

MINI-ROTL
 RESPONDER ALIGNMENT

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1. GENERAL INFORMATION

1.1 Description

1.11 This section provides the alignment procedure for the Responder circuit packs within the Mini-ROTL unit.

1.2 Sequence of Operation:

The tests of this section are arranged for ease of isolating troubles and are to be performed in the sequence specified and must be performed prior to the tests per Section 613.04.

1.3 Precautions and Notes

PRECAUTION 1: TO PREVENT DAMAGE TO THE CIRCUIT IT IS IMPERATIVE THAT THE CP NUMBER AGREE WITH THE CP NUMBER OF THE TRAY LOCATION USED. ANY MISMATCH OF PACK AND CONNECTOR MAY CAUSE SERIOUS DAMAGE.

PRECAUTION 2: WHEN CIRCUIT PACKS ARE REMOVED FOR ANY REASON, OR WHEN THE EXTENDER IS USED, EXTREME CARE MUST BE USED IN REPLACING THEM TO PREVENT BENDING OF THE BACKPLANE PINS. THE PINS IN THE BACKPLANE ARE SOMEWHAT FRAGILE AND ARE EASILY BENT. THE CIRCUIT PACK SHOULD BE SLID INTO ITS SLOT UNTIL THE PINS OF THE BACKPLANE BEGIN TO ENGAGE THE CIRCUIT PACK CONNECTOR. USING EVEN THUMB PRESSURE ON BOTH OF THE CARD EJECTORS, ENGAGE THE PINS OF THE BACKPLANE WITH THE CIRCUIT PACK CONNECTOR. IT WILL SLIDE SMOOTHLY WITH A PERCEPTIBLE TENSION AS THE PINS AND CONNECTOR ARE ENGAGED. WHEN PROPERLY SEATED THE CARD EJECTORS WILL ALMOST REST AGAINST THE HOUSING.

NOTE 1: Refer to Paragraph #6.1 before doing the responder alignment.

2. RECORDS AND REQUIREMENTS

2.1 Records

2.11 Results of tests covered in this section shall be recorded on Form SD-97-1313 and summarized on Form SD-97-1315.

2.2 Requirements

2.21 Test in this section meet requirements of SD and CD information.

3. TEST EQUIPMENT

3.1 Test Sets

<u>Amt</u>	<u>ITE</u>	<u>Description</u>
1	R-1005	Jewelers Screwdriver Set
1	5706	Reference Level Test Set (Wilcom T105B)
1	5945	ROTL Test Accessory Set
1	5469	Execuport
	or	
1	5689	Model 43 TTY
T1	92A	Control Unit
	or	
1	6164	Control Unit
	or	
1	5462	ROTL System Test Set
	or	
T1	H310-150	ROTL System Test Set
	T -	Use Telephone Company Equipment when available.

3.2 Spare Packs Package

<u>Amt</u>	<u>Code</u>	<u>Description</u>
1	SPP-838 LIST-2	ROTL Spare Packs Package

4. TEST SETUP INFORMATION

4.1 Execuport (ITE-5469)

4.11 Set the switches on the Execuport to the following positions:

<u>SWITCH</u>	<u>POSITION</u>
MODE	ISOLATE
DUPLEX	FULL
CHAR/SEC	10
PARITY	ODD
QSL	UPPER
LINE SPACING SWITCH	Back (two-position slide switch mounted on right side of paper roll)
POWER	ON (on back)

NOTE: If the line Spacing Switch is between positions, paper may spew out. Therefore, be certain the switch is secure in the back position.

4.12 Using an ITE-9868B cord, connect one end to the Terminal Connector on the back of the EXECUPORT and connect the other end to the EIA connector on the ROTL-3 Central Control Unit.

4.13 Using the power cord supplied, connect the EXECUPORT to an AC outlet.

4.2 Model 43 TTY (ITE-5689, List 3)

4.21 Set the switches on the Model 43 TTY to the following positions:

<u>Switch</u>	<u>Position</u>
Duplex	Full (DN)
CPS	10 (DN)
Parity	(DN)
Caps Lock	(DN)

4.22 The ITE-9868B cord is required to make a connection between the Model 43 TTY and EIA Connector on the CCU. In addition, Terminals 5, 6 and 8 on the

Model 43 end of the cord should be strapped together. Mark the cord "modified for Model 43 TTY."

4.23 Connect the power cord to an AC outlet.

4.3 ROTL System Test Set ITE-5462 or H-310-150

4.31 Set the switches as follows:

<u>SWITCH</u>	<u>POSITION</u>
Test preparation	100-0-900
Test Request	MEAS-ALL
Select	EXPANDED
DB Pads	NORMAL (No digits showing)
INT START	OFF
MFO	AUTO
ROS	HOLD
TST	ON HOOK
MF Digits	(as specified per each test)

NOTE: Any ROTL system test set MF digit thumbwheel switches not used must be set to OFF.

4.32 Using an ITE-9601 cord, connect the test set -48V INPUT jack to the the -48V jack on a near-by frame.

4.33 Using an ITE-9601 cord, connect the T & R jack on the test set to a subscriber line appearance.

4.34 RSTS lamps MEAS, NEW, N-E/F-N, CHK-2 are lit.

4.35 Operate the TST key to the OFF HOOK position, operate the ROS key to the DIAL position. Dial tone is heard from the speaker.

4.36 Dial the ROTL directory number.

4.37 If 15 seconds of TPT is heard, means a successful connection. Operat the ROS key to HOLD position.

4.38 If 60 or 120 IPM low tone is heard means an unsuccessful connection. Try again.

- 4.4 ITE-6164 or 92A Control Unit
- 4.41 Connect the power cord from the Control Unit to a 110 volt AC outlet.
- 4.42 Connect a subscriber line circuit (which has access to the ROTL Dial Up Line) to the Loop connector on the Control Unit with the 225A adapter.
- 4.43 Set the power switch to the "ON" position and momentarily depress the "RST" button.
- 4.44 Set the controls as indicated in Table 1, below.

TABLE 1

SWITCH POSITIONS FOR TRANSMISSION AND REMOTE OUTGOING TRUNK TESTS

SWITCH	POSITION
TOUCH-TONE/DIAL PULSE	TOUCH-TONE
ON-HOOK/OFF-HOOK	ON-HOOK
T-PADS	OFF, NO NUMBERS SHOWING
MONITOR	LOOP
MBO/NORM	NORM
SMALL/EXP	EXP
AUTO/MAN	AUTO
MEAS/SC	SC
VOL	UP

- 4.45 The controls and indicators for the Control Unit are shown in Figure 1 and a description of the function of each control/indicator is given in Table 2.

FIG. 1 CONTROL UNIT

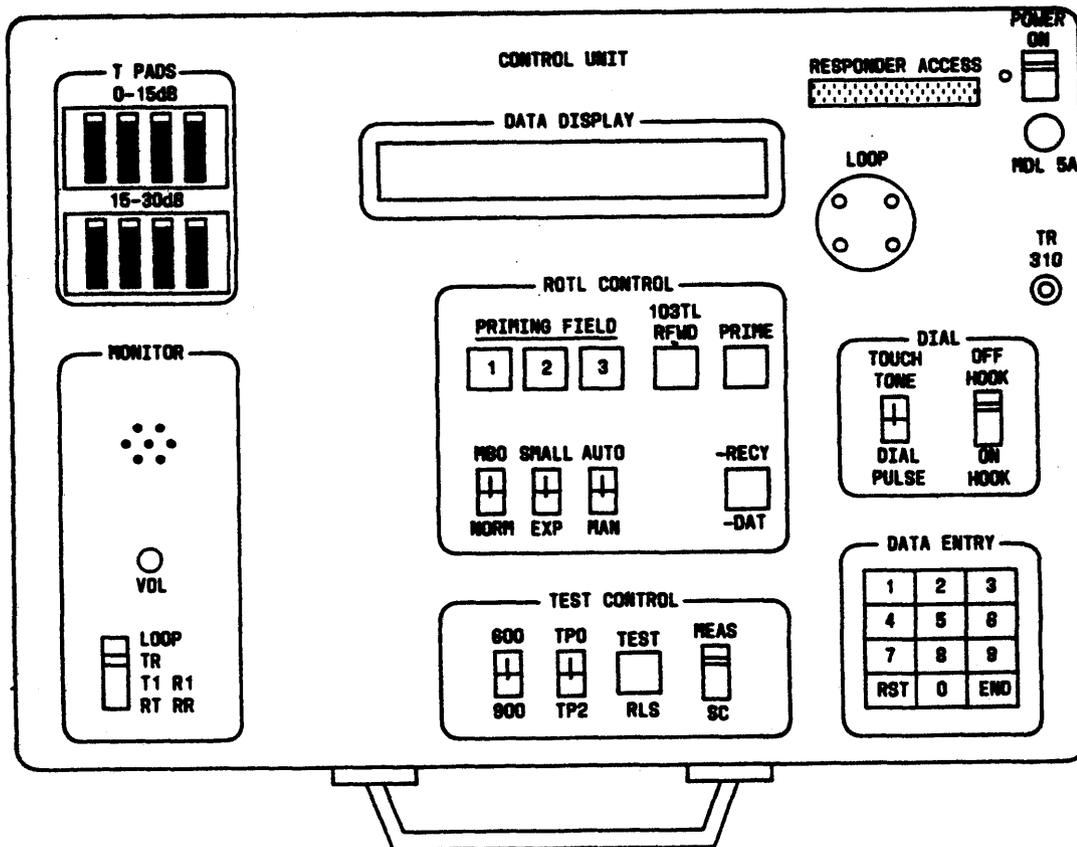


TABLE 2
CONTROLS AND INDICATORS

FUNCTION	CONTROL/INDICATOR		
	NAME	TYPE	FUNCTION
DATA DISPLAY		Numeric (LED)	Displays: Keypad entry information Contents of PRIMING FIELDS 1,2 and 3 Decoded transmission measurement results for the near-end and far-end while they are being made and the selected test code 52A responder test codes 52A responder measurements results Steps (1-5) showing the measurement progress of the 52A responder Negative sign to indicate that the release relay (RL) or release make-busy relay(RLMB) in the 52A responder is operated
ROTL CONTROL	PRIMING FIELD	Pushbutton	Used to enter data into PRIMING FIELDS 1, 2, and 3
	T03TL RFWD	Pushbutton	Causes a 100 ms burst of 1300 Hz to be transmitted by control unit
	PRIME	Pushbutton	Causes MF digits (tones) in PRIMING FIELDS to be outpulsed
	MBO/NORM	Slide	Overrides maintenance-busy trunks in MBO position
	SMALL/EXP	Slide	Selects small or expanded ROTL
	AUTO/MANUAL	Slide	Allows the entire PRIMING FIELD or one digit at a time to be outpulsed
	-RECY/-DAT	Pushbutton	Recycles ROTL unit. Drops ROTL connections if held for 2 seconds or longer.
TEST CONTROL	600 /900	Slide	Selects trunk impedance
	TPO/TP2	Slide	Selects transmission level point
	TEST	Pushbutton	Initiates testing; sends release when display is blank
	MEAS/SC	Toggle	Selects trunk transmission measurements or responder self-check tests
DATA ENTRY	Key pad	Pushbuttons	Used to enter data into unit and TOUCH-TONE control
	END	Pushbutton	Stops a test sequence; edits (deletes) last digit entered
	RST	Pushbutton	Stops a test and clears the DATA DISPLAY and PRIMING FIELDS 1, 2 and 3
DIAL	TOUCH-TONE/DIAL PULSE	Slide	Selects TOUCH-TONE or DIAL PULSE dialing mode
	ON-HOOK/OFF-HOOK	Toggle	Causes the control unit to go either OFF-HOOK or ON-HOOK to the DDD network
T-PADS	Attenuators	Slide	Allows manual insertion of up to 30 dB of loss to test the sensitivity of the ROTL tone detectors
MONITOR	VOLUME		Controls loudspeaker output
	LOOP/T-R/T1-R1/RT-RR		Connects MONITOR amplifier to designated signal pair for monitoring T1-R1, T-R and RT-RR positions monitor transmission leads from the 52A responder and LOOP monitors tones via the DDD network

TABLE 2 (Cont'd)
CONTROLS AND INDICATORS

FUNCTION	CONTROL/INDICATOR		
	NAME	TYPE	FUNCTION
	RESPONDER ACCESS	Connector	Connects umbilical cord from control unit to alignment pack. The alignment pack plugs in the 52A responder
	LOOP ACCESS	Connector	Connects control unit to the DDD network
	TR 310	Jack	Used for on-site ROTL maintenance activities
	POWER	Toggle	Controls power to control unit

4.5 Reference Level Test Set (ITE-5706)

4.51 600 Ohm OTLP

(600 ohm zero Transmission level Point) Set the Meter Switches as follows:

<u>SWITCH</u>	<u>POSITION</u>
Meter Range	<u>+.1DB</u>
Input Level (-30 to +10)	0
(-9 to 0)	0
(-.9 to 0)	0
Input	600 ohm DBM
	TERM
Function	MEAS INPUT
Output	OFF

4.52 900 Ohm OTLP

Set Meter Switches as follows:

<u>SWITCH</u>	<u>POSITION</u>
Meter Range	<u>+.1DB</u>
Input Level (-30 to +10)	0
(-9 to 0)	0
(-.9 to 0)	0
Input	900 ohm DBM
	TERM
Function	MEAS INPUT
Output	OFF

4.53 Using the cord supplied with the test set, connect the reference level test set to an AC outlet.

4.54 All connections between the ITE-5706 and the ROTL jacks are to be made using the low loss cord provided with set.

4.6 ROTL Test Panel (CP-10)

Verify that the switches on CP-10 are all down.

5. RESPONDER ALIGNMENT

This procedure precisely sets the output level of tones used for transmission measurement and precisely adjusts the tone detection circuitry. ITE-5469 or ITE-5689 and ITE-5706 are used for this test.

NOTE 1: The Millisecond Answers obtained during the following tests may vary 0.1 to 0.2 ms. This variance is normal. However, the variation must be within the limits specified.

NOTE 2: Operate the HLT switch when it is desired to stop the printout the DIAG ENAB switch must also be operated. Restore the HLT switch to continue.

5. RESPONDER ALIGNMENT (Cont'd)

ID	PRINTOUT	ACTION	TROUBLE
E1	* MONITOR RUNNING * STATE REQUEST AL 01 'RETURN' * TURN POWER OFF * PLACE CP5 IN EXTENDER * TURN POWER BACK ON * REQUEST ALIGN 01 * HIT SPACE WHEN DONE * HIT A TO ABORT	Follow proper circuit pack replacement procedures to put CP5 in the Extender. NOTE: The pots on the circuit pack are 35 turn pots, and may require 10 to 20 turns to detect a change.	
A	* MONITOR RUNNING * STATE REQUEST		
E2	AL 01 'RETURN' * TURN POWER OFF * PLACE CP5 IN EXTENDER * TURN POWER BACK ON * REQUEST ALIGN 01 * HIT SPACE WHEN DONE * HIT A TO ABORT		
E3	'SPACE BAR' * CONNECT LEVEL METER ON T,R, JACK * SET METER FOR 600 OTLP * HIT SPACE WHEN DONE * HIT A TO ABORT	See Para. 4.2 for ITE-5706 meter settings and connections.	
E4	'SPACE BAR' * ADJUST 1KHZ(0) POT (R72) FOR ODBM+.01 METER READING. * HIT SPACE WHEN DONE * HIT A TO ABORT	Adjust MW POT, R72 on CP5, CW to increase reading or CCW to decrease reading.	Reading is not obtained. 1) Replace CP5. To test Request Align 01, begin with Entry E2. 2) Replace CP6
E5	'SPACE BAR' * ADJUST 1KHZ (-16) (R71) FOR -16 DBM+ .01 METER READING * HIT SPACE WHEN DONE * HIT A TO ABORT	Reset ITE-5706 for -16DB input level. Adjust the 1kHz pot, R71 on CP5, CCW to increase reading or CW to decrease reading.	Reading is not obtained: Replace CP5. To test Request Align 01, begin with Entry E2.
E6	'SPACE BAR' * ADJUST 2.8 KHZ POT (R69) FOR -16 DBM+ .01 DB METER READING * HIT SPACE WHEN DONE * HIT A TO ABORT	Adjust the 2,8 kHz pot, R69, on CP5, CCW to increase reading or CW to decrease reading.	Reading is not obtained. Replace CP5. To test Request Align 01, begin with Entry E2.

5. RESPONDER ALIGNMENT (Cont'd)

ID	PRINTOUT	ACTION	TROUBLE
E7	'SPACE BAR' * ADJUST 400 HZ POT (R73) to -16 DB+.01 METER READING * HIT SPACE WHEN DONE * HIT A TO ABORT	Adjust the 400 Hz pot, R73, on CP5, CW to increase or CCW to decrease reading.	Reading is not obtained. Replace CP5. To test Request Align 01, begin with Entry E2.
E8	'SPACE BAR' * OPTIONAL STEP CHECK FOR 23 DBRNC +0.2 METER READING * HIT SPACE WHEN DONE * HIT A TO ABORT	This level is verified in a subsequent test, continue.	
E9	'SPACE BAR' -14 * ADJUST 2804 POT (R70) TO -14 DBM+.01 METER READING * HIT SPACE WHEN DONE * HIT A TO ABORT	Reset ITE-5706 for -14DB input level. Adjust the -14 DMB pot, R70 on CP5, CW to increase or CCW to decrease reading. NOTE: The final setting of pot R70 is made later in this test. When re-checking, this answer may be out-of-limits.	Answer is not in limits, Replace CP5. To test Request Align 01.
E10	'SPACE BAR' * TEST OF 900 OHM PAD * SET METER FOR 900 OHMS OTLP, METER SHOULD REQD 0 DBM +.02 * HIT SPACE WHEN DONE * HIT A TO ABORT	See Para. 4.2 for meter settings and connections.	When using the ITE-5706 Wilcommeter this reading is typically high (approx. +0.02 to +0.03), ignore this slight overrun, it is because of the meter.
E11	'SPACE BAR' * TEST OF 2 DB PAD * SET METER TO 600 OHMS METER SHOULD READ -2 DBM+.02 * HIT SPACE WHEN DONE * HIT A TO ABORT	Reset ITE-5706 for -2DB input level at 600 ohm termination.	
E12	'SPACE BAR' * TURN POWER OFF * PLACE CP6 IN EXTENDER * TURN POWER BACK ON * REQUEST ALIGN 02 * HIT SPACE WHEN DONE * HIT A TO ABORT * MONITOR RUNNING * STATE REQUEST	Follow proper circuit pack replacement procedures to remove extender from CP5 (reinsert CP5) and place CP6 on the extender.	
E13	AL 02 'RETURN' * TURN POWER OFF * PLACE CP 6 IN EXTENDER * TURN POWER BACK ON * REQUEST ALIGN 02 * HIT SPACE WHEN DONE * HIT A TO ABORT		

5. RESPONDER ALIGNMENT (Cont'd)

ID	PRINTOUT	ACTION	TROUBLE
E14	'SPACE BAR' * CONNECT LEVEL METER ONTO MWR JACK * SET METER FOR 600 OHMS OTLP * HIT SPACE WHEN DONE * HIT A TO ABORT	See Para. 4.2 for ITE-5706 meter settings and connections.	
E15	'SPACE BAR' * ADJUST REF POT R52 FOR 0 DBM+.01 METER READING * HIT SPACE WHEN DONE * HIT A TO ABORT	Adjust pot R52 on CP6, CW to increase or CCW to decrease reading. After reading is obtained, disconnect the level meter.	Reading cannot be obtained, replace CP6. To test Request Align 01, begin with Entry E1
E16	'SPACE BAR' STRAP MWR JACK TO T,R JACK * HIT SPACE WHEN DONE * HIT A TO ABORT	Use ITE-5954 plug to strap jacks.	
E17	'SPACE BAR' * REF ANS SHOULD BE 319 MS+40MS * REF ANS IS * XXX.X MS * REMOVE STRAP FROM MWR TO TR JACK * HIT SPACE WHEN DONE * HIT A TO ABORT	Note Ref. Ans. Remove the strap from MWR jack to TR jack.	Reference answer is not in limits: Replace CP7. To test Request Align 02, begin with Entry E13.
E18	'SPACE BAR' * ADJUST 600 OHM POT R50 SO ANS=REF+.2MS * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .	Adjust R50 on CP6 CCW to increase or CW to decrease reading. Answer printout is obtained approx. once a second.	A) Answer is not in limits, replace CP6. To test Request AL 02, begin with Entry E13. B) Answer is 3 MS+1MS, Remove strap from MWR jack to T,R jack.
E19	'SPACE BAR' * ADJUST 900 OHM POT R51, SO ANS=REF+0.2 MS * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .	Adjust pot R51 on CP6 CCW to increase or CW to decrease reading.	Answer is not in limits, replace CP6. To test Request AL 02, be-AL 02, begin with Entry E13.

5. RESPONDER ALIGNMENT (Cont'd)

ID	PRINTOUT	ACTION	TROUBLE
E20	'SPACE BAR' * TURN POWER OFF * PLACE CP7 IN EXTENDER * TURN POWER BACK ON * REQUEST ALFIGN 03 * HIT SPACE WHEN DONE * HIT A TO ABORT	Following proper circuit pack replacement procedures remove CP6 from the extender (reinsert CP6) from the extender (reinsert CP6) and place CP7 in the extender.	
E21	AL 03 'RETURN' * TURN POWER OFF * PLACE CP7 IN EXTENDER * TURN POWER BACK ON * REQUEST ALIGN 03 * HIT SPACE WHEN DONE * HIT A TO ABORT	NOTE: Some packs may require some of the pots to be adjusted 10 to 20 turns to detect a variation with the present meter settings. These pots are 35 turn pots.	
E22	'SPACE BAR' * STRAP MWR JACK TO T,R JACK * HIT SPACE WHEN DONE * HIT A TO ABORT	Use ITE-5954 Plug to strap jacks.	
E23	'SPACE BAR' * ADJUST LOSS GAIN POT (R48) FOR 99 MS+0.2 MS * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .	Adjust pot R48 on CP7 CCW to decrease or CW to increase reading.	Answer is not in limits, replace CP7. To Request AL03, begin with Entry E21.
E24	'SPACE BAR' * SET TM CONST POT (R47) FOR READING 419.0+0.2 MS * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .	Adjust pot R47 on CP7 CCW to decrease or CW to increase reading (See Note for Entry E21).	Answer is not in limits, CP7. To test request AL03, begin with Entry 21.
E25	'SPACE BAR' * ADJUST LOSS GAIN POT (R48) FOR 99 MS+0.2 MS * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .	Adjust pot R48 on CP7 CCW to decrease or CW to increase reading	

5. RESPONDER ALIGNMENT (Cont'd)

ID	PRINTOUT	ACTION	TROUBLE
E26	'SPACE BAR' * SET TM CONST POT (R47) FOR READING OF 419.0+0.2 MS * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .	Adjust pot R47 on CP7 CCW to decrease or CW to increase reading	
E27	'SPACE BAR' * ADJUST LOSS GAIN POT (R48) for 99 MS+0.2 MS * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .	Adjust pot R48 on CP7 CCW to decrease or CW to increase reading	
E28	'SPACE BAR' * SET TM CONST POT (R47) FOR READING OF 419.0+0.2 MS * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .	Adjust pot R47 on CP7 CCW to decrease or CW to increase reading. NOTE: If R47 and R48 were adjusted during entires E27 and E28, abort the test and request AL 03 begin with Entry 21. When this alignment is correct pots R47 and R48 should not have to be adjusted for E27 and E28.	
E29	'SPACE BAR' * ADJUST REF ADJ. POT (R50) FOR READ- ING OF 319 MS+.2 * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .	Adjust pot R50 on CP7 CW to in- crease or CCW to decrease reading.	Answer is not limits, replace CP7. To test request AL03, begin with Entry E21.
E30	'SPACE BAR' * REMOVE STRAP FROM MWR TO T,R JACK * HIT SPACE WHEN DONE * HIT A TO ABORT	Remove strap from MWR to TR jack.	

5. RESPONDER ALIGNMENT (Cont'd)

ID	PRINTOUT	ACTION	TROUBLE
E31	'SPACE BAR' * ADJUST NOISE GAIN POT (R52) to 19 MS +.3 MS * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .	Adjust pot R52 on CP7 CW to increase or CCW to decrease reading. NOTE: This reading may fluctuate between the upper and lower limits. The fluctuations should not be outside the specified limits.	Answer is not in limits, replace CP7. To test Request AL 03, begin with Entry E21.
E32	'SPACE BAR' * STRAP MWR JACK TO T,R JACK * HIT SPACE WHEN DONE * HIT A TO ABORT	Use ITE-5954 plug to strap jacks.	
E33	'SPACE BAR' * SET LL GAIN POT (R51) FOR READING OF 419 +0.2 MS * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .	Adjust pot R51 on CP7 CCW to increase or CW to decrease reading.	Answer is not in limits, replace CP7. To test request AL 03, begin with Entry E21.
E34	'SPACE BAR' * REMOVE STRAP FROM MWR TO T,R JACKS * HIT SPACE WHEN DONE * HIT A TO ABORT	Remove strap from MWR to TR jack.	
E35	'SPACE BAR' * CHECK FOR READING OF 3 MS+1. * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .		Answer is not in limits, replace CP7. To test request AL 03, begin with Entry E21.
E36	'SPACE BAR' * CHECK FOR READING OF 19 MS+1.0 * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . . .		Answer is not in limits, replace CP7. To test request AL 03, begin with Entry E21.

5. RESPONDER ALIGNMENT (Cont'd)

ID	PRINTOUT	ACTION	TROUBLE
E37	'SPACE BAR' TEST OF NOTCH FILTER * ANSWER SHOULD BE 3 MS+1 * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . .		Answer is not in limits, CP7. To test request A1 03, replace begin with Entry E21.
E38	'SPACE BAR' * TURN POWER OFF * PLACE CP5 IN EX- TENDER * TURN POWER BACK ON * REQUEST ALIGN 10 * REMOVE STRAP FROM MWR TO T,R JACK * HIT SPACE WHEN DONE * HIT A TO ABORT * MONITOR RUNNING * STATE REQUEST	Following proper circuit pack replacement procedures, remove CP7 from the extender, reinsert CP7, and put CP5 in extender. Remove strap from MWR jack to TR jack, unless this was done at E34.	
E39	AL 10 'RETURN' * TURN POWER OFF * PLACE CP5 IN EX- TENDER * TURN POWER BACK ON * REQUEST ALIGN 10 * REMOVE STRAP FROM MWT REF TO T,R JACKS * HIT SPACE WHEN DONE * HIT A TO ABORT	Remove strap from MWR to TR jack, unless done previously.	
E40	'SPACE BAR' * ADJUST POT R70 FOR READING OF 83 MS +0.2 * HIT SPACE WHEN DONE * HIT A TO ABORT * XXX.X MS * XXX.X MS . .	Adjust pot R70 on CP5 CW to in- crease or CCW to decrease reading.	
E41	'SPACE BAR' * TURN POWER OFF * RETURN ALL CPS TO NEST * TURN POWER BACK ON * REQUEST ALIGN 11 * HIT SPACE WHEN DONE * HIT A TO ABORT	Following proper circuit pack re- placement procedures, remove CP5 from the extender and re insert CP5.	
E42	A	Disconnect the TTY from the ROTL, test completed.	

6. ALIGNMENT CHECK

- 6.1 One pass of this test is to be made with no adjustment. If this test passes, the Responder Alignment is not required. A connection appraisal line must be available for this test, because a 105 test line must be accessed for this test.
- 6.11 This test may be performed using an ITE-6164 or a 92A Control Unit as described in Paragraph 6.12 or with a ROTL System Test Set ITE-5462 or H-310-150 as described in Paragraph 6.13.
- 6.12 Alignment check using an ITE-6164 or a 92A Control Unit.
- 6.121 Setup information is described in Paragraph 4.4.
- 6.1211 On the Control Unit, momentarily depress the RST button.
- 6.1212 Set the 900/600 switch to the trunk impedance and switch TPO/TP2 to the trunk transmission level point.
- 6.1213 Momentarily depress the PF1 button, enter digits 65 into Data Display using the Data Entry key pad. Momentarily depress the PF2 button, enter the "105 Far End Test Line" number into Data Display using the Data Entry key pad. The "Far End Test Line" must be a 105 type with a functional responder.
- 6.1214 Set the ON-HOOK/OFF-HOOK switch to the OFF-HOOK position. Dial tone is heard from the test set speaker.
- 6.1215 Enter the directory number of the ROTL access line in Data Display using the

Data Entry key pad. The ROTL unit will answer by returning TPT (test progress tone, 2225-Hz). Wait for the TPT to end. The ROTL unit will time out in 3 minutes unless it is recycled.

- 6.1216 Momentarily depress the Prime Button. MF tones followed by a short burst of TPT are heard from the test set speaker. After 2 bursts of TPT is heard, continue on to Paragraph 6.1217.
 - 6.1217 Enter the test code from Table 4 using the Data Entry key pad.
 - 6.1218 Momentarily depress the test button. The test results are displayed on the Data Display.
- NOTE 1: The End button must be momentarily depressed and a new code must be entered for each test except when 0 was entered initially.
- NOTE 2: All test codes (except 0) will be repeated continuously until the ROTL is timed out, recycled, or dropped.
- NOTE 3: To perform other tests, depress the End key and repeat from Paragraph 6.1217. To test another trunk, momentarily depress -RECY/-DAT button and repeat from Paragraph 6.1212. The test sequence is terminated by continuing on to Paragraph 6.1220.
- 6.1219 The allowable self check values are listed in Table 4

TABLE 4
BASIS TEST CODES

TEST CODE	OPERATION	ALLOWABLE SELF-CHECK VALUES ACCEPTABLE IF LESS THAN
BLANK	Responder release is sent to the responder by press TEST button.	
0	Tests 1 thru 10 below. Press TEST to advance to the next test.	
1	Level 0 dBm @ 1000 Hz	0.2
2	Noise (quite term)	2
3	L400 -16 dBm @ 400 Hz	0.3
4	L1000 -16 dBm @ 1000 Hz	0.3
5	L2800 -16 dBm @ 2800 Hz	0.3
6	C notched noise	2
7	ERL balance	2
8	SRL balance	2
9	SRLHI balance	2
10	Flat level -16 dBm	0.3

- 6.1220 Depress the -RECY/-DAT button for at least 2 seconds.
- 6.1221 Set the ON-HOOK/OFF-HOOK switch to the ON-HOOK position.
- 6.1222 Set the POWER switch to the OFF position.
- 6.1223 Disconnect the cord to the subscriber line circuit. The test is completed.
- 6.1224 If the readings were not within the requirements described in Paragraph 6.1219, try a different "105 Far End Test Line" and compare the difference. If the "Alignment Check Test" does not meet the requirements, the Alignment Procedure of Paragraph 5 must be applied.
- 6.13 Alignment check using a ROTL System Test Set, ITE-5462 or H-310-150.
- 6.131 Setup information is described in Paragraph 4.3.
- 6.1311 Select the proper position on the TEST PREPARATION switch, as listed in Table 5, to perform a 105 type transmission test. The transmission level point (0 or 2db) and the impedance of the trunk under test (600 or 900 ohms) should be supplied by the operating company.

TABLE 5

TEST PREPARATION SWITCH POSITION	DESCRIPTION OF POSITIONS		
	TYPE OF FAR END TEST LINE	TRANSMISSION LEVEL POINT OF THE NEAR END OF THE TRUNK	IMPEDANCE OF THE TRUNK
100-0-600	100	0	600
100-0-900	100	0	900
100-2-600	100	-2	600
100-2-900	100	-2	900
102-0-600	102	0	600
102-0-900	102	0	900
102-2-600	102	-2	600
102-2-900	102	-2	900
105-0-600	105	0	600
105-0-900	105	0	900
105-2-600	105	-2	600
105-2-900	105	-2	900

- 6.1312 Set the TEST REQUEST switch in the SCK-ALL position so that a self check between responders can be made.

- 6.1313 Set the MF thumbwheel switch's to KP, 65, the telephone number which will access a 105 Far End Test Line and a ST. The remainder of the switch's should be in the OFF position.
- 6.1314 Operate the TST key to the OFF-HOOK position, operate the ROS key to the DIAL position. Dial tone is heard from the test set speaker.
- 6.1315 Dial the ROTL access number. If approximately 15 seconds of TPT (tone) is heard, means a successful connection. Operate the ROS key to the HOLD position.
- 6.1316 If 60 IPM or 120 IPM busy tone is heard, means an unsuccessful connection, try again, starting at Paragraph 6.1314.
- 6.1317 Momentarily operate the RECYCLE switch, a short burst of TPS tone is heard.
- 6.1318 Momentarily operate the START MF switch. After all the digits have been transmitted and the ROTL equipment has outputted, verify that a short burst of TPT is heard, followed by two short bursts of TPT. This is an indication that the test line has been seized.
- 6.1319 Perform the tests of Table 6 noting the results as specified in the Table and associated notes. If lamp OLD lights at the beginning of test (indicating that far-end Responder is OLD 51-8 type) the test set will stop after step 5. The audible indications described in step 5 will not be heard.
- 6.1320 At the conclusion of the tests of Table 6 momentarily operate switch DATA RCV. Lamps ON, NOISE (or NOISE-TONE), DATA RDY, OLD (if lighted) and FE-NF are extinguished and lamps START INT, SCK, NEW, NE-FN and CHK2 are lighted. Operate switch START INT to OFF position. Lamp START INT is extinguished. Momentarily operate switch DATA RCV. Data display shows all zeros (000). Operate switch TEST REQUEST to position MEAS ALL. Lamps SCK is extinguished and lamp MEAS is lighted.

6.1321 A deviation of 0 means perfect alignment and a deviation of .1 is acceptable. A deviation of .2 or more is unacceptable, except for gain-slope (400, 1KHZ, 2,8KHZ) and C notched noise measurements. If the readings are not within requirements, try a different "105 Far End Test Line". If the "Alignment Check Test" does not meet the requirements, the Alignment Procedure of Paragraph 5 must be applied.

6.1322 The Measurement tests per Table 7 are for troubleshooting these tests can be used to help determine if the trouble is at the near-end or the far end. The TEST REQUEST switch must be in the MEAS-ALL position.

6.1323 Disconnect the cord to the subscribers line circuit. Disconnect all remaining used for the test. This test is completed.

TABLE 6
TEST SET OPERATIONS - RESPONDER SELF-CHECK (SCK)

STEP	SWITCH OPERATION		LAMP INDICATION		DATA* READOUT DISPLAY	NOTES AND AUDIBLE INDICATIONS
			LIT	EXTINGUISHED		
			SCK NEW N-E/F-N CHK2		000	See Notes 1 and 4
1	Operate INT START to Position ON	OP	INT START ON ODBM	CHK2	-00.0	2/6 MF Command (Loss SCK); 1 burst F-N loss data tone
		REL	DATA RDY OLD (See Para. 6.1319)	NEW (See Para. 6.1319)	+00.0	1 burst N-F loss data tone
2	DATA RCV	OP		DATA RDY		
		REL	F-E/N-F DATA RDY	N-E/F-N	+00.0	
3	DATA RCV	OP		DATA RDY		
		REL	N-E/F-N NOISE DATA RDY	F-E/N-F ODBM	-000 +000	2/6 MF Command (N-E Noise SCK) 1 burst N-E noise data tone
4	DATA RCV	OP		DATA RDY		
		REL	F-E/N-F DATA RDY	N-E/F-N	-000 +000	2/6 MF Command (F-E Noise SCK) 1 burst F-E noise data tone
5	DATA RCV	OP		DATA RDY		
		REL	N-E/F-N 400 HZ DATA RDY	F-E/N-F NOISE	-00.0 +00.0	2/6 MF Command (Gainslope SCK) 1 burst N-F loss data tone 1 burst F-N loss data tone
6	DATA RCV	OP		DATA RDY		
		REL	F-E/N-F DATA RDY	N-E/F-N	+00.0	
7	DATA RCV	OP		DATA RDY		
		REL	N-E/F-N 1KHZ DATA RDY	F-E/N-F 400 HZ	-00.0 +00.0	2/6 MF Command (Gainslope SCK) 1 burst N-F loss data tone 1 burst F-N loss data tone

TABLE 6 (Cont'd)
TEST SET OPERATIONS - RESPONDER SELF-CHECK (SCK)

STEP	SWITCH OPERATION		LAMP INDICATION		DATA* READOUT DISPLAY	NOTES AND AUDIBLE INDICATIONS	
			LIT	EXTINGUISHED			
8	DATA RCV	OP		DATA RDY	+00.0		
		REL	F-E/N-F DATA RDY	N-E/F-N			
9	DATA RCV	OP		DATA RDY	-00.0	2/6 MF Command (Gainslope SCK) 1 burst N-F loss data tone 1 burst F-N loss data tone	
		REL	N-E/F-N 2.8 KHZ	F-E/N-F 1KHZ	-00.0		
			DATA RDY				
10	DATA RCV	OP		DATA RDY	+00.0		
		REL	F-E/N-F DATA RDY	N-E/F-N			
11	DATA RCV	OP		DATA RDY	-000	2/6 MF Command (Noise Tone SCK) 1 burst N-F noise data tone 1 burst F-N noise data tone	
		REL	N-E/F-N NOISE TONE	F-E/N-F 2.8 KHZ			-000
			DATA RDY				
12	DATA RCV	OP		DATA RDY	+000		
		REL	F-E/N-F DATA RDY	N-E/F-N			
13	DATA RCV	OP		DATA RDY	000		
		REL	NEW N-E/F-N CHK2	OLD (See Para. 6.1319) F-E/N-F ON			

TABLE 7
TEST SET OPERATIONS - RESPONDER MEASUREMENTS (MEAS)

STEP	SWITCH OPERATION		LAMP INDICATION		DATA* READOUT DISPLAY	AUDIBLE INDICATION
			LIT	EXTINGUISHED		
			MEAS NEW N-E/F-N CHK2		000	
1	Operate INT START to position ON	INT START ON	CHK2		-00.0	2/6 MF Command(loss MEAS) 1 burst F-N loss data tone
		ODBM DATA RDY OLD (See Note 2)		NEW (See Note 2)	LOSS READING TYPICAL 04.0	

TABLE 7 (Cont'd)
TEST SET OPERATIONS - RESPONDER MEASUREMENTS (MEAS)

STEP	SWITCH OPERATION		LAMP INDICATION		DATA* READOUT DISPLAY	AUDIBLE INDICATION
			LIT	EXTINGUISHED		
2	DATA RCV	OP		DATA RDY	LOSS READING TYPICAL 04.0	
		REL	F-E/N-F DATA RDY	N-E/F-N		
3	DATA RCV	OP		DATA RDY	+000	2/6 MF Command (N-E Noise MEAS) 1 burst N-E noise data tone
		REL	N-E/F-N NOISE DATA RDY	F-E/N-F ODBM		
4	DATA RCV	OP		DATA RDY	+000	2/6 MF Command (F-E Noise MEAS) 1 burst F-E noise data tone
		REL	F-E/N-F DATA RDY	N-E/F-N		
5	DATA RCV	OP		DATA RDY	-000	2/6 MF Command (Gainslop MEAS) 1 burst N-F loss data tone 1 burst F-N loss data tone
		REL	N-F/F-N 400HZ DATA RDY	F-E/N-F NOISE		
6	DATA RCV	OP		DATA RDY	LOSS READING*	
		REL	F-E/N-F DATA RCV	N-E/F-N		
7	DATA RCV	OP		DATA RDY	-00.0	2/6 MF Command (Gainslop MEAS) 1 burst N-F loss data tone 1 burst F-N loss data tone
		REL	N-E/F-N 1KHZ DATA RDY	F-E/N-F 400 HZ		
8	DATA RCV	OP		DATA RDY	LOSS READING*	
		REL	F-E/N-F DATA RDY	N-E/F-N		
9	DATA RCV	OP		DATA RDY	-00.0	2/6 MF Command (Gainslop MEAS) 1 burst N-F loss data tone 1 burst F-N loss data tone
		REL	N-E/F-N 2.8 KHZ DATA RDY	F-E/N-F 1 KHZ		
10	DATA RCV	OP		DATA RDY	LOSS READING*	
		REL	F-E/N-F DATA RDY	N-E/F-N		
11	DATA RCV	OP		DATA RDY	+00.0	2/6 MF Command (Noise Tone MEAS) 1 burst N-F nose data tone 1 burst F-N nose data tone
		REL	N-E/F-N NOISE TONE DATA RDY	F-E/N-F 2.8 KHZ		
					NOISE READING	

TABLE 7 (Cont'd)
TEST SET OPERATIONS - RESPONDER MEASUREMENTS (MEAS)

STEP	SWITCH OPERATION		LAMP INDICATION		DATA* READOUT DISPLAY	AUDIBLE INDICATION
			LIT	EXTINGUISHED		
12	DATA RCV	OP		DATA RDY		
		REL	F-E/N-F	N-E/N-F		
13	DATA RCV	OP		DATA RDY		
		REL	NEW N-E/F-N CHK2	OLD (See Note 3) F-E/N-F ON	000	

*These readings will show 16 DB more loss than the actual trunk loss due to a pad in the Responder Circuit.

NOTE 1: When a test fault occurs one of the test fault lamps will light. Table A lists the fault codes used by the interrannator.

TABLE A

FAULT CODE	FAULT
1	Loss of Priming during test
2	Data Underrange (signal 3ms)
3	Both faults 1 and 2 above
4	Responder not equipped to make test (signal 1 second)
5	Both faults 1 and 4 above
6	(Not currently used)
7	No data received (no data within 2 seconds)

NOTE 2: These readings will vary from the 000 readings obtained during the Self-Check tests (Table 6) and represent the actual loss and noise measurements of the trunk. If lamp OLD lights at the beginning of test (indicating that far-end responder is OLD 51-B type) the test set will stop after step 5 and the audible indications described will not be heard.

NOTE 3: At the conclusion of the tests of Table 7 momentarily operate switch DATA RCV. Lamps ON, NOISE (or NOISE TONE), DATA RDY, OLD (if lighted) and FE-NF are extinguished and lamps START INT, MEAS, NEW, NE-FN and CHK-2 are lighted. Operate switch START INT to OFF position. Lamp START INT is extinguished. Momentarily operate switch DATA RCV. DATA display window shows all zeros (000).

7. DIAL-UP CONNECTION

NOTE: The cross connects to the line circuit associated with the ROTL port are to be made before proceeding with the following test.

1. Disconnect the TELETYPE from the ROTL EIA jack.
2. Locate the TELETYPE near a telephone that can be used to dial the ROTL. See MODE switch to LINE, if using the EXECUPORT.
3. If the Model #43 (ITE05689) TTY is used the Acoustic coupler (ITE-6084) is required. Using the ITE-98688 cord, connect the coupler to the TTY. Connect the power cord to an AC outlet, turn the power switch to the ON position.
4. Dial the telephone number for the ROTL port, ringing is tripped and Test Progress Tone is heard in the telephone handset.

7. DIAL-UP CONNECTION (Cont'd)

5. Connect the handset to the acoustic coupler (note the cord orientation on the side of the TELETYPE), (the READY lamp on the EXECUPORT lights and) a printout of MONITOR RUNNING STATE REQUEST is obtained. If the carrier light extinguishes, hand-up and redial the ROTL with the handset connected to the acoustic coupler.

ID	PRINTOUT	ACTION	TROUBLE
E1	* MONITOR RUNNING * STATE REQUEST TE RT 'RETURN' * THIS TEST SHOULD BE CONDUCTED VIA LOCAL KEYBOARD ACCESS ONLY! * MONITOR RUNNING * STATE REQUEST		Printout is not obtained: 1) Replace CP15 2) Replace CP12
E2	TE RA 'RETURN' RAM TET RESULT APPEARS EVERY 20 SECONDS * RAM OK * HIT "A" KEY		
E3	A * MONITOR RUNNING * STATE REQUEST		
E4	TE TD 'RETURN' * OPERATE SWITCH "TUT" ON CP15 * WOULD YOU LIKE TO TEST TONE DETECTORS USING EXTERNAL OSCILLATOR? * TYPE Y FOR YES OR N FOR NO		
E5	N * TYPE H TO HOLD TONE, C TO CONTINUE, ANY OTHER KEY TO ABORT * LISTEN FOR TPT * TPT DETECTOR OK * LISTEN FOR MW * MW DETECTOR OK * LISTEN FOR LT * LT DETECTORS OK * NO RCY TEST WHEN IN DDD MODE * TYPE H TO HOLD TONE, C TO CONTINUE, ANY OTHER KEY TO ABORT	During this test, it is not necessary to verify tones from the speaker.	
E6	A * MONITOR RUNNING * STATE REQUEST	Remove the handset from the acoustic coupler and place the phone on-hook.	

8. TROUBLE LOCATING GUIDE

8.1 General - The trouble locating procedures provided with the individual test should identify most sources of trouble normally encountered. Some of the Supplemental procedures provided in the following paragraphs require a detailed knowledge of the system and are used to verify system response using external test equipment.

8.2 Oscillators

8.21 The following check of frequencies are to be made using a Universal Frequency Counter. The ITE must be grounded to the +5V ground.

8.22 Low Tone, GUARD, and DATA are free running oscillators that can be verified at the Test Points on CP15.

<u>TEST POINT</u>	<u>FREQUENCY</u>
9	1200 Hz
7	2225 Hz
4	480 Hz
6	620 Hz

8.23 The MF Tones are checked by connecting the Frequency Counter to Term. C1 on CP17. A Test MF is performed Section 613.02, Para. 14 which allows verification of each frequency. The H command can be used to stop at the desired frequency.

8.24 405 Hz, 1004 Hz, and 2804 Hz Tones are checked by connecting the Frequency Counter to TP12 on CP5. A Test Tone Detector is performed Section 613.02, Para. 13, which allows verification of each frequency. The H command can be used to stop at the desired frequency.

8.3 Supplemental Test Commands

8.31 The following Commands are used to set up a particular path thru the Responder Function. An external oscillator is used to set a desired input level.

<u>COMMAND</u>	<u>DESCRIPTION</u>
TE LO	Test Loss Path
TE LL	Test Low Level Path
TE NO	Test Noise Path
TE NT	Test noise with Tone Path

8.32 The following is an example of the printout obtained with the Commands per 8.31.

<u>ID</u>	<u>PRINTOUT</u>
*	MONITOR RUNNING
*	STATE REQUEST
E1	TE LO 'RETURN'
*	INJECT SIGNAL TO BE MEASURED INTO T & R JACK
*	HIT SPACE WHEN DONE
*	HIT A TO ABORT
E2	'SPACE'
*	XXX.X MS
*	XXX.X MS
	.
	.
	.
E3	A
*	MONITOR RUNNING
*	STATE REQUEST

8.33 When the response of a Tone Detector is in question, an external oscillator can be used to verify its response. The following commands are used to verify the Tone Detectors.

<u>COMMAND</u>	<u>FUNCTION</u>
TE TD	Tests TPT, MW, LT and 1300 HZ Tone Detectors
TE MF	Tests MF Tone Detectors

8.34 The following is an example of a printout obtained with a Command per Para. 8.33.

<u>ID</u>	<u>PRINTOUT</u>
*	MONITOR RUNNING
*	STATE REQUEST
E1	TE TD
*	OPERATE SWITCH "TUT" ON CP10
*	WOULD YOU LIKE TO TEST TONE DETECTORS USING A EXTERNAL OSCILLATOR
*	TYPE Y FOR YES OR N FOR NO
E2	Y
*	THIS IS A QUICK TEST LISTING DETECTED TONES
*	1300 HZ BIT SET
*	CARRIER BIT SET
*	WOULD YOU LIKE TO TEST AGAIN?
*	TYPE Y FOR YES OR N FOR NO.

Arrowed Lines indicate new or changed information.

Reason for Reissue:
To change Paragraph's 6.1219, 6.1319, 6.1320, 6.1321, Tables 4, 6 and 7.

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