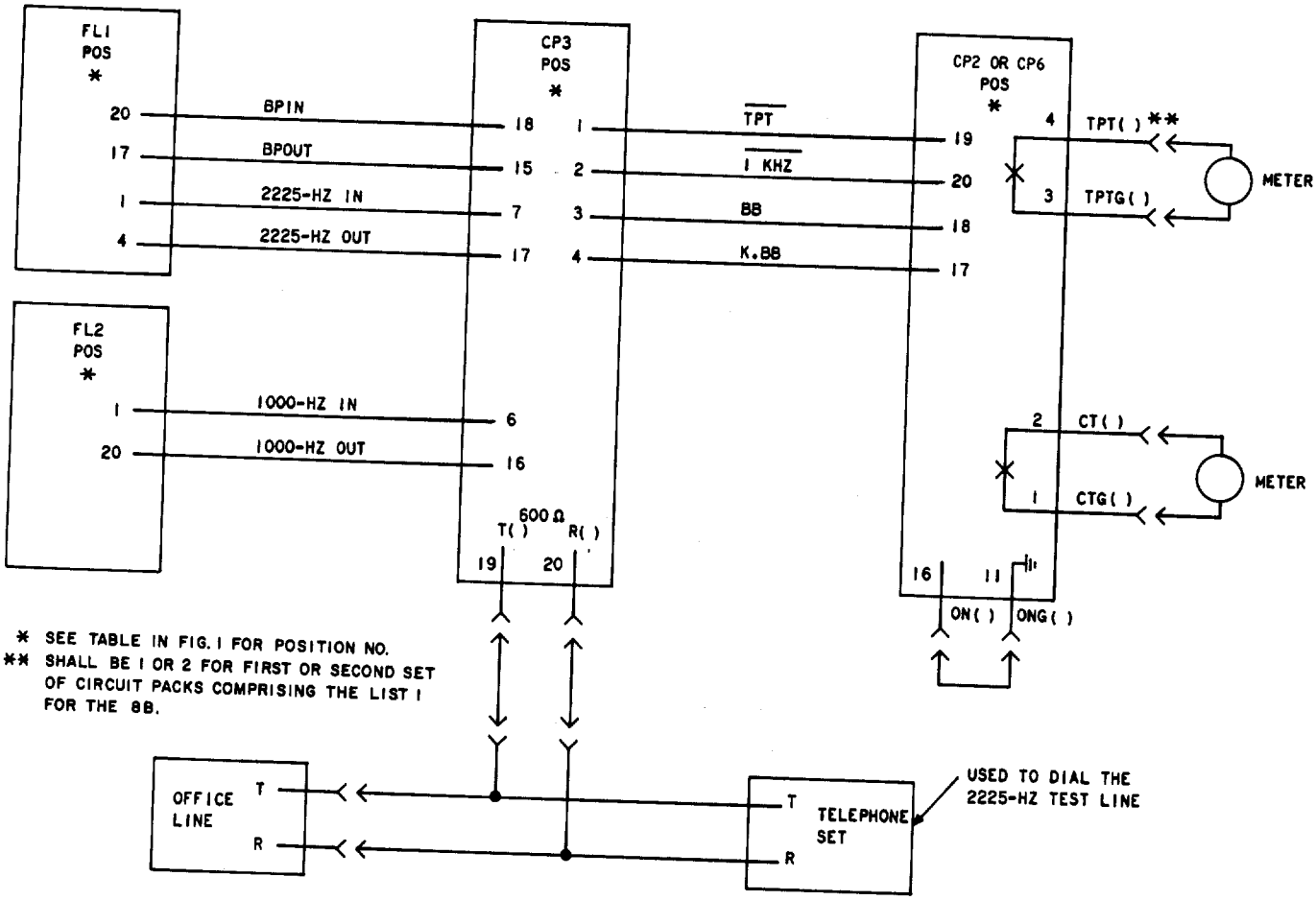
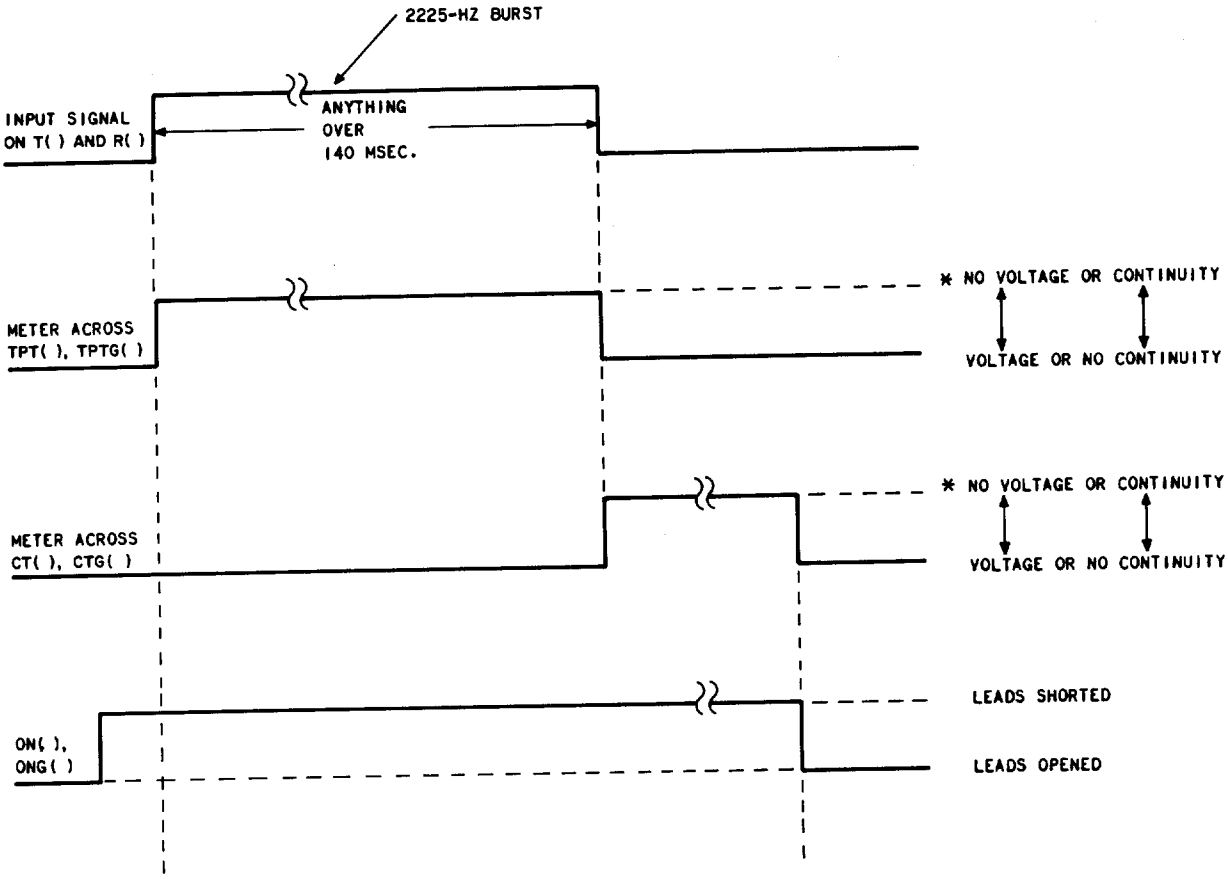


Fig. 2—Setup for 2225-Hz Detection



* IN SOME CASES A VOLTAGE, NO VOLTAGE INDICATION WILL APPEAR ACROSS THE LEADS AND IN OTHER CASES CONTINUITY, NO CONTINUITY. (SEE TABLE B)

Fig. 2A—2225-Hz Tone Detection

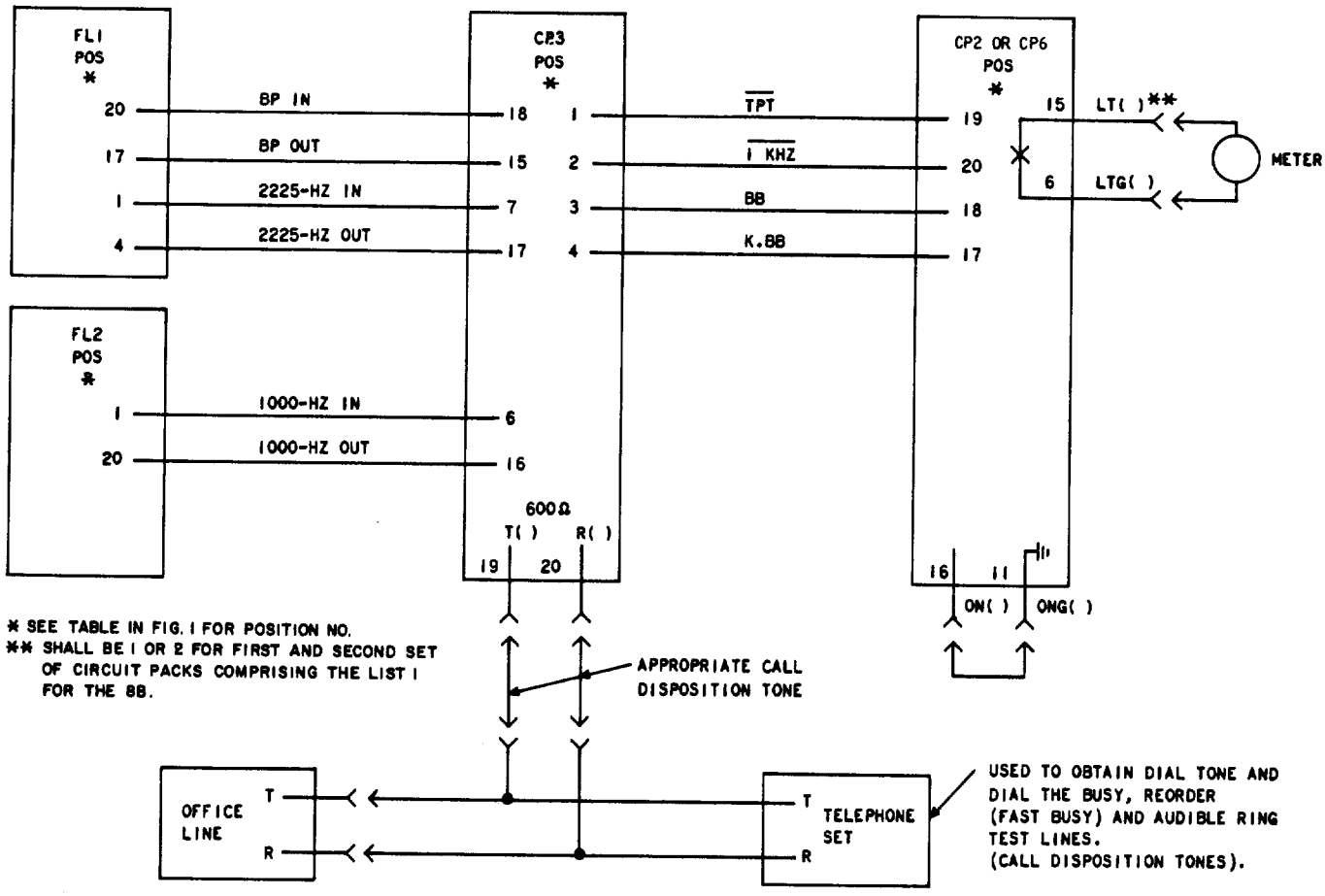
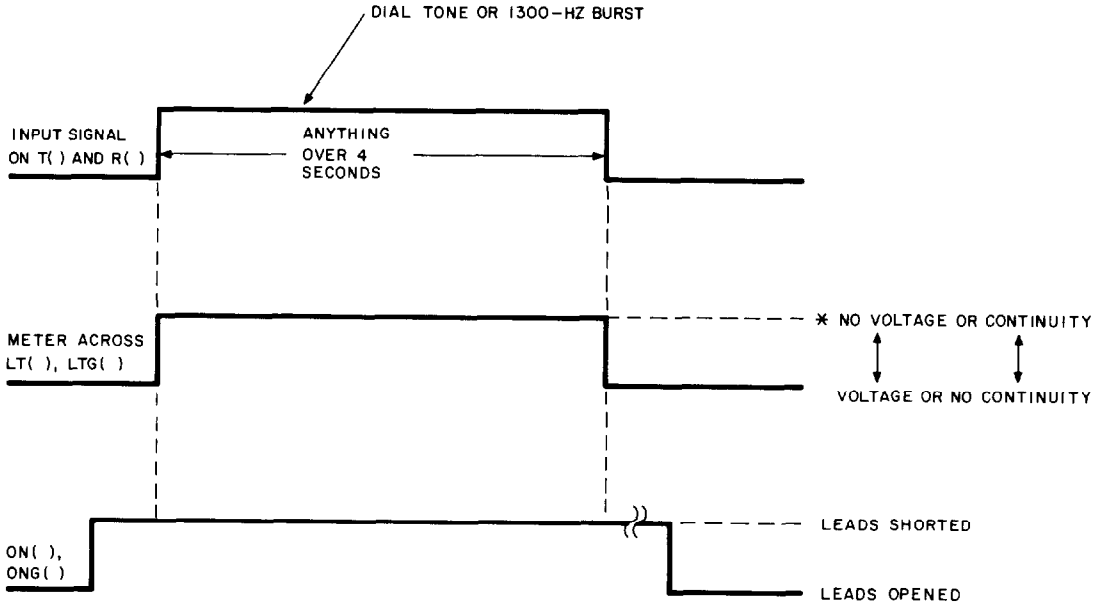
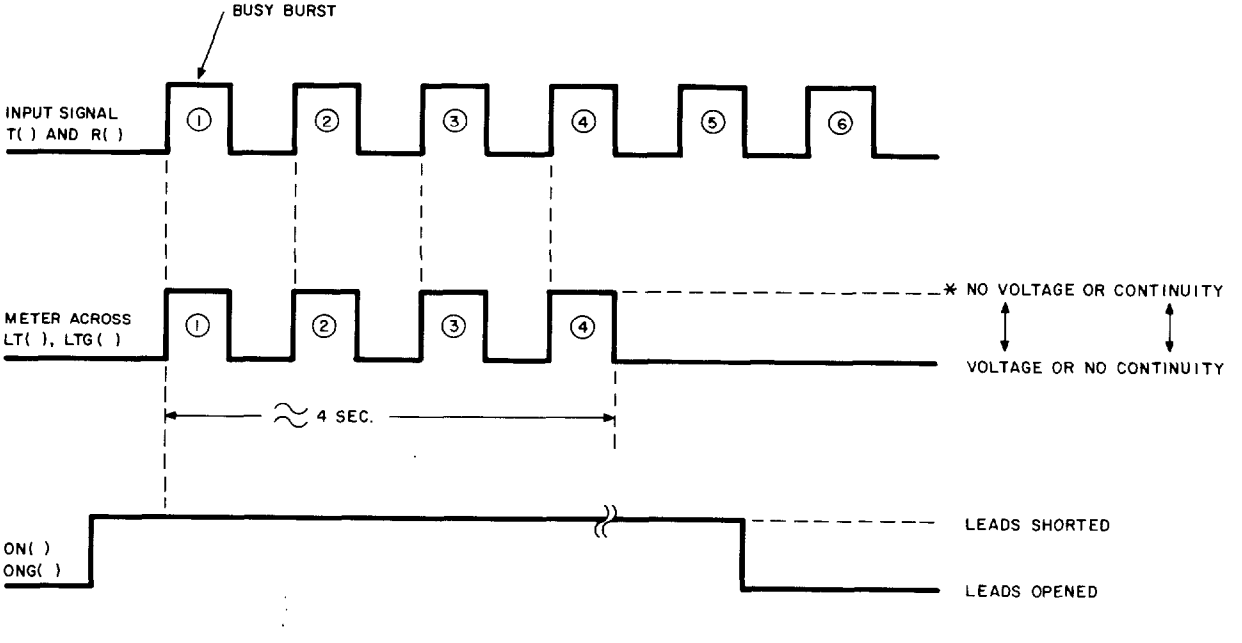


Fig. 3—Setup for Call Disposition Tones Detection



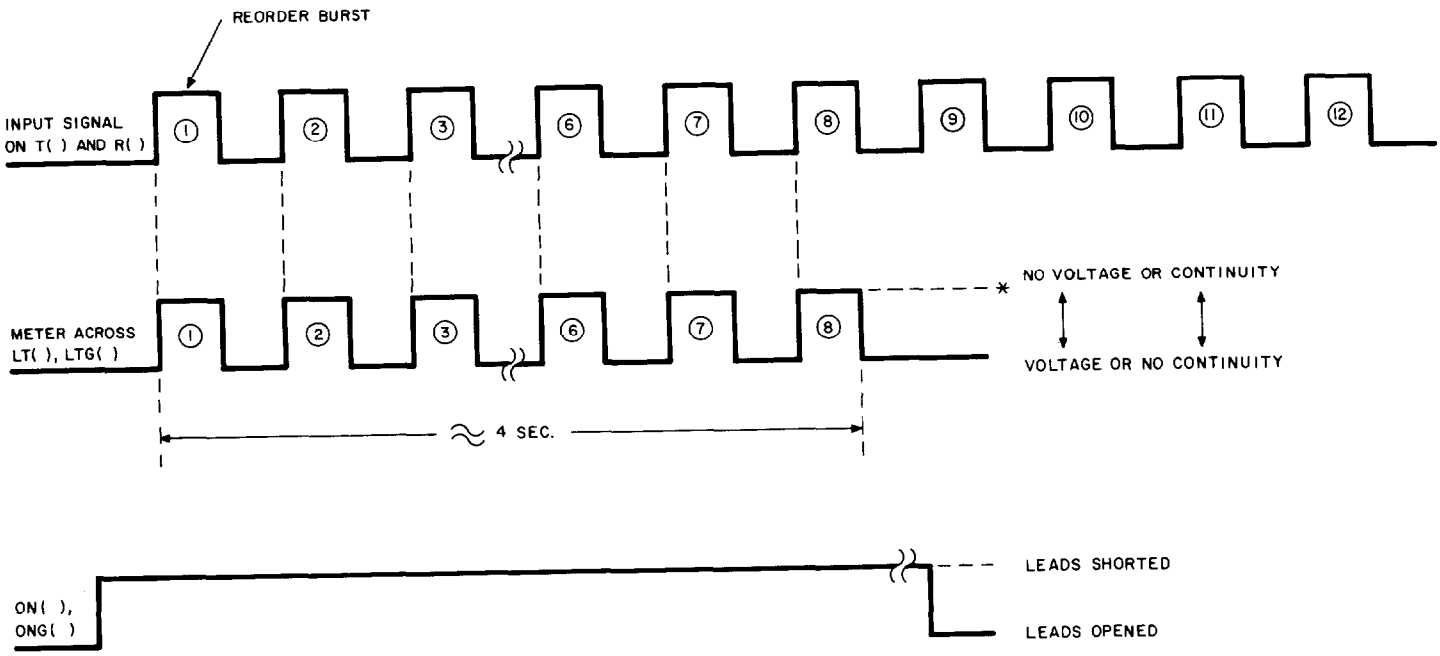
* IN SOME CASES A VOLTAGE, NO VOLTAGE INDICATION WILL APPEAR ACROSS THE LEADS AND IN OTHER CASES CONTINUITY, NO CONTINUITY. (SEE TABLE B)

Fig. 3A—Dial-Tone Detection and Sensitivity



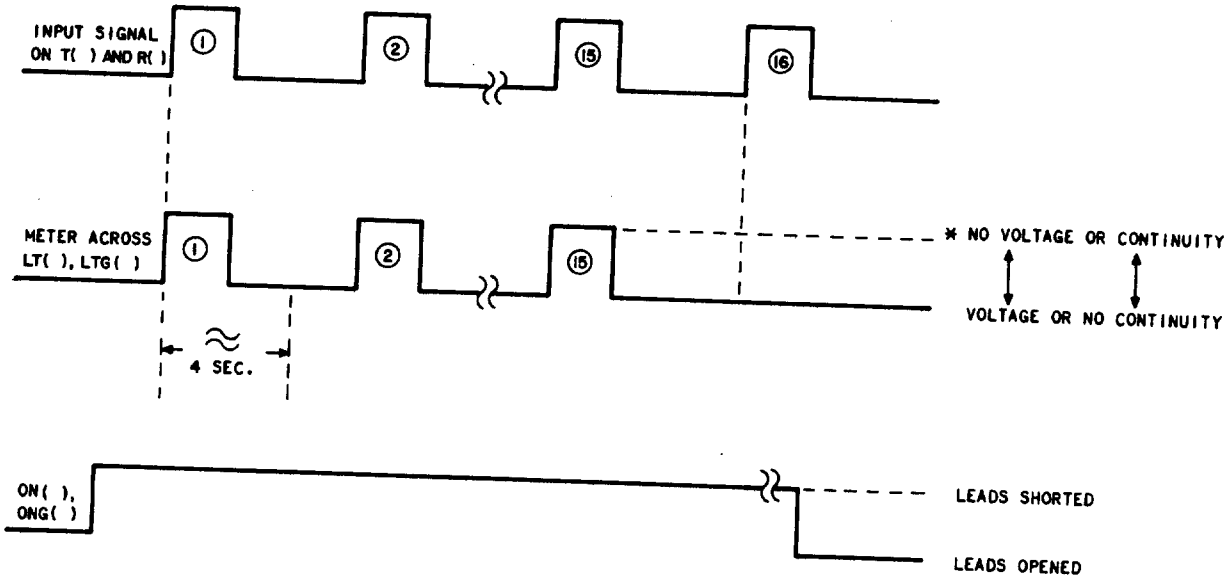
* IN SOME CASES A VOLTAGE, NO VOLTAGE INDICATION WILL APPEAR ACROSS THE LEADS AND IN OTHER CASES CONTINUITY, NO CONTINUITY. (SEE TABLE B)

Fig. 3B—Busy-Tone Detection



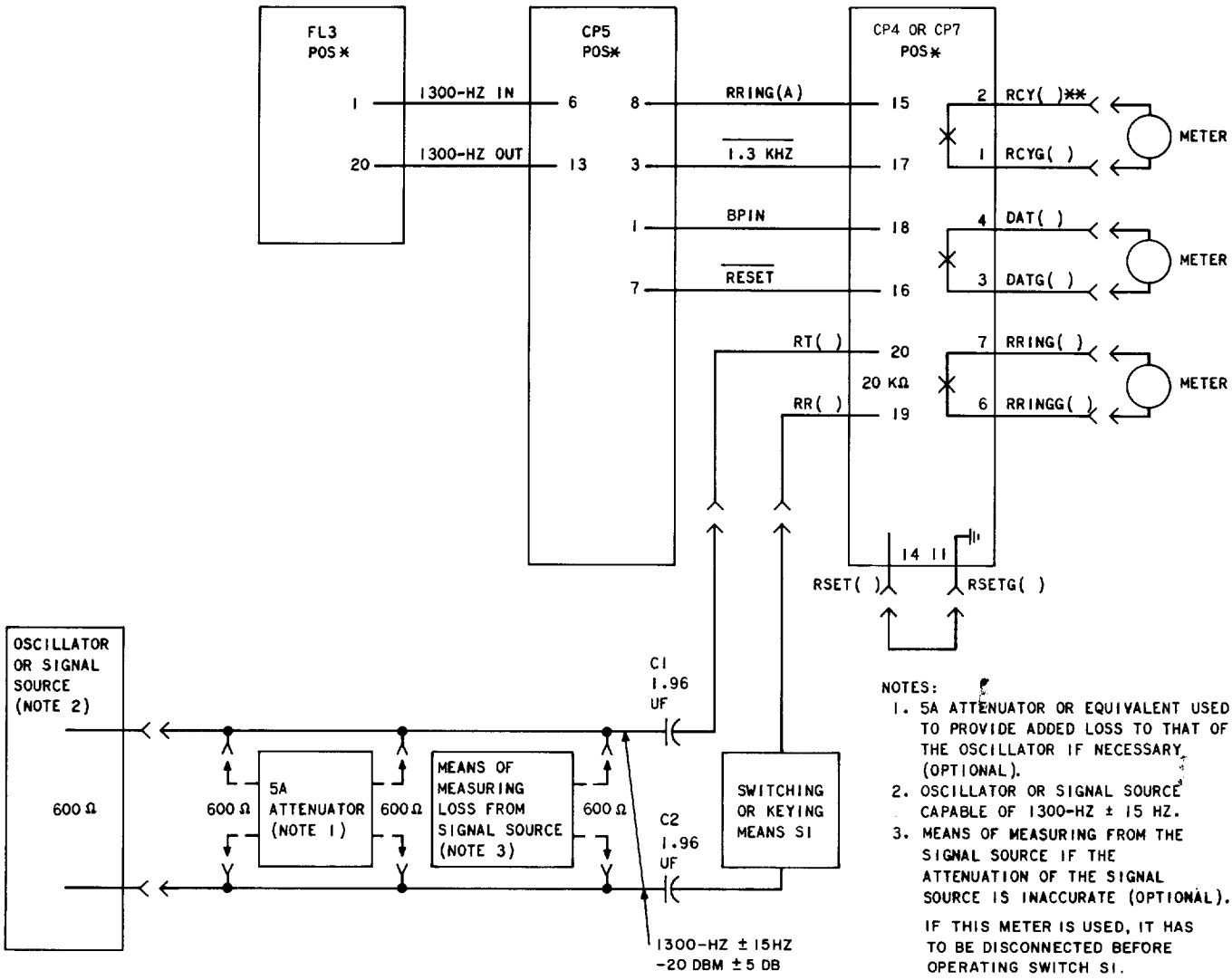
* IN SOME CASES A VOLTAGE, NO VOLTAGE INDICATION WILL APPEAR ACROSS THE LEADS AND IN OTHER CASES CONTINUITY, NO CONTINUITY. (SEE TABLE B)

Fig. 3C—Reorder (Fast Busy) Tone Detection



* IN SOME CASES A VOLTAGE, NO VOLTAGE INDICATION WILL APPEAR ACROSS THE LEADS AND IN OTHER CASES CONTINUITY, NO CONTINUITY. (SEE TABLE B)

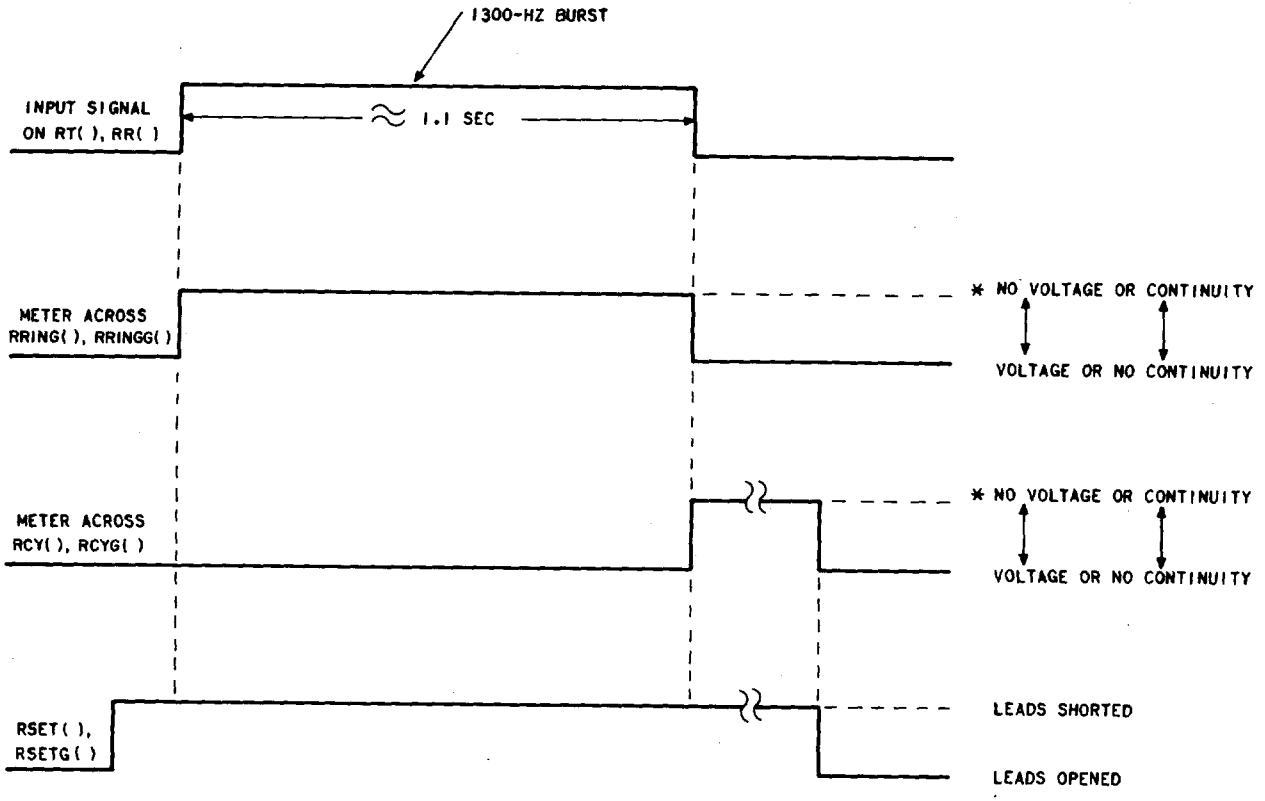
Fig. 3D—Audible Ring-Tone Detection



		SYSTEM	
		ROTL (8A)	OTTS (8B)
*	CP NO.	EQ. LOCATION	EQ. LOCATION
1ST LIST 2	CP4 OR CP7	34	50
	CP5	29	45
	FL3	25	41
2ND LIST 2	CP4 OR CP7	48	64
	CP5	43	59
	FL3	39	55
3RD LIST 2	CP4 OR CP7	62	78
	CP5	57	73
	FL3	53	69

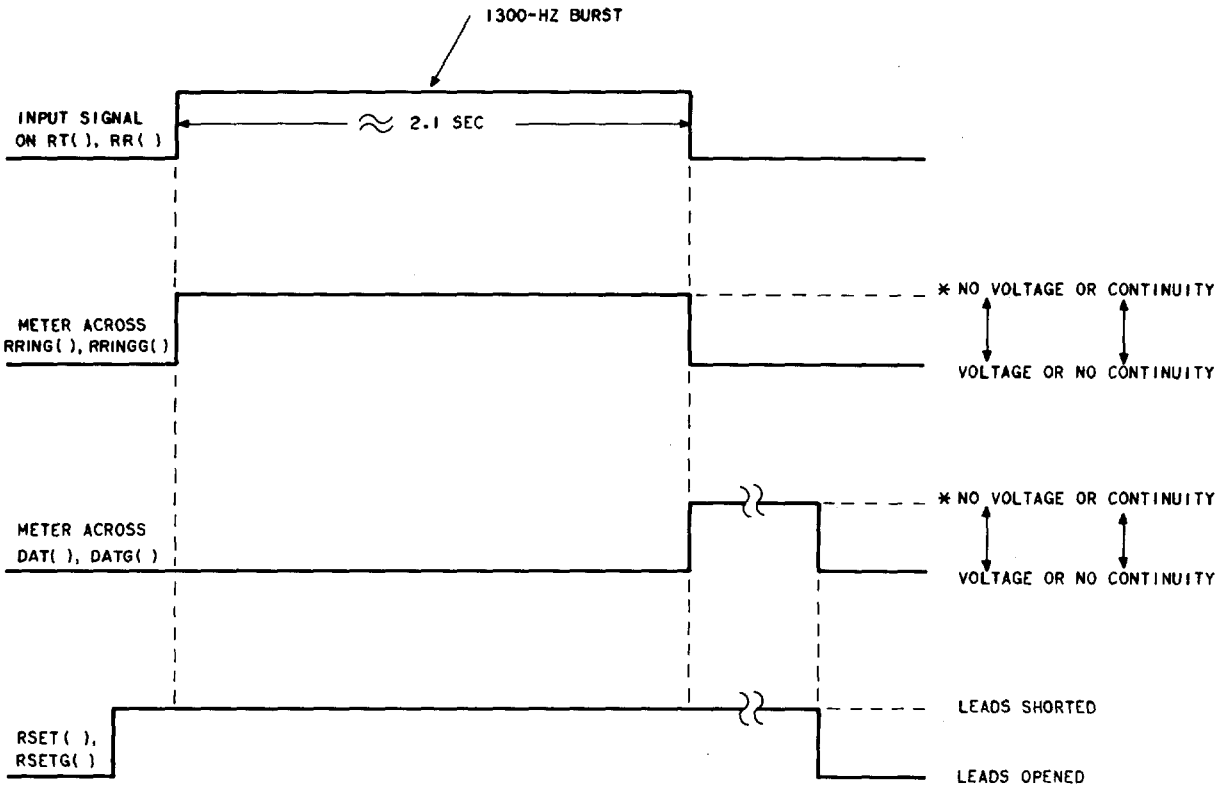
** SHALL BE 1, 2 OR 3 FOR 1ST, 2ND OR 3RD LIST 2.

Fig. 4—Setup for List 2 1300-Hz Detection (–20 dBm ±5 dB)



* IN SOME CASES A VOLTAGE, NO VOLTAGE INDICATION WILL APPEAR ACROSS THE LEADS AND IN OTHER CASES CONTINUITY, NO CONTINUITY. (SEE TABLE B)

Fig. 4A—1300-Hz Recycle Detection



* IN SOME CASES A VOLTAGE, NO VOLTAGE INDICATION WILL APPEAR ACROSS THE LEADS AND IN OTHER CASES CONTINUITY, NO CONTINUITY. (SEE TABLE B)

Fig. 4B—1300-Hz Drop Access Trunk (DAT) Detection