CONTINUITY
ELECTRONIC LEAD VERIFICATION SYSTEM - "COSMIC" D.F.

CONTENTS

1. GENERAL

1.1 Scope of Section

This section provides information and methods to be employed for verifying the continuity of switchboard cable leads associated with the Telephone Central Office bulk wiring operations on "COSMIC" Distributing Frames. The verification procedures covered herein are applicable to both new and additions to "COSMIC" Frames.

1.11 The methods of this section cover the application of the "Electronic Lead Verification System" as a vehicle for performing cable lead verification operations.

1.2 Precautions Against Personal Injury, Equipment Damage and Service Interruptions

1.21 General precautions to be taken against personal injury, equipment damage and service interruptions are covered in Handbook 0 and are to be observed at all times as they apply to the operations being performed.

1.3 Reference Information

1.31 Refer to Handbook 9, Section 910, for the detailed method of operation of the test sets used in this section.

1.32 The terminations shown for cable leads as shown in this section were obtained from typical equipment drawings. For each specific job, particular running lists should be used.

2. TEST EQUIPMENT

2.1 Equipment

Amount	ITE	Description
1	5420-L1, L4	Test Accessory Set
1	5421	Analyzer Test Set
1	5422	Encoder, Master
1	5423	200 Circuit Encoder
	or	
1	5424	1000 Circuit Encoder
*1	4137A	Continuity Test Set AC
2	9650	Operator's Telephone Set
As Required	R-3436	Flags

*Cords and accessories are furnished with the test set.

2.2 Cords and Accessories

Amount	ITE	Description
*1	9214A	Interconnect Cable (30')
*1	9214B	Interconnect Cable (60')
*1	9214C	Interconnect Cable (100')
**1	5906-L1	302 Connector Adapter (pair 1-50)
**1	5906-L2	302 Connector Adapter (pair 51-100) (pair 1-100 Protector Frame)
**2	5907	78 Type COSMIC Connector Block Adapter (100 pair)
**2	5908	78 Type COSMIC Connector Block Adapter (50 pair)
**8	9276C	Test Cord 12' Long, 50 Conductors
*	Included in ITE-5420-L1	
**	Included in ITE-5420-L4	

3. APPLICATIONS

3.1 General

3.11 The Electronic Lead Verification System is designed to provide wire identification, wire search, short circuit and open circuit verification of Installer wiring. The system is used for continuity verification and circuit analysis in Telephone Central Office bulk wiring operations. In general, there are three major components required for the COSMIC frame bulk wiring verification as follows:

3.12 The Analyzer and Master Test Encoder provide readout and control functions, respectively. These units are located near the frame under test. For identification purposes, this location will be considered as "END A" or the point of origin.

3.13 The 200 or 1000 circuit encoder provides test access at the far end of the wiring being tested and for identification purposes, this end will be considered as "END B" or the point of destination.

3.14 Test cords are designed to follow assigned numbering when feasible. When it becomes impractical to have an exact match between the apparatus terminal number and the analyzer display image, a compromise is used which has a pattern that can be readily recognized as described below:

Example - FIG. 5 shows the location of test sets and frames under test. FIG. 6 and 7 show the display image numbers associated with each of the 78 connector block termainals (COSMIC frame, ITE-5907, FIG. 7), and 302 connector terminals (protector frame, ITE-5906, FIG. 6) for the frames under test as shown in FIG. 5. "N" representing any number from 0 to 9, the following pattern will occur:

Location	Image
Tip	ONN (e.g. 000,001---099)
Ring	1NN (e.g. 100,101---199)

3.15 Conductor colors should not be employed during verification operations. Continuity verification must be performed as a terminal-to-terminal check disregarding the associated lead color information listed on CCED's or running sheets. Terminal-to-terminal checking not only provides for continuity checking of the leads, but verifies the integrity of functional lead assignments within a circuit. This type of checking, thereby, eliminates the chance of missing slipped terminals that can readily occur when checking by color code.

3.2 Method of Operation

3.21 Tests in this section may be performed after all interbay leads have been run and connected as well as switchboard cable.

3.22 It is recommended that these continuity tests be performed before power application tests are performed.

3.23 The basic test operation will be made utilizing the automatic scan mode feature of the ELVS test sets. In the automatic mode, adapters/fixtures are interfaced to an appropriate group of leads at both ends of the "cable under test" and tested automatically. In the manual test mode, adapters/fixtures are interfaced to an appropriate group of leads at one end of the "cable under test" and leads at the other end are hand probed one at a time. The automatic scan test will be made as described in PAR. 3.25 and Table A. For detailed information on the use of the test sets, refer to Handbook 9, section 910. Refer to FIG. 3 and 4.

3.24 The test described in this paragraph will insure that the System will automatically scan a group of leads using the ITE-5421 Analyzer, ITE-5422 Master Test Encoder, and an ITE-5423 200 Circuit Encoder or ITE-5424 1000 Circuit Encoder.

Step 1: Interconnect the ELVS in the following manner (refer to FIG 2):

a) Interconnect the "MP" Connector of the Encoder Input Section of the Analyzer to an "M" connector of the Output Section of the Master Test Encoder. Use an ITE-9054 Interconnect Cord for this interconnection.

b) Interconnect the remaining "M" jack of the Output Section of the Master Test Encoder to an "M" jack of an ITE-5423 200 Circuit Encoder or ITE-5424 1000 Circuit Encoder. Use an ITE-9054 Interconnect Cord for this interconnection.

c) Interconnect the L1 connector of the Input Section of the Master Test Encoder to the L1 Connector of the Input Section of the ITE-5423 200 Circuit Encoder. If an ITE-5424 is used, be sure that the L1 Connector of Zone 1 is selected. Use the ITE-9276C Cord for this interconnection. This cord is used as the "cable under test". It contains 50 conductors.

Step 2: a) Set control on the ELVS test sets as shown in Table A, on ITE-5422.

Step 3: a) At the Master Test Encoder Scan Control Section, momentarily depress the RESET button. Next, momentarily operate STEP toggle switch and observe that a readout of $^{A}_{B}$ 000 apperas in the display window. Each operation of the STEP switch will advance the display one digit i.e., $^{A}_{B}$ 000, 001,002.....

b) Momentarily operate the RESET button. Then operate the toggle switch to SCAN and observe that the readout will automatically count past $^{A}_{B}$ 049. (i.e. 50 leads, 000 to 049).

c) Observe that the display stops at "A050." A steady tone alarm condition will be heard from the analyzer indicating an open condition (the scan controller will try to transmitt and receive a signal through input "50" of the R_2 connectors) because there is no continuity from the "A" encoder to "B" encoder. A red FAIL lamp will also light.

d) Operate the MUTE pushbutton. This will set a mute flip-flop silencing the audible tone. The mute flip-flop automatically resets when the condition producing the alarm is removed. Do not operate reset button.

e) Next, disconnect the "cable under test" from the L1 connectors on both test sets and connect it to R_2 connectors on both test sets. The display should now read $^{A}_{B}$ 050 without alarm conditions. Then operate the toggle switch to SCAN and observe that the readout will automatically count past $^{A}_{B}$ 099 (i.e. 50 leads, 050 to 099) and stop at "A100." A steady alarm tone will heard and red FAIL lamp will light. Operate the MUTE pushbutton to silence the audible tone. Do not operate reset button. Similarly, connect the same cable between L3 connectors (display from 100 to 149 and between R4 connectors (display from 150 to 199) of both test sets. Observe that when display counts $^{A}_{B}$ 199, the green pass lamp will light (i.e., the scan limit 199 set by the thumbwheel switches is reached). The display will automatically extinguish. The green PASS lamp will light.

3.25 Automatic Scan Procedure

3.251 Capabilities - The Electronic Lead Verification System can be used to rapidly and automatically scan leads that are associated in clusters of 200 called "zones". The Automatic Scan feature (VERIFY Mode) applies a HI-Z Mode test signal to each lead in sequence at the "origin" ("End A" in the example setup shown in FIG. 5). If the lead is "good", the next lead number is tested. A wiring error will be indicated by a steady alarm tone, a red FAIL light, and a steady display Image or multiple Images which can be analyzed to determine the type and location of the error in a manner described in PAR. 4.

3.252 Setup and Normal Operation - Again, the construction of the various components permits the ELVS to be set up rapidly by one person in most applications. After connecting the ELVS units and cords as shown in FIG. 5, the installer sets the Preset switch for the correct scanning action (END POINT 1) and sets the SCAN LIMIT thumbwheel switches to the number specified by Table A. This will usually be one less than the number of leads to be tested, because the system counts starting with lead 000 and continues up to lead 199.

3.253 In the example shown in FIG. 5, the PRESET switch is set to END POINT 1 Mode and the SCAN LIMIT thumbwheels are set to 199. Momentarily moving the SCAN/STEP toggle switch to the SCAN position will start the Automatic Scan operation. Scanning will continue until the "Scan Limit" is reached (green PASS light operates to indicate completion of scan) or until a wiring trouble is encountered. Scanning stops at each lead with a trouble condition so that the trouble condition may be analyzed. The ITE-5906 and ITE-5907 per FIG. 5 are explained in PAR. 3.26. When an automatic scan of the 100 pairs is completed, the user will move the test fixtures and cords to the next adjacent 78 type block on the COSMIC frame. The destination END test fixture and cords at the 302 connector shall be moved to the next assigned 302 connector. The automatic scan test is repeated again.

3.254 Whenever a wiring error is encountered and is going to be corrected immediately, be sure to depress the RESET button in the scan control section of the ITE-5422 Master Test Encoder before any wiring correction is performed.

3.26 In testing cables from the protector frame (302 connector) or COSMIC distributing frame (78 type connector), use adapters as follows:

Frame	Drawings	Interfacing Adapter
Protector Frame (302 Connector)	ED-1A220-30 -31	ITE-5906 L1, L2
COSMIC Distributing	ED-6C014-10	ITE-5907 (100 Pair)
Frame (78 Type 100 or 50 pair Connecting Block)		ITE-5908 (50 Pair)

3.261 Test equipment shall be arranged as shown in FIG. 5. At end "B", plug two adapters, ITE-5906, List 1 and List 2, on the 302 Connector so as to contact the rows designated 1,2---25,26---50, (List 1); 51,52---75,76---99,100 (List 2). Adapters should be plugged to equipment side jack connections. Four pins in each adapter (two on top and two on bottom) are distinct from contact pins. These pins being longer, plug in first into the 302 connector and should be employed as guide pins. Connect four ITE-9267C Cords to connectors (L1, R2, L3, R4) on both adapters. Spring clips on adapters should be locked at all times. Plug other ends of test cords to the connectors designated as L1, R2, L3, R4 on ITE-5423 or ITE-5424.

3.262 At end "A", plug the ITE-5907 Adapter on the front of 78 type (100 pair) COSMIC block so as to contact the rows designated as 1, 2, 3---25,26---50,51---75,76---99,100. Connect four ITE-9276C Cords to connectors (L1, R2, L3, R4) on the adapter. Spring clips on adapter should be locked at all times. Plug other ends of cords to the connectors designated as L1, R2, L3, R4 on ITE-5422 Master Test Encoder. Interconnect test sets as shown in FIG. 5. See PAR. 3.27 for procedure to plug and unplug ITE-5907 and ITE-5908.

3.27 The following procedure may be employed to plug and unplug ITE-5907 and ITE-5908 Adapters.

3.271 Press both anchor release plates towards AMPHENOL CONNECTORS.

3.272 Insert Adapter so that it interfaces all (200 or 100) contacts on COSMIC block from front (i.e. cross connections side).

3.273 Press adapter slightly towards COSMIC block and then release "Anchor Release Plates" so that they are anchored in the grooves of fanning strips of COSMIC block by four stoppers.

3.274 For unplugging the Adapter, reverse procedure may be employed. CARE SHOULD BE OBSERVED THAT ANCHOR RELEASE PLATES STOPPERS ARE COMPLETELY OUT OF FANNING STRIPS GROOVES BEFORE REMOVING ADAPTER FROM COSMIC BLOCK.

3.28 Verification of tie cable leads can also be carried out in a similar manner using two ITE-5907 Adapters and/or two ITE-5908 Adapters. Caution should be observed when connecting ITE-9276C Cords on L1, R2, L3, R4 connectors of adapters and test sets.

3.281 When tie cable is connected between two 100 pair 78 type blocks, two ITE-5907 Adapters should be used to verify the leads. See FIG. 7 for readout display.

3.282 When tie cable is connected between one 100 pair 78 type block and two 50 pair 78 type block, one ITE-5907 and two ITE-5908 Adapters should be used to verify the leads. See FIG. 7 and 8 for readout display.

3.283 When tie cable is connected between two 50 pair 78 type connecting blocks, two ITE-5908 Adapters should be used to verify the leads. Only 50 pairs can be checked at a time. Only L1 and R2 connectors on ITE-5422 and ITE-5423 (or ITE-5424) will be used. See FIG. 9 for readout display. The display will start at 000 and stop at 049. The display 050 to 099 can be skipped by setting End Point Switch on 2 and Thumbwheel Switch at 149 on ITE-5422, Master Test Encoder. This will allow the system to skip 050 to 099 and then continue scanning (testing) ring leads with display 100 to 149 (see FIG. 9).

CAUTION: READOUT DISPLAY ON ANALYZER STARTS AT 000, BUT SYSTEM ACTUALLY SCANS (TESTS) PAIR 50 TIP LEAD AND THEN CONTINUES WITH PAIR 1 TIP LEAD AS 001 DISPLAY. AFTER SCANNING FIRST 50 PAIRS, TIP LEADS (DISPLAY 000 TO 049), THE SYSTEM SCANS PAIR 100 WITH DISPLAY 050 FOR TIP LEAD AND THEN CONTINUE WITH PAIR 51 TIP LEAD AS 051 DISPLAY. AFTER SCANNING SECOND 50 PAIRS TIP LEADS (DISPLAY 050 TO 099) THE SYSTEM SCANS RING LEADS WITH APPROPRIATE DISPLAY ON ANALYZER.

3.3 Wiring Errors

3.31 If a wiring error and/or reversal is located during verification, affected lead(s) should be reconnected to the proper termination(s) immediately according to handbook requirements. If not corrected immediately, leads should be clearly identified with R-3436 Flags. An accurate record of all wiring errors must be kept on SD-97-1313.

4. ANALYSIS OF WIRING TROUBLE CONDITIONS

4.1 Display Images

FIG. 1 is a double exposed photograph of the Display Control section of the Analyzer which shows the positions of the "short indicator bars", "A" and "B" indicators, and a multiple "Image". The Image you see will depend on the exact type of trouble (open, short, miswire), the test signal mode (HI-Z, LO-Z), and whether you are using Automatic Scan or Manual operation.

4.2 Normal Control Settings

During normal operation, the display MODE control will be set to SELECT and the A GROUP and B GROUP switches will be ON.

4.3 Good Leads

4.31 Manual Operation - A test signal is applied by hand probing one lead ("End A" in FIG. 3). If the lead is continuous, the test signal will arrive at one (and only one) connector contact in the Encoder ("End B" in the example). If the lead is wired to the correct terminal, the correct Image will be displayed.

4.32 Automatic Scan - A HI-Z Mode test signal is applied automatically to one lead (at "End A" in FIG. 5). If the lead is "good", the test signal will arrive at one (and only one) connector contact in each Encoder ("End A" and "End B"). If the lead is wired to the correct terminal, information from "End A" and "End B" will "match" and scanning will continue.

4.4 Analysis Procedure

4.41 When Required - "Good" leads and "Open" lead locations will be evident from the display as explained in PARS. 4.3, 4.52 and 4.62. Other wiring errors are analyzed using the GROUP, and Selector switches.

4.42 Using Selector Switches - During analysis of other fault conditions, the MODE switch of the Display Control section in the SELECT position allows the HUNDREDS-TENS-UNITS selector switches to "select" or filter out those leads of interest. Signals on leads not "selected" will be ignored and do not appear on the display. The letter N on the selector switch represents any digit from 0 to 9 and allows all digits to display.

4.43 Using the A GROUP - B GROUP Switches - During Automatic Scan, two Encoders are providing display information to the analyzer. By turning either switch OFF, information from one Encoder can be displayed to quickly analyze reverses.

4.5 Recognizing Trouble (Automatic Scan)

4.51 Automatic Scan - A wiring error is indicated by a steady alarm tone, a red FAIL light, and a steady display Image or multiple Images.

4.52 Open Circuits

4.521 The Automatic Scan will stop on the "open" lead and display the lead location and one letter (not both). To continue scanning, momentarily operate the SCAN/STEP toggle switch to STEP the ELVS past the faulty lead and then to SCAN to proceed.

4.53 Miswires or Reverses

4.531 A "miswire" or "reverse" will be indicated by the presence of two lead location codes (multiple Images) on the display. Both "End" designators ("A" and "B") will be lit. This display is also representative of short circuits and leads wired through a resistance to a common point. To determine which condition exists, first turn OFF the A GROUP switch and note the single lead location code display. This lead location is one end of the miswire.

NOTE: If multiple Images still display, refer to PAR. 6.8 for the method of analyzing short circuit errors.

Second, turn the A GROUP switch ON and turn the B GROUP switch OFF. Again, a single lead location code display is the second end of the miswire. A multiple Image indicates short circuit faults.

Third, turn the B GROUP switch ON and proceed with scanning by momentarily moving the SCAN/STEP switch to STEP, then SCAN.

4.532 Example - Suppose that a miswire or reverse causes a multiple Image as follows:

Position	Display
Group Indicators	A & B
HUNDREDS Digit	0 & 1
TENS Digit	2
UNITS Digit	0

Turn the B group switch OFF and observe the display. A single lead location is one end of miswire. Next, turn the A group switch OFF and the B group switch ON. Observe the dislay. A single lead location is second end of miswire.

Group Switch		Display
A	B	
ON	OFF	020
OFF	ON	120

If this error is not corrected immediately, a STEP switch will allow the operator to skip that lead. Continue scanning by operating SCAN switch. When it reaches lead 120, a similar display will appear.

Position	Display
Group Indicator	A & B
HUNDREDS Digit	0 & 1
TENS Digit	2
UNITS Digit	0

Turn the B group switch OFF and observe the display. A single lead location is one end of miswire. Next, turn A group switch OFF and B group switch ON and observe the display. A single lead location is second end of miswire.

Group Switch		Display
A	B	
ON	OFF	120
OFF	ON	020

This display is exactly reverse of first display.

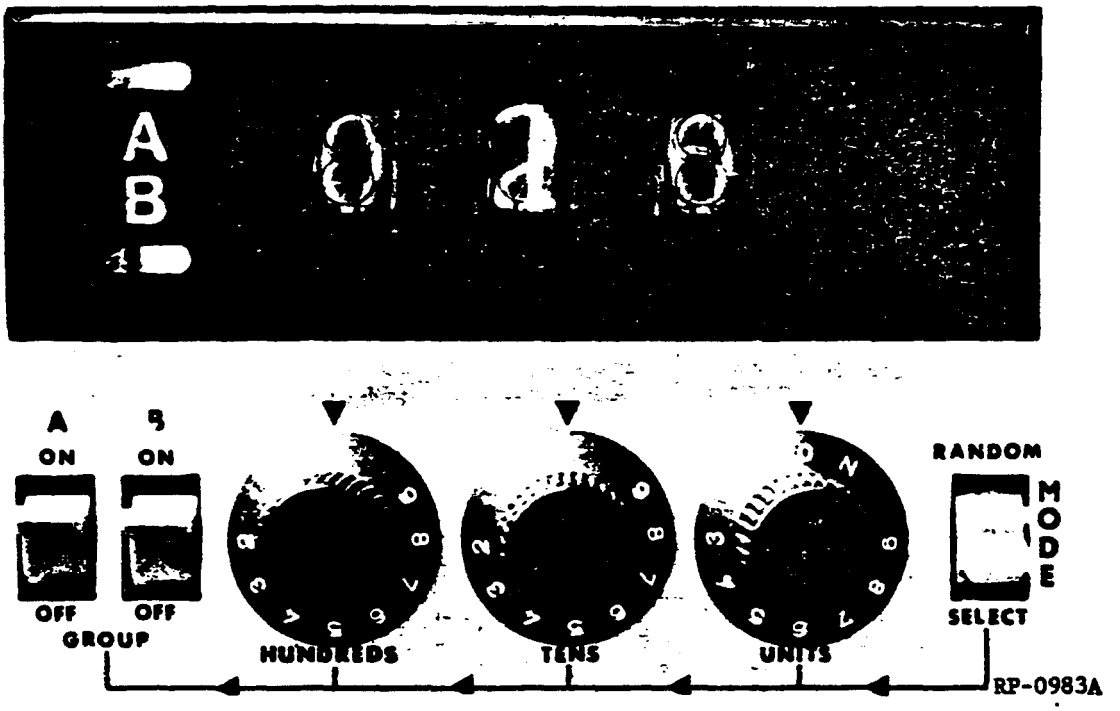

FIG. 1 ELVS DISPLAY MULTIPLE IMAGES

4.54 Short Circuits

4.541 Procedure - In Automatic Scan operation, a multiple Image may mean a reverse or a short circuit. A quick test to decide which type error has been found can be done using the A GROUP - B GROUP switches as described in PAR. 4.53. Any multiple Images displayed while either the A GROUP or B GROUP is OFF indicate a short circuit condition. The multiple Images can then be analyzed to find the exact leads involved in a manner similar to Manual operation.

4.542 Example - Suppose that a short circuit causes a multiple Image as follows:

Position	Display
Group Indicators	A & B
HUNDREDS Digit	0
TENS Digit	3 & 4
UNITS Digit	1 & 9

Place the MODE control in SELECT. Turn OFF the A GROUP switch to check for a reverse. In this example, when either the A GROUP or B GROUP is OFF, a multiple Image remains. Analyze the short circuit using the Selector switches.

Setting	Image
NNN	089
ONN	089
03N	031
031	031
039	None
04N	049
041	None
049	049

The analysis indicates that leads 031 and 049 are shorted together. Leads 039 and 041 are not involved in the error.

NOTE: In Automatic Scan operation, the HI-Z Mode test signal is used. In HI-Z Mode, resistances less than 5 megohms between leads will indicate as short circuits, depending on the SIGNAL LEVEL control setting.

4.6 Recognizing a Trouble (Manual Operation)

4.61 Good Lead

4.611 A single correct Image is the "good" indication. Any Images different from the expected one indicate a trouble condition. The steady alarm tone occurs only in cases of leads connected together or to a common point.

4.62 Open Circuits

4.621 The open circuit indication is an absence of any display or alarm tone. If the hand probe is touching a wire, and no Image appears on the display, the wire is "open".

4.63 Miswires or Reverses

4.631 An incorrect three digit Image number on the display indicates the lead location of the miswire. For example, if the expected Image is 010 and the actual Image is 001, the lead at location 001 on the apparatus interfaced to the Encoder at "End B" is miswired to location 010 at the apparatus being hand probed ("End A").

4.64 Short Circuits

4.641 Procedure - Two or more lead location code Images simultaneously displayed during Manual operation represent a short circuit, low resistance between leads, or leads connected to a common point. With the Display Control MODE switch in SELECT Mode, a multiple Image in any decade of the display can be "dialed out" by using the HUNDREDS -TENS-UNITS selector switches. To minimize the amount of "knob-twirling" start with all selector switches in position N. Dial the selector switch of the most significant digit (left-most) showing a multiple Image until a single number displays on that tube. Continue the selection left to right until a single lead location code is visible. This will be the lowest lead location involved in the wiring error. Repeat the procedure for higher lead location numbers.

4.642 Example - Suppose that a short circuit causes multiple Image as follows:

Position	Display
HUNDREDS Digits	0 & 1
TENS Digits	7 & 8
UNITS Digits	1 & 5

There are eight possible leads involved in this short circuit. The possibilities are lead locations 071, 075, 081, 085, 171, 175, 181 and 185. To determine which leads are actually shorted, place the Display Control mode switch in the SELECT Mode. Selector switch settings and Images are shown below:

Selector Switch Setting Hundreds	Tens	Units	Image
N	N	N	085
0	N	N	085
0	7	N	075
0	7	0	None
0	7	1	071
0	7	5	075
0	8	N	081
0	8	1	081
0	8	5	None
1	N	N	185
1	7	1	None
1	7	5	None
1	8	N	185
1	8	1	None
1	8	5	185

The analysis indicates that leads 071, 075, 081, and 185 are involved in the short circuit. The absence of a display (display "blanked") shows that leads 085, 171, 175, and 181 are not part of the multiple short circuit.

ATTACHMENT
Figures 2 to 9 on Pages 10 to 16

Reason for Reissue:
Change figures 1 through 5 to read Figures 5 through 9; add new Figures 1 through 3, Table A, and PAR. 4. Minor changes made in PAR. 1 and 2.

4.7 Grounded Leads - A GROUND switch is located in the lower left area of the Analyzer faceplate. When this switch is "down" (toward the "ground" symbol), the HI-Z Mode test signal is applied to the "ground" lead of the AC power cord through the CHARGER connector. Any grounded leas which are connected to the Encoder provide a return path for the test signal. The test signal going through the Encoder diode matrix will cause the Analyzer to display the lead location code of all grounded leads. Multiple Images can be analyzed using the procedure for short circuits.

Engineering Planning Manger
Common Installation and Services

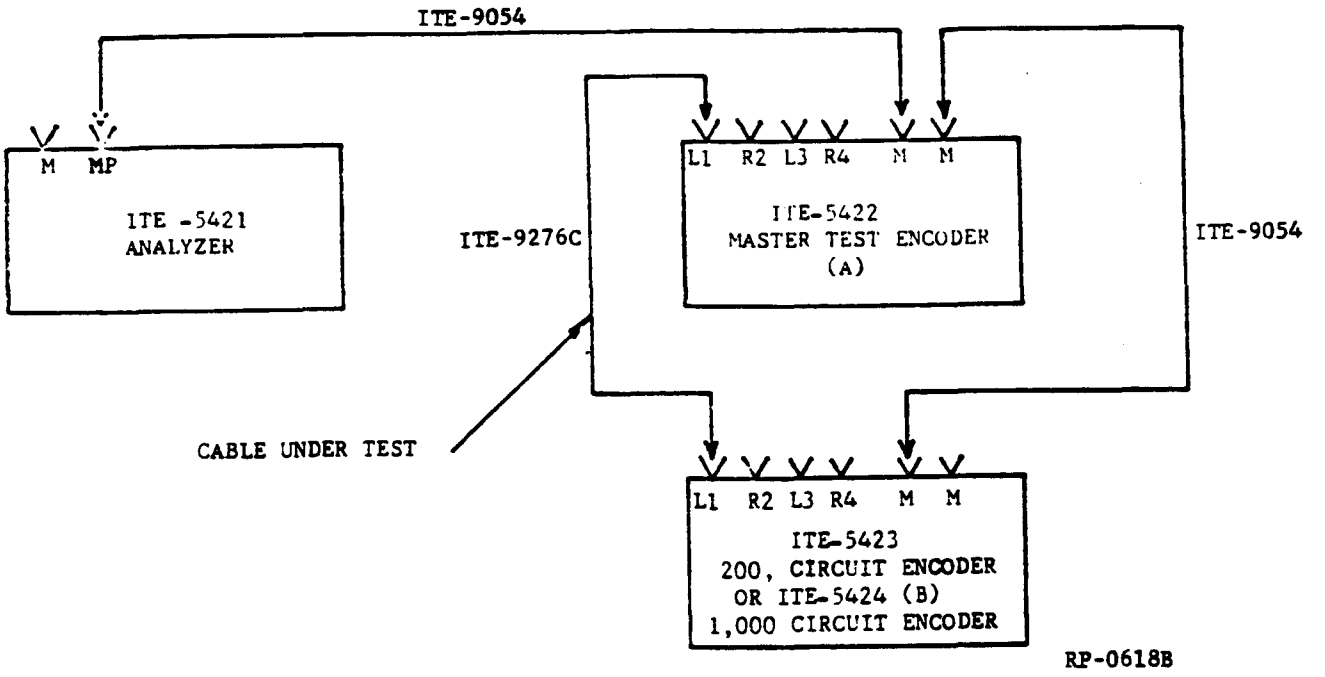

FIG. 2 INTERCONNECT SETUP FOR AUTOMATIC SCAN FUNCTION TEST

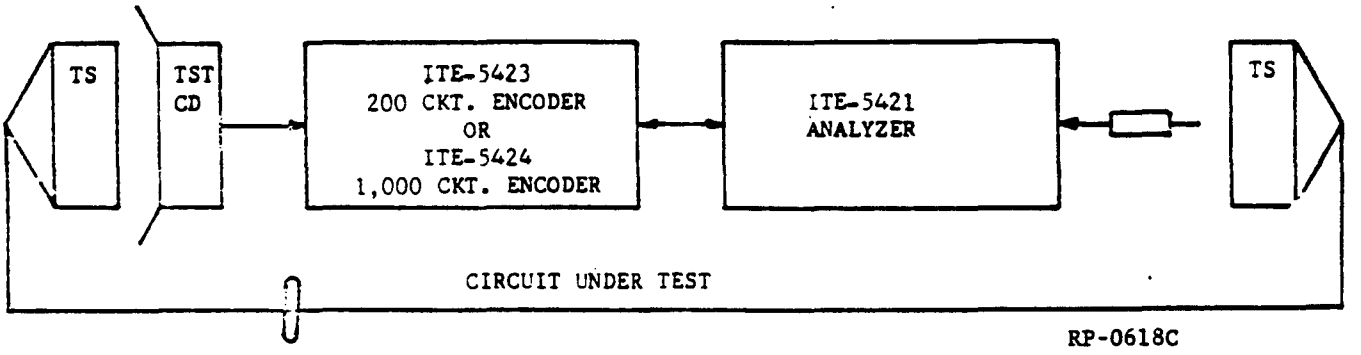

FIG. 3 MANUAL PROBING SETUP

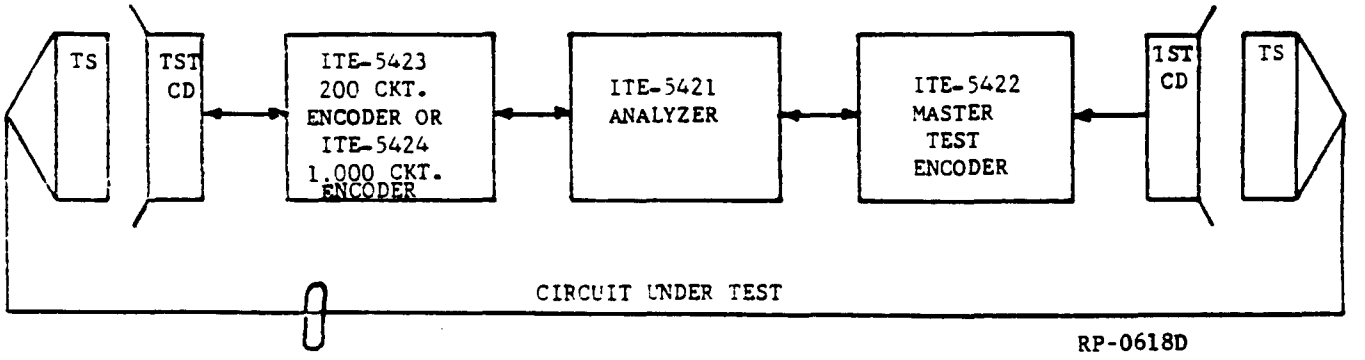

FIG. 4 AUTOMATIC SCAN SETUP

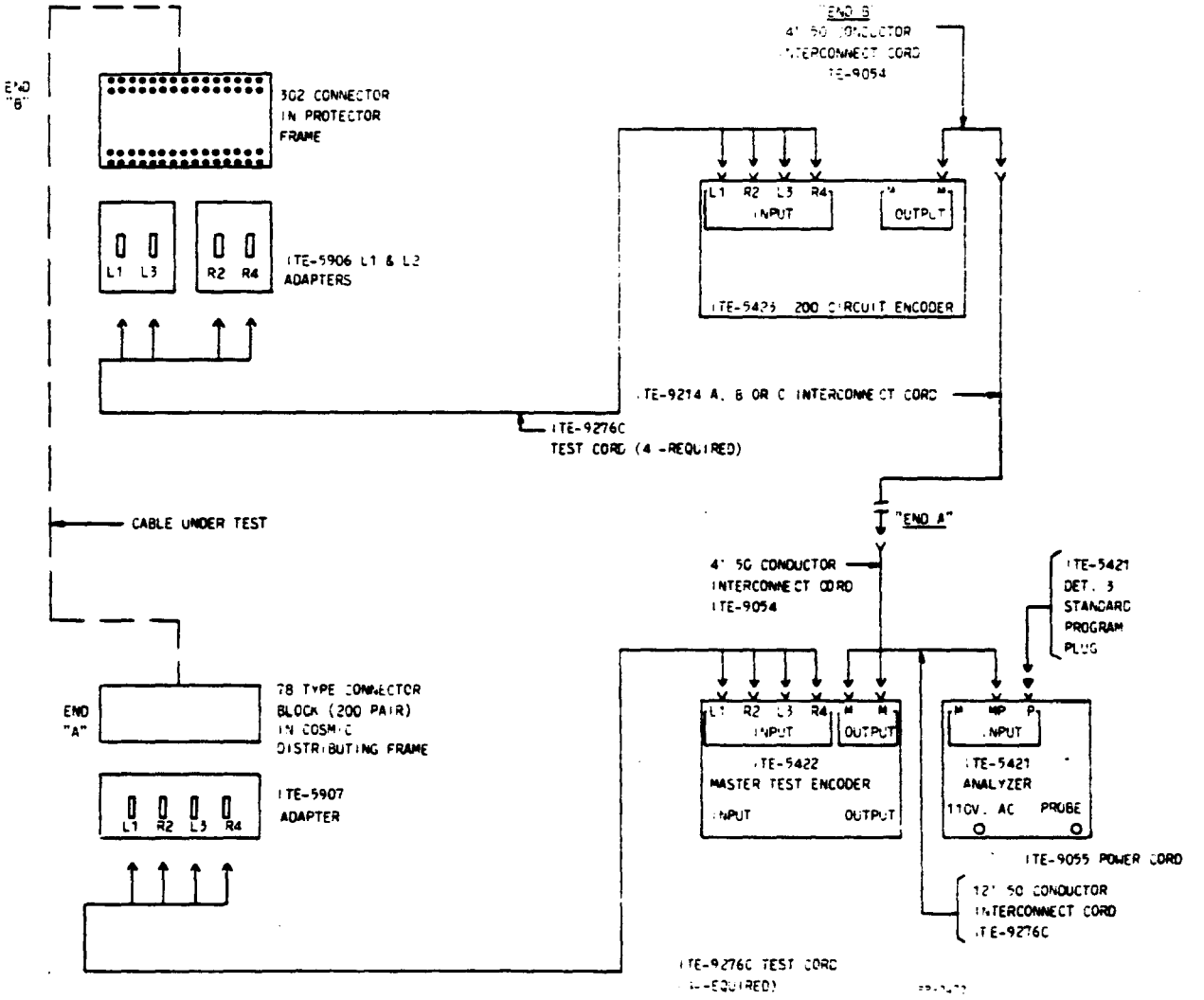

FIG. 5 PROTECTOR FRAME AND COSMIC DISTRIBUTING FRAME

CKT PAIR NO.	T	R	CKT PAIR NO.	T	R
01	001	101	26	026	126
02	002	102	27	027	127
03	003	103	28	028	128
04	004	104	29	029	129
05	005	105	30	030	130
06	006	106	31	031	131
07	007	108	32	032	132
08	008	108	33	033	133
09	009	109	34	034	134
10	010	110	35	035	135
11	011	111	36	036	136
12	012	112	37	037	137
13	013	113	38	038	138
14	014	114	39	039	139
15	015	115	40	040	140
16	016	116	41	041	141
17	017	117	42	042	142
18	018	118	43	043	143
19	019	119	44	044	144
20	020	120	45	045	145
21	021	121	46	046	146
22	022	122	47	047	147
23	023	123	48	048	148
24	024	124	49	049	149
25	025	125	50	000	100

ITE-5906 List 1

CKT PAIR NO.	T	R	CKT PAIR NO.	T	R
51	051	151	76	076	176
52	052	152	77	077	177
53	053	153	78	078	178
54	054	154	79	079	179
55	055	155	80	080	180
56	056	156	81	081	181
57	057	157	82	082	182
58	058	158	83	083	183
59	059	159	84	084	184
60	060	160	85	085	185
61	061	161	86	086	186
62	062	162	87	087	187
63	063	163	88	088	188
64	064	164	89	089	189
65	065	165	90	090	190
66	066	166	91	091	191
67	067	167	92	092	192
68	068	168	93	093	193
69	069	169	94	094	194
70	070	170	95	095	195
71	071	171	96	096	196
72	072	172	97	097	197
73	073	173	98	098	198
74	074	174	99	099	199
75	075	175	100	050	150

ITE-5906 List 2

T AND R ARE CABLE SCAN DISPLAY READOUT
01 TO 100 ARE CIRCUIT PAIR NUMBERS ON 302 CONNECTOR

FIG. 6 **READOUT DISPLAY ASSOCIATED WITH ITE-5906 LIST L AND LIST 2 ADAPTERS** (PAR. 3.26)

CKT Pair No	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
T	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025
R	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125
CKT Pair No	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
T	026	027	028	029	030	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	000
R	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	100
CKT Pair No	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
T	051	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068	069	070	071	072	073	074	075
R	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	619	170	171	172	173	174	175
CKT Pair No	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
T	076	077	078	079	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095	096	097	098	099	050
R	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	150

Row No. 1

Row No 2

Row No 3

Row No 4

T ANDR ARE CABLE SCAN DISPLAY READOUT
CIRCUIT PAIRS ARE STAMPED ON COSMIC BLOCK

FIG. 7 READOUT DISPLAY ASSOCIATED WITH ITE-5907 ADAPTER
(PAR. 3.24, 3.281 AND 3.282)

CKT Pair No	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
T	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025	Row. No. 1
R	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	
																										78 Type COSMIC Block A (50 pair)
CKT Pair No	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
T	026	027	028	029	030	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	000	Row No. 2
R	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	100	

CKT Pair No	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
T	051	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068	069	070	071	072	073	074	075	Row No. 1
R	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	
																										78 Type COSMIC Block A+1 (50 pair)
CKT Pair No	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
T	076	077	078	079	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095	096	097	098	099	050	Row No. 2
R	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	150	

T AND R ARE CABLE SCAN DISPLAY READOUT
CIRCUIT PAIRS ARE STAMPED ON COSMIC BLOCK

FIG. 8 READOUT DISPLAY ASSOCIATED WITH ITE-5908 ADAPTERS (PAR. 3.282)

CKT Pair No	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
T	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025
R	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125
CKT Pair No	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
T	026	027	028	029	030	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	000
R	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	100

Row No. 1

78 Type COSMIC Block (50 pair)

Row No. 2

T AND R ARE CABLE SCAN DISPLAY READOUT
CIRCUIT PAIRS ARE STAMPING ON COSMIC BLOCK

FIG. 9 READOUT DISPLAY ASSOCIATED WITH ITE-5908 ADAPTER (PAR. 3.283)

TABLE A

ELECTRONIC LEAD VERIFICATION SYSTEM

TEST SET CONTROL SETTINGS COSMIC TESTING

ITE-5421 ANALYZER	ENCODER INPUT SECTION	DISPLAY CONTROL SECTIONS						ALARM SECTION			SIGNAL CONTROL SECTION						
TEST OPERATION MODE	PROGRAM PLUG (J3)	GROUP A	GROUP B	DECADE SELECTOR HDS	DECADE SELECTOR TEN	DECADE SELECTOR UNIT	MODE	VOLUME	LATCH	TEST MODE	SENSITIVITY	GROUND	SIGNAL LEVEL	PROBE JACK	LO-Z HI-Z	EXT/ LOC	IMPEDANCE LEVEL
AUTOMATIC SCAN VERIFY 100 PAIRS 50 PAIRS 64 PAIRS	ITE 5421 NOTE B DET 5 DET 3 DET 8	ON	ON	N	N	N	SELECT	MID RANGE	OFF	VERIFY	HI	NOTE A	MAX	...	...	LOCAL	....

ITE 5422 MTC	INPUT SECTION				FORMAT SECTION		SCAN CONTROL SECTION				SIGNAL OUTPUT SECTION		
TEST OPERATION MODE	J_1	J_2	J_3	J_4	ZONE	GROUP	SCAN LIMIT	PRESET	SCAN/ STEP	SCAN RATE	SPARE JACK	PROBE JACK	HI-Z/ LO-Z
AUTOMATIC SCAN VERIFY								END POINT					
100 PAIRS	L_1	R_2	L_3	R_4	(000-199)	A	199	1	NOTE C	MID-RANGE	....	....	....
50 PAIRS	L_1		L_3		(000-199)	A	149	2					
64 PAIRS	L_1	R_2	L_3	R_4	(000-199)	A	177	1					

ITE 5423 200 CKT ENCODER	INPUT SECTION				FORMAT SECTION		SIGNAL OUTPUT SECTION		
TEST OPERATION MODE	J_1	J_2	J_3	J_4	ZONE	GROUP	SPARE JACK	PROBE JACK	HI-ZI LO-Z
AUTOMATIC SCAN VERIFY									
100 PAIRS	L_1	R_2	L_3	R_4	(000-199)	B	...	...	...
50 PAIRS	L_1		L_3		(000-199)	B	...	...	...
64 PAIRS	L_1	R_2	L_3	R_4	(000-199)	B	...	...	...

NOTES -

A. THE ITE 5421 ANALYZER MUST BE CONNECTED TO AN A/C OUTLET WITH AN ITE 9055 POWER CORD. THIS CORD PROVIDES A GROUND REFERENCE FOR TESTING GROUNDED LEADS.

B. PROGRAM PLUGS AND ASSOCIATED TEST FIXTURES
ITE-5421 DET 3-ITE-5906,5907,5908 (DECIMAL COUNT)
ITE-5421 DET 8-ITE-5909 (OCTAL COUNT)

C. OPERATING THE TOGGLE SWITCH TO SCAN POSITION WILL START THE AUTOMATIC SCANNING. OPERATING THE TOGGLE SWITCH TO STEP POSITION WILL STEP THE IMAGE AND TEST TO THE NEXT INDICATION.

RP-0985X