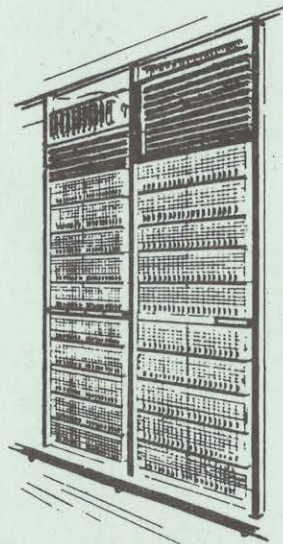


NO. 5 CROSSBAR DIAL TELEPHONE SYSTEM SKETCHES

EDUCATIONAL BULLETIN NO. 2.5B-2

Issued December 1948



Western Electric Company
INCORPORATED
HAWTHORNE WORKS

Central Region Engineering

Technical Training Section

CROSSBAR NO. 5 DIAL TELEPHONE SYSTEM SKETCHES

This bulletin is issued to provide general information concerning the relationship between equipment and frames used in the Crossbar No. 5 Dial Telephone System. Information contained herein is to be used for educational purposes only.

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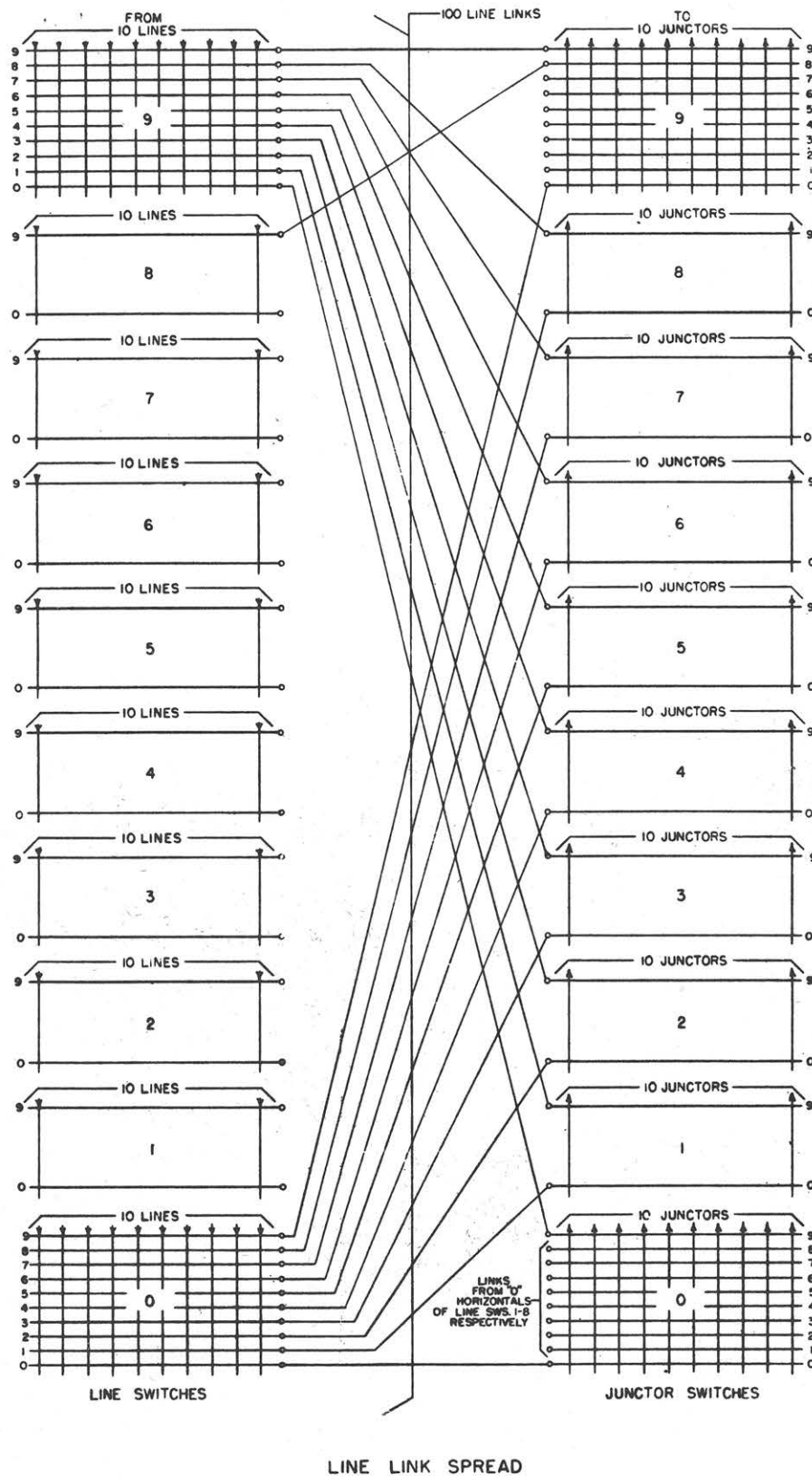
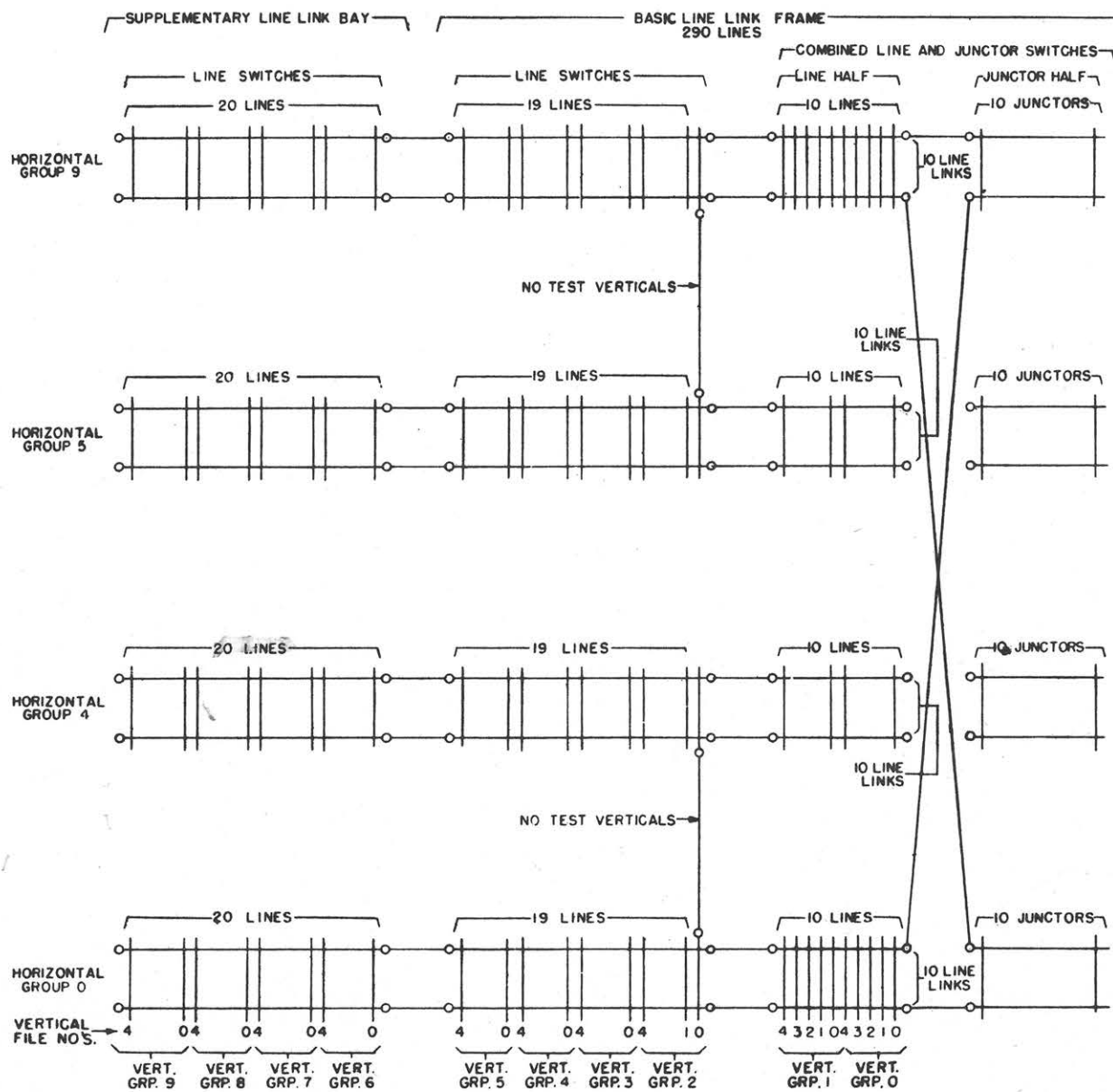


FIG. 5B-010



LINE LINK FRAME SCHEMATIC, WIRING SIDE
FRAME ARRANGED FOR 490 LINES

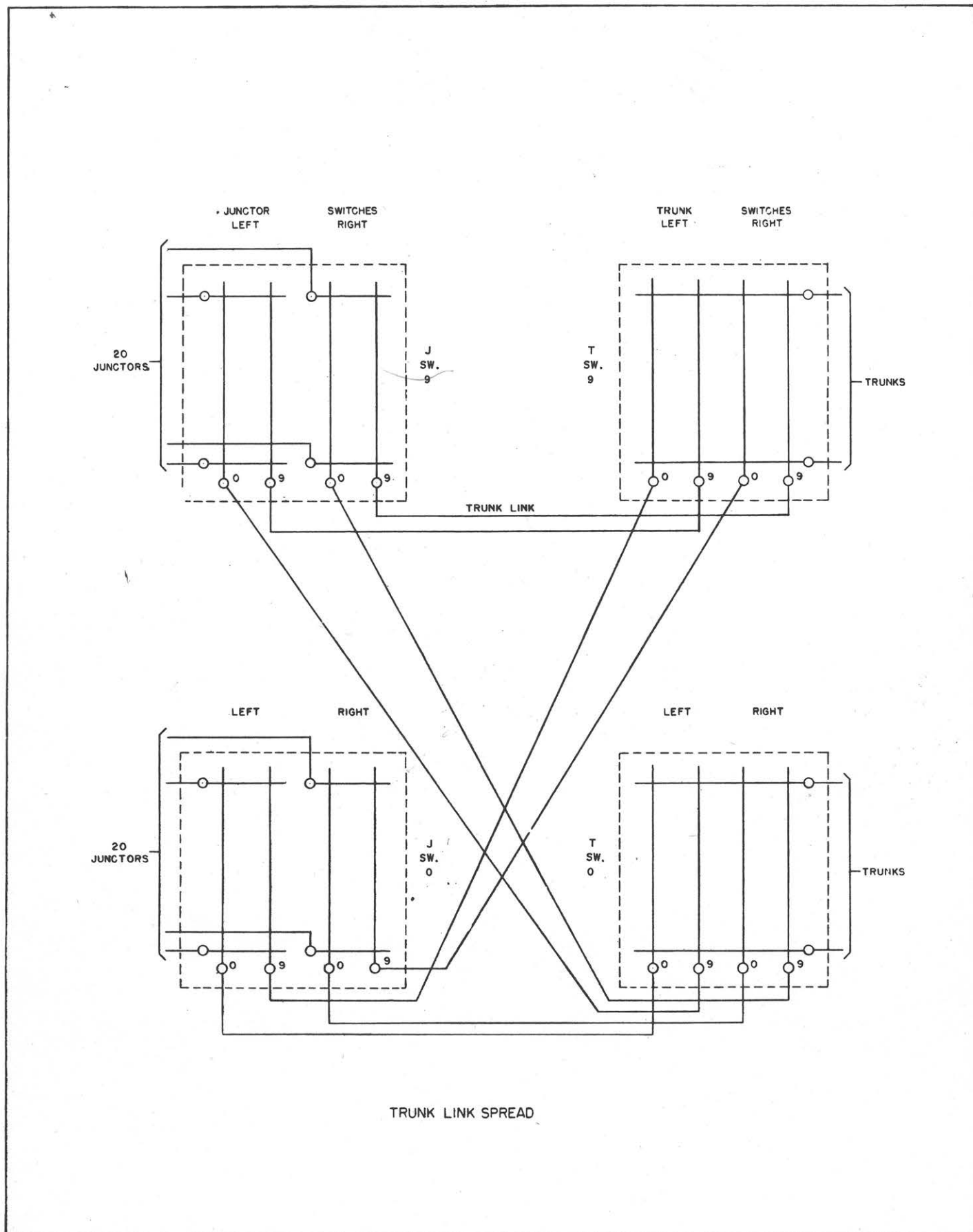
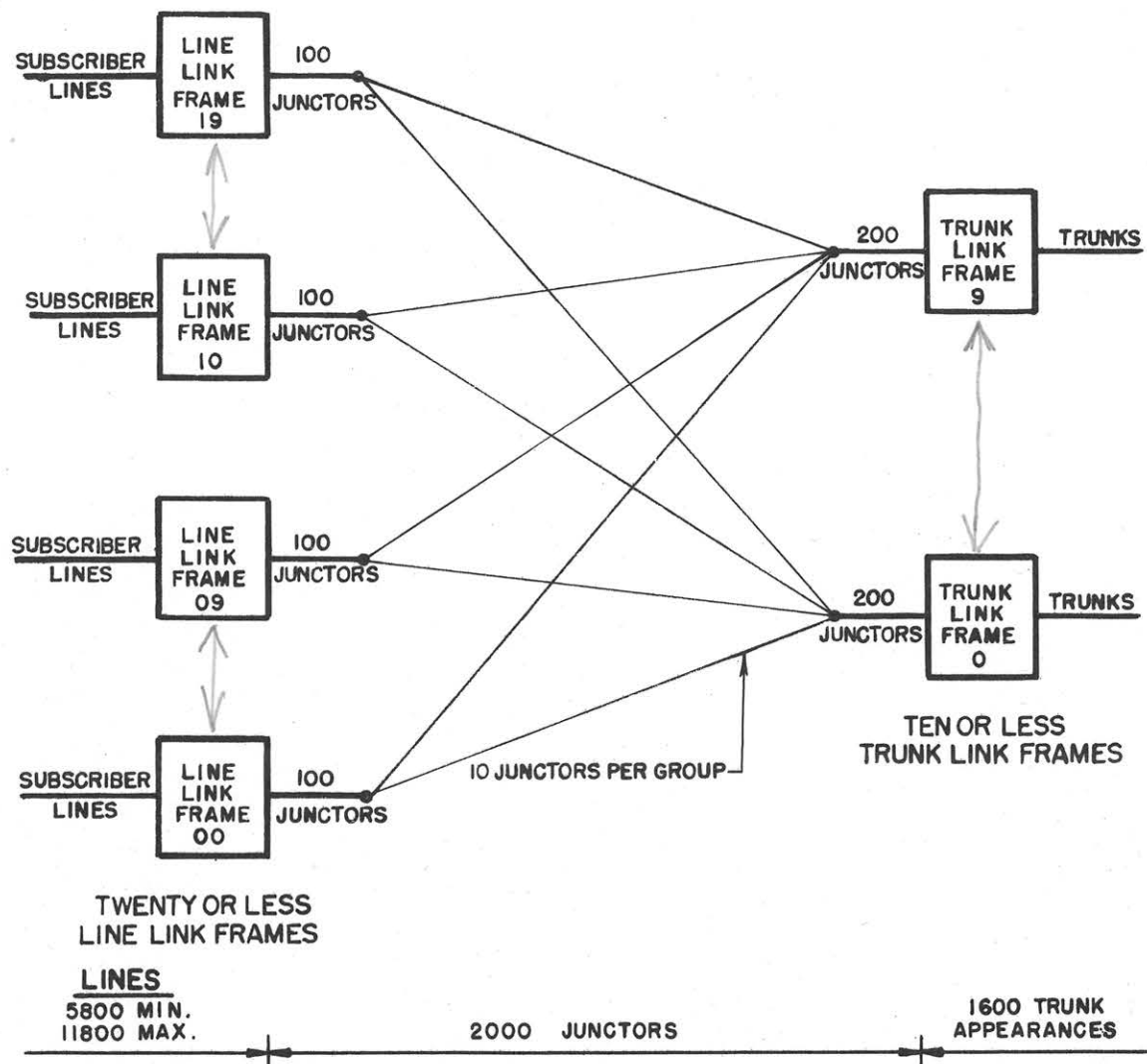
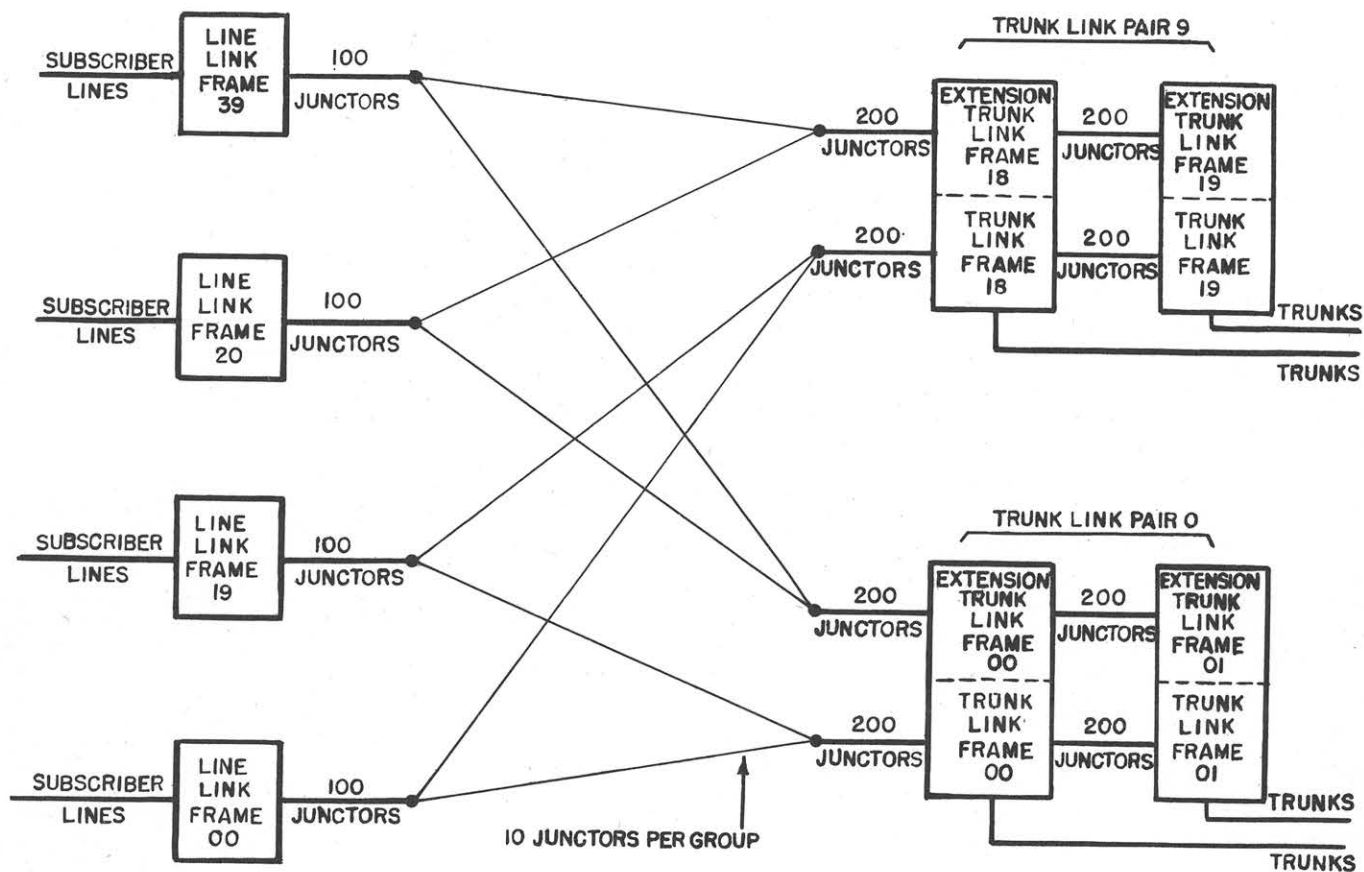


FIG.5B-012



JUNCTOR DISTRIBUTION

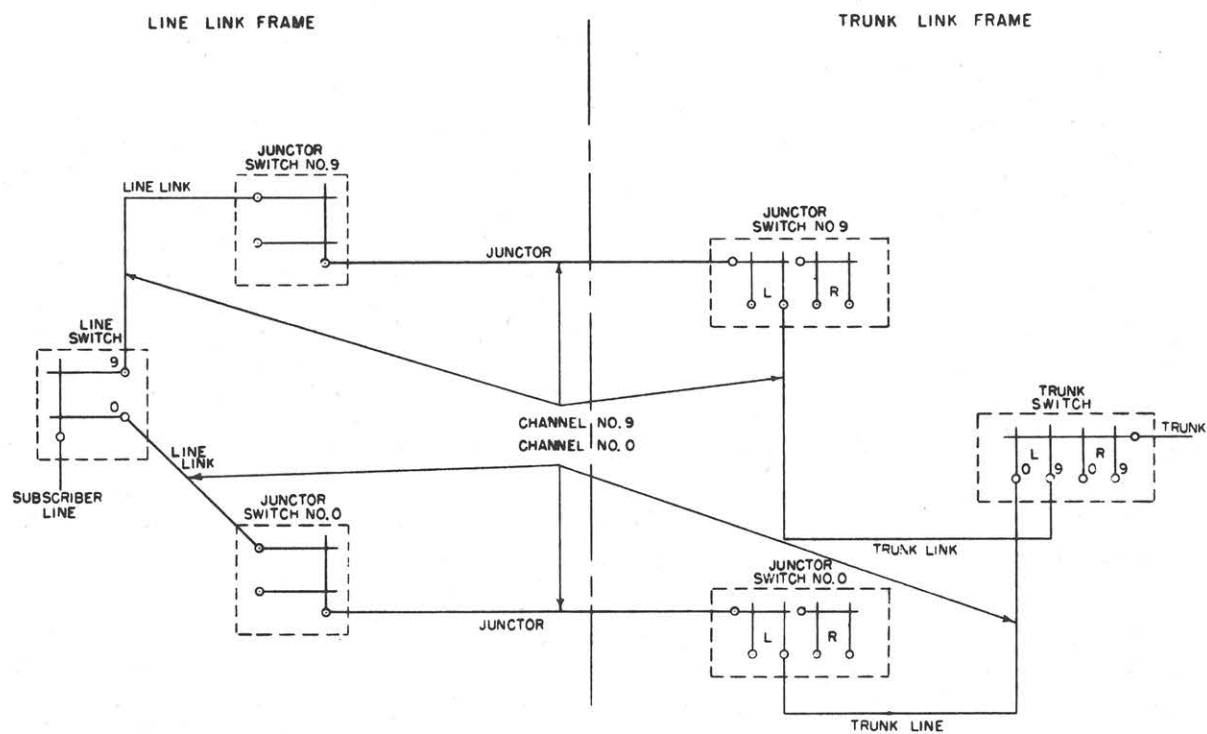
10 OR LESS TRUNK LINK FRAMES



FORTY OR LESS
LINE LINK FRAMES

TWENTY OR LESS
TRUNK LINK AND
EXTENSION FRAMES

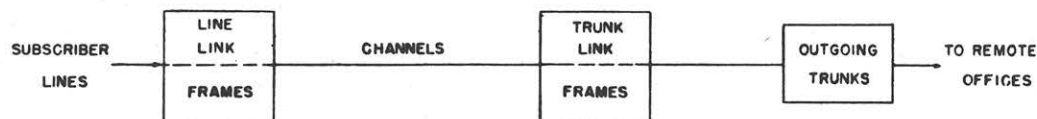
JUNCTOR DISTRIBUTION
WITH
PAIRING OF TRUNK LINK FRAMES



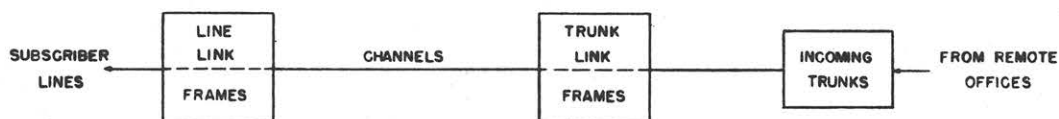
NOTE:
THE CHANNEL NUMBER ALWAYS CORRESPONDS TO THE LINE SWITCH HORIZONTAL NUMBER OF THE LINE LINK, THE TRUNK SWITCH VERTICAL NUMBER OF THE TRUNK LINK, AND THE JUNCTION SWITCH NUMBER. ALL OTHER ELEMENTS ARE NUMBERED INDEPENDENTLY OF CHANNEL NUMBER CONSIDERATIONS.

CHANNELS

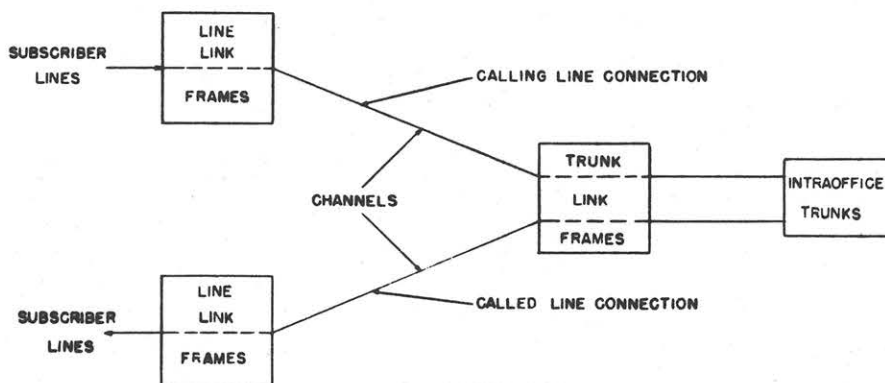
FIG.5B-030



A- OUTGOING CALLS



B- INCOMING CALLS

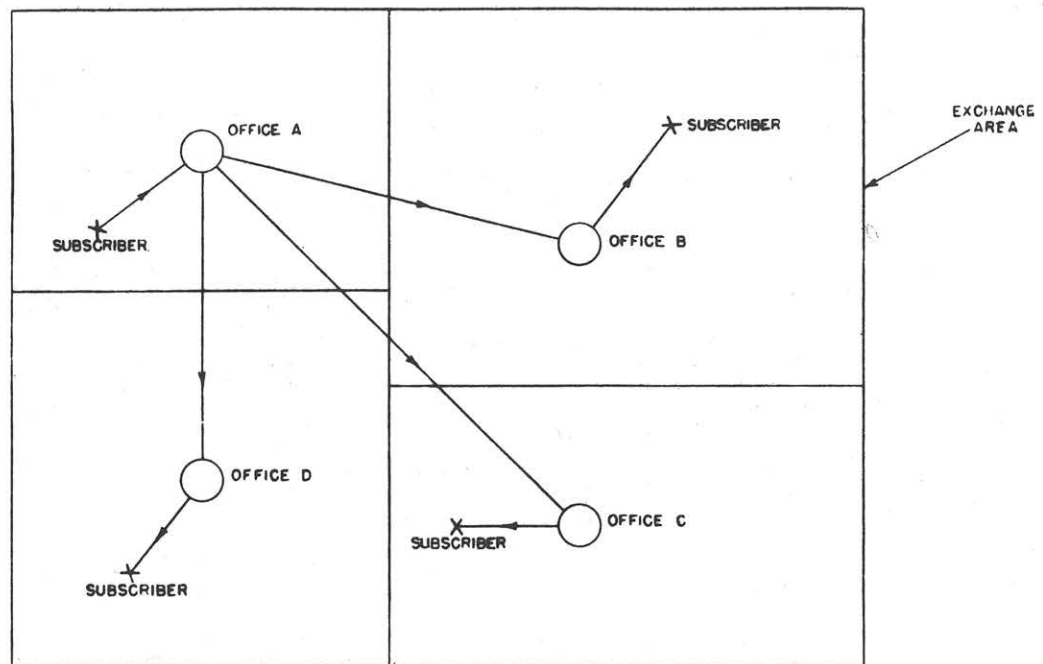


C- INTRAOFFICE CALL

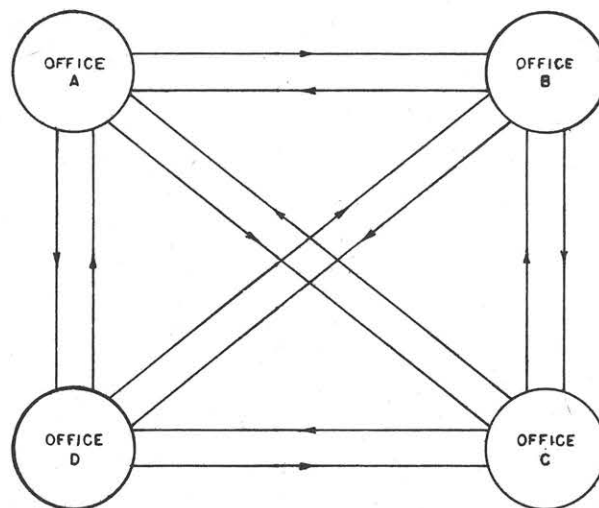


D- DIALING CONNECTION

COMMON USE OF CHANNELS

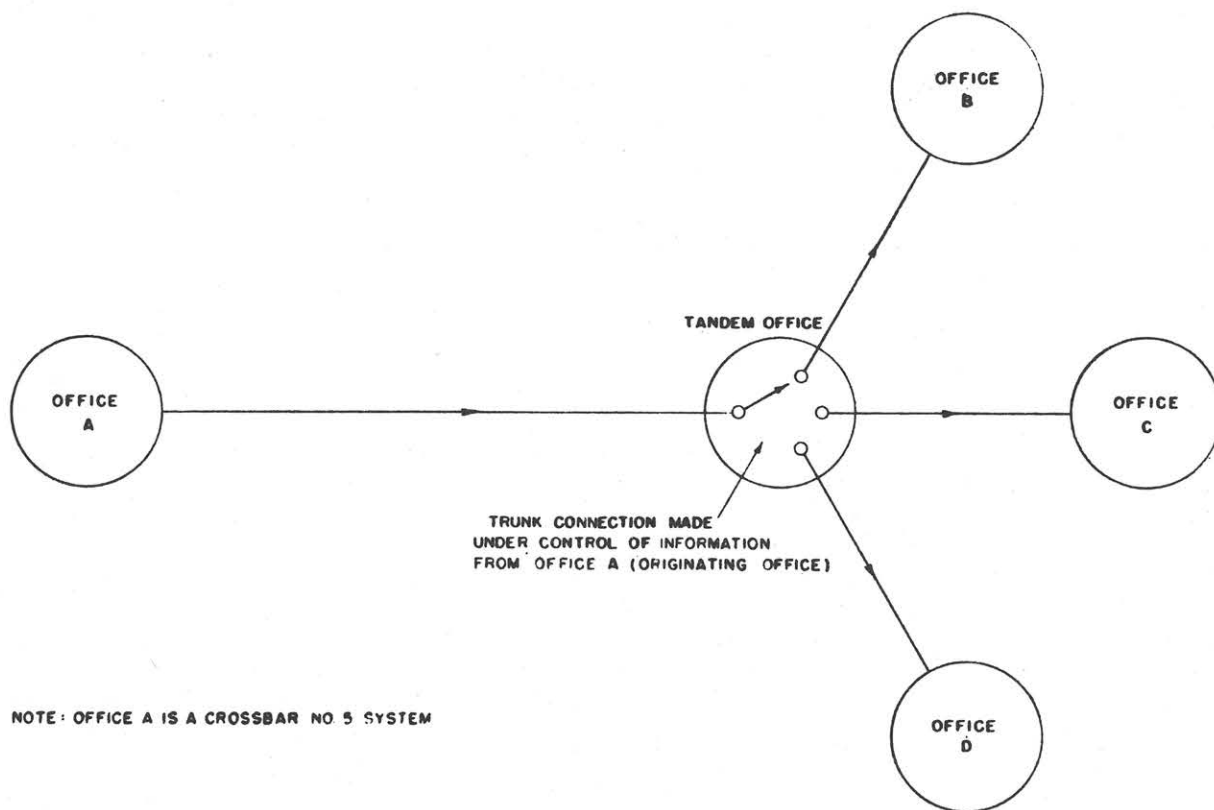


DIRECT TRUNK ROUTES FROM OFFICE A

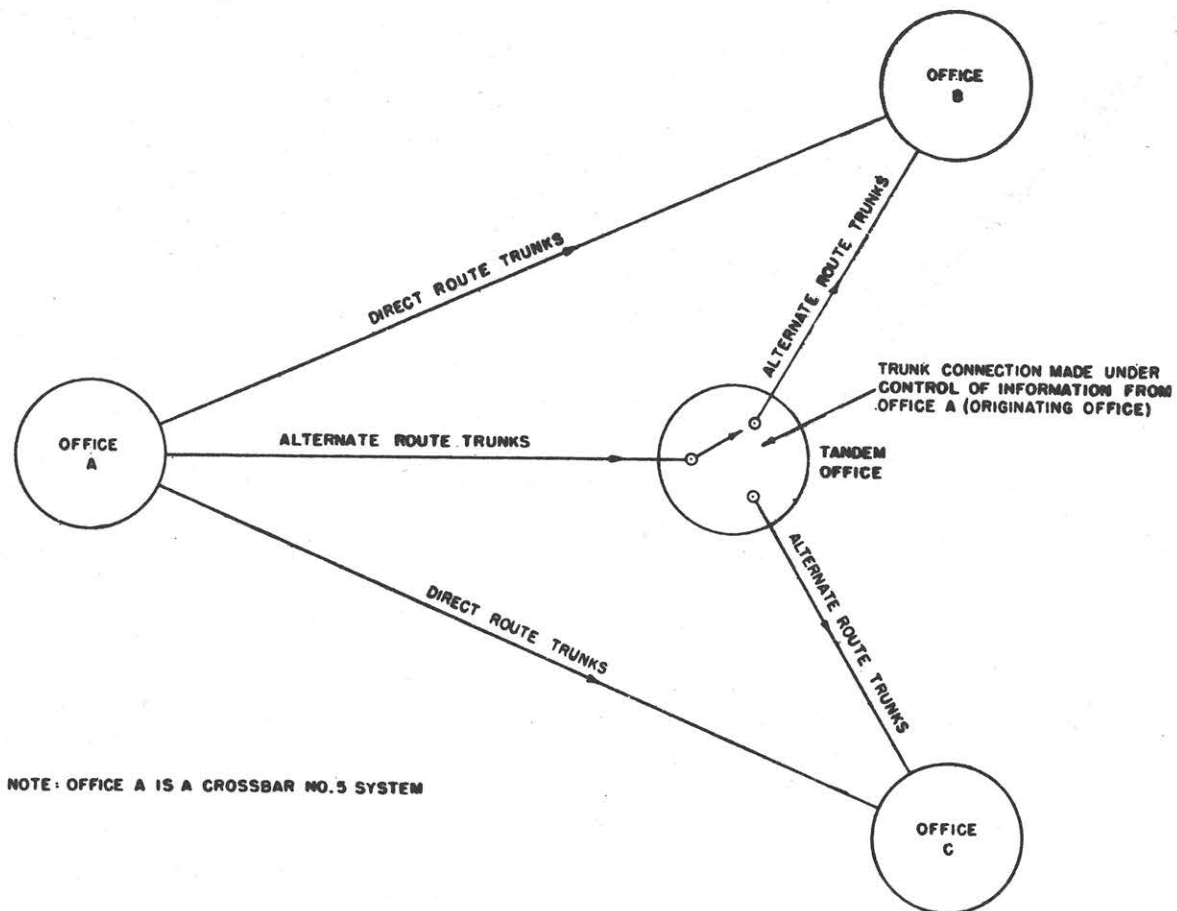


DIRECT TRUNK ROUTES FOR ALL OFFICES

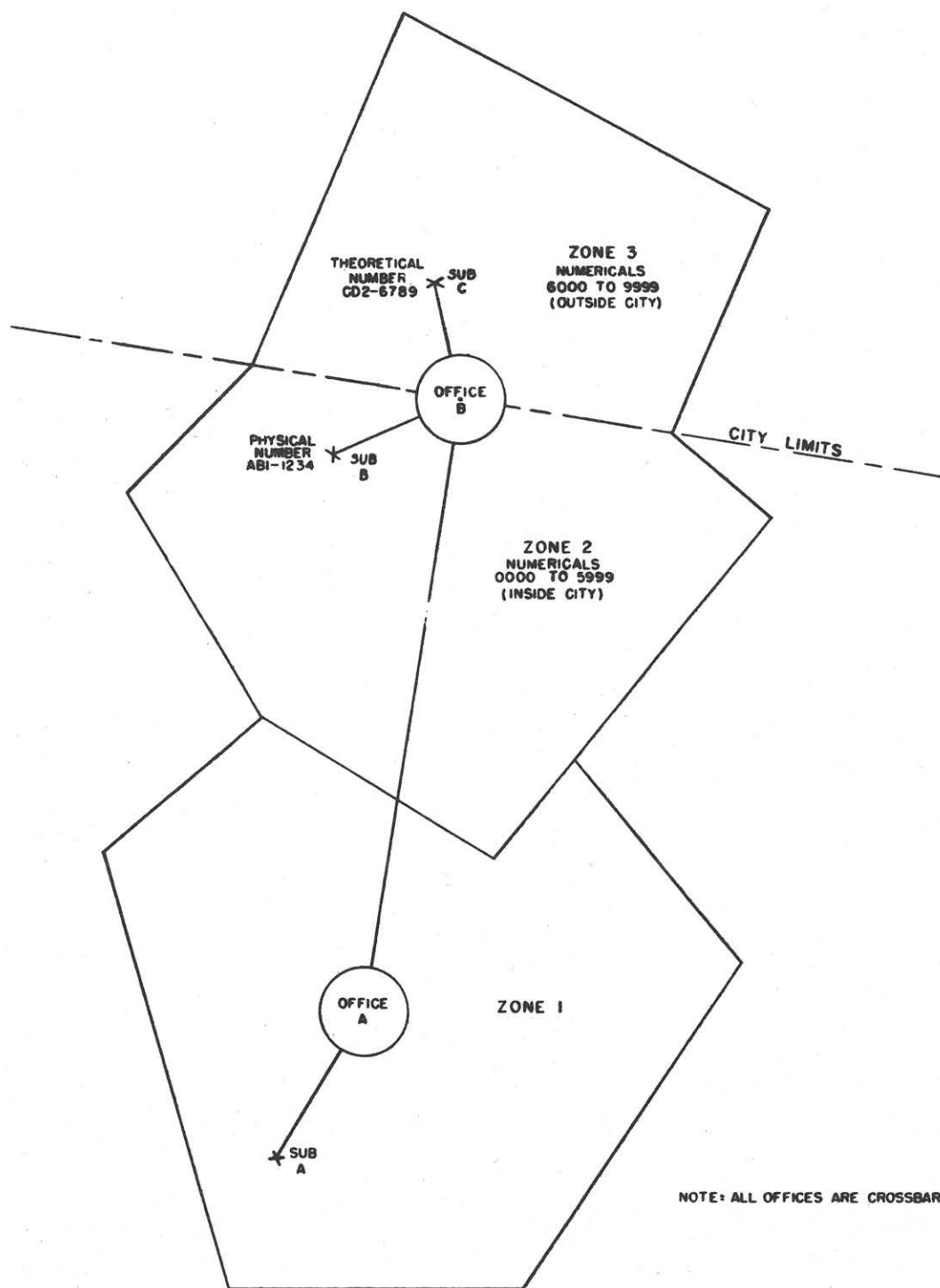
DIRECT TRUNK ROUTE PRINCIPLE



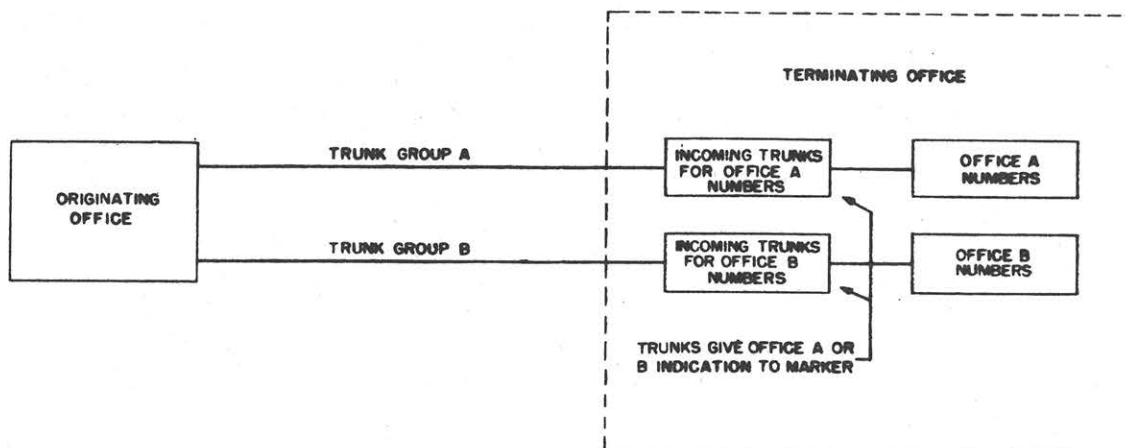
TANDEM ROUTE PRINCIPLE



DIRECT & ALTERNATE ROUTES
ROUTES FROM OFFICE A TO OFFICES B & C

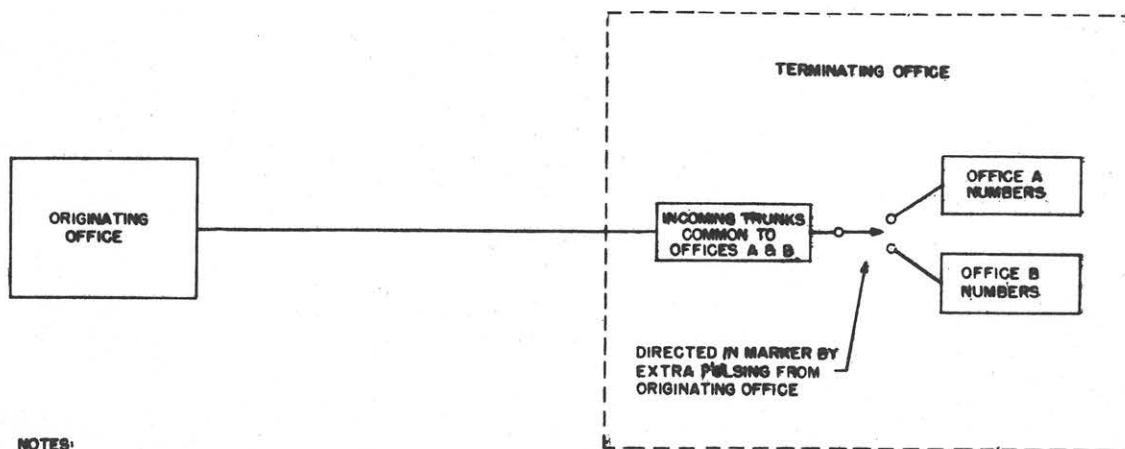


EXCHANGE AREA WITH ZONING



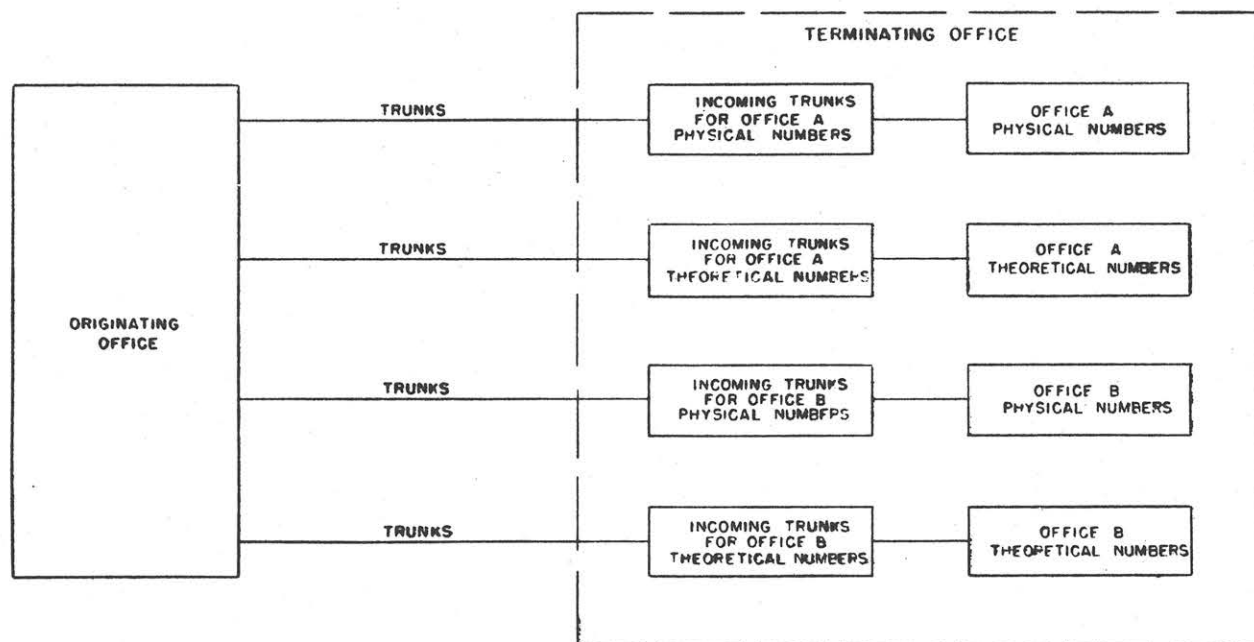
NOTES:
1. TERMINATING OFFICE IS CROSSBAR NO. 5 SYSTEM.

OFFICE INDICATION BY TRUNK GROUPS, INCOMING CALL

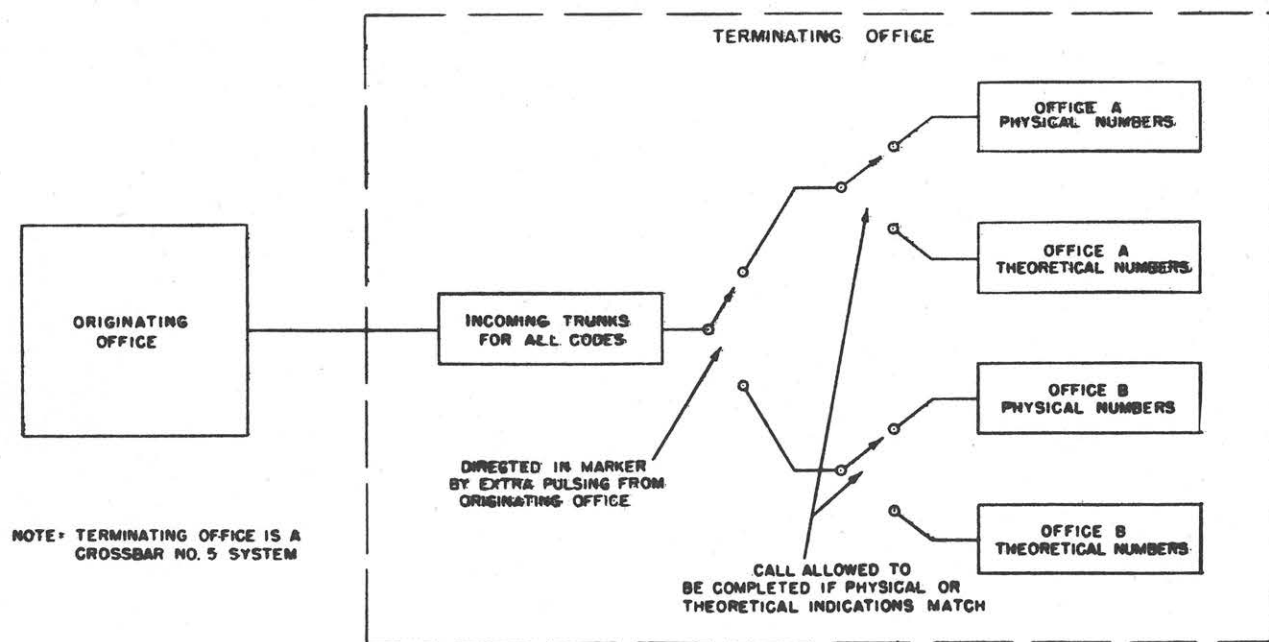


NOTES:
1. TERMINATING OFFICE IS CROSSBAR NO. 5 SYSTEM.

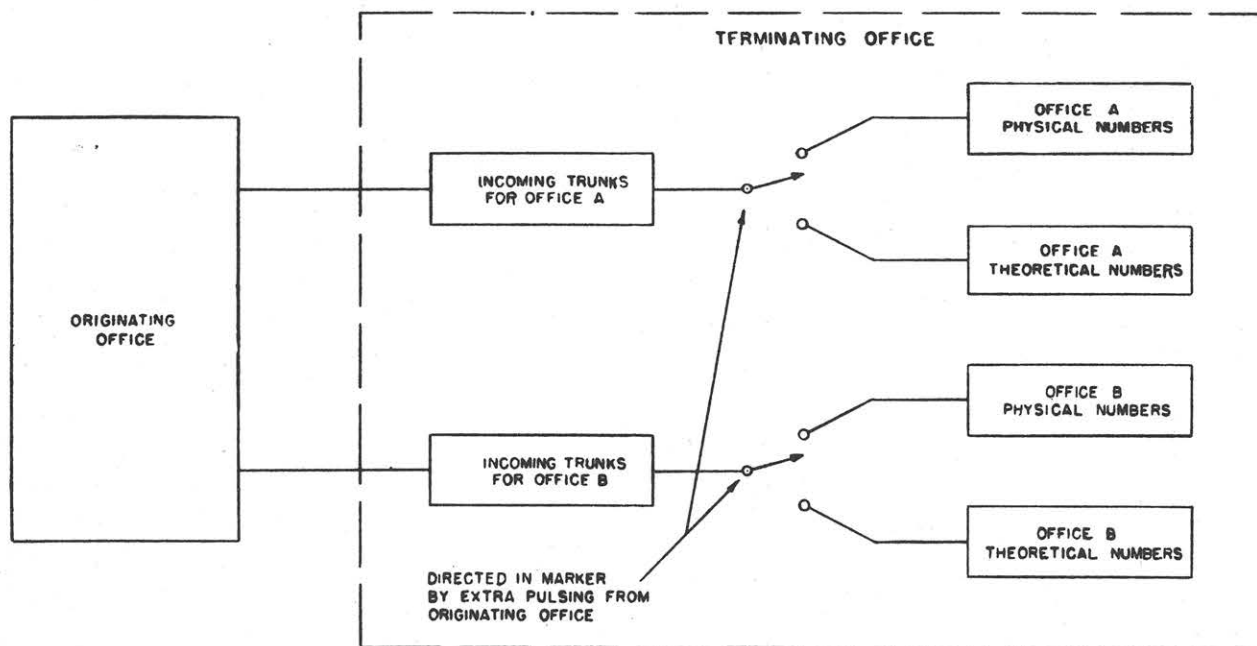
OFFICE INDICATION BY EXTRA PULSING, INCOMING CALL MULTI-OFFICE TRUNK GROUPS, COMMON AND INDIVIDUAL



OFFICE & PHYSICAL - THEORETICAL INDICATION BY TRUNK GROUPS

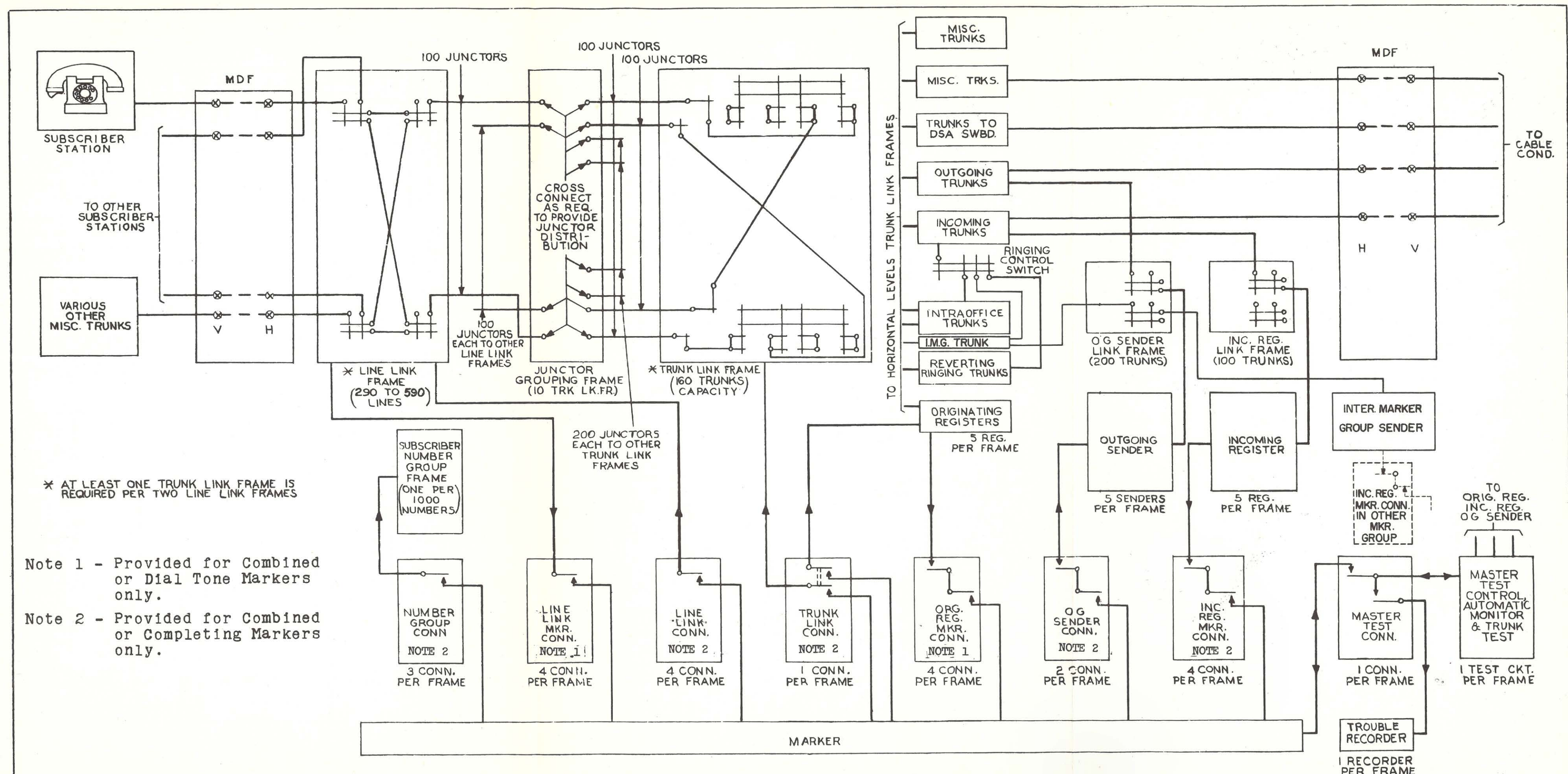


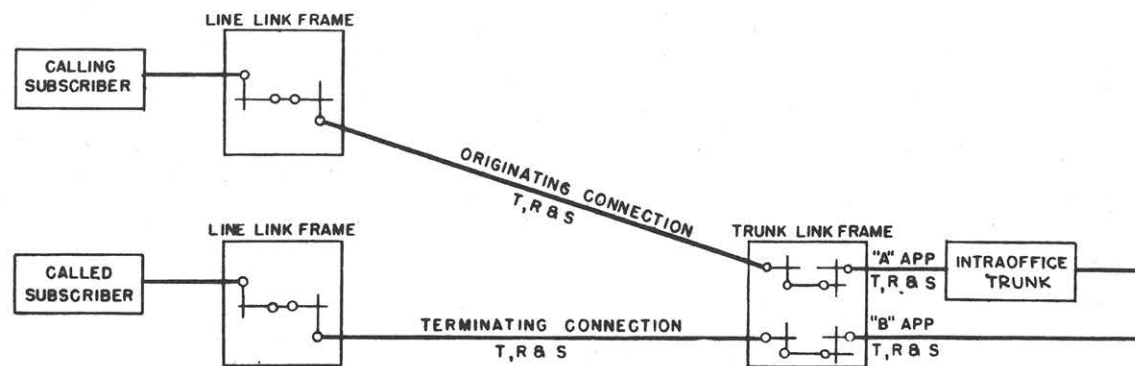
OFFICE & PHYSICAL - THEORETICAL INDICATION BY EXTRA PULSING
MULTI-OFFICE TRUNK GROUPS, PHYSICAL - THEORETICAL



NOTE: TERMINATING OFFICE IS A CROSSBAR NO. 5 SYSTEM

PHYSICAL - THEORETICAL OPERATION OF INDIVIDUAL TRUNK GROUPS
INDICATIONS BY TRUNK GROUPS AND EXTRA PULSING

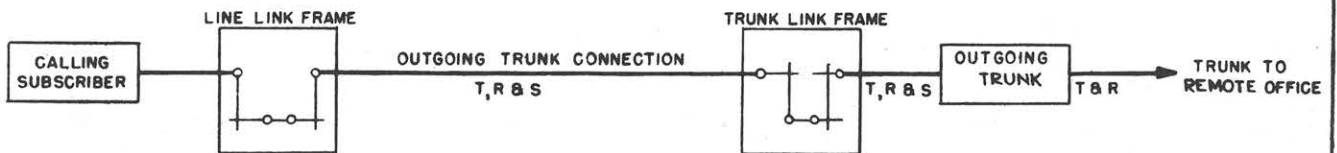




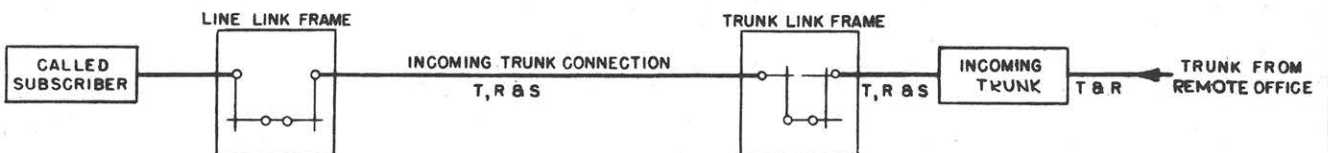
ESTABLISHED INTRAOFFICE TRUNK CONNECTION



REVERTING TRUNK CONNECTION



OUTGOING TRUNK CONNECTION

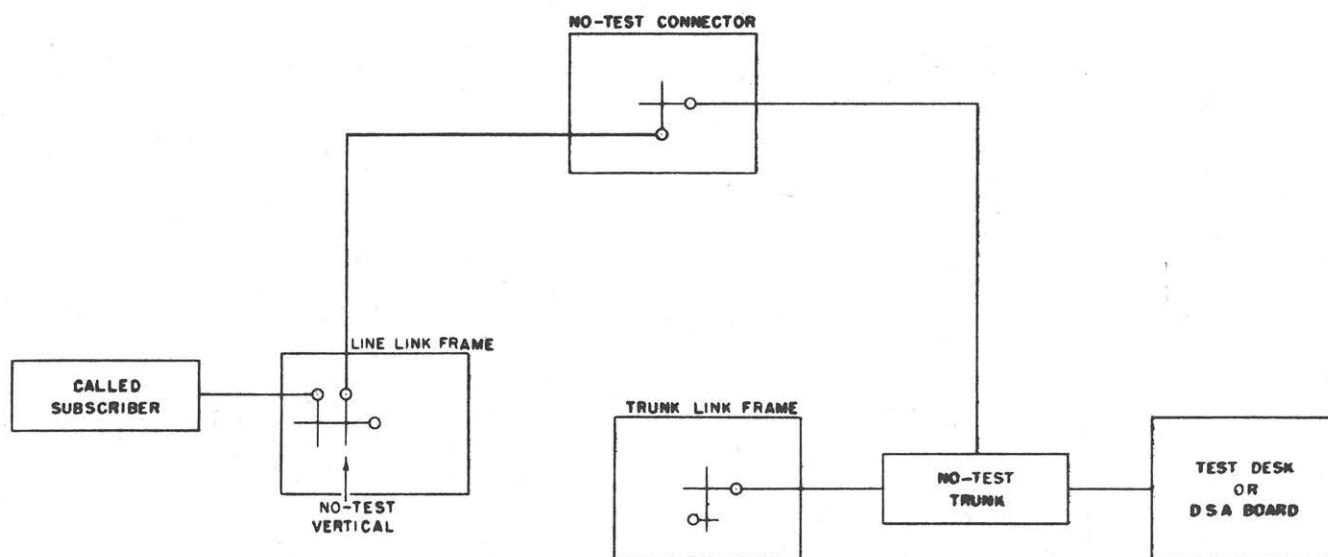


INCOMING TRUNK CONNECTION

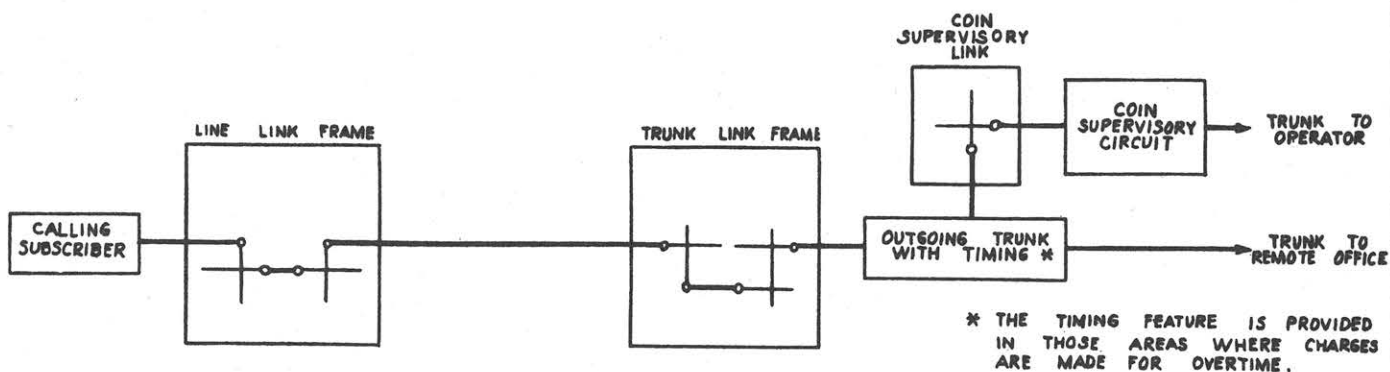


ESTABLISHED DIALING CONNECTION

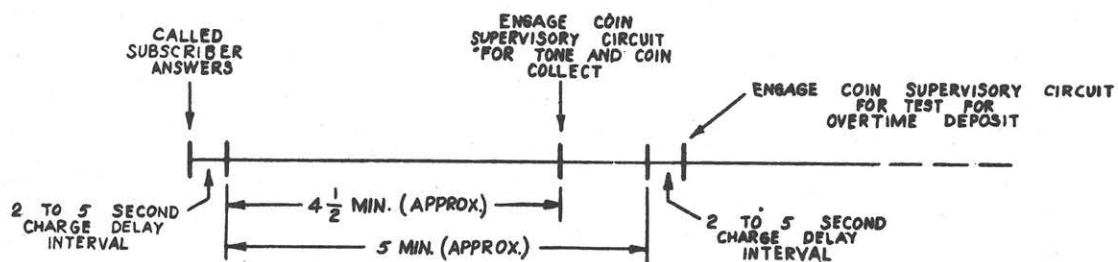
CONNECTIONS WITHIN A NO. 5 CROSSBAR CENTRAL OFFICE



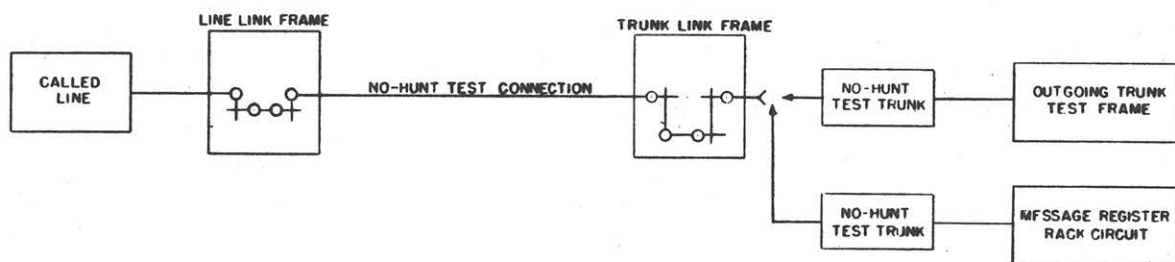
NO-TEST CALL ESTABLISHED THROUGH NO-TEST CONNECTOR



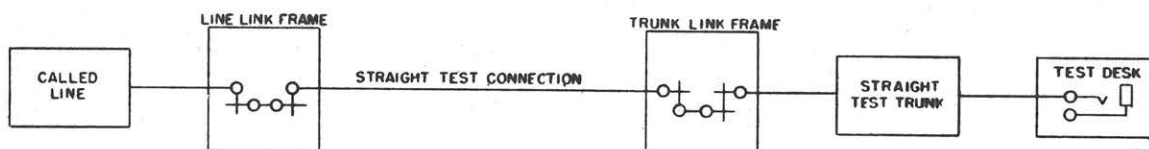
ASSOCIATION OF COIN TRUNK AND COIN SUPERVISORY LINK



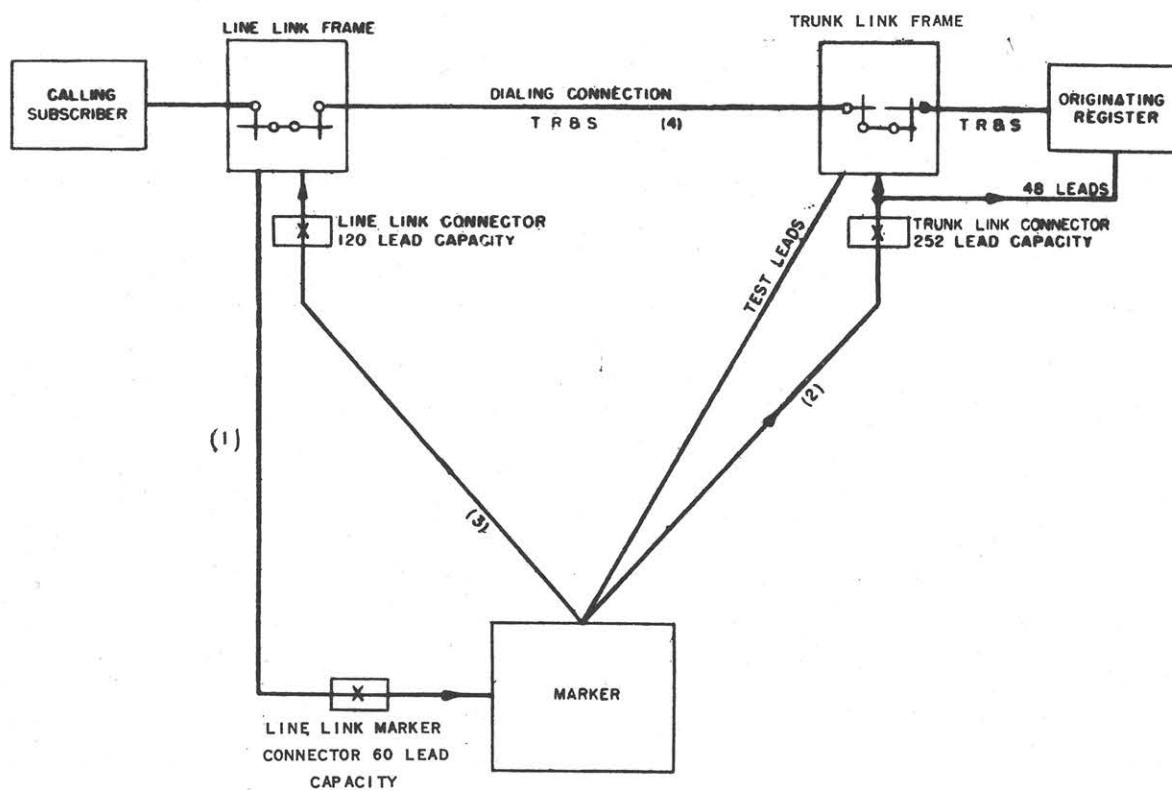
INTERVALS FOR COIN OPERATION WITH OVERTIME
COIN TRUNK CONNECTION TO COIN SUPERVISORY LINK



ESTABLISHED NO-HUNT TEST CONNECTION



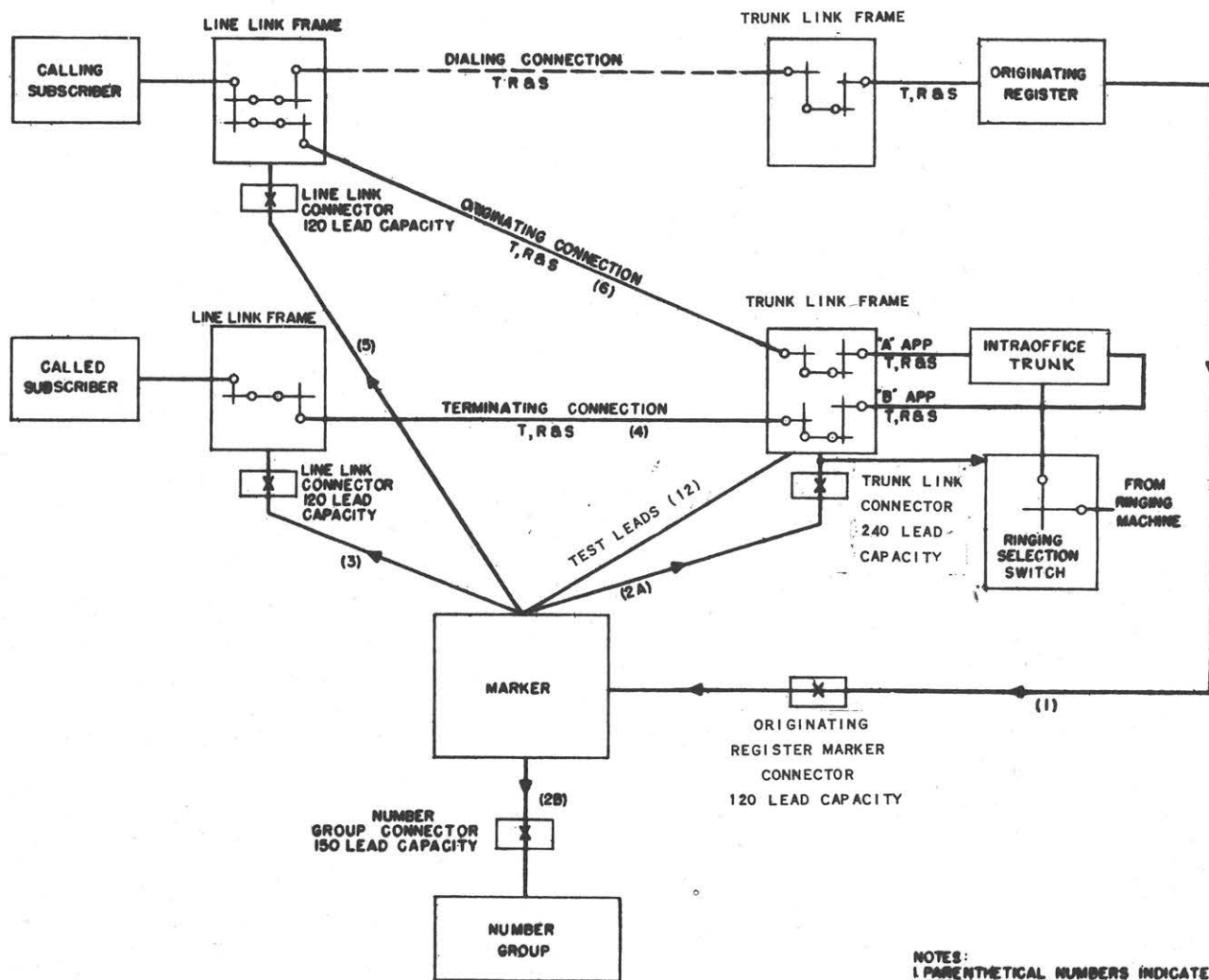
ESTABLISHED STRAIGHT TEST CONNECTION
TEST CALL CONNECTIONS



NOTES:
 1. PARENTHETICAL NUMBERS INDICATE ORDER OF CONNECTIONS
 2. ARROWS INDICATE DIRECTION OF CONNECTIONS

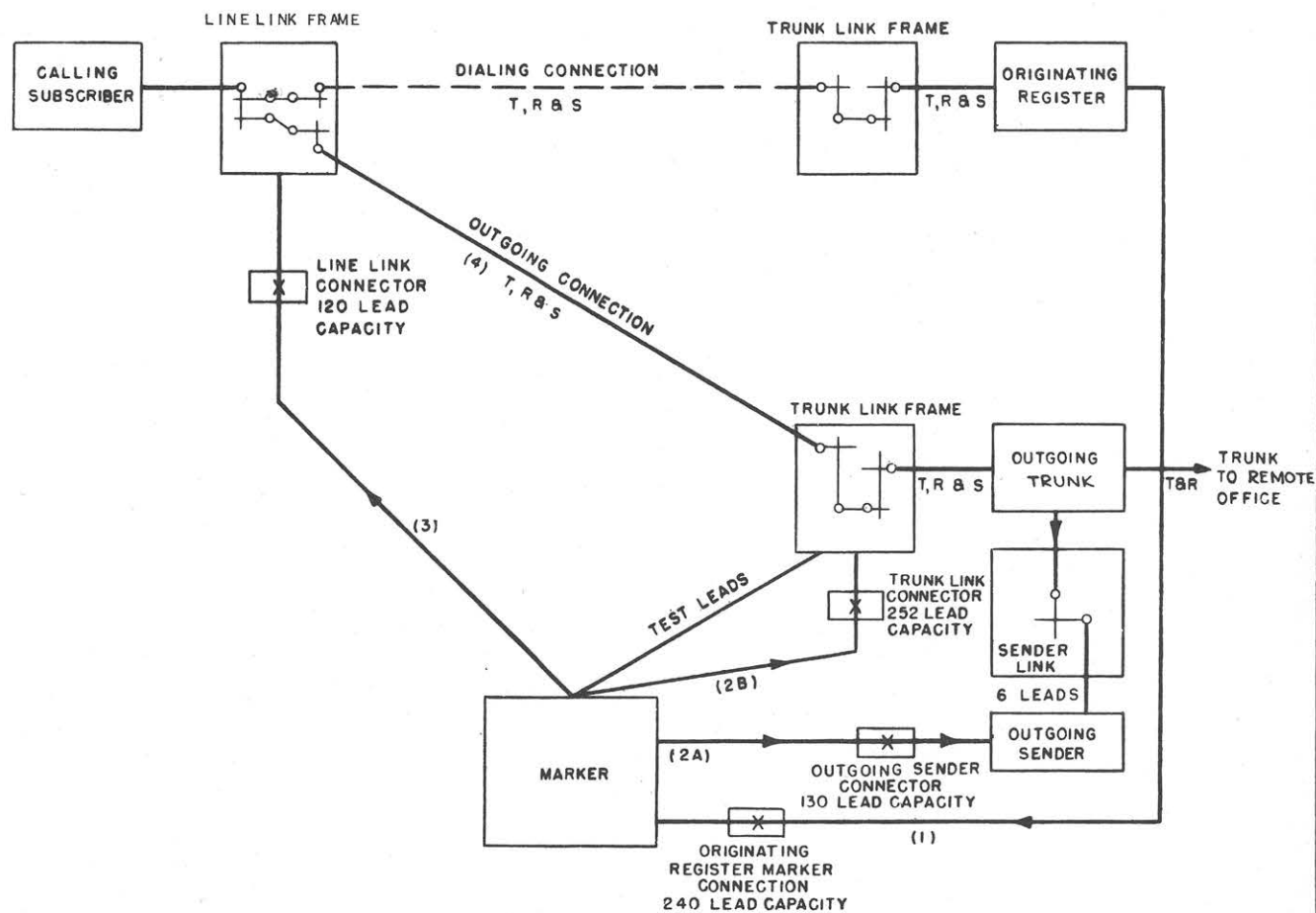
ESTABLISHING DIALING CONNECTION

FIG. 5B-055



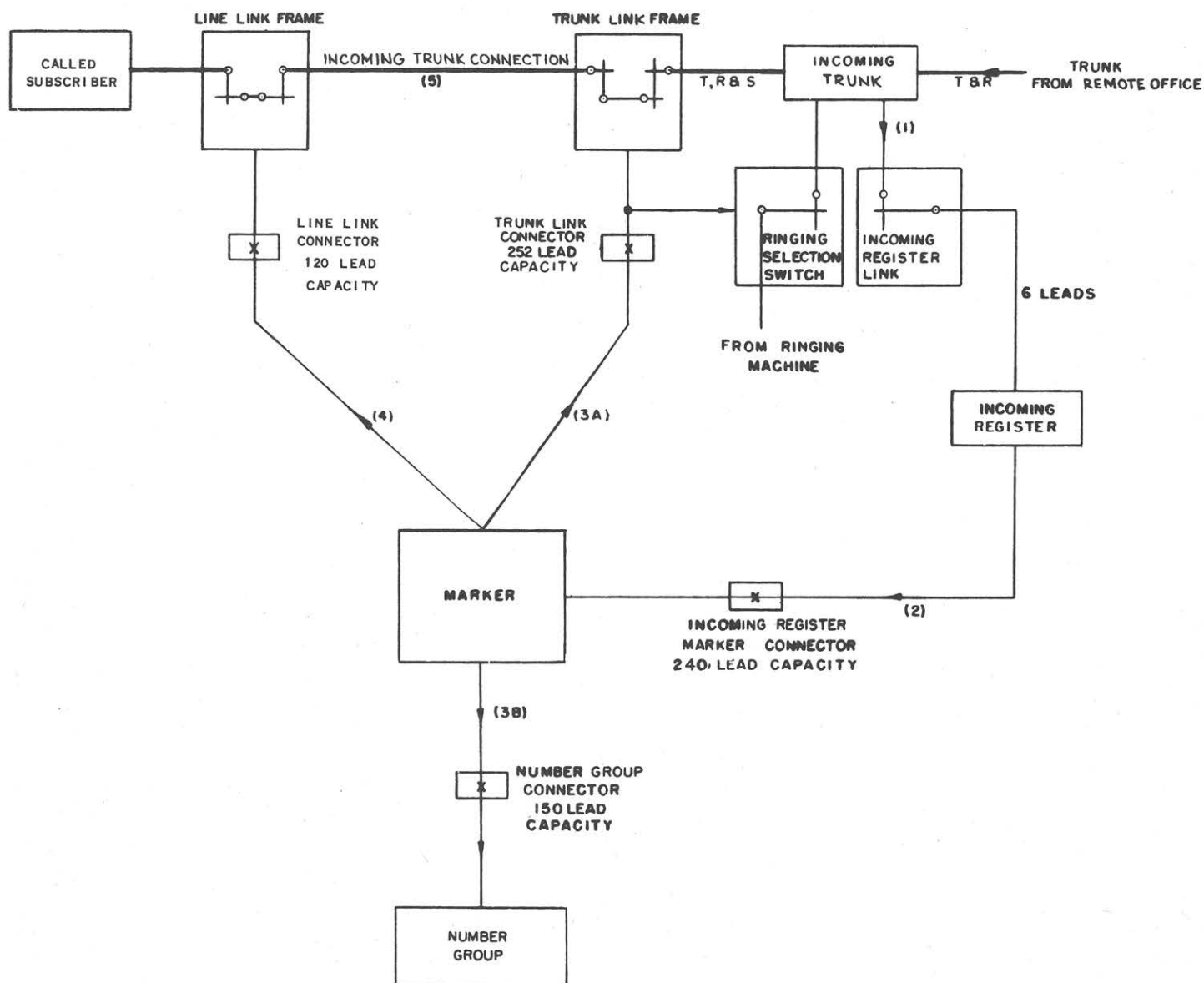
NOTES:
1 PARENTHESES INDICATE
ORDER OF CONNECTIONS.
2 ARROWS INDICATE DIRECTION OF
CONNECTIONS.

ESTABLISHING INTRAOFFICE TRUNK CONNECTION



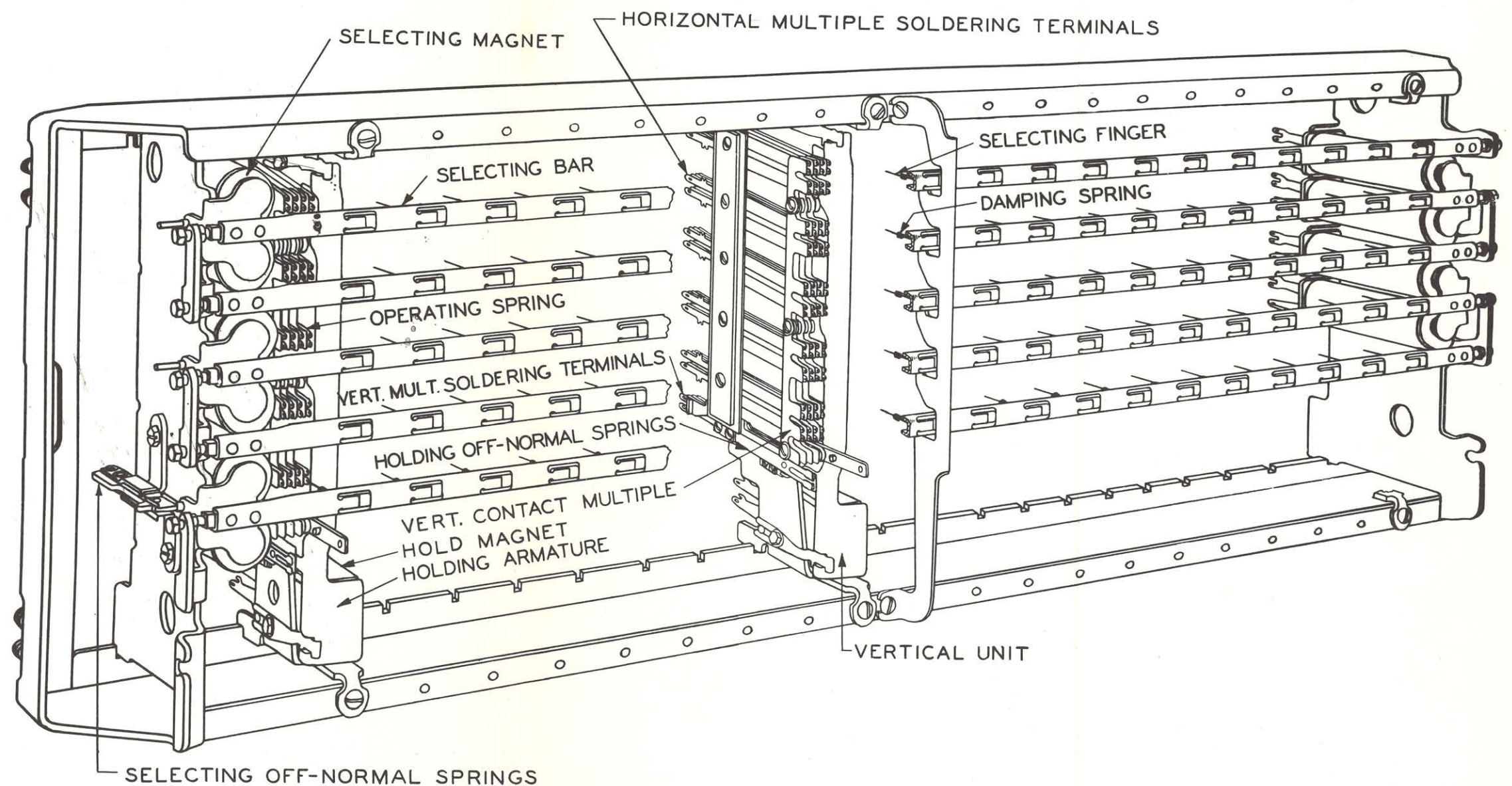
NOTES:
 1. PARENTHEetical NUMBERS
 INDICATE ORDER OF CONNECTIONS.
 2. ARROWS INDICATE DIRECTION
 OF CONNECTIONS.

ESTABLISHING OUTGOING TRUNK CONNECTION

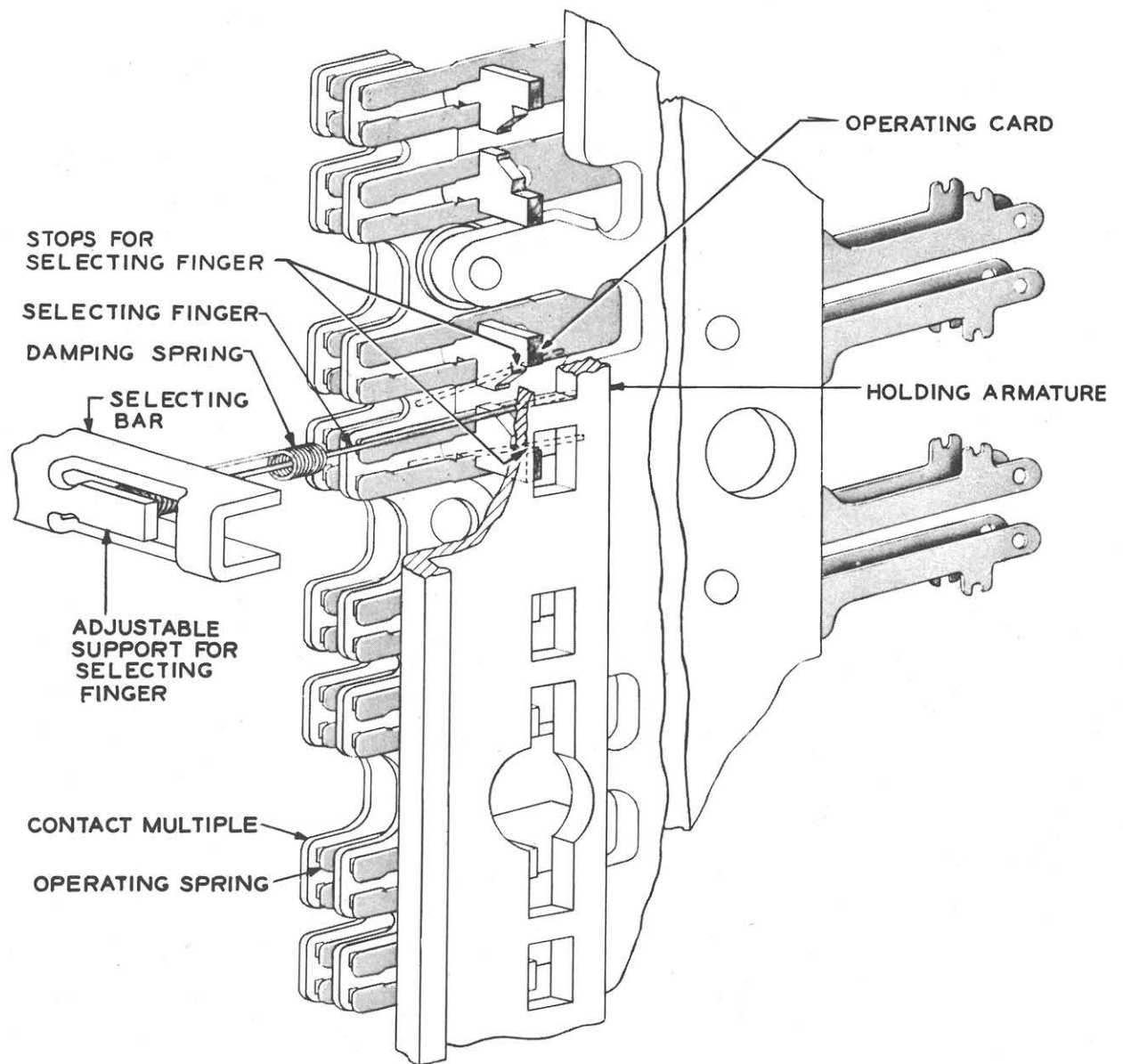


- NOTES:
1. PARENTHEetical NUMBERS INDICATE ORDER OF CONNECTIONS
 2. ARROWS INDICATE DIRECTION OF CONNECTIONS

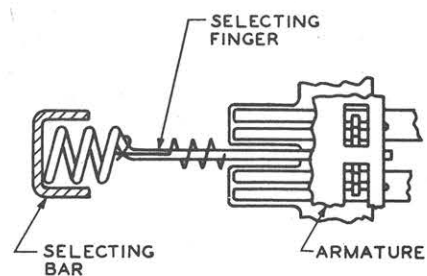
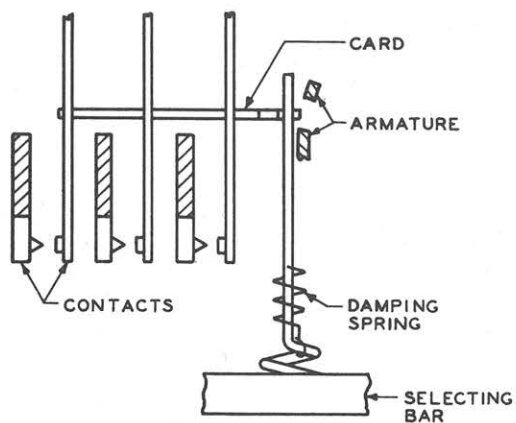
ESTABLISHING INCOMING TRUNK CONNECTION



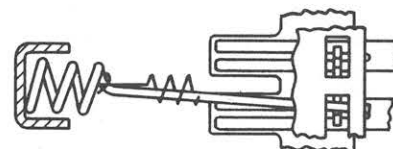
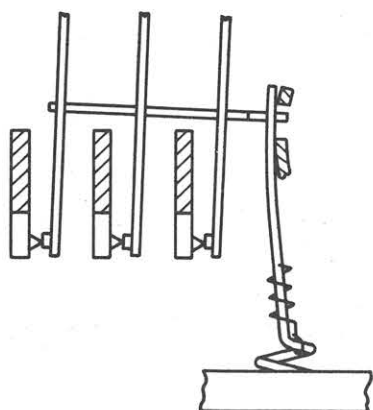
PARTIAL PERSPECTIVE VIEW OF 20-VERTICAL UNIT CROSSBAR SWITCH (200 POINT)



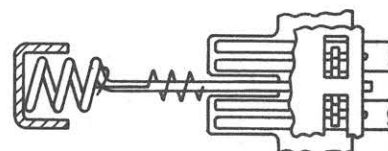
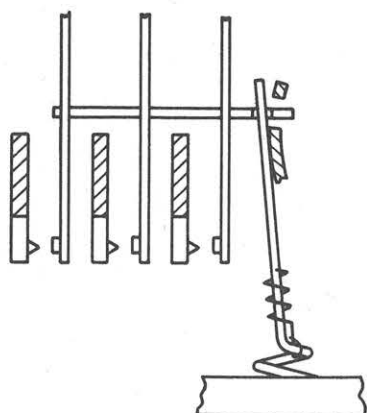
PARTIAL PERSPECTIVE VIEW OF THE
SELECTION ELEMENTS OF A CROSSBAR SWITCH
VERTICAL UNIT



VERTICAL UNIT NORMAL

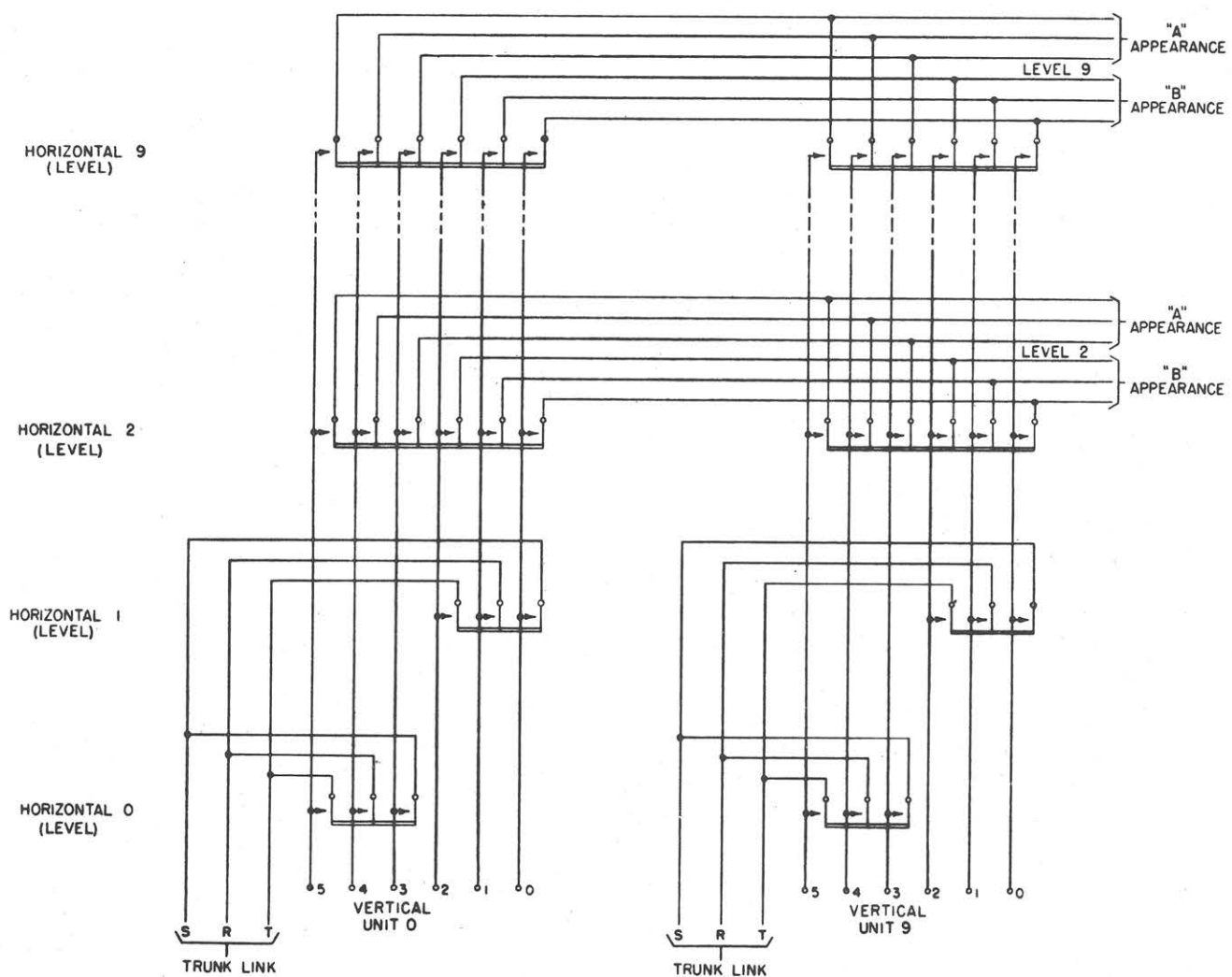


LOWER CROSS POINT OF A PAIR OPERATED

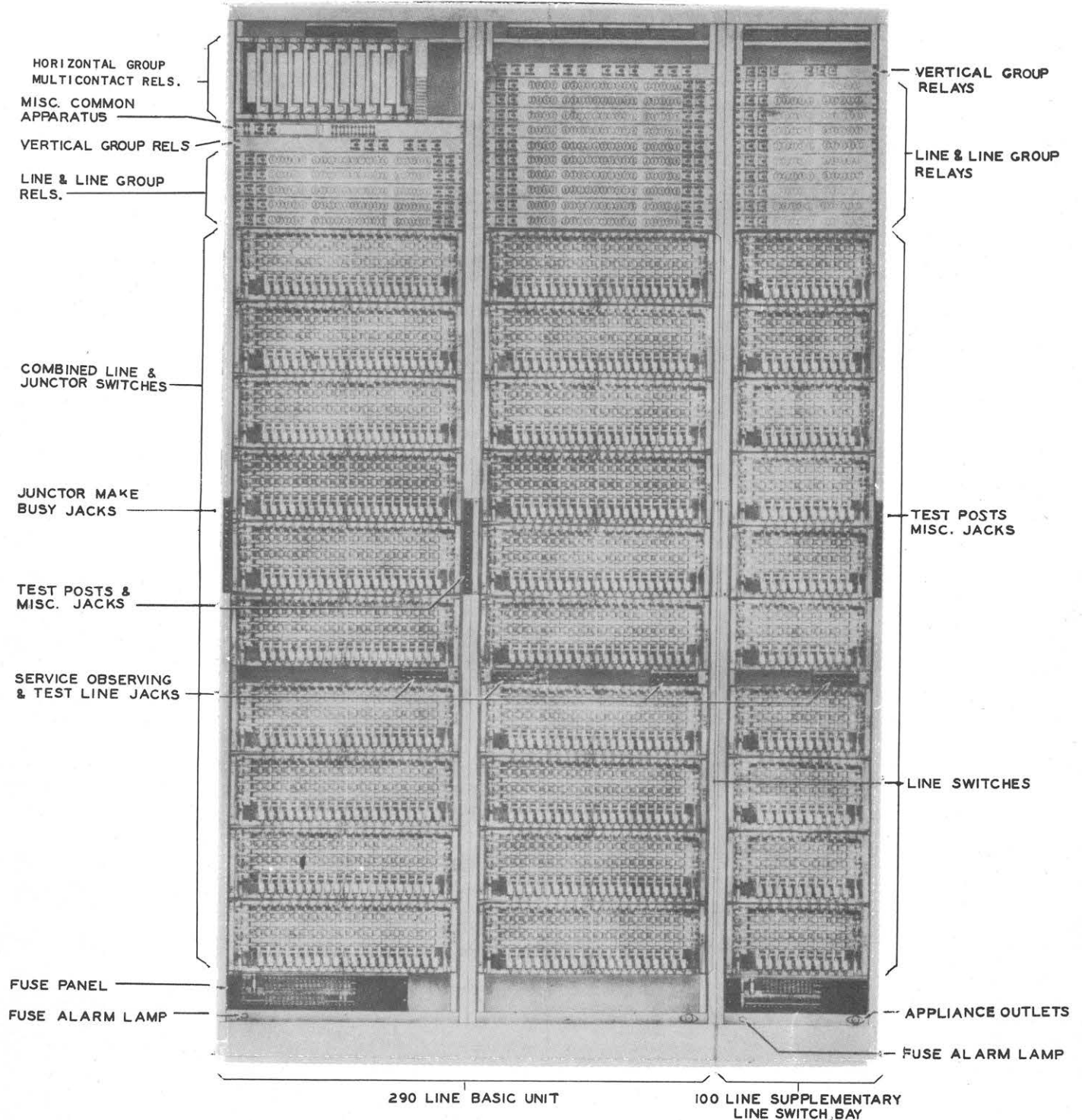


LOWER CROSS POINT NORMAL, ARMATURE OPERATED

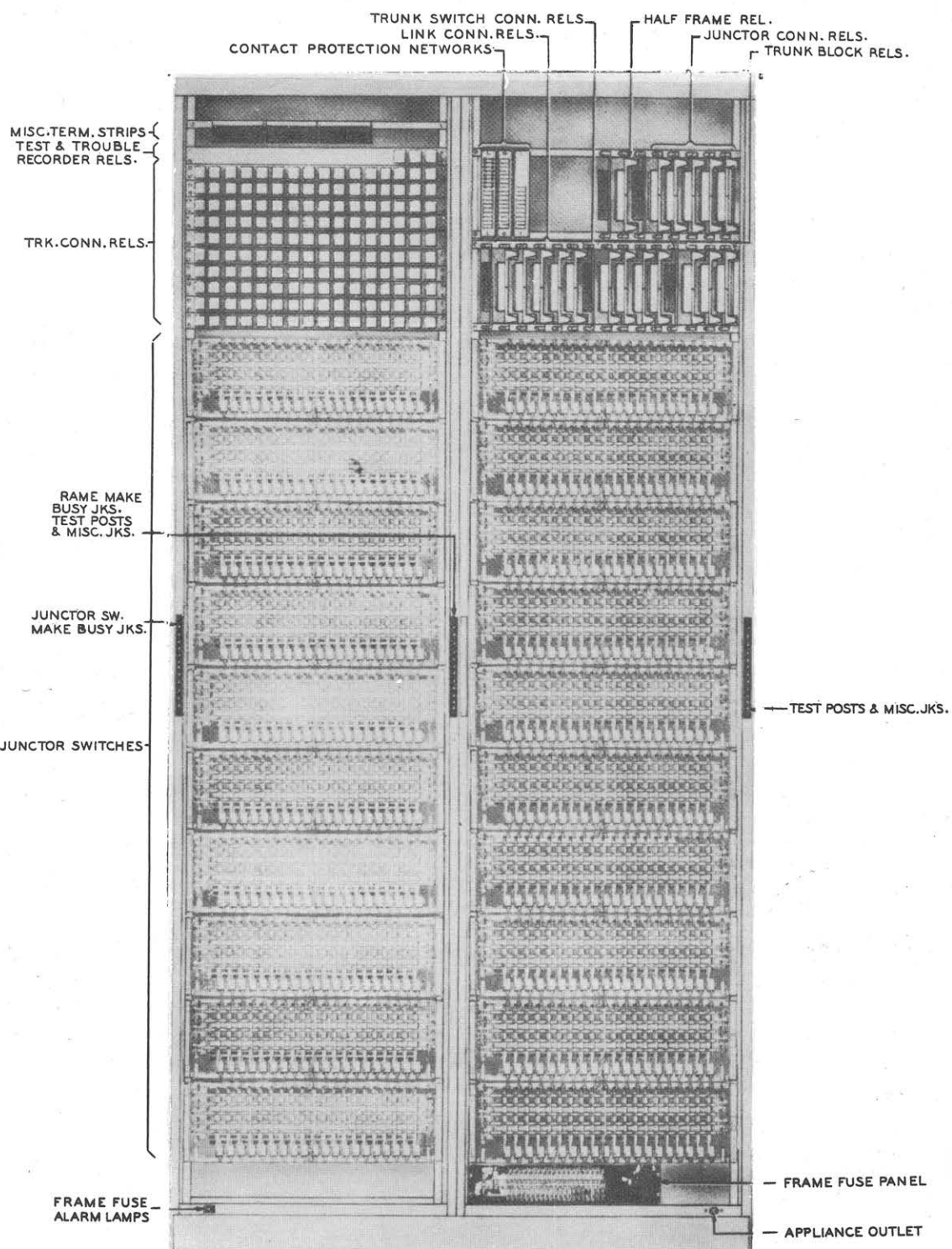
CROSSBAR SWITCH
SELECTING MECHANISM



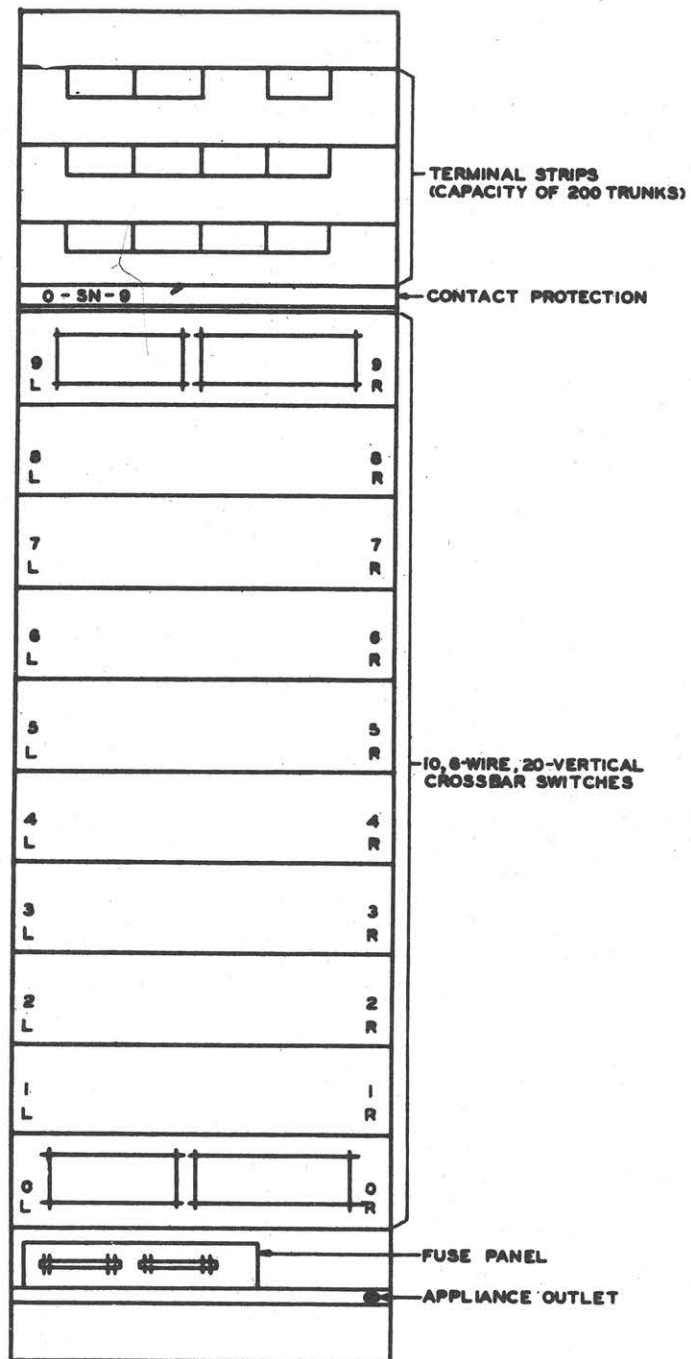
SWITCH ARRANGED FOR 16 TRUNK APPEARANCES



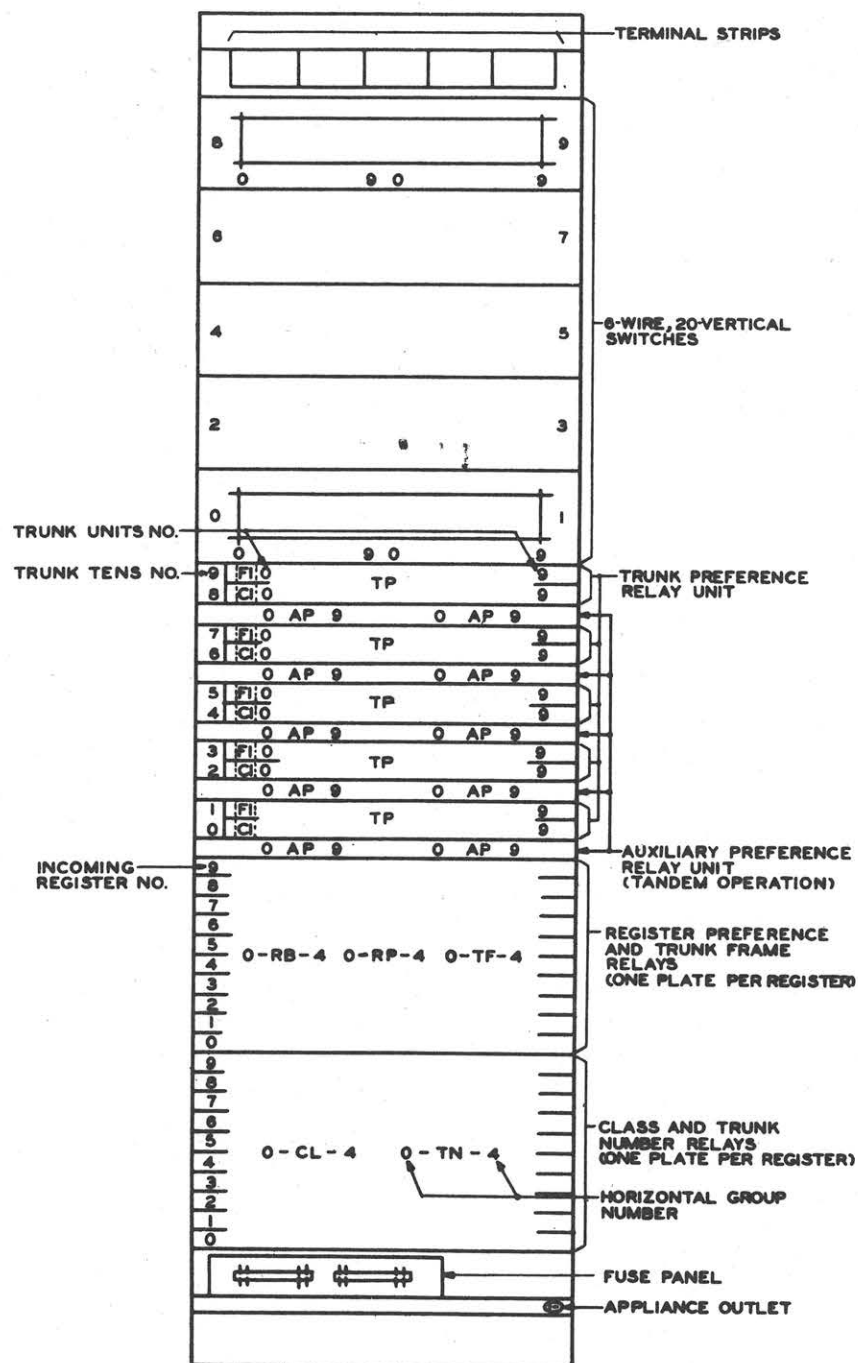
LINE LINK FRAME - FRONT VIEW



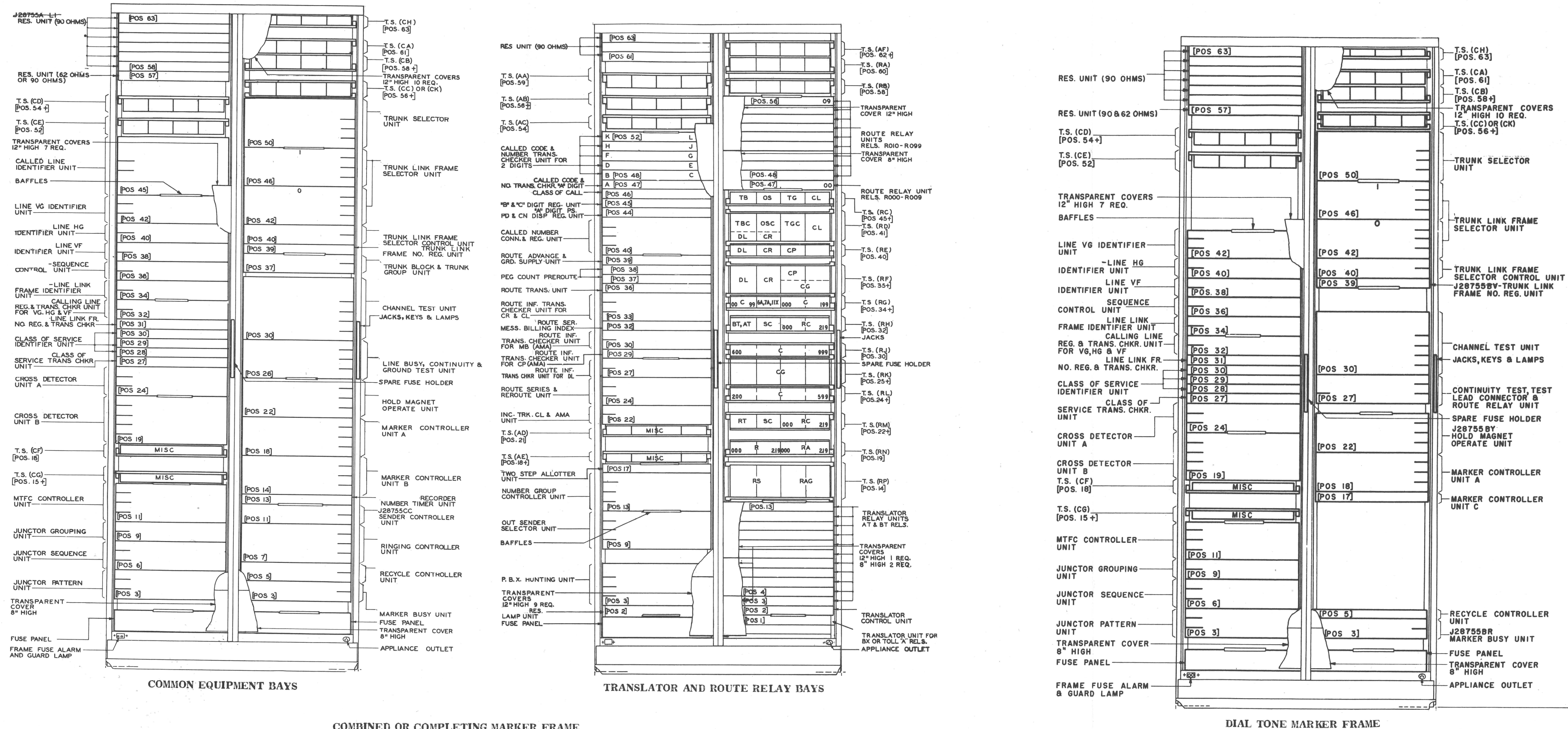
TRUNK LINK FRAME

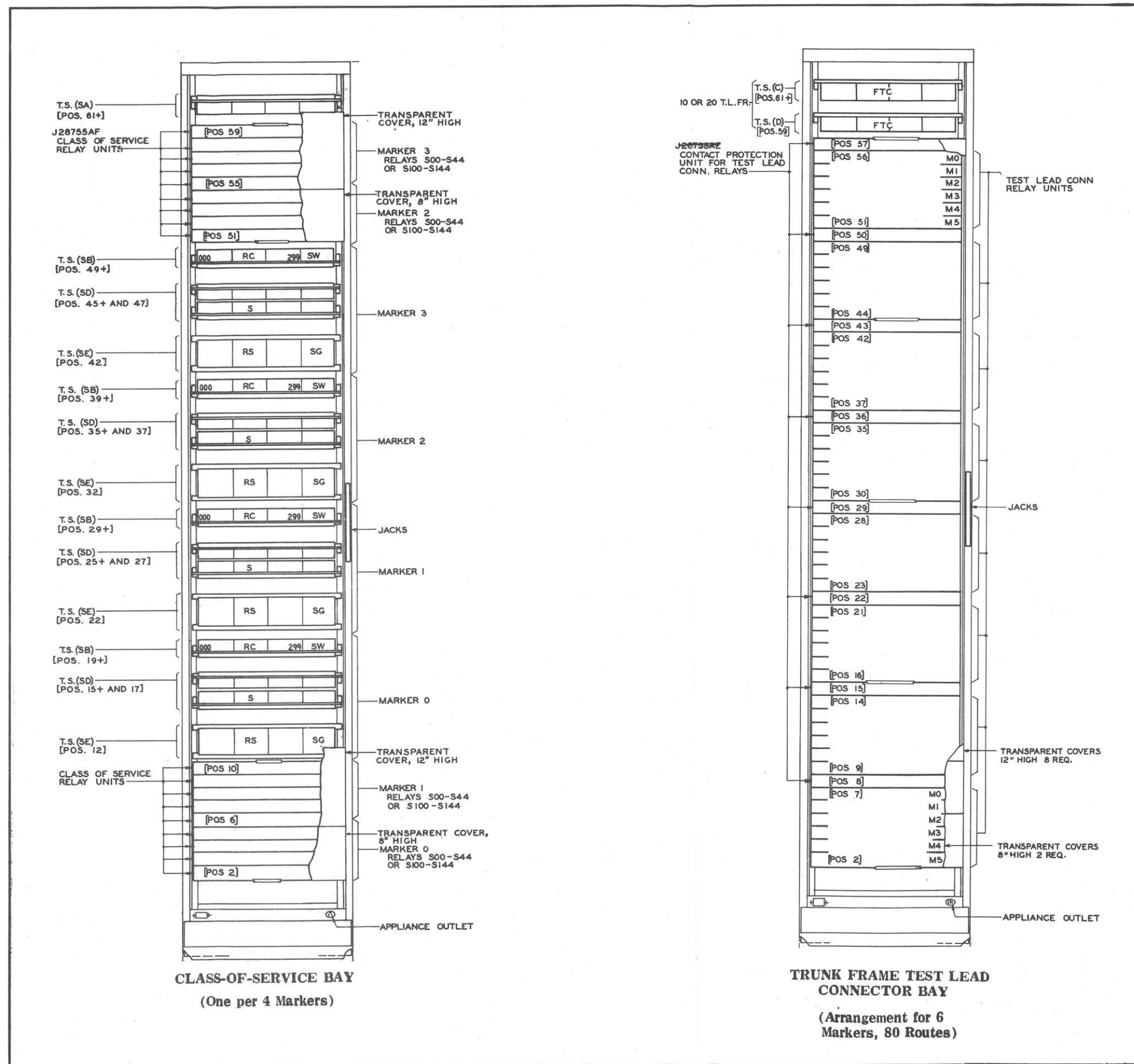


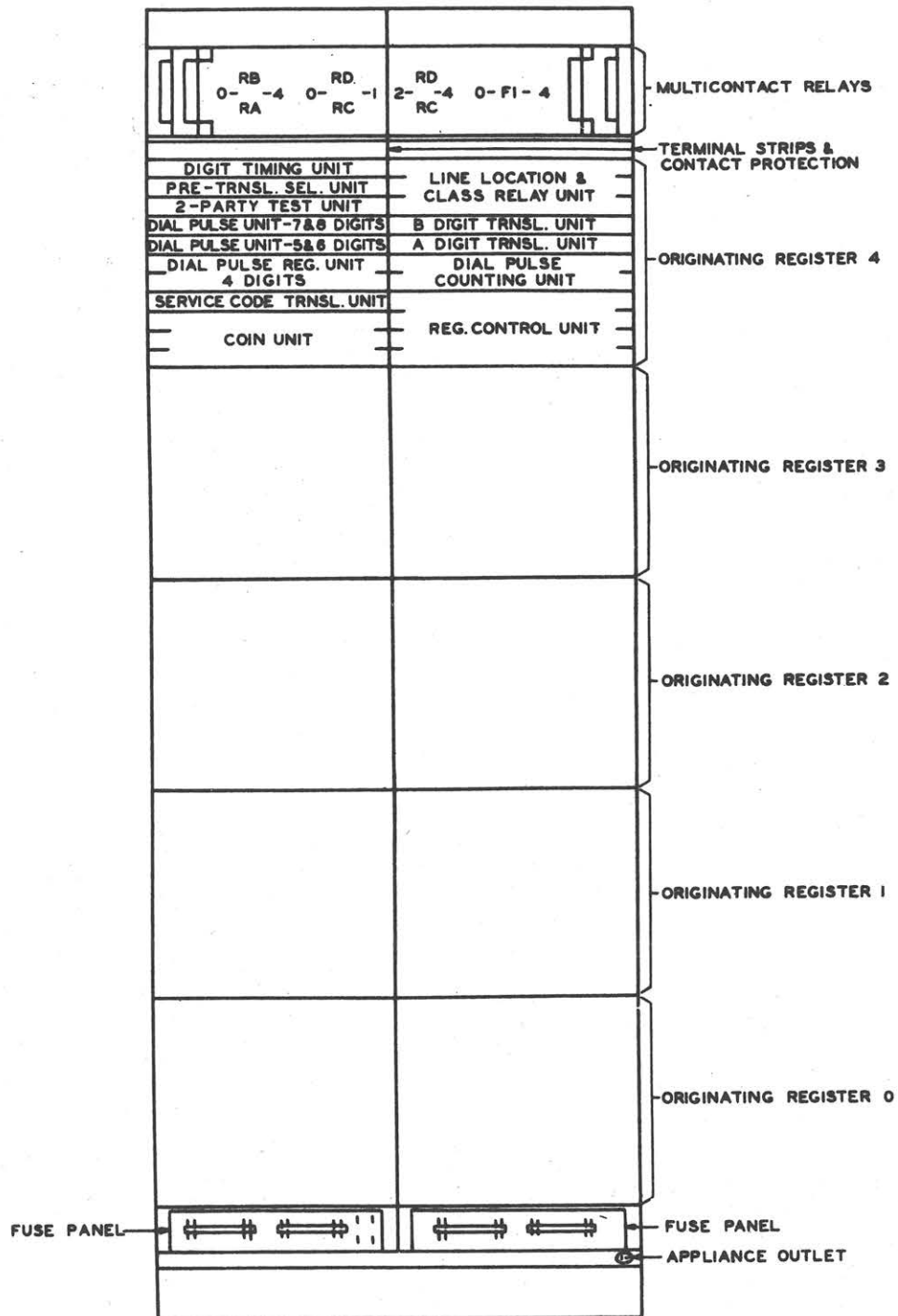
OUTGOING SENDER LINK FRAME



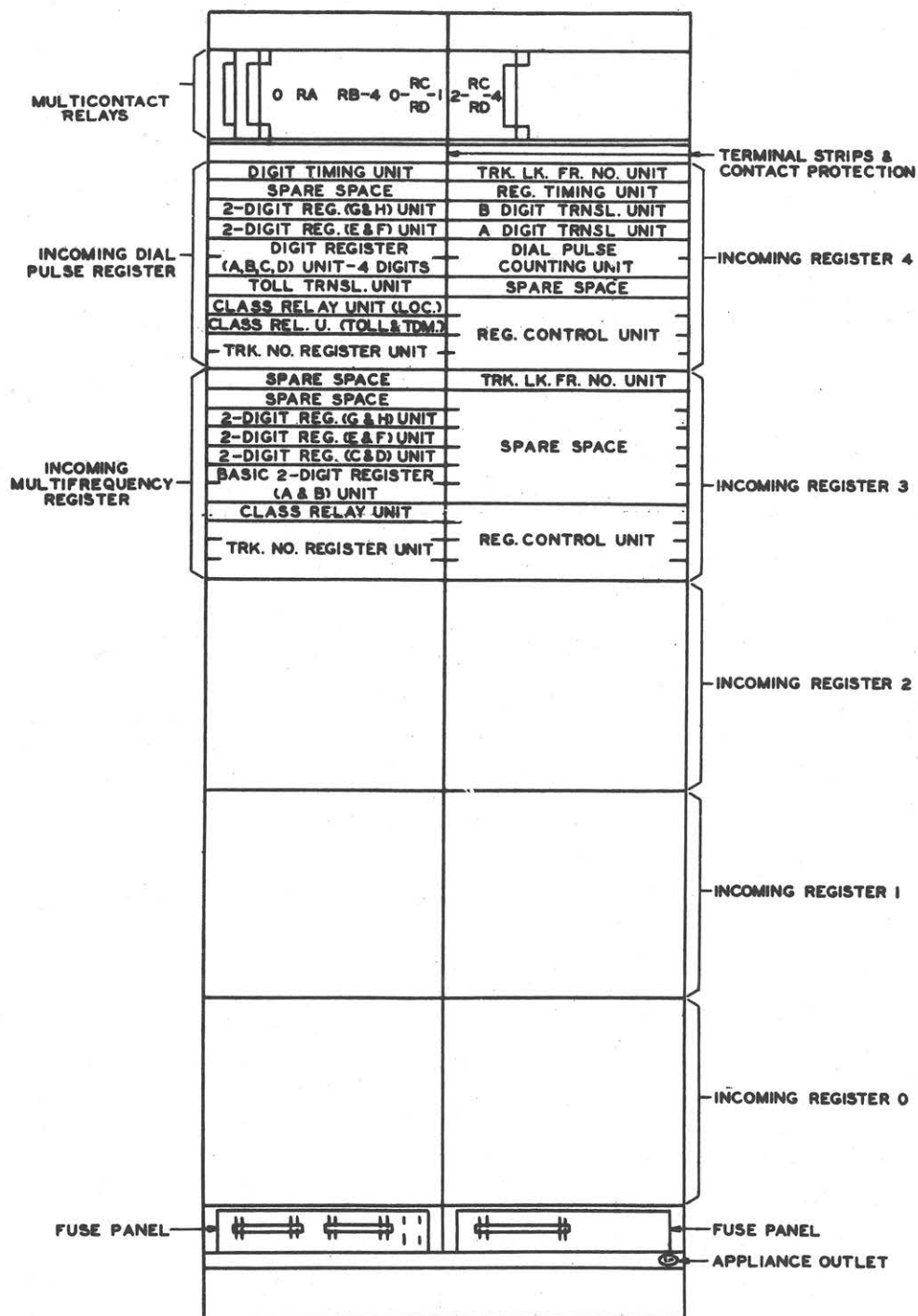
INCOMING REGISTER LINK FRAME





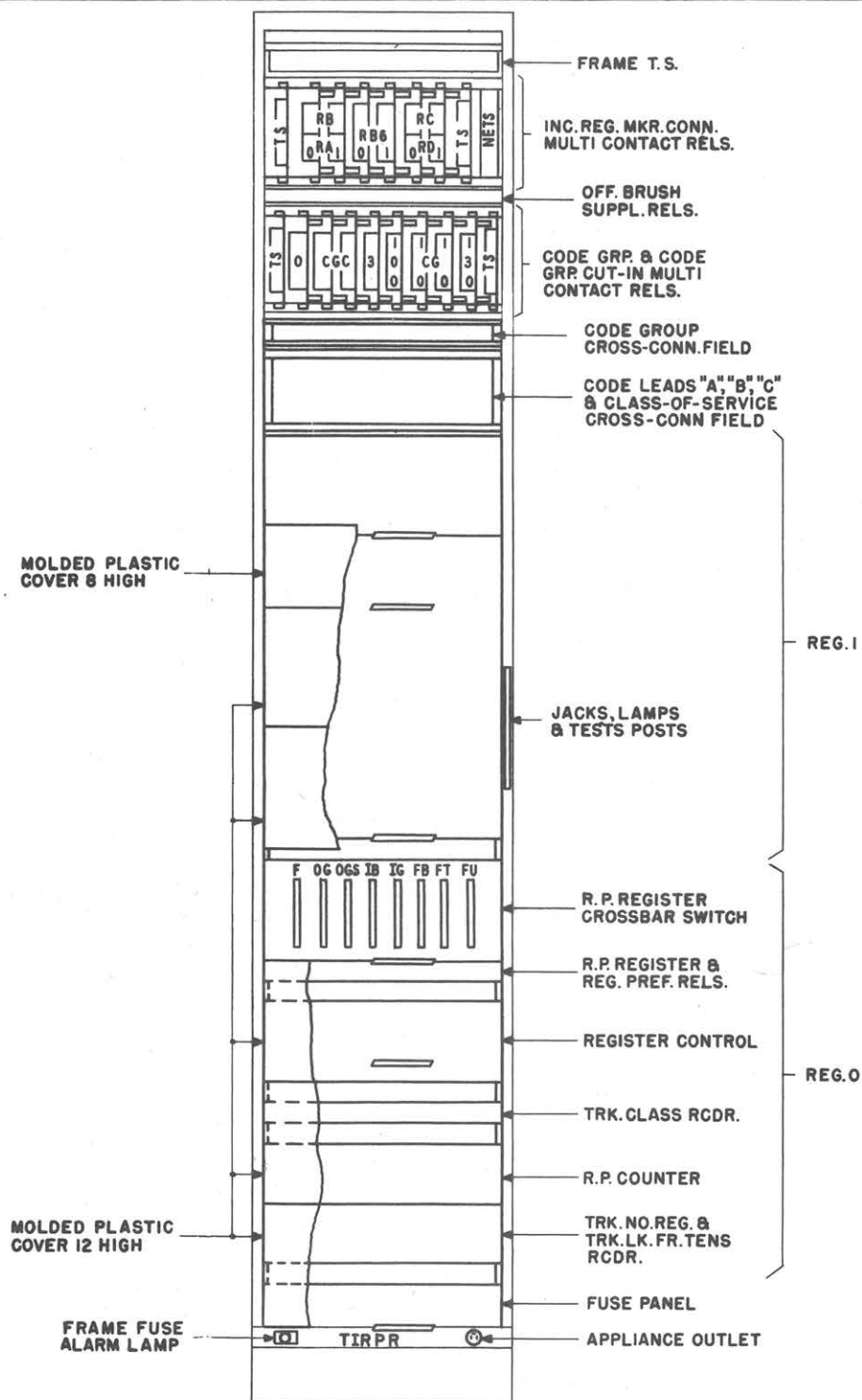


DIAL PULSE ORIGINATING REGISTER FRAME

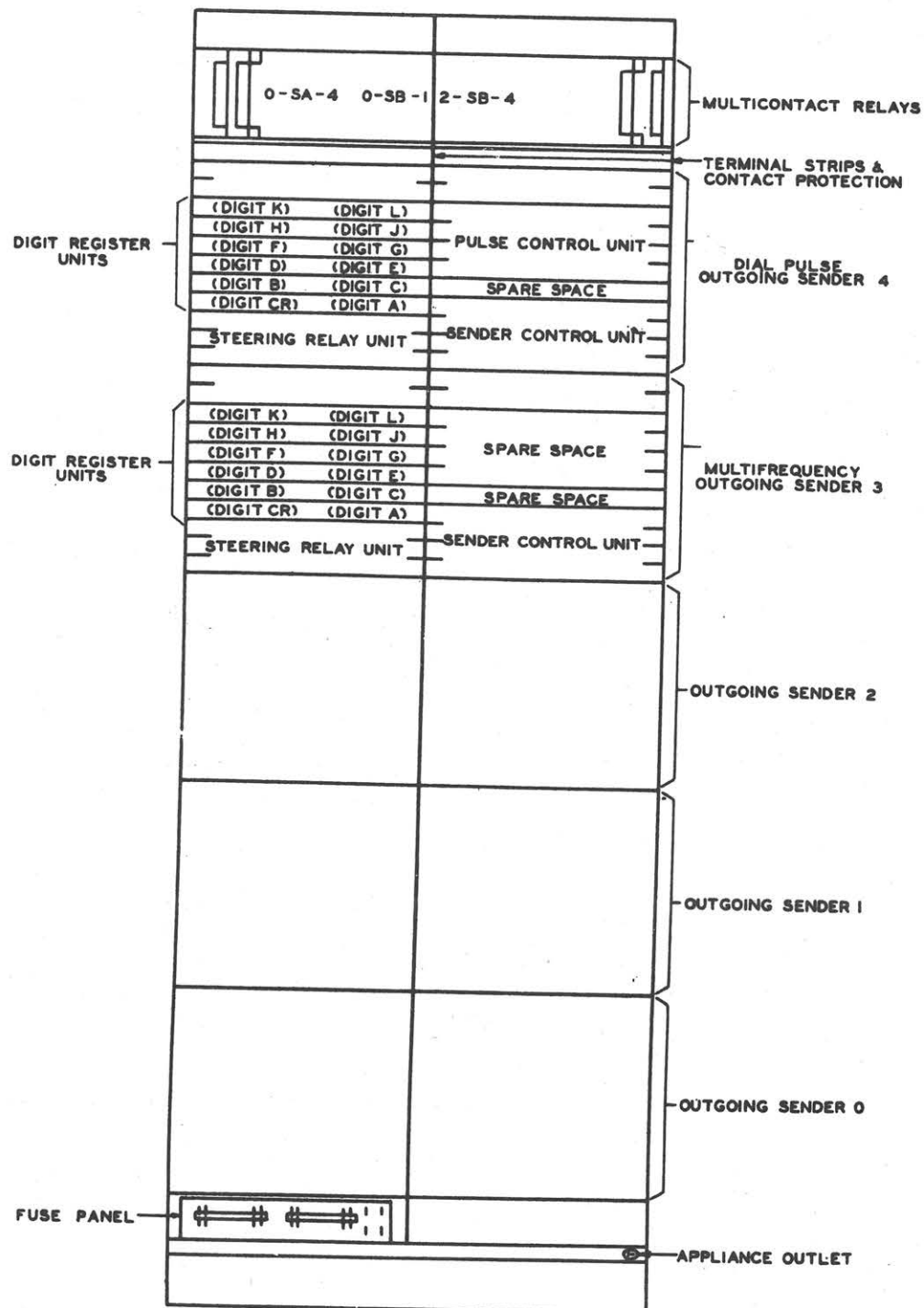


NOTE:
REGISTERS ON THIS FRAME MAY BE EITHER
DIAL PULSE OR MULTIFREQUENCY TYPE OR
ANY COMBINATION OF THE TWO TYPES.

DIAL PULSE OR MULTIFREQUENCY INCOMING REGISTER FRAME

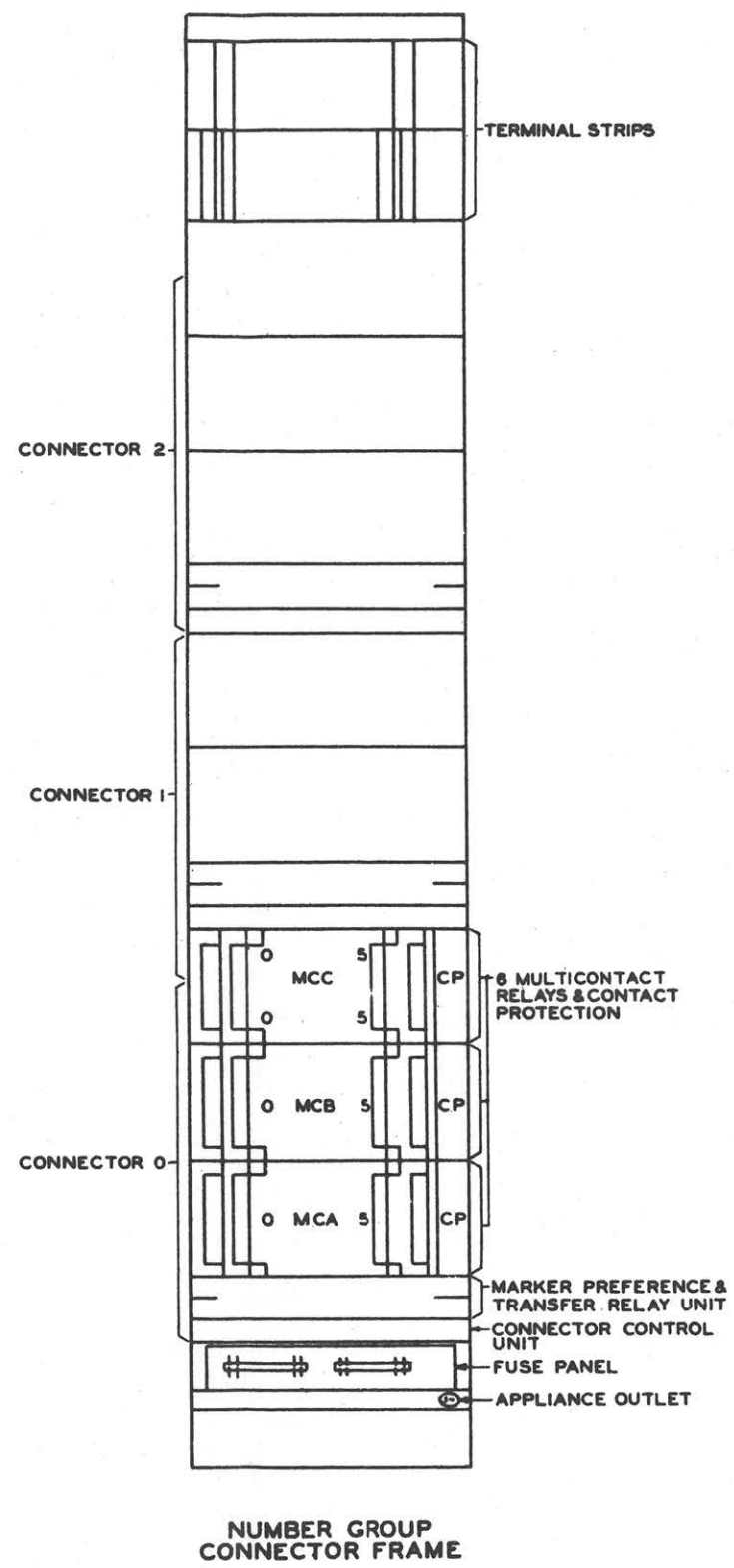
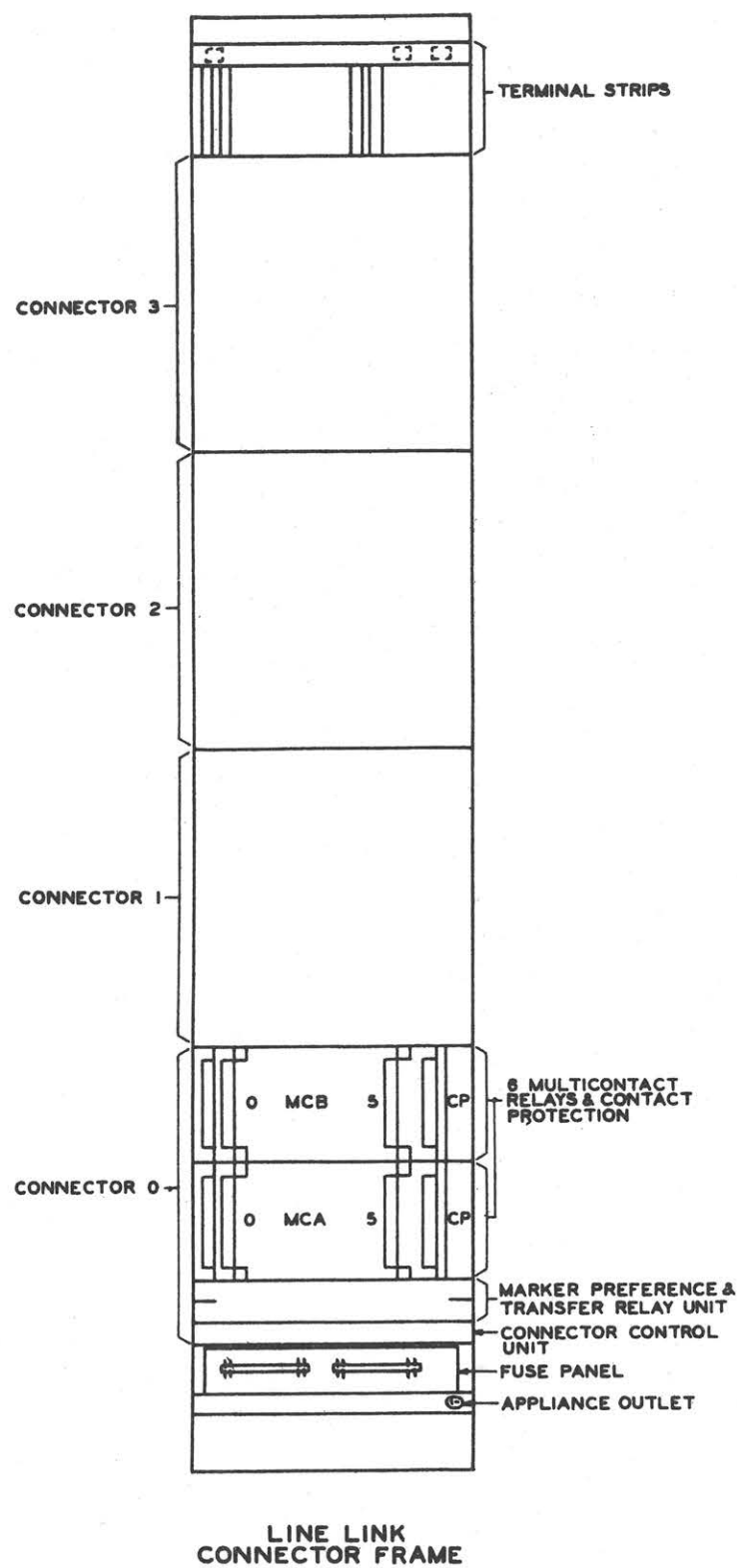


TANDEM INCOMING REVERTIVE PULSE REGISTER FRAME

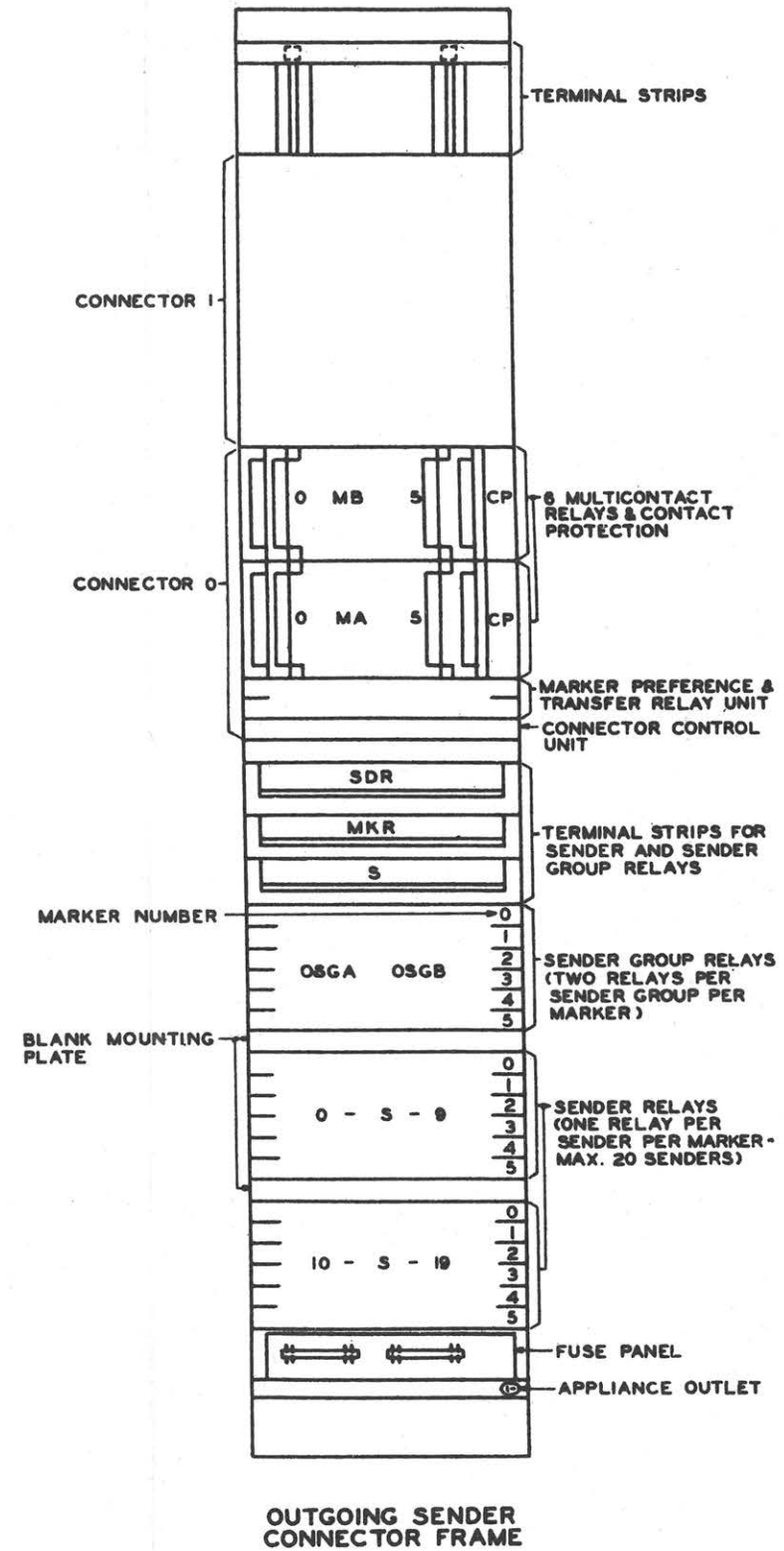


NOTE:
SENDERS ON THIS FRAME MAY BE EITHER DIAL PULSE OR MULTIFREQUENCY TYPE OR
ANY COMBINATION OF THE TWO TYPES.

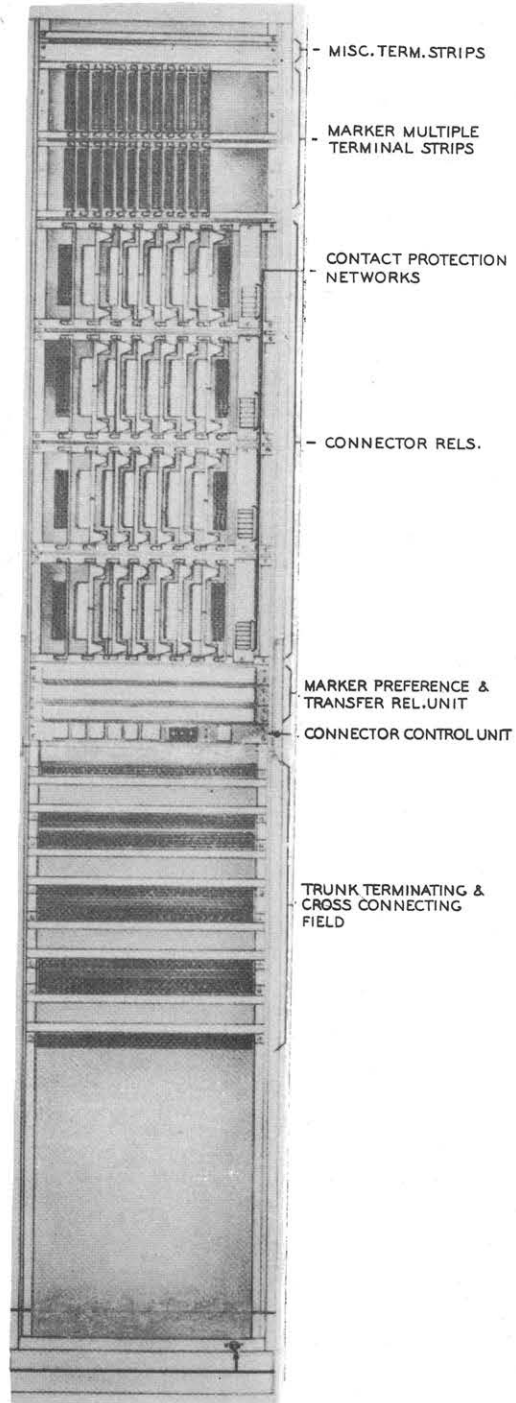
**DIAL PULSE OR MULTIFREQUENCY
OUTGOING SENDER FRAME**



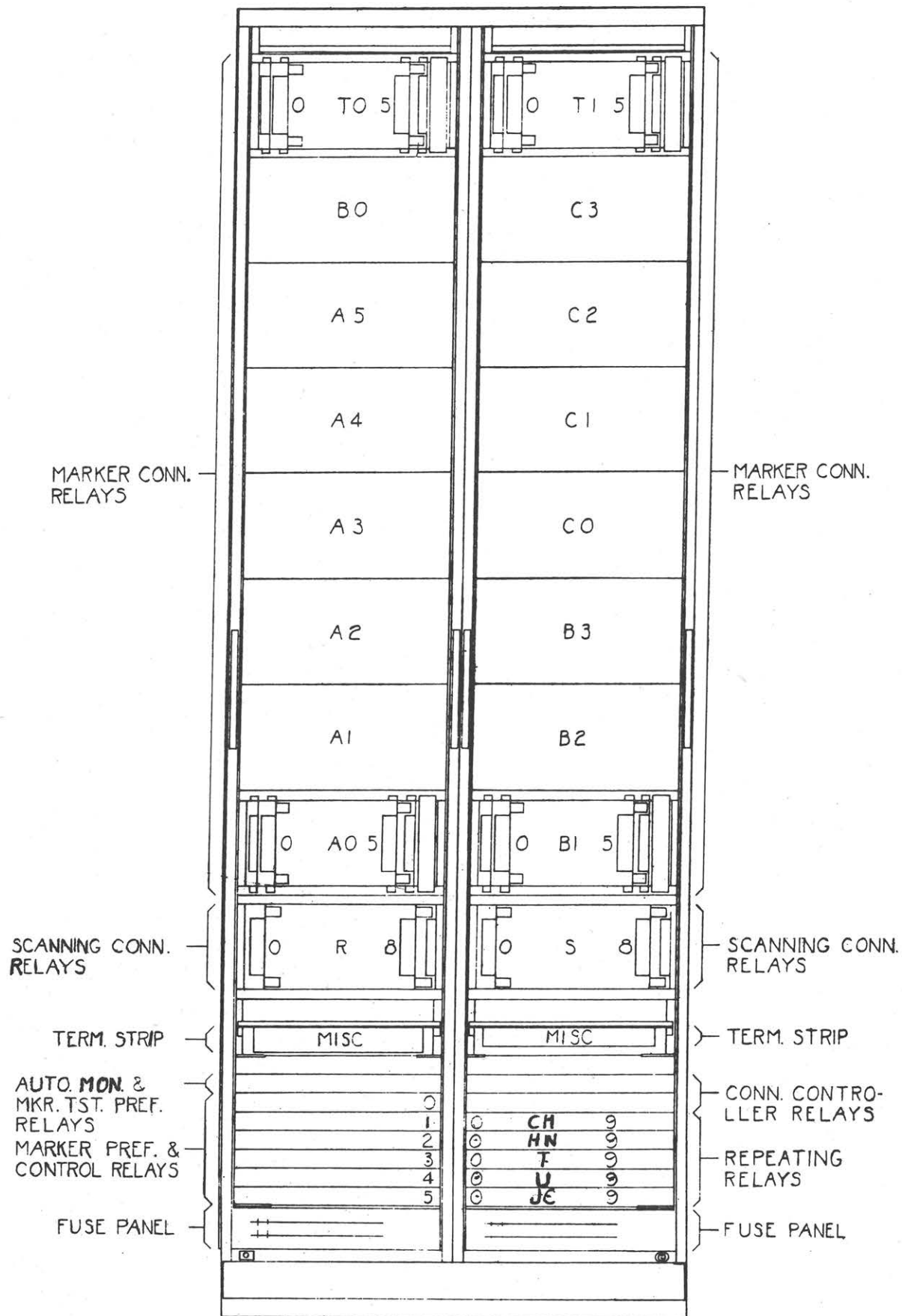
CONNECTOR FRAMES



OUTGOING SENDER CONNECTOR FRAME



TRUNK LINK CONNECTOR FRAME



MASTER TEST
CONNECTOR FRAME

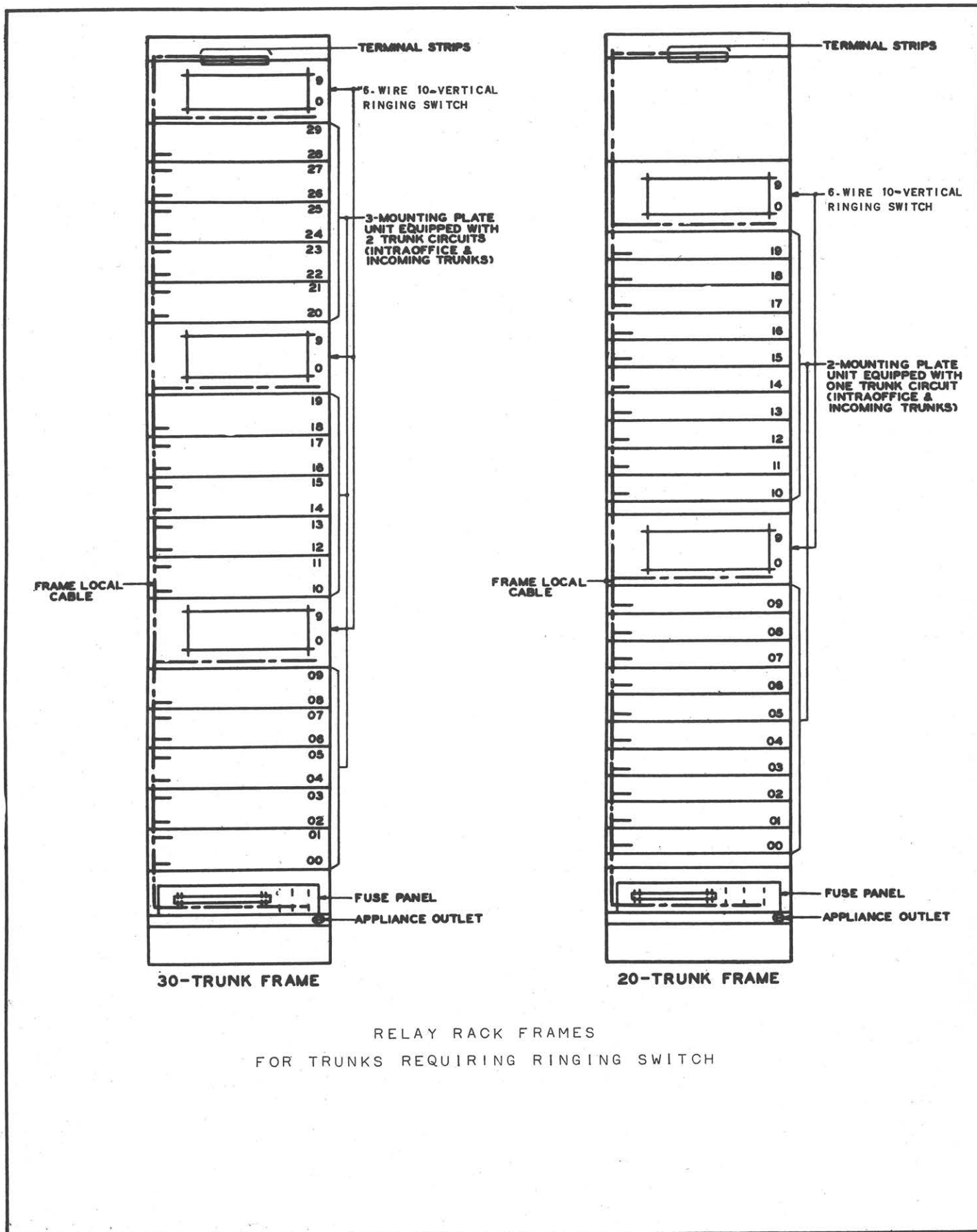
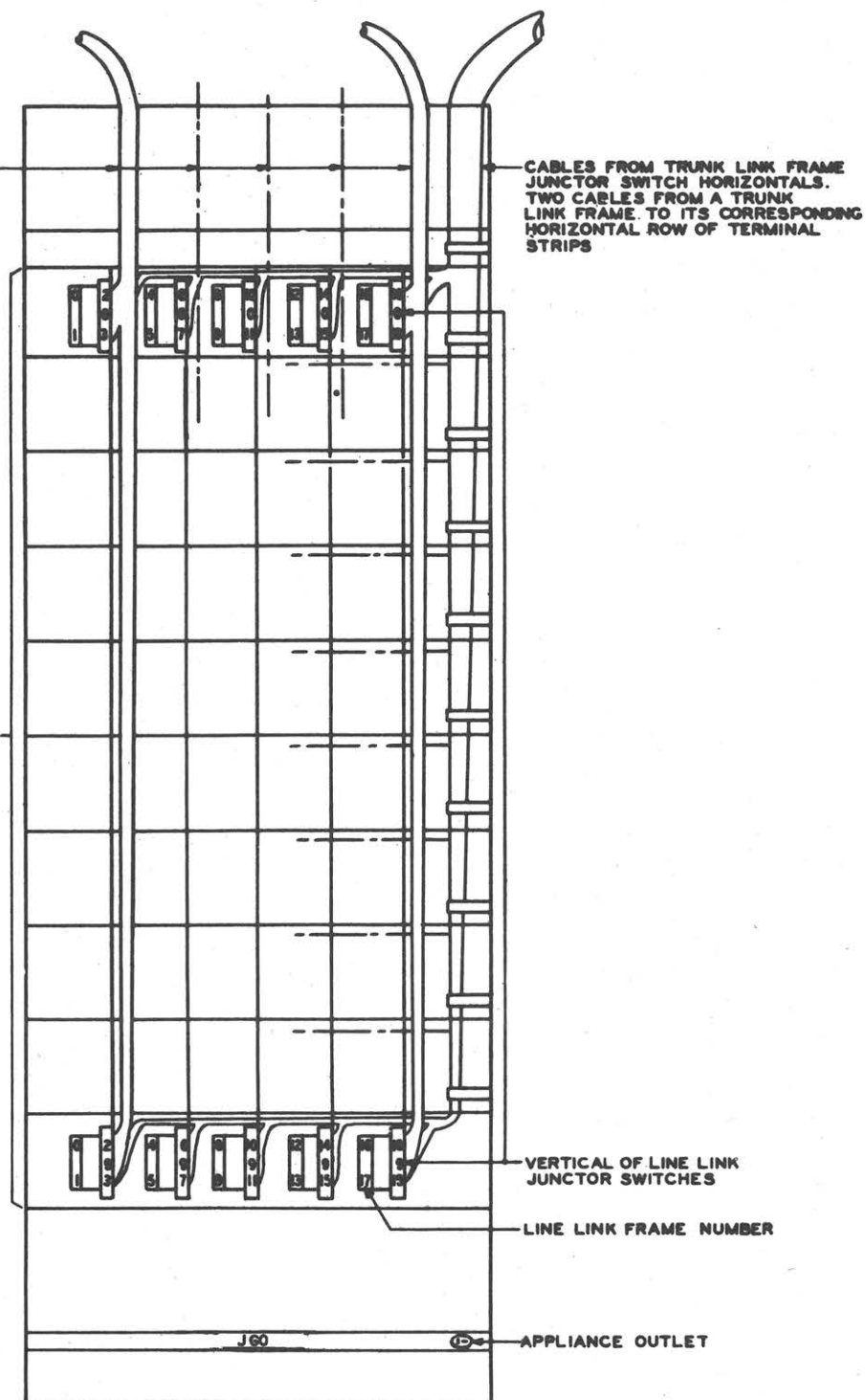


FIG.5B-160

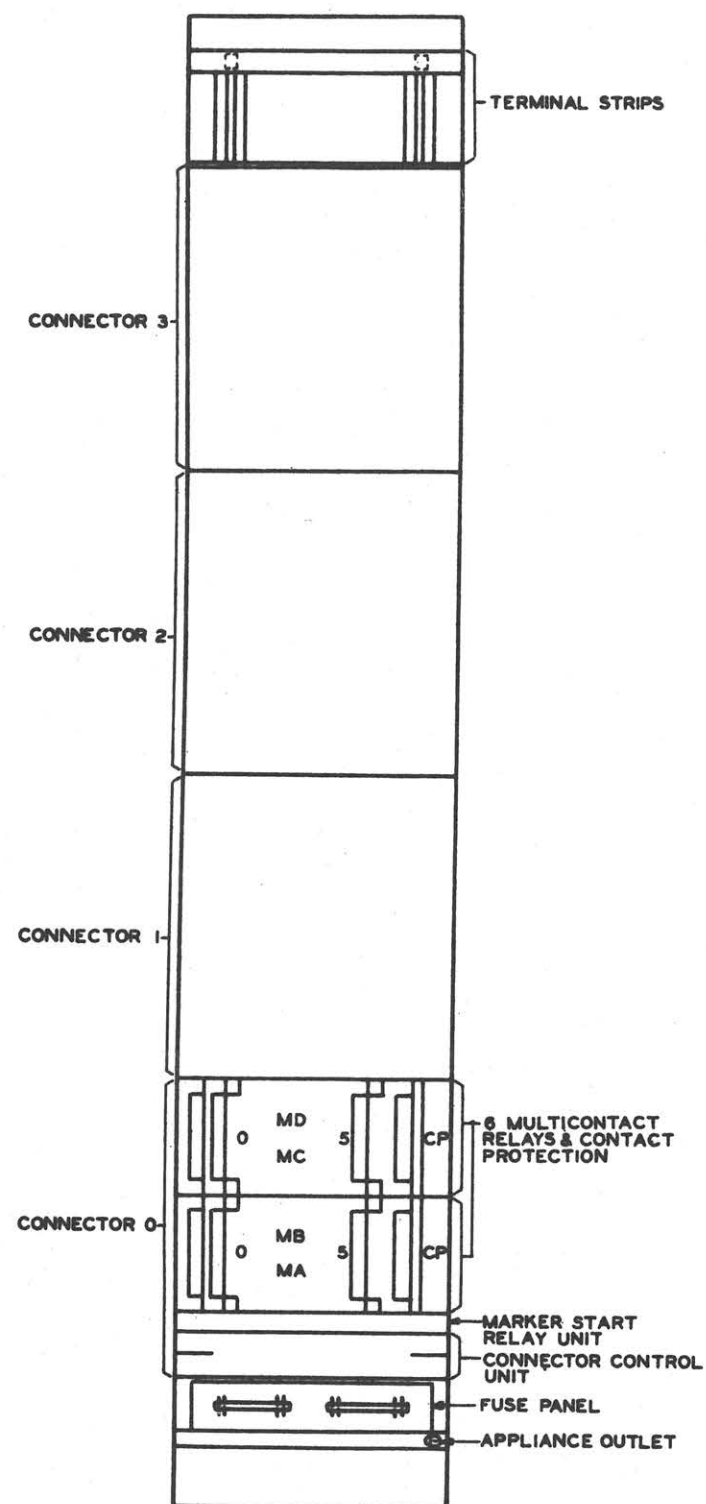
CABLES FROM LINE LINK FRAME
JUNCTOR SWITCH VERTICALS. ONE
CABLE FROM EACH OF 4 LINE
LINK FRAMES PER VERTICAL
ROW OF TERMINAL STRIPS

CABLES FROM TRUNK LINK FRAME
JUNCTOR SWITCH HORIZONTALS.
TWO CABLES FROM A TRUNK
LINK FRAME TO ITS CORRESPONDING
HORIZONTAL ROW OF TERMINAL
STRIPS

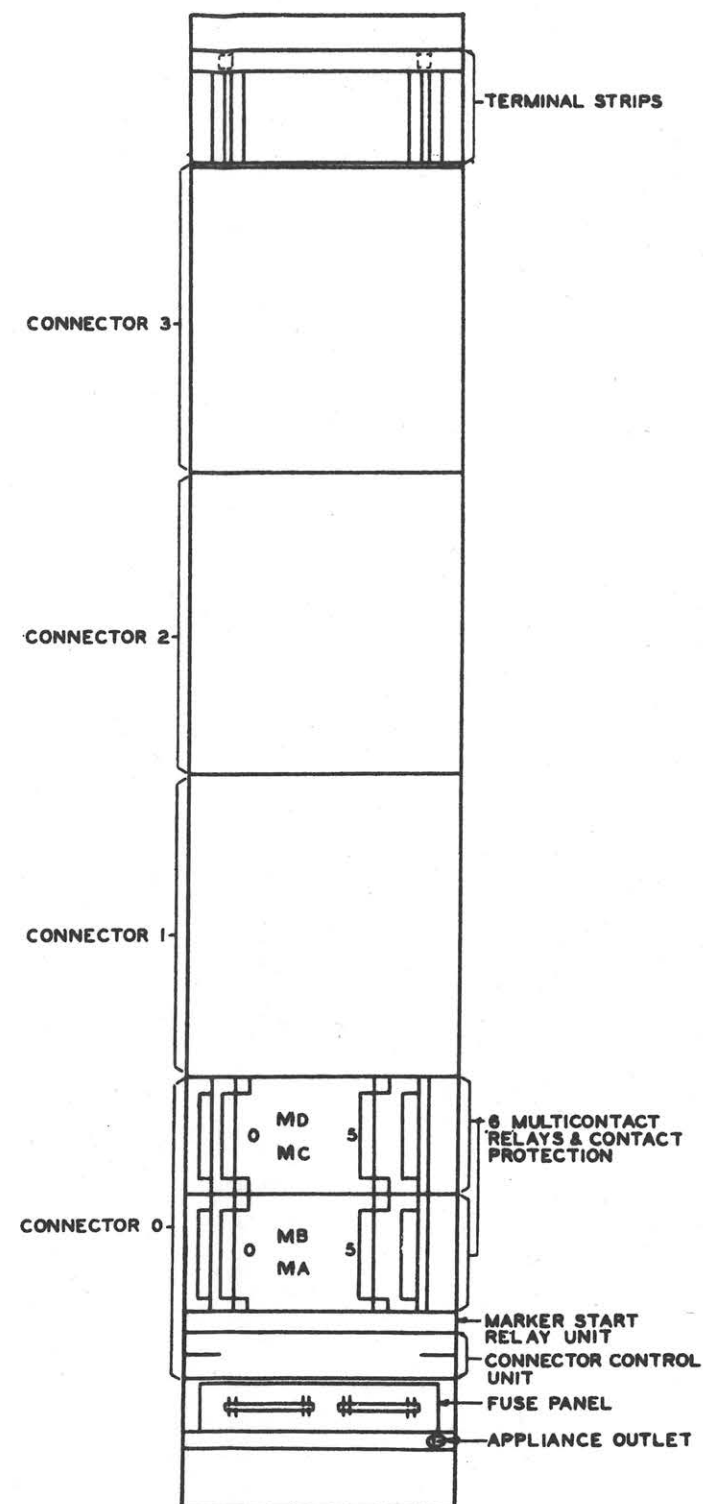
50 TERMINAL STRIPS



JUNCTOR GROUPING FRAME ARRANGED FOR
20 LINE LINK AND 10 TRUNK LINK FRAMES

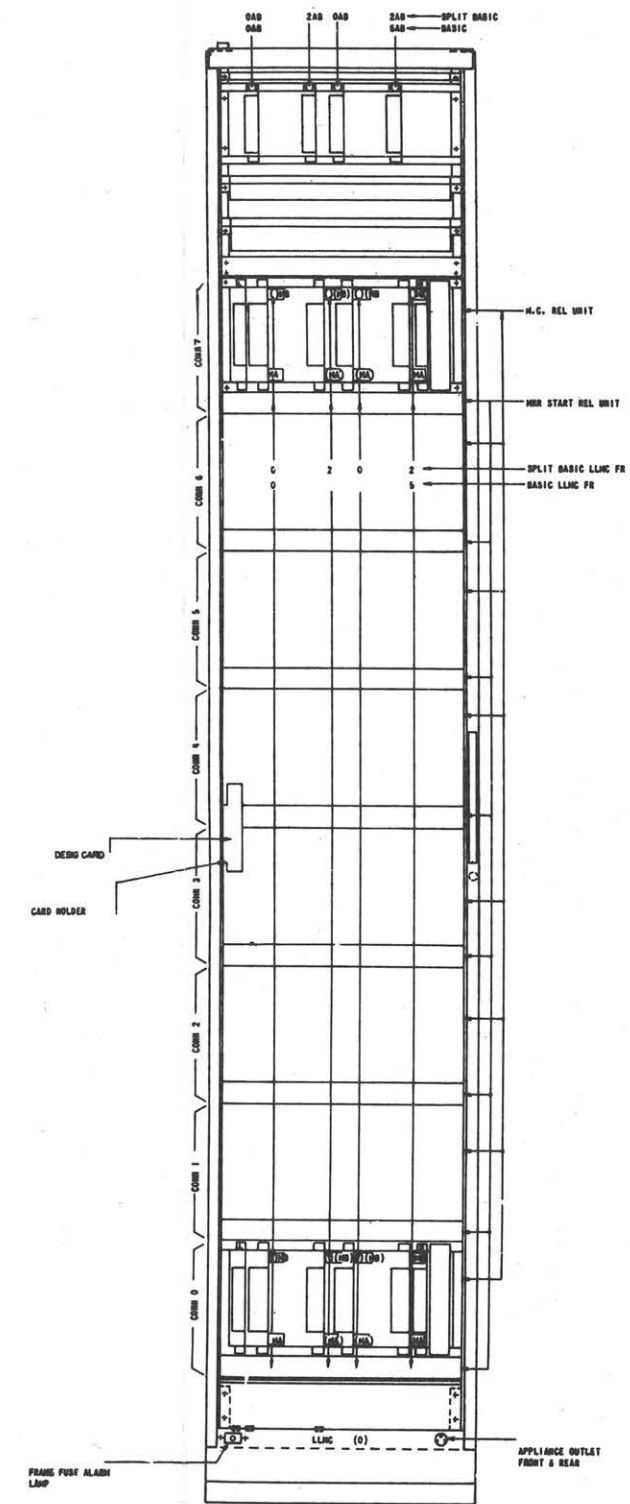


**ORIGINATING REGISTER
MARKER CONNECTOR FRAME**



**INCOMING REGISTER
MARKER CONNECTOR FRAME**

MARKER CONNECTOR FRAMES

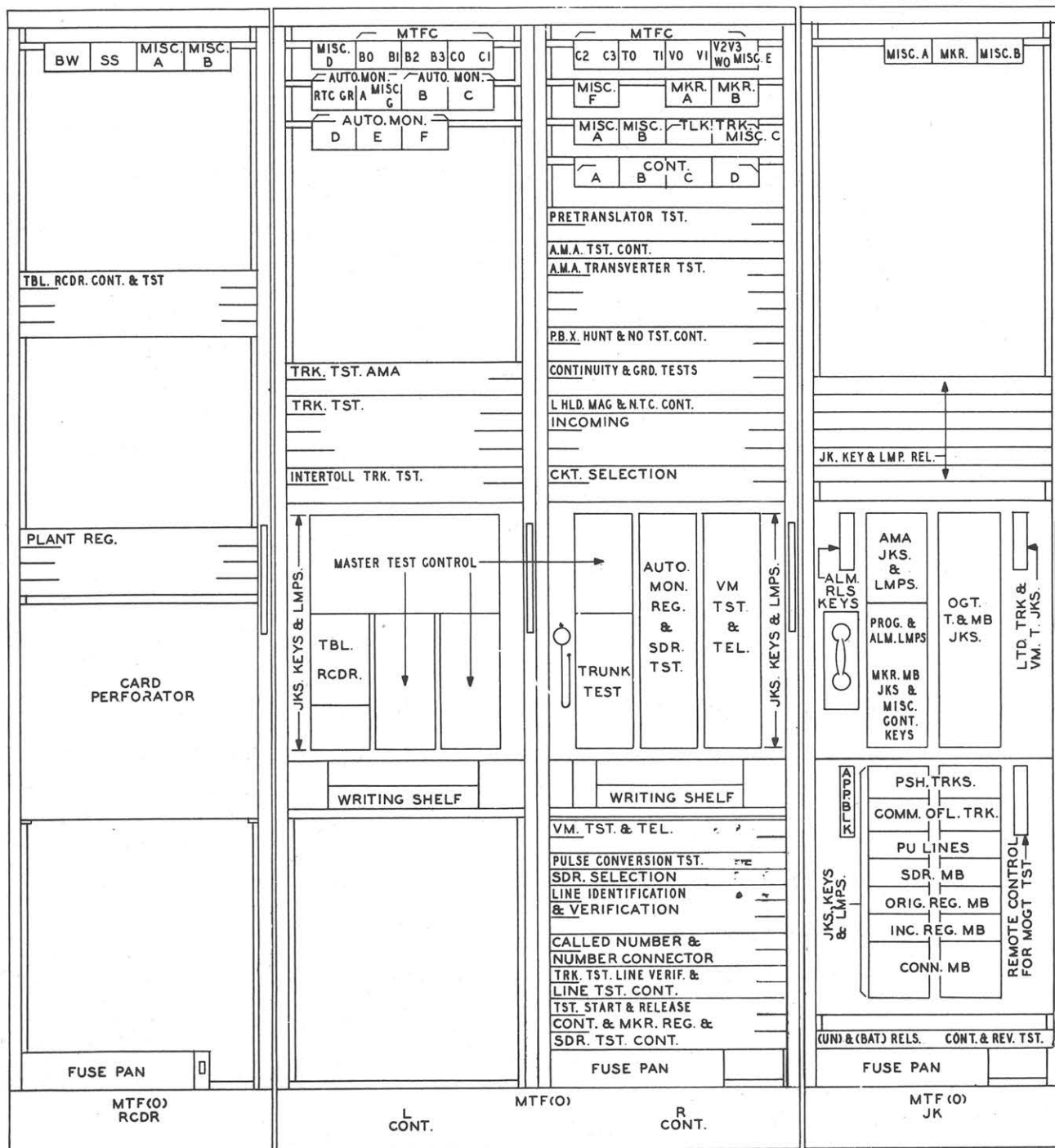


LINE LINK
MARKER CONNECTOR FRAME

RECORDER BAY

CONTROL BAYS

JACK BAY



MASTER TEST FRAME
BAYS LOCATED IN MAINTENANCE CENTER

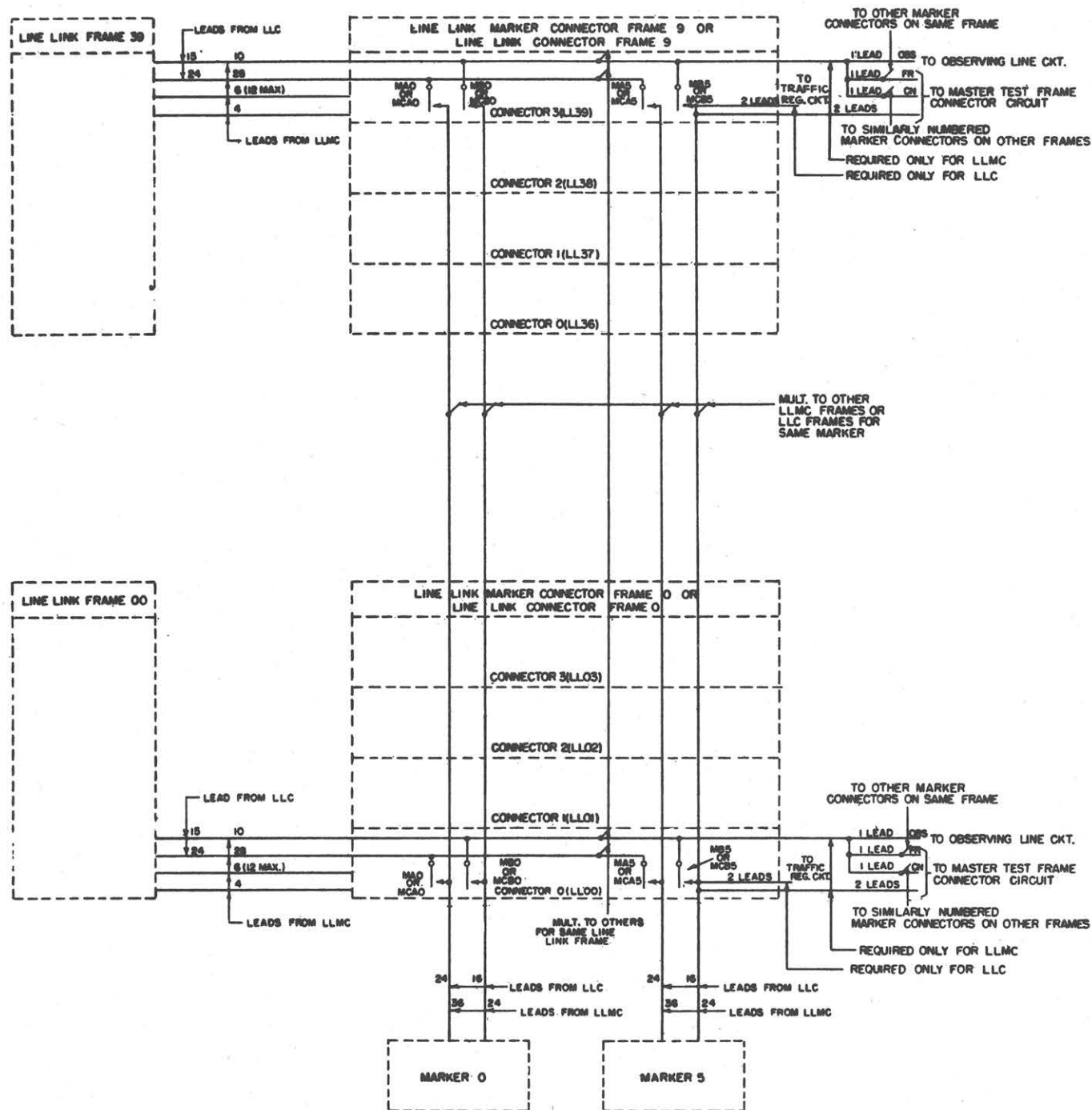
REG. & SDR. TST. BAYS

AUTO. MON. BAY

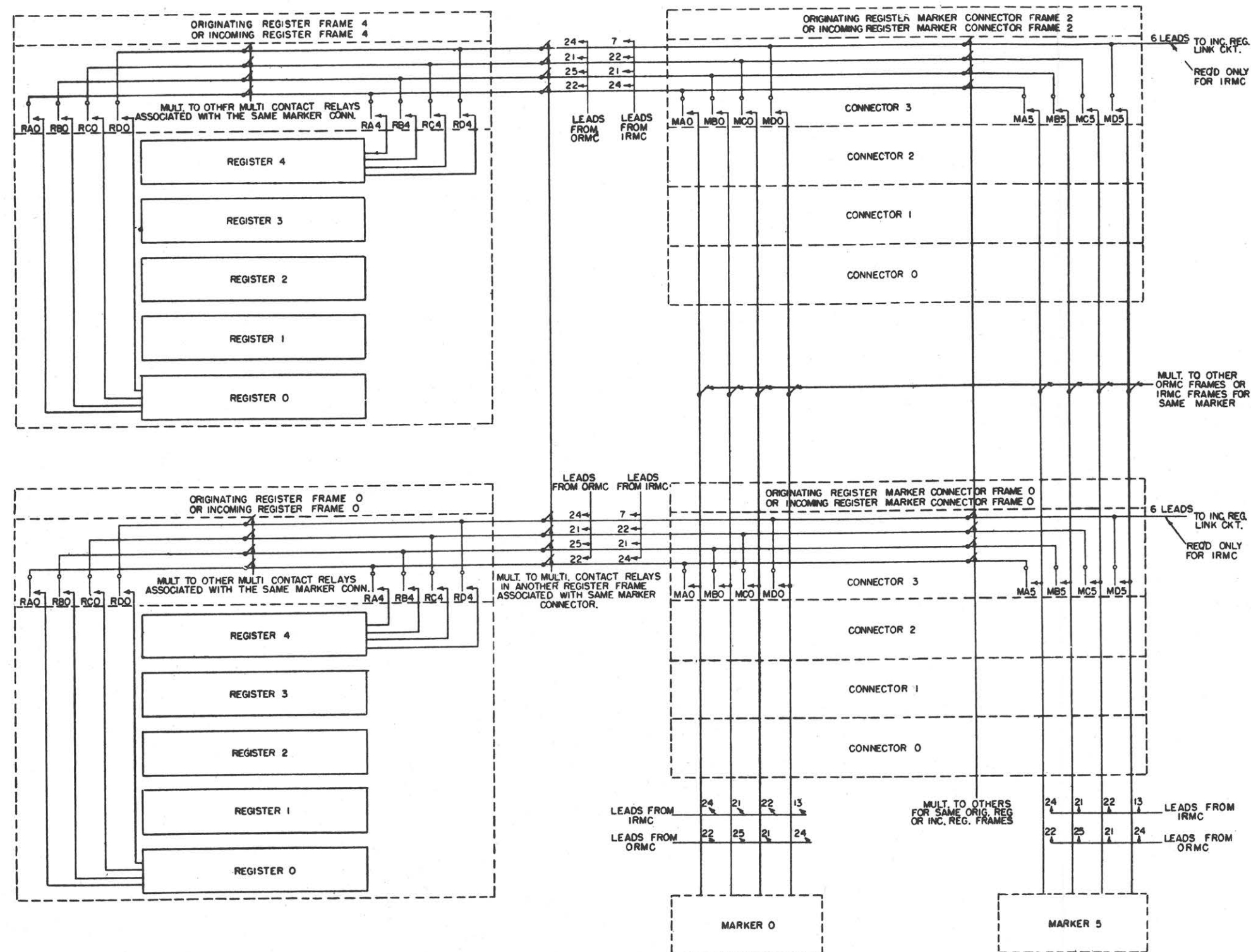
AUX. REG. &
SDR. TST. BAY

REG. & SDR. TST. BAYS			AUTO. MON. BAY			AUX. REG. & SDR. TST. BAY					
C	MTF D	E	MTF F	MTF A	MISC. A	MTF B	REG. TST.	SDR. & MKR.	REG. TST	MON	MISC A
A	REG. B	LKA	REG. LKB.	MON.	MISC. B	AUX. RST.	MISC. A				
AUX. RST.			5								
			4								
			3								
			2								
			1								
TRK. IDENT.			INC. REG. GRP. 0			11 TH. DIGIT			REV. REG. MISC. TST.		
						10 TH.			REV. NO. TRANSL.		
TDM. TRK. IDENT.						9 TH.			REV. REG. TST. STEERING		
LINE IDENT.						8 TH.			REV. REG. TST. TIMING		
MKR. IDENT.						7 TH.					
OUT P. STEERING						6 TH.			REV. SDR. TST. CONTROLLER		
						5 TH.			P.C.I. SDR. TST. CONTROLLER		
DIGIT TIMING TST.			INC. REG. GRP.			4 TH.			REV. & P.C.I. SDR. TST. COMMON		
			TRK. CLASS			3RD.					
M.F. GEN. FAST. P.			INC. REG. TST. CONT. CLASS CHK.			2ND.					
			INC. REG. TST. CONT. WINK			1ST. DIGIT			REV. PULSE GEN. INTERRUPTER RELS.		
M.F. GEN. SLOW P.			INC. REG. TST. CONT. CONT.			CODE ROUTE DIGIT			REV. PULSE GEN. PULSING RELS.		
						STEER. REG. & MAT. REL. CONT.			P.C.I. TRANSFER		
D.P. GEN. RING. PAN.			TST. CONTROLLER CONT.			CONT. TO TST. REG.			P.C.I. REG.		
			TST. CONT. TMG.			CONT. TO TST. SDRS.			P.C.I. STEERING		
D.P. GEN. CONT. REL.			ORIG. REG. TST. CONT. CONT.			D.P. COUNTING					
			ORIG. REG. TST. CONT. COIN TMG.			D.P. AMPL. REP. & BIAS CONT.			REV. PULSE REG.		
D.P. GEN. CTG. RELS.			SDR. TST. CONT.						P.C.I. PULSE AMPL.		
						M.F. AMP.			REV. COUNTING & REG. CONT.		
D.P. GEN. INTER. REL.						MON. CONT.			REV. MON. & SDR. TST. COUNTING		
						MON. ALL.			REV. REG. TST. COUNTING		
D.P. GEN. P. & CTG. REL.						CONN. CONT.					
									FUSE PAN.		
M.F. REC. PAN. (11-1 3/4 PLTS.)						8 11					
						4 MKR. PREF. 7					
						0 3					
						0 SDR. GRP. 5					
FUSE PAN.											
L RST	MTF (0)	R RST				MTF (0) AM			MTF (0) ARST		

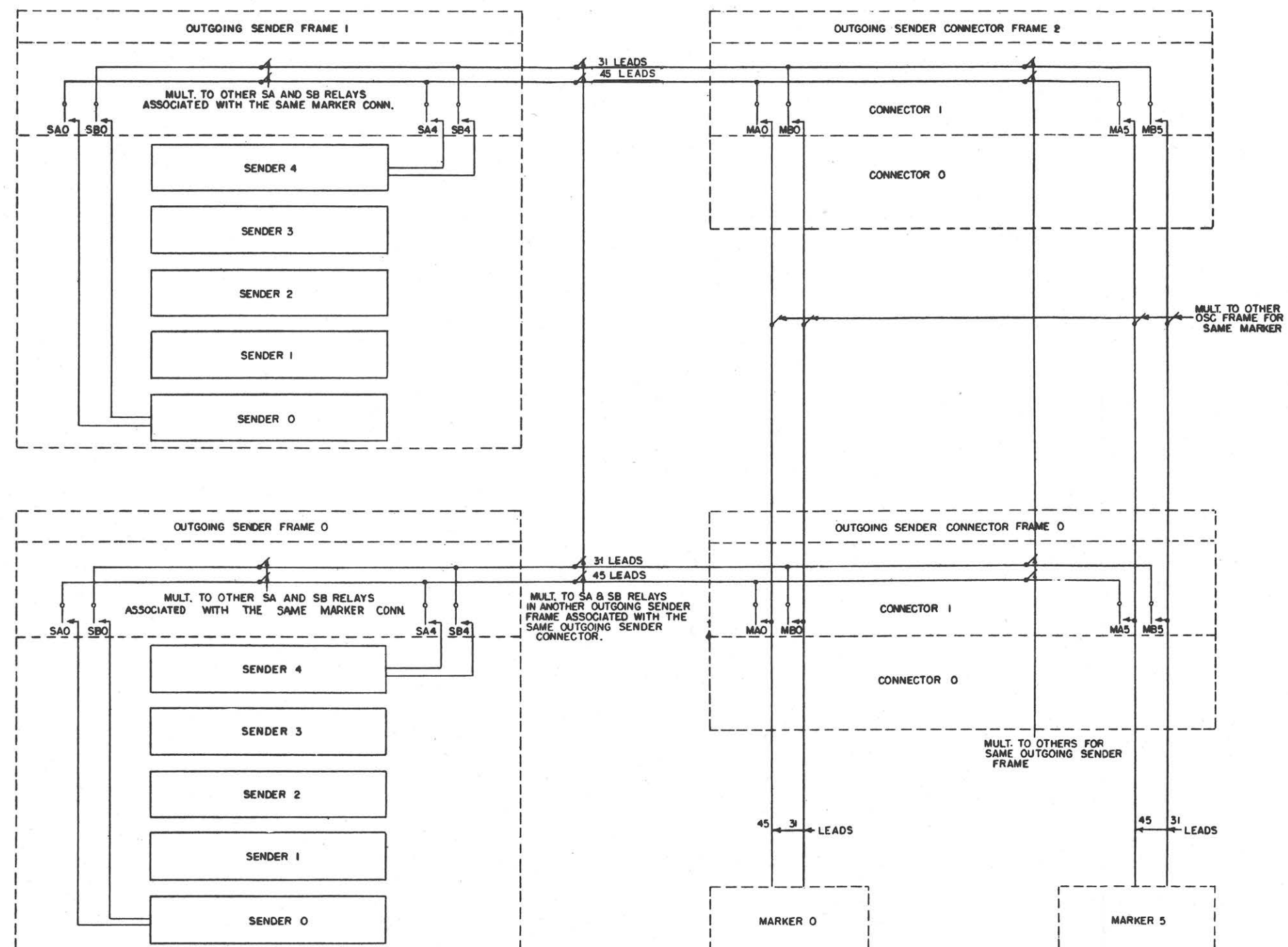
MASTER TEST FRAME
BAYS NOT LOCATED IN MAINTENANCE CENTER



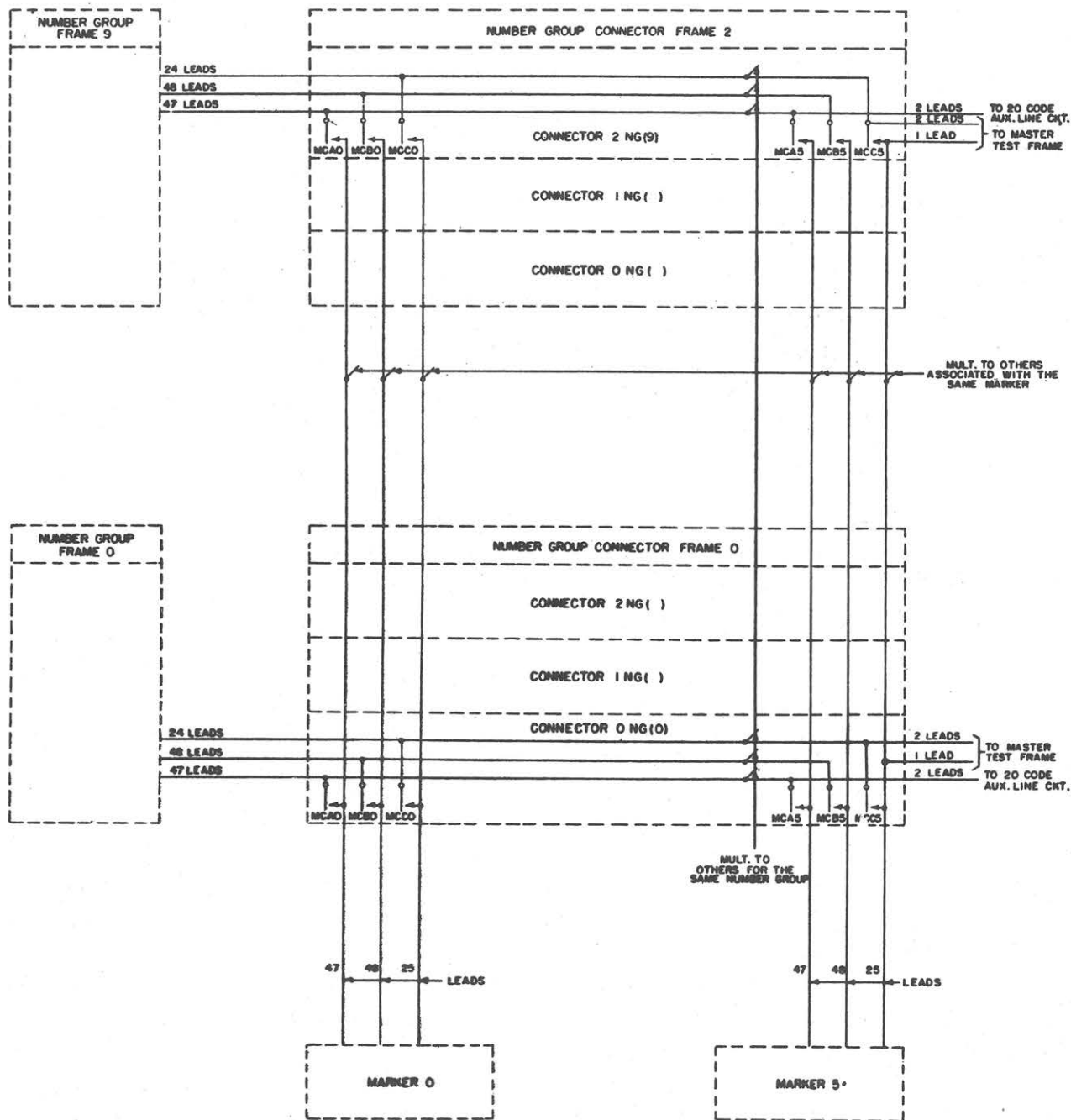
TYPICAL MULTIPLE ARRANGEMENT OF THE
LINE LINK MARKER CONNECTOR FRAMES
OR THE LINE LINK CONNECTOR FRAMES



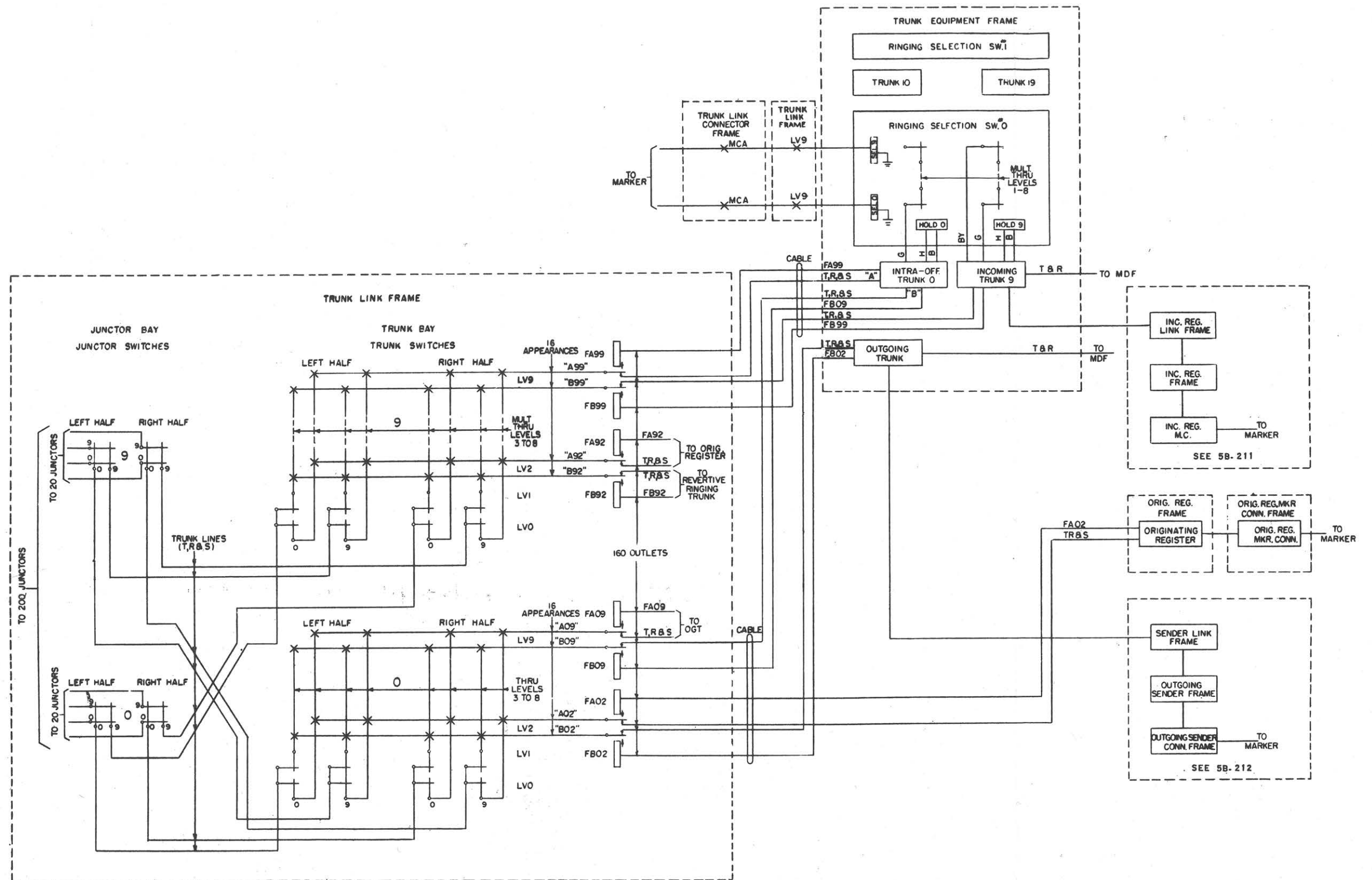
TYPICAL MULTIPLE ARRANGEMENT OF THE ORIGINATING REGISTER FRAMES AND THE ORIGINATING REGISTER MARKER CONNECTOR FRAMES OR THE INCOMING REGISTER FRAMES AND THE INCOMING REGISTER MARKER CONNECTOR FRAMES



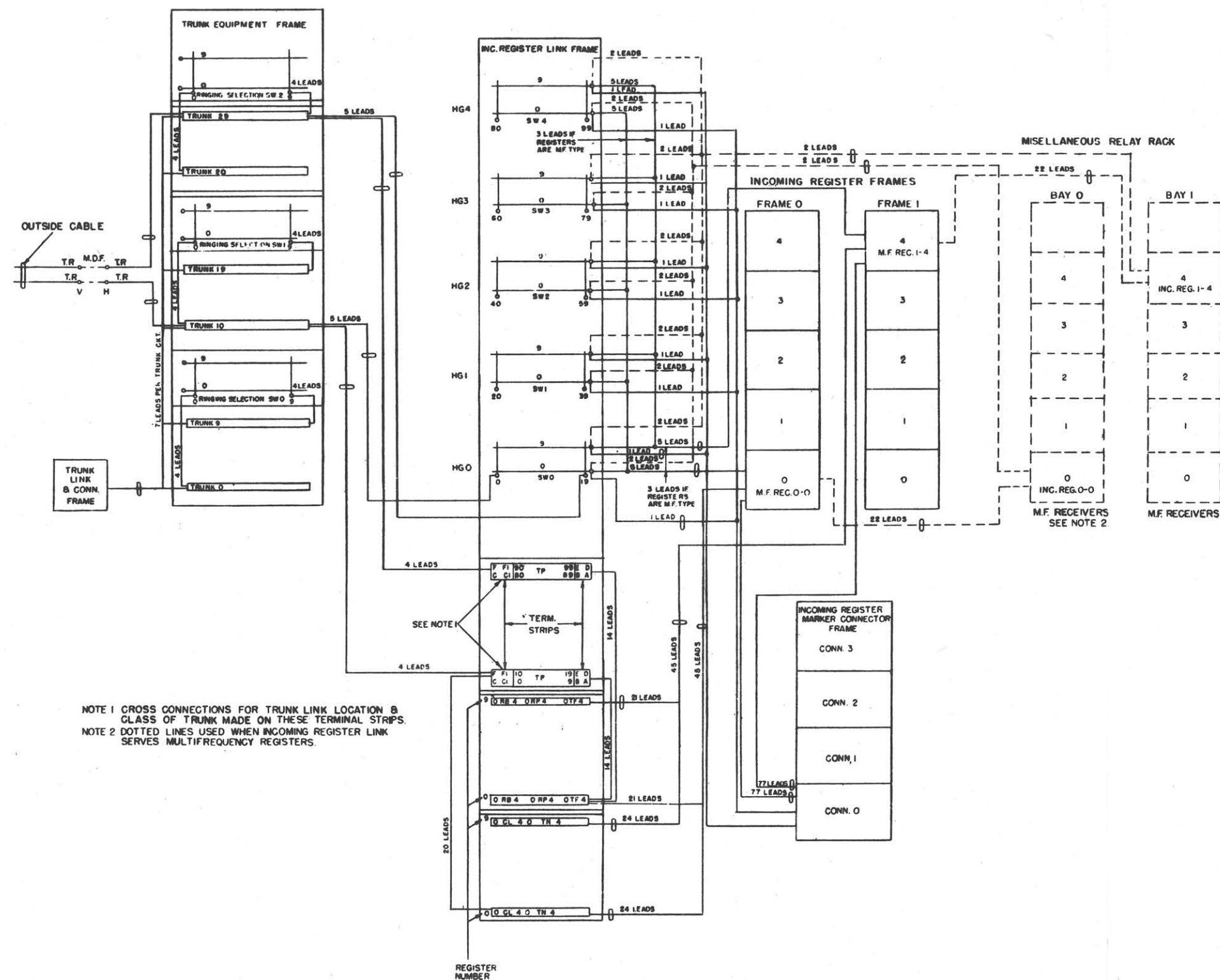
TYPICAL MULTIPLE ARRANGEMENT OF THE OUTGOING SENDER FRAMES
AND THE OUTGOING SENDER CONNECTOR FRAMES



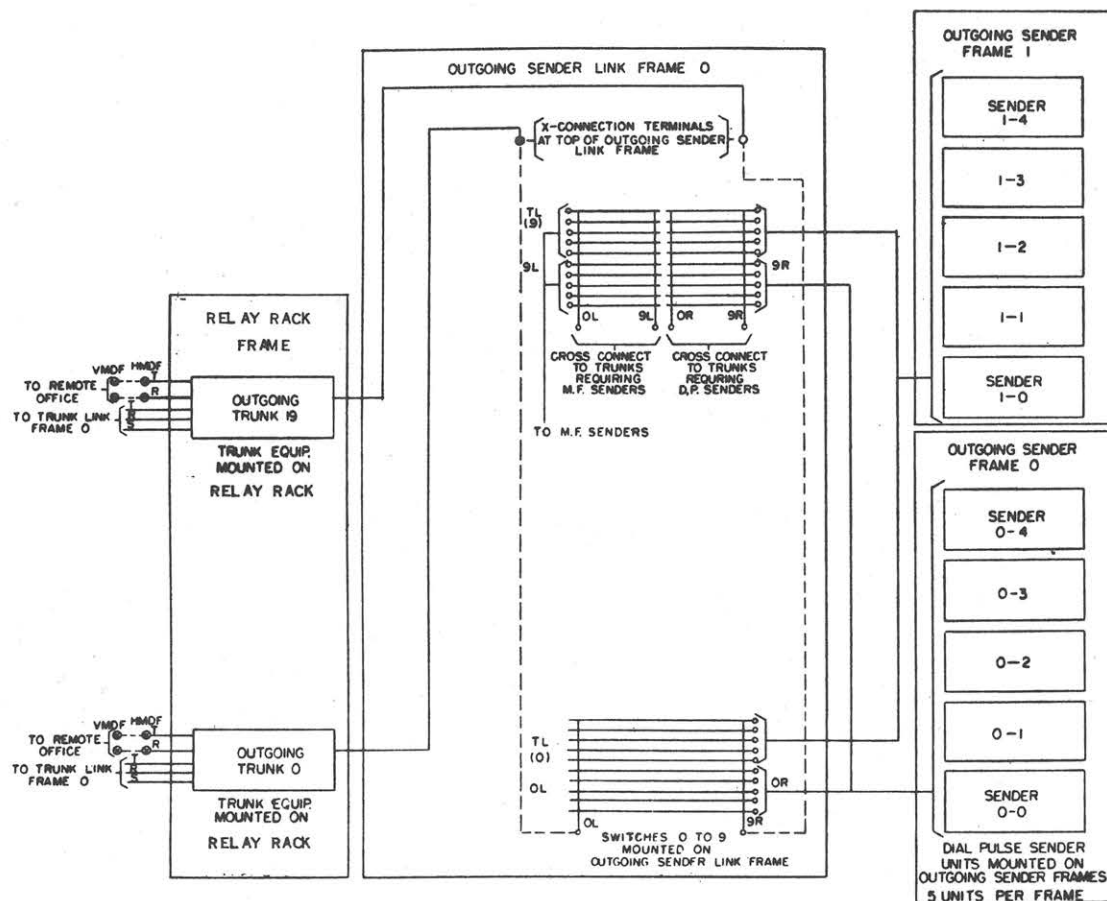
TYPICAL MULTIPLE ARRANGEMENT
OF THE NUMBER GROUP CONNECTOR FRAMES



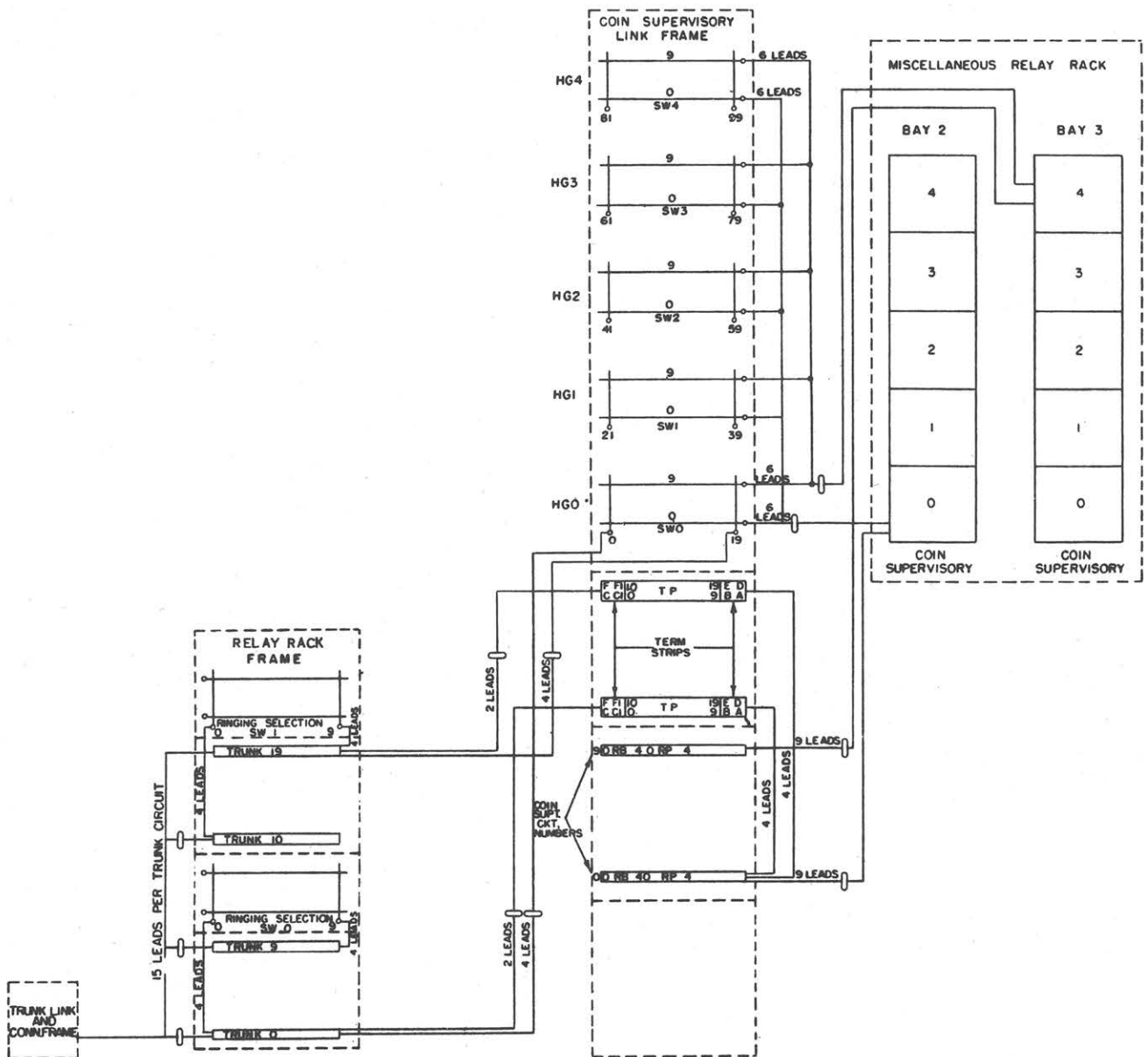
TYPICAL CONNECTING ARRANGEMENT
OF TRUNKS & REGISTER, S TO THE TRUNK LINK FRAME



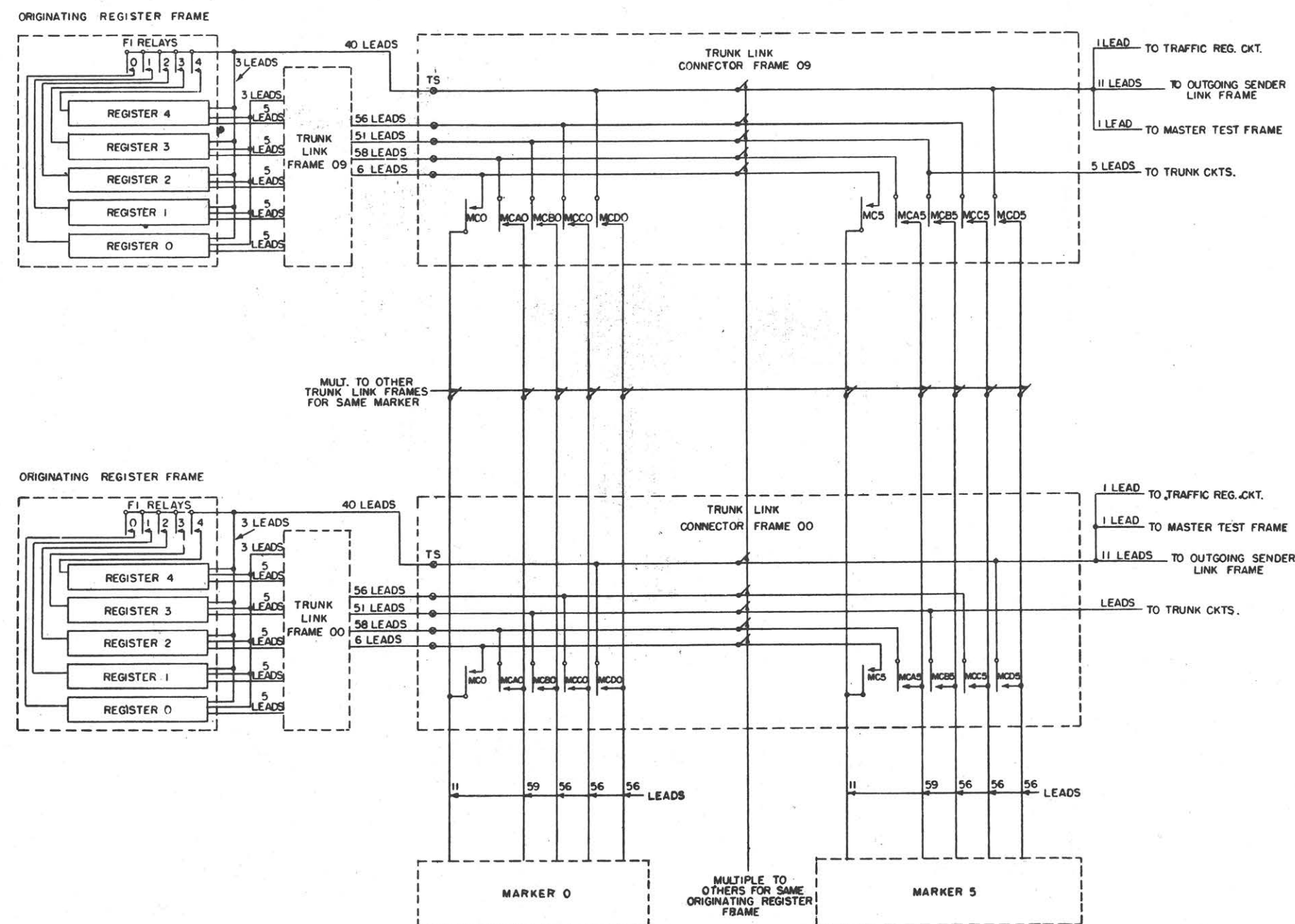
TYPICAL CONNECTING ARRANGEMENTS OF TRUNKS, INCOMING REGISTERS, & INCOMING REGISTER LINKS



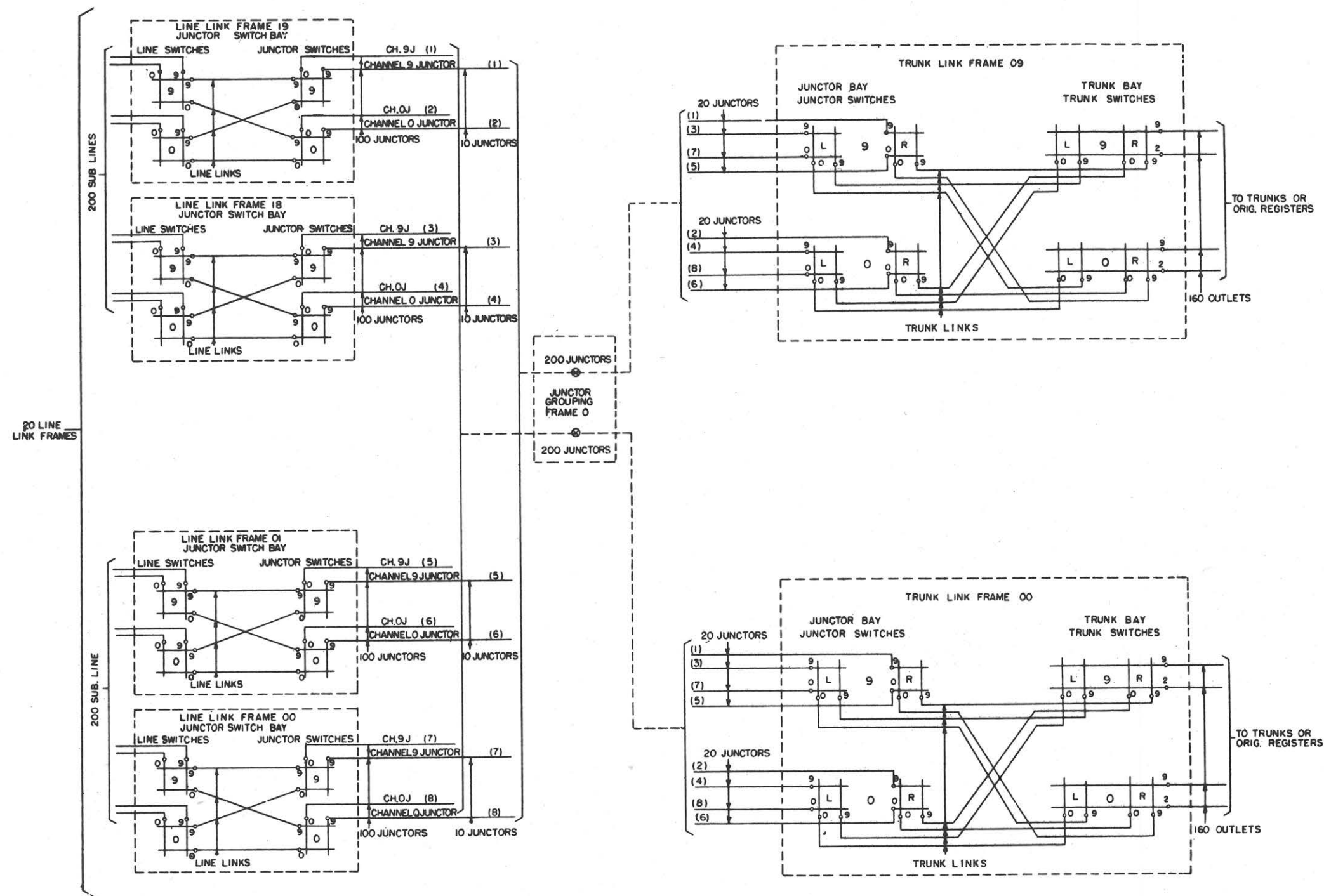
EQUIPMENT ASSOCIATION
TRUNKS, SENDER LINKS, & SENDERS



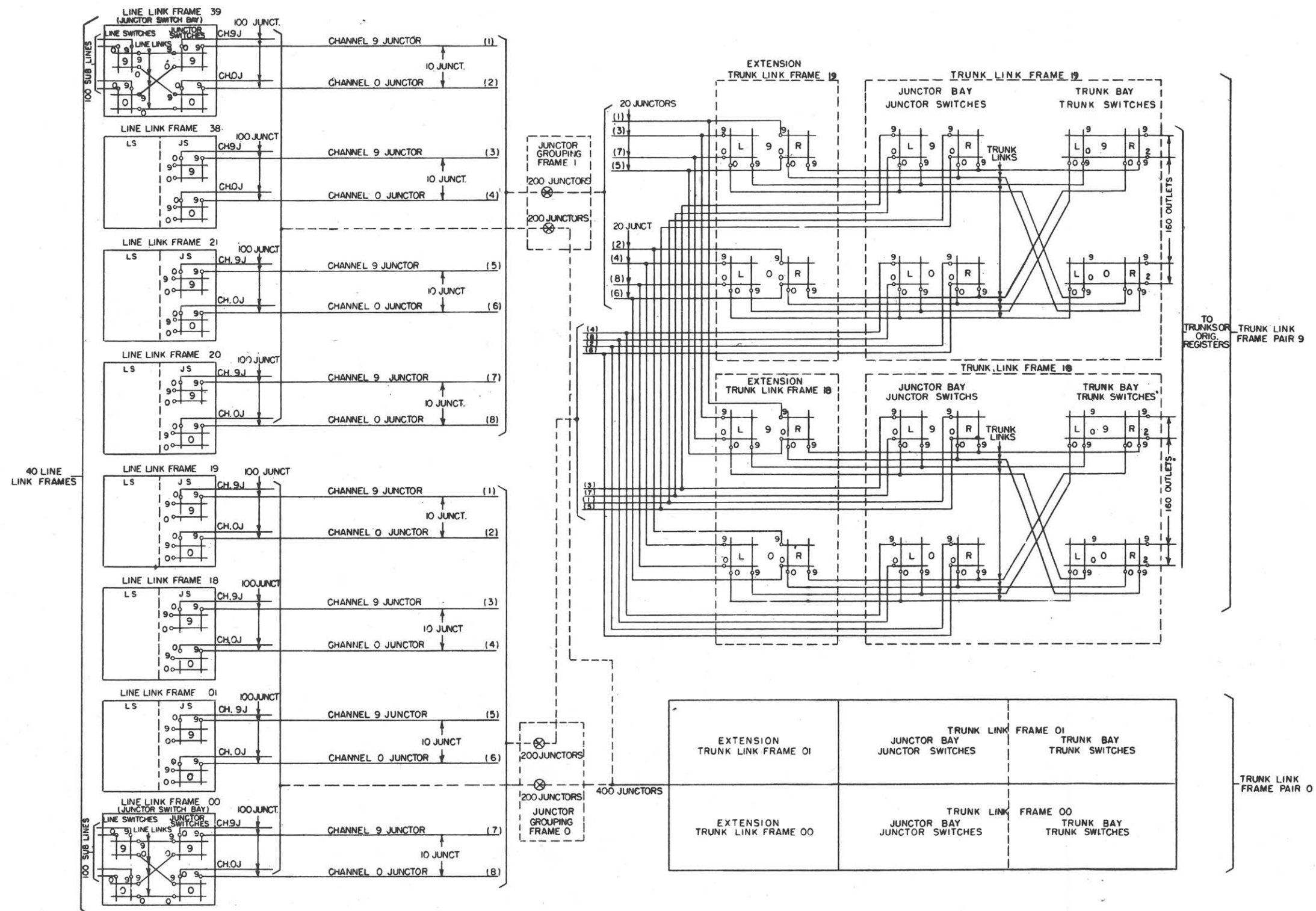
TYPICAL CONNECTING ARRANGEMENTS OF INTRA OFFICE COIN TRUNKS,
COIN SUPERVISORY CIRCUITS, AND COIN SUPERVISORY LINKS.



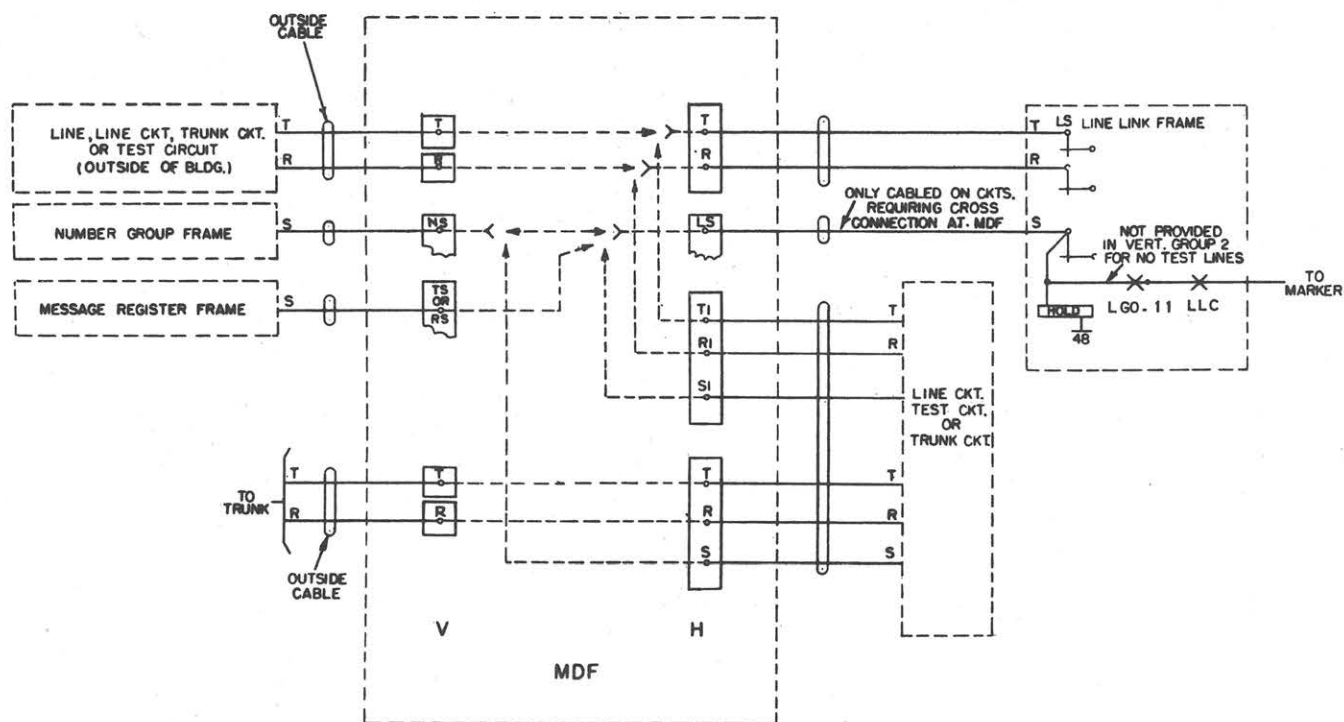
TYPICAL MULTIPLE ARRANGEMENT
OF THE TRUNK LINK CONNECTOR FRAMES



JUNCTOR DISTRIBUTION FOR
20 LINE LINK AND 10 TRUNK LINK FRAMES
INITIAL INSTALLATION



PAIRED OPERATION OF TRUNK LINK FRAMES
AND JUNCTOR DISTRIBUTION FOR
40 LINE LINK FRAMES & 10 TRUNK LINK FRAME PAIRS
INITIAL INSTALLATION



TYPICAL CABLING & CROSS-CONNECTION
ARRANGEMENT OF THE SLEEVE CIRCUIT AT THE MDF

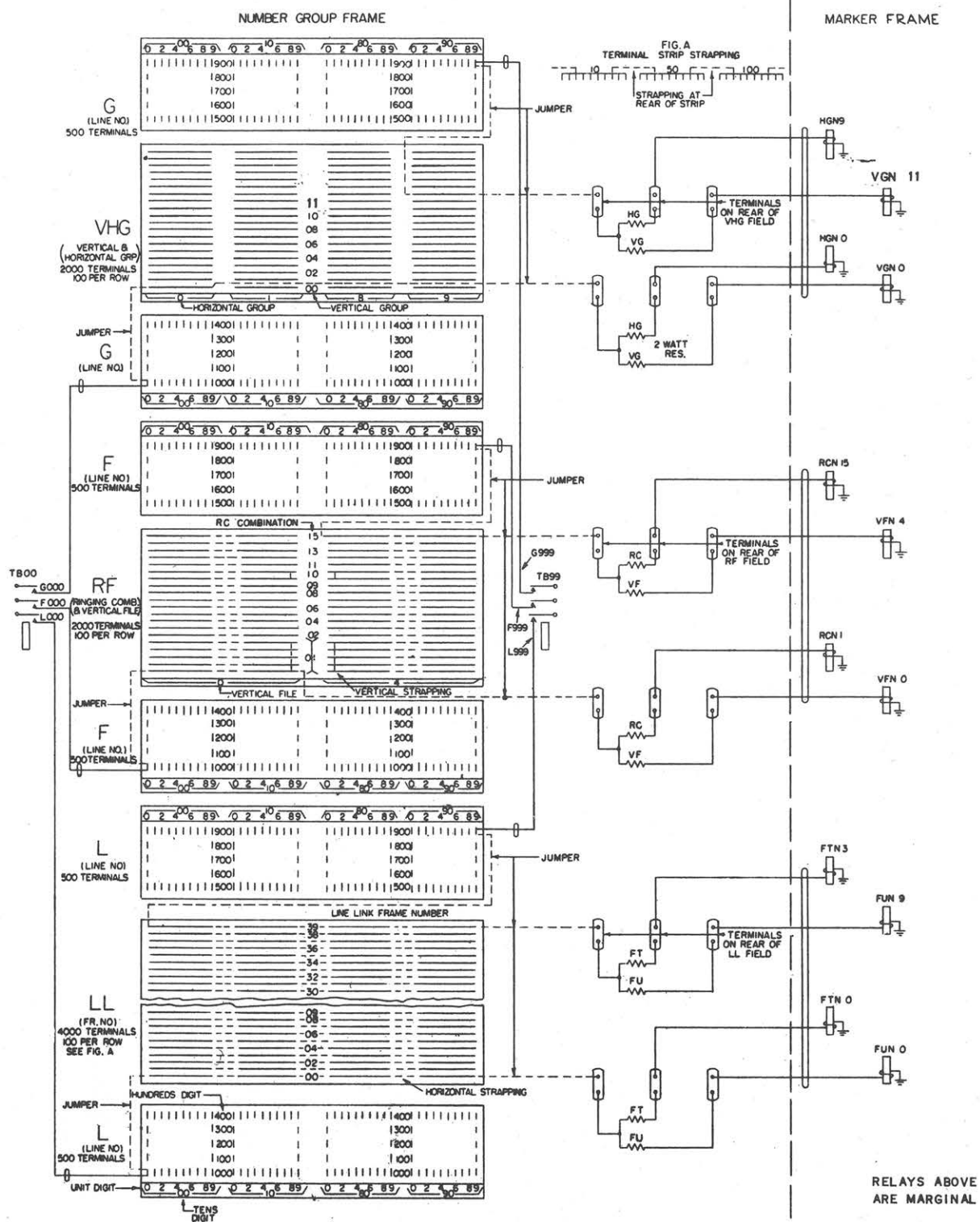
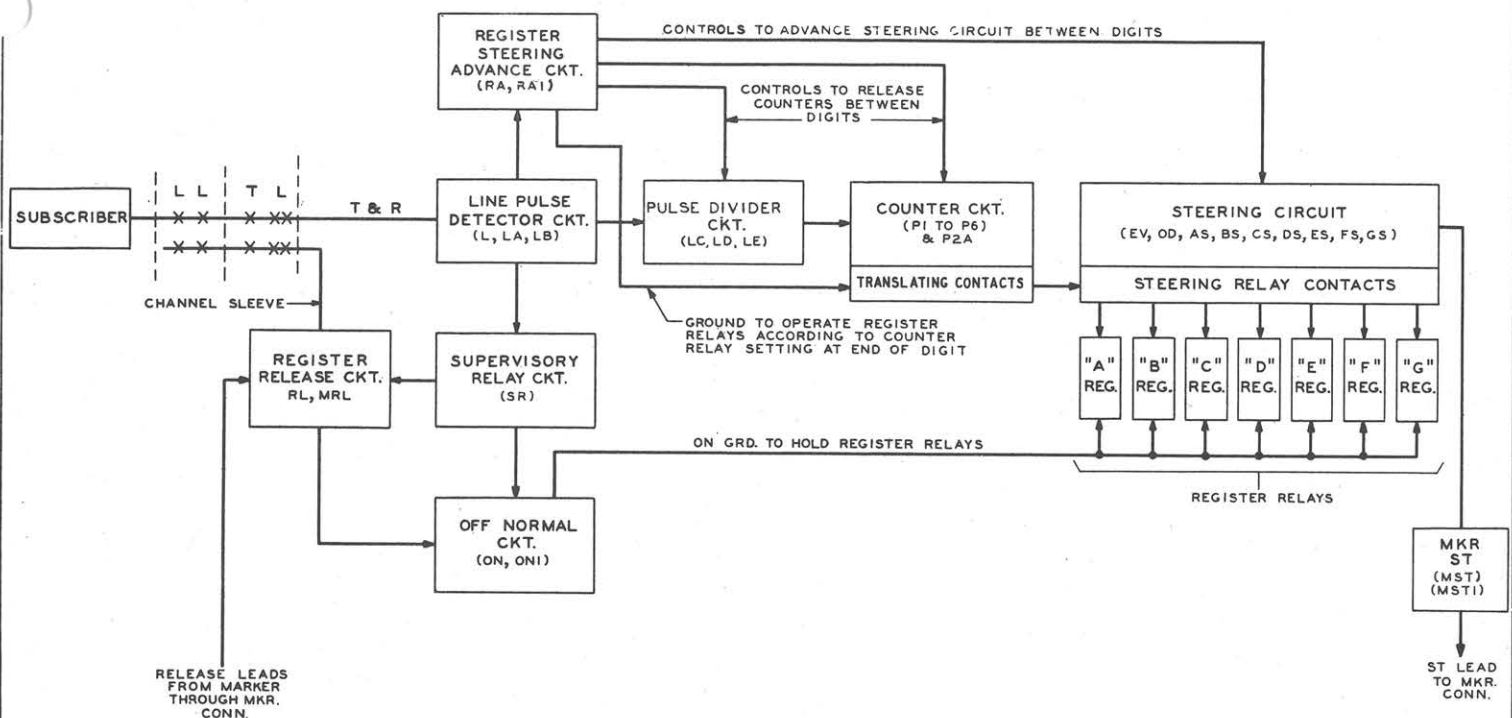
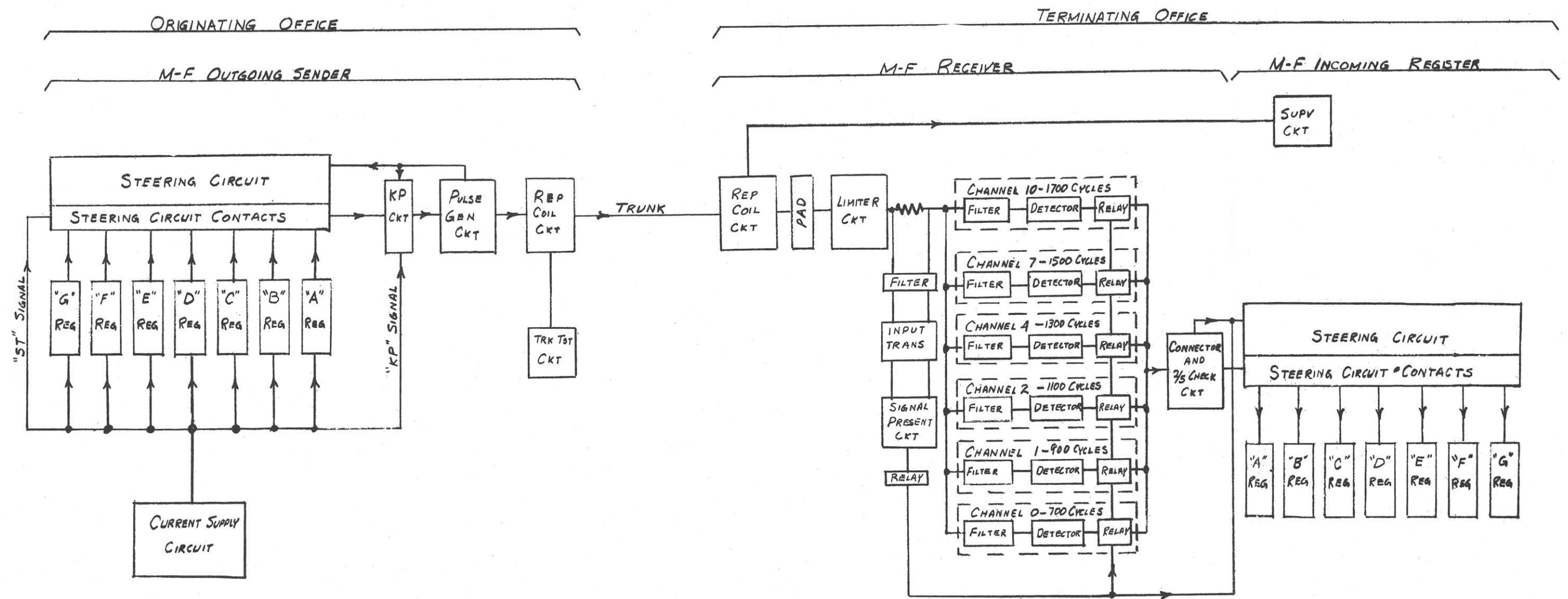


FIG.5B-241



BLOCK DIAGRAM OF DIAL PULSE COUNTER & REGISTER



BLOCK DIAGRAM OF MULTIFREQUENCY PULSING CIRCUITS

