

AMT.	ITE	Description
1	9223	Cord, Test, Dist. Fr. (183)
1	9225	Cord, Test, Misc. Loose Terminal
(As Req'd)	R-3436	Flage

3. METHOD OF VERIFICATION

3.1 Information Provided

- 3.11 No. 5 Crossbar Offices are provided with Cable Connecting Sheets (CCS) by their local Centralized Cable Analysis Organization to perform sequential fanning and connecting wiring operations for all switchboard cables. Sheets are provided for all required cable runs whether they be bulk, formed, or P-wire.
- 3.12 The standard CCS sheets received will have been marked by the CCA Organization for specified job conditions (circuit numbers, terminal numbers, unit numbers, options for cable conductors, etc.) to cover all detailed originating and terminating information for each conductor end for each cable run furnished. Sheets are collated and bound with frame folder cover sheet SD-3-210 on a per frame or type of frame basis with a copy in both the "from" and "to" folder for each run.
- 3.13 These Cable Connecting Sheets are to be used for performing the required continuity verification of switchboard cable leads.

3.2 Procedure

- 3.21 Cables connected on a frame are referred to as "originating" (from) or "terminating" (to) depending on the frame control of a given cable run. The controlling end of a cable run is that frame from which the cable originates. Within a frame folder containing CCS's for cables to be verified, both originating and terminating cable runs will be collated. All cable runs within that folder which list the selected frame on the left hand side of the CCS (from end) should be verified at this time. This will result in all cable designations controlled by this frame being verified. Cables within the folder which show the frame on the "to" end will be verified from the respective controlling frames for these cables.

3.22 Each lead designation of every cable should be "buzzed" between the respective "to" and "from" terminations shown until all conductors have been verified. The left half of the CCS depicts the terminations at the controlling frame and the right half depicts the terminations at the connecting frames. Repeat this procedure until all cables controlled by the frame under review have been verified in a similar manner. After each cable is verified, completion of that item should be recorded in the appropriate column on the SD-3-210 cover sheet.

3.23 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 also listed on the CCS. 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.

3.24 Continuity verification as described above is performed with the ITE-4137 or ITE-4137A AC Continuity Set. Cables listed in Table "B" may be verified using an "Electronic Lead Verification System". (See Table "B").

3.3 A.C. Continuity Set ITE-4137 or ITE-4137A (see Handbook 69C, Vol. 1, Sec. 0.2, Par. 5)

3.31 Plug the ITE-4137 or ITE-4137A into a 105-125V AC outlet and verify the continuity of short leads as illustrated in Figure 1. Verify the continuity of long leads as shown in Figure 2 or 3.

3.32 When not in use, disconnect power from the ITE set by removing plug from frame AC outlet.

3.4 Electronic Lead Verification System

3.41 For test set operation, refer to the manufacturing instruction manual and Handbook 9, Section 910.

3.42 Referring to Table "B", set up the ITE-5421 Analyzer at the frame to be probed. At the frame to be cord interfaced locate the ITE-5423 Encoder. In

terconnect the test sets using cords provided. See Figure 4 and 5 for typical set-up.

- 3.43 Various combinations of test cords other than those specified in subsequent operational applications and tables are applicable in permitting the system to operate automatically. Refer to G.I.C.-1.01, Paragraphs 3.26, 3.31, 3.35, 4.5, 5.4, Handbook 9, Section 910 and Section 923, Figure 6, typical Automatic Scan Applications.

4. APPLICATIONS

4.1 Auxiliary Line Link Frame

- 4.11 Interconnect ITE-9218 Test Cords to banjo connection on rear of crossbar switch. Using hand probe, verify wiring at Link Link Frame Junctor Switch for continuity, crosses and false ground.

NOTE: If junctor grouping frame is cross connected, it may be necessary to adjust impedance level (ITE-5421) for single image on the sleeve leads.

4.2 Line Link Frame

- 4.21 Subscriber Lines: When hand probing at Line Link Frame, the vertical off normal spring must be operated to remove ground from the tip of the subscriber line. This may be accomplished by manually operating the vertical holding armature.

- 4.22 Junctors: If junctor grouping frame is cross connected, it may be necessary to adjust impedance level (ITE-5421) for single image on the sleeve lead.

4.3 Trunk Link Frame

- 4.31 It may be necessary to adjust the impedance level (ITE-5421) for single image on the sleeve lead.

4.4 Connector Frames

- 4.41 Marker Mult: Set-up interlacing cords at the last equipped multiple appearance. Hand probe multiple toward the markers.

NOTE: It is recommended that this verification should be done prior to connecting the multiple at the marker termination.

- 4.42 Connectors: Verify all connector cables prior to fusing of various frames using impedance level adjustment to isolate double image through windings of various apparatus. A hard ground will not adjust out and must be identified if it is correct.

4.5 Number Group Frame

- 4.51 A number of leads will have resistance bridge and can be adjusted using the impedance level adjustment. However, certain options will provide hard ground on leads. These must be identified prior to verification.

4.6 Completing Marker Route Relay Frame

- 4.61 The FTC leads must be verified prior to cross connecting these leads in the Trunk Link Frame.

5. WIRING ERRORS

- 5.1 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 and an accurate record kept on SD-4-1313 of future action to be taken.

TABLE A

ITEM	LOCATION OF LEAD TESTS FOR EXCEPTED ITEMS (PARA. 1.31)	
	HANDBOOK SECTION NUMBERS	HB 69SP
	HB 69C	
Power & Tone Distribution Leads From the PRTD	569A02	101
Office Interrupter Distribution Leads	527A02, 527A03, 527A04, 530A14 & 586A07	201 & 201.1
Leads to Traffic Registers	526A03	490
Leads to Message Registers	526A05	209
Leads to Plant Registers	532A26	104
Trunk Link to Relay Rack Trunks	586A08	106
OSL, IRL, CSL and CII to Relay Rack Trunks	586A10	106.1

TABLE B

HB 9

ITEM	TEST SET LOCATIONS	LEADS TO BE HAND PROBED	CORD INTER-FACING INFORMATION			READ-OUT INFORMATION		
			CORD	JACK CONNECTION	LOCATION OF FIXTURES	SWITCH GRP	SWITCH ZONE	IMAGE
Aux Line Link FR	ITE-5421 at Basic LL FR ITE-5423 at ALL FR	LL JTRS T, R, S AT LL FR	(2) ITE-9218 AT ALL FR	Cord 1 L to L1	SW 0, Levels 0-4 NOTE (1)	A	1	000-029
				Cord 2 L to L3	SW 0, Levels 5-9 NOTE (1) (Repeat for SW 1-9)	A	1	100-129
Line Link FR Basic & Supp'l.	ITE-5421 at LL FR ITE-5423/5422 at HMDF	LL Subs Leads T, R, &/or S AT LL FR	(1) ITE-9223 AT HMDF	L1 to L1 R2 to R2	Term. Strip (ITE-5423)	A	1	000-199
				L3 to L3 R4 to R4	Term. Strip (ITE-5422)	A	2	200-399
Line Link FR	ITE-5421 at JTR GRP FR ITE-5423 at Basic LL FR	LL JTRS T, R, S AT JTR GRP FR	(2) ITE-9222 AT LL FR	Cord 1 L to L1	SW 0 Verts 0L-9L	A	1	00-29
				Cord 2 L to L3	SW 0 Verts 0R-9R (Repeat for SW 1-9)	A	1	100-129
Line Link FR to ALL	ITE-5421 at ALL FR ITE-5423 at Basic LL FR	LL JTRS T, R, S AT LL FR	(2) ITE-9222 AT LL FR	Cord 1 L to L1	SW 0 Vert 0 NOTE (2) - 9 NOTE (2)	A	1	00-29
				Cord 2 L to L3	SW 1 Vert 0-9	A	1	100-129
Trunk Link FR	ITE-5421 at JTR GRP FR ITE-5423 at TL FR	TL JTRS T, R, S AT JTR GRP FR	(2) ITE-9218 AT LL FR JTR SW	Cord 1 L to L1	SW 0 Level 0L-9L NOTE (1)	A	1	00-29
				Cord 2 L to L3	SW 0 Level 0R-9R NOTE (1) Repeat for SW 1-9	A	1	100-129
Line Link Conn FR Marker Multiple	ITE-5421 at 1st Appearance ITE-5423 at Last Appearance	Mkr Mult MA, MB Term Strip At First Appearance	(2) ITE-9217 Last Appearance	Cord 1 L to L1 R to R2	Last Appearance Mkr Mult MAL MA2	A	1	00-59
				Cord 2 L to L3 R to R4	Last Appearance Mkr Mult MB1 MB2	A	1	100-159
Line Link Conn FR to Line Link	ITE-5421 at LLC FR ITE-5423 at LL FR	Line Link FR "A" Term Strip MA, MB, 1 & 2	(2) ITE-9216 at LL FR	Cord 1 L to L1 R to R2	Connect Fixture #1 to MAL 1 & Fixture #2 to MAL 2	A	1	00-59
				Cord 2 L to L3 R to R4	Ditto above on MBL 1 & MBL 2	A	1	100-159

NOTE

(1) Cord fixture designed for 6 point switch. To use on 3 point switch connect left three connectors to X-Bar switch T, R, S of each level.

NOTE

(2) Use left or right depending on Line Link assignment to ALL FR.

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TABLE B (Cont'd)

ITEM	TEST SET LOCATIONS	LEADS TO BE HAND PROBED	CORD INTER-FACING INFORMATION			READ-OUT INFORMATION		
			CORD	JACK CONNECTION	LOCATION OF FIXTURES	SWITCH GRP	SWITCH ZONE	IMAGE
Trunk Link Conn FR Marker Multiple	ITE-5421 1st Appearance ITE-5423 Last Appearance	Mkr Mult MA, MB, MC All Appearances	(2) ITE-9217	Cord 1 L to L1 R to R2	Last Appearance Mkr Mult MA1 MA2	A	1	00-59
				Cord 2 L to L3 R to R4	MB1 MB2	A	1	100-159
			(1) ITE-9217 Repeat Use of Cord 1 for MC1 & MC2 Term Strip	Ditto Cord 1 Above for MC1 & MC2	A	1	00-59	
Trunk Link Conn for Trunk Link	ITE-5421 TLC FR ITE-5423 TL FR	Trunk Link FR "D" Term Strip MA, MB, MC 1 & 2	(2) ITE-9216	Cord 1 L to L1 R to R2	Connect Fixture #1 to MAL1 Fixture #2 to MAL2	A	1	00-59
				Cord 2 L to L3 R to R4	Ditto Above on MBL1 & MBL2	A	1	100-159
			(1) ITE-9216 Repeat use of Cord 1 for MCL1 & MCL2 Term Strip	Ditto Cord 1 Above for MCL 1 & 2	A	1	00-59	
Out-Sender Conn FR Marker Mult	ITE-5421 1st Appearance ITE-5423 Last Appearance	Mkr Mult MA, MB & MC	(2) ITE-9217	Cord 1 L to L1 R to R2	Last Appearance Mkr Mult MA1 MA2	A	1	00-59
				Cord 2 L to L3 R to R4	MB1 MB2	A	1	100-159
			(1) ITE-9217 Repeat use of Cord 1 for MC1 & MC2 Term Strip	Ditto Cord 1 Above for MC1 & MC2	A	1	00-59	
Out-Sender Conn FR Sender Mult	ITE-5423 OSC Frame ITE-5421 OS Frames	Sender Part Mult SA, SB, SC Refer to W.L. for Mult Assignment	(2) ITE-9216	Cord 1 L to L1 R to R2	Connect Fixture #1 to MA1 & Fixture #2 to MA2	A	1	00-59
				Cord 2 L to L3 R to R4	MB1 MB2	A	1	100-159
			(1) ITE-9216 Ditto Cord 1 Above for MC1 & MC2		A	1	00-59	

TABLE B (Cont'd)

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ITEM	TEST SET LOCATIONS	LEADS TO BE HAND PROBED	CORD INTER-FACING INFORMATION			READ-OUT INFORMATION		
			CORD	JACK CONNECTION	LOCATION OF FIXTURES	SWITCH GRP	SWITCH ZONE	IMAGE
Number Group Conn FR Mkr Mult	ITE-5421 1st Appearance ITE-5423 Last Appearance	Mkr Mult MCA, MCB, MCC, MCD, MCE	(2) ITE-9217	Cord 1 L to L1 R to R2	Last Appearance Mkr Mult MCA MCB	A	1	00 59
				Cord 2 L to L3 R to R4				MCC MCD
			(1) ITE-9217 Repeat Use of for MCE	Cord 1	Use Fixture #1	A	1	00-04 10-14 50-54
Number Group Conn FR Number Group	ITE-5421 NGC FR ITE-5423 NG FR	NG FR A Term Strip MA, MB, MC, MD, ME	(2) ITE-9216	Cord 1 L to L1 R to R2	Connect Fixture #1 to MCA L Fixture #2 to MCB L	A	1	00 59
				Cord 2 L to L3 R to R4				MCC L MCD L
			(1) ITE-9216 Repeat Use of for MCE L	Cord 1	Use Fixture #1	A	1	00-04 10-14 50-54
ORMC FR Mkr Mult	ITE-5421 1st Appearance ITE-5423 Last Appearance	Mkr Mult MA, MB, MC, MD, ME	(2) ITE-9217	Cord 1 L to L1 R to R2	Last Appearance Mkr Mult MA MB	A	1	00 59
				Cord 2 L to L3 R to R4				MC MD
			(1) ITE-9217 Repeat Use of for ME	Cord 1	Use Fixture #1	A	1	00-04 50-54
ORMC FR Register Mult	ITE-5423 ORMC FR ITE-5421 OR FR	Register Mult RAL, RBL, RCL Refer to W.L. For Multiple Assignment	(2) ITE-9216	Cord 1 L to L1 R to R2	RAL RBL	A	1	00 59
				Cord 2 L to L3				RCL (R4 Not Used)

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TABLE B (Cont'd)

ITEM	TEST SET LOCATIONS	LEADS TO BE HAND PROBED	CORD INTER-FACING INFORMATION			READ-OUT INFORMATION		
			CORD	JACK CONNECTION	LOCATION OF FIXTURES	SWITCH GRP	SWITCH ZONE	IMAGE
IRMC FR Mkr Mult	ITE-5421 at 1st Appearance ITE-5423 at Last Appearance	MKR Mult MA, MB, MC, MD, ME	(2) ITE-9217	Cord 1 L to L1 R to R2	Last Appearance Mkr Mult MA MB	A	1	00 59
				Cord 2 L to L3 R to R4	MC	A	1	100 159
			(1) ITE-9217 Repeat Use of Cord 1 for ME	Use Fixture #1	A	1	00-04 00-54	
IRMC FR Reg. Part	ITE-5423 at IRMC FR ITE-5421 IR FR	Register Mult RAL/R, RBL/R RCL/R, RDL/R REL/R Refer to W.L. for Mult Assignment	(2) ITE-9216	Cord 1 L to L1 R to R2	Connect Fixture #1 to MAL Fixture #2 to MBL	A	1	00 59
				Cord 2 L to L3 R to R4	MCL MDL	A	1	100 159
			(1) ITE-9216 Repeat Use of Cord 1 for MEL	Use Fixture #1	A	1	00-04 50-54	
Comp Mkr for RR Frame	ITE-5421 Trunk Link FR ITE-5423 at Route Relay FR	Trunk Link "C" Term Strip FTC or Multiple of FTC to other Route Relay Frame	(2) ITE-9217	Cord 1 L to L1 R to R2	Connect Fixture #1 to TL- () 00-44 Fixture #2 to 05-49	A	1	00 49
				Cord 2 L to L3 R to R4	TL- () 50-94 55-99	A	1	100 149
T-LL FR Link Mult	ITE-5321 at FR with Lowest VG - ITE-5423 at FR with Highest VG -	Link Mult Levels 0-9 Switches 0-9 T,R,S,T1,R1,TS	(2) ITE-9218 Connect Fixtures on Vert 0 of Highest VG#	Cord 1 L to L1 R to R2	SW-0 Level 0-4 SW-0 Level 5-9	A	1	00 59
				Cord 2 L to L3 R to R4	SW-1 Level 0-4 SW-1 Level 5-9	A	1	100 159
			Repeat for switches 2-9					
T-LL FR JTR Mult	ITE-5421 At T-LL FR SW ITE-5423 at T-TL JTR SW	T-LL JTR Mult Vert 0-9 Switches 0-9 T,R,S,T1,R1,TS	(2) ITE-9218 Connect Fix. on Vert - 0	Cord 1 L to L1 R to R1	SW-0 Level 0-4 SW-0 Level 5-9	A	1	00 59
				Cord 2 L to L3 R to R4	SW-1 Level 0-4 SW-1 Level 5-9	A	1	100 159

TABLE B (Cont'd)

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ITEM	TEST SET LOCATIONS	LEADS TO BE HAND PROBED	CORD INTER-FACING INFORMATION			READ-OUT INFORMATION				
			CORD	JACK CONNECTION	LOCATION OF FIXTURES	SWITCH GRP	SWITCH ZONE	IMAGE		
Completing Marker FR MTC	ITE-5421 at MTC for CMKR 0-3 or SMTC for C Mkr 4-11 ITE-5423 at Comp Mkr	MTC Relays A0-A11	ITE-9221	L1 to L1	Connect Fixture to A0-A3 of MTC "CE" Terminal Strip	A0&1	A	1	00-49	
				R2 to R2		A2&3	A	1	100-149	
				L3 to L3			A	1	150-159	
				R4 to R4	Repeat for A4-A7			Example Contact Image A0, A2 00-54 00-54 A1, A3 00-04 05-09 10-14 15-19 thru A1, A3 50-54 55-59		
				L3 to L3	A8 & A9 "TR" Term. Strip					100-159
				R4 to R4	Connect Fixtures on entire Block.					
				L1 & R1	Not Used					
		MTC Relays B2 & B3		L1 to L1	Connect Fixture To A10,A11,B2,B3	A10, A11			00-54	
				R2 to R2		B2, B3			100-159	
		MTC Relays B0 & B1 C0 & C1		L1 to L1	Connect Fixture To C0,C1,&B0,B1	C0 & C1			00-49	
				R2 to R2		B0 & B1	Ditto for A0-A3		100-149	
		MTC Relays B4-B7		L3 to L3	MTC "CB" Term. Strip				150-159	
				R4 to R4						
MTC Relays C, C3	L1 to L1	Connect Fixture To B4,B5,B6,B7	B4 & B5			00-49				
	R2 to R2		B6 & B7			50-59				
MTC Relays C4, C5 T0, T1	L3 to L3	MTC "TS" Term. Strip				100-149				
	R4 to R4					150-159				
MTC Relays C, C3	L1 to L1	Connect Fixture To C2 & C3	C2 & C3			00-49				
	R2 to R2					50-59				
MTC Relays C, C3	L3 & R4	MTC "CB" Term. Strip								
	Not Used									
MTC Relays C4, C5 T0, T1	L1 to L1	Connect Fixture To C4,C5,T0,T1	C4 & C5			00-49				
	R2 to R2		T0 & T1			50-59				
MTC Relays C4, C5 T0, T1	L3 to L3	MTC "CA" Term. Strip				100-149				
	R4 to R4					150-159				

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TABLE B (Cont'd)

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ITEM	TEST SET LOCATIONS	LEAD TO BE HAND PROBED	CORD INTER-FACING INFORMATION			READ-OUT INFORMATION			
			CORD	JACK CONNECTION	LOCATION OF FIXTURES	SWITCH GRP	SWITCH ZONE	IMAGE	
Completing Marker FR MTC	ITE-5421 at MTC or SMTC ITE-5423 at Comp Mkr	MTC Relay T2 & T3	ITE-9221	L1 to L1 R2 to R2	Connect Fixture to T2 & T3 MTC "CA" TS L3 & R4 Not Used	T2 & T3	A	1	00-49 50-59
		MTC Relay C6 & C7		L1 to L4 R2 to R2	MTC "TR" TS L3 & R4 Not Used	C6 & C7	A	1	00-49 50-59
		MTC Relay E0 & E2		L1 to L1 R2 to R2	MTC "CJ" TS L3 & R4 Not Used	E0 & E2	A	1	00-49 50-59
		MTC Relay D0 & D1		L3 to L3 R4 to R4	MTC "CH" TS L1 & L2 Not Used	D0 & D1	A	1	100-149 150-159
		MTC Relay E1		L1 to R1 R2 to R2	MTC "TT" TS	E1	A	1	00-54
Dial Tone Mrk MTC	ITE-5421 at MTC ITE-5423 at DTM	MTC Relay B10, B11 C10, C11	ITE-9221	L1 to L1 R2 to R2 L3 to L3 R4 to R4	Connect Fixture To B10, B11 C10 & C11 MTC "A" TS	B10, B11 C10, C11	A A	1 1	00-49 50-59 100-149 150-159
		MTC Relay T4, T5, T6, T7		Repeat as Above MTC "A" TS					
		MTC Relay A12, A13, A14, A15		Repeat as Above MTC "B" TS					
		MTC Relay C8, C9, C10		L1 to L1 R2 to R2 L3 to L3	Connect Fixtures To C8, C9, C10 MTC "B" TS R4 Not Used	C8, C9 C10	A A	1 1	00-49 50-59 100-144 150-154
				L3 to L3 R4 to R4	Connect Fixture to A16, A17 L1 & R2 Not Used	A16, A17	A	1	100-149 150-159
		MTC Relay A16, A17							

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TABLE B (Cont'd)

ITEM	TEST SET LOCATIONS	LEADS TO BE HAND PROBED	CORD INTER-FACING INFORMATION			READ-OUT INFORMATION		
			CORD	JACK CONNECTION	LOCATION OF FIXTURES	SWITCH GRP	SWITCH ZONE	IMAGE
LLP FR Mkr Mult.	ITE-5421 at LLP FR ITE-5423 at Comp Mkr	LLP 000-199	ITE-9221	L1 to L1 R2 to R2 L3 to L3 R4 to R4	Connect Fixture to LLP "CJ" TS So as top rows match	A	1	010-159 Note: Row 000-009 & Row 100-109 Not Used
RRNG FR Number Sleeve	ITE-5421 at HMDF or HIDF ITE-5423 at RRNG	Number Sleeve at HMDF or HIDF	ITE-9219	L1 to L1 R2 to R2 L3 to L3	TS "A" NS Portion Be certain contacts & Relays configuration are covered by both fixture	A	1	000-119 Note: Relay 0 Contact 1-12 will be 000, 010, 020, etc. thru 100, 110, 120 and Relay 1 Contact 1-12 will be 001, 011, 021, etc. thru 101, 111, 121
Translator FR TV Mult.	ITE-5421 at 1st Appearance ITE-5423 at Last Appearance	TV Mult TVA, TVB, TVC TVD All Appearance	(2) ITE-9217	Cord 1 L to L1 R to R2	Connect Fixture #1 to TVA & Fixture #2 to TVB	A	1	00 59
				Cord 2 L to L3 R to R4	TVC TVD	A	1	100 159
YJ Mult All FR	ITE-5421 at Frame being probed ITE-5423 Where test cord is interfaced	YJ Mult Frames may probed by line-up and/or aisles	ITE-9225	L to L1	Interface Cord as required to Misc Term Strip Refer to CCS Sheets for Pchg Numbers	A	1	00-49

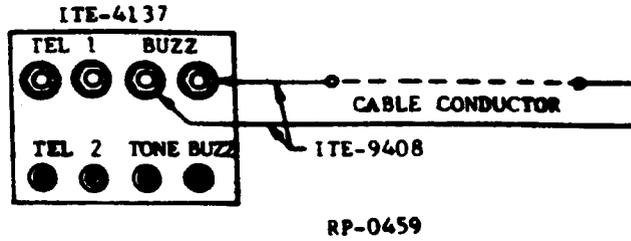


FIG. 1 SHORT LEAD
(PAR. 3.31)

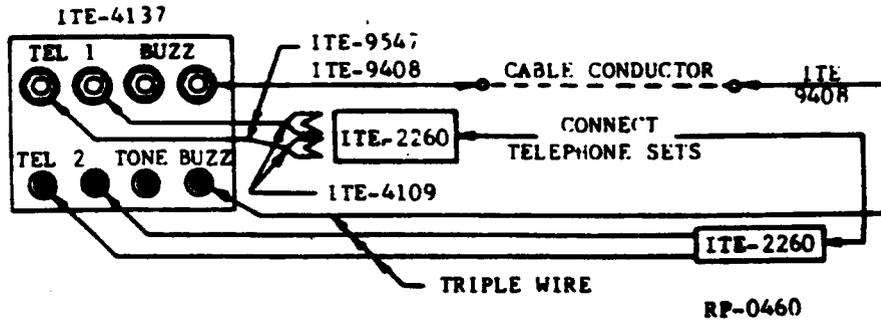
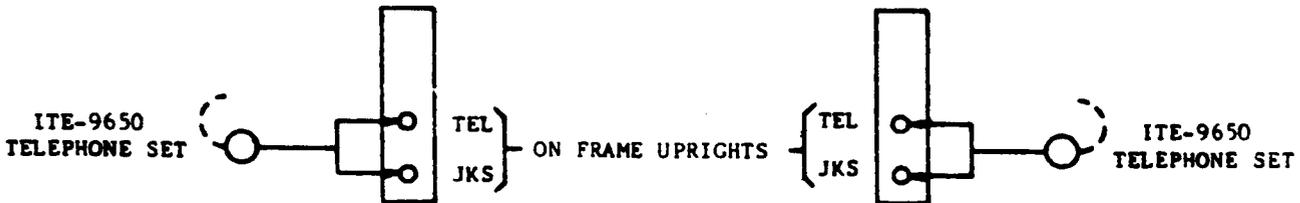
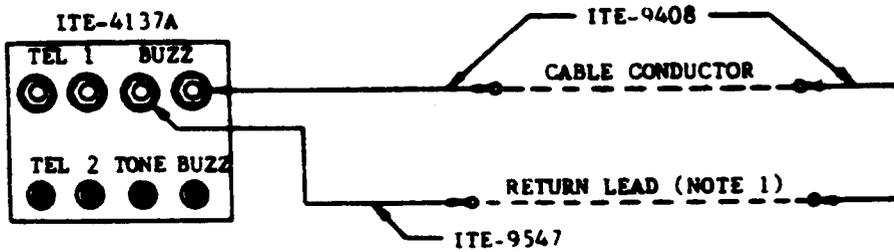


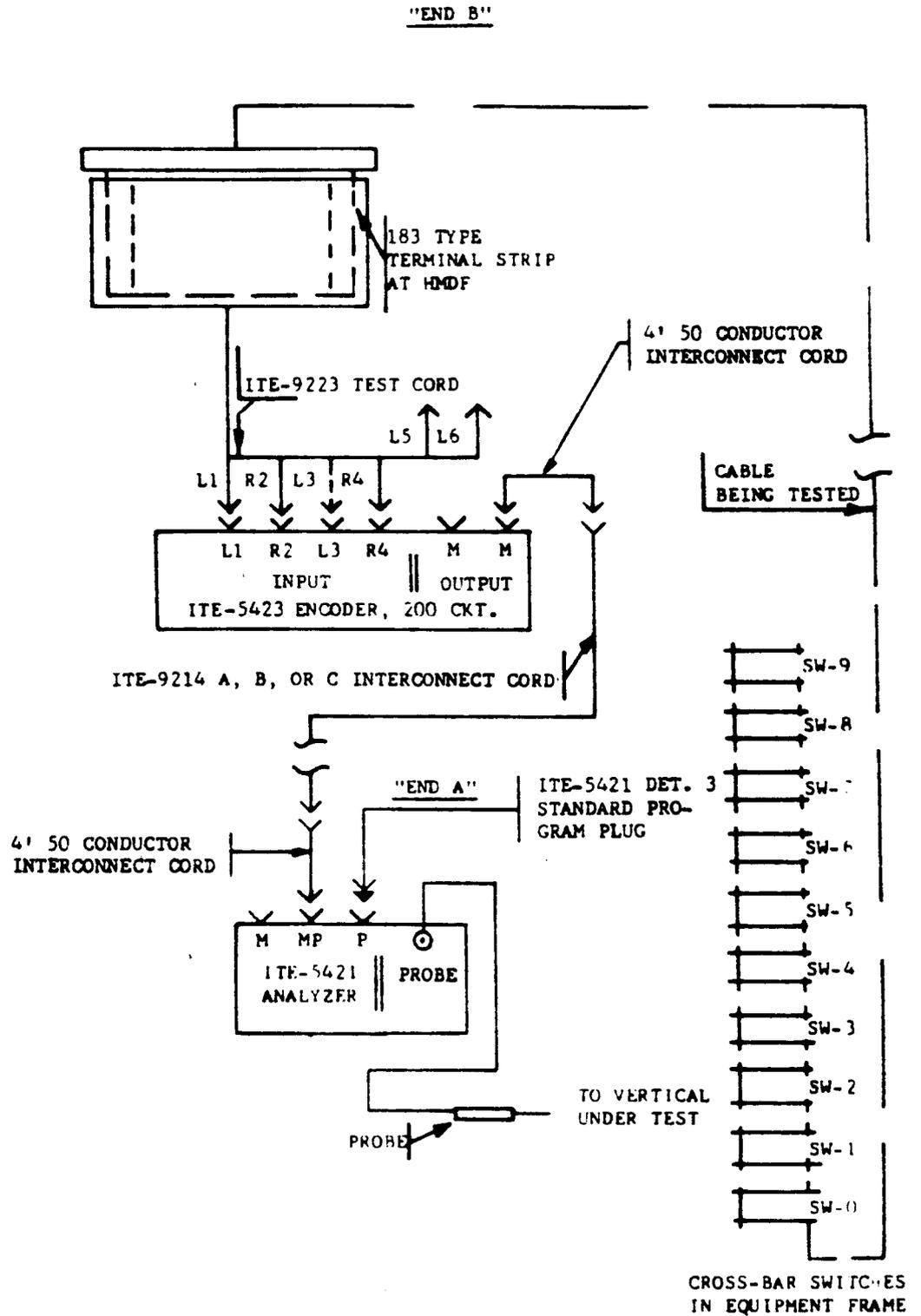
FIG. 2 LONG LEAD WITH TALKING CIRCUIT
(PAR. 3.31)



NOTE-1: RETURN LEAD SHOULD BE FREE OF POTENTIAL AND GROUND.

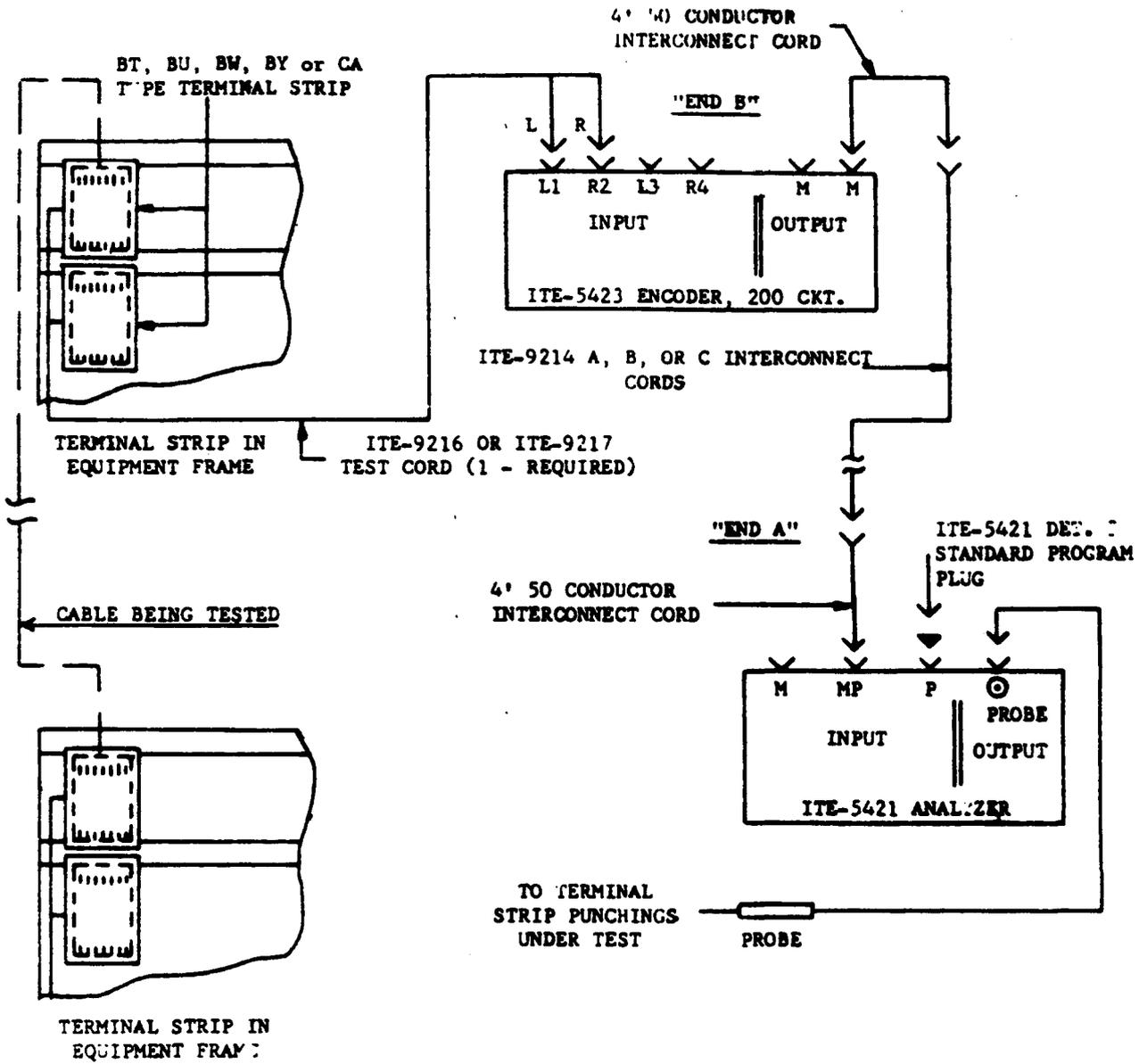
FIG. 3 LONG LEAD USING OFFICE TELEPHONE CIRCUIT
(PAR. 3.31)

RP-0461



KP-0460

FIG. 4 TYPICAL TEST SET UP
(PAR. 3.42)



RP-0471

FIG. 5 EQUIPMENT LAYOUT FOR TESTING CONTINUITY BETWEEN MULTIPLE TERMINAL STRIPS ON EQUIPMENT FRAMES (PAR. 3.31)

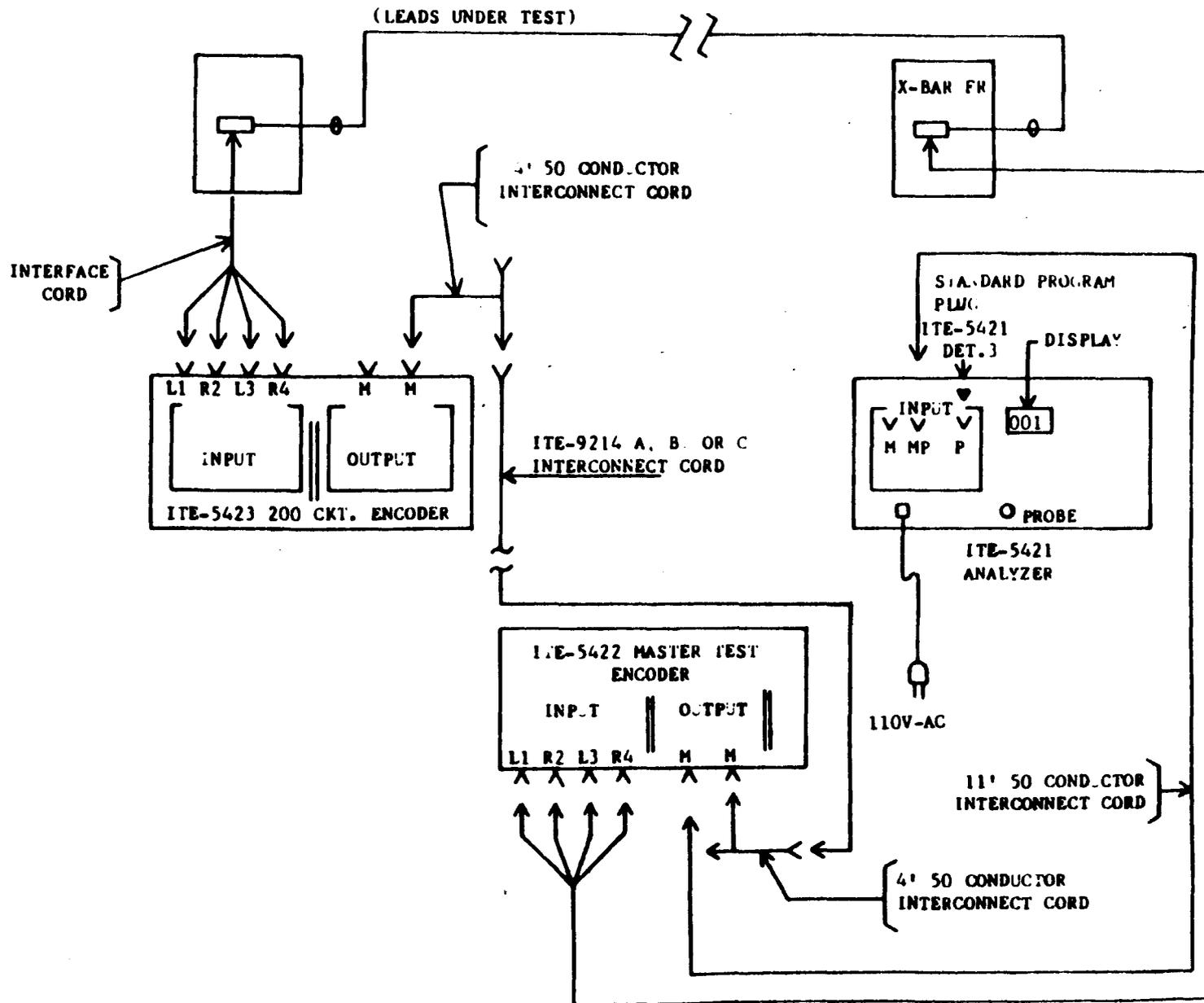


FIG. 6 TYPICAL TEST SETUP
(PAR. 3.3)

RP-0619