

TUR CONNECTION VERIFIER TEST SET H-400-430
PERFORMANCE OF ASSIGNED FUNCTIONS
AND CIRCUIT PACK REPLACEMENT
AND ADJUSTMENT PROCEDURES

CONTENTS	PAGE	CONTENTS	PAGE
1. GENERAL	1	Register and Traffic Data Converter Test Oscillator (20 and 7 PPS) . . .	17
2. APPARATUS	2	● Step and Reset Operations Check Under Detectors Cross Condition . . .	18
3. POWER CHECK	5		
4. ADJUSTMENTS	7	1. GENERAL	
● TOUCH-TONE® Oscillator Frequency Check and Adjustments (CTP-8) . . .	7	1.01 This section is used to verify that the traffic usage recorder connection verifier (TUR CV), Fig. 1, is capable of performing its assigned functions. This section also provides information for the replacement and adjustment of circuit packs used in this test set.	
TUR UNIT	8	1.02 This section is issued to provide information not previously available for determining whether a trouble encountered is associated with the equipment being tested or with the test set itself. This section also provides the procedures for adjusting circuit packs which may or may not have been obtained on a replacement basis through local distribution.	
REMOTE UNIT	9		
● TOUCH-TONE Oscillator Amplitude Adjustments	10		
TUR UNIT	10		
REMOTE UNIT	11		
5. SELF-CHECK SYSTEM FUNCTIONS	11		
● TUR Step Advance and Reset Verifications	12	<i>Note:</i> Circuit packs obtained from the factory are <i>not</i> preadjusted. The associated procedure of this section must be followed for adjusting packs under this classification.	
● Ground-Busy and Battery-Busy Verifications	13	1.03 The performance checks of this section should be performed before any testing is attempted using this test set. If the test set is used quite frequently, the checks of this section should be performed periodically.	
● Detector Cross Verification	15	1.04 <i>Lettered Steps:</i> A letter a, b, c, etc, added to a step number in Parts 3, 4, or 5 of this section indicates an action which may or may not be required depending upon local conditions. The condition under which a lettered step or a	
● COE Verifications	16		
● Pulse Generator Speed Verifications	17		
TUR Step-Scan Oscillator (5.9 PPS) . . .	17		
Reset Oscillator (28.5 PPS)	17		

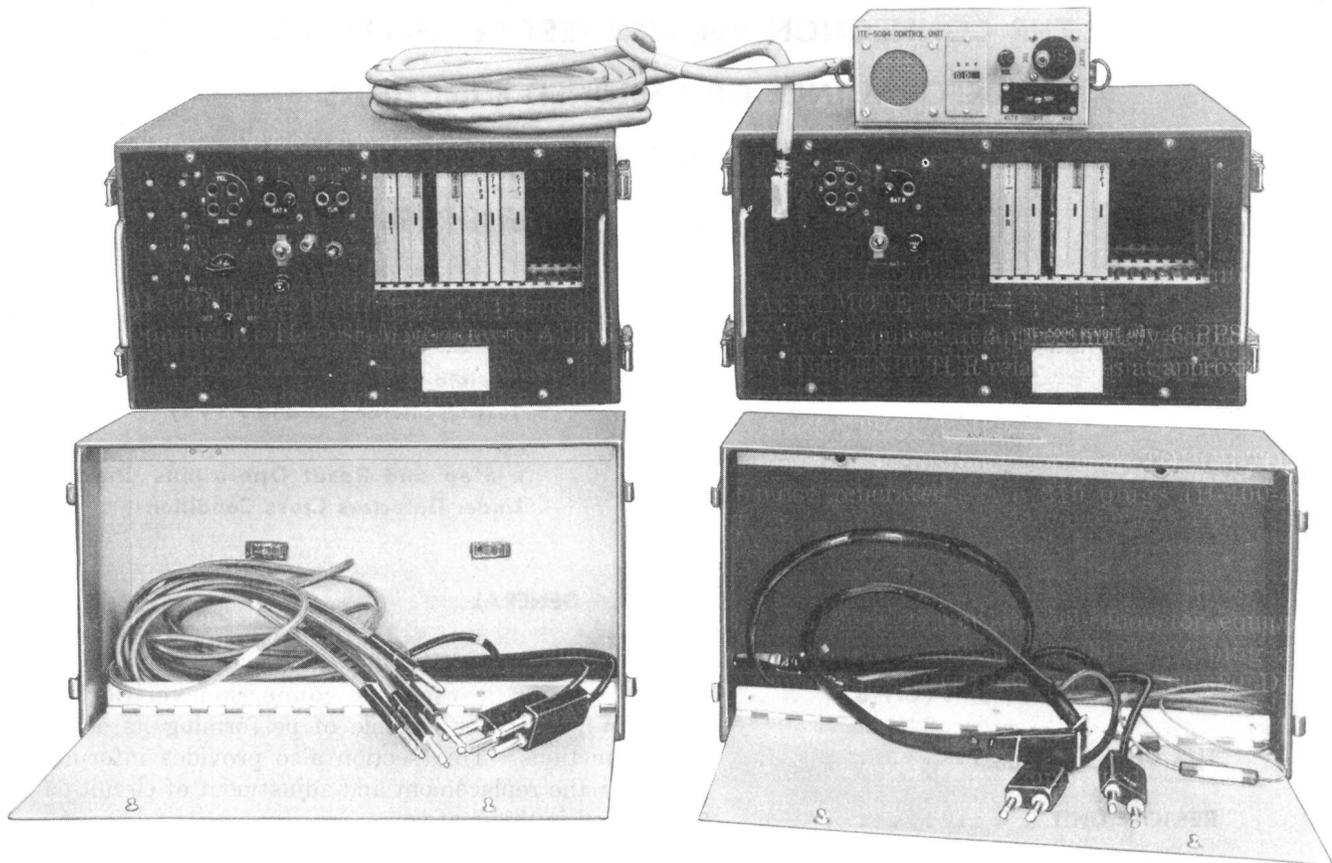


Fig. 1—TUR Connection Verifier Test Set

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 procedure. Where a condition does not apply, all steps designated by that letter should be omitted.

2. APPARATUS

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

2.02 TUR connection verifier test set H-400-430.

2.03 Tektronix-type oscilloscope, 545B or equivalent, equipped with C-A plug-in unit.

2.04 Hewlett Packard frequency counter, 5521A or equivalent.

2.05 Hewlett Packard VTVM, 400C or equivalent.

2.06 Test set cord, 6 feet long, 4-conductor, equipped with two 327A plugs (H-400-430 DET. 31 cord).

2.07 Test set cord, 12 feet long, 3-conductor, equipped with two 310 plugs (H-400-430 DET. 32 cord).

2.08 Test cord, 25 feet long, 14-conductor, equipped with one Amphenol 67-06P18-64 plug and one Amphenol 67-01P18-64 plug (H-400-430 DET. 33 cord).

2.09 Test set cord, 12 feet long, one-conductor, equipped with one Mini-Gator clip at one end and ITE-2455 G-1 plug at the other end (H-400-430 DET. 34 cord).

TABLE A

APPARATUS		PART 3 POWER CHECK	PART 4 ADJUSTMENTS				PART 5 SELF-CHECK SYSTEM FUNCTIONS					
			FREQUENCY		AMPLITUDE		TUR STEP ADVANCE	GRD BUSY AND BAT. BUSY	DETECTOR CROSS	COE	PULSE GENERATOR SPEED	STEP AND RESET
			TUR	RMT	TUR	RMT						
Test Set H-400-430	(2.02)	1	1	1			1	1	1	1	1	1
Oscilloscope	(2.03)		1	1	1	1					1	
Frequency Counter	(2.04)		1	1								
VTVM	(2.05)	1	1	1								
DET. 31 Cord	(2.06)					1	1	1	1	1	1	1
DET. 32 Cord	(2.07)	2	2	2			2	2	2	2	2	2
DET. 33 Cord	(2.08)	1	1	1			1	1	1	1	1	1
DET. 34 Cord	(2.09)									1		
DET. 35 Cord	(2.10)							1	1	2		1
IWI3A Cord	(2.11)		2	1	1	2						
159A Adapter	(2.12)		1	1				1				
72B Tool	(2.13)	1	1	1				1				
624B Tool	(2.14)							1	2			2
KS-19355, L3 Tool	(2.15)		1	1								
Screwdriver	(2.16)	√	√	√	√	√	√	√	√	√	√	√

√ As required

2.10 Test set cord, 12 feet long, 6-conductor, equipped with one Jones 306-CCT plug at one end and six ITE-2461 sockets at the other end (H-400-430 DET. 35 cord).

2.11 Testing cord, 893 cord, 3 feet long, equipped with two 360A tools (1W13A cord).

2.12 159A adapter (extender board).

2.13 72B tool (circuit pack extractor).

2.14 624B tool(s) to be used in conjunction with DET. 35 cord.

2.15 KS-19355 L3 adjuster to be used for adjusting transformers.

2.16 Assorted screwdrivers as required for adjustments and gaining access to interior of test set units.

3. POWER CHECK

3.01 Part 3 provides a power check of the test set. This part should be performed on a routine basis only or when trouble is suspected in the test set. If trouble is suspected in the test set, this procedure should be performed before any other self-system testing.

STEP	ACTION	VERIFICATION
------	--------	--------------

Power Check

1	Remove all circuit packs from units.	
2	Verify that REMOTE UNIT and TUR UNIT fuse blocks contain good fuses of proper rating (1/2 amp).	
3	At TUR UNIT— Operate BAT A key to OFF.	
4	At REMOTE UNIT— Operate BAT B key to OFF.	
5	Make connections as shown in Fig. 2.	
6	At TUR UNIT— Operate BAT A key to ON.	BAT A lamp lighted.
7	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
8a	If verification of Step 6 or 7 is not obtained— Check for operated fuse, faulty or missing lamp.	
	Note: Replace fuse or lamp as required and repeat Steps 6 and 7.	
9	Using a VTVM or equivalent, check for voltages of Table B.	
10b	If voltages of Step 9 are not within limits— Check diodes CR 1-5 of TUR UNIT or diodes CR 12-16 of REMOTE UNIT.	

TABLE B

TUR UNIT			
ITEM	LOCATION	TERMINAL	VOLTAGE
JACK	BAT	TIP	-48
CONN. (CTP-8)	1-2	13	-36
		14	-12
CONN. (CTP-5)	1-4	0	-28
		2	-24
		13	-36
CONN. (CTP-7)	1-7	0	-28
		2	-24
		5	-28
		13	-36
		14	-12
		24	-28
CONN. (CTP-2)	1-9	13	GRD
		15	-24
CONN. (CTP-4)	1-10	13	-48
CONN. (CTP-3)	1-12	4	-28
		12	-48
		13	GRD
		15	-24
REMOTE UNIT			
JACK	BAT	TIP	-48
CONN. (CTP-8)	2-2	13	-36
		14	-12
CONN. (CTP-5)	2-4	0	-28
		2	-24
		13	-36
CONN. (CTP-6)	2-7	0	-28
		2	-24
		5	-28
		13	-36
		14	-12
		24	-28
CONN. (CTP-1)	2-9	13	GRD
		14	-12
		15	-24

Note: All voltages ± 2 volts.

STEP	ACTION	VERIFICATION
11b	Check -48 volt DC source.	
12	At TUR UNIT— Operate BAT A key to OFF.	BAT A lamp extinguished.
13	At REMOTE UNIT— Operate BAT B key to OFF.	BAT B lamp extinguished.
14	Install all circuit packs in respective locations. <i>Note:</i> See Table B for a guide.	
15	At TUR UNIT— Operate BAT A key to ON.	BAT A lamp lighted.
16	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
17	Check that respective voltages have not deviated ± 1 volt by rechecking connectors 1-7 (TUR UNIT) and 2-7 (REMOTE UNIT) for -12, -24, -28, and -36 volts DC.	Voltages do <i>not</i> deviate more than ± 1 volt.

4. ADJUSTMENTS

4.01 The adjustments of this section can be performed on a routine basis if desired. These adjustments however are intended for use in adjusting circuit packs obtained from the factory which are *not* preadjusted. These procedures must be used for adjusting packs under this classification.

4.02 After performing the frequency adjustment of the oscillator(s), it is necessary to perform the amplitude adjustment of the forementioned circuit pack. (See associated part in this section.)

4.03 The following adjustments are performed and in this order:

- TOUCH-TONE Oscillator Frequency Check and Adjustments (CTP-8)

TUR UNIT
REMOTE UNIT

- TOUCH-TONE Oscillator Amplitude Adjustments

TUR UNIT
REMOTE UNIT

STEP	ACTION	VERIFICATION
------	--------	--------------

● TOUCH-TONE Oscillator Frequency Check and Adjustments (CTP-8)

- | | | |
|---|--|--|
| 1 | Make connections as shown in Fig. 2. | |
| 2 | Connect oscilloscope, frequency counter, and VTVM to chassis ground and to either sleeve lead of the TEL jacks in unit being tested. | |
| 3 | Using KS-19355 L3 tool, perform Steps 4 through 20 for oscillator adjustment of TUR | |

SECTION 252-124-302

STEP	ACTION	VERIFICATION
-------------	---------------	---------------------

UNIT and/or Steps 21 through 40 for oscillator adjustment of REMOTE UNIT.

TUR UNIT

- | | | |
|----|--|--|
| 4 | At TUR UNIT—
Turn power off. | |
| 5 | Remove circuit pack CTP-8 (position 1-2). | |
| 6 | Insert 159A extender board into position 1-2. | |
| 7 | Attach CTP-8 circuit pack to extender board. | |
| 8 | Turn power on. | |
| 9 | Using 1W13A cord, connect clip lead from relay GB-L to circuit pack CTP-3 (position 1-12) terminal 12. | GB relay operated. |
| 10 | Adjust T1 transformer to 697 Hz to ± 1 Hz. | |
| 11 | Remove 1W13A cord. | GB relay released. |
| 12 | Using 1W13A cord, connect clip lead from relay BB-L to circuit pack CTP-3 (position 1-12) terminal 13. | BB relay operated. |
| 13 | Adjust T1 transformer to 697 Hz ± 1 Hz. | |
| 14 | At 159A extender board in position 1-2—
Disconnect lead 26. | |
| 15 | Using another 1W13A cord, connect clip lead from relay XD-U to circuit pack CTP-3 (position 1-12) terminal 15. | XD relay operated. |
| 16 | Adjust T2 transformer to 1447 Hz ± 1 Hz. | |
| 17 | Remove 1W13A cords. | XD relay released.
BB relay released. |
| | Note: The CTP-8 circuit packs are to be marked T and R after they are adjusted for the TUR and REMOTE UNITS if not already marked. These designations should appear on the front metal plates of the circuit packs in black stencil letters. These designations are to insure that these packs <i>are not</i> interchangeable between the TUR and REMOTE UNITS. | |
| 18 | Disconnect frequency counter. | |

STEP	ACTION	VERIFICATION
19	Remove all clip leads.	
20	Reconnect terminal 26 on 159A extender board inserted in TUR UNIT.	
	<i>Note:</i> Leave 159A extender board in position 1-2 for oscillator amplitude adjustment. (See associated section in this part.)	
REMOTE UNIT		
21	At REMOTE UNIT— Turn power off.	
22	Remove circuit pack CTP-8 (position 2-2).	
23	Insert 159A extender board into position 2-2.	
24	Connect frequency counter to terminal 26.	
25	Attach CTP-8 circuit pack to extender board.	
26	Turn power on.	852 Hz present at terminal 26.
27	Remove frequency counter from terminal 26.	
28	Reconnect frequency counter to COE binding post on CONTROL UNIT.	852 Hz present at COE binding post on CONTROL UNIT.
29	Remove connection between frequency counter and COE binding post.	
30	Connect frequency counter to either sleeve lead of REMOTE UNIT.	
31	Adjust T3 transformer to 852 Hz ± 1 Hz.	
32	Using 1W13A cord, connect clip lead from relay SA-L to circuit pack CTP-1 (position 2-9) terminal 13.	SA relay operated.
33	Adjust T4 transformer to 1209 Hz ± 1 Hz.	
34	Remove 1W13A cord.	SA relay released.
35	Using 1W13A cord, connect clip lead from relay TRS-L to circuit pack CTP-1 (position 2-9) terminal 13.	TRS relay operated.
36	Adjust T4 transformer to 1336 Hz ± 1 Hz.	
37	Remove 1W13A cord.	TRS relay released.

SECTION 252-124-302

STEP	ACTION	VERIFICATION
	<i>Note:</i> The CTP-8 circuit packs are to be marked T and R after they are adjusted for the TUR and REMOTE UNITS if not already marked. These designations should appear on the front metal plates of the circuit packs in black stencil letters. These designations are to insure that these packs <i>are not</i> interchangeable between the TUR and REMOTE UNITS.	
38	Disconnect frequency counter.	
39	Remove all clip leads.	
40	Reconnect terminal 26 on 159A extender board inserted in REMOTE UNIT.	
	<i>Note:</i> Leave 159A extender board in position 2-2 for oscillator amplitude adjustment. (See associated section in this part.)	
• TOUCH-TONE Oscillator Amplitude Adjustments		
TUR UNIT		
1	At TUR UNIT— Using H-400-430 DET. 31 cord, connect TEL jack of TUR UNIT to TEL jack of REMOTE UNIT. Refer to Fig. 3.	
2	Connect oscilloscope to either sleeve lead of TEL jack in TUR UNIT.	
3	Using 1W13A cord, connect clip lead from relay GB-L to circuit pack CTP-3 (position 1-12) terminal 12.	
4	At CTP-8 of TUR UNIT— Adjust potentiometer R4 (top) for 1.3 volts peak to peak at 697 Hz.	CTP-8 adjusted for 1.3 volts peak to peak at 697 Hz.
	<i>Note:</i> Amplitude is only about one-half output of REMOTE UNIT oscillator and is <i>not</i> to exceed this ratio.	
5	Remove pin connector from terminal 26 on extender board in position 1-2.	
6	Using 1W13A cord, connect clip lead from relay XD-U to circuit pack CTP-3 (position 1-12) terminal 15.	XD relay operated.

STEP	ACTION	VERIFICATION
7	At CTP-8 of TUR UNIT— Adjust potentiometer R10 for 1.3 volts peak to peak at 1447 Hz. <i>Note:</i> Do <i>not</i> exceed this voltage.	CTP-8 adjusted for 1.3 volts peak to peak at 1447 Hz.
8	Disconnect all clip leads.	
9	Reconnect pin connector to terminal 26 on extender board in position 1-2.	Adjustment of amplitude and frequency of oscillator in TUR UNIT now complete.

REMOTE UNIT

10	Connect oscilloscope to either sleeve lead of the TEL jack in REMOTE UNIT.	
11	Using 1W13A cord, connect clip lead from relay SA-L to circuit pack CTP-1 (position 2-9) terminal 13.	SA relay operated.
12	Adjust oscilloscope for sine-wave frequency of 1209 Hz.	
13	At CTP-8 of REMOTE UNIT— Adjust potentiometer R10 (bottom) for maximum amplitude.	Maximum amplitude approximately 2.6-2.8 volts peak to peak.
14	Remove 1W13A cord.	SA relay released. No waveform on oscilloscope.
15	Using 1W13A cord, connect COE binding post on CONTROL UNIT to sleeve lead of TEL jack on REMOTE UNIT.	
16	At CTP-8 of REMOTE UNIT— Adjust potentiometer R4 (top) for maximum amplitude.	Maximum amplitude approximately 2.6-2.8 volts peak to peak at 852 Hz.
17	Connect oscilloscope to COE TST binding post of CONTROL UNIT.	Maximum amplitude approximately 2.6-2.8 volts peak to peak.
18	Disconnect all clip leads.	Adjustment of amplitude and frequency of oscillator in REMOTE UNIT now complete.

5. SELF-CHECK SYSTEM FUNCTIONS

5.01 The checks of this part should be performed on a routine basis or whenever trouble is suspected in the test set. These checks should not be performed however if a circuit pack has been replaced. An adjustment (if necessary) of the replaced pack should be performed before proceeding with these checks.

5.02 The checks of this part are arranged to check all of the functions that the test set is intended to perform.

5.03 The following checks are performed and in this order:

- TUR Step Advance and Reset Verifications

SECTION 252-124-302

● Ground-Busy and Battery-Busy Verifications

GROUND BUSY

BATTERY BUSY

● Detector Cross Verification

● COE Verifications

● Pulse Generator Speed Verifications

TUR Step-Scan Oscillator (5.9 PPS)

Reset Oscillator (28.5 PPS)

Register and Traffic Data Converter Test Oscillator (20 and 7 PPS)

● Step and Reset Operations Check Under Detectors Cross Condition

STEP

ACTION

VERIFICATION

● **TUR Step Advance and Reset Verifications**

1 Make connections as shown in Fig. 3.

2 At TUR UNIT and REMOTE UNIT—
Operate BAT A and BAT B keys to on.

BAT A and BAT B lamps lighted.

Note: TOUCH-TONE frequencies are now capable of being transmitted and detected over the telephone DET. 31 cord which simulates an office "talk" circuit.

3 At CONTROL UNIT—
Operate AUTO-OFF-MAN key to AUTO.

At REMOTE UNIT—
SA relay pulses at approximately 6 PPS.
At TUR UNIT TUR relay pulses at approximately 6 PPS.
At CONTROL UNIT—
Register scores once for each TOUCH-TONE pulse generated.

4 At CONTROL UNIT—
Rotate volume control clockwise or counterclockwise until interrupted tone from CONTROL UNIT speaker is clear and distinct.

5 Operate AUTO-OFF-MAN key to MAN.

6 Operate AUTO-OFF-MAN key to OFF and MAN three times while observing SA and TUR relays of Step 3.

SA and TUR relays operated and released for each key operation.

7 Depress RESET key.

At REMOTE UNIT—
TRS relay operated.
At TUR UNIT—
RST relay operated.
At CONTROL UNIT—
Counter unit reset to 00.

8 At TUR UNIT and REMOTE UNIT—
Operate BAT A and BAT B keys to off.

BAT A and BAT B lamps extinguished.

STEP	ACTION	VERIFICATION
9	Remove all connections.	
• Ground-Busy and Battery-Busy Verifications		
1	Make connections as shown in Fig. 3.	
2	At TUR UNIT and REMOTE UNIT— Verify BAT A and BAT B keys off.	BAT A and BAT B lamps not lighted.
3	Remove circuit pack CTP-1 (position 2-9).	
4	Insert 159A extender board into position 2-9.	
5	Attach CTP-1 circuit pack to extender board.	
6	At TUR UNIT and REMOTE UNIT— Operate BAT A and BAT B keys on.	BAT A and BAT B lamps lighted.
7	At TUR UNIT— Set DET switch to 0.	

GROUND-BUSY

8	Using H-400-430 DET. 35 cord, connect one end to GB socket on TUR UNIT and connect socket 0 equipped with 624B tool to frame ground (or ground potential).	At TUR UNIT— DET BSY lamp lighted. GB relay operated. At CONTROL UNIT— Clear and distinct 697-Hz tone heard. Adjust volume control— (Control Unit).
9	At CTP-1 circuit pack of REMOTE UNIT— Adjust potentiometer R13 fully clockwise.	
10	At TUR UNIT— Operate DET switch to positions 1 through 5 simultaneously.	At TUR UNIT— DET BSY lamp not lighted. GB relay nonoperated. At CONTROL UNIT— No tone heard.
11	Remove H-400-430 DET. 35 cord, socket 0 from ground.	
12	At TUR UNIT— Set DET switch to 1.	
13	Using H-400-430 DET. 35 cord, connect socket 1 equipped with 624B tool to frame ground (or ground potential).	At TUR UNIT— DET BSY lamp lighted. GB relay operated. At CONTROL UNIT— Clear and distinct 697-Hz tone heard.

SECTION 252-124-302

STEP	ACTION	VERIFICATION
14	At TUR UNIT— Operate DET switch to positions 0 and 2 through 5.	At TUR UNIT— DET BSY lamp not lighted. GB relay nonoperated. At CONTROL UNIT— No tone heard.
15	Remove H-400-430 DET. 35 cord, socket 1 from ground.	
16	Repeat Steps 12 through 15 for the four remaining positions of DET switch, connecting associated socket of H-400-430 DET. 35 cord to frame ground (or ground potential).	
17	At TUR UNIT and REMOTE UNIT— Operate BAT A and BAT B keys off.	BAT A and BAT B lamps extinguished.
18	Remove all test cords.	
19	Remove circuit pack CTP-1 (position 2-9).	
20	Remove 159A extender board from position 2-9.	
21	Reinsert CTP-1 circuit pack into position 2-9.	

BATTERY-BUSY

22	Using H-400-430 DET. 35 cord, connect one end to BB socket on TUR UNIT and connect socket 0 equipped with 624B tool to frame -48 volts (or -48 volt battery).	At TUR UNIT— DET BSY lamp lighted. BB relay operated. At CONTROL UNIT— Clear and distinct 697-Hz tone heard. Adjust volume control— (Control Unit).
23	At CTP-1 circuit pack of REMOTE UNIT— Adjust potentiometer R13 fully clockwise.	
24	At TUR UNIT— Operate DET switch to positions 1 through 5 simultaneously.	At TUR UNIT— DET BSY lamp not lighted. BB relay nonoperated. At CONTROL UNIT— No tone heard.
25	Remove H-400-430 DET. 35 cord, socket 0 from -48 volts.	
26	At TUR UNIT— Set DET switch to 1.	

STEP	ACTION	VERIFICATION
27	Using H-400-430 DET. 35 cord, connect socket 1 equipped with 624B tool to frame -48 volts (or -48 volt battery).	At TUR UNIT— DET BSY lamp lighted. BB relay operated. At CONTROL UNIT— Clear and distinct 697-Hz tone heard.
28	At TUR UNIT— Operate DET switch to positions 0 and 2 through 5.	At TUR UNIT— DET BSY lamp not lighted. BB relay nonoperated. At CONTROL UNIT— No tone heard.
29	Remove H-400-430 DET. 35 cord, socket 1 from -48 volts.	
30	Repeat Steps 26 through 29 for the four remaining positions of DET switch, connecting associated socket of H-400-430 DET. 35 cord to -48 volts (or -48 volt battery).	
31	At TUR UNIT and REMOTE UNIT— Operate BAT A and BAT B keys off.	BAT A and BAT B lamps extinguished.
32	Remove all test cords.	
33	Remove circuit pack CTP-1 (position 2-9).	
34	Remove 159A extender board from position 2-9.	
35	Reinsert CTP-1 circuit pack into position 2-9.	

• Detector Cross Verification

1	Make connections as shown in Fig. 3.	
2	At TUR UNIT and REMOTE UNIT— Operate BAT A and BAT B keys to on.	BAT A and BAT B lamps lighted.
3	At TUR UNIT— Set DET switch to 0.	
4	Using H-400-430 DET. 35 cord, connect one end to GB socket on TUR UNIT and connect sockets 0 and 1 equipped with 624B tools together.	
5	With sockets 0 and 1 connected together, connect to TUR frame ground (or chassis ground).	At TUR UNIT— GB and XD relays operated. At CONTROL UNIT— Dual tone of 697 Hz and 1447 Hz heard.

SECTION 252-124-302

STEP	ACTION	VERIFICATION
6	Disconnect H-400-430 DET. 35 cord.	
7	Using H-400-430 DET. 35 cord, connect one end to BB socket on TUR UNIT and connect sockets 0 and 1 equipped with 624B tools together.	
8	With sockets 0 and 1 connected together, connect to TUR frame -48 volts (or -48 volt battery).	At TUR UNIT— BB and XD relays operated. At CONTROL UNIT— Dual tone of 697 Hz and 1447 Hz heard.
9	Disconnect H-400-430 DET. 35 cord.	
10	At TUR UNIT and REMOTE UNIT— Operate BAT A and BAT B keys to off.	BAT A and BAT B lamps extinguished.
11	Remove all connections.	
• COE Verifications		
1	Make connections as shown in Fig. 3.	
2	At TUR UNIT and REMOTE UNIT— Operate BAT A and BAT B keys to on.	BAT A and BAT B lamps lighted.
3	Using H-400-430 DET. 35 cord, connect Jones plug to COE-1 jack on TUR UNIT.	
4	Using another H-400-430 DET. 35 cord, connect Jones plug to COE-2 jack on TUR UNIT.	
5	Using H-400-430 DET. 34 cord, connect plug end to COE jack on CONTROL UNIT.	
6	At CONTROL UNIT— Operate AUTO-OFF-MAN key to AUTO.	At REMOTE UNIT— SA relay operated. At TUR UNIT— TUR relay operated. At CONTROL UNIT— CU counter scores continuously.
7	Using H-400-430 DET. 34 cord, connect Mini-Gator clip to each of the 12 ends of the two H-400-430 DET. 35 cord one at a time.	Pulsing and scoring stops whenever contact is made between the two cords.
8	At TUR UNIT and REMOTE UNIT— Operate BAT A and BAT B keys to off.	BAT A and BAT B lamps extinguished.
9	Remove all connections.	

STEP	ACTION	VERIFICATION
• Pulse Generator Speed Verifications		
TUR Step-Scan Oscillator (5.9 PPS)		
1	Make connections as shown in Fig. 3.	
2	At TUR UNIT— Connect oscilloscope to TUR-U relay.	
3	At TUR UNIT and REMOTE UNIT— Operate BAT A and BAT B keys to on.	BAT A and BAT B lamps lighted.
4	At CONTROL UNIT— Operate AUTO-OFF-MAN key to AUTO.	Generator pulses at approximately 6 PPS.
5	Operate AUTO-OFF-MAN key to OFF.	
Reset Oscillator (28.5 PPS)		
6	Disconnect oscilloscope from TUR relay.	
7	Connect oscilloscope to CTP-1 (position 2-9) terminal 6.	
8	At CONTROL UNIT— Depress RESET key.	At REMOTE UNIT— TRS relay operated. At TUR UNIT— RST relay operated. At oscilloscope— Square-wave output observed.
9	Disconnect oscilloscope.	
Register and Traffic Data Converter Test Oscillator (20 and 7 PSS)		
10	Connect oscilloscope to RT-L relay.	
11	At TUR UNIT— Operate TDC-OFF-REG key to REG.	RT relay pulses. At oscilloscope— Square-wave output of approximately 18.5 PPS observed.
12	At TUR UNIT— Operate TDC-OFF-REG key to TDC.	RT relay pulses. At oscilloscope— Square-wave output of approximately 7 PPS observed.
	Note: The pulsing for Steps 11 and 12 is generated by circuit pack CTP-2 (position 1-9) in TUR UNIT.	

SECTION 252-124-302

STEP	ACTION	VERIFICATION
● Step and Reset Operations Check Under Detectors Cross Condition		
1	Make connections as shown in Fig. 3.	
2	At TUR UNIT and REMOTE UNIT— Operate BAT A and BAT B keys to on.	BAT A and BAT B lamps lighted.
3	At TUR UNIT— Set DET switch to 0.	
4	Using H-400-430 DET. 35 cord, connect Jones plug to GB jack on TUR UNIT and connect sockets 0 and 1 equipped with 624B tools together.	
5	With sockets 0 and 1 connected together, connect to TUR frame ground (or ground potential).	At CONTROL UNIT— Detector cross tone heard.
6	At CONTROL UNIT— Operate AUTO-OFF-MAN key to AUTO.	At TUR UNIT and REMOTE UNIT— TUR and SA relays, respectively, pulse in synchronism.
7	At CONTROL UNIT— Depress RESET key several times while observing RST relay in TUR UNIT.	At TUR UNIT— RST relay operates each time RESET key of CONTROL UNIT depressed.
8a	If verification of either Step 6 or 7 or both is not obtained— Recheck amplitudes of oscillators in CTP-8 packs of TUR UNIT and REMOTE UNIT.	
9a	Check CTP-5 packs of TUR UNIT and REMOTE UNIT for generation of a square wave.	
10	At TUR UNIT and REMOTE UNIT— Operate BAT A and BAT B keys to off.	BAT A and BAT B lamps extinguished.
11	Remove all connections.	

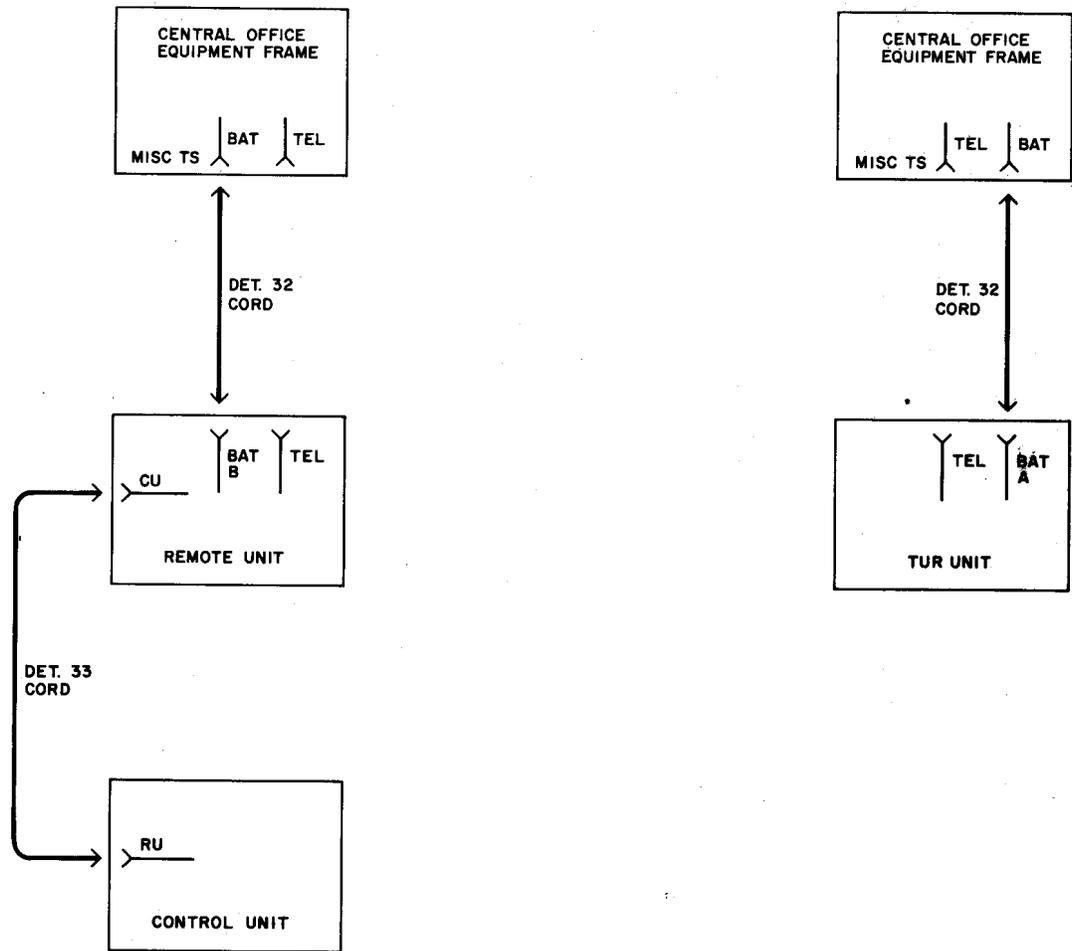


Fig. 2—Preparation of Inter-Unit Cord Connections (Power Check and Frequency Adjustments)

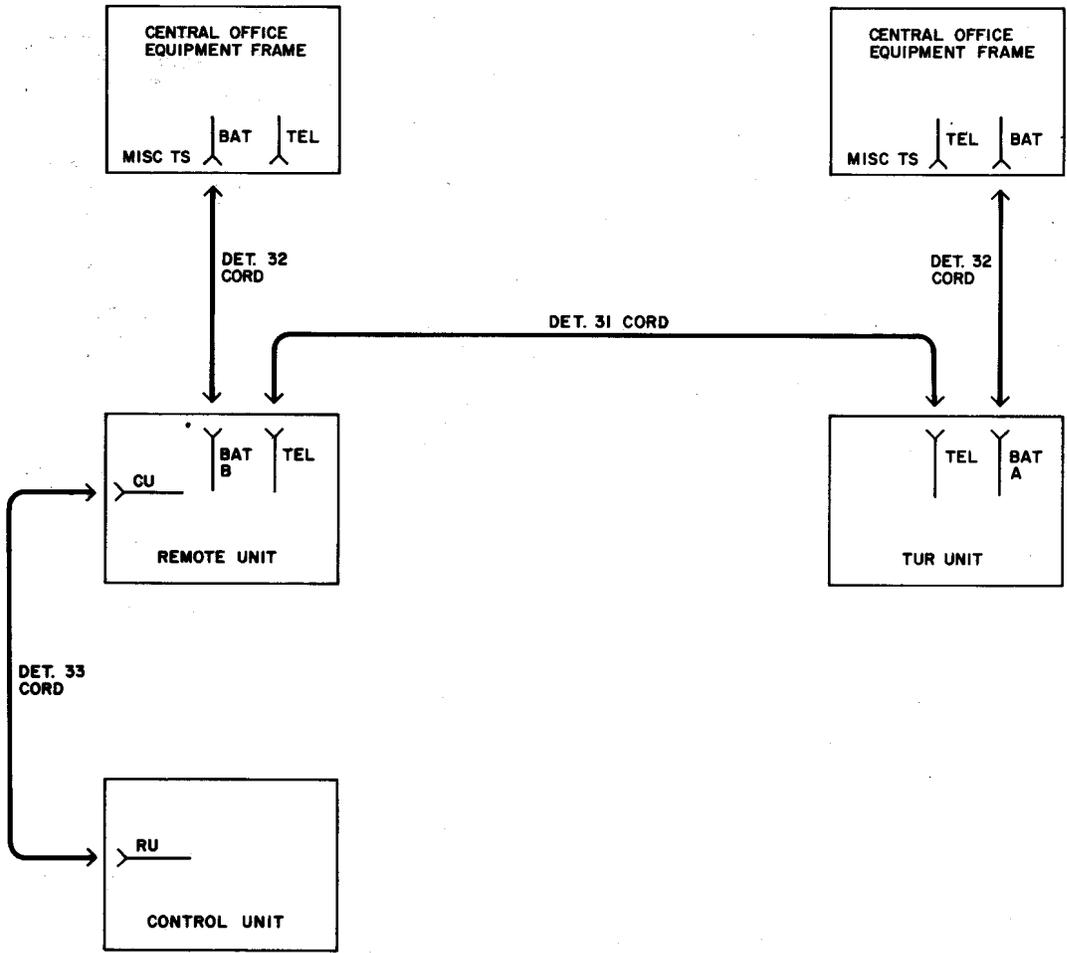


Fig. 3—Inter-Unit Cord Connections-for-(Amplitude Adjustments and System Checks)