

COPY No. _____

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BSP A 128,819

ISSUE _____, LISTS _____

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ISSUE _____, LISTS _____

ISSUE _____, LISTS _____

ISSUE _____, LISTS _____

TOLL SWITCHING SYSTEM No. 4A
SEQUENCE CHARTS, OPERATIONAL SKETCHES
AND
REFERENCE MATERIAL



BELL TELEPHONE LABORATORIES
INCORPORATED
SWITCHING SYSTEMS DEVELOPMENT DEPARTMENT
463 WEST STREET
NEW YORK 14

PRINTED
IN
U.S.A.

MASTER LEGEND FOR SEQUENCE CHARTS

MP-10379

- RELAY OR OTHER APPARATUS OPERATIONS AND RELEASES ONLY ARE SHOWN.
- VERTICAL PROGRESSION DOWNWARD SHOWS RELATIVE TIME PHASE OF RELAY OR OTHER APPARATUS MOVEMENTS (OPERATION OR RELEASE).
- COORDINATES ARE USED TO LOCATE THE POSITION OF APPARATUS ON SC'S. THE HORIZONTAL COORDINATE IS ALPHABETICALLY DESIGNATED. THE VERTICAL COORDINATE IS NUMERICALLY DESIGNATED STARTING WITH 101 ON SHEET 1, 201 ON SHEET 2, ETC. THUS D304 MEANS VERTICAL COLUMN D, SHEET 3, HORIZONTAL LINE 4.
- THE FOLLOWING TABLE SHOWS, ON A LINE BASIS, THE OPERATE AND RELEASE TIMES WHICH ARE USED FOR THE APPARATUS:

APPARATUS	OPERATE	RELEASE
ALL RELAYS EXCEPT SLOW OPERATE, SLOW RELEASE, TIMED AND MULTICONTACT	1 LINE	1 LINE
SLOW OPERATE RELAYS	2 LINES(MIN.)	1 LINE
SLOW RELEASE RELAYS	1 LINE	2 LINES (MIN.)
TIMED RELAYS, COLD CATHODE TUBES ETC.	SEE NOTE 11	SEE NOTE 11
MULTICONTACT RELAYS	2 LINES	1 LINE
SELECT MAGNETS	2 LINES	1 LINE
HOLD MAGNETS	2 LINES	1 LINE
PERFORATOR MAGNETS	2 LINES	2 LINES
OTHER APPARATUS	1 LINE	1 LINE

5. OPERATE SYMBOLS:

EXPLANATION:

- AL RELAY OR OTHER APPARATUS COMES TO FULLY OPERATED CONDITION AT THIS POINT. FOR POLAR RELAYS WITHOUT BIASING SPRINGS, THE ARMATURE HAS MOVED TO FRONT OR LEFT CONTACT.
- RDR PIN READER PINS ARE MOVED TO PASS THROUGH THE PERFORATED HOLES IN TAPE AT THIS POINT. READER PIN CONTACTS ARE CLOSED ONLY IF A HOLE IS PERFORATED.
- TC INTERRUPTER OR TIMER HAS CLOSED ITS B CONTACT.

6. RELEASE SYMBOLS:

EXPLANATION:

- AL RELAY OR OTHER APPARATUS COMES TO FULLY RELEASED CONDITION AT THIS POINT. FOR POLAR RELAYS WITHOUT BIASING SPRINGS, THE ARMATURE HAS MOVED TO BACK OR RIGHT CONTACT.
- RDR PIN READER PINS ARE MOVED AWAY FROM THE TAPE AND ALL READER CONTACTS ARE OPENED AT THIS POINT.
- TC INTERRUPTER OR TIMER HAS OPENED ITS PU CONTACT.

7. COMBINED OPERATE AND RELEASE SYMBOL:

EXPLANATION:

- Z RELAY OR OTHER APPARATUS HAS EITHER OPERATED OR RELEASED.

8. SYMBOL DESIGNATIONS:

THE OPERATE (X) AND RELEASE (+) SYMBOLS ARE USED IN CONJUNCTION WITH THE FOLLOWING DESIGNATIONS:

- RELAY WINDING DESIGNATIONS:
 - C- ONE OR MORE OF CO TO Cn OR CA TO Cn
 - CO-9 OR CO-Cn ALL OF CO TO C9 OR CD TO Cn INCLUSIVE
 - FA-D ALL OF FA TO FD INCLUSIVE
 - A,C BOTH A AND C
 - CB-(-1) ALL CB- EXCEPT ONE
 - HG $\frac{2}{5}$ A COMBINATION OF "2 OUT OF 5"
 - L/R EITHER L OR R OR ONE OF A SERIES L TO R
 - (TOP) MC TOP HALF OF MC MULTICONTACT RELAY
 - (BOT) MC BOTTOM HALF OF MC MULTICONTACT RELAY
 - MC BOTH HALVES OF MC MULTICONTACT RELAY

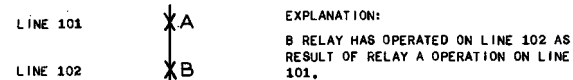
(B) OTHER APPARATUS DESIGNATIONS:

EXPLANATION:

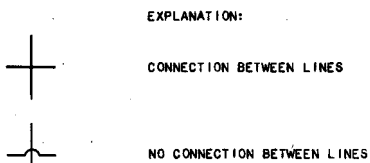
- AR KEY AR KEY CONTACT
- AJACK A JACK CONTACT
- ALLAMP AL LAMP
- THOLD T HOLD MAGNET
- JSEL J SELECT MAGNET
- USTEP 10/20 U STEP MAGNET. BRUSHES ARE IN CONTACT WITH BANK TERMINAL 10 OR 20
- PACMAG PAC MAGNET
- A2PERF A2 PERFORATOR MAGNET
- VARVARISTOR VAR VARISTOR (X CONDUCTING, + NON-CONDUCTING)
- TWATUBE TWA TUBE
- CL- PH. TRAN. CL- PHOTO TRANSISTOR (X CONDUCTING, + NON-CONDUCTING)

9. CONNECTING LINES:

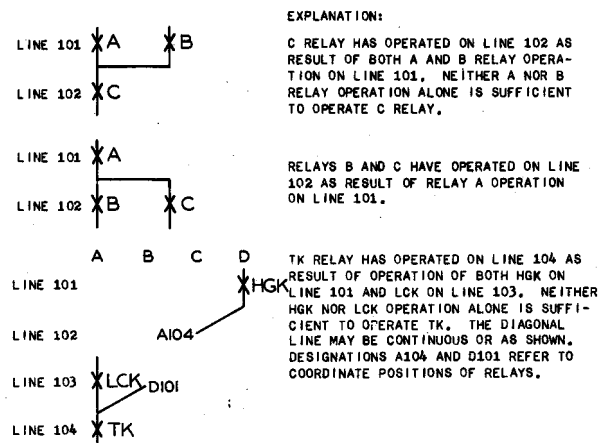
(A) VERTICAL LINES ARE USED TO LINK CAUSES WITH EFFECTS ON SUCCEEDING LINES AS:



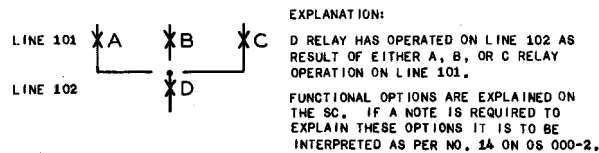
(B) HORIZONTAL AND VERTICAL LINE COMBINATIONS ARE USED AS FOLLOWS:



(C) HORIZONTAL AND OBLIQUE LINES ARE USED TO CONNECT MULTIPLE CAUSES PRODUCING A COMMON EFFECT OR TO CONNECT MULTIPLE EFFECTS PRODUCED BY THE SAME CAUSE AS:

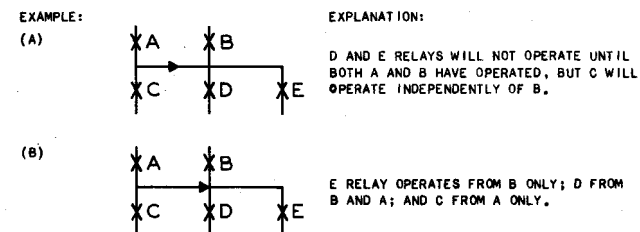


(D) APPARATUS OPTIONS OR FUNCTIONAL OPTIONS ARE SHOWN BY A BREAK IN THE HORIZONTAL AND VERTICAL CONNECTING LINES.

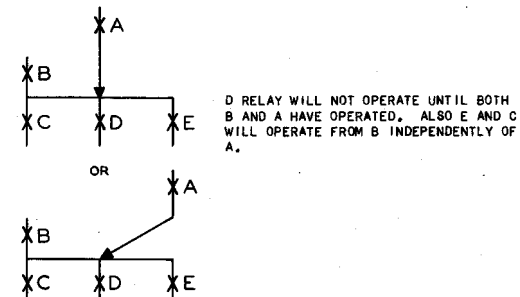


10. ARROWHEADS:

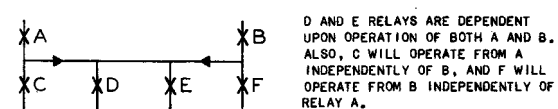
ARROWHEADS ARE USED TO BLOCK AND LIMIT EFFECTS OF RELAY OPERATIONS ON EACH OTHER. THEY MAY BE PLACED AT THREE DIFFERENT POSITIONS ON CONNECTING LINES.



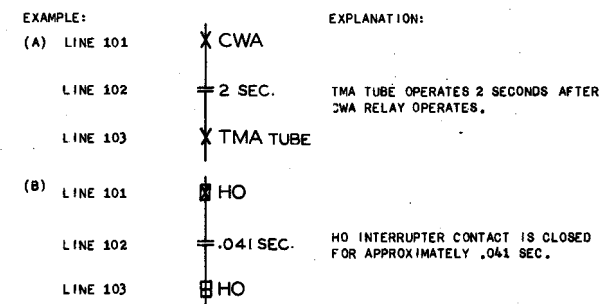
(C)



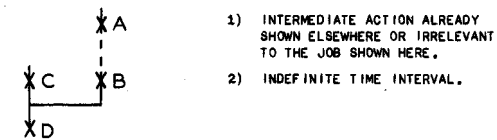
(D) IN SOME CASES TWO ARROWHEADS MAY BE SHOWN AS:



11. THE TIME DELAY INTRODUCED BY A TIMED CIRCUIT IS SHOWN THUS:

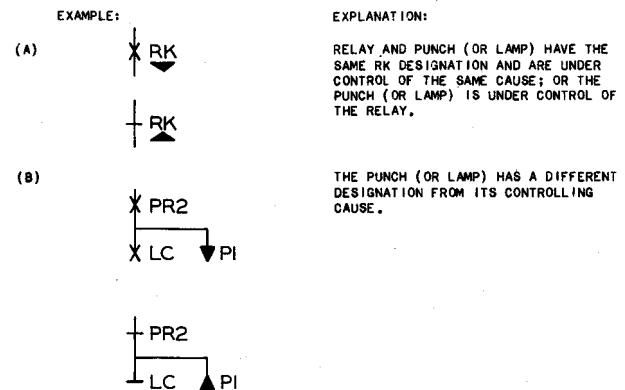


12. A DOTTED VERTICAL LINE MAY DENOTE EITHER OF THE FOLLOWING:



13. PUNCH DESIGNATIONS AND LAMP INDICATIONS ARE SHOWN ON SEQUENCE CHARTS IN THE FOLLOWING MANNER:

- A SOLID INVERTED TRIANGLE (▼) INDICATES THAT A PERFORATION IS MADE OR A LAMP IS LIGHTED IF A TROUBLE RECORD IS TAKEN AT THIS TIME.
- A SOLID UPRIGHT TRIANGLE (▲) INDICATES THAT A PERFORATION IS NOT MADE OR A LAMP IS NOT LIGHTED IF A TROUBLE RECORD IS TAKEN AT THIS TIME.



14. THE CIRCUIT MOST FREQUENTLY USED IN A PARTICULAR SEQUENCE CHART IS IDENTIFIED BY AN ASTERISK OPPOSITE ITS SD NUMBER IN THE LIST OF DRAWINGS ABOVE THE TITLE BLOCK. NO CIRCUIT ABBREVIATIONS ARE SHOWN ON THE SEQUENCE CHART NEXT TO RELAYS ASSOCIATED WITH THIS CIRCUIT. THE CIRCUITS IN WHICH ALL OTHER RELAYS APPEAR ARE SHOWN IN BRACKETS ADJACENT TO THE RELAY DESIGNATIONS ON THE SEQUENCE CHART (SEE EXAMPLE).

TRANSLATOR CKT. 80-25754-01, ISS. 8
*TRANSVERTER CKT. 80-25802-01, ISS. 3

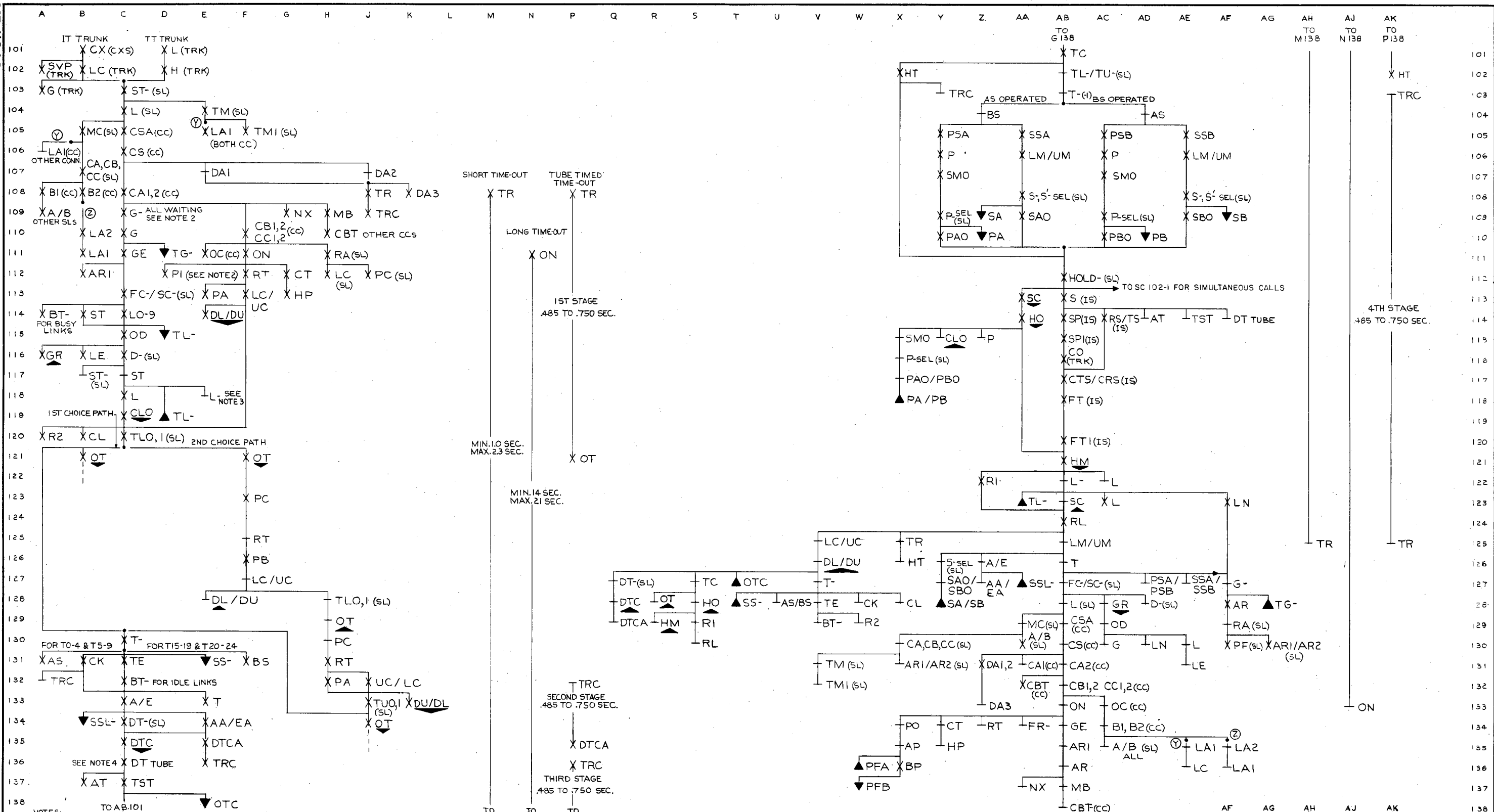
15. THIS LEGEND APPLIES, WITH SOME EXCEPTIONS, TO SEQUENCE CHARTS PROVIDED ON OS'S. SEE OS 000-2, NO. 13A.

MASTER LEGEND FOR SEQUENCE CHARTS

SC 000-2

MP-11640

ISSUE	1	DATE	6-12-51
REVISION			
DATE			

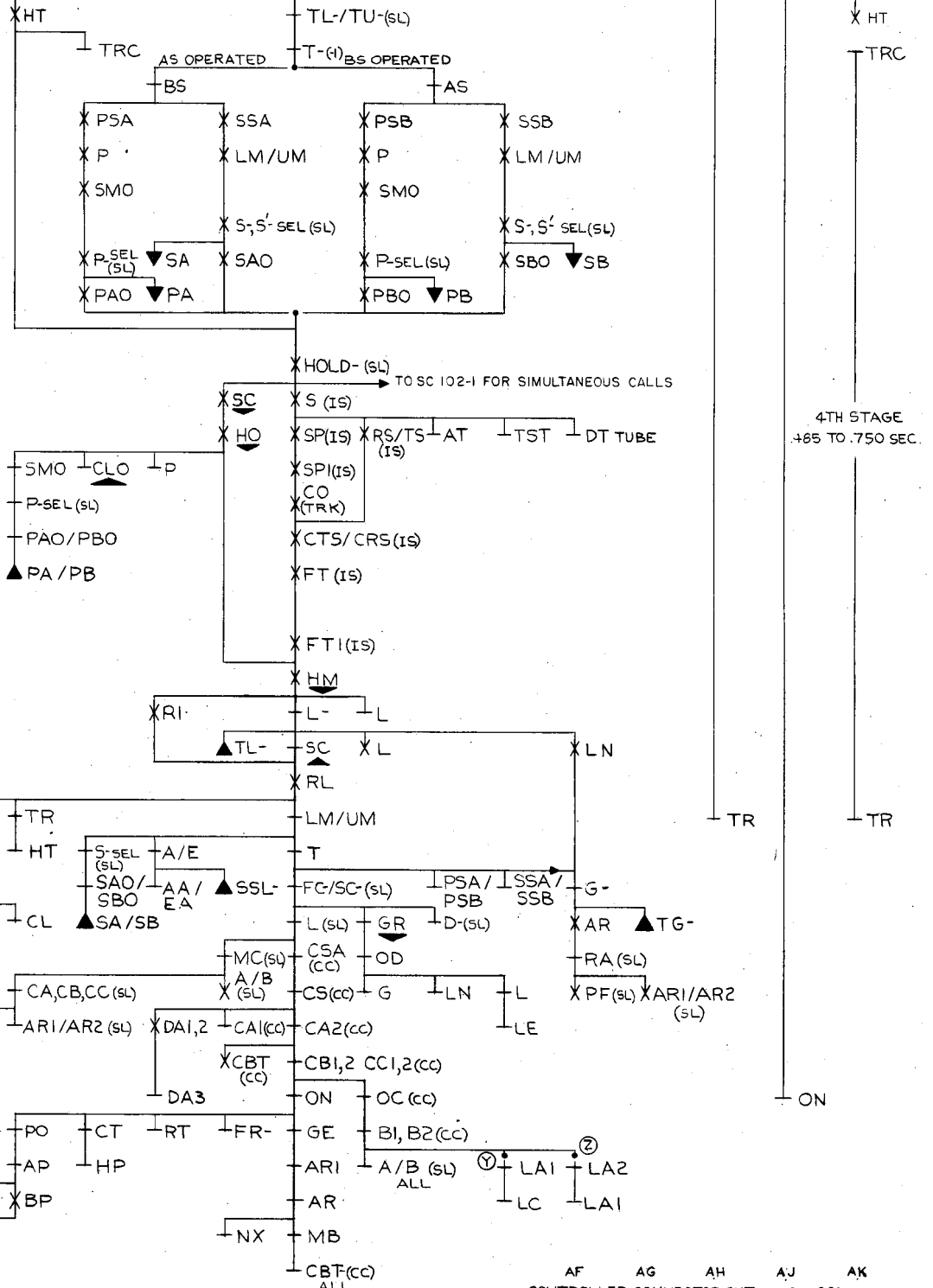
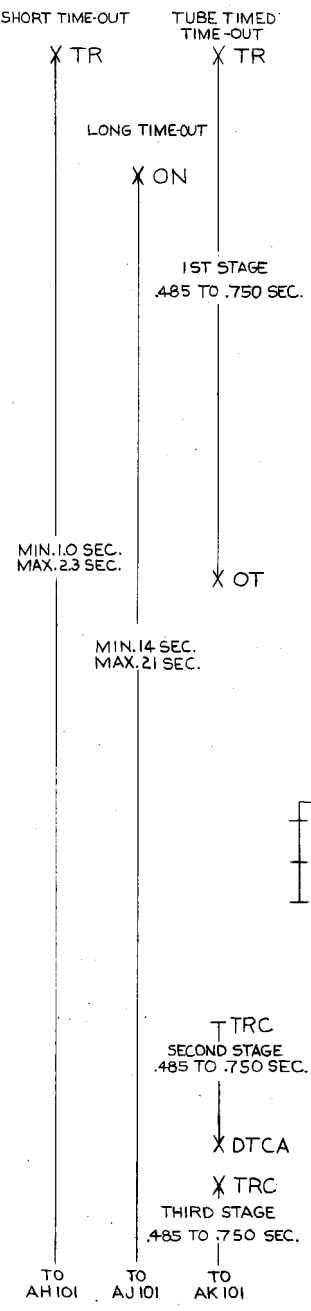


NOTES:

SC OPTION	FEATURE OR OPTION	SD OPTION	SD
Y	IF ACCESS IS REQUIRED TO 12 OR LESS SDR. LINK FR'S.	Y	68336-01
Z	IF ACCESS IS REQUIRED TO 12 OR MORE SDR. LINK FR'S.	Z	68336-01

3. ALL L's EXCEPT THOSE ASSOCIATED WITH TRUNKS HAVING GROUNDED START LEADS.
 4. ASSUMES NO COMPETING CONTROLLERS.

2. ASSUMES PO AND AP OPERATED FROM PREVIOUS CALL.



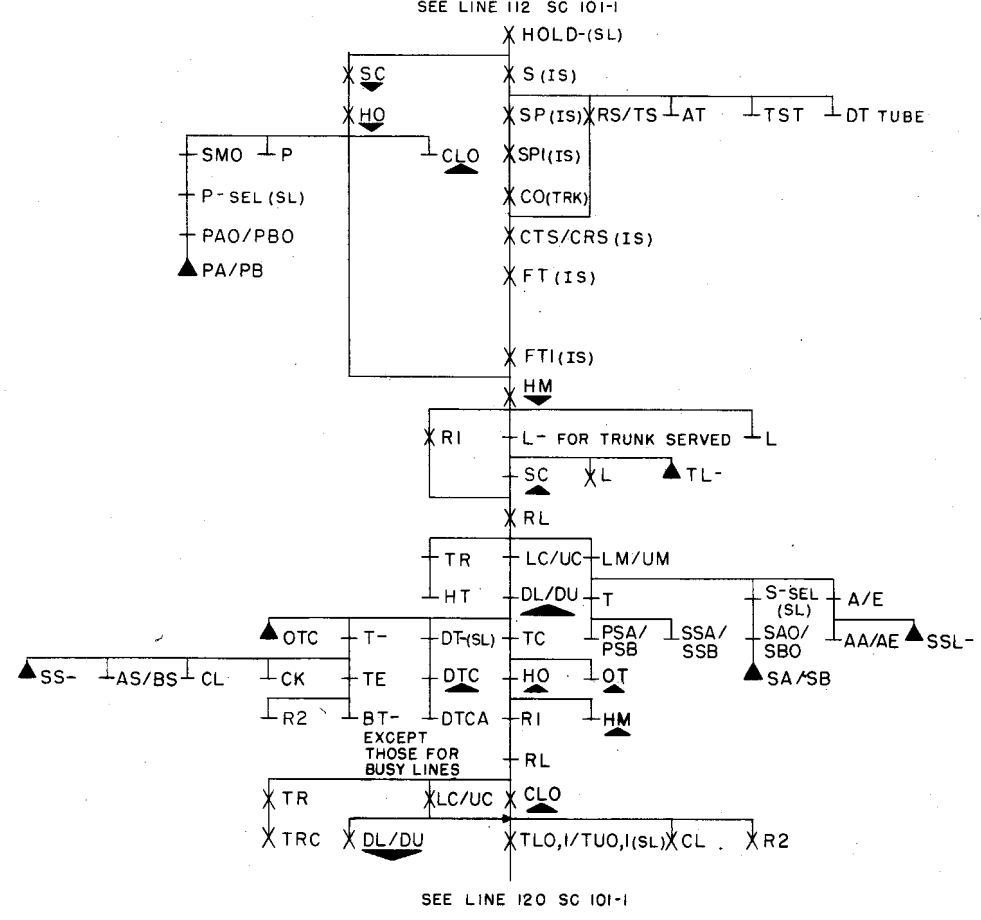
AF	AG	AH	AJ	AK
CONTROLLER CONNECTOR CKT.			SD-68336-01	ISS. 5
CX SIGNALING CKT. TYPE B			SD-9504-0-01	ISS. 12
INCOMING SENDER CKT-DP			SD-68221-01	ISS. 12
* LINK CONTROLLER CKT.			SD-68028-01	ISS. 24
SDR LINK & CONNECTOR CKT.			SD-68334-01	ISS. 11
TOLL TANDEM TRUNK CKT-DP			SD-68315-01	ISS. 5
2-WAY INTERTOLL TRUNK CKT-DP INCOMING			SD-68232-01	ISS. 8

**LINK CONTROLLER
OVER-ALL OPERATIONS**

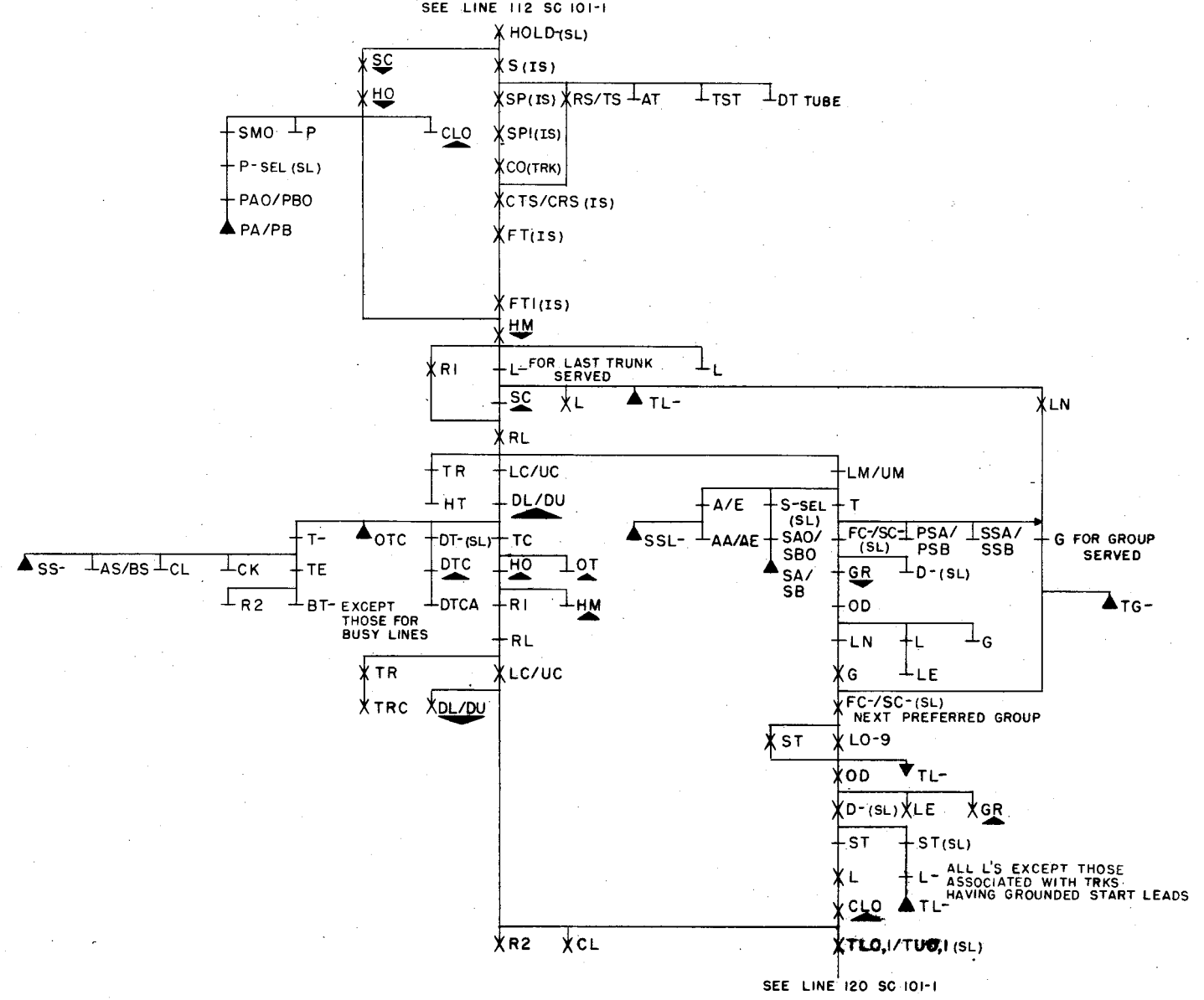
NO. 4A TOLL

SC 101-1

SERVING SIMULTANEOUS CALLS WITHIN ONE TRUNK GROUP

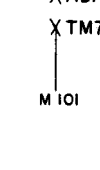
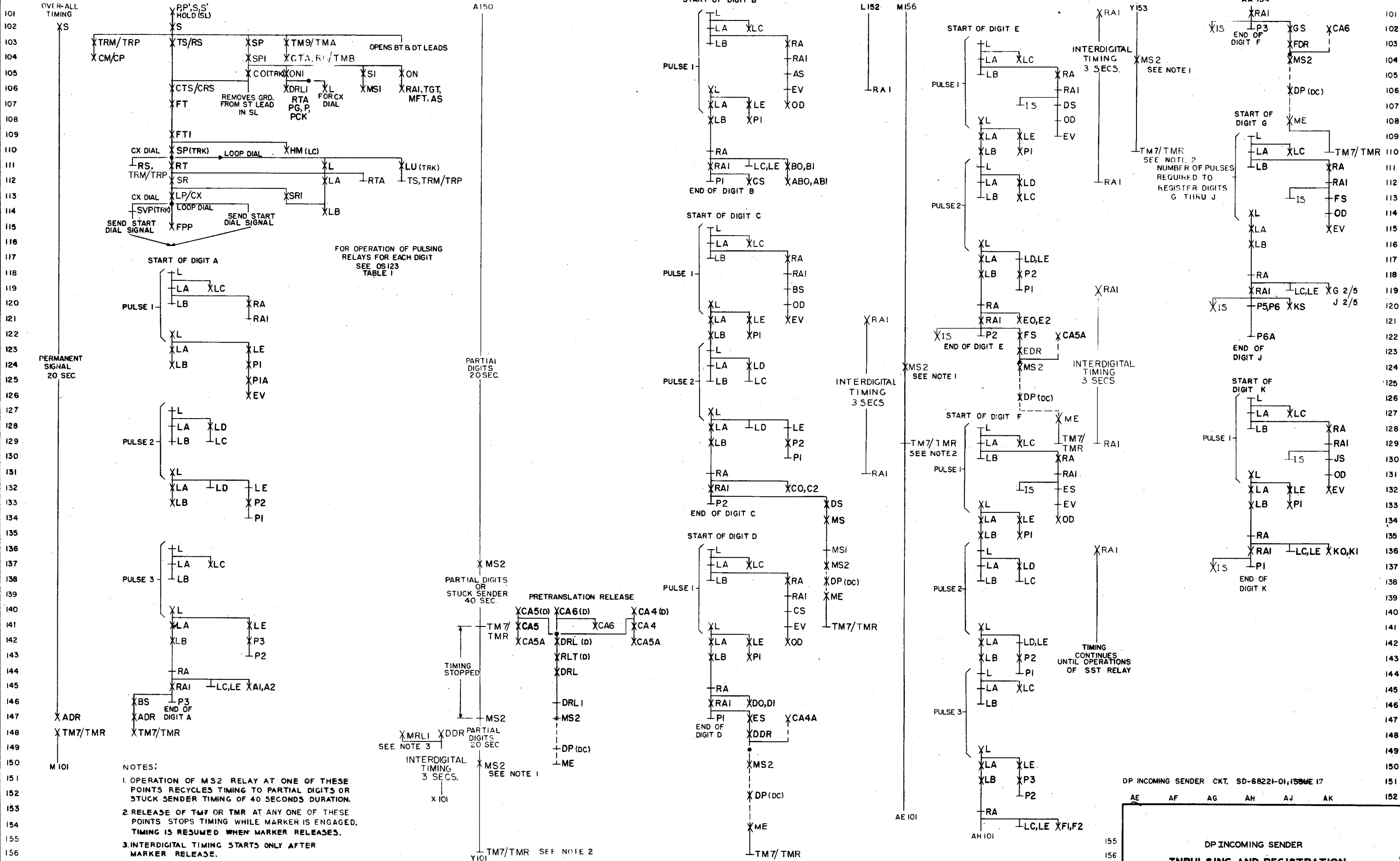


SERVING SIMULTANEOUS CALLS IN MORE THAN ONE TRUNK GROUP



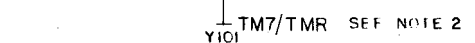
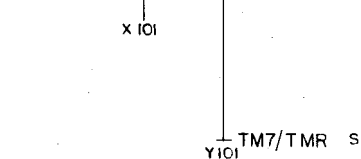
ISSUE	DATE
1	5-23-51

LINK CONTROLLER
SIMULTANEOUS CALLS

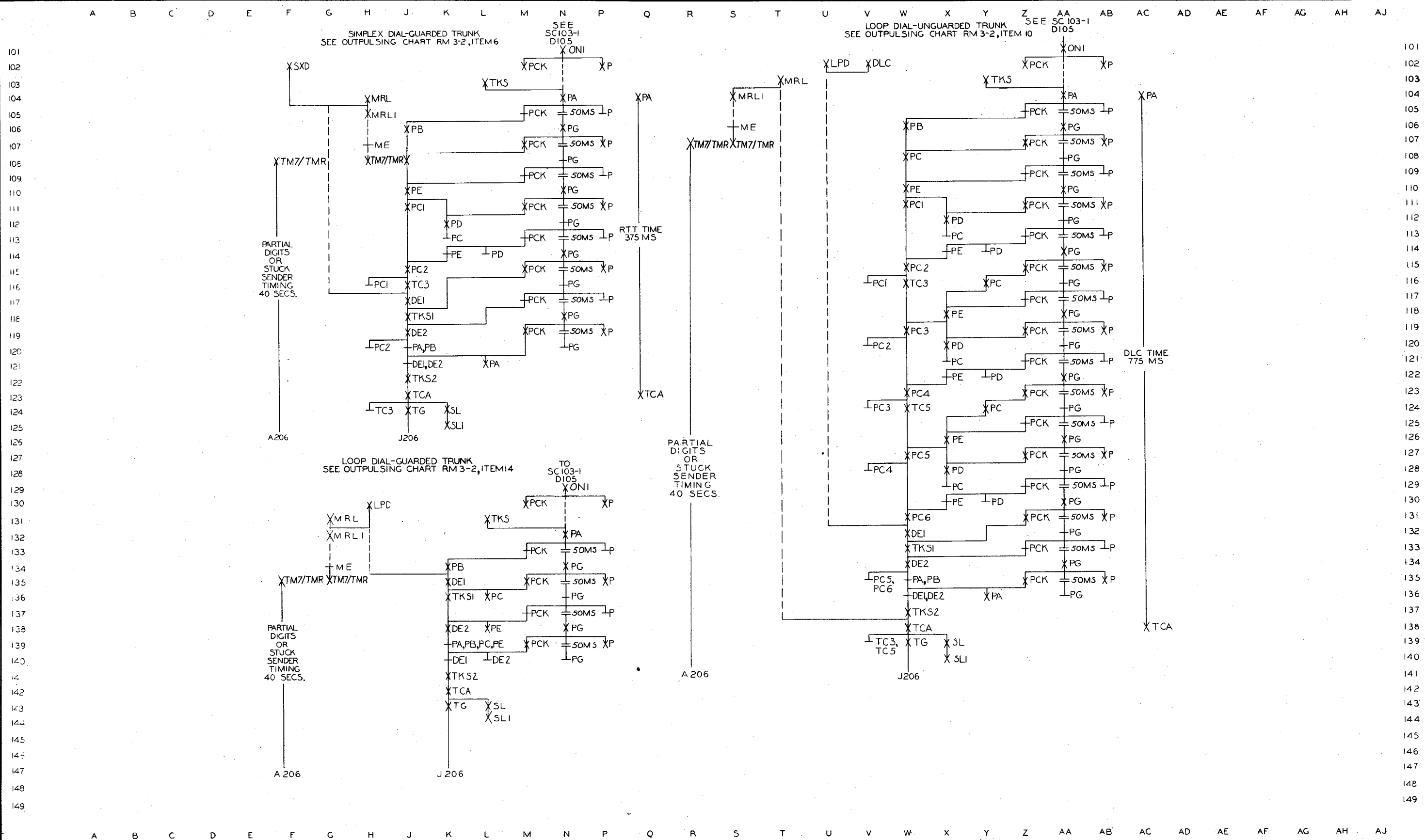


FOR OPERATION OF PULSING RELAYS FOR EACH DIGIT SEE OS123 TABLE I

- NOTES:
- OPERATION OF MS2 RELAY AT ONE OF THESE POINTS RECYCLES TIMING TO PARTIAL DIGITS OR STUCK SENDER TIMING OF 40 SECONDS DURATION.
 - RELEASE OF TM7 OR TMR AT ANY ONE OF THESE POINTS STOPS TIMING WHILE MARKER IS ENGAGED. TIMING IS RESUMED WHEN MARKER RELEASES.
 - INTERDIGITAL TIMING STARTS ONLY AFTER MARKER RELEASE.



ISSUE	1	2	3
DATE	8-15-51	8-10-53	



1	2	3	4
1	2	3	4
DATE	8-11-53		

2 SHEETS, SHEET 1

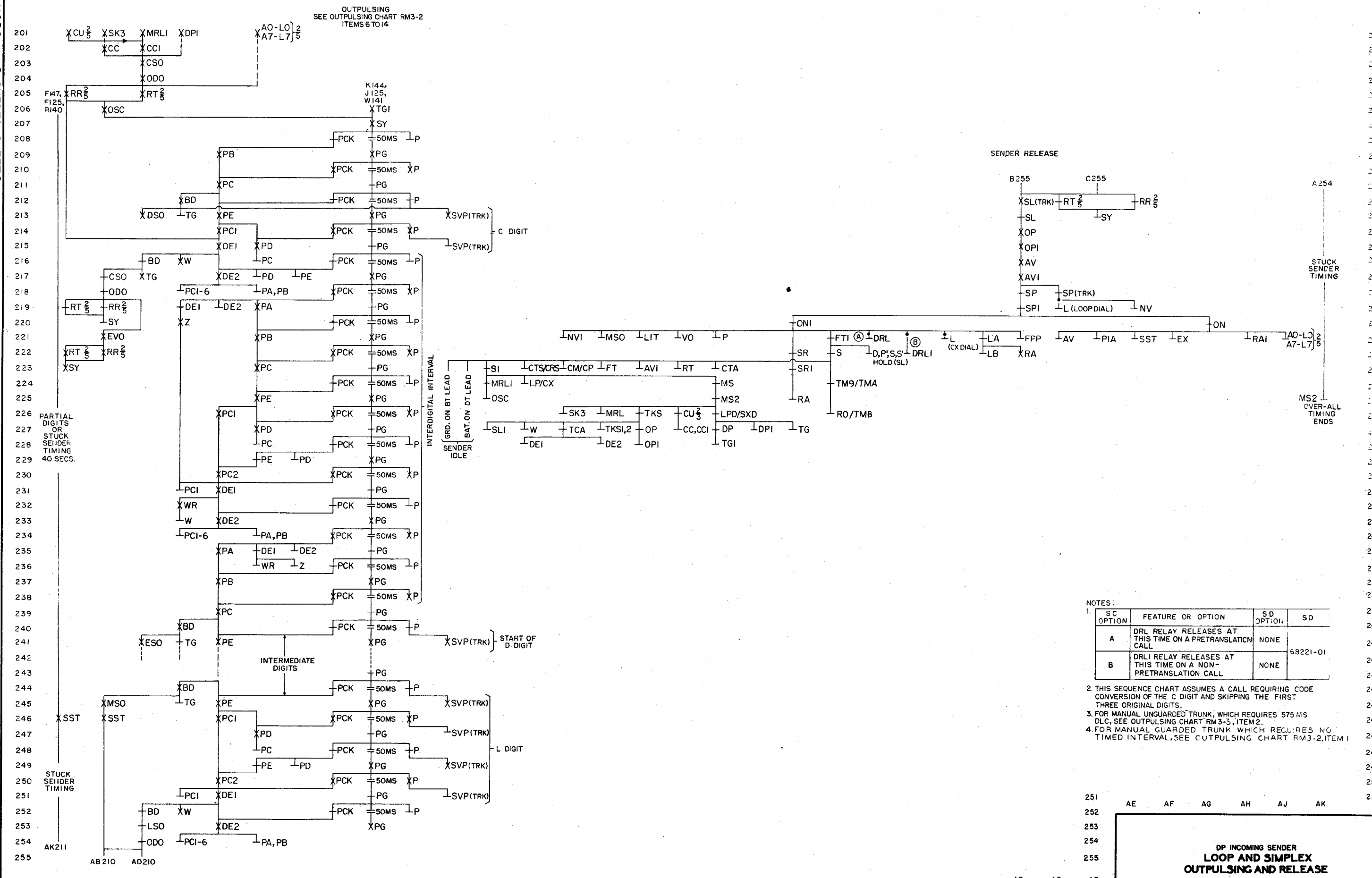
MP-11680

DP INCOMING SENDER
LOOP AND SIMPLEX
OUTPULSING AND RELEASE

SC104-1 2 SHEETS, SHEET 1

NO. 4A TOLL

BELL TELEPHONE LABORATORIES, INC.
PRINTED IN U. S. A.



OUTPUTTING
SEE OUTPUTTING CHART RM3-2
ITEMS 6 TO 14

SENDER RELEASE

NOTES:

SC OPTION	FEATURE OR OPTION	SD OPTION	SD
A	DRL RELAY RELEASES AT THIS TIME ON A PRETRANSLATION CALL	NONE	
B	DRLI RELAY RELEASES AT THIS TIME ON A NON-PRETRANSLATION CALL	NONE	68221-01

- THIS SEQUENCE CHART ASSUMES A CALL REQUIRING CODE CONVERSION OF THE C DIGIT AND SKIPPING THE FIRST THREE ORIGINAL DIGITS.
- FOR MANUAL UNGUARDED TRUNK, WHICH REQUIRES 575 MS DLC, SEE OUTPUTTING CHART RM3-3, ITEM 2.
- FOR MANUAL GUARDED TRUNK WHICH REQUIRES NO TIMED INTERVAL, SEE OUTPUTTING CHART RM3-2, ITEM 1.

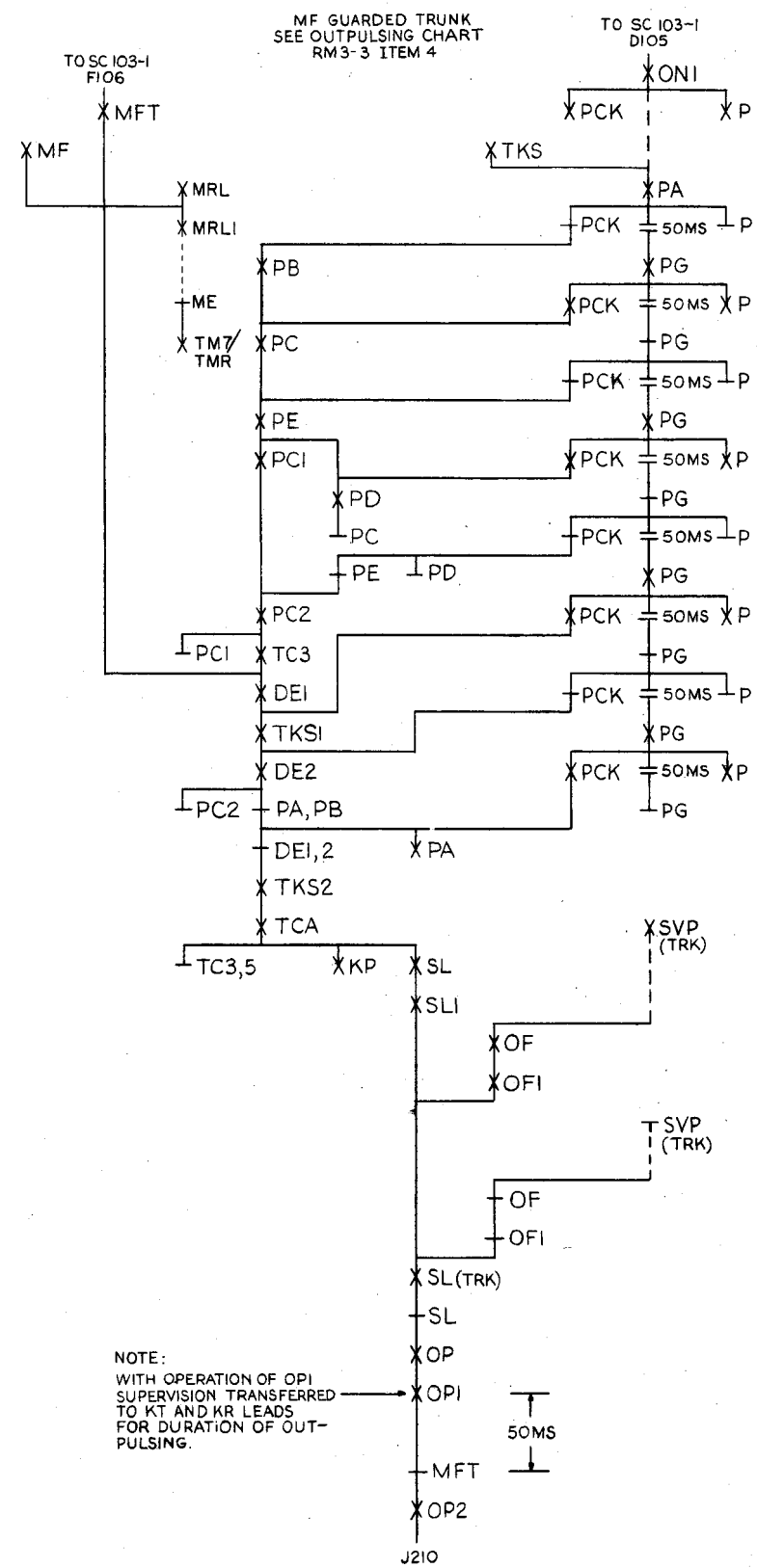
ISSUE	1	1.3.54	2	1.3.54
DATE	8-13-57	8-17-59		

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MF GUARDED TRUNK
SEE OUTPULSING CHART
RM3-3 ITEM 4

MF GUARDED TRUNK
SEE OUTPULSING CHART
RM3-3 ITEM 5



XPA

XTCA

PARTIAL DIGITS OR STUCK SENDER TIMING 40 SECS

A201

XDLC XMF

XTCA

TC3,5

50MS

J210

XPA

DLC TIME 575 MS

XTCA

XSVP (TRK)

50MS

DISTANT OFFICE STOP PULSING SIGNAL

DISTANT OFFICE START PULSING SIGNAL

SUPERVISION VIA KT AND KR LEADS

NOTE: WITH OPERATION OF OPI SUPERVISION TRANSFERRED TO KT AND KR LEADS FOR DURATION OF OUTPULSING.

DP INCOMING SENDER
MF OUTPULSING
AND
RELEASE

SC 105-1 2 SHEETS, SHEET 1

NO. 4A TOLL

BELL TELEPHONE LABORATORIES, INC.

ORDER AS BSP ITEM MP-11731

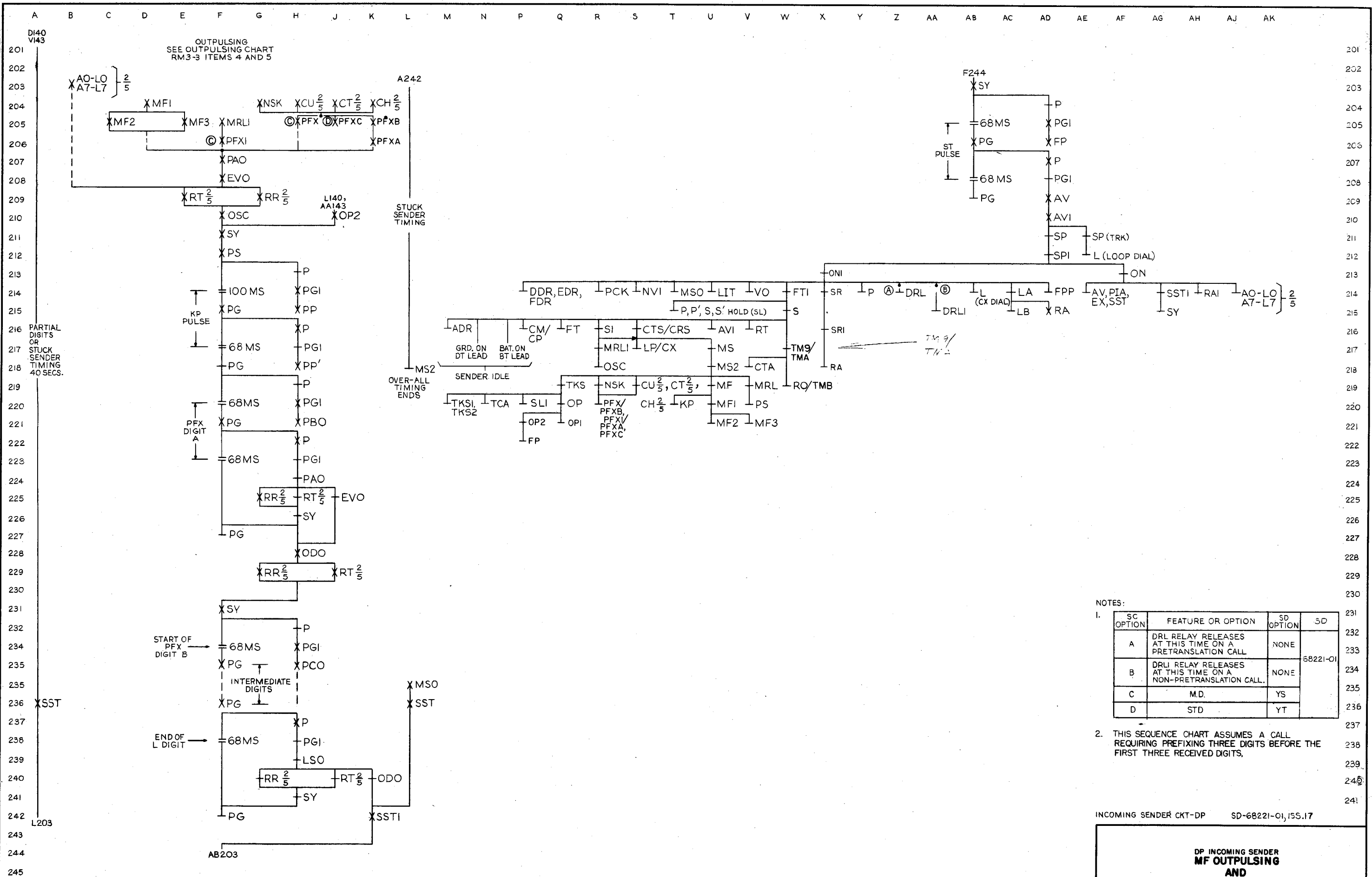
PRINTED IN U.S.A.

ISSUE	1	11-28-51	8-14-53
DATE			

2 SHEETS, SHEET 1

MP-11731

ISSUE	DATE
1	11-28-51
2	8-7-53



NOTES:

SC OPTION	FEATURE OR OPTION	SD OPTION	SD
A	DRL RELAY RELEASES AT THIS TIME ON A PRETRANSLATION CALL	NONE	68221-01
B	DRL RELAY RELEASES AT THIS TIME ON A NON-PRETRANSLATION CALL	NONE	
C	M.D.	YS	
D	STD	YT	

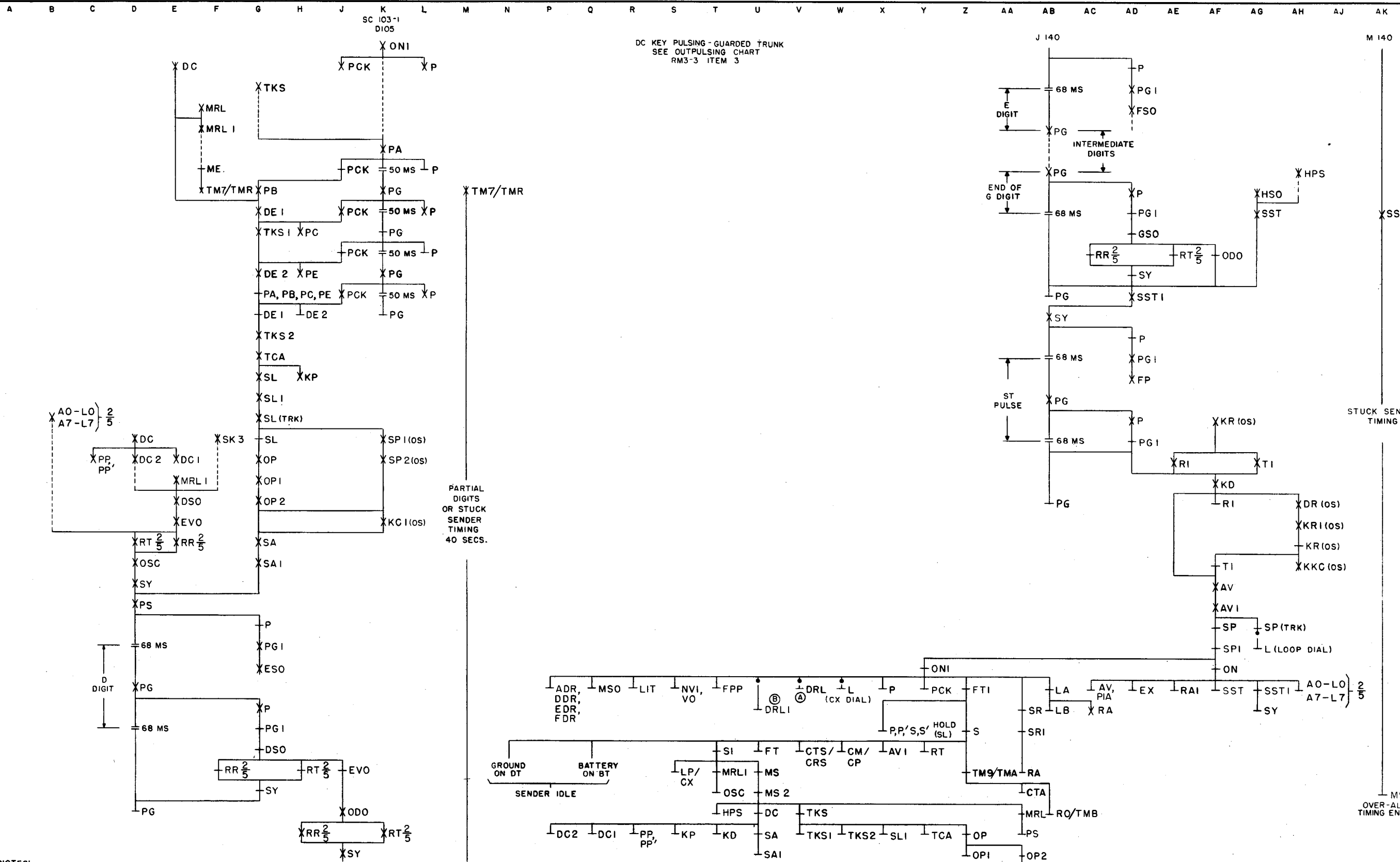
2. THIS SEQUENCE CHART ASSUMES A CALL REQUIRING PREFIXING THREE DIGITS BEFORE THE FIRST THREE RECEIVED DIGITS.

INCOMING SENDER CKT-DP SD-68221-01,ISS.17

**DP INCOMING SENDER
MF OUTPUTTING
AND
RELEASE**

MP-11732

ISSUE	1	2	3	4	5
DATE	11/28/51	6/10/53			



NOTES:

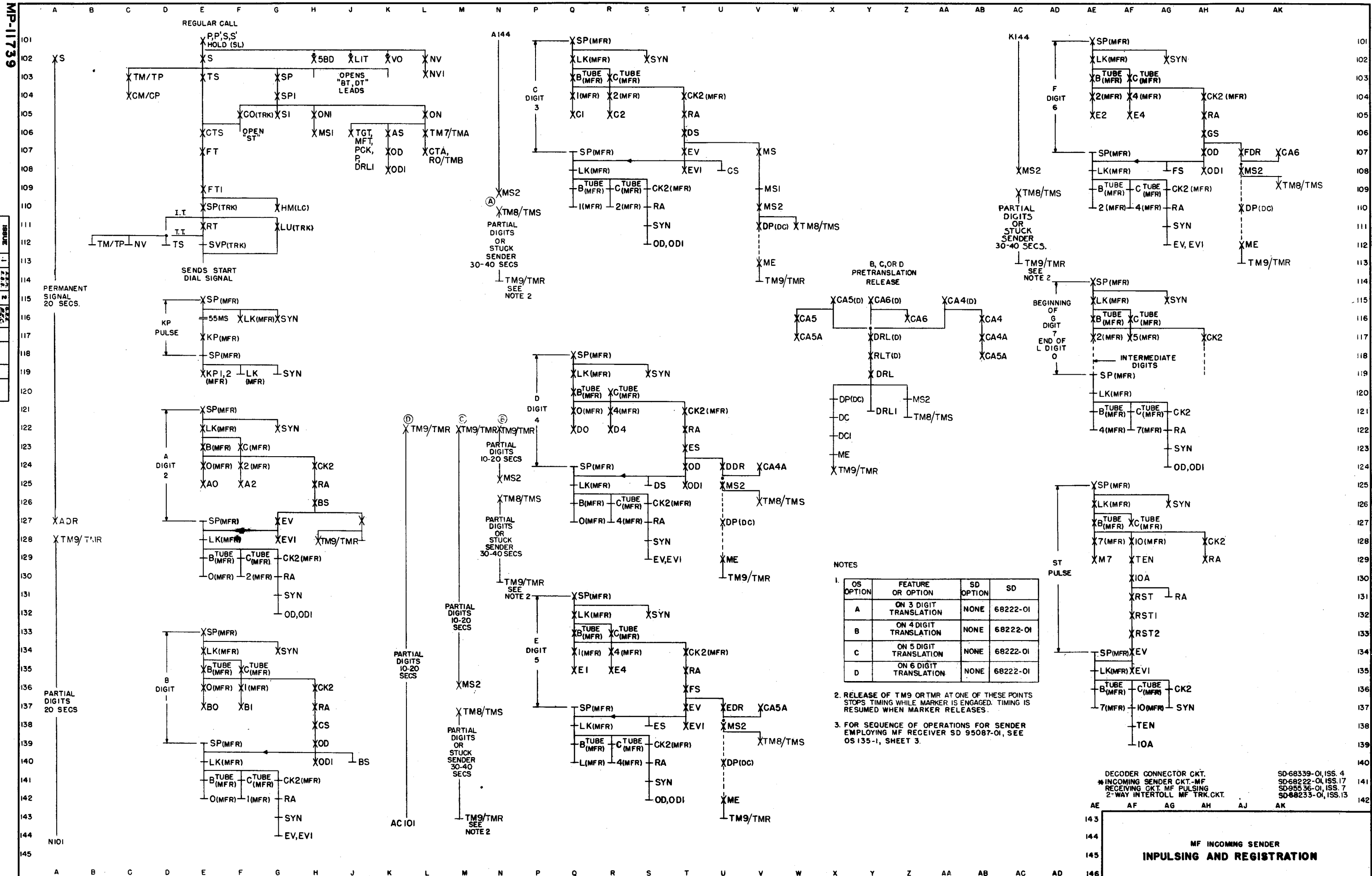
SC OPTION	FEATURE OR OPTION	SD OPTION	SD
A	DRL RELAY RELEASES AT THIS TIME ON A PRETRANSLATION CALL	NONE	68221-01
B	DRLI RELAY RELEASES AT THIS TIME ON A NON-PRETRANSLATION CALL	NONE	68221-01

INCOMING SENDER CKT. DP SD-68221-01, ISS. 17
 OUTGOING SENDER CKT. SD-68018-01, ISS. 25

DP INCOMING SENDER
DC OUTPULSING
AND
RELEASE

NO 4A TOLL

SC 106-1



ISSUE	1	2	3	4	5	6	7	8	9	10
DATE	12/14/47	1/16/48	2/10/48	3/10/48	4/10/48	5/10/48	6/10/48	7/10/48	8/10/48	9/10/48

NOTES

- | OS OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|------------------------|-----------|----------|
| A | ON 3 DIGIT TRANSLATION | NONE | 68222-01 |
| B | ON 4 DIGIT TRANSLATION | NONE | 68222-01 |
| C | ON 5 DIGIT TRANSLATION | NONE | 68222-01 |
| D | ON 6 DIGIT TRANSLATION | NONE | 68222-01 |
- RELEASE OF TM9 OR TMR AT ONE OF THESE POINTS STOPS TIMING WHILE MARKER IS ENGAGED. TIMING IS RESUMED WHEN MARKER RELEASES.
- FOR SEQUENCE OF OPERATIONS FOR SENDER EMPLOYING MF RECEIVER SD 95087-01, SEE OS 135-1, SHEET 3.

DECODER CONNECTOR CKT. SD-68339-01, ISS. 4
 *INCOMING SENDER CKT.-MF SD-68222-01, ISS. 17
 RECEIVING CKT. MF PULSING SD-95536-01, ISS. 7
 2-WAY INTERTOLL MF TRK. CKT. SD-68233-01, ISS. 13

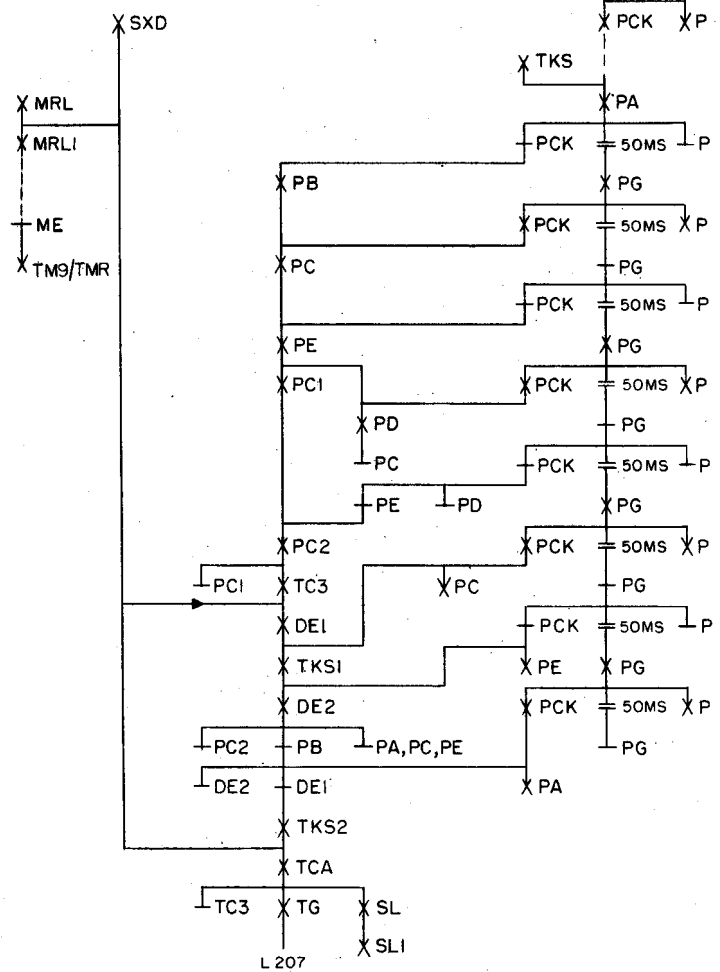
**MF INCOMING SENDER
 IMPULSING AND REGISTRATION**

NO. 4 A TOLL

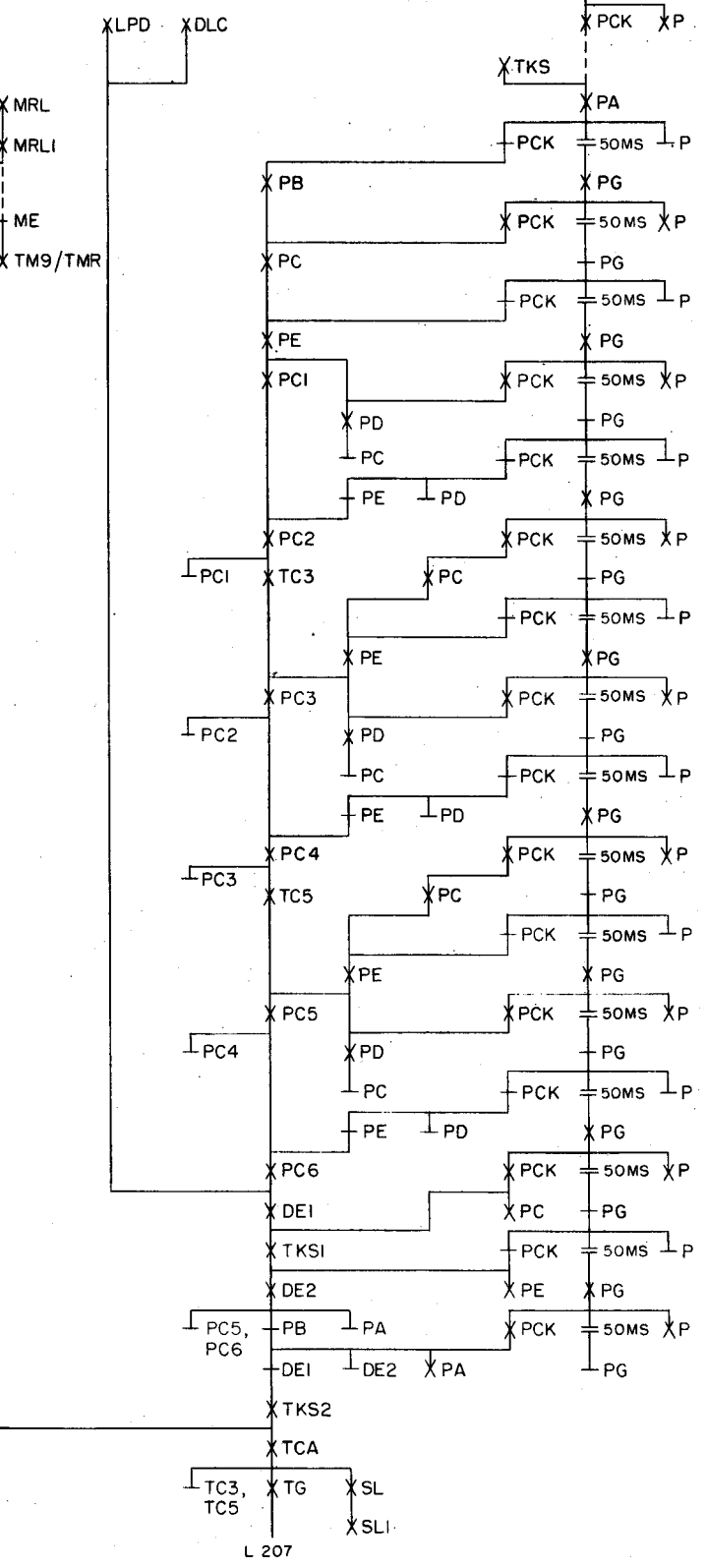
SC 107-1

- NOTES:
- | SC OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|--|-----------|----------|
| A | DRL RELAY RELEASE AT THIS TIME ON A PRETRANSLATION CALL | NONE | 68222-01 |
| B | DRLI RELAY RELEASE AT THIS TIME ON A NON-PRETRANSLATION CALL | NONE | 68222-01 |
2. FOR MANUAL UNGUARDED TRUNK WHICH REQUIRES 575 MS DLC, SEE OUTPULSING CHART RM 3-3, ITEM 2.
3. FOR MANUAL GUARDED TRUNK WHICH REQUIRES NO TIMED INTERVAL, SEE OUTPULSING CHART RM 3-3, ITEM 1.

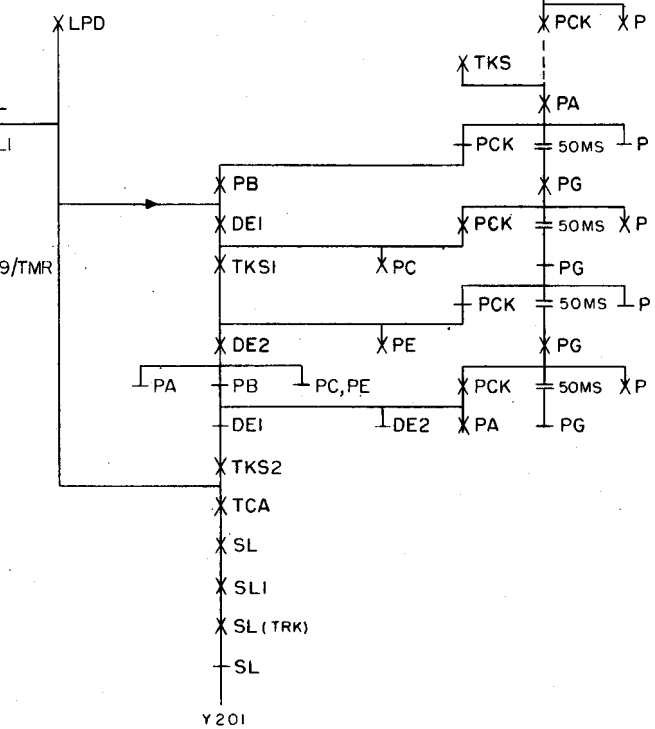
SIMPLEX DIAL-GUARDED TRUNK
SEE OUTPULSING CHART-RM 3-3 ITEM 6



LOOP DIAL-UNGUARDED TRUNK
SEE OUTPULSING CHART-RM 3-3 ITEM 10



LOOP DIAL-GUARDED TRUNK
SEE OUTPULSING CHART-RM 3-3 ITEM 14



INCOMING SENDER CKT-MF SD-68222-01, ISS. 17

MF INCOMING SENDER LOOP AND SIMPLEX OUTPULSING OR RELEASE

SC 108-1

2 SHEETS, SHEET 1

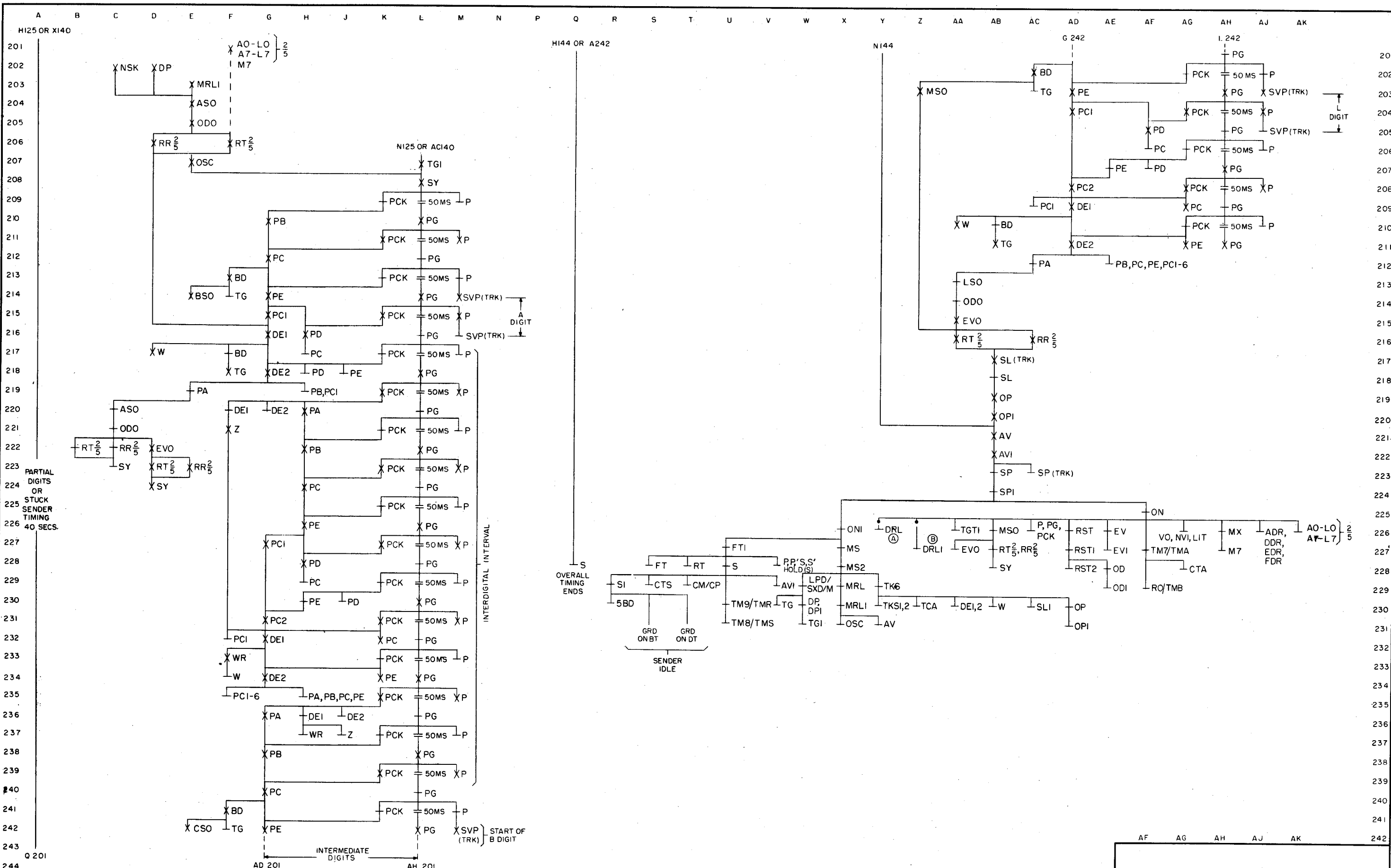
NO. 4A TOLL

ISSUE	1	2	3
DATE	11-19-57	8-13-58	

2 SHEETS, SHEET 1

MP-11733

ISSUE	1	2	3	4
DATE	11-19-51	1-17-52	8-13-53	



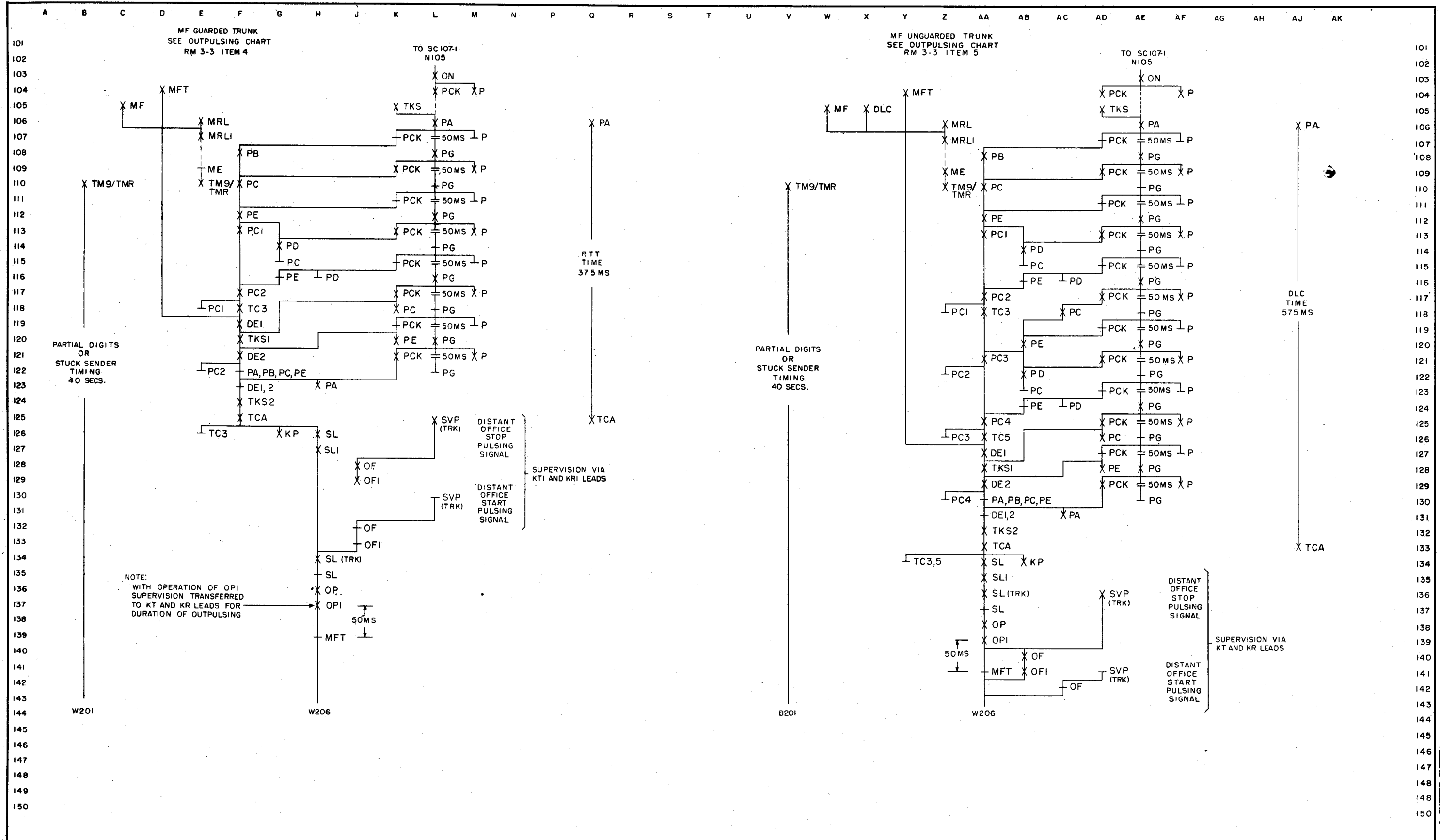
AF AG AH AJ AK

**MF INCOMING SENDER
LOOP AND SIMPLEX
OUTPULSING OR RELEASE**

NO. 4A TOLL

2 SHEETS, SHEET 2

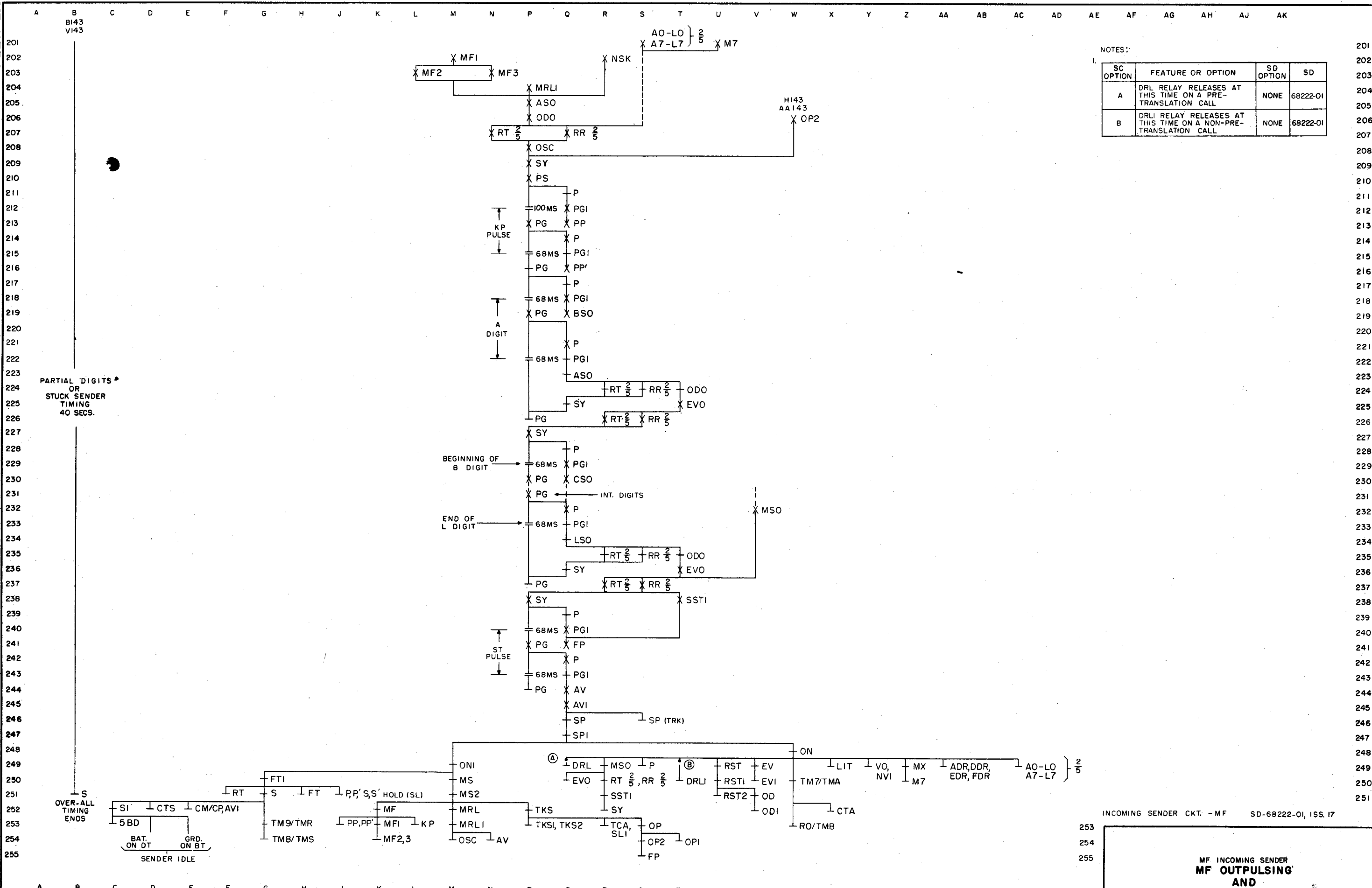
SC 108-1



ISSUE	1	2	3	4
DATE	11-23-51	7-29-53		

2 SHEETS, SHEET 1
MP-11734

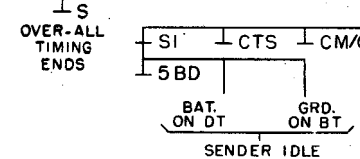
ISSUE	DATE
1	11-28-51
2	7-29-53



NOTES:

SC OPTION	FEATURE OR OPTION	SD OPTION	SD
A	DRL RELAY RELEASES AT THIS TIME ON A PRE-TRANSLATION CALL	NONE	68222-01
B	DRLI RELAY RELEASES AT THIS TIME ON A NON-PRE-TRANSLATION CALL	NONE	68222-01

PARTIAL DIGITS OR STUCK SENDER TIMING 40 SECS.



INCOMING SENDER CKT. - MF SD-68222-01, ISS. 17

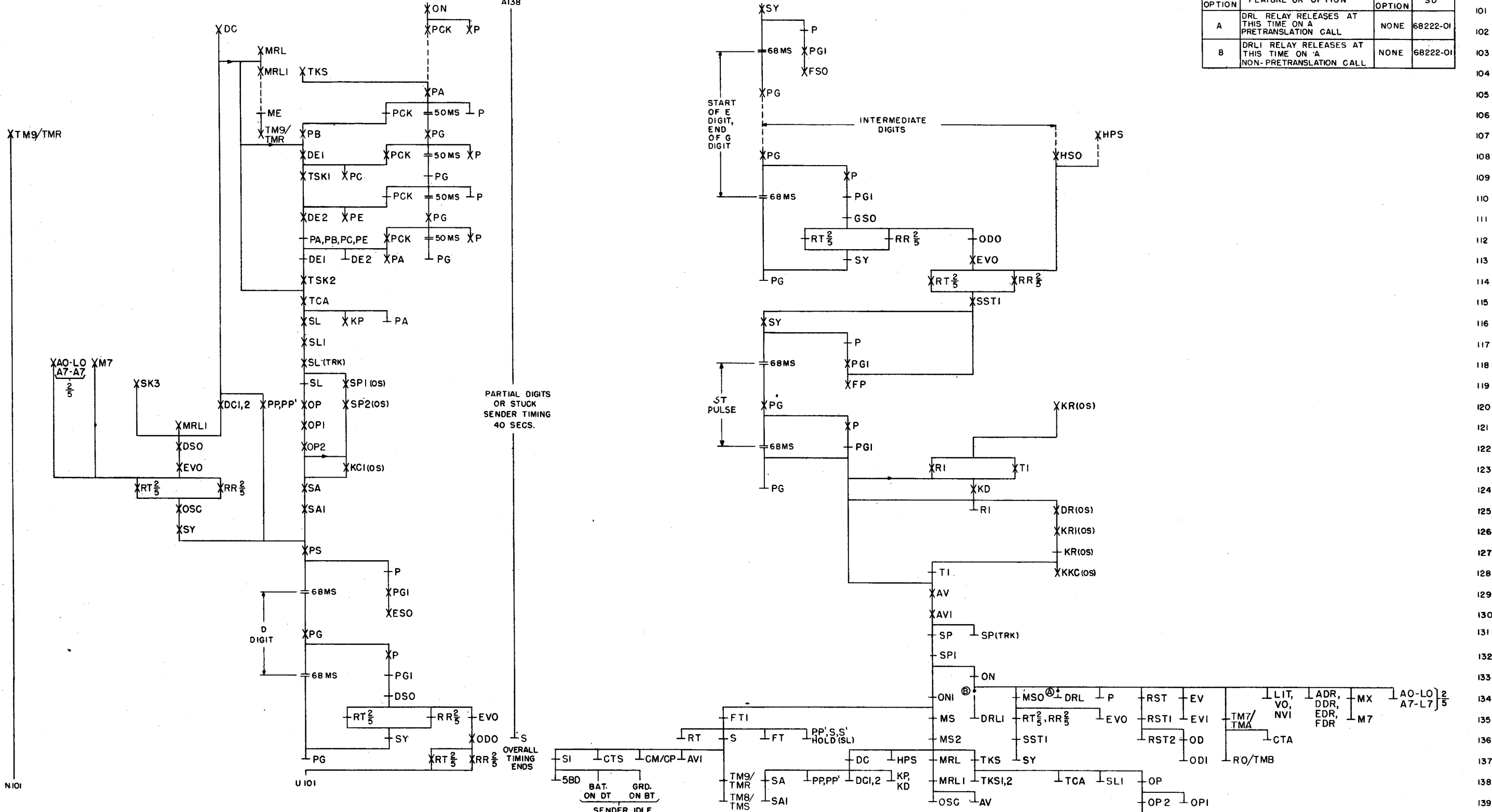
DC KEY PULSING - GUARDED TRUNK
(SEE OUTPULSING CHART RM3-3 ITEM 3)

TO SC107-1, N105

A138

NOTES:

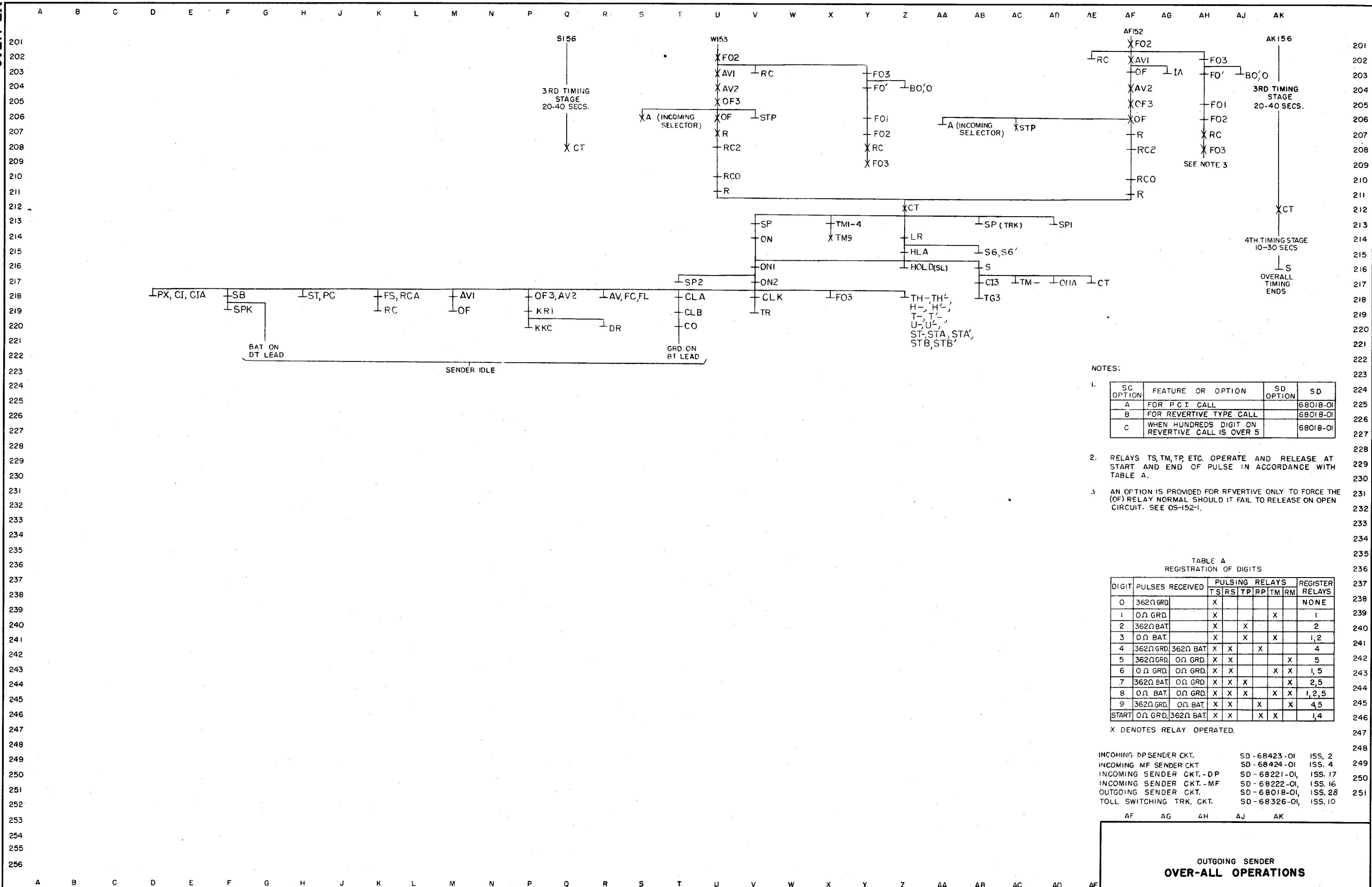
SC OPTION	FEATURE OR OPTION	SD OPTION	SD
A	DRL RELAY RELEASES AT THIS TIME ON A PRETRANSLATION CALL	NONE	68222-01
B	DRLI RELAY RELEASES AT THIS TIME ON A NON-PRETRANSLATION CALL	NONE	68222-01



*MF INCOMING SENDER CKT. OUTGOING SENDER CKT. SD-68222-01, ISS.17 SD-68018-01, ISS.25

ISSUE	DATE
1	11-26-51
2	8-7-53

ISSUE	1	2	3
DATE	11-28-51	12-16-53	



- RELAYS TS, TM, TP, ETC. OPERATE AND RELEASE AT START AND END OF PULSE IN ACCORDANCE WITH TABLE A.
- AN OPTION IS PROVIDED FOR REVERTIVE ONLY TO FORCE THE (OF) RELAY NORMAL SHOULD IT FAIL TO RELEASE ON OPEN CIRCUIT. SEE 05-152-1.

TABLE A
REGISTRATION OF DIGITS

DIGIT	PULSES RECEIVED	PULSING RELAYS						REGISTER RELAYS
		TS	RS	TP	RP	TM	RM	
0	362Ω GRD	X						NONE
1	0Ω GRD	X				X		1
2	362Ω BAT	X	X					2
3	0Ω BAT	X	X	X		X		1,2
4	362Ω GRD, 362Ω BAT	X	X		X			4
5	362Ω GRD, 0Ω GRD	X	X			X		5
6	0Ω GRD, 0Ω GRD	X	X			X	X	1,5
7	362Ω BAT, 0Ω GRD	X	X	X			X	2,5
8	0Ω BAT, 0Ω GRD	X	X	X		X	X	1,2,5
9	362Ω GRD, 0Ω BAT	X	X		X		X	4,5
START	0Ω GRD, 362Ω BAT	X	X		X	X		1,4

X DENOTES RELAY OPERATED.

INCOMING DP SENDER CKT. SD - 68423-01 ISS. 2
 INCOMING MF SENDER CKT. SD - 68424-01 ISS. 4
 INCOMING SENDER CKT. - DP SD - 68221-01, ISS. 17
 INCOMING SENDER CKT. - MF SD - 68222-01, ISS. 16
 OUTGOING SENDER CKT. SD - 68018-01, ISS. 28
 TOLL SWITCHING TRK. CKT. SD - 68326-01, ISS. 10

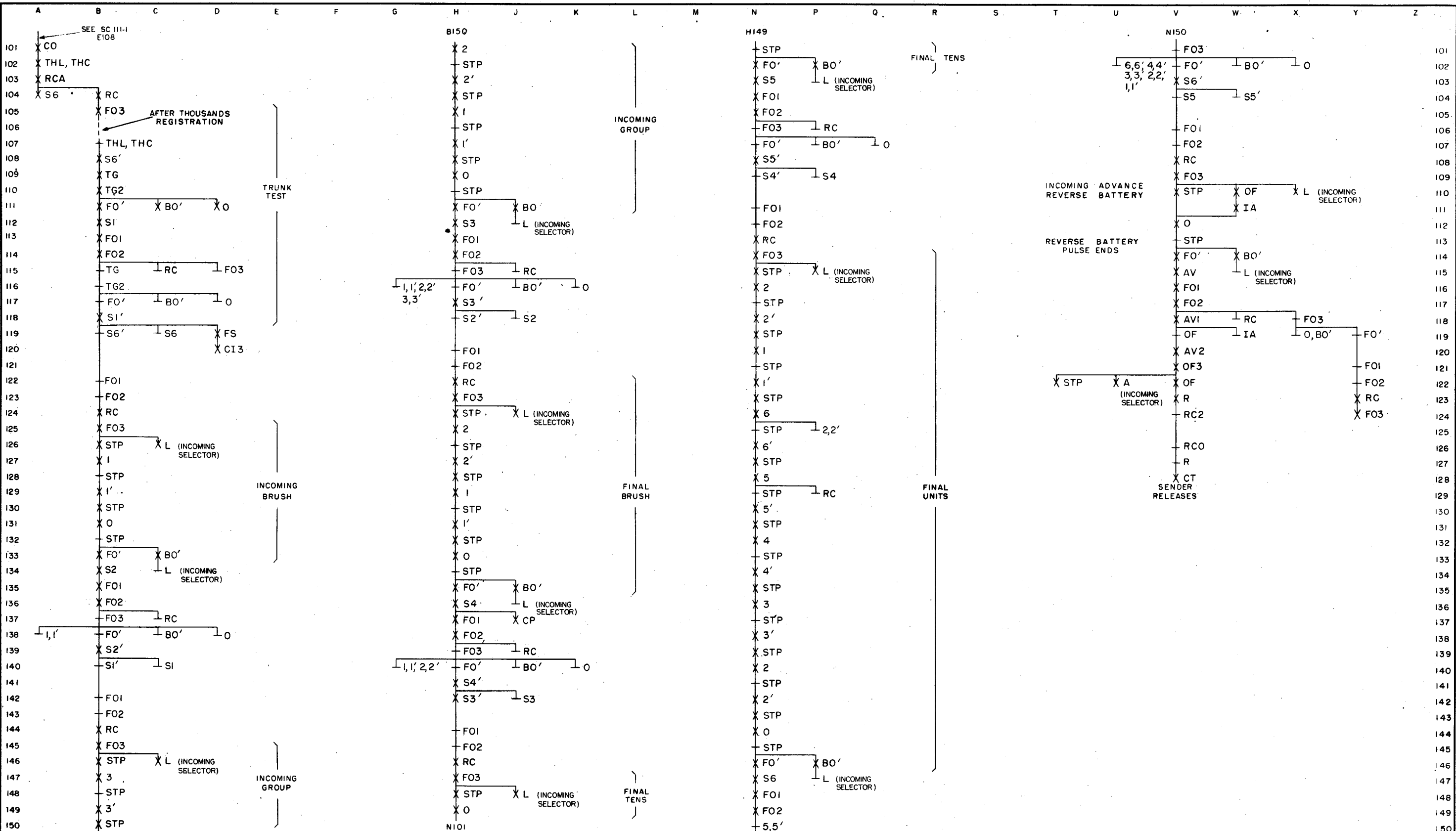
AF AG AH AJ AK

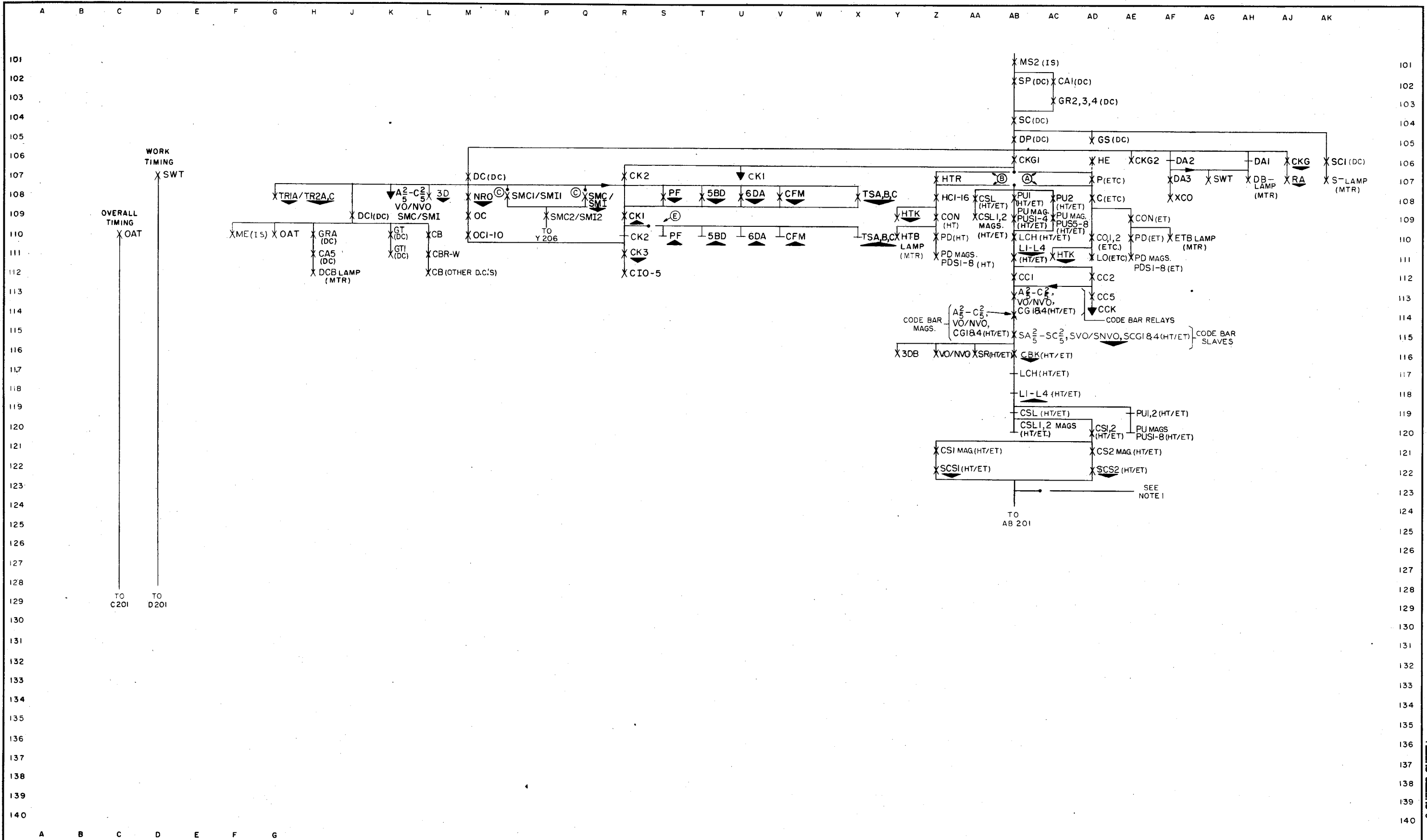
**OUTGOING SENDER
OVER-ALL OPERATIONS**

NO. 4A OR 4M TOLL

SC III-1

ISSUE	1	2	3	4
DATE	1/1-2-53	1/2-3-53	1/4-5-53	1/6-7-53





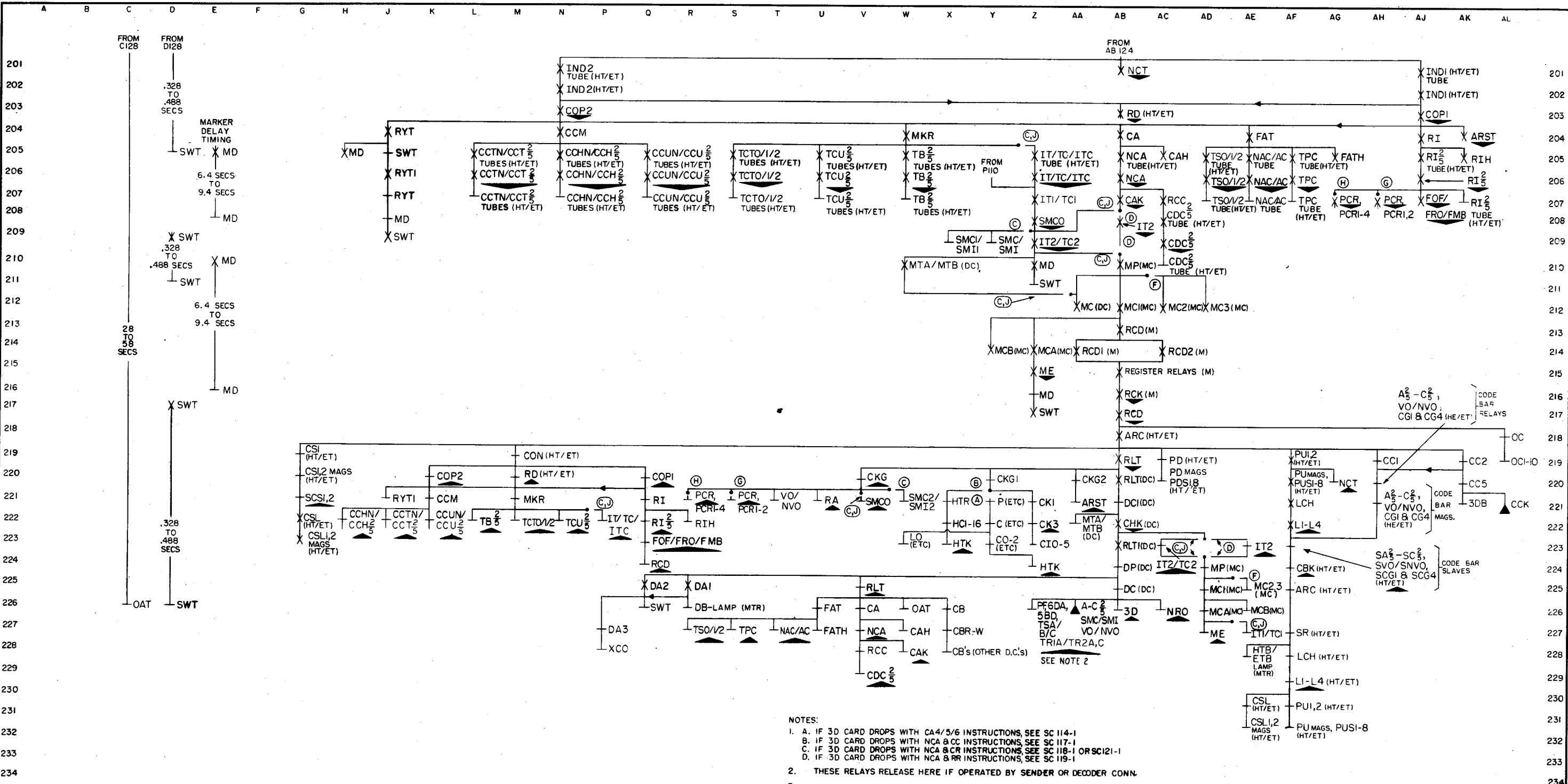
DECODER
OVERALL OPERATIONS FOR A CALL COMPLETED BY 3-DIGIT TRANSLATION
SC 113-1
 2 SHEETS, SHEET 1

H J K
 NO. 4A OR 4M TOLL

ISSUE	1	2	3	4
DATE	9-25-51	10-29-51		

2 SHEETS, SHEET 1
MP-11686

ISSUE	DATE
1	9-25-51
2	10-29-53



- NOTES:
- IF 3D CARD DROPS WITH CA4/5/6 INSTRUCTIONS, SEE SC 114-1
 - IF 3D CARD DROPS WITH NCA & CC INSTRUCTIONS, SEE SC 117-1
 - IF 3D CARD DROPS WITH NCA & CR INSTRUCTIONS, SEE SC 118-1 OR SC121-1
 - IF 3D CARD DROPS WITH NCA & RR INSTRUCTIONS, SEE SC 119-1
 - THESE RELAYS RELEASE HERE IF OPERATED BY SENDER OR DECODER CONN.
 - | SC OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|---|-----------|----------|
| A | PLUG IN THE JACK AT TROUBLE RECORDER FRAME ALLOWS SEIZURE OF THE EMERGENCY TRANSLATOR | NONE | |
| B | DECODER NOT PLUGGED BUSY AND THE EMERGENCY TRANSLATOR HAS NOT BEEN SUBSTITUTED | NONE | |
| C | SEPARATE TRAIN OFFICE | FIG. A | |
| D | COMBINED TRAIN OFFICE | FIG. B | 68340-01 |
| E | THESE RELAYS RELEASE UNLESS GROUNDED BY THE SENDER OR DECODER CONNECTOR | NONE | |
| F | FOR OFFICES HAVING MORE THAN 6 TRUNK BLOCK CONNECTORS | X & Y | 68395-01 |
| G | F. T. BOXES 1-8 PAIRED | FIG. C | |
| H | F. T. BOXES 1-16 PAIRED | FIG. D | 68340-01 |
| J | SEPARATE TRAIN COMBINED OPERATION OFFICE | FIG. E | 68340-01 |

- INCOMING SENDER M.F. 4M SD-68424-01, ISS. 4
- INCOMING SENDER D.P. 4M SD-68423-01, ISS. 2
- CARD TRANSLATOR CKT. SD-68342-01, ISS. 6
- * DECODER CKT. SD-68340-01, ISS. 8
- DECODER CONNECTOR CKT. SD-68339-01, ISS. 4
- INCOMING SENDER CKT. D.P. 4A SD-68221-01, ISS. 14
- INCOMING SENDER CKT. M.F. 4A SD-68222-01, ISS. 16
- MARKER CKT. SD-68368-01, ISS. 7
- MARKER CONNECTOR CKT. SD-68395-01, ISS. 5
- TRANSLATOR CONNECTOR CKT. SD-68341-01, ISS. 6
- MISC. CKT. TROUBLE RECORDER SD-68392-01, ISS. 5

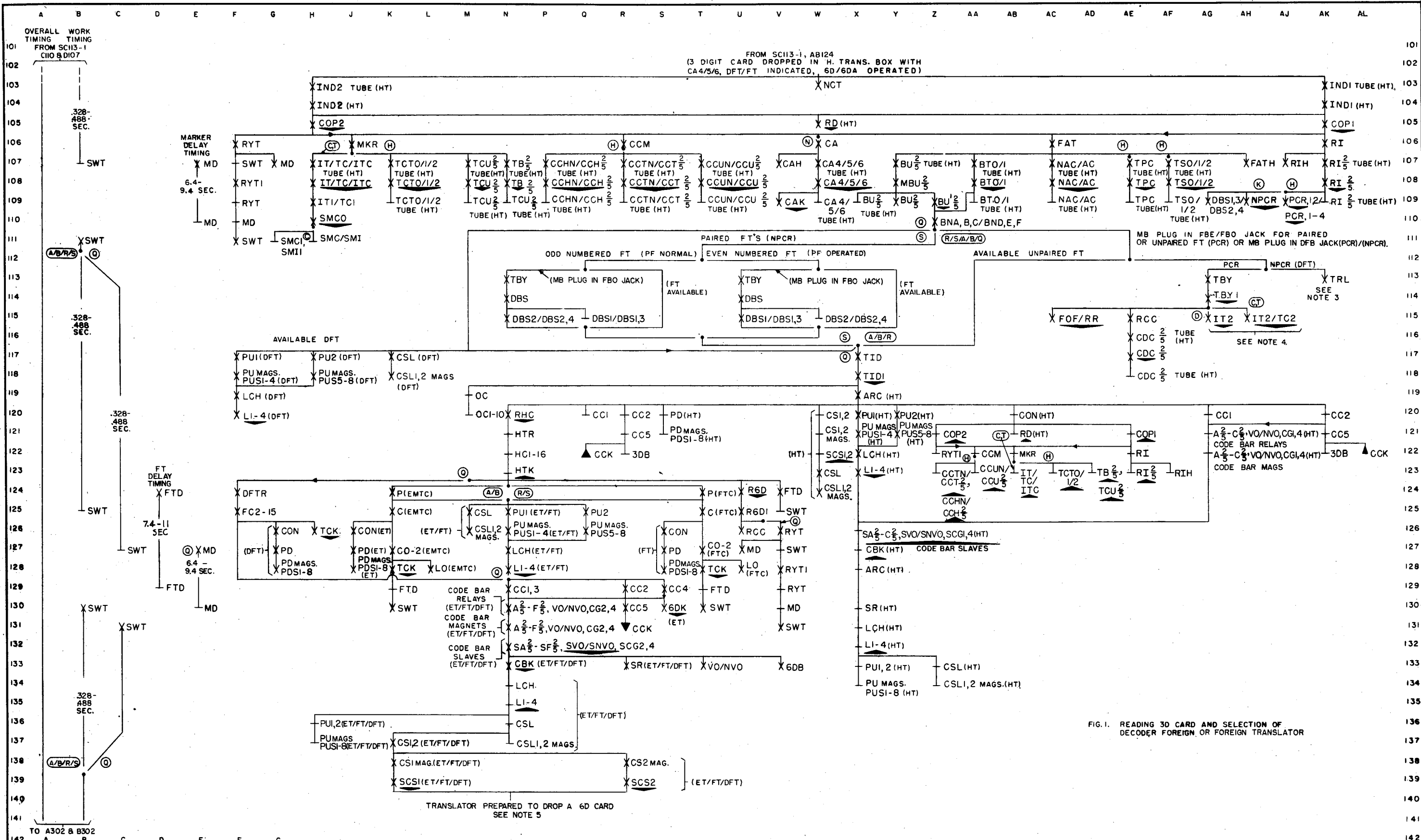


FIG. 1. READING 3D CARD AND SELECTION OF DECODER FOREIGN OR FOREIGN TRANSLATOR

DECODER
OVERALL OPERATIONS FOR A CALL COMPLETED BY 6-DIGIT TRANSLATION
 FOF/FRO/FMB ROUTING INSTRUCTION ON A 6D CARD

SC.115-1

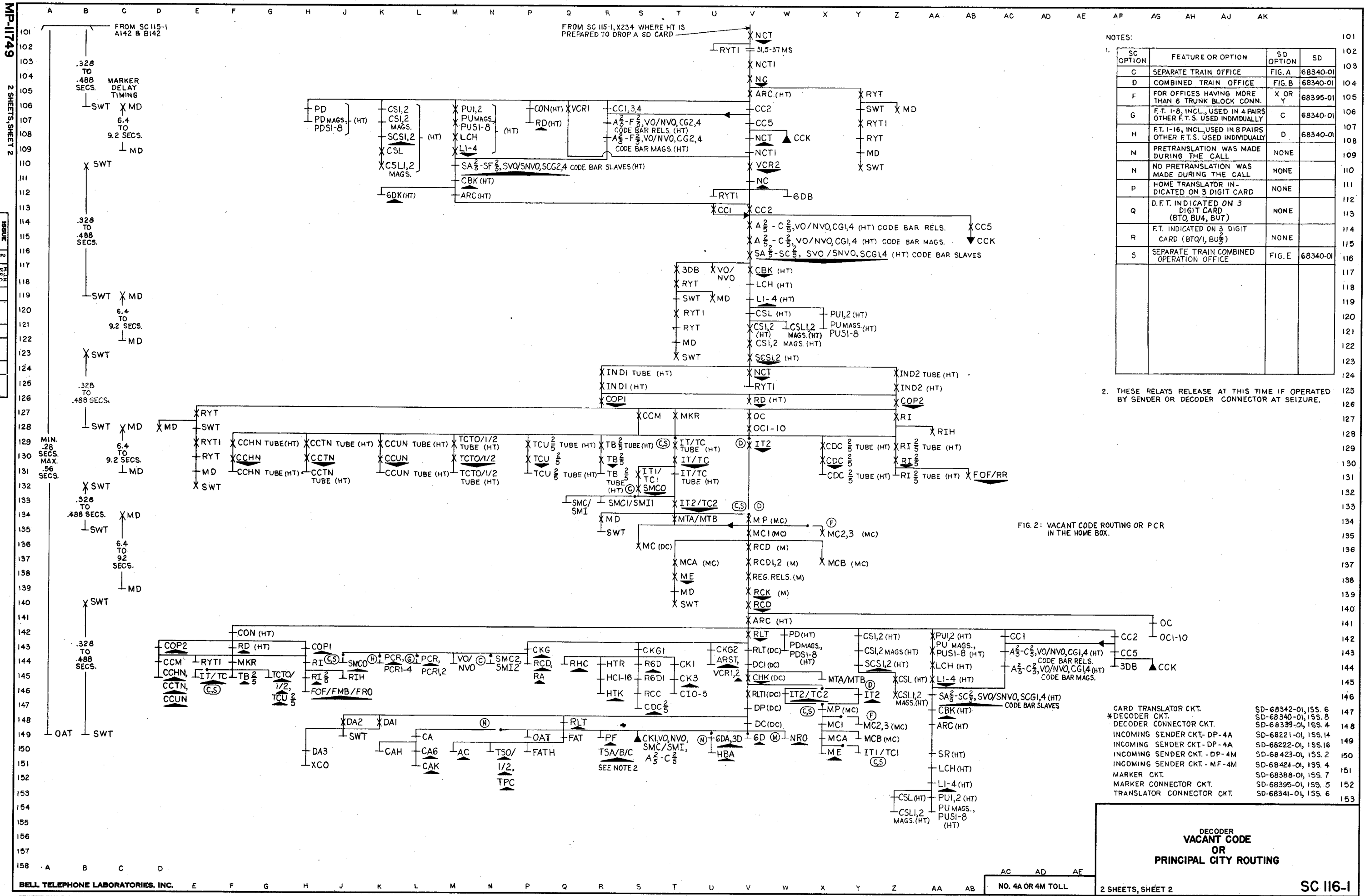
3 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

REVISION	1	2	3
DATE	12-17-51	1/9-27-52	

3 SHEETS, SHEET 1

MP-11748



NOTES:

SC OPTION	FEATURE OR OPTION	SD OPTION	SD
C	SEPARATE TRAIN OFFICE	FIG. A	68340-01
D	COMBINED TRAIN OFFICE	FIG. B	68340-01
F	FOR OFFICES HAVING MORE THAN 6 TRUNK BLOCK CONN.	X OR Y	68395-01
G	F.T. 1-8, INCL., USED IN 4 PAIRS OTHER F.T.S. USED INDIVIDUALLY	C	68340-01
H	F.T. 1-16, INCL., USED IN 8 PAIRS OTHER F.T.S. USED INDIVIDUALLY	D	68340-01
M	PRETRANSLATION WAS MADE DURING THE CALL	NONE	
N	NO PRETRANSLATION WAS MADE DURING THE CALL	NONE	
P	HOME TRANSLATOR INDICATED ON 3 DIGIT CARD	NONE	
Q	D.F.T. INDICATED ON 3 DIGIT CARD (BTO, BU4, BU7)	NONE	
R	F.T. INDICATED ON 3 DIGIT CARD (BTO/1, BU5)	NONE	
S	SEPARATE TRAIN COMBINED OPERATION OFFICE	FIG. E	68340-01

2. THESE RELAYS RELEASE AT THIS TIME IF OPERATED BY SENDER OR DECODER CONNECTOR AT SEIZURE.

FIG. 2: VACANT CODE ROUTING OR PCR IN THE HOME BOX.

- CARD TRANSLATOR CKT. SD-68342-01, 1SS. 6
- *DECODER CKT. SD-68340-01, 1SS. 8
- DECODER CONNECTOR CKT. SD-68399-01, 1SS. 4
- INCOMING SENDER CKT. - DP-4A SD-68221-01, 1SS. 14
- INCOMING SENDER CKT. - DP-4A SD-68222-01, 1SS. 16
- INCOMING SENDER CKT. - DP-4M SD-68423-01, 1SS. 2
- INCOMING SENDER CKT. - MF-4M SD-68424-01, 1SS. 4
- MARKER CKT. SD-68388-01, 1SS. 7
- MARKER CONNECTOR CKT. SD-68395-01, 1SS. 5
- TRANSLATOR CONNECTOR CKT. SD-68341-01, 1SS. 6

DECODER
VACANT CODE
OR
PRINCIPAL CITY ROUTING

MP-11749 2 SHEETS, SHEET 2

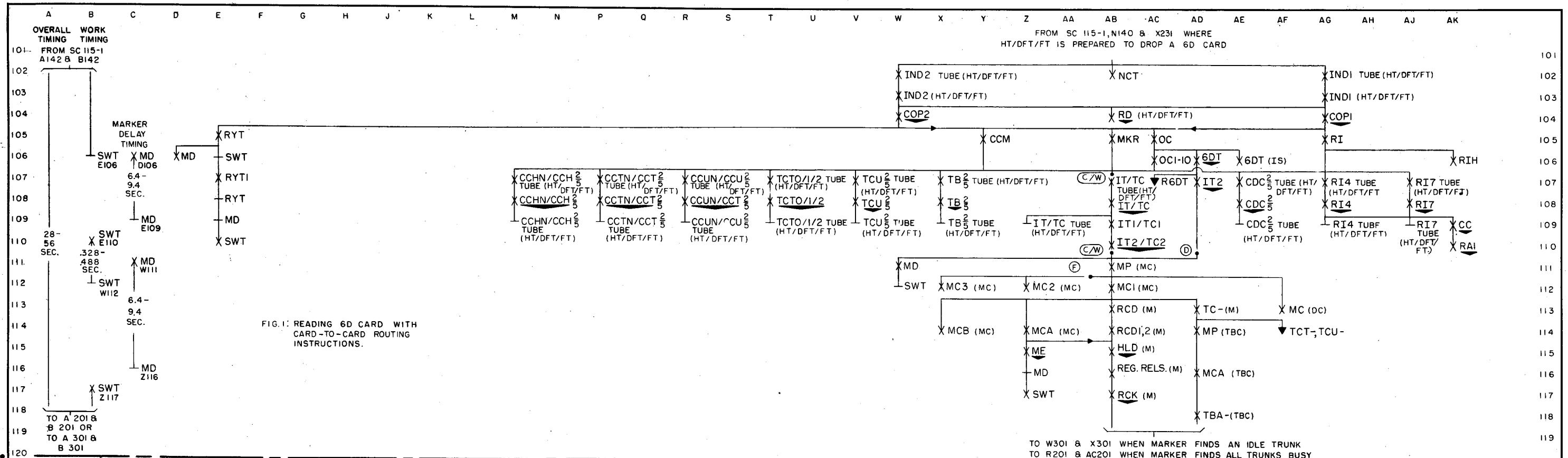


FIG. 1: READING 6D CARD WITH CARD-TO-CARD ROUTING INSTRUCTIONS.

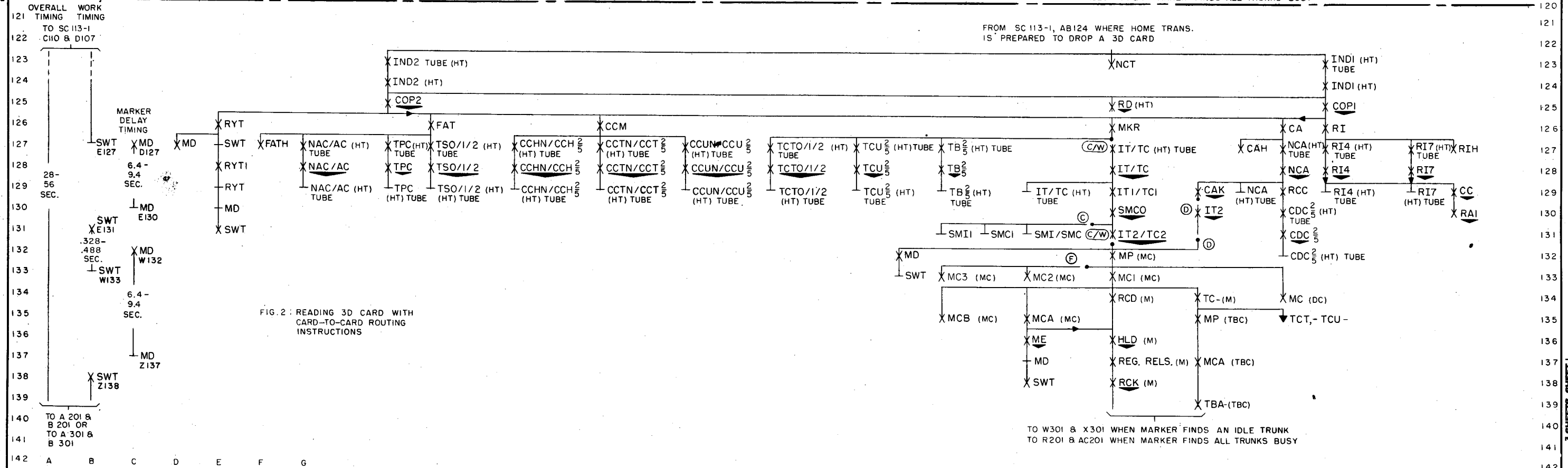


FIG. 2: READING 3D CARD WITH CARD-TO-CARD ROUTING INSTRUCTIONS.

DECODER
OVERALL OPERATIONS FOR A CALL
 USING CARD-TO-CARD ROUTING INSTRUCTION
 (3D CARD IN HT OR 6D CARD IN HT/DFT/FT)

SC 117-1 3 SHEETS, SHEET 1 NO. 4A OR 4M TOLL

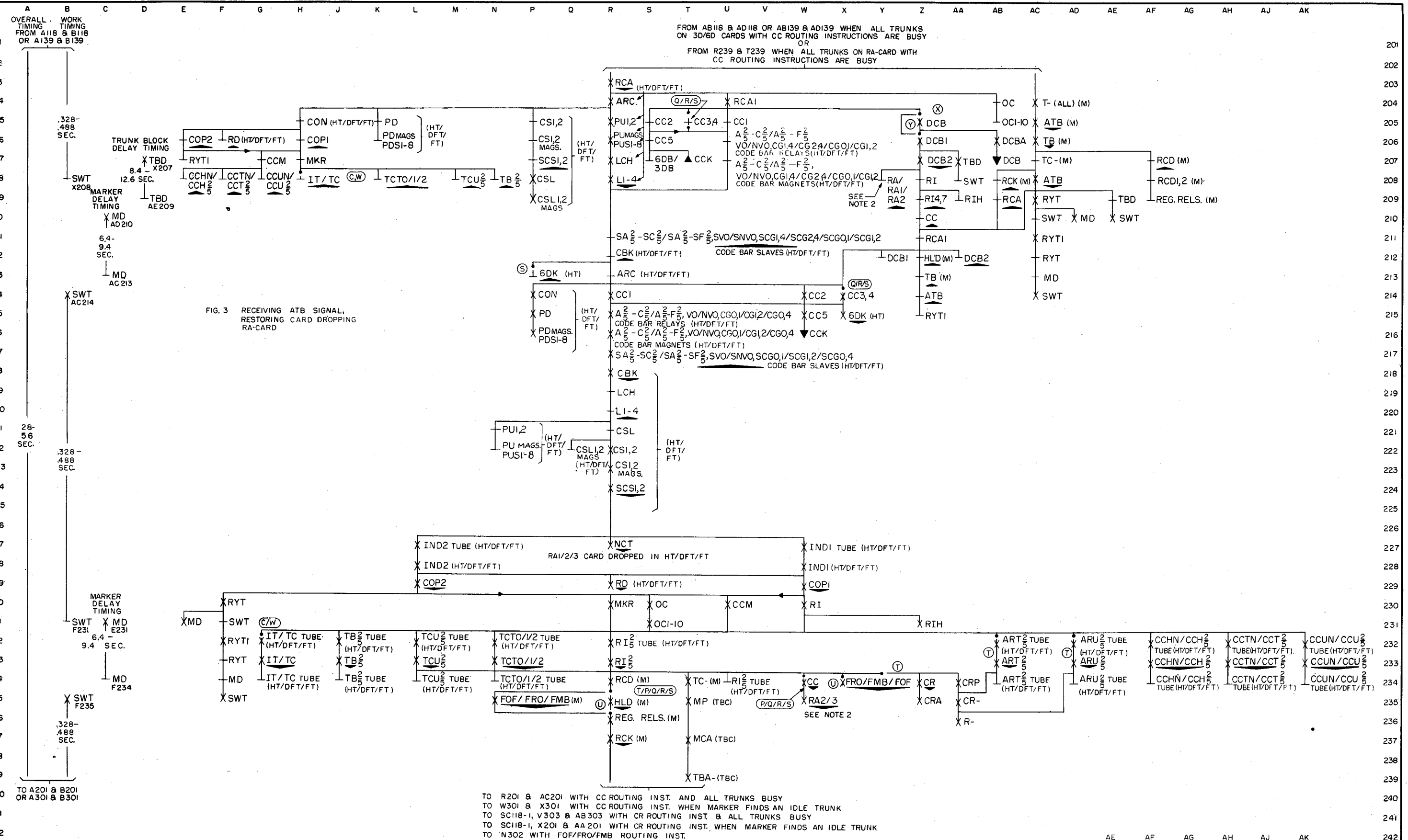
BELL TELEPHONE LABORATORIES, INC.
 PRINTED IN U. S. A.

ISSUE	1	2	3
DATE	12-17-51	10-28-53	

3 SHEETS, SHEET 1
MP-11750

MP-11750 3 SHEETS, SHEET 2

REVISION	DATE	BY	CHKD
1	12-7-51		
2	10-28-53		



ISSUE	DATE	BY	REASON
1	1-17-51	R.E.C.	REVISION
2	10-28-53	R.E.C.	REVISION

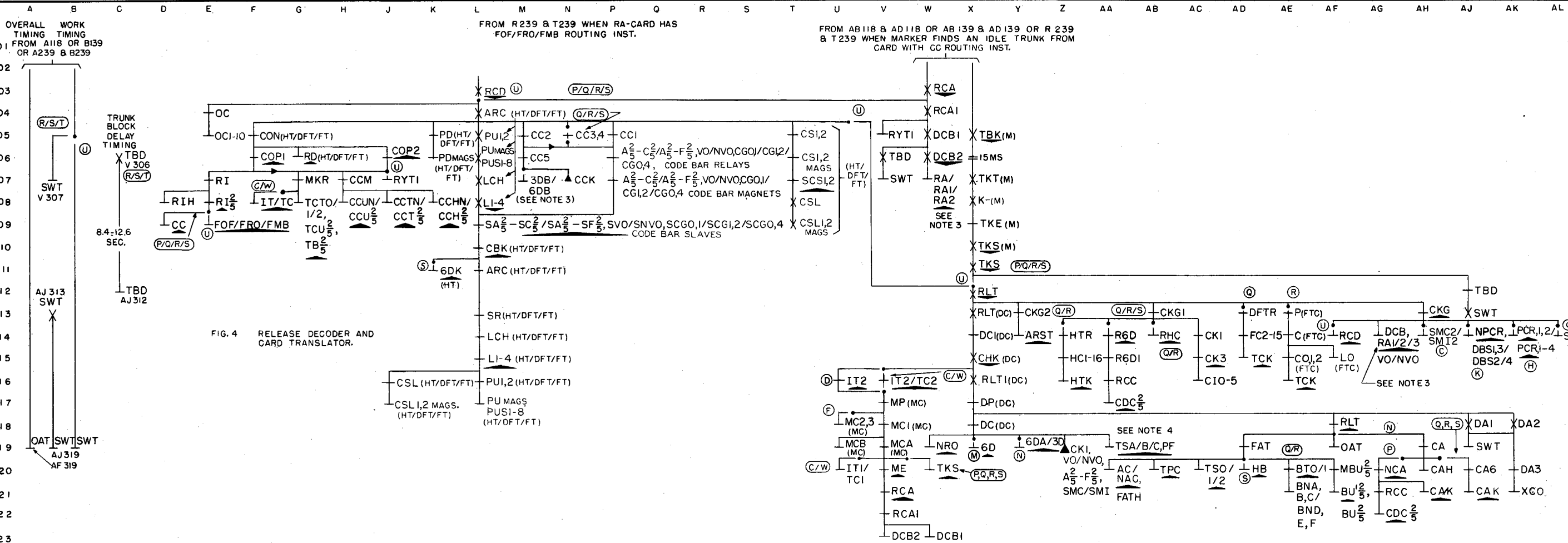


FIG. 4 RELEASE DECODER AND CARD TRANSLATOR.

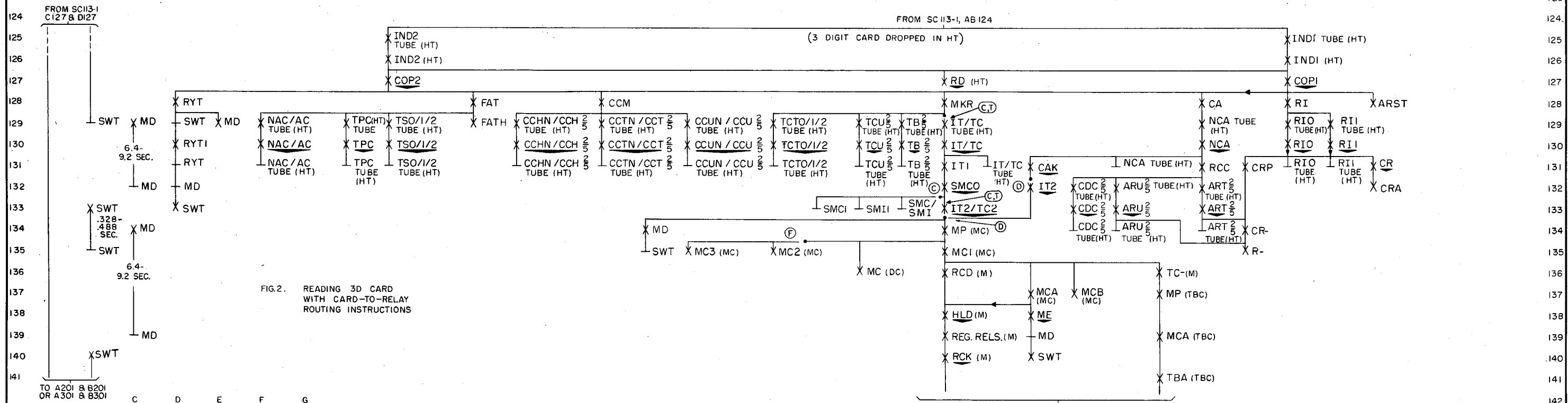
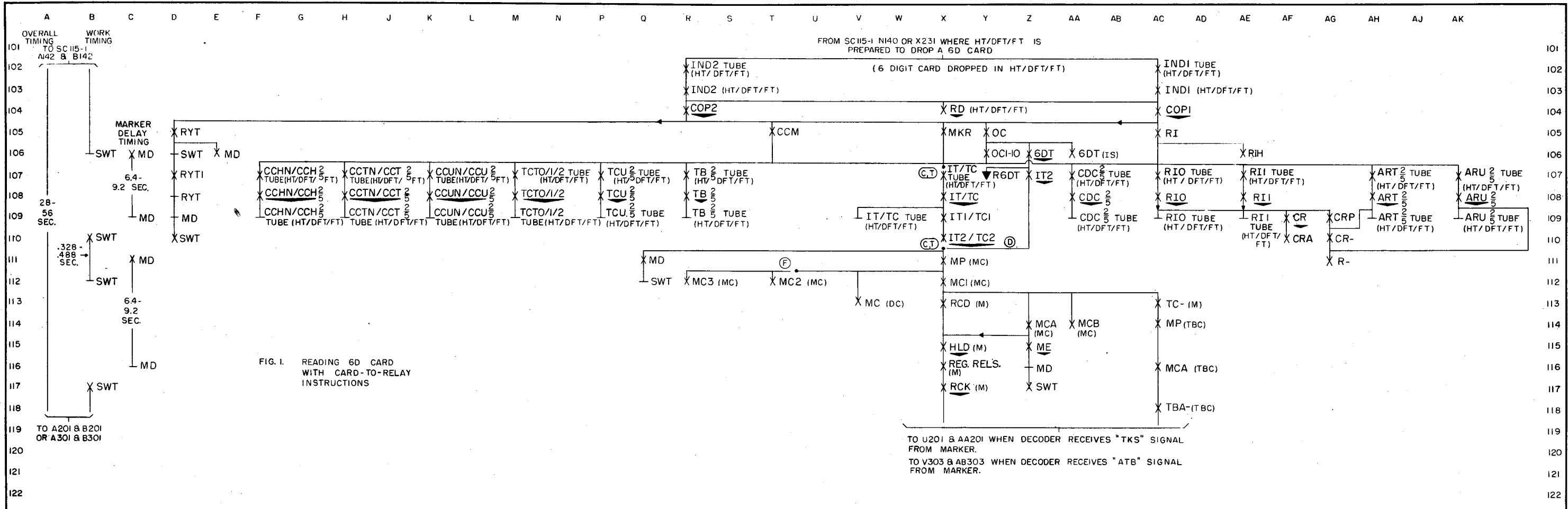
NOTES:

SC OPTION	FEATURE OR OPTION	SD OPTION	SD
C	SEPARATE TRAIN OFFICE	FIG.A	68340-01
D	COMBINED TRAIN OFFICE	FIG.B	68340-01
F	FOR OFFICES HAVING MORE THAN 6 TRUNK BLOCK CONNECTORS	X OR Y	68395-01
H	PCR-INDICATED BY OPERATION OF RI1/RI2/RI4 FROM FIRST 3D CARD	NONE	
K	NPCR-INDICATED BY OPERATION OF RI7&RI0 FROM FIRST 3D CARD	NONE	
M	PRETRANSLATION WAS MADE DURING CALL	NONE	
N	NO PRETRANSLATION WAS MADE DURING CALL	NONE	
P	CC ROUTING INSTRUCTIONS ON 3D CARD (HT)	NONE	
Q	CC ROUTING INSTRUCTIONS ON 6D CARD (DFT)	NONE	
R	CC ROUTING INSTRUCTIONS ON 6D CARD (FT)	NONE	
S	CC ROUTING INSTRUCTIONS ON 6D CARD (HT)	NONE	
T	CR ROUTING INSTRUCTIONS ON LAST RA-CARD (3D OR 6D, HT/DFT/FT)	NONE	
U	FOF/FRO/FMB ROUTING INSTRUCTIONS ON LAST RA-CARD (3D OR 6D, HT/DFT/FT)	NONE	
V	3DB/6DB RELEASED WHEN 3D OR 6D CARD IS BEING RESTORED	NONE	
W	SEPARATE TRAIN COMBINED OPERATION OFFICE	FIG.E	68340-01
X	WHEN 3D/6D CARD IS RESTORED	NONE	68340-01
Y	WHEN RAI/2/3 CARD IS RESTORED DCB RELAY LOCKED	NONE	68340-01

- IF 3D/6D CARD IS BEING RESTORED, OPERATED DCB2 WILL RELEASE RA & OPERATED CC WILL OPERATE RAI. IF RAI CARD IS BEING RESTORED (IN ORDER TO DROP AN RA2 CARD) OPERATED DCB2 WILL RELEASE RAI & OPERATED CC WILL OPERATE RA2. IF RA2 CARD IS BEING RESTORED (IN ORDER TO DROP AN RA3 CARD) OPERATED DCB2 WILL RELEASE RA2.
- IF AN IDLE TRUNK IS FOUND FROM TRANSLATOR ON A:
 - A- 3D/6D CARD: NORMAL CC5 RELEASES 3DB/6DB OPERATED DCB2 RELEASES RA NORMAL CKG RELEASES RA1
 - B- RAI CARD: OPERATED DCB2 RELEASES RAI NORMAL CKG RELEASES RA2
 - C- RA2 CARD: OPERATED DCB2 RELEASES RA2 NORMAL CKG RELEASES RA3
 - D- RA3 CARD: NORMAL CKG RELEASES RA3
- THESE RELAYS RELEASE AT THIS TIME IF OPERATED BY SENDER OR DECODER CONNECTOR AT SEIZURE.

- INCOMING DP SENDER CKT-4A SD-68221-01, ISS.14
- INCOMING MF SENDER CKT-4A SD-68222-01, ISS.16
- DECODER CONNECTOR CKT SD-68339-01, ISS.4
- *DECODER CKT SD-68340-01, ISS.8
- TRANSLATOR CONNECTOR CKT SD-68341-01, ISS.6
- CARD TRANSLATOR CKT SD-68342-01, ISS.6
- MARKER CKT SD-68348-01, ISS.7
- MARKER CONNECTOR CKT SD-68395-01, ISS.5
- INCOMING DP SENDER CKT-4M SD-68423-01, ISS.2
- INCOMING MF SENDER CKT-4M SD-68424-01, ISS.4

DECODER
OVERALL OPERATIONS FOR A CALL USING CARD-TO-CARD ROUTING INSTRUCTION
 (3D CARD IN HT OR 6D CARD IN HT/DFT/FT)



DECODER
OVERALL OPERATIONS FOR A CALL
USING CARD-TO-RELAY ROUTING
INSTRUCTION

SC 118-1

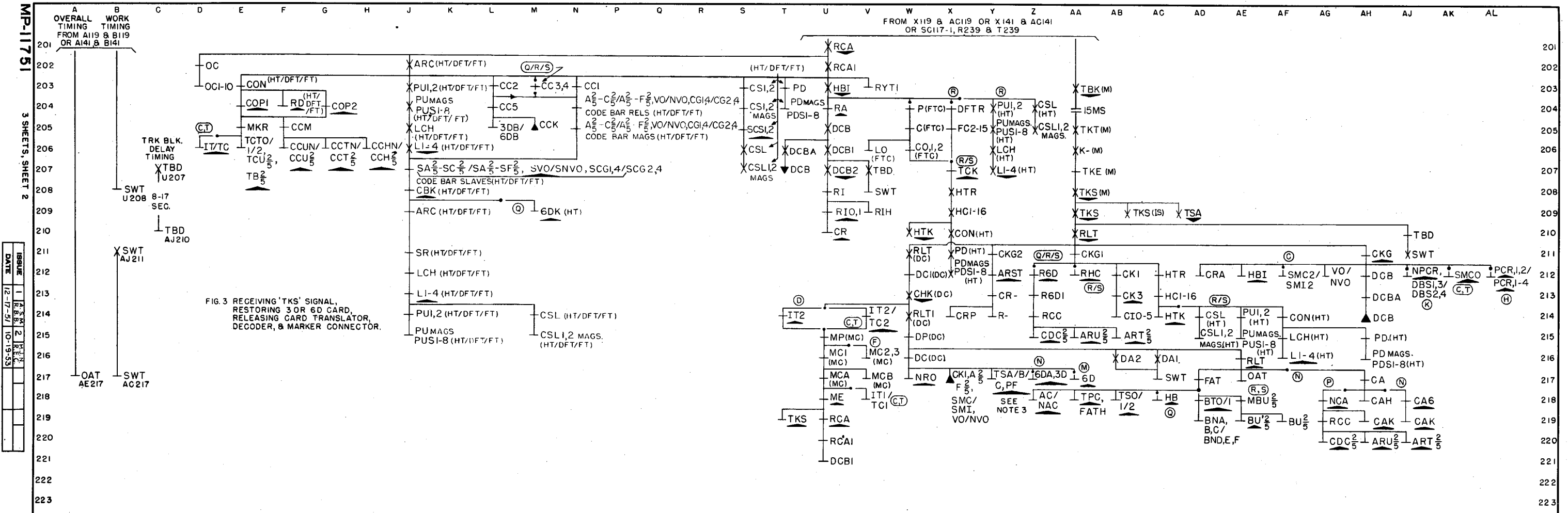
3 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

BELL TELEPHONE LABORATORIES, INC.
PRINTED IN U. S. A.

MP-11751

ISSUE	1	DATE	12-17-51
REL.	2	DATE	10-19-53



MP-11751
3 SHEETS, SHEET 2

ISSUE	DATE	BY	REASON
1	12-17-51	W. J. C.	REVISED
2	10-19-53	W. J. C.	REVISED

NOTES:

SC OPTION	FEATURE OR OPTION	SD OPTION	SD
C	SEPARATE TRAIN OFFICE	FIG. A	68340-01
D	COMBINED TRAIN OFFICE	FIG. B	68340-01
F	FOR OFFICES HAVING MORE THAN 6 TRUNK BLOCK CONNECTORS	X OR Y	68395-01
H	PCR-INDICATED BY OPERATION OF RI1/RI2/RI4 FROM FIRST 3D CARD	NONE	
K	NPCR-INDICATED BY OPERATION OF RI7 & RIO FROM FIRST 3D CARD	NONE	
M	PRETRANSLATION WAS MADE DURING CALL	NONE	
N	NO PRETRANSLATION WAS MADE DURING CALL	NONE	
P	CR ROUTING INSTRUCTIONS ON 3D CARD	NONE	
Q	CR ROUTING INSTRUCTIONS ON 6D CARD (H. TRANS.)	NONE	
R	CR ROUTING INSTRUCTIONS ON 6D CARD (DFT)	NONE	
S	CR ROUTING INSTRUCTIONS ON 6D CARD (FT)	NONE	
T	SEPARATE TRAIN COMBINED OPERATION OFFICE	FIG. E	68340-01

- FIG. 4 IS CONTINUED ON FIG. 5, SC119-1, V301 WHICH IS SEQUENCE FOR READING 'AR' CARD AND RELEASING OF THE HOME TRANS, DECODER, AND MARKER CONNECTOR.
THE SAME SEQUENCE OF OPERATION IS USED FOR CARD-TO-RELAY ROUTING INSTRUCTION EXCEPT THAT CRA AND CRP RELEASE AND NOT RRA AND RRP.
- THESE RELAYS RELEASE HERE IF OPERATED BY SENDER OR DECODER CONNECTOR AT SEIZURE.

- CARD TRANSLATOR CKT. SD-68342-01, ISS. 6
- DECODER CONNECTOR CKT. SD-68339-01, ISS. 4
- *DECODER CKT. SD-68340-01, ISS. 8
- INCOMING SENDER CKT. - DP-4A SD-68221-01, ISS. 14
- INCOMING SENDER CKT. - MF-4A SD-68222-01, ISS. 16
- MARKER CONNECTOR CKT. SD-68395-01, ISS. 5
- MARKER CKT. SD-68388-01, ISS. 7
- TRANSLATOR CONNECTOR CKT. SD-68341-01, ISS. 6
- INCOMING SENDER CKT. - DP-4M SD-68423-01, ISS. 2
- INCOMING SENDER CKT. - MF-4M SD-68424-01, ISS. 4

DECODER
**OVERALL OPERATIONS FOR A CALL
USING CARD-TO-RELAY ROUTING
INSTRUCTION**

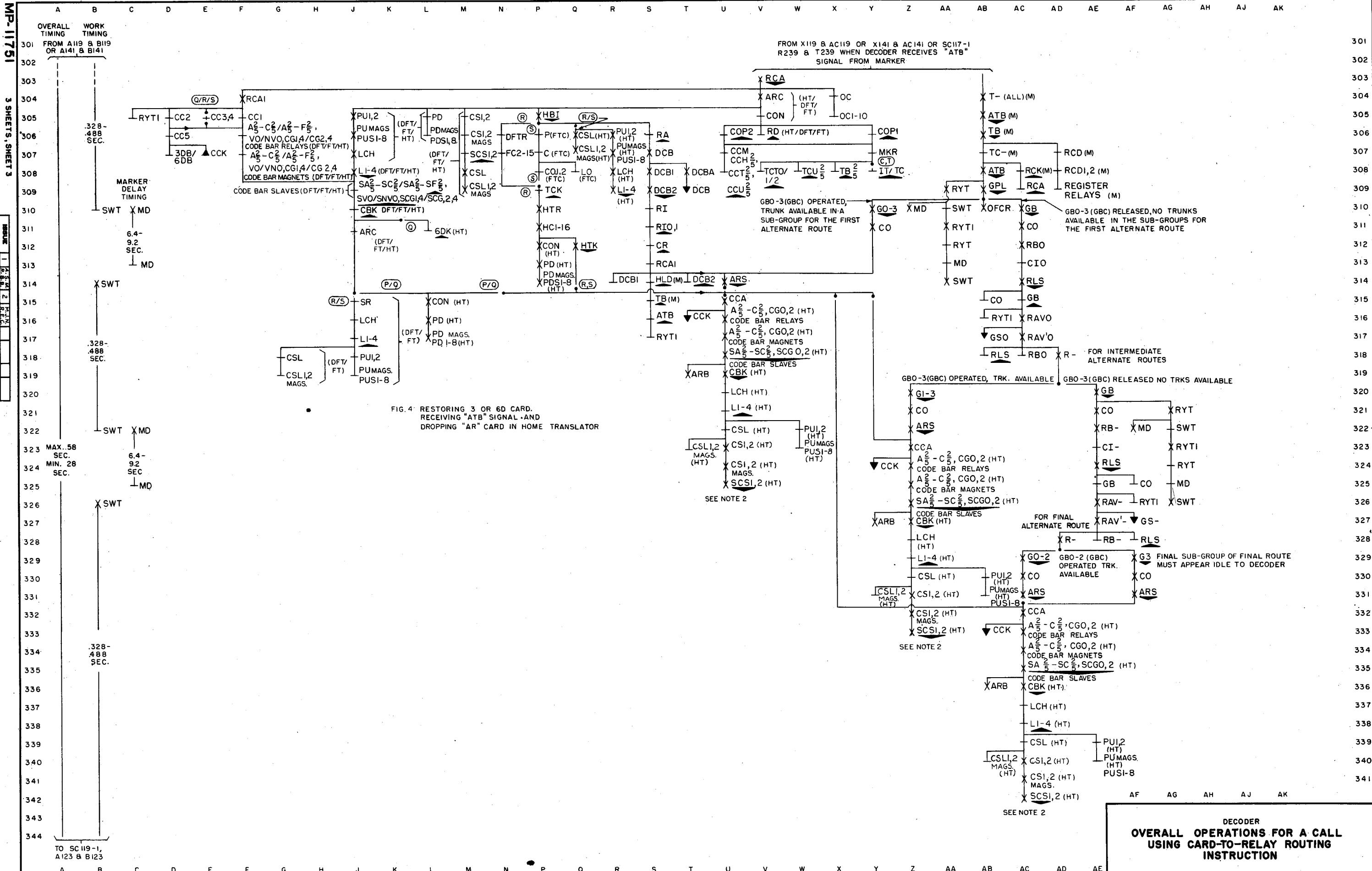


FIG. 4 RESTORING 3 OR 6D CARD. RECEIVING "ATB" SIGNAL AND DROPPING "AR" CARD IN HOME TRANSLATOR

MP-11751
3 SHEETS, SHEET 3

REVISION	DATE	BY	CHKD
1	12-7-51		
2	10-18-53		

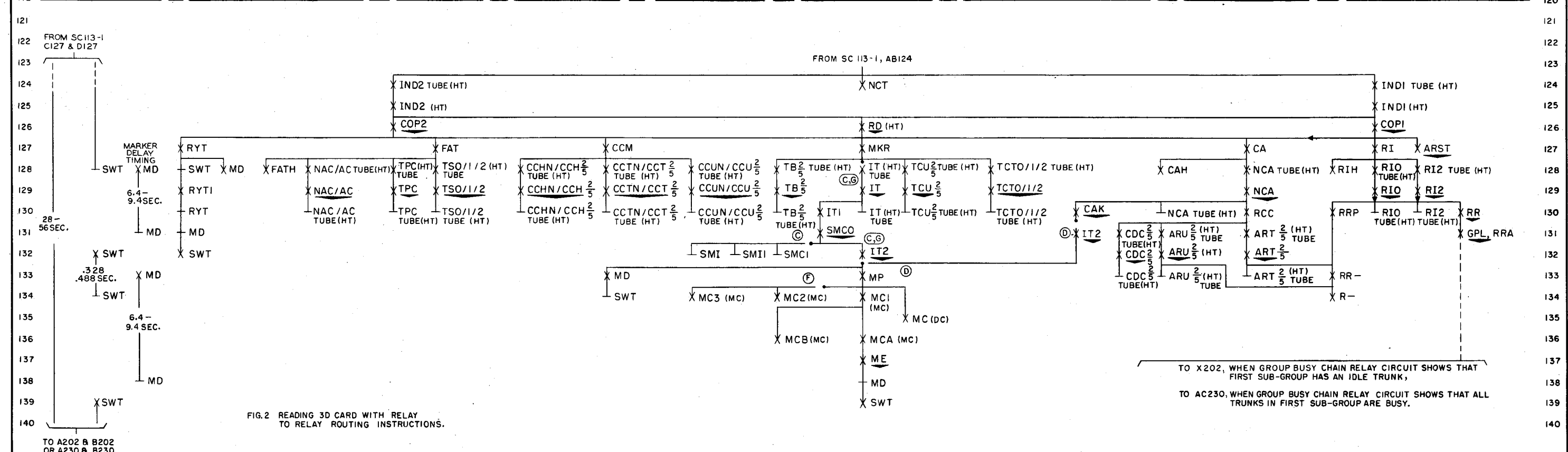
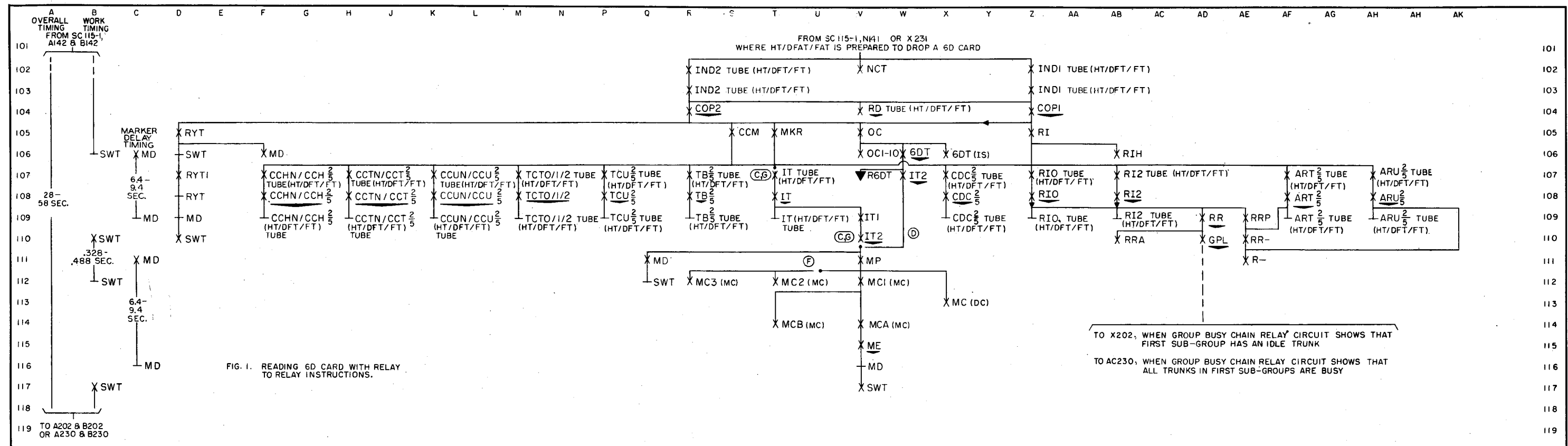
MAX. 58 SEC.
MIN. 28 SEC.

TO SC 119-1,
A123 & B123

DECODER
OVERALL OPERATIONS FOR A CALL
USING CARD-TO-RELAY ROUTING
INSTRUCTION

NO. 4A OR 4M TOLL

3 SHEETS, SHEET 3



DECODER
**OVERALL OPERATIONS FOR A CALL
 USING RELAY-TO-RELAY ROUTING
 INSTRUCTION**

SC 119-1

3 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

ISSUE	1	2	3
DATE	12-17-51	10-28-53	

3 SHEETS, SHEET 1

MP-11754

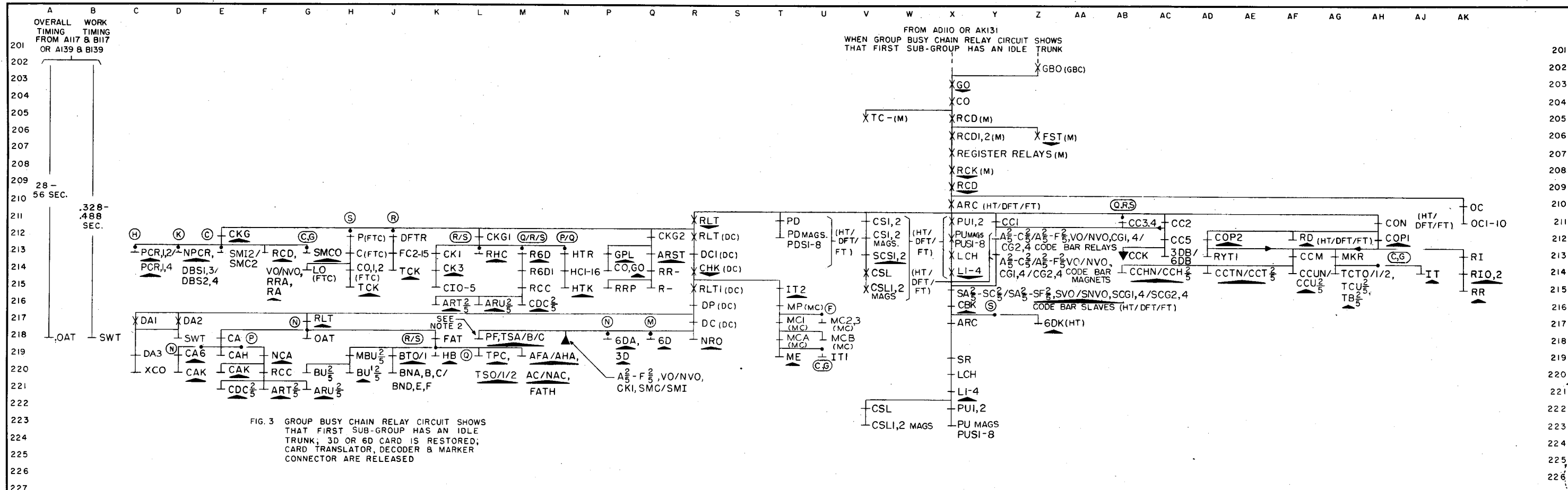


FIG. 3 GROUP BUSY CHAIN RELAY CIRCUIT SHOWS THAT FIRST SUB-GROUP HAS AN IDLE TRUNK; 3D OR 6D CARD IS RESTORED; CARD TRANSLATOR, DECODER & MARKER CONNECTOR ARE RELEASED

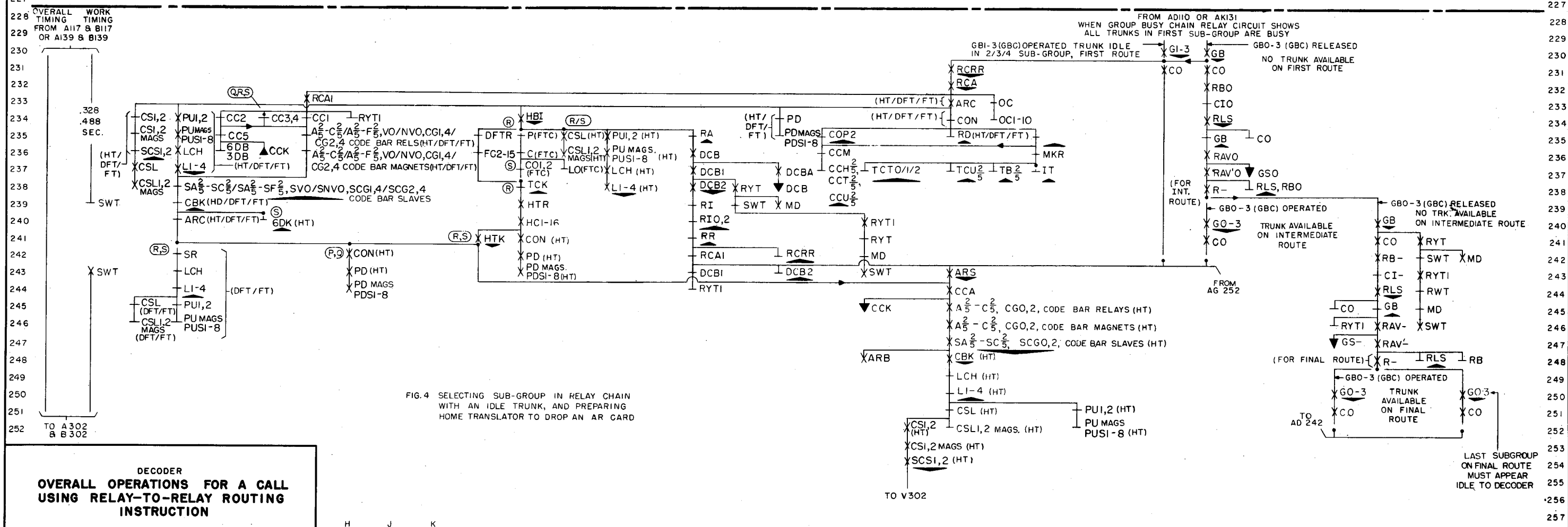
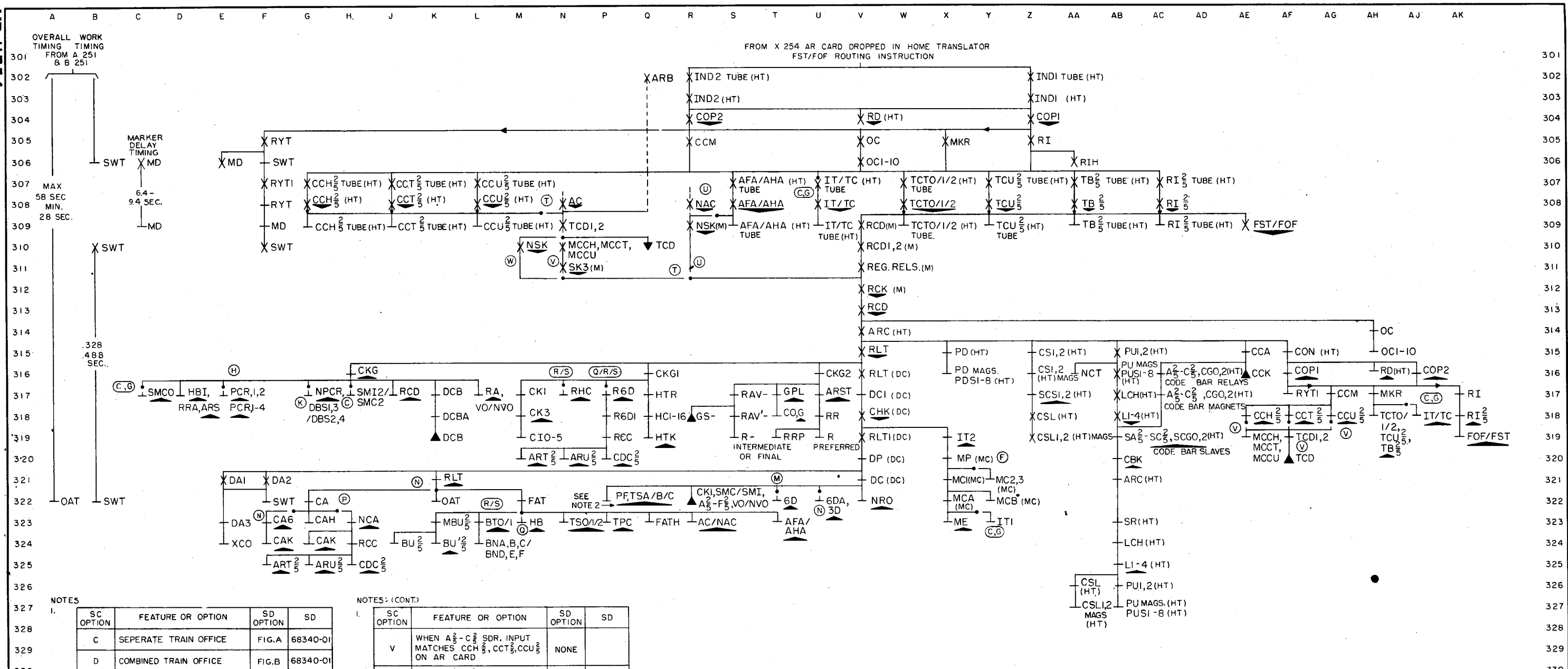


FIG. 4 SELECTING SUB-GROUP IN RELAY CHAIN WITH AN IDLE TRUNK, AND PREPARING HOME TRANSLATOR TO DROP AN AR CARD

DECODER
OVERALL OPERATIONS FOR A CALL USING RELAY-TO-RELAY ROUTING INSTRUCTION

ISSUE	1	2	3	4
DATE	12-17-51	10-26-53		



NOTES

SC OPTION	FEATURE OR OPTION	SD OPTION	SD
C	SEPERATE TRAIN OFFICE	FIG. A	68340-01
D	COMBINED TRAIN OFFICE	FIG. B	68340-01
F	FOR OFFICES HAVING MORE THAN 6 TRUNK BLOCK CONNECTORS.	X OR Y	68395-01
G	SEPERATE TRAIN COMBINED OPERATION OFFICE	FIG. E	68340-01
H	PCR-INDICATED BY OPERATION OF RI1/RI2/RI4 FROM FIRST 3D CARD	NONE	
K	NPCR-INDICATED BY OPERATION OF RI7 & RIO FROM FIRST 3D CARD	NONE	
M	PRETRANSLATION WAS MADE DURING CALL	NONE	
N	NO PRETRANSLATION WAS MADE DURING CALL	NONE	
P	RR ROUTING INSTRUCTION ON 3D CARD	NONE	
Q	RR ROUTING INSTRUCTION ON 6D CARD (HT)	NONE	
R	RR ROUTING INSTRUCTION ON 6D CARD (DFT)	NONE	
S	RR ROUTING INSTRUCTION ON 6D CARD (FT)	NONE	
T	AC OPERATED FROM 3D/6D CARD	NONE	
U	NAC OPERATED FROM 3D/6D CARD	NONE	

NOTES (CONT.)

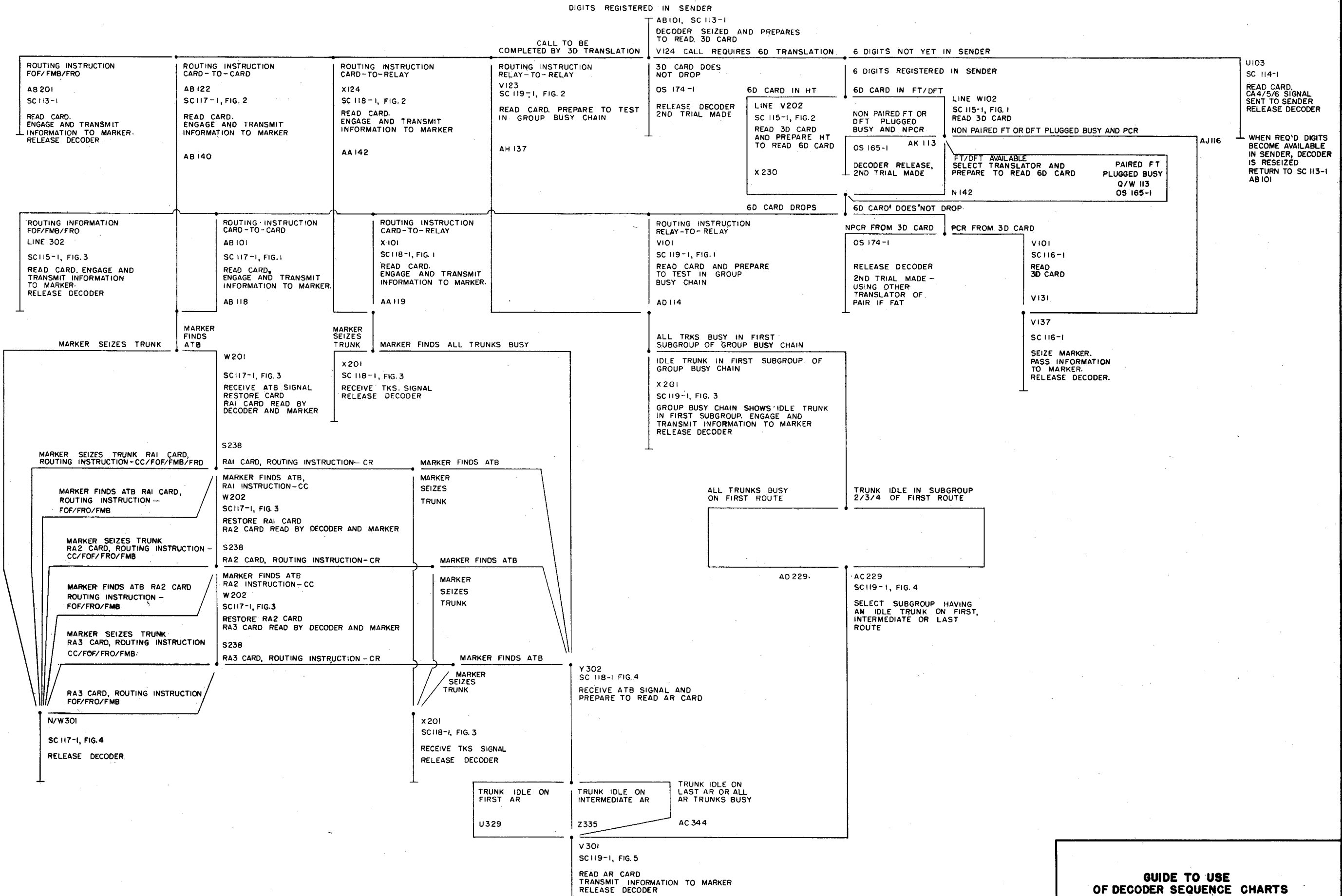
SC OPTION	FEATURE OR OPTION	SD OPTION	SD
V	WHEN A ₂ ² -C ₂ ² SDR. INPUT MATCHES CCH ₂ ² , CCT ₂ ² , CCU ₂ ² ON AR CARD	NONE	
W	WHEN A ₂ ² -C ₂ ² SDR. INPUT DOESN'T MATCH CCH ₂ ² , CCT ₂ ² , CCU ₂ ²	NONE	

2. THESE RELAYS RELEASE HERE IF OPERATED BY SENDER OR DECODER CONNECTOR AT SEIZURE.

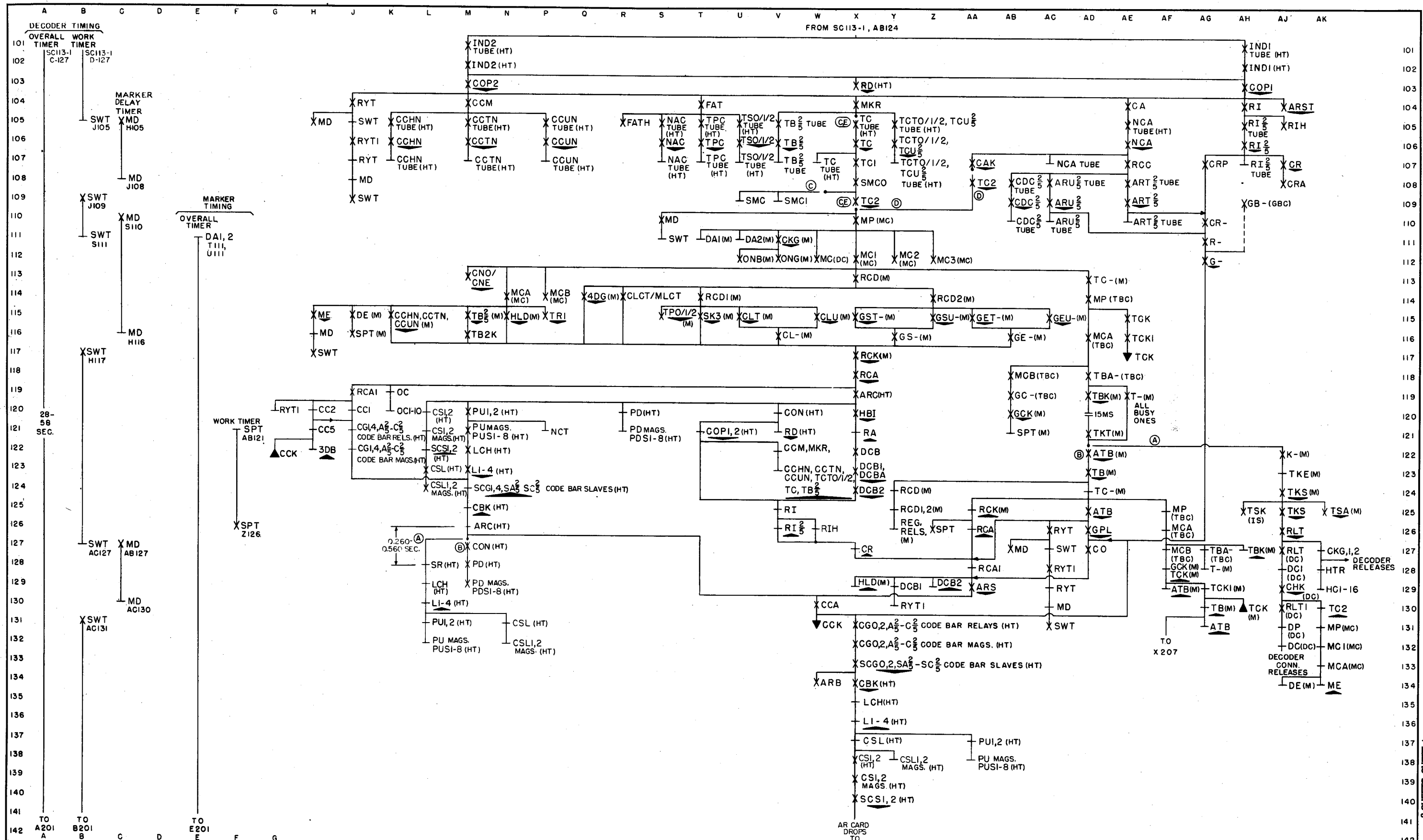
FIG. 5: READING AR CARD AND RELEASING HOME TRANSLATOR, DECODER & MARKER CONNECTOR.

CARD TRANSLATOR CKT	SD 68342-01, ISS 6
DECODER CONNECTOR CKT	SD 68339-01, ISS 4
* DECODER CKT.	SD 68340-01, ISS 8
INCOMING SENDER CKT - DP-4A	SD-68221-01, ISS 14
INCOMING SENDER CKT - MF-4A	SD-68222-01, ISS 16
INCOMING SENDER CKT - DP-4M	SD-68423-01, ISS 2
INCOMING SENDER CKT - MF-4M	SD-68424-01, ISS 4
MARKER CONNECTOR CKT	SD-68395-01, ISS 5
MARKER CKT.	SD-68388-01, ISS 7
TRANSLATOR CONNECTOR CKT.	SD-68341-01, ISS 6

ISSUE	1	2
DATE	1-3-52	12-21-53



GUIDE TO USE OF DECODER SEQUENCE CHARTS



**DECODER AND MARKER
OVERALL OPERATIONS FOR
A CR TYPE CALL
(HLD ROUTING)**

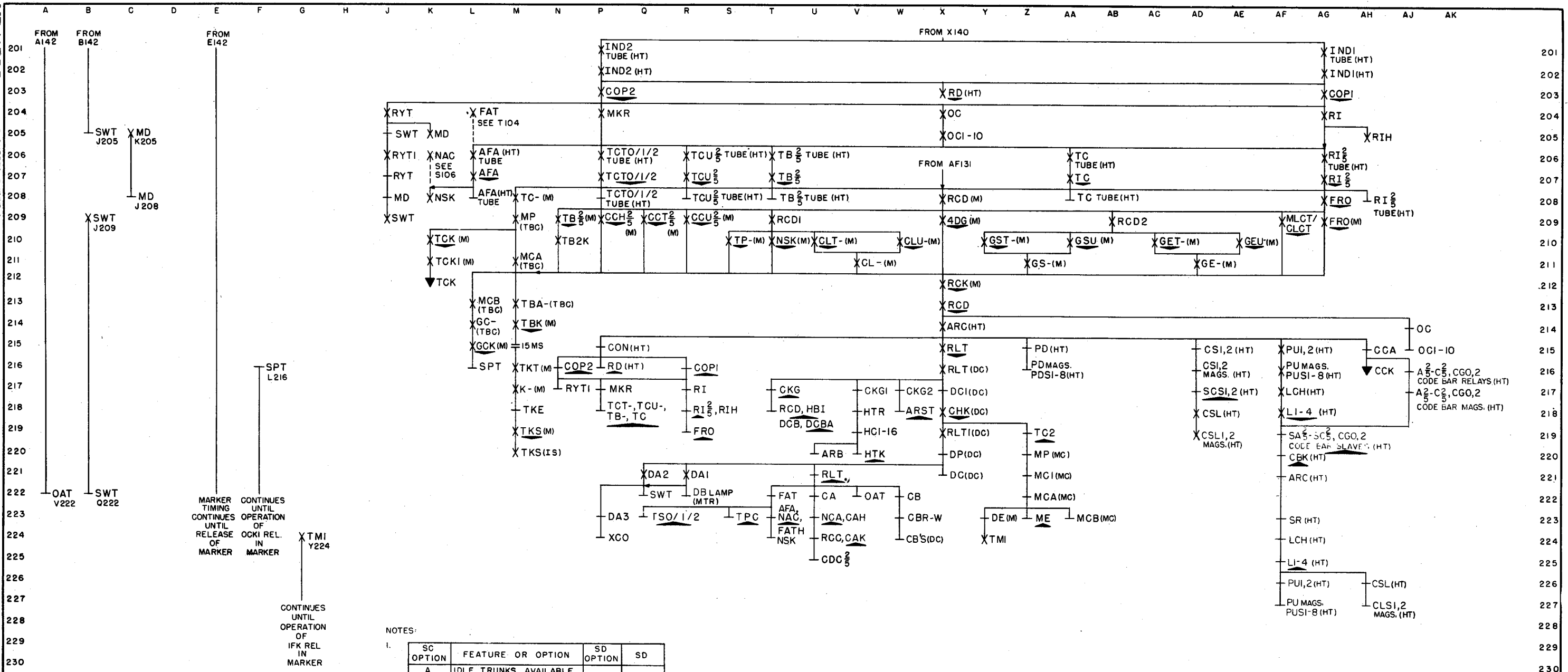
SCI21-1 2 SHEETS, SHEET 1 NO. 4A OR 4M TOLL

BELL TELEPHONE LABORATORIES, INC.
PRINTED IN U. S. A.

ISSUE	1	2	3
DATE	12-14-51	1-29-53	

2 SHEETS, SHEET 1
MP-11755

ISSUE	1	2	3	4
DATE	12-14-51	12-23-51		



MARKER TIMING CONTINUES UNTIL RELEASE OF MARKER

CONTINUES UNTIL OPERATION OF OCKI REL. IN MARKER

CONTINUES UNTIL OPERATION OF IFX REL IN MARKER

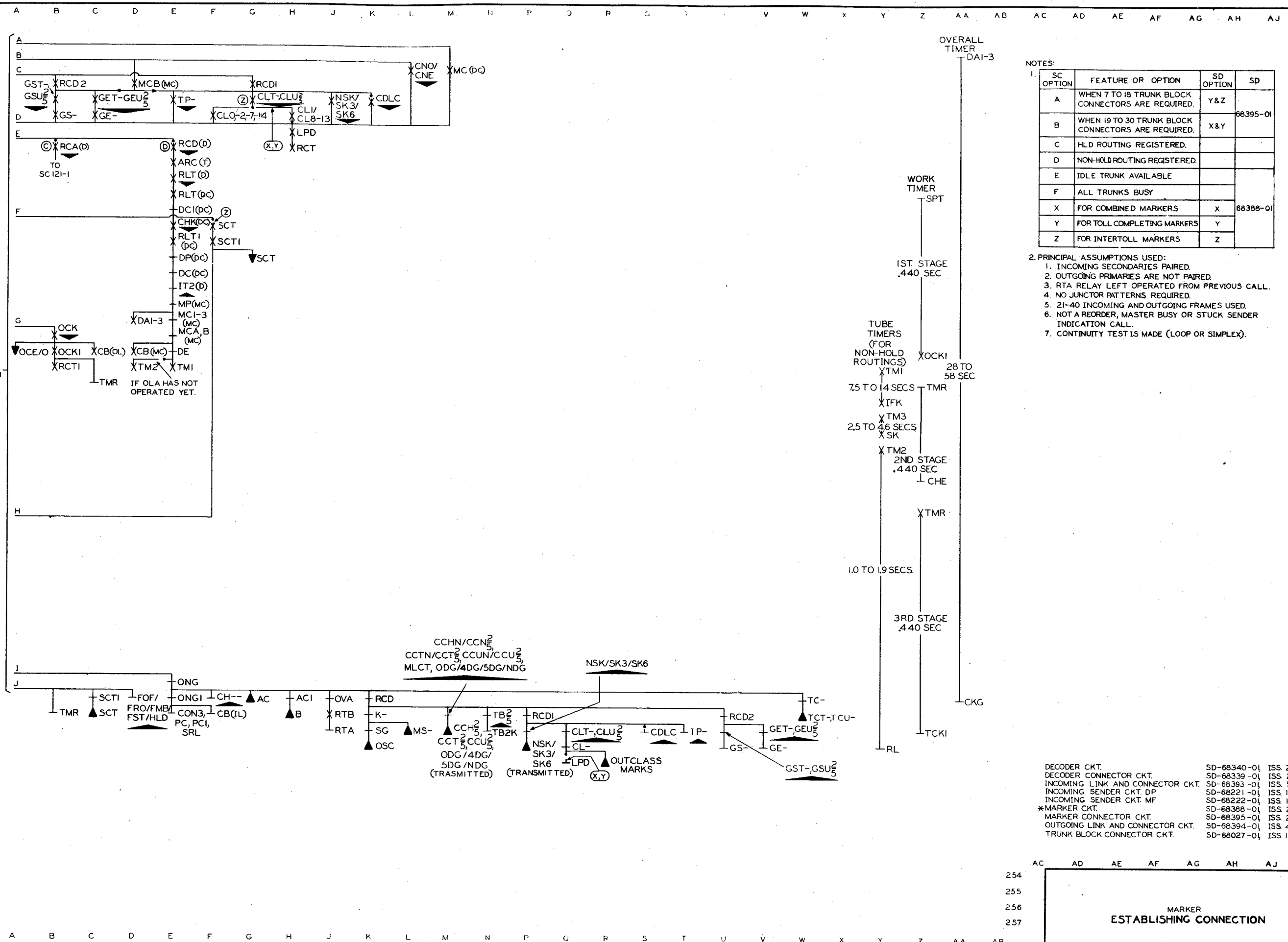
NOTES:

- | SC OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|--|-----------|----------|
| A | IDLE TRUNKS AVAILABLE | | |
| B | ALL TRUNKS BUSY | | |
| C | SEPARATE TRAIN OPERATION | FIG.A | |
| D | COMBINED TRAIN OPERATION | FIG.B | 68340-01 |
| E | SEPARATE TRAIN COMBINED-OPERATION OFFICE | FIG.E | |

2. MAIN ASSUMPTIONS IN PREPARATION OF THIS SEQUENCE CHART ARE:
 TOLL COMPLETING MARKER USED.
 TRUNKS AVAILABLE ON AR CARD.
 DFT OF FT NOT INVOLVED.

CARD TRANSLATOR CKT. SD-68342-01, ISS. 6
 *DECODER CKT. SD-68340-01, ISS. 8
 DECODER CONNECTOR CKT. SD-68339-01, ISS. 4
 MARKER CKT. SD-68389-01, ISS. 7
 MARKER CONNECTOR CKT. SD-68395-01, ISS. 5

ISSUE	DATE
1	10-1-51



NOTES:

SC OPTION	FEATURE OR OPTION	SD OPTION	SD
A	WHEN 7 TO 18 TRUNK BLOCK CONNECTORS ARE REQUIRED.	Y&Z	68395-01
B	WHEN 19 TO 30 TRUNK BLOCK CONNECTORS ARE REQUIRED.	X&Y	
C	HLD ROUTING REGISTERED.		
D	NON-HOLD ROUTING REGISTERED.		
E	IDLE TRUNK AVAILABLE		
F	ALL TRUNKS BUSY		
X	FOR COMBINED MARKERS	X	68388-01
Y	FOR TOLL COMPLETING MARKERS	Y	
Z	FOR INTERTOLL MARKERS	Z	

2. PRINCIPAL ASSUMPTIONS USED:
1. INCOMING SECONDARIES PAIRED.
 2. OUTGOING PRIMARIES ARE NOT PAIRED.
 3. RTA RELAY LEFT OPERATED FROM PREVIOUS CALL.
 4. NO JUNCTOR PATTERNS REQUIRED.
 5. 21-40 INCOMING AND OUTGOING FRAMES USED.
 6. NOT A REORDER, MASTER BUSY OR STUCK SENDER INDICATION CALL.
 7. CONTINUITY TEST IS MADE (LOOP OR SIMPLEX).

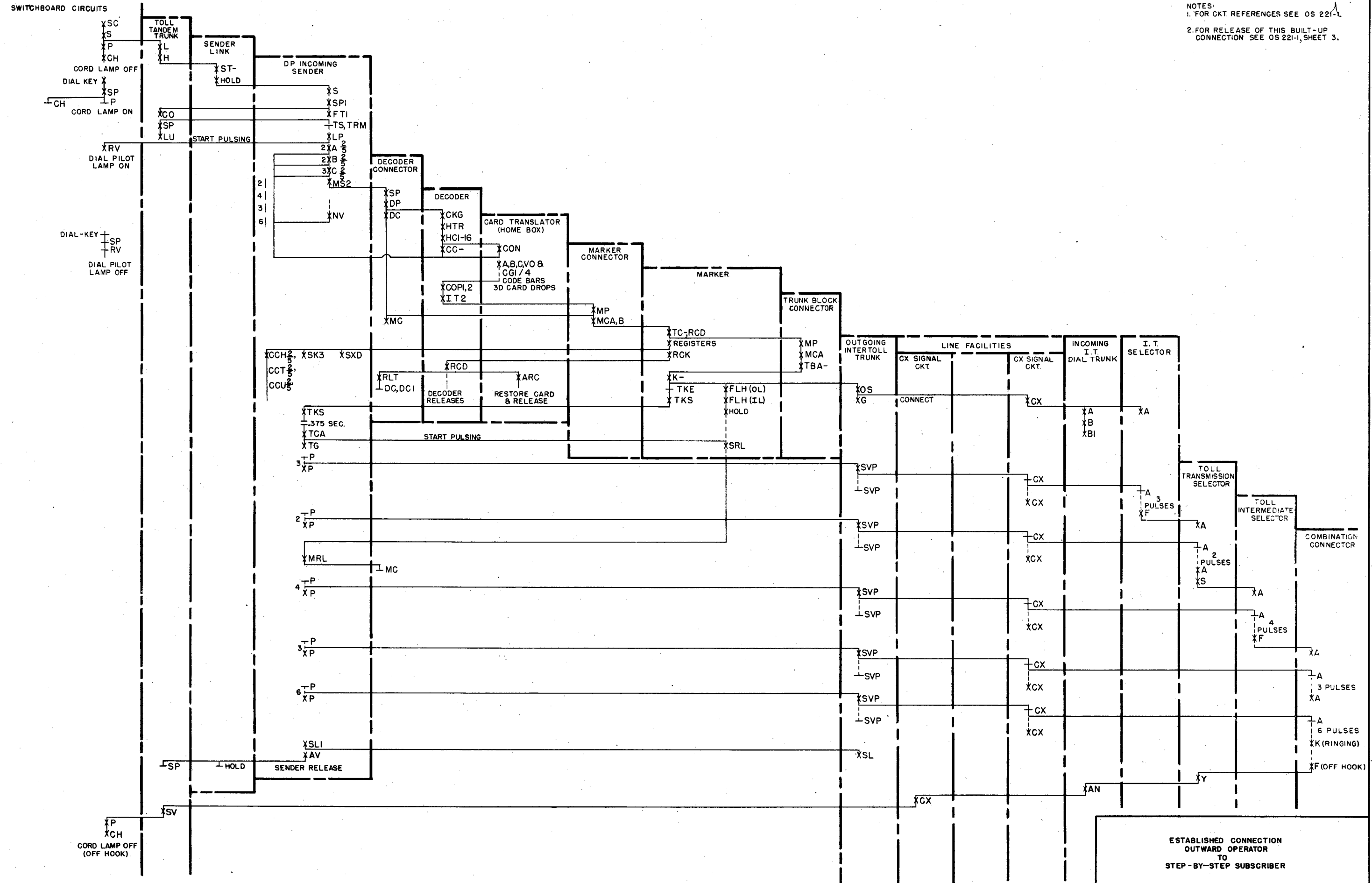
DECODER CKT.	SD-68340-01	ISS 2
DECODER CONNECTOR CKT.	SD-68339-01	ISS 2
INCOMING LINK AND CONNECTOR CKT.	SD-68393-01	ISS 5
INCOMING SENDER CKT. DP	SD-68221-01	ISS 12
INCOMING SENDER CKT. MF	SD-68222-01	ISS 12
*MARKER CKT.	SD-68388-01	ISS 2
MARKER CONNECTOR CKT.	SD-68395-01	ISS 2
OUTGOING LINK AND CONNECTOR CKT.	SD-68394-01	ISS 4
TRUNK BLOCK CONNECTOR CKT.	SD-68027-01	ISS 16

MARKER ESTABLISHING CONNECTION

NO. 4A TOLL

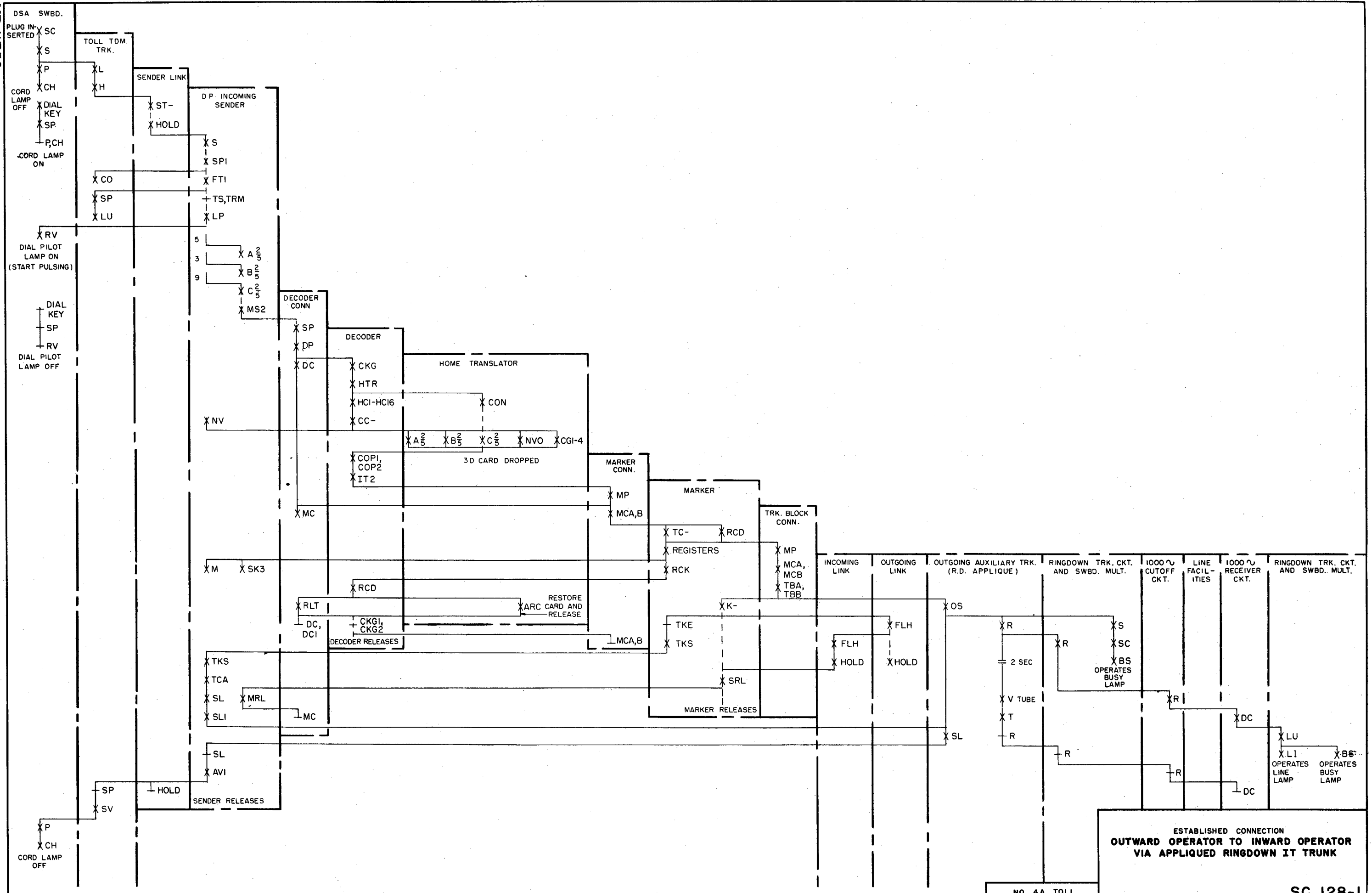
SC 122-1

ISSUE	1	11/17/51
DATE	5-19-51	



MP-11752

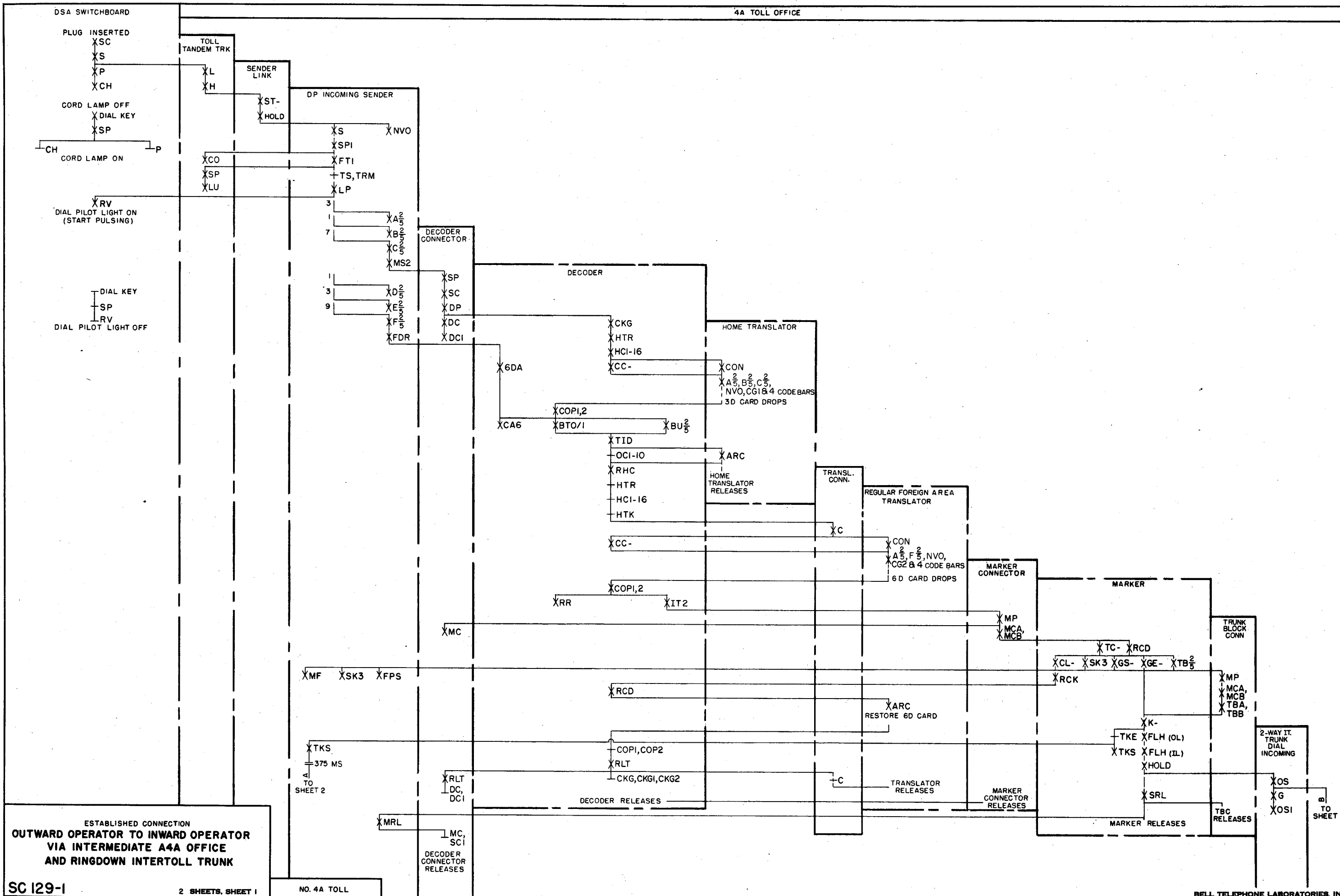
REVISION	1	1-1-57
DATE	1-2-57	



ESTABLISHED CONNECTION
 OUTWARD OPERATOR TO INWARD OPERATOR
 VIA APPLIED RINGDOWN IT TRUNK

NO. 4A TOLL

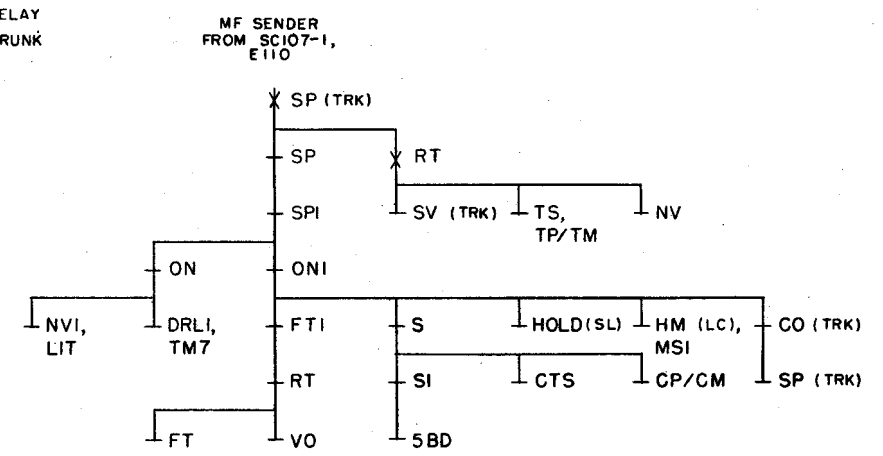
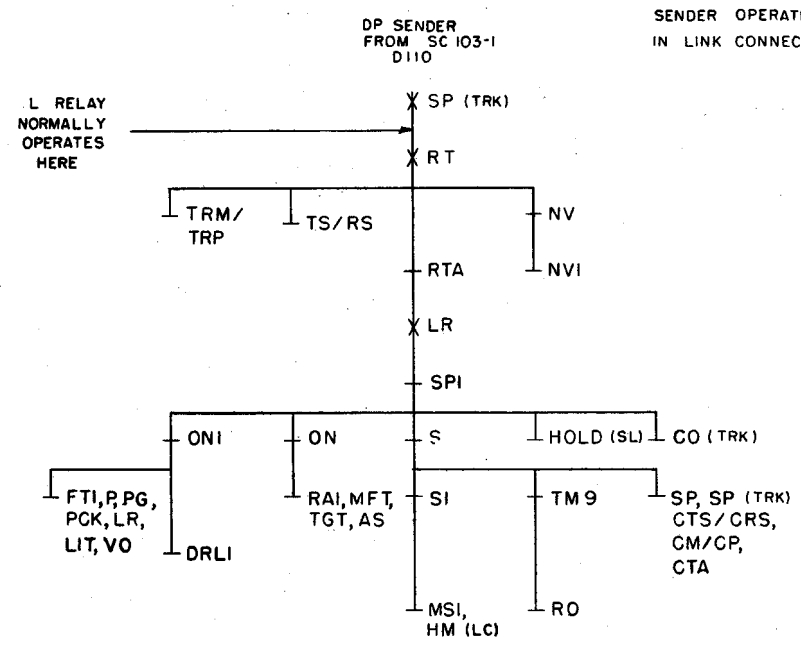
SC 128-1



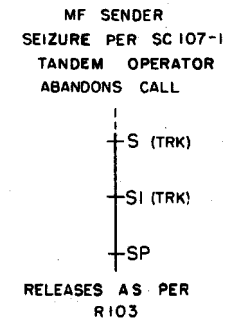
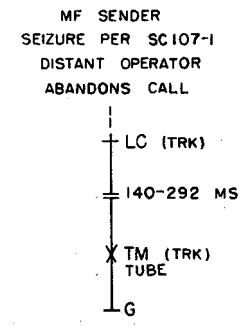
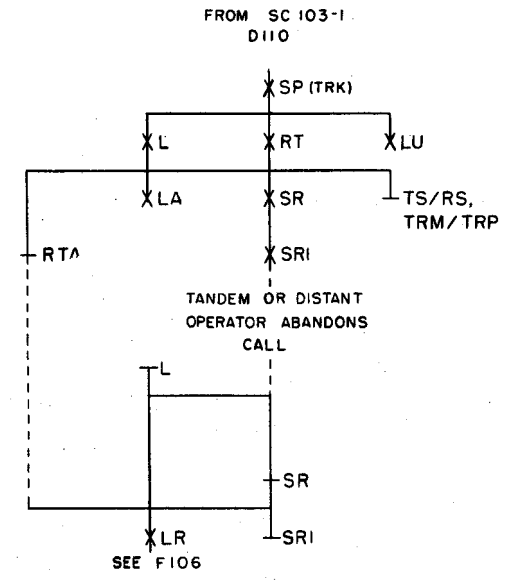
ESTABLISHED CONNECTION
 OUTWARD OPERATOR TO INWARD OPERATOR
 VIA INTERMEDIATE 4A OFFICE
 AND RINGDOWN INTERTOLL TRUNK

REVISION	1	12-28-57
DATE		

REVISION	1
DATE	12-26-51



SENDER OPERATIONS ON CALLS ABANDONED AFTER OPERATION OF SP RELAY IN INCOMING TRUNK AND UP TO DECODER SEIZURE



INCOMING SENDER CKT-DP	SD-68221-01	ISS-12
INCOMING SENDER CKT-MF	SD-68222-01	ISS-12
TANDEM TRUNK CKT.	SD-68315-01	ISS-7
2-WAY INTERTOLL TRUNK CKT-DP	SD-68232-01	ISS-9
2-WAY INTERTOLL TRUNK CKT-MF	SD-68233-01	ISS-11

ABANDONED CALLS
MF & DP SENDERS
SC 130-1

MASTER LEGEND FOR OPERATIONAL SKETCHES

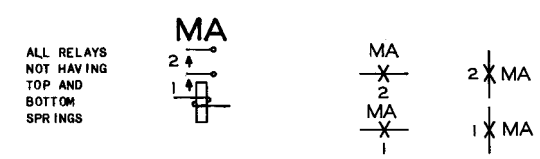
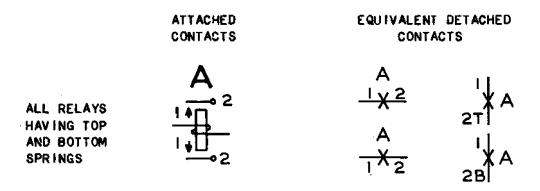
THE SYMBOLS AND CONVENTIONS USED ON OPERATIONAL SKETCHES (OS-) ARE THE SAME AS THOSE USED ON THE STANDARD CIRCUIT SCHEMATIC DRAWINGS (SD-) WITH THE FOLLOWING EXCEPTIONS:

1. ATTACHED CONTACTS MAY BE POSITIONED WITHOUT REGARD TO THEIR TOP OR BOTTOM LOCATIONS AS:

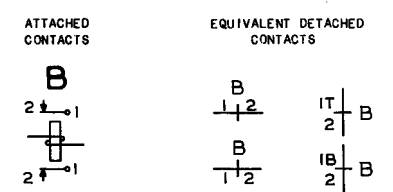


2. DETACHED CONTACT SYMBOLS ARE USED WHENEVER THEY AID IN SIMPLIFYING THE SKETCHES. THEY ARE SHOWN THUS:

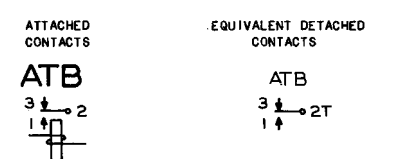
(A) MAKE CONTACTS:



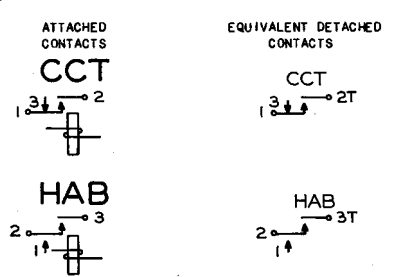
(B) BREAK CONTACTS:



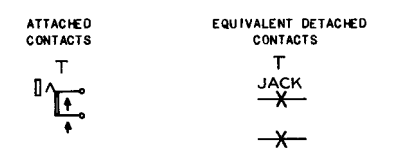
(C) TRANSFER CONTACTS:



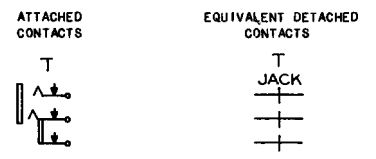
(D) OTHER CONTACTS:



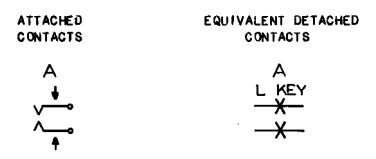
(E) JACK WITH MAKE CONTACTS:



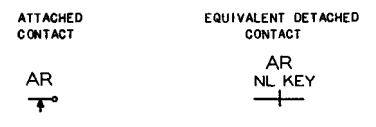
(F) JACK WITH BREAK CONTACTS:



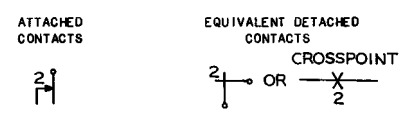
(G) LOCKING KEY WITH MAKE CONTACTS:



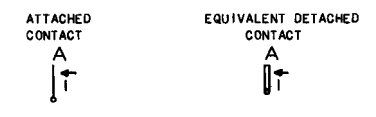
(H) NON-LOCKING KEY WITH BREAK CONTACT:



(J) CROSSBAR SELECTOR-TYPE SWITCH:



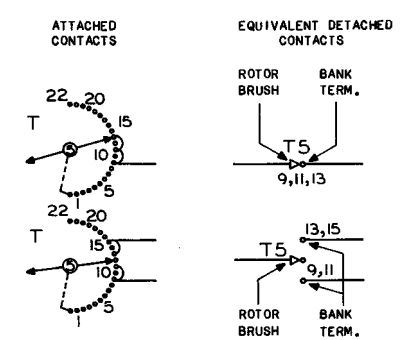
(K) READER INTERRUPTER CONTACT:



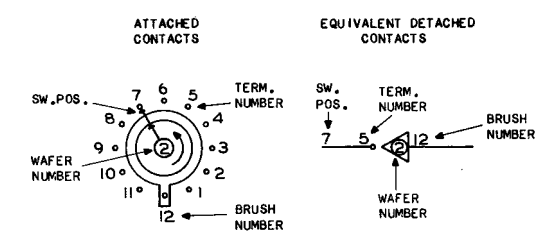
(L) TIMER CONTACT:



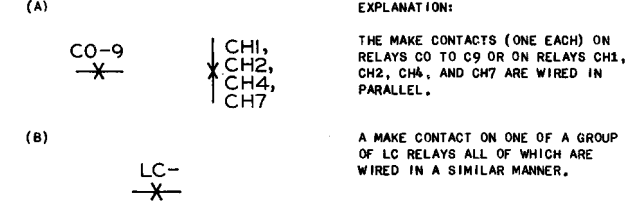
(M) 206 AND SIMILAR TYPE SELECTORS:



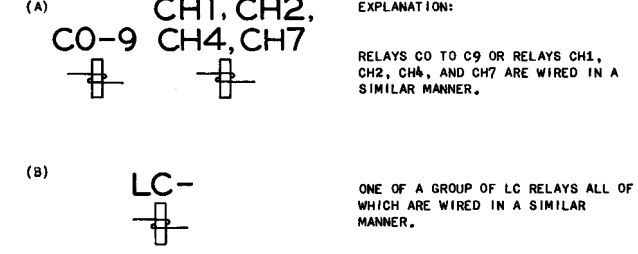
(N) WAFER SWITCH:



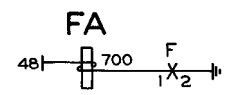
3. CONTACT DESIGNATION:



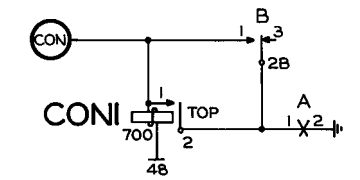
4. WINDING DESIGNATION:



5. BATTERY SYMBOL WITH THE NOMINAL VOLTAGE IS SHOWN THUS:

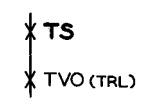


6. TROUBLE RECORD PUNCHES (OR LAMPS) ARE SHOWN BY A CIRCLE ENCLOSING THE PUNCH (OR LAMP) DESIGNATION. FOR EXAMPLE:



- IN GENERAL THE OHMS SYMBOL (Ω) USED ON CIRCUIT SCHEMATIC DRAWINGS IS OMITTED.
- IN GENERAL, STRAPPING OR MULTIPLE CONVENTIONS ARE OMITTED.
- CONTACT PROTECTION IS GENERALLY OMITTED.
- APPARATUS CODES FOR VACUUM TUBES ONLY ARE SHOWN.
- INDICATION OF INNER ENDS AND TERMINAL NUMBERING OF WINDINGS ARE OMITTED. HOWEVER ON POLAR RELAYS, WINDING TERMINAL NUMBERS AND POLARIZATION ARE SHOWN.
- POLAR RELAYS WITH BIASING SPRINGS ARE INDICATED BY BS FOLLOWING THE RELAY DESIGNATION. POLAR RELAYS WITHOUT BIASING SPRINGS ARE INDICATED BY NBS FOLLOWING THE RELAY DESIGNATION.
- SEQUENCE CHARTS ON OPERATIONAL SKETCHES:
 - SEQUENCE CHARTS ARE GENERALLY PROVIDED ON EACH OS. THESE DIFFER FROM THE SC'S MADE FOR A COMPLETE JOB OR CALL IN THE FOLLOWING MANNER:
 - ONLY A SUFFICIENT NUMBER OF RELAY MOVEMENTS ARE SHOWN WHICH PERMIT PROPER UNDERSTANDING OF THE OPERATING PATHS APPEARING ON THE OS.
 - THE DESIGNATIONS OF ALL APPARATUS FOR WHICH THE OPERATING PATHS ARE SHOWN ON THE OS ARE INDICATED LARGER AND HEAVIER THAN DESIGNATIONS IDENTIFYING OTHER APPARATUS.
 - PUNCH DESIGNATIONS ARE OMITTED.
 - COORDINATES ARE OMITTED.

(B) EXAMPLE:



EXPLANATION: THE CIRCUIT MOST FREQUENTLY USED IN A PARTICULAR SEQUENCE CHART IS IDENTIFIED BY AN ASTERISK OPPOSITE ITS SD NUMBER IN THE LIST OF DRAWINGS ABOVE THE TITLE BLOCK. NO CIRCUIT ABBREVIATIONS ARE SHOWN ON THE SEQUENCE CHART NEXT TO RELAYS ASSOCIATED WITH THIS CIRCUIT. THE CIRCUITS IN WHICH ALL OTHER RELAYS APPEAR ARE SHOWN IN BRACKETS ADJACENT TO THE RELAY DESIGNATIONS ON THE SEQUENCE CHART (SEE EXAMPLE).

TRANSLATOR CKT. SD-25802-01, ISS. 3
*TRANSVERTER CKT. SD-25754-01, ISS. 8

14. OPTIONS ARE DESCRIBED BY A NOTE AS SHOWN BELOW:

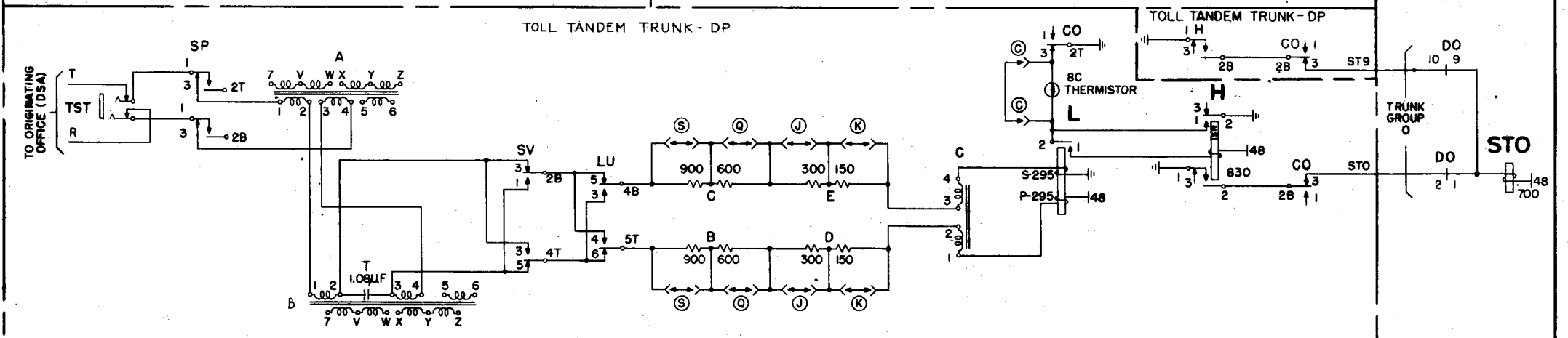
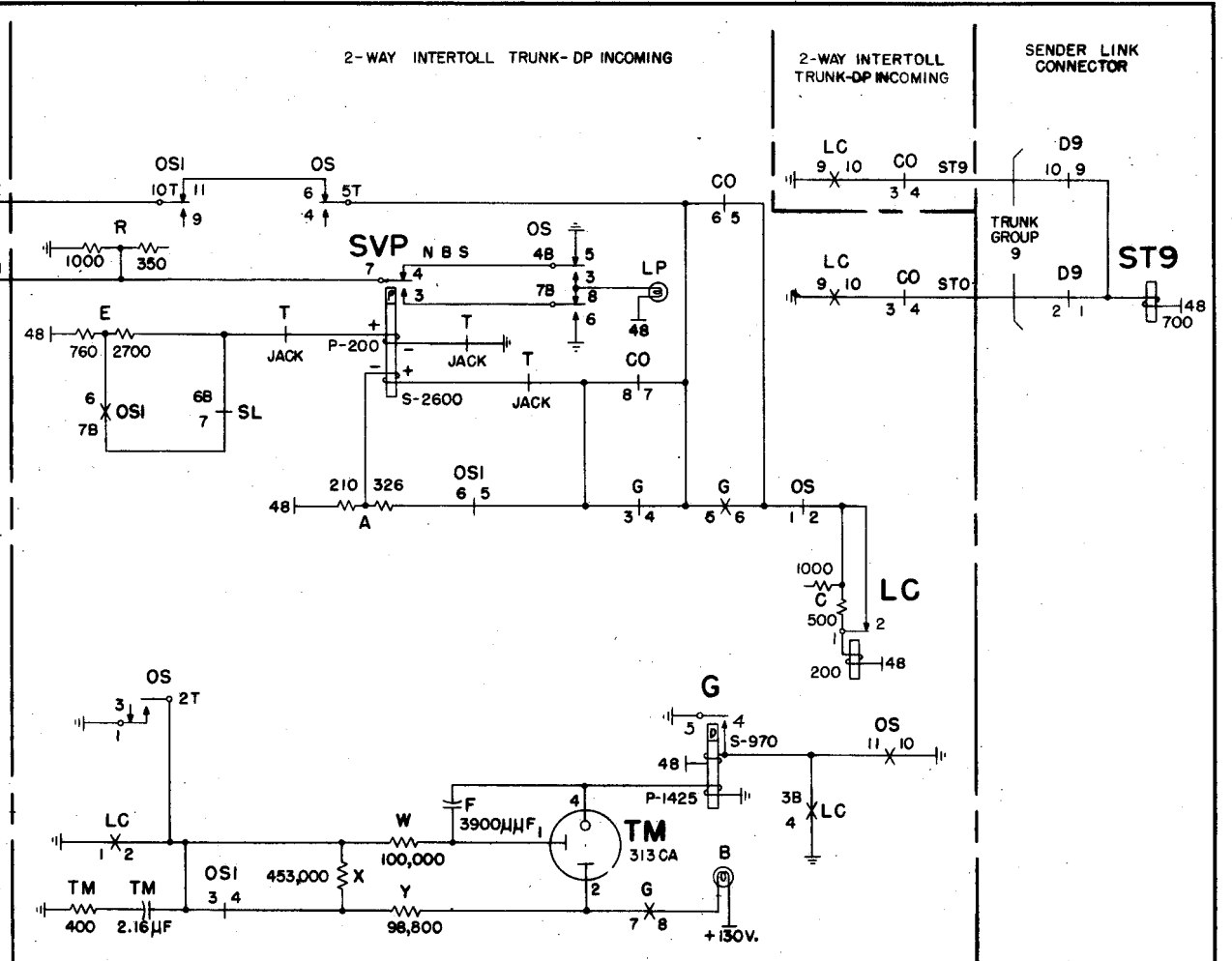
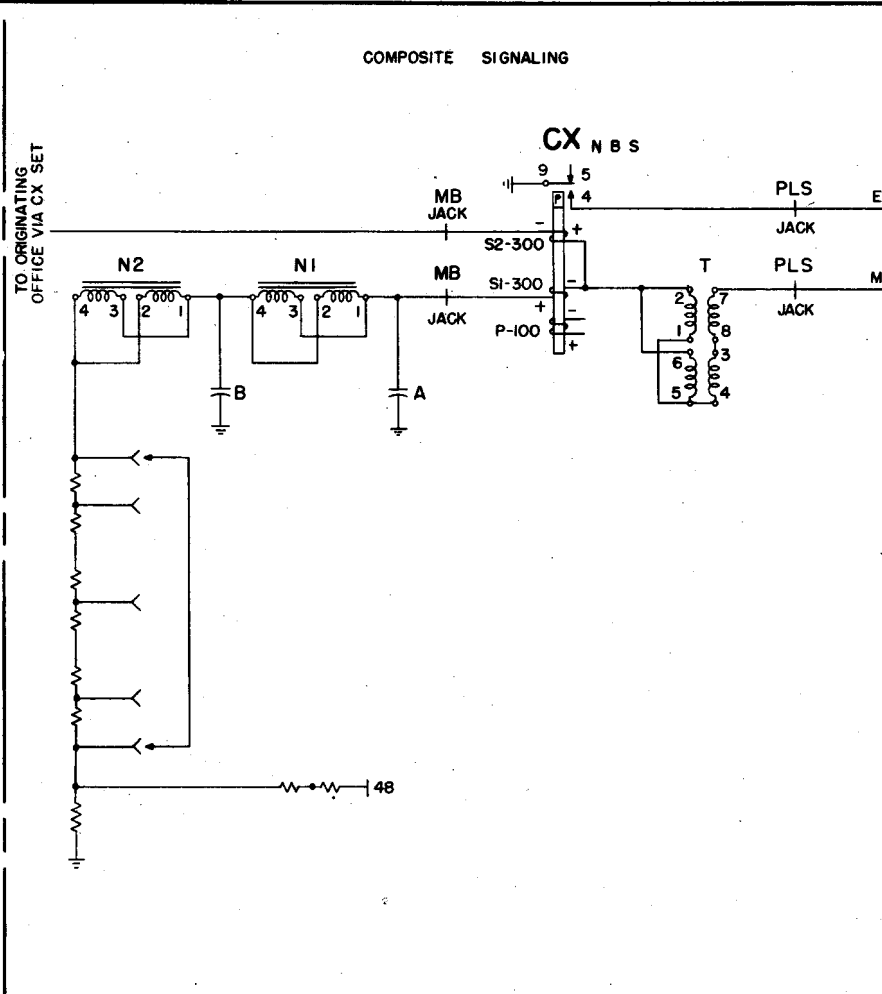
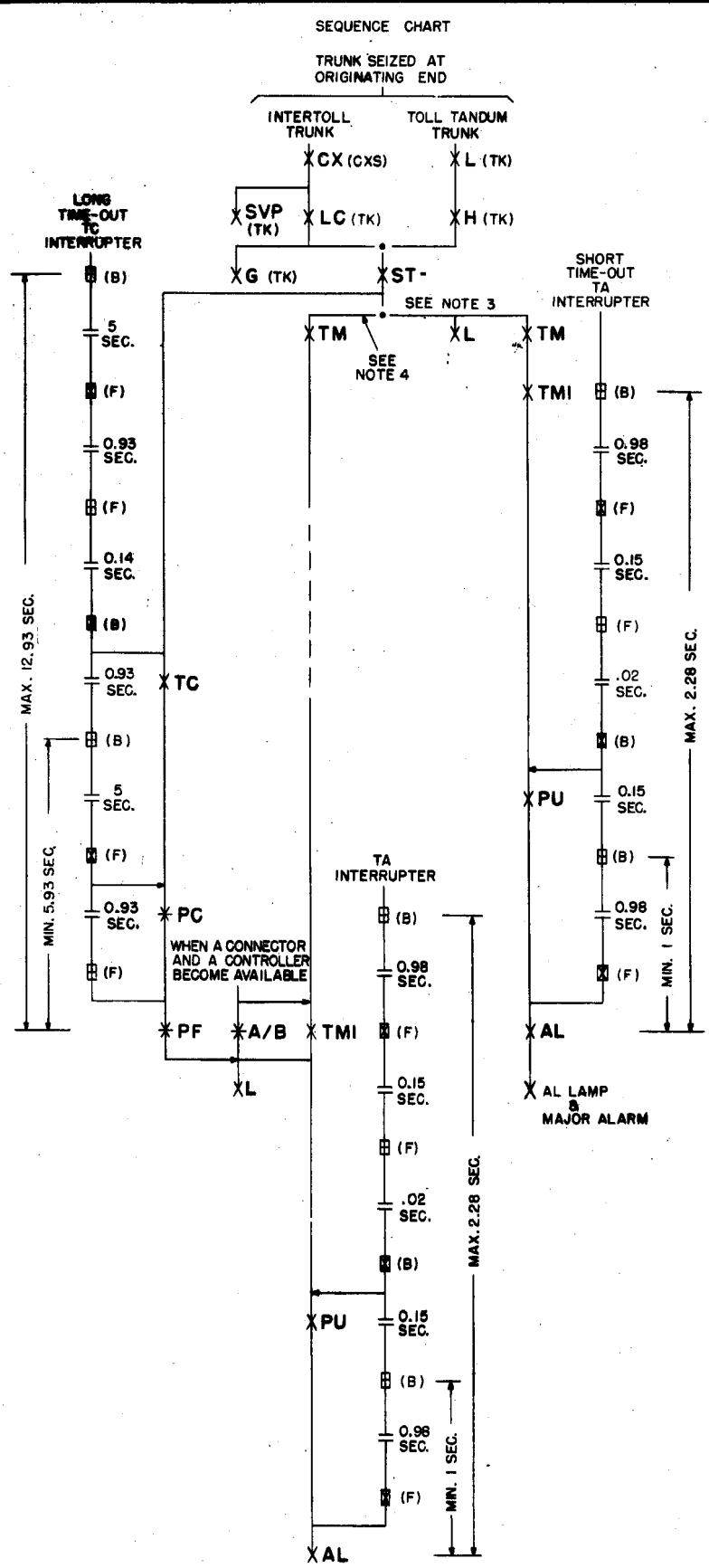
NOTE:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	OPERATION WITH INTERTOLL AND TWO-WAY TRUNKS	N	25579-01
B	NO OPERATION WITH INTERTOLL AND TWO-WAY TRUNKS	LOOPED LEADS	
E	WHEN AMA IS PROVIDED	FIG. 4	25579-01
F		ZY AND FIG. 12	

THIS NOTE IS INTERPRETED IN THE FOLLOWING MANNER:

- THE OS OPTION COLUMN LISTS THE LETTERS ARBITRARILY ASSIGNED TO FEATURES OR OPTIONS SHOWN ON THE PARTICULAR OS.
- THE FEATURE OR OPTION COLUMN BRIEFLY DESCRIBES THE FEATURES OR OPTIONS SPECIFIED ON THE OS.
- THE SD OPTION COLUMN LISTS THE SD OPTIONS CORRESPONDING TO THE OS OPTIONS WHEN APPLICABLE. THESE OPTIONS ARE ON THE PARTICULAR ISSUE OF THE SD LISTED OVER THE TITLE BOX ON THE OS. IN SOME CASES, MORE THAN ONE OPTION MAY BE SHOWN FOR A PARTICULAR FEATURE (SEE OS OPTIONS E AND F). THESE USUALLY RESULT FROM IMPROVEMENTS INCORPORATED ON B OR D ISSUES OF THE ASSOCIATED SD. THE OPTIONS LISTED MAY NOT APPEAR ON EARLIER ISSUES OF THE SD. IF THEY DO NOT APPEAR ON THE SD ISSUE AVAILABLE IN THE OFFICE, IT WILL BE NECESSARY TO DETERMINE BY COMPARISON OF THE CIRCUIT ARRANGEMENTS ON THE OS AND SD AVAILABLE WHICH OPTIONS ARE INSTALLED. IF THEY DO APPEAR ON THE SD AVAILABLE, THE OPTIONS INSTALLED CAN BE DETERMINED FROM THE OFFICE WIRING LISTS OR FROM THE RECORD OF FIGURES, WIRING AND APPARATUS CHANGES ON THE SD.
- THE SD COLUMN LISTS THE SD NUMBER ON WHICH THE OPTIONS DESCRIBED IN (C) APPEAR.

ISSUE	1	2	3	4	5	6	7	8	9	10
DATE	11-24-50									



NOTES

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	TO CHANGE SENDER LINK TIME-OUT INTERVAL FROM SHORT TO LONG TIME-OUT B TO PROVIDE LOCKOUT FOR LINK FRAMES SERVING ONE TYPE OF SENDER ONLY.	FIG. 11 X & M WIRING	68334-01
B	TO PROVIDE LOCKOUT ONLY FOR LINK FRAMES SERVING ONE TYPE OF SENDER ONLY.	FIG. 10 X WIRING	
C	WHEN TRUNK CABLE CONDUCTORS ARE LESS THAN FIVE MILES IN LENGTH.	Z A	68315-01
S,Q,J,K	TO REGULATE TRUNK RESISTANCE	S,Q,J,K WIRING	

- TO SENDER LINK FRAME USING SAME CONTROLLER CONNECTOR.
- ASSUMES ONE OR MORE CONTROLLER CONNECTORS AND CONTROLLERS AVAILABLE.
- ASSUMES A CONTROLLER CONNECTOR AND A LINK CONTROLLER ARE NOT AVAILABLE.

SENDER LINK AND CONNECTOR
TRUNK START AND
CONTROLLER CONNECTOR PREFERENCE

2 SHEETS, SHEET 1 MP-11612

ISSUE	DATE
1	1/15/55
2	1/15/55
3	1/15/55
4	1/15/55
5	1/15/55
6	1/15/55
7	1/15/55
8	1/15/55
9	1/15/55
10	1/15/55

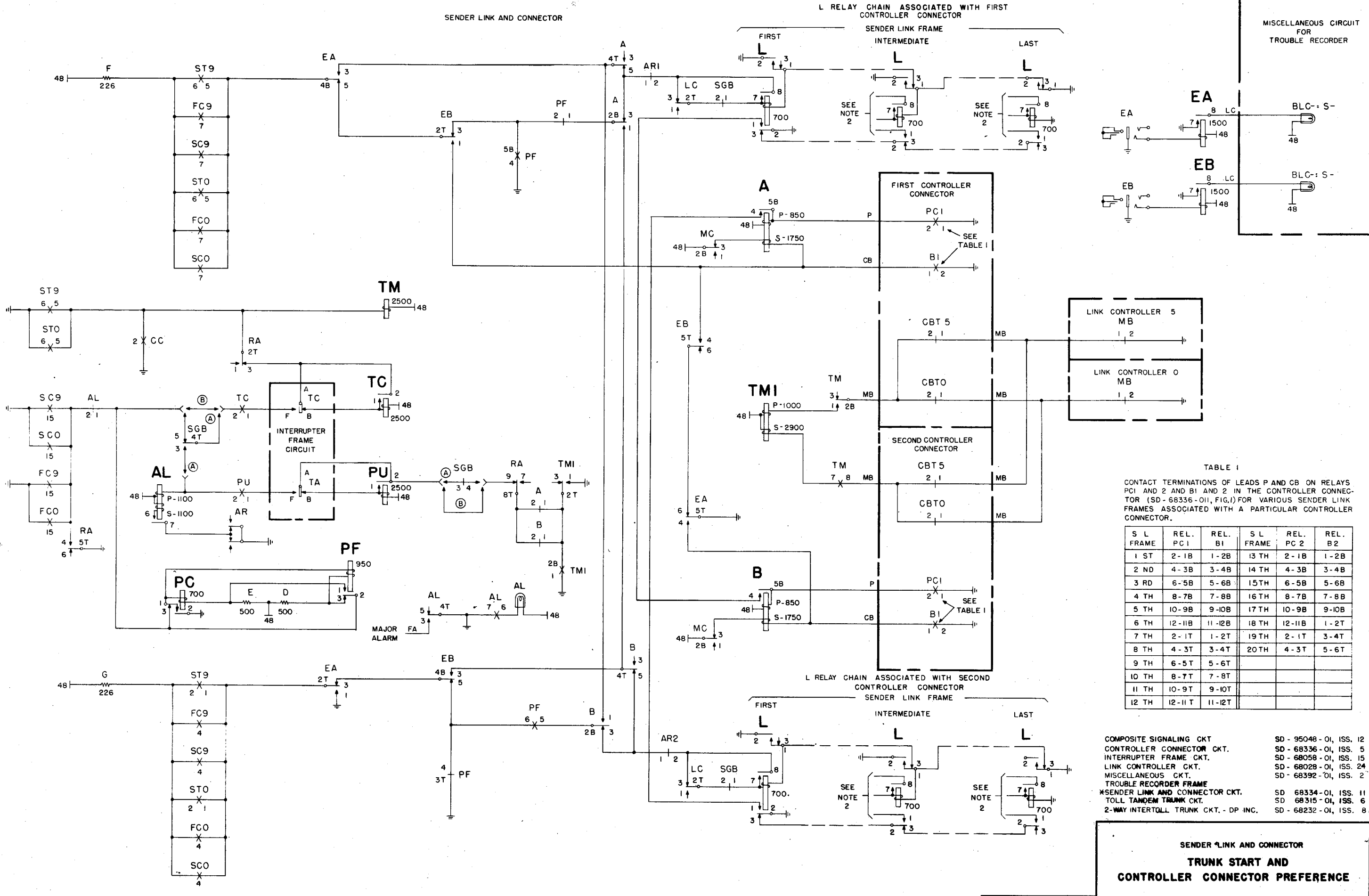


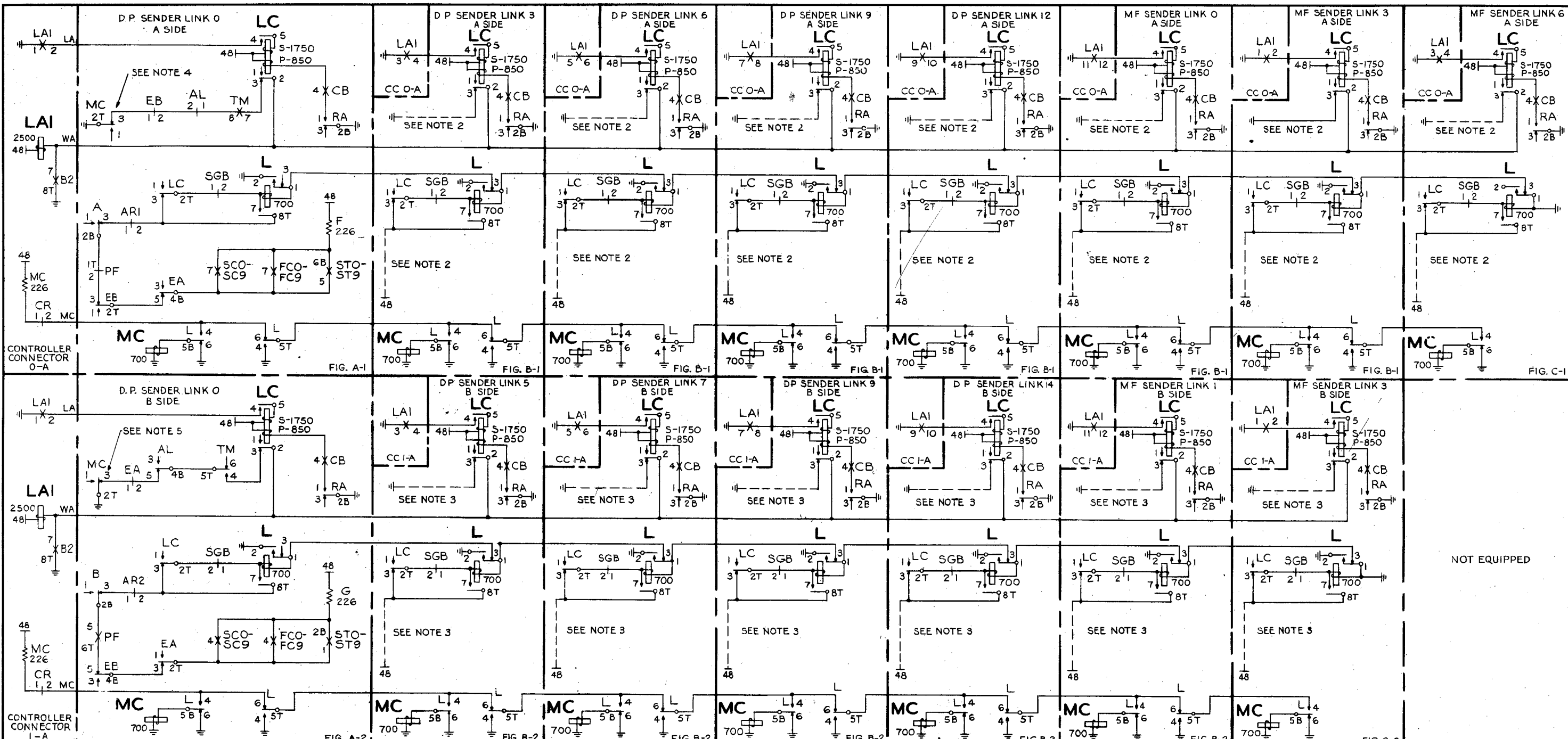
TABLE I
CONTACT TERMINATIONS OF LEADS P AND CB ON RELAYS PC1 AND B1 AND 2 IN THE CONTROLLER CONNECTOR (SD-68336-01, FIG.1) FOR VARIOUS SENDER LINK FRAMES ASSOCIATED WITH A PARTICULAR CONTROLLER CONNECTOR.

S L FRAME	REL. PC1	REL. B1	S L FRAME	REL. PC 2	REL. B 2
1 ST	2-1B	1-2B	13 TH	2-1B	1-2B
2 ND	4-3B	3-4B	14 TH	4-3B	3-4B
3 RD	6-5B	5-6B	15 TH	6-5B	5-6B
4 TH	8-7B	7-8B	16 TH	8-7B	7-8B
5 TH	10-9B	9-10B	17 TH	10-9B	9-10B
6 TH	12-11B	11-12B	18 TH	12-11B	1-2T
7 TH	2-1T	1-2T	19 TH	2-1T	3-4T
8 TH	4-3T	3-4T	20 TH	4-3T	5-6T
9 TH	6-5T	5-6T			
10 TH	8-7T	7-8T			
11 TH	10-9T	9-10T			
12 TH	12-11T	11-12T			

- COMPOSITE SIGNALING CKT SD - 95048 - 01, ISS. 12
- CONTROLLER CONNECTOR CKT. SD - 68336 - 01, ISS. 5
- INTERRUPTER FRAME CKT. SD - 68058 - 01, ISS. 15
- LINK CONTROLLER CKT. SD - 68028 - 01, ISS. 24
- MISCELLANEOUS CKT. SD - 68392 - 01, ISS. 2
- TROUBLE RECORDER FRAME
- *SENDER LINK AND CONNECTOR CKT. SD 68334-01, ISS. 11
- TOLL TANDEM TRUNK CKT. SD 68315-01, ISS. 6
- 2-WAY INTERTOLL TRUNK CKT. - DP INC. SD - 68232 - 01, ISS. 8

SENDER LINK AND CONNECTOR
TRUNK START AND
CONTROLLER CONNECTOR PREFERENCE

REVISION	1	12-27-57
DATE	5-23-57	



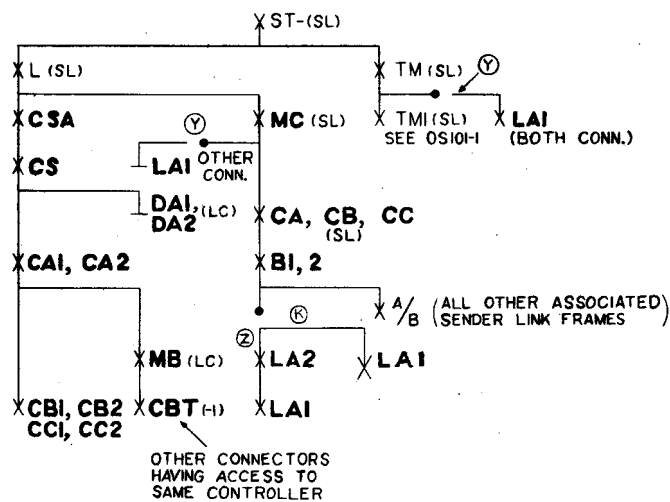
CONT. CONN.	D P SENDER LINK	FIGURE	DP SENDER LINK	FIGURE	DP SENDER LINK	FIGURE	DP SENDER LINK	FIGURE	SENDER LINK	FIGURE	MF SENDER LINK	FIGURE	MF SENDER LINK	FIGURE	MF SENDER LINK	FIGURE
2A	1	A-1	4	B-1	7	B-1	10	B-1	DP 13	B-1	1	B-1	4	7	C-1	
3-A	1	A-2	3	B-2	8	B-2	10	B-2	DP 12	B-2	2	B-2	4	6	C-2	
4A	2	A-1	5	B-1	8	B-1	11	B-1	DP 14	B-1	2	B-1	5	C-1	NOT EQUIPPED	
5-A	2	A-2	4	B-2	6	B-2	11	B-2	DP 13	B-2	0	B-2	5	B-2	7	C-2
O-B	15	A-1	18	B-1	21	B-1	24	B-1	DP 27	B-1	8	B-1	11	B-1	14	C-1
1-B	15	A-2	20	B-2	22	B-2	24	B-2	DP 29	B-2	9	B-2	11	C-2	NOT EQUIPPED	
2-B	16	A-1	19	B-1	22	B-1	25	B-1	DP 28	B-1	9	B-1	12	B-1	15	C-1
3-B	16	A-2	18	B-2	23	B-2	25	B-2	DP 27	B-2	10	B-2	12	B-2	14	C-2
4-B	17	A-1	20	B-1	23	B-1	26	B-1	DP 29	B-1	10	B-1	13	C-1	NOT EQUIPPED	
5-B	17	A-2	19	B-2	21	B-2	26	B-2	DP 28	B-2	8	B-2	13	B-2	15	C-2
O-C	30	A-1	33	B-1	36	B-1	39	B-1	DP 42	B-1	17	B-1	20	B-1	23	C-1
1-C	30	A-2	35	B-2	37	B-2	39	B-2	MF 16	B-2	18	B-2	20	C-2	NOT EQUIPPED	
2-C	31	A-1	34	B-1	37	B-1	40	B-1	DP 43	B-1	18	B-1	21	B-1	24	C-1
3-C	31	A-2	33	B-2	36	B-2	40	B-2	DP 42	B-2	19	B-2	21	B-2	23	C-2
4-C	32	A-1	35	B-1	38	B-1	41	B-1	MF 16	B-1	19	B-1	22	C-1	NOT EQUIPPED	
5-C	32	A-2	34	B-2	36	B-2	41	B-2	DP 43	B-2	17	B-2	22	B-2	24	C-2

- NOTES:
- PREFERENCE CHAIN IS ARRANGED FOR 44 DP SENDER LINK AND 25 MF SENDER LINK SERVED BY 18 CONTROLLER CONNECTORS IN 3 GROUPS OF 6 EACH. EACH GROUP IS SERVED BY 6 LINK CONTROLLERS.
 - THROUGH SAME SEQUENCE AS DP SENDER LINK 0 FOR CONTROLLER CONNECTOR O-A.
 - THROUGH SAME SEQUENCE AS DP SENDER LINK 0 FOR CONTROLLER CONNECTOR I-A.
 - THROUGH CONTACTS OF MC RELAY ASSOCIATED WITH THE SECOND OR "B" SIDE OF THE SDR. LINK FRAME.
 - THROUGH CONTACTS OF MC RELAY ASSOCIATED WITH THE FIRST OR "A" SIDE OF THE SDR. LINK FRAME.

CONTROLLER CONNECTOR CKT. SD-68336-01, 1SS.5
 SENDER LINK AND CONNECTOR CKT. SD-68334-01, 1SS.11

**SENDER LINK AND CONNECTOR
TYPICAL PREFERENCE CHAIN**

SEQUENCE CHART



NOTES:
1. TO OTHER ASSOCIATED MC RELAYS.

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
Y	ACCESS REQUIRED TO TWELVE OR LESS SENDER LINK FRAMES (MFF DISC)	Y, M	
Z	ACCESS REQUIRED TO MORE THAN TWELVE (MFR) SENDER LINK FRAMES (DISC)	Z	68336-01
K	LINK FRAME TRAFFIC LOCKOUT WITH ACCESS TO 1 OR LESS FRAMES (STD)	K	

TABLE 1

CONTACT TERMINATIONS OF LEAD LA ON RELAYS LA1 & LA2 IN THE CONTROLLER CONNECTOR (SD-68336-01, FIG.1) FOR VARIOUS SENDER LINK FRAMES ASSOCIATED WITH A PARTICULAR CONTROLLER CONNECTOR.

S.L. FR.	REL. FR. LA1	S.L. FR.	REL. FR. LA2
1	ST-2-1B	13	TH-2-1B
2	ND-4-3B	14	TH-4-3B
3	RD-6-5B	15	TH-6-5B
4	TH-8-7B	16	TH-8-7B
5	TH-10-9B	17	TH-10-9B
6	TH-12-11B	18	TH-2-1T
7	TH-2-1T	19	TH-4-3T
8	TH-4-3T	20	TH-6-5T
9	TH-6-5T		
10	TH-8-7T		
11	TH-10-9T		
12	TH-12-11T		
Y M			ABOVE ASSIGNMENT Z OPTION ONLY

* CONTROLLER CONNECTOR CKT. SD-68336-01, ISS.7
LINK CONTROLLER CKT. SD-68028-01, ISS.24
MISC. CKT. FOR TROUBLE RECORDER SD-68392-01, ISS.2
SENDER LINK AND CONNECTOR CKT. SD-68334-01, ISS.11

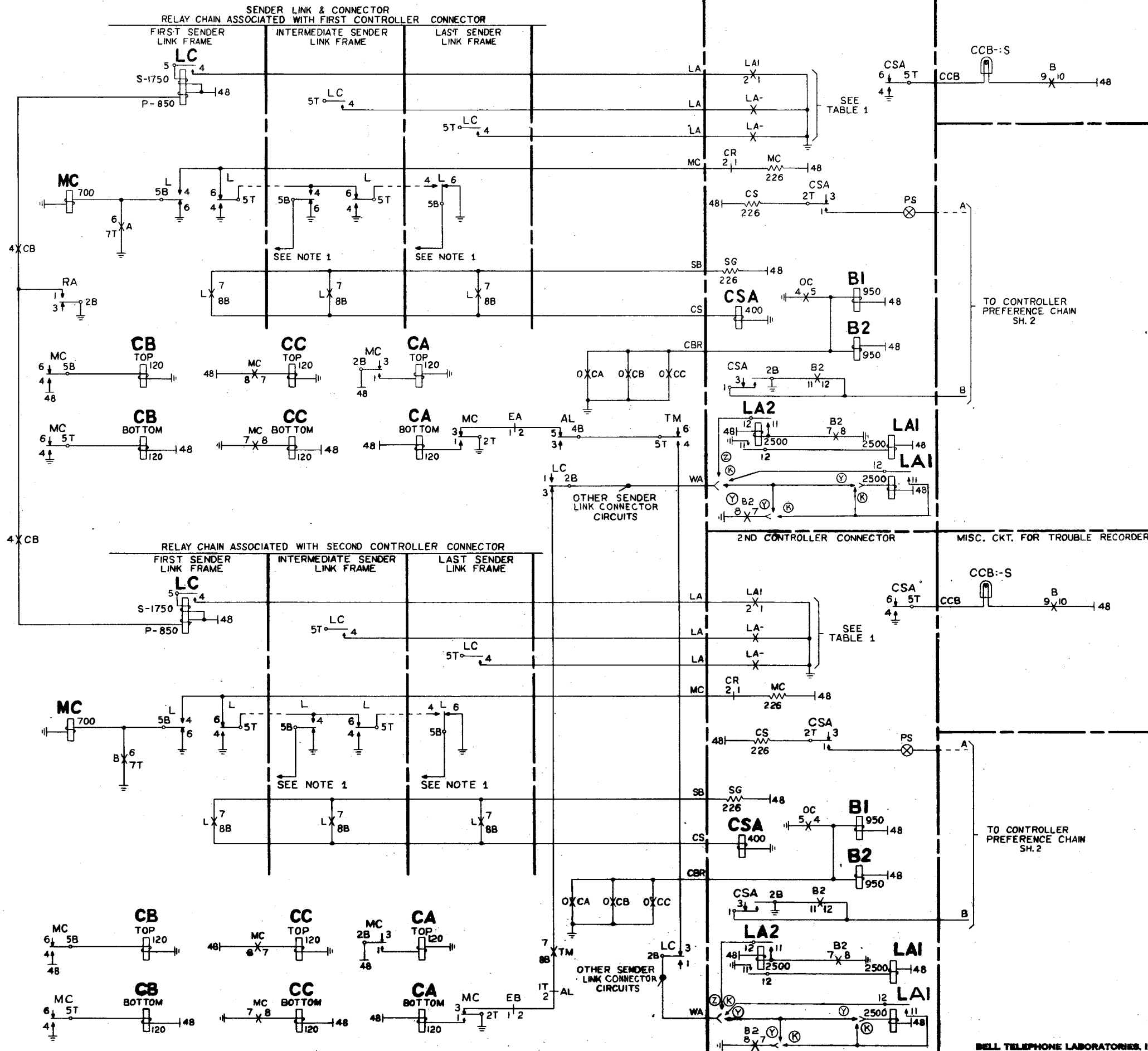
CONTROLLER CONNECTOR SEIZURE AND LINK CONTROLLER PREFERENCE

OS 103-1

2 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS SUP. FROM MP-11614



ISSUE	DATE
1	7-16-51

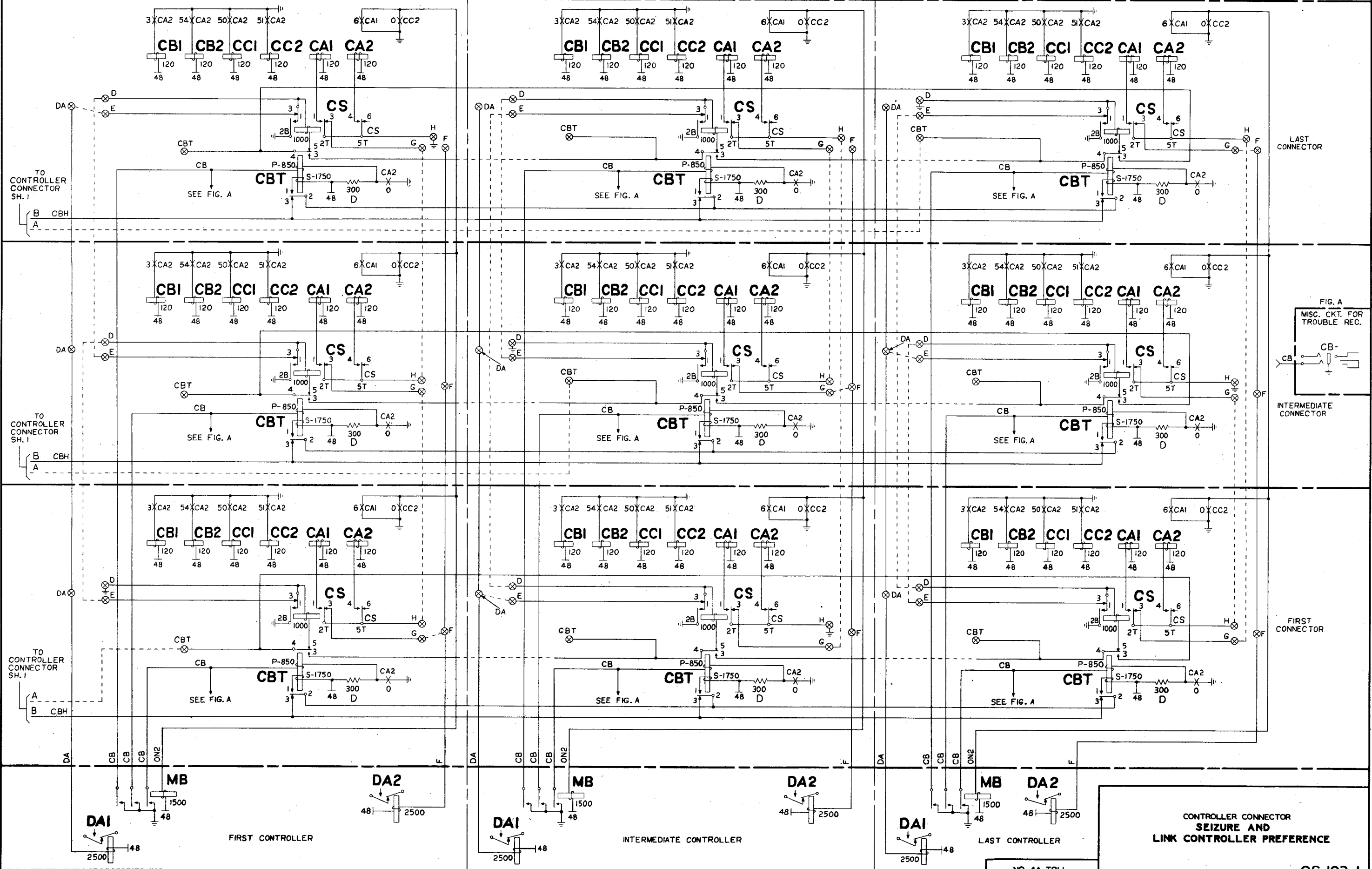
2 SHEETS, SHEET 1

MP-11614

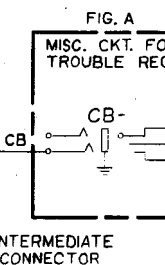
BELL TELEPHONE LABORATORIES, INC. PRINTED IN U.S.A.

ISSUE	1	REV.	
DATE	7-16-51		

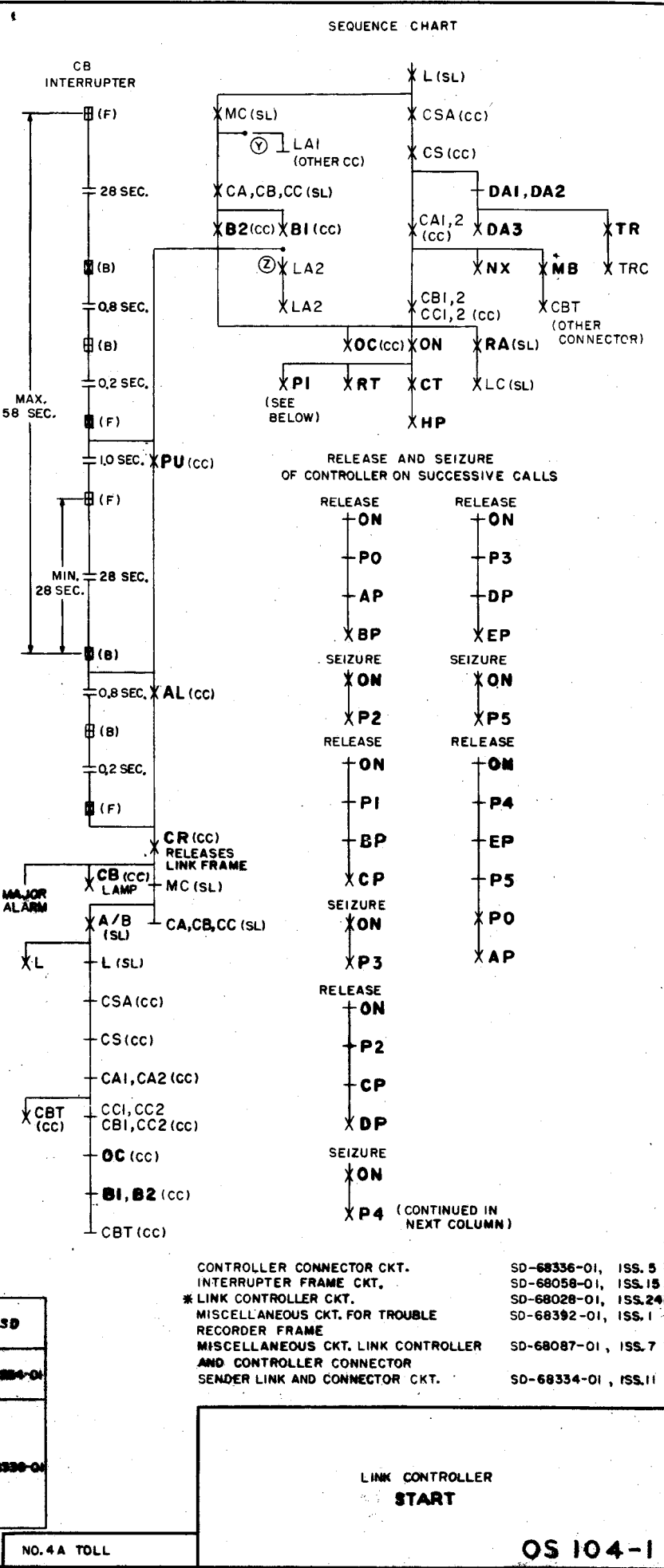
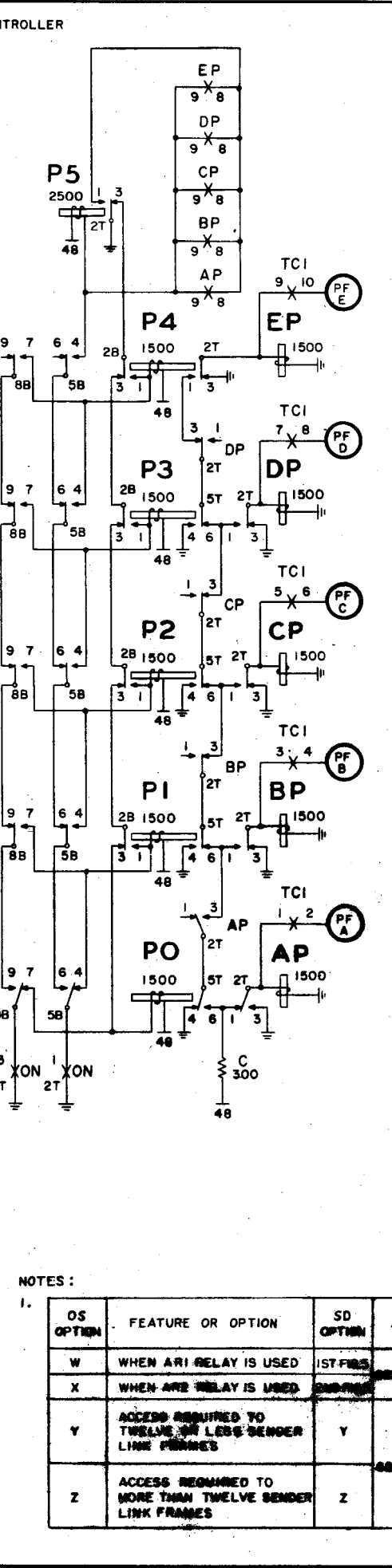
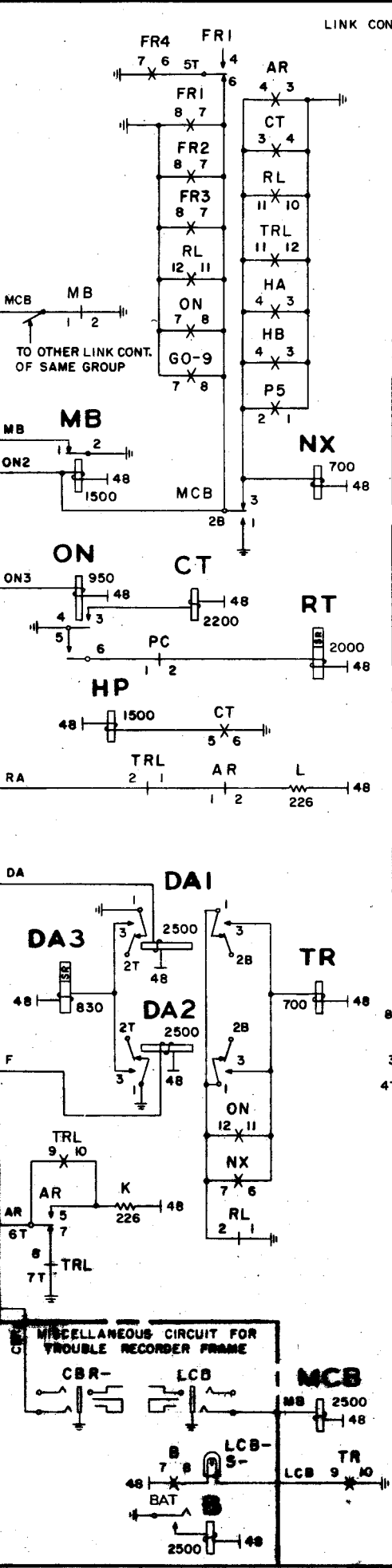
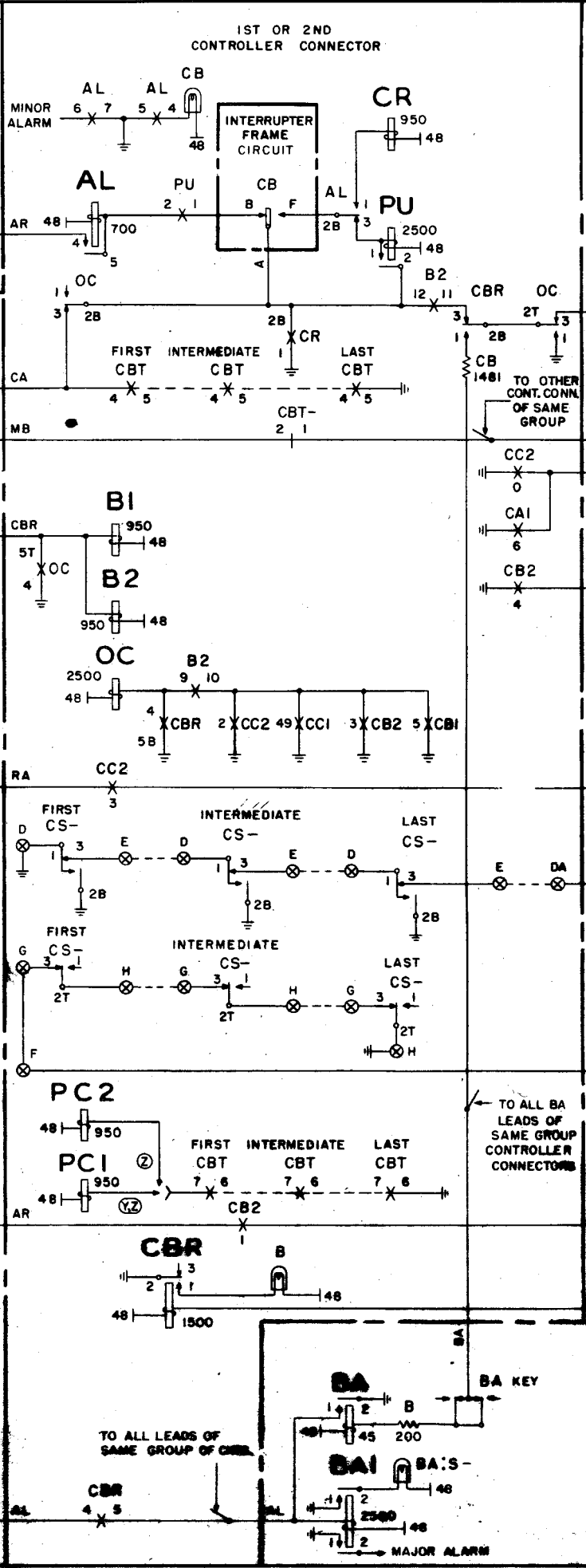
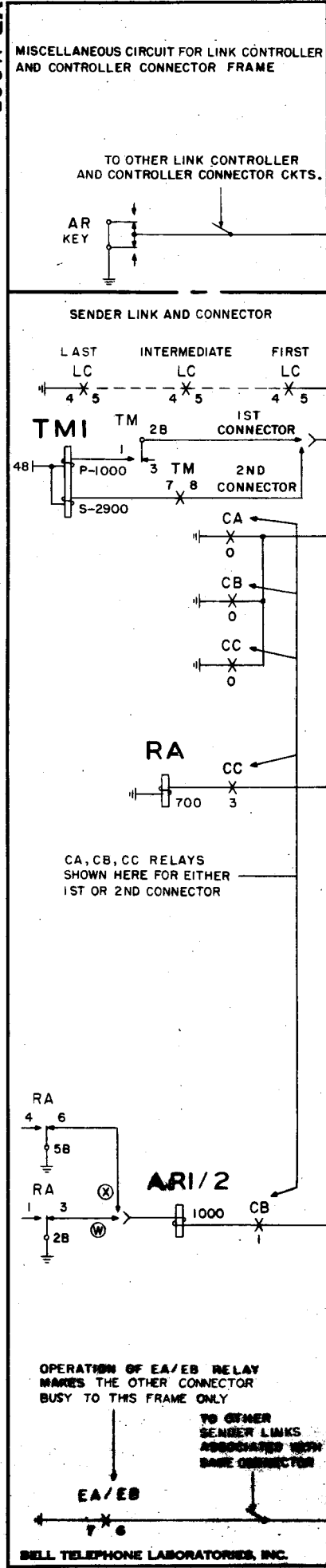
CONTROLLER PREFERENCE CHAIN IN CONTROLLER CONNECTOR



LAST CONNECTOR



FIRST CONNECTOR



MP-11615

ISSUE	1
DATE	6-7-57

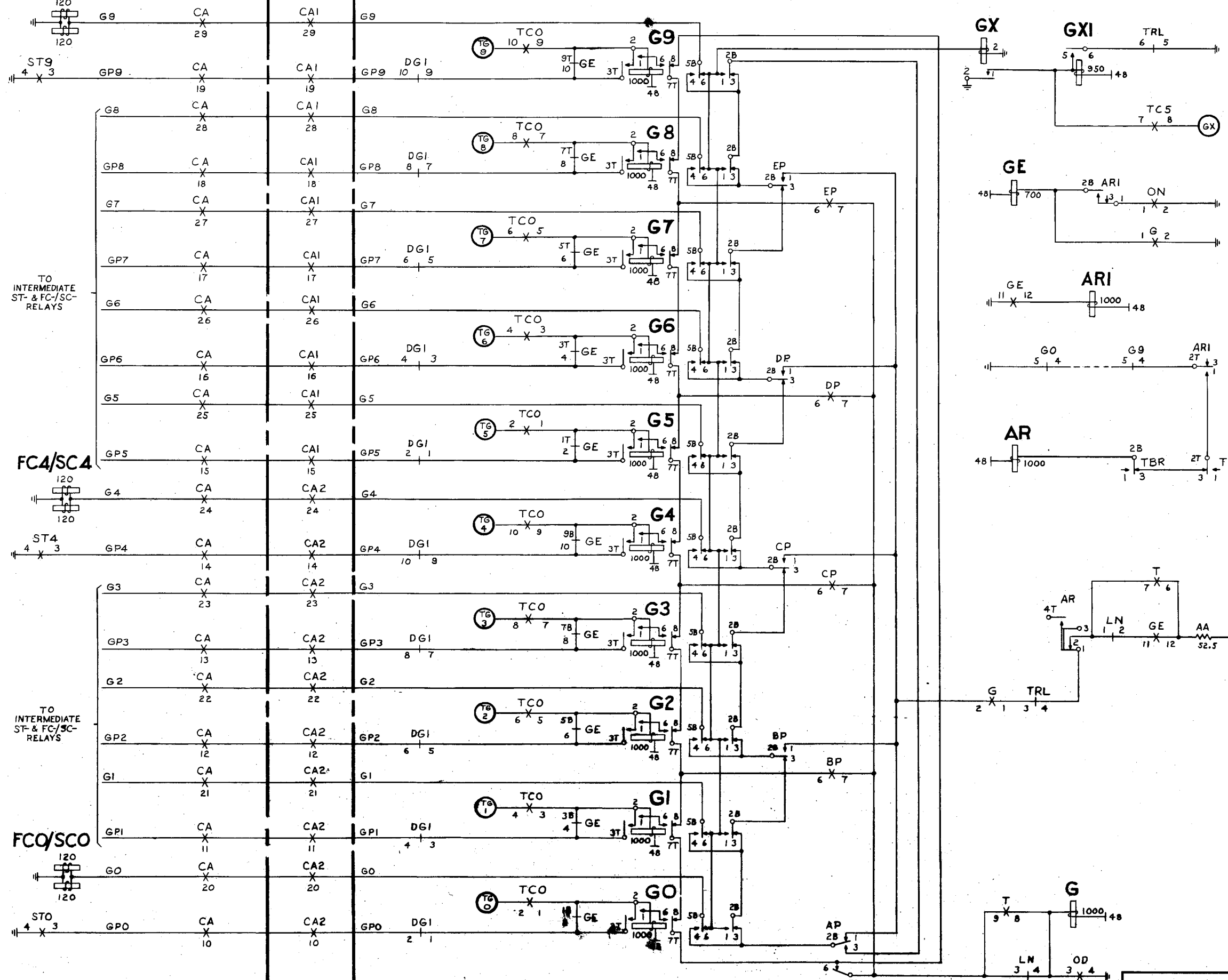
SENDER LINK & CONNECTOR FC9/SC9

CA RELAYS ASSOCIATED WITH 1ST CONTROLLER CONNECTOR OR WITH 2ND CONTROLLER CONNECTOR

1ST OR 2ND CONTROLLER CONNECTOR

LINK CONTROLLER

SEQUENCE CHART



TO INTERMEDIATE ST- & FC/SC-RELAYS

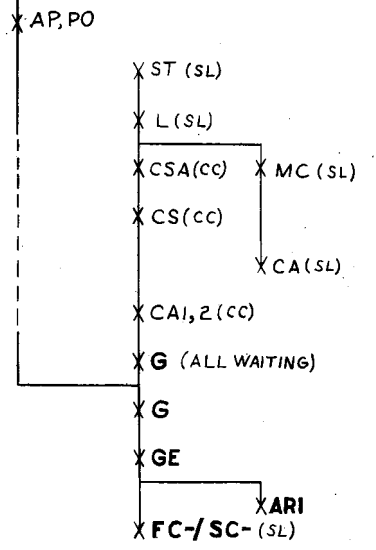
TO INTERMEDIATE ST- & FC/SC-RELAYS

FC0/SC0

ST0

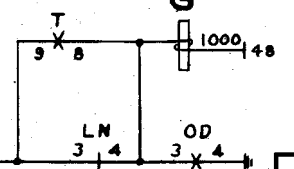
BELL TELEPHONE LABORATORIES, INC. PRINTED IN U.S.A.

THE OPERATED AP TO EP RELAY CONTROLS STARTING POINT IN G RELAY CHAIN. THIS CALL ASSUMES AP AND PO OPERATED



CONTROLLER CONNECTOR CKT. SD-68336-01, ISS. 5
 * LINK CONTROLLER CKT. SD-68028-01, ISS. 24
 SENDER LINK AND CONNECTOR CKT. SD-68334-01, ISS. 11

LINK CONTROLLER TRUNK GROUP SELECTION

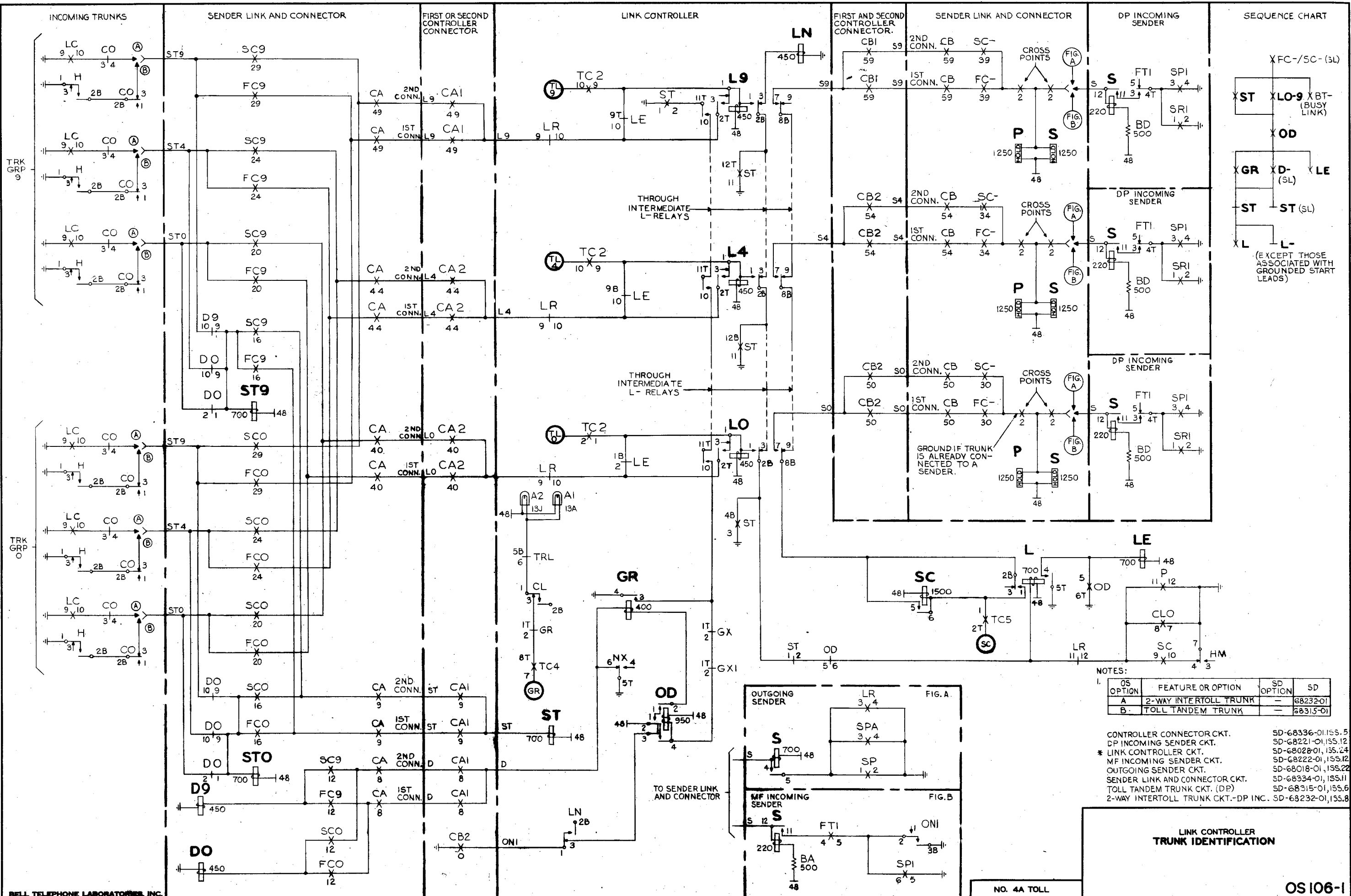


NO. 4A TOLL

OS105-1

ORDER AS BSP ITEM MP-11615

ISSUE	DATE
1	12/21/51
2	6-10-57



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	2-WAY INTERTOLL TRUNK	-	68232-01
B	TOLL TANDEM TRUNK	-	68315-01

- CONTROLLER CONNECTOR CKT. SD-68336-01,ISS.5
- DP INCOMING SENDER CKT. SD-68221-01,ISS.12
- * LINK CONTROLLER CKT. SD-68028-01,ISS.24
- MF INCOMING SENDER CKT. SD-68222-01,ISS.12
- OUTGOING SENDER CKT. SD-68018-01,ISS.22
- SENDER LINK AND CONNECTOR CKT. SD-68334-01,ISS.11
- TOLL TANDEM TRUNK CKT. (DP) SD-68315-01,ISS.6
- 2-WAY INTERTOLL TRUNK CKT.-DP INC. SD-68232-01,ISS.8

LINK CONTROLLER TRUNK IDENTIFICATION

NO. 4A TOLL

OS 106-1

TWO-WAY INTERTOLL TRUNK

SENDER LINK AND CONNECTOR

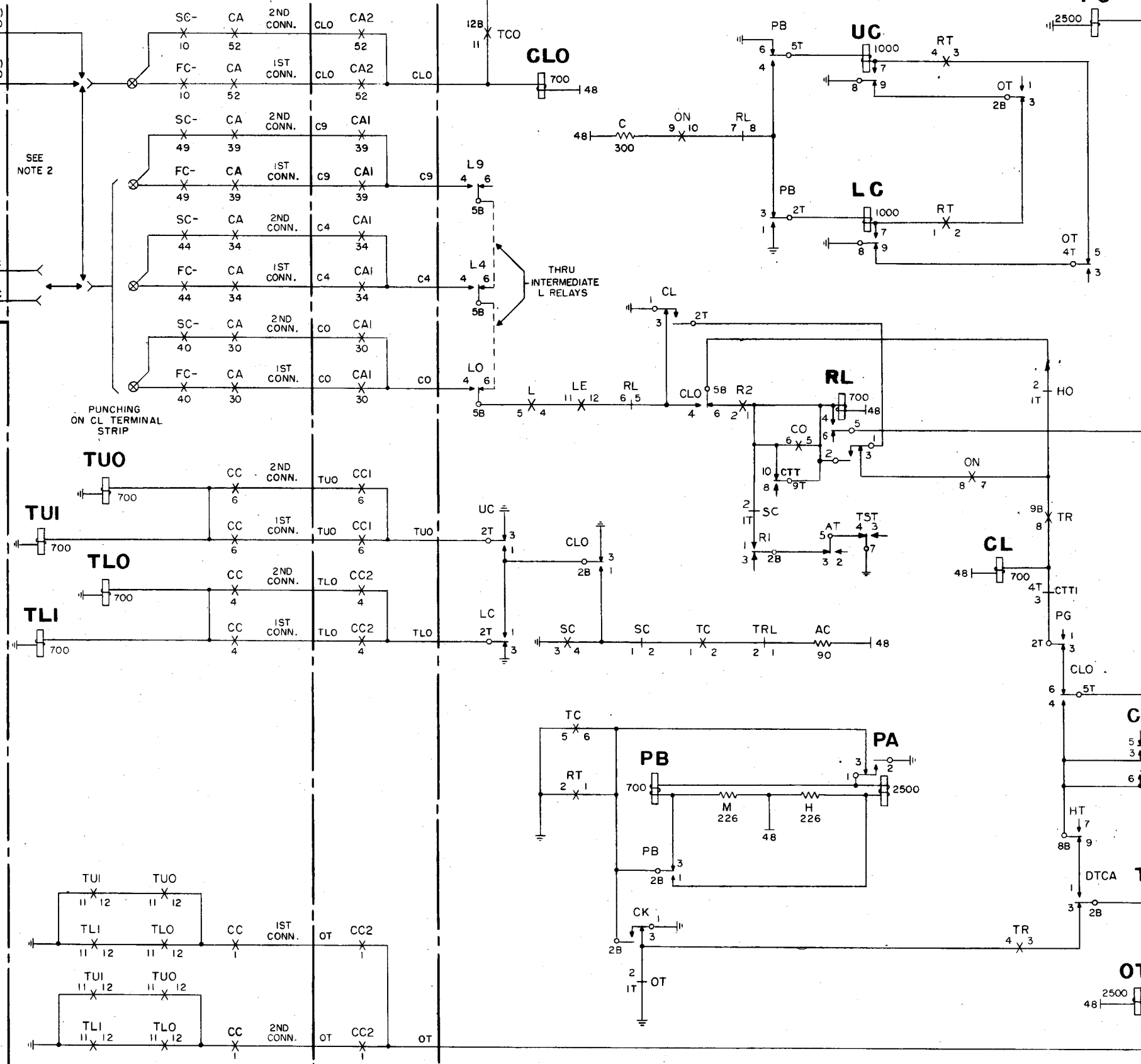
CONTROLLER CONNECTOR

LINK CONTROLLER

MISCELLANEOUS CIRCUIT TROUBLE RECORDER FRAME (LINK CONTROLLER CANCEL TEST CKT.)

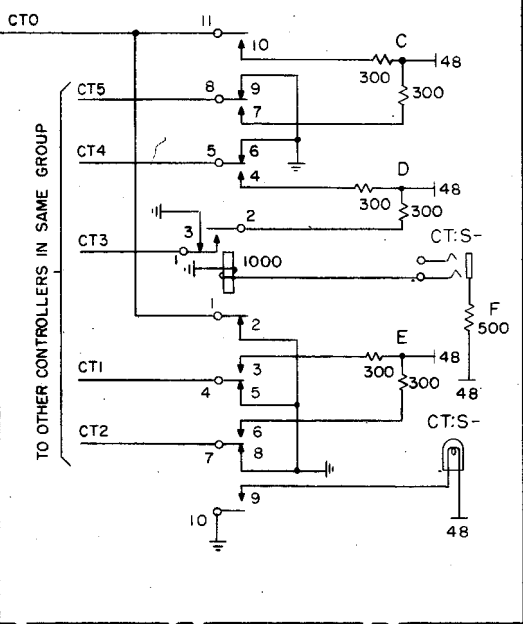
CT:S-

NOTES
 1 "V" WIRING (SD-68028-01) EMPLOYED ON T-RELAY CHAIN PROVIDING LOWER TO HIGHER NUMBER PREFERENCE ON EVEN NUMBERED CONTROLLERS.
 2 WHEN CONNECTION IS MADE TO A 2-WAY INTERTOLL TRK. OR TOLL TANDEM TRK., THE OPERATING PATH OF THE CLO RELAY IS COMPLETED WITHIN THE SENDER LINK AND CONNECTOR CIRCUIT BY CROSS CONNECTIONS ON THE CL TERMINAL STRIP. FOR A 2-WAY TRK. THE OPERATION OF THE CLO RELAY IS UNDER THE CONTROL OF THE LC RELAY IN THE TRUNK CIRCUIT.



CONTROLLER CONNECTOR CKT. SD-68336-01, ISS. 5
 *LINK CONTROLLER CKT. SD-68028-01, ISS. 24
 MISC. CKT. TROUBLE RECORDER FRAME SD-68392-01, ISS. 2
 SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS. 11
 2-WAY INTERTOLL TRK. CKT.-DP INCOMING SD-68232-01, ISS. 8
 2-WAY INTERTOLL TRK. CKT.-MF INCOMING SD-68233-01, ISS. 9

LINK CONTROLLER UPPER OR LOWER PREFERENCE CHANGE "V" WIRING



ISSUE	1
REVISED	2, 3, 4
DATE	6-15-51

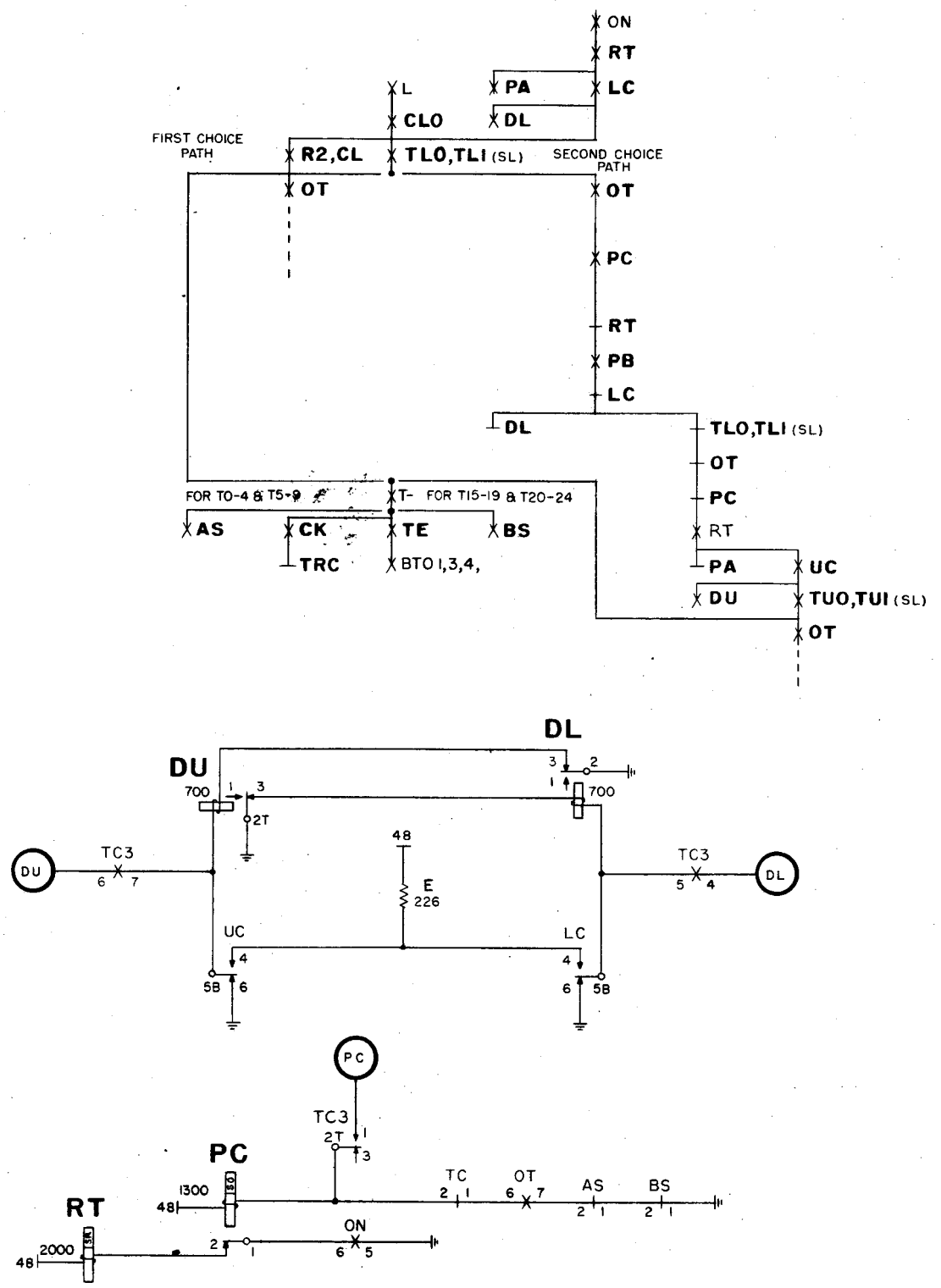
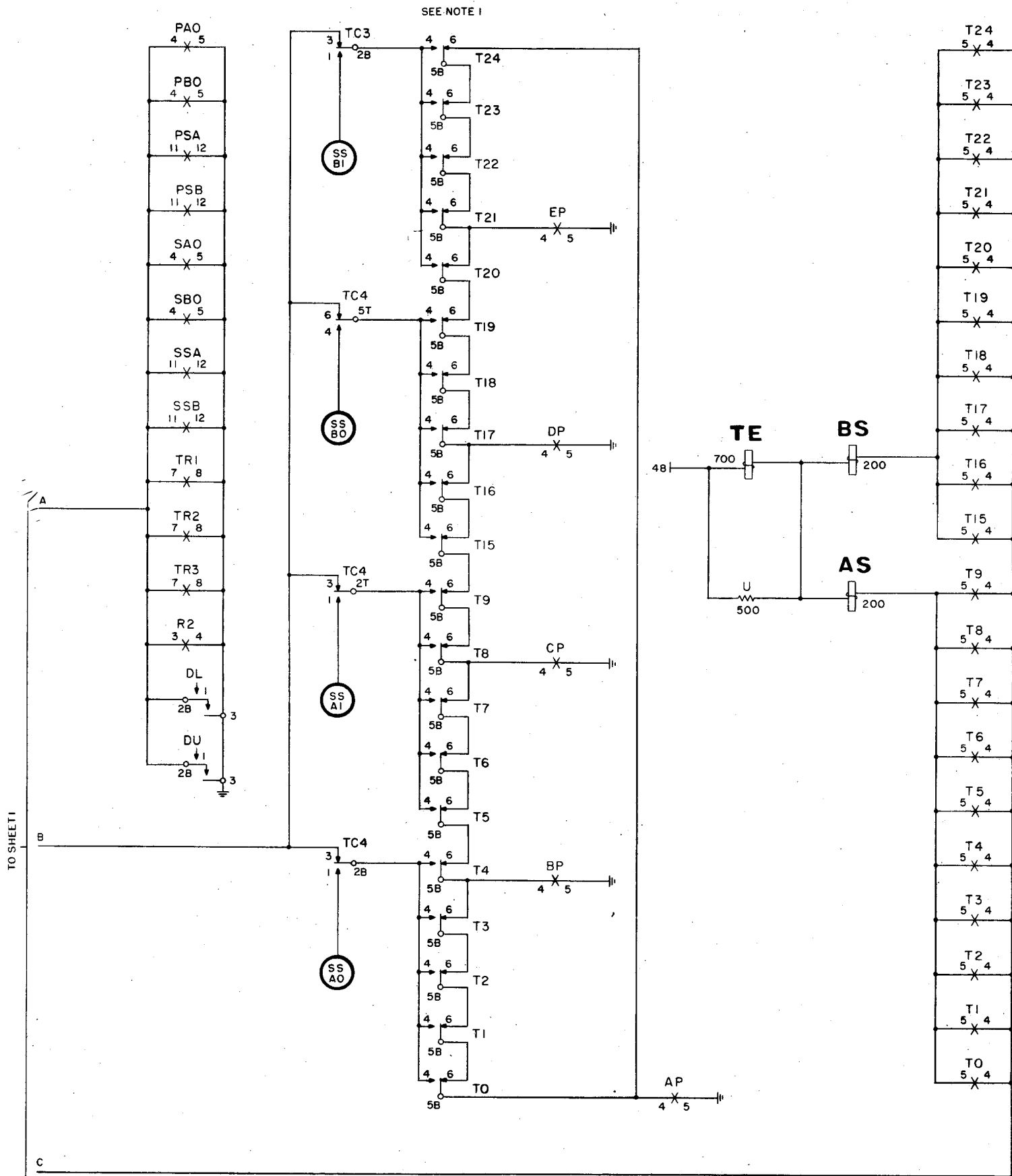
2 SHEETS, SHEET 1

MP-11617

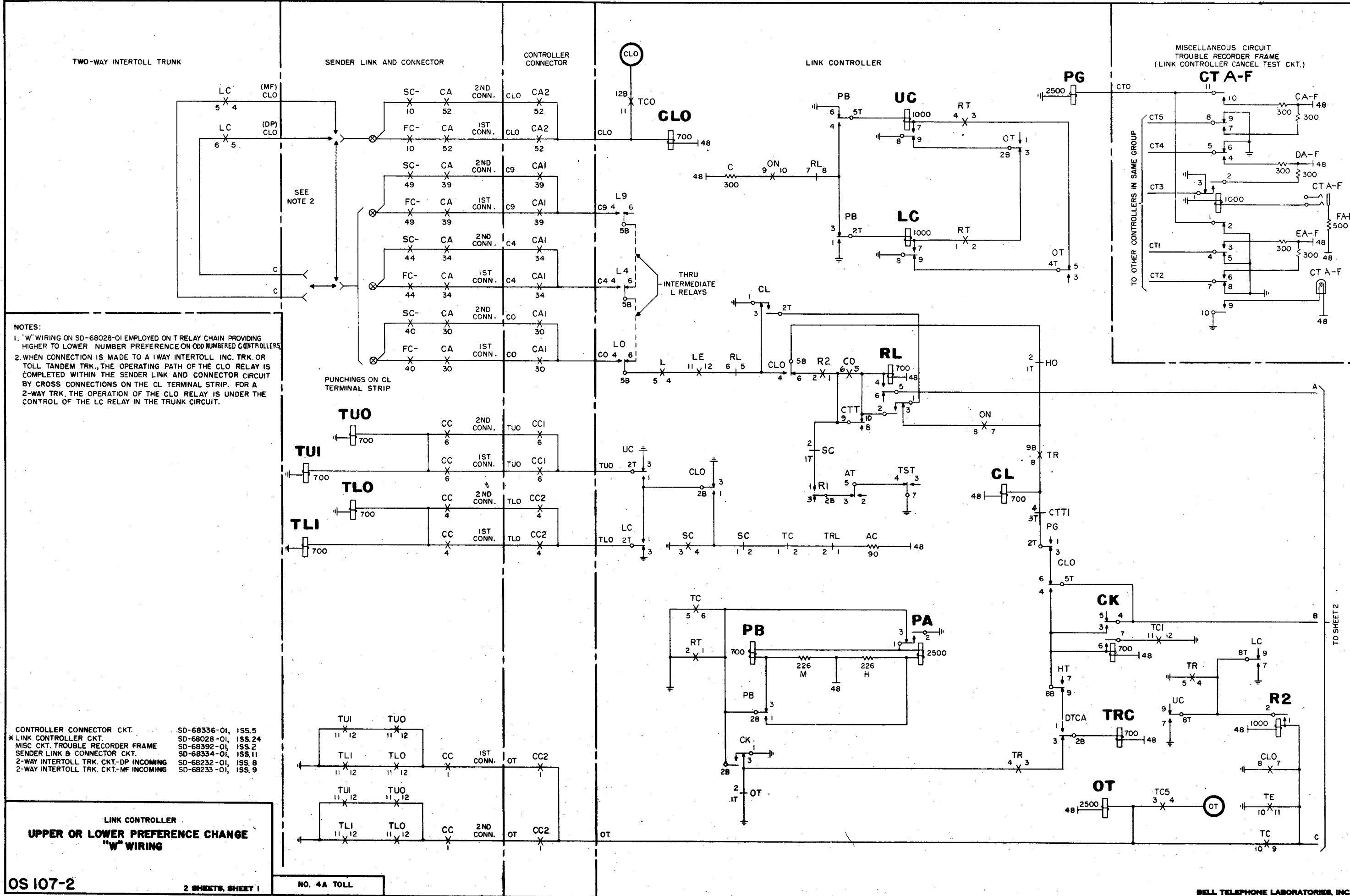
REVISION	DATE	BY	CHKD

LINK CONTROLLER

SEQUENCE CHART



LINK CONTROLLER
UPPER OR LOWER PREFERENCE CHANGE
"V" WIRING



NOTES:

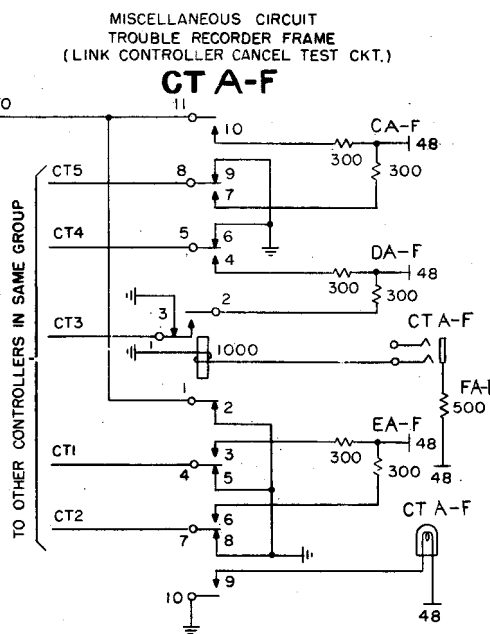
1. "W" WIRING ON SD-68028-01 EMPLOYED ON T RELAY CHAIN PROVIDING HIGHER TO LOWER NUMBER PREFERENCE ON ODD NUMBERED CONTROLLERS.

2. WHEN CONNECTION IS MADE TO A 1WAY INTERTOLL INC. TRK. OR TOLL TANDEM TRK., THE OPERATING PATH OF THE CLO RELAY IS COMPLETED WITHIN THE SENDER LINK AND CONNECTOR CIRCUIT BY CROSS CONNECTIONS ON THE CL TERMINAL STRIP. FOR A 2-WAY TRK. THE OPERATION OF THE CLO RELAY IS UNDER THE CONTROL OF THE LC RELAY IN THE TRUNK CIRCUIT.

CONTROLLER CONNECTOR CKT. SD-68336-01, ISS. 5
 LINK CONTROLLER CKT. SD-68028-01, ISS. 24
 MISC. CKT. TROUBLE RECORDER FRAME SD-68392-01, ISS. 2
 SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS. 11
 2-WAY INTERTOLL TRK. CKT-DP INCOMING SD-68232-01, ISS. 8
 2-WAY INTERTOLL TRK. CKT-MF INCOMING SD-68233-01, ISS. 9

LINK CONTROLLER
UPPER OR LOWER PREFERENCE CHANGE
"W" WIRING

OS 107-2 2 SHEETS, SHEET 1 NO. 4A TOLL



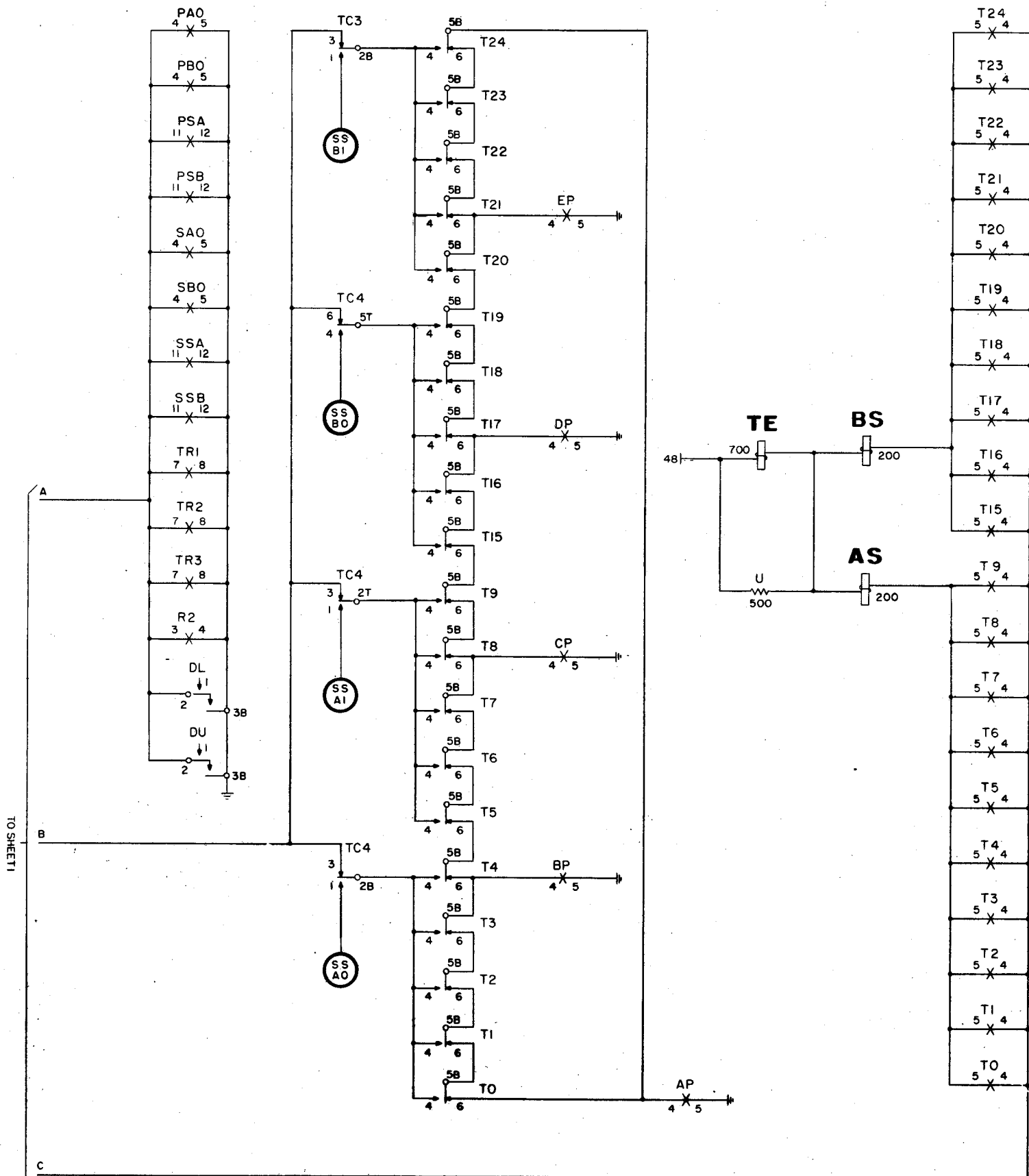
ISSUED	
DATE	7-20-51

2 SHEETS, SHEET 1

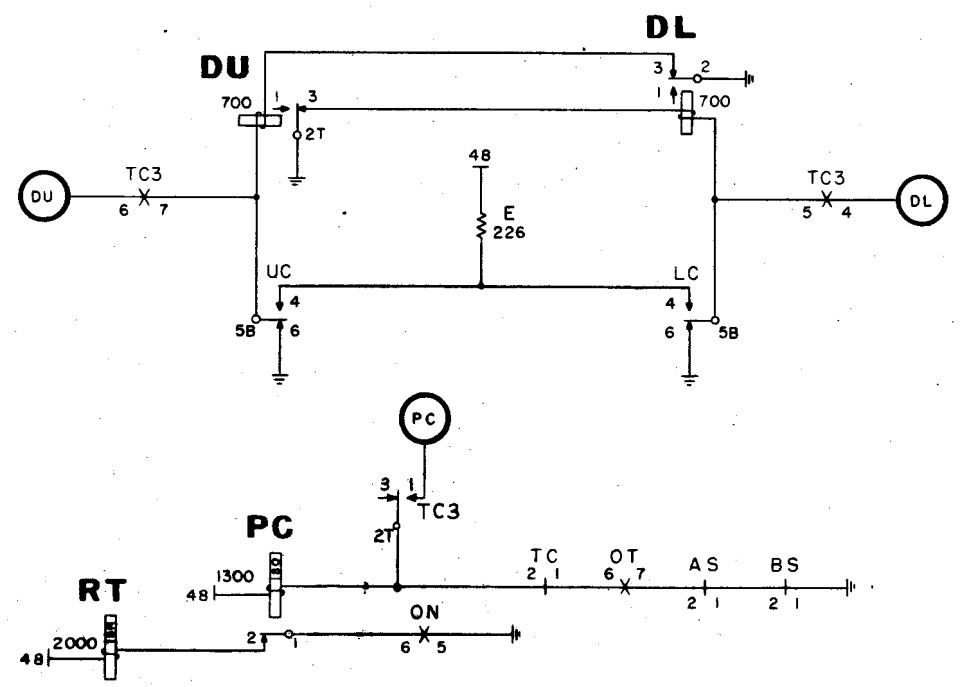
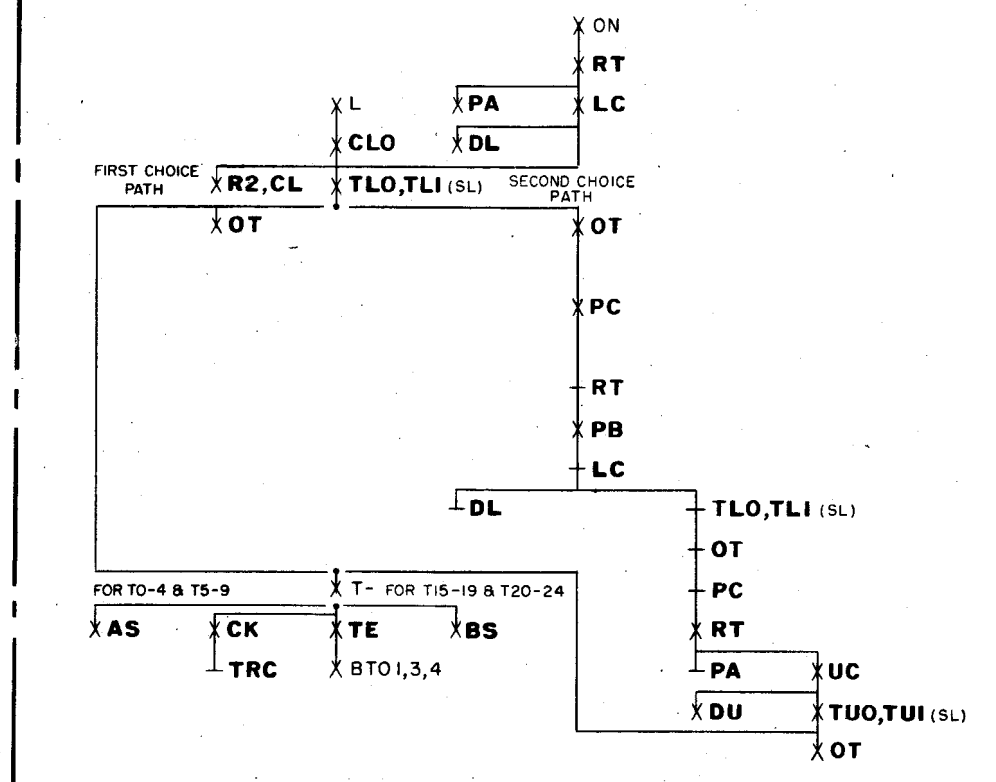
ISSUE	1	REV.	
DATE	7-20-51		

LINK CONTROLLER

SEE NOTE 1

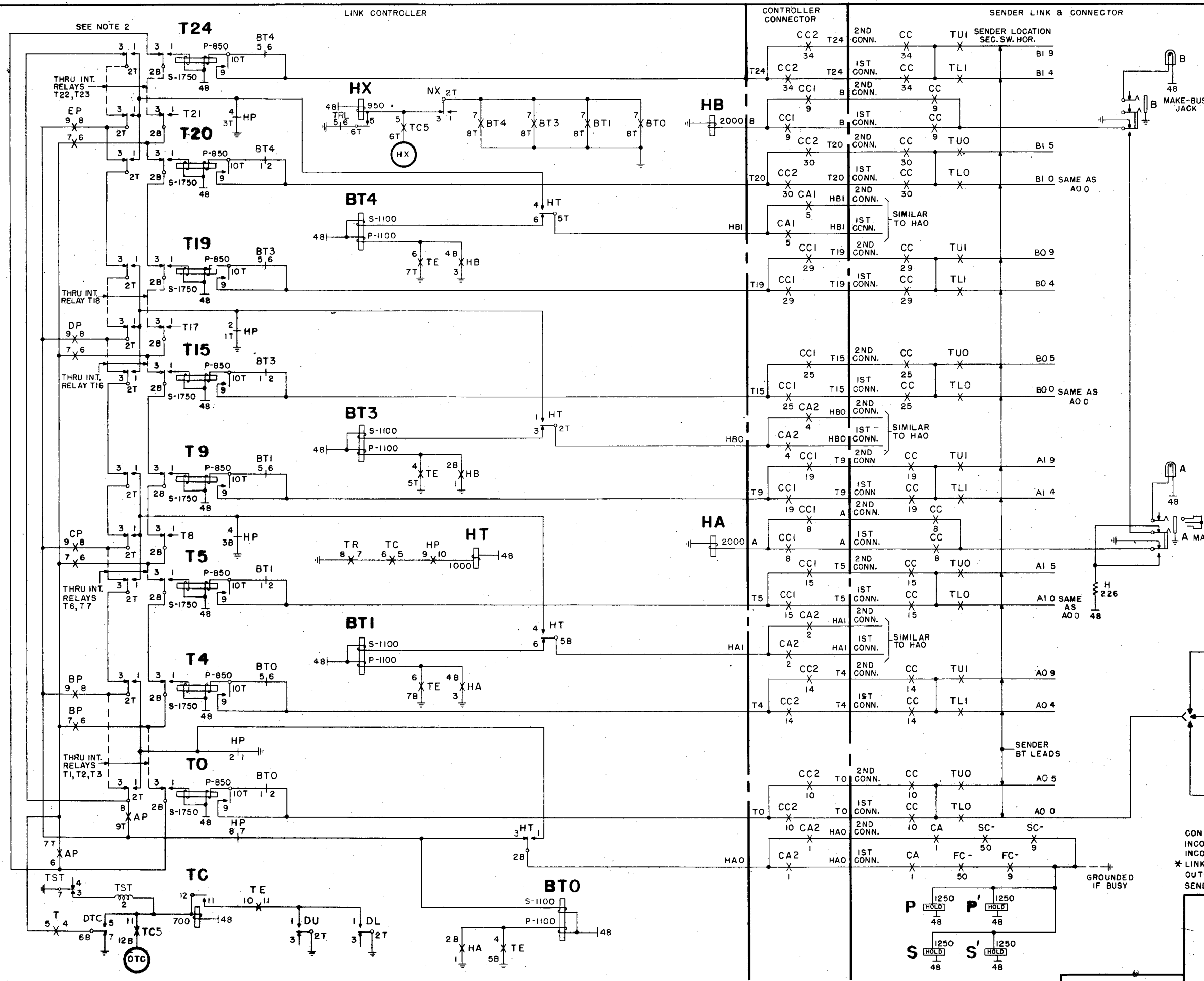


SEQUENCE CHART

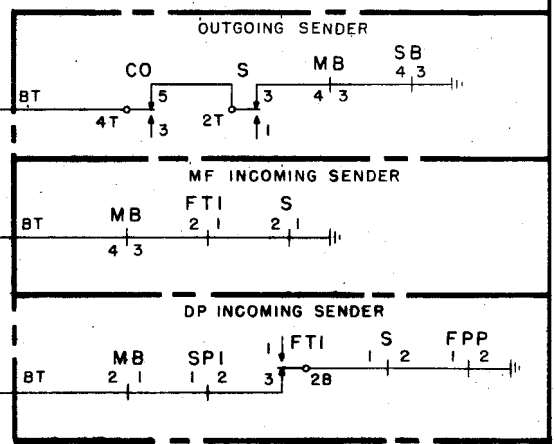


LINK CONTROLLER
UPPER OR LOWER PREFERENCE CHANGE
"W" WIRING

ISSUE	DATE
1	11-22-51
2	6-18-57
3	
4	
5	
6	
7	
8	
9	
10	



- NOTES:
- FOR SEQUENCE CHART SEE OS 109-1.
 - "V" WIRING (SD-68028-01) SHOWN ON T-RELAY CHAIN PROVIDING LOWER TO HIGHER PREFERENCE ON EVEN NUMBERED CONTROLLERS.

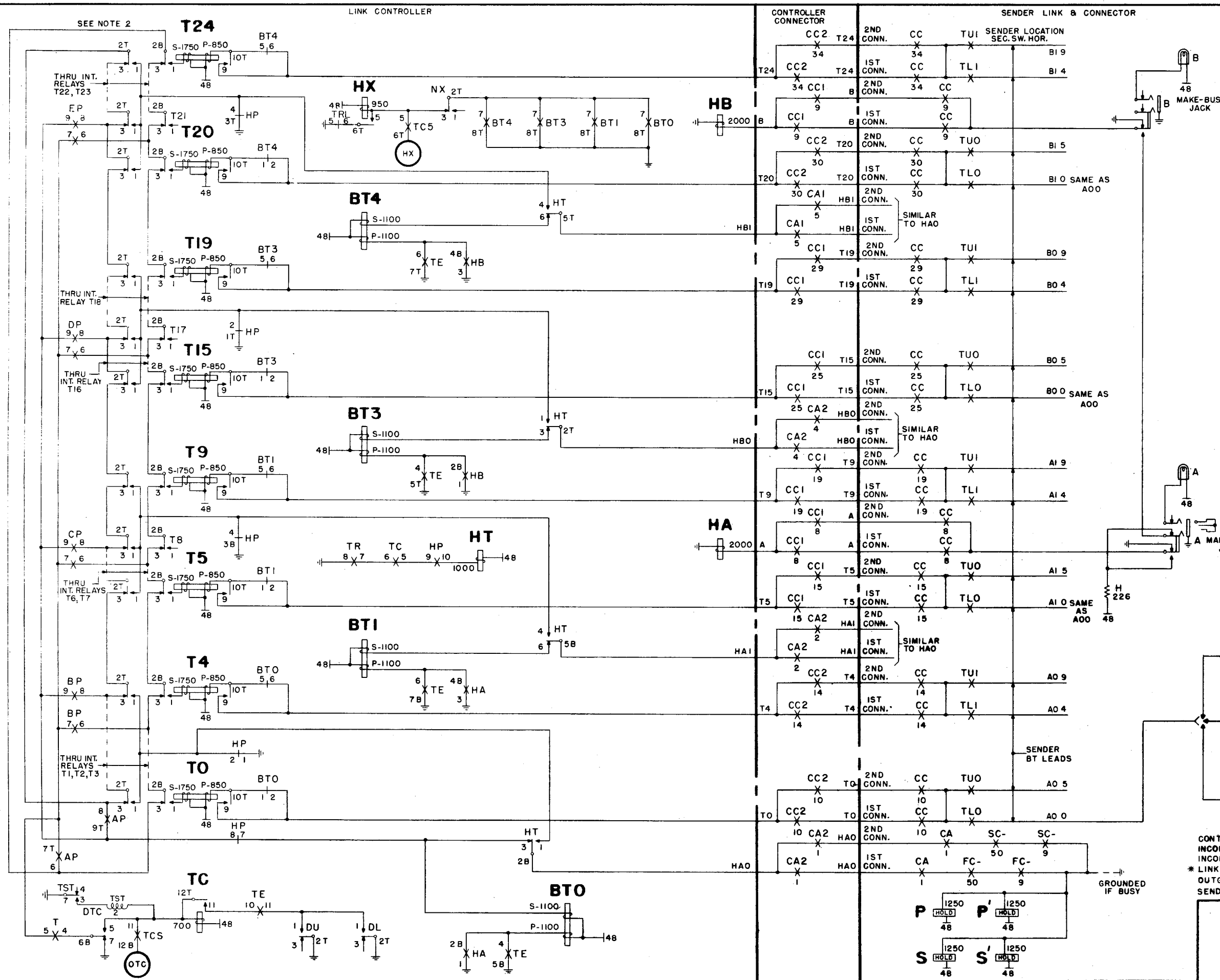


- CONTROLLER CONNECTOR CKT. SD-68336-01, ISS. 5
 INCOMING SENDER CKT. DP SD-68221-01, ISS. 12
 INCOMING SENDER CKT. MF SD-68222-01, ISS. 12
 * LINK CONTROLLER CKT. SD-68028-01, ISS. 24
 OUTGOING SENDER CKT. SD-68018-01, ISS. 22
 SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS. 11

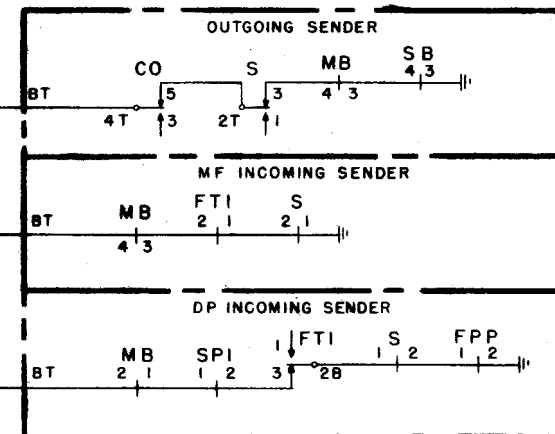
LINK CONTROLLER TESTING FOR IDLE SENDERS AND IDLE LINKS "V" WIRING

NO. 4A TOLL

ISSUE	DATE
1	6-16-57



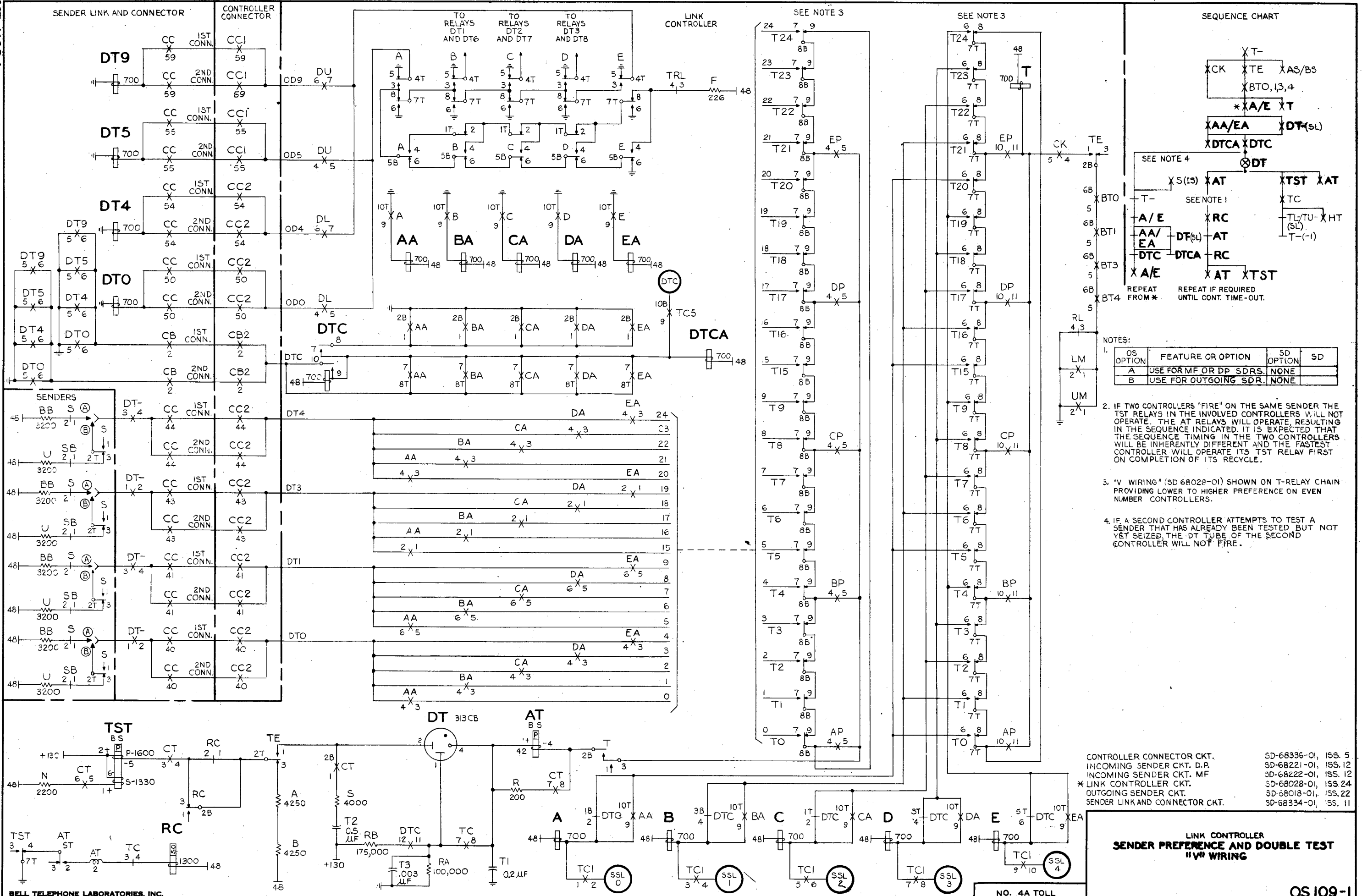
- NOTES:
- FOR SEQUENCE CHART SEE OS 109-1.
 - "W" WIRING (SD-68028-01) SHOWN ON T-RELAY CHAIN PROVIDING HIGHER TO LOWER PREFERENCE ON ODD NUMBERED CONTROLLERS.



- CONTROLLER CONNECTOR CKT. SD-68336-01, ISS. 5
 INCOMING SENDER CKT. DP SD-68221-01, ISS. 12
 INCOMING SENDER CKT. MF SD-68222-01, ISS. 12
 * LINK CONTROLLER CKT. SD-68028-01, ISS. 24
 OUTGOING SENDER CKT. SD-68018-01, ISS. 22
 SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS. 11

LINK CONTROLLER
TESTING FOR IDLE SENDERS AND IDLE LINKS "W" WIRING

ISSUE	1	2	3
DATE	6-18-57		



MP-1625

SENDER LINK AND CONNECTOR

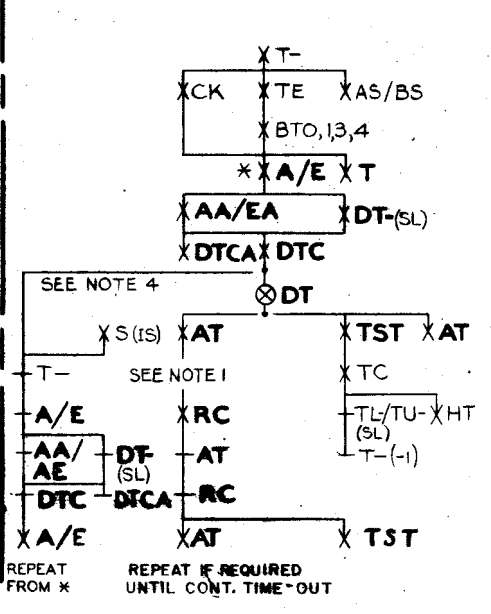
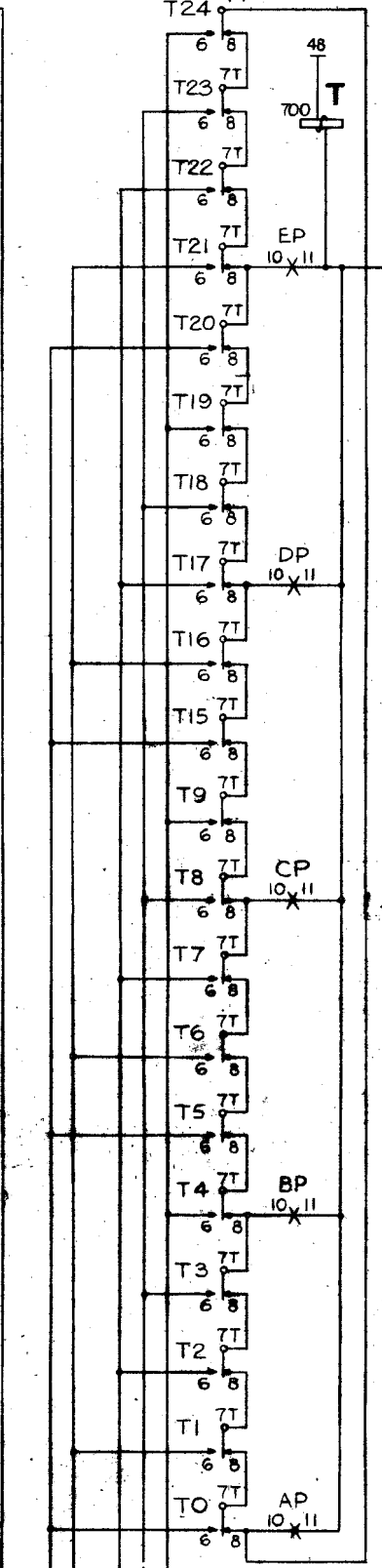
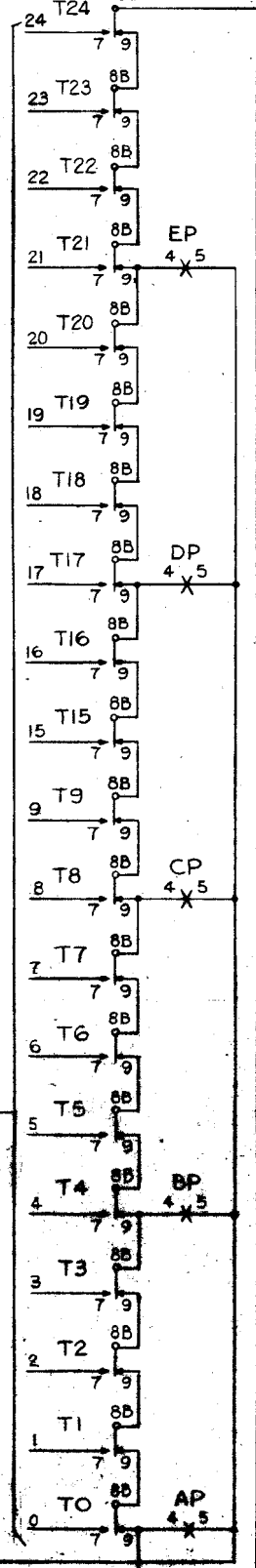
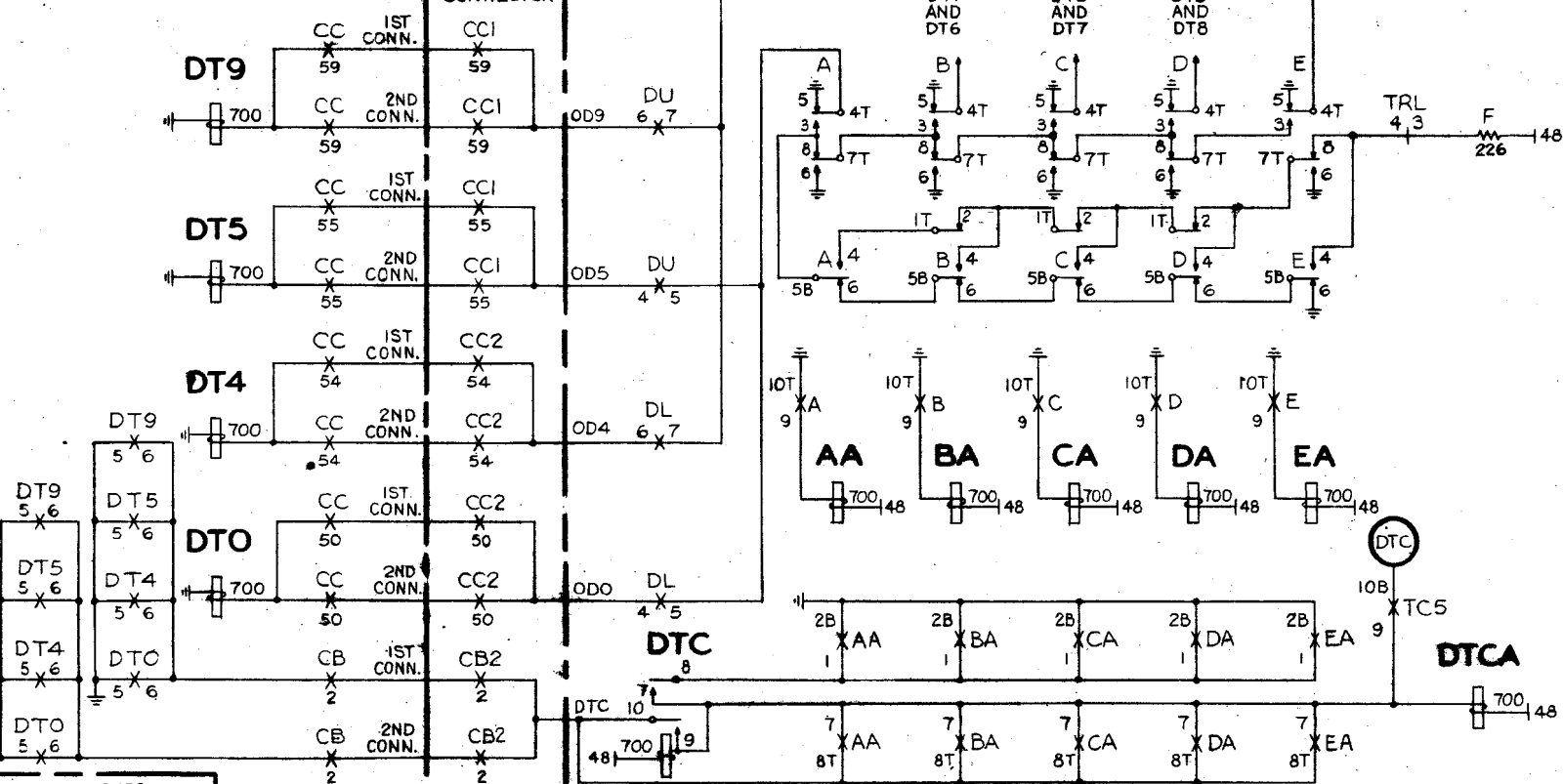
CONTROLLER CONNECTOR

LINK CONTROLLER

SEE NOTE 3

SEE NOTE 3

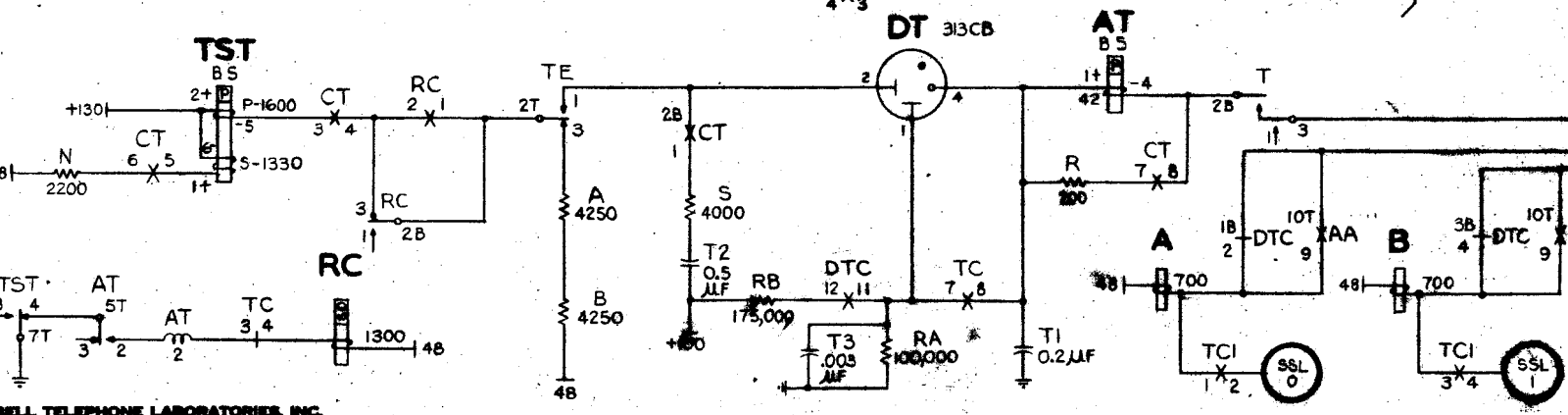
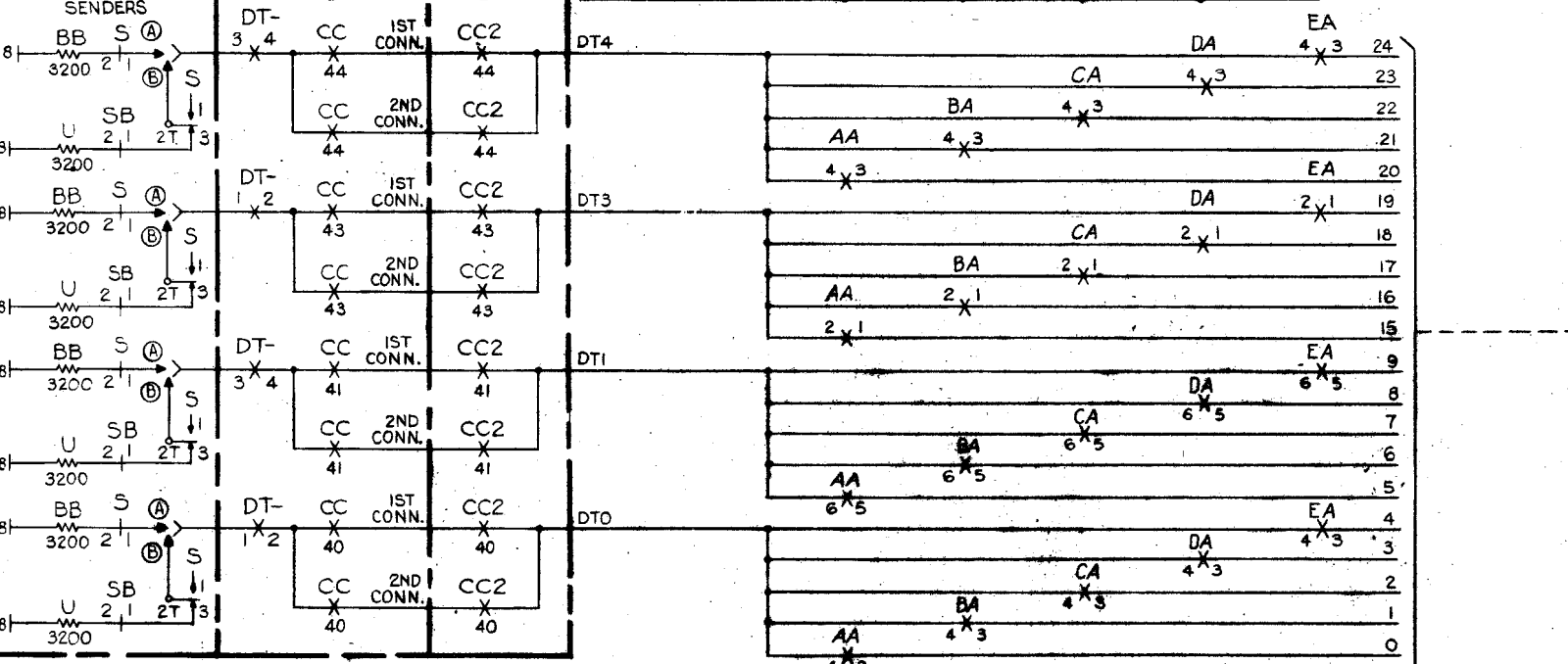
SEQUENCE CHART



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	USE FOR MF OR DP SDRS.	NONE	
B	USE FOR OUTGOING SDR.	NONE	

- IF TWO CONTROLLERS "FIRE" ON THE SAME SENDER THE TST RELAYS IN THE INVOLVED CONTROLLERS WILL NOT OPERATE. THE AT RELAYS WILL OPERATE, RESULTING IN THE SEQUENCE INDICATED. IT IS EXPECTED THAT THE SEQUENCE TIMING IN THE TWO CONTROLLERS WILL BE INHERENTLY DIFFERENT AND THE FASTEST CONTROLLER WILL OPERATE ITS TST RELAY FIRST ON COMPLETION OF ITS RECVLE.
- "W" WIRING (SD 68028-01) SHOWN ON T-RELAY CHAIN PROVIDING HIGHER TO LOWER PREFERENCE ON ODD NUMBER CONTROLLERS.
- IF A SECOND CONTROLLER ATTEMPTS TO TEST A SENDER THAT HAS ALREADY BEEN TESTED BUT NOT YET SEIZED, THE DT TUBE OF THE SECOND CONTROLLER WILL NOT FIRE.



- CONTROLLER CONNECTOR CKT. SD-68336-01, 1SS. 5
- INCOMING SENDER CKT. D P SD-68221-01, 1SS. 12
- INCOMING SENDER CKT. MF SD-68222-01, 1SS. 12
- LINK CONTROLLER CKT. SD-68028-01, 1SS. 24
- OUTGOING SENDER CKT. SD-68018-01, 1SS. 22
- SENDER LINK AND CONNECTOR CKT. SD-68334-01, 1SS. 11

LINK CONTROLLER SENDER PREFERENCE AND DOUBLE TEST "W" WIRING

NO. 4A TOLL

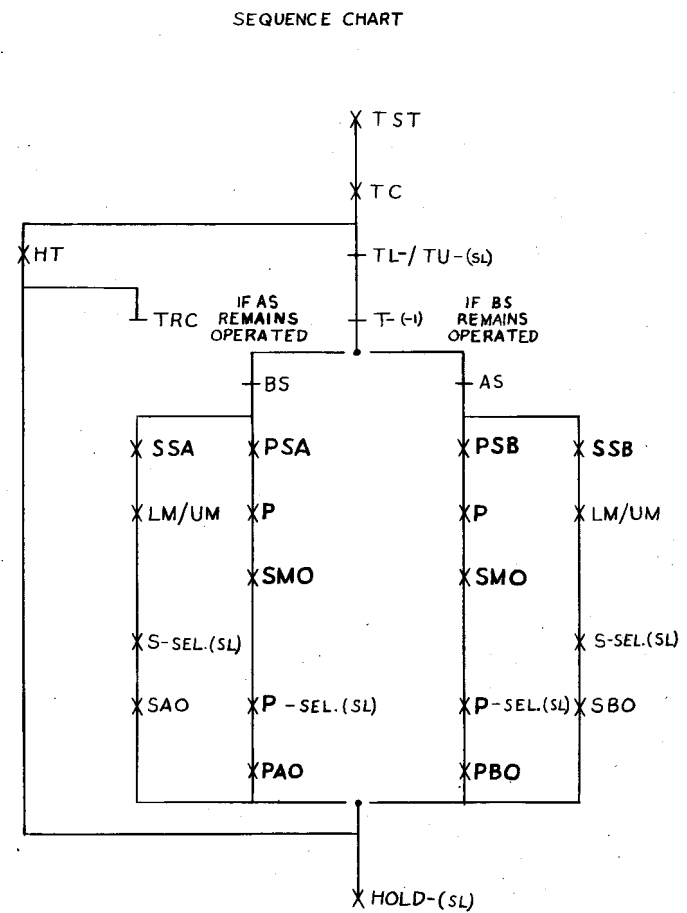
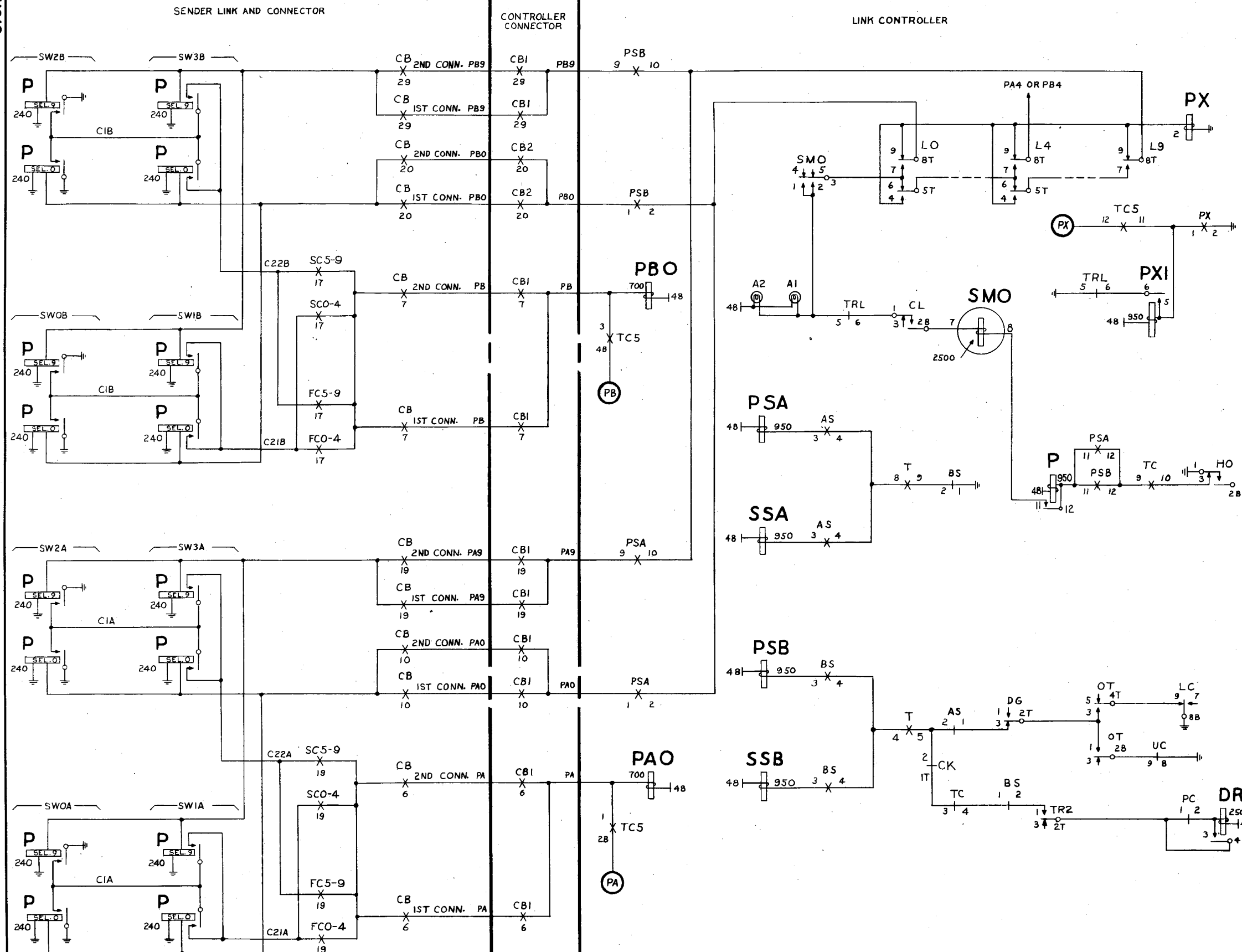
BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U. S. A.

OS 109-2

ORDER AS BSP ITEM MP-11625

ISSUE	1	7/24/55
DATE	6-9-55	

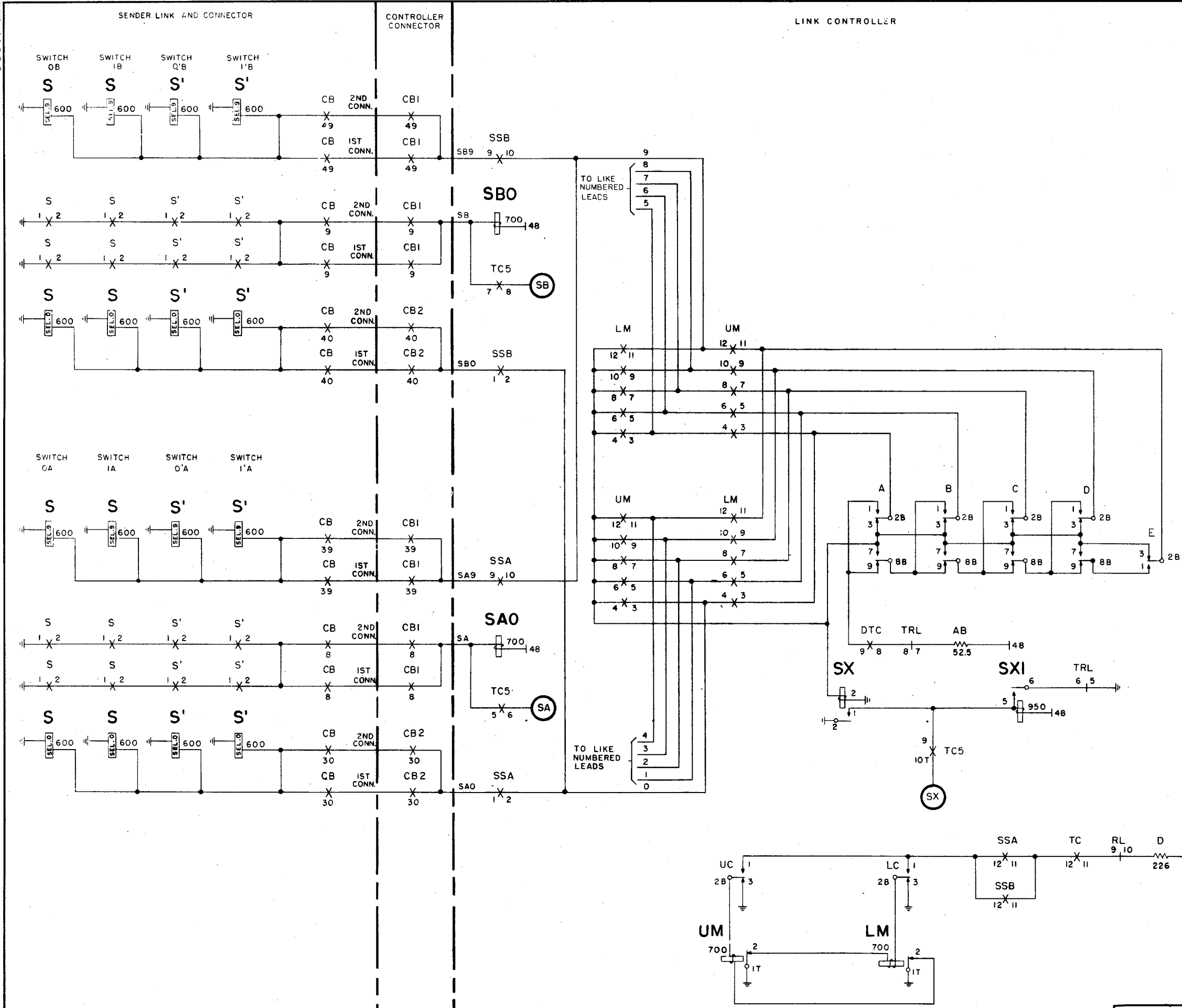


CONTROLLER CONNECTOR CKT. SD-68336-01, ISS. 5
 * LINK CONTROLLER CKT. SD-68028-01, ISS. 24
 SENDER LINK AND CONNECTOR CKT. SD-68334-01, ISS. 11

LINK CONTROLLER
 PRIMARY SELECT MAGNET OPERATION

NO. 4A TOLL

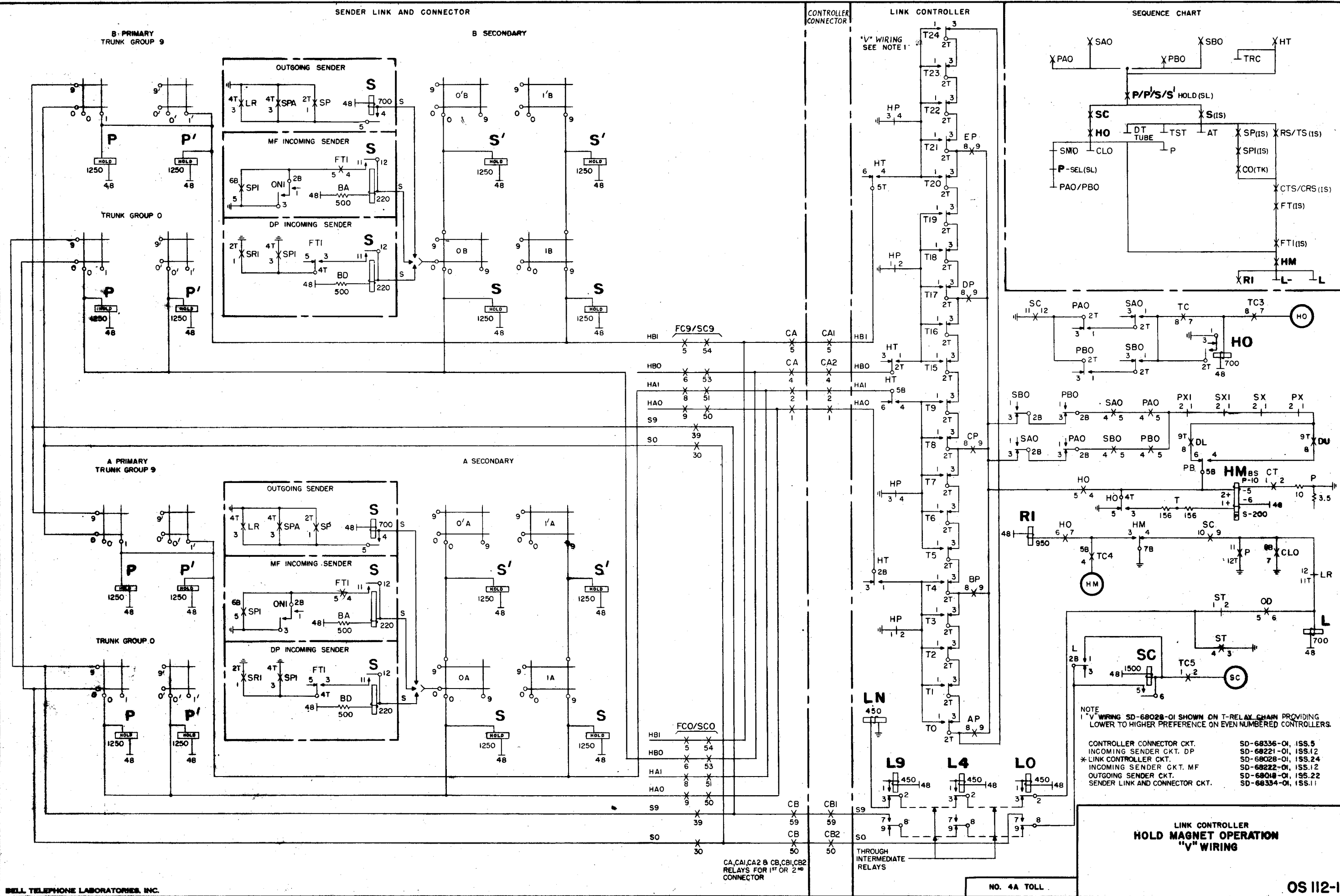
ISSUE	1	DATE	6-26-57
REVISED			
DATE			



CONTROLLER CONNECTOR CKT. SD-68336-01, ISS. 7
 * LINK CONTROLLER CKT. SD-68028-01, ISS. 24
 SENDER LINK AND CONNECTOR CKT. SD-68334-01, ISS. 11

**LINK CONTROLLER
 SECONDARY SELECT MAGNET OPERATION**

REVISION	1	1/25/55
DATE	7-27-57	



NOTE
 "V" WIRING SD-68028-01 SHOWN ON T-RELAY CHAIN PROVIDING LOWER TO HIGHER PREFERENCE ON EVEN NUMBERED CONTROLLERS.

CONTROLLER CONNECTOR CKT. SD-68336-01, ISS.5
 INCOMING SENDER CKT. DP SD-68221-01, ISS.12
 * LINK CONTROLLER CKT. SD-68028-01, ISS.24
 INCOMING SENDER CKT. MF SD-68222-01, ISS.12
 OUTGOING SENDER CKT. SD-68018-01, ISS.22
 SENDER LINK AND CONNECTOR CKT. SD-68334-01, ISS.11

LINK CONTROLLER
 HOLD MAGNET OPERATION
 "V" WIRING

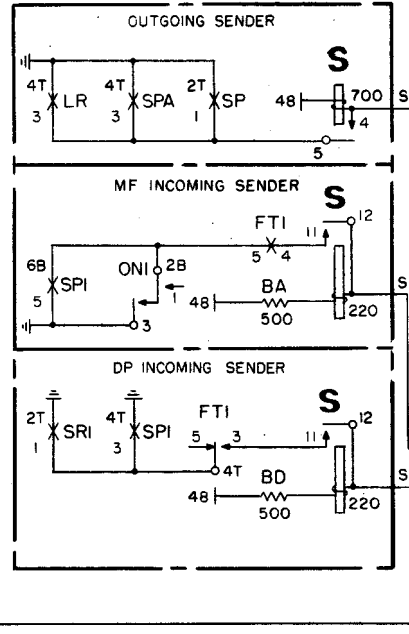
CA, CA1, CA2 & CB, CBI, CB2 RELAYS FOR 1ST OR 2ND CONNECTOR

ISSUE	1	W.A.V.
DATE	5-22-51	

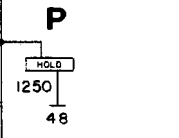
SENDER LINK AND CONNECTOR

B PRIMARY TRUNK GROUP 9

B SECONDARY

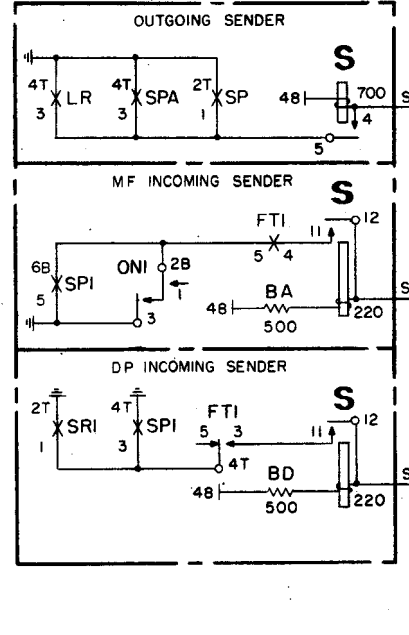


TRUNK GROUP 0

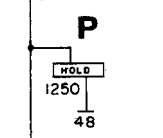


A PRIMARY TRUNK GROUP 9

A SECONDARY

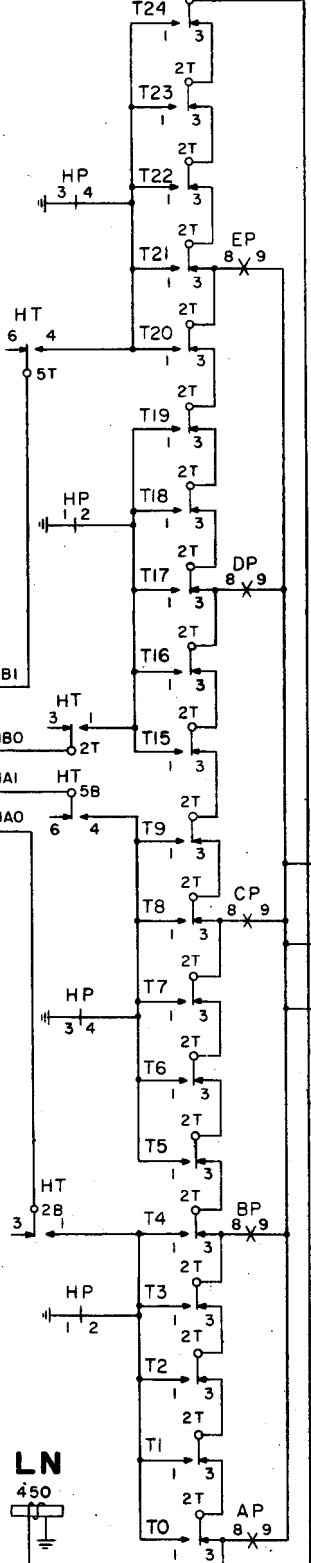


TRUNK GROUP 0

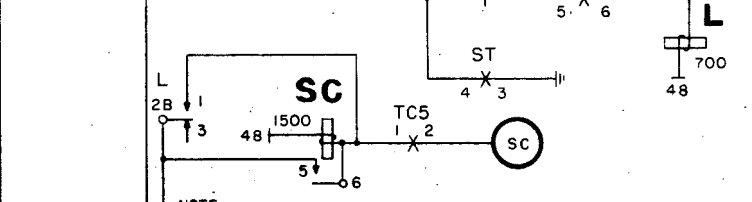
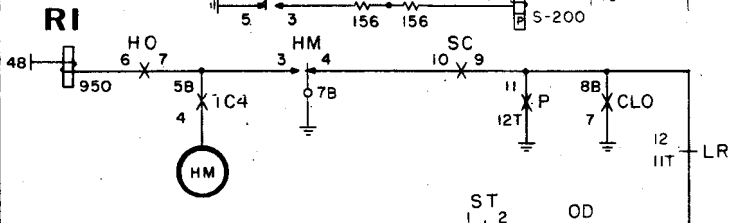
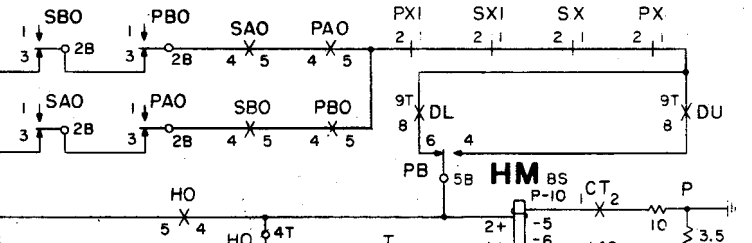
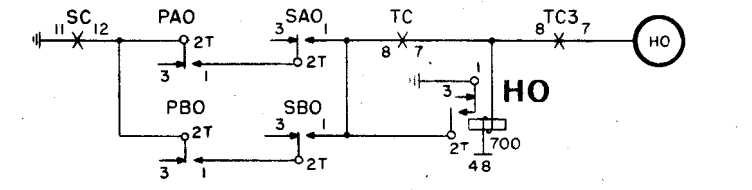
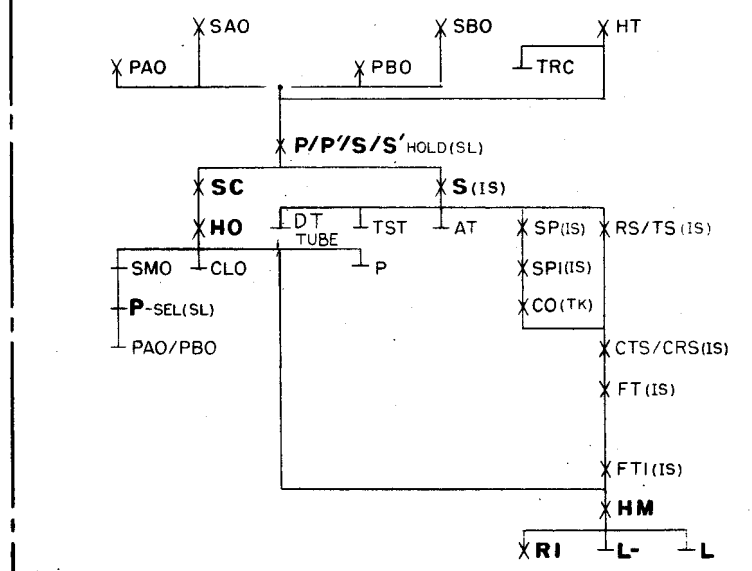


CONT. CONN.

LINK CONTROLLER "W" WIRING



SEQUENCE CHART



- NOTE:
 1 "W" WIRING SD-68028-01 SHOWN ON T-RELAY CHAIN PROVIDING HIGHER TO LOWER PREFERENCE ON ODD NUMBERED CONTROLLERS.
- | | |
|--------------------------------|----------------------|
| CONTROLLER CONNECTOR CKT. | SD-68336-01, ISS. 5 |
| INCOMING SENDER CKT. DP | SD-68221-01, ISS. 12 |
| INCOMING SENDER CKT. MF | SD-68222-01, ISS. 12 |
| LINK CONTROLLER CKT. | SD-68028-01, ISS. 24 |
| OUTGOING SENDER CKT. | SD-68018-01, ISS. 22 |
| SENDER LINK AND CONNECTOR CKT. | SD-68334-01, ISS. 11 |

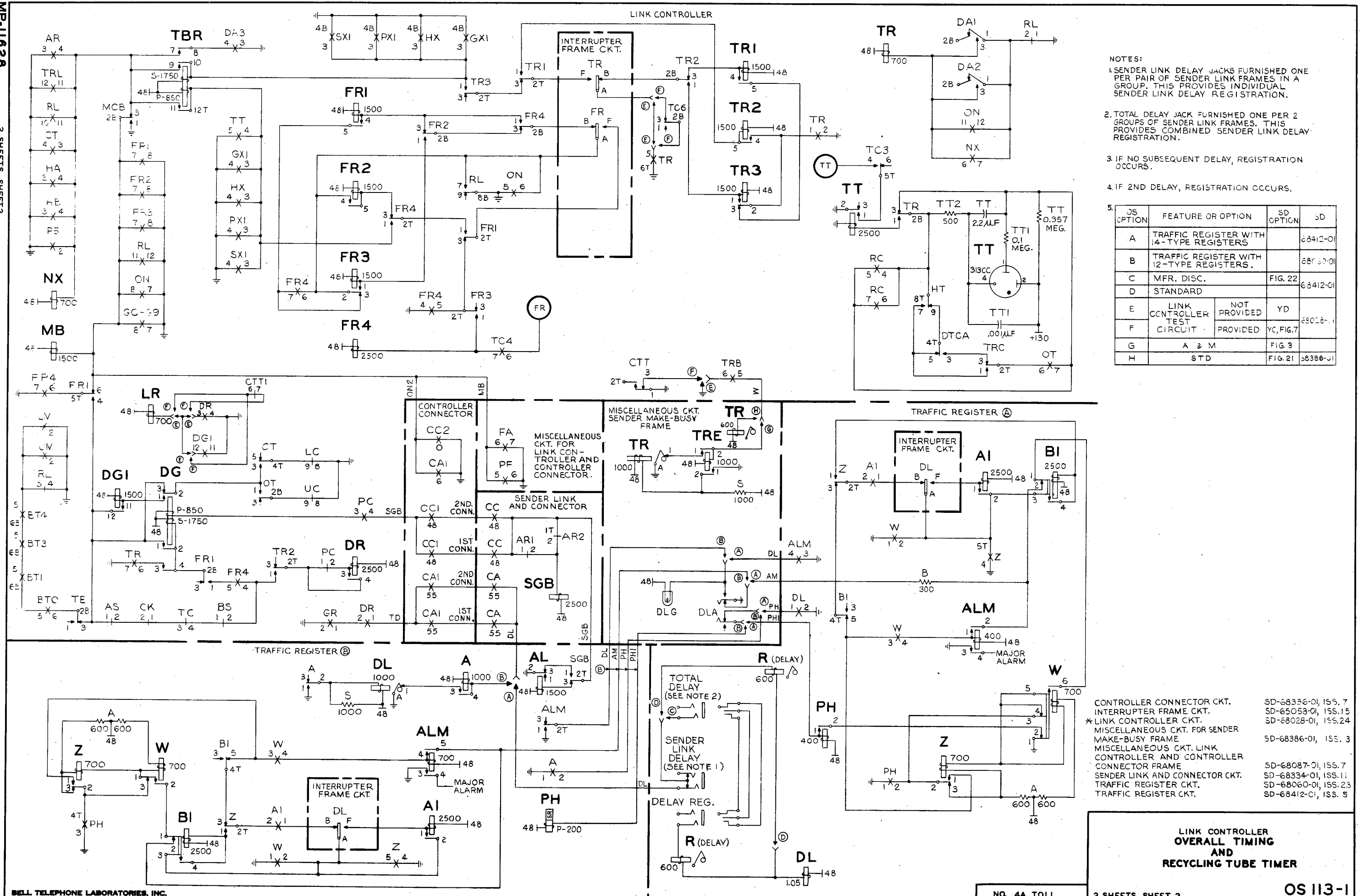
LINK CONTROLLER HOLD MAGNET OPERATION "W" WIRING

CA, CA1, CA2 & CB, CB1, CB2 RELAYS FOR 1ST OR 2ND CONNECTOR

THROUGH INTERMEDIATE RELAYS

NO. 4A TOLL

REVISE	DATE	BY	CHKD
1	7-20-51		



- NOTES:
1. SENDER LINK DELAY JACKS FURNISHED ONE PER PAIR OF SENDER LINK FRAMES IN A GROUP. THIS PROVIDES INDIVIDUAL SENDER LINK DELAY REGISTRATION.
 2. TOTAL DELAY JACK FURNISHED ONE PER 2 GROUPS OF SENDER LINK FRAMES. THIS PROVIDES COMBINED SENDER LINK DELAY REGISTRATION.
 3. IF NO SUBSEQUENT DELAY, REGISTRATION OCCURS.
 4. IF 2ND DELAY, REGISTRATION OCCURS.

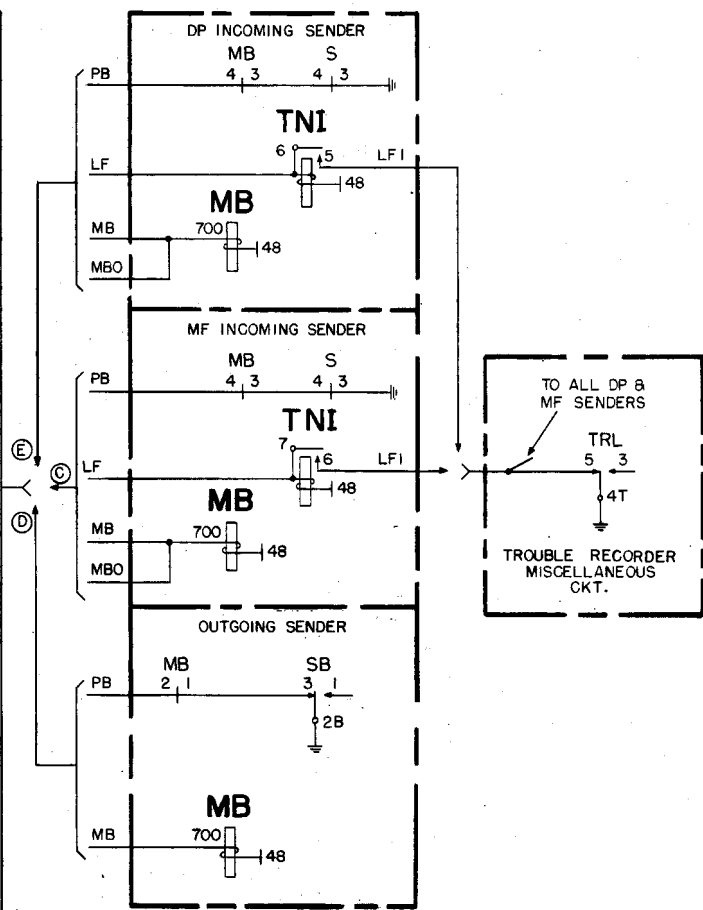
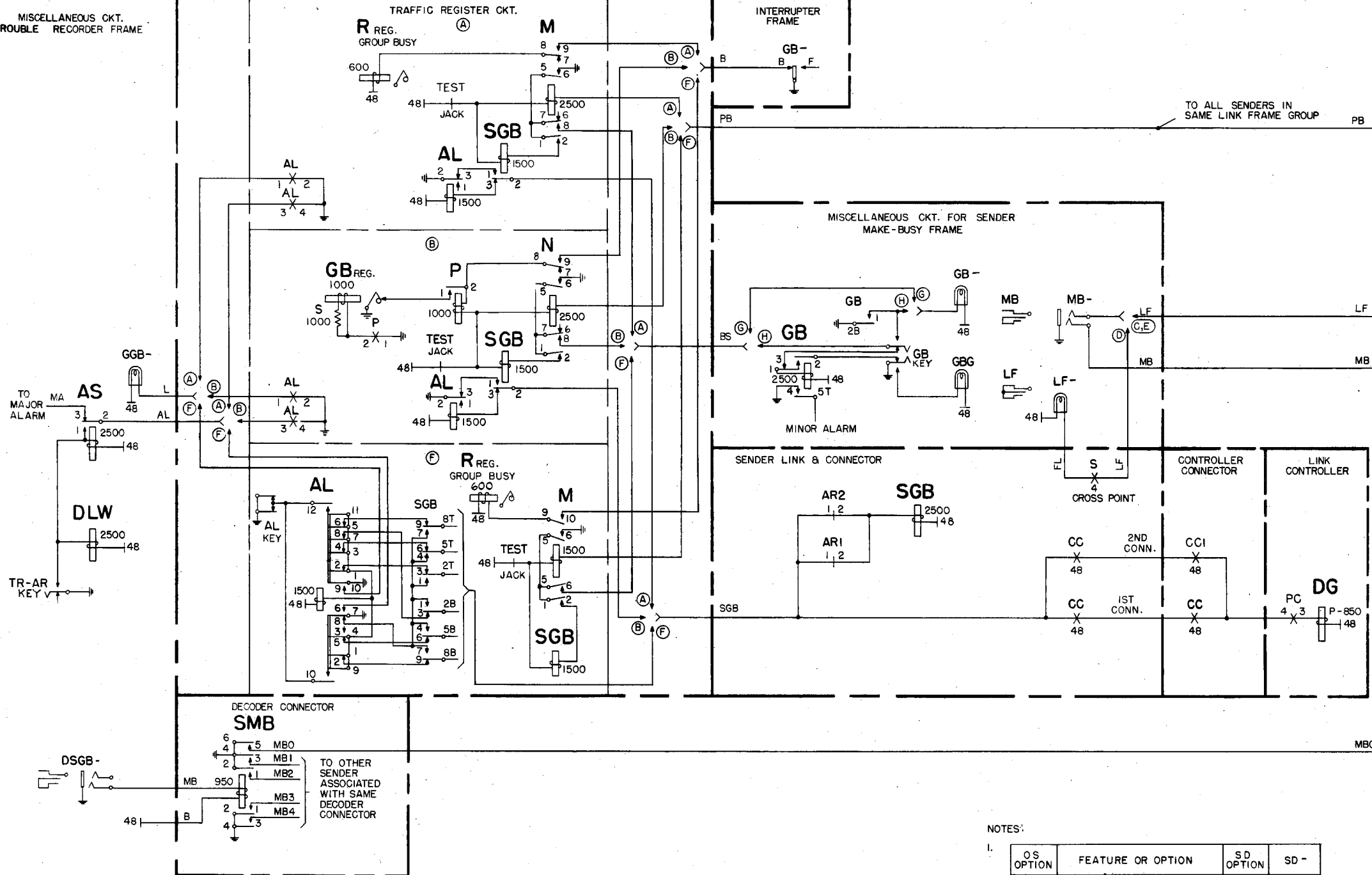
OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	TRAFFIC REGISTER WITH 14-TYPE REGISTERS		68412-01
B	TRAFFIC REGISTER WITH 12-TYPE REGISTERS		68430-01
C	MFR. DISC.	FIG. 22	68412-01
D	STANDARD		68412-01
E	LINK CONTROLLER TEST CIRCUIT	NOT PROVIDED PROVIDED	YD YC, FIG. 7
G	A & M	FIG. 3	68018-01
H	STD	FIG. 21	68386-01

- CONTROLLER CONNECTOR CKT. SD-68336-01, ISS. 7
- INTERRUPTER FRAME CKT. SD-65053-01, ISS. 15
- * LINK CONTROLLER CKT. SD-68028-01, ISS. 24
- MISCELLANEOUS CKT. FOR SENDER MAKE-BUSY FRAME SD-68386-01, ISS. 3
- MISCELLANEOUS CKT. LINK CONTROLLER AND CONTROLLER CONNECTOR FRAME SD-68087-01, ISS. 7
- SENDER LINK AND CONNECTOR CKT. SD-68334-01, ISS. 11
- TRAFFIC REGISTER CKT. SD-68060-01, ISS. 23
- TRAFFIC REGISTER CKT. SD-68412-01, ISS. 5

**LINK CONTROLLER
OVERALL TIMING
AND
RECYCLING TUBE TIMER**

MISCELLANEOUS CKT.
TROUBLE RECORDER FRAME

ISSUE	1	2	3
DATE	6-7-57		



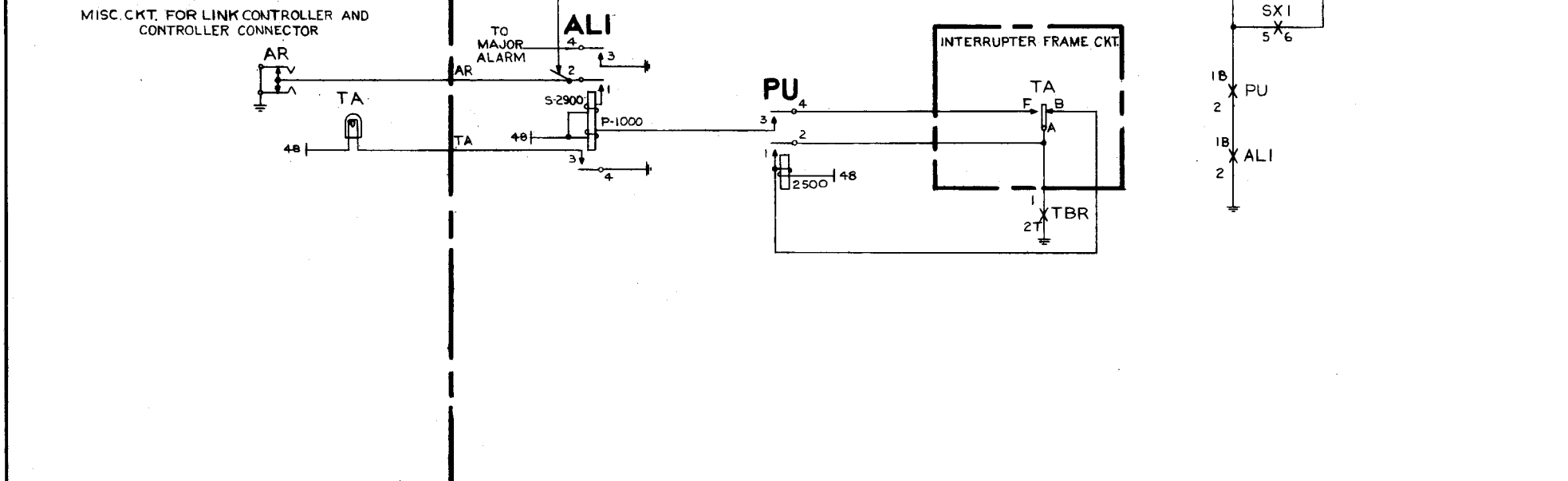
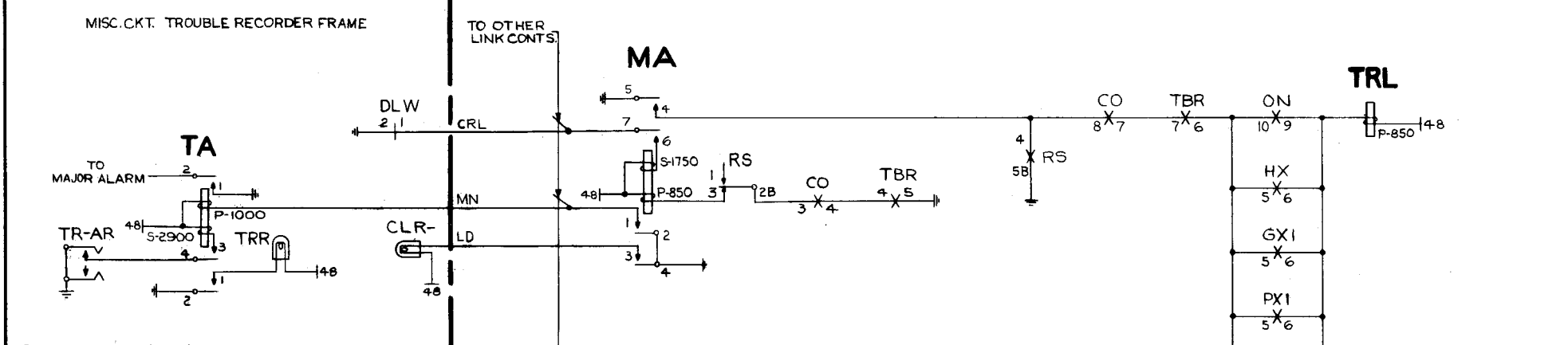
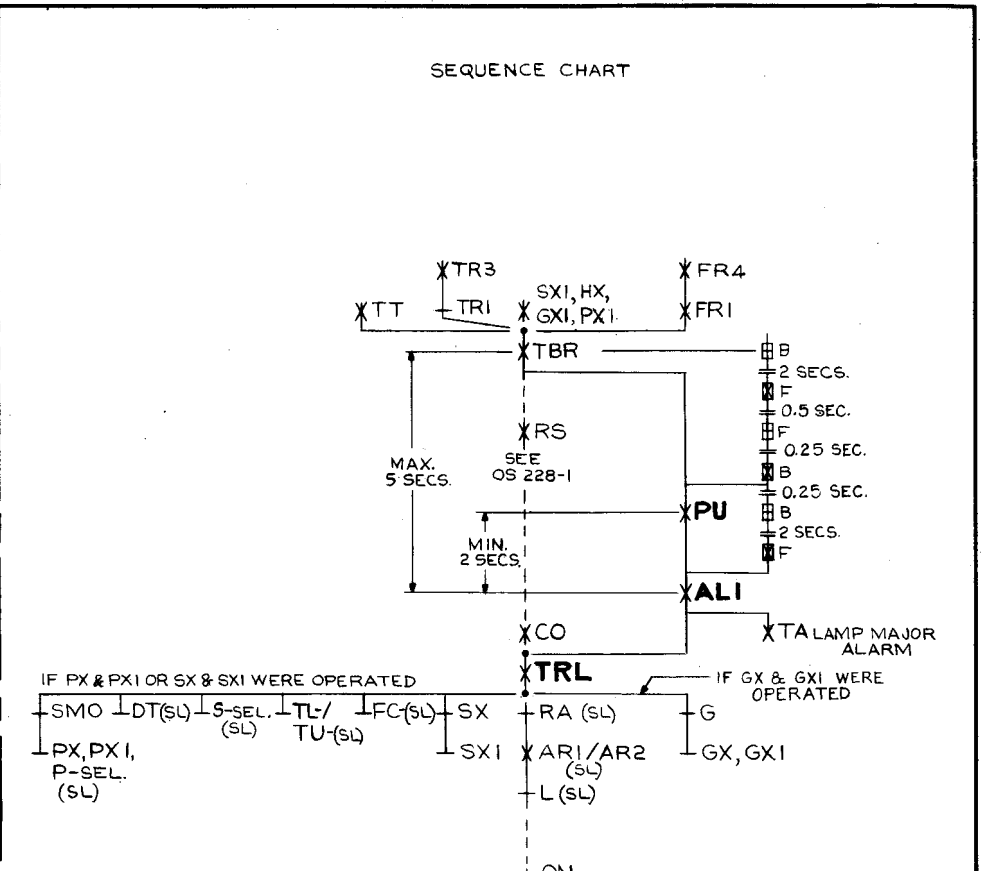
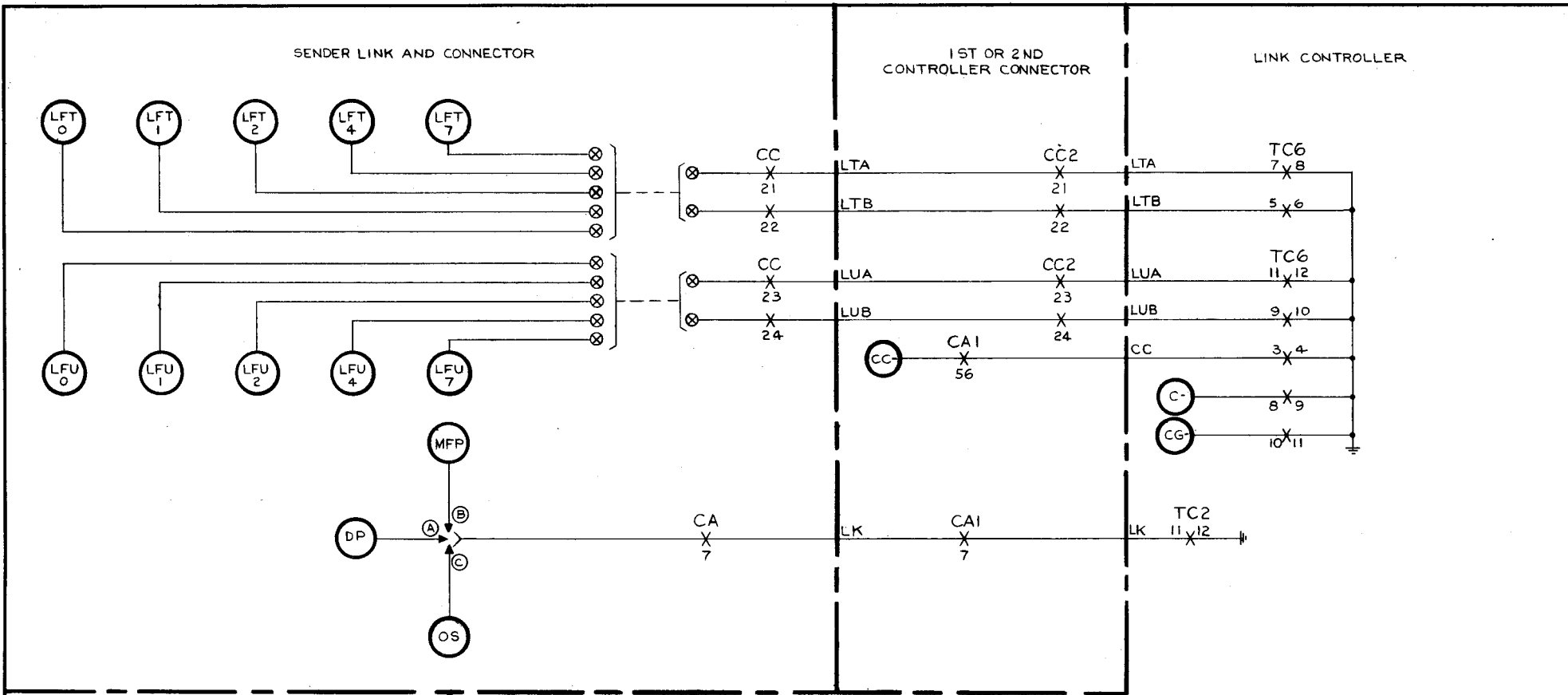
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD -
A	TRAFFIC REGISTER CKT. WITH 14 TYPE REGISTERS	FIG. 18, 19 MD.	68412-01
B	TRAFFIC REGISTER CKT. WITH 12 TYPE REGISTERS		68060-01
C	FOR MF INCOMING SENDERS		68222-01
D	FOR OUTGOING SENDERS		68018-01
E	FOR DP INCOMING SENDERS		68221-01
F	TRAFFIC REGISTER CKT. WITH 14 TYPE REGISTERS	FIG. 36, 38	68412-01
G	A&M	FIG. 11	68386-01
H	STANDARD	FIG. 18	68386-01

- CONT. CONN. CKT. SD-68336-01, ISS. 5
- DECODER CONN. CKT. SD-68339-01, ISS. 2
- DP INCOMING SENDER CKT. SD-68221-01, ISS. 12
- INT. FR. CKT. SD-68058-01, ISS. 15
- LINK CONT. CKT. SD-68028-01, ISS. 24
- MF INCOMING SENDER CKT. SD-68222-01, ISS. 12
- MISC. CKT. TBL. RECORDER FR. SD-68392-01, ISS. 2
- OUTGOING SENDER CKT. SD-68018-01, ISS. 22
- SENDER LINK & CONN. CKT. SD-68334-01, ISS. 11
- SENDER MAKE-BUSY FR. MISC. CKT. SD-68386-01, ISS. 3
- TRAFFIC REGISTER CKT. SD-68412-01, ISS. 4
- TRAFFIC REGISTER CKT. SD-68060-01, ISS. 23

LINK CONTROLLER
SENDER GROUP BUSY REGISTER,
MAKE-BUSY JACKS, GROUNDED
GROUP BUSY LEAD LAMP

ISSUE	1
DATE	6-22-51



OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	WHEN SDR LINK SERVES DP INC. SDRS.		
B	WHEN SDR LINK SERVES MF INC. SDRS.		
C	WHEN SDR LINK SERVES OUTGOING SDRS.		

- CONTROLLER CONN. CKT. SD-68336-01, ISS. 5
- INTERRUPTER FRAME CKT. SD-68058-01, ISS. 15
- *LINK CONTROLLER CKT. SD-68028-01, ISS. 24
- MISC. CKT. FOR LINK CONT. & CONT. CONN. SD-68087-01, ISS. 7
- MISC. CKT. TROUBLE RECORDER FR. SD-68392-01, ISS. 2
- SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS. 11

**LINK CONTROLLER
TROUBLE RELEASE CONDITIONS**

ISSUE	DATE	BY	CHKD	REV.
1	7-10-51			
2	10-7-53			

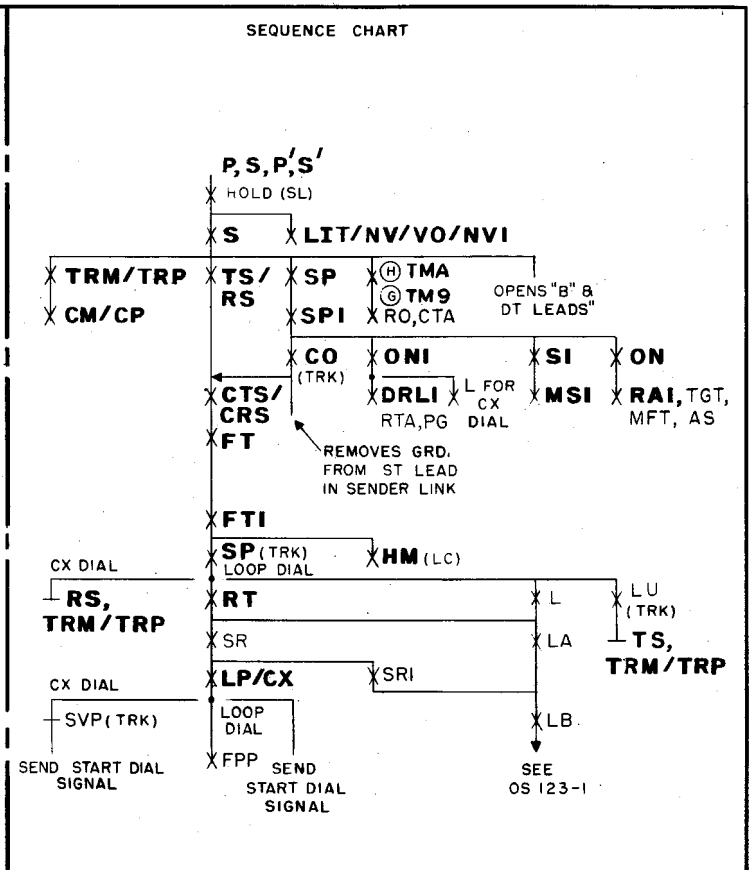
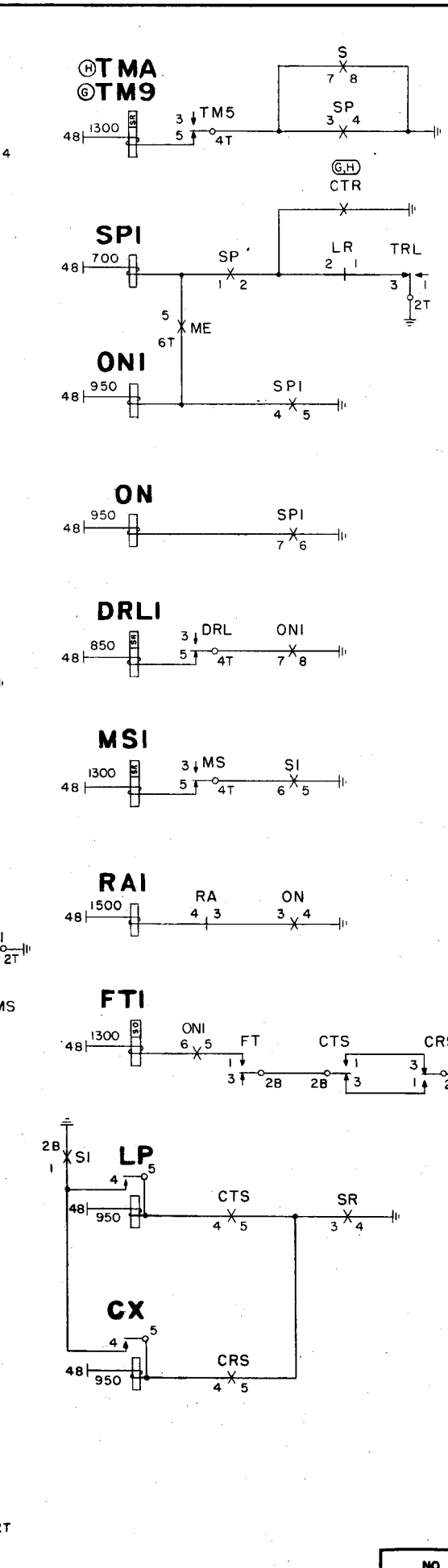
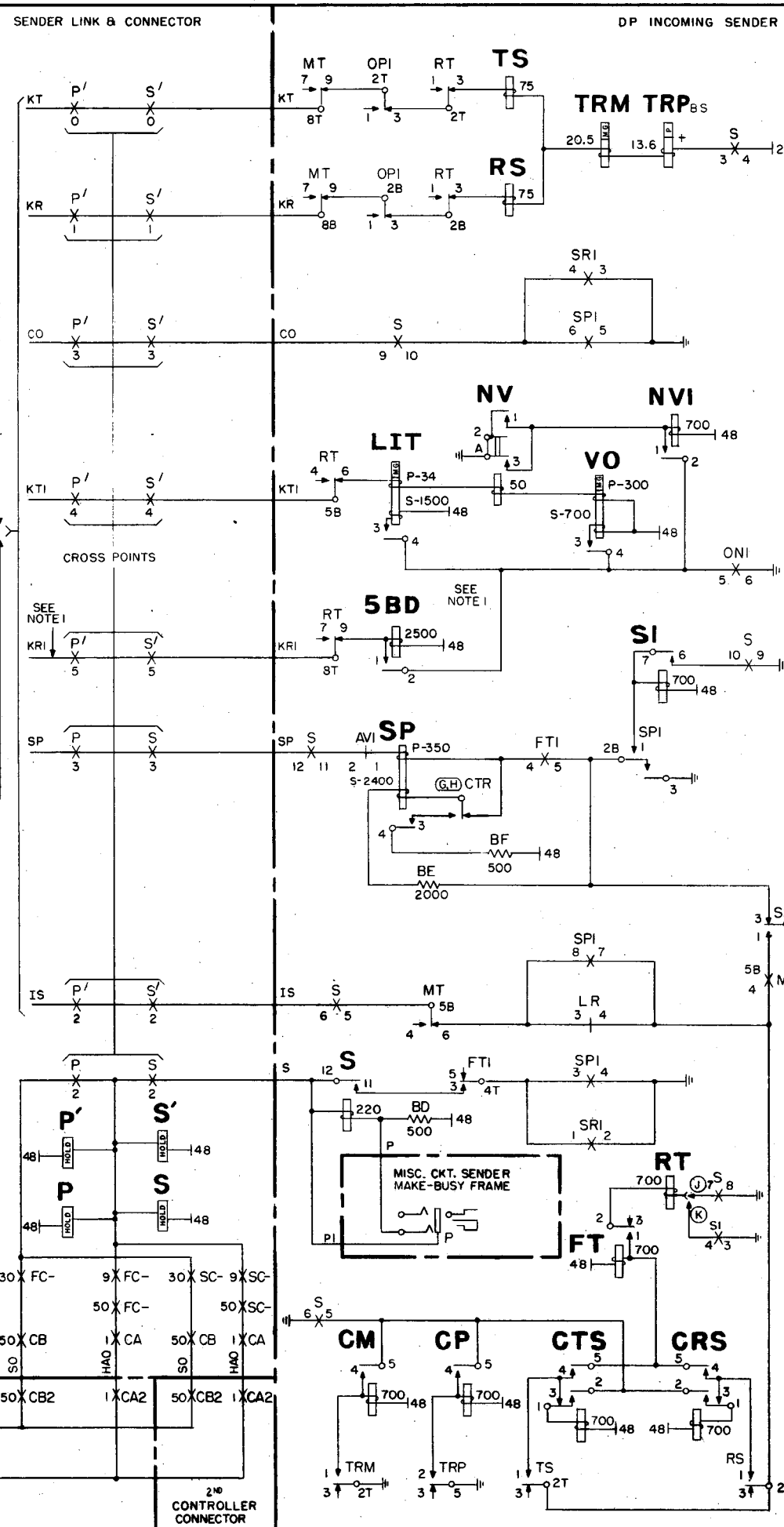
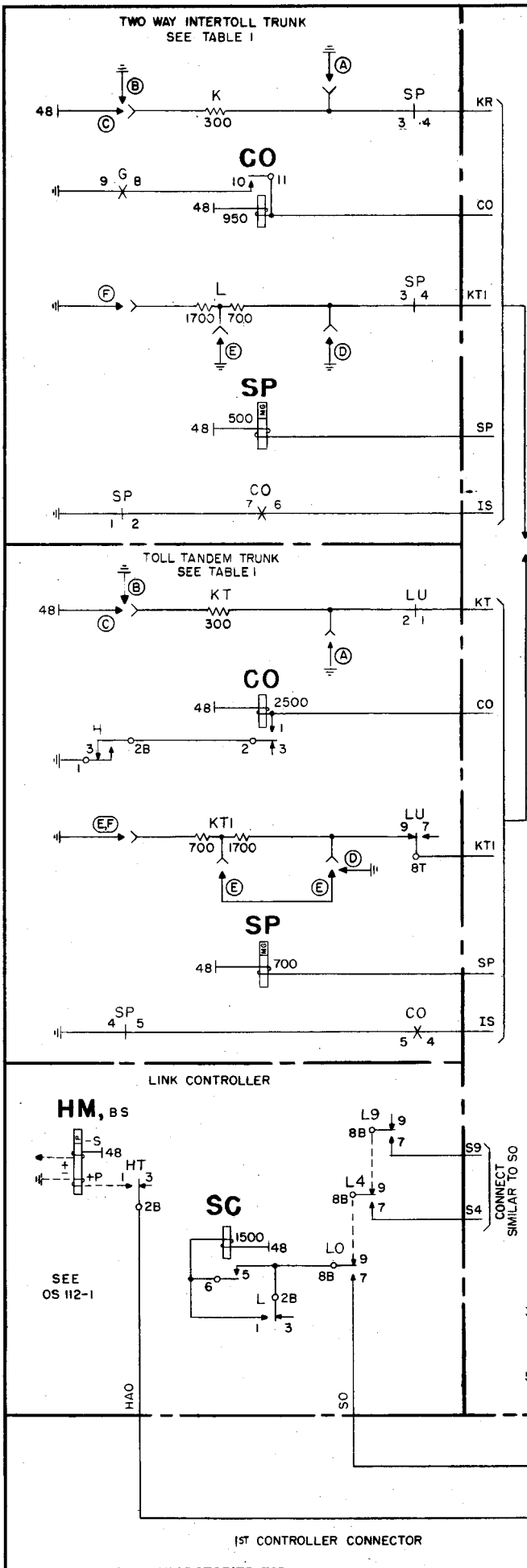


TABLE I: TRUNK CLASS INDICATION

TYPE OF TRUNK	TRUNK CIRCUIT		SENDER RELAYS										
	LEAD	WIRE OPTION	CONDITION	TS	RS	TRM	TRP	CM	CP	CTS	CRS	LP	CX
TOLL TANDEM	KT	A	0Ω GRD	X		X		X		X	X	X	X
		B	300Ω GRD	X						X	X	X	X
		C	300Ω 48V	X		X		X		X	X	X	X
INTERTOLL	KR	A	0Ω GRD		X	X		X				X	X
		B	300Ω GRD		X							X	X
		C	300Ω 48V		X		X		X			X	X

TABLE 2: TRUNK CLASS INDICATION FOR VIA & TERMINAL

LEAD	WIRE OPTION	CLASS OF OUTGOING TRK. REQ	SENDER RELAYS			
OPEN	NONE	VIA OR TERMINAL	LIT	NV	NVI	VO
0Ω GRD	D	VIA ONLY	X	X	X	X
700Ω GRD	E	VIA ONLY		X	X	X
2400Ω GRD	F	VIA OR TERMINAL		X	X	

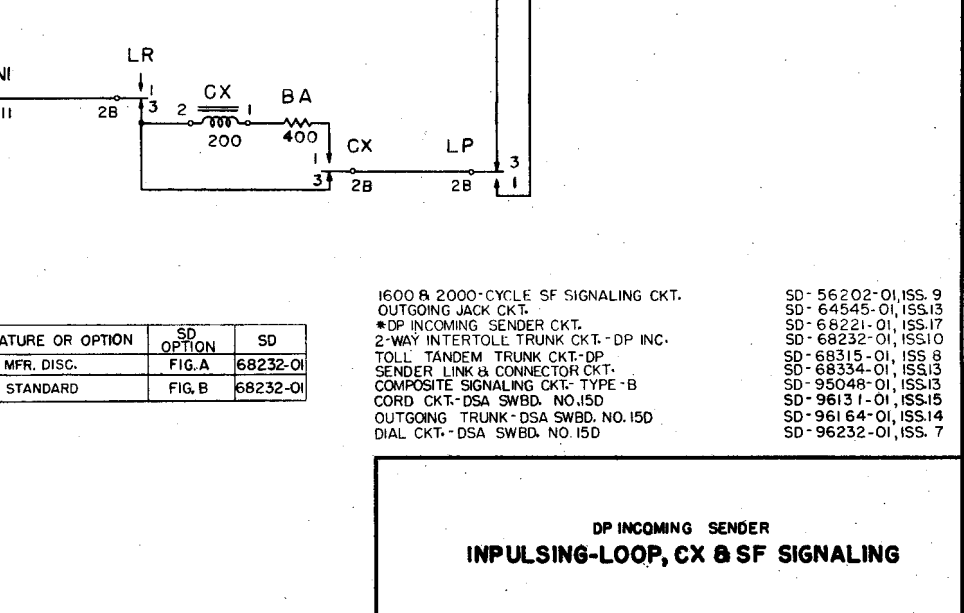
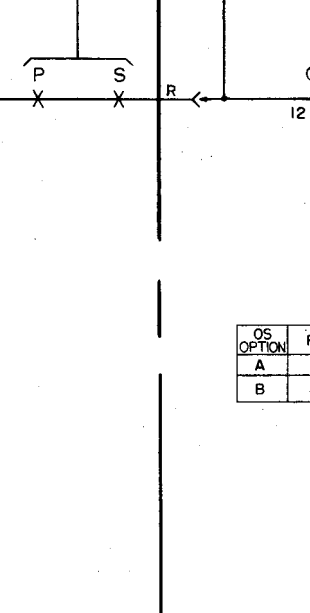
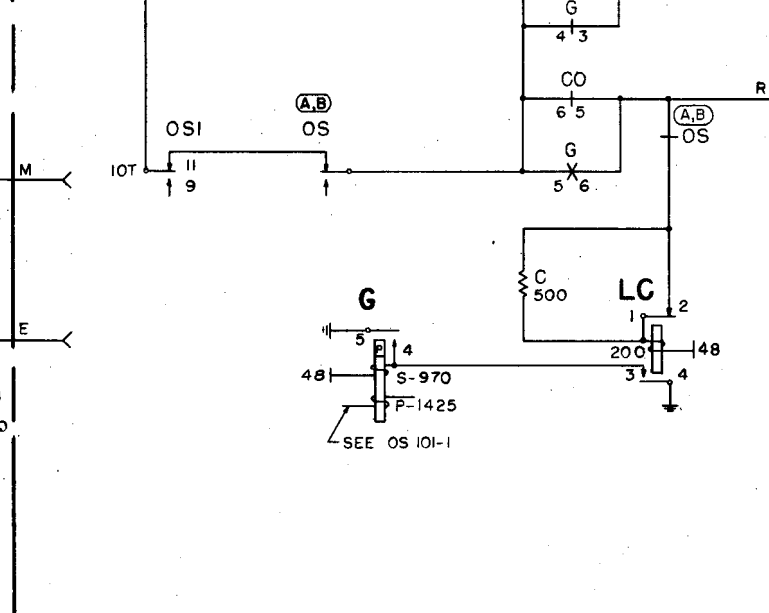
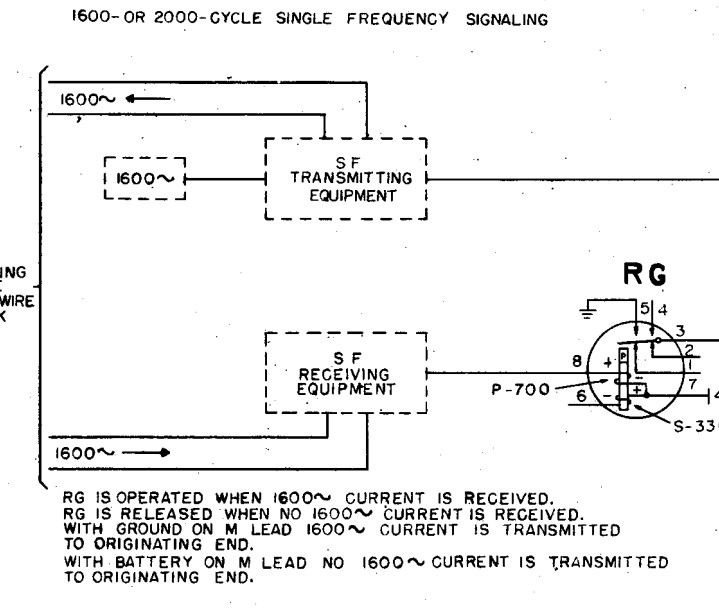
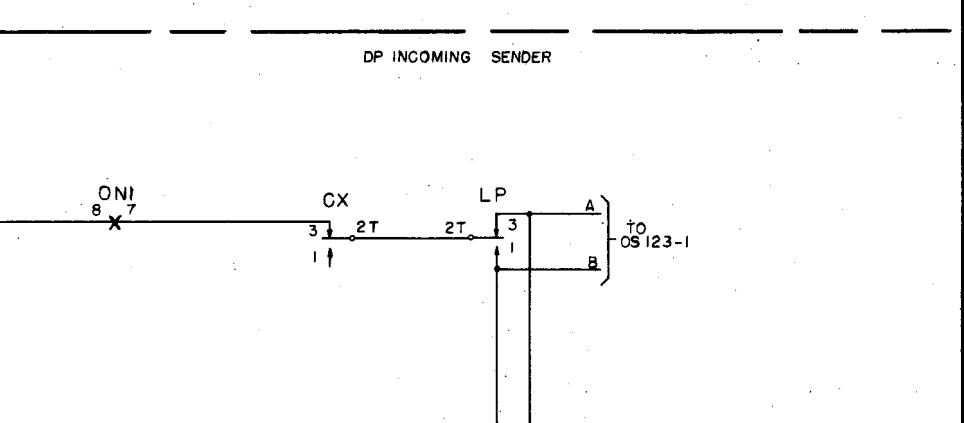
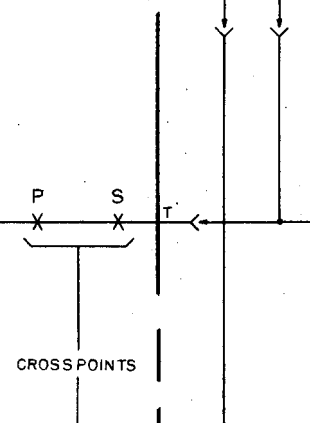
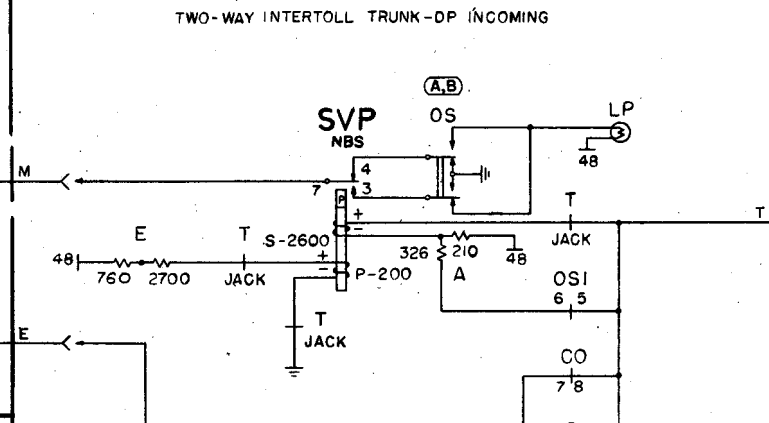
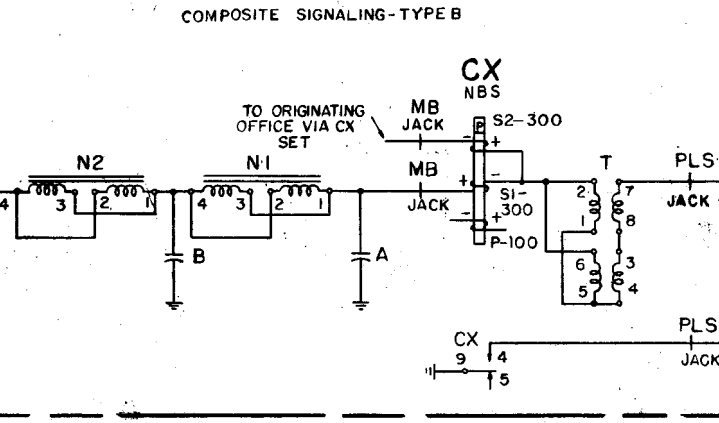
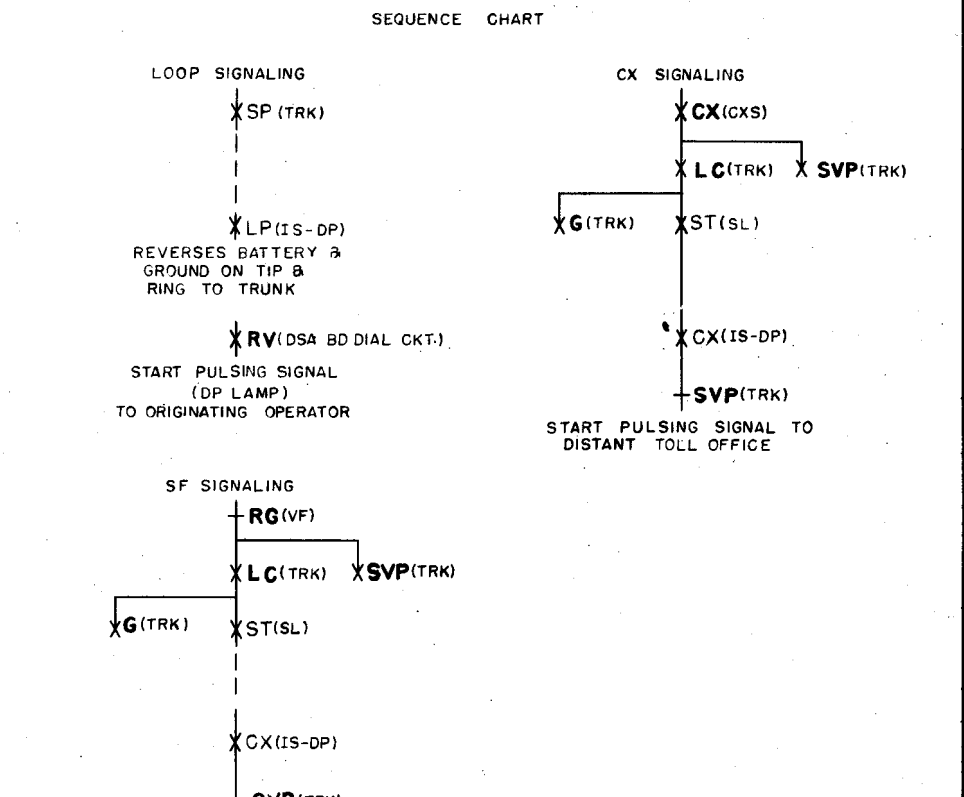
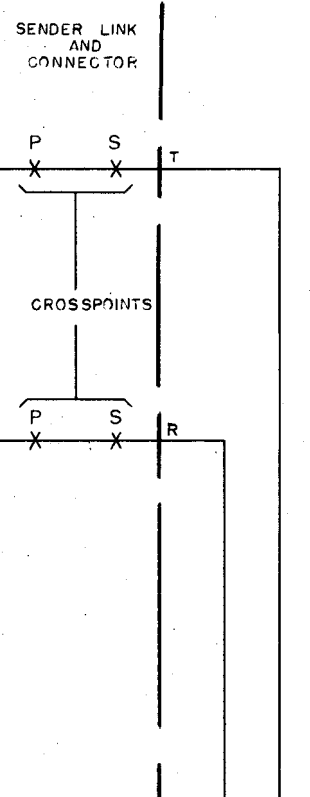
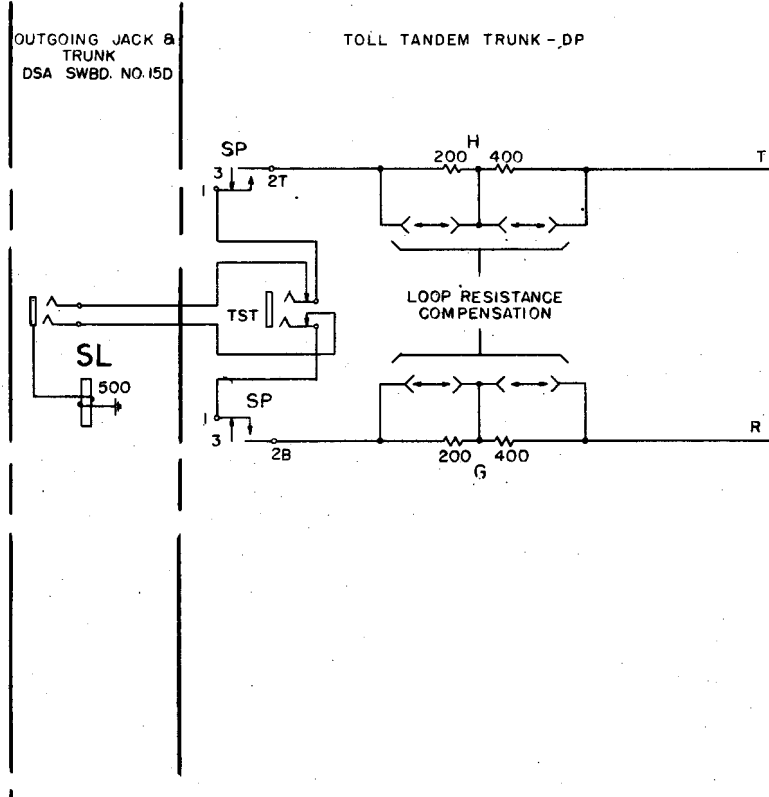
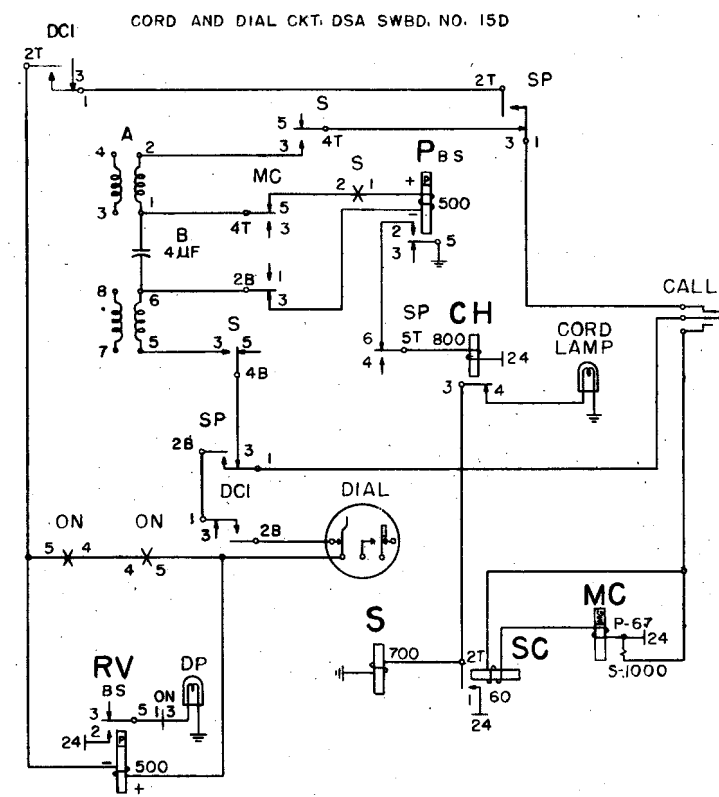
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
G	FIG. 4 PROVIDED	FIG. 4	68221-01
H	FIG. 22 PROVIDED	FIG. 22	68221-01
J	FIG. L PROVIDED	FIG. L	68221-01
K	FIG. M PROVIDED	FIG. M	68221-01

2. RELAY (5BD) IS NOT USED FOR TRUNK CIRCUIT SHOWN.

LINK CONTROLLER CKT. SD-68025-01, ISS. 28
 * INCOMING SENDER CKT. DP SD-68221-01, ISS. 17
 2-WAY INTERTOLL TRUNK CKT. INCOMING DP SD-68232-01, ISS. 10
 TOLL TANDEM TRUNK CKT. DP SD-68315-01, ISS. 8
 SENDER LINE & CONNECTOR CKT. SD-68334-01, ISS. 13
 CONTROLLER CONNECTOR CKT. SD-68336-01, ISS. 6
 MISC. CKT. SENDER MAKE-BUSY FRAME. SD-68386-01, ISS. 5

REVISION	1	DATE	2-24-51
DATE	5-25-51		10-7-53



OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	MFR. DISC.	FIG. A	68232-01
B	STANDARD	FIG. B	68232-01

1600 & 2000-CYCLE SF SIGNALING CKT.
 OUTGOING JACK CKT.
 *DP INCOMING SENDER CKT.
 2-WAY INTERTOLL TRUNK CKT.-DP INC.
 TOLL TANDEM TRUNK CKT.-DP
 SENDER LINK & CONNECTOR CKT.
 COMPOSITE SIGNALING CKT.-TYPE B
 CORD CKT.-DSA SWBD. NO.15D
 OUTGOING TRUNK - DSA SWBD. NO.15D
 DIAL CKT.- DSA SWBD. NO.15D

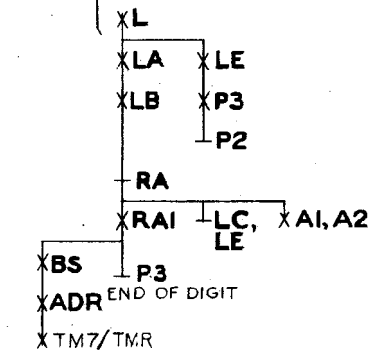
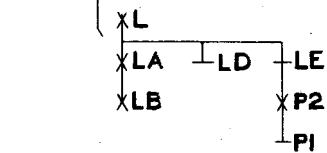
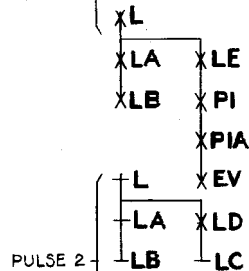
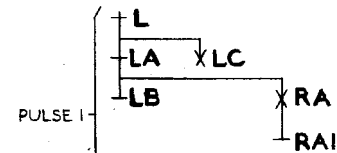
SD-56202-01, ISS. 9
 SD-64545-01, ISS.13
 SD-68221-01, ISS.17
 SD-68232-01, ISS.10
 SD-68315-01, ISS. 8
 SD-68334-01, ISS.13
 SD-95048-01, ISS.13
 SD-96131-01, ISS.15
 SD-96164-01, ISS.14
 SD-96232-01, ISS. 7

RG IS OPERATED WHEN 1600~ CURRENT IS RECEIVED.
 RG IS RELEASED WHEN NO 1600~ CURRENT IS RECEIVED.
 WITH GROUND ON M LEAD 1600~ CURRENT IS TRANSMITTED TO ORIGINATING END.
 WITH BATTERY ON M LEAD NO 1600~ CURRENT IS TRANSMITTED TO ORIGINATING END.

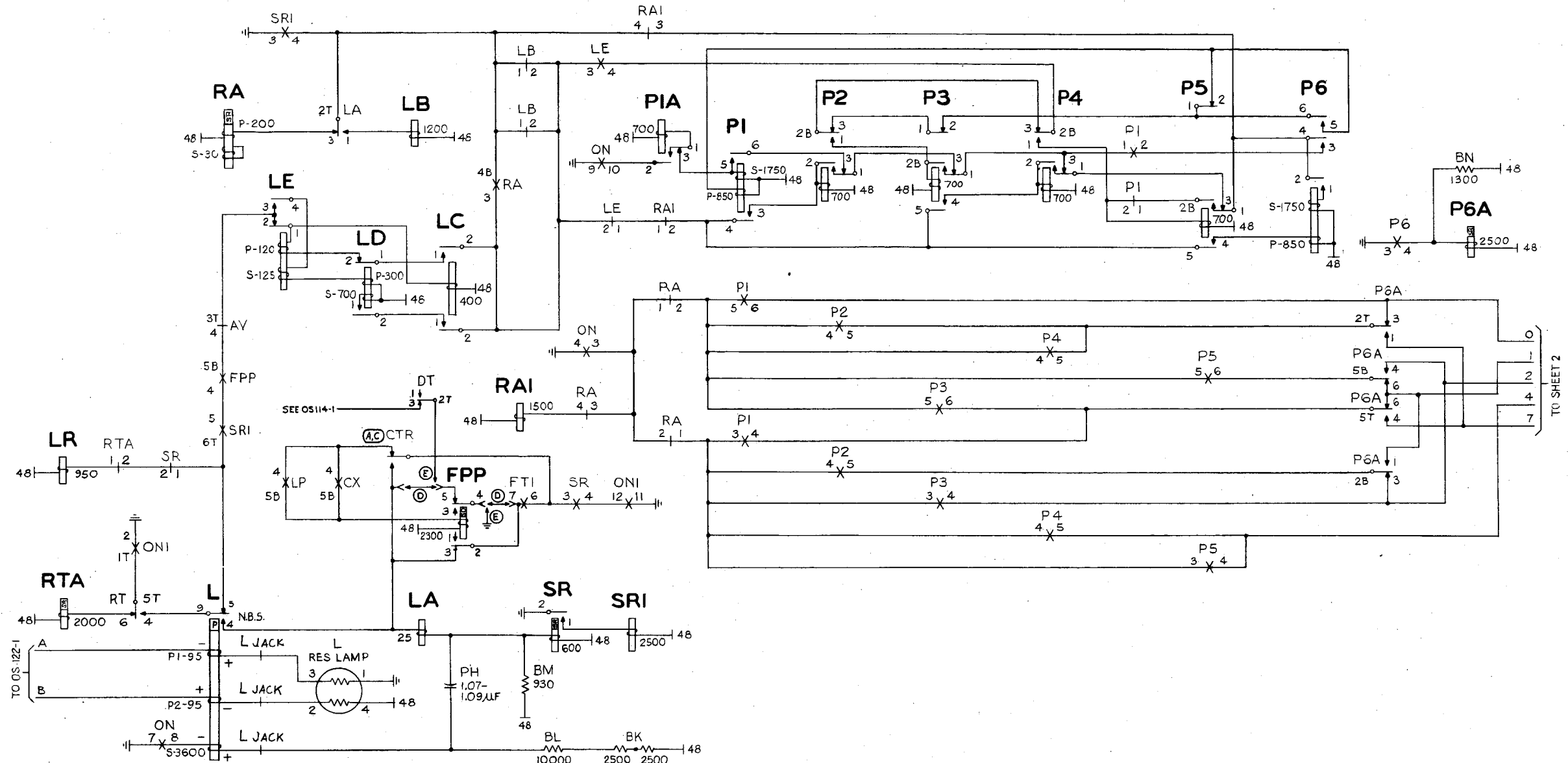
DP INCOMING SENDER
 IMPULSING-LOOP, CX & SF SIGNALING

SEQUENCE CHART

START OF DIGIT



SEE NOTE 2



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
W	3 DIGIT TX	W	
E	FIG. M PROVIDED		
D	FIG. L PROVIDED		68221-01
C	FIG. 22 PROVIDED		
B	2 & 3 DIGIT TX	B	
A	FIG. 4 PROVIDED		

2. FOR SEQUENCE CHART OF COMPLETE REGISTRATION OF DIGITS SEE SC 103-1.

STEERING CIRCUIT PROGRESS

DIGIT	RAI	EV	OD	AS	BS	CS	DS	ES	FS	GH	HS	JS	KS	LS
A	R	O	H	H	O									
B	R	O	R	H	H									
C	R	O	H	R	R									
D	R	O	R	O	H									
E	R	O	H	R										
F	R	O	R	O	H									
G	R	O	H	R										
H	R	O	R	O	H									
J	R	O	H	R										
K	R	O	R	O	H									
L	R	O	H	R										

† EV INITIALLY OPERATES ON FIRST DIGIT FROM PIA
* AS INITIALLY OPERATES FROM OFF-NORMAL GRD.

OPERATION OF PULSING RELAYS OF EACH DIGIT

PULSE	L	LC	LD	LE	P-RELAYS		COMB*
					OPERATED	RELEASED	
1	R	O	H	O	P1		C,1
2	R	O	R	H	P2	P1	0,2
3	R	O	H	O	P3	P2	1,2
4	R	O	R	H	P4	P3	0,4
5	R	O	H	O	P5	P4	1,4
6	R	O	R	H	P5, P6		2,4
7	R	O	H	O	P1, P6	P5	0,7
8	R	O	R	H	P2, P6	P1	1,7
9	R	O	H	O	P3, P6	P2	2,7
10	R	O	R	H	P4, P6		4,7

* INDICATES WHICH OF CORRESPONDINGLY NUMBERED A₅, B₅, ETC., RELAYS ARE OPERATED AT END OF DIGIT.

* INCOMING SENDER CKT. DP SD-68221-01, ISS. 17

DP INCOMING SENDER
IMPULSING-PULSE COUNT & REGISTRATION
OS 123-1

2 SHEETS, SHEET 1

NO. 4A TOLL

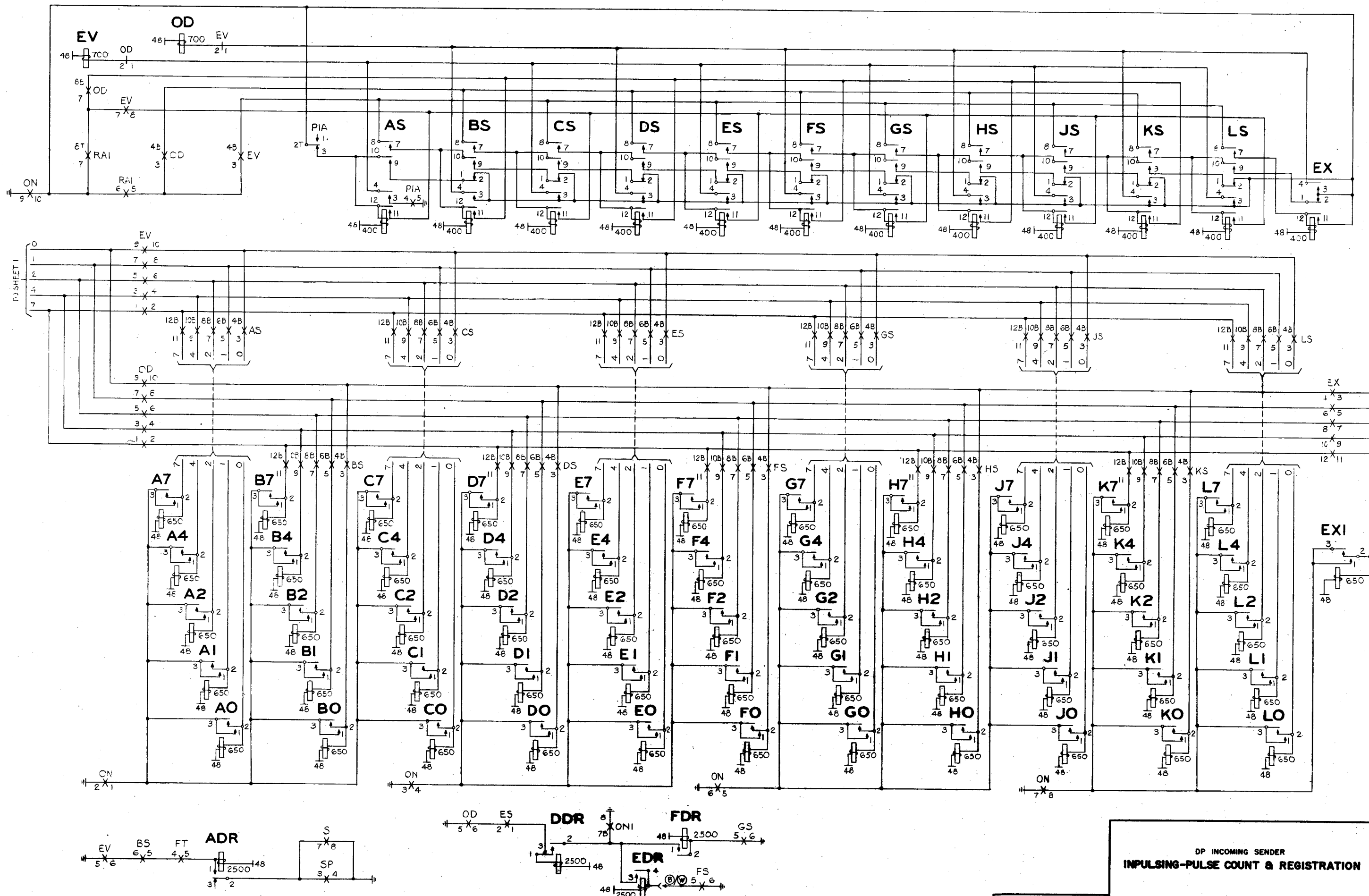
ORDER AS BSP ITEM MP-11648

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U. S. A.

2 SHEETS, SHEET 1
MP-11648
ISSUE 1 1-51
DATE 8-30-51 9-1-53

ISSUE	1	DATE	8-30-51
REVISED	2	DATE	9-1-53



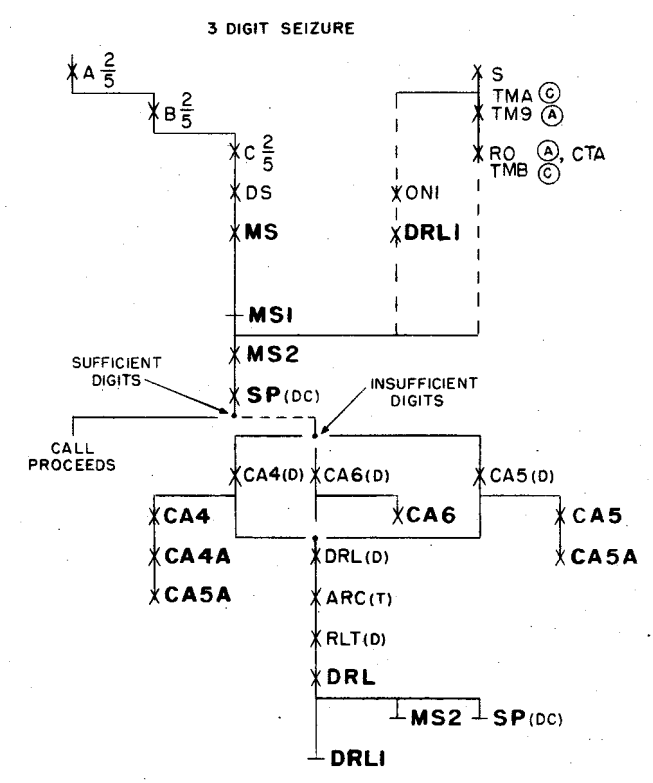
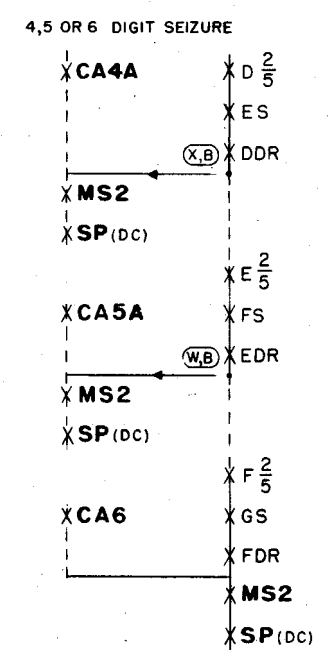
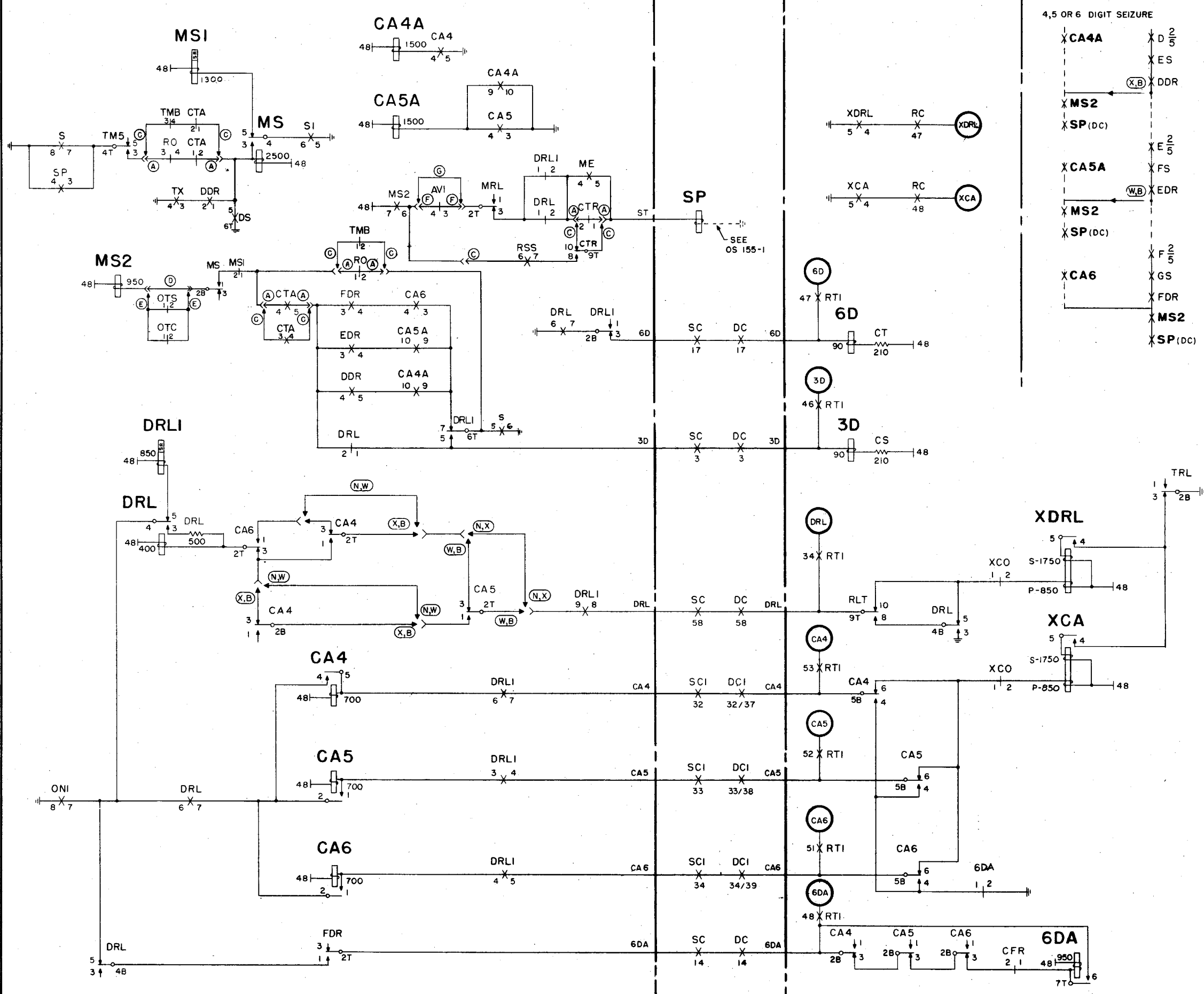
ISSUE	DATE
1	8-10-51
2	8-11-53

DP INCOMING SENDER

DECODER CONNECTOR

DECODER

SEQUENCE CHARTS



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
N	1 DIGIT TX CALLS	LOOP WIRING	68221-01
X	2 DIGIT TX CALLS	X	
W	3 DIGIT TX CALLS	W	
B	2 AND 3 TX CALLS	B	
A	FIG. 4 PROVIDED		
C	FIG. 22 PROVIDED		
D	WITHOUT LOAD CONTROL TIMING	FIG. G	
E	WITH LOAD CONTROL TIMING	FIG. H	
F	M.D.	YY	
G	STD	YZ	

*INCOMING SENDER CKT. DP
DECODER CONNECTOR CKT.
DECODER CKT

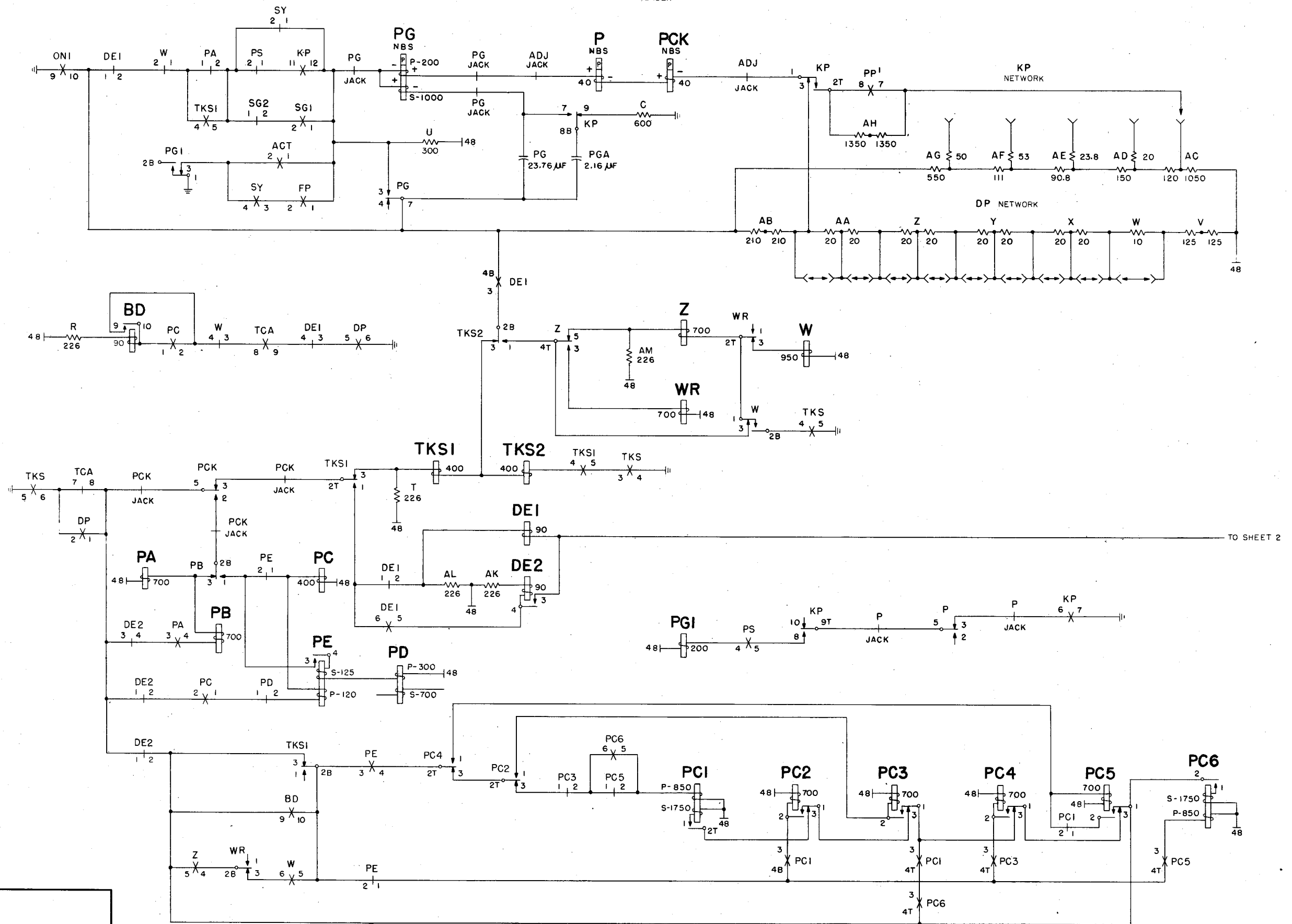
SD-68221-01, ISS. 17
SD-68339-01, ISS. 4
SD-68340-01, ISS. 5

**DP INCOMING SENDER
DECODER CONNECTOR START**

NO. 4A TOLL

OS 124-1

DP INCOMING SENDER



TO SHEET 2

ISSUE	1	A.S.E.	2	REV.	
DATE	8-15-51		8-24-51		

2 SHEETS, SHEET 1

MP-11675

DP INCOMING SENDER
PULSE GENERATION & RECAPTURE

OS 125-1

2 SHEETS, SHEET 1

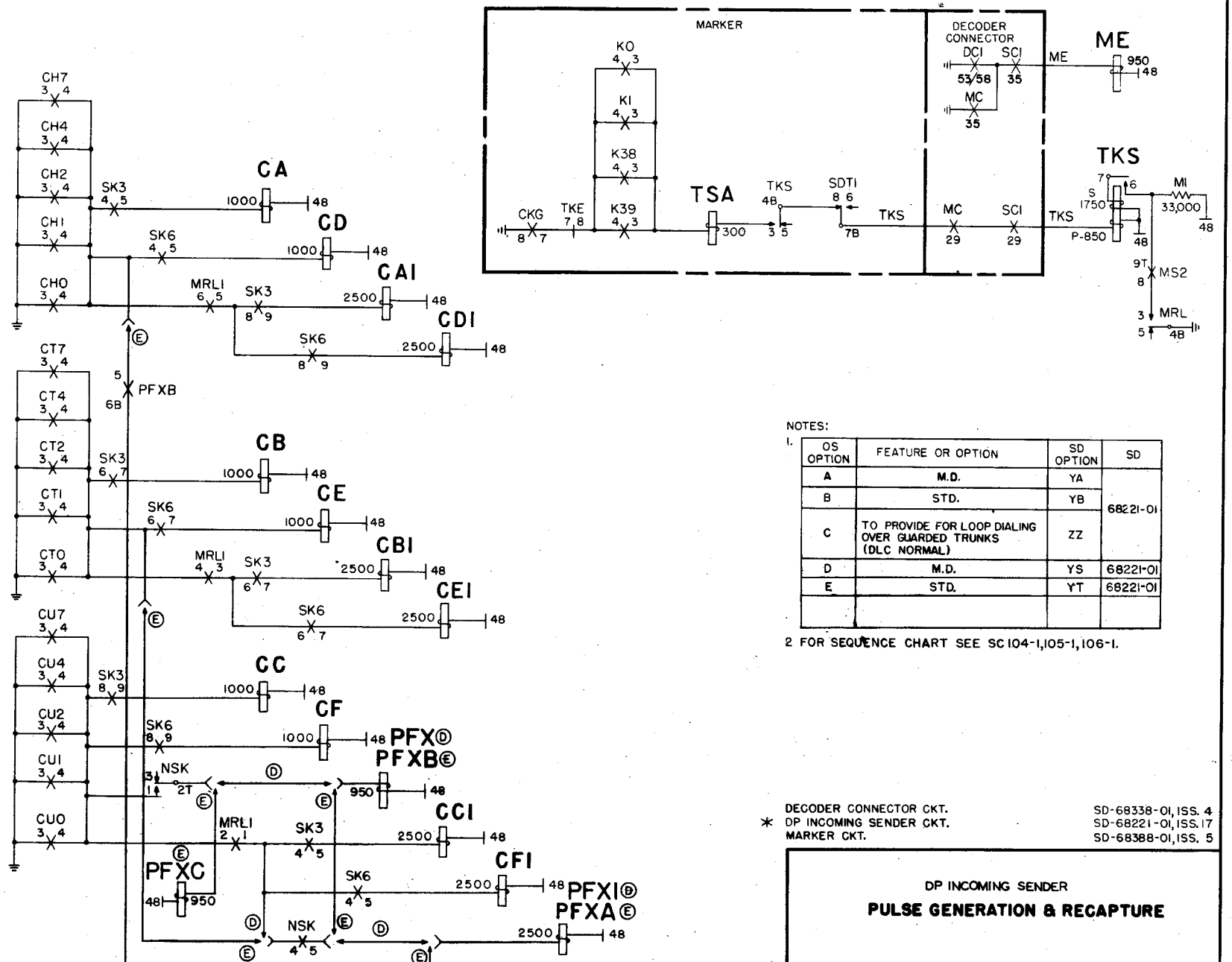
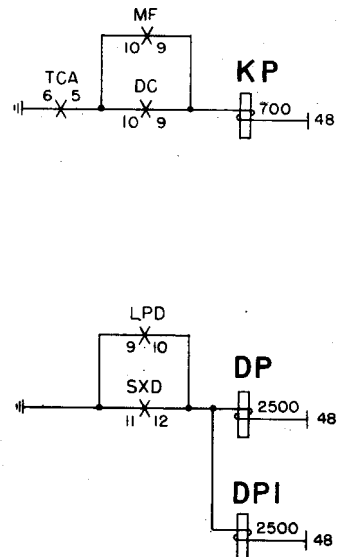
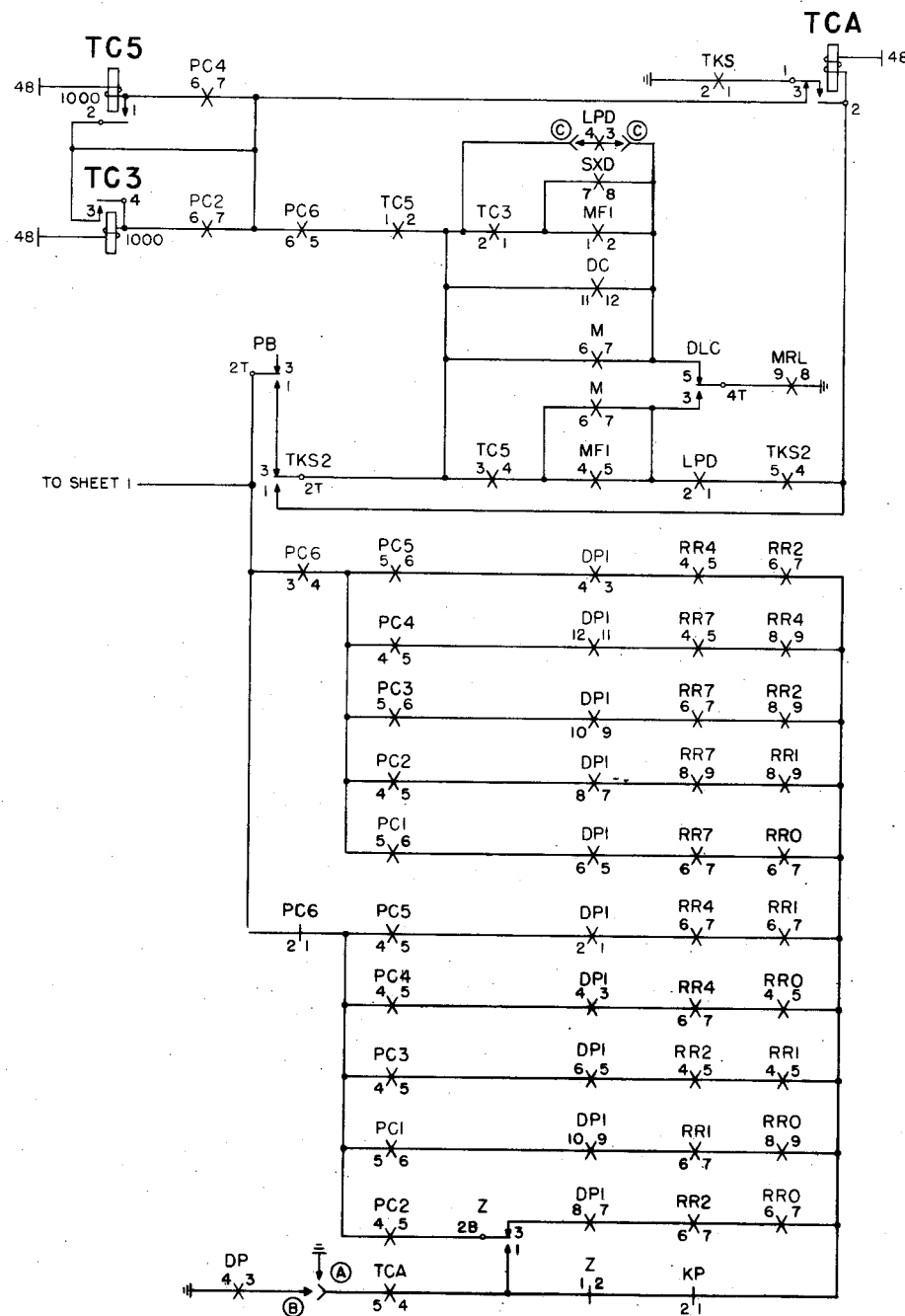
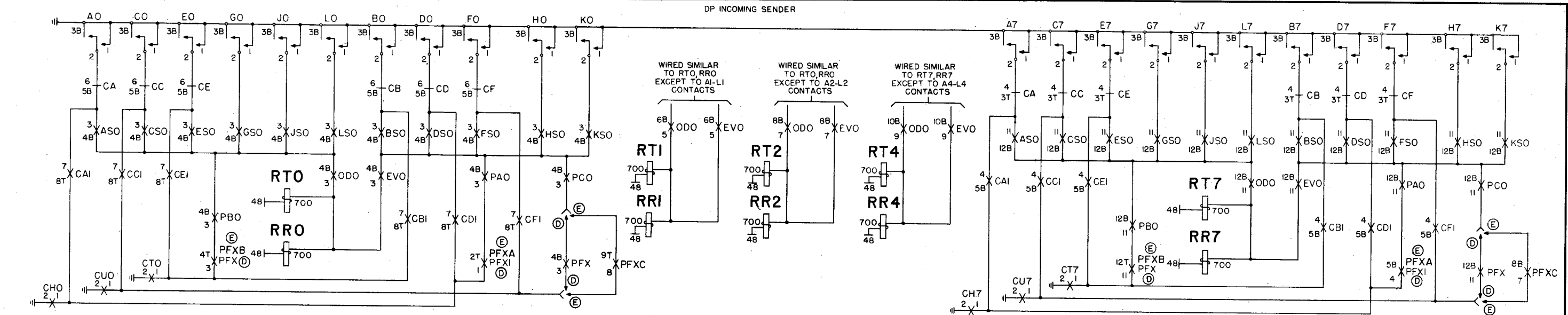
NO. 4A TOLL

ORDER AS BSP ITEM MP-11675

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U. S. A.

ISSUE	1	2
DATE	8-13-51	8-24-53



NOTES:

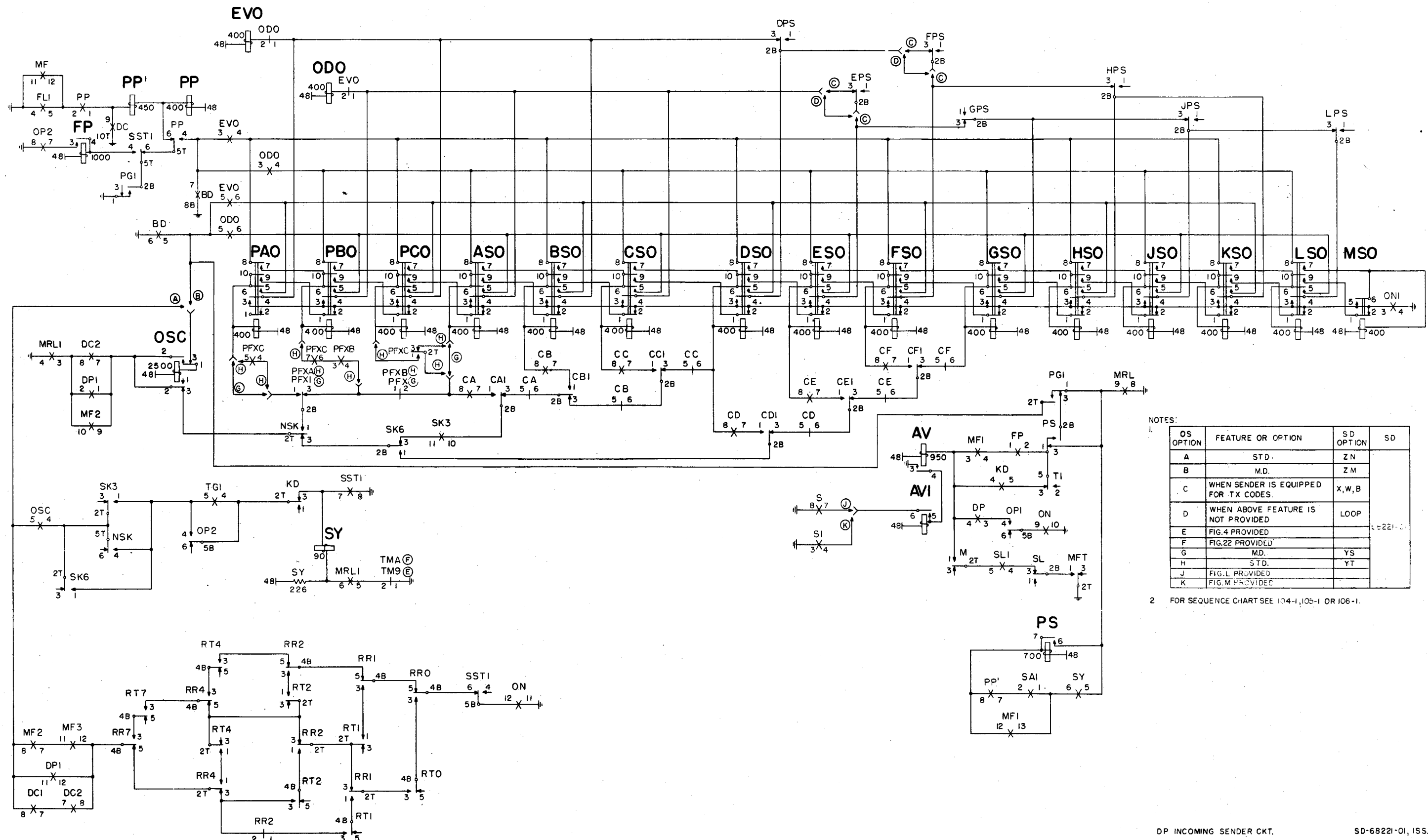
OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	M.D.	YA	
B	STD.	YB	68221-01
C	TO PROVIDE FOR LOOP DIALING OVER GUARDED TRUNKS (DLC NORMAL)	ZZ	
D	M.D.	YS	68221-01
E	STD.	YT	68221-01

2 FOR SEQUENCE CHART SEE SC104-1,105-1,106-1.

DECODER CONNECTOR CKT. SD-68338-01, ISS. 4
 * DP INCOMING SENDER CKT. SD-68221-01, ISS. 17
 MARKER CKT. SD-68388-01, ISS. 5

**DP INCOMING SENDER
PULSE GENERATION & RECAPTURE**

ISSUE	1	2
DATE	8-10-51	8-19-53



NOTES:

- | OS OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|---------------------------------------|-----------|----------|
| A | STD. | Z N | 68221-01 |
| B | M.D. | Z M | |
| C | WHEN SENDER IS EQUIPPED FOR TX CODES. | X, W, B | |
| D | WHEN ABOVE FEATURE IS NOT PROVIDED | LOOP | |
| E | FIG. 4 PROVIDED | | |
| F | FIG. 22 PROVIDED | | |
| G | M.D. | Y S | |
| H | STD. | Y T | |
| J | FIG. L PROVIDED | | |
| K | FIG. M PROVIDED | | |
- FOR SEQUENCE CHART SEE 104-1, 105-1 OR 106-1.

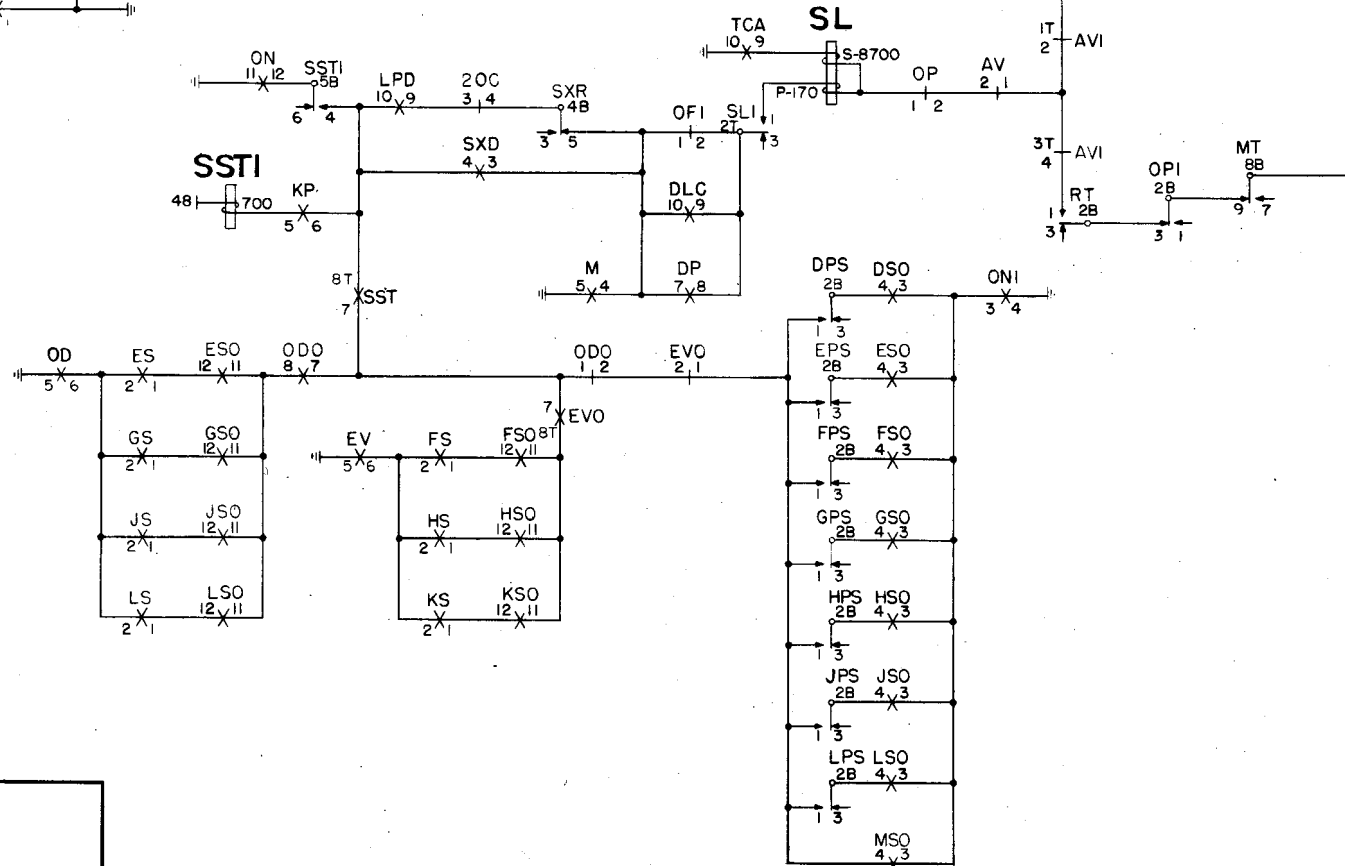
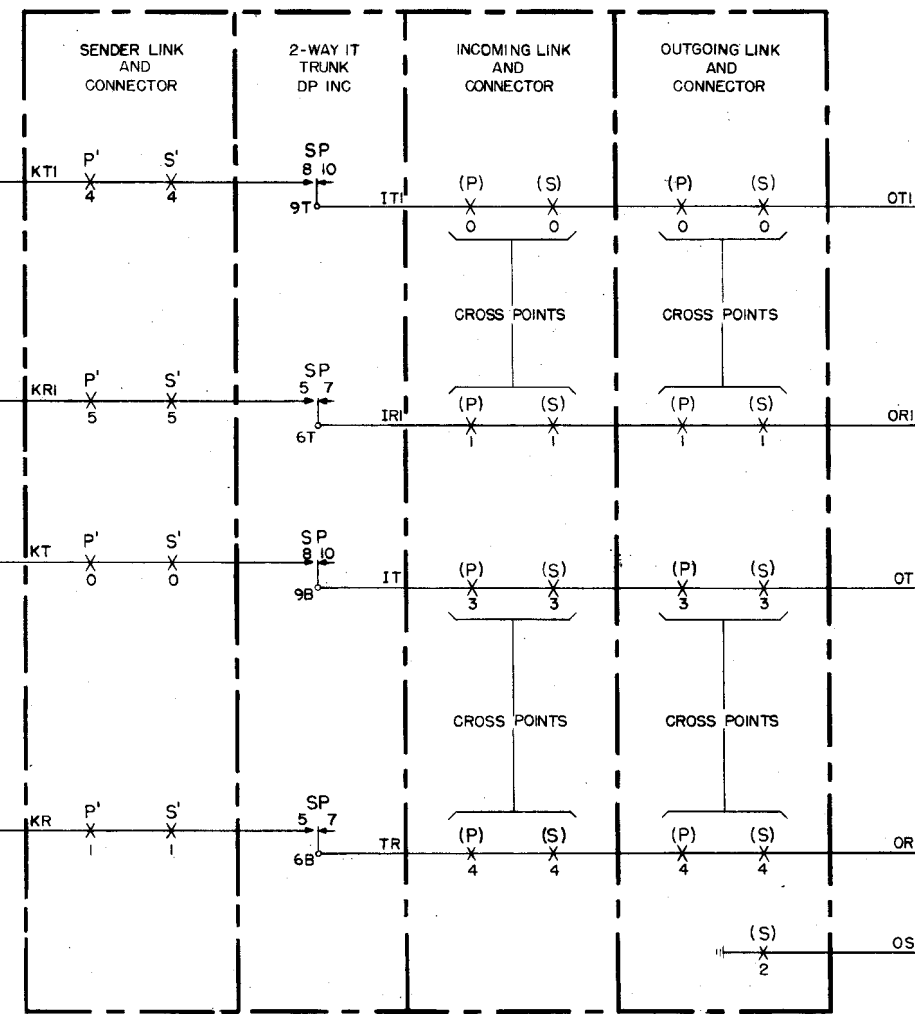
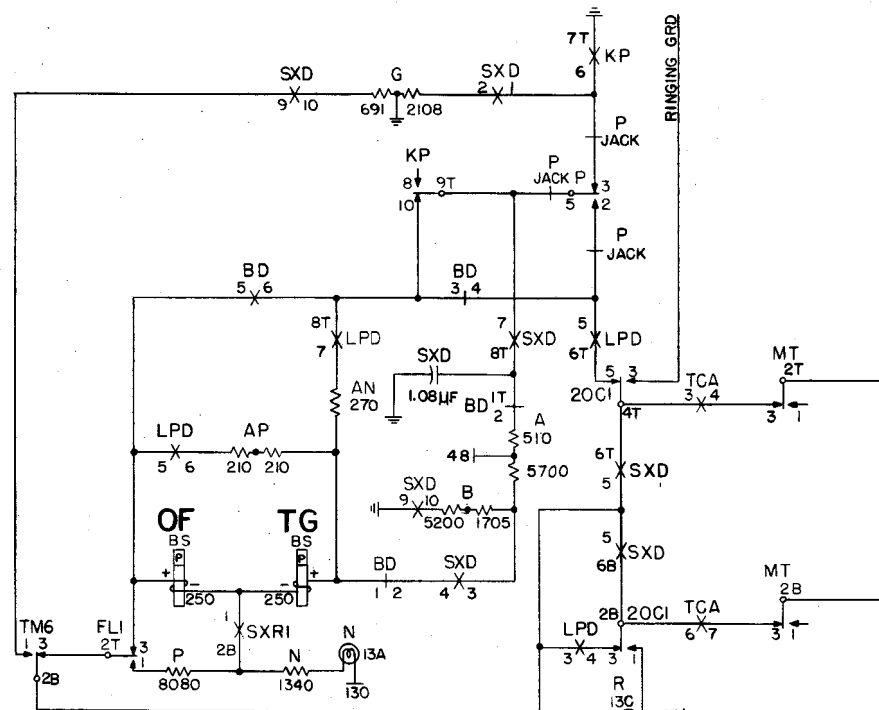
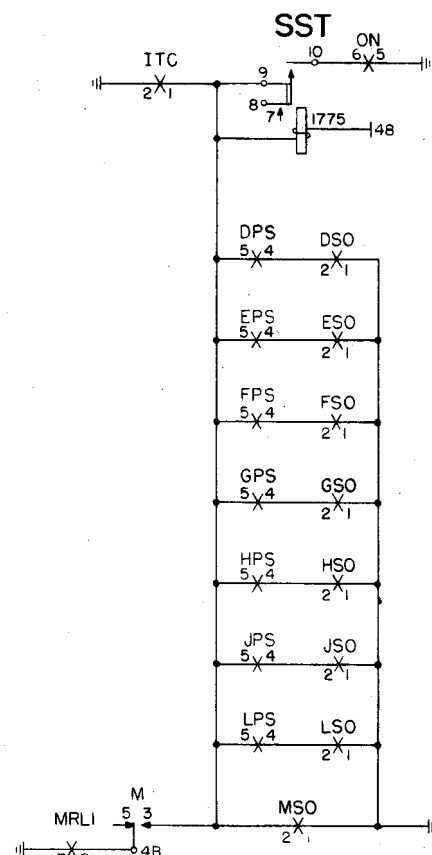
DP INCOMING SENDER CKT. SD-68221-01, 1SS. 17

**DP INCOMING SENDER
OUTSTEERING CONTROL**

NO. 4A TOLL

OS 126-1

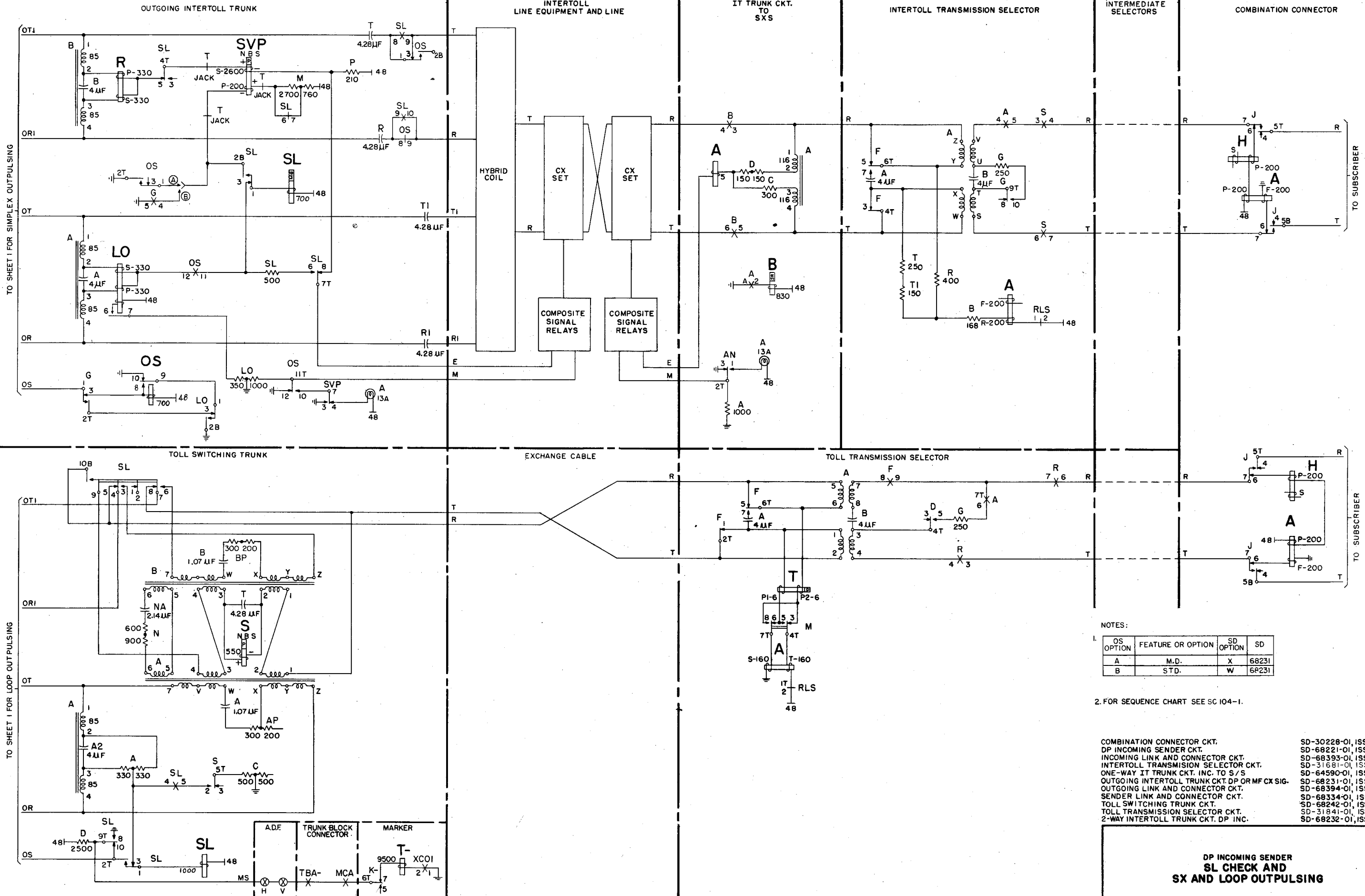
DP INCOMING SENDER



DP INCOMING SENDER
SL CHECK AND
SX AND LOOP OUTPUTSING

ISSUE	1	2	3
DATE	8-7-51	7-27-53	

ISSUE	1	2	3
DATE	8-7-51	7-2-53	



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	M.D.	X	68231
B	STD.	W	68231

2. FOR SEQUENCE CHART SEE SC 104-1.

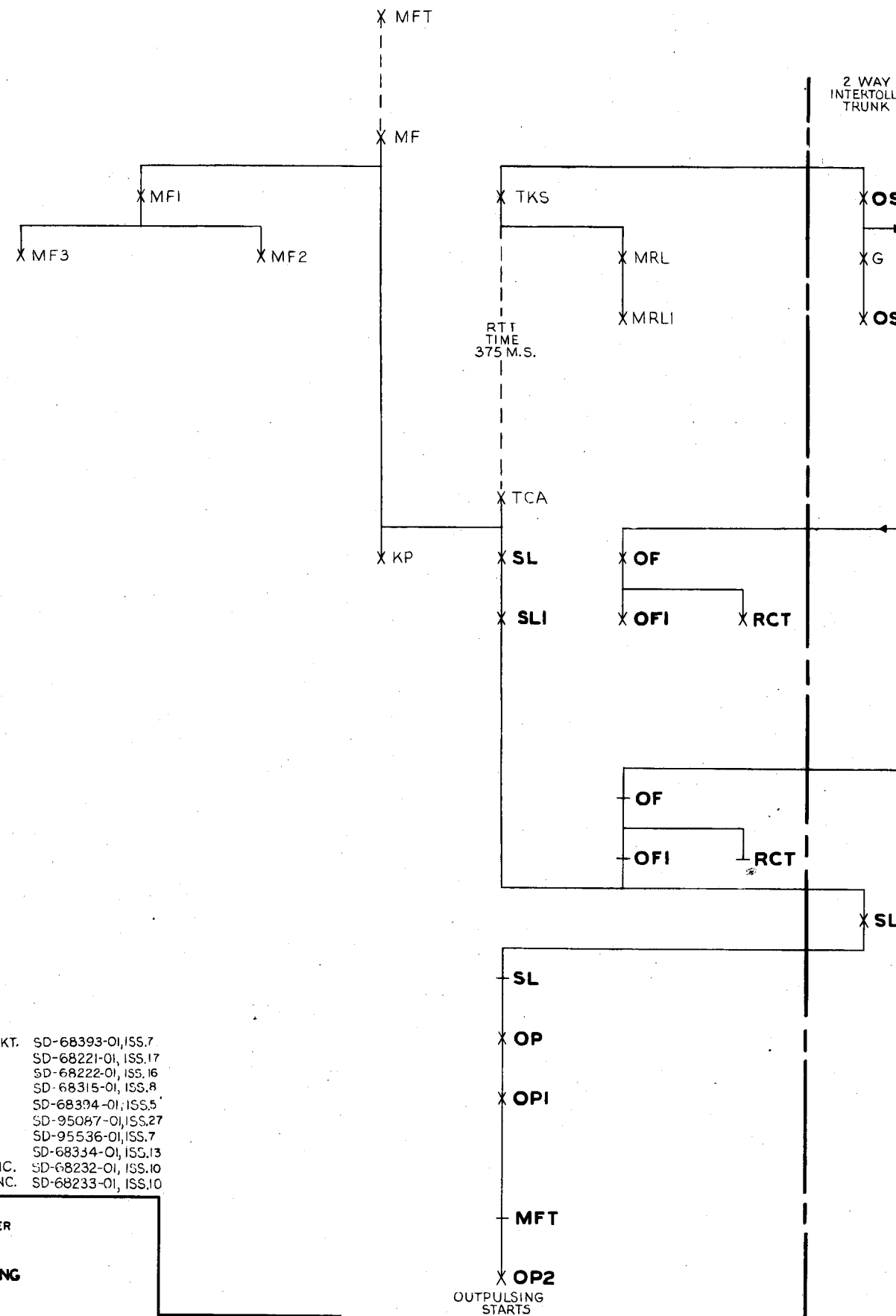
- COMBINATION CONNECTOR CKT. SD-30228-01, ISS.28
- DP INCOMING SENDER CKT. SD-68221-01, ISS.17
- INCOMING LINK AND CONNECTOR CKT. SD-68393-01, ISS.7
- INTERTOLL TRANSMISSION SELECTOR CKT. SD-31681-01, ISS.9
- ONE-WAY IT TRUNK CKT. INC. TO S/S SD-64590-01, ISS.10
- OUTGOING INTERTOLL TRUNK CKT. DP OR MF CX SIG. SD-68231-01, ISS.8
- OUTGOING LINK AND CONNECTOR CKT. SD-68394-01, ISS.5
- SENDER LINK AND CONNECTOR CKT. SD-68334-01, ISS.13
- TOLL SWITCHING TRUNK CKT. SD-68242-01, ISS.11
- TOLL TRANSMISSION SELECTOR CKT. SD-31841-01, ISS.13
- 2-WAY INTERTOLL TRUNK CKT. DP INC. SD-68232-01, ISS.10

**DP INCOMING SENDER
SL CHECK AND
SX AND LOOP OUTPULSING**

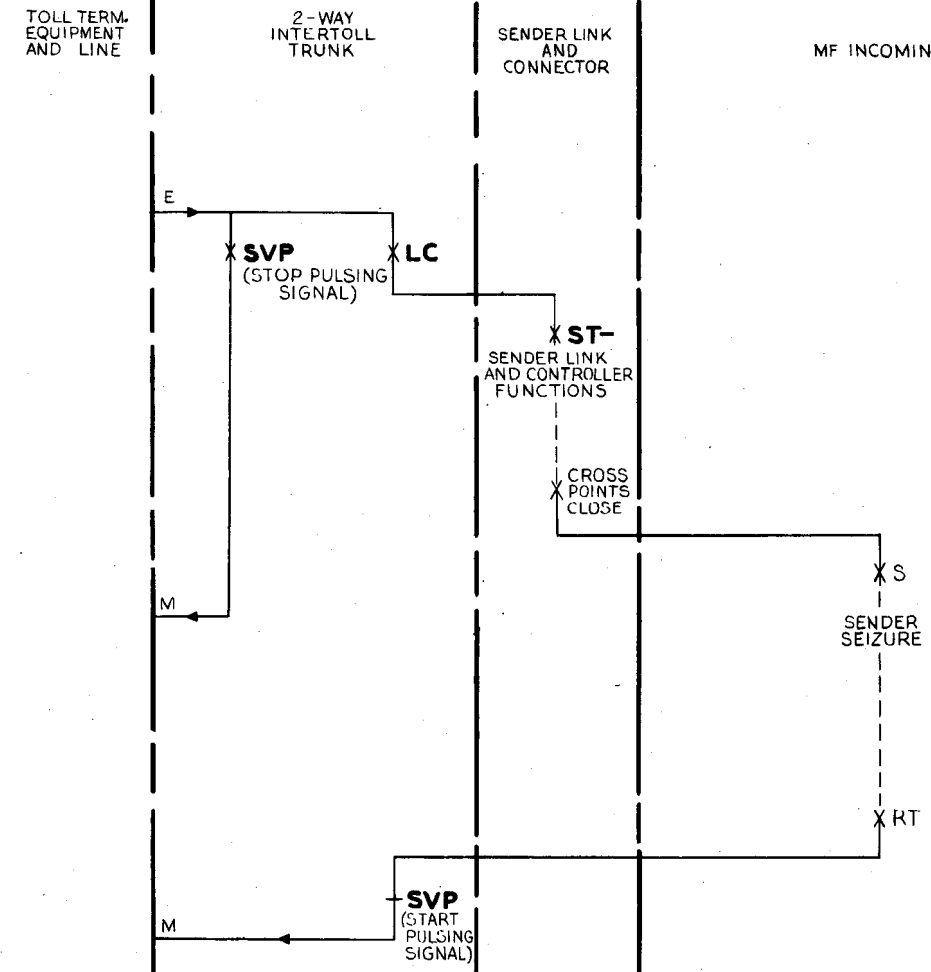
LOCAL 4A OFFICE

DISTANT 4A OFFICE

DP INCOMING SENDER



TOLL TERM. EQUIPMENT AND LINE



MF INCOMING SENDER

- INCOMING LINK AND CONNECTOR CKT. SD-68393-01, ISS.7
- * INCOMING SENDER CKT.-DP SD-68221-01, ISS.17
- INCOMING SENDER CKT.-MF SD-68222-01, ISS.16
- INCOMING TANDEM TRUNK CKT.-DP SD-68315-01, ISS.8
- OUTGOING LINK AND CONNECTOR CKT. SD-68394-01, ISS.5
- RECEIVING CKT. MF PULSING SD-95087-01, ISS.27
- RECEIVING CKT. MF PULSING SD-95536-01, ISS.7
- SENDER LINK AND CONNECTOR CKT. SD-68334-01, ISS.13
- 2-WAY INTERTOLL TRUNK CKT.-DP INC. SD-68232-01, ISS.10
- 2-WAY INTERTOLL TRUNK CKT.-MF INC. SD-68233-01, ISS.10

DP INCOMING SENDER
SL CHECK
AND
MF OUTPULSING
TO 4A OR 4A

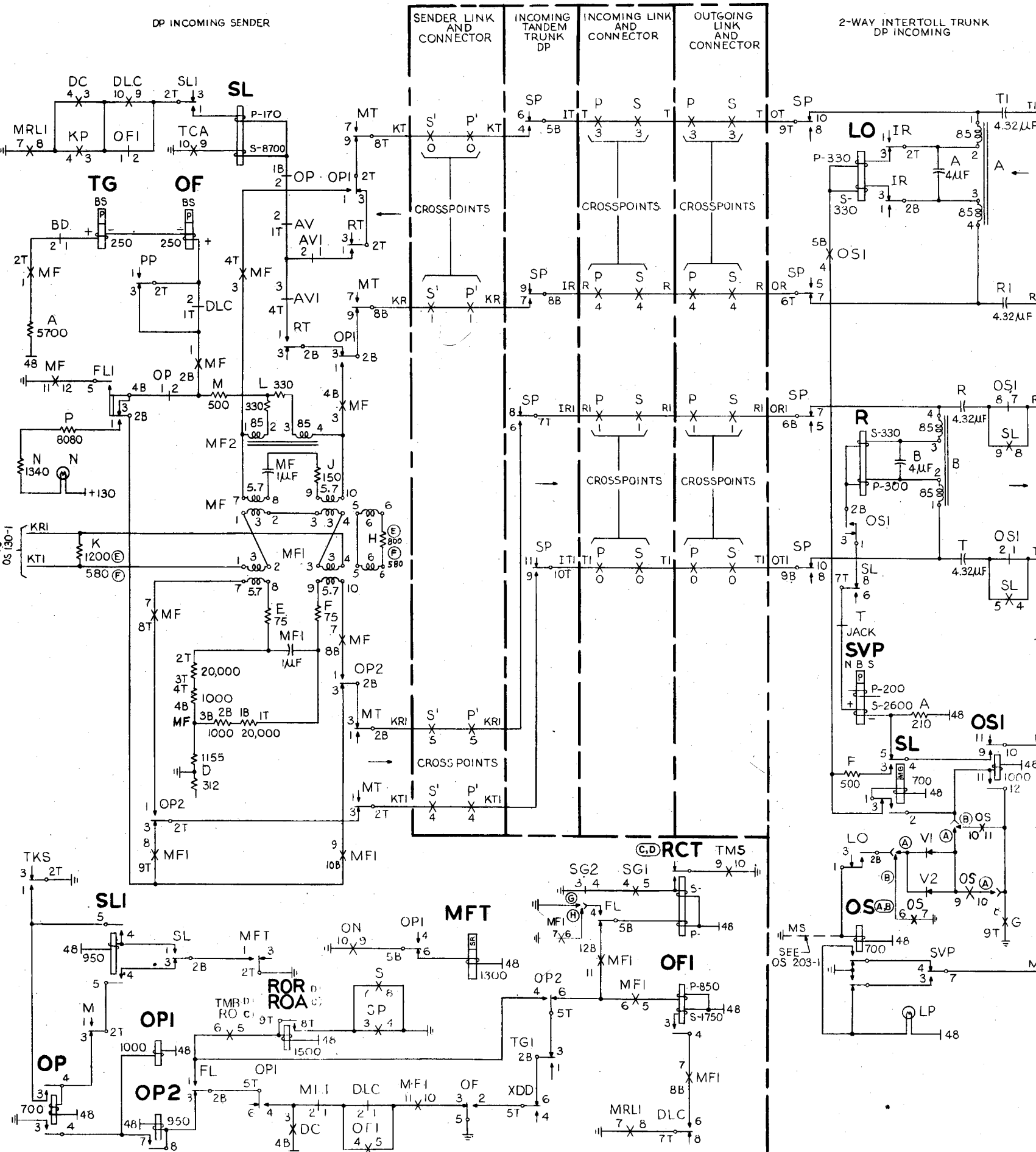
OS 128-1 2 SHEETS, SHEET 1 NO. 4A TOLL

ISSUE	1	2	3	4	5	6	7	8	9	10
DATE	11-20-51	8-18-53								

2 SHEETS, SHEET 1

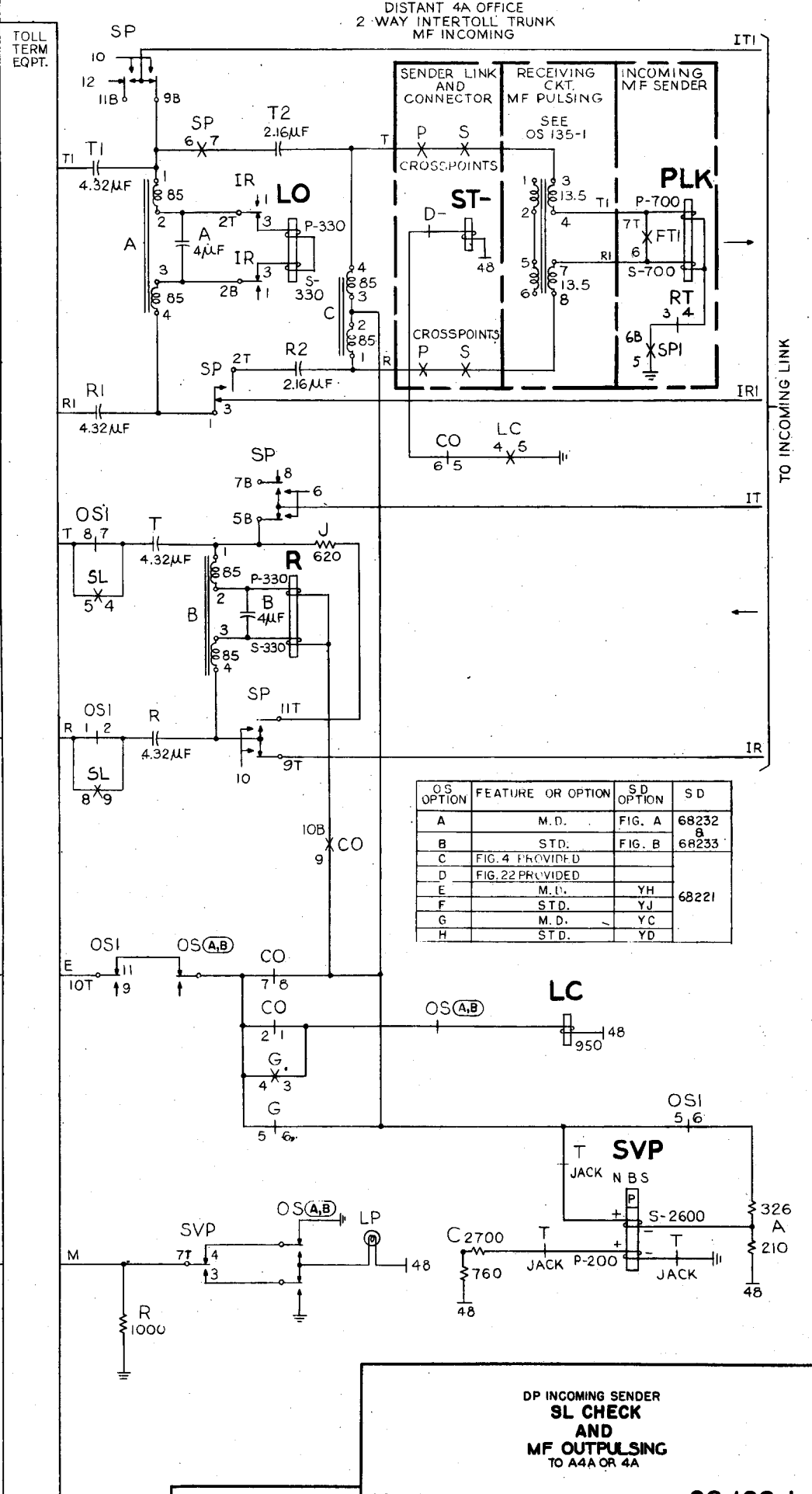
MP-11724

LOCAL 4A OFFICE



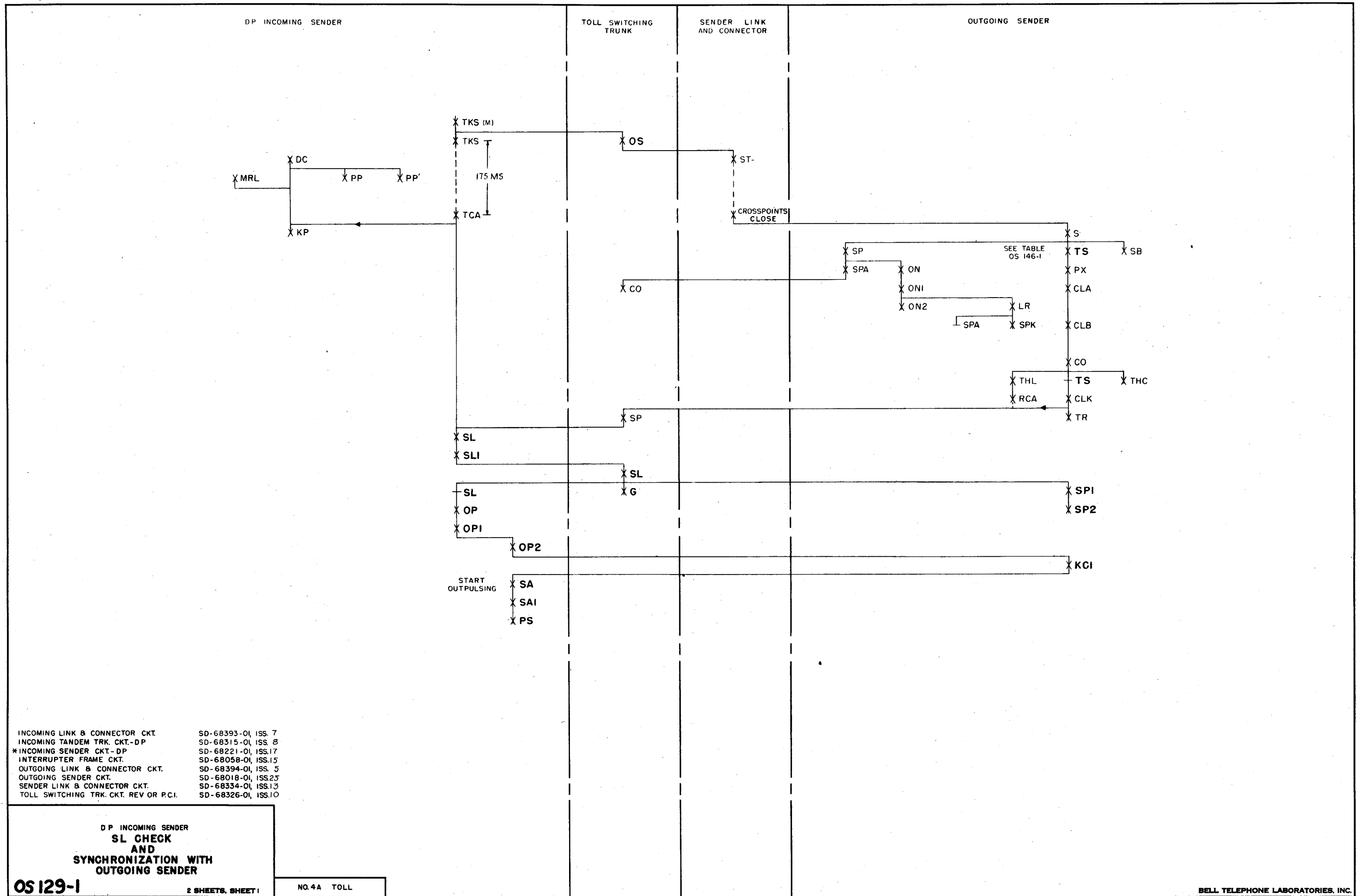
TOLL TERM. EQPT.

TOLL TERM. EQPT.



OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	M.D.	FIG. A	68232
B	STD.	FIG. B	68233
C	FIG. 4 PROVIDED		
D	FIG. 22 PROVIDED		
E	M.D.	YH	68221
F	STD.	YJ	
G	M.D.	YC	
H	STD.	YD	

DP INCOMING SENDER
SL CHECK
AND
MF OUTPULSING
TO 4A OR 4A



- INCOMING LINK & CONNECTOR CKT. SD-68393-01, ISS. 7
- INCOMING TANDEM TRK. CKT.-DP SD-68315-01, ISS. 8
- *INCOMING SENDER CKT.-DP SD-68221-01, ISS.17
- INTERRUPTER FRAME CKT. SD-68058-01, ISS.15
- OUTGOING LINK & CONNECTOR CKT. SD-68394-01, ISS. 5
- OUTGOING SENDER CKT. SD-68018-01, ISS.25
- SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS.13
- TOLL SWITCHING TRK. CKT. REV OR P.C.I. SD-68326-01, ISS.10

**DP INCOMING SENDER
SL CHECK
AND
SYNCHRONIZATION WITH
OUTGOING SENDER**

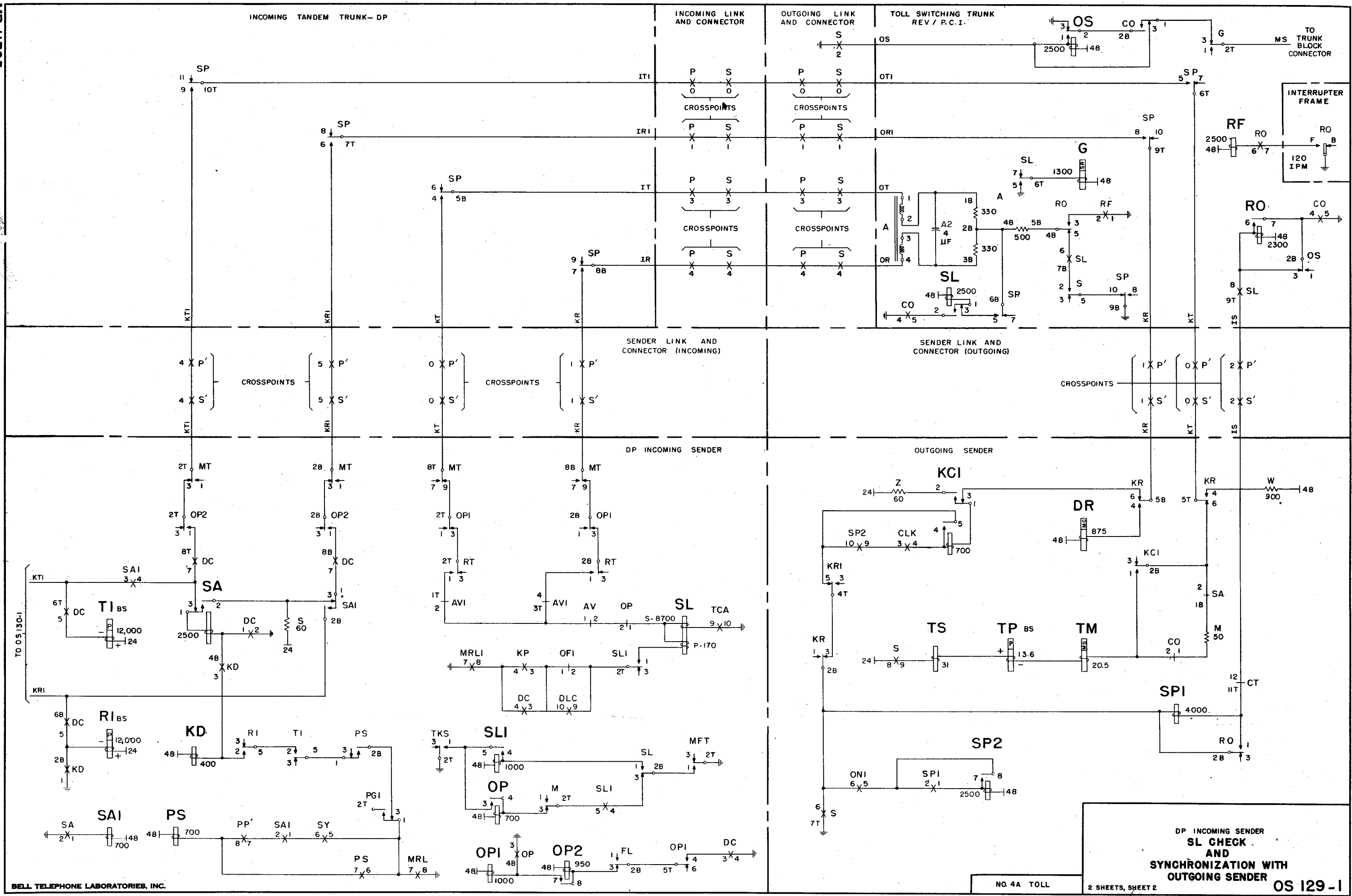
OS129-1

2 SHEETS, SHEET 1

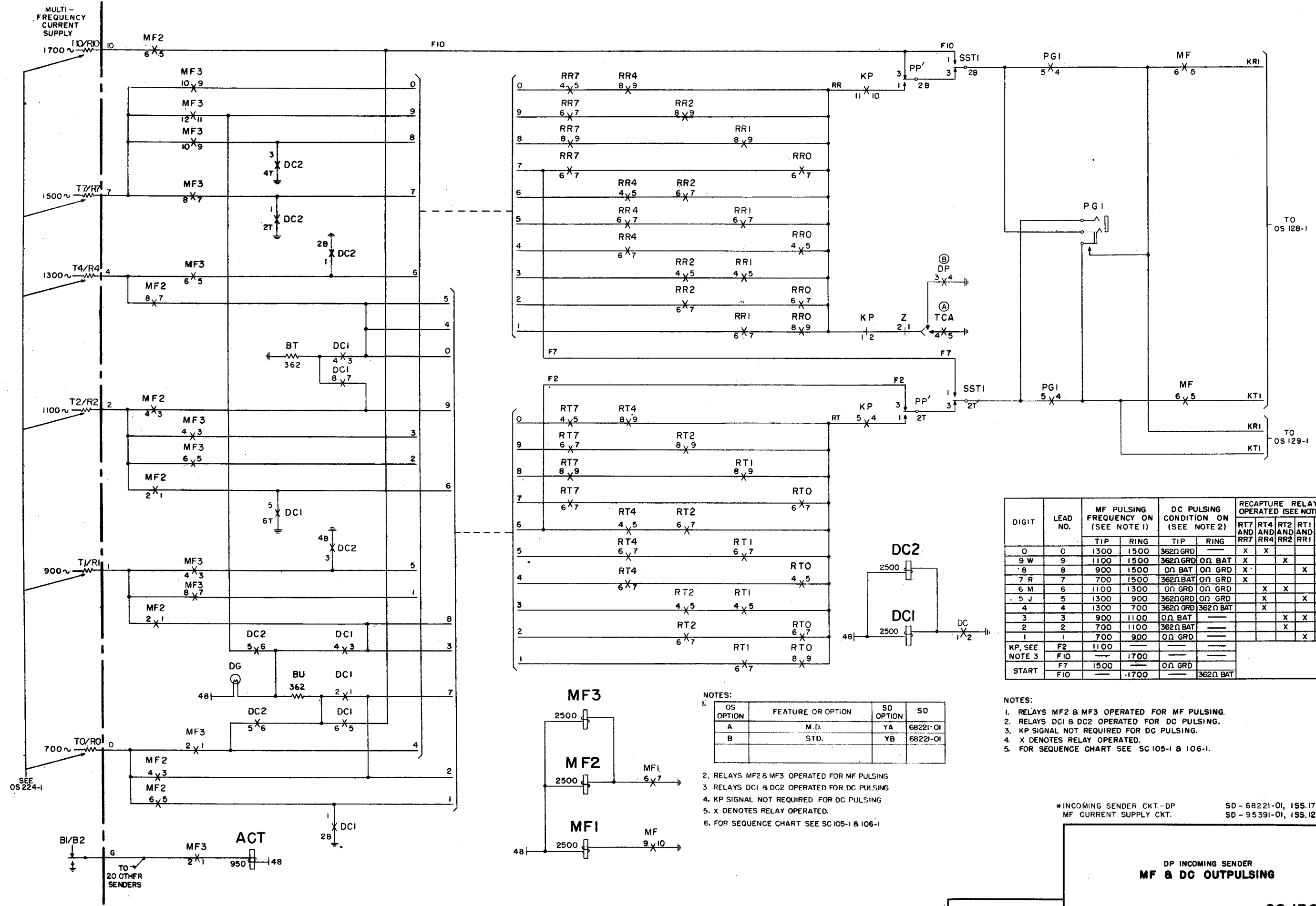
NO. 4A TOLL

ISSUE	1	A.S.M.	2	A.S.S.	R.E.C.
DATE	11-19-51			8-19-55	

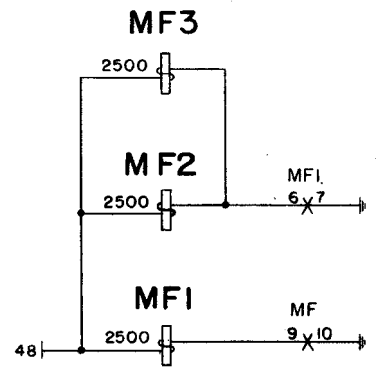
ISSUED	1	1-1-51	2	1-1-51
DATE	11-15-51	8-15-50		



ISSUE	1	2	3	4	5
DATE	11-26-57	8-19-55			



DIGIT	LEAD NO.	MF PULSING FREQUENCY ON (SEE NOTE 1)		DC PULSING CONDITION ON (SEE NOTE 2)		RECAPTURE RELAYS OPERATED (SEE NOTE 4)					
		TIP	RING	TIP	RING	RT7 AND RR7	RT4 AND RR4	RT2 AND RR2	RT1 AND RR1	RTO AND RRO	
0	0	1300	1500	362Ω GRD	—	X	X				
9 W	9	1100	1500	362Ω GRD	0Ω BAT	X		X			
8	8	900	1500	0Ω BAT	0Ω GRD	X			X		
7 R	7	700	1500	362Ω BAT	0Ω GRD	X				X	
6 M	6	1100	1300	0Ω GRD	0Ω GRD		X	X			
5 J	5	1300	900	362Ω GRD	0Ω GRD		X		X		
4	4	1300	700	362Ω GRD	362Ω BAT		X			X	
3	3	900	1100	0Ω BAT	—			X	X		
2	2	700	1100	362Ω BAT	—			X	X		
1	1	700	900	0Ω GRD	—				X	X	
KP, SEE NOTE 3	F2	1100	—	—	—						
	F10	—	1700	—	—						
	F7	1500	—	0Ω GRD	—						
START	F10	—	1700	—	362Ω BAT						



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	M.D.	YA	68221-01
B	STD.	YB	68221-01

- RELAYS MF2 & MF3 OPERATED FOR MF PULSING
- RELAYS DC1 & DC2 OPERATED FOR DC PULSING
- KP SIGNAL NOT REQUIRED FOR DC PULSING
- X DENOTES RELAY OPERATED.
- FOR SEQUENCE CHART SEE SC 105-1 & 106-1

- NOTES:
- RELAYS MF2 & MF3 OPERATED FOR MF PULSING.
 - RELAYS DC1 & DC2 OPERATED FOR DC PULSING.
 - KP SIGNAL NOT REQUIRED FOR DC PULSING.
 - X DENOTES RELAY OPERATED.
 - FOR SEQUENCE CHART SEE SC 105-1 & 106-1.

*INCOMING SENDER CKT.-DP
MF CURRENT SUPPLY CKT.

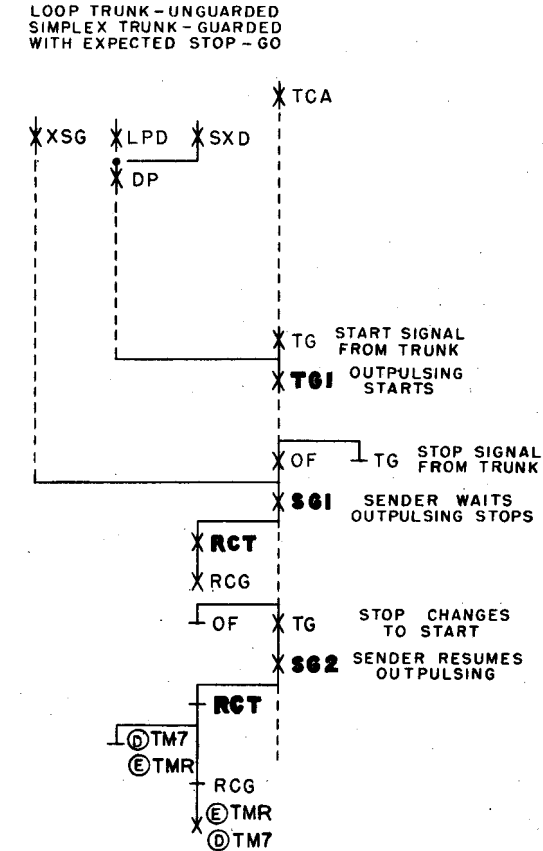
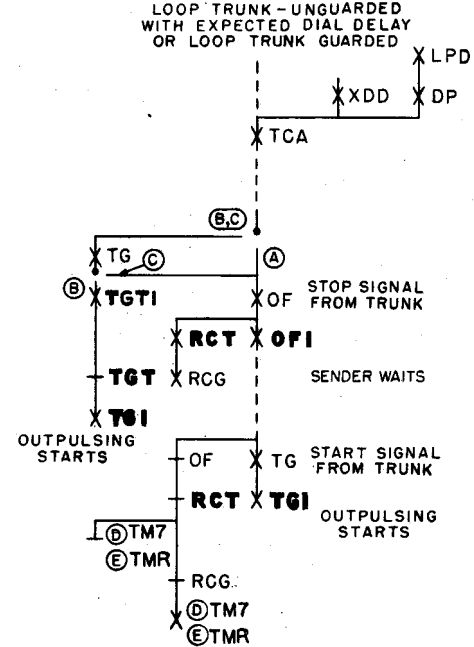
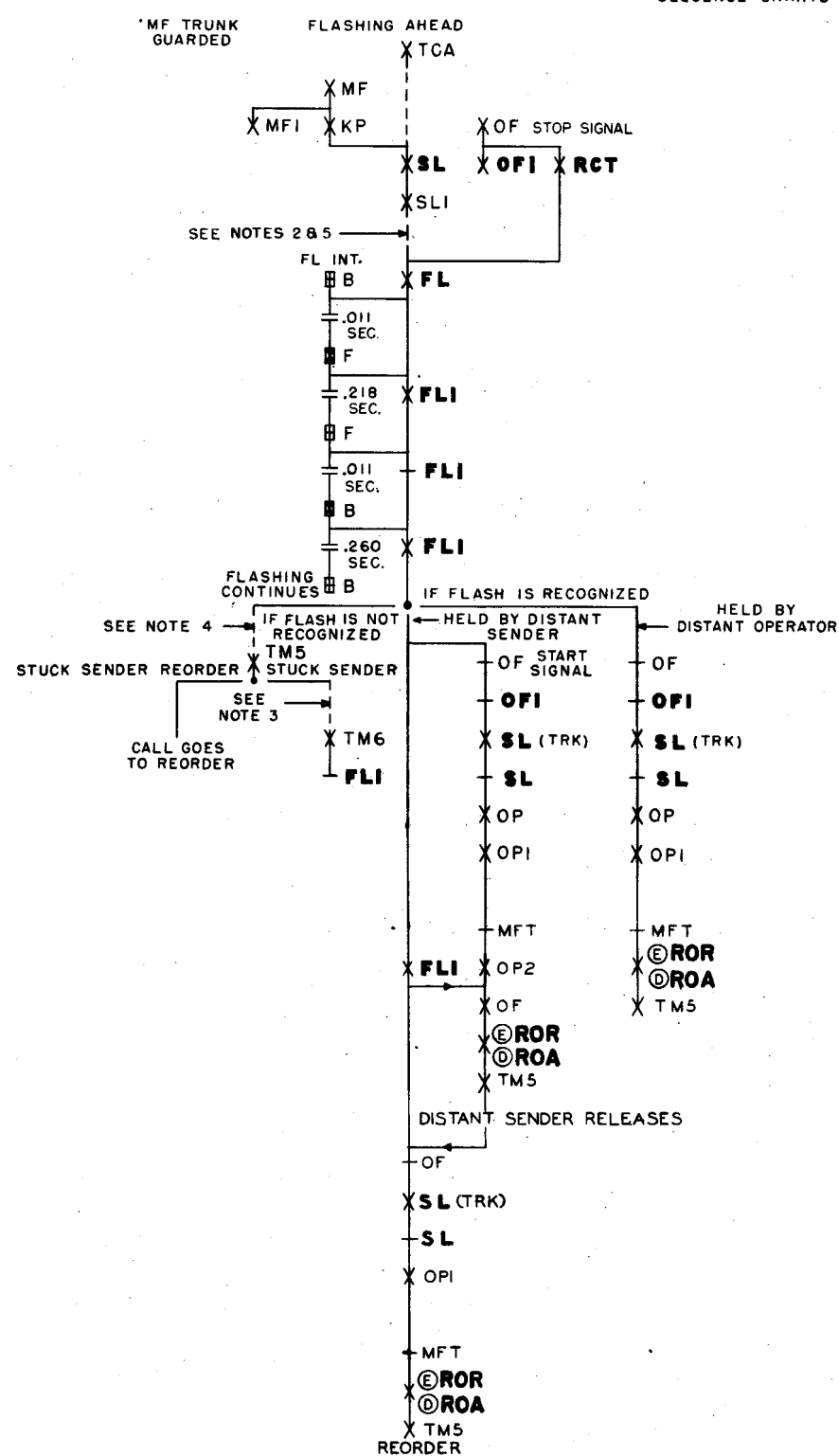
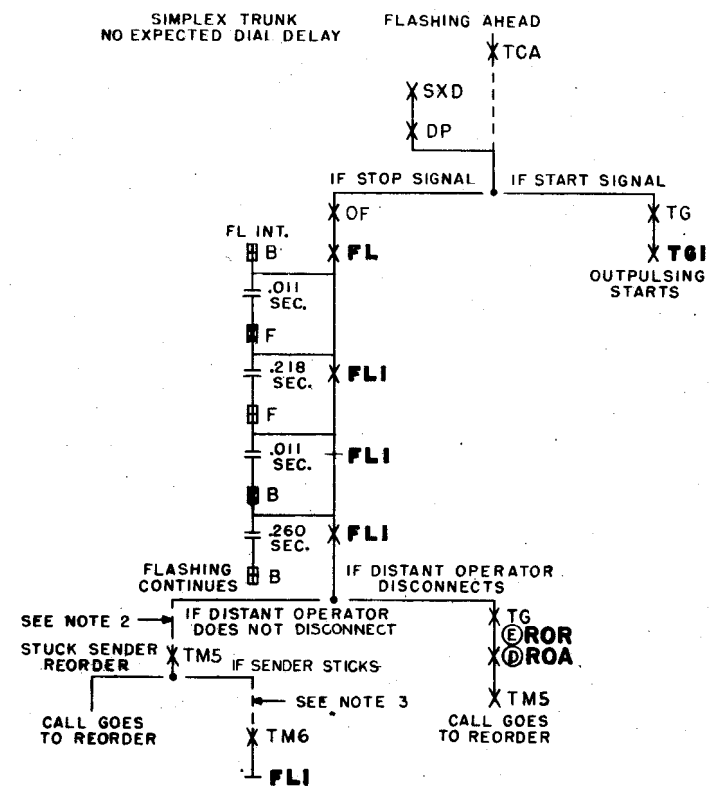
SD - 68221-01, ISS.17
SD - 95391-01, ISS.12

DP INCOMING SENDER
MF & DC OUTPUTSING

NO. 4 A TOLL

OS 130-1

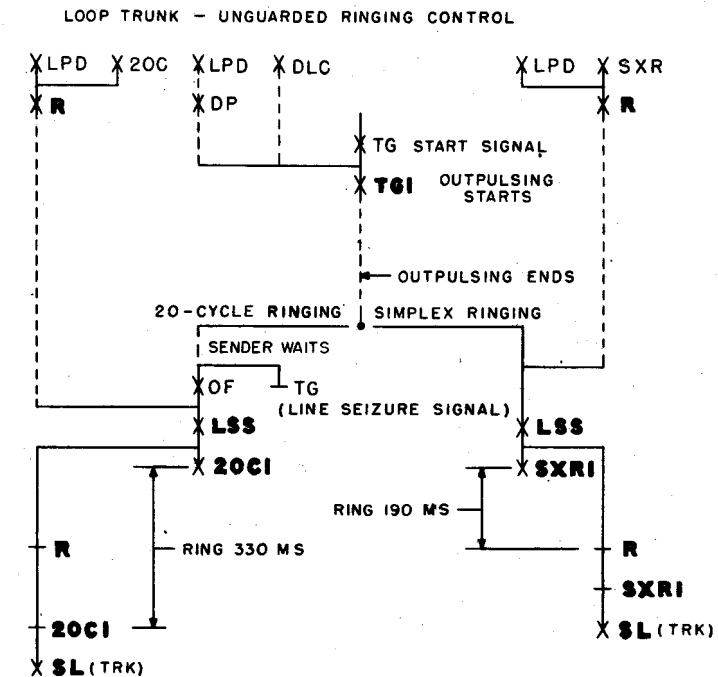
SEQUENCE CHARTS



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	IF INITIAL SIGNAL IS STOP & IS FOLLOWED BY START		
B	IF INITIAL SIGNAL IS START & DOES NOT CHANGE		
C	IF INITIAL SIGNAL IS START & IS FOLLOWED BY STOP		
D	FIG. 4 PROVIDED		68221-01
E	FIG. 22 PROVIDED		
YC	STD.	YC	
YD	M.D.	YD	
ZY	TO PREVENT BLOCKING OF OUTPULSING WITH XSG OPERATED.	ZY	

- SENDER IN ORIGINATING OFFICE TIMES OUT IN 30-40 SECONDS IF NO RESPONSE IS RECEIVED.
- SENDER TIMES 10 SECONDS MORE, THEN OPERATES TM6 TO STOP FLASHING.
- IF FLASH IS NOT RECOGNIZED IN 10-20 SECONDS.
- ASSUME SENDER IN DISTANT OFFICE TIMES OUT LATER THAN SENDER IN ORIGINATING OFFICE.



DIAL PULSE INCOMING SENDER CKT. SD-68221-01,ISS.17
 INTERRUPTER FRAME CKT. SD-68058-01,ISS.15
 OUTGOING INTERTOLL TRK.CKT.DP/MF SD-68231-01,ISS.8

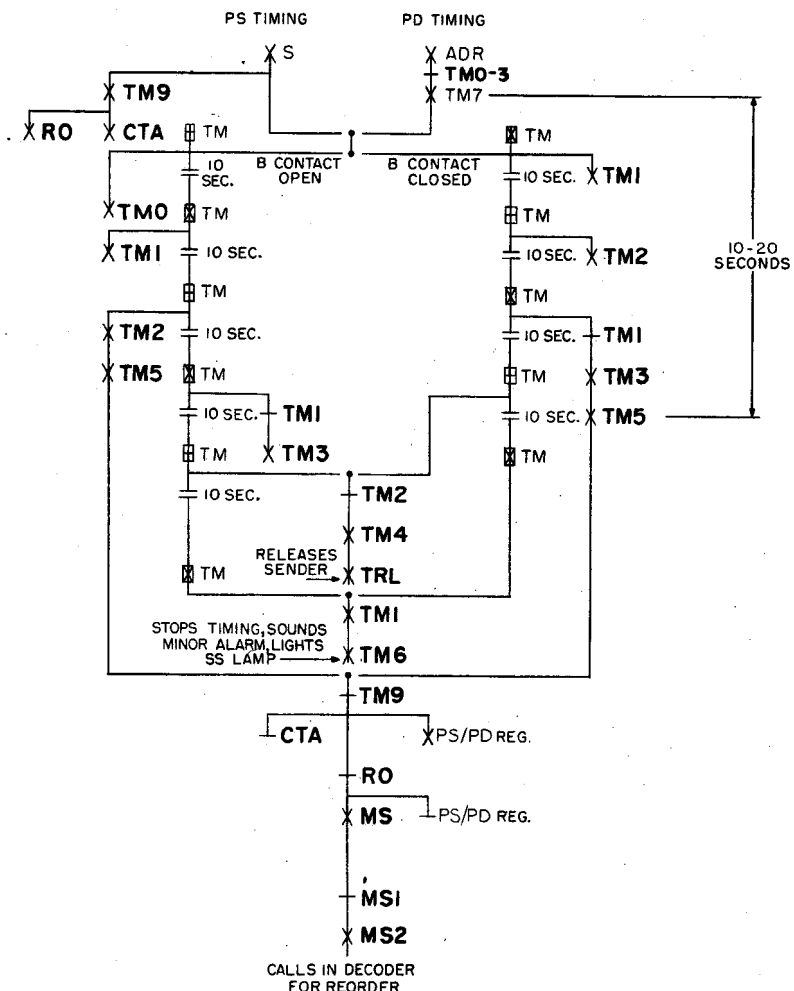
DP INCOMING SENDER
RINGING AND STOP CONTROL
 FLASHING AHEAD

ISSUE	1	2	3	4
DATE	9-24-51	8-11-53		

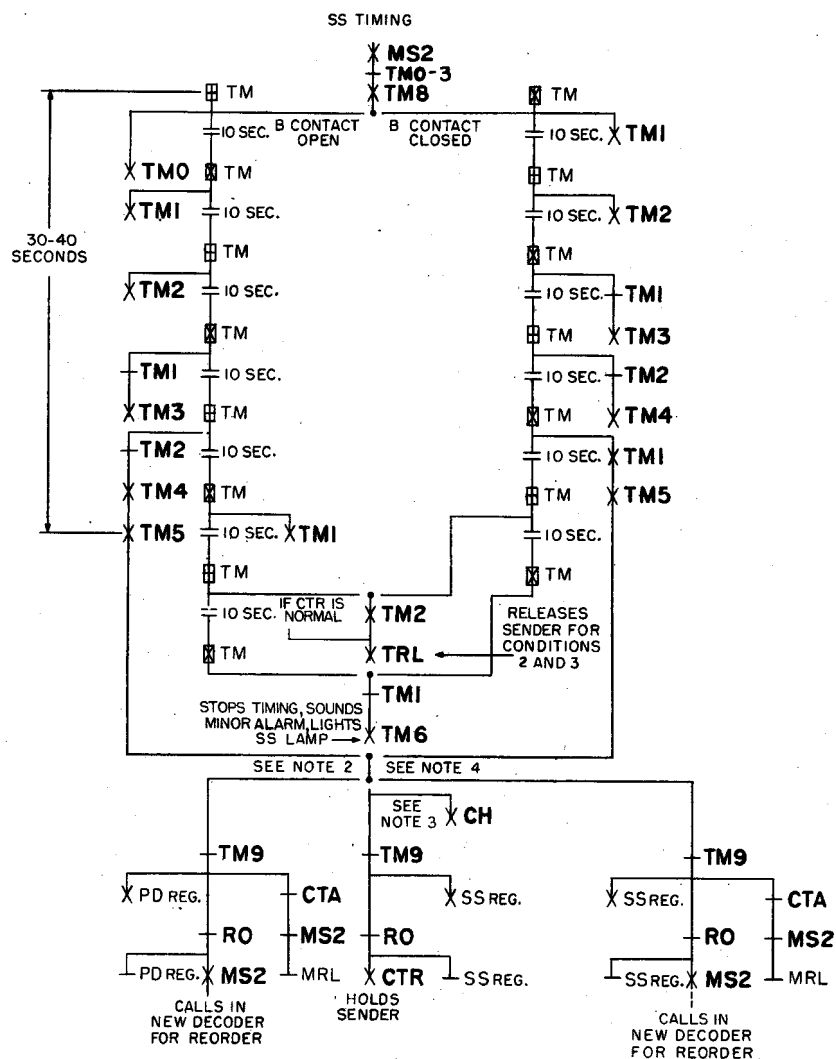
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	MANUFACTURE DISC.		
B	STANDARD		
C	MANUFACTURE DISC.	YQ	
D	STANDARD	YR	
E	LOAD CONTROL TIMING NOT PROVIDED	FIG.G	68221-01
F	LOAD CONTROL TIMING PROVIDED	FIG.H	
G	TRAFFIC USAGE RECORDER PROVIDED	YX	
H	TRAFFIC USAGE RECORDER NOT PROVIDED	FIG.L	
J	LOAD CONTROL TIMING WITH TRAFFIC USAGE RECORDER	FIG.M	

- ONLY 3 DIGITS RECEIVED (SST RELAY NORMAL).
- AVAILABLE CIRCUIT FOR CH RELAY, OR CTR KEY OPERATED, SST RELAY OPERATED.
- NO AVAILABLE CIRCUIT FOR CH RELAY, CTR KEY NORMAL, SST RELAY OPERATED.
- CTR KEY IS NORMAL AS SHOWN.



SEQUENCE CHART

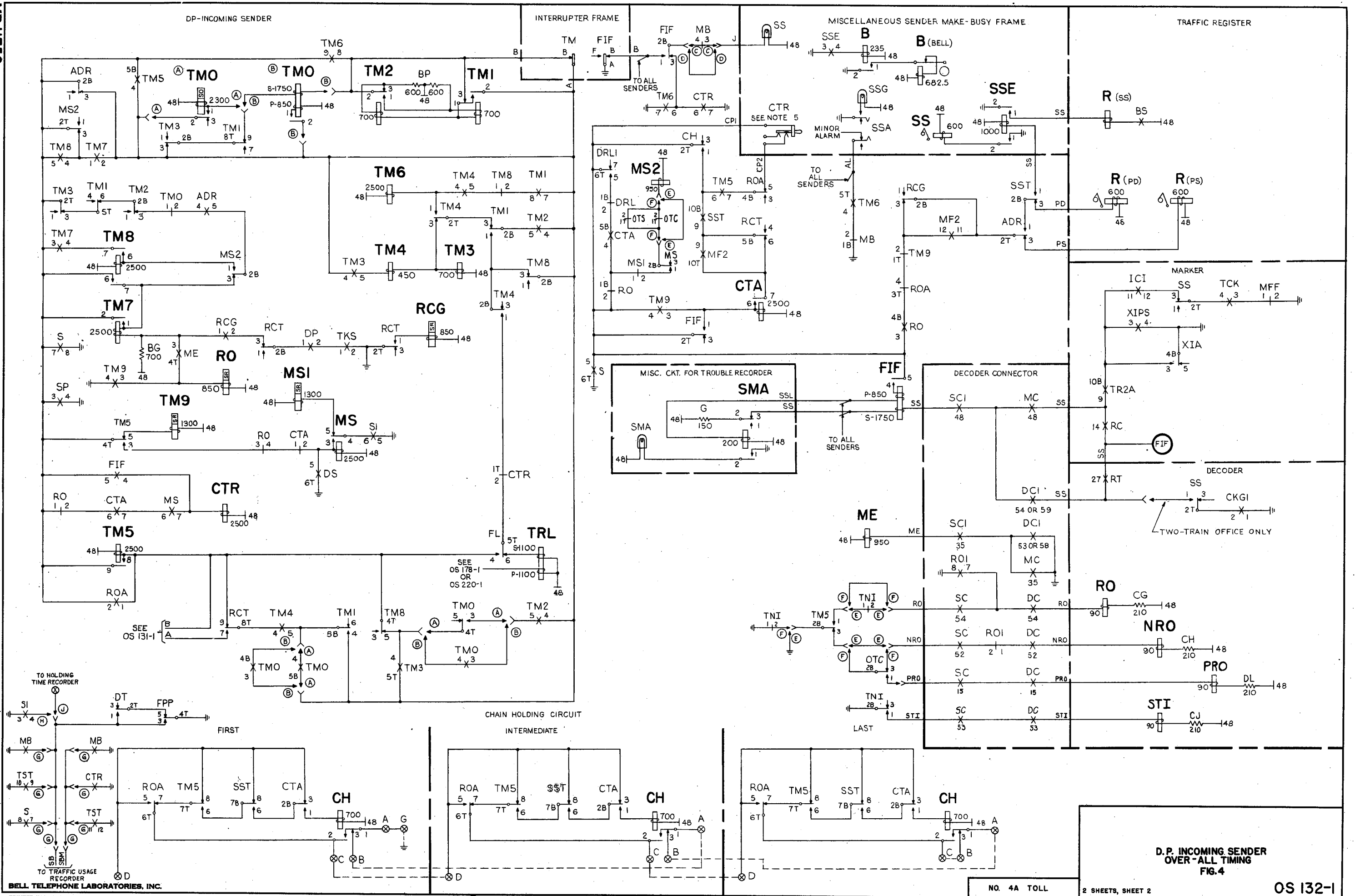


- INTERRUPTER FRAME SD-68058-01, ISS.15
- *INCOMING SENDER CKT.-D.P. SD-68221-01, ISS.17
- DECODER CONNECTOR CKT. SD-68559-01, ISS.4
- DECODER CKT. SD-68340-01, ISS.5
- MISCELLANEOUS CKT. FOR SENDER MAKE-BUSY FR. SD-68366-01, ISS.5
- MARKER CKT. SD-68388-01, ISS.5
- MISCELLANEOUS CKT. FOR TROUBLE RECORDER SD-68392-01, ISS.5
- MARKER CONNECTOR CKT. SD-68395-01, ISS.5
- TRAFFIC REGISTER CKT. SD-68412-01, ISS.7

D.P. INCOMING SENDER OVER-ALL TIMING FIG.4

ISSUE	1	DATE	1-18-52
REV.	2	DATE	9-10-53

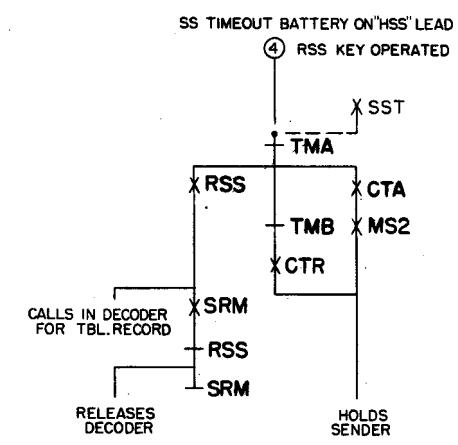
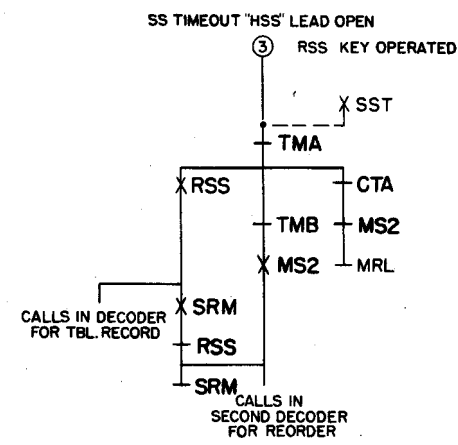
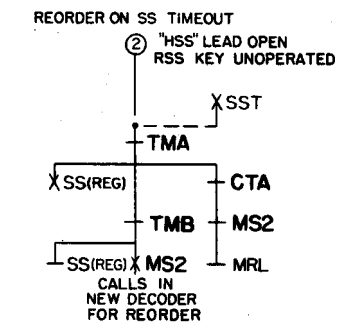
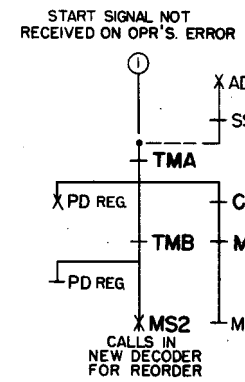
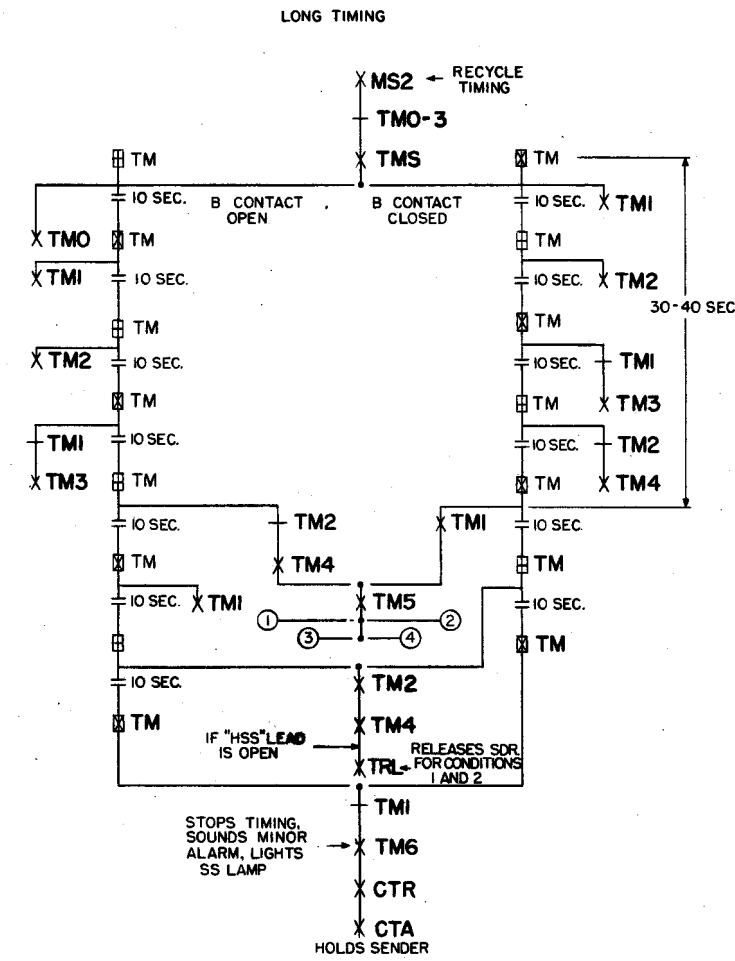
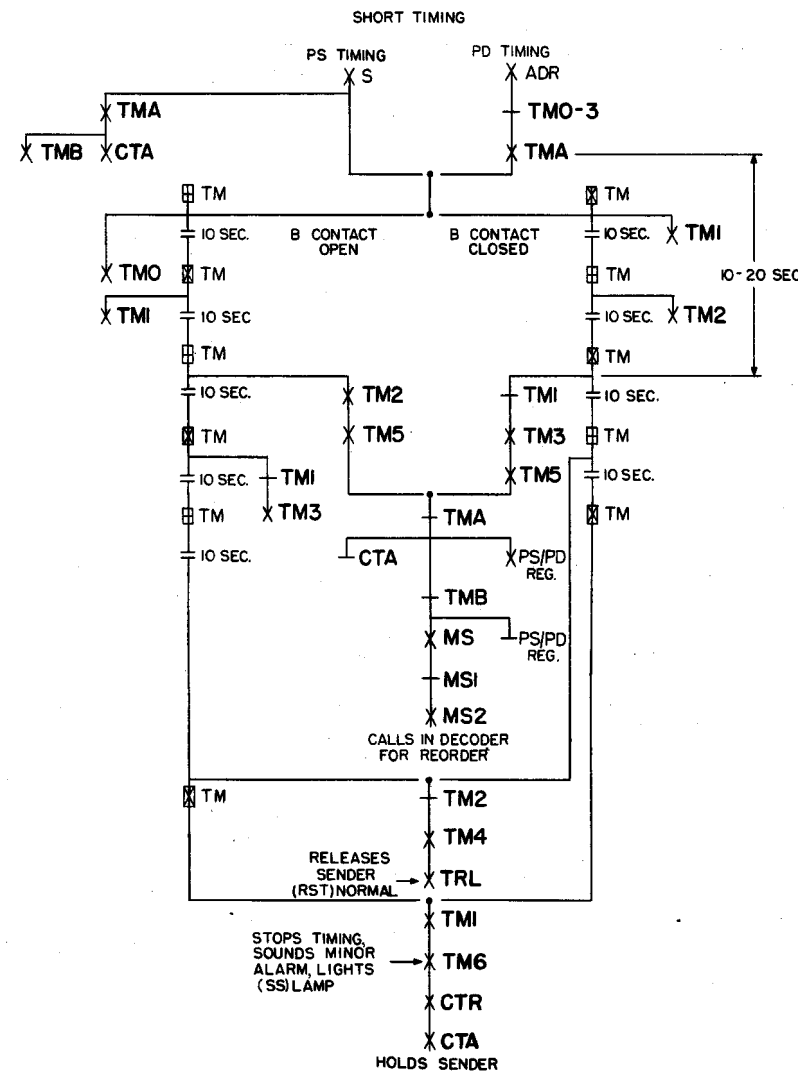
ISSUE	DATE	BY	CHKD
1	1-18-52		
2	9-10-53		



SEQUENCE CHART

NOTES

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	LOAD CONTROL TIMING NOT PROVIDED	FIG G	6822I-01
B	LOAD CONTROL TIMING PROVIDED	FIG H	6822I-01
C	M. D.	YQ	6822I-01
D	STD.	YR	6822I-01
E	TRAFFIC USAGE RECORDER PROVIDED	YX	6822I-01
F	TRAFFIC USAGE RECORDER NOT PROVIDED	FIG L	6822I-01
G	LOAD CONTROL TIMING PROVIDED WITH TRAFFIC USAGE RECORDER	FIG M	6822I-01

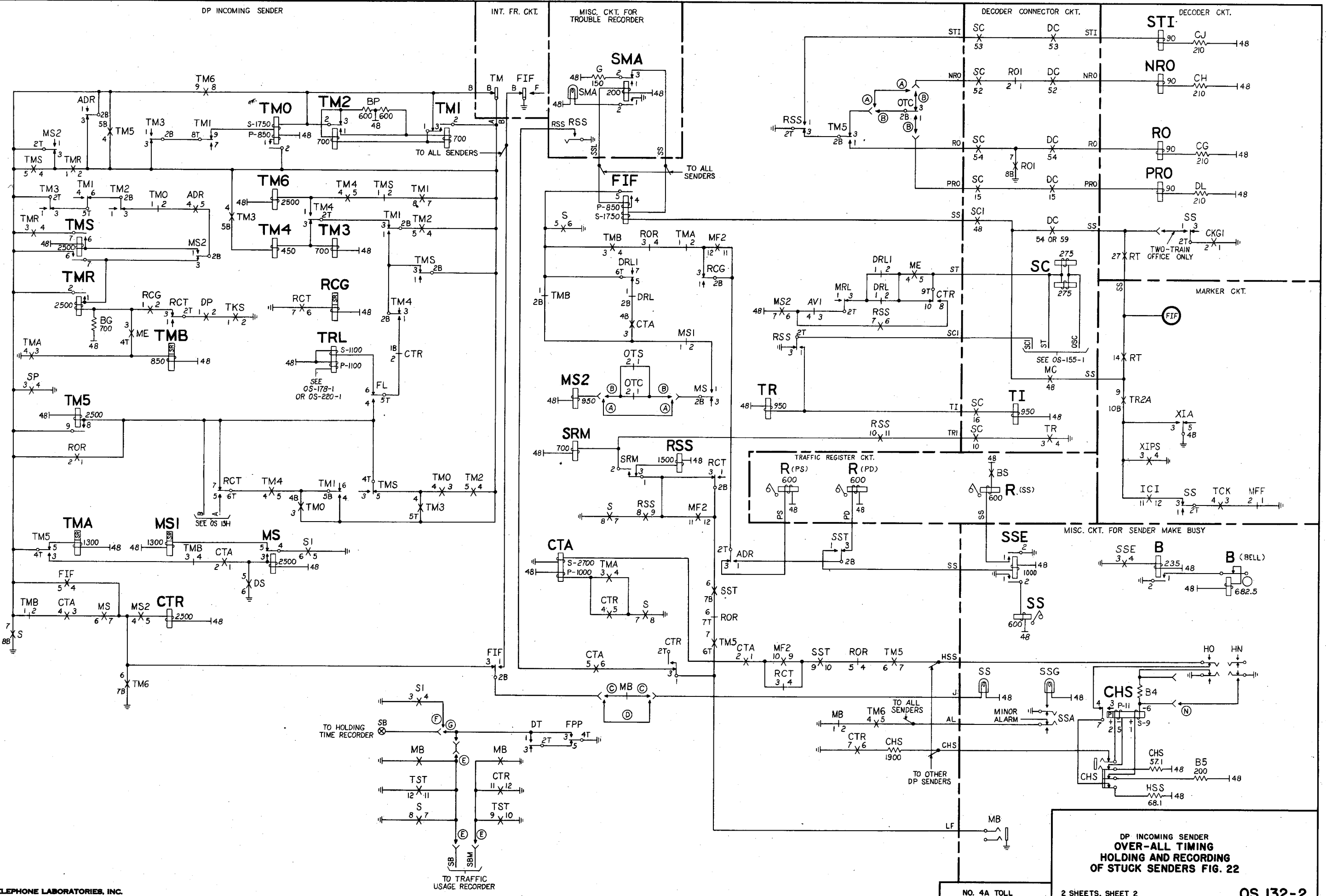


- DECODER CKT. SD-68340-01, ISS.5
- DECODER CONN. CKT. SD-68331-01, ISS.4
- INCOMING SENDER CKT.-DP SD-68221-01, ISS.17
- INTERRUPTOR FRAME SD-68058-01, ISS.15
- MARKER CKT. SD-68398-01, ISS.5
- MARKER CONN. CKT. SD-68395-01, ISS.5
- MISC. CKT. FOR SENDER MAKE BUSY FRAME SD-68386-01, ISS.15
- MISC. CKT. FOR TROUBLE RECORDER SD-68392-01, ISS.5
- TRAFFIC REGISTER CKT. SD-68412-01, ISS.7

DP INCOMING SENDER
OVER-ALL TIMING
HOLDING AND RECORDING
OF STUCK SENDERS FIG.22

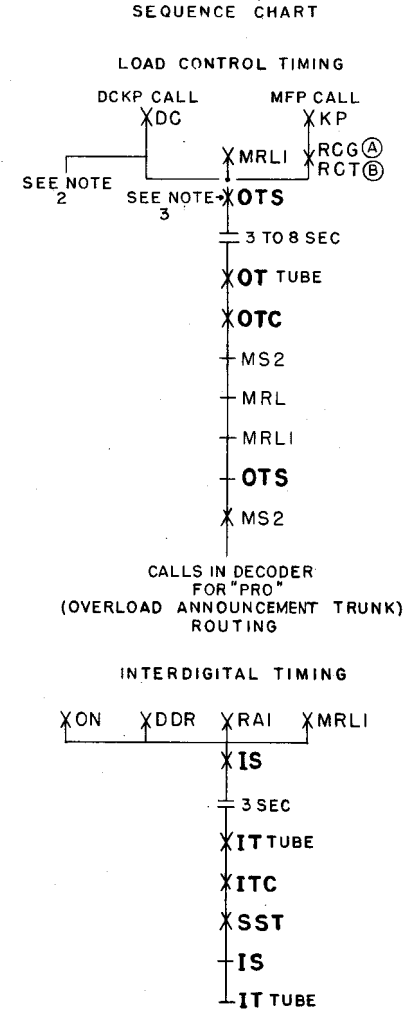
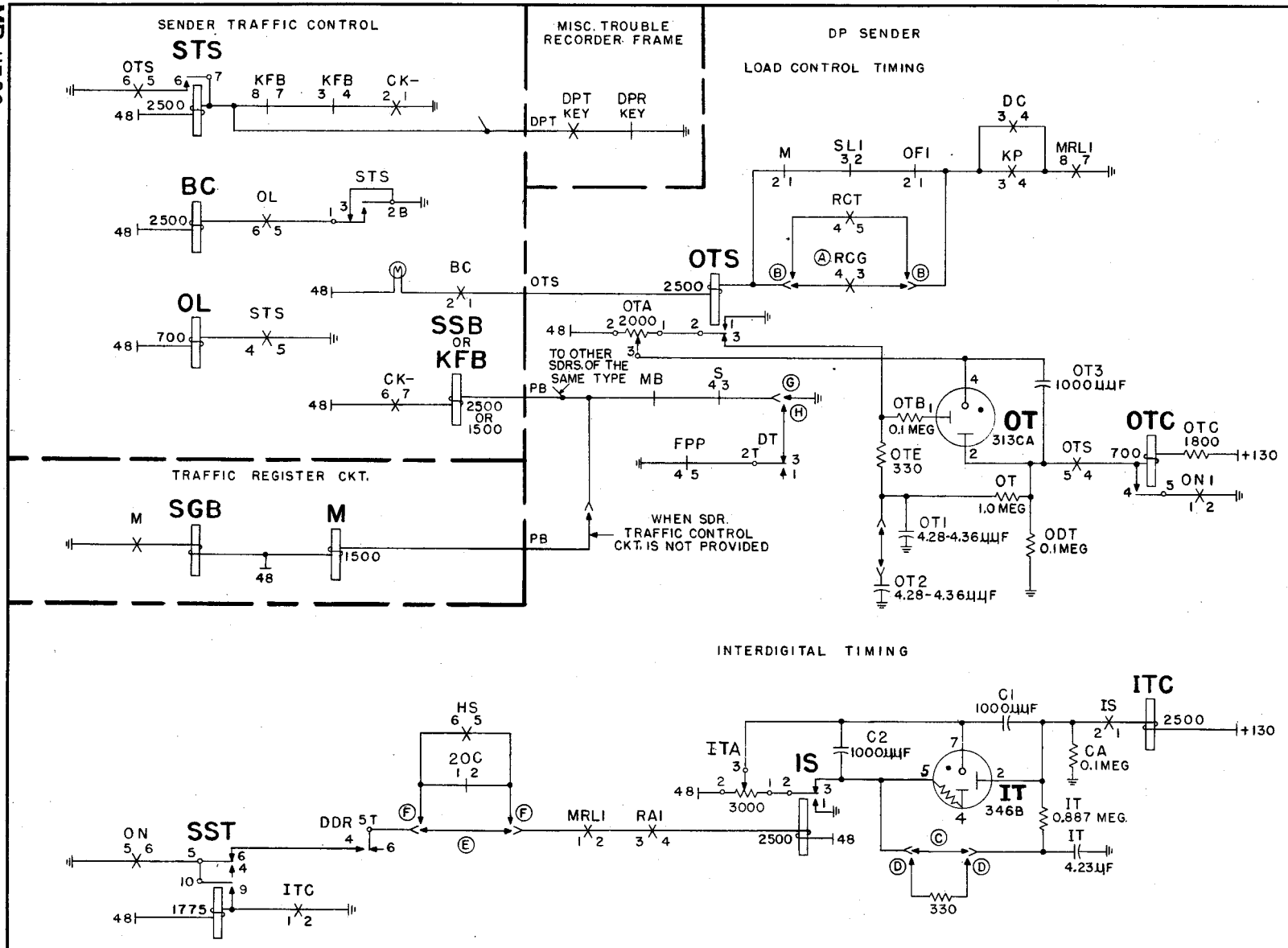
ISSUE	1	5/24/55
DATE	10-20-55	

ISSUE	1	2	3	4
DATE	10-20-53			



DP INCOMING SENDER
OVER-ALL TIMING
HOLDING AND RECORDING
OF STUCK SENDERS FIG. 22

ISSUE	1	2	3	4
DATE	9-1-53			

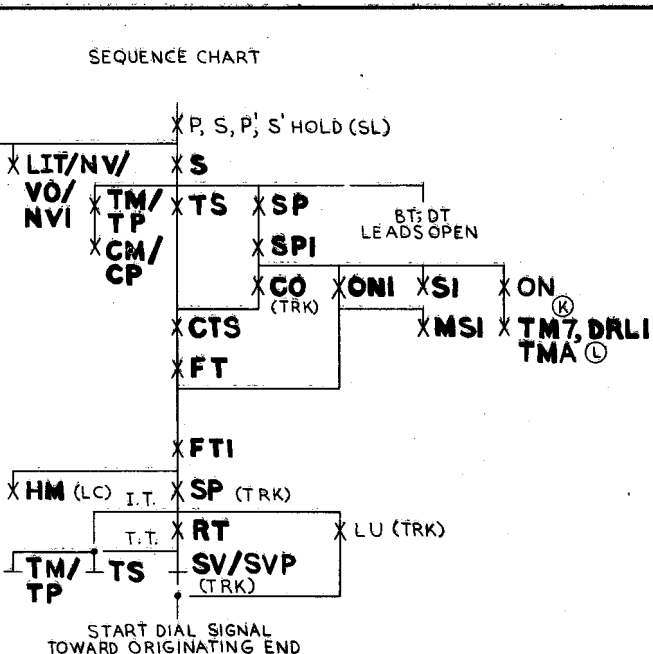
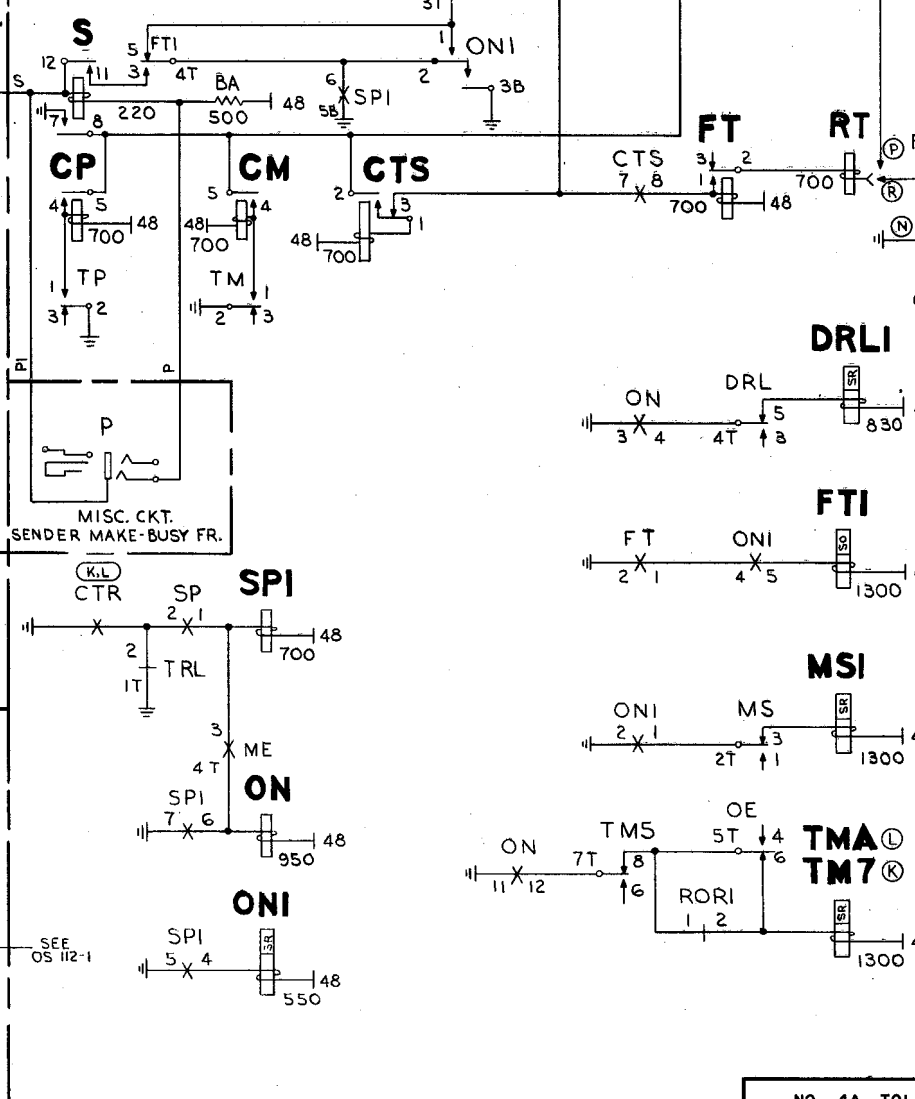
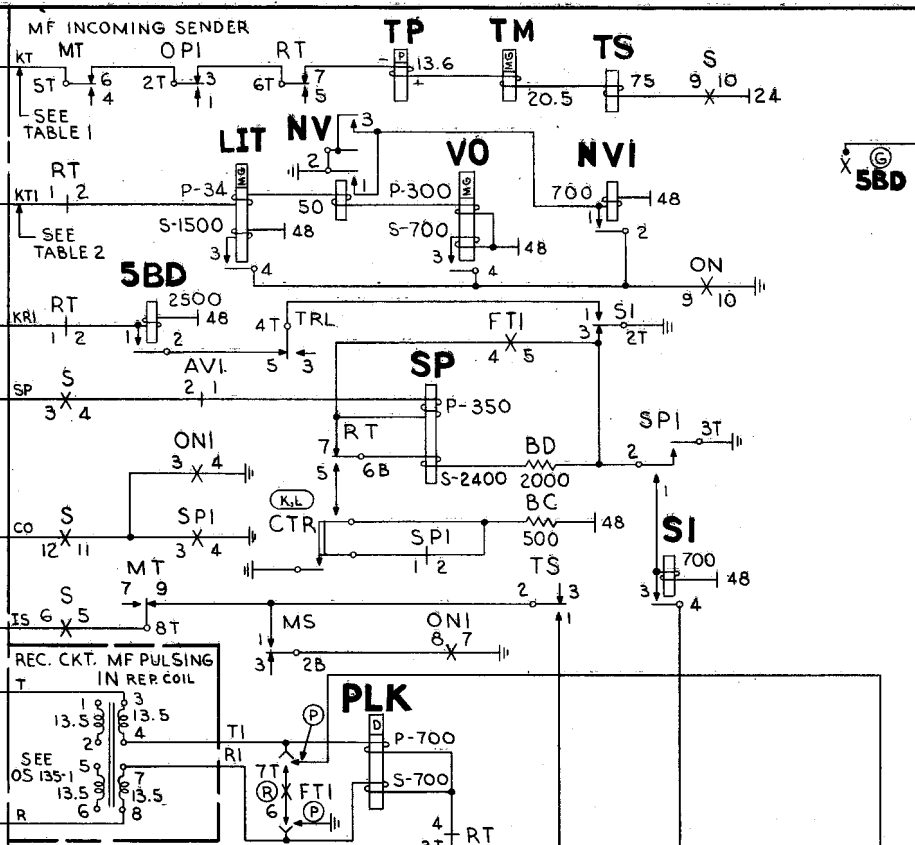
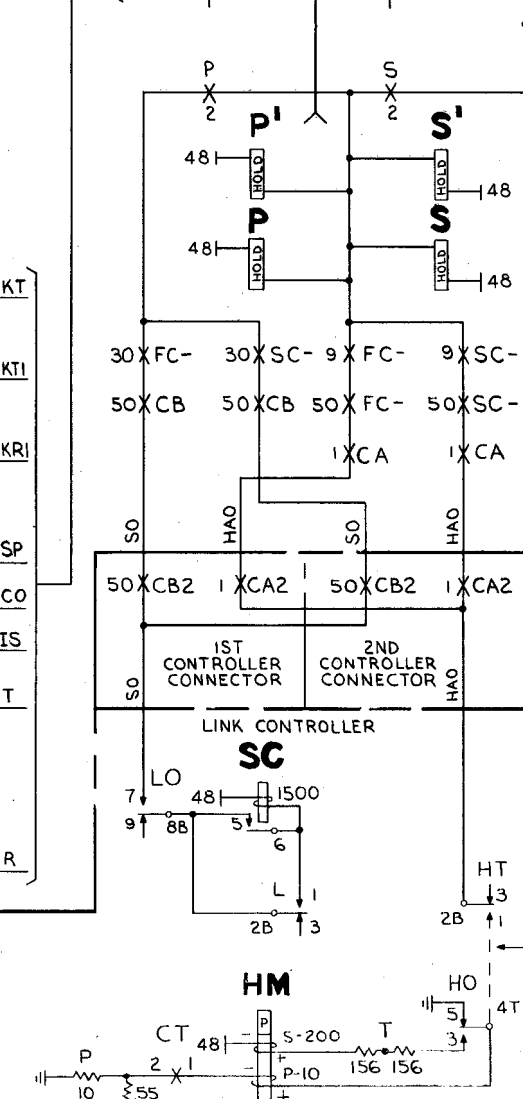
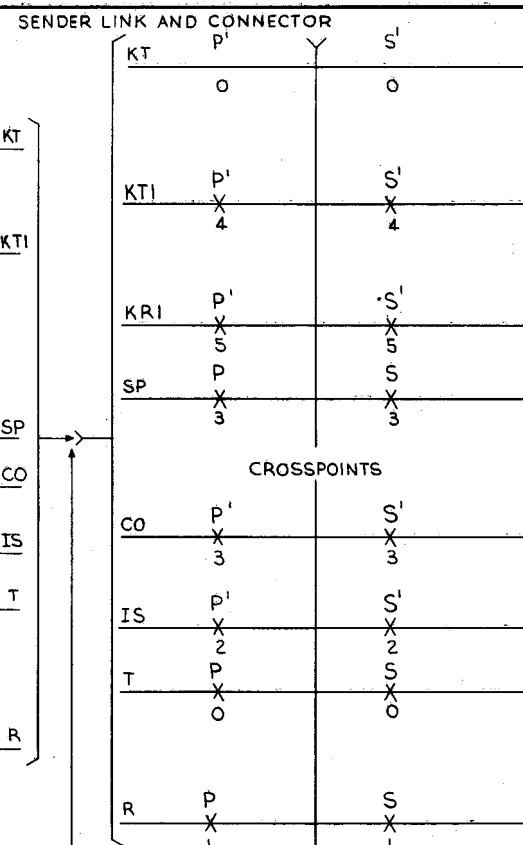
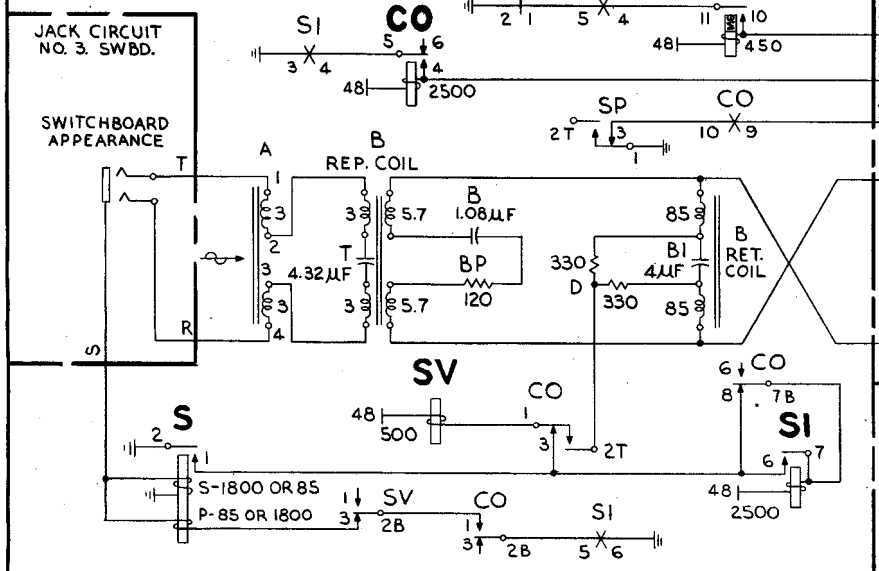
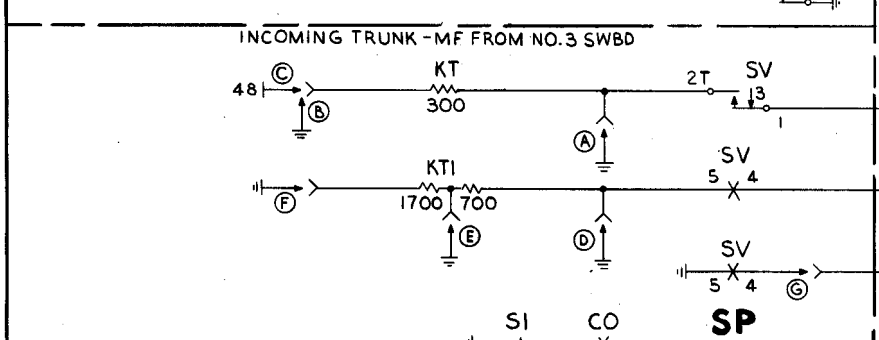
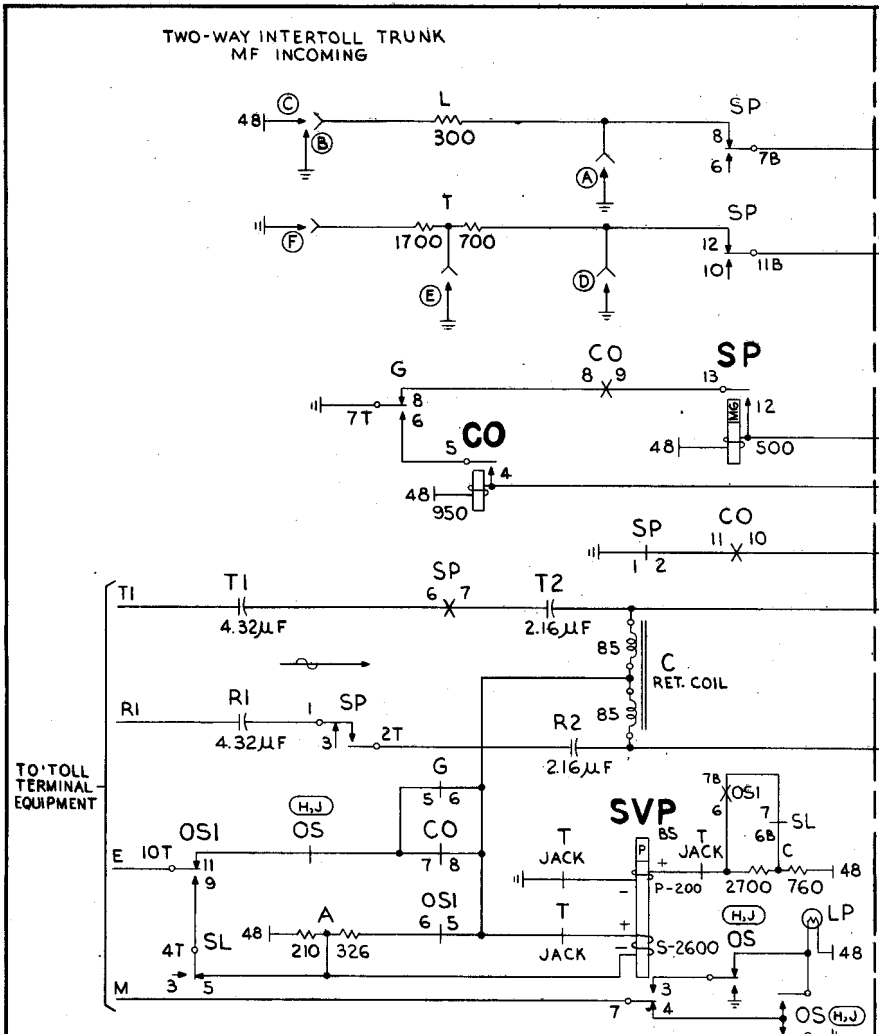


NOTES:

- | OS OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|---|-----------|----------|
| A | FIG. 4 PROVIDED | | |
| B | FIG. 22 PROVIDED | | |
| C | M.D. | YU | |
| D | STD. | YV | |
| E | LPD-20C CALLS DO NOT REQUIRE 7 DIGITS REGISTERED IN THE SENDER. | FIG. N | 68221-01 |
| F | LPD-20C CALLS REQUIRE 7 DIGITS REGISTERED IN THE SENDER. | FIG. O | |
| G | LOAD CONTROL TIMING NOT PROVIDED | FIG. L | |
| H | LOAD CONTROL TIMING PROVIDED | FIG. M | |
- THE LACK OF OUTGOING SENDER PREVENTS THE OPERATION OF SENDER (SL) & (SLI) RELAYS.
- BATTERY CONNECTED TO (OTS) WINDING FROM SDR. TRAFFIC CONTROL CKT. WHEN A SHORTAGE OF SENDERS EXISTS IN A KEY FRAME GROUP.

INCOMING SENDER CKT.-DP SD-68221-01,ISS.17
 TRAFFIC REGISTER CKT. SD-68412-01,ISS.7
 SENDER TRAFFIC CONTROL CKT. SD-68455-01,ISS.1

ISSUE	1	2	3	4
DATE	11-28-51	9-14-52		



NOTES:

OPTION	FEATURE OR OPTION	SD	SD
G	TO OBTAIN PREFERENCE DURING PERIODS OF POSTED DELAY	Q	68237-01
H	MD.	FIG. A	68233-01
J	STD.	FIG. B	68233-01
K	FIG. 4. PROVIDED		
L	FIG. 20. PROVIDED		
M	LOAD CONT. TIMING NOT PROV.	FIG. L	68222-01
N	LOAD CONT. TIMING PROV.	FIG. M	
P	M.D.	ZM	
R	STD.	ZN	

TABLE 1 - TRUNK CLASS INDICATION

TYPE OF TRUNK	TRUNK CIRCUIT		SENDER RELAYS					
	KT LEAD	WIRE OPTION	TP	TM	TS	CP	CM	CTS
TOLL TANDEM	0Ω GRD.	A		X	X		X	X
	300Ω GRD.	B			X		X	X
	300Ω BAT.	C	X		X	X	X	X
INTER-TOLL	0Ω GRD.	A		X	X		X	X
	300Ω GRD.	B			X		X	X
	300Ω BAT.	C	X		X	X	X	X

X DENOTES RELAY OPERATED

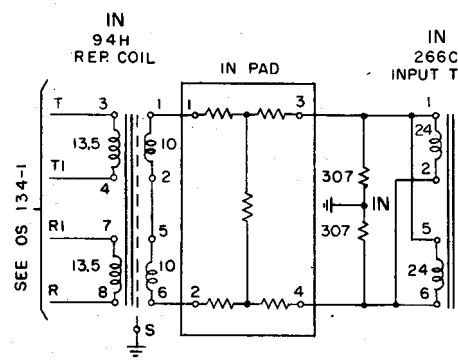
TABLE 2 - TRUNK CLASS INDICATION FOR VIA AND TERMINAL ROUTING

LEAD KT1	WIRE OPTION	CLASS OF OUTGOING TRUNK REG.	SENDER RELAY			
			LIT	NV	NVI	VO
OPEN	NONE	VIA OR TERM.				
0Ω GRD.	D	VIA ONLY	X	X	X	X
700Ω GRD.	E	VIA ONLY	X	X	X	X
2400Ω GRD.	F	VIA OR TERM.	X	X		

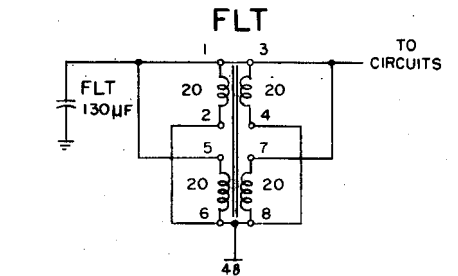
X DENOTES RELAY OPERATED

CONTROLLER CONNECTOR CKT. SD-68336-01, ISS. 8
 * INCOMING SENDER CKT. MF SD-68222-01, ISS. 17
 INCOMING TRK. CKT. FROM NO.3 SWBD. MF SD-68237-01, ISS. 7
 JACK CKT. NO.3 SWITCHBOARD SD-64545-01, ISS. 12
 LINK CONTROLLER CKT. SD-68028-01, ISS. 28
 MISC. CKT. SENDER MAKE-BUSY FRAME SD-68386-01, ISS. 5
 RECEIVING CKT. MF PULSING SD-95536-01, ISS. 7
 RECEIVING CKT. MF PULSING SD-95087-01, ISS. 27
 SENDER LINK AND CONNECTOR CKT. SD-68334-01, ISS. 13
 2-WAY INTERTOLL TRK. CKT. MF INCOMING SD-68233-01, ISS. 13

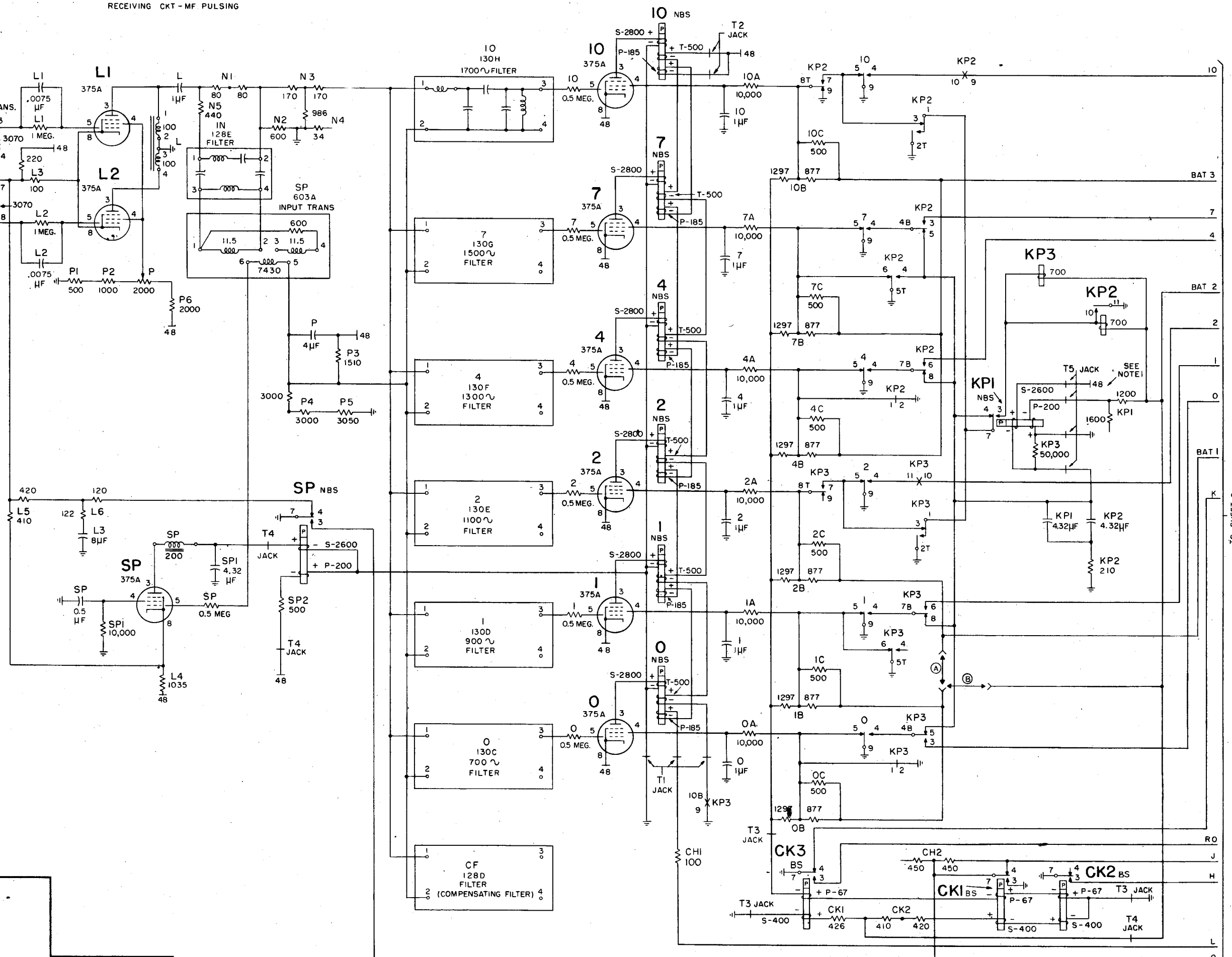
RECEIVING CKT - MF PULSING



NOTES:
 1 BATTERY FEED TO CIRCUITS SHOWN ON THIS SHEET IS THROUGH THE FILTER ILLUSTRATED EXCEPT BATTERY ON SECONDARY WINDING OF KPI



OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	M.D.	ZJ	95087-01
B	STD.	ZK	95087-01
C	M.D.	XC	
D	STD.	XD	
E	M.D.	G	68222-01
F	STD.	F	
G	ALL LPD-20C CALLS REQUIRE 7 DIGITS REGISTERED IN SENDER	XE	
H	THREE FREQUENCY DETECTION NOT PROVIDED	XG	68222-01
J	THREE FREQUENCY DETECTION PROVIDED	XH	68222-01



INCOMING SENDER CKT. MF SD-68222-01, ISS. 17
 RECEIVING CKT. MF PULSING SD-95087-01, ISS. 27

MF INCOMING SENDER REGISTRATION WITH RECEIVING CKT. SD-95087

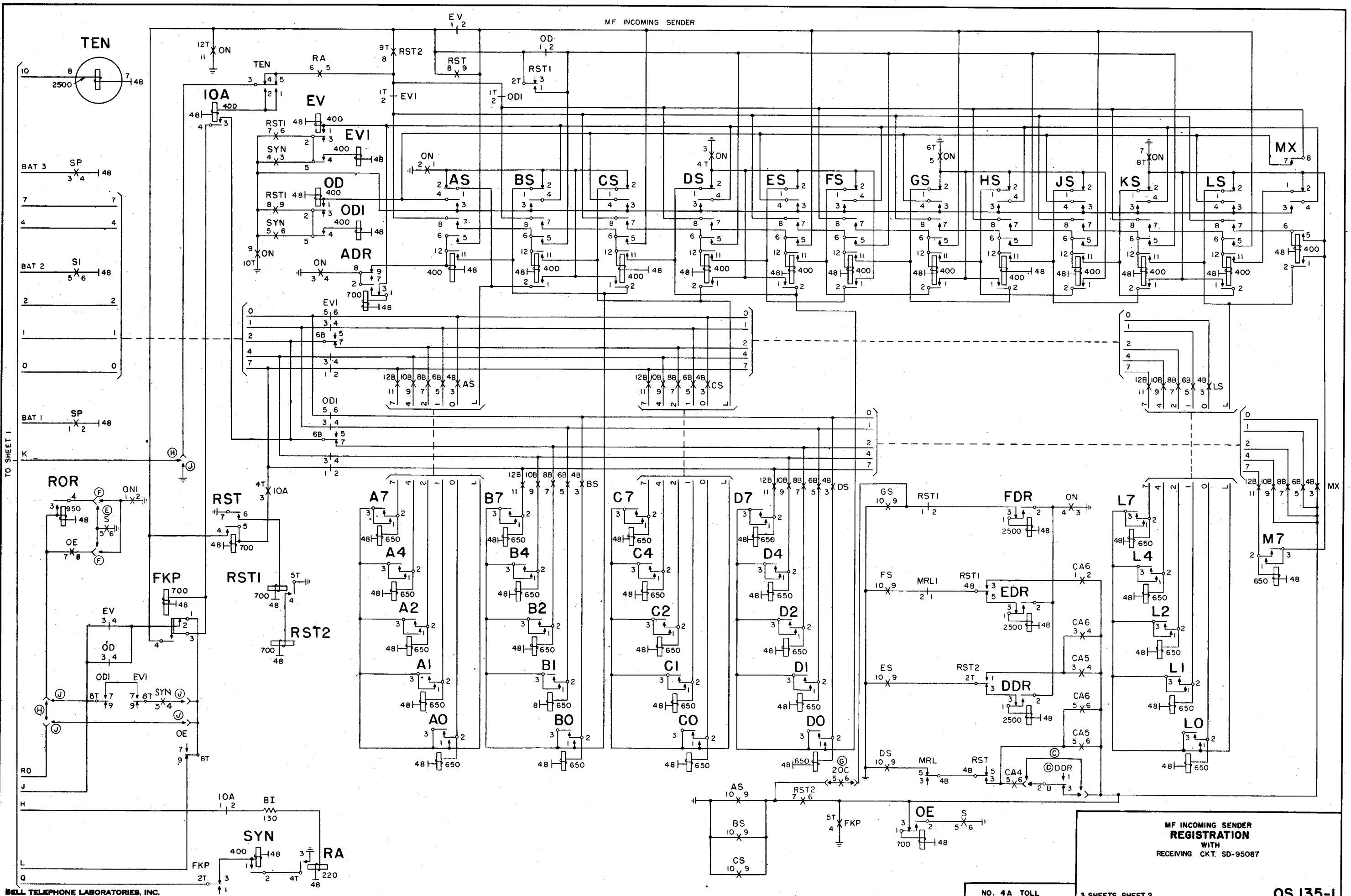
OS 135-1 3 SHEETS, SHEET 1 NO. 4A TOLL

ISSUE	DATE
1	11-26-51
2	8-18-53

3 SHEETS, SHEET 1

MP-11722

ISSUE	1	2	3	4
DATE	1/4/51	6/8/53		



MF INCOMING SENDER REGISTRATION WITH RECEIVING CKT. SD-95087

ISSUE	1	1/24/54
DATE	11-28-51	6-10-53

SEQUENCE CHART

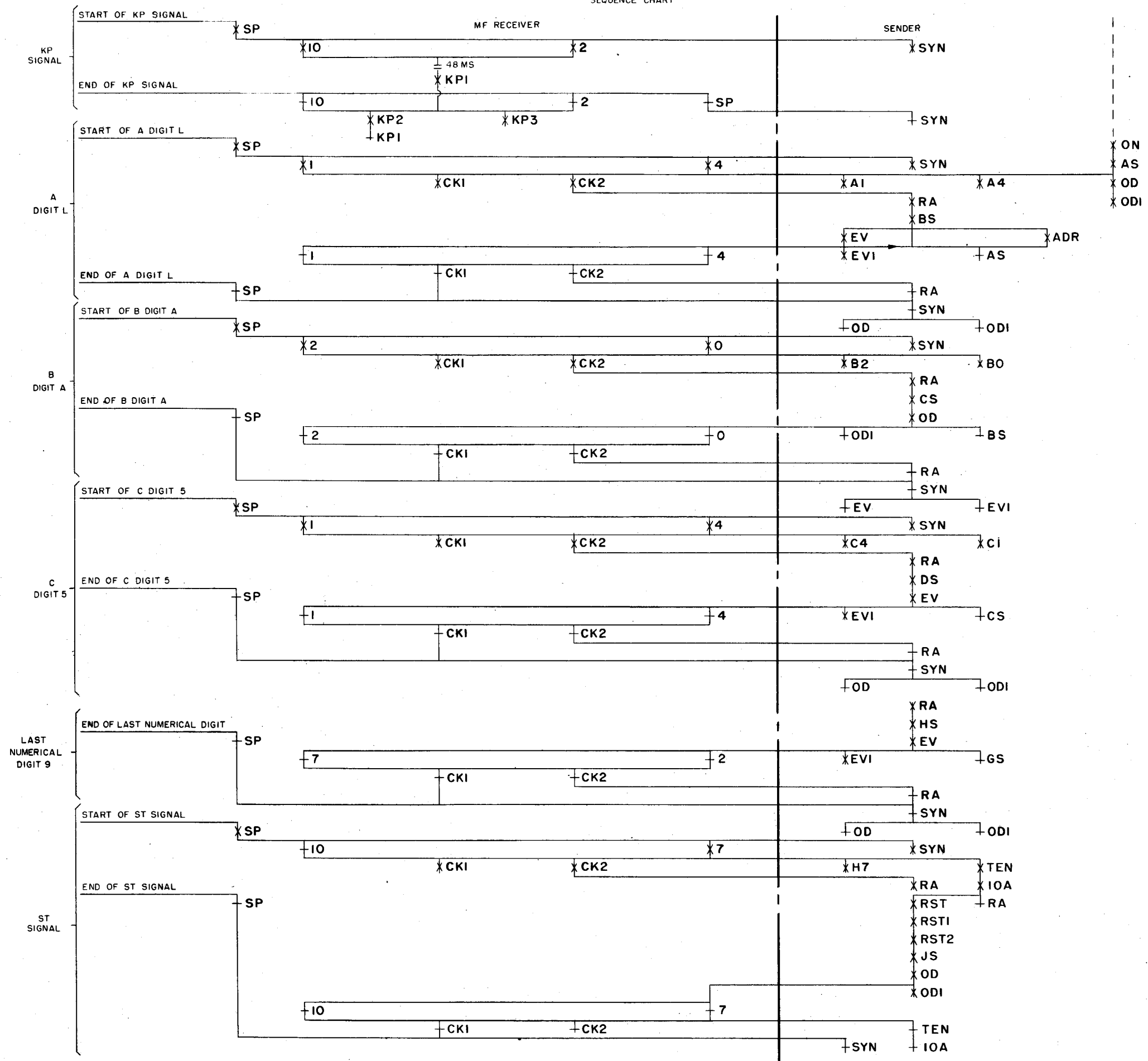


TABLE A
STEERING CIRCUIT PROGRESS

DIGIT	RA	EV	OD	AS	BS	CS	DS	ES	FS	GS	HS	JS	KS	LS	MX
KP			H+	H+											
A	O R	O H	R	R	O H										
B	O R	R	O H		R	O H									
C	O R	O H	R			R	O H								
D	O R	R	O H				R	O H							
E	O R	O H	R					R	O H						
F	O R	R	O H						R	O H					
G	O R	O H	R							R	O H				
H	O R	R	O H								R	O H			
J	O R	O H	R									R	O H		
K	O R	R	O H										R	O H	
L	O R	O H	R											R	O H
START	O R	H	O H												H

O DENOTES RELAY OPERATED
H DENOTES RELAY HELD
R DENOTES RELAY RELEASE
+ DENOTES INITIALLY OPERATED AT SEIZURE FROM OFF-NORMAL GROUND

TABLE B

CODES	CHANNEL NO. & FREQUENCY					
	(0) 700~	(1) 900~	(2) 1100~	(4) 1300~	(7) 1500~	(10) 1700~
KP			X			X
1	X	X				
2	X		X			
3		X	X			
4	X			X		
5		X		X		
6			X	X		
7	X				X	
8		X			X	
9			X		X	
0				X	X	
ST					X	X

MF INCOMING SENDER
REGISTRATION
WITH
RECEIVING CKT. SD-95087

ISSUE	1	1/24/54
DATE	11-28-51	6-10-53

SEQUENCE CHART

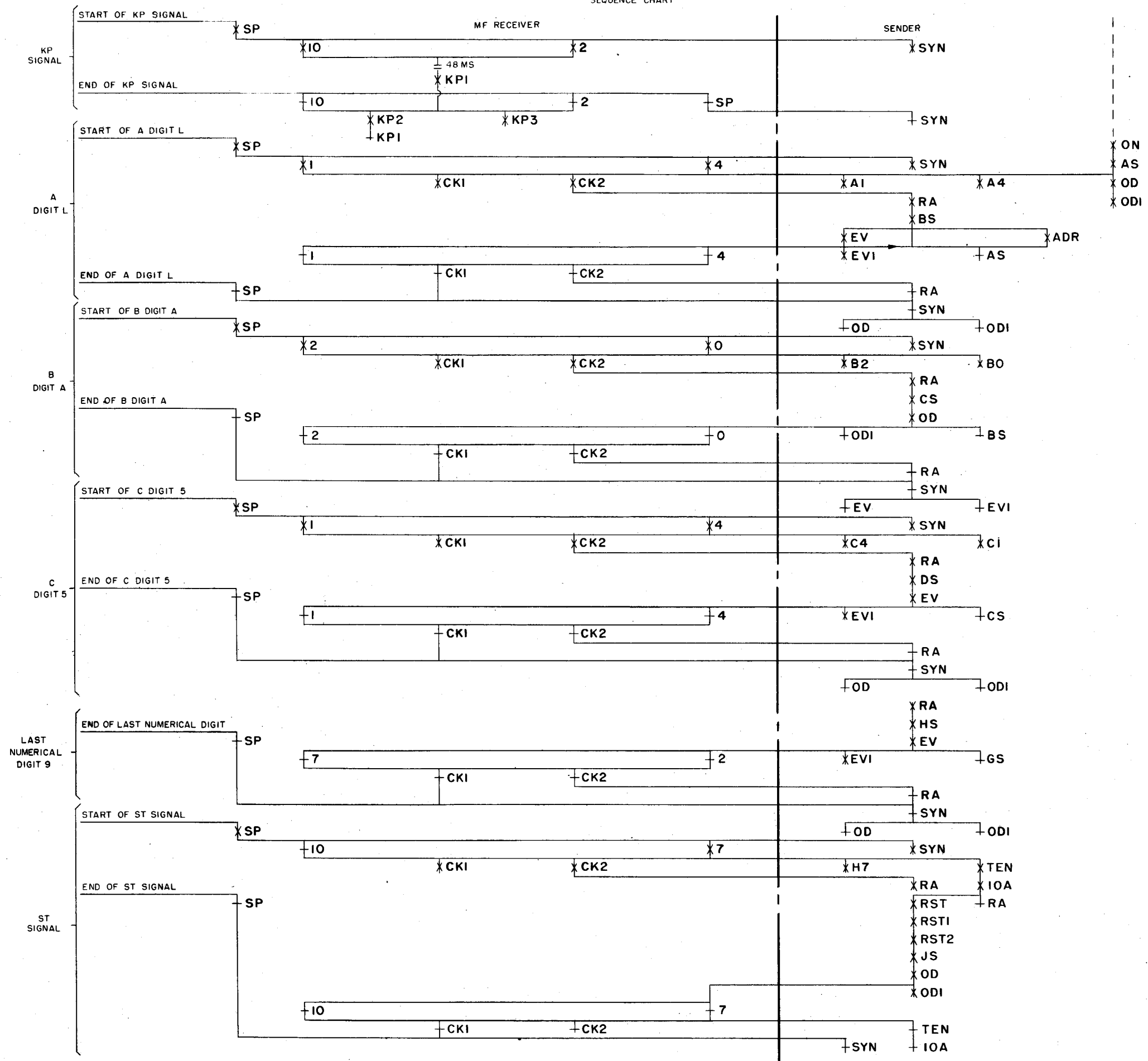


TABLE A
STEERING CIRCUIT PROGRESS

DIGIT	RA	EV	OD	AS	BS	CS	DS	ES	FS	GS	HS	JS	KS	LS	MX
KP			H+	H+											
A	O R	O H	R	R	O H										
B	O R	R	O H		R	O H									
C	O R	O H	R			R	O H								
D	O R	R	O H				R	O H							
E	O R	O H	R					R	O H						
F	O R	R	O H						R	O H					
G	O R	O H	R							R	O H				
H	O R	R	O H								R	O H			
J	O R	O H	R									R	O H		
K	O R	R	O H										R	O H	
L	O R	O H	R											R	O H
START	O R	H	O H												H

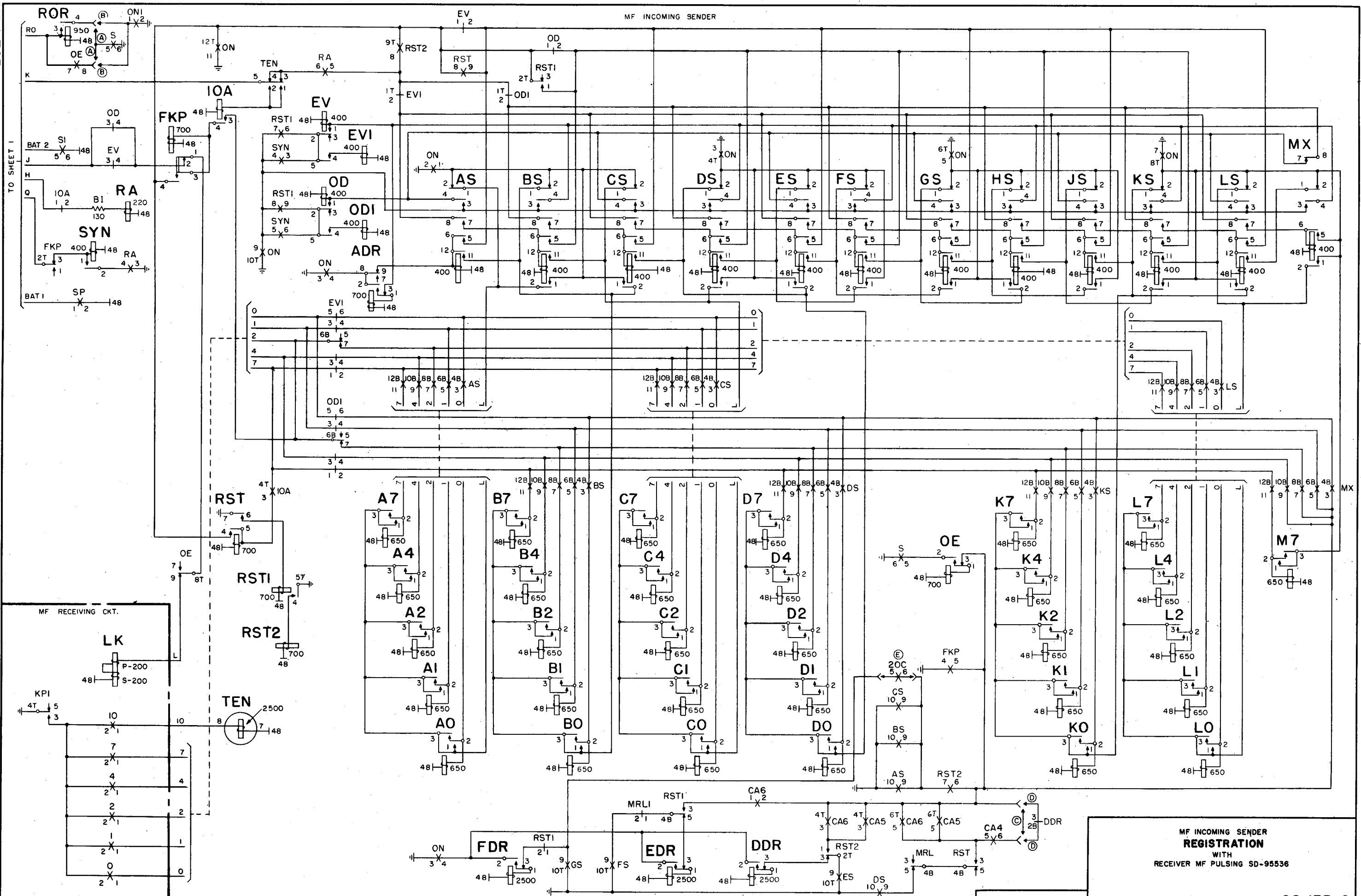
O DENOTES RELAY OPERATED
H DENOTES RELAY HELD
R DENOTES RELAY RELEASE
+ DENOTES INITIALLY OPERATED AT SEIZURE FROM OFF-NORMAL GROUND

TABLE B

CODES	CHANNEL NO. & FREQUENCY					
	(0) 700~	(1) 900~	(2) 1100~	(4) 1300~	(7) 1500~	(10) 1700~
KP			X			X
1	X	X				
2	X		X			
3		X	X			
4	X			X		
5		X		X		
6			X	X		
7	X				X	
8		X			X	
9			X		X	
0				X	X	
ST					X	X

MF INCOMING SENDER
REGISTRATION
WITH
RECEIVING CKT. SD-95087

REVISED	1	AS	2	REVISION
DATE	11-29-51	9-1-53		



ISSUE	1	1-28-51
DATE	2	9-1-53

SEQUENCE CHART

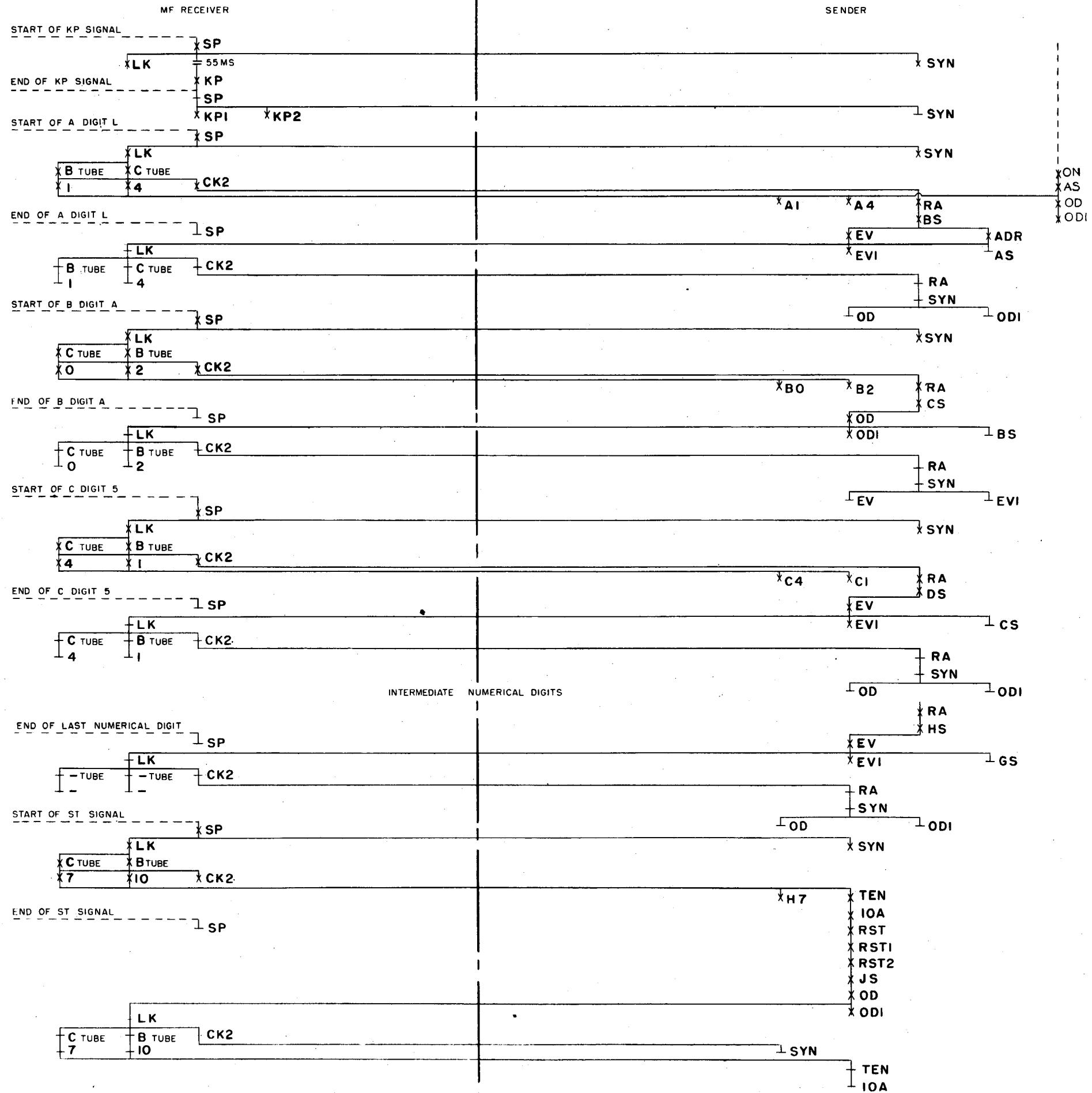


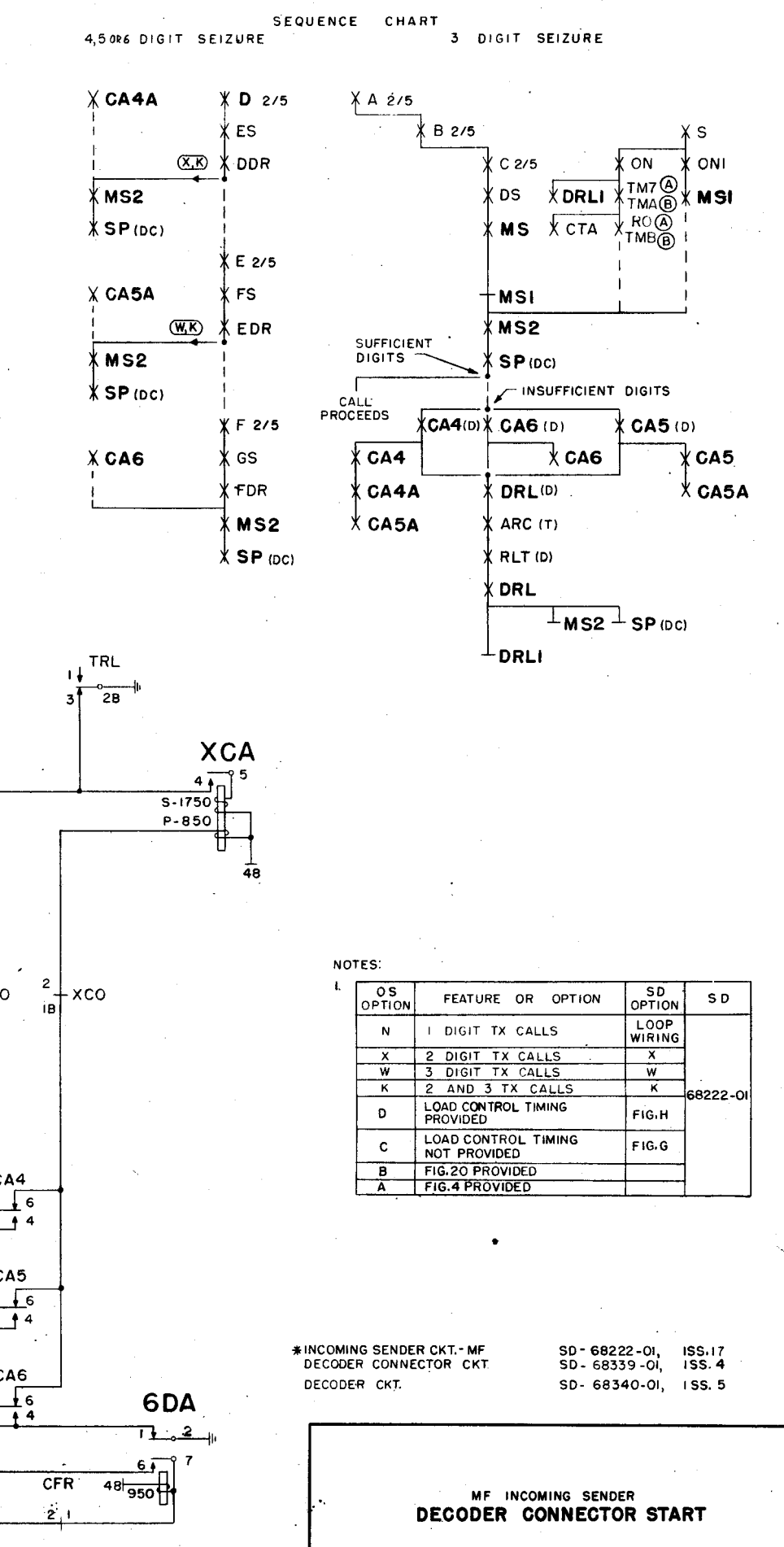
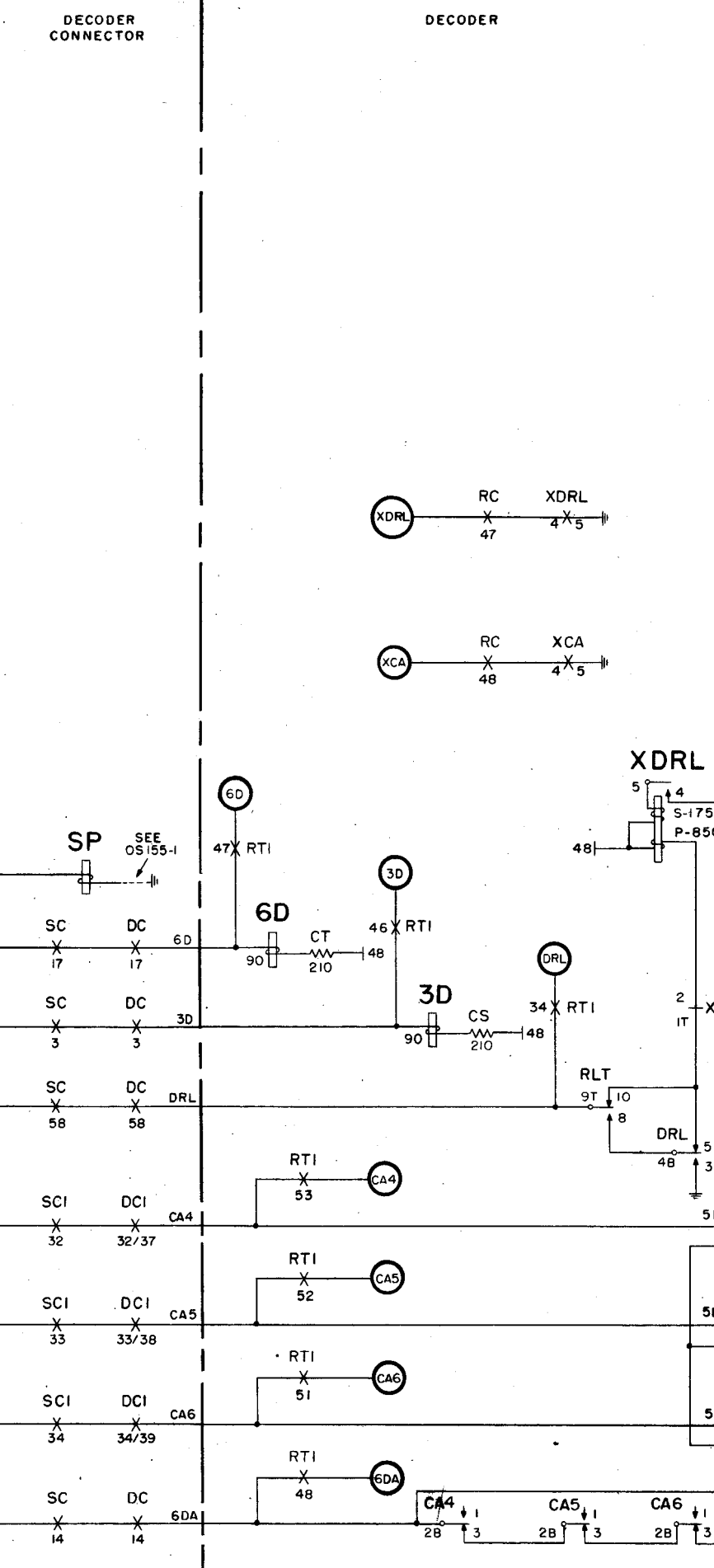
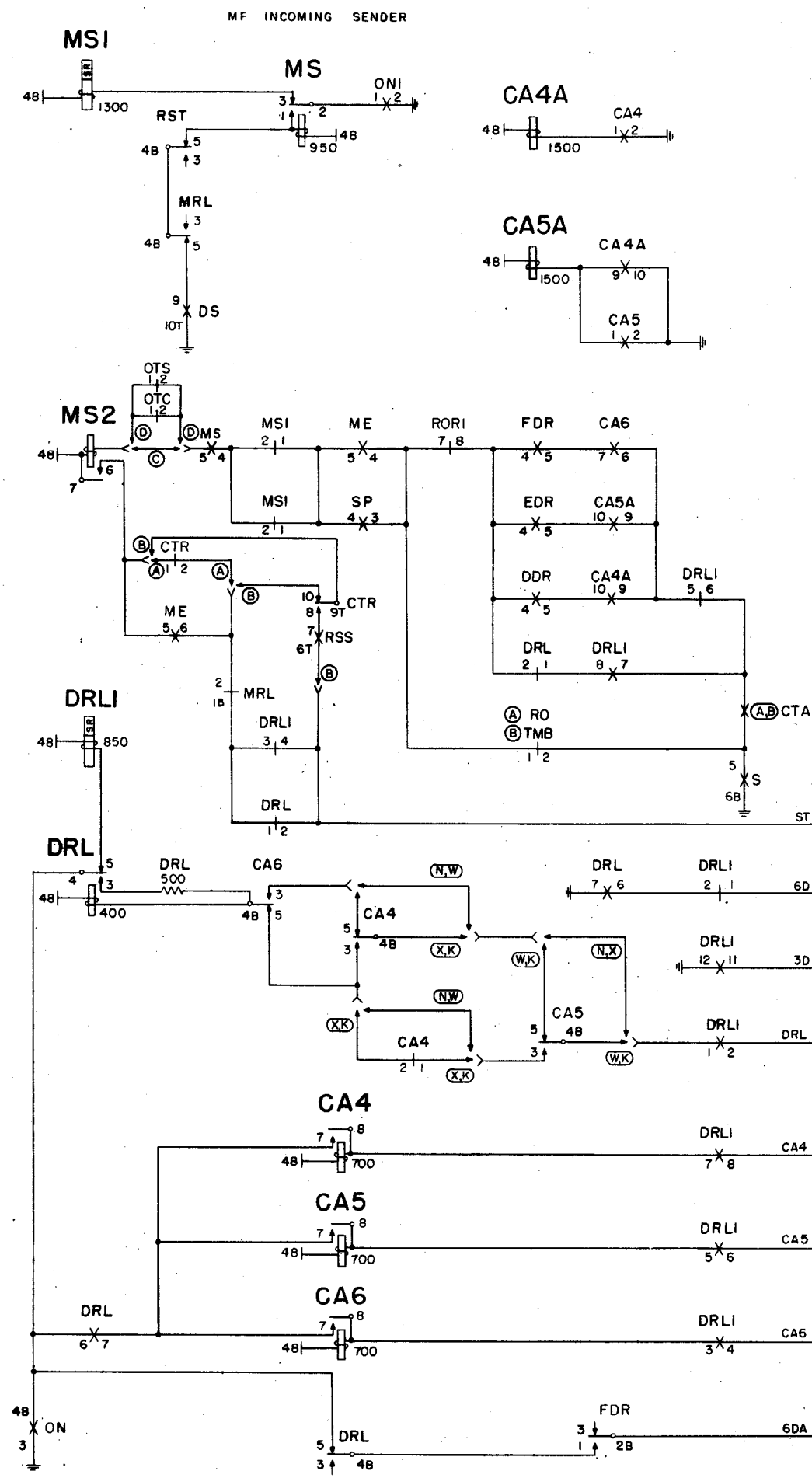
TABLE I
STEERING CIRCUIT PROGRESS

DIGIT	RA	EV	OD	AS	BS	CS	DS	ES	FS	GS	HS	JS	KS	LS	MX
KP			H+	H+											
A	O	R	O	R	O										
B	O	R	O	R		O									
C	O	R	O	R			O	H							
D	O	R	O	R				O							
E	O	R	O	R					O						
F	O	R	O	R						O					
G	O	R	O	R							O				
H	O	R	O	R								O			
J	O	R	O	R									O		
K	O	R	O	R										O	
L	O	R	O	R											O
START	O	R	H	O											H

O DENOTES RELAY OPERATED.
H DENOTES RELAY HELD.
R DENOTES RELAY RELEASED.
+ DENOTES INITIALLY OPERATED AT SEIZURE FROM OFF-NORMAL GROUND.

SD OPTION	FEATURE OR OPTION	SD OPTION	SD
A	M.D.	G	68222-01
B	STD.	F	
C	M.D.	XC	
D	STD.	XD	
E	ALL LPD-20C CALLS REQUIRE 7 DIGITS REGISTERED IN THE SENDER	XE	

REVISION	1	1-5-51	2	2-22-52
DATE	11-26-51	8-27-53		



NOTES:

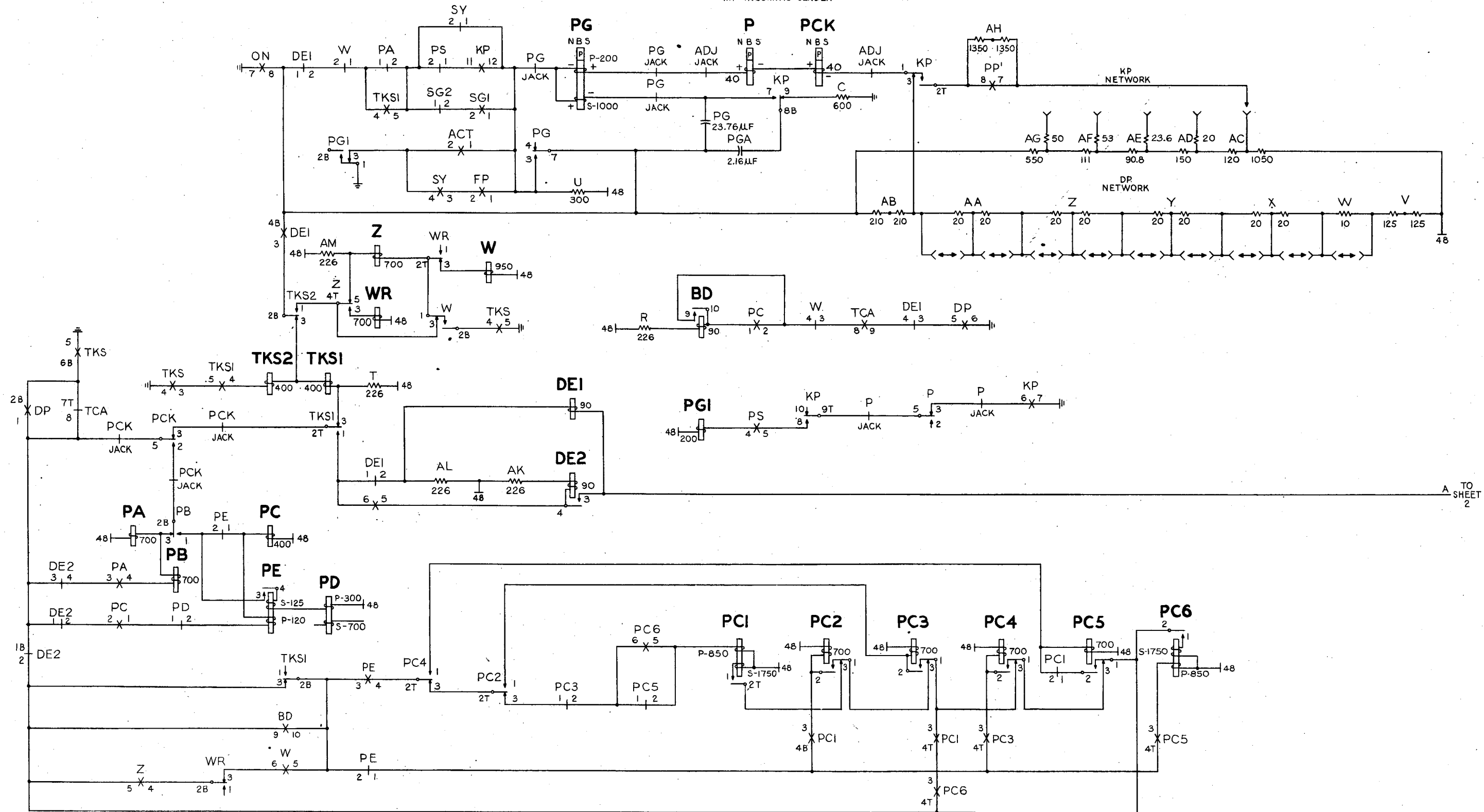
OS OPTION	FEATURE OR OPTION	SD OPTION	SD
N	1 DIGIT TX CALLS	LOOP WIRING	
X	2 DIGIT TX CALLS	X	
W	3 DIGIT TX CALLS	W	
K	2 AND 3 TX CALLS	K	68222-01
D	LOAD CONTROL TIMING PROVIDED	FIG.H	
C	LOAD CONTROL TIMING NOT PROVIDED	FIG.G	
B	FIG.20 PROVIDED		
A	FIG.4 PROVIDED		

*INCOMING SENDER CKT.-MF
 DECODER CONNECTOR CKT.
 DECODER CKT.

SD- 68222-01, ISS.17
 SD- 68339-01, ISS.4
 SD- 68340-01, ISS.5

MF INCOMING SENDER
 DECODER CONNECTOR START

MF INCOMING SENDER



REVISED	1	DATE	11-28-51
DESIGNED	2	BY	J.P.S.
CHECKED		DATE	8-19-53

2 SHEETS, SHEET 1

MP-11728

MF INCOMING SENDER
PULSE GENERATION AND RECAPTURE
 OS137-1

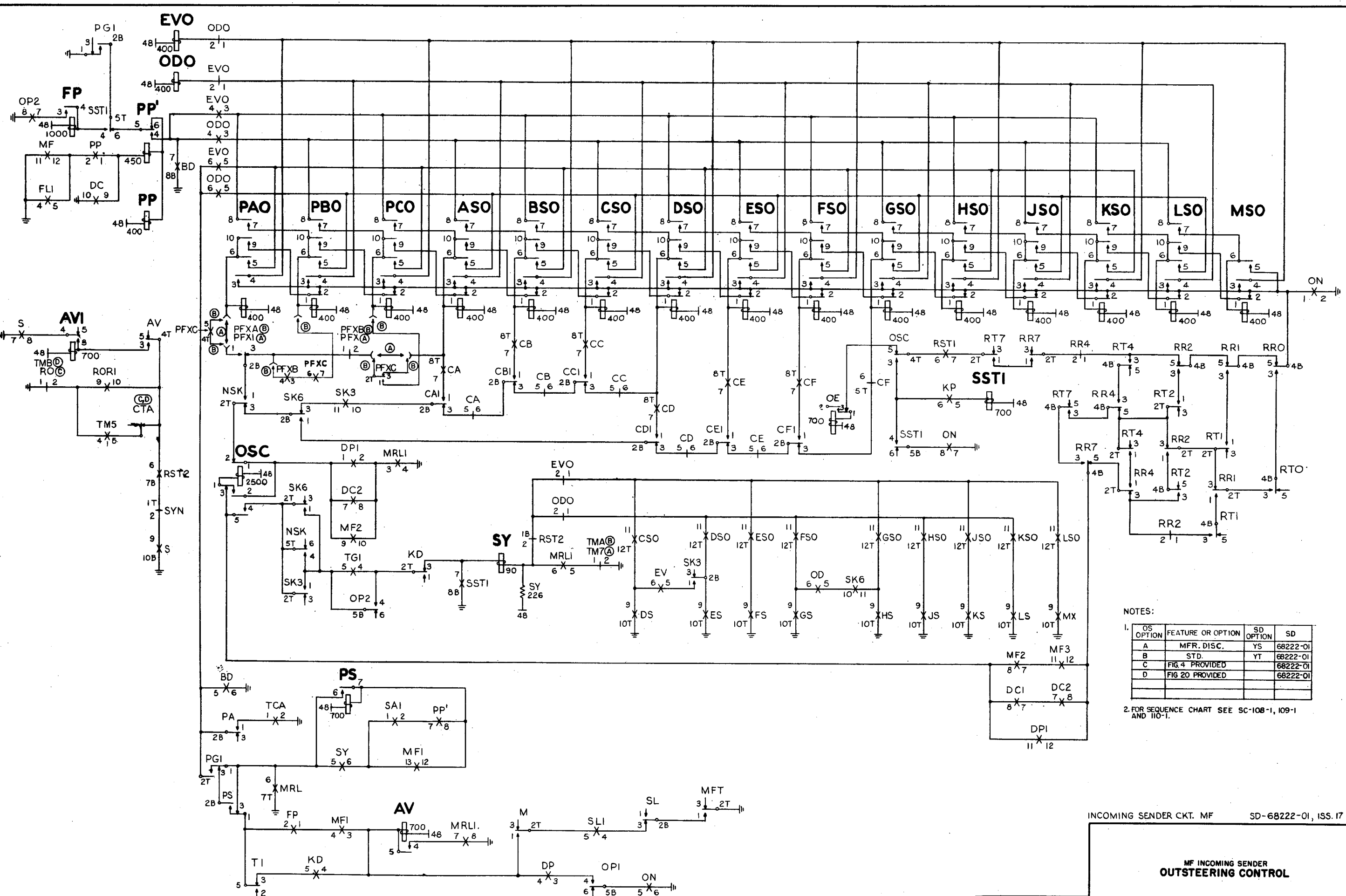
2 SHEETS, SHEET 1

NO. 4A TOLL

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U. S. A.

ORDER AS BSP ITEM MP-11728



DATE	1 MAR 2 1948
BY	WJS
CHKD	WJS
APPD	

NOTES:

- | OS OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|-------------------|-----------|----------|
| A | MFR. DISC. | YS | 68222-01 |
| B | STD. | YT | 68222-01 |
| C | FIG 4 PROVIDED | | 68222-01 |
| D | FIG 20 PROVIDED | | 68222-01 |

2. FOR SEQUENCE CHART SEE SC-108-1, 109-1 AND 110-1.

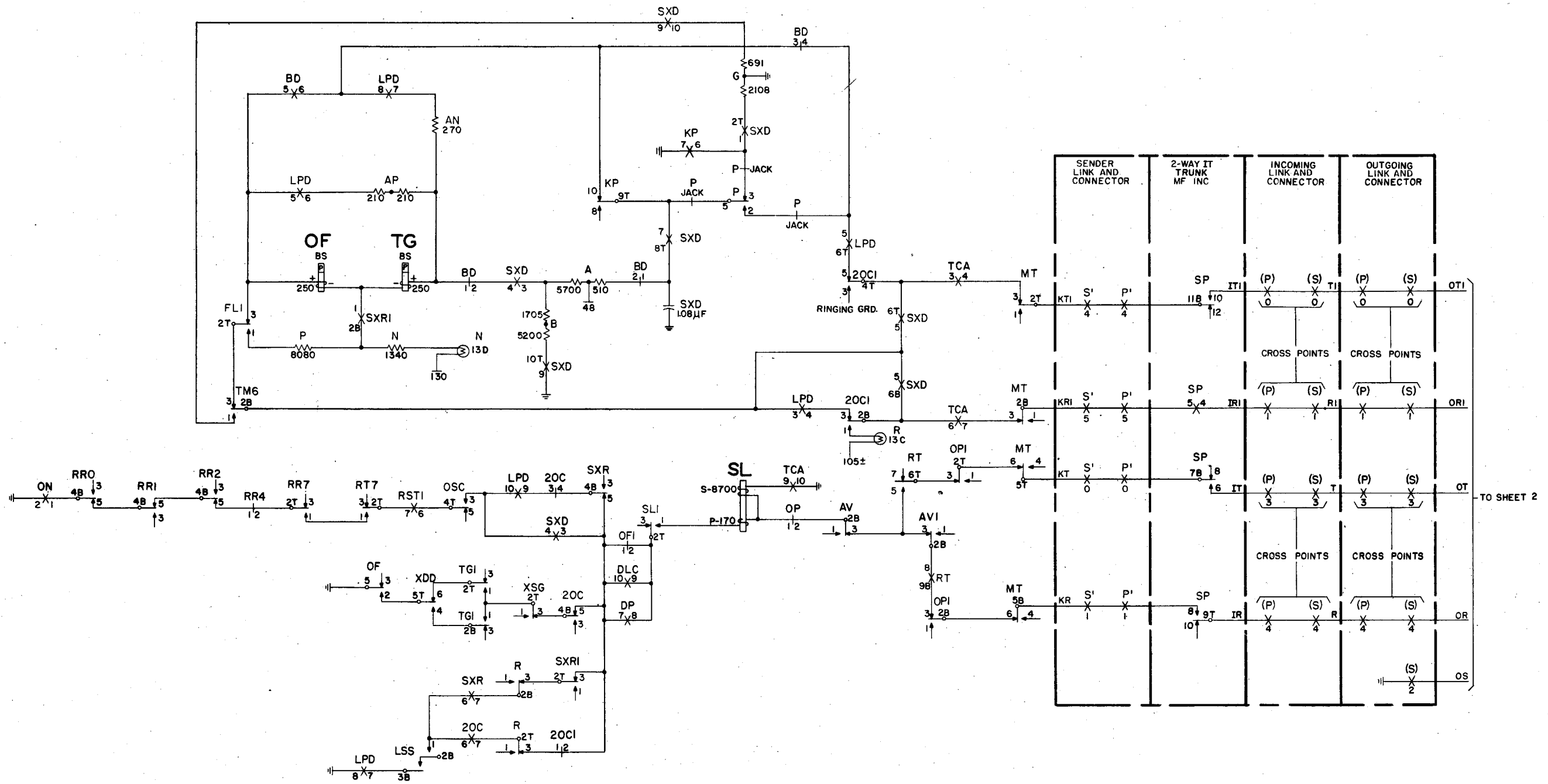
INCOMING SENDER CKT. MF SD-68222-01, ISS. 17

**MF INCOMING SENDER
OUTSTEERING CONTROL**

NO. 4A TOLL

OS 138-1

MF INCOMING SENDER



MF INCOMING SENDER
SL CHECK & SX
AND LOOP OUTPUTS

OS 139-1

2 SHEETS, SHEET 1

NQ 4A TOLL

ORDER AS B&P ITEM MP-11729

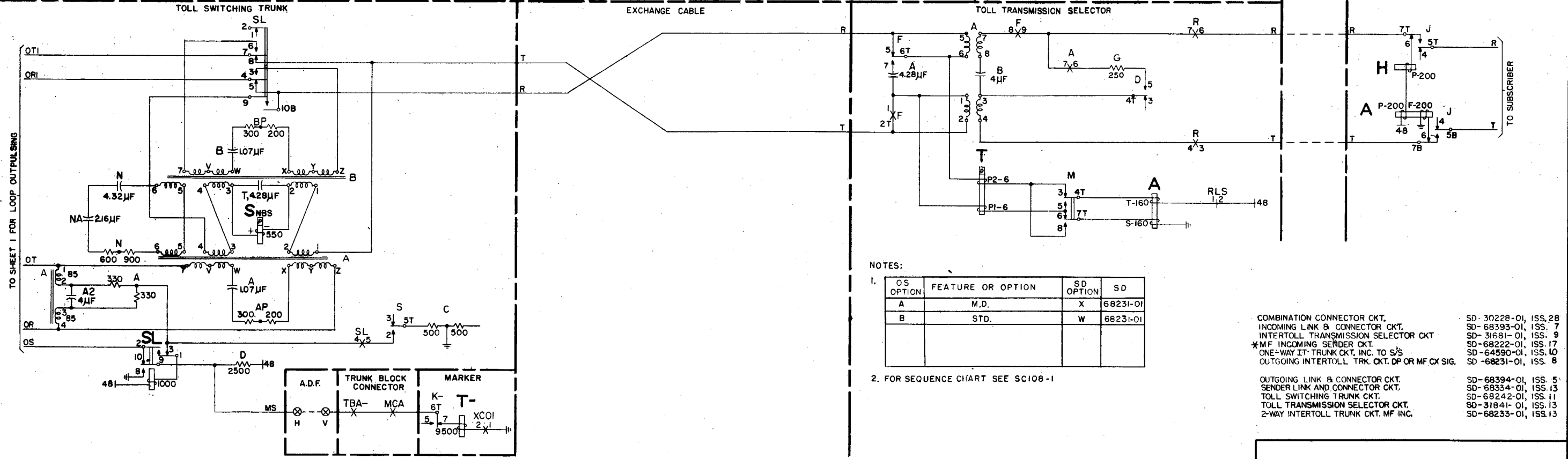
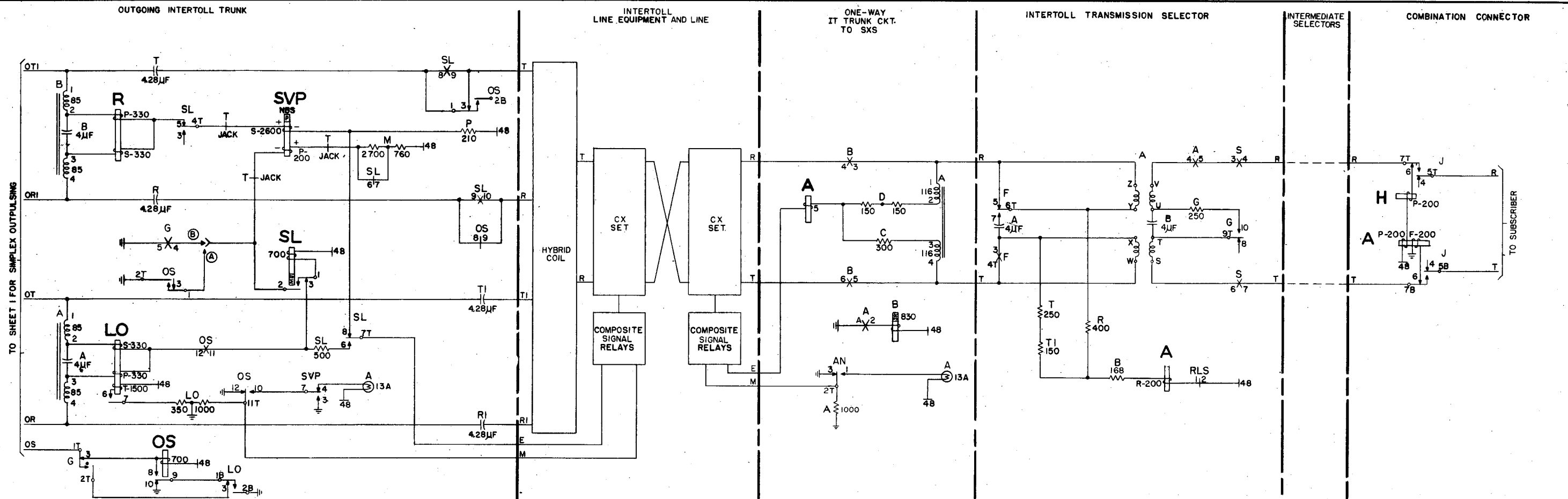
BELL TELEPHONE LABORATORIES, INC.
PRINTED IN U. S. A.

ISSUE	1	2	3
DATE	11-19-57	8-13-53	

2 SHEETS, SHEET 1

MP-11729

REVISION	DATE
1	11-11-51
2	8-3-53



NOTES:

- | OS OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|-------------------|-----------|----------|
| A | M.D. | X | 68231-01 |
| B | STD. | W | 68231-01 |

- COMBINATION CONNECTOR CKT. SD-30228-01, ISS. 28
- INCOMING LINK & CONNECTOR CKT. SD-68393-01, ISS. 7
- INTERTOLL TRANSMISSION SELECTOR CKT. SD-31681-01, ISS. 9
- *MF INCOMING SENDER CKT. SD-68222-01, ISS. 17
- ONE-WAY IT-TRUNK CKT. INC. TO S/S SD-64590-01, ISS. 10
- OUTGOING INTERTOLL TRK. CKT. DP OR MF CX SIG. SD-68231-01, ISS. 8
- OUTGOING LINK & CONNECTOR CKT. SD-68394-01, ISS. 5
- SENDER LINK AND CONNECTOR CKT. SD-68334-01, ISS. 13
- TOLL SWITCHING TRUNK CKT. SD-68242-01, ISS. 11
- TOLL TRANSMISSION SELECTOR CKT. SD-31841-01, ISS. 13
- 2-WAY INTERTOLL TRUNK CKT. MF INC. SD-68233-01, ISS. 13

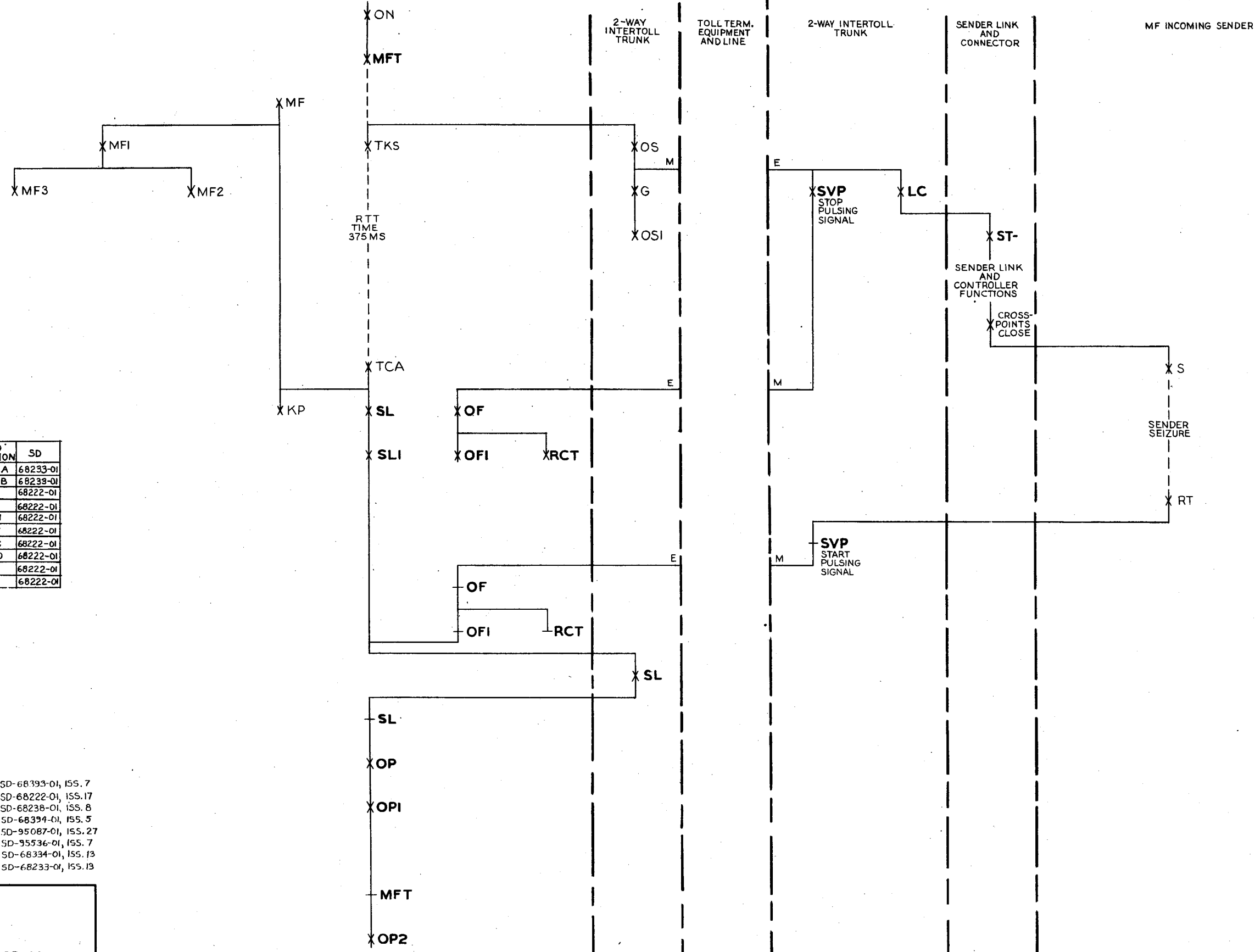
MF INCOMING SENDER
 SL CHECK & SX
 AND LOOP OUTPULSING

LOCAL 4A OFFICE

MF INCOMING SENDER

DISTANT 4A OFFICE

MF INCOMING SENDER



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	M.D.	FIG. A	68233-01
B	STD.	FIG. B	68233-01
C	FIG. 4 PROVIDED		68222-01
D	FIG. 20 PROVIDED		68222-01
E	M.D.	YH	68222-01
F	STD.	YJ	68222-01
G	M.D.	YC	68222-01
H	STD.	YD	68222-01
J	M.D.	G	68222-01
K	STD.	F	68222-01

- INCOMING LINK AND CONNECTOR CKT. SD-68393-01, ISS. 7
- INCOMING SENDER CKT.-MF SD-68222-01, ISS. 17
- INCOMING TANDEM TRUNK FROM 3CL SWBD. SD-68238-01, ISS. 8
- OUTGOING LINK AND CONNECTOR CKT. SD-68394-01, ISS. 5
- RECEIVING CKT.-MF PULSING SD-95087-01, ISS. 27
- RECEIVING CKT. MF PULSING SD-95536-01, ISS. 7
- SENDER LINK AND CONNECTOR CKT. SD-68334-01, ISS. 13
- 2-WAY INTERTOLL TRUNK CKT.-MF INC. SD-68233-01, ISS. 13

**MF INCOMING SENDER
SL CHECK
AND
MF OUTPUT PULSING TO A4A OR 4A**

OS 140-1

2 SHEETS, SHEET 1

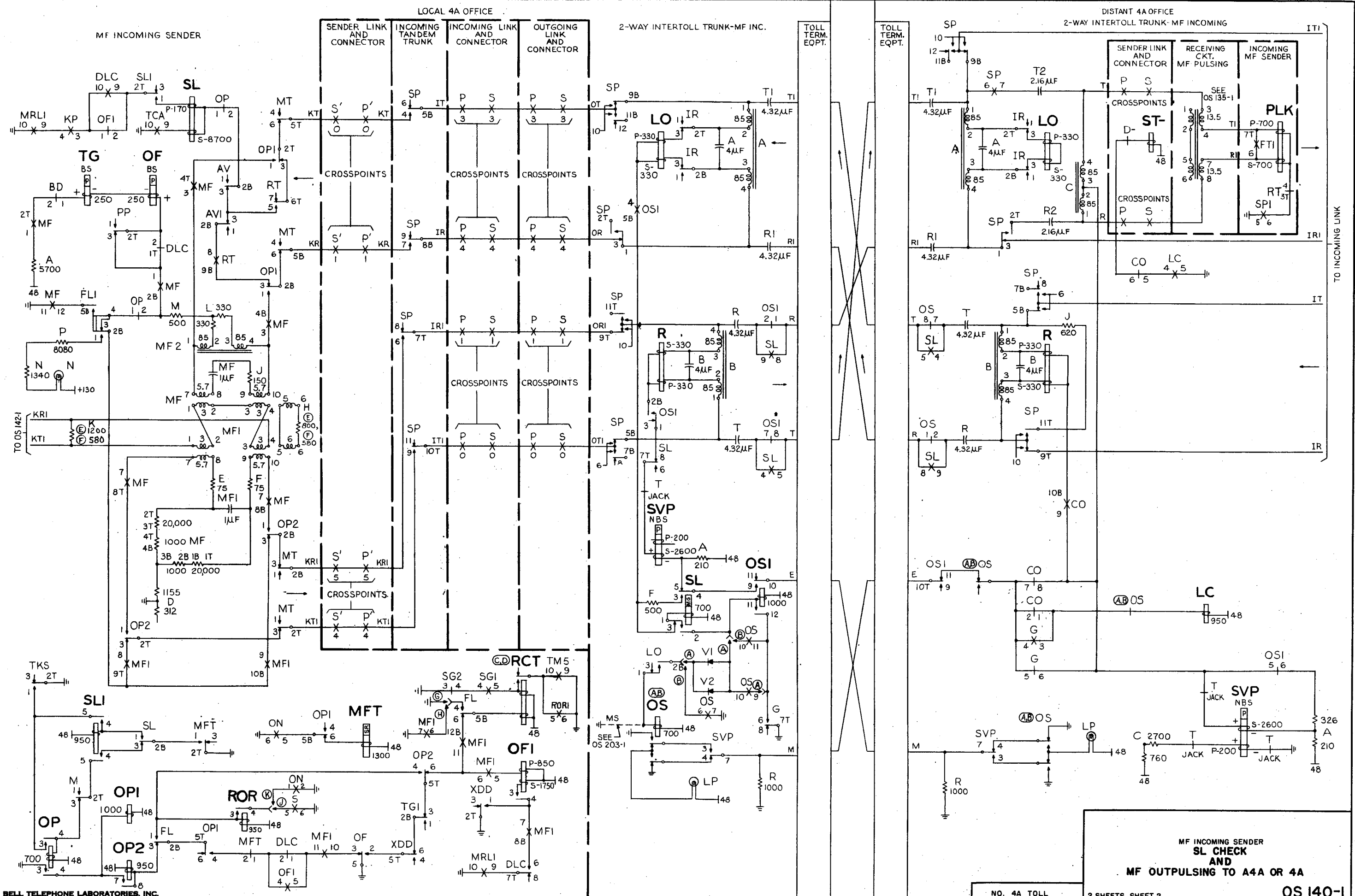
NO. 4A TOLL

ISSUE	1	2	3	4
DATE	11-28-51	8-18-53		

2 SHEETS, SHEET 1

MP-11730

ISSUE	1	2	3	4
DATE	11-22-51	8-16-52		

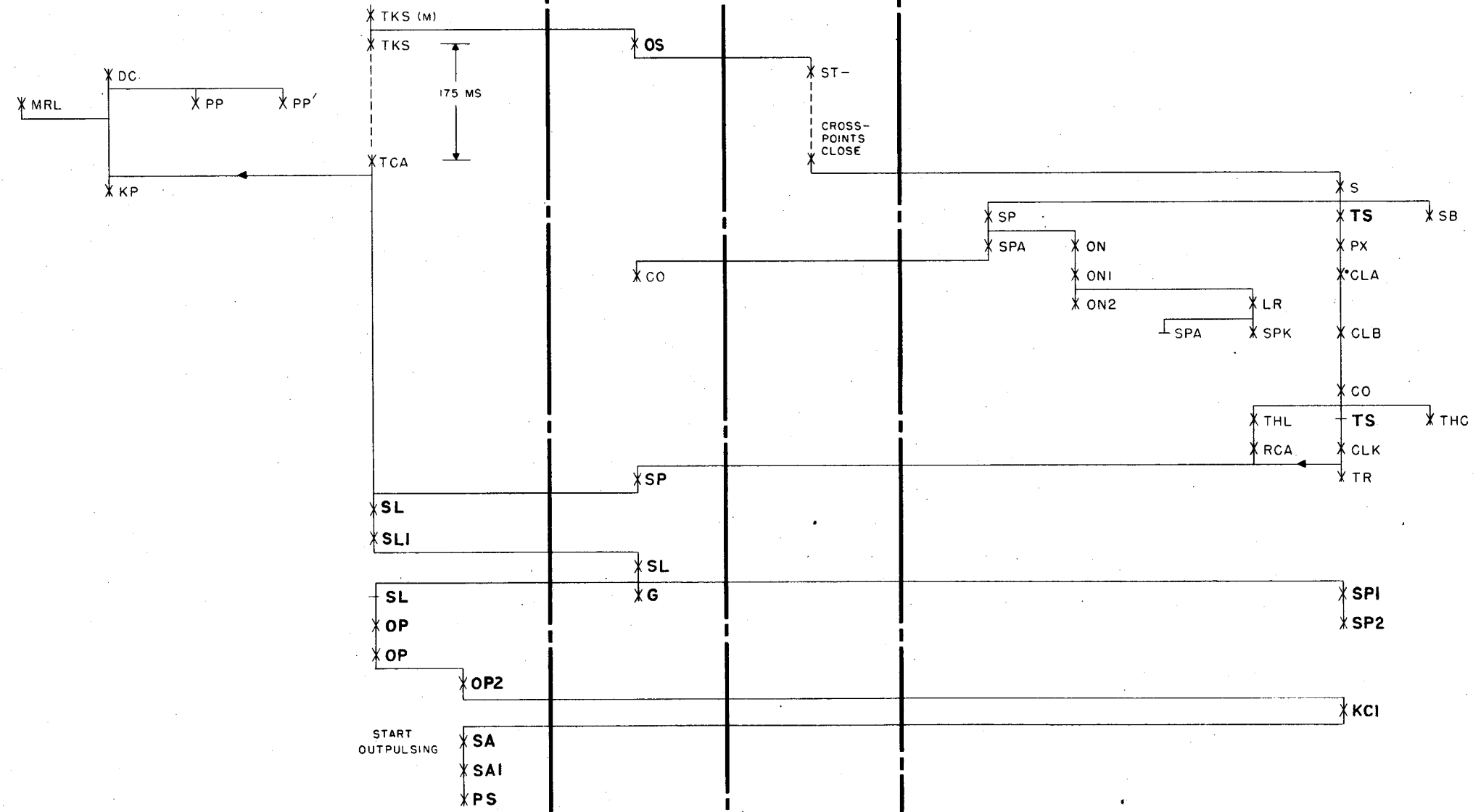


INCOMING SENDER

TOLL SWITCHING TRUNK

SENDER LINK AND CONNECTOR

OUTGOING SENDER



- INCOMING LINK & CONNECTOR CKT. SD-68393 - 01, ISS. 7
- INCOMING SENDER CKT.-MF SD-68222 - 01, ISS. 16
- INCOMING TRUNK CKT. SD-68237 - 01, ISS. 7
- INT. FRAME CKT. SD-68058 - 01, ISS. 15
- MARKER CKT. SD-68388 - 01, ISS. 5
- OUTGOING LINK & CONNECTOR CKT. SD-68394 - 01, ISS. 5
- OUTGOING SENDER CKT. SD-68018 - 01, ISS. 25
- SENDER LINK & CONNECTOR CKT. SD-68334 - 01, ISS. 13
- TOLL SWITCHING TRK. CKT.-REV. OR PCL. SD-68326 - 01, ISS. 10
- TRUNK BLOCK CONNECTOR CKT. SD-68027 - 01, ISS. 13

MF INCOMING SENDER
**SL CHECK & SYNCHRONIZATION
 WITH OUTGOING SENDER**

OS 141-1

2 SHEETS, SHEET 1

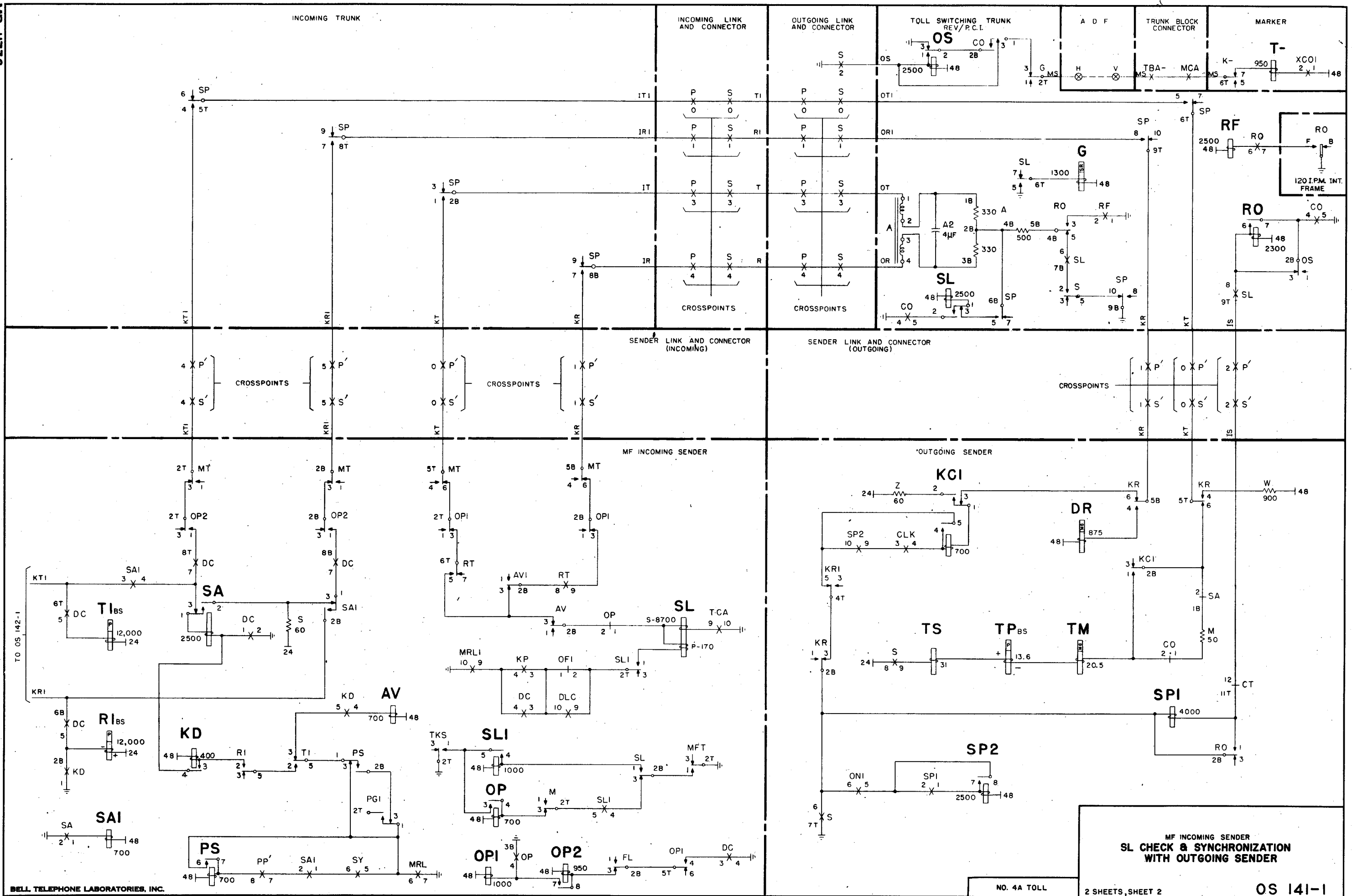
NO. 4A TOLL

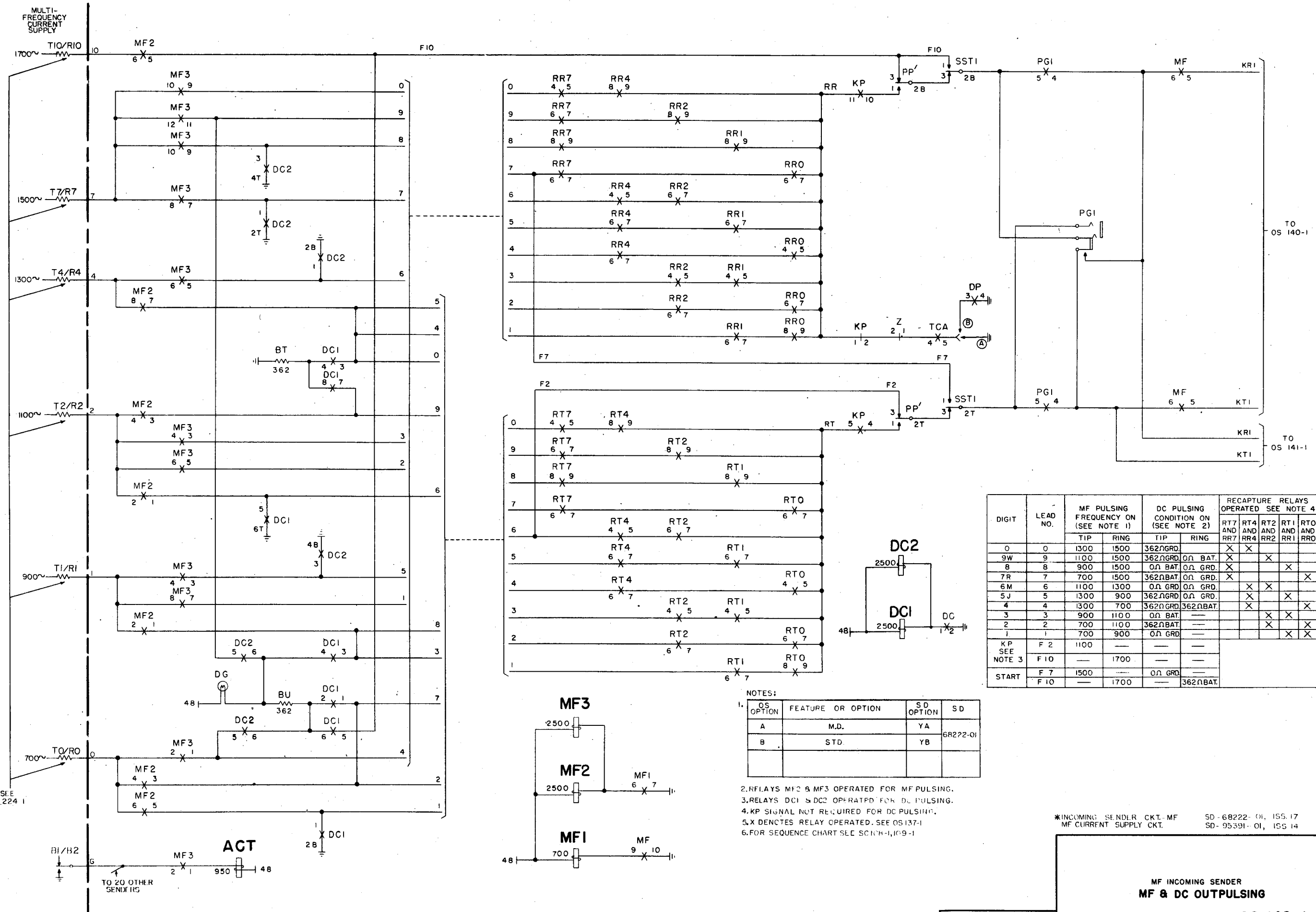
ISSUE	1	2	3
DATE	11-26-51	7-27-53	

2 SHEETS, SHEET 1

MP-11736

REVISED	1	11/22/52	2	11/22/52
DATE	11-22-52	7-27-53		





REVISION	1	1/14/53	2	6/1/53
DATE	11/26/51	8/16/53		

DIGIT	LEAD NO.	MF PULSING FREQUENCY ON (SEE NOTE 1)		DC PULSING CONDITION ON (SEE NOTE 2)		RECAPTURE RELAYS OPERATED SEE NOTE 4				
		TIP	RING	TIP	RING	RT7 AND RR7	RT4 AND RR4	RT2 AND RR2	RT1 AND RR1	RTO AND RRO
0	0	1300	1500	362ΩGRD.	—	X	X			
9W	9	1100	1500	362ΩGRD.	0ΩBAT.	X		X		
8	8	900	1500	0ΩBAT	0ΩGRD.	X			X	
7R	7	700	1500	362ΩBAT	0ΩGRD.	X				X
6M	6	1100	1300	0ΩGRD	0ΩGRD.		X	X		
5J	5	1300	900	362ΩGRD	0ΩGRD.		X		X	
4	4	1300	700	362ΩGRD	362ΩBAT.		X			X
3	3	900	1100	0ΩBAT	—			X	X	
2	2	700	1100	362ΩBAT	—			X	X	X
1	1	700	900	0ΩGRD	—				X	X
KP SEE NOTE 3	F 2	1100	—	—	—					
	F 10	—	1700	—	—					
	F 7	1500	—	0ΩGRD	—					
START	F 10	—	1700	—	362ΩBAT.					

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	M.D.	YA	
B	STD.	YB	6R272-01

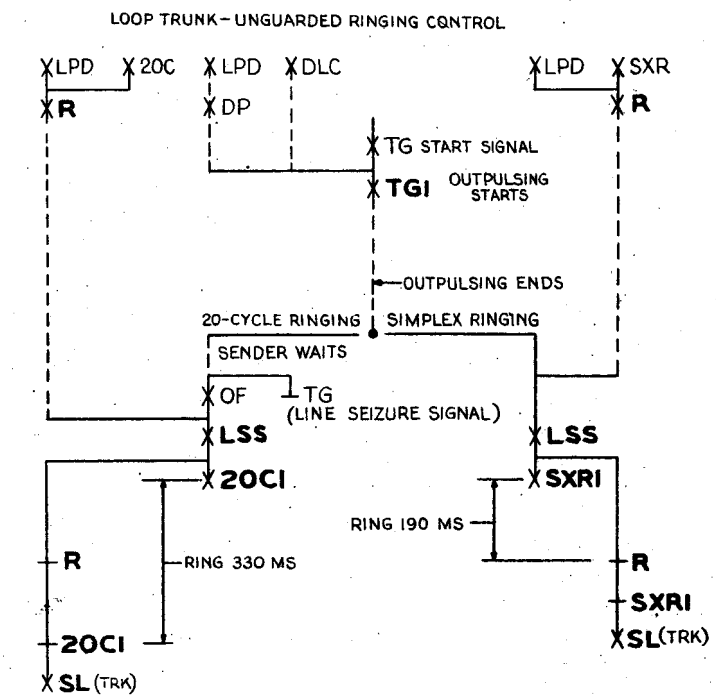
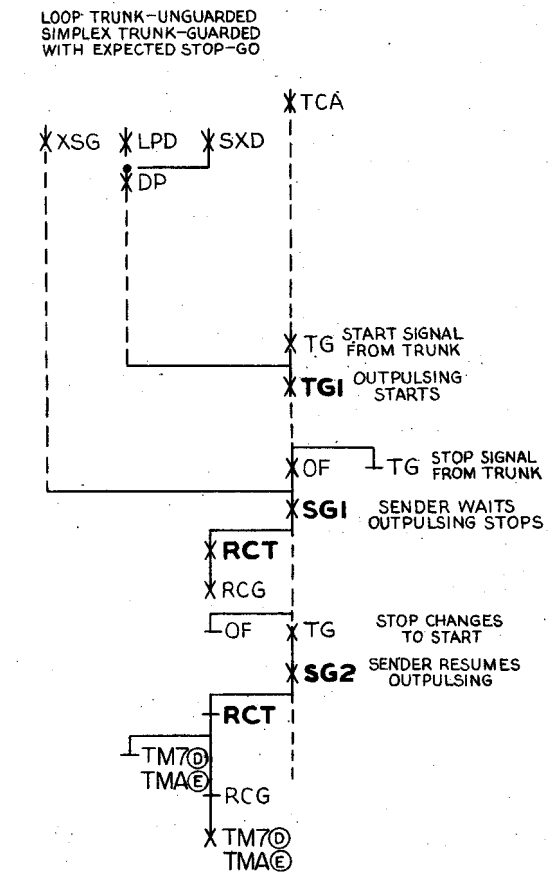
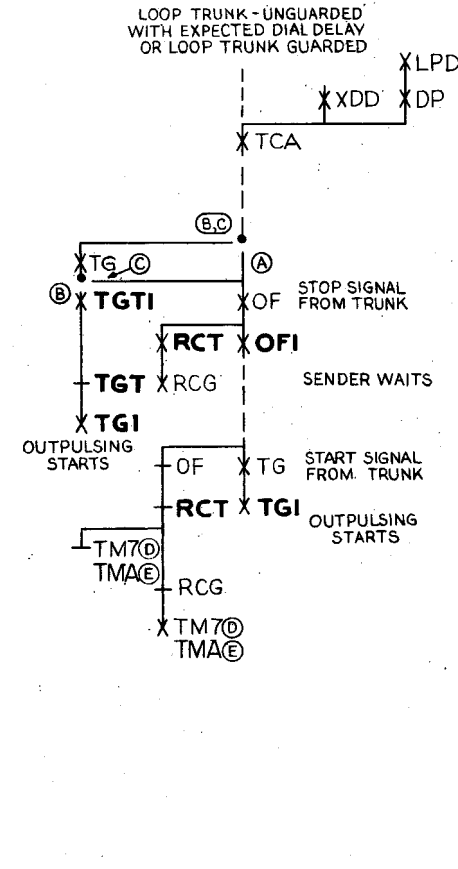
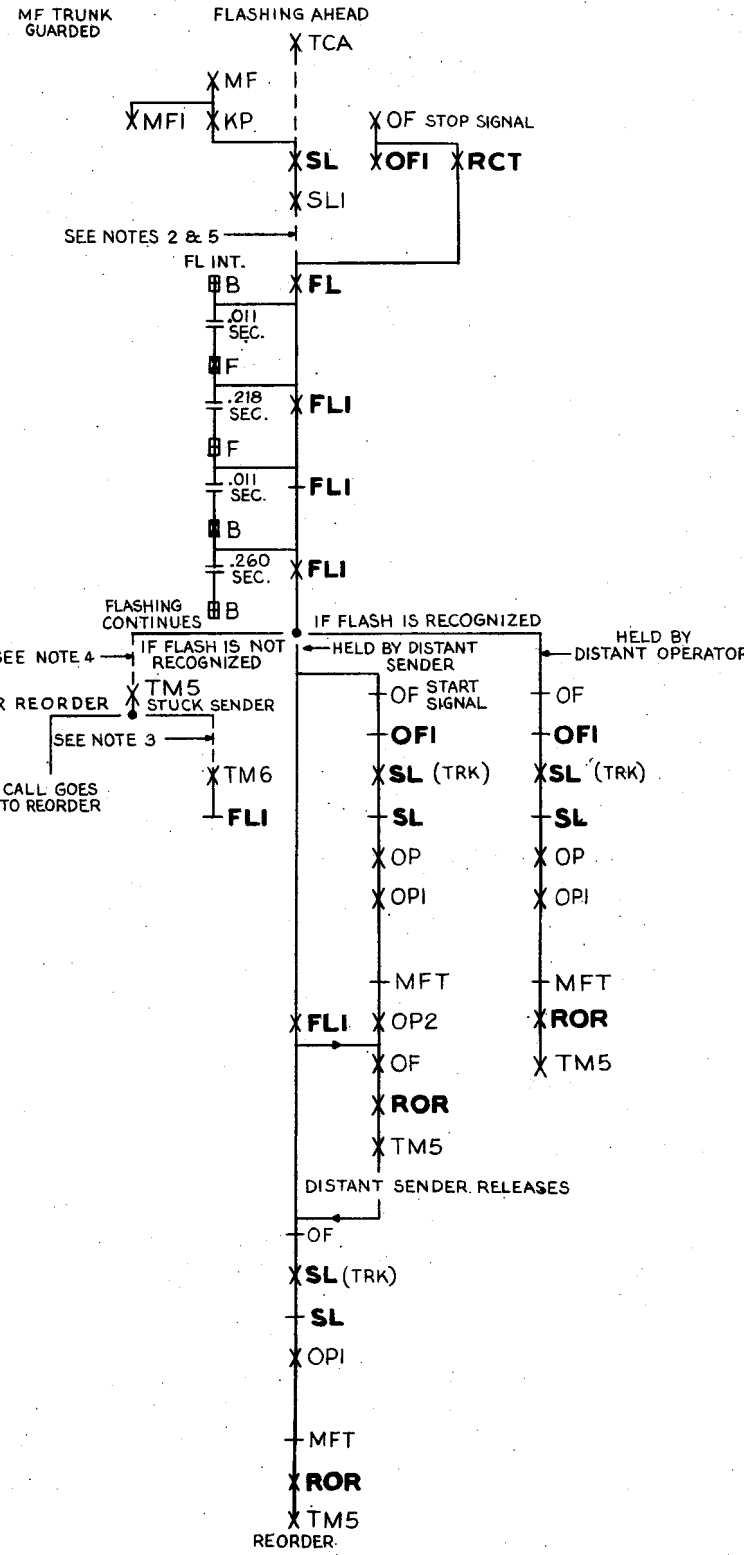
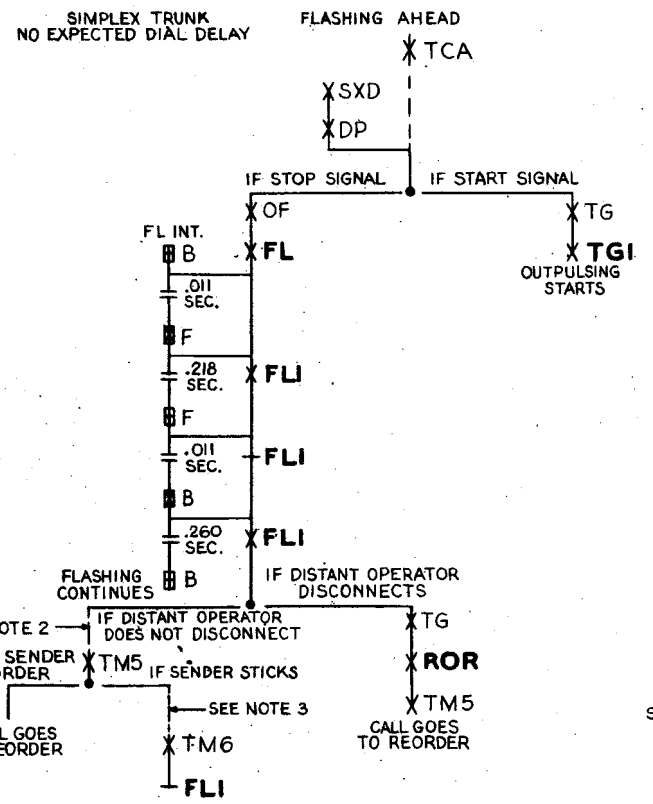
- RELAYS MF2 & MF3 OPERATED FOR MF PULSING.
- RELAYS DC1 & DC2 OPERATED FOR DC PULSING.
- KP SIGNAL NOT REQUIRED FOR DC PULSING.
- X DENOTES RELAY OPERATED. SEE OS137-1
- FOR SEQUENCE CHART SEE SCHEM-1109-1

*INCOMING SENDLR. CKT.-MF SD-68222-01, ISS. 17
MF CURRENT SUPPLY CKT. SD-95391-01, ISS. 14

**MF INCOMING SENDER
MF & DC OUTPULSING**

OS 142-1

SEQUENCE CHARTS



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	IF INITIAL SIGNAL IS STOP & IS FOLLOWED BY START		
B	IF INITIAL SIGNAL IS START & DOES NOT CHANGE.		
C	IF INITIAL SIGNAL IS START & IS FOLLOWED BY STOP		
YC	STD.	YC	68221-01
YD	M.D.	YD	
ZY	TO PREVENT BLOCKING OF OUTPULSING WITH XSG OPERATED	ZY	
D	FIG. 4 PROVIDED		
E	FIG. 20 PROVIDED		

- SENDER IN ORIGINATING OFFICE TIMES OUT IN 30-40 SECONDS IF NO RESPONSE IS RECEIVED.
- SENDER TIMES 10 SECONDS MORE, THEN OPERATES TM6 TO STOP FLASHING.
- IF FLASH IS NOT RECOGNIZED IN 10-20 SECONDS.
- ASSUME SENDER IN DISTANT OFFICE TIMES OUT LATER THAN SENDER IN ORIGINATING OFFICE.

MF INCOMING SENDER RINGING AND STOP CONTROL FLASHING AHEAD

OS 143-1

2 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS DSP ITEM MP-11738

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U.S.A.

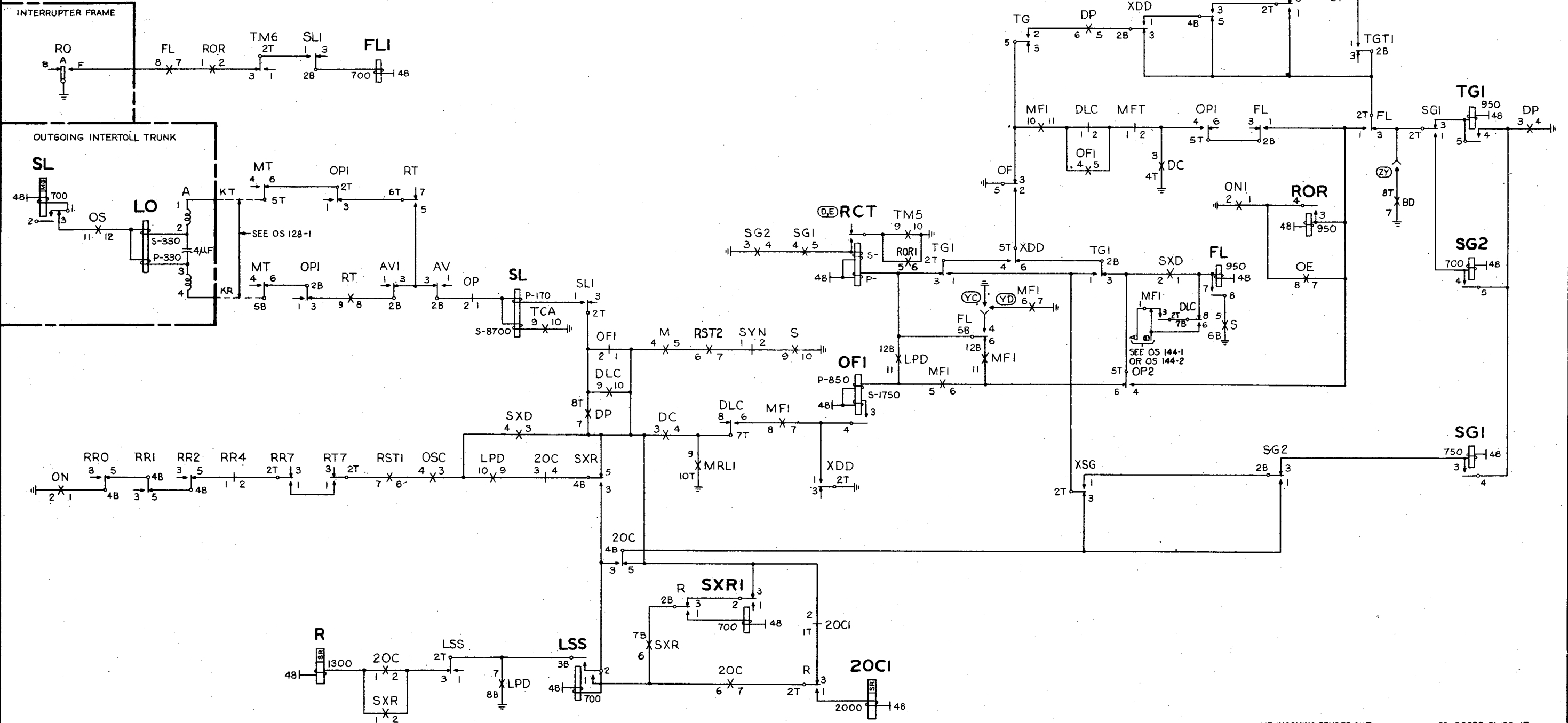
ISSUE	1	REVISED	2	DATE	11-28-51	7-29-53
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2 SHEETS, SHEET 1

MP-11738

MF INCOMING SENDER

REVISION	1	DATE	11-28-51
	2	DATE	7-25-53
	3	DATE	
	4	DATE	



MF INCOMING SENDER CKT. SD-68222-01, ISS. 17
 INTERRUPTER FRAME CKT. SD-68059-01, ISS. 35
 OUTGOING INTERTOLL TRK. CKT. DP/MF SD-68231-01, ISS. 8

MF INCOMING SENDER
RINGING AND STOP CONTROL
FLASHING AHEAD

SEQUENCE CHARTS

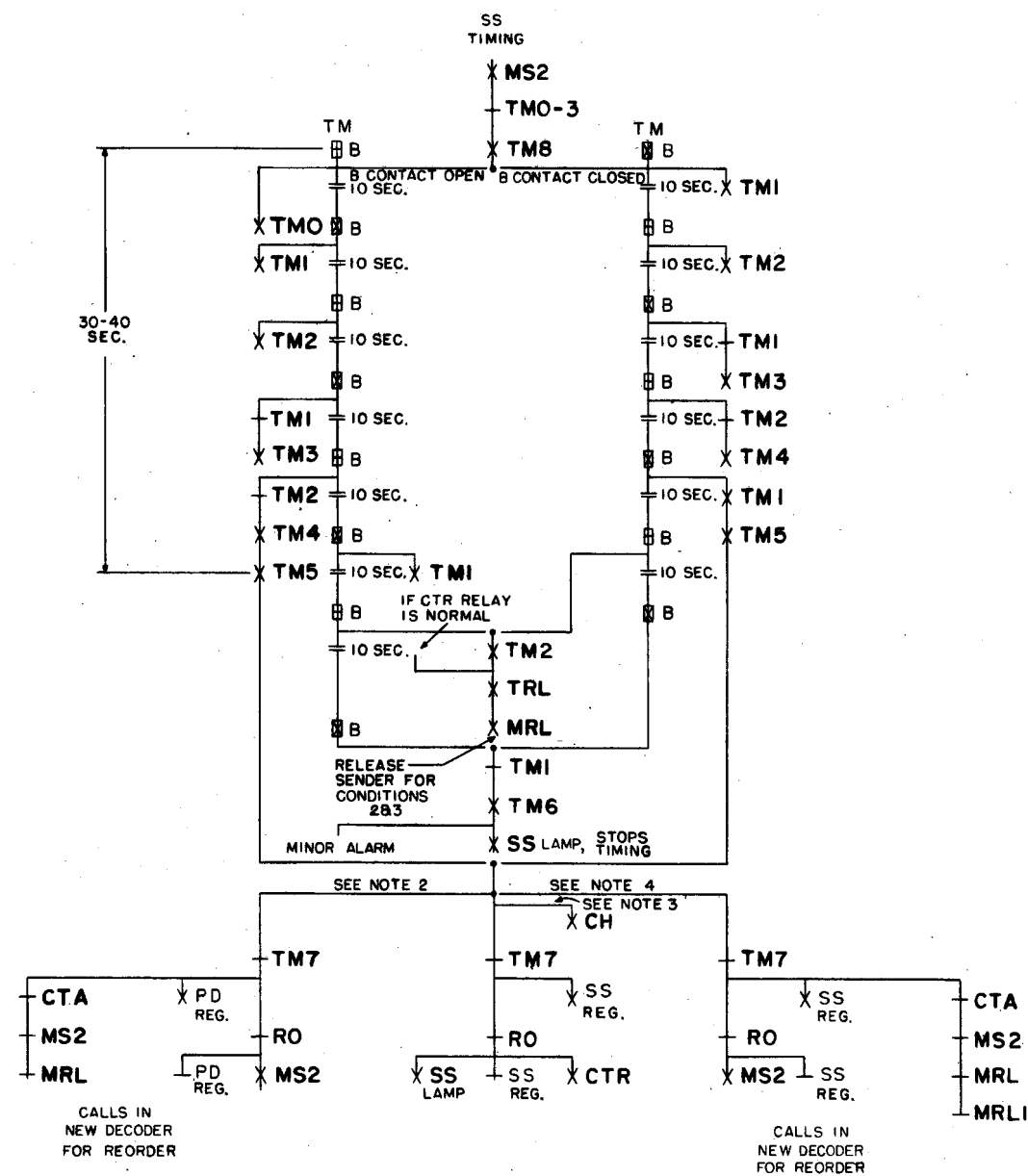
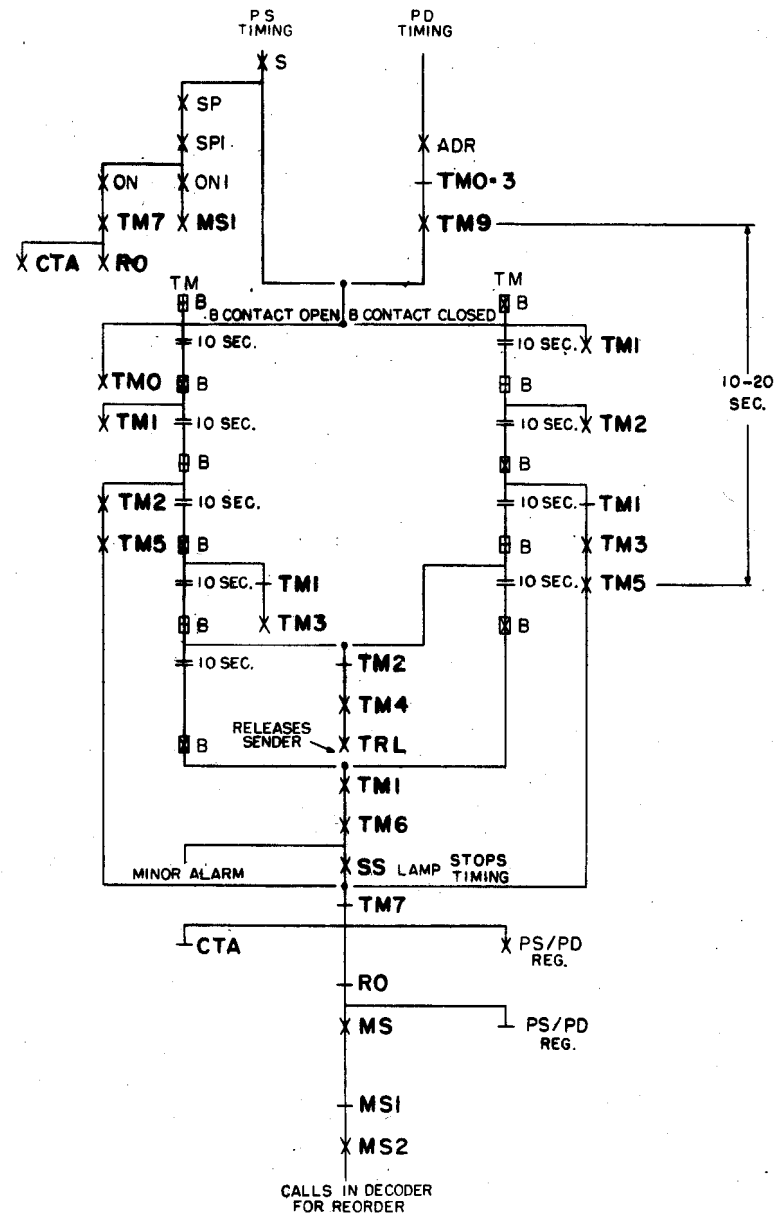
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	MFR. DISC.		68222-01
B	STANDARD		
C	MFR. DISC.	YQ	
D	STANDARD	YR	
E	LOAD CONT. TIMING NOT PROVIDED	FIG. 6	
F	LOAD CONT. TIMING PROVIDED	FIG. H	
G	TR USAGE RECORDER PROVIDED	FIG. MYX	
H	TR USAGE RECORDER NOT PROVIDED	FIG. L	

2. START SIGNAL NOT RECEIVED OR OPERATOR'S ERROR. (RST) NORMAL

3. AVAILABLE CKT. FOR (CH) REL. OR (CTR) KEY OPERATED. (RST) RELAY OPERATED.

4. NO AVAILABLE CIRCUIT FOR (CH) RELAY OR (CTR) KEY NORMAL. (RST) RELAY OPERATED.



- INTERRUPTER FRAME CKT. SD-68058-01, ISS. 19
- INCOMING SENDER CKT.-MF SD-68222-01, ISS. 17
- DECODER CONNECTOR CKT. SD-68339-01, ISS. 4
- DECODER CKT. SD-68340-01, ISS. 5
- MISC. CKT.-SENDER MAKE-BUSY FRAME SD-68386-01, ISS. 5
- MARKER CKT. SD-68388-01, ISS. 5
- MISC. CKT. TROUBLE RECORDER SD-68392-01, ISS. 5
- TRAFFIC REGISTER CKT. SD-68412-01, ISS. 7

MF INCOMING SENDER
OVER-ALL TIMING AND
MISCELLANEOUS TROUBLE CONDITIONS
FIG. 4

OS144-1

2 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS BSP ITEM MP-11763

BELL TELEPHONE LABORATORIES, INC.

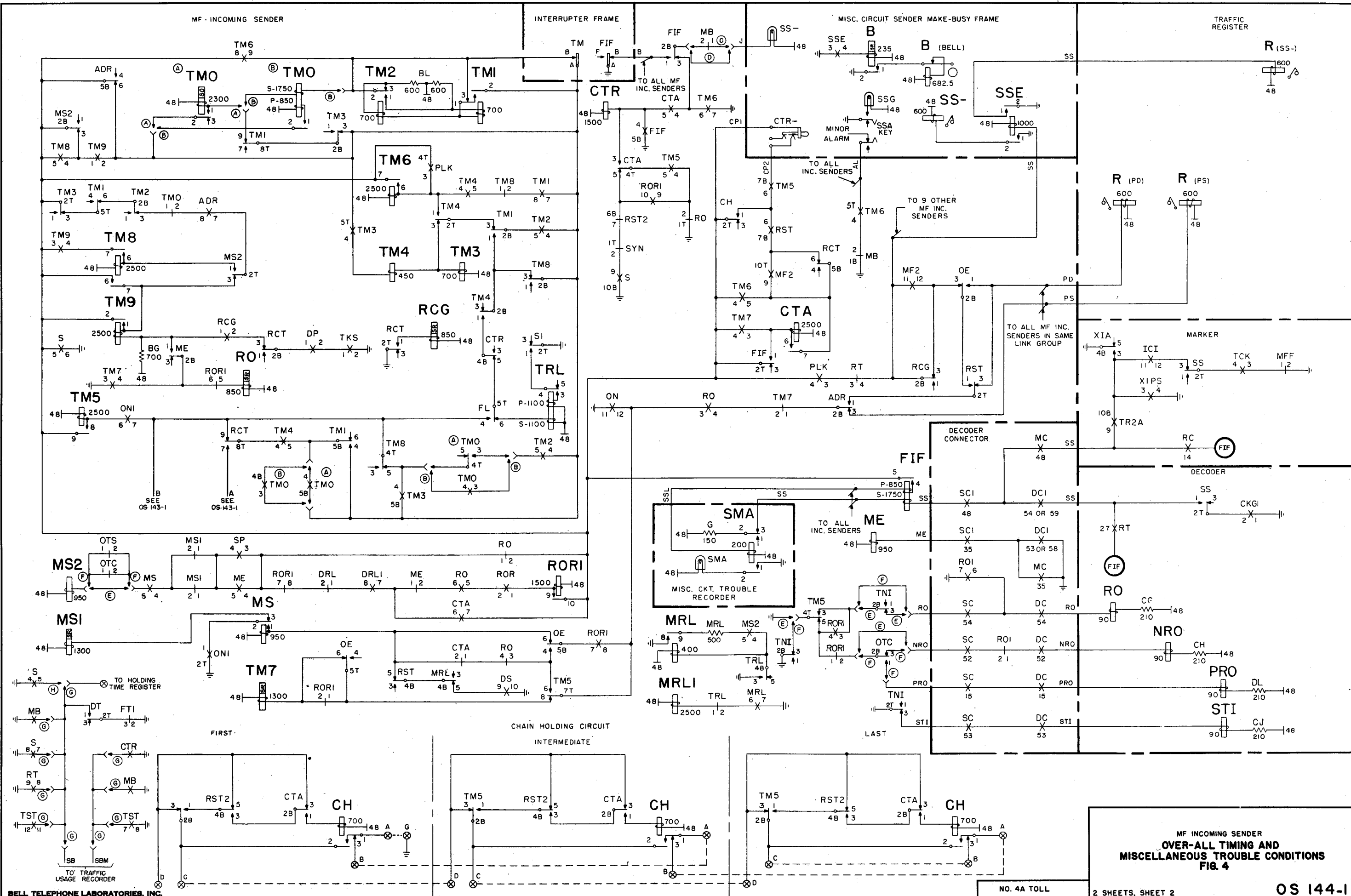
PRINTED IN U. S. A.

REVISION	1	DATE	1-18-52
	2	DATE	9-1-53

2 SHEETS, SHEET 1

MP-11763

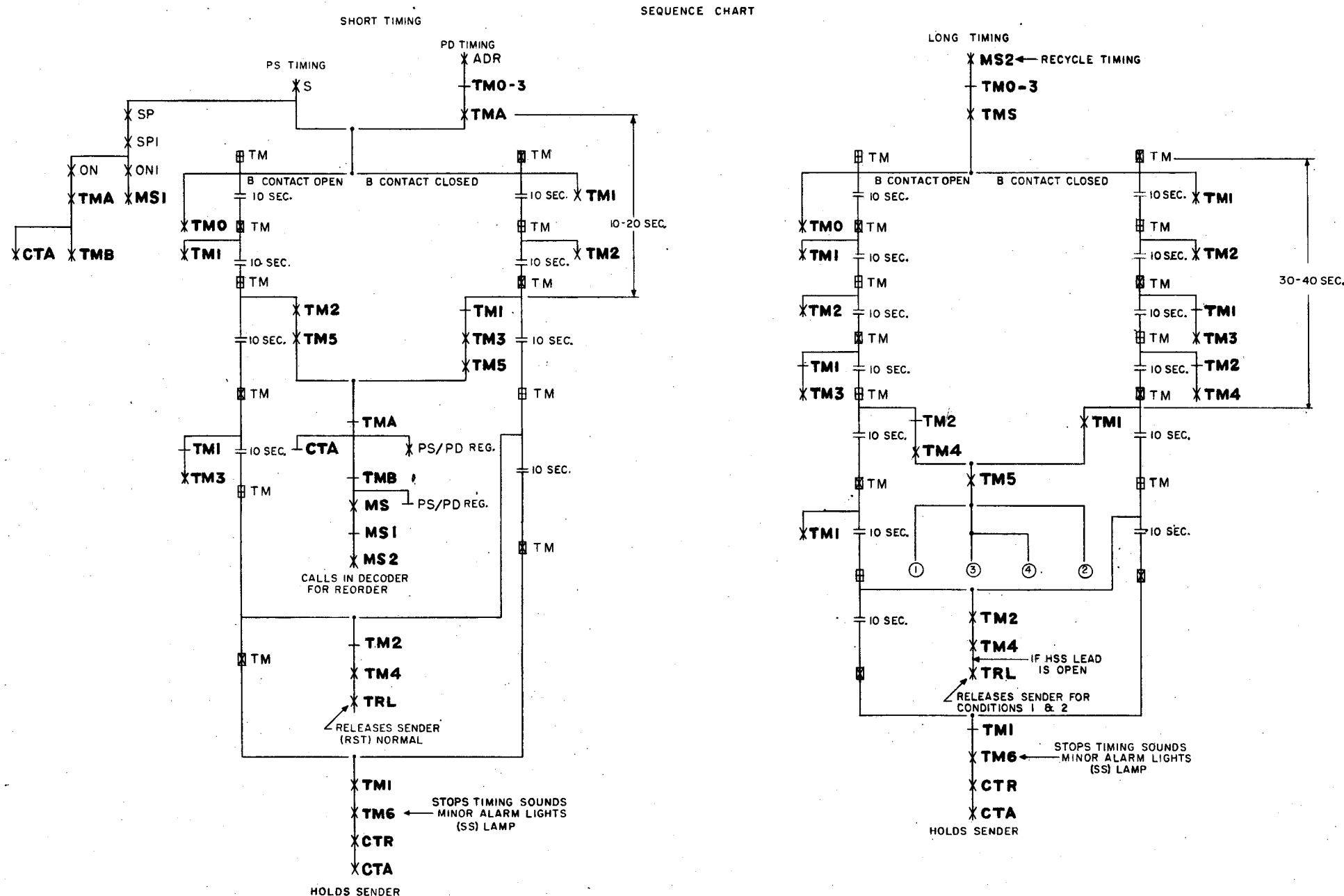
ISSUE	1	2	3
DATE	1-18-52	9-7-53	



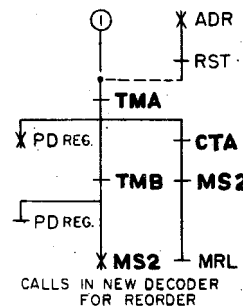
MF INCOMING SENDER OVER-ALL TIMING AND MISCELLANEOUS TROUBLE CONDITIONS FIG. 4

NOTES:

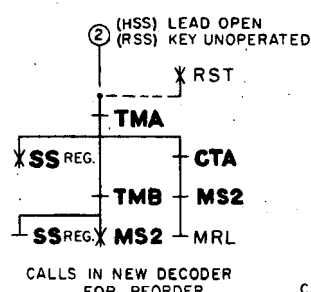
OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	LOAD CONTROL TIMING NOT PROVIDED	FIG.G	68222-01
B	LOAD CONTROL TIMING PROVIDED	FIG.H	
C	MFR.DISC.	YQ	
D	STD.	YR	
E	TRAFFIC USAGE RECORDER PROVIDED	YX	
F	TRAFFIC USAGE RECORDER NOT PROVIDED	FIG.L	
G	LOAD CONTROL TIMING PROVIDED WITH TRAFFIC USAGE RECORDER	FIG.M	



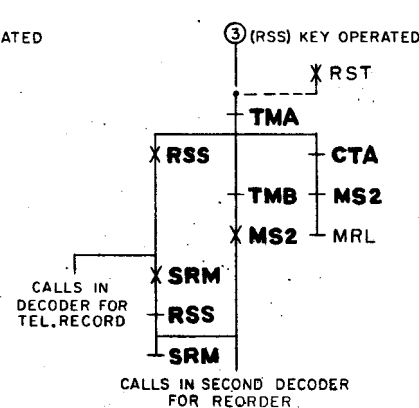
1. START SIGNAL NOT RECEIVED OR OPERATORS ERROR.



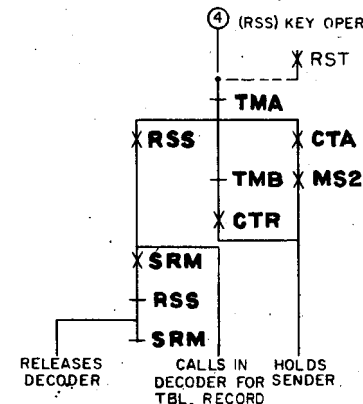
2. REORDER ON "SS" TIMEOUT.



3. "SS" TIMEOUT - "HSS" LEAD OPEN.



4. "SS" TIMEOUT - BATTERY ON "HSS" LEAD.

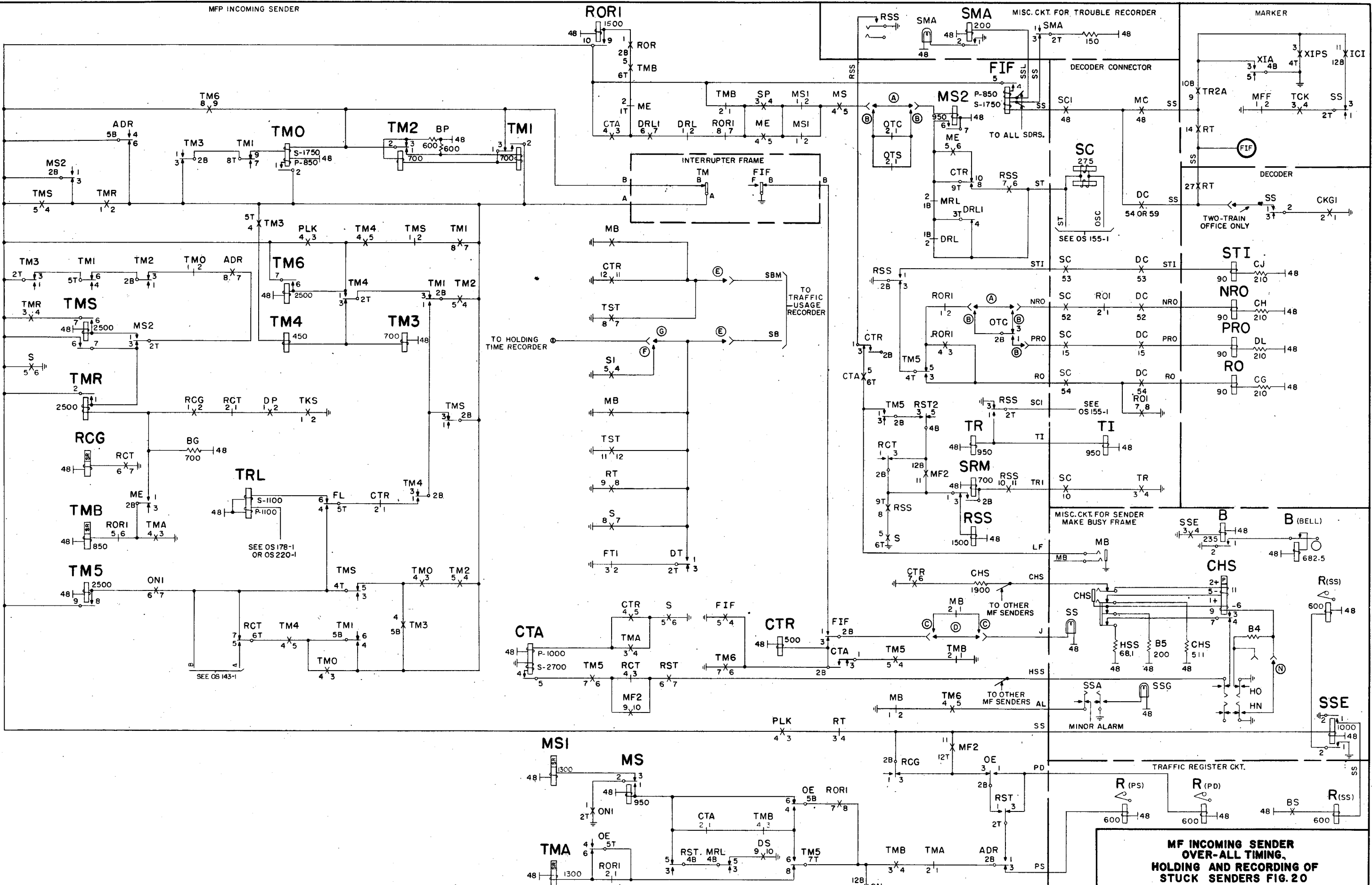


- DECODER CKT. SD-68340-01, ISS.5
- DECODER CONN.CKT. SD-68339-01, ISS.4
- INCOMING SENDER CKT.-MF SD-68222-01, ISS.17
- INTERRUPTER FRAME SD-68058-01, ISS.15
- MARKER CKT. SD-68398-01, ISS.5
- MARKER CONN.CKT. SD-68395-01, ISS.5
- MISC.CKT.FOR SENDER MAKE BUSY FRAME SD-68386-01, ISS.15
- MISC.CKT.FOR TROUBLE RECORDER SD-68392-01, ISS.5
- TRAFFIC REGISTER CKT. SD-68412-01, ISS.7

**MF INCOMING SENDER
OVER-ALL TIMING,
HOLDING AND RECORDING OF
STUCK SENDERS FIG.20**

ISSUE	1	2	3
DATE	11-7-53		

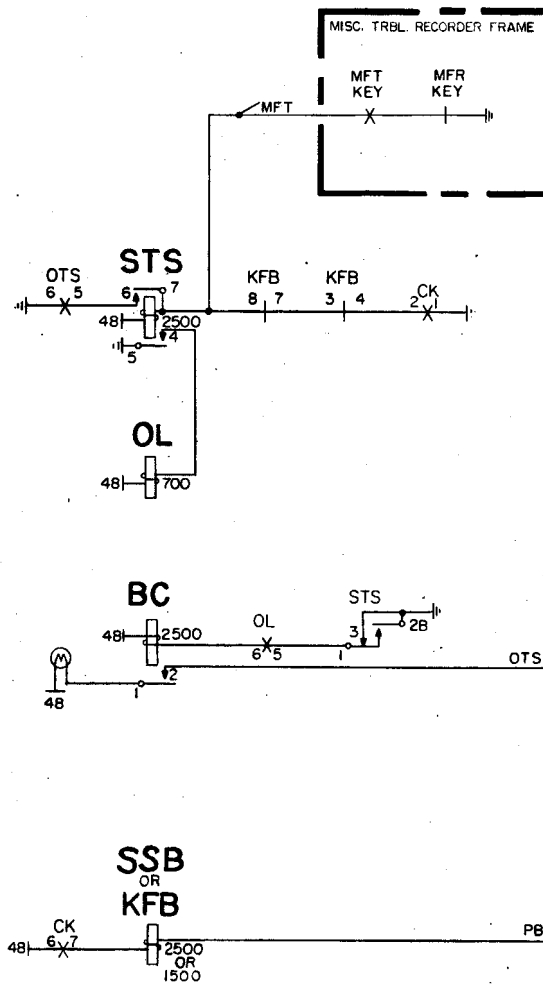
ISSUE	1	2	3
DATE	11-7-53		



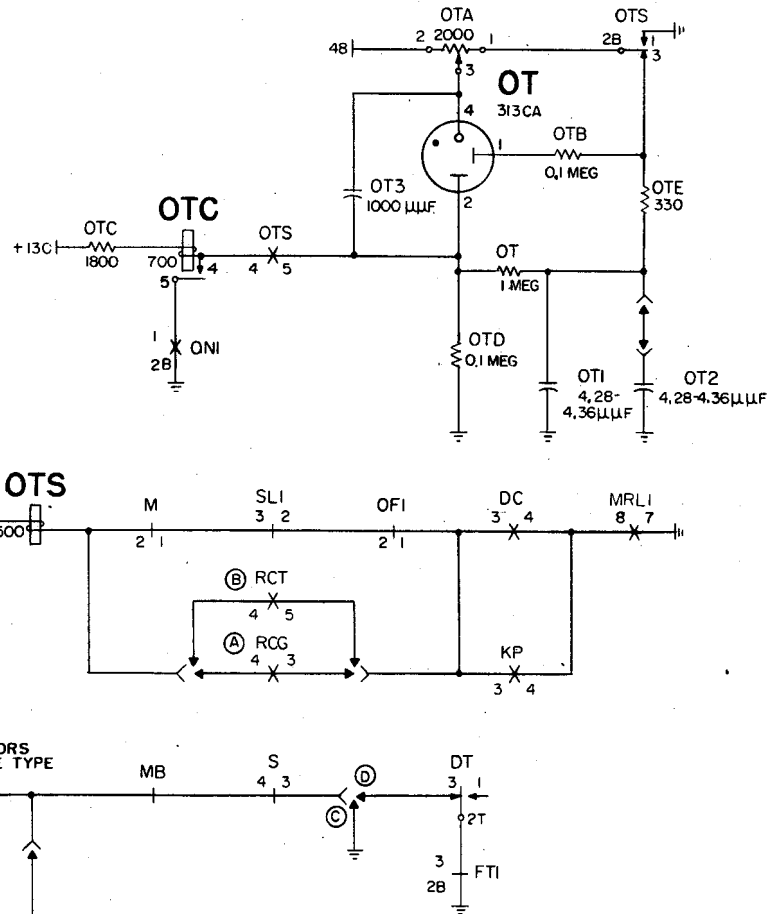
**MF INCOMING SENDER
OVER-ALL TIMING,
HOLDING AND RECORDING OF
STUCK SENDERS FIG. 20**

ISSUE	1	DATE	9-7-53

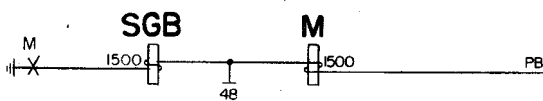
SENDER TRAFFIC CONTROL



INTERSENDER LOAD CONTROL TIMING



TRAFFIC REGISTER CKT.

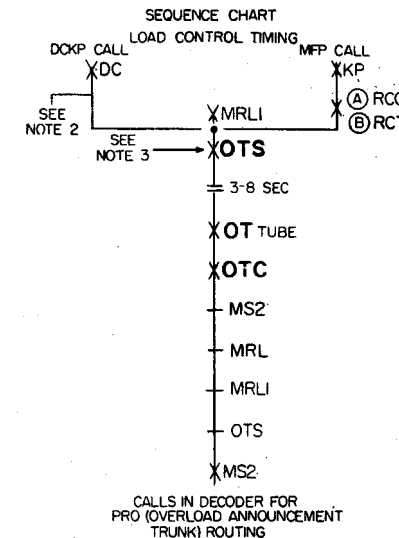


WHEN SDR TRAFFIC CONTROL CKT. IS NOT PROVIDED

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FIG. 4 PROVIDED		68222-01
B	FIG. 2C PROVIDED		
C	LOAD CONTROL TIMING NOT PROVIDED	FIG. L	
D	LOAD CONTROL TIMING PROVIDED	FIG. M	

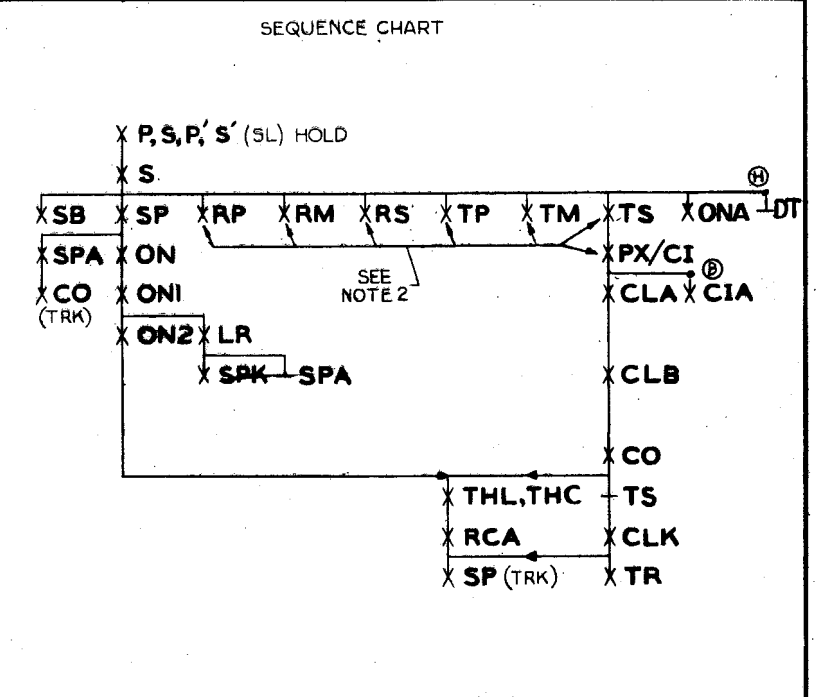
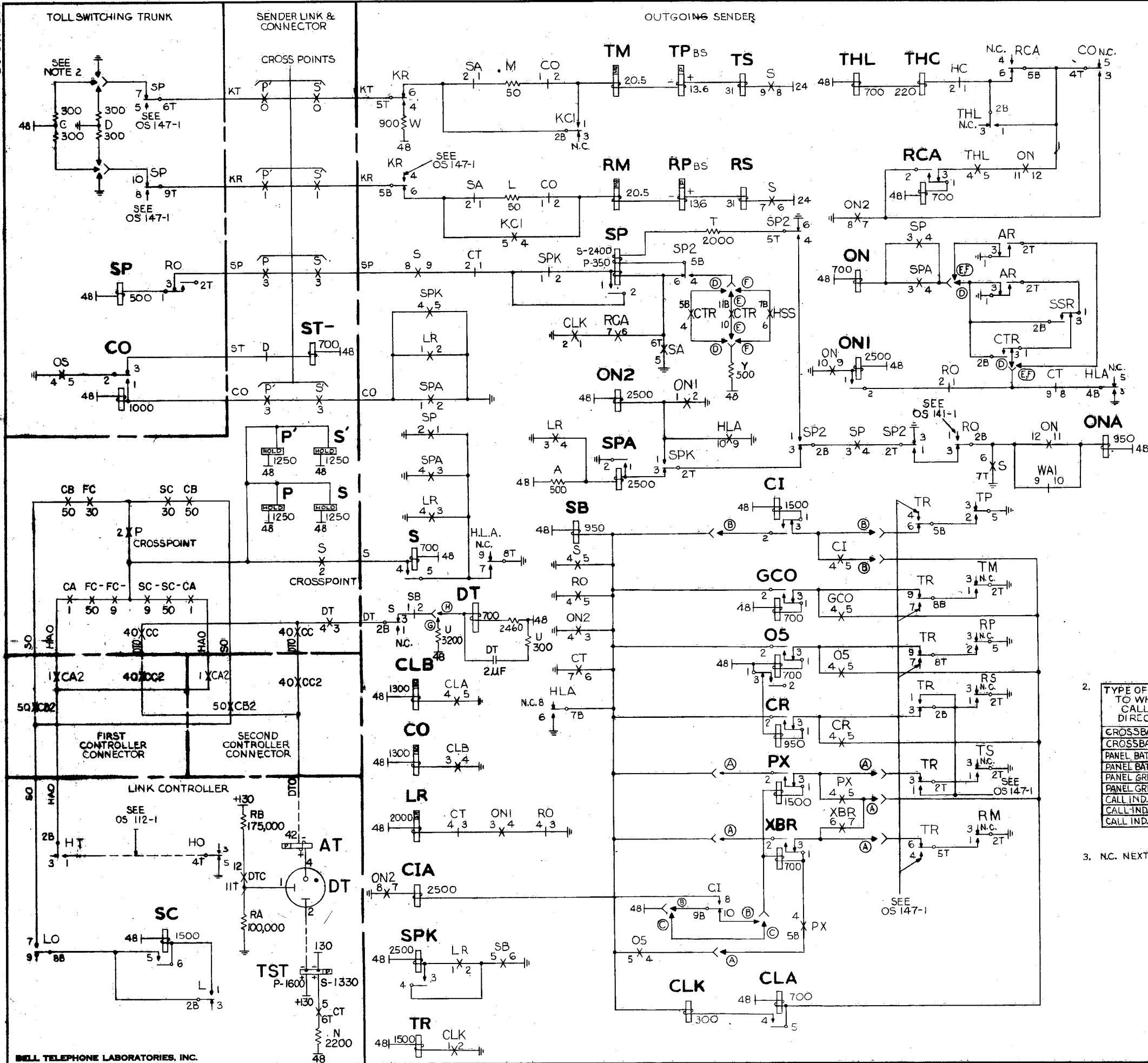
- THE LACK OF OUTGOING SENDER PREVENTS THE OPERATION OF SENDER (SL) & (SLI) RELAYS.
- BATTERY CONNECTED TO (OTS) WINDING FROM SDR TRAFFIC CONTROL CKT. WHEN A SHORTAGE OF SENDERS EXISTS IN A KEY FRAME GROUP.



INCOMING SENDER CKT-MF SD-68222-01, ISS. 17
 MISC. CKT. TRUBLE RECORDER FR. SD-68392-01, ISS. 5
 TRAFFIC REGISTER CKT. SD-68412-01, ISS. 7
 SENDER TRAFFIC CONTROL CKT. SD-68455-01, ISS. 1

MF INCOMING SENDER INTERSENDER LOAD CONTROL TIMING

MP-11642



OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	WHEN USED FOR DIAL OFFICES EQUIPPED FOR REVERTIVE PULSES.	U	
B	WHEN USED FOR MANUAL OFFICES EQUIPPED FOR P.C.I. PULSES	ZQ	
C	WHEN FEATURE ABOVE IS NOT PROVIDED.	"Z" LOOP	
D	WHEN CHAIN K.T. AND (CTR) KEY METHOD FOR HOLDING STUCK SENDERS IS PROVIDED	FIG. A	68018-01
E	WHEN COMMON KEY METHOD FOR HOLDING STUCK SENDERS IS PROVIDED.	FIG. B	
F	WHEN COMMON KEY METHOD FOR HOLDING STUCK SENDERS IS PROVIDED. FOR MODIFICATION OF OFFICES TO COMMON KEY METHOD. FOR ADDITIONS TO OFFICES THAT HAVE BEEN MODIFIED AND FOR OFFICES WHERE FIG. A HAS NEVER BEEN INSTALLED.	FIG. C	
G	IMPROVED LK. CONT. HOLDBACK OR TR. USAGE REC.	FIG. D	
H		FIG. E	

OFFICE CLASS INDICATIONS

TYPE OF OFFICE TO WHICH CALL IS DIRECTED	TYPE OF RINGING	WIRING OPTIONS		PULSE AND CLASS RECEIVING RELAYS								CLASS REGISTER RELAYS					
		CONT	AUTO	KT	KR	TS	RS	TP	RP	TM	RM	O5	PX	XBR	CR	GCO	CI
CROSSBAR	✓			300Ω GRD.	300Ω BAT.	X	X		X			X	X	X	X	X	X
CROSSBAR	✓			300Ω GRD.	GRD.	X	X				X	X	X	X	X	X	X
PANEL BAT. CUT-OFF	✓			300Ω GRD.	OPEN	X	X				X	X	X	X	X	X	X
PANEL BAT. CUT-OFF	✓			300Ω GRD.	300Ω GRD.	X	X				X	X	X	X	X	X	X
PANEL GRD. CUT-OFF	✓			GRD.	OPEN	X	X				X	X	X	X	X	X	X
PANEL GRD. CUT-OFF	✓			GRD.	300Ω GRD.	X	X				X	X	X	X	X	X	X
CALL IND. TO 9999	✓			300Ω BAT.	OPEN	X	X				X	X	X	X	X	X	X
CALL IND. TO 10499	✓			300Ω BAT.	GRD.	X	X				X	X	X	X	X	X	X
CALL IND. TO 10999	✓			300Ω BAT.	300Ω BAT.	X	X				X	X	X	X	X	X	X

X DENOTES RELAY OPERATED.

3. N.C. NEXT TO CONTACT MEANS NO CONNECTION ON THAT CONTACT.

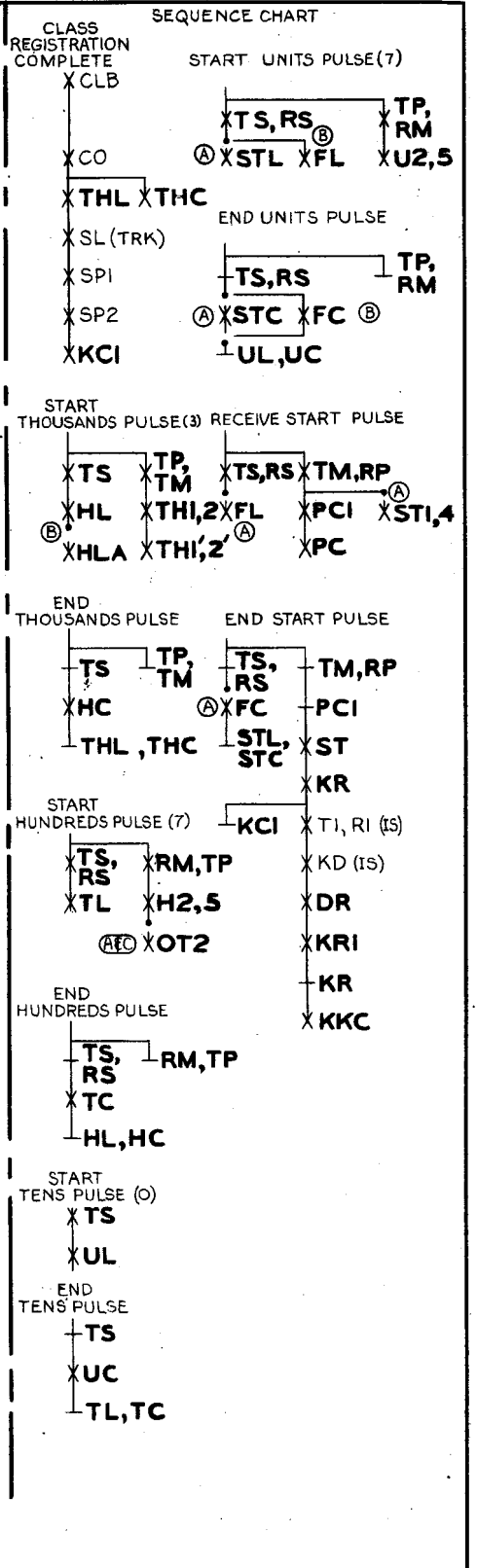
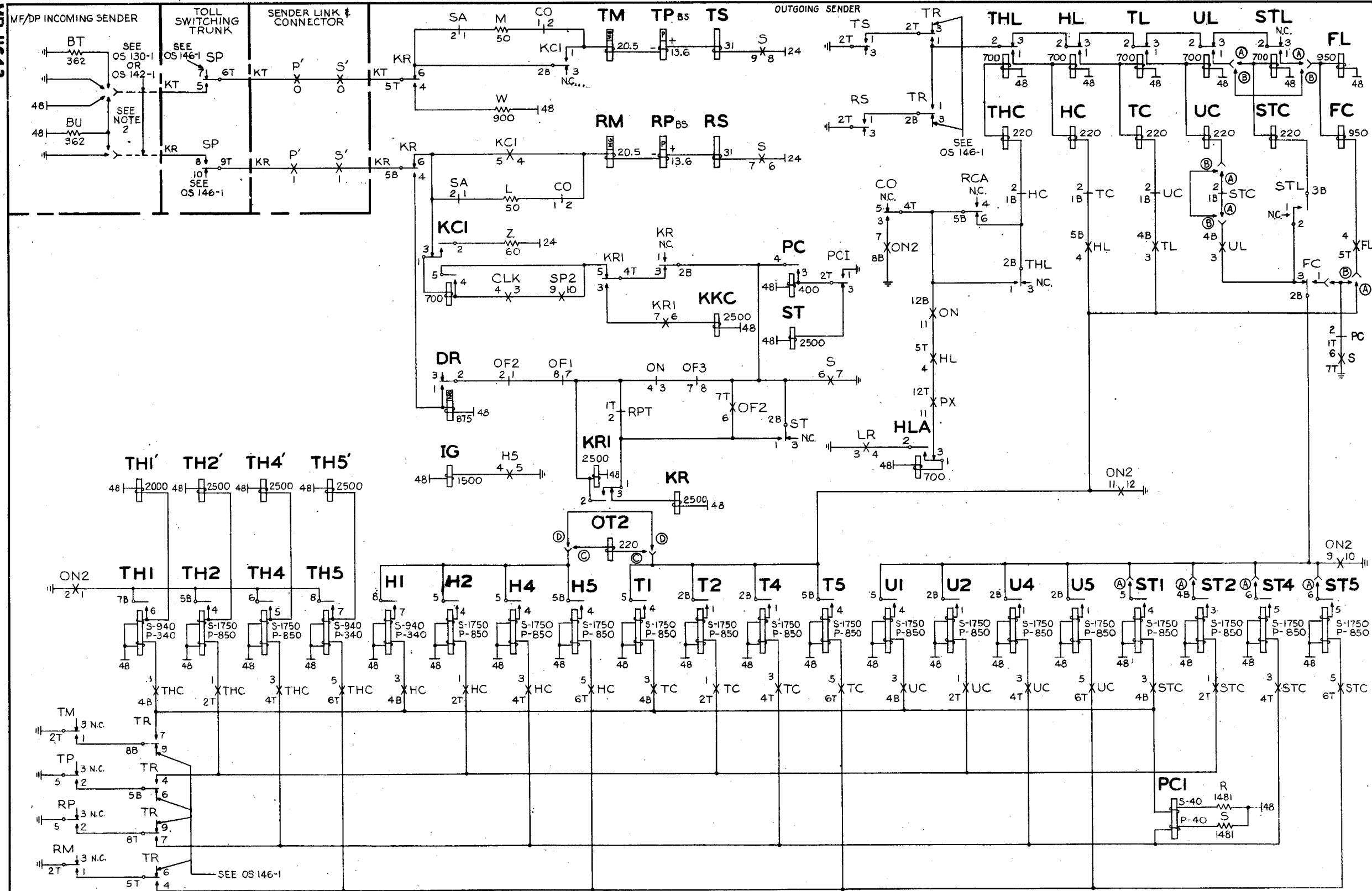
CONTROLLER CONNECTOR CKT. SD-68336-01, ISS. 9
 LINK CONTROLLER SD-68028-01, ISS. 28
 * OUTGOING SENDER (REV. & P.C.I.) SD-68018-01, ISS. 28
 SENDER LINK & CONN. CKT. SD-68334-01, ISS. 14
 TOLL SWITCHING TRUNK CKT. SD-68326-01, ISS. 10

NO. 4A OR 4M TOLL

OUTGOING SENDER SEIZURE
 OS 146-1

MP-11643

ISSUE 1 PART 2 REC
DATE 7-16-51 11-20-53



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR MANUAL OFFICES RE-QUIRING PCI PULSING.	ZQ ZL	68018-01
B	FOR OFFICES NOT REQUIR-ING PCI PULSING.	LOOP WIRING & ZM	68018-01
C	FOR PCI OFFICES WITH MORE THAN 10,000 NUMBERS.	H	68018-01
D	FOR PCI OFFICES WITH LESS THAN 10,000 NUMBERS.	LOOP WIRING	63018-01

REGISTRATION OF DIGITS

DIGIT	PULSES RECEIVED KT LEAD KR LEAD	PULSING RELAYS TS RS TP RP TM RM	REGISTER RELAYS
0	362Ω GRD	X	NONE
1	0Ω GRD	X	1
2	362Ω BAT.	X X	2
3	0Ω BAT.	X X X	1,2
4	362Ω GRD 362Ω BAT.	X X X	4
5	362Ω GRD 0Ω GRD	X X X	5
6	0Ω GRD 0Ω GRD	X X X X	1,5
7	362Ω BAT. 0Ω GRD	X X X X	2,5
8	0Ω BAT. 0Ω GRD	X X X X X	1,2,5
9	362Ω GRD 0Ω BAT.	X X X X X	4,5
START	0Ω GRD 362Ω BAT.	X X X X X	1,4

X DENOTES RELAY OPERATED.

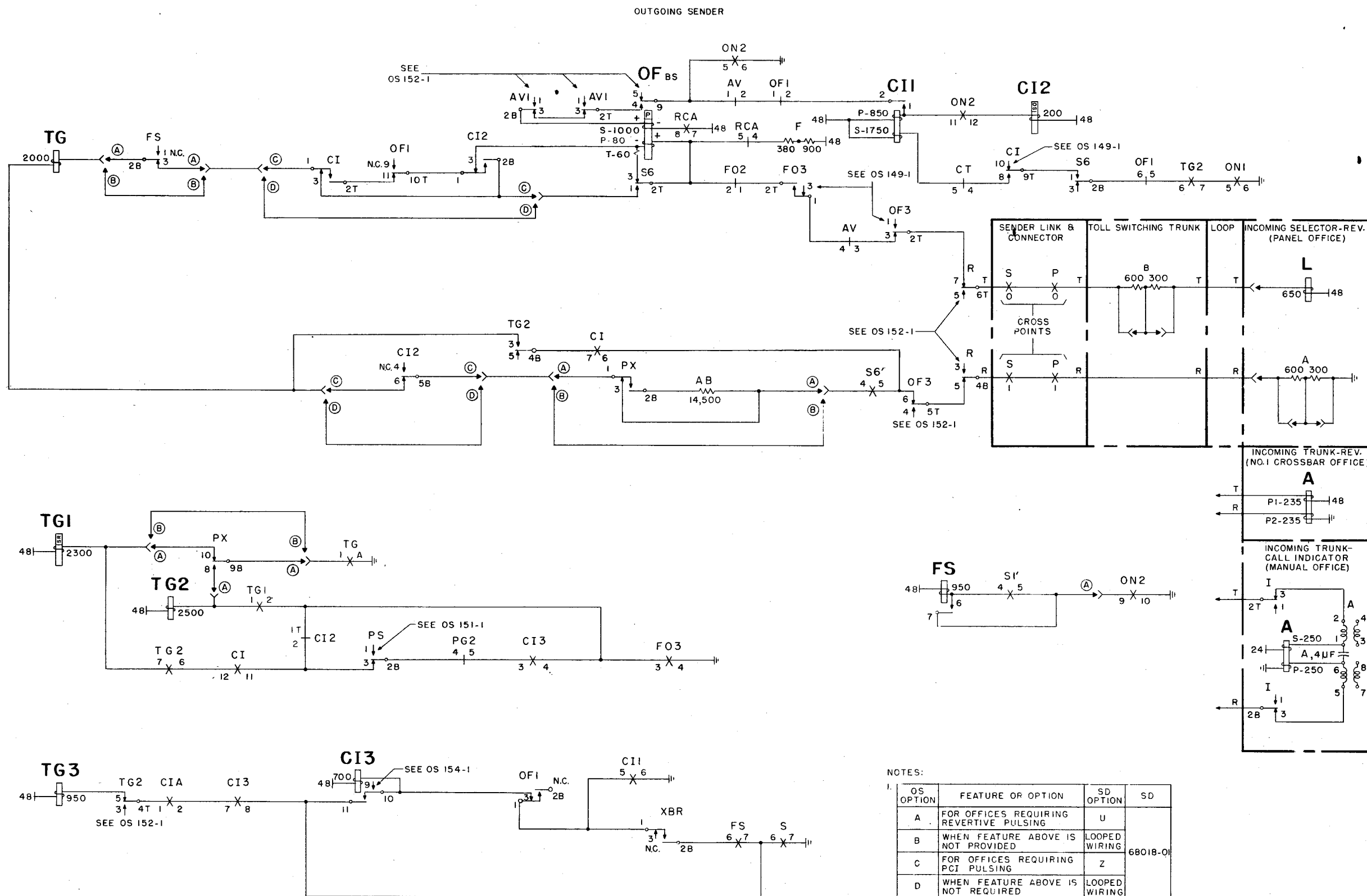
INCOMING SENDER CKT. DP SD-68221-01, ISS.17
 * OUTGOING SDR. CKT. SD-68018-01, ISS.28
 SDR LINK & CONN. CKT. SD-68334-01, ISS.14
 TOLL SWITCHING TRK. CKT. SD-68326-01, ISS.10

OUTGOING SENDER
REGISTRATION

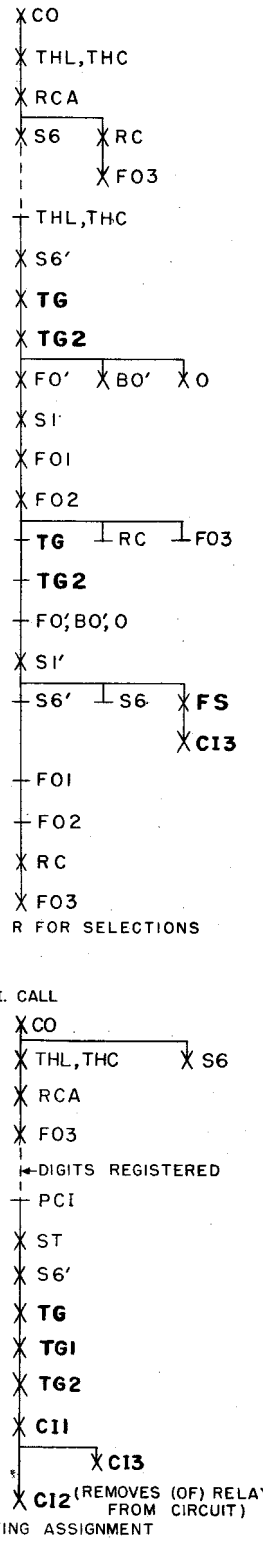
NO. 4A OR 4M TOLL

OS 147-I

ISSUE	1	2	3
DATE	7-11-51	12-27-53	



SEQUENCE CHART
PANEL OR NO.1 CROSSBAR CALL



CLOSES T & R FOR SELECTIONS

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR OFFICES REQUIRING REVERTIVE PULSING	U	68018-01
B	WHEN FEATURE ABOVE IS NOT PROVIDED	LOOPE WIRING	
C	FOR OFFICES REQUIRING PCI PULSING	Z	
D	WHEN FEATURE ABOVE IS NOT REQUIRED	LOOPE WIRING	

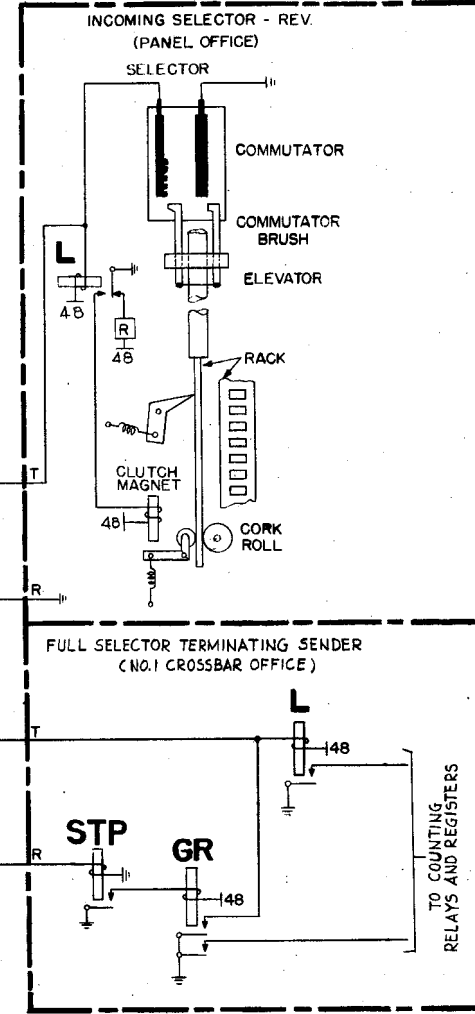
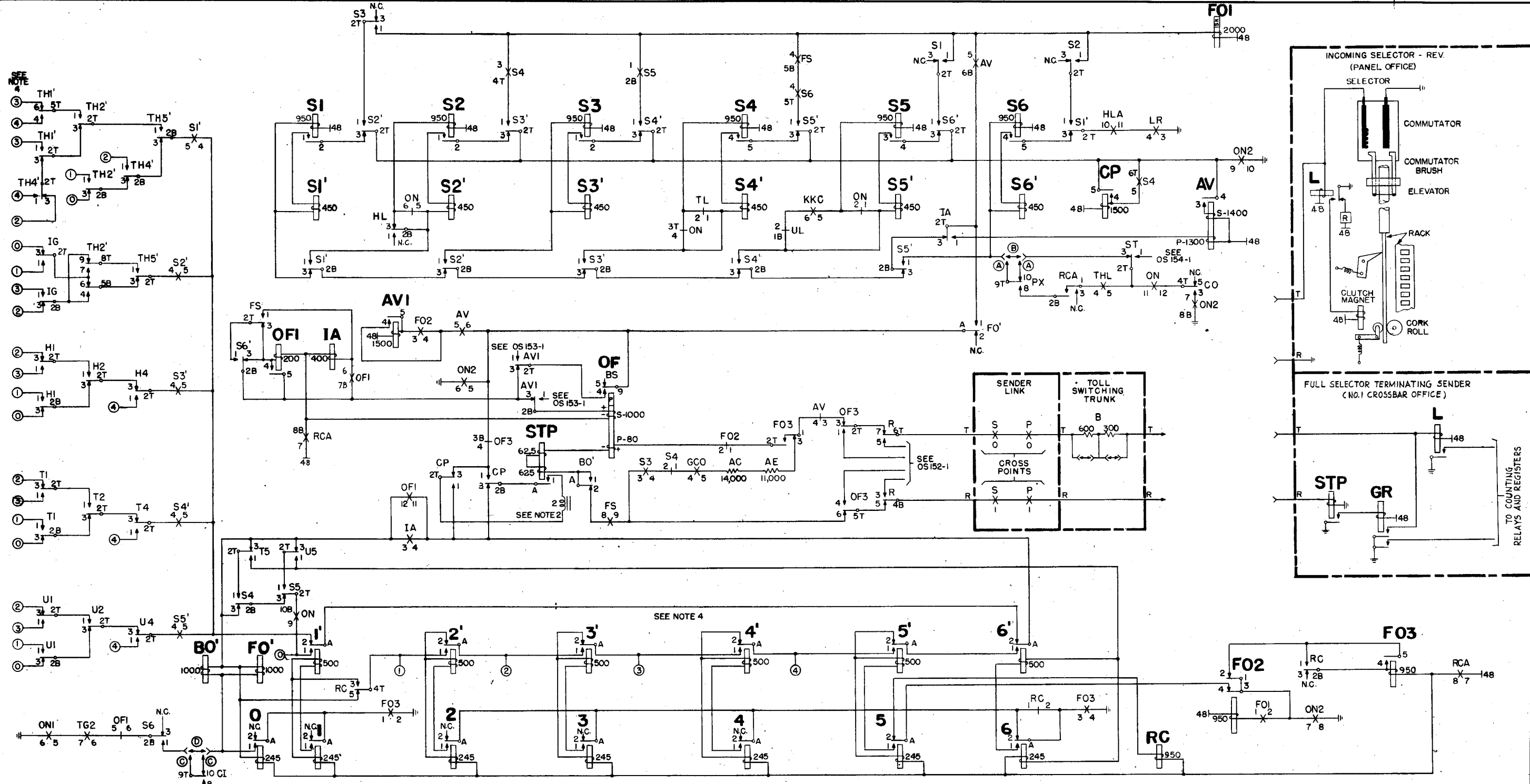
2 N.C. NEXT TO CONTACT MEANS NO CONNECTION ON THAT CONTACT.

- INCOMING SELECTOR-REV. CKT. SD-21115-01, ISS.25
- INCOMING TRUNK (CALL INDICATOR) CKT. SD-12900-01, ISS.22
- INCOMING TRUNK-REV. CKT. SD-25302-01, ISS.23
- *OUTGOING SENDER (REV/PCI) CKT. SD-68018-01, ISS.28
- SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS.14
- TOLL SWITCHING TRUNK (REV/PCI) CKT. SD-68326-01, ISS.10

OUTGOING SENDER
TRUNK TEST

NO. 4A OR 4M TOLL

OS 148-1



REVISION	DATE	BY	CHK
1	7-16-51		
2	11-23-51		

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR OFFICES REQUIRING REVERTIVE PULSING	U	
B	WHEN ABOVE FEATURE IS NOT REQUIRED	LOOPED WIRING	68018-01
C	FOR OFFICES REQUIRING P.C.T. PULSING	ZQ	
D	WHEN ABOVE FEATURE IS NOT PROVIDED	LOOPED WIRING	

- NOTES: (CONTINUED)
- 200CL RETARD COIL IS FURNISHED AS PART OF 268A RELAY.
 - FOR SEQUENCE CHART SEE SC111-1 & 112-1.
 - CONNECT WIRES TERMINATING IN NUMBERED CIRCLES TO COUNTING RELAYS 1 TO 4.
 - N.C. NEXT TO CONTACT MEANS NO CONNECTION ON THAT CONTACT.

TABLE A
SEQUENCE OF SELECTIONS

SELECTION MADE	RELAYS OPERATED
TRUNK TEST	S6, S6'
INCOMING BRUSH	S1, S1'
INCOMING GROUP	S2, S2'
FINAL BRUSH	S3, S3'
FINAL TENS	S4, S4'
FINAL UNITS	S5, S5'
INCOMING ADVANCE	S6, S6'

TABLE B
PULSE COUNTING

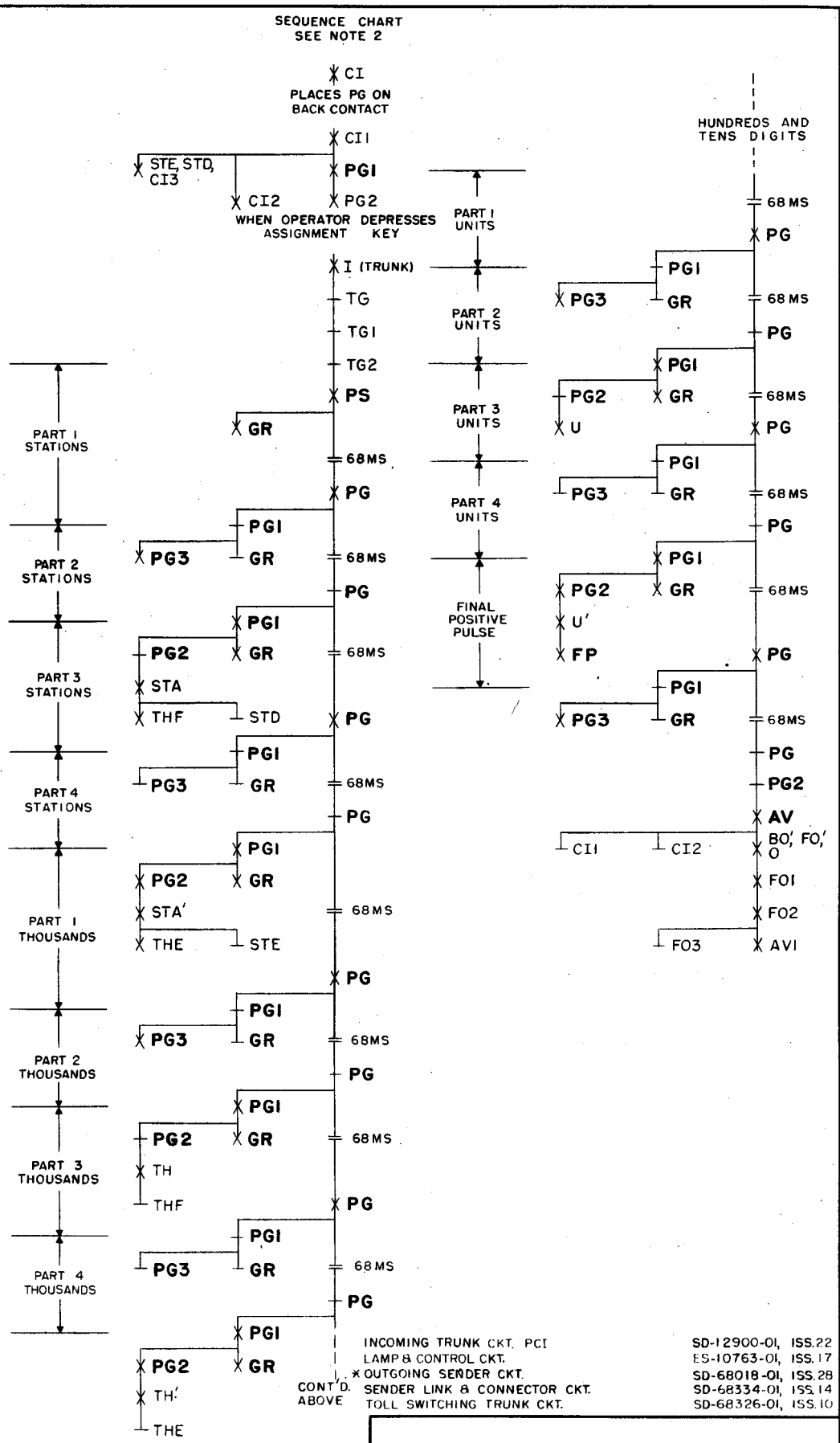
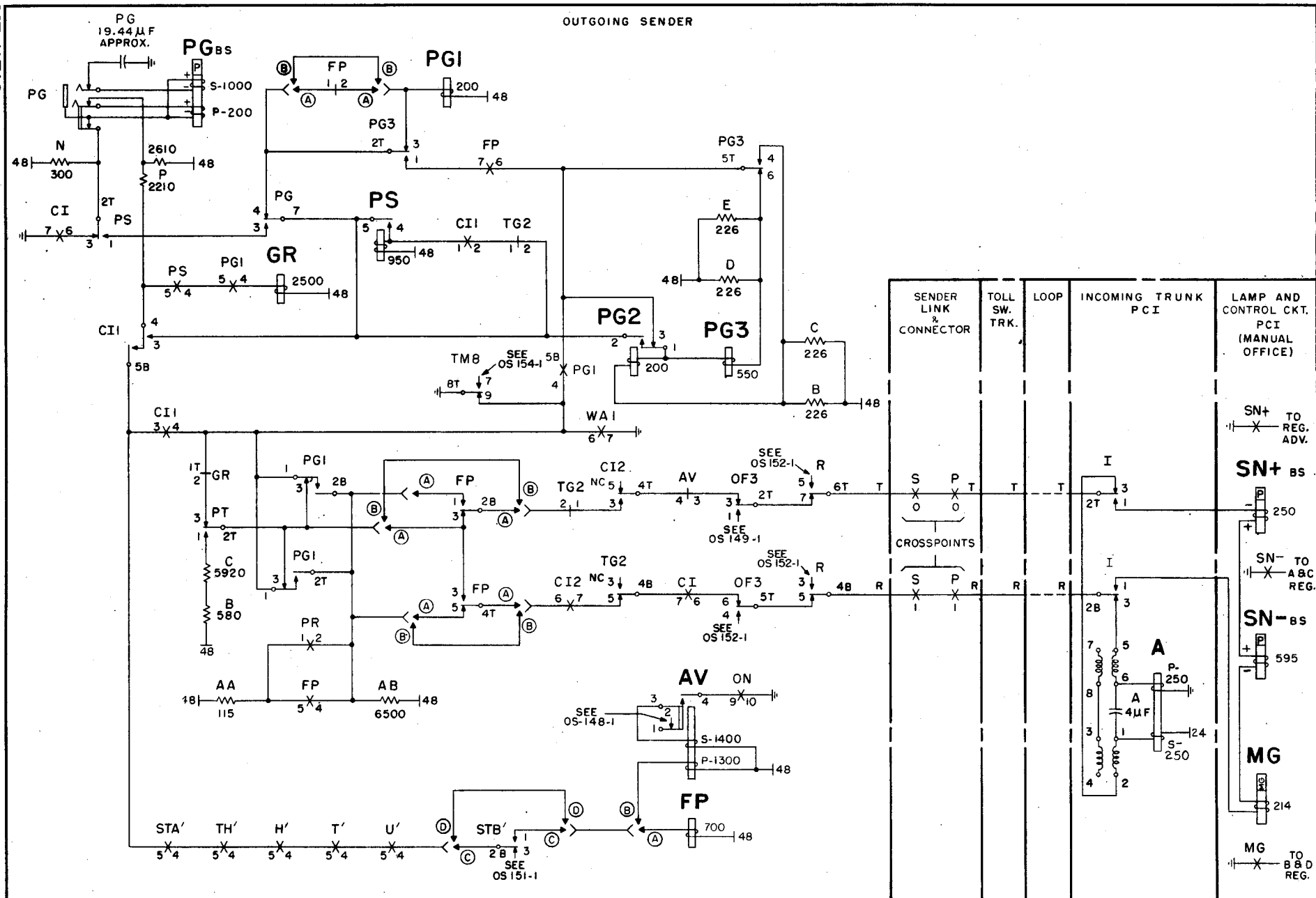
DIGIT	COUNTERS OPERATED
0	0
1	1 0
2	2 1 0
3	3 2 1 0
4	4 3 2 1 0
5	5 4 3 2 0
6	1 6 5 4 3 2 0
7	2 1 6 5 4 3 2 0
8	3 2 1 6 5 4 3 2 0
9	4 3 2 1 6 5 4 3 2 0

FULL SELECTOR TERM SENDER CKT. SD-25013-01, ISS 39
 INCOMING SELECTOR-REV. CKT. SD-21115-01, ISS 25
 OUTGOING SENDER CKT. SD-68018-01, ISS 28
 SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS 14
 TOLL SWITCHING TRUNK CKT. SD-68326-01, ISS 10

**OUTGOING SENDER
REVERTIVE PULSE COUNTING
AND
SEQUENCE OF SELECTIONS**

NO. 4A OR 4M TOLL

REVISION	1	AS SHOWN
DATE	10-22-51	11-23-53



NOTES:

- | OS OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|---|------------------|----------|
| A | HEAVY FINAL PULSE REQ. | X | 68018-01 |
| B | FEATURE ABOVE NOT REQ. | LOOPE WIRING & T | |
| C | PROVIDED WHEN OFFICE* HAS OVER 10,000 LINES | Y | |
| D | WHEN ABOVE FEATURE IS NOT PROVIDED | LOOPE WIRING | |

PCI PULSES

DIGIT	HUNDREDS TENS UNITS	THOUSANDS	STATIONS
0	- n - n - n - n - n - n - n - n - n		
1	P n - n - n - n - N P n - n - n		
2	- N - n P n - n - n - n - n - n		
3	P N - n - n P n - n - n - n - n		
4	- n P n - n - n - n - n - n - n		
5J	- n - n - N - N - n - n - n - n P n		
6M	P n - n - N P N - n - n - n - n - n		
7R	- N - n - N P N - n - n - n - n - n		
8	P N - n - n - n P n - n - n - n - n		
9W	- n P N - n - n P N - n - n - n - n		

LEGEND:
 - DENOTES BLANK PULSE
 n DENOTES LIGHT NEGATIVE PULSE
 N DENOTES HEAVY NEGATIVE PULSE
 P DENOTES LIGHT POSITIVE PULSE

- | PULSE | PULSE CONTROL RELAYS | | |
|-------|----------------------|-----|-----|
| | PG1 | PG2 | PG3 |
| 1 | X | X | |
| 2 | | X | X |
| 3 | X | | X |
| 4 | | | X |

X DENOTES RELAY OPERATED

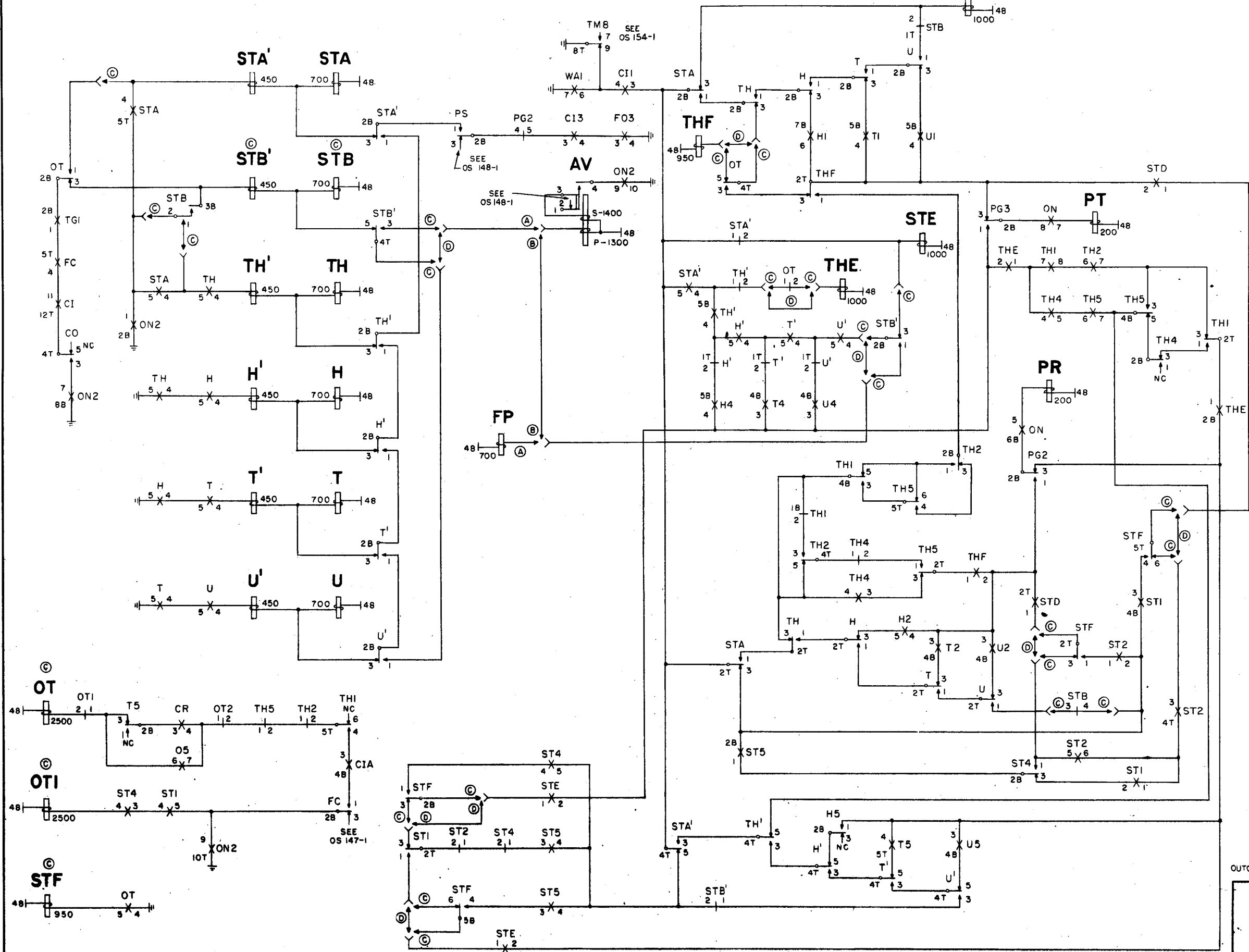
5. NC NEXT TO CONTACT MEANS NO CONNECTION ON THAT CONTACT.

OUTGOING SENDER
 PCI PULSE GENERATION

ISSUE	1	REV.	2	DATE	10-22-51
DATE	10-22-51	REV.	2	DATE	11-29-53

OUTGOING SENDER

STD

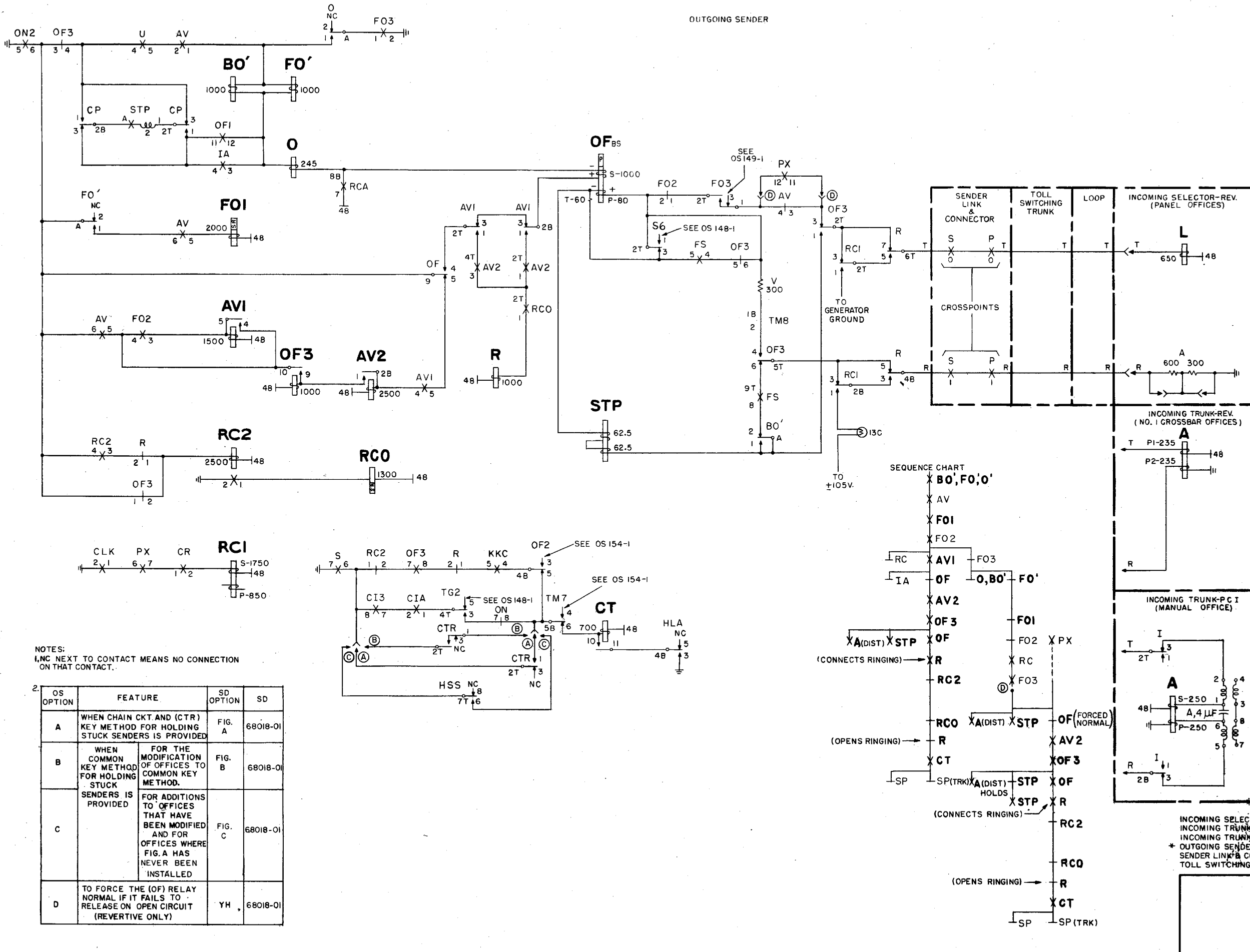


NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	HEAVY FINAL PULSE REQUIRED	X	68018-01
B	FEATURE ABOVE NOT REQUIRED	T	
C	PROVIDED WHEN OFFICE HAS OVER 10,000 LINES	Y	
D	WHEN FEATURE ABOVE IS NOT PROVIDED.	LOOPED WIRING	

TH	H-T-U	STA	DIGIT			
			PART 1	PART 2	PART 3	PART 4
0	0	0				
2	1	I	PT			
4	2	W		PR		
6	3	R	PT	PR		
8	4	J			PT	
1	5	M				PR
3	6		PT			PR
5	7			PR		PR
7	8		PT	PR		PR
9	9				PT	PR

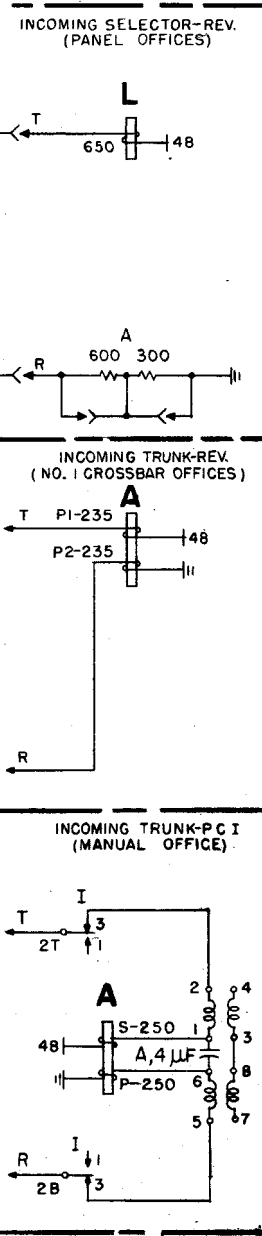
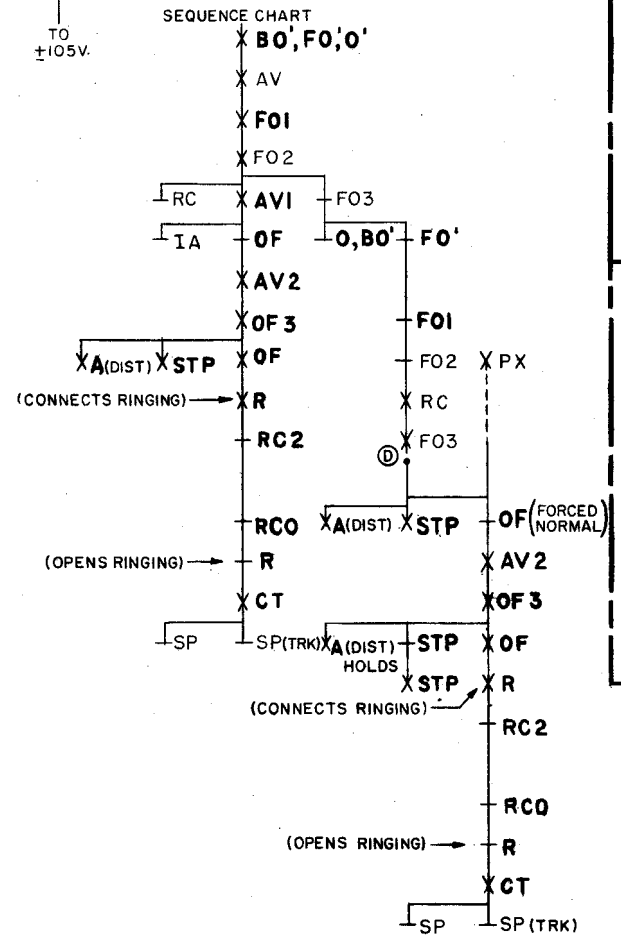
- 3. NC NEXT TO CONTACT MEANS NO CONNECTION ON THAT CONTACT.
- 4. FOR SEQUENCE CHART SEE OS 150-1.



REVISION	1	2	3
DATE	10/27/51	12-18-53	

NOTES:
1, NC NEXT TO CONTACT MEANS NO CONNECTION ON THAT CONTACT.

OS OPTION	FEATURE	SD OPTION	SD
A	WHEN CHAIN CKT. AND (CTR) KEY METHOD FOR HOLDING STUCK SENDERS IS PROVIDED	FIG. A	68018-01
B	WHEN COMMON KEY METHOD FOR HOLDING STUCK SENDERS IS PROVIDED	FOR THE MODIFICATION OF OFFICES TO COMMON KEY METHOD.	FIG. B 68018-01
C	FOR ADDITIONS TO OFFICES THAT HAVE BEEN MODIFIED AND FOR OFFICES WHERE FIG. A HAS NEVER BEEN INSTALLED	FIG. C	68018-01
D	TO FORCE THE (OF) RELAY NORMAL IF IT FAILS TO RELEASE ON OPEN CIRCUIT (REVERTIVE ONLY)	YH	68018-01



- INCOMING SELECTOR CKT.-REV. SD-2115-01, ISS.25
- INCOMING TRUNK CKT.-PCI SD-12900-01, ISS.22
- INCOMING TRUNK CKT.-REV. SD-25302-01, ISS.23
- OUTGOING SENDER CKT. SD-68018-01, ISS.28
- SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS.14
- TOLL SWITCHING TRUNK CKT.-REV/PCI SD-68326-01, ISS.10

OUTGOING SENDER TRUNK CLOSURE AND CONTROLLED RINGING

NO. 4A OR 4M TOLL

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	WHEN 12-TYPE REGISTER IS PROVIDED		68060-01
B	WHEN 14-TYPE REGISTER IS PROVIDED		68412-01
C	WHEN CHAIN CKT. & CTR KEY METHOD FOR HOLDING STUCK SENDERS IS PROVIDED	FIG. A	
D	FOR OFFICES THAT HAVE BEEN MODIFIED TO COMMON KEY METHOD	FIG. B	
E	WHEN COMMON KEY METHOD FOR HOLDING STUCK SENDERS IS PROVIDED	FOR ADDITIONS TO OFFICES THAT HAVE BEEN MODIFIED TO COMMON KEY METHOD AND FOR OFFICES WHERE CHAIN CKT. AND CTR KEY METHOD (FIG. A) HAS NEVER BEEN INSTALLED	FIG. C
F	TO FORCE OF RELAY NORMAL IF IT FAILS TO RELEASE ON OPEN CIRCUIT. (REVERTIVE ONLY)	YH	68018-01

- OVERFLOW IS AN ALL-TRUNKS-BUSY CONDITION. TELLTALE IS A TROUBLE CONDITION. EITHER OF THESE CAN OCCUR AT ANY TIME DURING COURSE OF SELECTIONS, CAUSING OF RELAY TO OPERATE.
- CALL IS CONTROLLED BY INCOMING SENDER UNTIL KKC RELAY OPERATES. IF THE INCOMING SENDER RELEASES, OR THE TRUNK IS RELEASED WHEN LINKS ARE NOT AVAILABLE, THE CALL IS WIPE OUT.
- RELEASE OF ON RELAY RELEASES PT & PR RELAYS, CAUSING ALL FURTHER DIGITS TO BE OUTPULSED AS ZEROS.
- RELEASE OF ON RELAY OPENS COUNTING RELAY CIRCUIT; NEXT SELECTION GOES TO TELLTALE.
- PARTIAL DIGITS IS RECOGNIZED BY REGISTRATION OF PREMATURE START SIGNAL.
- NC NEXT TO CONTACT MEANS NO CONNECTION ON THAT CONTACT.

- INCOMING SELECTOR CKT. REV. SD-21115-01, ISS. 25
- INCOMING TRUNK CKT. REV. SD-25302-01, ISS. 23
- *OUTGOING SENDER CKT. SD-68018-01, ISS. 28
- SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS. 14
- TRAFFIC REGISTER CKT. SD-68060-01, ISS. 28
- TRAFFIC REGISTER CKT. SD-68412-01, ISS. 7
- TOLL SWITCHING TRUNK CKT. SD-68326-01, ISS. 10

**OUTGOING SENDER
OVERFLOW, TELLTALE
AND
WIPEOUT**

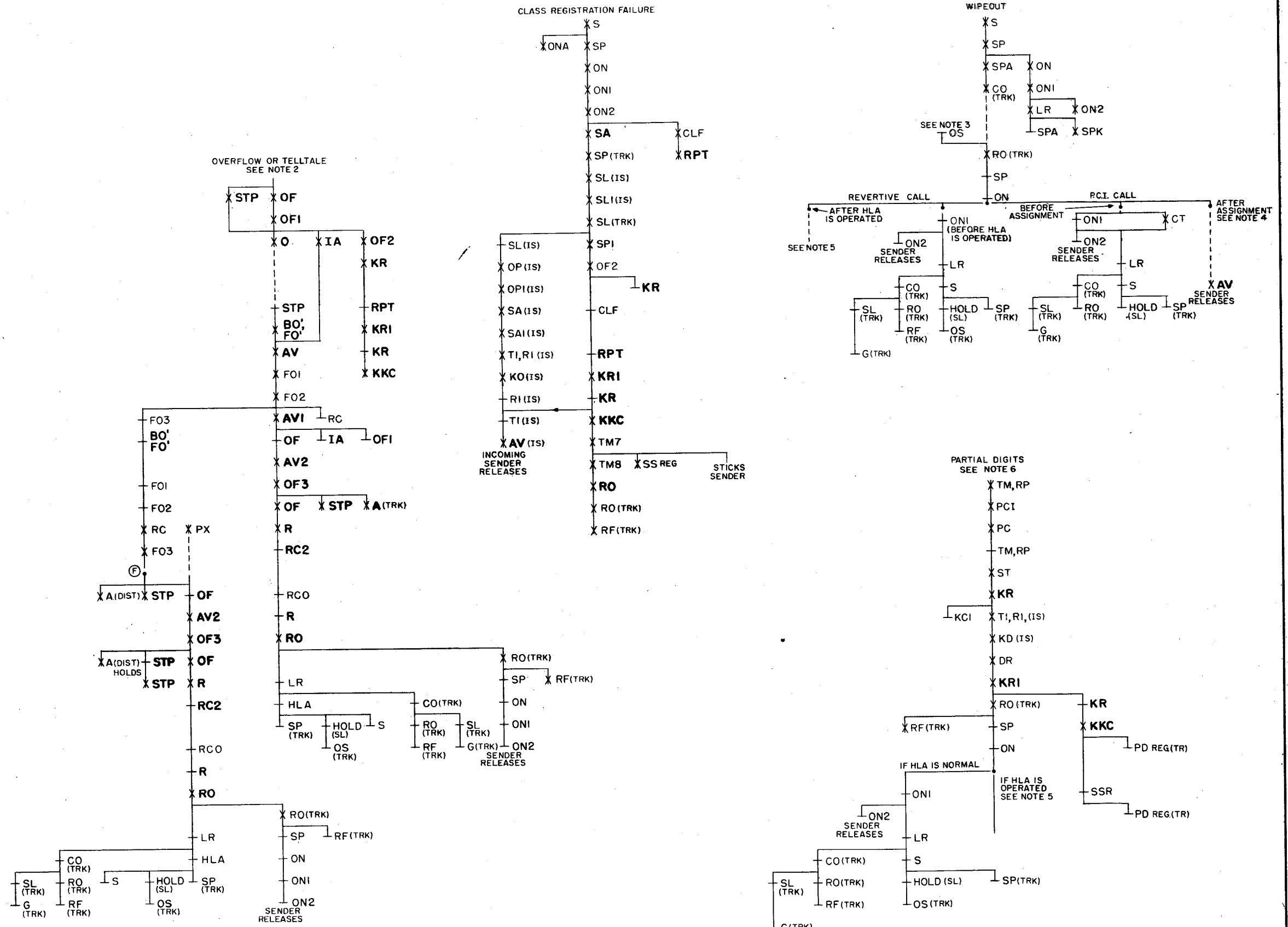
OS 153-1

2 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

ORDER AS BSP ITEM MP-11720

SEQUENCE CHART

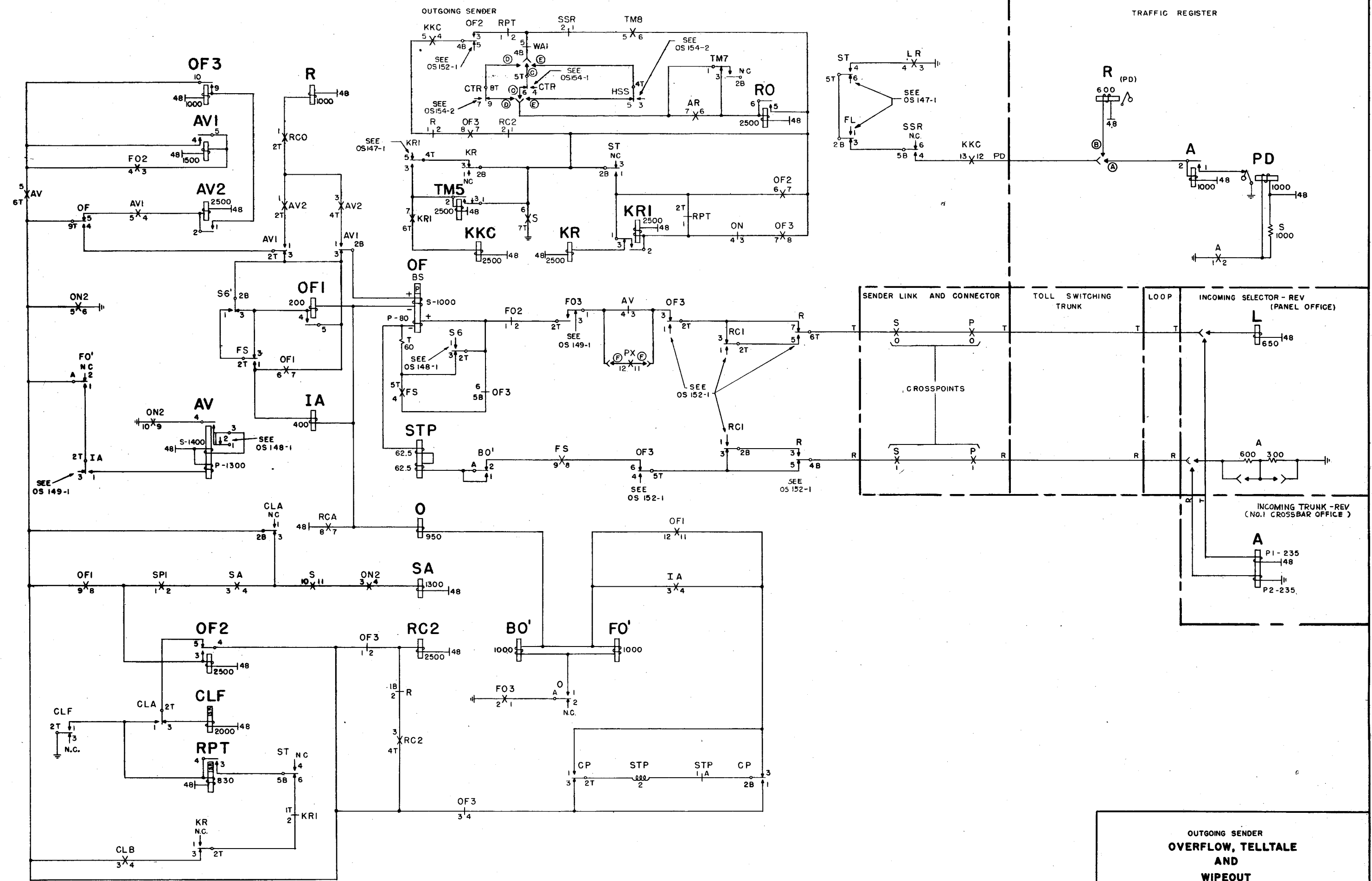


ISSUE DATE 12-28-63

2 SHEETS, SHEET 1

MP-11720

REVISE	1	12-23-51	2	12-23-51
DATE	11-22-51	12-23-51		



**OUTGOING SENDER
OVERFLOW, TELLTALE
AND
WIPEOUT**

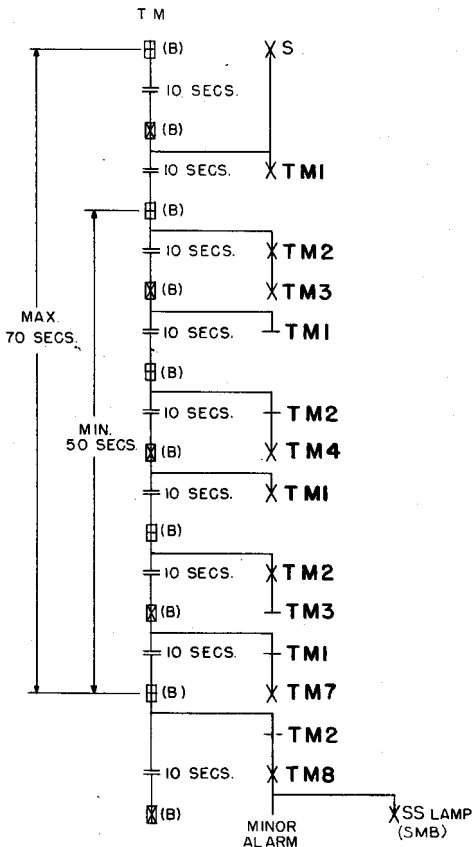
SEQUENCE CHART

NOTES:

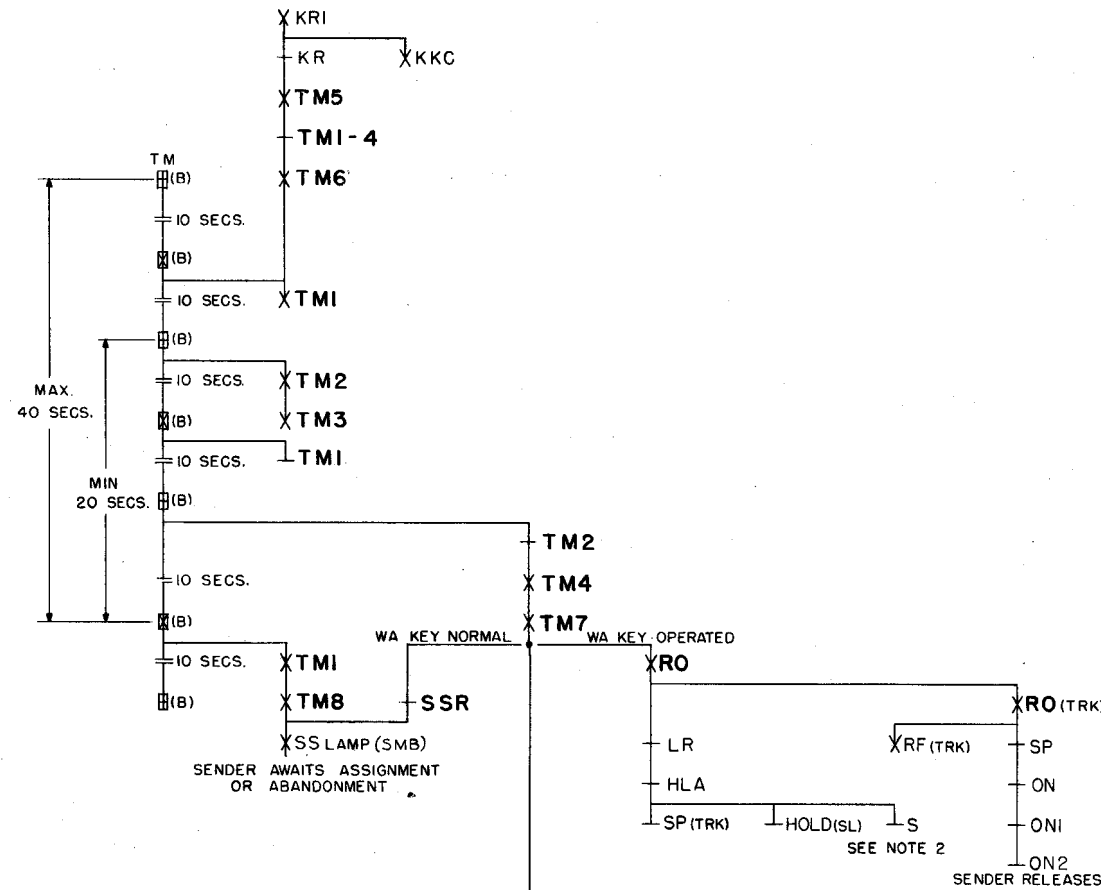
OS OPTION	FEATURE OR OPTION	SD OPTION	SD
ZL	TO CAUSE REORDER AND PARTIAL DIGITS REGISTRATION IF START SIGNAL IS RECEIVED PREMATURELY WHEN PCI IS PROVIDED	ZL	
ZM	TO CAUSE REORDER AND PARTIAL DIGITS REGISTRATION IF START SIGNAL IS RECEIVED IN UNITS POSITION WHEN PCI IS NOT PROVIDED	ZM	68018-01
	WHEN CHAIN CKT AND (CTR) KEY METHOD FOR HOLDING STUCK SENDERS IS PROVIDED	FIG.A	

- IF SENDER DOES NOT RELEASE WITHIN 10 SECONDS OPERATION OF TMB RELAY WILL OPERATE THE STUCK SENDER REGISTER AND ALARM.
- AVAILABLE CIRCUIT FOR CH RELAY, CTR KEY NORMAL.
- NO AVAILABLE CIRCUIT FOR CH RELAY, CTR KEY OPERATED.
- NO AVAILABLE CIRCUIT FOR CH RELAY, CTR KEY NORMAL.
- SENDER FORCES NEXT SELECTION TO TELLTALE (OS153-1) AND ATTEMPTS TO RELEASE. IF NO RELEASE IN 10 SECONDS, OPERATION OF TMB RELAY MAKES A SECOND ATTEMPT FOR REORDER AND RELEASE.
- NC NEXT TO CONTACT MEANS NO CONNECTION ON THAT CONTACT.

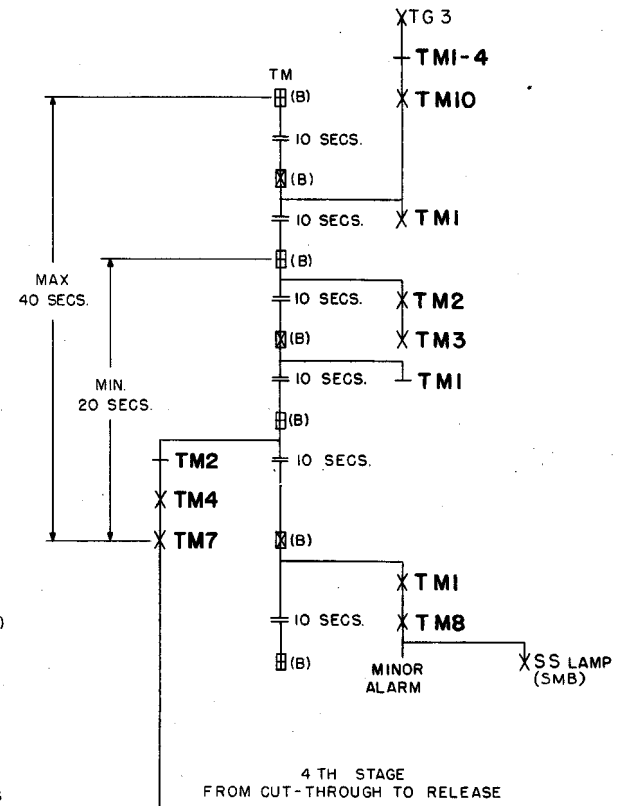
1ST STAGE
FROM SEIZURE TO KEY KICKOFF



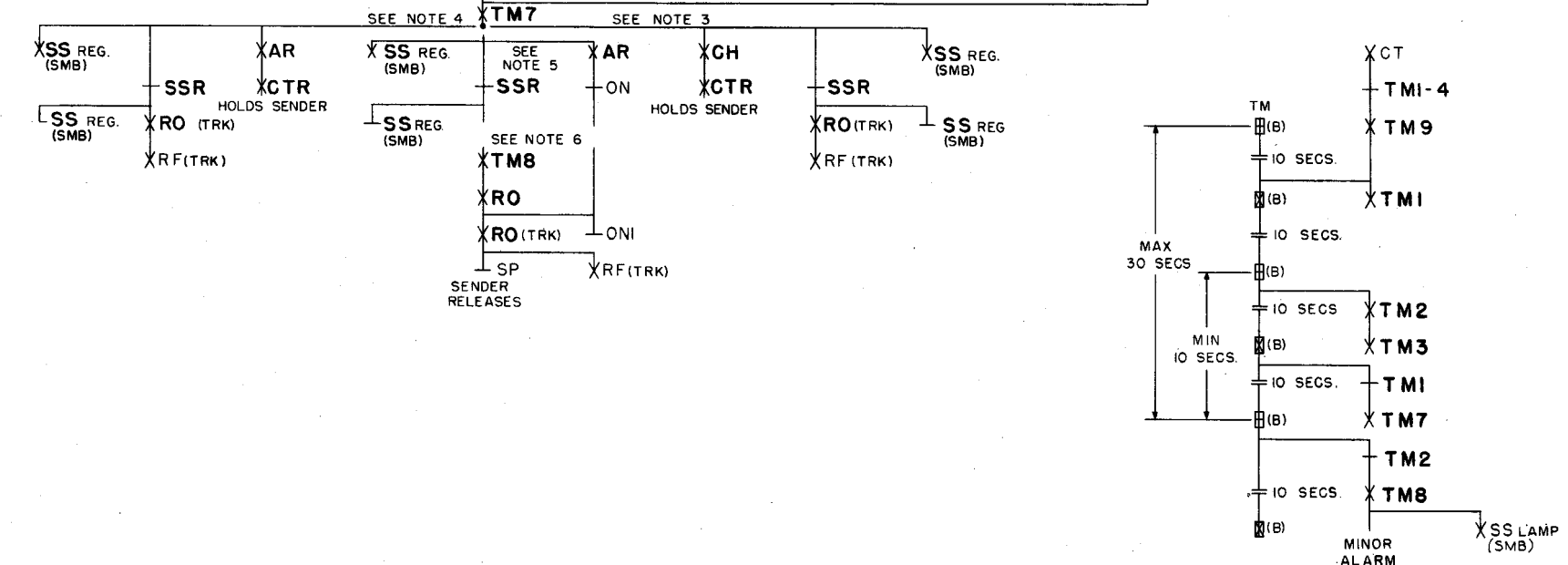
2ND STAGE
FROM KEY KICKOFF TO ASSIGNMENT



3RD STAGE
FROM ASSIGNMENT TO CUT-THROUGH



4TH STAGE
FROM CUT-THROUGH TO RELEASE



INTERRUPTER FRAME CKT. SD-68058-01, ISS. 20
 MISC. CKT. SENDER MAKE-BUSY FR. SD-68386-01, ISS. 5
 *OUTGOING SENDER CKT. SD-68018-01, ISS. 28
 SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS. 14
 TOLL SWITCHING TRUNK CKT. - REV. OR PCI SD-68326-01, ISS. 10

OUTGOING SENDER
OVER-ALL TIMING
 WITH CHAIN CKT. AND CTR KEY METHOD
 FOR HOLDING STUCK SENDERS

OS 154-1

2 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS BSP ITEM MP-11719

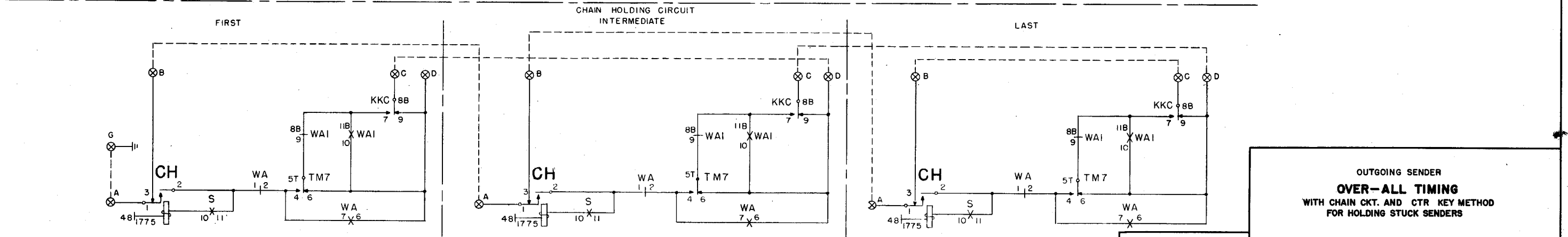
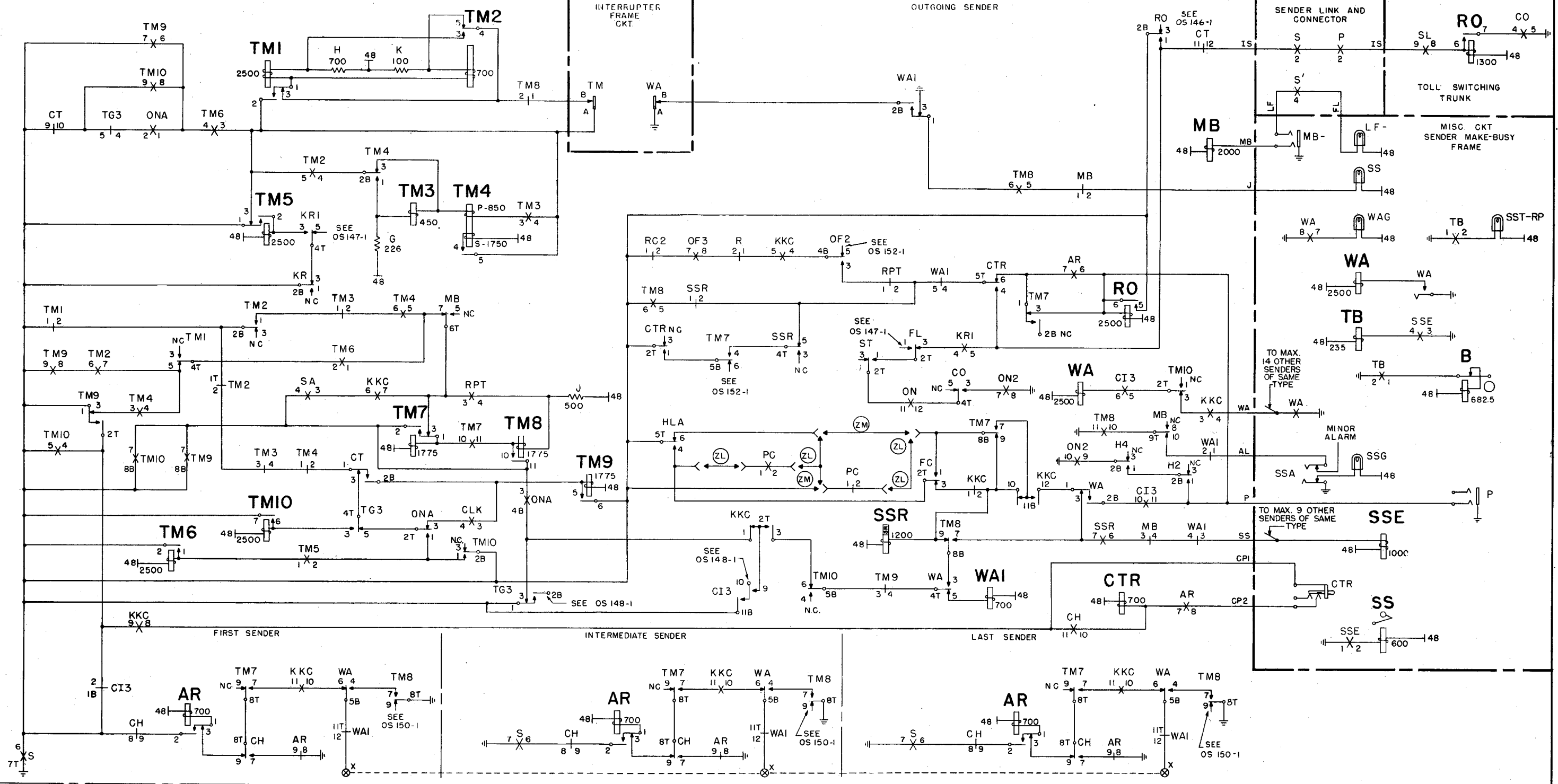
BELL TELEPHONE LABORATORIES, INC.
 PRINTED IN U. S. A.

ISSUE	1	2	3
DATE	10-22-51	12-16-53	

2 SHEETS, SHEET 1

MP-11719

REVISION	1	2	3	4
DATE	10-22-51	10-16-53		



OUTGOING SENDER
OVER-ALL TIMING
 WITH CHAIN CKT. AND CTR KEY METHOD
 FOR HOLDING STUCK SENDERS

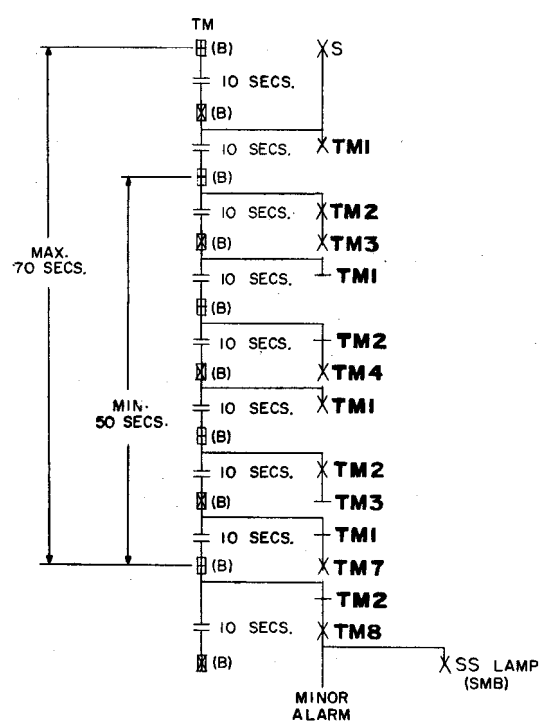
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR OFFICES THAT HAVE BEEN MODIFIED TO COMMON KEY METHOD FOR HOLDING STUCK SENDERS.	FIG. B	
B	FOR ADDITIONS TO OFFICES THAT HAVE BEEN MODIFIED TO COMMON KEY METHOD AND FOR OFFICES WHERE CHAIN CKT. AND (CTR) KEY METHOD (FIG. A) HAS NEVER BEEN INSTALLED.	FIG. C	
ZL	TO CAUSE REORDER AND PARTIAL DIGITS REGISTRATION IF START SIGNAL IS RECEIVED PREMATURELY WHEN PCI IS PROVIDED.	ZL	68018-01
ZM	TO CAUSE REORDER AND PARTIAL DIGITS REGISTRATION IF START SIGNAL IS RECEIVED IN UNITS POSITION WHEN PCI IS NOT PROVIDED.	ZM	

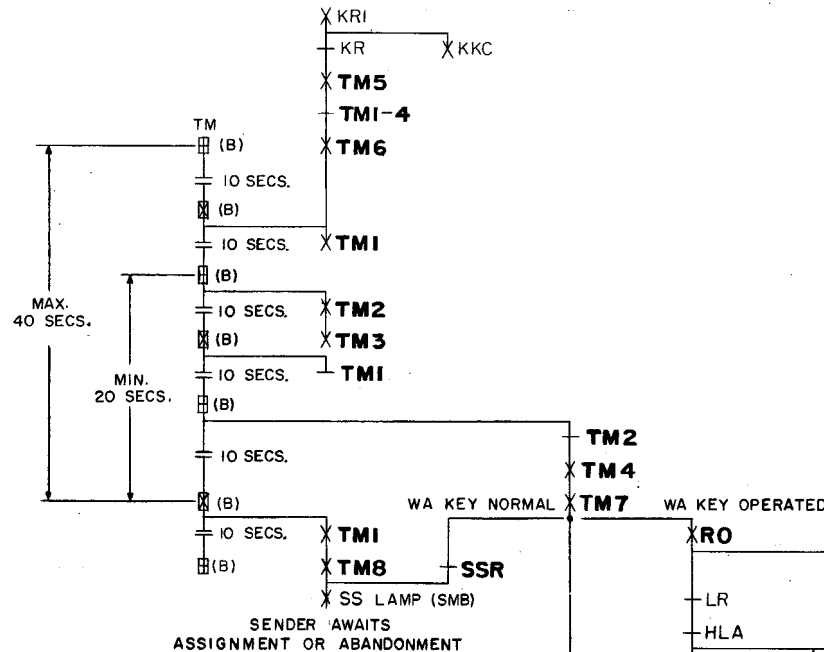
- IF SENDER DOES NOT RELEASE WITHIN 10 SECONDS OPERATION OF TMB RELAY WILL OPERATE THE STUCK SENDER REGISTER AND ALARM.
- SENDER FORCES NEXT SELECTION TO TELLTALE(OS 153-1) AND ATTEMPTS TO RELEASE. IF NO RELEASE IN 10 SECONDS OPERATION OF TMB RELAY MAKES A SECOND ATTEMPT FOR REORDER AND RELEASE.
- "N" SENDER MAY BE THE 2ND,3RD,4TH,5TH,7TH OR 10TH SENDER TO STICK. THIS CHOICE IS MADE BY MEANS OF STRAPPING WHICH CHANGES THE BIAS OF THE (CHS) RELAY.
- NC NEXT TO CONTACT MEANS NO CONNECTION ON THAT CONTACT.

SEQUENCE CHART

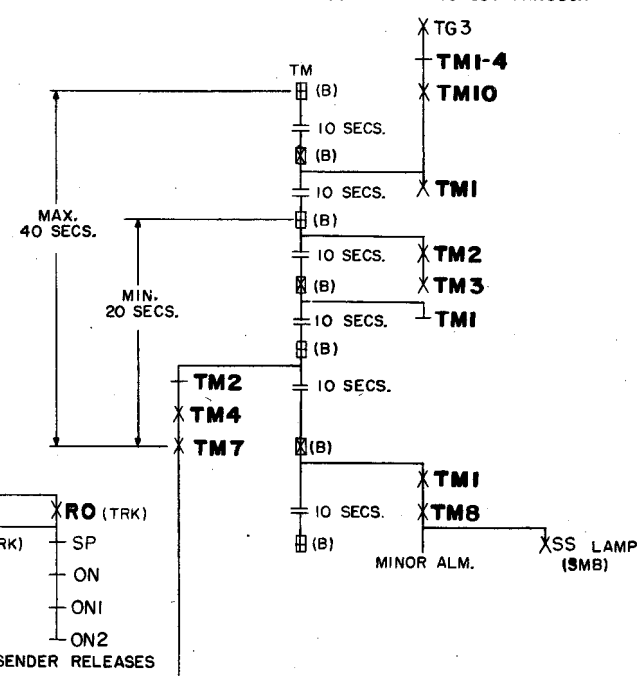
1ST STAGE
FROM SEIZURE TO KEY KICKOFF



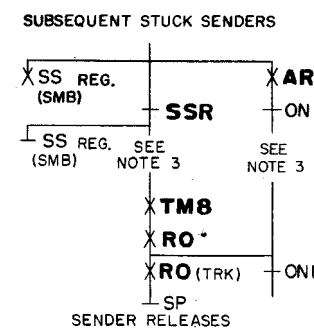
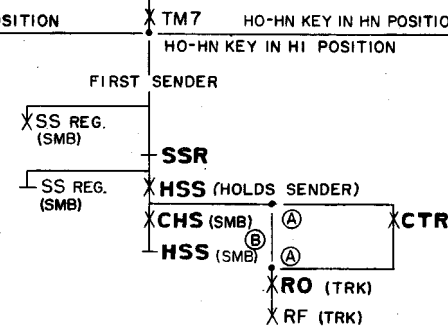
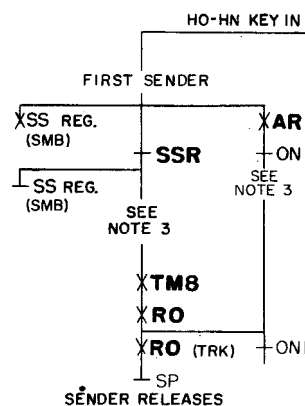
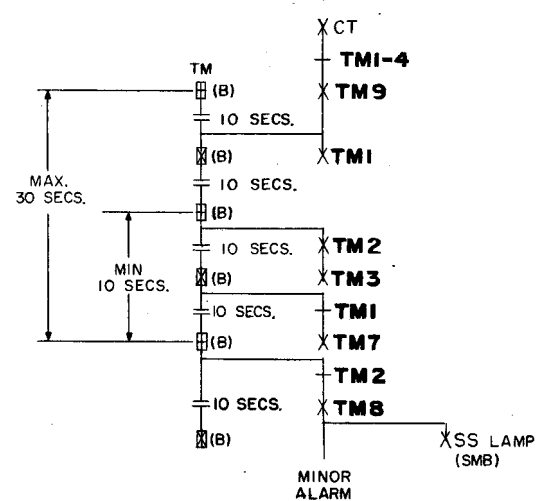
2ND STAGE
FROM KEY KICKOFF TO ASSIGNMENT



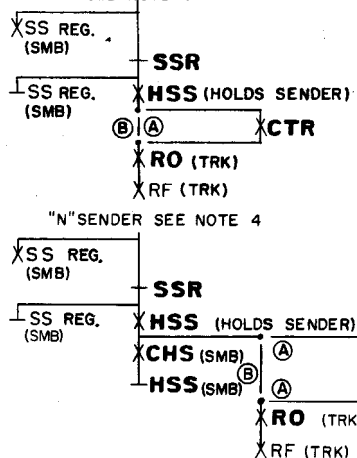
3RD STAGE
FROM ASSIGNMENT TO CUT-THROUGH



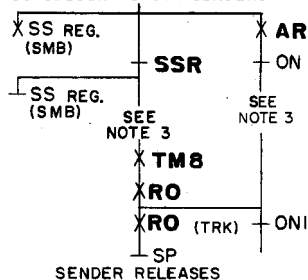
4TH STAGE
FROM CUT-THROUGH TO RELEASE



FIRST TO "N" SENDER
(EXCLUSIVE OF "N" SENDER)
SEE NOTE 4



SUBSEQUENT STUCK SENDERS



- INTERRUPTER FRAME CKT. SD-68058-01, ISS.20
- MISC. CKT. SENDER MAKE BUSY FR.(4A) SD-68306-01, ISS. 5
- MISC. CKT. SENDER MAKE BUSY FR.(4M) SD-68144-01, ISS.16
- OUTGOING SENDER CKT. SD-68018-01, ISS.28
- SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS.14
- TOLL SWITCHING TRUNK CKT.-REV.OR PCI SD-68326-01, ISS.10

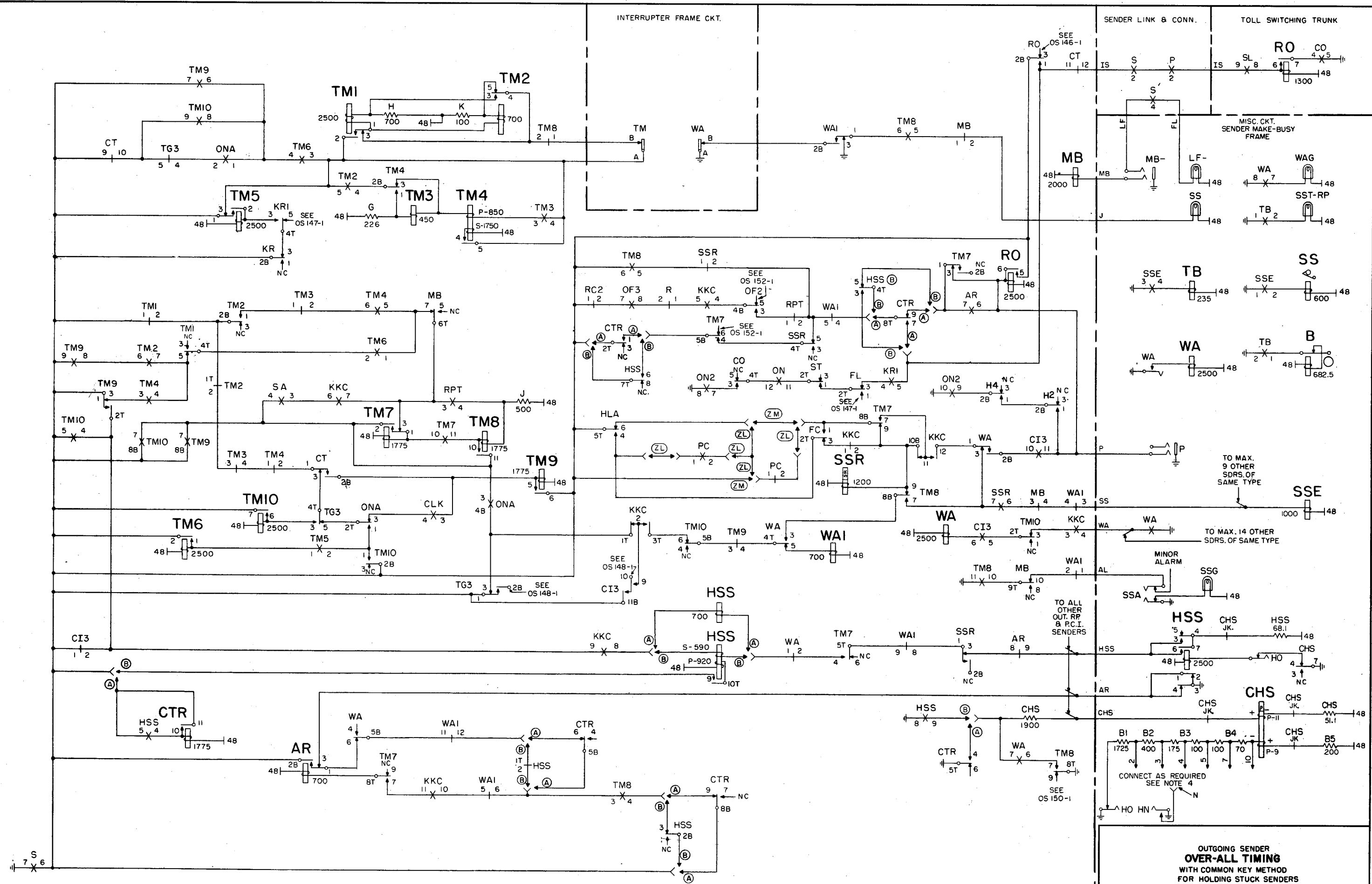
OUTGOING SENDER
OVER-ALL TIMING
WITH COMMON KEY METHOD
FOR HOLDING STUCK SENDERS

ISSUE DATE 1-6-54

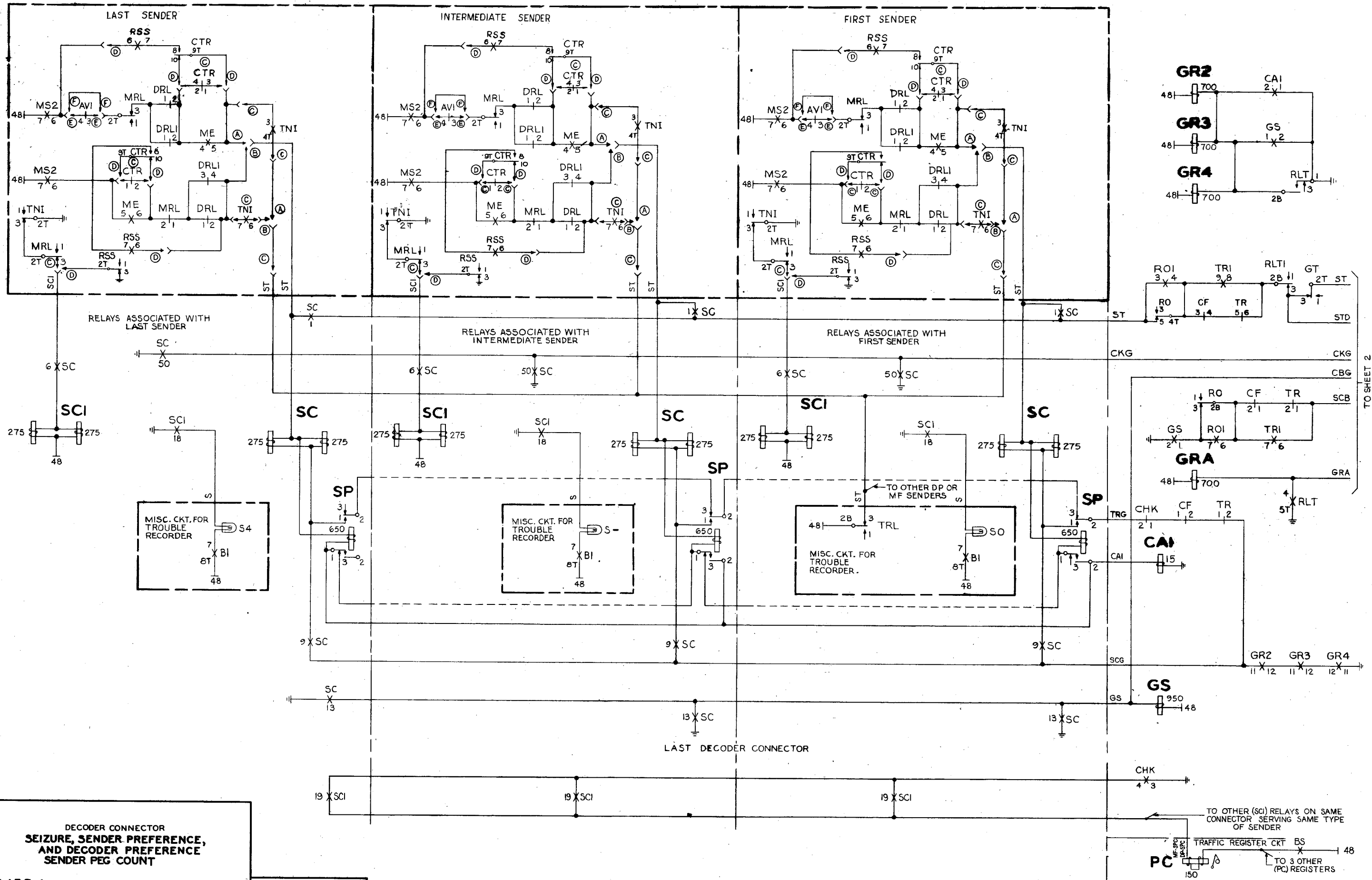
2 SHEETS, SHEET 1

MP-10852

ISSUE	1	1	1
DATE	1-6-54		



DECODER CONNECTOR SENDER PREFERENCE CHAIN



TO SHEET 2

REVISE	1	2	3	4	5
DATE	6-15-53	5-20-53	10-14-53		

2 SHEETS, SHEET 1

MP-11600

DECODER CONNECTOR
SEIZURE, SENDER PREFERENCE,
AND DECODER PREFERENCE
SENDER PEG COUNT

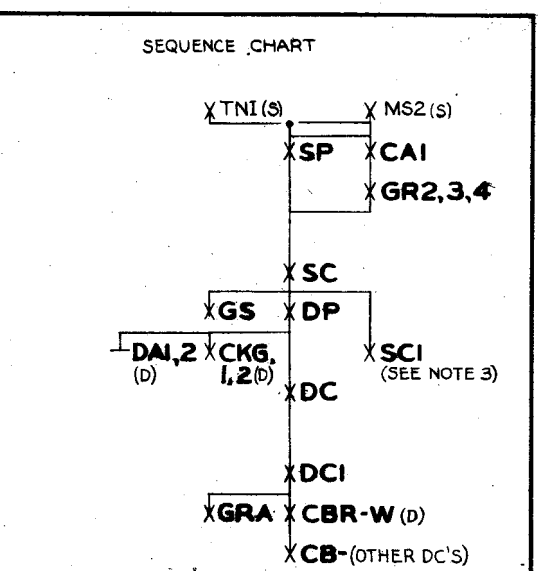
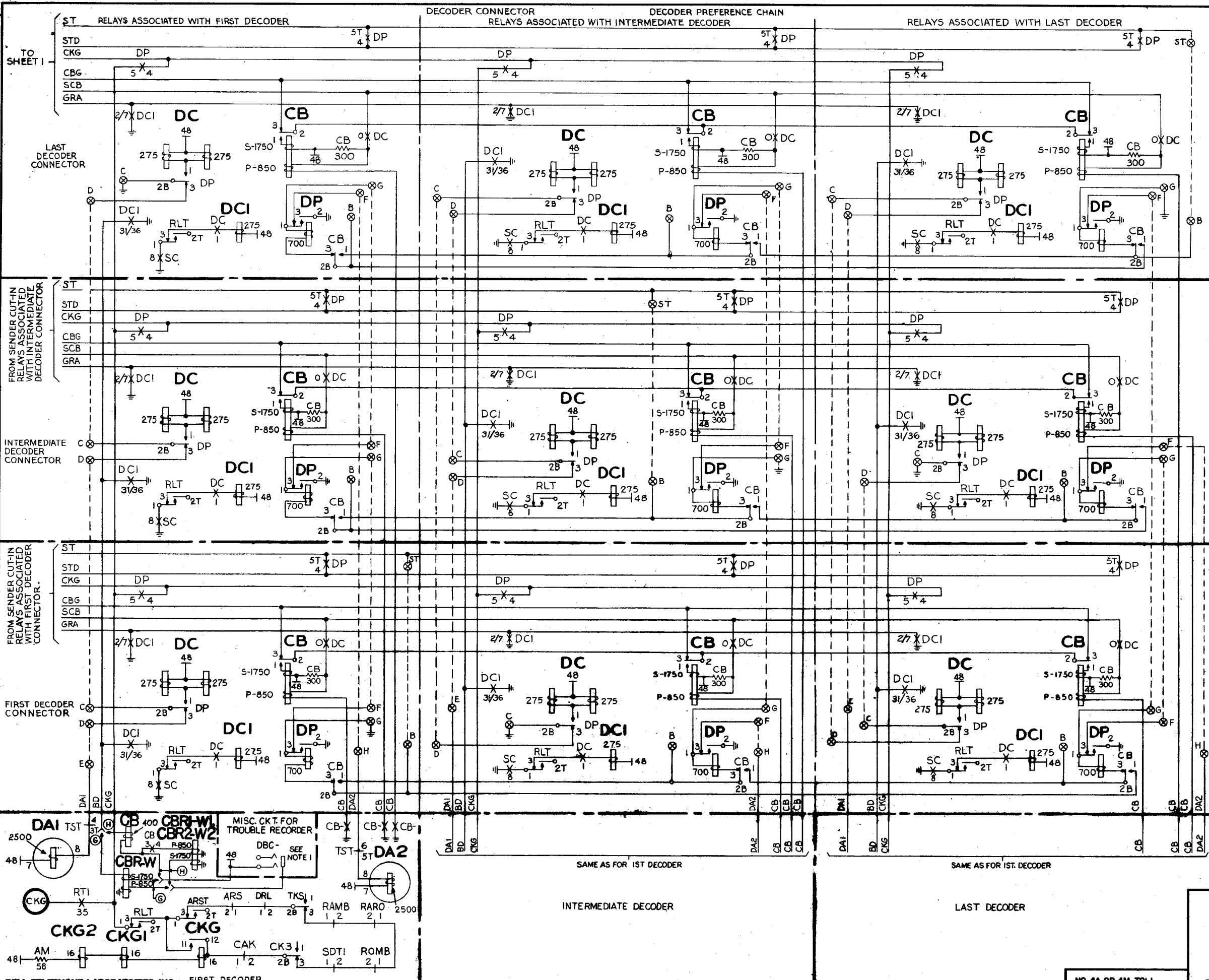
OS 155-1

2 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

BELL TELEPHONE LABORATORIES, INC.
PRINTED IN U. S. A.

ISSUE	DATE
1	6-18-51
2	5-20-53
3	10-14-53



NOTES:

1. A JACK IS ASSOCIATED WITH EACH CBR-W RELAY. (SEE OS 179-1)

2.

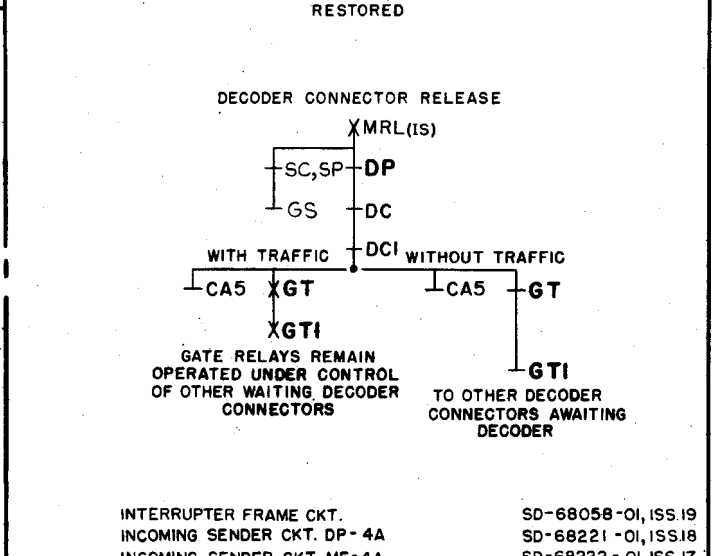
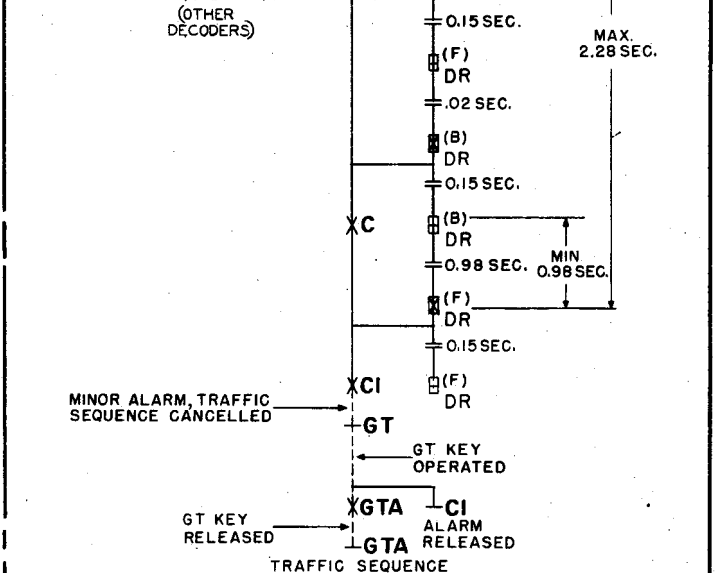
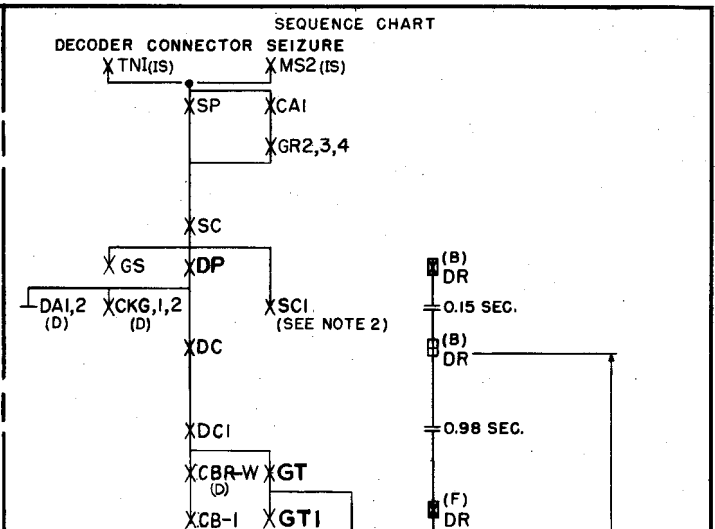
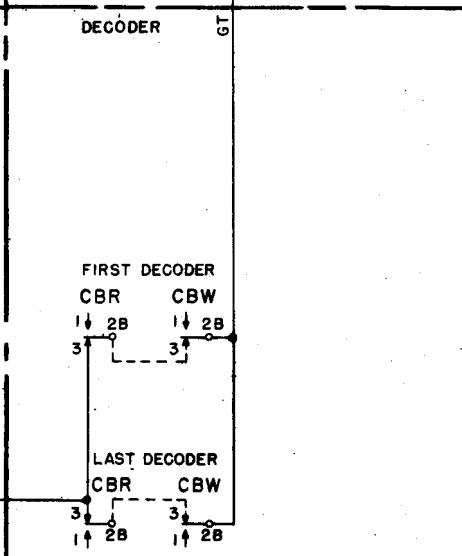
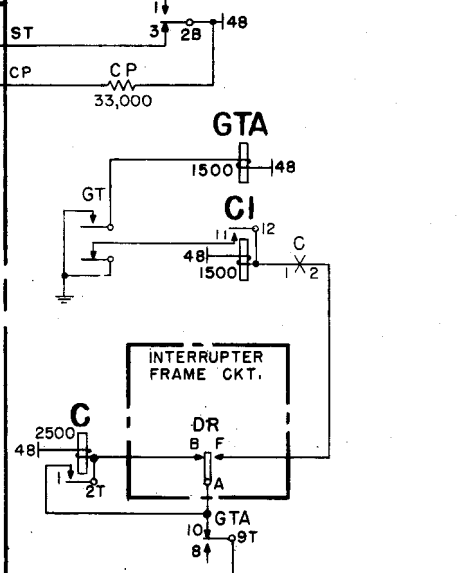
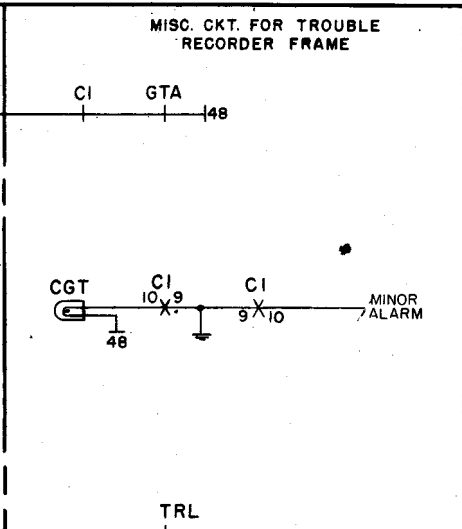
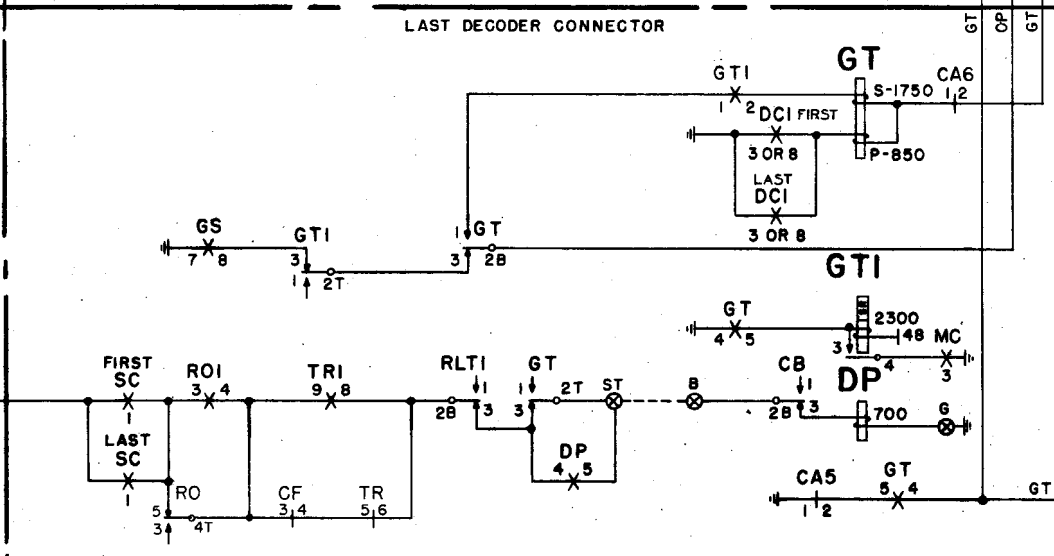
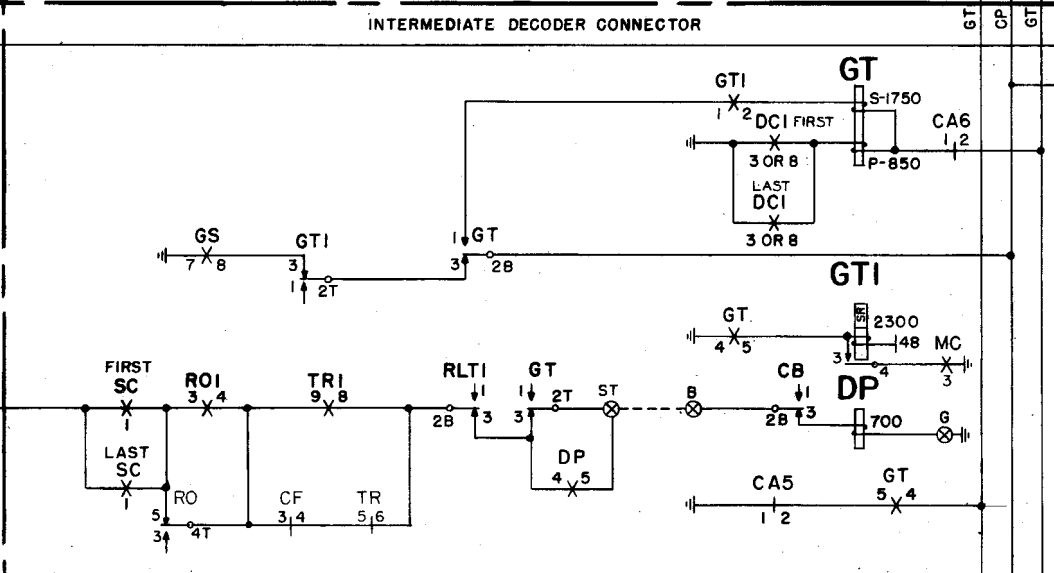
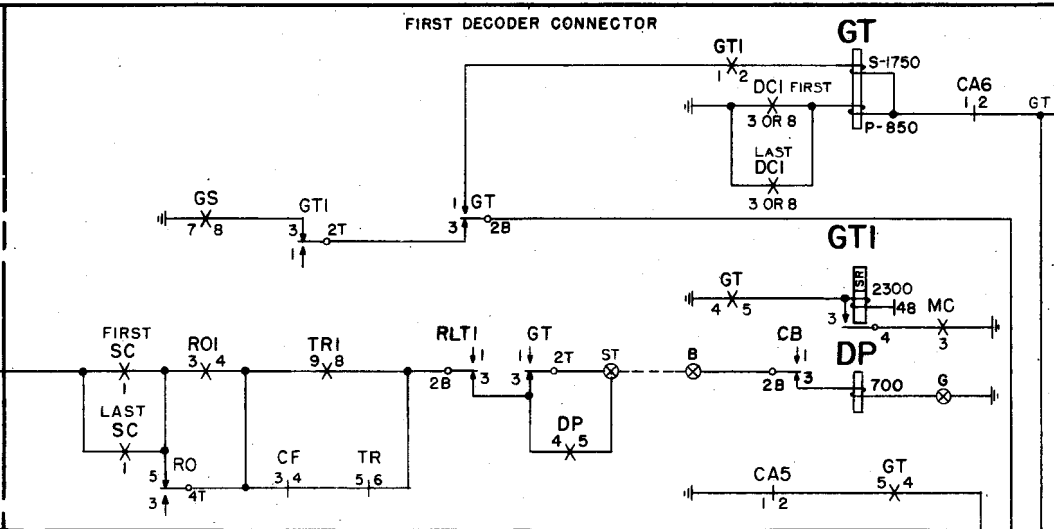
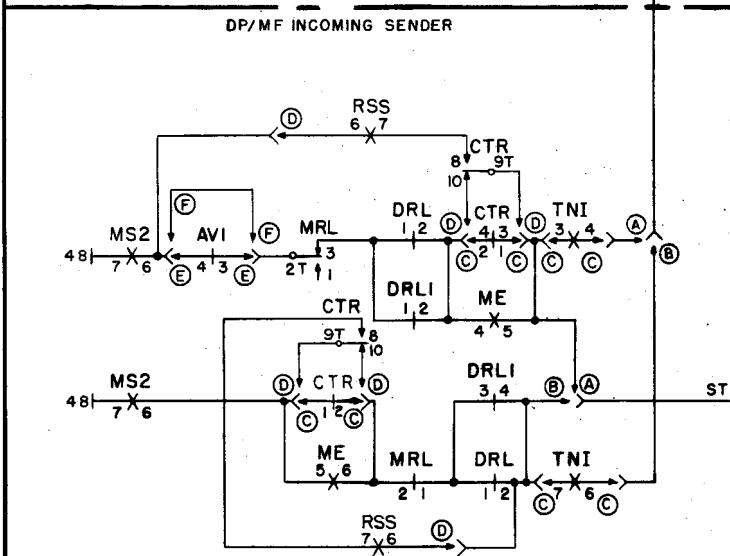
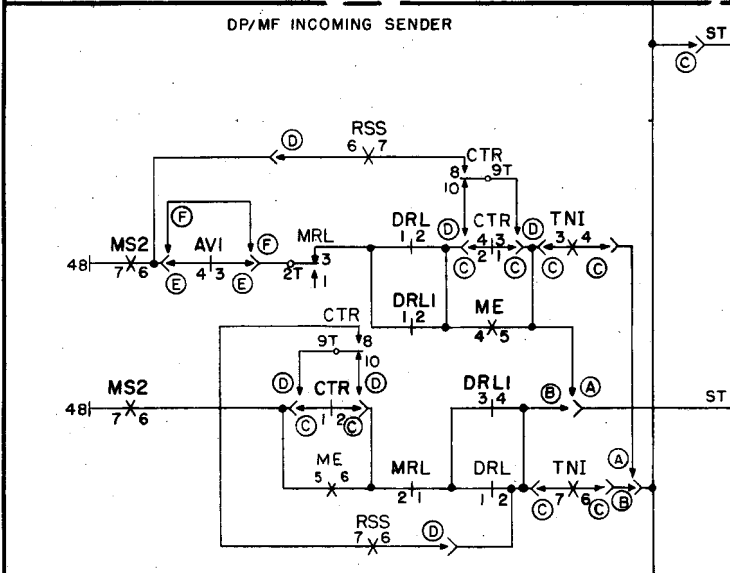
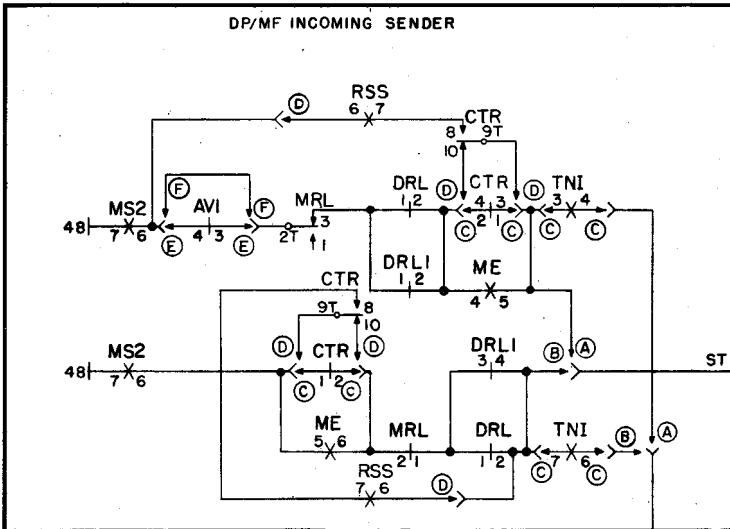
OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	WHEN DP INCOMING SENDER IS USED.	NONE	68221-01
B	WHEN MF INCOMING SENDER IS USED.	NONE	68222-01
C	RECORD STUCK SENDERS	NOT PROVIDED	FIG. 4 68221-01 OR 68222-01
		PROVIDED	FIG. 22 68221-01 FIG. 20 68222-01
E	MFR. DISC.	YY	68221-01
F	STANDARD	YZ	68221-01
G	MFR. DISC.	FIG. 19	68340-01
H	STANDARD	FIGS. 25, 26 & 27	68340-01

3. SCI DOES NOT OPERATE ON TNI CARDS.

TRAFFIC REGISTER CKT.	SD-68412-01,	ISS. 7
DECODER CKT.	SD-68340-01,	ISS. 8
DECODER CONNECTOR CKT.	SD-68339-01,	ISS. 6
DECODER-MARKER TEST AND TROUBLE RECORDER FRAME CKT.	SD-68389-01,	ISS. 5
INCOMING SENDER CKT. DP-4A	SD-68221-01,	ISS. 16
INCOMING SENDER CKT. DP-4M	SD-68423-01,	ISS. 2
INCOMING SENDER CKT. MF-4A	SD-68222-01,	ISS. 17
INCOMING SENDER CKT. MF-4M	SD-68424-01,	ISS. 2
MARKER CKT.	SD-68388-01,	ISS. 5
MISC. CKT. FOR TROUBLE RCDR.	SD-68392-01,	ISS. 5

DECODER CONNECTOR SEIZURE, SENDER PREFERENCE, AND DECODER PREFERENCE SENDER PEG COUNT

ISSUE	1	2	3
DATE	4-30-51	7-20-53	10-5-53



- INTERRUPTER FRAME CKT. SD-68058-OI, ISS.19
 INCOMING SENDER CKT. DP-4A SD-68221-OI, ISS.18
 INCOMING SENDER CKT. MF-4A SD-68222-OI, ISS.17
 * DECODER CONNECTOR CKT. SD-68339-OI, ISS.6
 DECODER CKT. SD-68340-OI, ISS.8
 MISC. CKT. FOR TROUBLE RECORDER FRAME SD-68392-OI, ISS.5
 INCOMING SENDER CKT. DP-4M SD-68423-OI, ISS.2
 INCOMING SENDER CKT. MP-4M SD-68424-OI, ISS.2

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	WHEN DP INC. SDR. IS USED	NONE	68221-OI
B	WHEN MF INC. SDR. IS USED	NON	68222-OI
C	RECORD STUCK SENDERS	NOT PROVIDED	FIG.4 68221-OI OR 68222-OI
		PROVIDED	FIG.22 68221-OI
D		FIG.20	68222-OI
E	MFR. DISC.	YY	68221-OI
F	STD.	YZ	68221-OI

2. SCI DOES NOT OPERATE ON TNI CALL

NO. 4A OR 4M TOLL

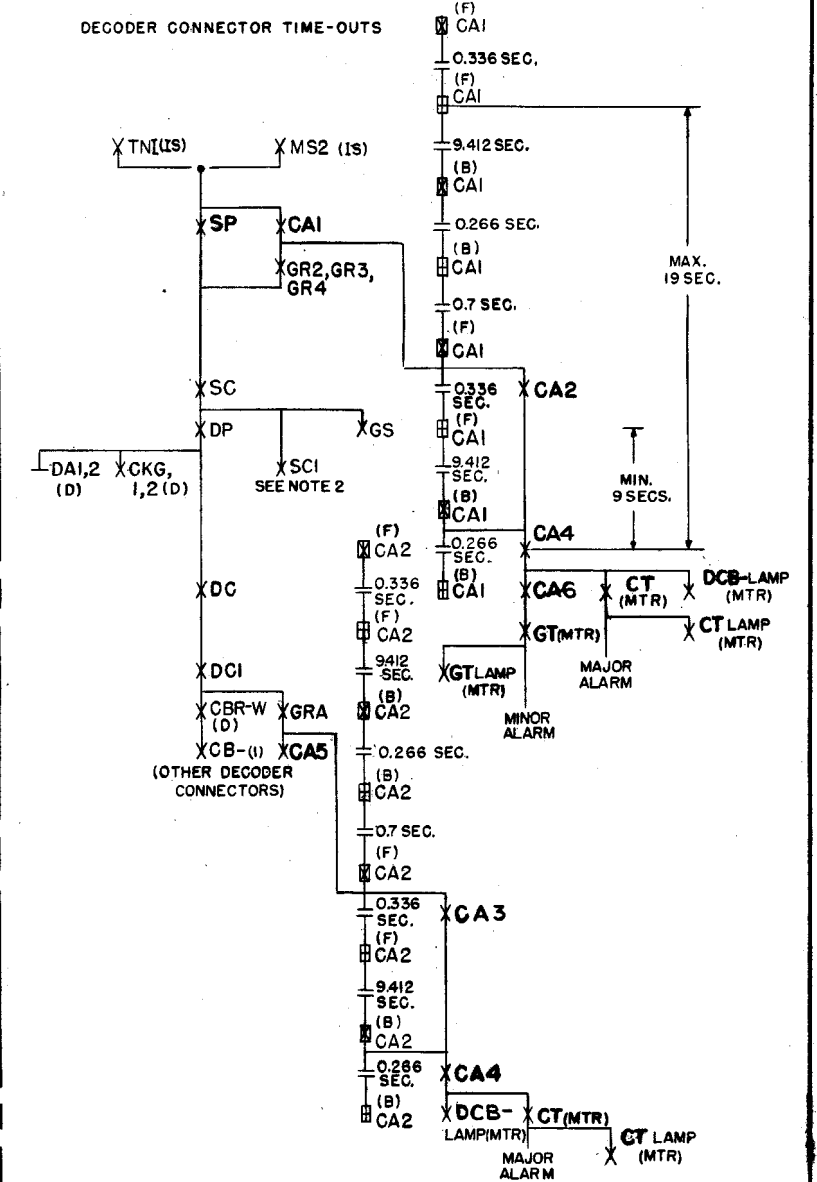
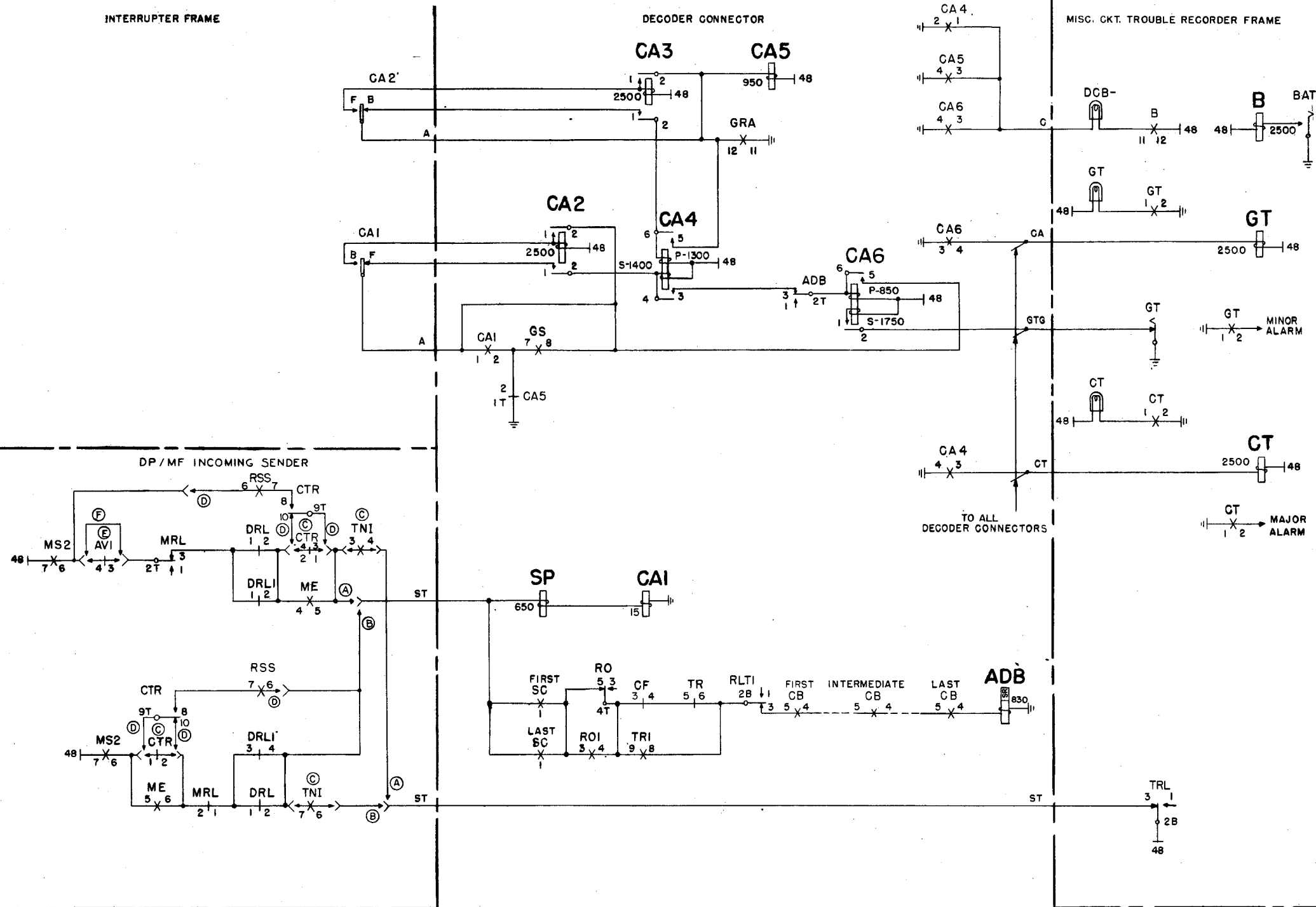
ISSUE	1	2	3	4
DATE	5-0-51	7-17-53	10-5-53	

INTERRUPTER FRAME

DECODER CONNECTOR

MISC. CKT. TROUBLE RECORDER FRAME

SEQUENCE CHART



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR DP INCOMING SDRS.	NONE	68221-01
B	FOR MF INCOMING SDRS.	NONE	68222-01
C	RECORD STUCK	NOT PROVIDED	FIG. 4 68221-01 OR 68222-01
		PROVIDED	FIG. 22 68221-01 FIG. 20 68222-01
E	M.D.	YY	68221-01
F	S.T.D.	YZ	68221-01

2. SCI DOES NOT OPERATE ON TNI TYPE CALLS.

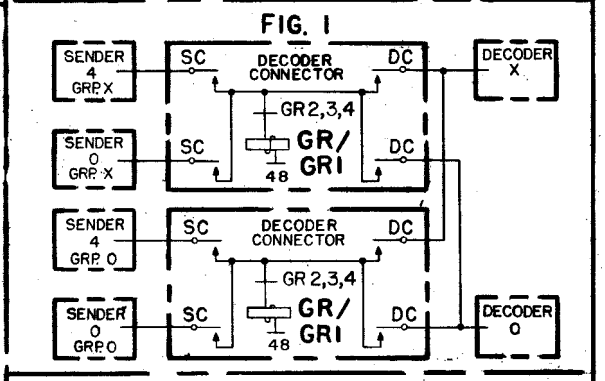
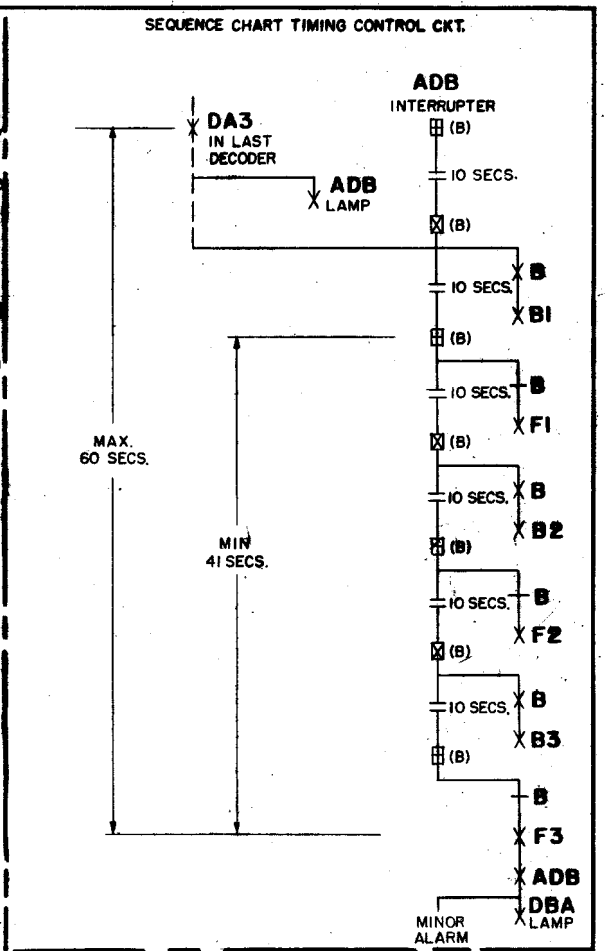
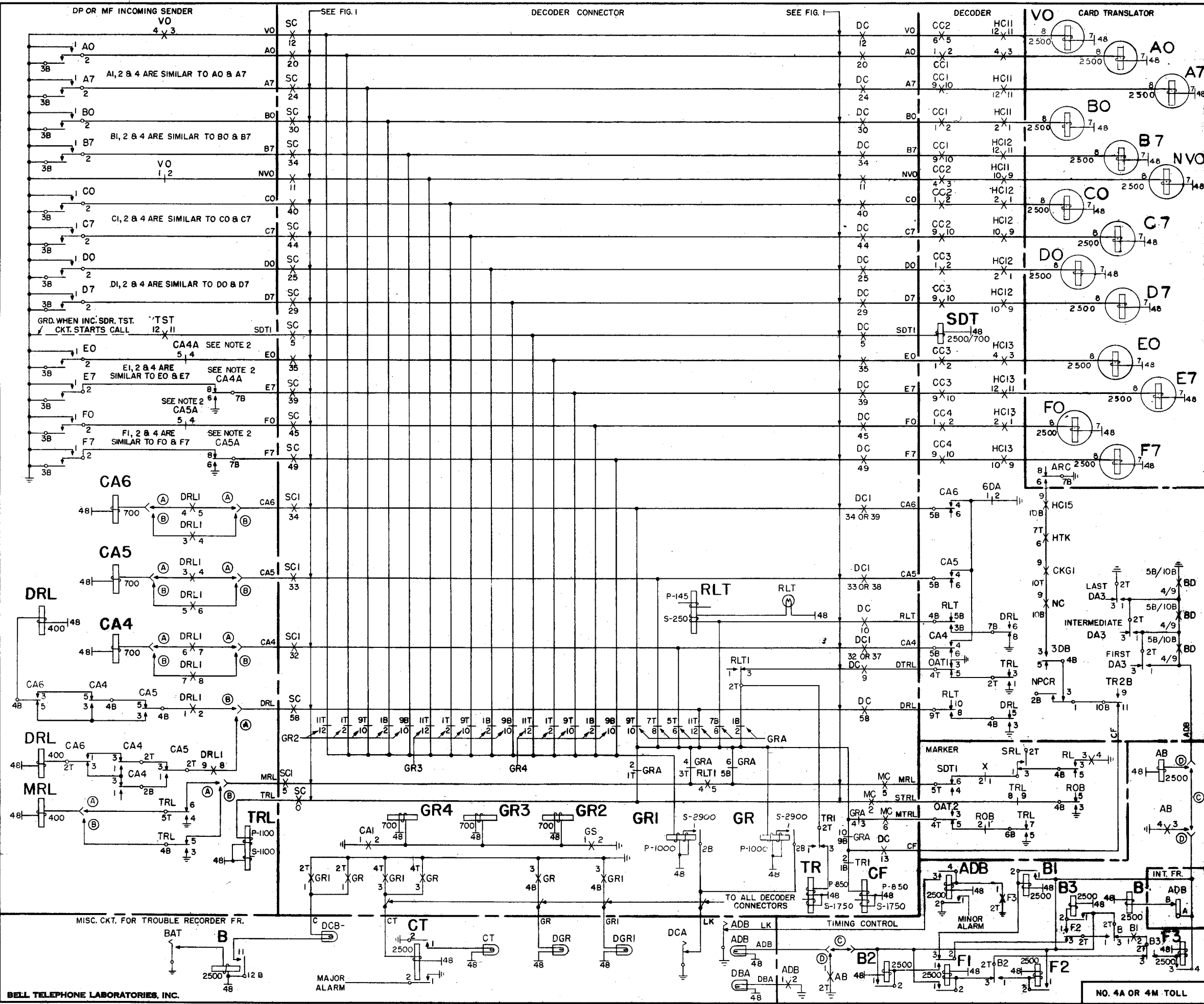
- INTERRUPTER FRAME CKT. SD-68058-01, ISS. 19
- INCOMING SENDER CKT. - DP-4A SD-68221-01, ISS. 18
- INCOMING SENDER CKT. - MF-4A SD-68222-01, ISS. 17
- * DECODER CONNECTOR CKT. SD-68339-01, ISS. 6
- DECODER CKT. SD-68340-01, ISS. 8
- MISC. CKT. FOR TROUBLE RECORDER SD-68392-01, ISS. 5
- INCOMING SENDER CKT. - DP-4M SD-68423-01, ISS. 2
- INCOMING SENDER CKT. - MF-4M SD-68424-01, ISS. 2

DECODER CONNECTOR TIME-OUTS

OS 157-1

ORDER AS BSP ITEM MP-11602

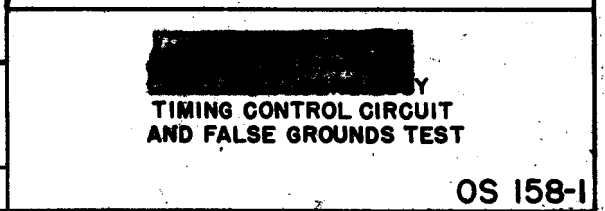
ISSUE	1	2	3	4
DATE	7-3-51	7-5-53	10-4-53	

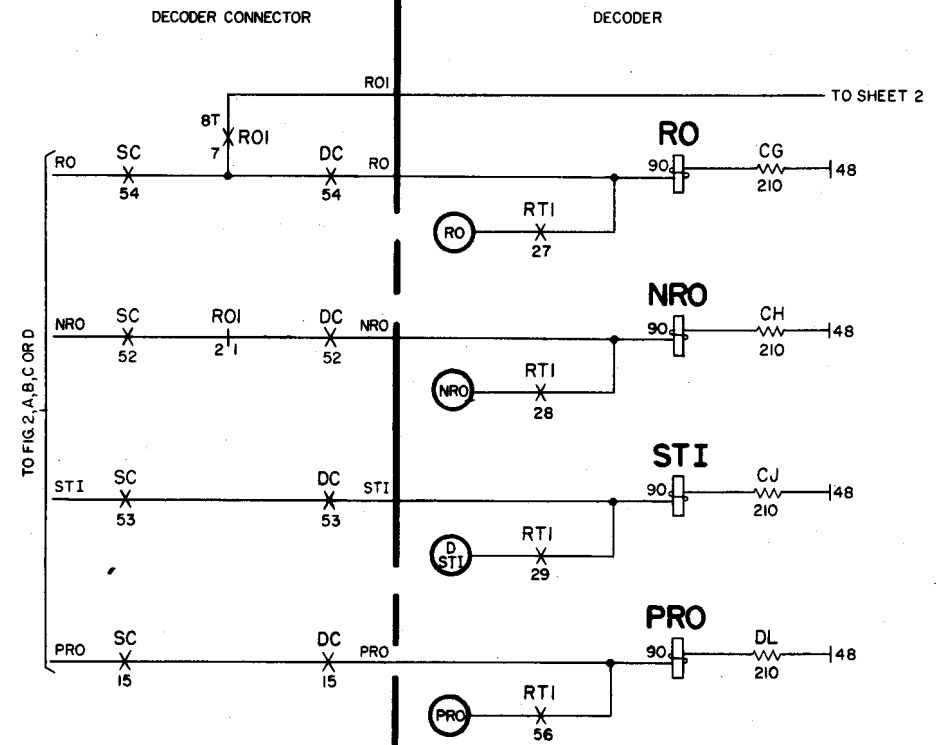
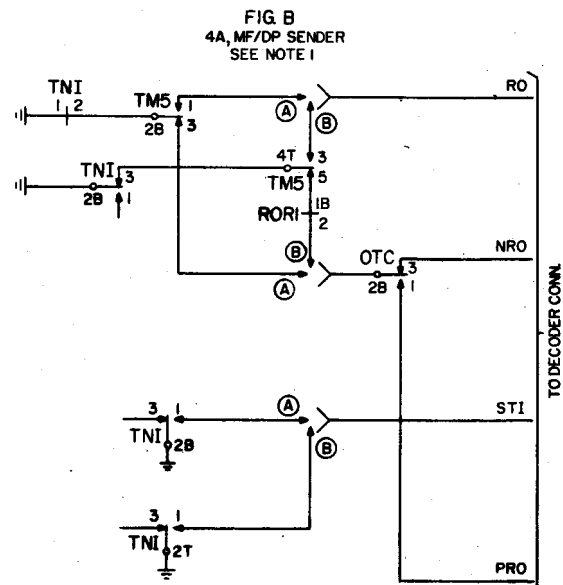
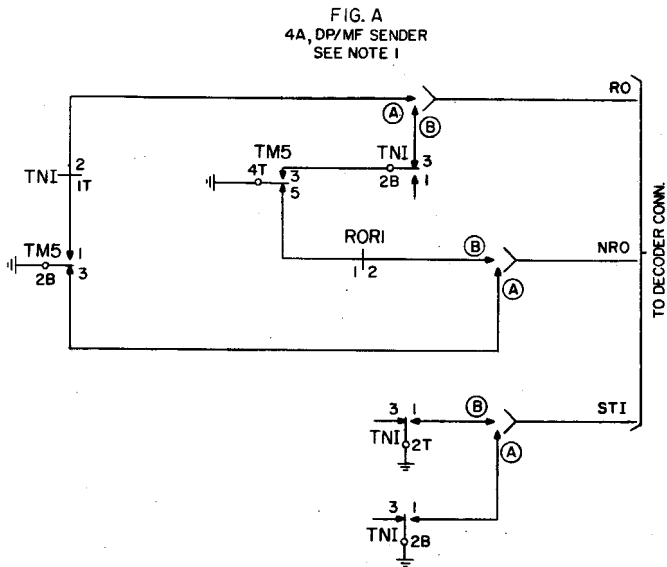
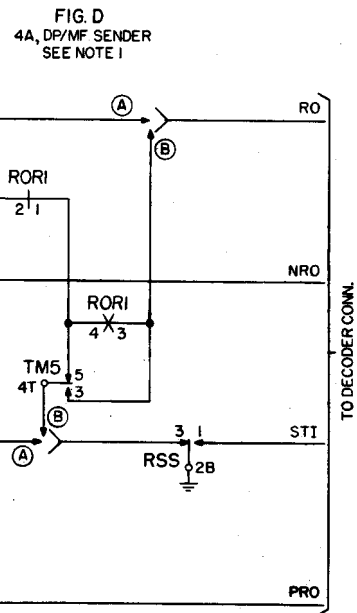
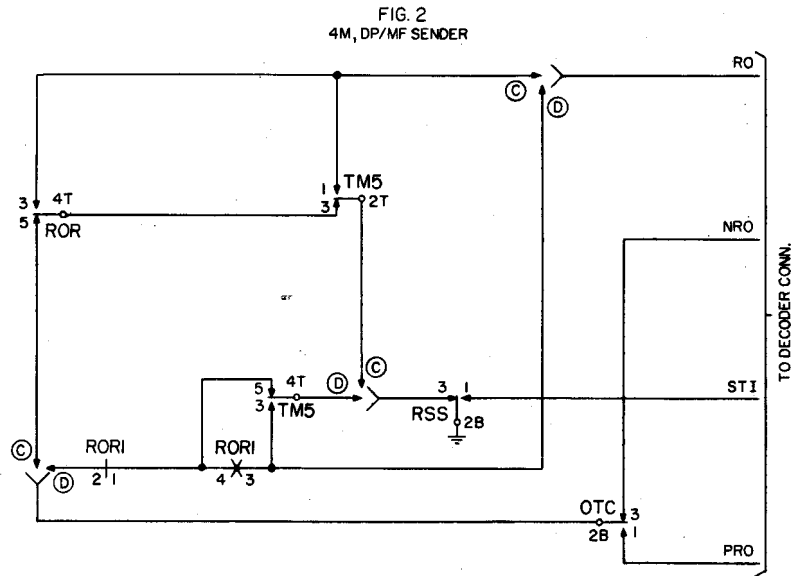
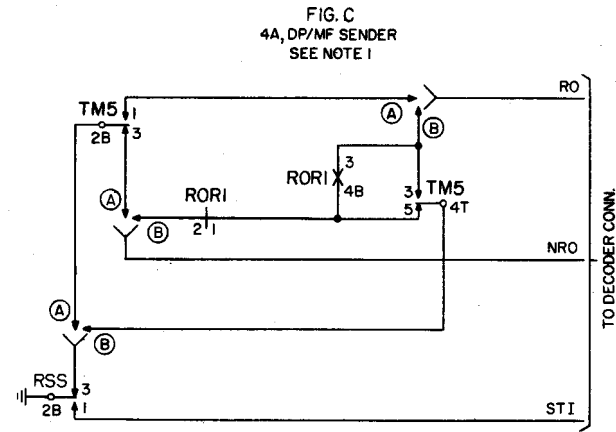


NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR DP INCOMING SENDERS	NONE	68221-01
B	FOR MF INCOMING SENDERS	NONE	68221-01
C	ALL DECODERS BUSY LAMP AT TRAFFIC SUPERVISORY RACK	NOT PROVIDED	Z 68416-01
D		PROVIDED	Y

2. THE USE OF CA4, CA5 & CA6, CA4A & CA5A RELS. ASSUMES THAT SENDERS ARE WIRED FOR 2 & 3-DIGIT TX CODES.
- INTERRUPTER FRAME CKT SD-68058-01, ISS.19
 DP INCOMING SENDER CKT-4A SD-68221-01, ISS.18
 MF INCOMING SENDER CKT-4A SD-68222-01, ISS.17
 DECODER CONNECTOR CKT SD-68339-01, ISS.6
 DECODER CKT SD-68340-01, ISS.8
 CARD TRANSLATOR CKT SD-68342-01, ISS.6
 MARKER CKT SD-68368-01, ISS.9
 MISC. CKT FOR TROUBLE RECORDER FRAME SD-68389-01, ISS.2
 DP INCOMING SENDER-4M SD-68416-01, ISS.2
 MF INCOMING SENDER-4M SD-68423-01, ISS.2
 SD-68424-01, ISS.2





DECODER
SEIZURE AND INTEGRITY CHECK

OS 160-1

2 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

ORDER AS B&P ITEM MP-

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U. S. A.

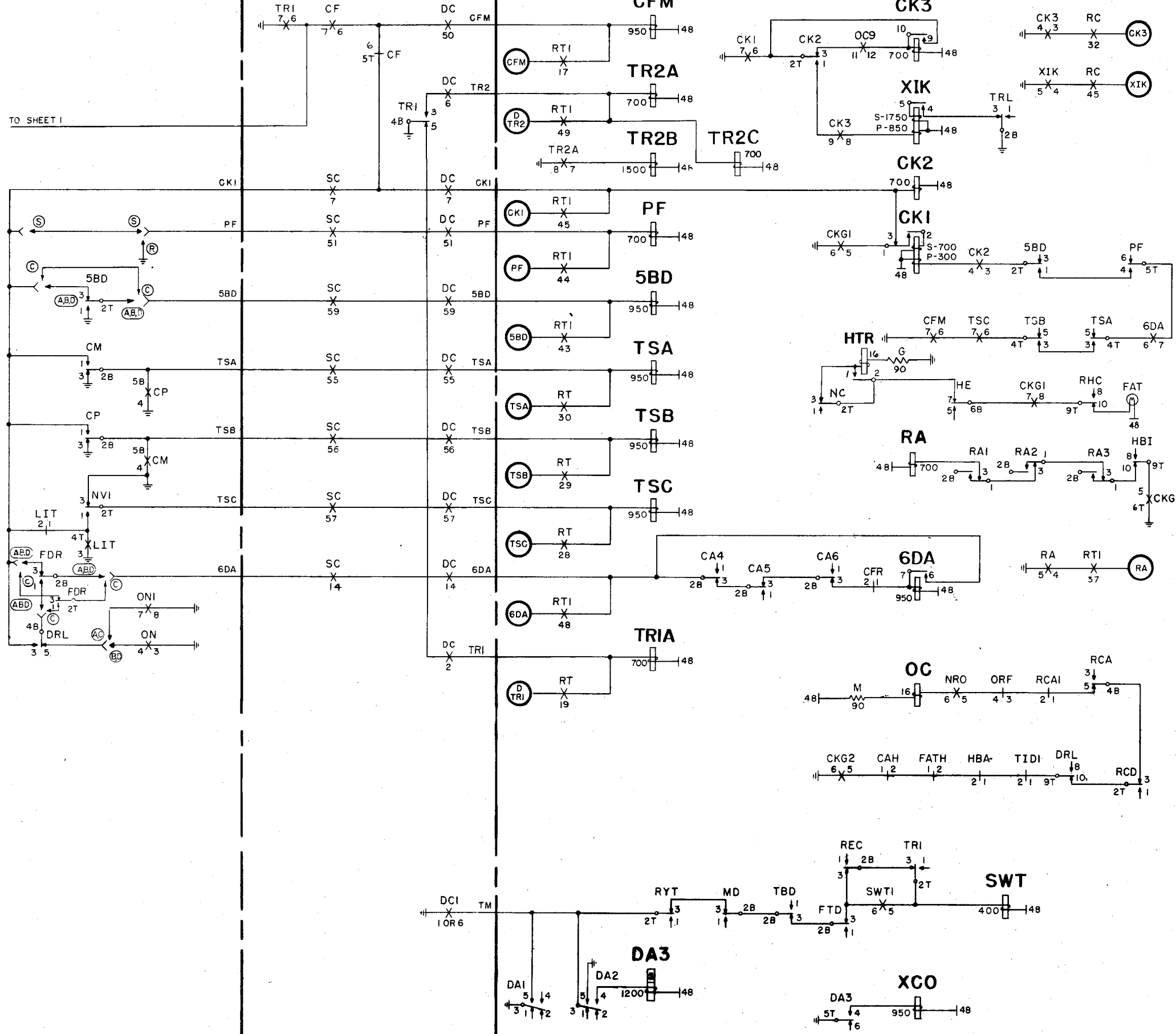
ISSUE	2	REV.	
DATE	10-1-53		

2 SHEETS, SHEET 1

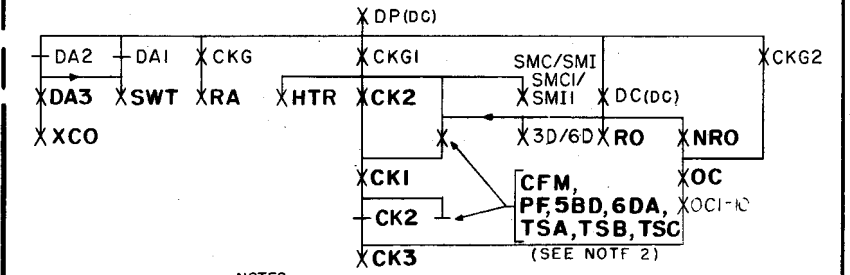
MP-11605

ISSUE	DATE	BY	CHKD
1	3-25-51		
2	10-1-51		

FIG 1
4A/4M DP/MF INCOMING SENDER



SEQUENCE CHART



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	WHEN 4A DP SENDER IS USED		68221-01
B	WHEN 4A MF SENDER IS USED		68222-01
C	WHEN 4M DP SENDER IS USED		68423-01
D	WHEN 4M MF SENDER IS USED		68424-01
R	TO ALTER CONNECTOR PREFERENCE OF A SDR. GROUP BEGINNING WITH THE FIRST SENDER	R	68221-01 68222-01 68423-01 68424-01
S	TO ALTER CONNECTOR PREFERENCE OF A SDR. GROUP BEGINNING WITH THE SECOND SENDER	S	68221-01 68222-01 68423-01 68424-01
FIG A	INTERSENDER LOAD CONTROL TIMING NOT PROVIDED AND CONTROL OF STUCK SENDERS BY CTR KEYS AND CHAIN RELAYS. NO RECORDING OF STUCK SENDERS	Z	68221-01 68222-01
FIG B	INTERSENDER LOAD CONTROL TIMING PROVIDED AND CONTROL OF STUCK SENDERS BY CTR KEYS AND CHAIN RELAYS. NO RECORDING OF STUCK SENDERS	Z	68221-01 68222-01
FIG C	INTERSENDER LOAD CONTROL TIMING NOT PROVIDED AND CONTROL OF STUCK SENDERS BY COMMON KEY WITH AUTOMATIC RECORDING OF STUCK SENDERS	FIGS 22, H, K & L	68221-01
FIG D	INTERSENDER LOAD CONTROL TIMING PROVIDED AND CONTROL OF STUCK SENDERS BY COMMON KEY WITH AUTOMATIC RECORDING OF STUCK SENDERS	FIGS 22, H, K & M	68222-01

2. THESE RELAYS RELEASE UNLESS GROUNDED BY THE SENDER OR DECODER CONNECTOR.

TRAFFIC SEPARATION INFORMATION

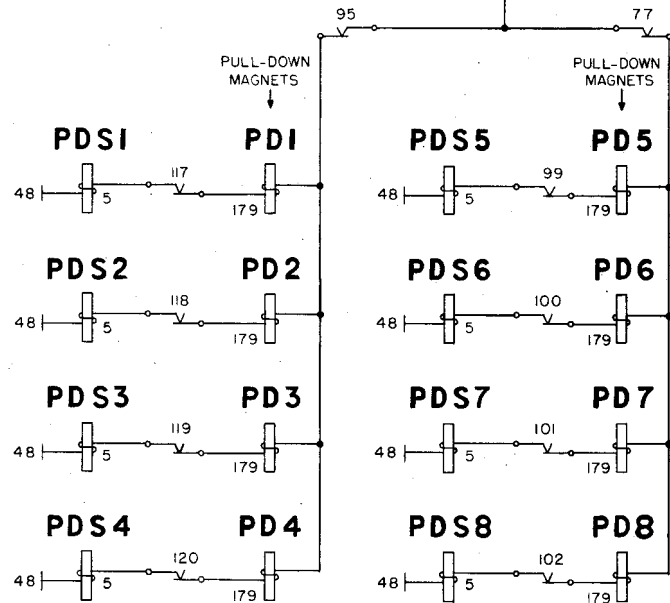
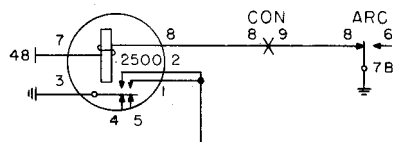
TABLE A				TABLE B		
SENDER RELAYS OPERATED		DECODER RELAYS OPERATED		SENDER RELAYS OPERATED	DECODER RELAYS OPERATED	
CM	CP	TSA	TSB	NVI	LIT	TSC
X			X	X		
		X	X	X	X	X
	X	X				X

- INCOMING SENDER CKT, MP 4M SD-68424-01 ISS 1
- INCOMING SENDER CKT, DP 4M SD-68423-01 ISS 1
- *DECODER CKT. SD-68340-01 ISS. 8
- DECODER CONNECTOR CKT. SD-68339-01 ISS. 4
- INCOMING SENDER CKT, DP 4A SD-68221-01 ISS. 14
- INCOMING SENDER CKT, MF 4A SD-68222-01 ISS. 16

DECODER
SEIZURE AND INTEGRITY CHECK

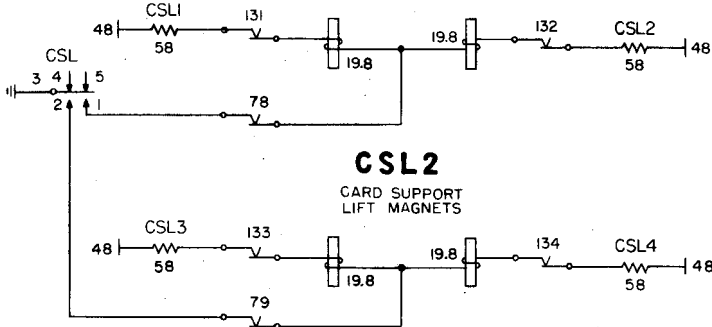
CARD TRANSLATOR

PD

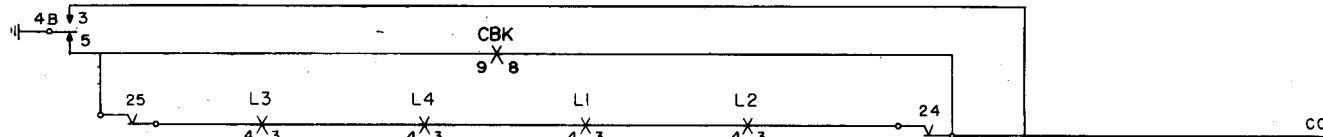


CSLI

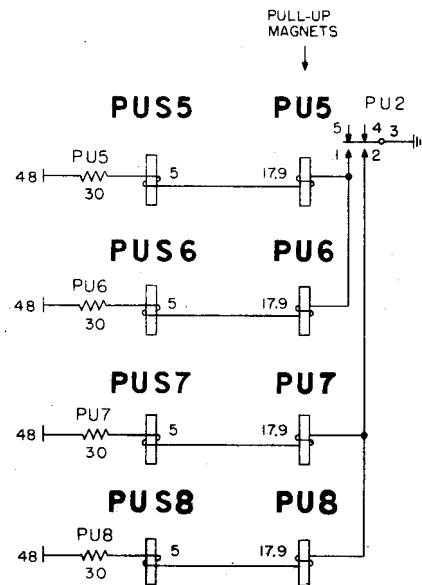
CARD SUPPORT LIFT MAGNETS



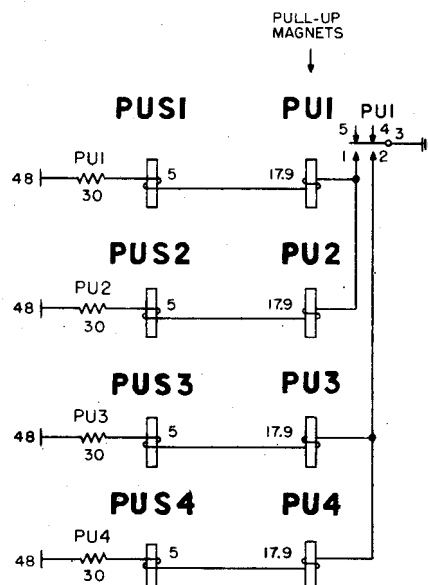
ARC



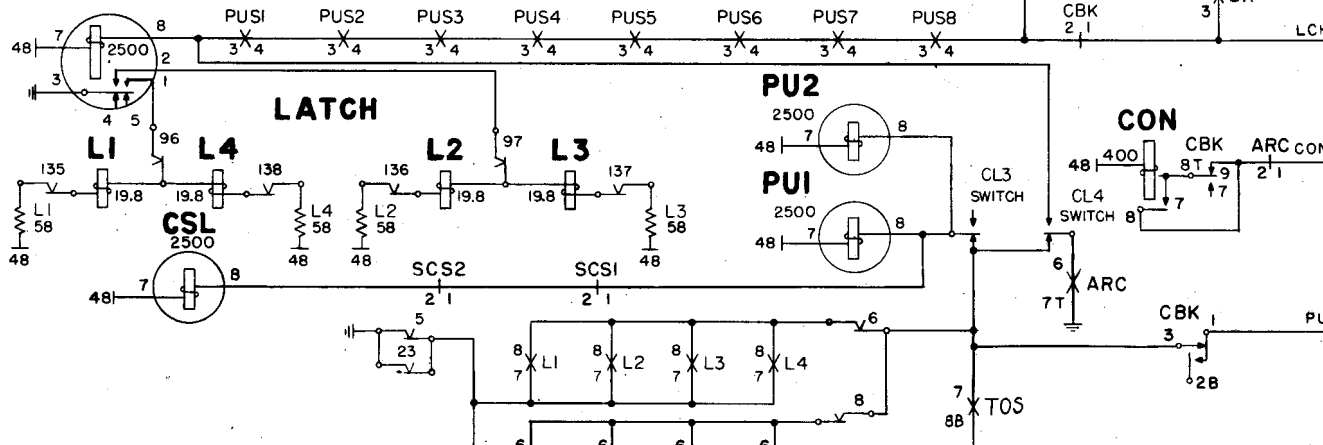
PULL-UP MAGNETS



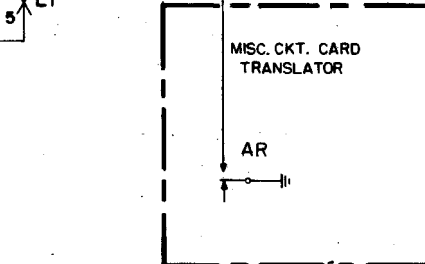
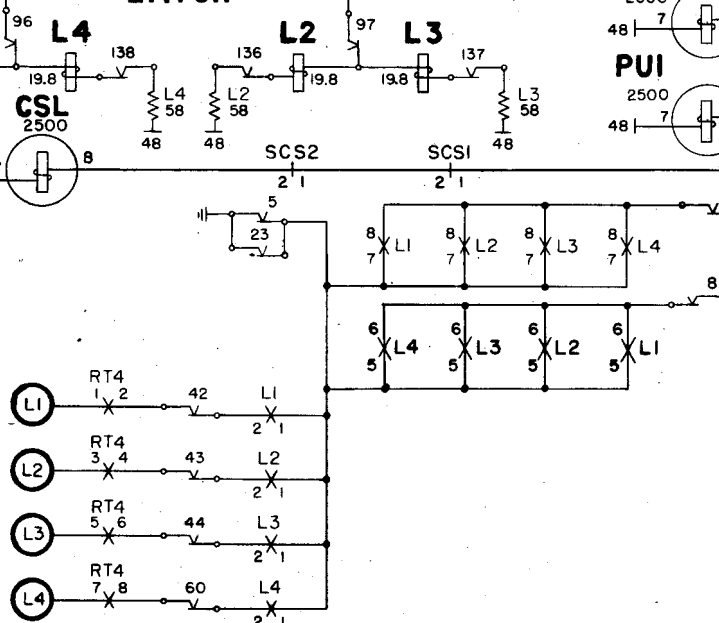
PULL-UP MAGNETS



LCH



LATCH



DECODER
CONNECT TO CARD TRANSLATOR

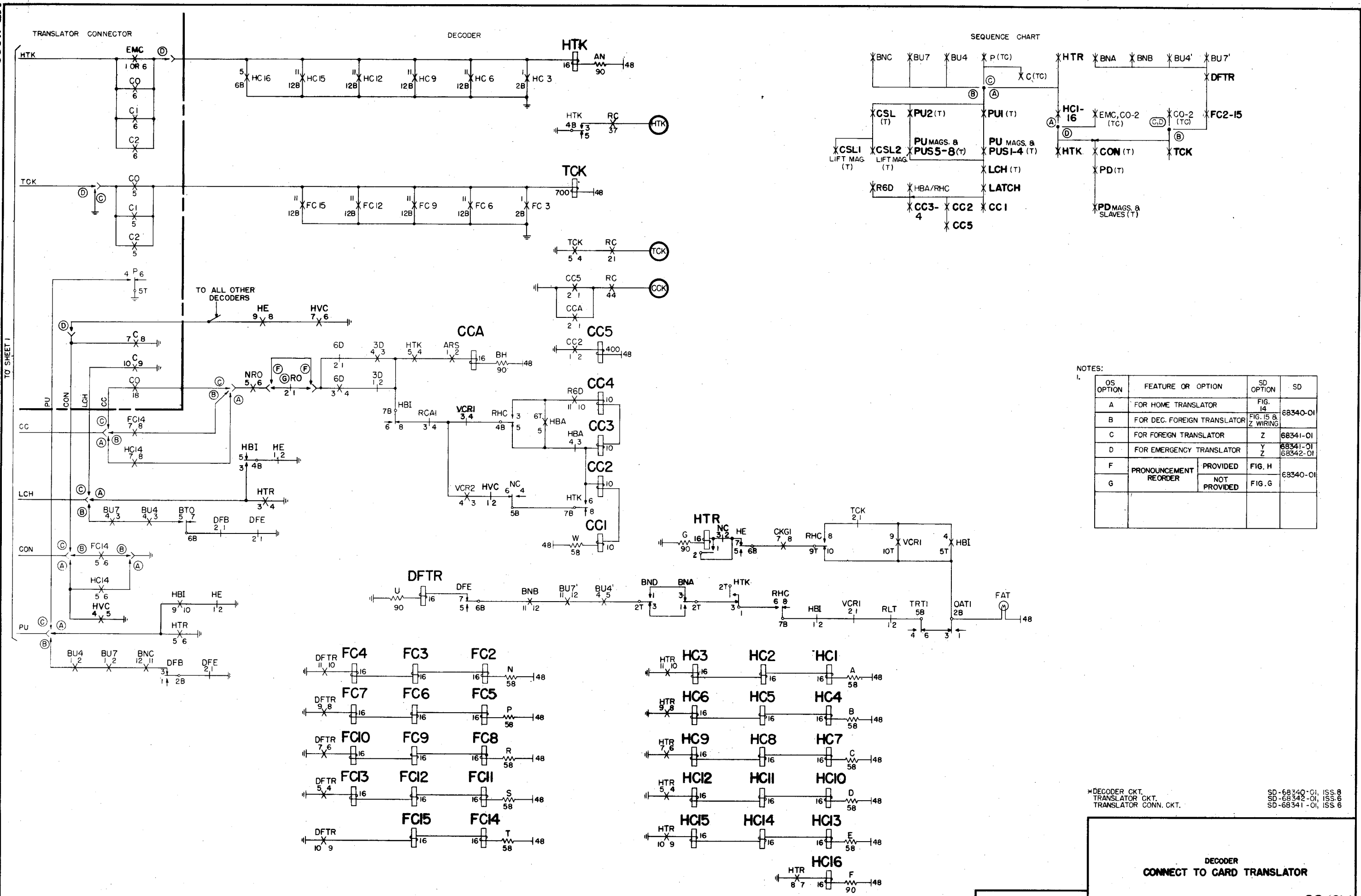
REVISED	1	10-51
DATE	8-10-51	9-23-53

2 SHEETS, SHEET 1

MP-11669

TO SHEET 2

ISSUE	1	DATE	8-10-51
DATE	8-10-51	ISSUE	1



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR HOME TRANSLATOR	FIG. I4	68340-01
B	FOR DEC. FOREIGN TRANSLATOR	FIG. I5 & Z WIRING	
C	FOR FOREIGN TRANSLATOR	Z	68341-01
D	FOR EMERGENCY TRANSLATOR	Y Z	68341-01 68342-01
F	PRONOUNCEMENT REORDER	PROVIDED NOT PROVIDED	FIG. H FIG. G
G			

*DECODER CKT. TRANSLATOR CKT. TRANSLATOR CONN. CKT. SD-68340-01, ISS-8 SD-68342-01, ISS-6 SD-68341-01, ISS-6

DECODER CONNECT TO CARD TRANSLATOR

ISSUE	1	2	3
DATE	9-17-51	9-30-51	

TABLE A

OPERATION OF AO-D7 CODE BAR MAGNETS																								
INCOMING SENDER		DECODER CONNECTOR		DECODER								TRANSLATOR CONNECTOR		CARD TRANSLATOR										
REGISTER RELAY CONTACTS	CONNECTOR RELAY CONTACTS	TROUBLE RECORDER CUT-IN RELAY CONTACTS	PUNCH	CODE CUT-IN RELAY CONTACTS	LEAD TO SHEET 1	HOME TRANSLATOR CONN. RELAY CONTACTS	DECODER FOREIGN-AREA TRANSLATOR CONN. RELAY CONTACTS	CONNECTOR RELAY CONTACTS	CODE BAR RELAYS	RES.	JACK SPRING	CODE BAR MAGNETS	JACK SPRING	CODE BAR SLAVE RELAY CONTACTS										
AO	20	20	RT1	0	AO	1T	CC1	2T	AO	4T	HC11	3T	4T	FC11	3T	20	AO	AO	18	AO	9	5T	SA0	6T
A1	21	21	RT1	1	A1	3T	CC1	4T	A1	6T	HC11	5T	6T	FC11	5T	21	A1	A1	19	A1	27	9T	SA1	10T
A2	22	22	RT1	2	A2	5T	CC1	6T	A2	8T	HC11	7T	8T	FC11	7T	22	A2	A2	20	A2	45	9T	SA2	10T
A4	23	23	RT1	3	A4	7T	CC1	8T	A4	10B	HC11	9B	10B	FC11	9B	23	A4	A4	21	A4	63	9T	SA4	10T
A7	24	24	RT1	4	A7	9T	CC1	10T	A7	12B	HC11	11B	12B	FC11	11B	24	A7	A7	22	A7	81	9T	SA7	10T
BO	30	30	RT	54	BO	1B	CC1	2B	BO	2B	HC11	1B	2B	FC11	1B	30	BO	BO	36	BO	10	5T	SB0	6T
B1	31	31	RT	55	B1	3B	CC1	4B	B1	4B	HC11	3B	4B	FC11	3B	31	B1	B1	37	B1	28	9T	SB1	10T
B2	32	32	RT	56	B2	5B	CC1	6B	B2	6B	HC11	5B	6B	FC11	5B	32	B2	B2	38	B2	46	9T	SB2	10T
B4	33	33	RT	57	B4	7B	CC1	8B	B4	8B	HC11	7B	8B	FC11	7B	33	B4	B4	39	B4	64	9T	SB4	10T
B7	34	34	RT	58	B7	9B	CC1	10B	B7	12T	HC12	11T	12T	FC12	11T	34	B7	B7	40	B7	82	9T	SB7	10T
CC	40	40	RT	49	CO	1T	CC2	2T	CO	2T	HC12	1T	2T	FC12	1T	40	CO	CO	54	CO	10	5T	SC0	6T
C1	41	41	RT	50	C1	3T	CC2	4T	C1	4T	HC12	3T	4T	FC12	3T	41	C1	C1	55	C1	28	9T	SC1	10T
C2	42	42	RT	51	C2	5T	CC2	6T	C2	6T	HC12	5T	6T	FC12	5T	42	C2	C2	56	C2	46	9T	SC2	10T
C4	43	43	RT	52	C4	7T	CC2	8T	C4	8T	HC12	7T	8T	FC12	7T	43	C4	C4	57	C4	64	9T	SC4	10T
C7	44	44	RT	53	C7	9T	CC2	10T	C7	10T	HC12	9T	10T	FC12	9T	44	C7	C7	78	C7	82	9T	SC7	10T
DO	25	25	RT	44	DO	1T	CC3	2T	NONE	2B	HC12	1B	2B	FC12	1B	25	DO	DO	72	DO	11	5T	SD0	6T
D1	26	26	RT	45	D1	3T	CC3	4T	NONE	4B	HC12	3B	4B	FC12	3B	26	D1	D1	73	D1	29	9T	SD1	10T
D2	27	27	RT	46	D2	5T	CC3	6T	NONE	6B	HC12	5B	6B	FC12	5B	27	D2	D2	74	D2	47	9T	SD2	10T
D4	28	28	RT	47	D4	7T	CC3	8T	NONE	8B	HC12	7B	8B	FC12	7B	28	D4	D4	75	D4	65	9T	SD4	10T
D7	29	29	RT	48	D7	9T	CC3	10T	NONE	10B	HC12	9B	10B	FC12	9B	29	D7	D7	76	D7	83	9T	SD7	10T

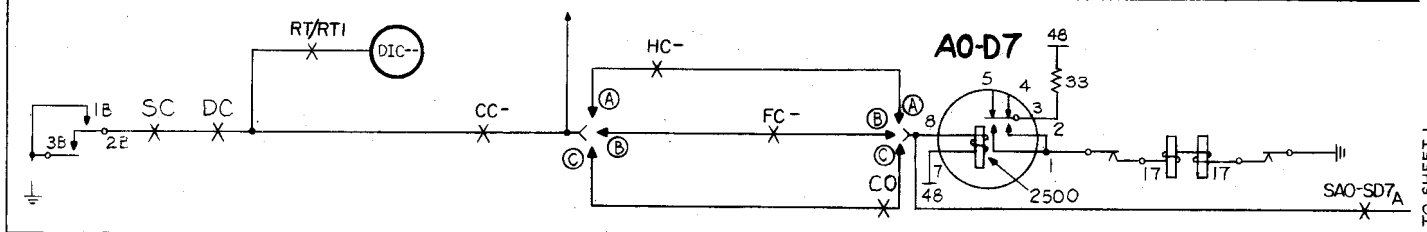


TABLE B

OPERATION OF E0-F7 CODE BAR MAGNETS																						
INCOMING SENDER		DECODER CONNECTOR		DECODER								TRANSLATOR CONNECTOR		CARD TRANSLATOR								
REGISTER RELAY CONTACTS	DESIGNATION OF LEAD TO SHEET 1	CONNECTOR RELAY CONTACTS	TBL. RCDR. CUT-IN RELAY CONTACTS	PUNCH	CODE CUT-IN RELAY CONTACTS	HOME TRANSLATOR CONN. RELAY CONTACTS	DECODER FOREIGN-AREA TRANSLATOR CONN. RELAY CONTACTS	CONNECTOR RELAY CONTACTS	CODE BAR RELAYS	RES.	JACK SPRING	CODE BAR MAGNETS	JACK SPRING	CODE BAR SLAVE RELAY CONTACTS								
E0	E0-A	E0-B	35	35	39	E0	1B	CC3	2E	4T	3T	4T	3T	35	E0	E0	90	E0	11	5T	SE0	6T
E1	E1-A	E1-B	36	36	40	E1	3B	CC3	4B	6T	5T	6T	5T	36	E1	E1	91	E1	29	9T	SE1	10T
E2	E2-A	E2-B	37	37	41	E2	5B	CC3	6B	8T	7T	8T	7T	37	E2	E2	92	E2	47	9T	SE2	10T
E4	E4-A	E4-B	38	38	42	E4	7B	CC3	8B	10T	9T	10T	9T	38	E4	E4	93	E4	65	9T	SE4	10T
E7	E7-A	E7-B	39	39	43	E7	9B	CC3	10B	12T	11T	12T	11T	39	E7	E7	94	E7	83	9T	SE7	10T
FO	FO-A	FO-B	45	45	34	FO	1T	CC4	2T	2T	1T	2T	1T	45	FO	FO	108	FO	12	5T	SFO	6T
F1	F1-A	F1-B	46	46	35	F1	3T	CC4	4T	4B	3B	4B	3B	46	F1	F1	109	F1	30	9T	SF1	10T
F2	F2-A	F2-B	47	47	36	F2	5T	CC4	6T	6B	5B	6B	5B	47	F2	F2	110	F2	48	9T	SF2	10T
F4	F4-A	F4-B	48	48	37	F4	7T	CC4	8T	8B	7B	8B	7B	48	F4	F4	111	F4	66	9T	SF4	10T
F7	F7-A	F7-B	49	49	38	F7	9T	CC4	10T	10B	9B	10B	9B	49	F7	F7	112	F7	84	9T	SF7	10T

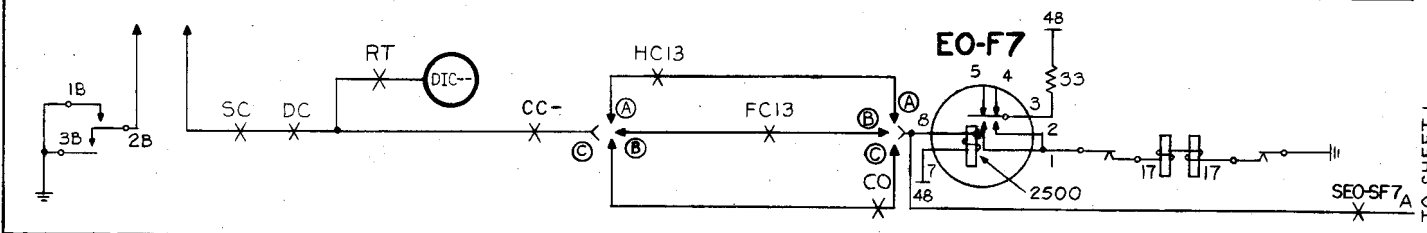


TABLE C

OPERATION OF CODE BAR SLAVE RELAYS													
CARD TRANSLATOR													
JACK SPRINGS	CODE BAR MAGNET CONTACTS	JACK SPRINGS	CODE BAR SLAVE RELAYS & CONTACTS	RES.	TROUBLE RECORDER CUT-IN RELAY CONTACTS	PUNCH							
5 & 23	CS1	13	4B	SCS1	3B	SCS1	8B	RT	7B	CS1			
5 & 23	VO	14	7T	SVO	8T	SVO	6B	RT	5B	VO			
5 & 23	NVO	15	7T	SNVO	8T	SNVO	4B	RT	3B	NVO			
5 & 23	AO	31	4B	SA0	3B	SA0	4T	RT3	3T	AO			
5 & 23	A1	32	6B	SA1	5B	SA1	6T	RT3	5T	A1			
5 & 23	A2	33	6B	SA2	5B	SA2	8T	RT3	7T	A2			
5 & 23	A4	34	6B	SA4	5B	SA4	10T	RT3	9T	A4			
5 & 23	A7	35	6B	SA7	5B	SA7	12T	RT3	11T	A7			
5 & 23	BO	49	4B	SBO	3B	SBO	4B	RT3	3B	BO			
5 & 23	B1	50	6B	SB1	5B	SB1	6B	RT3	5B	B1			
5 & 23	B2	51	6B	SB2	5B	SB2	8B	RT3	7B	B2			
5 & 23	B4	52	6B	SB4	5B	SB4	10B	RT3	9B	B4			
5 & 23	B7	53	6B	SB7	5B	SB7	12B	RT3	11B	B7			
5 & 23	CO	67	4B	SCO	3B	SCO	4T	RT2	3T	CO			
5 & 23	C1	68	6B	SC1	5B	SC1	6T	RT2	5T	C1			
5 & 23	C2	69	6B	SC2	5B	SC2	8T	RT2	7T	C2			
5 & 23	C4	70	6B	SC4	5B	SC4	10T	RT2	9T	C4			
5 & 23	C7	71	6B	SC7	5B	SC7	12T	RT2	11T	C7			
41 & 59	DO	85	4B	SD0	3B	SD0	4B	RT2	3B	DO			
41 & 59	D1	86	6B	SD1	5B	SD1	6B	RT2	5B	D1			
41 & 59	D2	87	6B	SD2	5B	SD2	8B	RT2	7B	D2			
41 & 59	D4	88	6B	SD4	5B	SD4	10B	RT2	9B	D4			
41 & 59	D7	89	6B	SD7	5B	SD7	12B	RT2	11B	D7			
41 & 59	EO	103	4B	SEO	3B	SEO	4T	RT1	3T	EO			
41 & 59	E1	104	6B	SE1	5B	SE1	6T	RT1	5T	E1			
41 & 59	E2	105	6B	SE2	5B	SE2	8T	RT1	7T	E2			
41 & 59	E4	106	6B	SE4	5B	SE4	10T	RT1	9T	E4			
41 & 59	E7	107	6B	SE7	5B	SE7	12T	RT1	11T	E7			
41 & 59	FO	121	4B	SFO	3B	SFO	4B	RT1	3B	FO			
41 & 59	F1	122	6B	SF1	5B	SF1	6B	RT1	5B	F1			
41 & 59	F2	123	6B	SF2	5B	SF2	8B	RT1	7B	F2			
41 & 59	F4	124	6B	SF4	5B	SF4	10B	RT1	9B	F4			
41 & 59	F7	125	6B	SF7	5B	SF7	12B	RT1	11B	F7			
41 & 59	CG0	139	8B	SCG0	7B	SCG0	2B	RT1	1B	CG0			
41 & 59	CG1	140	7B	SCG1	8B	SCG1	10T	RT	9T	CG1			
41 & 59	CG2	141	10B	SCG2	9B	SCG2	12T	RT	11T	CG2			
41 & 59	CG4	142	8B	SCG4	7B	SCG4	2B	RT	1B	CG4			
41 & 59	CS2	143	4B	SCS2	3B	SCS2	10B	RT	9B	CS2			

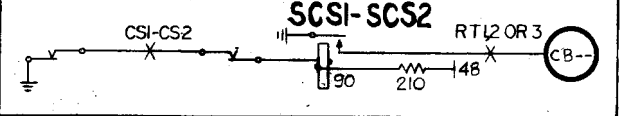
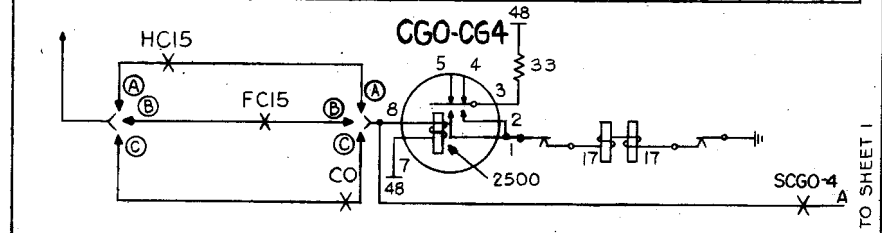


TABLE D

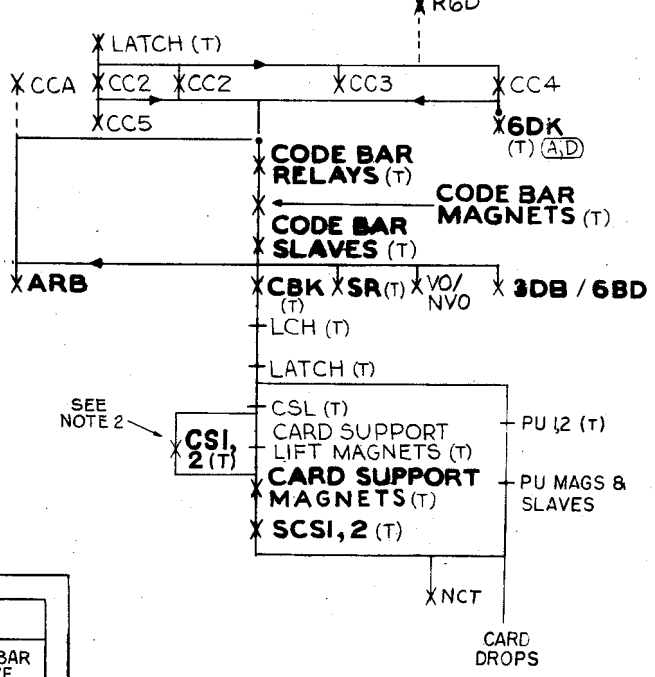
OPERATION OF CARD GROUPING CODE BAR MAGNETS													
DECODER		TRANSLATOR CONNECTOR		CARD TRANSLATOR									
DESIGNATION OF LEAD TO SHEET 1	HOME TRANSLATOR CONN. RELAY CONTACTS	DECODER FOREIGN-AREA RELAY CONTACTS	CONNECTOR RELAY CONTACTS	CODE BAR RELAYS	RES.	JACK SPRING	CODE BAR MAGNETS	JACK SPRING	CODE BAR SLAVE RELAY CONTACTS				
CG0	3T	4T	3T	4T	50	CG0	CG0	126	CG0	12	9T	SCG0	10T
CG1	5T	6T	5T	6T	51	CG1	CG1	127	CG1	30	9T	SCG1	10T
CG2	7T	8T	7T	8T	52	CG2	CG2	128	CG2	48	9T	SCG2	10T
CG4	9T	10T	9T	10T	53	CG4	CG4	129	CG4	66	9T	SCG4	10T



NOTES:

- OS OPTION | FEATURE OR OPTION | SD OPTION | SD
 - A | FOR HOME TRANSLATOR | FIG. 14 | 68340-01
 - B | FOR DECODER FOREIGN TRANSLATOR | FIG. 15 | 68340-01
 - C | FOR FOREIGN TRANSLATOR | Z | 68341-01
 - D | FOR EMERGENCY TRANSLATOR | FIG. 3 & V | 68342-01
 - E | 1 DIGIT TX CALLS | LOOPED WIRING | 68221-01
 - F | 2,3,OR 2 & 3 DIGIT TX CALLS | XWB | 68423-01
- CS1 & 2 MAGNETS ARE ENERGIZED BY CS1 & 2 RELAYS OPERATED, BUT DO NOT OPERATE UNTIL CARD SUPPORT LIFT MAGNETS ARE DE-ENERGIZED.
 - LEADS 1 & 2 CONNECT TO AO-A7 AS REQUIRED TO AGREE WITH 1ST DIGIT OF ROUTE RELAY NUMBER.
 - LEADS 3 & 4 CONNECT TO BO-B7 AS REQUIRED TO AGREE WITH 2ND DIGIT OF ROUTE RELAY NUMBER.

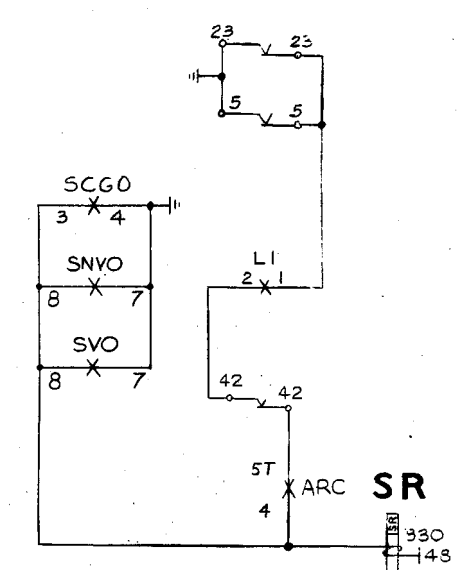
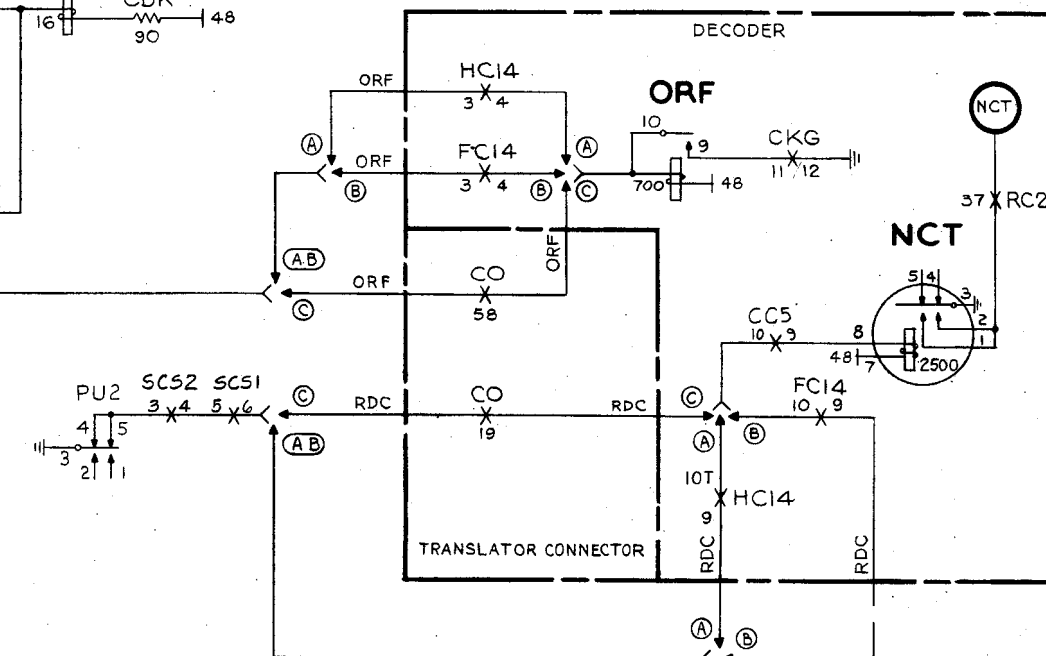
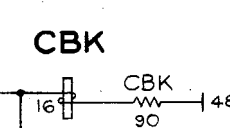
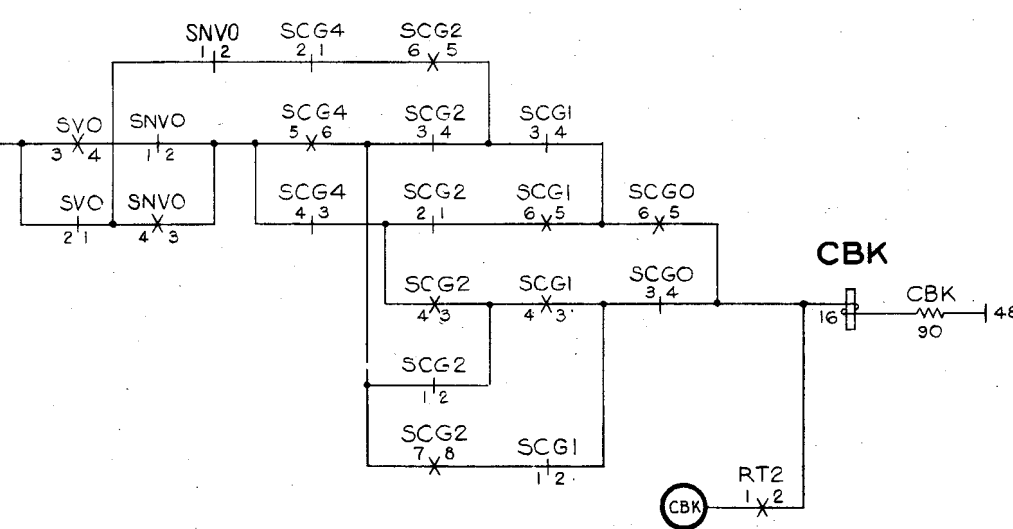
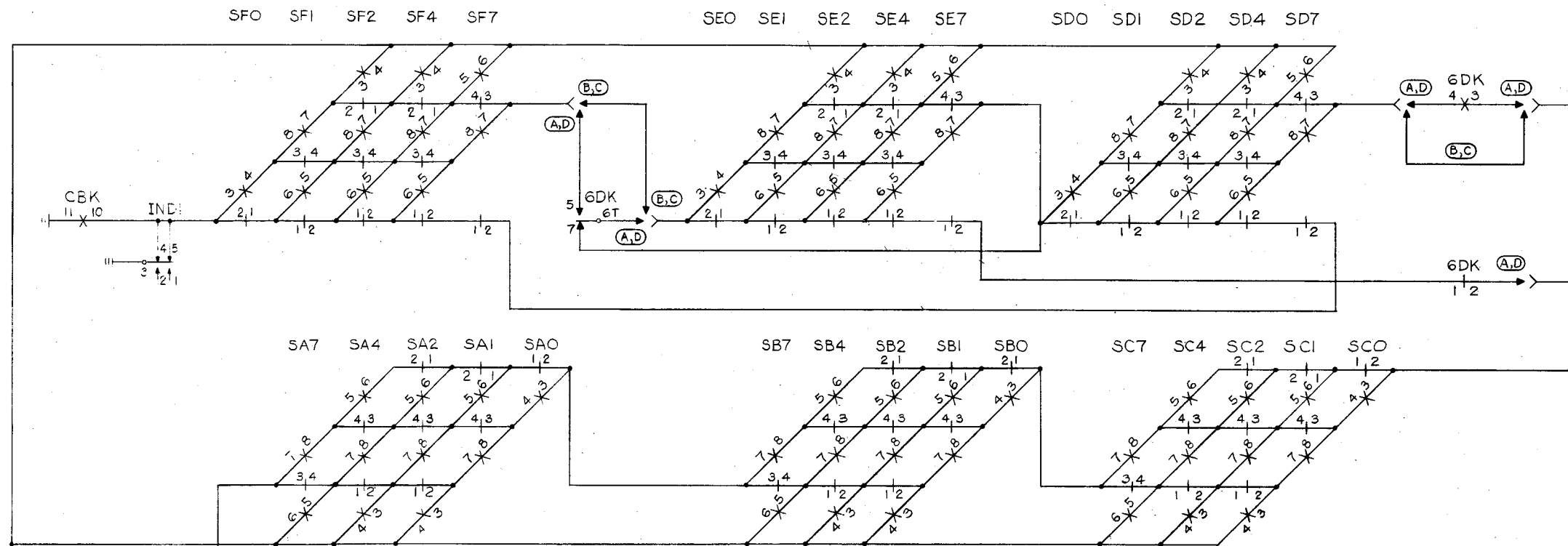
SEQUENCE CHART



- INCOMING SENDER CKT DP 4M | SD-68423-

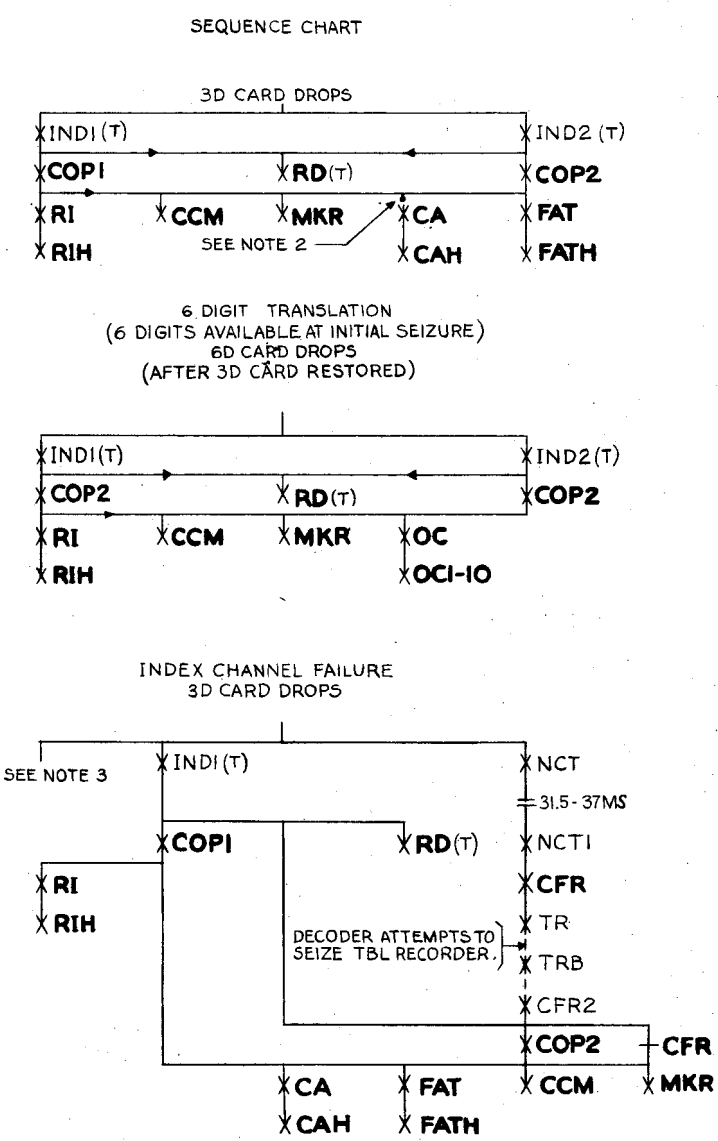
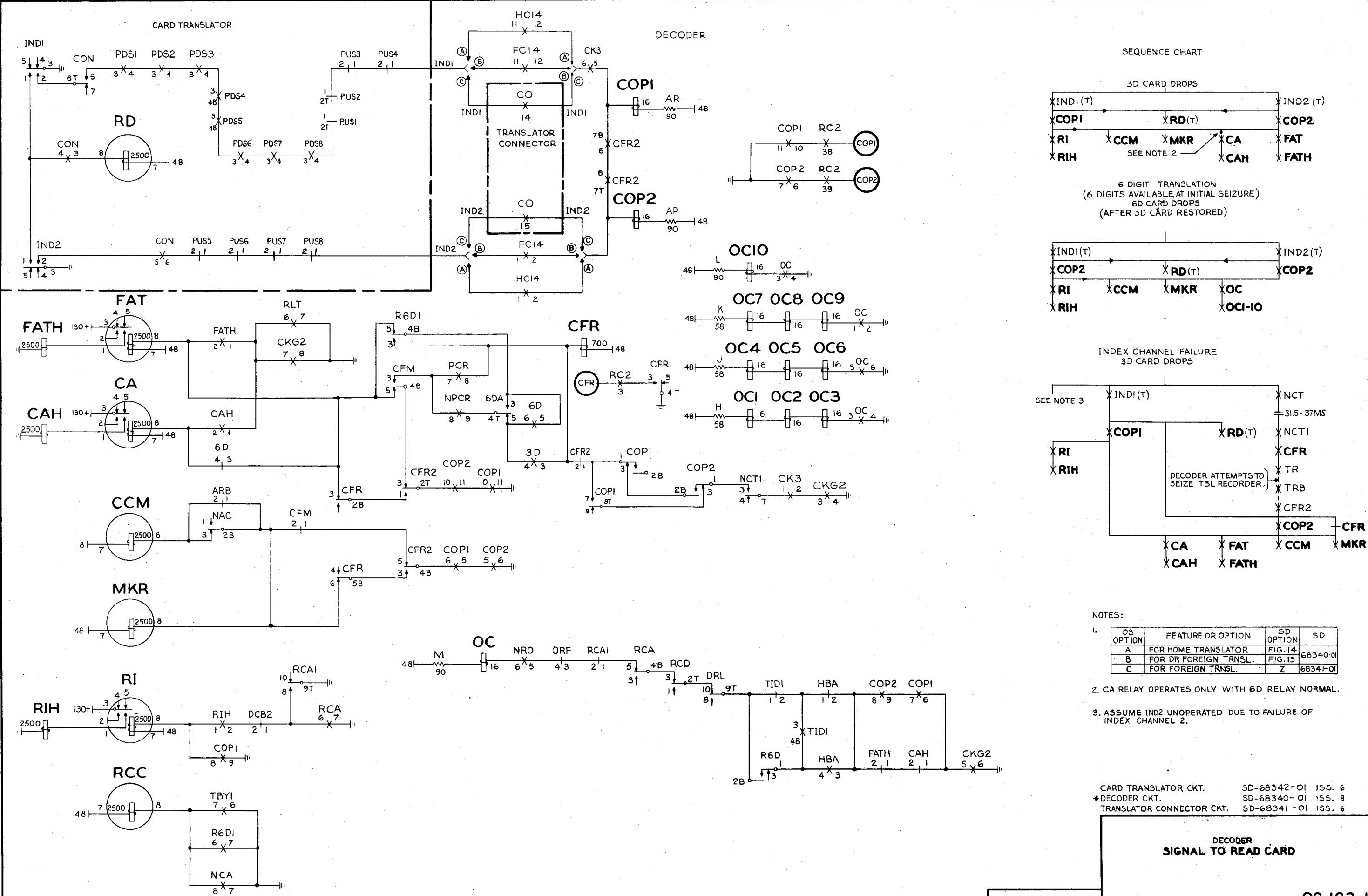
ISSUE	1	APR 51	2	MAY 51
DATE	9-17-51		9-30-51	

CARD TRANSLATOR



DECODER INPUT INFORMATION TO CARD TRANSLATOR

ISSUE	DATE
1	5-17-57
2	9-20-58



NOTES:

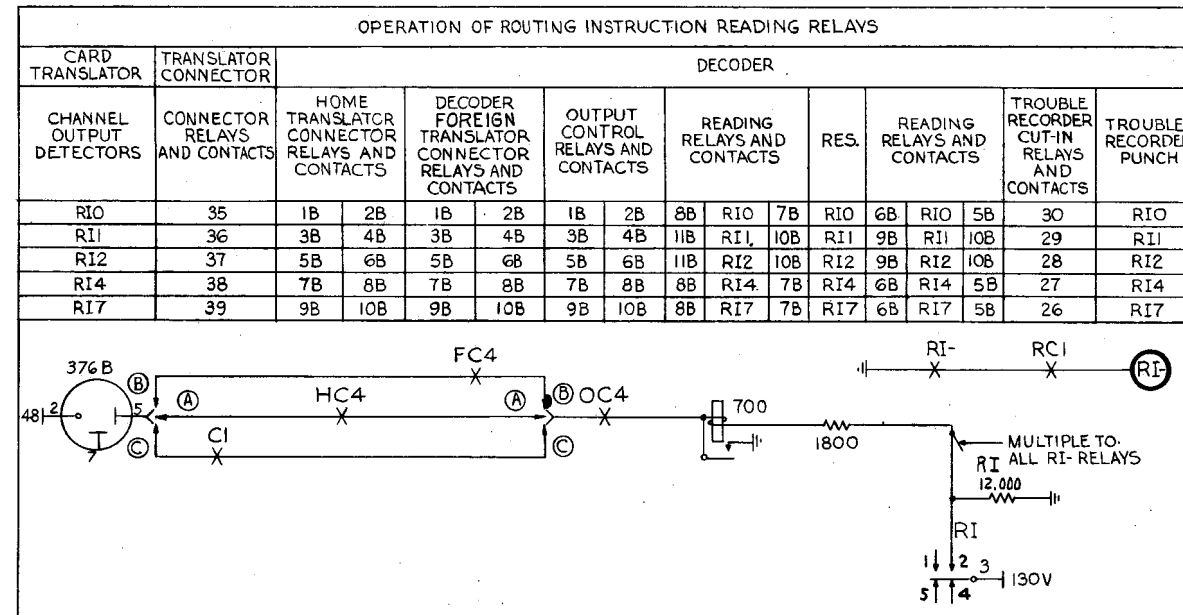
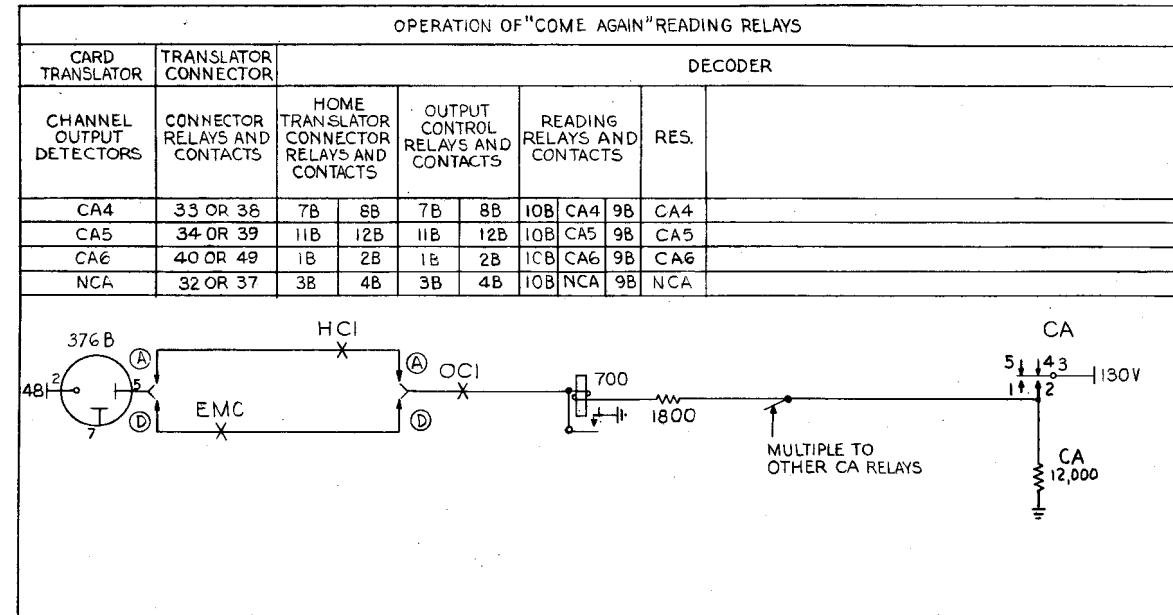
- | OS OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|-----------------------|-----------|----------|
| A | FOR HOME TRANSLATOR | FIG. 14 | 68340-01 |
| B | FOR DR FOREIGN TRNSL. | FIG. 15 | 68341-01 |
| C | FOR FOREIGN TRNSL. | Z | 68341-01 |
- CA RELAY OPERATES ONLY WITH 6D RELAY NORMAL.
- ASSUME IND2 UNOPERATED DUE TO FAILURE OF INDEX CHANNEL 2.

CARD TRANSLATOR CKT. SD-68342-01 ISS. 6
 *DECODER CKT. SD-68340-01 ISS. 8
 TRANSLATOR CONNECTOR CKT. SD-68341-01 ISS. 6

**DECODER
 SIGNAL TO READ CARD**

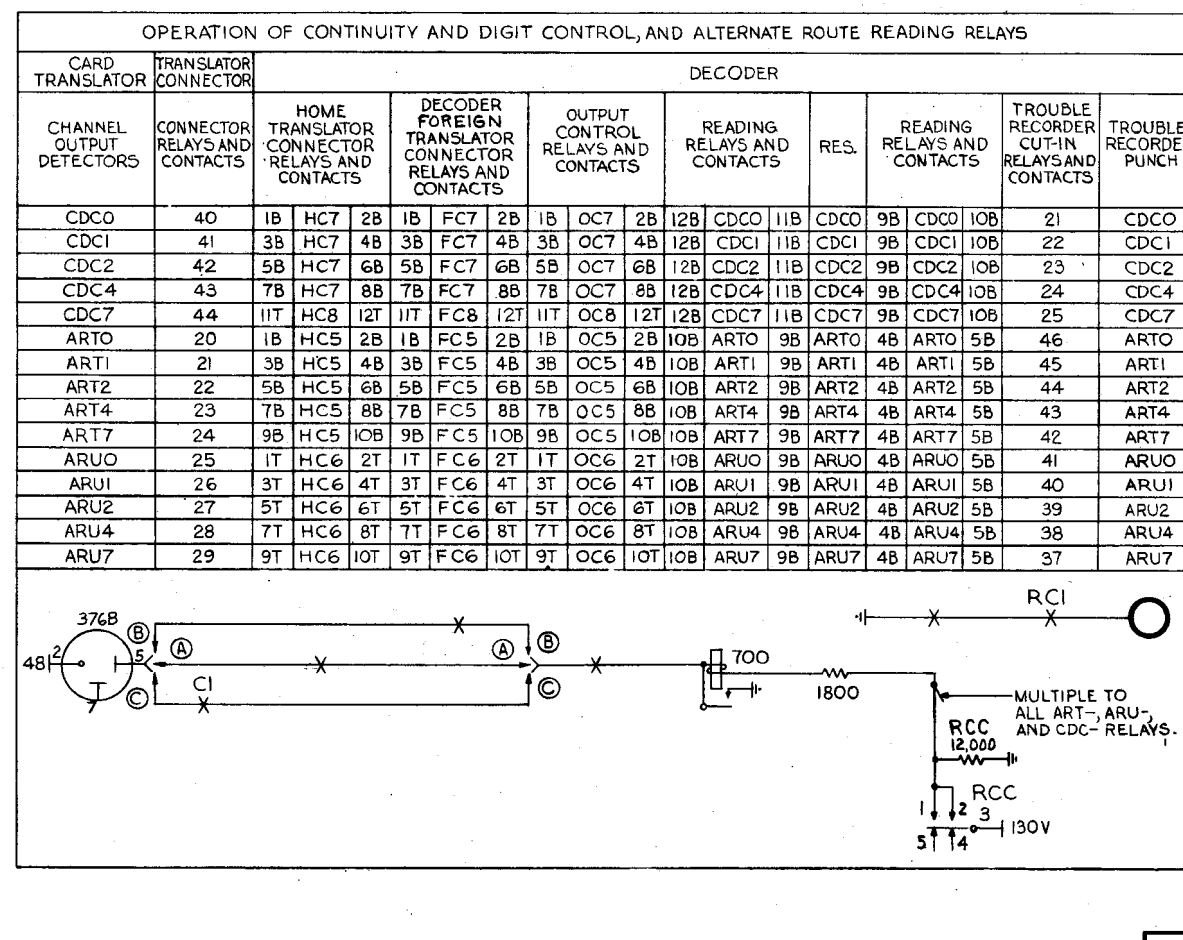
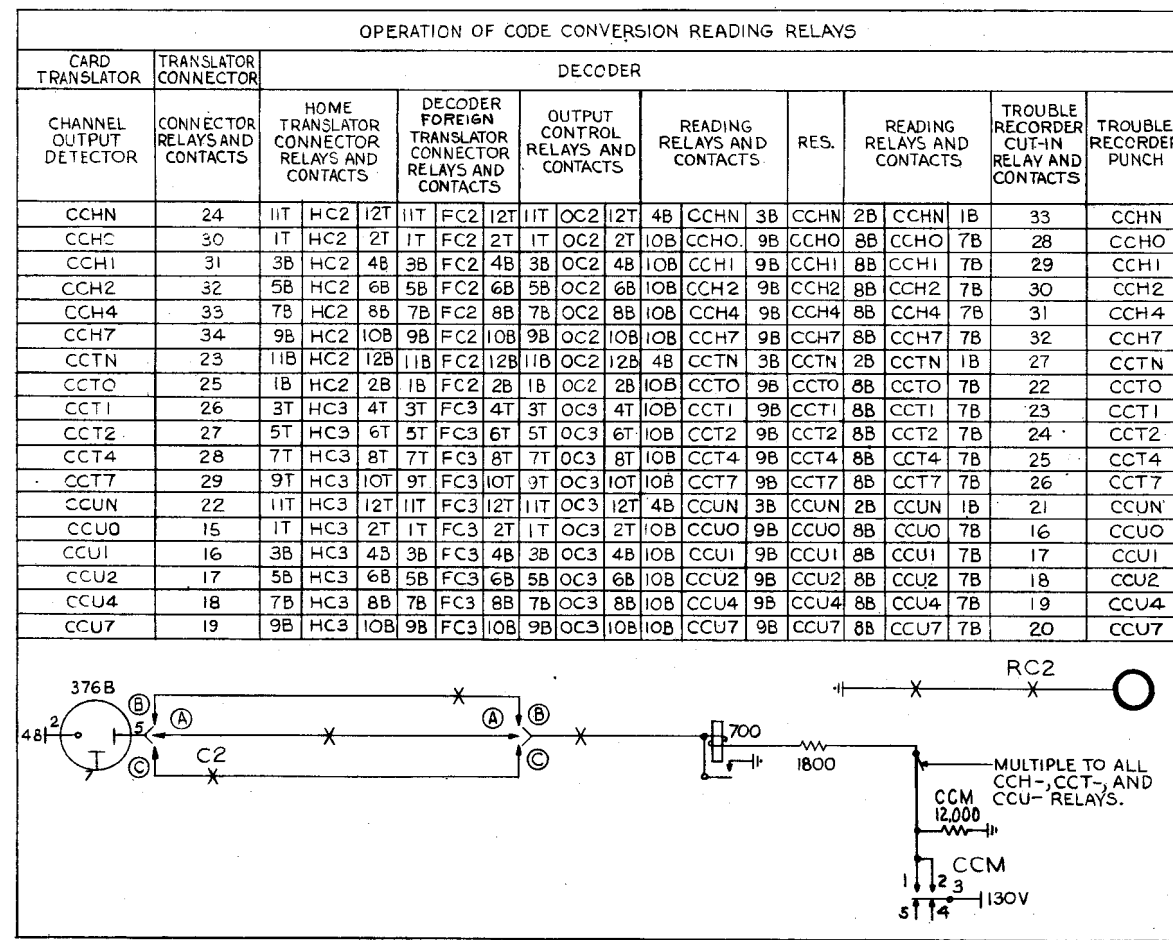
NO. 4A OR 4M TOLL

ISSUE	DATE	BY	CHKD
1	7-6-57		
2	9-7-53		



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR HOME TRANSLATOR	FIG. 14 Y	68340-01 68342-01
B	FOR DECODER FOREIGN TRANSLATOR	FIG. 15 W	68340-01 68342-01
C	FOR FOREIGN TRANSLATOR	Z	68341-01 68342-01
D	FOR EMERGENCY TRANSLATOR	FIG. 3 X	68341-01 68342-01



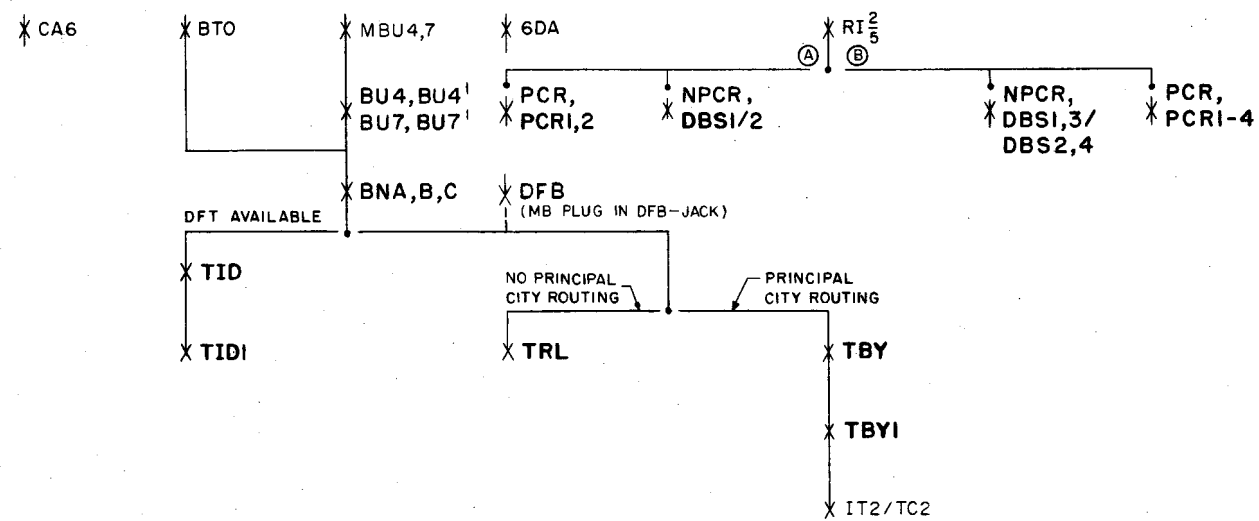
DECODER CONNECTOR CKT.	SD-68339-01, SS. 4
DECODER CKT.	SD-68340-01, SS. 8
TRANSLATOR CONNECTOR CKT.	SD-68341-01, SS. 6
CARD TRANSLATOR CKT.	SD-68342-01, SS. 6
MARKER CKT.	SD-68388-01, SS. 7
MARKER CONNECTOR CKT.	SD-68395-01, SS. 5

DECODER
READING CARD TRANSLATOR OUTPUT

SEQUENCE CHART

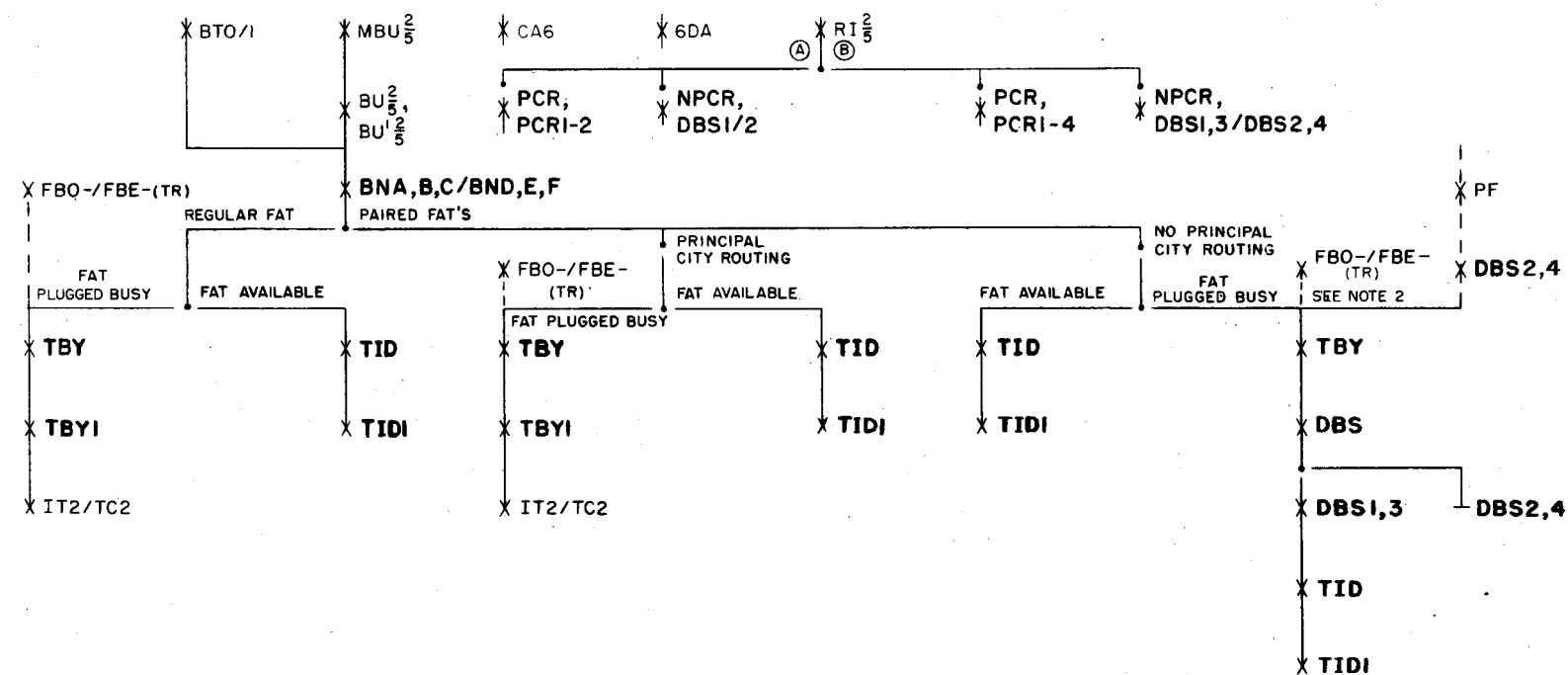
AVAILABILITY OF DF TRANS.

INFORMATION READ FROM 3D CARD. ASSUME 6 DIGITS AVAILABLE.



AVAILABILITY OF FA TRANS.

INFORMATION READ FROM 3D CARD. ASSUME 6 DIGITS AVAILABLE.



MISC. CKT. TROUBLE RECORDER

FIG. C

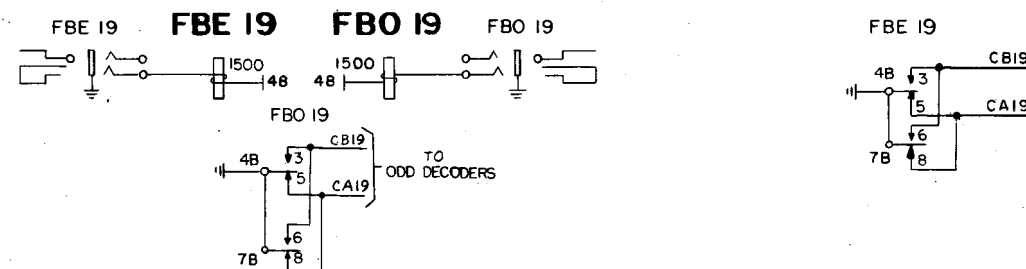
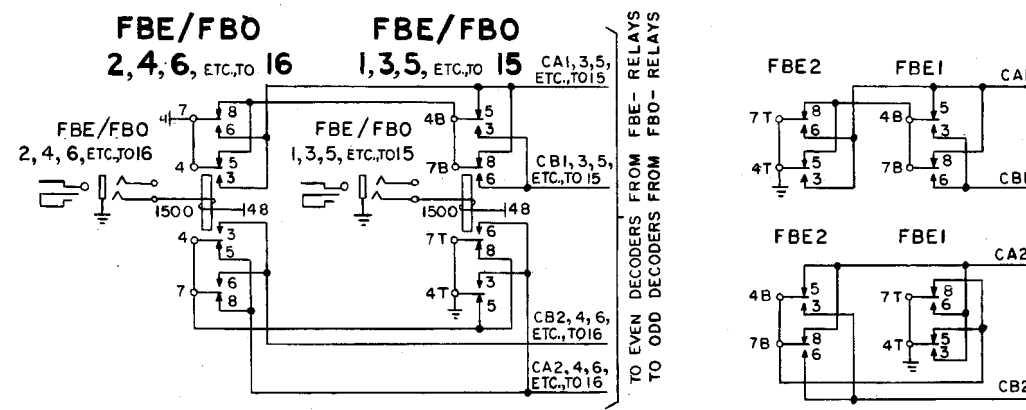


FIG. D

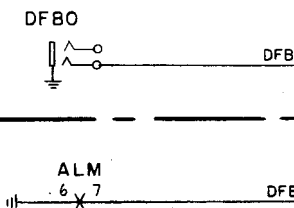


TO EVEN DECODERS FROM FBE- RELAYS
TO ODD DECODERS FROM FBO- RELAYS

- CB1
- CB2
- CB19
- CA19
- CA2
- CA1

TO SHEET 2

CARD TRANSLATOR



DECODER
CARD TRANSLATOR
AVAILABILITY CHECK

OS 165-1

3 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

ORDER AS BSP ITEM MP-11607

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U. S. A.

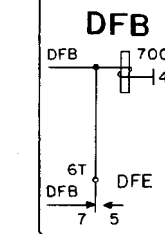
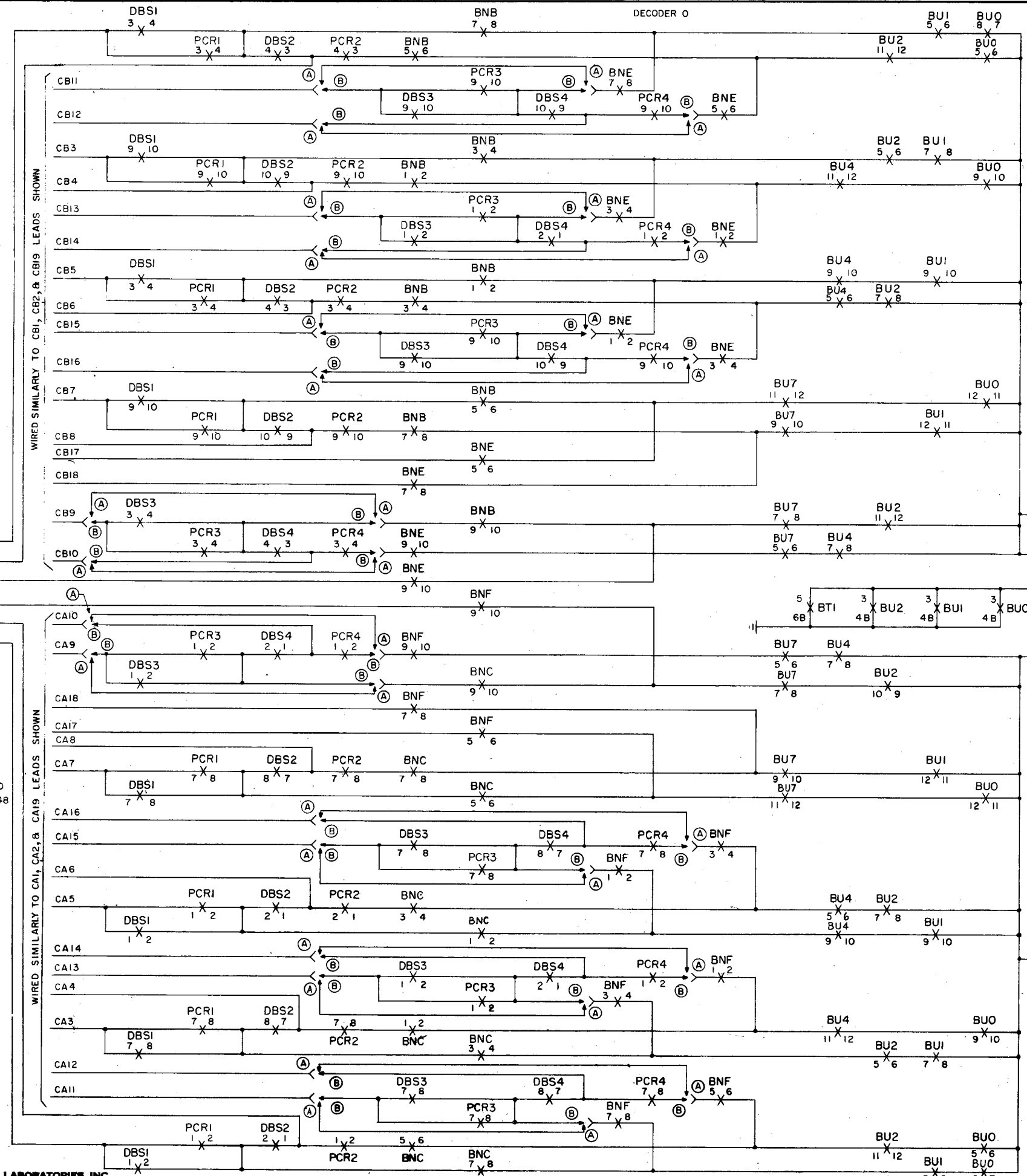
ISSUE	1	2	3	4	5	6	7	8	9	10	11	12
DATE	7-3-51											

3 SHEETS, SHEET 1

MP-11607

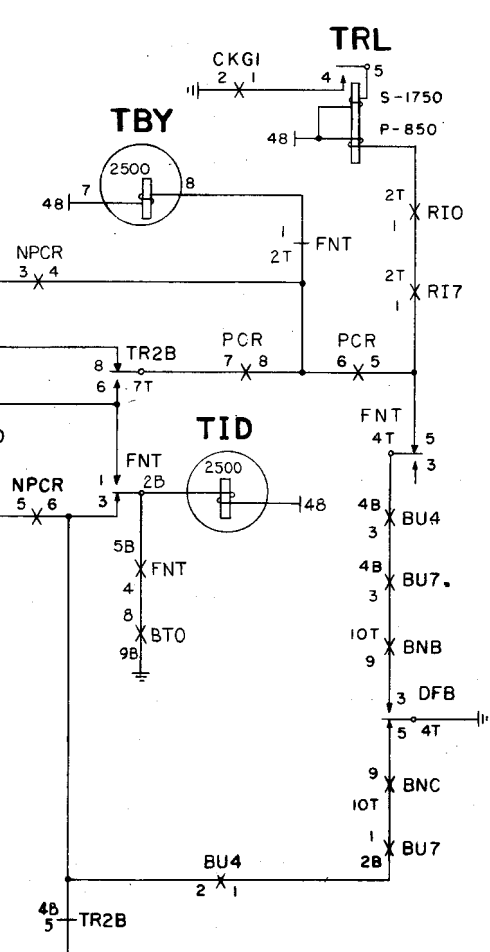
ISSUE	1	2	3	4
DATE	7-3-51	10-1-51		

TO SHEET 1



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	WHEN BOXES 1-8 ARE PAIRED	FIG. C	68340-01
B	WHEN BOXES 1-16 ARE PAIRED	FIG. C & D	
FIG. C	TO MAKE A NON-PAIRED TRANSLATOR BUSY TO ALL EVEN, ALL ODD, OR ALL DECODERS	FIG. 33	68392-01
FIG. D	TO MAKE EITHER ONE OF A PAIR OF TRANSLATORS BUSY TO ALL EVEN, ALL ODD, OR ALL DECODERS	FIG. 66	68392-01



CARD TRANSLATOR CIRCUIT SD-68342-01, ISS. 6
 *DECODER CIRCUIT SD-68340-01, ISS. 8
 MISC. CKT. TBL. RECORDER FRAME SD-68392-01, ISS. 5
 TRANSLATOR CONN. CKT. SD-68341-01, ISS. 6

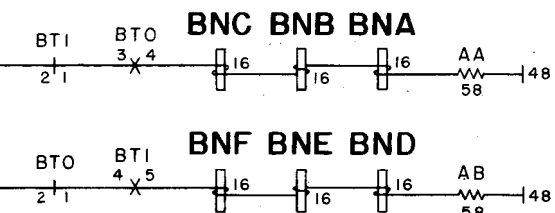
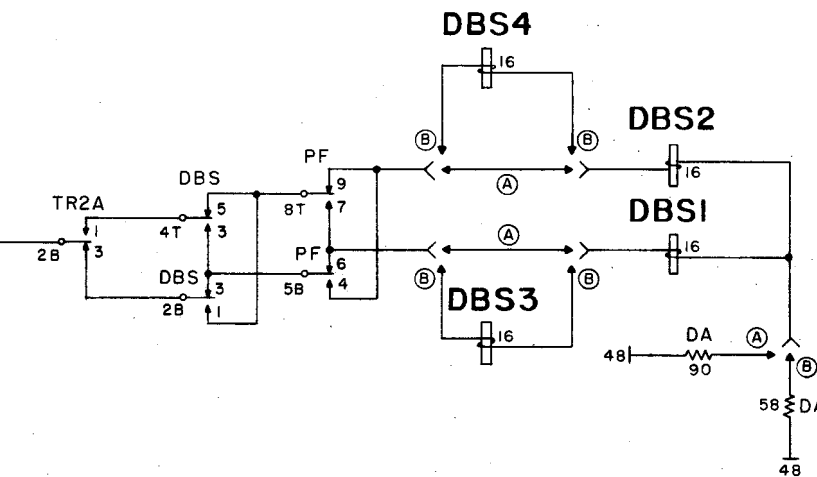
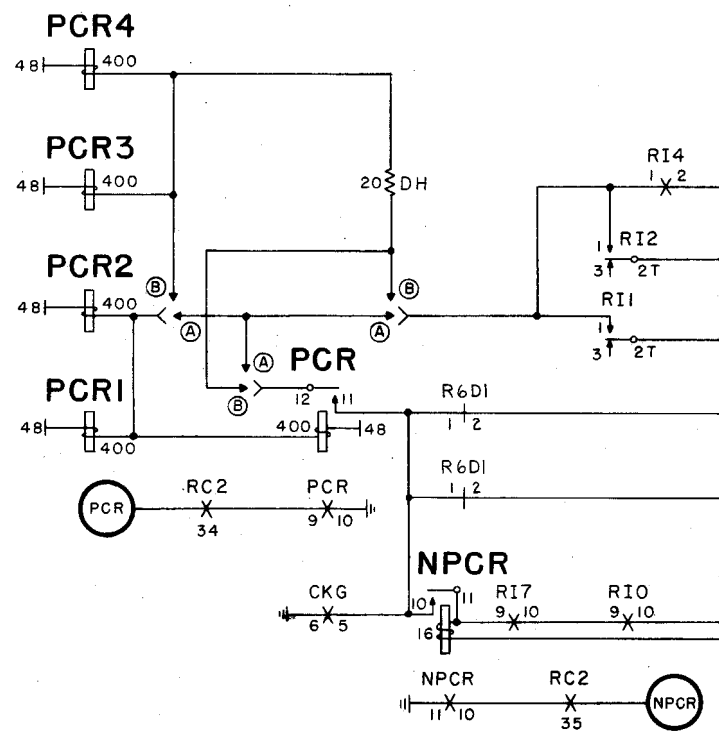
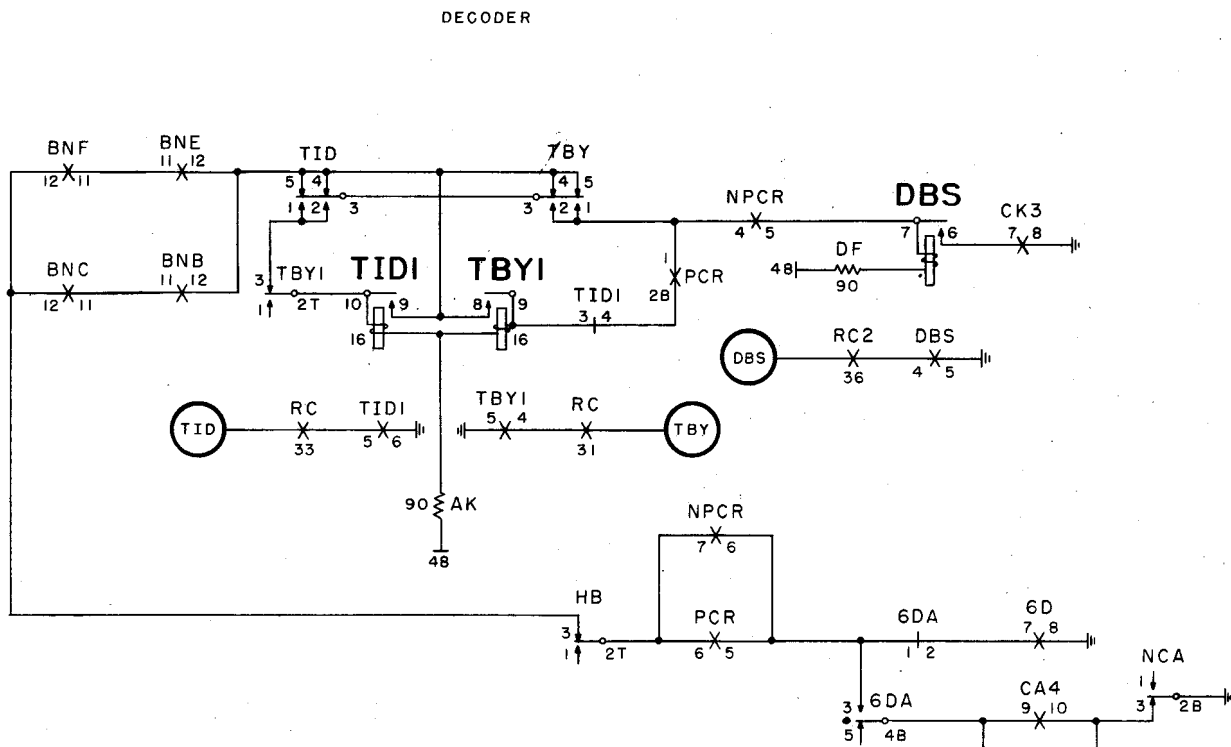
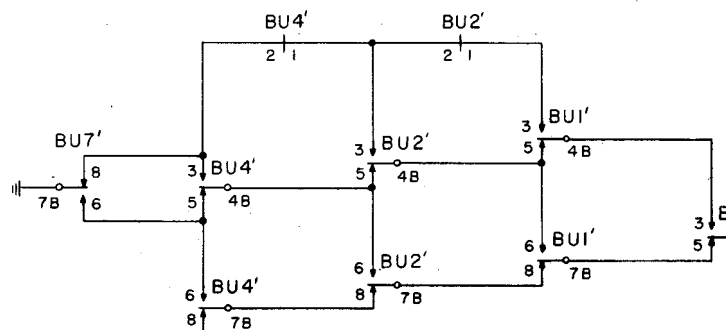
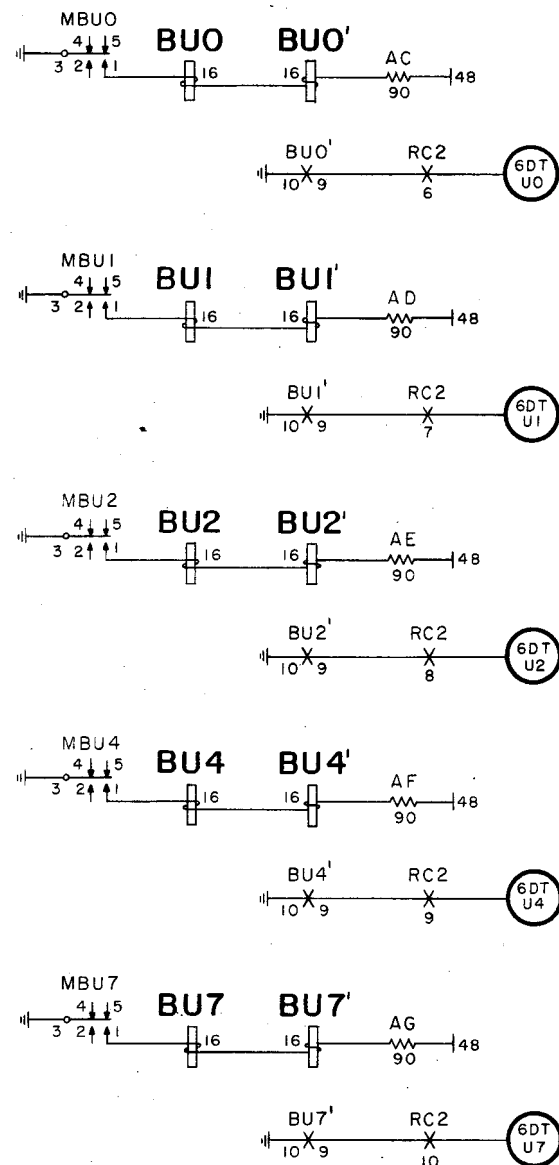
**DECODER
CARD TRANSLATOR
AVAILABILITY CHECK**

NO. 4A OR 4M TOLL

3 SHEETS, SHEET 2

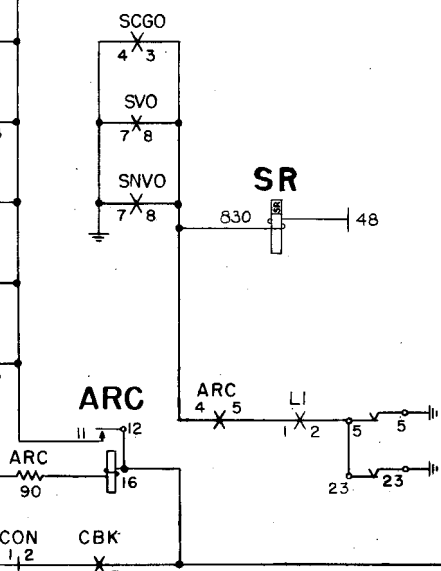
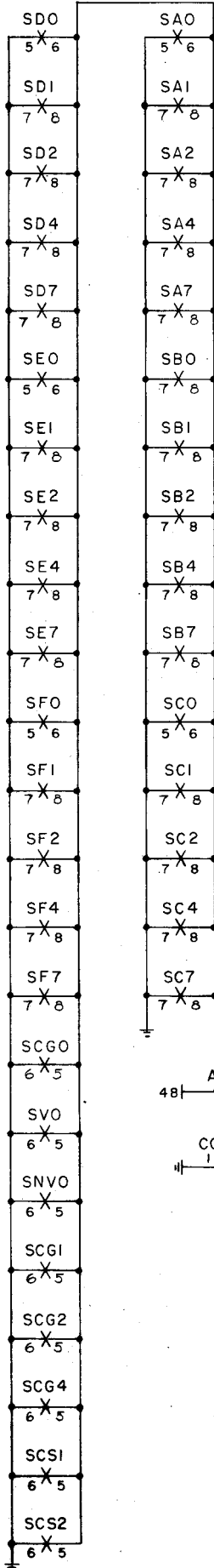
OS 165-1

ISSUE	1	2	3
DATE	7-3-51	10-1-59	

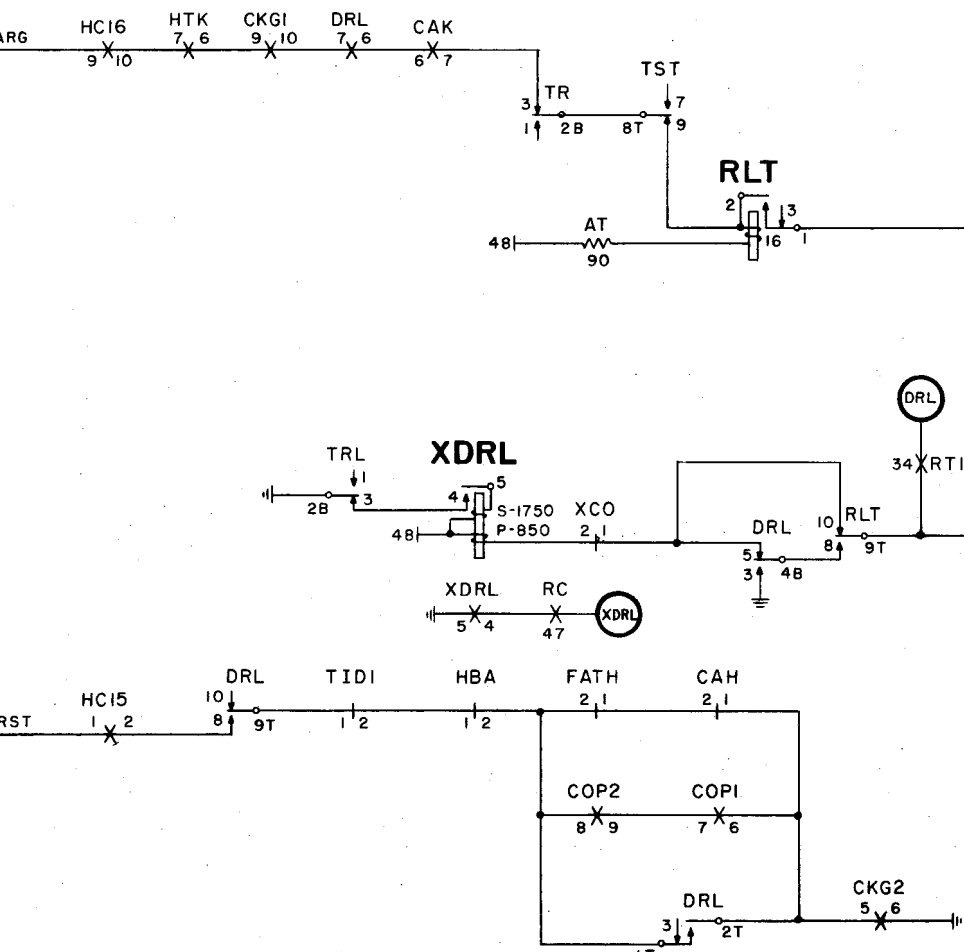
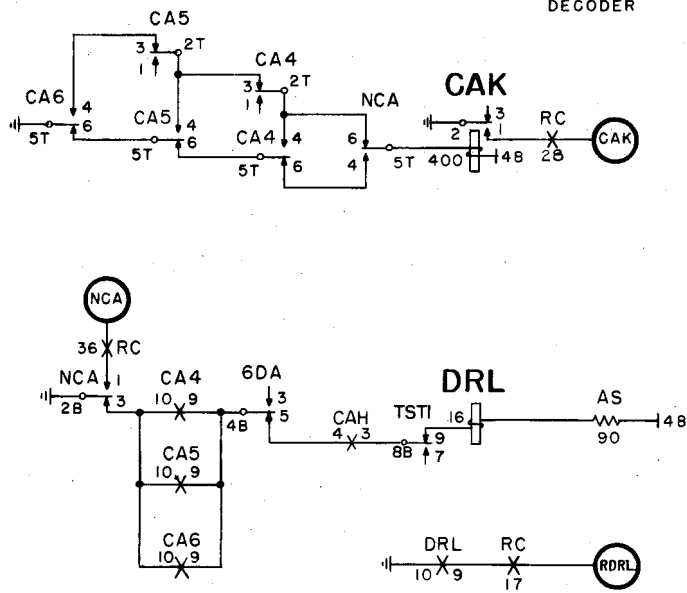


ISSUE	1	2
DATE	6-27-51	7-8-53

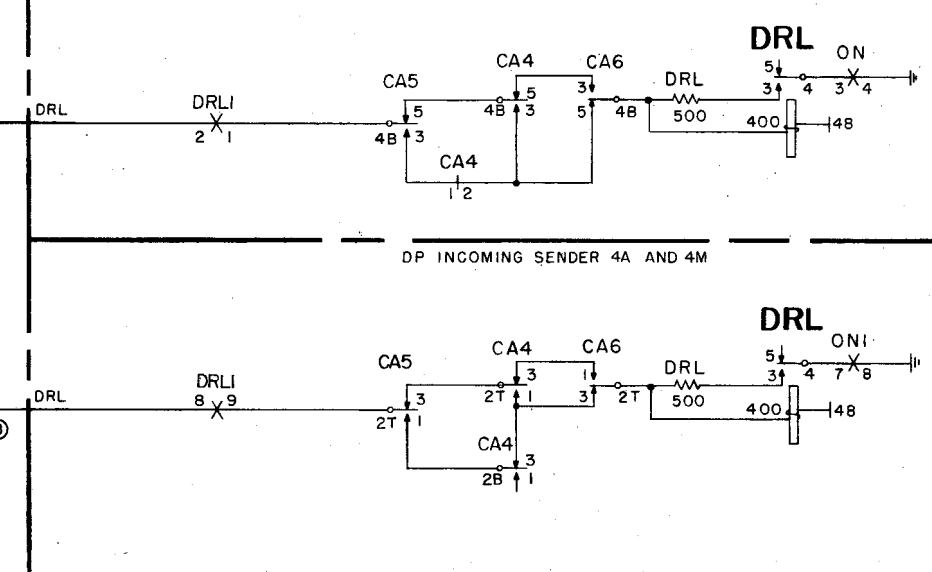
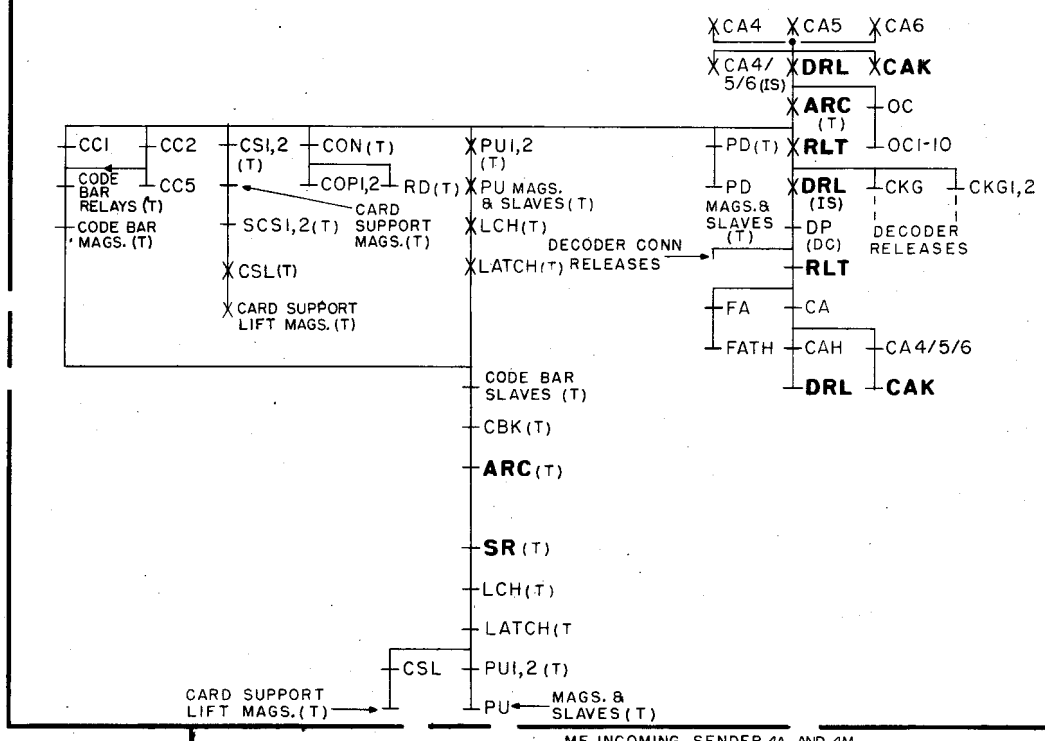
CARD TRANSLATOR



DECODER



SEQUENCE CHART

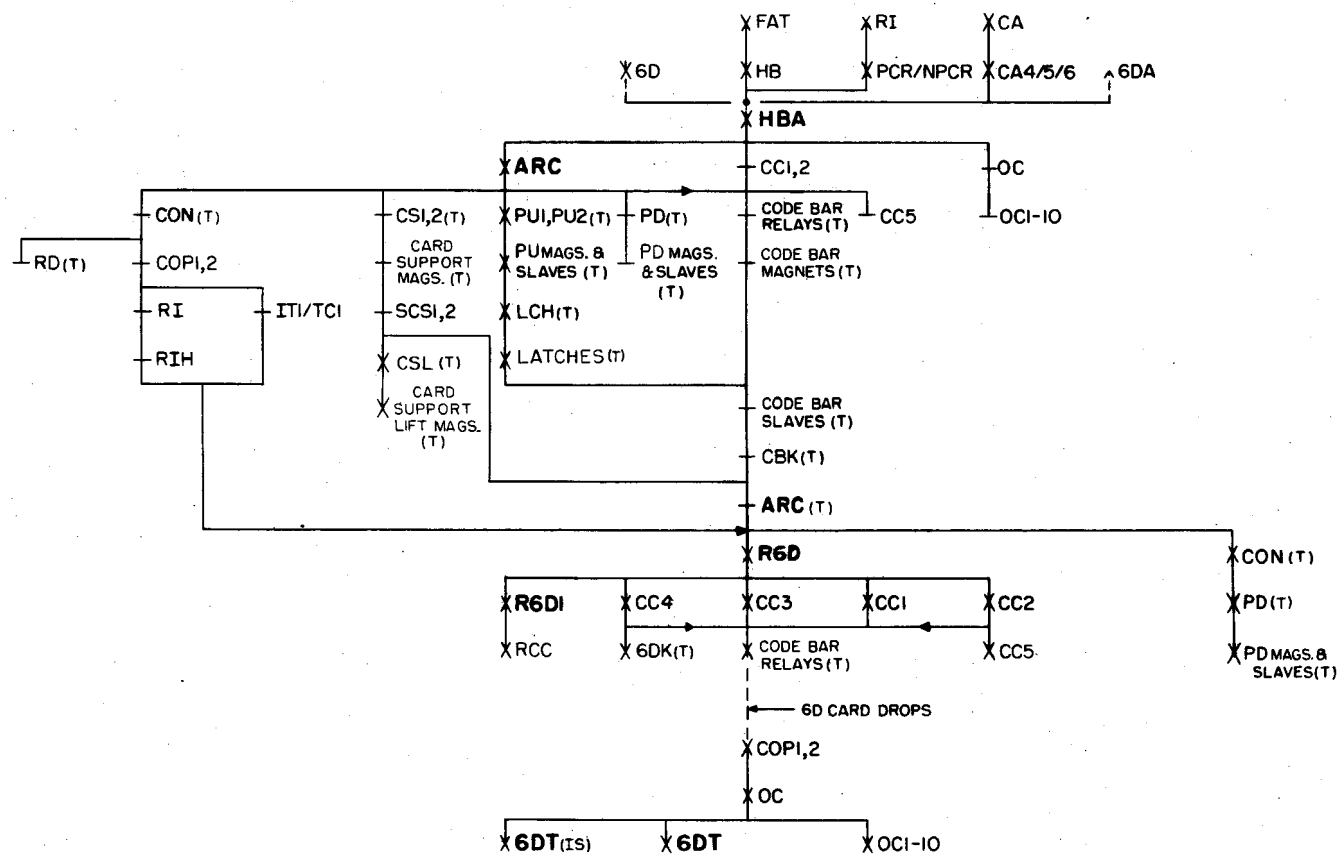


NOTES:

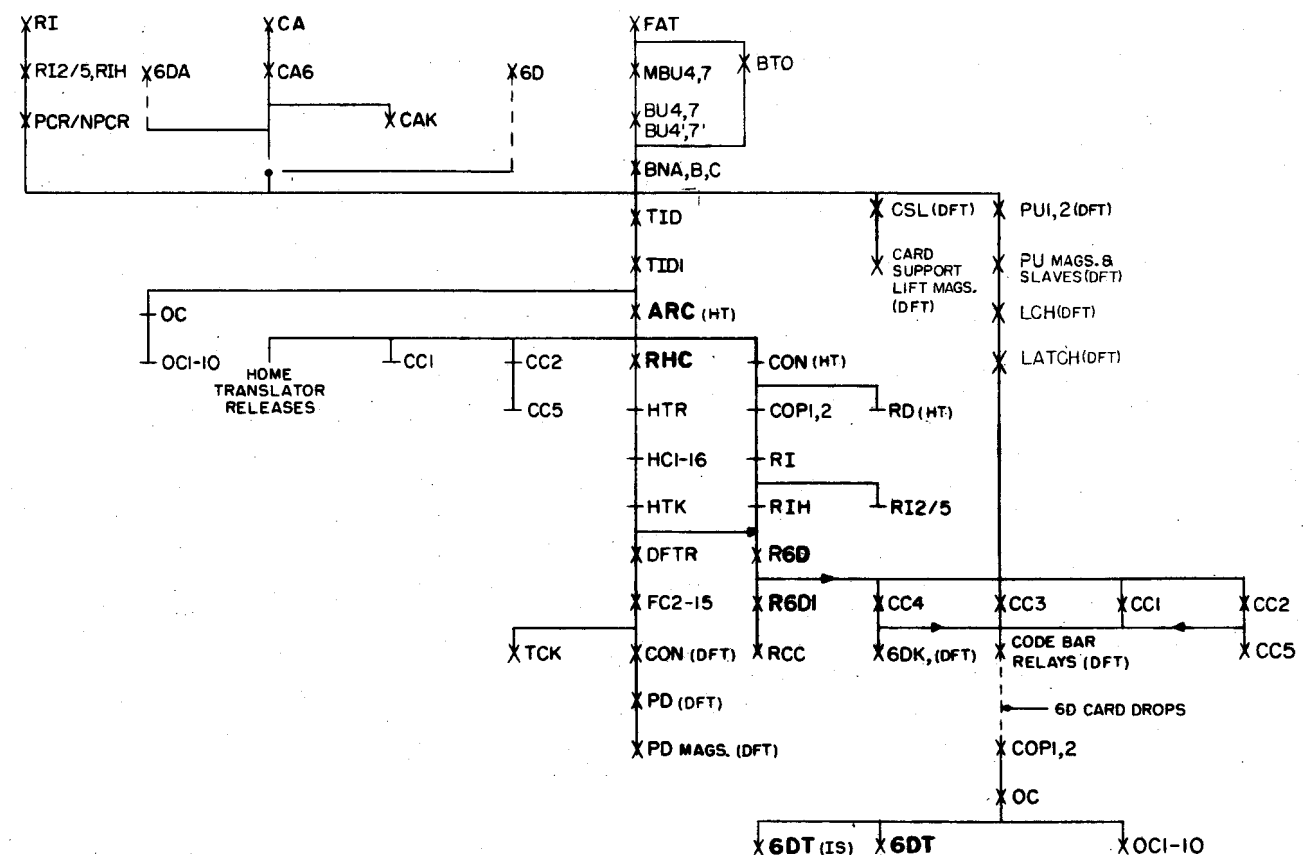
OS OPTION	FEATURE OR OPTION	SD OPTION	SD-
A	FOR MF INCOMING SENDER		68423-01 68222-01
B	FOR DP INCOMING SENDER		68424-01 68221-01

- INCOMING SENDER CKT DP 4A SD-68221-01, ISS.14
- INCOMING SENDER CKT. MF 4A SD-68222-01, ISS.16
- DECODER CONNECTOR CKT. SD-68339-01, ISS. 4
- *DECODER CKT. SD-68340-01 ISS. 8
- TRANSLATOR CONNECTOR CKT. SD-68341-01, ISS.6
- CARD TRANSLATOR CKT. SD-68342-01, ISS.6
- INCOMING SENDER CKT. DP 4M SD-68423-01, ISS.1
- INCOMING SENDER CKT. MF 4M SD-68424-01, ISS.1

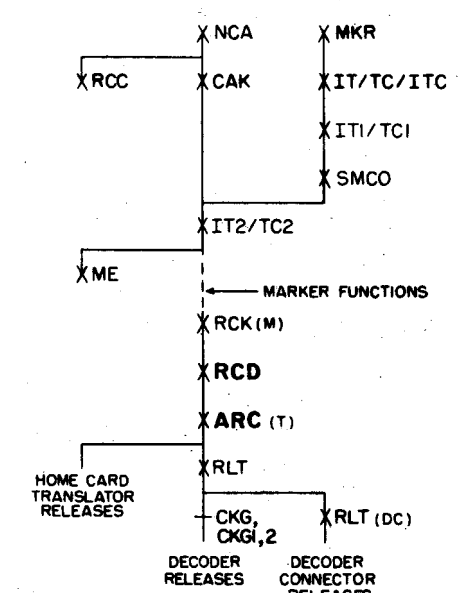
6 DIGIT TRANSLATION IN HOME CARD TRANSLATOR
FOF, FRO, FMB, FST



6 DIGIT TRANSLATION IN DECODER FOREIGN TRANSLATOR
FOF, FRO, FMB, FST

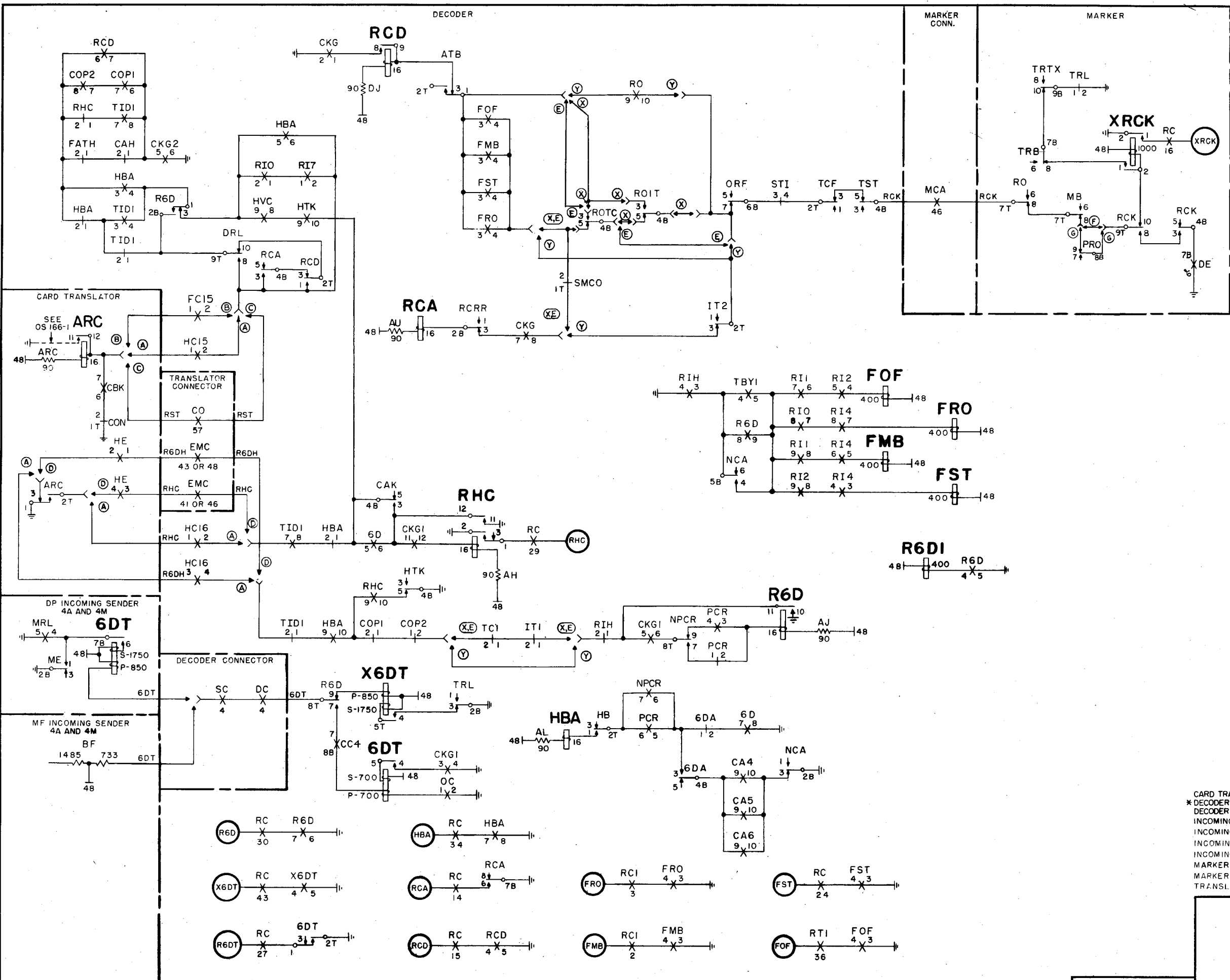


3 DIGIT TRANSLATION
FOF, FRO, FMB, FST



DECODER
3-AND 6-DIGIT TRANSLATION
FOF, FRO, FMB, FST

ISSUE	1	2	3	4	5
DATE	6-21-51	8-16-53			



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
X	SEPARATE TRAIN OPERATION	X, FIG. A	68340-01
Y	COMBINED TRAIN OPERATION	Y, FIG. B	68340-01
A	HOME TRNSL.	FIG. 14	68340-01
B	DECODER FOREIGN TRNSL.	FIG. 15	68340-01
C	FOREIGN TRNSL.	Z	68341-01
D	EMERGENCY TRNSL.	Y, FIG. 3	68341-01
E	SEPARATE TRAIN COMBINED OPERATION	R, FIG. E	68340-01
F	INTER-SENDER LOAD CONTROL TIMING	NOT PROVIDED	FIG. A
G		PROVIDED	FIG. B

ROUTE TO REGULAR GROUP OF MASTER BUSY TRUNKS
 ROUTE TO OVERLOAD ANN. TRK. OR SEP. GRP. OF MASTER BUSY TRKS. OR TO OTHER TRKS.

CARD TRANSLATOR CKT.	SD-68342-01, ISSUE 6
*DECODER CKT.	SD-68340-01, ISSUE 8
DECODER CONN. CKT.	SD-68339-01, ISSUE 4
INCOMING SENDER DP CKT. 4A	SD-68221-01, ISSUE 14
INCOMING SENDER DP CKT. 4M	SD-68423-01, ISSUE 2
INCOMING SENDER MF CKT. 4A	SD-68222-01, ISSUE 16
INCOMING SENDER MF CKT. 4M	SD-68424-01, ISSUE 4
MARKER CKT.	SD-68388-01, ISSUE 7
MARKER CONN. CKT.	SD-68395-01, ISSUE 5
TRANSLATOR CONN. CKT.	SD-68341-01, ISSUE 6

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	SEPARATE TRAIN OPERATION	FIG. A	68340-01
B	COMB. TRAIN OPERATION	FIG. B	68340-01
C	INTERTOLL MARKERS		68395-01
D	TOLL COMPLETING MARKERS		68395-01
E	SEPARATE TRAIN COMBINED OPERATION	FIG. E	
F	PRONOUNCEMENT REORDER PROVIDED	FIG. F	68340-01
G	PRONOUNCEMENT REORDER NOT PROVIDED	FIG. G	
J	COMB. TRAIN OPERATION PRONOUNCEMENT REORDER PROVIDED	FIG. B, FIG. F	68340-01
K	COMB. TRAIN OPERATION PRONOUNCEMENT REORDER NOT PROVIDED	FIG. B, FIG. G	68340-01
N	EVEN DECODERS	N.FIG. E	68340-01
O	ODD DECODERS	O.FIG. F	

2. IN SEPARATE TRAIN OPERATION, WHEN TRUNK APPEARS ON ONLY ONE TRAIN THE 10,000Ω GROUND IS APPLIED TO THE UNUSED SM-LEAD.

TABLE 1

INCOMING TRUNK APPEARANCE SEPARATE TRAIN OFFICE
X DENOTES RELAY OPERATED.

TRUNK CIRCUIT		DECODER RELAYS						INCOMING TRUNK APPEARANCE.	
LEAD	OPTION SEE NOTE 2	CONDITION	SMI	SMC	SMI1	SMC1	SMI2		SMC2
SMC	H	10000Ω GRD.	X		X	X	X		INTERTOLL FRAME
SMI	NONE	GRD.							
SMC	NONE	GRD.		X	X	X		X	TOLL COMPL. FR.
SMI	R	10000Ω GRD.							
SMC	NONE	GRD.	X	X	X	X	X	X	IT & TOLL COMPL. FR.
SMI	NONE	GRD.							

TABLE 2

MARKER REQUIRED SEPARATE TRAIN OFFICE
X DENOTES RELAY OPERATED.

REPRESENTING INCOMING TRUNK APPEARANCE		REPRESENTING OUTGOING TRUNK APPEARANCE		SELECTING TYPE OF MARKER		INDICATING MISMATCH		MARKER REQUIRED	
SMI2	SMC2	IT	TC	ITC	ITI	TCI	ROIT		ROTC
X		X			X				INTERTOLL
X			X		X		X		INTERTOLL
X				X	X				INTERTOLL
	X	X				X		X	TOLL COMPL.
	X		X			X			TOLL COMPL.
	X	X			X				TOLL COMPL.
X	X	X			X				INTERTOLL
X	X		X			X			TOLL COMPL.
X	X			X		X			TOLL COMPL.

* DECODER CKT. SD-68340-01, ISS. 8
 DECODER CONNECTOR CKT. SD-68339-01, ISS. 4
 INCOMING LINK & CONN. CKT. SD-68393-01, ISS. 7
 MARKER CONNECTOR CKT. SD-68395-01, ISS. 5
 SENDER LINK & CONN. CKT. SD-68334-01, ISS. 13
 TWO-WAY TRUNK CKT. SD-68232-01, ISS. 10

DECODER
MARKER SELECTION
 COMBINED SEPARATE-TRAIN AND
 SEPARATE TRAIN COMBINED OPERATION

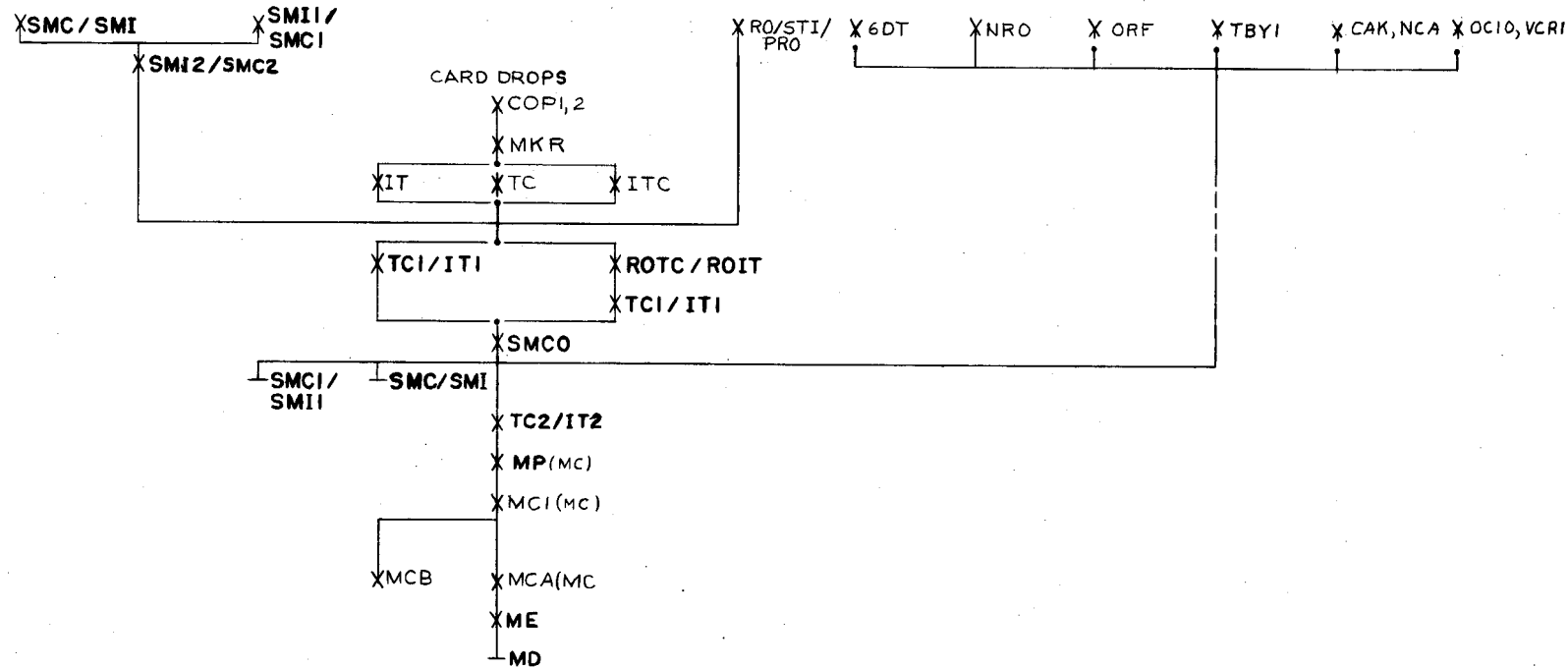
OS168-1

2 SHEETS, SHEET 1

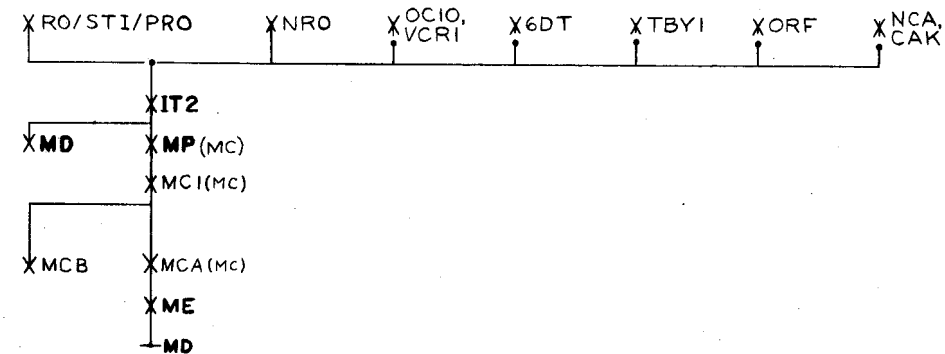
NO. 4A TOLL

ORDER AS SUP ITEM MP-11610

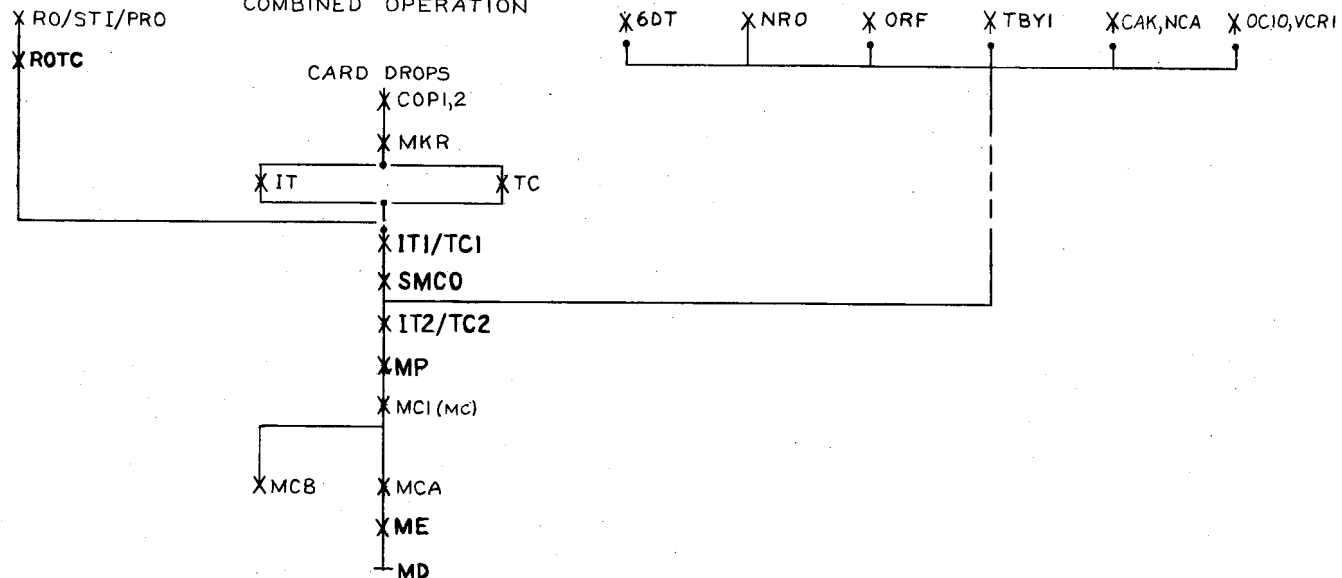
SEQUENCE CHART
 SEPARATE TRAIN OFFICE



COMBINED TRAIN



SEPARATE TRAIN
 COMBINED OPERATION

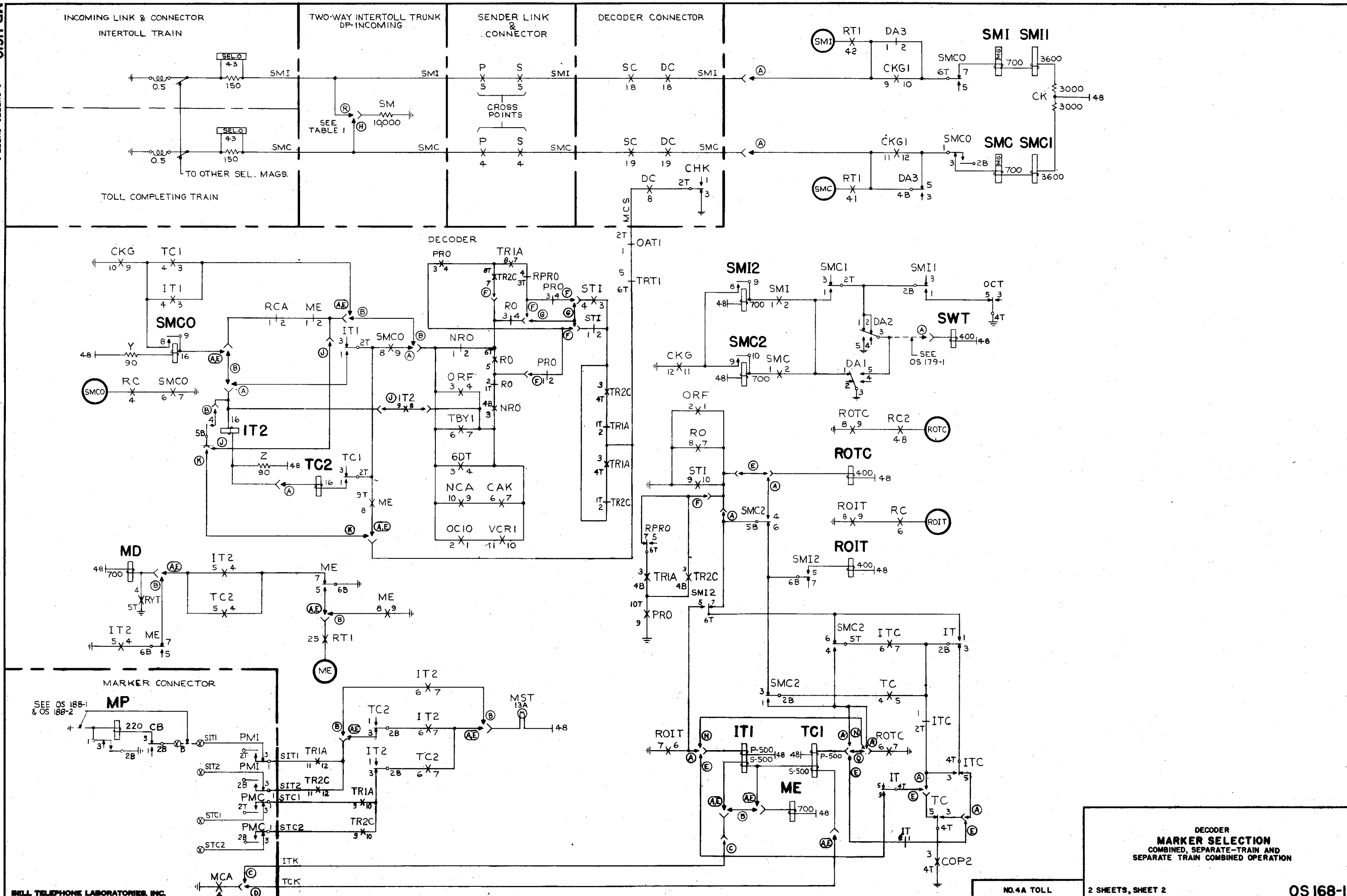


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DATE	6-25-51	7-7-53	

2 SHEETS, SHEET 1

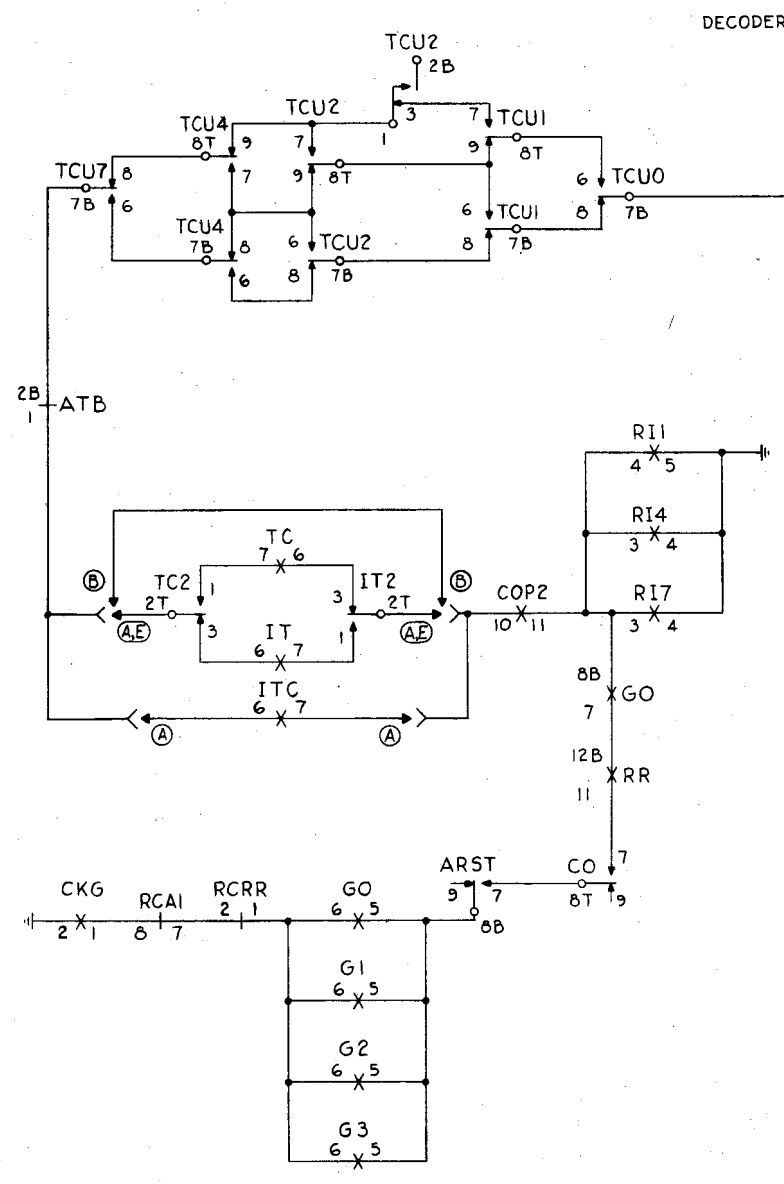
MP-11610

ISSUE	1	2	3
DATE	6-23-51	7-7-53	

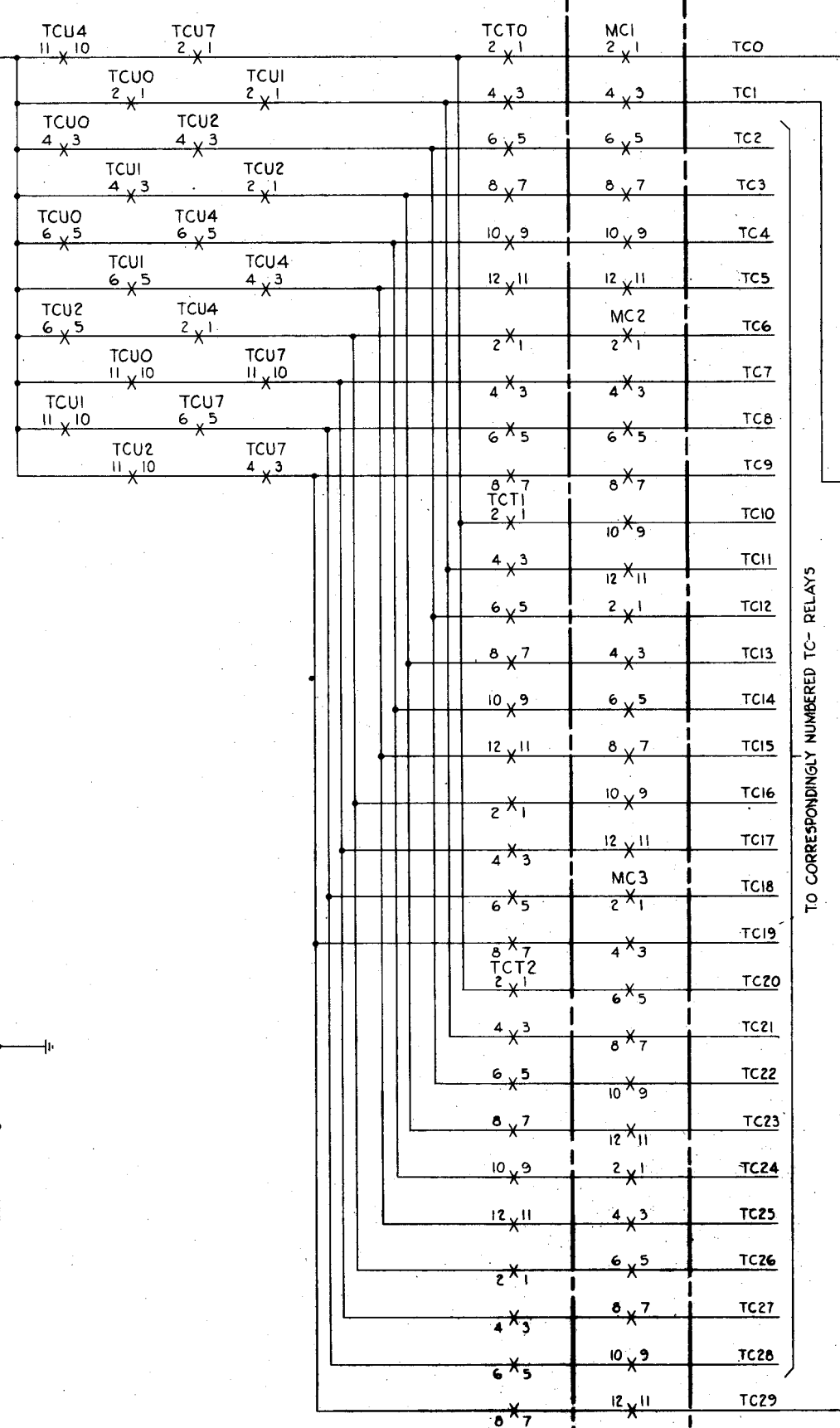


ISSUE: 1 1.3 2 3 4 5
DATE: 6-21-57 6-23-53

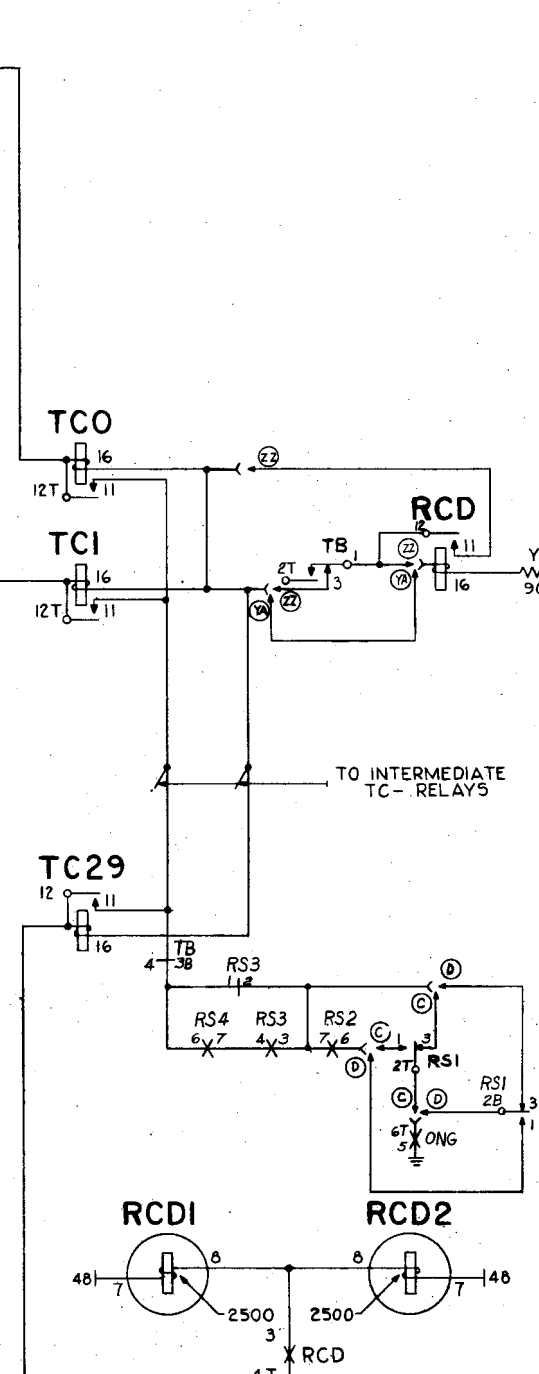
DECODER



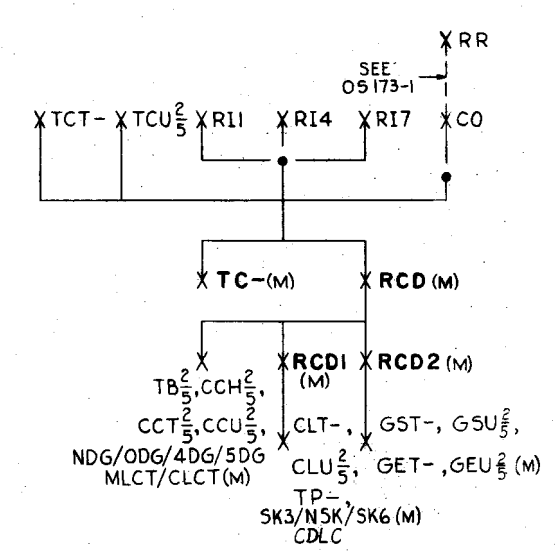
MARKER CONNECTOR



MARKER



SEQUENCE CHART



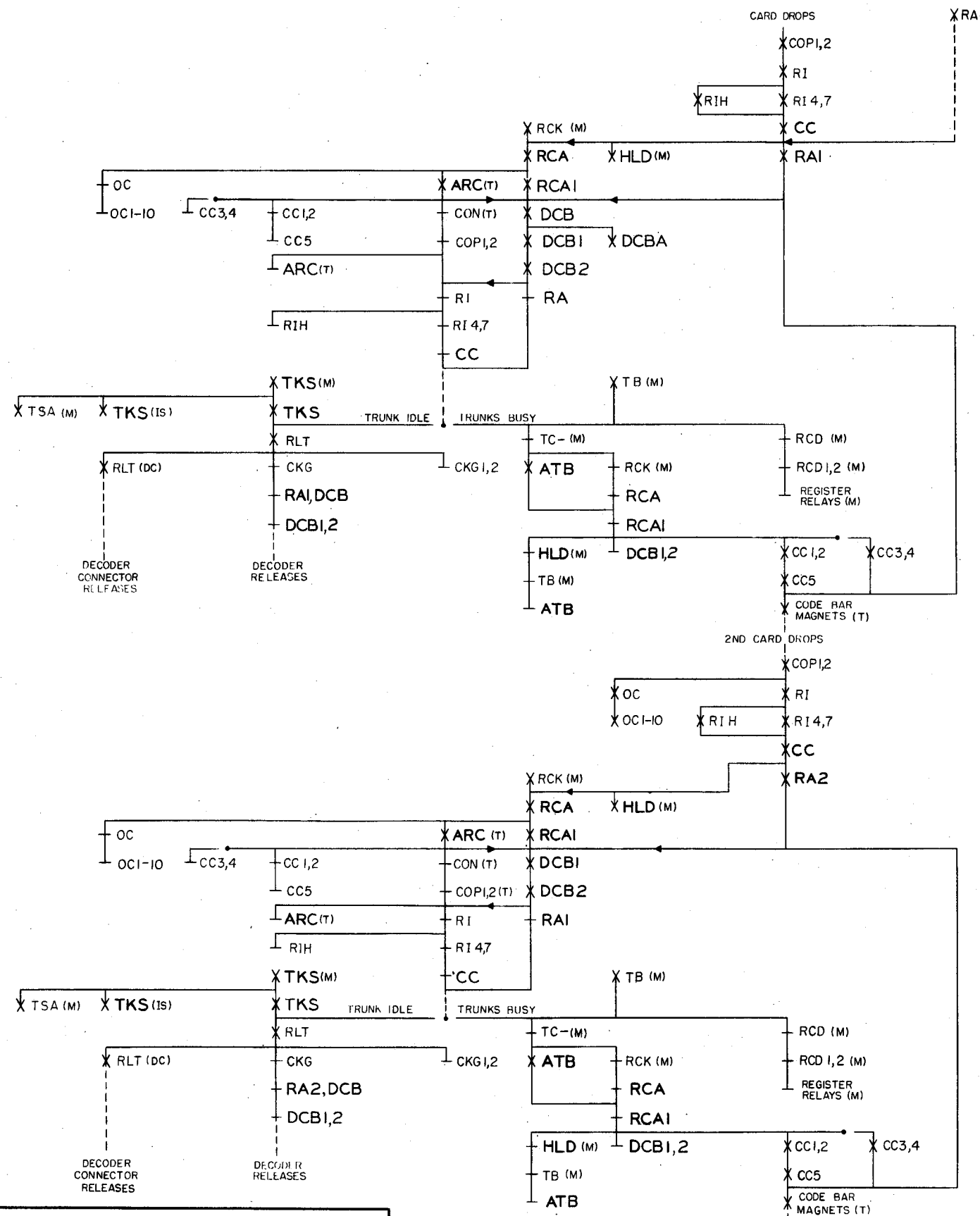
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	SEPARATE TRAIN OPERATION	FIG. A	68340-01
B	COMBINED TRAIN OPERATION	FIG. B	68340-01
NOT PROVIDED			
C	ROUTE TO REG. GROUP OF MAS. BUSY TRUNKS	FIG. A	
D	INTER-SENDER LOAD CONTROL TIMING	PROVIDED	ROUTE TO OVERLOAD ANN. TRUNK OR TO SEPARATE GROUP OF MAS. BUSY TRUNKS OR OTHER TRUNKS
E	SEPARATE TRAIN COMBINED OPERATION	FIG. E	68340-01
ZZ	M.D.	ZZ	68388-01
YA	STD.	YA	68388-01

* DECODER CKT. SD-68340-01, 155.8
 MARKER CKT. SD-68388-01, 155.7
 MARKER CONNECTOR CKT. SD-68395-01, 155.5

DECODER SIGNAL MARKER TO READ CARD

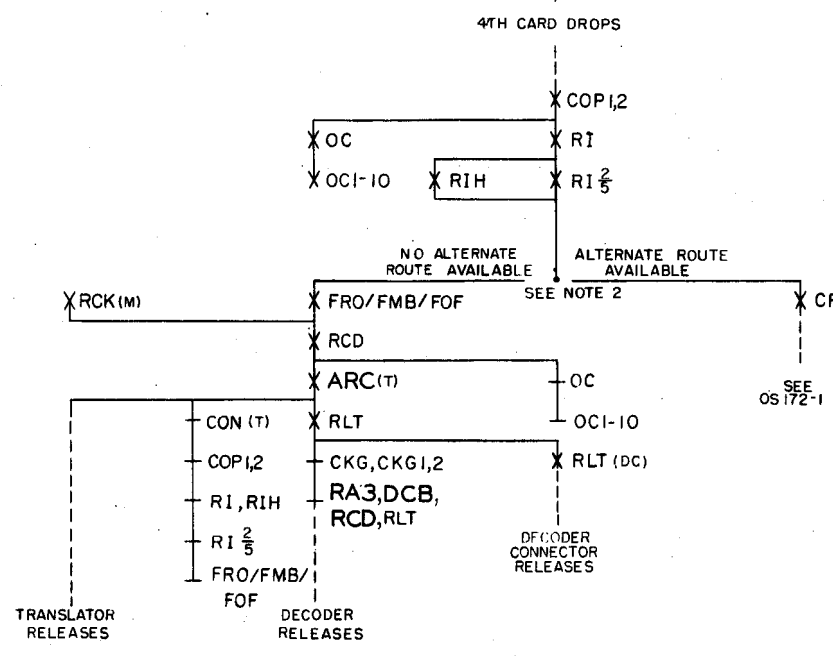
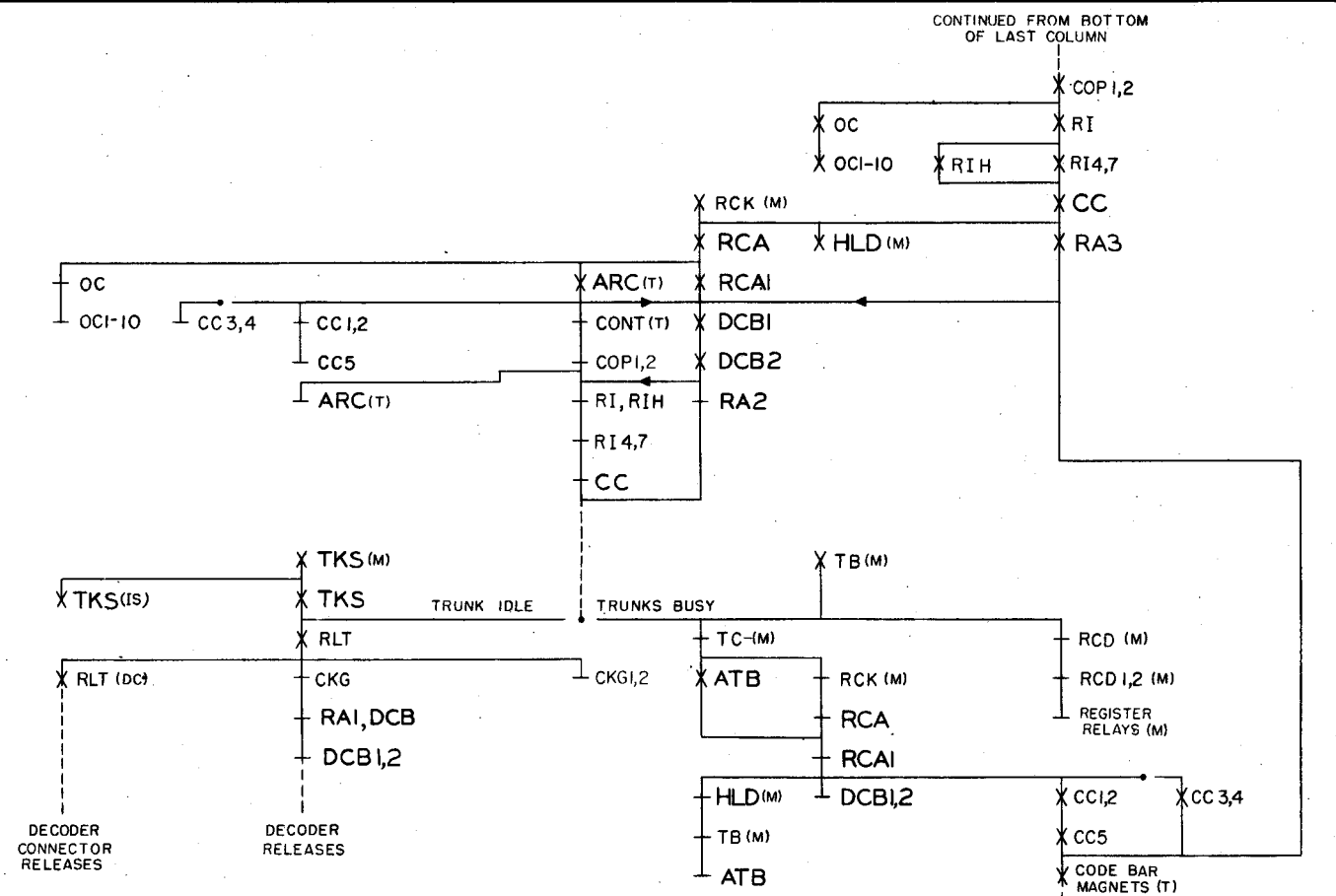
NO. 4A TOLL



DECODER
CARD-TO-CARD OPERATION
OS 170-1
2 SHEETS, SHEET 1

NO. 4A TOLL

3RD CARD DROPS
CONTINUED AT TOP
OF NEXT COLUMN

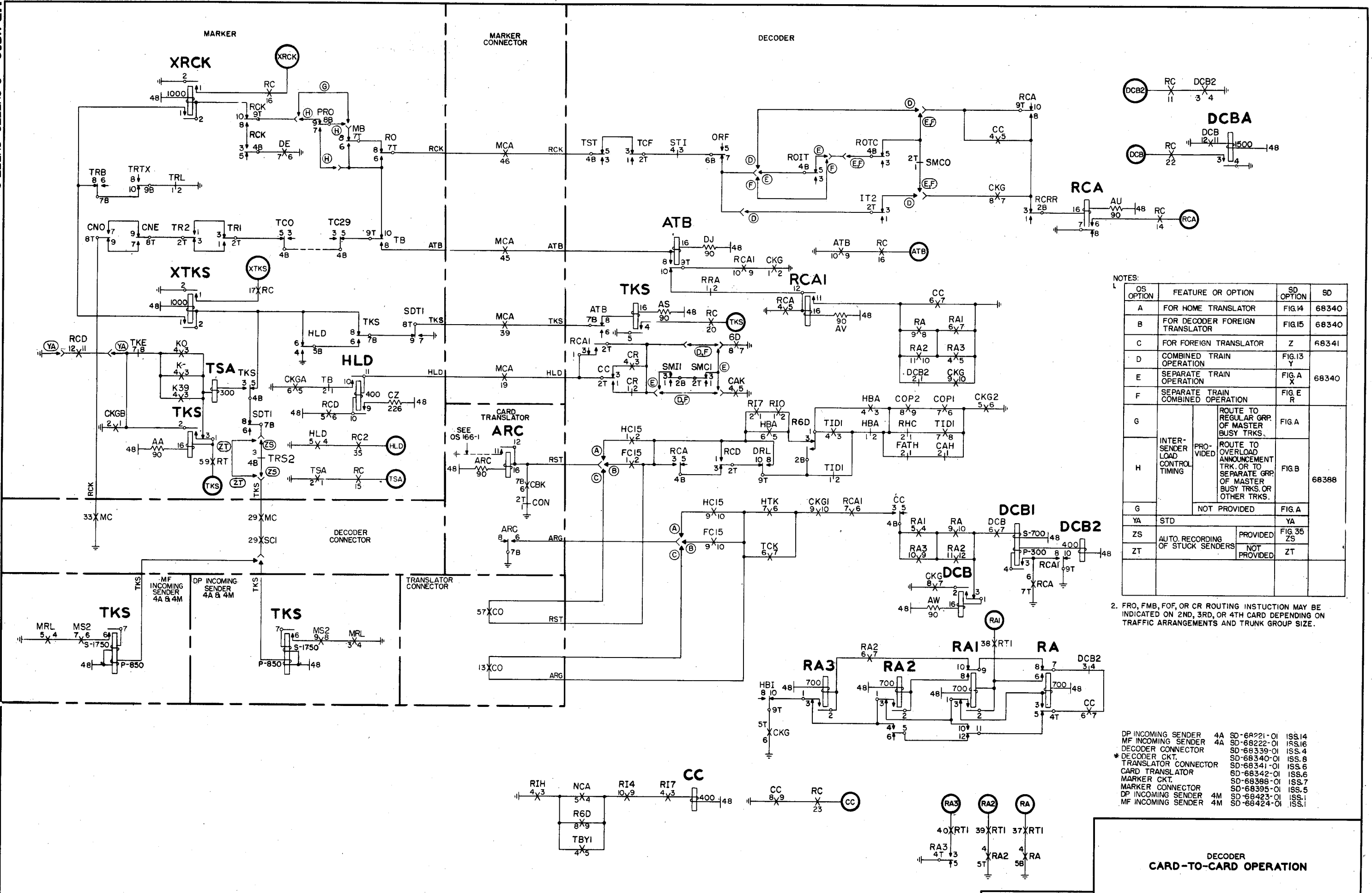


ISSUE	1	2	3	4	5	6	7	8	9	10
DATE	12-14-51	7-30-53								

2 SHEETS, SHEET 1

MP-11753

ISSUE	1	2	3
DATE	12-14-51	7-30-53	



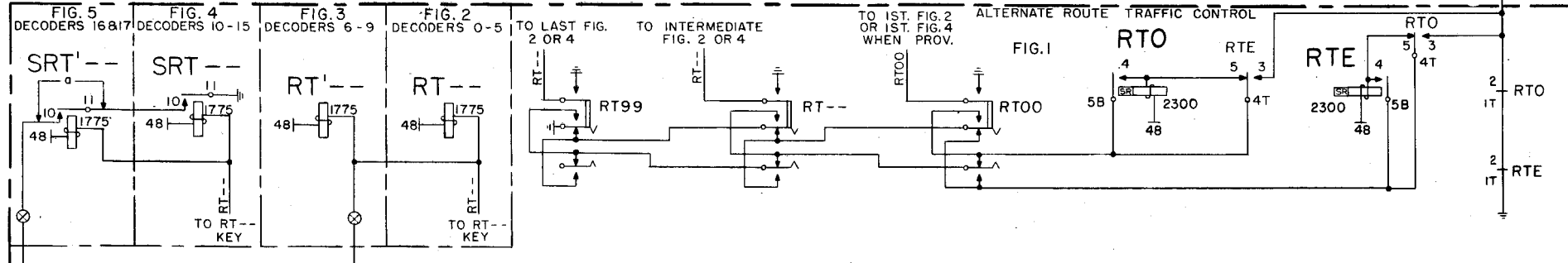
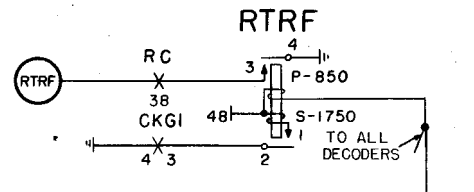
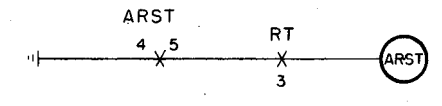
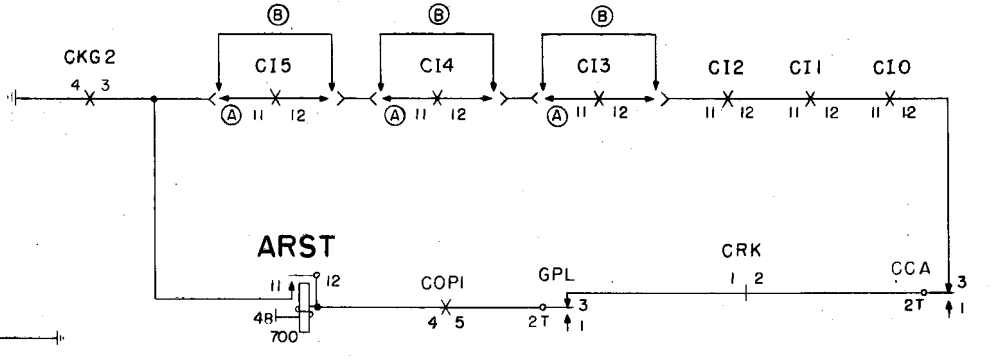
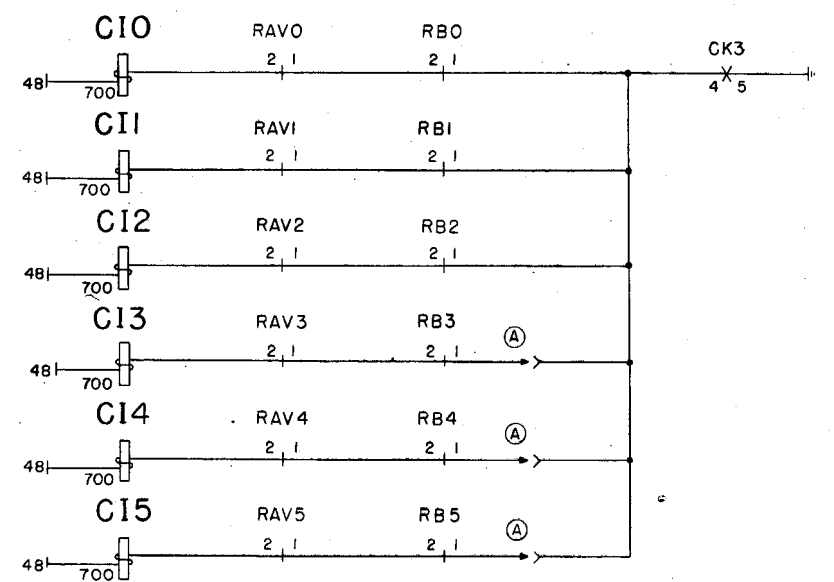
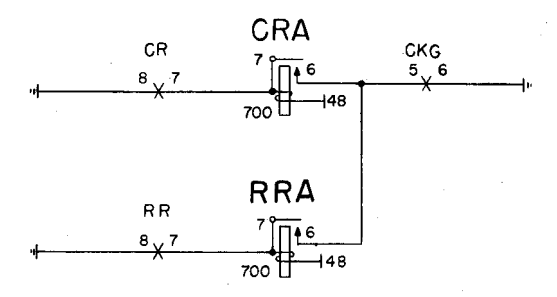
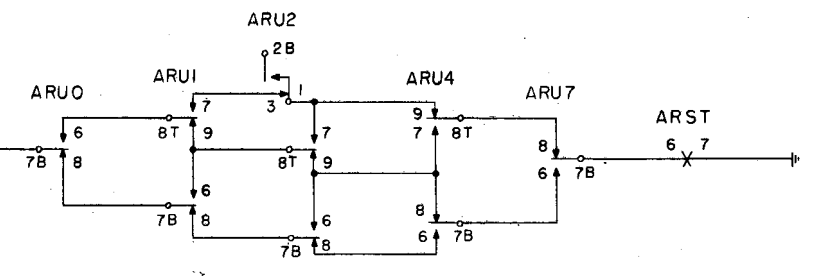
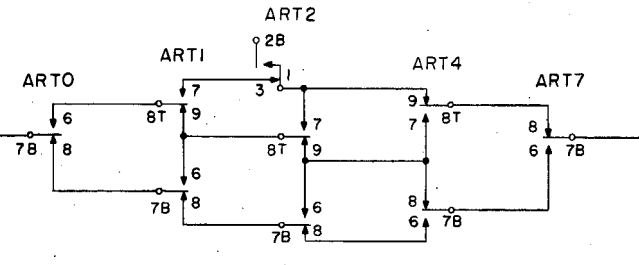
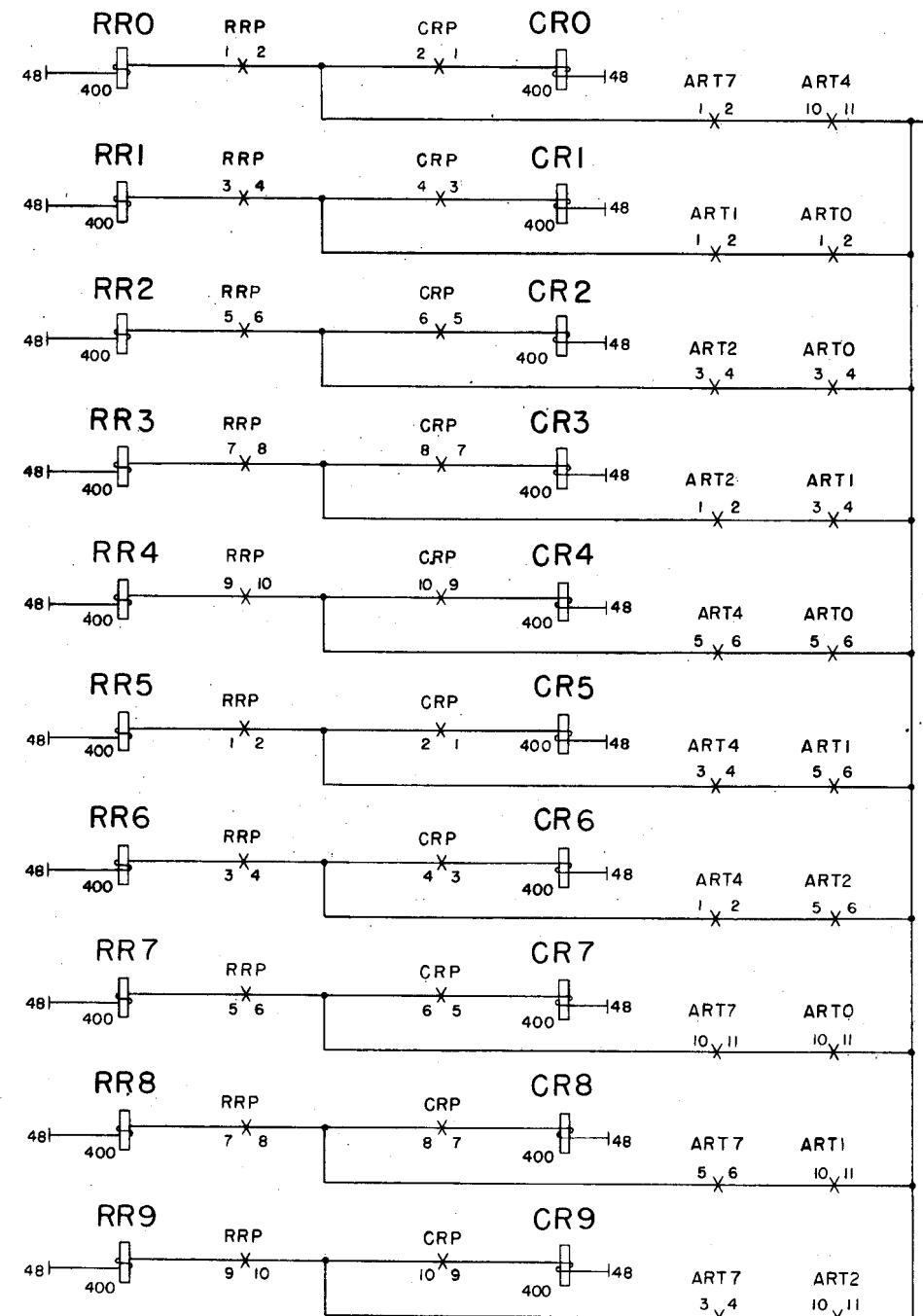
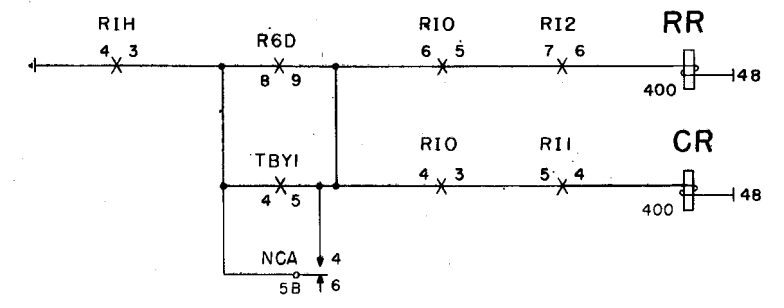
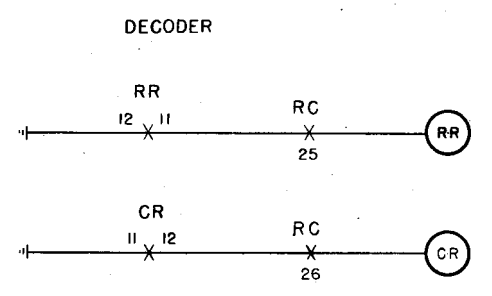
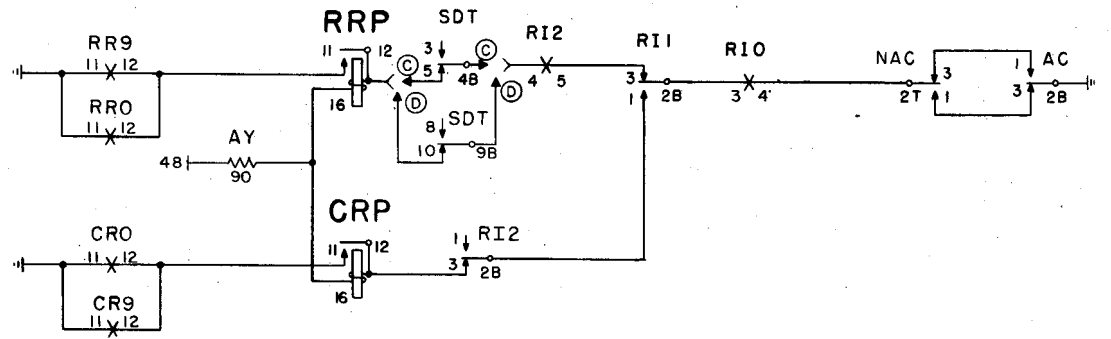
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR HOME TRANSLATOR	FIG.14	68340
B	FOR DECODER FOREIGN TRANSLATOR	FIG.15	68340
C	FOR FOREIGN TRANSLATOR	Z	68341
D	COMBINED TRAIN OPERATION	FIG.13 Y	
E	SEPARATE TRAIN OPERATION	FIG. A X	68340
F	SEPARATE TRAIN COMBINED OPERATION	FIG. E R	
G	ROUTE TO REGULAR GRP. OF MASTER BUSY TRKS.	FIG. A	
H	INTER-SENDER LOAD CONTROL TIMING	PROVIDED ROUTE TO OVERLOAD ANNOUNCEMENT TRK. OR TO SEPARATE GRP. OF MASTER BUSY TRKS. OR OTHER TRKS.	FIG. B 68388
G	NOT PROVIDED	FIG. A	
YA	STD	YA	
ZS	AUTO. RECORDING OF STUCK SENDERS	PROVIDED	FIG. 35 ZS
ZT		NOT PROVIDED	ZT

2. FRO, FMB, FOF, OR CR ROUTING INSTRUCTION MAY BE INDICATED ON 2ND, 3RD, OR 4TH CARD DEPENDING ON TRAFFIC ARRANGEMENTS AND TRUNK GROUP SIZE.

DP INCOMING SENDER 4A	SD-68221-01	ISS.14
MF INCOMING SENDER 4A	SD-68222-01	ISS.16
DECODER CONNECTOR	SD-68339-01	ISS.4
* DECODER CKT.	SD-68340-01	ISS.8
TRANSLATOR CONNECTOR	SD-68341-01	ISS.6
CARD TRANSLATOR	SD-68342-01	ISS.6
MARKER CKT.	SD-68388-01	ISS.7
MARKER CONNECTOR	SD-68395-01	ISS.5
DP INCOMING SENDER 4M	SD-68423-01	ISS.1
MF INCOMING SENDER 4M	SD-68424-01	ISS.1

DECODER
CARD-TO-CARD OPERATION



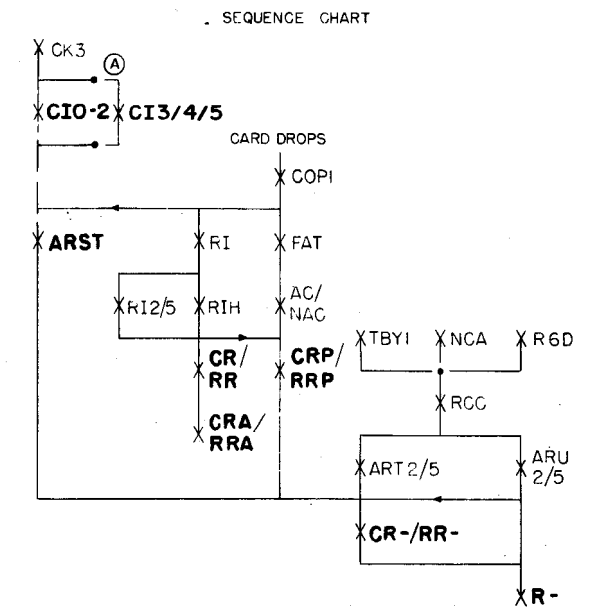
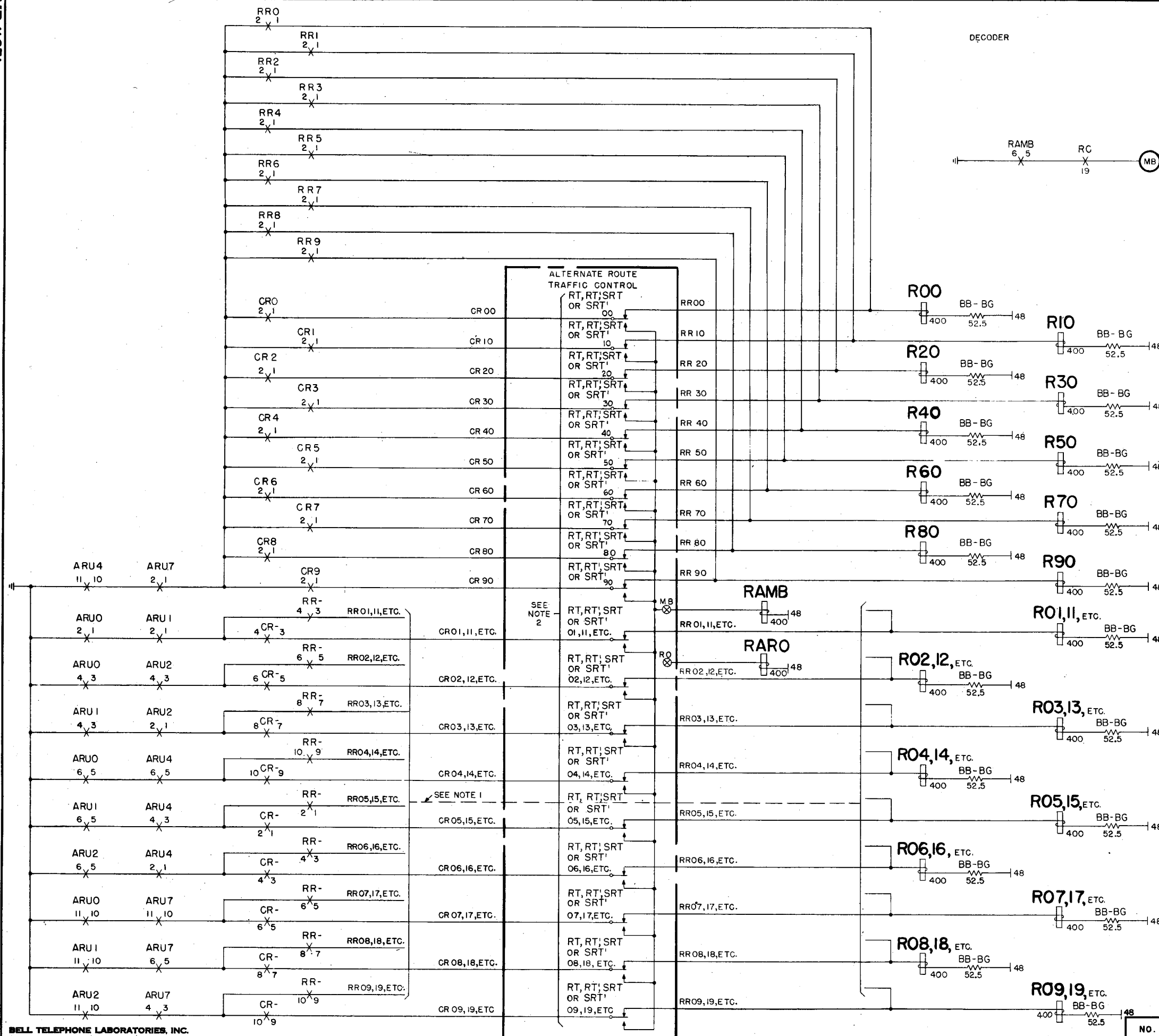
DECODER
ROUTE RELAY SELECTION
OS 171-1
2 SHEETS, SHEET 1
NO. 4A OR 4M TOLL

ISSUE	1	2	3	4
DATE	7-5-57	9-16-58		

2 SHEETS, SHEET 1

MP-11631

ISSUE	1	2
DATE	7-1-51	9-15-53



- NOTES:
- THESE LEADS CONNECT DIRECTLY TO CORRESPONDINGLY NUMBERED R-RELAYS IN MANNER SIMILAR TO R00, R10, ETC.
 - IN ALTERNATE ROUTE TRAFFIC CONTROL CIRCUIT, DECODERS 0-5 CONNECT TO RELAYS RT'00-99, DECODERS 6-9 CONNECT TO RELAYS RT'00-99, DECODERS 10-15 CONNECT TO RELAYS SRT'00-99, AND DECODERS 16-17 CONNECT TO RELAYS SRT'00-99.

DECODER	RELAY	MB	CR--	RR--
0	RT--	2B	1B	3B
1		4B	5B	6B
2		7B	8B	9B
3		2T	1T	3T
4		4T	5T	6T
5		7T	8T	9T
6	RT'--	2B	1B	3B
7		4B	5B	6B
8		7B	8B	9B
9		2T	1T	3T
10	SRT'--	2B	1B	3B
11		4B	5B	6B
12		7B	8B	9B
13		2T	1T	3T
14		4T	5T	6T
15		7T	8T	9T
16	SRT'--	2B	1B	3B
17		4B	5B	6B

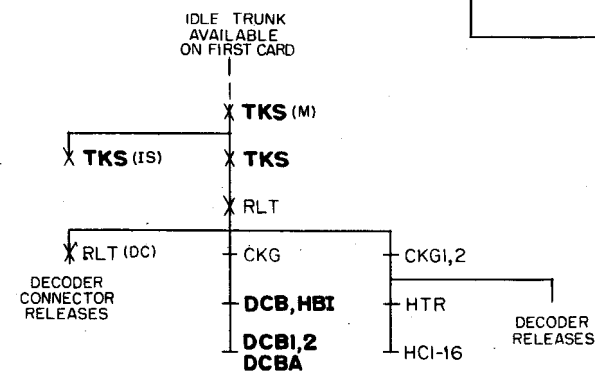
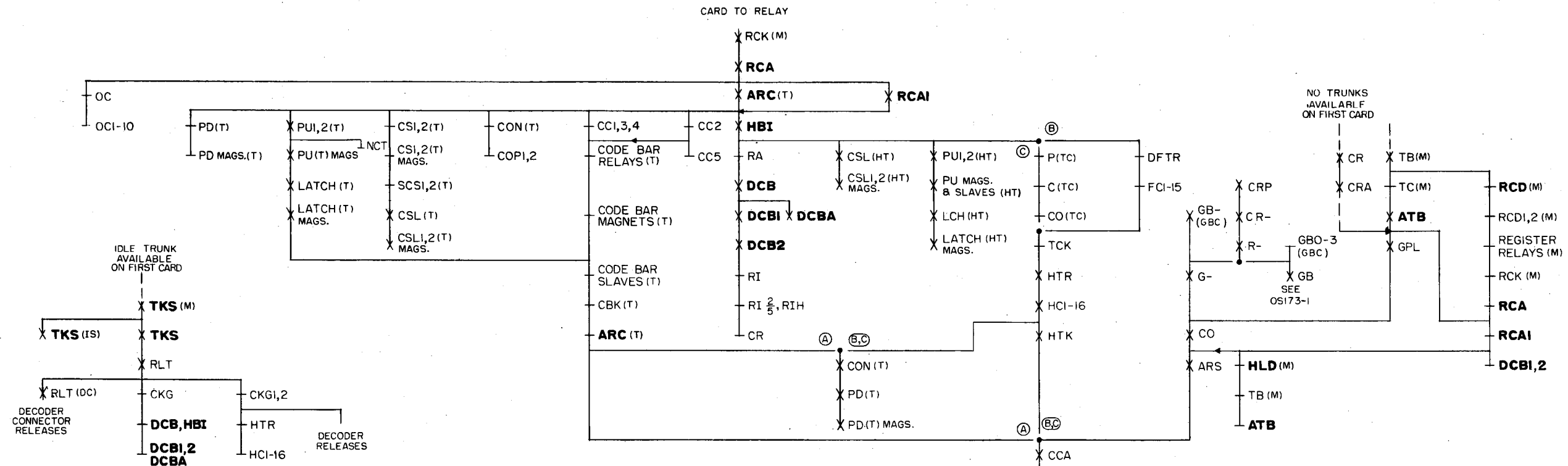
3.

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	IF CI3,4,OR 5 RELAYS ARE REQUIRED		
B	IF CI3,4,OR 5 RELAYS ARE NOT REQUIRED		68340-01
C	M. D.	FIG. H	
D	STD.	FIG. J	

ALTERNATE ROUTE TRAFFIC CONTROL GKT. SD-68408-01,ISS.2
 *DECODER CIRCUIT. SD-68340-01,ISS.8

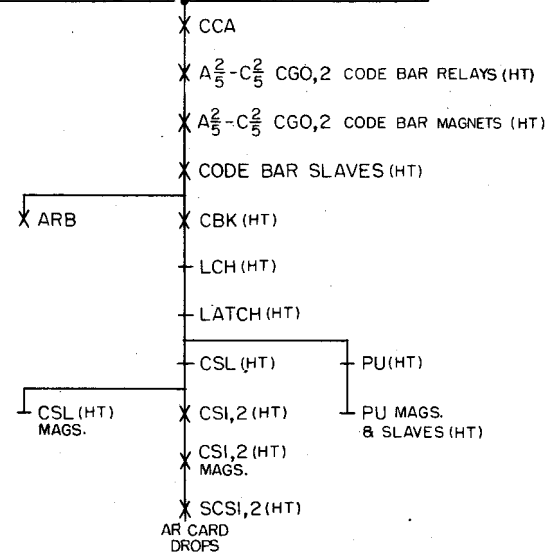
DECODER
ROUTE RELAY SELECTION

NO. 4A OR 4M TOLL 2 SHEETS, SHEET 2



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR HOME TRANSLATOR	FIG. 14	
B	FOR DECODER FOREIGN TRANSLATOR	FIG. 15	68340-01
C	FOR FOREIGN TRANSLATOR	Z	68341-01
D	COMBINED TRAIN OPERATION	FIG. B,Y	
E	SEPARATE TRAIN OPERATION	FIG. A,X	68340-01
F	SEPARATE TRAIN COMBINED OPERATION	FIG. E	
G	INTER-SENDER LOAD CONT. TIMING	NOT PROVIDED	FIG. A
		ROUTE TO REGULAR GROUP OF MASTER BUSY TRKS.	FIG. A
H	PROVIDED	ROUTE TO OVERLOAD ANNOUNCEMENT TRK OR TO SEPARATE GROUP OF MASTER BUSY TRKS. OR OTHER TRKS.	FIG. B
YA	STANDARD	YA	
ZS	AUTO. RE-CORDING OF STUCK SENDERS	PROVIDED	7/5 FIG. 34
ZT		NOT PROVIDED	ZT



- CARD TRANSLATOR CKT. SD-68342-01, ISS. 6
- *DECODER CKT. SD-68340-01, ISS. 8
- DECODER CONNECTOR CKT. SD-68339-01, ISS. 4
- INCOMING SENDER CKT.-DP 4A SD-68221-01, ISS. 14
- INCOMING SENDER CKT.-DP 4M SD-68423-01, ISS. 2
- INCOMING SENDER CKT.-MF 4A SD-68222-01, ISS. 16
- INCOMING SENDER CKT.-MF 4M SD-68424-01, ISS. 4
- MARKER CKT. SD-68388-01, ISS. 7
- MARKER CONNECTOR CKT. SD-68395-01, ISS. 5
- TRANSLATOR CONNECTOR CKT. SD-68341-01, ISS. 6

DECODER
CARD-TO-RELAY AND
RELAY-TO-RELAY OPERATIONS

OS 172-1

3 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

ORDER AS BSP ITEM MP-11758

BELL TELEPHONE LABORATORIES, INC.

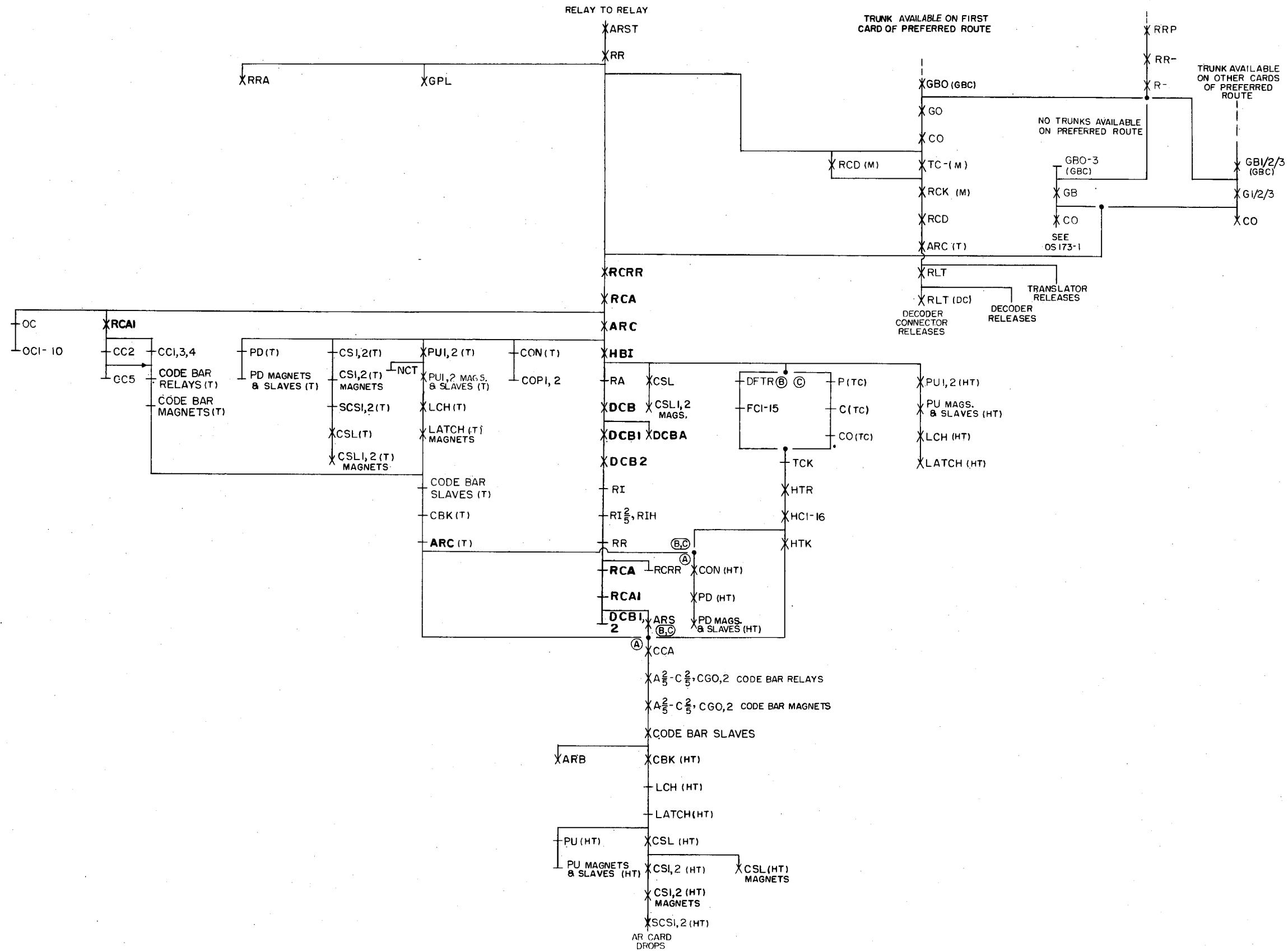
PRINTED IN U. S. A.

ISSUE	2	12/1/53
DATE	12-7-53	

3 SHEETS, SHEET 1

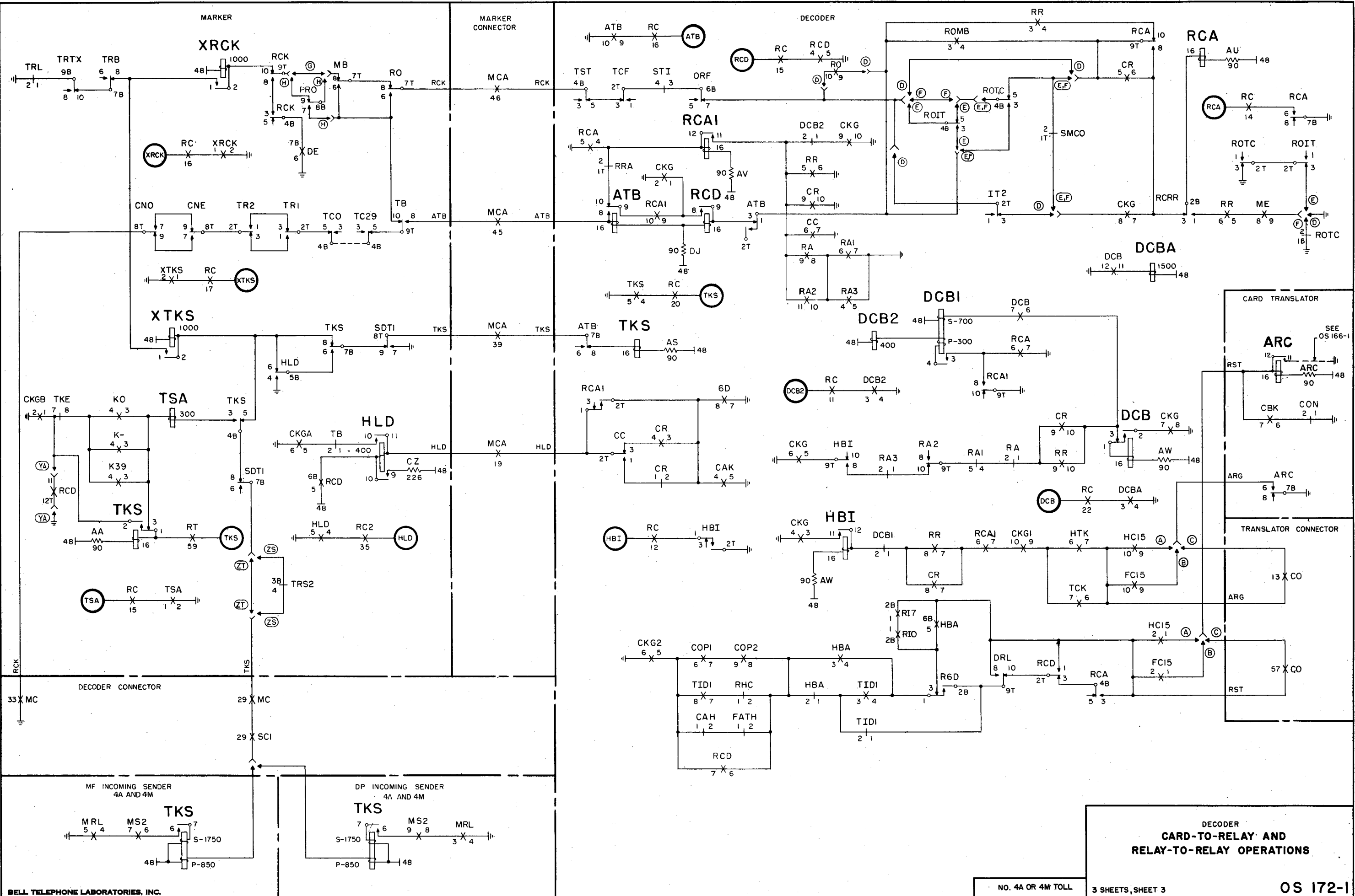
MP-11758

ISSUE	2	11/1/53
DATE	10-7-53	



DECODER
CARD-TO-RELAY AND
RELAY-TO-RELAY OPERATIONS

ISSUED	1 12 58	BY	W. J. M.
DATE	12-14-57	BY	W. J. M.
		BY	W. J. M.
		BY	W. J. M.



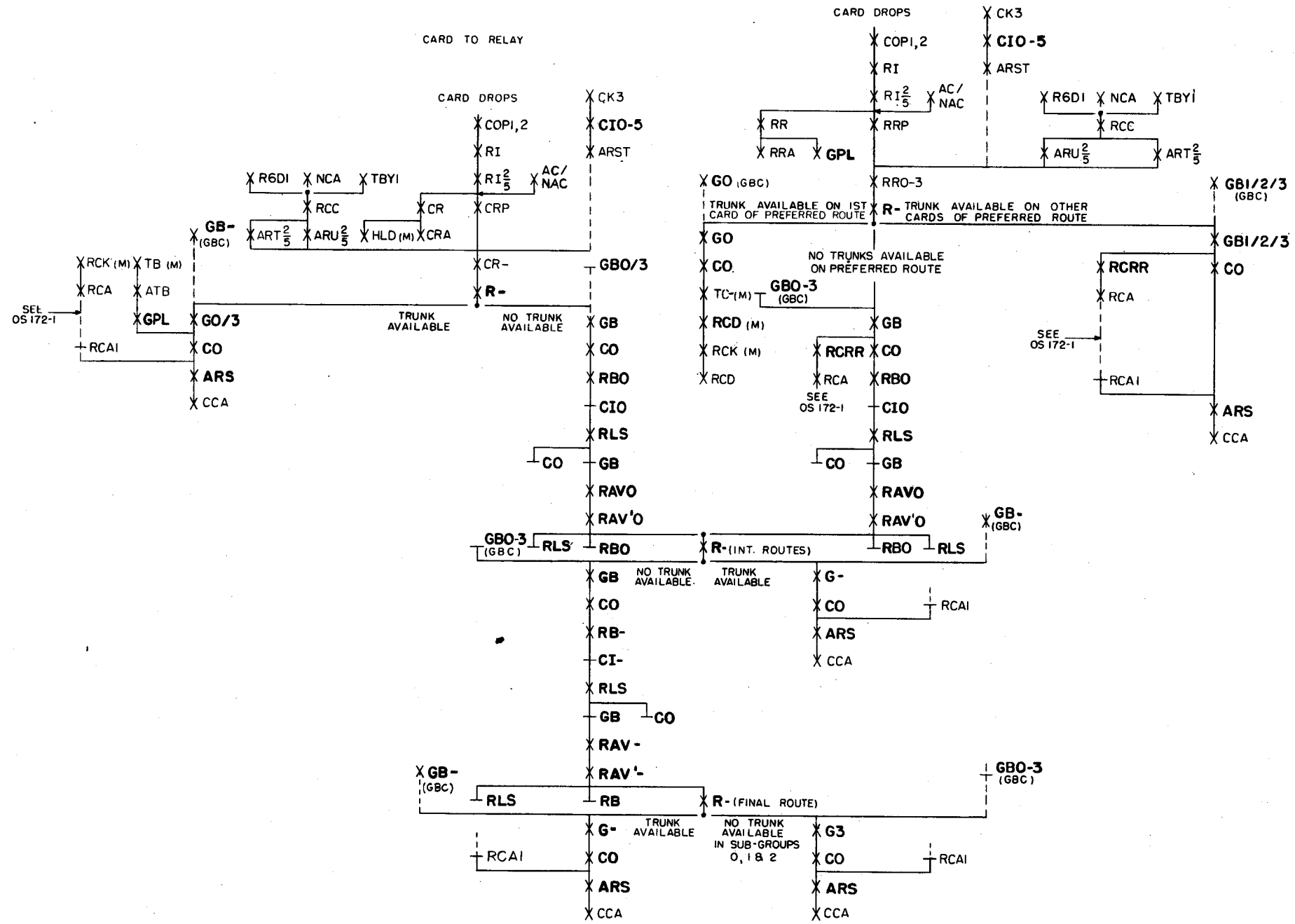
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	LAST RELAY IN FINAL ROUTE TRUNK GROUPS	Z	68420-01
B	LAST RELAY IN NON-FINAL ROUTE (HIGH USAGE) TRUNK GROUPS	W	68420-01

2. NUMBERS IN PARENTHESIS FOR R-RELAYS INDICATE THE ARBITRARILY ASSIGNED GROUND SUPPLY ASSOCIATED WITH EACH R-RELAY.

SEQUENCE CHART

RELAY TO RELAY



ALTERNATE ROUTE TRAFFIC CONTROL CKT. SD-68408-01, ISS. 2
 *DECODER CKT. SD-68340-01, ISS. 8
 GROUP CHAIN RELAY CKT. SD-68420-01, ISS. 4
 TRUNK BLOCK CONNECTOR CKT. SD-68027-01, ISS. 19

DECODER
 ROUTE RELAY TREE
 AND
 GROUND SUPPLIES

OS 173-1

2 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS BSP ITEM MP-11757

BELL TELEPHONE LABORATORIES, INC.

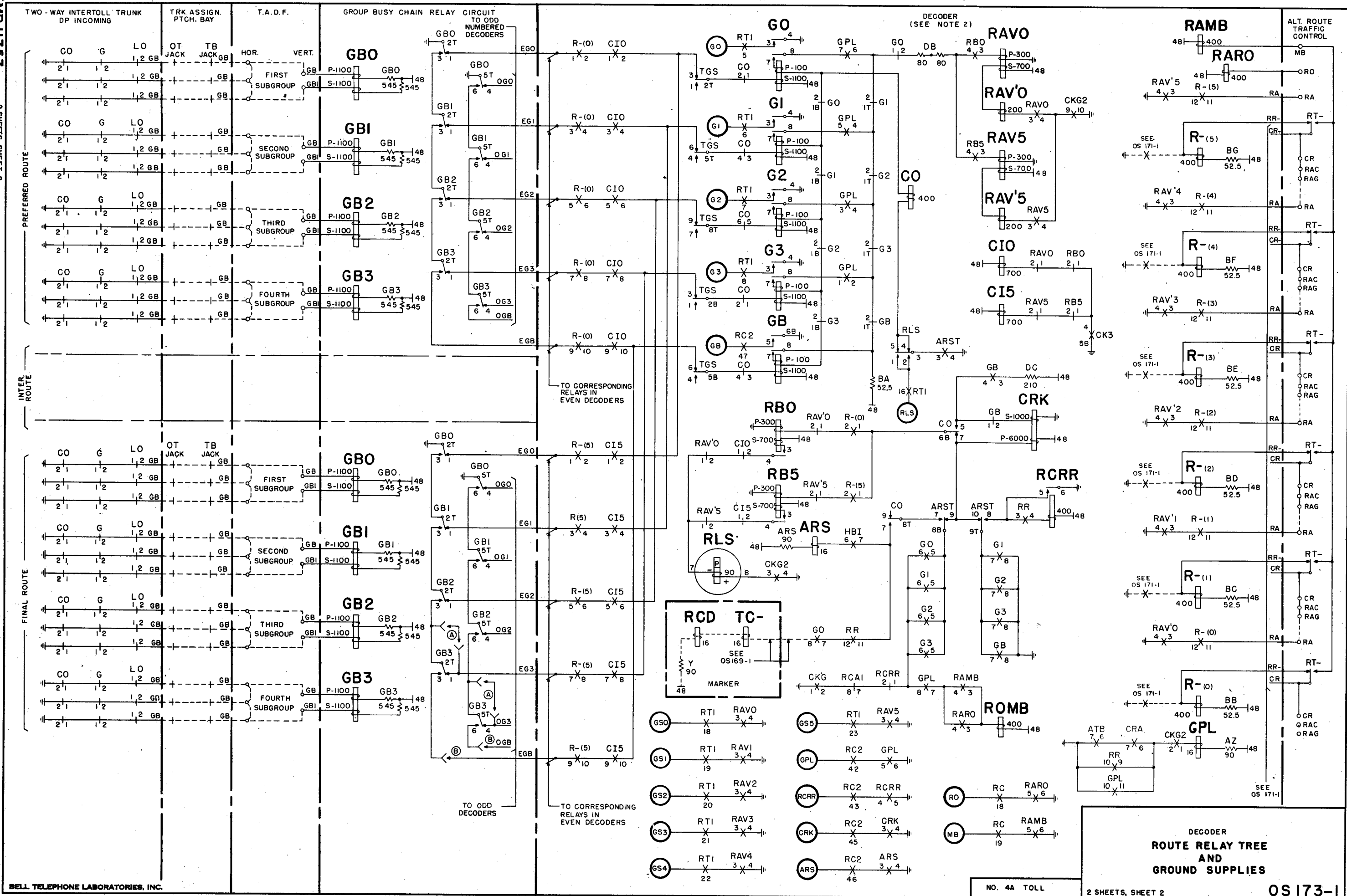
PRINTED IN U. S. A.

ISSUE	2	FILE	
DATE	8-5-53		

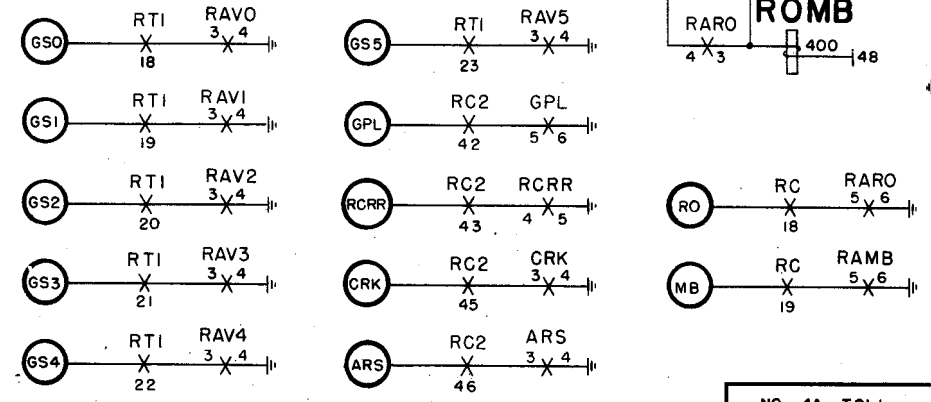
2 SHEETS, SHEET 1

MP-11757

ISSUE	1	DATE	12-14-51
REVISION	2	DATE	5-3-53

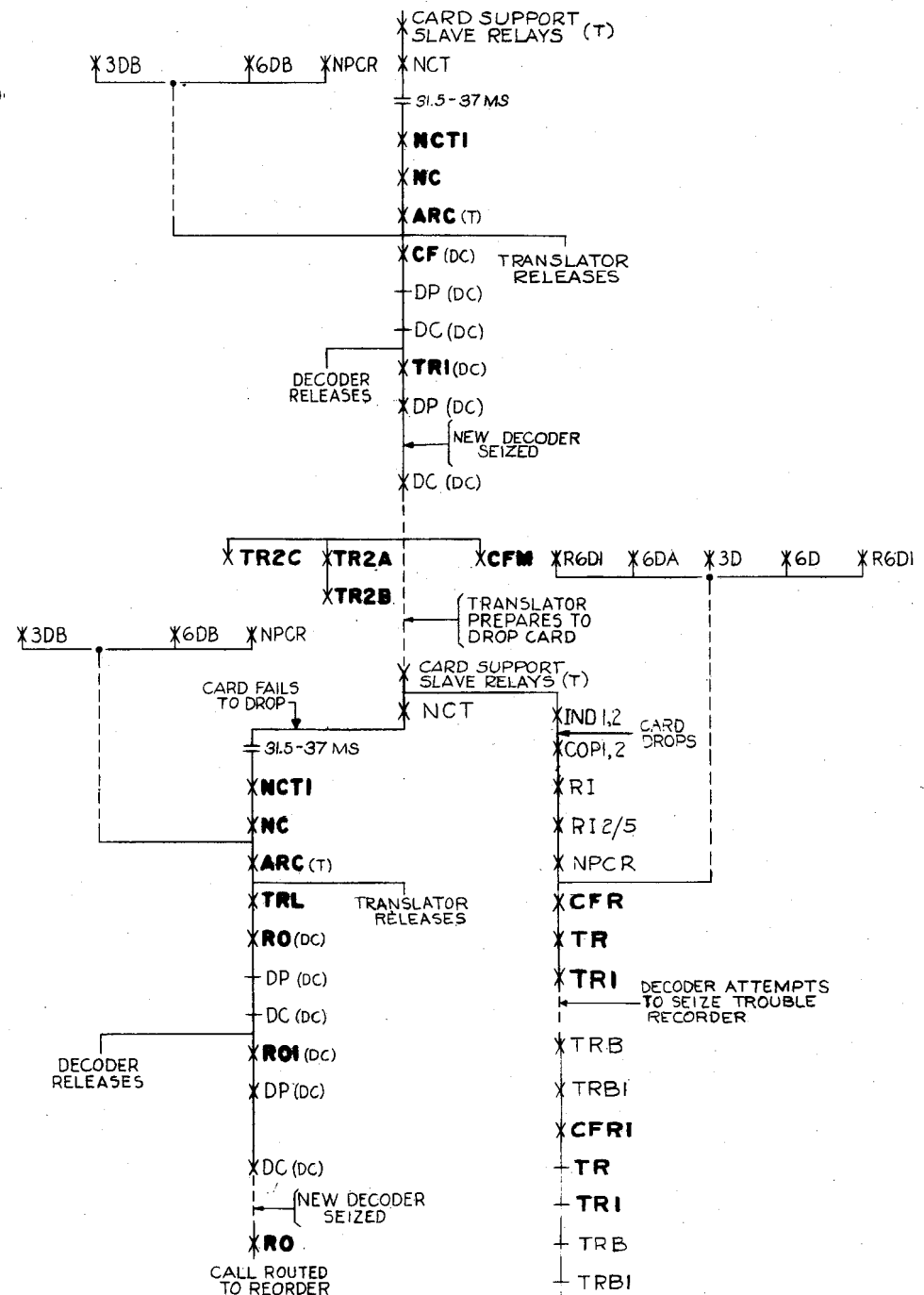
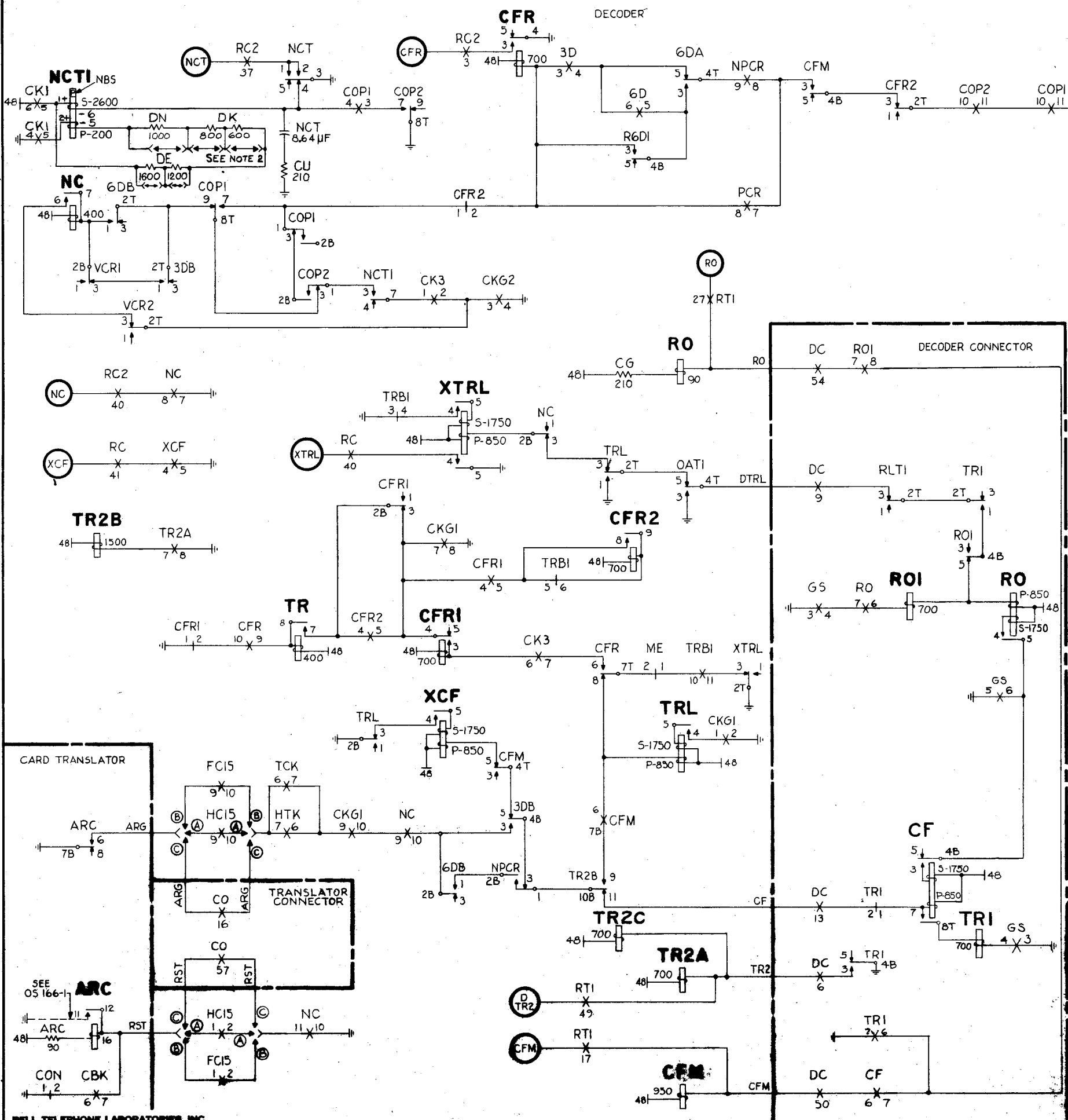


DECODER
ROUTE RELAY TREE
AND
GROUND SUPPLIES



REVISION	DATE
1	7-3-51
2	8-9-53

SEQUENCE CHART
NO CARD, 3-DIGIT OR 6-DIGIT WITH NPCR



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR HOME TRANSLATOR	FIG.14	68340-01
B	FOR DECODER FOREIGN TRANSLATOR	FIG.15	68340-01
C	FOR FOREIGN TRANSLATOR	Z	68341-01

2. THE VARIOUS TIME INTERVALS IN THE TABLE BELOW MAY BE USED BY THE DECODER TO ALLOW SUFFICIENT TIME FOR THE CARD TRANSLATOR TO DROP A CARD. THESE INTERVALS ARE OBTAINED BY STRAPPING OUT VARIOUS RESISTANCES AS SHOWN.

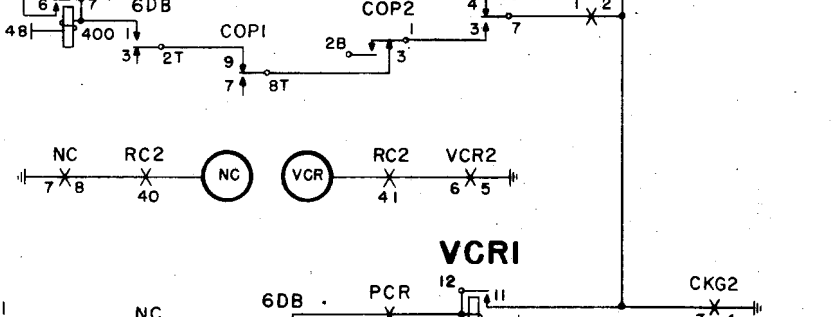
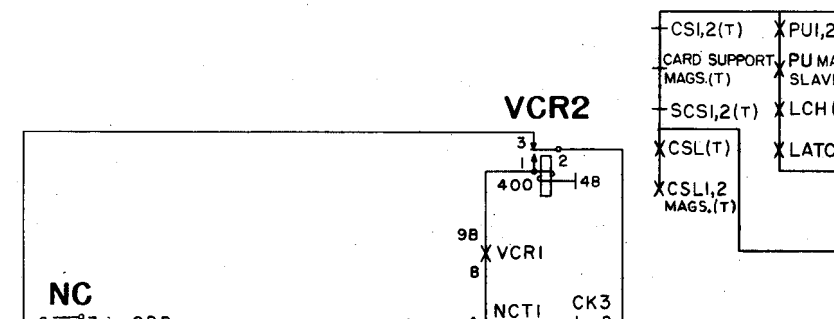
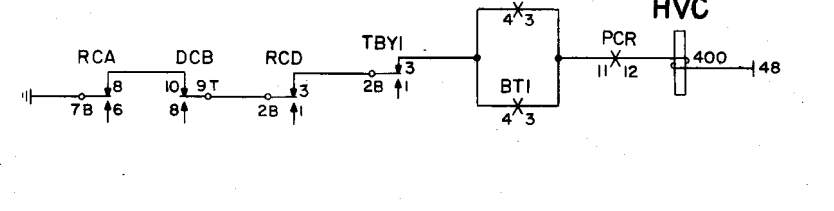
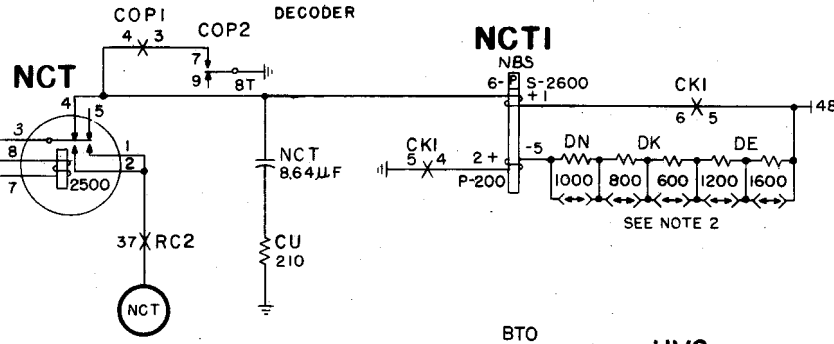
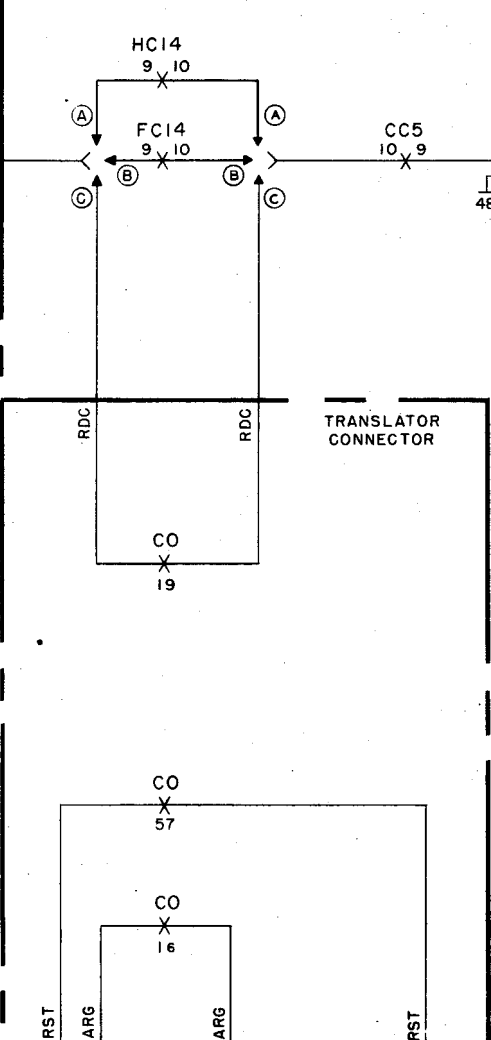
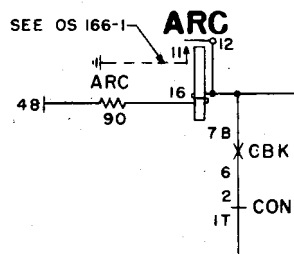
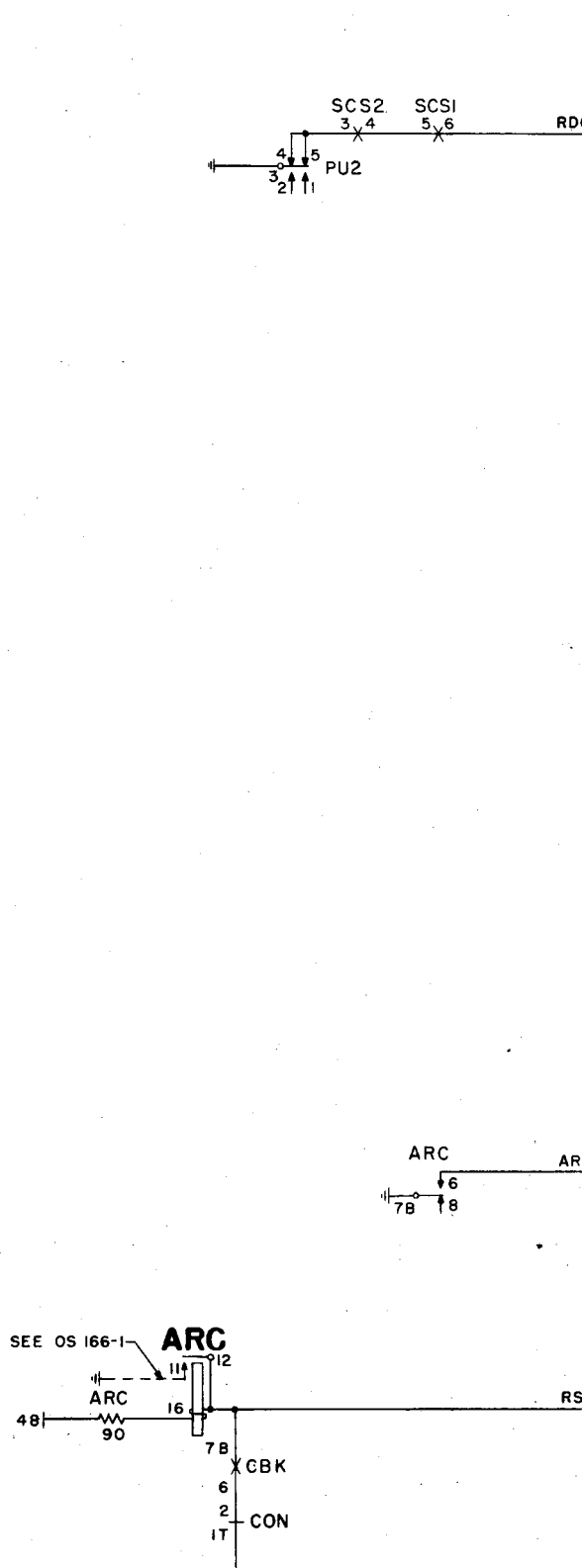
TIME INTERVAL SECONDS		RESISTANCE
MIN.	MAX.	
.0215	.027	600 Ω
.027	.033	800 Ω
.033	.037	1000 Ω
.035	.041	1200 Ω
.0315	.045	1400 Ω
.055	.067	2800 Ω

CARD TRANSLATOR CKT.	SD-68342-01,	ISS 6
DECODER CKT.	SD-68340-01,	ISS 8
DECODER CONNECTOR CKT.	SD-68339-01,	ISS 4
TRANSLATOR CONNECTOR CKT.	SD-68341-01,	ISS 6

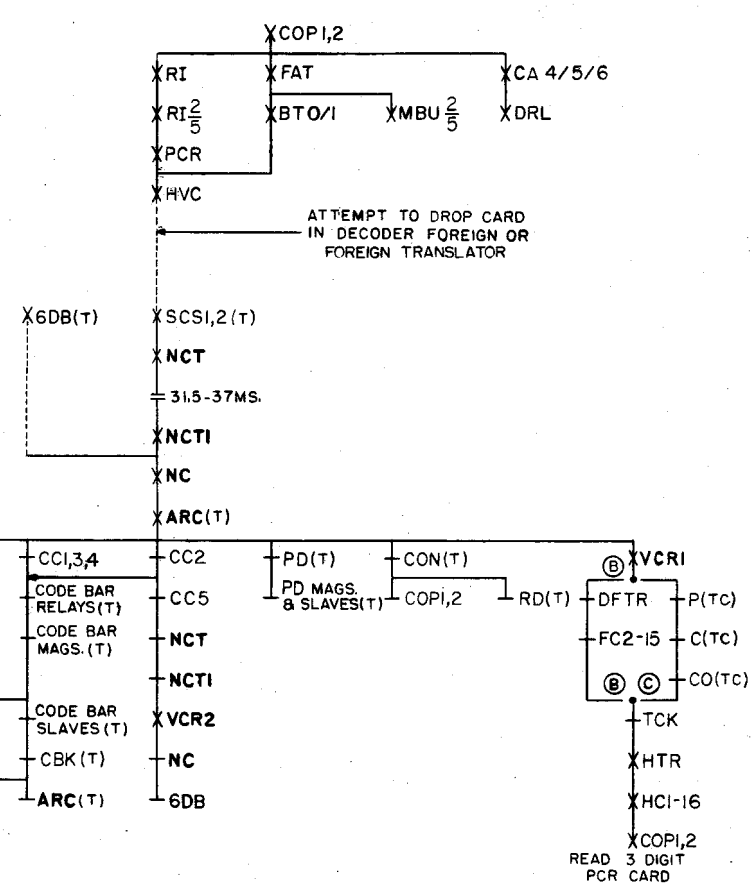
**DECODER
BLANK CODES OR CARD FAILURES
3-DIGIT TRANSLATION
OR
6-DIGIT TRANSLATION WITH NPCR**

ISSUE	1	2	3
DATE	6-22-51	9-28-53	

CARD TRANSLATOR



SEQUENCE CHART



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR HOME TRANSLATOR	FIG. 14	68340-01
B	FOR DECODER FOREIGN TRANSLATOR	FIG. 15	68340-01
C	FOR FOREIGN TRANSLATOR	Z	68341-01

2. THE VARIOUS TIME INTERVALS IN THE TABLE BELOW MAY BE USED BY THE DECODER TO ALLOW SUFFICIENT TIME FOR THE CARD TRANSLATOR TO DROP A CARD. THESE INTERVALS ARE OBTAINED BY STRAPPING OUT VARIOUS RESISTANCES AS SHOWN. TIMING INTERVAL (C) SHALL BE USED FOR INITIAL INSTALLATIONS

TIMING INTERVAL	TIME INTERVAL SECONDS		RESISTANCE
	MIN.	MAX.	
A	.0215	.027	600Ω
B	.027	.033	800Ω
C	.0315	.037	1000Ω
D	.035	.041	1200Ω
E	.0385	.045	1400Ω
F	.055	.067	2800Ω

CARD TRANSLATOR CKT. SD-68342-01, ISS. 6
 *DECODER CKT. SD-68340-01, ISS. 8
 TRANSLATOR CONNECTOR CKT. SD-68341-01, ISS. 6

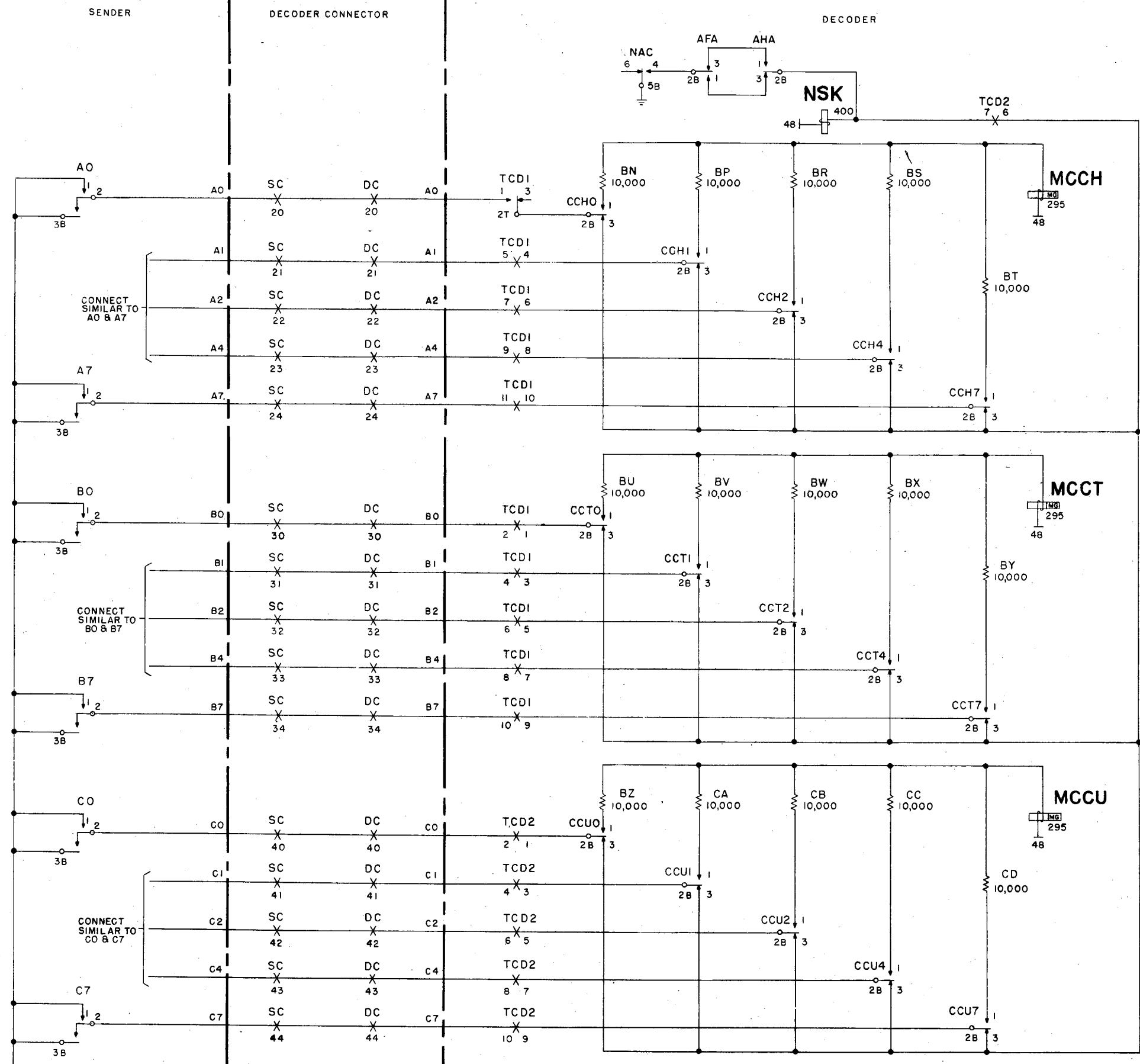
DECODER
 PRINCIPAL CITY
 OR
 VACANT CODE ROUTING
 6 - DIGIT TRANSLATION

NO. 4A OR 4M TOLL

OS 175-1

NOTE:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR HOME TRANSLATOR	FIG. 14	68340-01
B	FOR DECODER FOREIGN TRANSLATOR	FIG. 15	68340-01
C	FOR FOREIGN TRANSLATOR	Z	68341-01
D	COMBINED TRAIN OFFICES	X	68388-01
	SEPARATE TRAIN OFFICE COMBINED OPERATION		
D	SEPARATE TRAIN OFFICE (4 A ONLY)	Y	68388-01
	FOR TOLL COMPLETING MARKERS		
E	4 A OFFICES ONLY	B	68340-01



INCOMING SENDER CKT. DP 4A SD-68221-01, ISS. 14
 INCOMING SENDER CKT. MF 4A SD-68222-01, ISS. 16
 DECODER CONNECTOR CKT. SD-68339-01, ISS. 4
 DECODER CKT. SD-68340-01, ISS. 8
 TRANSLATOR CONN. CKT. SD-68341-01, ISS. 6
 TRANSLATOR CKT. SD-68342-01, ISS. 6
 MARKER CKT. SD-68388-01, ISS. 7
 MARKER CONN. CKT. SD-68395-01, ISS. 5
 INCOMING SENDER CKT. DP 4M SD-68423-01, ISS. 2
 INCOMING SENDER CKT. MF 4M SD-68424-01, ISS. 4

DECODER
 CODE DIGIT TRANSFER AND
 CODE MATCHING CHECK

OS 176-1

2 SHEETS, SHEET 1

NO 4A OR 4M TOLL

ORDER AS BSP ITEM MP-11633

BELL TELEPHONE LABORATORIES, INC.
 PRINTED IN U.S.A.

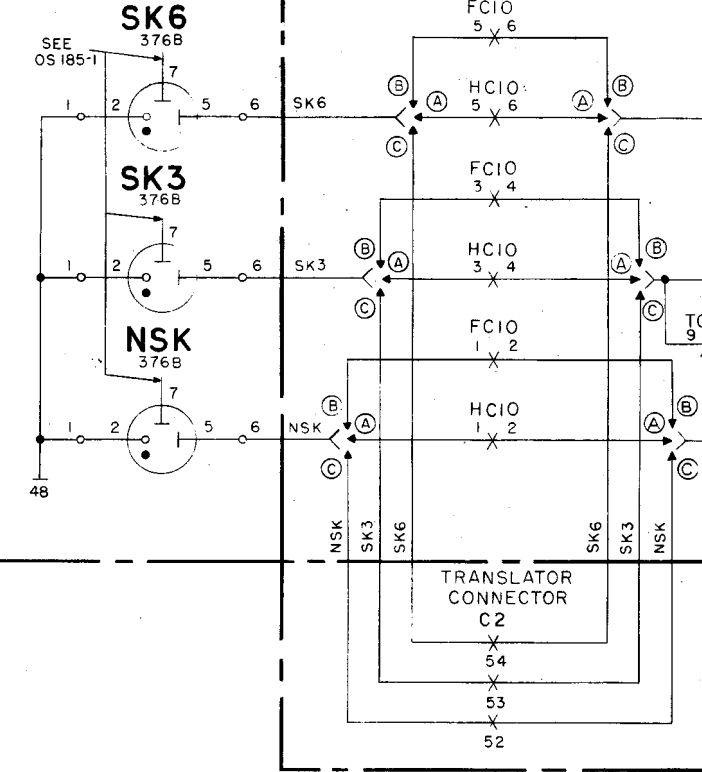
ISSUE	1	2	3
DATE	6-22-51	8-13-53	

2 SHEETS, SHEET 1

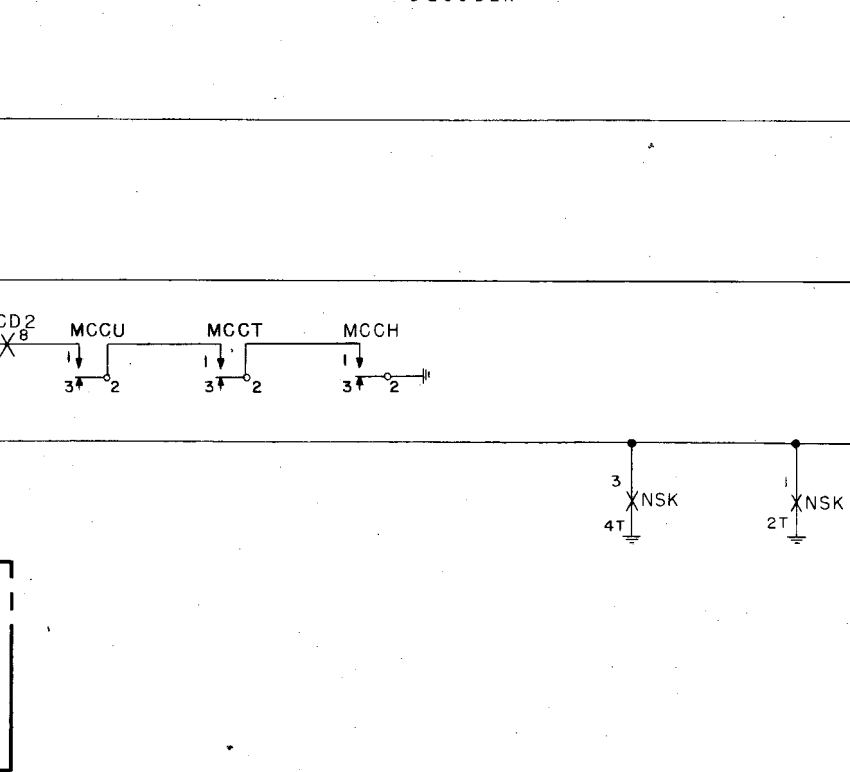
MP-11633

ISSUE	DATE
1	6-22-51
2	8-7-53

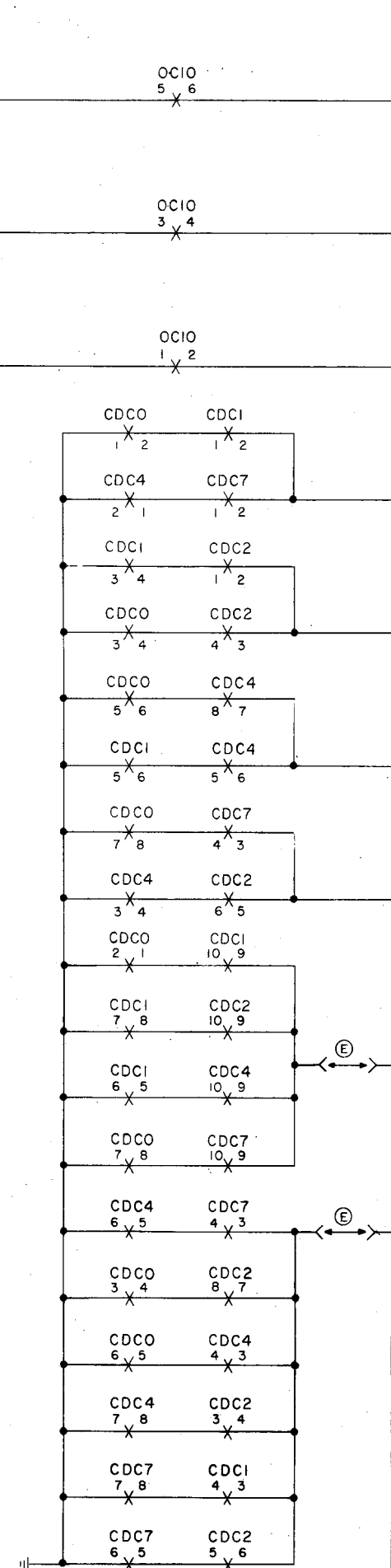
CARD TRANSLATOR



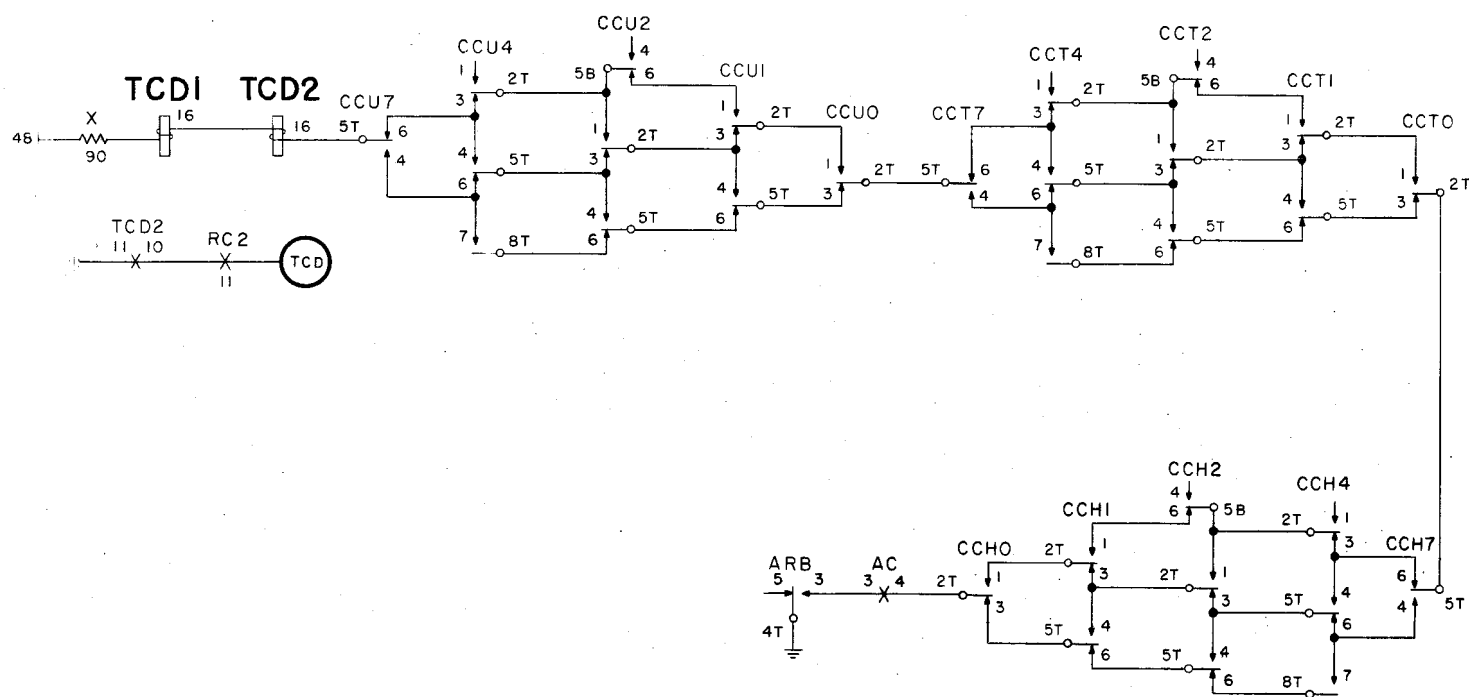
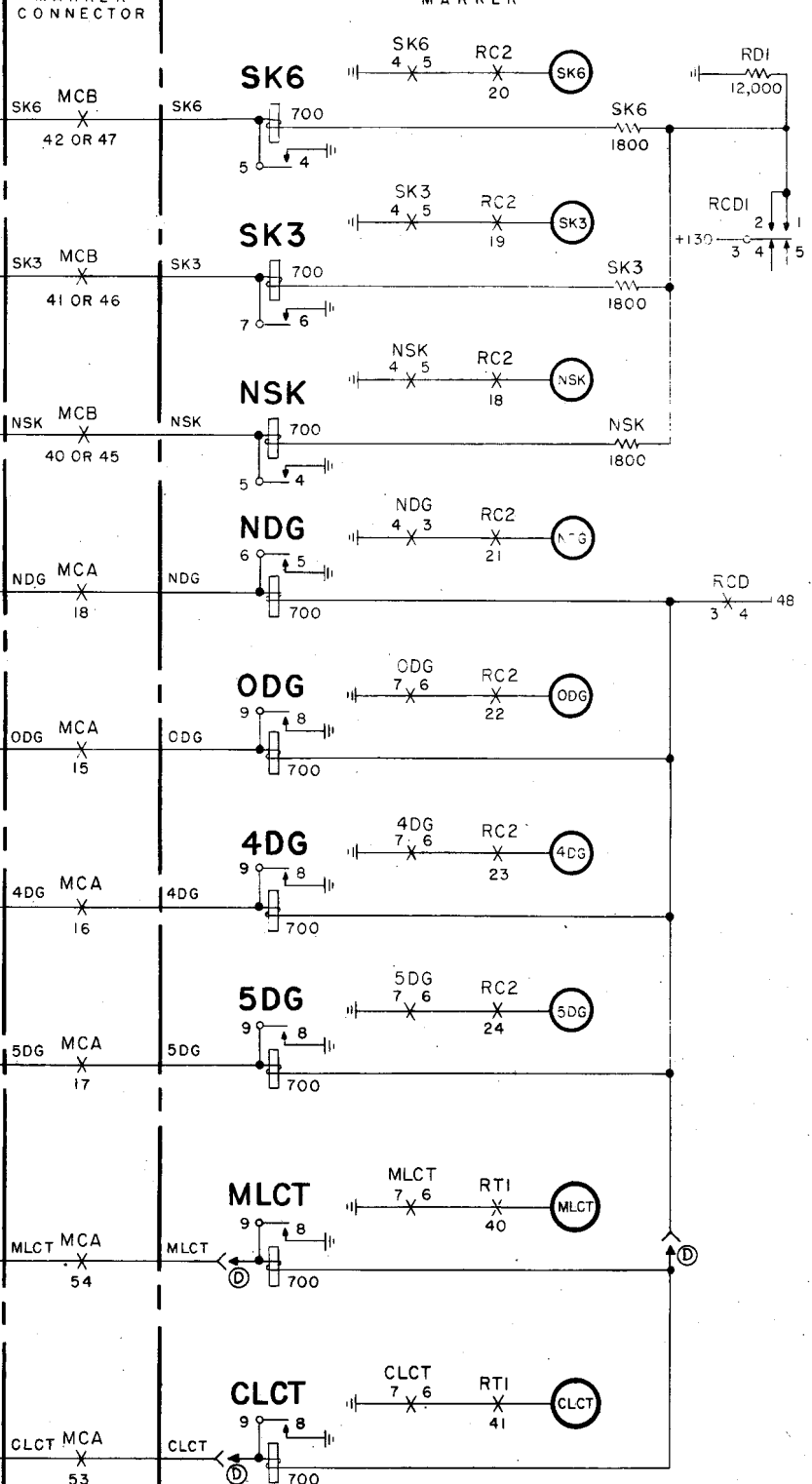
DECODER



MARKER CONNECTOR



MARKER



DECODER
CODE DIGIT TRANSFER AND
CODE MATCHING CHECK

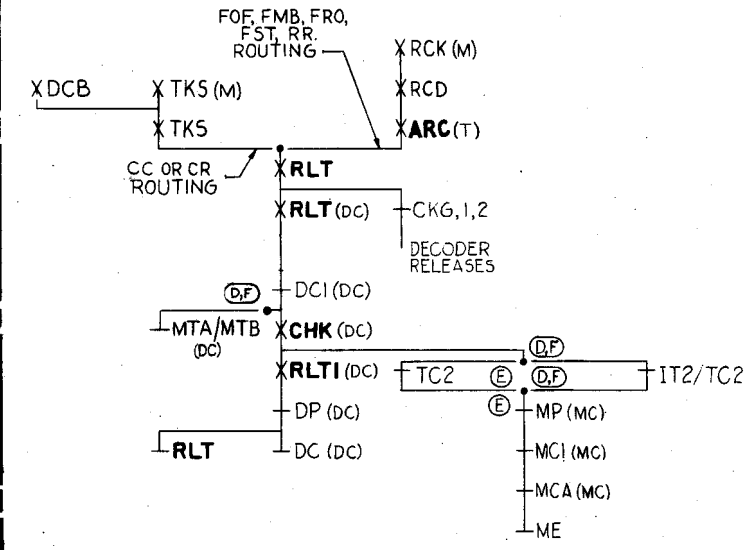
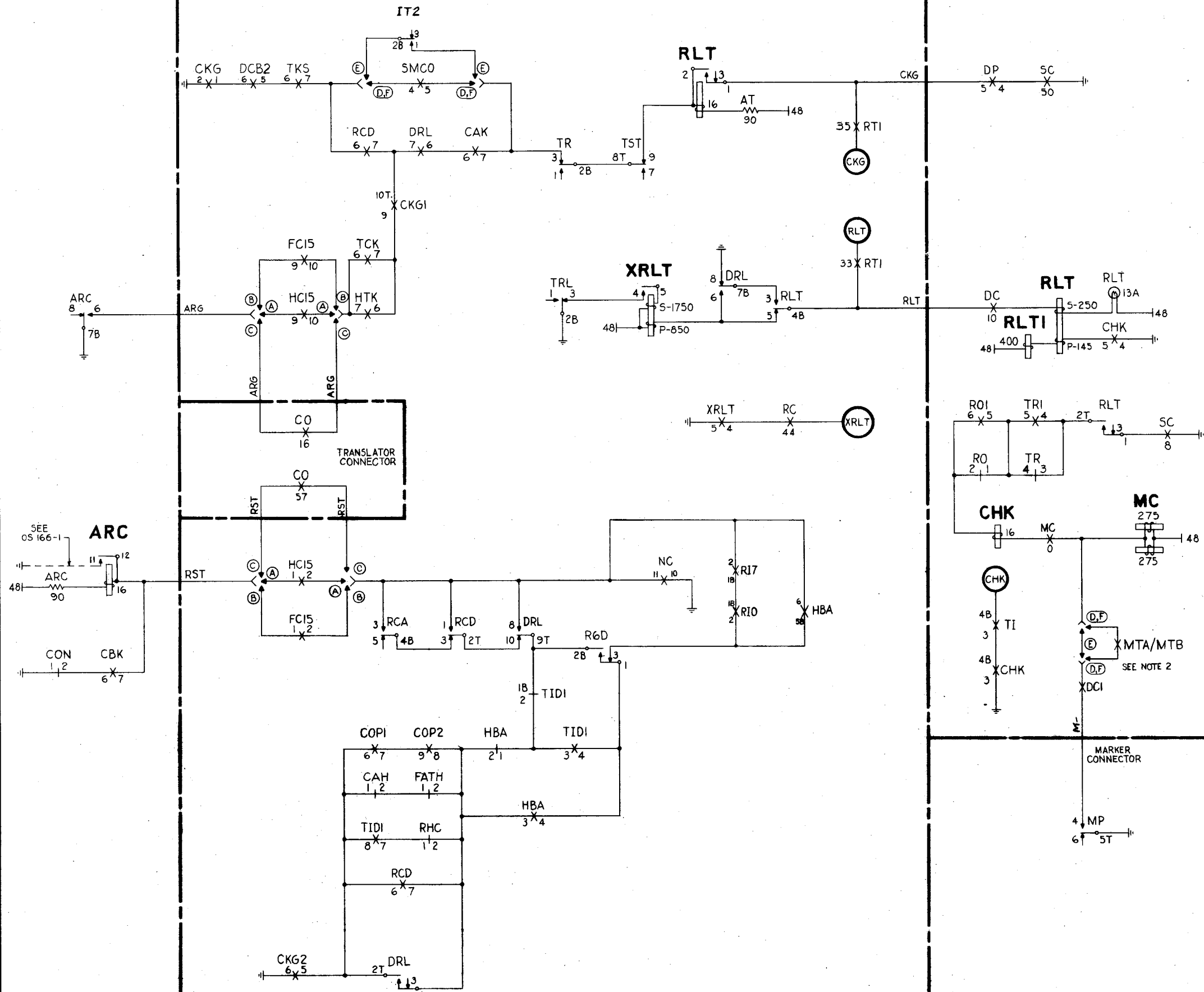
ISSUED	1	11/54	2	11/54
DATE	6-27-51	9-30-53		

CARD TRANSLATOR

DECODER

DECODER CONNECTOR

SEQUENCE CHART



NOTES:

OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR HOME TRANSLATOR	FIG. 14	68340-01
B	FOR DECODER FOREIGN TRANSLATOR	FIG. 15	68341-01
C	FOR FOREIGN TRANSLATOR	Z	68341-01
D	SEPARATE TRAIN OPERATION	FIG. A & X	68340-01
	COMBINED TRAIN OPERATION	FIG. B & Y	68340-01
F	SEPARATE TRAIN COMBINED OPERATION	FIG. E & R	68340-01

2.

LEAD	DC1 CONTACT	MTA/MTB CONTACTS
M0	10/15	1B-2B
M1	11/16	3B-4B
M2	12/17	5B-6B
M3	13/18	7B-8B
M4	14/19	9B-10B
M5	20/25	3T-4T
M6	21/26	5T-6T
M7	22/27	7T-8T
M8	23/28	9T-10T
M9	24/29	11T-12T

CARD TRANSLATOR	SD-68342-01	ISS. 6
*DECODER	SD-68340-01	ISS. 8
DECODER CONNECTOR	SD-68339-01	ISS. 4
MARKER CONNECTOR	SD-68395-01	ISS. 3
TRANSLATOR CONNECTOR	SD-68341-01	ISS. 6

**DECODER
REGULAR RELEASE**

NOTES

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	HOME TRANSLATOR	FIG. 14 Y	68340-01 68342-01
B	DECODER FOREIGN TRANSLATOR	FIG. 15 W	68340-01 68342-01
C	FOREIGN TRANSLATOR	Z X	68341-01 68342-01
D	IF MARKER IS NOT ATTACHED	NONE	68340-01
E	IF MARKER IS ATTACHED	NONE	68340-01
F	EMERGENCY TRANSLATOR	FIG. 3 FIG. 2	68341-01 68342-01
G	INTER-SENDER LOAD CONTROL TIMING	NOT PROVIDED	68388-01
		ROUTE TO REGULAR GRP. OF MASTER BUSY TRUNKS	
		PRO-VIDED	FIG. B
H	ROUTE TO OVERLOAD ANNOUNCEMENT TRUNKS OR SEPARATE GRP. OF MASTER BUSY TRUNKS OR OTHER TRKS.		
J	4A		68221-01 68222-01
K	CONTROL OF STUCK SENDERS BY CTR KEYS AND CHAIN RELAYS. NO RECORDING OF STUCK SENDERS. 4A	FIGS. 4 & J, Z WIRING	68221-01 68222-01
L	CONTROL OF STUCK SENDERS BY COMMON KEY WITH AUTOMATIC RECORDING OF STUCK SENDERS. 4A	FIGS. 22 & K	68221-01 68222-01
M	4M		68423-01 68424-01

- IF DECODER FAILS TO IDENTIFY INCOMING TRUNK LOCATION TO ESTABLISH MARKER CONNECTION.
- ANY TROUBLE, OTHER THAN THE TROUBLE DESCRIBED IN NOTE 2 WHICH CAUSES OPERATION OF TR RELAY.
- IF TROUBLE RECORDER TIMES OUT.

- | | |
|---------------------------------------|----------------------|
| CARD TRANSLATOR CKT. | SD-68342-01, ISS. 6 |
| *DECODER CKT. | SD-68340-01, ISS. 8 |
| DECODER CONNECTOR CKT. | SD-68339-01, ISS. 4 |
| INC. SENDER CKT. -DP-4A | SD-68221-01, ISS. 14 |
| INC. SENDER CKT. -DP-4M | SD-68423-01, ISS. 2 |
| INC. SENDER CKT. -MF-4A | SD-68222-01, ISS. 16 |
| INC. SENDER CKT. -MF-4M | SD-68424-01, ISS. 4 |
| MARKER CKT. | SD-68388-01, ISS. 7 |
| MARKER CONNECTOR CKT. | SD-68395-01, ISS. 5 |
| MISC. CKT. FOR TROUBLE RECORDER FRAME | SD-68392-01, ISS. 5 |
| TRANSLATOR CONNECTOR CKT. | SD-68341-01, ISS. 6 |

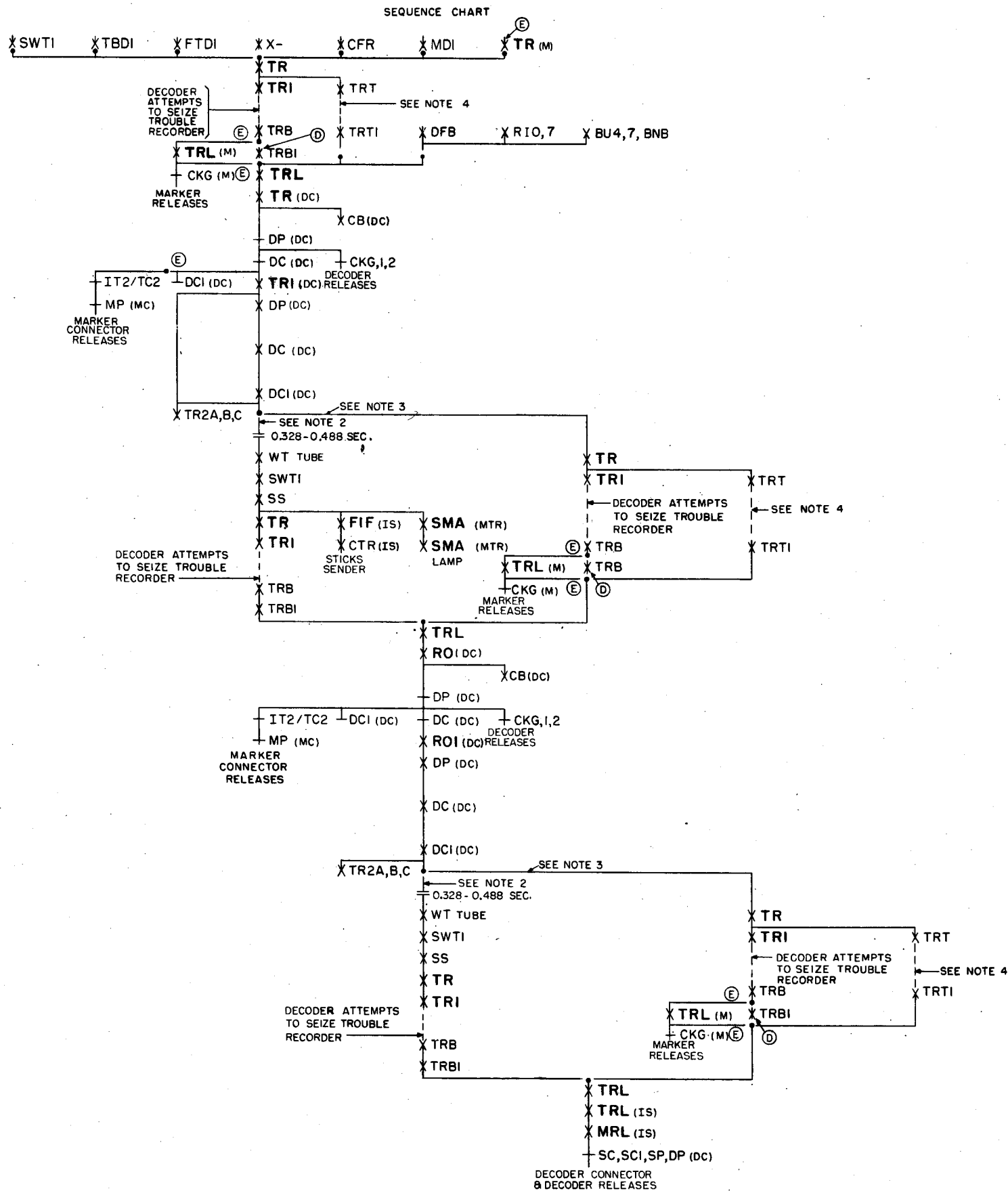
DECODER.
TROUBLE RELEASE CONDITIONS

OS 178-1

2 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

ORDER AS B&P ITEM MP-11765

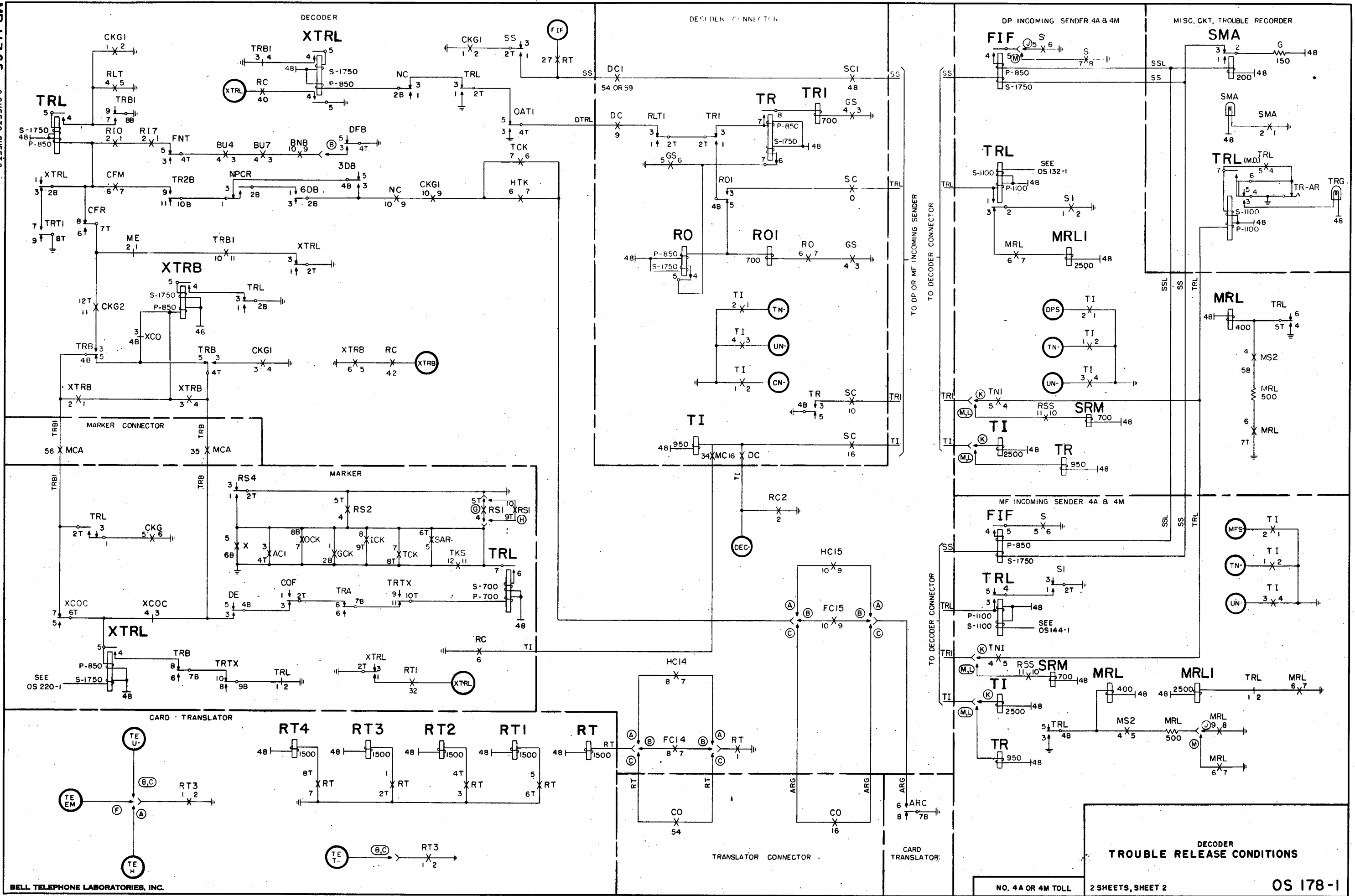


ISSUE	1	2	3	4
DATE	1-18-52	9-30-53		

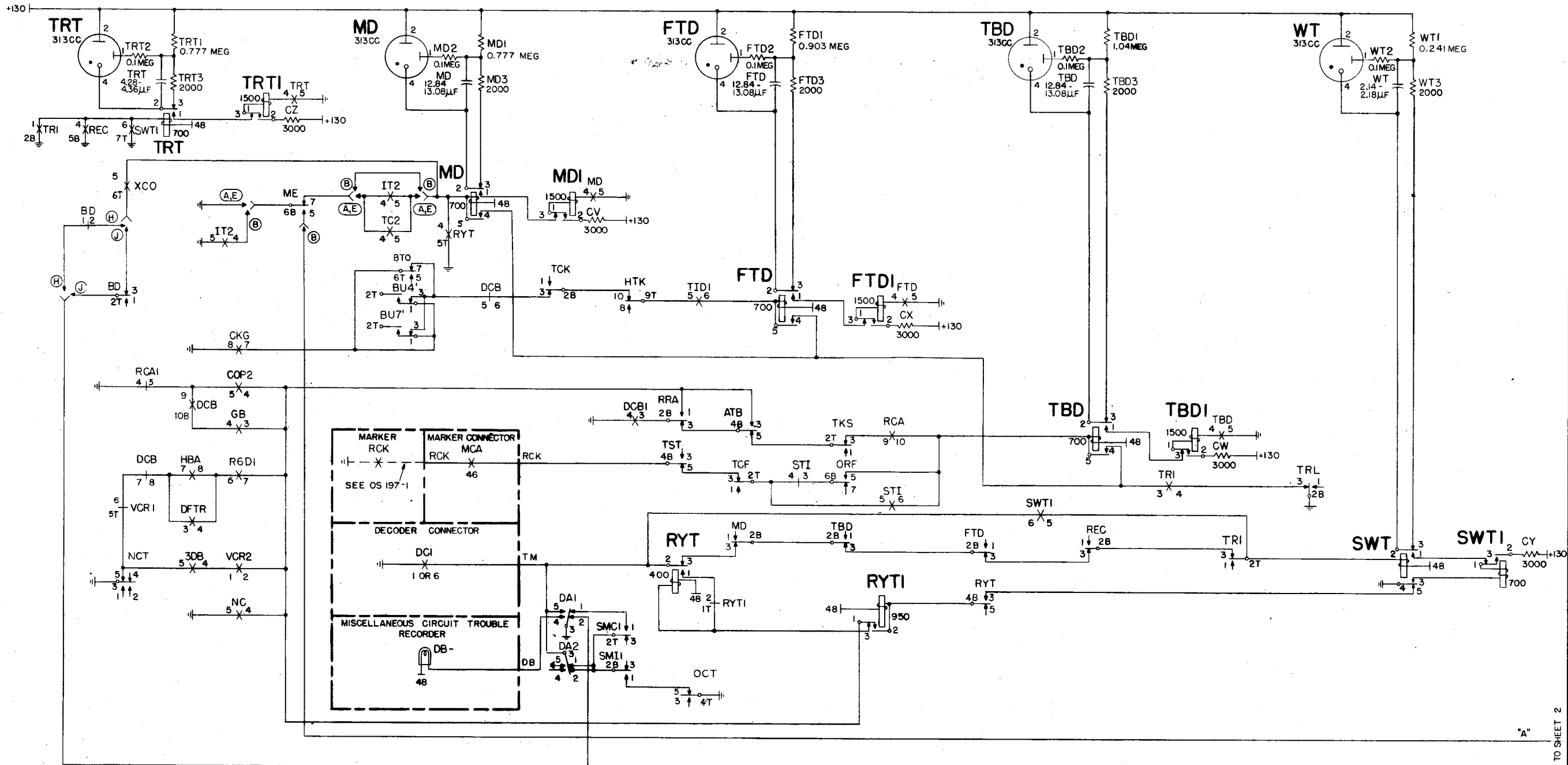
2 SHEETS, SHEET 1

MP-11765

ISSUE	1	2	3
DATE	1-19-52	9-20-53	



DECODER



ISSUE	1	2	3	4
DATE	6-28-57	10-1-53		

TO SHEET 2

3 SHEETS, SHEET 1

MP-11636

DECODER
TIMING, TROUBLE CROSSES AND
REQUEST FOR TROUBLE RECORDER

OS179-1

3 SHEETS, SHEET 1

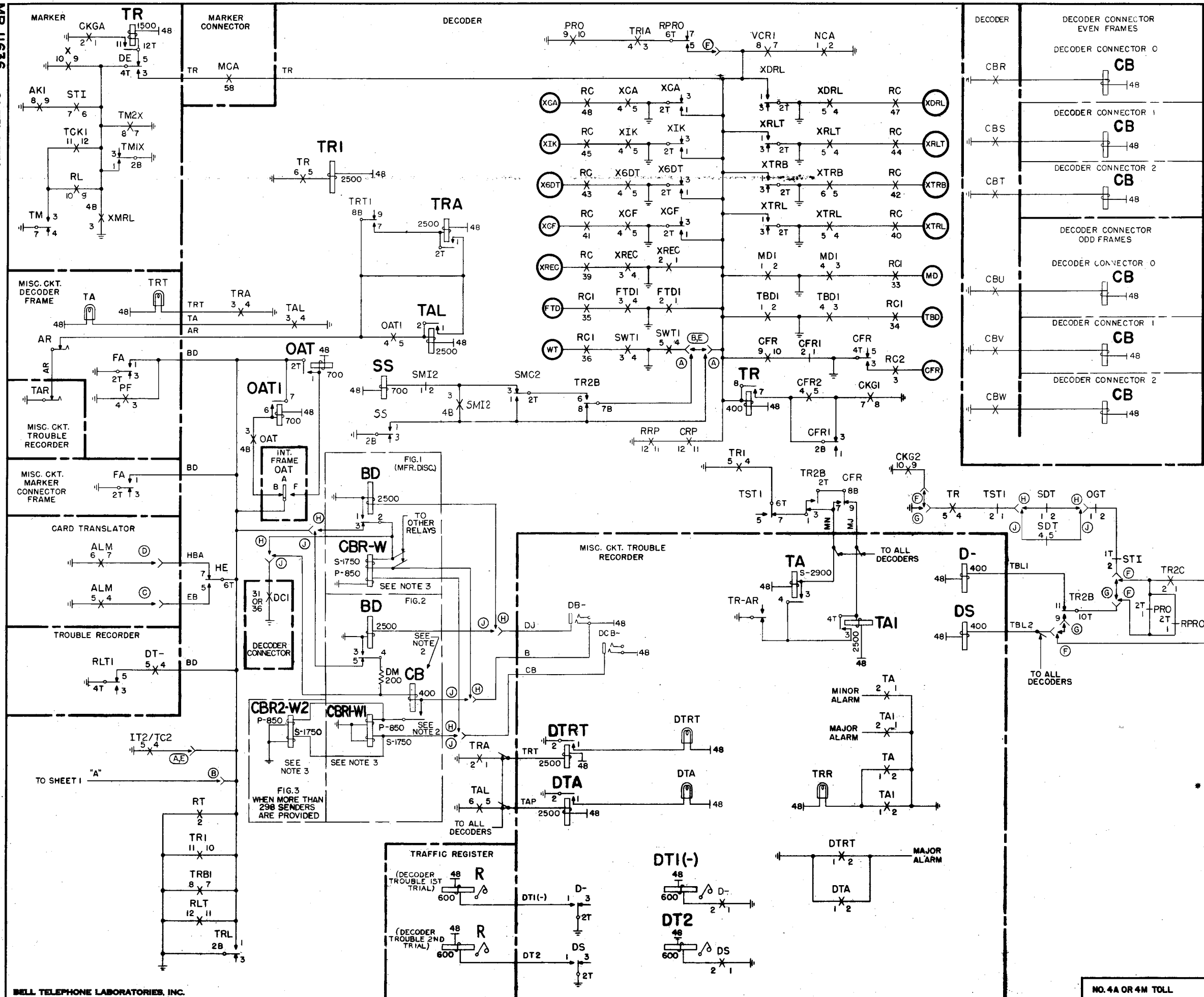
NO. 4A OR 4M TOLL

ORDER AS BSP ITEM MP-11636

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U. S. A.

ISSUE	1	2	3
DATE	6-28-57	10-1-53	



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR SEPARATE TRAIN OPERATION	FIGS. A & X WIRING	68340-01
B	FOR COMBINED TRAIN OPERATION	FIGS. B & Y WIRING	68342-01
C	FOR EMERGENCY TRANS.	Z	
D	FOR HOME TRANSLATOR	Y	
E	SEPARATE TRAIN COMBINED OPERATION	FIGS. E & R WIRING	
F	INTER-SENDER LOAD CONTROL TIMING	ROUTE TO OVERLOAD ANNOUNCEMENT TRKS. OR TO SEPARATE GRP. OF MASTER BUSY TRKS. OR OTHER TRKS.	FIGS. F, H & K WIRING
		ROUTE TO REGULAR GRP. OF MASTER BUSY TRKS.	FIGS. F, H & K WIRING
G	NOT PROVIDED	FIG. GBU WIRING	68340-01
H	M.D.	FIGS. H, K & L	
J	STD.	FIGS. J, L, 25, 26 & 27	

2 (CB) RELAY CONTACTS RELAY COILS

1T-2T	CBS 1,2
3T-4T	CBV 1,2
1B-2B	CBU 1,2
3B-4B	CBU 1,2
5B-6B	CBV 1,2
7P-8B	CBW 1,2

3 RELAY

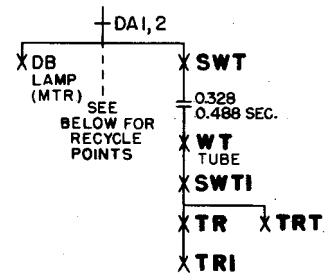
RELAY	CONN. NO.	CP-CONTACT
FOR DECODER CONNECTOR FRMS. 0-19	EVEN	ODD
CBR OR CBR1	CONN. NO. 0 EVEN FRMS.	0 1 10B-11
CBS OR CBS1	CONN. NO. 1 EVEN FRMS.	2 3 6B-7B
CBT OR CBT1	CONN. NO. 2 EVEN FRMS.	4 5 6B-7B
CBU OR CBU1	CONN. NO. 0 ODD FRMS.	6 7 4B-5B
CBV OR CBV1	CONN. NO. 1 ODD FRMS.	8 9 2T-1
CBW OR CBW1	CONN. NO. 2 ODD FRMS.	10 11 4T-3T
FOR DECODER CONNECTOR FRMS. 20-25	EVEN	ODD
CBR2	CONN. NO. 0 EVEN FRMS.	12 13 6T-5T
CBS2	CONN. NO. 1 EVEN FRMS.	14 15 8T-7T
CBT2	CONN. NO. 2 EVEN FRMS.	16 17 10T-9T
CBU2	CONN. NO. 0 ODD FRMS.	18 19 12T-11T
CBV2	CONN. NO. 1 ODD FRMS.	20 21 5B-6B
CBW2	CONN. NO. 2 ODD FRMS.	22 23 3B-4B
		24 25 1B-2B

- GARD TRANSLATOR CKT. SD-68342-01, ISS. 6
- * DECODER CKT. SD-68340-01, ISS. 8
- DECODER CONNECTOR SD-68339-01, ISS. 4
- INTERRUPTER FRAME CKT. SD-68058-01, ISS. 15
- MARKER CKT. SD-68388-01, ISS. 7
- MARKER CONNECTOR CKT. SD-68395-01, ISS. 5
- MISC. CKT. DECODER FRAME SD-68411-01, ISS. 1
- MISC. CKT. MARKER CONNECTOR FRAME SD-68419-01, ISS. 2
- MISC. CKT. TROUBLE RECORDER FRAME SD-68392-01, ISS. 5
- TRAFFIC REGISTER CKT. SD-68442-01, ISS. 7
- TROUBLE RECORDER CKT. SD-68389-01, ISS. 5

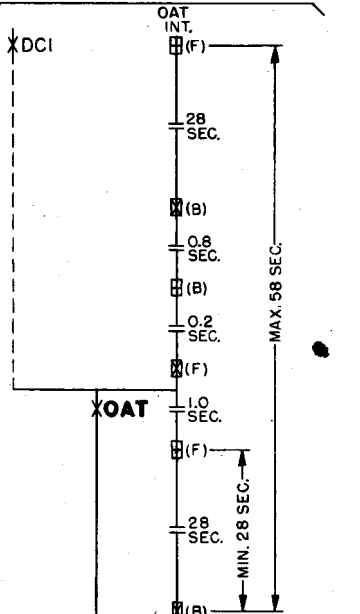
DECODER
TIMING, TROUBLE CROSSES AND
REQUEST FOR TROUBLE RECORDER

ISSUE	1	2
DATE	6-28-57	10-7-55

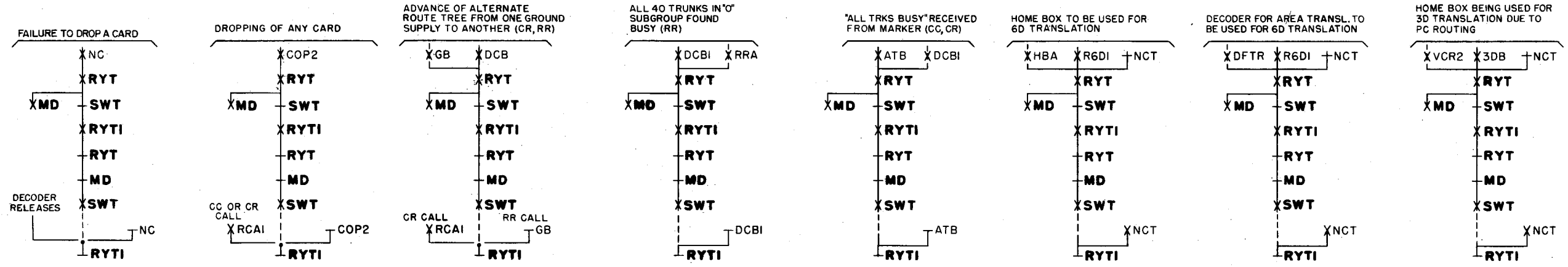
DECODER
SEQUENCE CHARTS
WORK TIMING



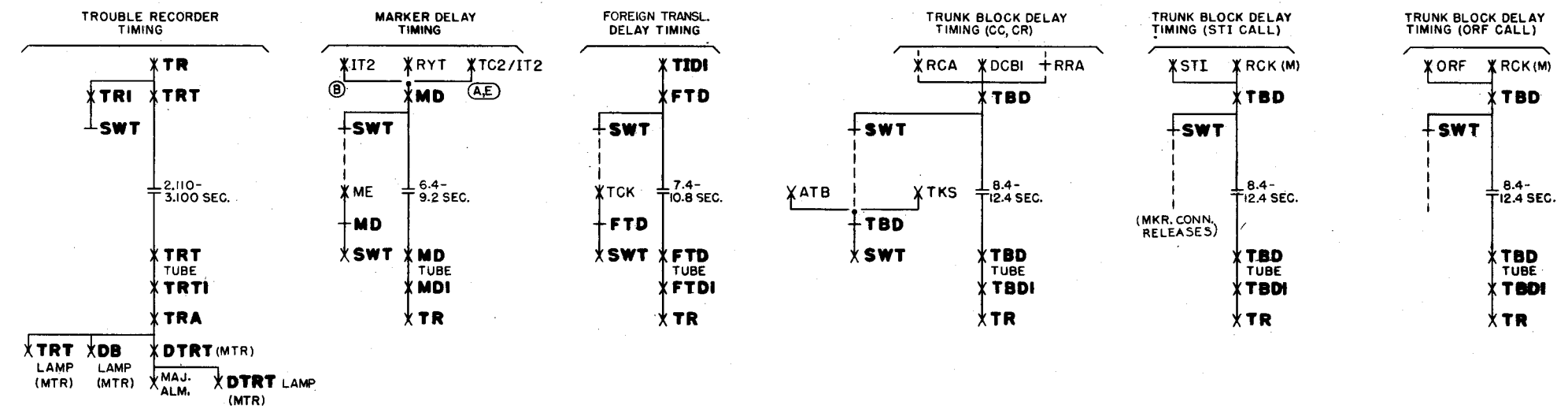
OVERALL TIMING



WORK TIMER MAY BE RECYCLED BY ANY OF THE FOLLOWING

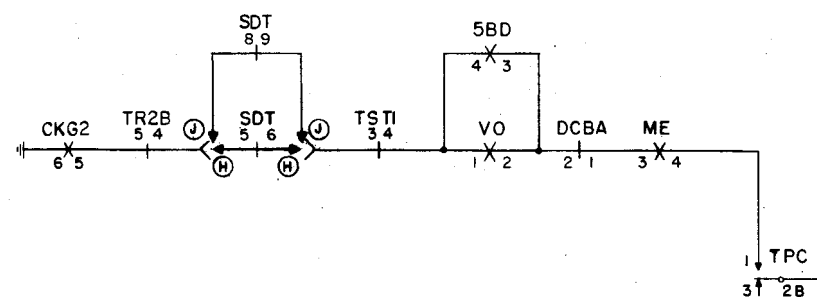
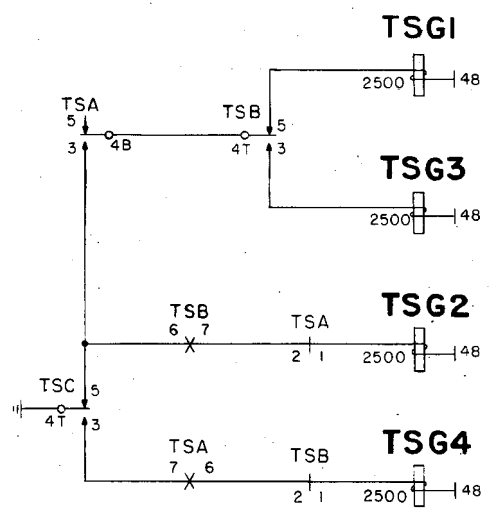
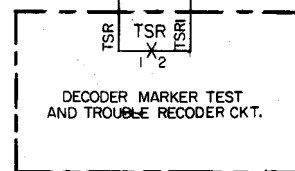
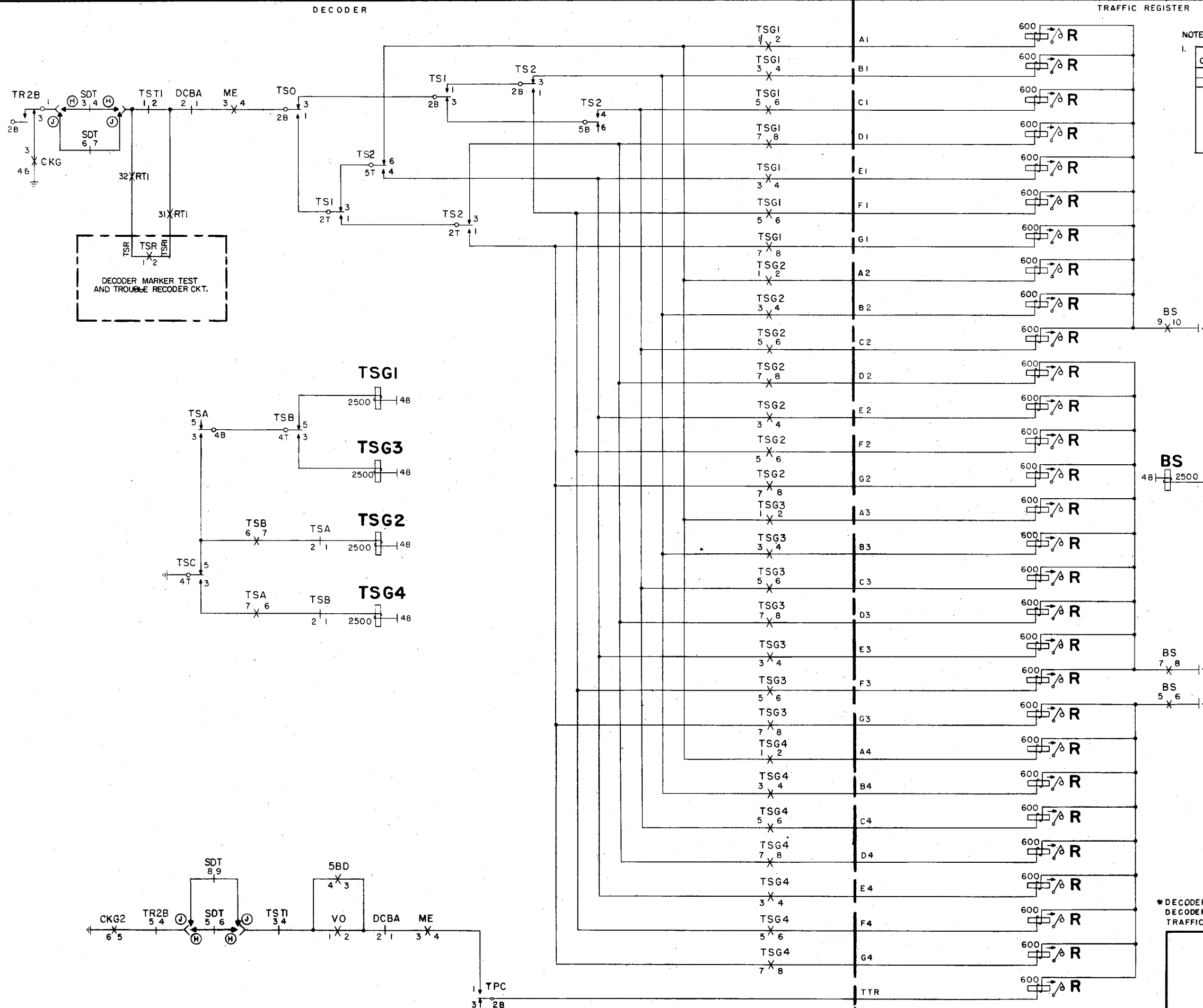


WORK TIMER MAY BE STOPPED & RESTARTED BY ANY OF THE FOLLOWING



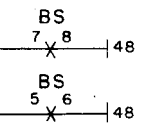
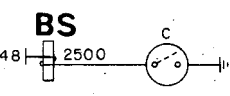
DECODER
TIMING, TROUBLE CROSSES AND
REQUEST FOR TROUBLE RECORDER

ISSUE	1	2	3	4	5
DATE	5-28-51	10-29-53			



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
H	MFR. DISC.	FIG-H	68340-01
J	STD.	FIG-J	



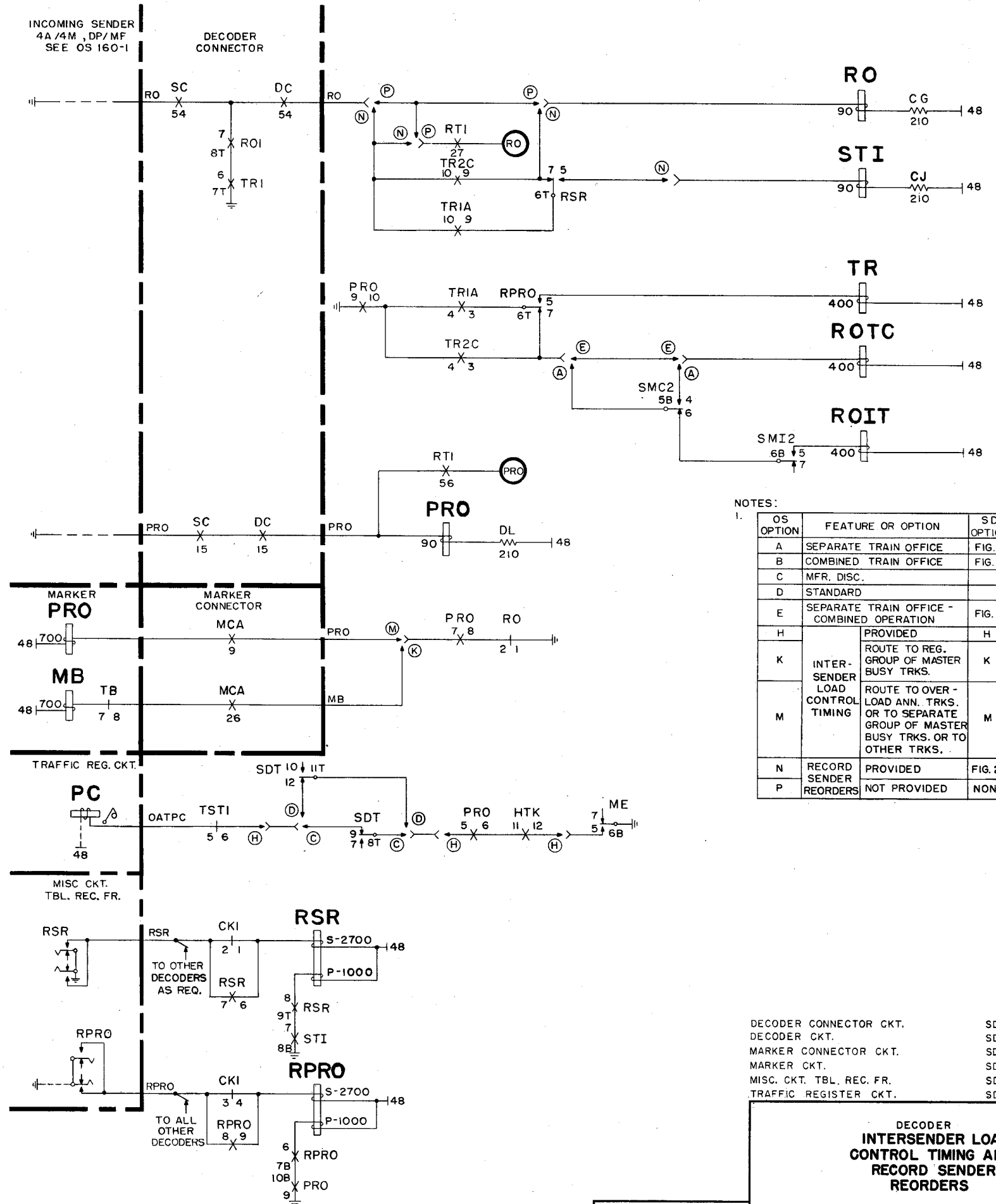
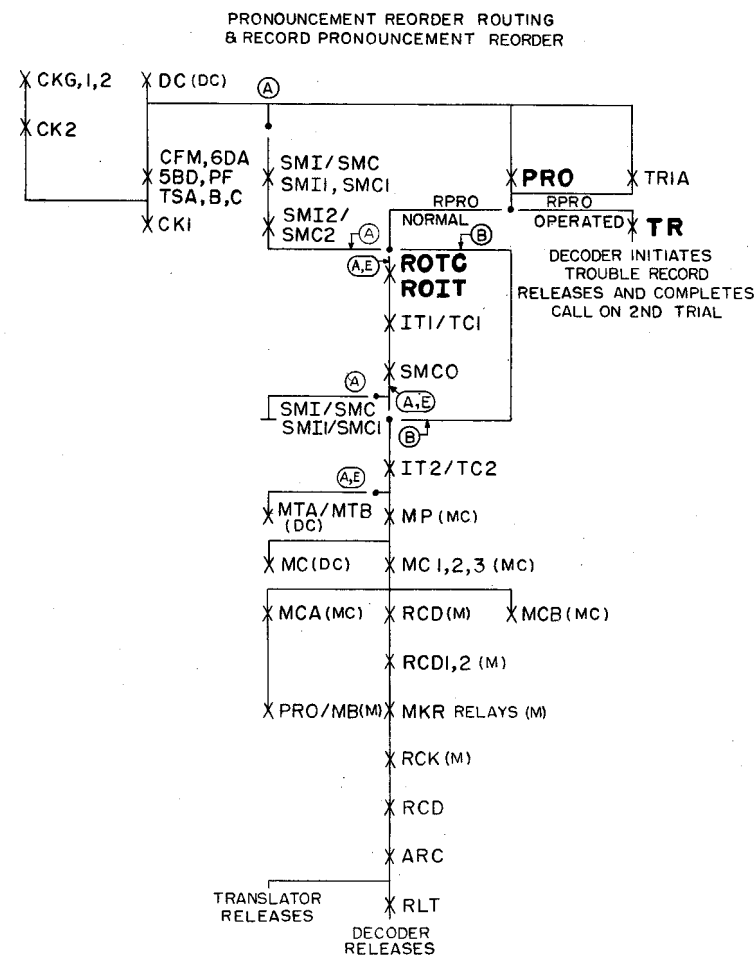
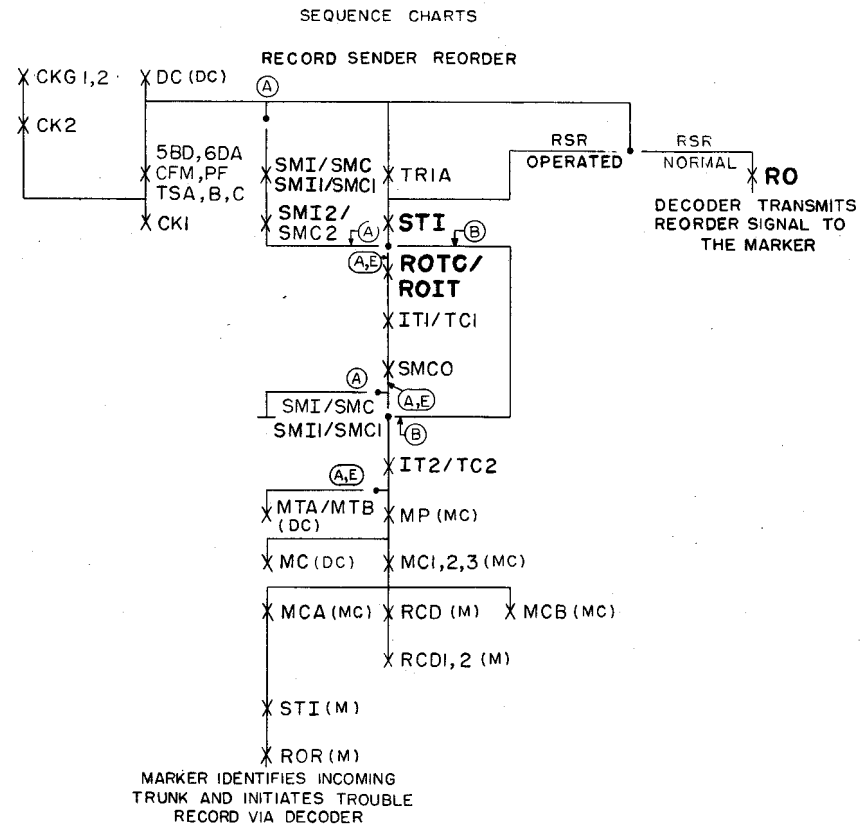
*DECODER CKT. SD-68340-01 ISS. 8
 DECODER MKR. TEST & TBL. REC. CKT. SD-68389-01 ISS. 6
 TRAFFIC REGISTER CKT. SD-68412-01 ISS. 7

DECODER TRAFFIC SEPARATION AND THRU TRAFFIC PEG COUNT REGISTERS

NO. 4A OR 4M TOLL

OS 180-1

ISSUE	DATE	REV.
1	12-8-53	



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	SEPARATE TRAIN OFFICE	FIG. A	68340-01
B	COMBINED TRAIN OFFICE	FIG. B	
C	MFR. DISC.		
D	STANDARD		
E	SEPARATE TRAIN OFFICE - COMBINED OPERATION	FIG. E	
H	PROVIDED	H	68340-01
K	INTER-SENDER LOAD CONTROL TIMING	K	
M	ROUTE TO REG. GROUP OF MASTER BUSY TRKS. OR TO SEPARATE GROUP OF MASTER BUSY TRKS. OR TO OTHER TRKS.	M	
N	RECORD SENDER REORDERS	PROVIDED	FIG. 28
P	NOT PROVIDED	NONE	

DECODER CONNECTOR CKT.	SD-68339-01	ISS. 4
DECODER CKT.	SD-68340-01	ISS. 8
MARKER CONNECTOR CKT.	SD-68341-01	ISS. 5
MARKER CKT.	SD-68388-01	ISS. 8
MISC. CKT. TBL. REC. FR.	SD-68392-01	ISS. 7
TRAFFIC REGISTER CKT.	SD-68412-01	ISS. 5

DECODER INTERSENDER LOAD CONTROL TIMING AND RECORD SENDER REORDERS

NO 4A OR 4M TOLL

REVISION	1	2	3	4	5
DATE	5-29-57	10-9-53			

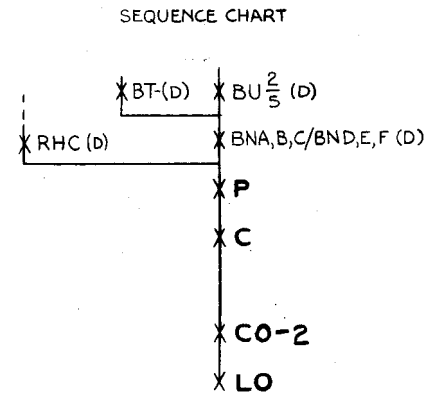
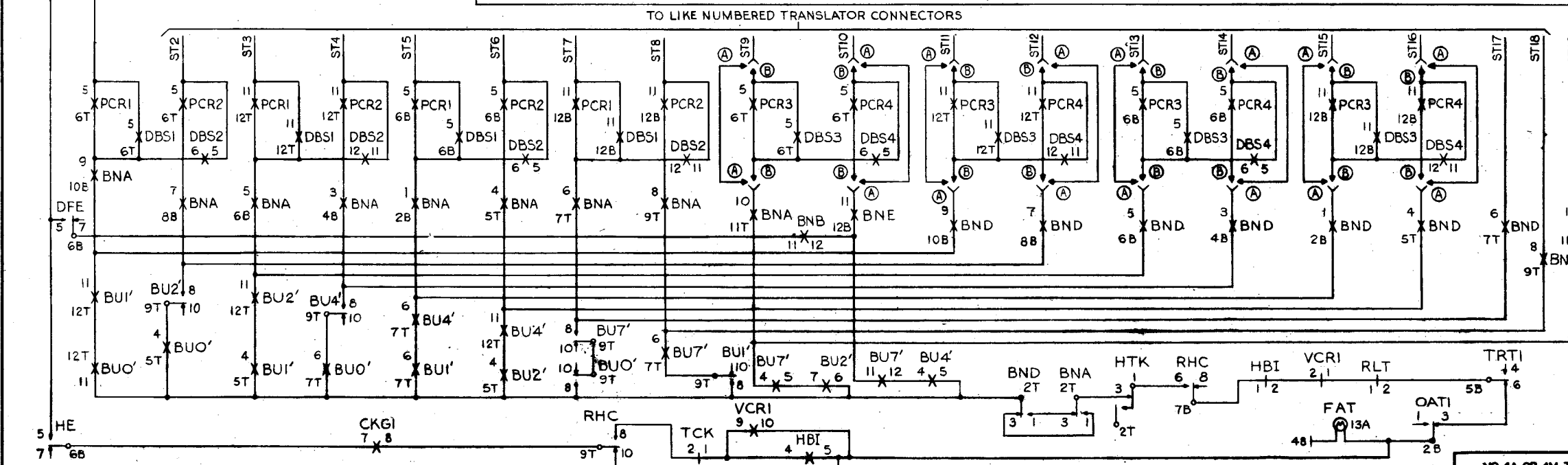
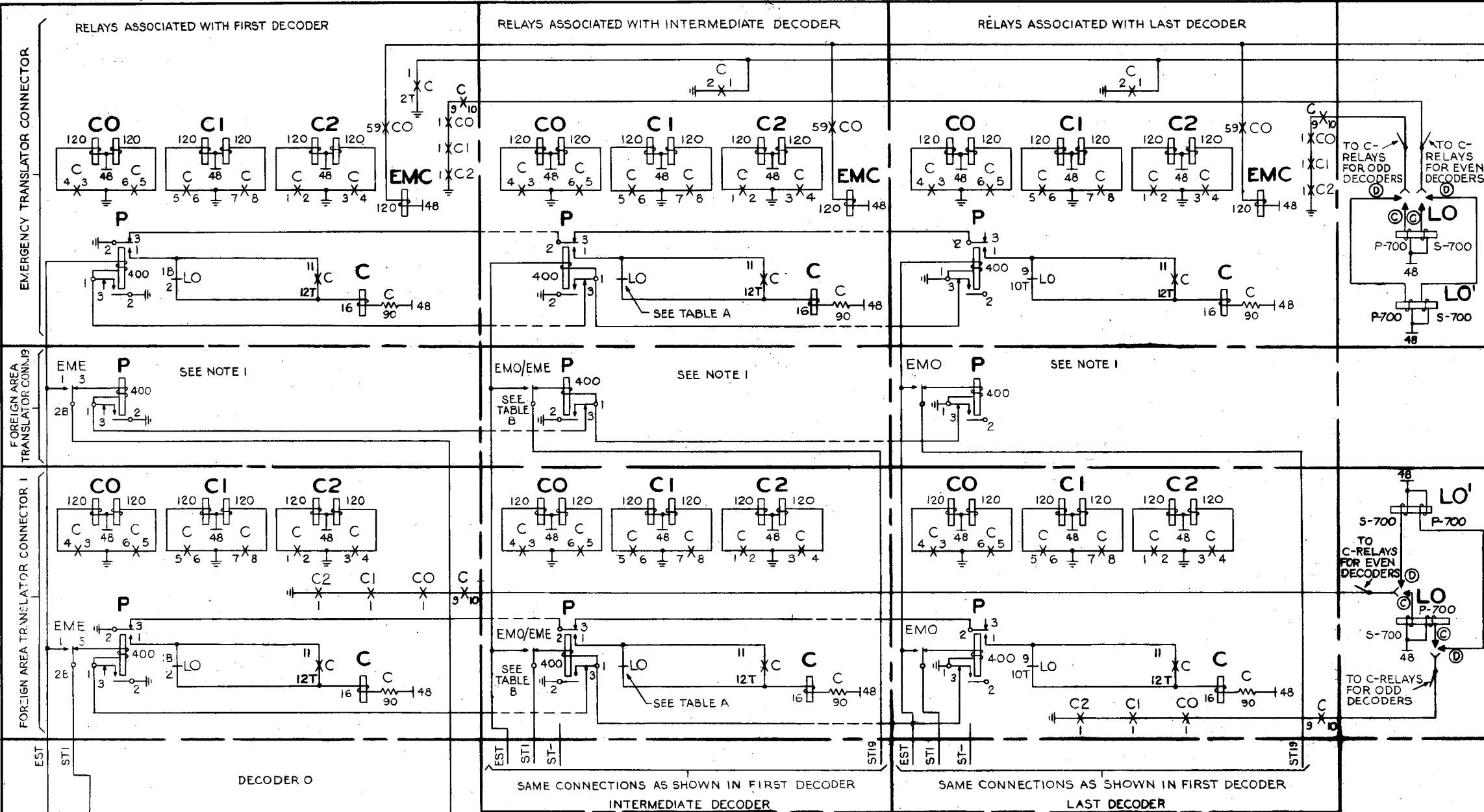


TABLE A

LO & LO' RELAY ASSIGNMENTS

DECODER NUMBER	0	1	2	3	4	5	6	7	8	9
LO RELAY CONTACTS	1B 2B	3B 4B	5B 6B	7B 8B	9B 10B	1T 2T	3T 4T	5T 6T	7T 8T	9T 10T
DECODER NUMBER	10	11	12	13	14	15	16	17		
LO' RELAY CONTACTS	1B 2B	3B 4B	5B 6B	7B 8B	9B 10B	1T 2T	3T 4T	5T 6T		

TABLE B

EME/EMO & EME'/EMO' RELAY ASSIGNMENTS

DECODER NUMBER	0	1	2	3	4	5	6	7	8	9
EME RELAY CONTACTS	1B 2B 3B	4B 5B 6B	7B 8B 9B	1T 2T 3T	4T 5T 6T	7T 8T 9T				
EMO RELAY CONTACTS	1B 2B 3B	4B 5B 6B	7B 8B 9B	1T 2T 3T	4T 5T 6T	7T 8T 9T				
DECODER NUMBER	10	11	12	13	14	15	16	17		
EME' RELAY CONTACTS	1B 2B 3B	4B 5B 6B	7B 8B 9B	1T 2T 3T	4T 5T 6T					
EMO' RELAY CONTACTS	1B 2B 3B	4B 5B 6B	7B 8B 9B	1T 2T 3T	4T 5T 6T					

NOTES:

- ARRANGEMENT SAME AS CONNECTOR I SHOWN
- | OS OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|--------------------|------------|----------|
| A | PAIRED BOXES 1-8 | FIG. 9 & C | 68340-01 |
| B | PAIRED BOXES 16 | FIG. 9 & D | 68340-01 |
| C | FOR DECODERS 0-9 | FIG. 2 | |
| D | FOR DECODERS 10-17 | FIG. 6 | 68341-01 |

CARD TRANSLATOR CKT. SD-68342-01, ISS. 7
 DECODER CKT. SD-68340-01, ISS. 8
 * TRANSLATOR CONNECTOR CKT. SD-68341-01, ISS. 6

TRANSLATOR CONNECTOR SEIZURE AND DECODER PREFERENCE

ISSUE	1	2	3
DATE	6-25-51	10-7-53	

MISC. CKT. EMERGENCY TRANSLATOR CONNECTOR

EMERGENCY CARD TRANSLATOR

TOS

MISC. CKT. TROUBLE RECORDER

REPLACING FOREIGN AREA TRANSLATOR

SEQUENCE CHART

REPLACING HOME TRANSLATOR

EA

EB

HE

HE

HOME CARD TRANSLATOR

TOS

DECODER FOREIGN AREA CARD TRANSLATOR

TOS

FOREIGN AREA CARD TRANSLATOR

TOS

TRANSLATOR CONNECTOR

EMO

EME

EMO'

EME'

SN MG

MGI

MAJOR ALARM

FAO

FAE

DFT

TOS

DAI

DFB

DFE

DG

DFE

EBO

EBE

MISC. CKT. TRANSLATOR CONNECTOR

BFO/TF0

BFE/TFE

FBE-

FBO-

FBE-

FBO-

FBE-

FBO-

FBO-

FBO-

FBO-

FBO-

FBO-

FBO-

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	NON-PAIRED TRANSLATORS	FIG. 33	68392-01
B	PAIRED TRANSLATORS	FIG. 33, FIG. 66	68392-01
C	FOR DECODERS 0-9	FIG. 4	68341-01
D	FOR DECODERS 10-17	FIG. 5	68341-01

2. THE CARDS ARE REMOVED FROM BOX (DFT OR FAT) AND PLACED IN EMERGENCY BOX.

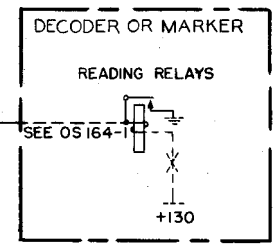
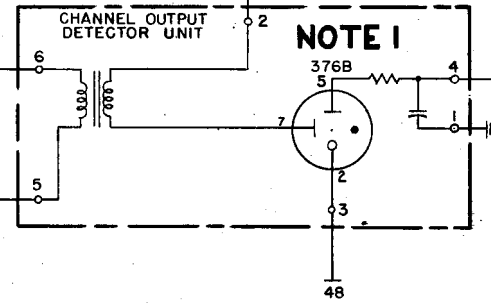
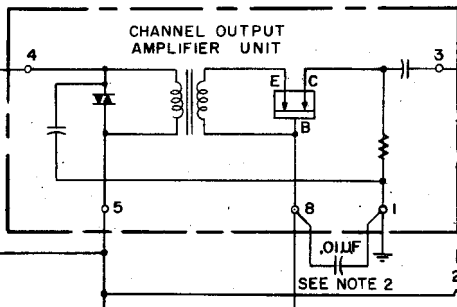
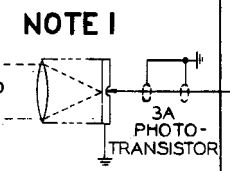
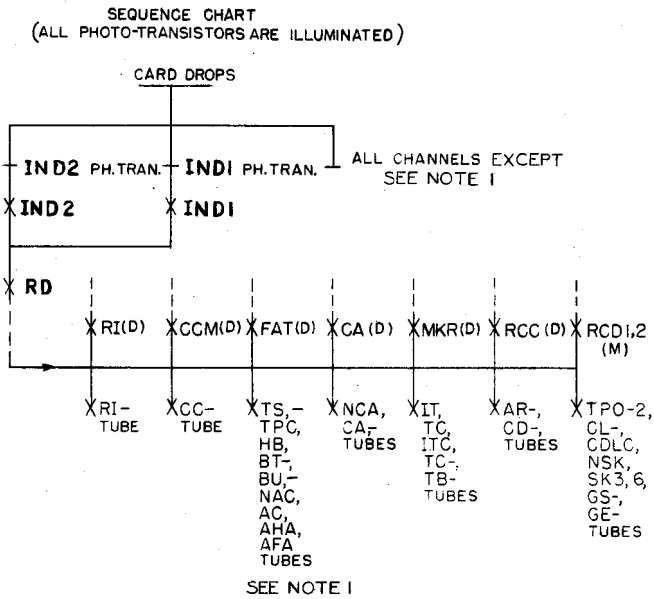
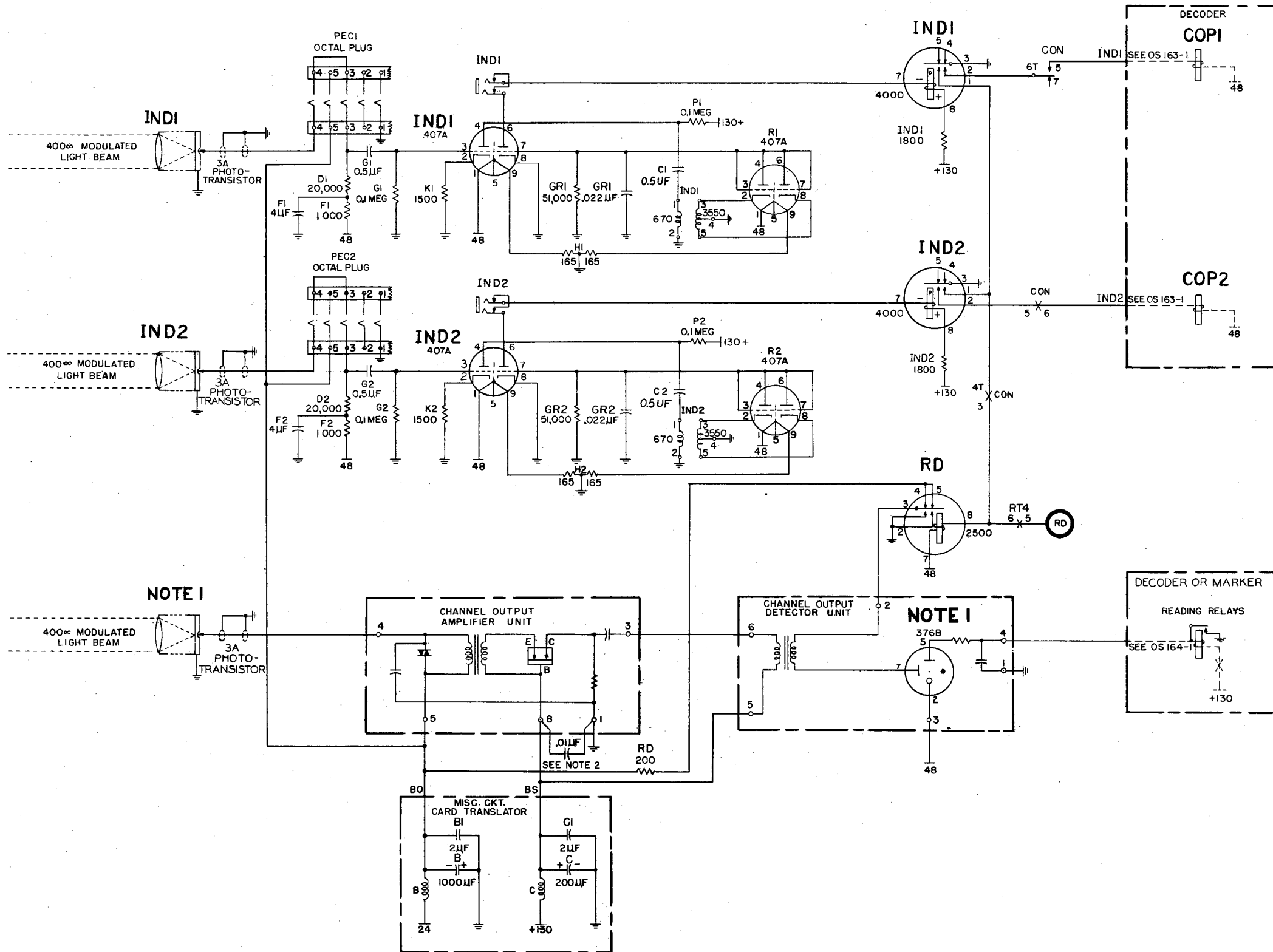
DECODER CONNECTOR CKT.	SD-68339-01, 155.6
CARD TRANSLATOR CKT.	SD-68342-01, 155.7
DECODER CKT.	SD-68340-01, 155.8
MISC. CKT. EMER. TRNSL. CONN.	SD-68429-01, 155.3
MISC. CKT. TRNSL. CONN.	SD-68418-01, 155.3
MISC. CKT. TROUBLE RECORDER	SD-68392-01, 155.5
*TRANSLATOR CONNECTOR CKT.	SD-68341-01, 155.6

**TRANSLATOR CONNECTOR
MAKE BUSY ARRANGEMENTS
FOR TRANSLATORS
AND
SUBSTITUTION OF EMERGENCY
TRANSLATOR**

NO. 4A OR 4M TOLL

OS 184-1

ISSUE	1	2
DATE	1-22-51	



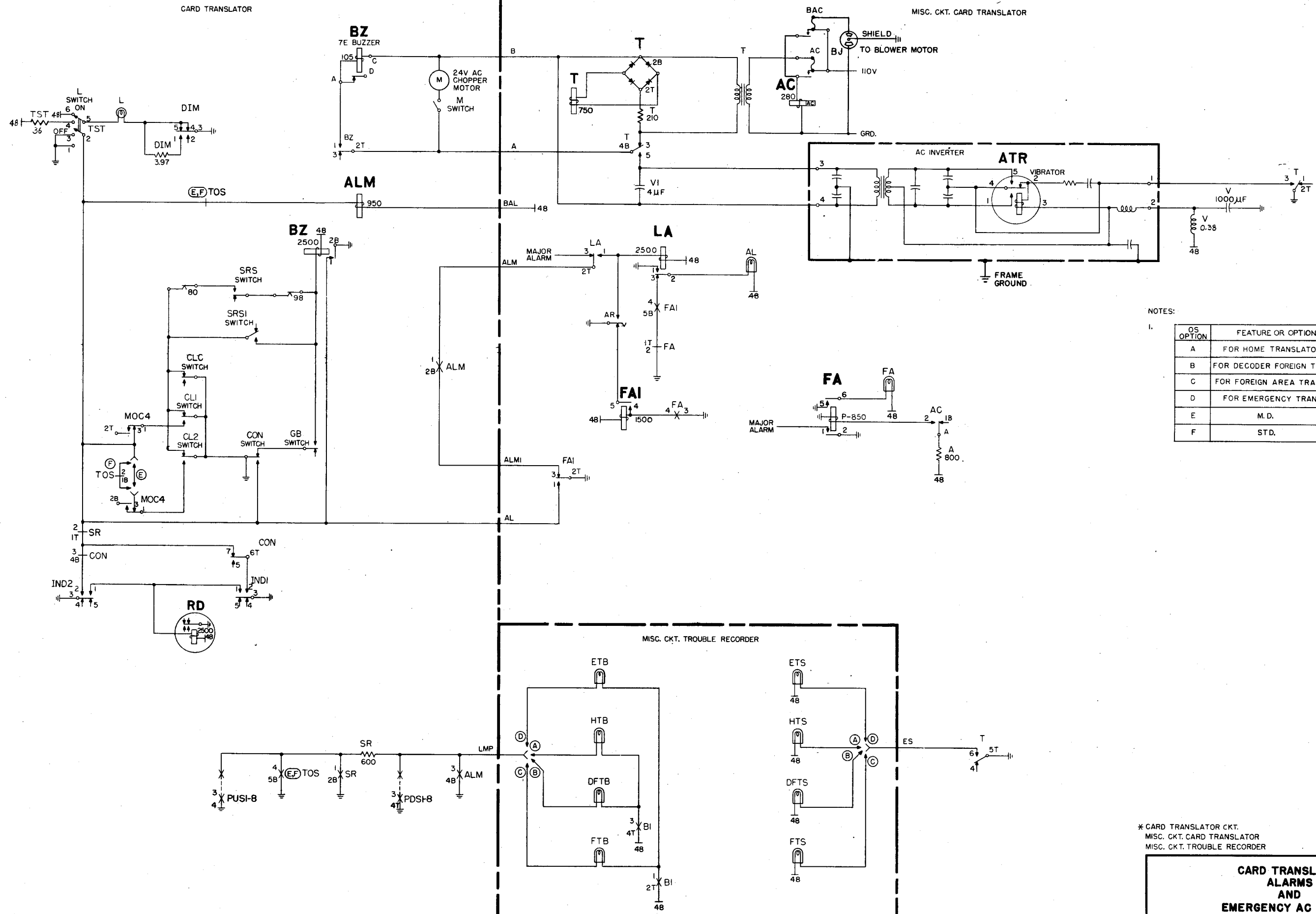
- NOTES:**
1. CHANNELS ASSOCIATED WITH ENLARGED HOLES IN THE DROPPED CARD.
 2. THIS CONDENSER IS PROVIDED FOR THE FOLLOWING CHANNELS ONLY: TSO, CLTO, ART4, CDC2, CCH7, TCT2, AND GSU7.

* CARD TRANSLATOR SD-68342-01, ISS. 7
 DECODER SD-68340-01, ISS. 5
 MISC. CKT. CARD TRANSLATOR SD-68407-01, ISS. 5

**CARD TRANSLATOR
 INDEX AND CHANNEL
 DETECTION CIRCUITS**

NO 4A OR 4M TOLL

ISSUE	1	4/54	2	5/54
DATE	8-7-51	10-8-53		



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR HOME TRANSLATOR	FIGS. 40 & 72	68392-01
B	FOR DECODER FOREIGN TRANS.	FIGS. 40 & 74	
C	FOR FOREIGN AREA TRANS.	FIGS. 39 & 73	
D	FOR EMERGENCY TRANS.	FIGS. 38 & 71	
E	M. D.	FIG. A	68342-01
F	STD.	FIG. B	11

* CARD TRANSLATOR CKT. SD-68342-01, ISS. 7
 MISC. CKT. CARD TRANSLATOR SD-68407-01, ISS. 5
 MISC. CKT. TROUBLE RECORDER SD-68392-01, ISS. 5

**CARD TRANSLATOR
 ALARMS
 AND
 EMERGENCY AC SUPPLY**

NO 4A OR 4M TOLL

OS 186-1

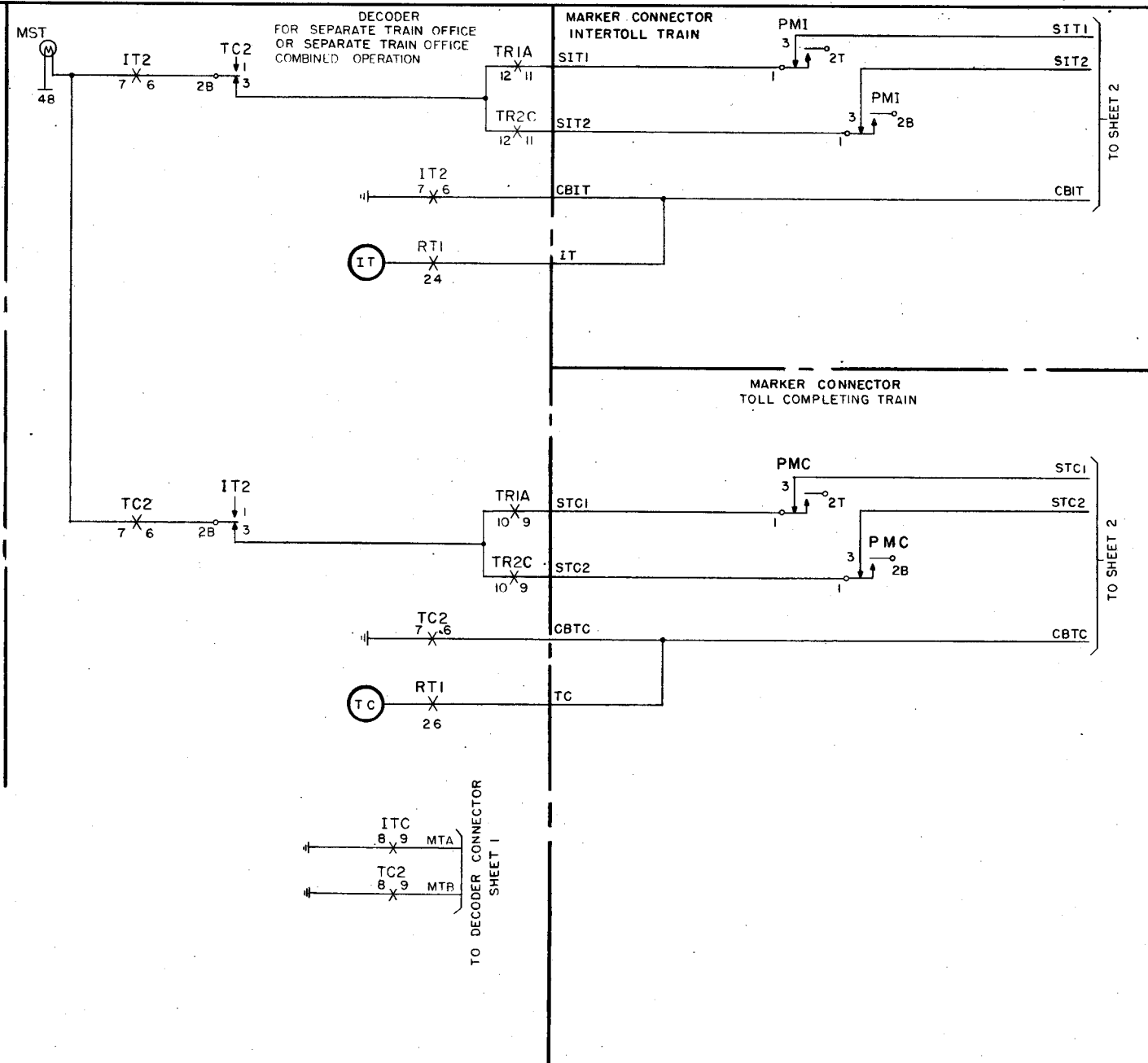
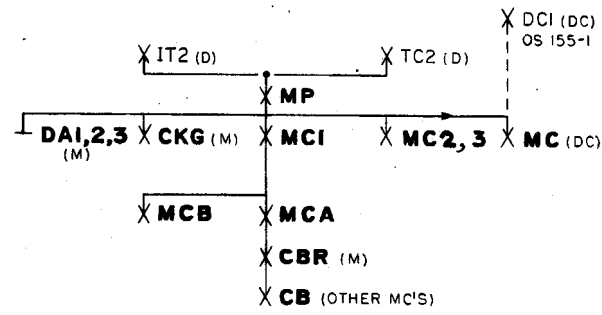
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
Z	FOR OFFICES HAVING SIX OR LESS TRUNK BLOCK CONNECTORS.	Z	68395-01
Y	FOR OFFICES HAVING SEVEN TO EIGHTEEN TRUNK BLOCK CONNECTORS.	Y,Z	68395-01
X	FOR OFFICES HAVING NINETEEN TO THIRTY TRUNK BLOCK CONNECTORS.	V,X,Y	68395-01

2. CONTACT ASSIGNMENTS OF M-LEADS ON DCI, MTA AND MTB RELAYS.

LEAD MARKER NO.	CONTACT NUMBER			
	DCI RELAYS		MTA RELAYS	MTB RELAYS
	EVEN	ODD		
M0	10	15	1-2B	1-2B
M1	11	16	3-4B	3-4B
M2	12	17	5-6B	5-6B
M3	13	18	7-8B	7-8B
M4	14	19	9-10B	9-10B
M5	20	25	3-4T	3-4T
M6	21	26	5-6T	5-6T
M7	22	27	7-8T	7-8T
M8	23	28	9-10T	9-10T
M9	24	29	11-12T	11-12T

SEQUENCE CHART



- DECODER CKT. SD-68340-01, ISS. 8
- DECODER CONNECTOR CKT. SD-68339-01, ISS. 6
- MARKER CKT. SD-68388-01, ISS. 8
- *MARKER CONNECTOR CKT. SD-68395-01, ISS. 5
- MISC. CKT. TROUBLE RECORDER FRAME SD-68392-01, ISS. 5

MARKER CONNECTOR
SEPARATE TRAIN OFFICE &
SEPARATE TRAIN OFFICE
COMBINED OPERATION
OS 188-1

2 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

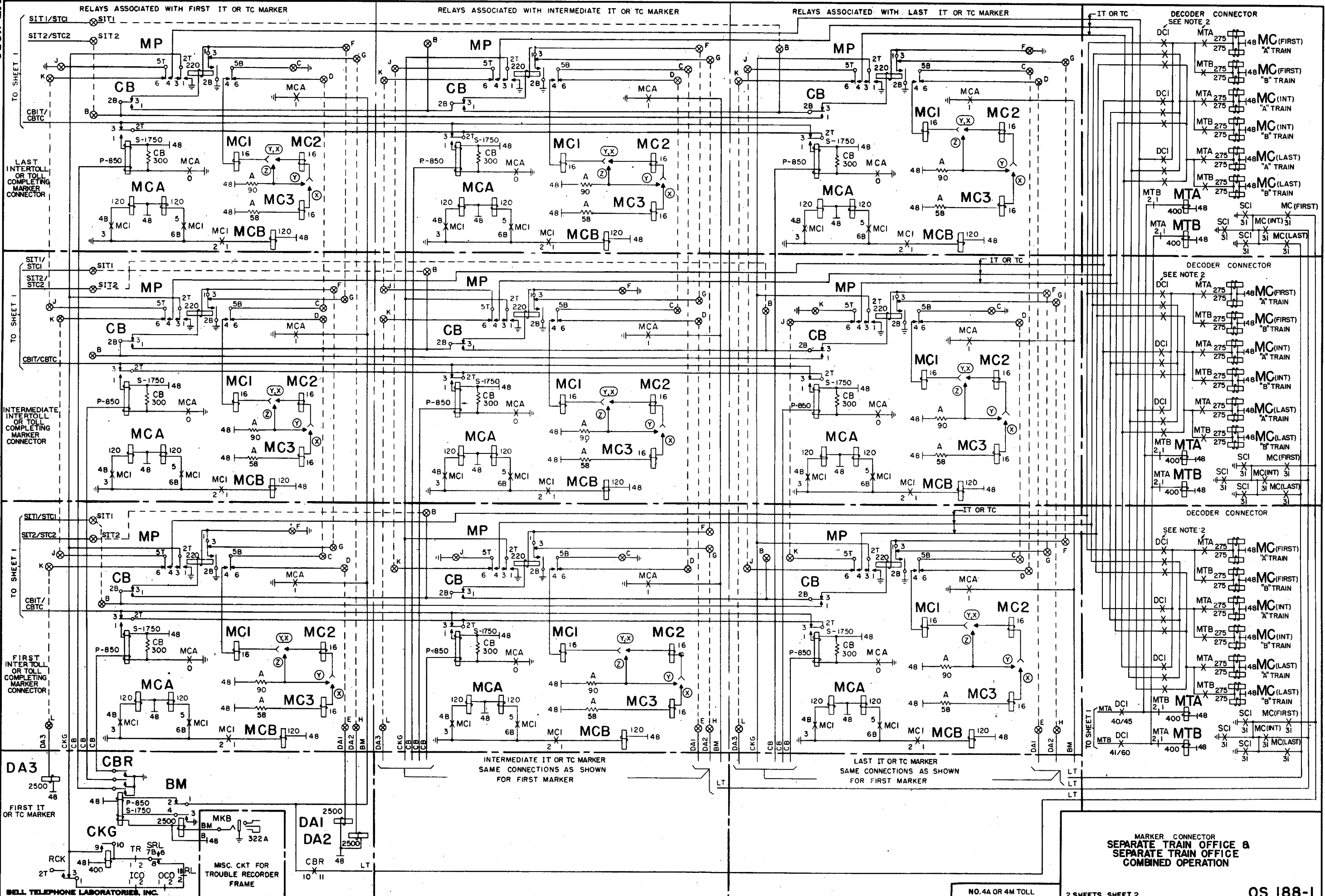
ISSUE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
DATE																					

2 SHEETS, SHEET 1

MP-11650

MP-11650 2 SHEETS, SHEET 2

REVISED	1	11-19-53
DATE	2	11-19-53



BELL TELEPHONE LABORATORIES, INC.

NO. 4A OR 4M TOLL

2 SHEETS, SHEET 2

OS 188-1

MARKER CONNECTOR
 SEPARATE TRAIN OFFICE &
 SEPARATE TRAIN OFFICE
 COMBINED OPERATION

ORDER AS BPP ITEM MP-11650

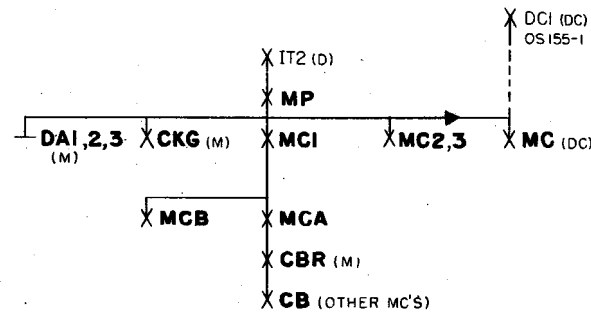
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
Z	FOR OFFICES HAVING SIX OR LESS TRUNK BLOCK CONNECTORS.	Z	68395-01
Y	FOR OFFICES HAVING SEVEN TO EIGHTEEN TRUNK BLOCK CONNECTORS.	Y,Z	68395-01
X	FOR OFFICES HAVING NINETEEN TO THIRTY TRUNK BLOCK CONNECTORS.	Y,X,Y	68395-01

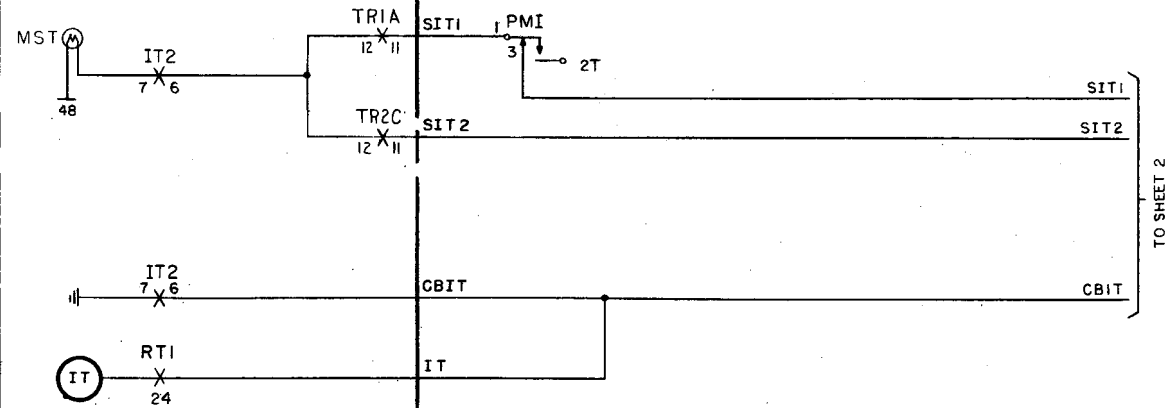
2. CONTACT ASSIGNMENTS OF M-LEADS ON DCI RELAYS.

LEAD (MARKER NO.)	CONTACT NUMBER	
	EVEN DCI RELAYS	ODD DCI RELAYS
M0	10	15
M1	11	16
M2	12	17
M3	13	18
M4	14	19
M5	20	25
M6	21	26
M7	22	27
M8	23	28
M9	24	29

SEQUENCE CHART



DECODER (FOR COMBINED TRAIN OPERATION)



TO SHEET 2

- DECODER CKT. SD-68340-01, ISS. 8
- DECODER CONNECTOR CKT. SD-68339-01, ISS. 6
- MARKER CKT. SD-68388-01, ISS. 8
- * MARKER CONNECTOR CKT. SD-68395-01, ISS. 4
- MISC. CKT. TROUBLE RECORDER FRAME SD-68392-01, ISS. 5

MARKER CONNECTOR
COMBINED TRAIN OPERATION

OS 188-2

2 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

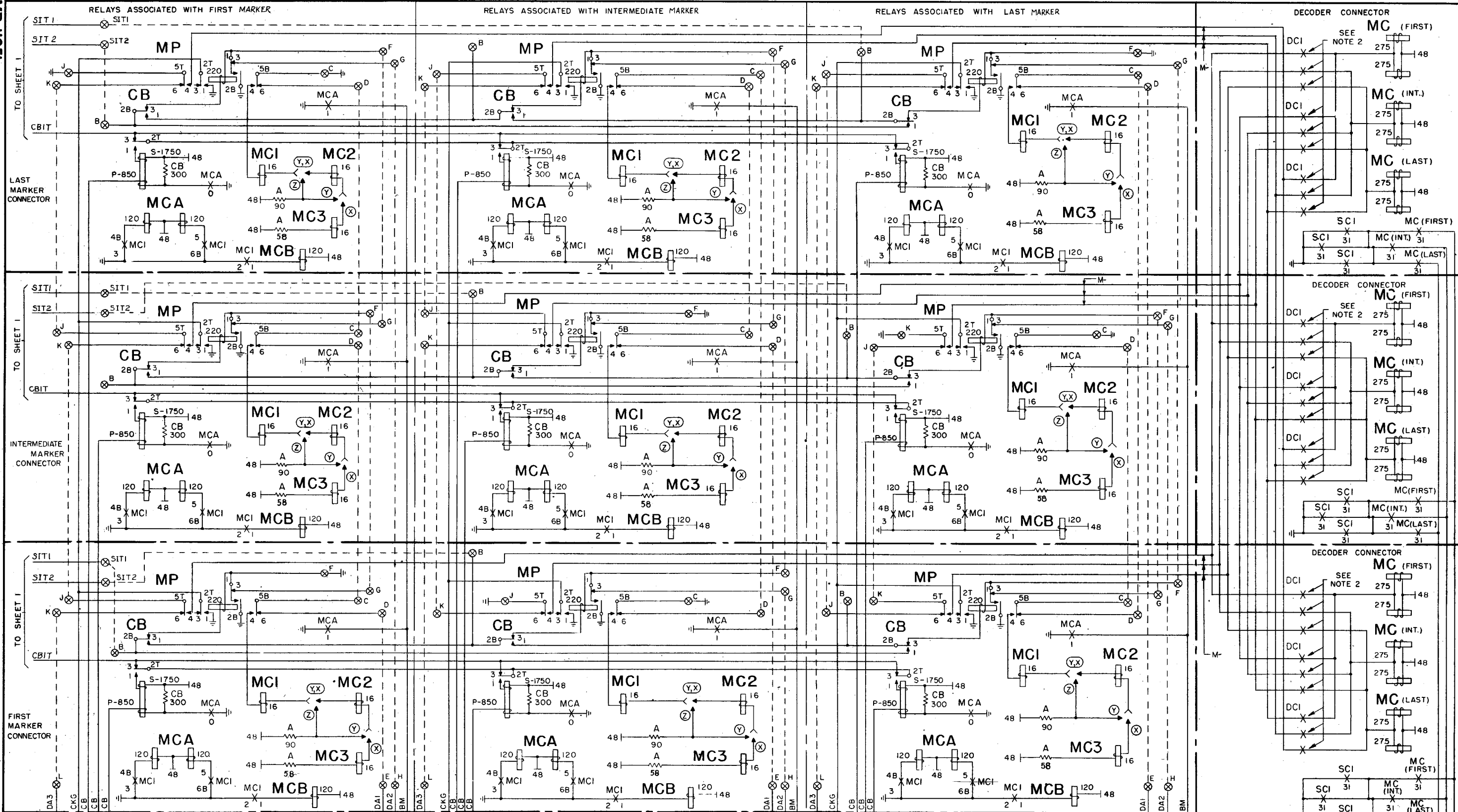
ORDER AS BSP ITEM MP-11651

ISSUE	1	2	3	4	5	6	7	8	9	10
DATE	8-16-57	11-9-53								

2 SHEETS, SHEET 1

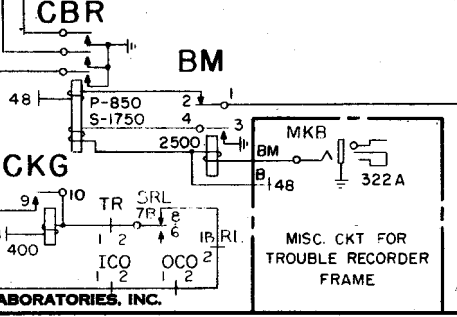
MP-11651

REVISED	1	2	3	4	5
DATE	11-27-57	1-15-58	3-10-58	4-15-58	5-15-58



DA3

FIRST COMBINED MARKER



DA1

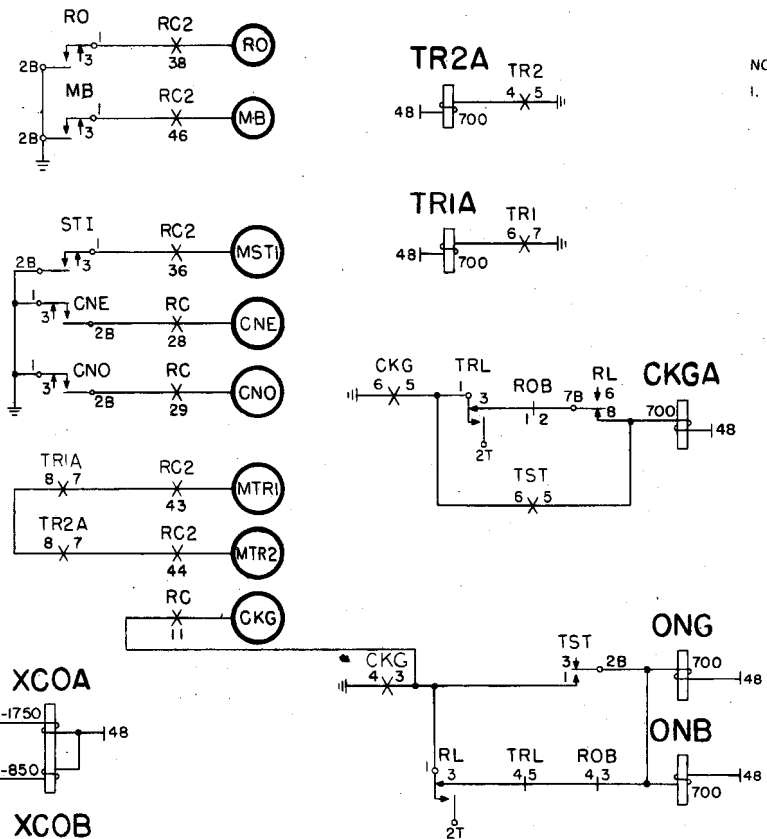
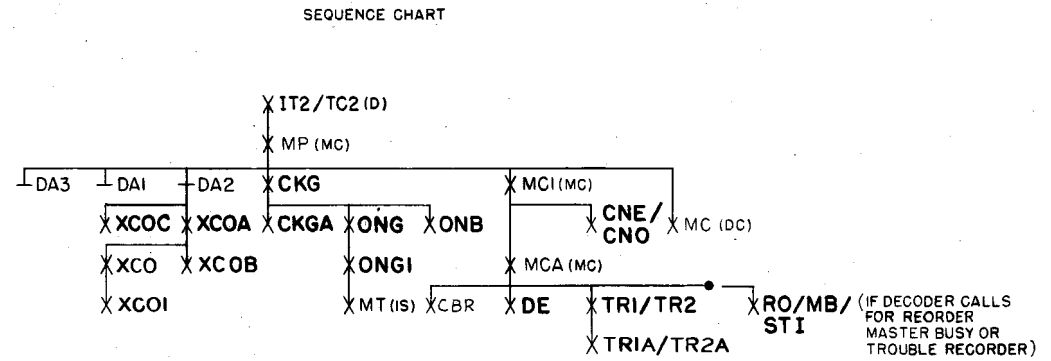
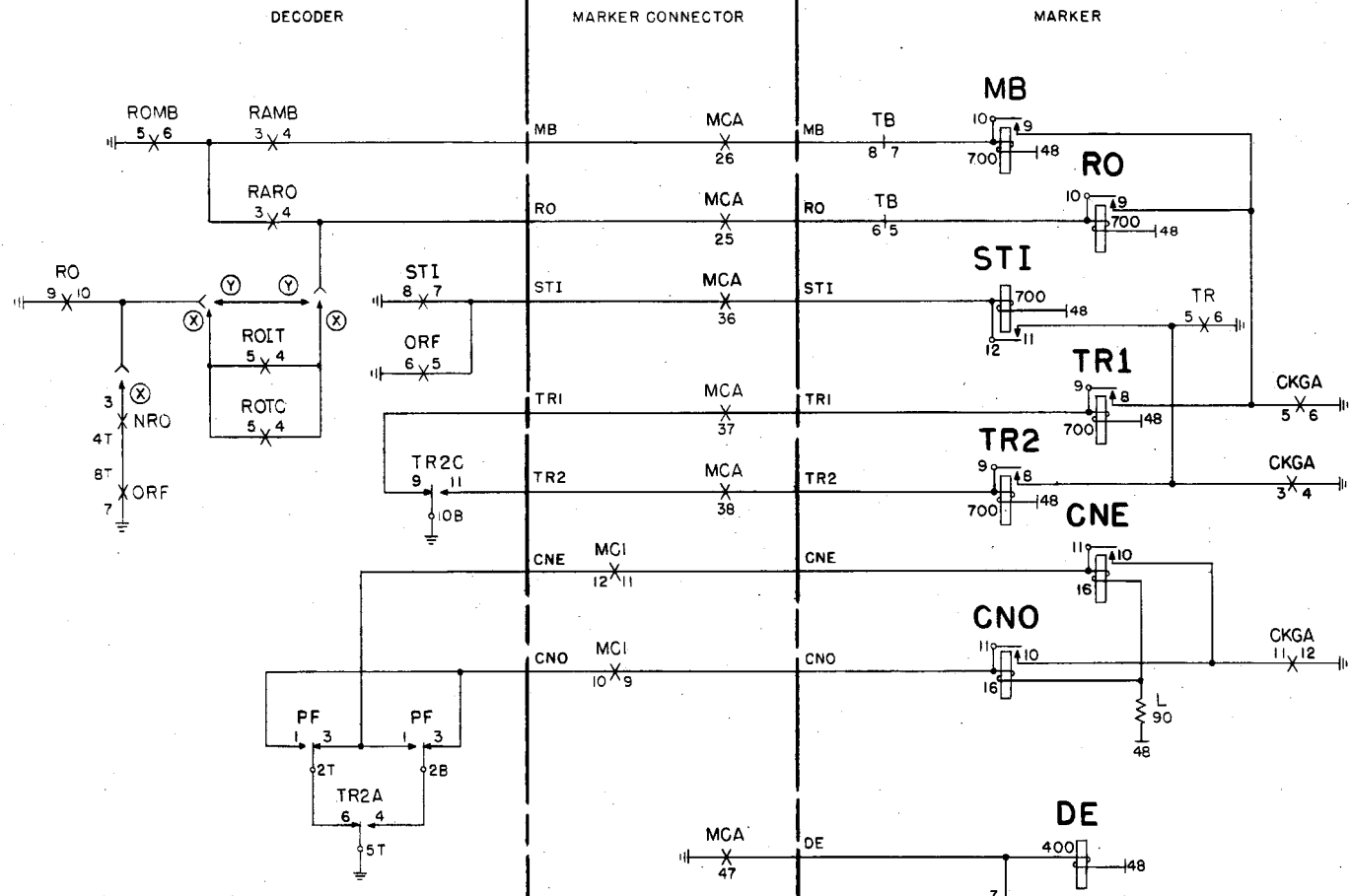
DA2

INTERMEDIATE COMBINED MARKER SAME CONNECTIONS AS SHOWN FOR FIRST MARKER

LAST COMBINED MARKER SAME CONNECTIONS AS SHOWN FOR FIRST MARKER

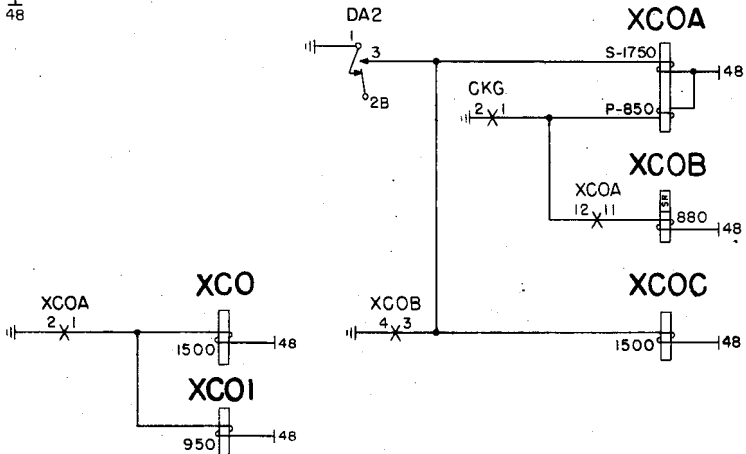
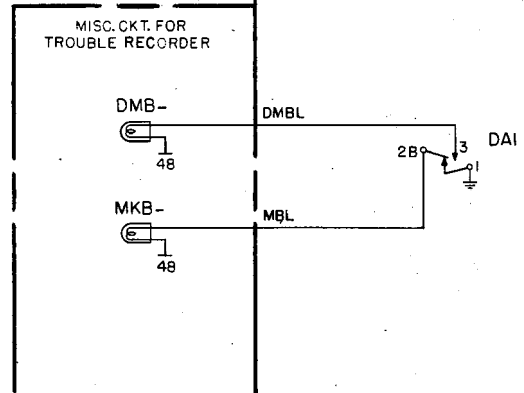
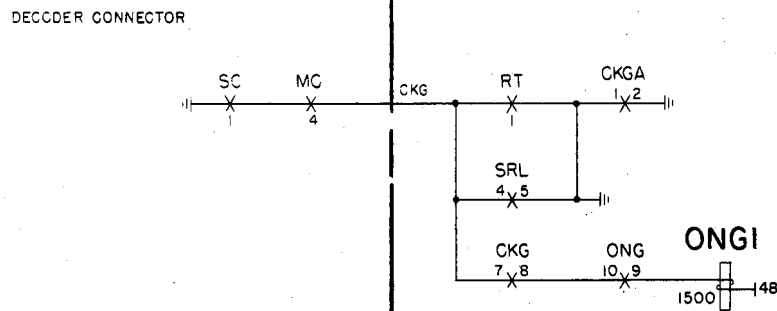
MARKER CONNECTOR COMBINED TRAIN OPERATION

ISSUE	1	2	3
DATE	8-10-51		



NOTE:

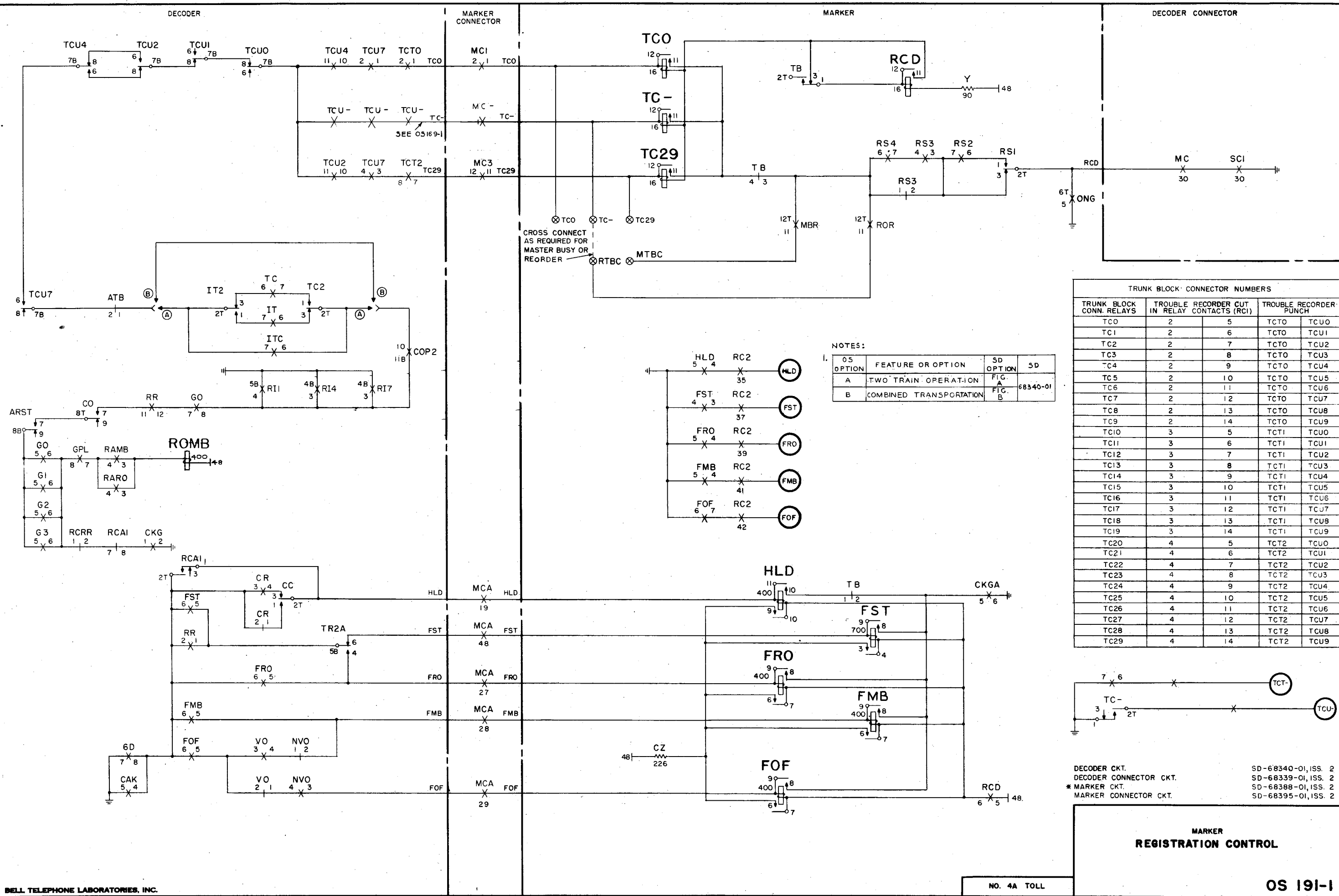
OS OPTION	FEATURE OR OPTION	SD OPTION	SD
X	TWO-TRAIN OPERATION	X	68340-01
Y	COMBINED TRAIN OPERATION	FIG. A	68340-01



DECODER CONNECTOR CKT. SD-68339-01, ISS. 2
DECODER CKT. SD-68340-01, ISS. 2
INTERRUPTER FRAME CKT. SD-68658-01, ISS. 15
MARKER CONNECTOR CKT. SD-68395-01, ISS. 2
* MARKER CKT. SD-68388-01, ISS. 2
MISC. CKT. FOR TROUBLE RECORDER SD-68392-01, ISS. 2

**MARKER
SEIZURE AND REGISTRATION
OF MISC. INFORMATION FROM
DECODER**

ISSUE	1	2	3
DATE	8-15-57		

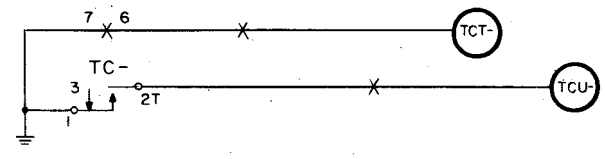


CROSS CONNECT AS REQUIRED FOR MASTER BUSY OR REORDER

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	TWO TRAIN OPERATION	FIG. A	68340-01
B	COMBINED TRANSPORTATION	FIG. B	

TRUNK BLOCK CONNECTOR NUMBERS			
TRUNK BLOCK CONN. RELAYS	TRouble RECORDER CUT IN RELAY CONTACTS (RCI)	TROUBLE RECORDER PUNCH	
TC0	2	5	TCT0 TCU0
TC1	2	6	TCT0 TCU1
TC2	2	7	TCT0 TCU2
TC3	2	8	TCT0 TCU3
TC4	2	9	TCT0 TCU4
TC5	2	10	TCT0 TCU5
TC6	2	11	TCT0 TCU6
TC7	2	12	TCT0 TCU7
TC8	2	13	TCT0 TCU8
TC9	2	14	TCT0 TCU9
TC10	3	5	TCT1 TCU0
TC11	3	6	TCT1 TCU1
TC12	3	7	TCT1 TCU2
TC13	3	8	TCT1 TCU3
TC14	3	9	TCT1 TCU4
TC15	3	10	TCT1 TCU5
TC16	3	11	TCT1 TCU6
TC17	3	12	TCT1 TCU7
TC18	3	13	TCT1 TCU8
TC19	3	14	TCT1 TCU9
TC20	4	5	TCT2 TCU0
TC21	4	6	TCT2 TCU1
TC22	4	7	TCT2 TCU2
TC23	4	8	TCT2 TCU3
TC24	4	9	TCT2 TCU4
TC25	4	10	TCT2 TCU5
TC26	4	11	TCT2 TCU6
TC27	4	12	TCT2 TCU7
TC28	4	13	TCT2 TCU8
TC29	4	14	TCT2 TCU9



DECODER CKT. SD-68340-01, ISS. 2
 DECODER CONNECTOR CKT. SD-68339-01, ISS. 2
 * MARKER CKT. SD-68388-01, ISS. 2
 MARKER CONNECTOR CKT. SD-68395-01, ISS. 2

**MARKER
REGISTRATION CONTROL**

ISSUE	1	A-S-M
DATE	9-10-51	

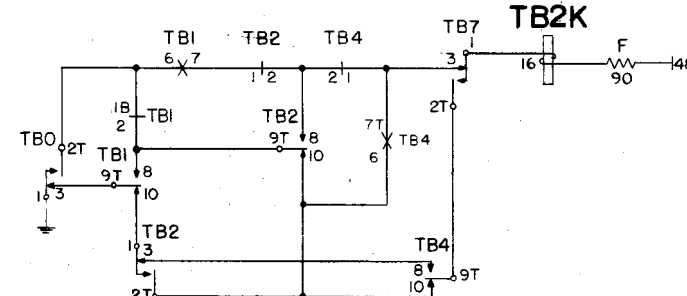
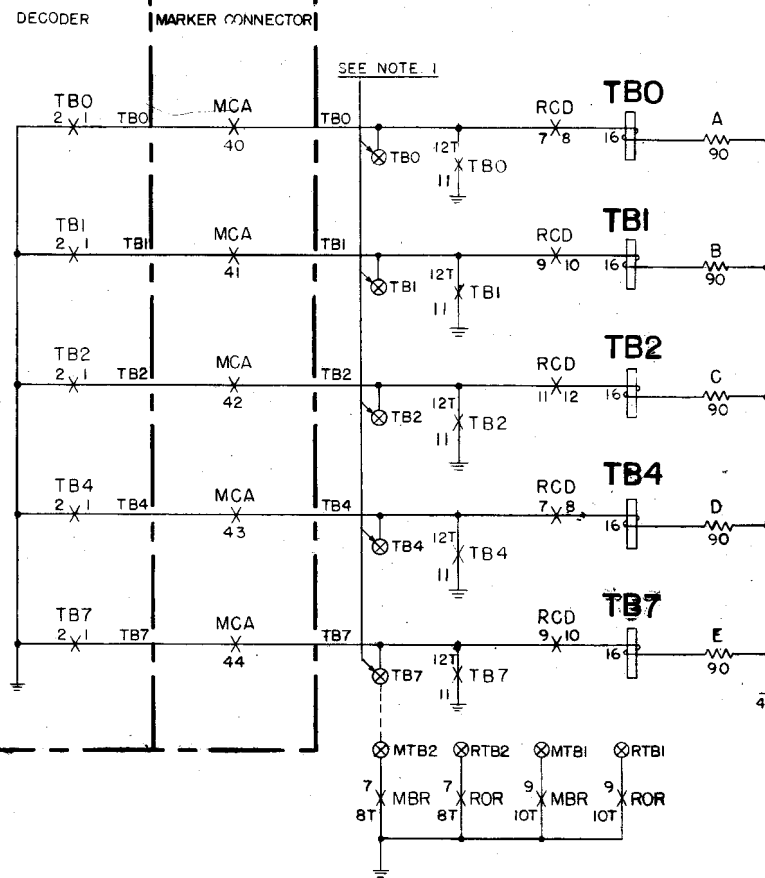
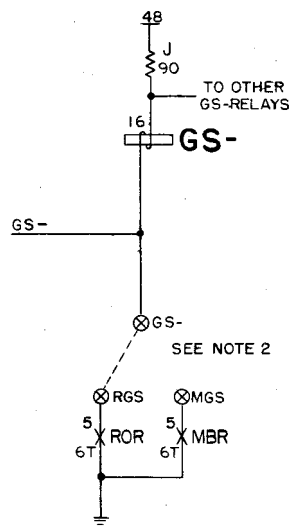
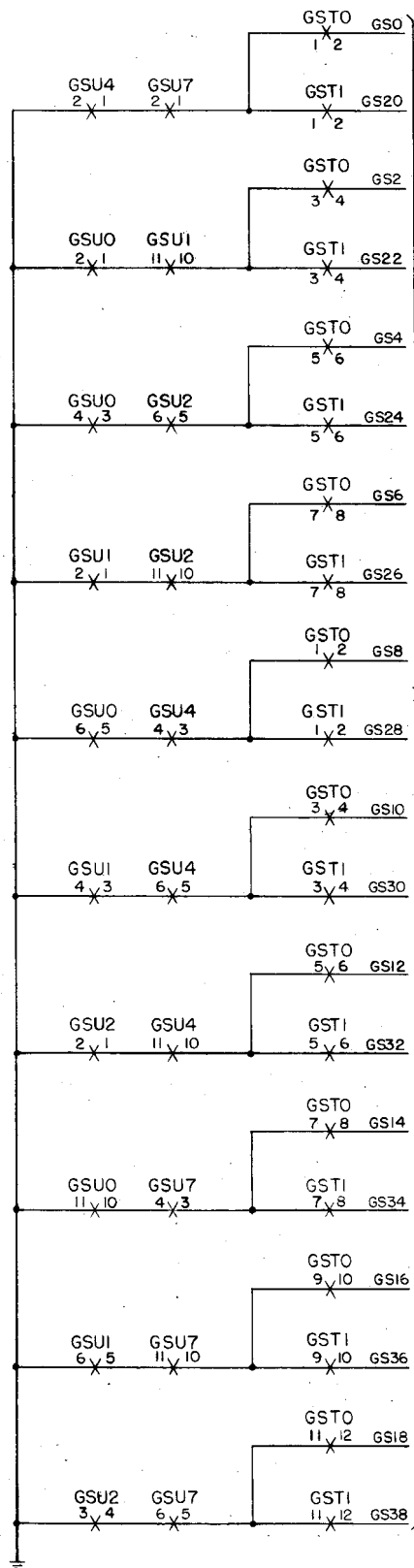
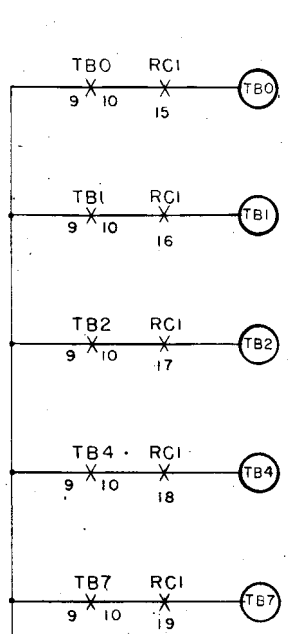
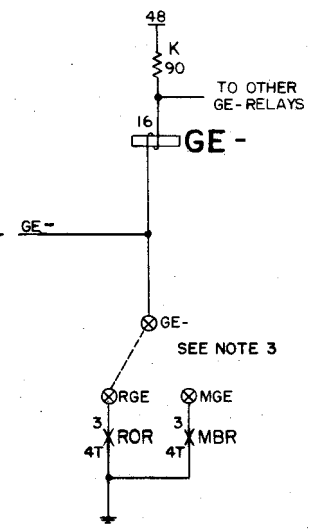
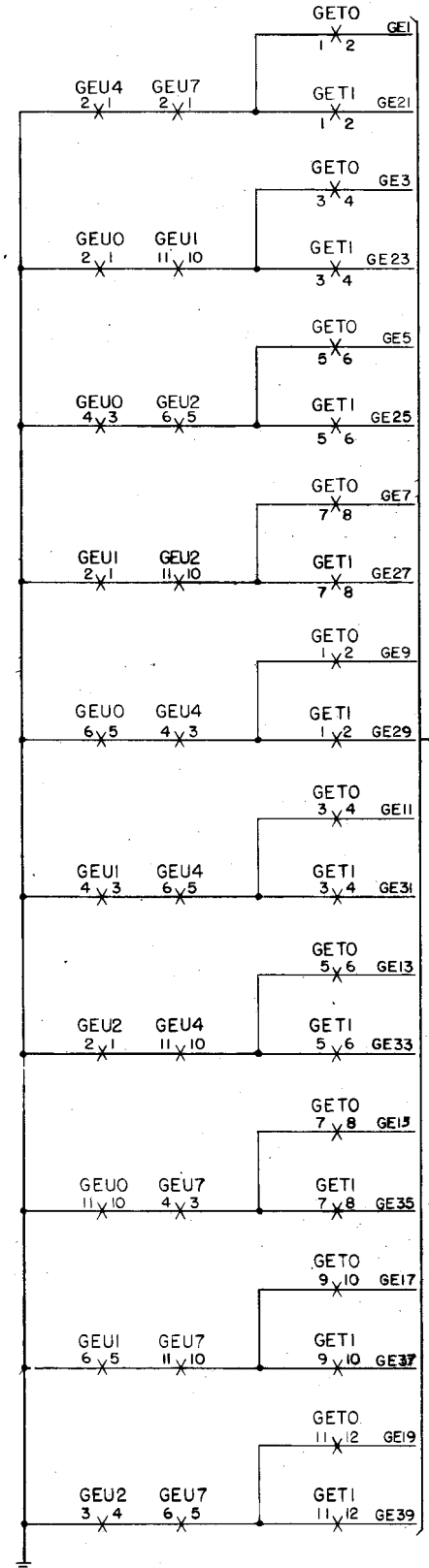


TABLE A
SHOWING GS- AND GE- RELAYS
OPERATED FROM REGISTERED INFORMATION

REGISTERED INFORMATION ON		RELAYS OPERATED	
GSU#	GEU#	GS-	GE-
00	00	0	1
01	01	2	3
02	02	4	5
03	03	6	7
04	04	8	9
05	05	10	11
06	06	12	13
07	07	14	15
08	08	16	17
09	09	18	19
10	10	20	21
11	11	22	23
12	12	24	25
13	13	26	27
14	14	28	29
15	15	30	31
16	16	32	33
17	17	34	35
18	18	36	37
19	19	38	39



MARKER



- NOTES:
- CROSS CONNECT TO RTB1, RTB2, MTB1 OR MTB2 PUNCHING AS REQUIRED FOR REORDER OR MASTER BUSY.
 - CROSS CONNECT TO RGS OR MGS PUNCHING AS REQUIRED FOR REORDER OR MASTER BUSY.
 - CROSS CONNECT TO RGE OR MGE PUNCHING AS REQUIRED FOR REORDER OR MASTER BUSY.

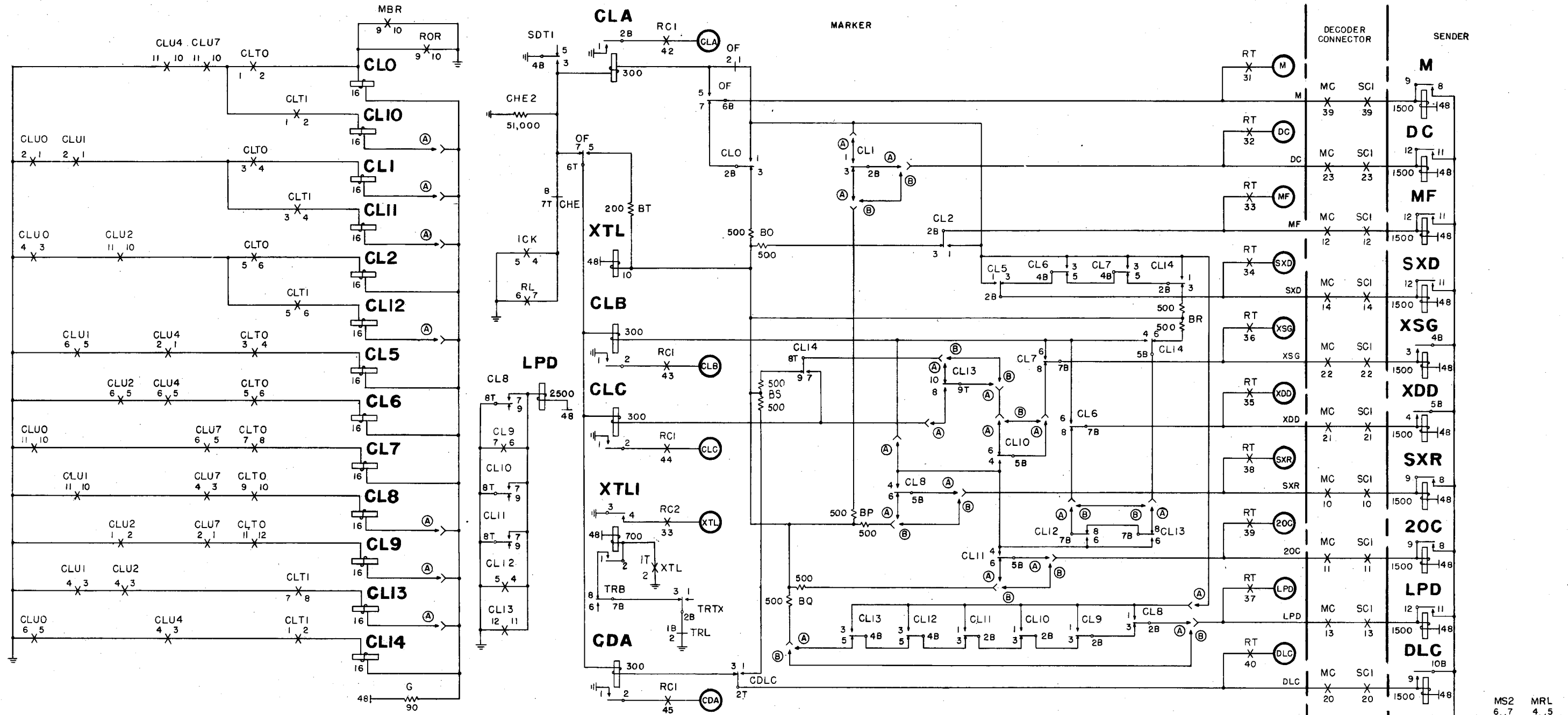
DECODER CKT. SD-68340-01, ISS. 2
 MARKER CKT. SD-68388-01, ISS. 2
 MARKER CONN. CKT. SD-68395-01, ISS. 2

MARKER
 TRUNK GROUP START & END

NO. 4A TOLL

OS 192-1

ISSUE	1
DATE	1-10-57



MARKER	SENDER RELAY OPERATION AND FUNCTION										MARKER	
	M	DC	MF	SXD	XDD	XSG	LPD	SXR	20C	DLC		
CL0	CLA	X									**	**
CL1	CLA		X								**	**
CL2	CLA			X							**	**
CL5	CLA				X						**	**
CL6	CLA, B				X						**	**
CL7	CLA, B				X						**	**
CL8*	CLA, B				X		X	X			**	**
CL9*	CLA				X		X	X			**	**
CL10*	CLA, B				X		X	X			**	**
CL11*	CLA, B				X		X	X	X		**	**
CL12*	CLA, B				X		X	X			**	**
CL13*	CLA, B, C				X	X	X	X			**	**
CL14	CLA, B, C				X	X	X	X			**	**

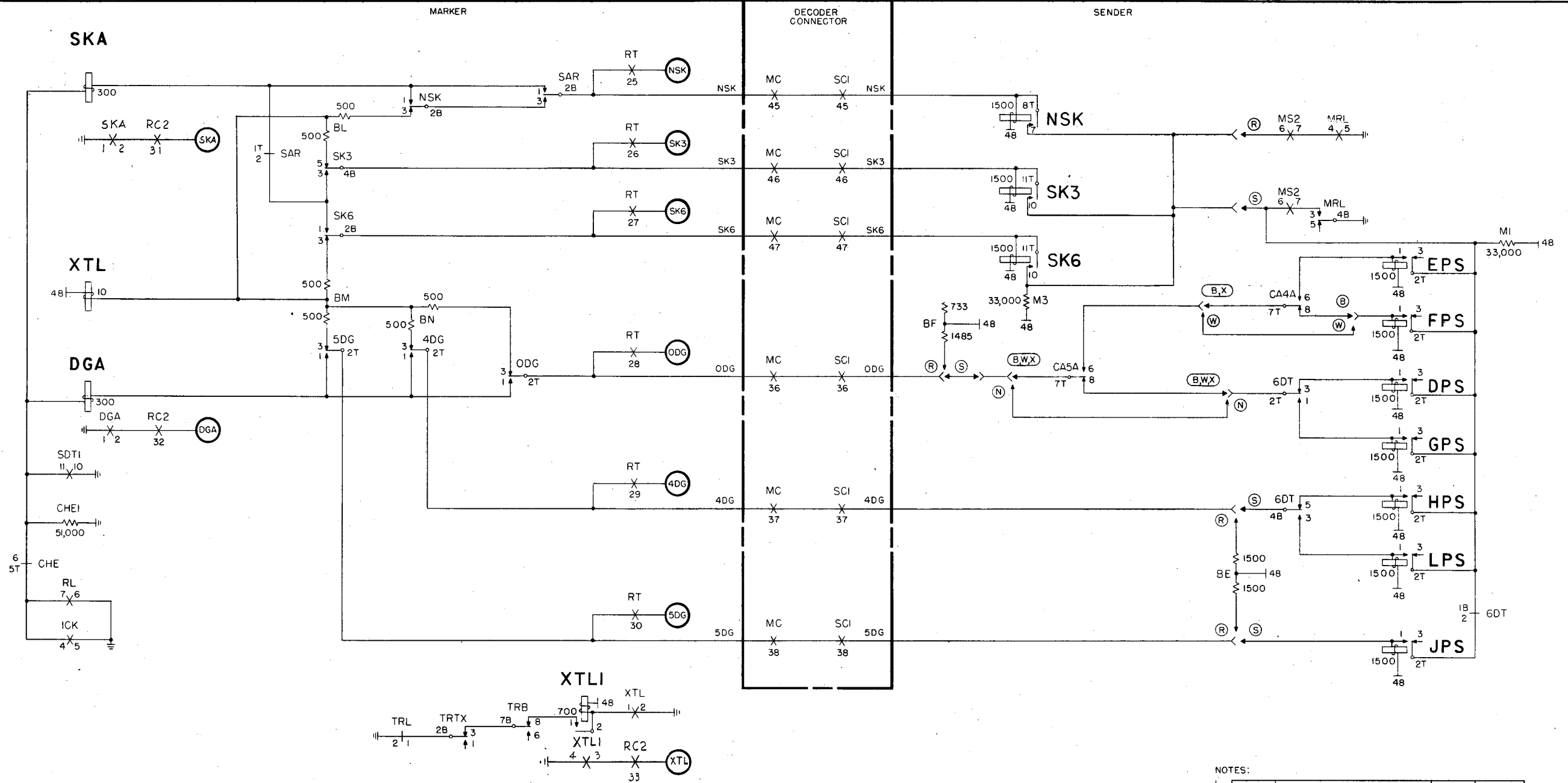
X DENOTES RELAY OPERATED
 ** OPTIONAL-YES OR NO.
 * PROVIDED ONLY IN TOLL COMPLETING OR COMBINED MARKERS.

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR COMBINED MARKERS	X	68388-01
	FOR TOLL COMPLETING MARKERS	Y	
B	FOR INTERTOLL MARKERS	Z	
R	FOR MF SENDERS	-	68222-01
S	FOR DP SENDERS	-	68221-01

DECODER CONNECTOR CKT. SD-68339-01, ISS.2
 DP INCOMING SENDER CKT. SD-68221-01, ISS.12
 *MARKER CKT. SD-68388-01, ISS.2
 MF INCOMING SENDER CKT. SD-68222-01, ISS.12

MARKER CLASS INFORMATION

ISSUE	1	4/57
DATE	8-30-57	



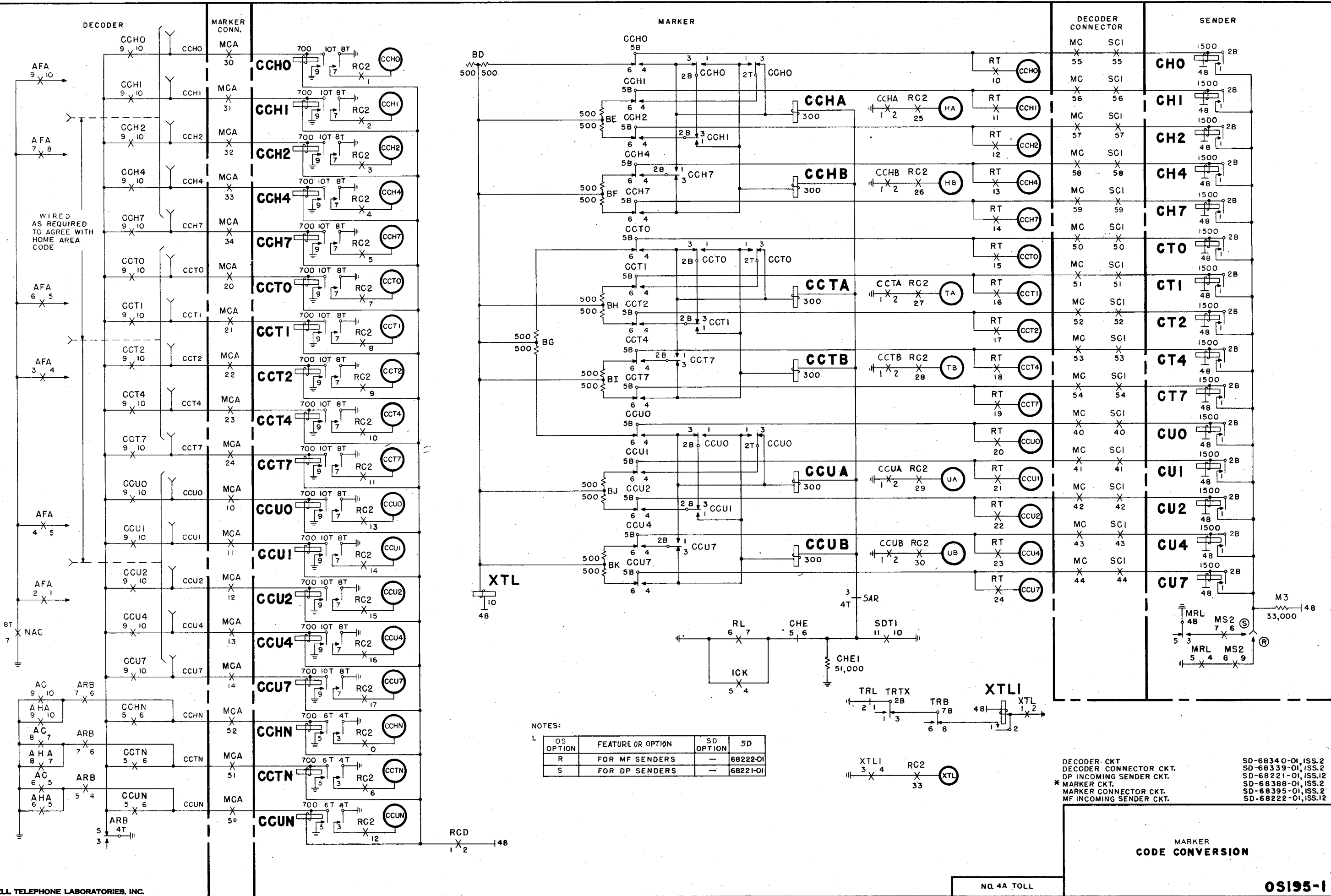
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
B	2 & 3-DIGIT TX	B	
N	1-DIGIT TX	LOOPED WIRING	68221-01
R	FOR MF SENDERS		68222-01
S	FOR DP SENDERS		
W	3-DIGIT TX	W	68221-01
X	2-DIGIT TX	X	

DECODER CONNECTOR CKT. SD-68339-01, ISS. 2
 DP INCOMING SENDER CKT. SD-68221-01, ISS. 12
 * MARKER CKT. SD-68368-01, ISS. 2
 MF INCOMING SENDER CKT. SD-68222-01, ISS. 12

**MARKER
 DIGIT AND VARIABLE
 SPILL CONTROL**

ISSUE	1	3.5.57
DATE	9-7-57	



WIRED AS REQUIRED TO AGREE WITH HOME AREA CODE

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
R	FOR MF SENDERS	-	68222-01
S	FOR DP SENDERS	-	68221-01

DECODER-CKT
 DECODER CONNECTOR CKT.
 DP INCOMING SENDER CKT.
 MARKER CKT.
 MARKER CONNECTOR CKT.
 MF INCOMING SENDER CKT.

SD-68340-01,ISS.2
 SD-68339-01,ISS.2
 SD-68221-01,ISS.12
 SD-68388-01,ISS.2
 SD-68395-01,ISS.2
 SD-68222-01,ISS.12

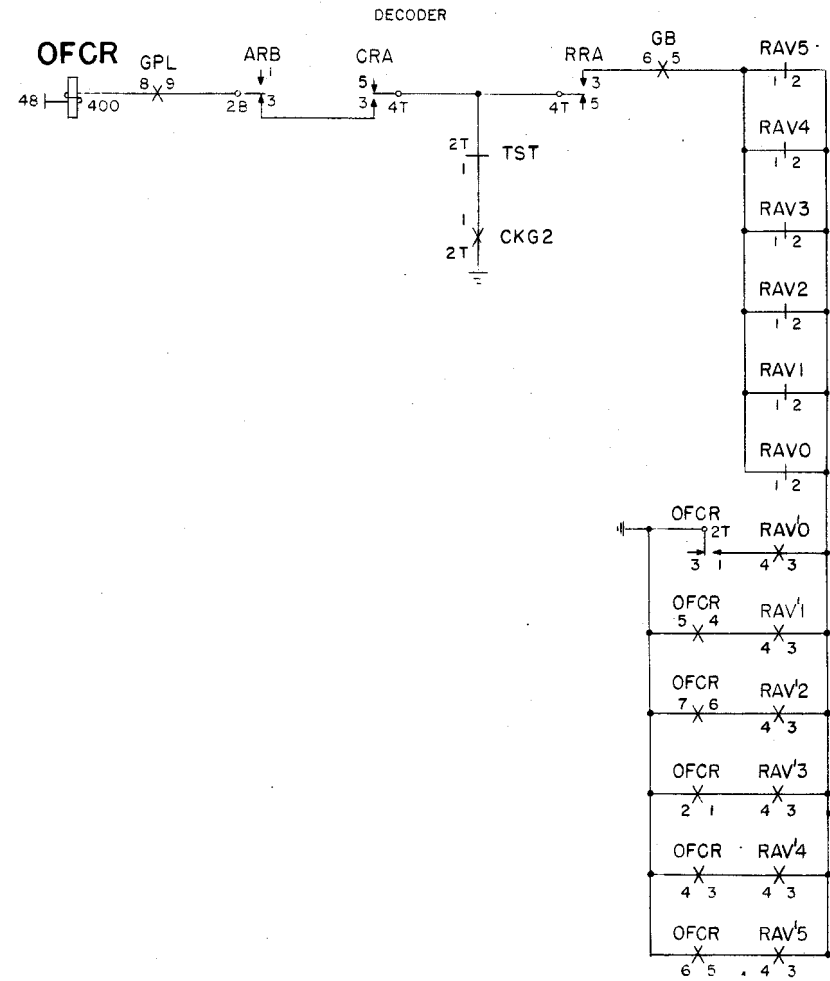
MARKER
CODE CONVERSION

NO. 4A TOLL

OS195-1

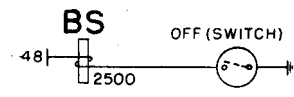
ORDER AS BSP ITEM MP-11674

ISSUE	DATE
1	9-19-51
2	1-22-52
3	1-22-52
4	1-22-52
5	1-22-52



TRAFFIC REGISTER DISTRIBUTING FRAME

TRAFFIC REGISTER CIRCUIT



DPO(99) SEE NOTE 2

DPO(00)

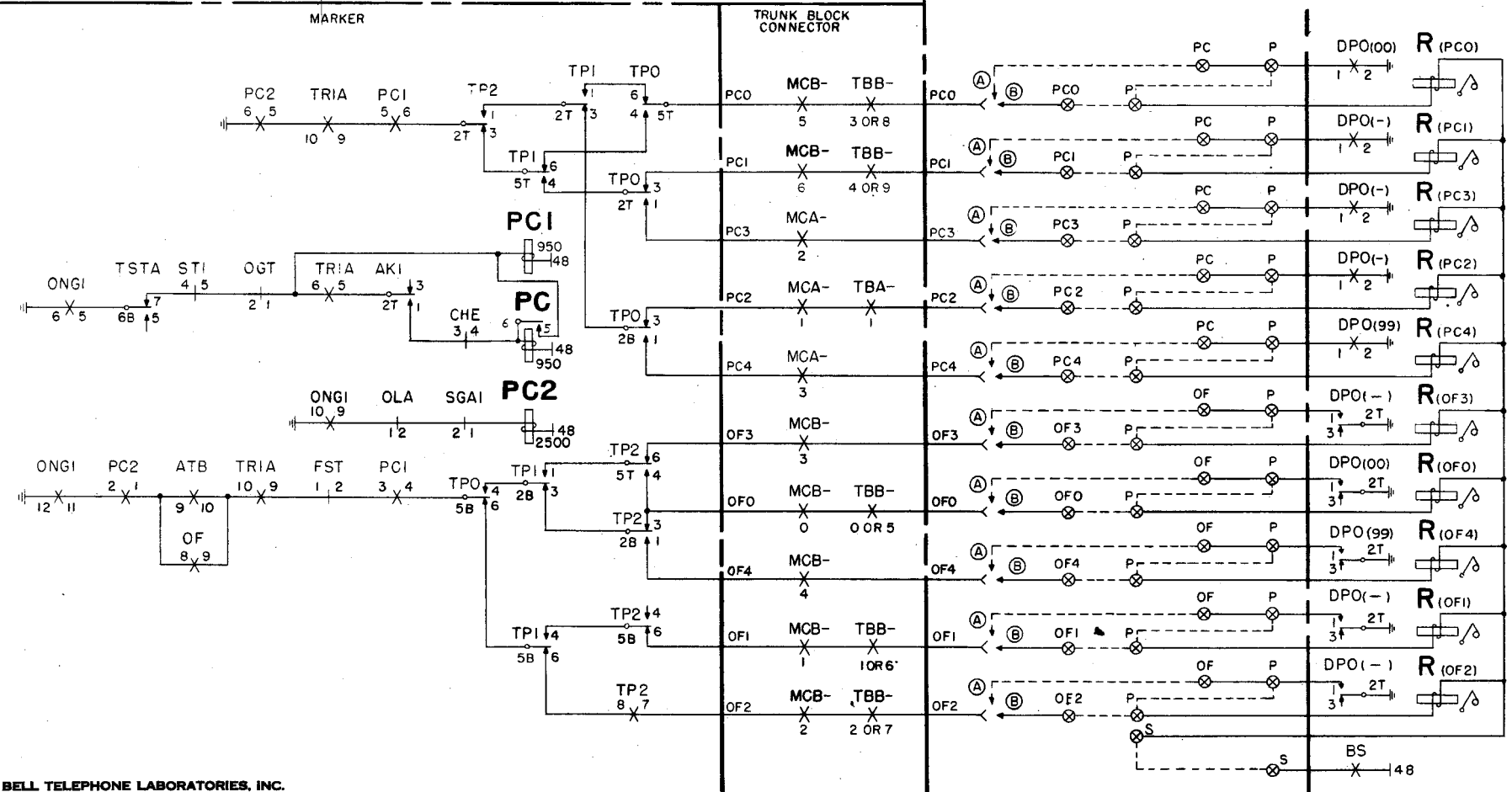
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	WHEN TRUNK GROUP HAS A ROUTE RELAY IN THE DECODER ASSOCIATED WITH IT.	FIG. 35	68412-01
B	WHEN TRUNK GROUP DOES NOT HAVE A ROUTE RELAY IN THE DECODER ASSOCIATED WITH IT.		

2. OPERATION OF PC & OF REGISTERS:

MARKER	TRAFFIC REGISTER	
TP-RELAY OPERATED	PC REGISTER OPERATED	OF REGISTER OPERATED
0	PC0	OF0
1	PC1	OF1
2	PC2	OF2
0 & 1	PC3	OF3
0 & 2	PC4	OF4
1 & 2	PC0	NONE
0,1 & 2	NONE	OF0

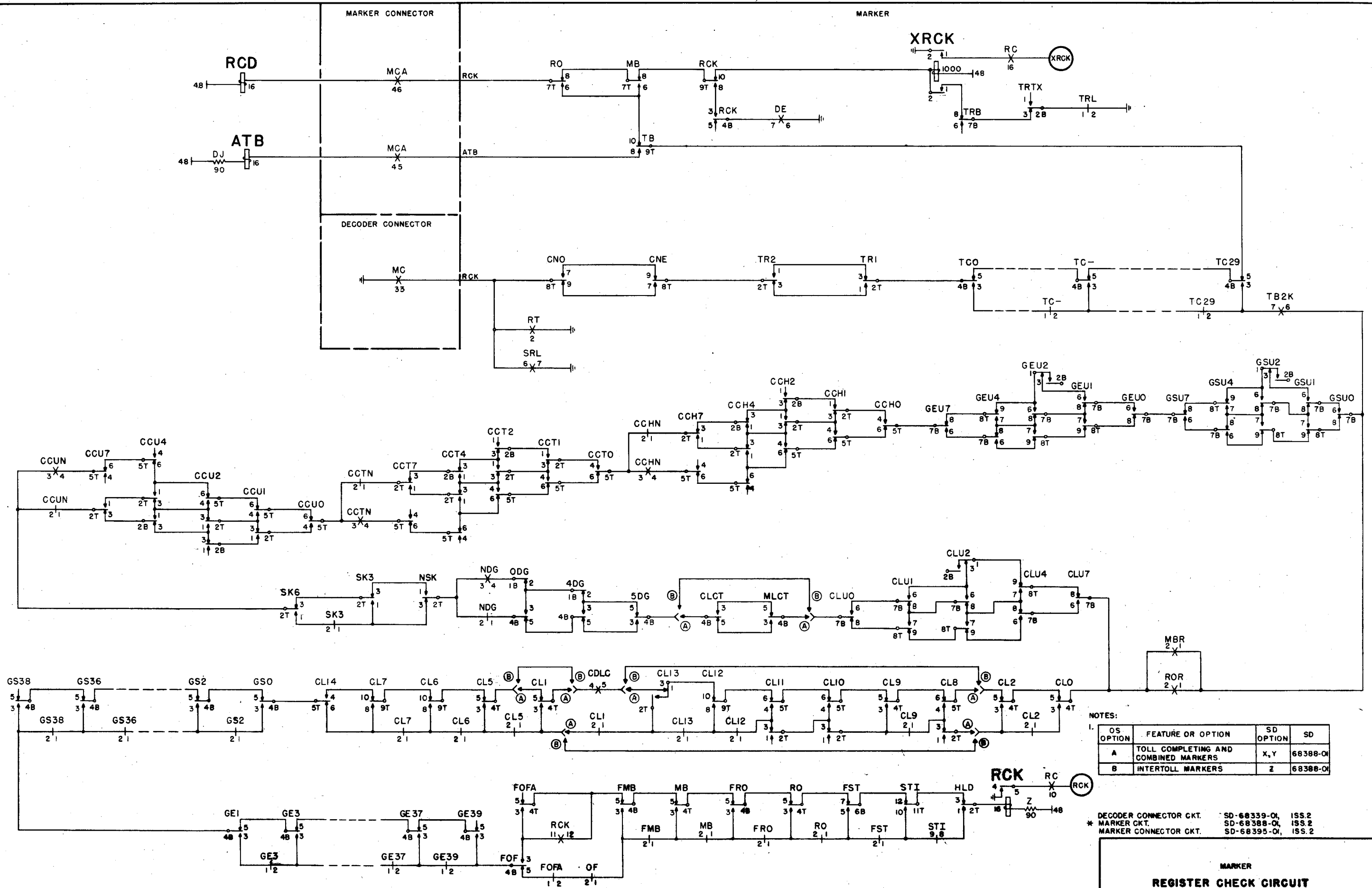
3. DPO RELAYS FURNISHED 1 PER TRUNK GROUP ASSOCIATED WITH DECODER ROUTE RELAYS.
 4. NUMBERS IN PARENTHESES ARE ARBITRARILY ASSIGNED TO INDICATE ASSOCIATION WITH CORRESPONDINGLY NUMBERED ROUTE RELAYS IN THE DECODER.



DECODER CKT SD-68340-01, ISS 8
 MARKER CKT SD-68388-01, ISS 7
 TRAFFIC REGISTER CKT SD-68412-01, ISS 7
 TRUNK BLOCK CONN. CKT SD-68027-01, ISS 19

DECODER-MARKER
**TRUNK GROUP PEG COUNT
 AND
 TRUNK GROUP OVERFLOW REGISTRATION**
 OS 196-1

ISSUE	1
DATE	9-13-51



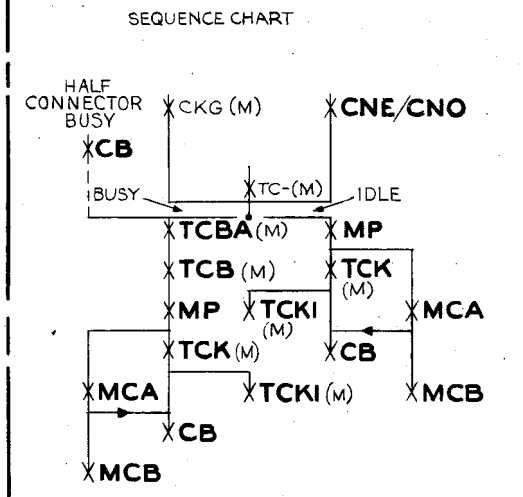
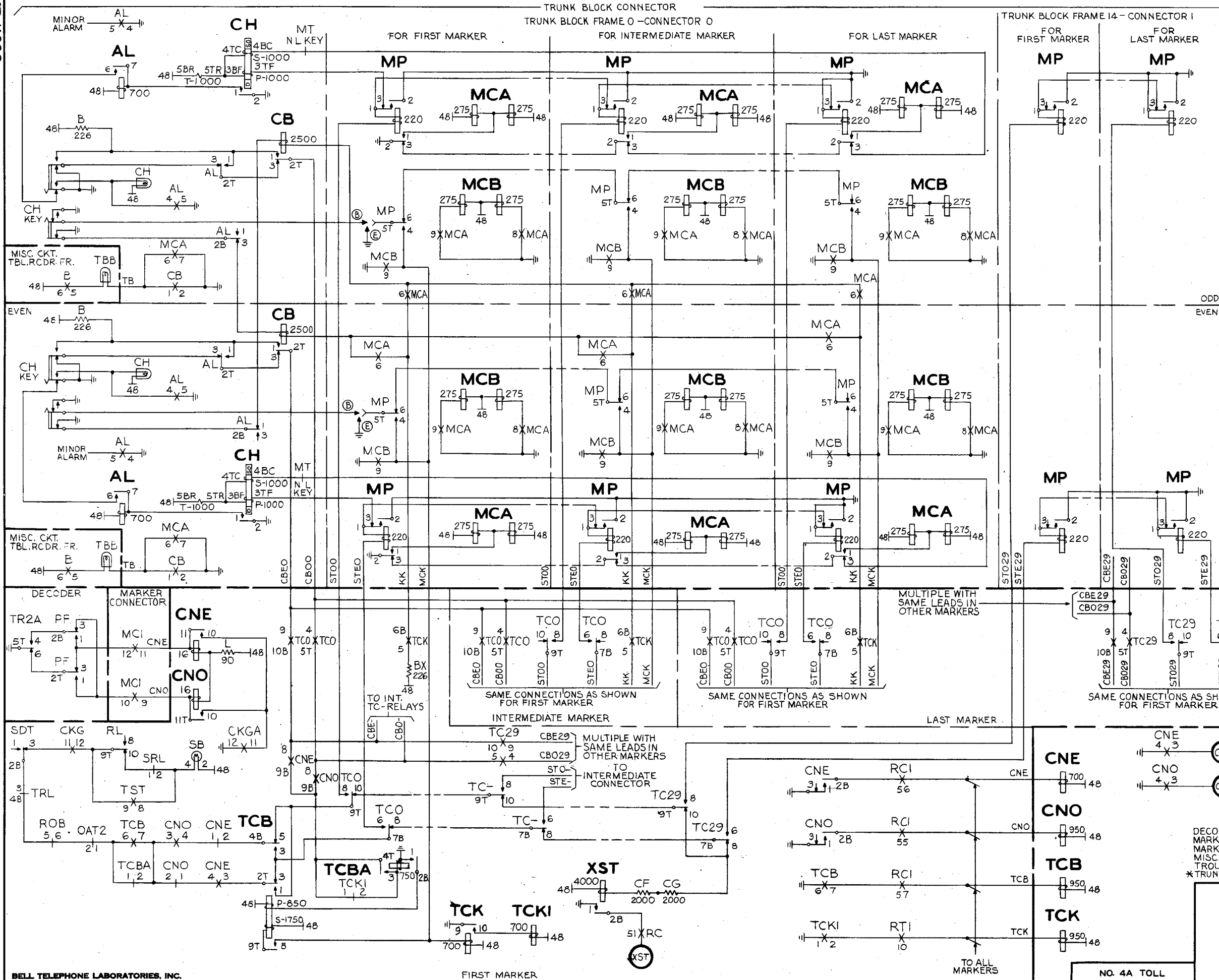
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	TOLL COMPLETING AND COMBINED MARKERS	X, Y	68388-01
B	INTERTOLL MARKERS	Z	68388-01

DECODER CONNECTOR CKT. SD-68339-01, ISS.2
 * MARKER CKT. SD-68388-01, ISS.2
 MARKER CONNECTOR CKT. SD-68395-01, ISS.2

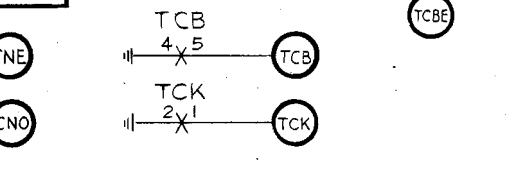
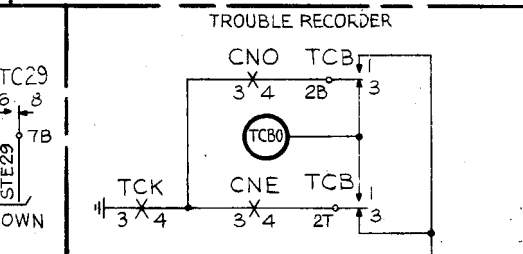
MARKER
REGISTER CHECK CIRCUIT

NO. 4A TOLL



NOTES:

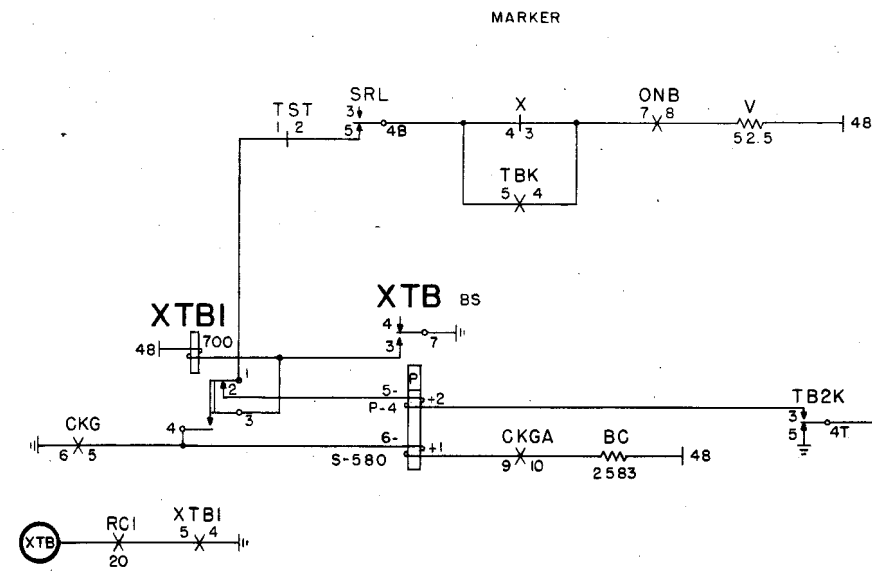
OS OPTION	FEATURE OR OPTION	SD OPTION	SD
E	M.D.	E	5802-21
B	STD.	B	68027-21



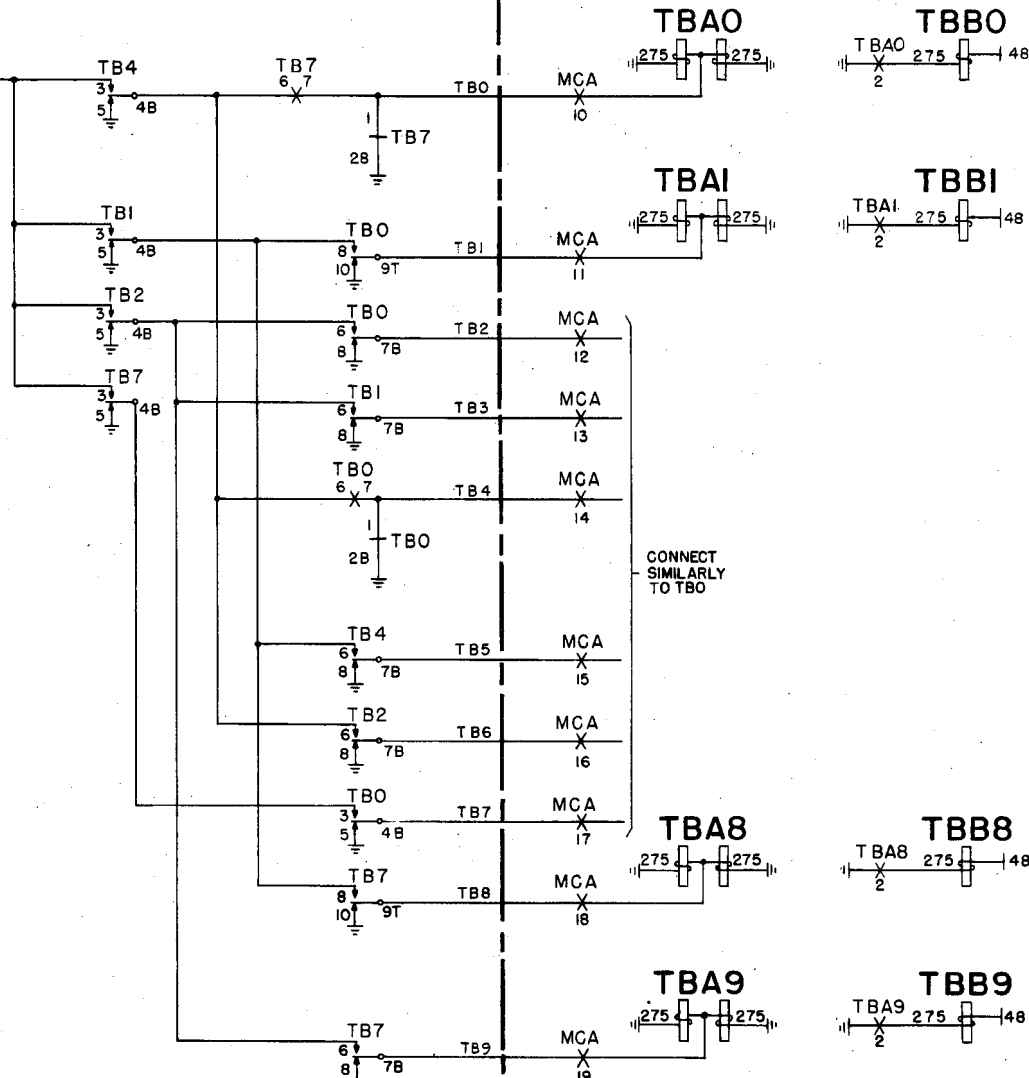
- DECODER CKT. SD-68340-01, ISS. 2
- MARKER CKT. SD-68388-01, ISS. 2
- MARKER CONNECTOR CKT. SD-68395-01, ISS. 2
- MISC. CKT. TBL. RCDR. FR. SD-68392-01, ISS. 2
- TROUBLE RECORDER CKT. SD-68389-01, ISS. 2
- *TRUNK BLOCK CONNECTOR CKT. SD-68027-01, ISS. 16

MARKER SEIZURE OF TRUNK BLOCK CONNECTOR

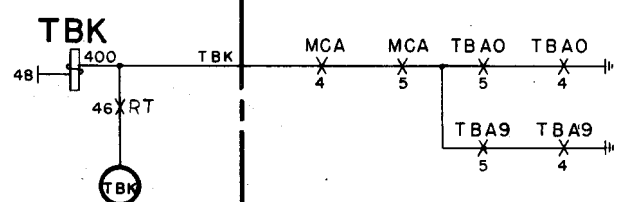
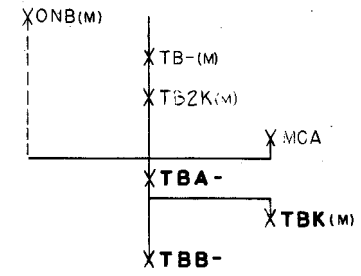
ISSUE	1	1	1	1	1
DATE	6-30-51				



TRUNK BLOCK CONNECTOR



SEQUENCE CHART



MARKER CKT. SD-68388-01, ISS. 2
 * TRUNK BLOCK CONNECTOR CKT. SD-68027-01, ISS. 16

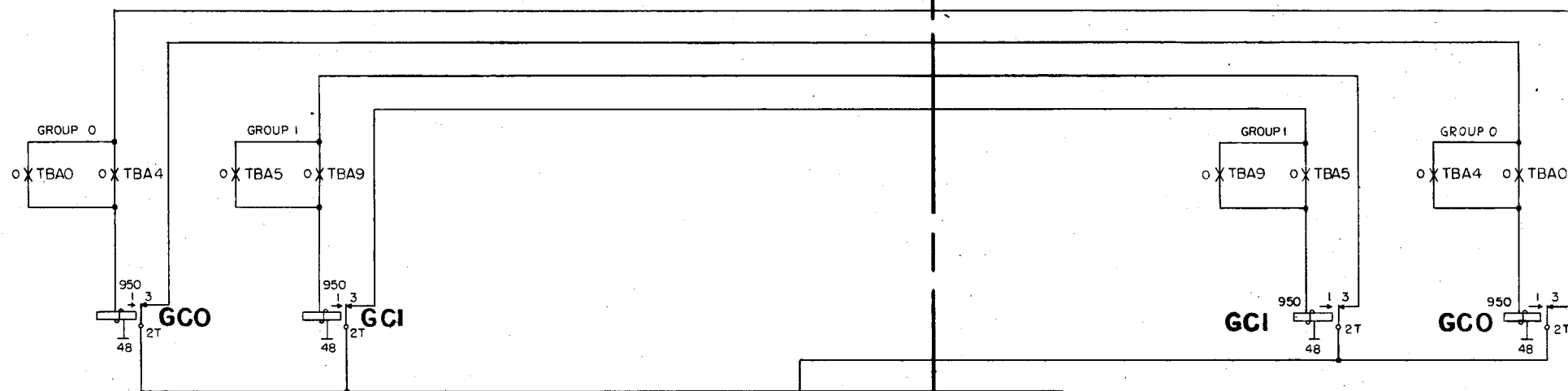
MARKER TRUNK BLOCK RELAY OPERATION

NO. 4A TOLL

ISSUE	1	2	3	4	5
DATE	9-1-51				

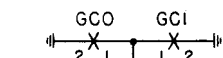
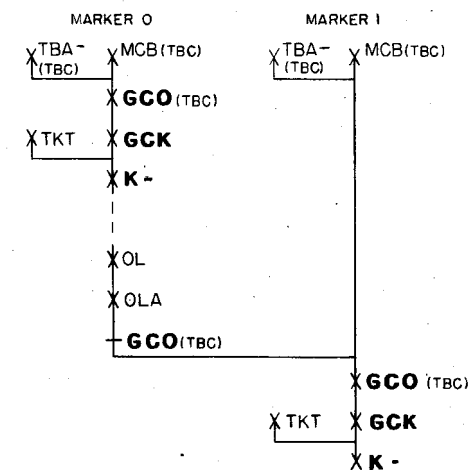
TRUNK BLOCK CONNECTOR

EVEN ODD



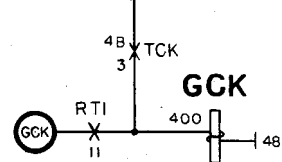
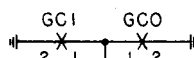
SEQUENCE CHART

BOTH MARKERS SEEKING ACCESS TO TRUNKS IN GROUP 0 OR IN GROUP 1



7 MCB

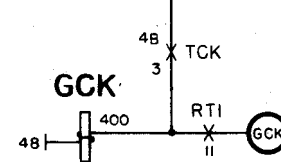
7 MCB



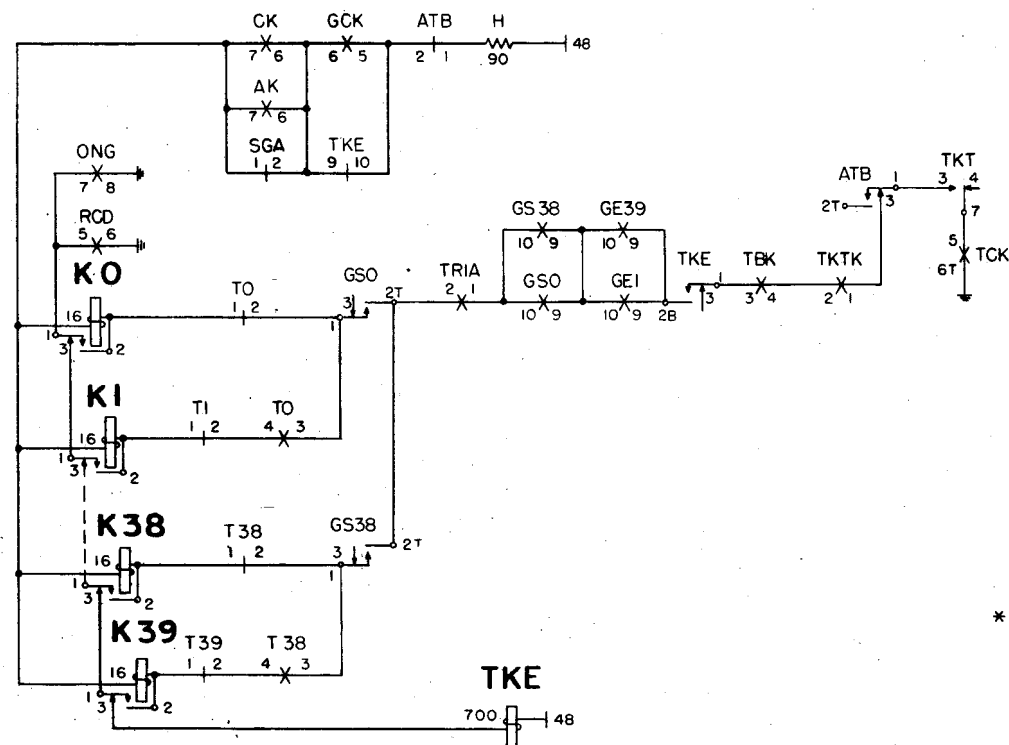
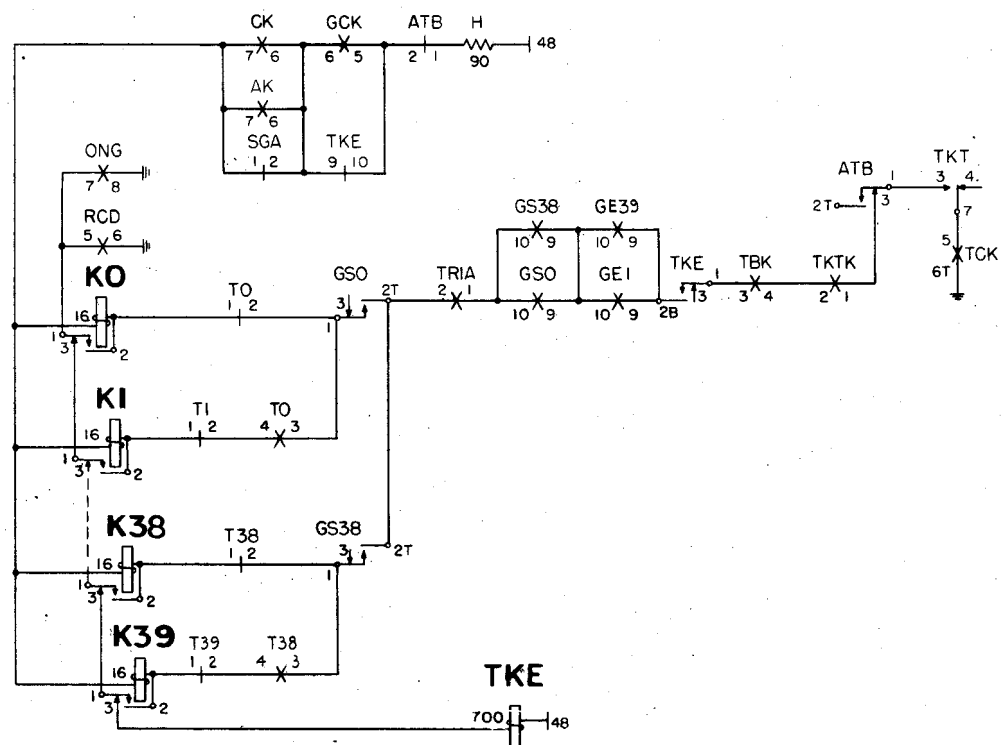
MARKER 0

IT OLA

IT OLA



MARKER 1



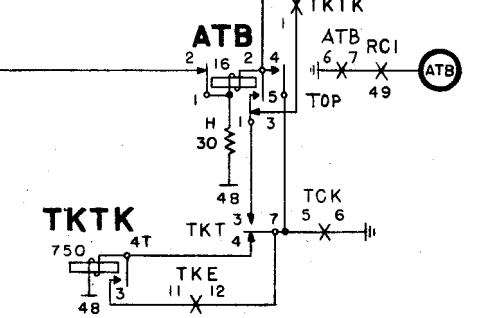
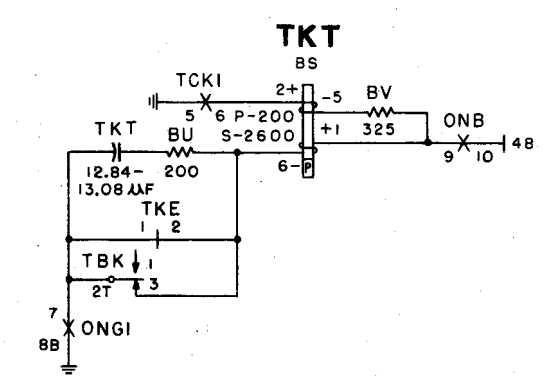
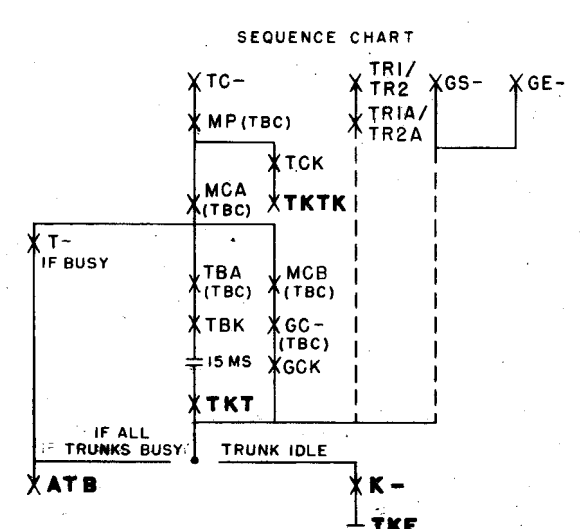
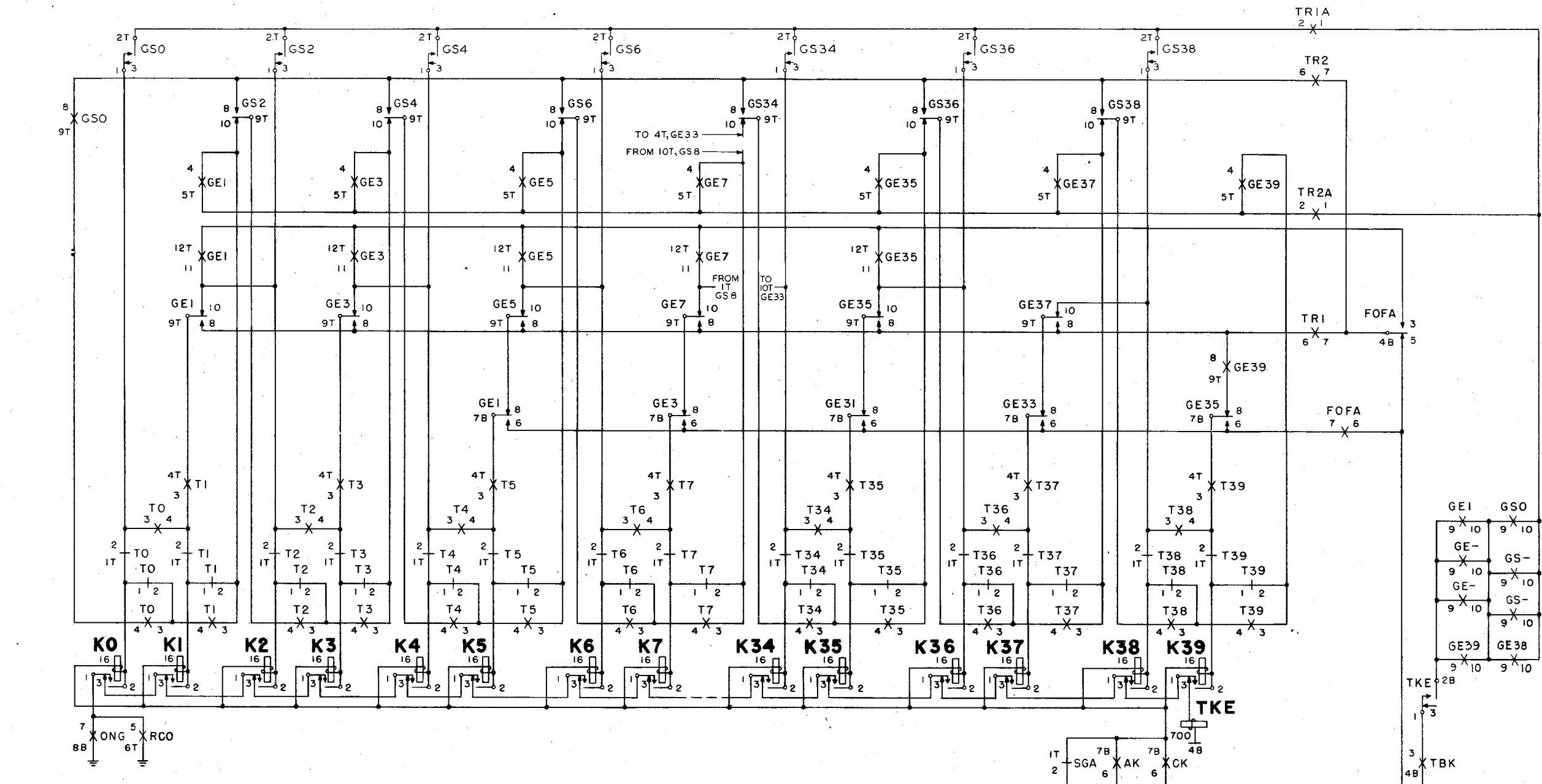
* MARKER CKT. SD-68388-01, 155.2
 TRUNK BLOCK CONNECTOR CKT. SD-68027-03, 155.16

MARKER
 TRAFFIC LOCKOUT IN
 TRUNK BLOCK CONNECTOR

NO. 4A TOLL

OS 200-1

ISSUE	1
DATE	3-17-51

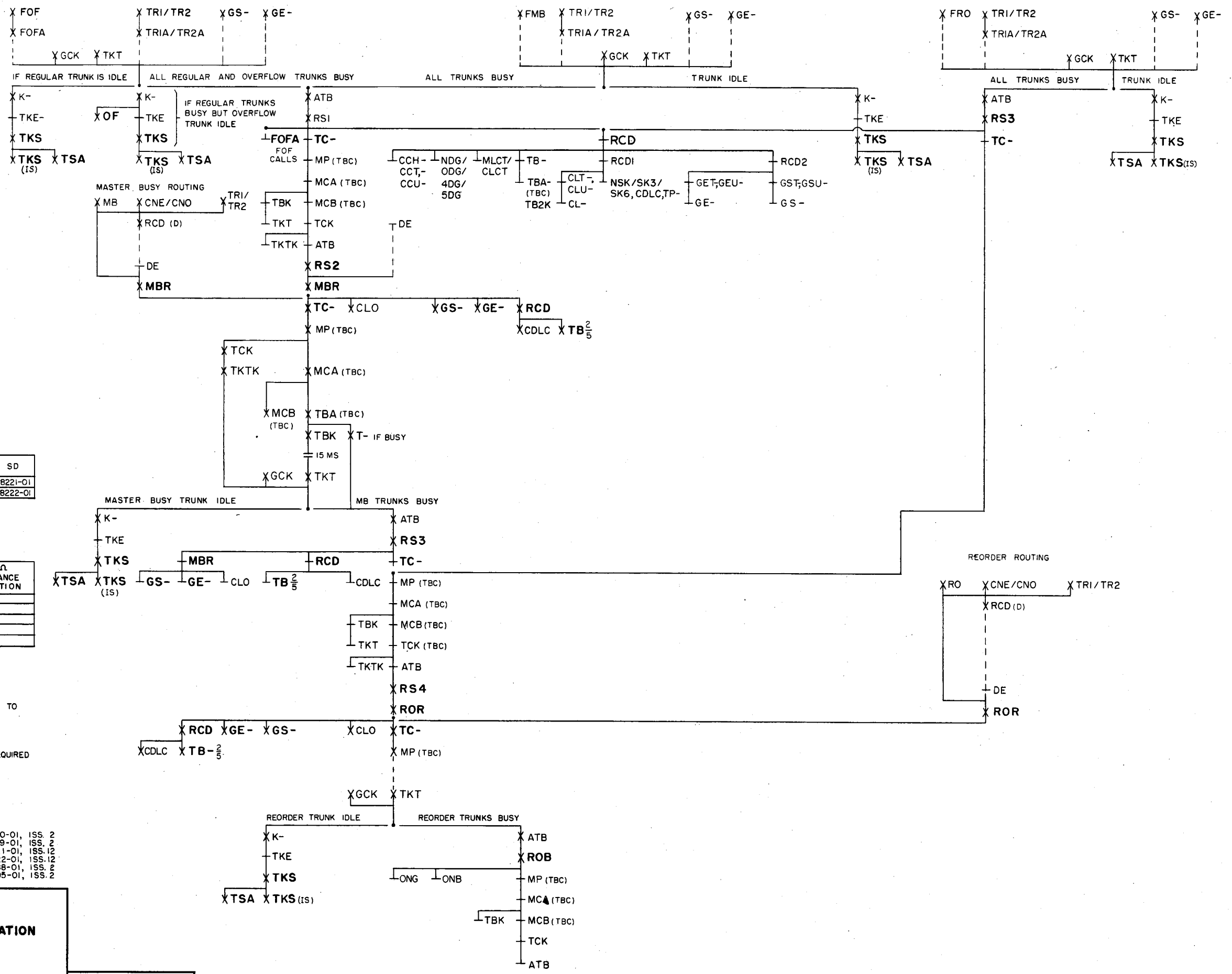


* MARKER CKT. SD-68388-01, ISS. 2

MARKER TRUNK SELECTION

NO. 4A TOLL

OS201-1



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR DP SENDERS		68221-01
B	FOR MF SENDERS		68222-01

TB RELAY	RCD CONTACTS TO TERMINAL	TB-RELAY	90Ω RESISTANCE DESIGNATION
TB0	7B	8B	A
TB1	9B	10B	B
TB2	11B	12B	C
TB4	9T	10T	D
TB7	11T	12T	E

3 DECODER FURNISHES NEW ROUTING INFORMATION TO MARKER

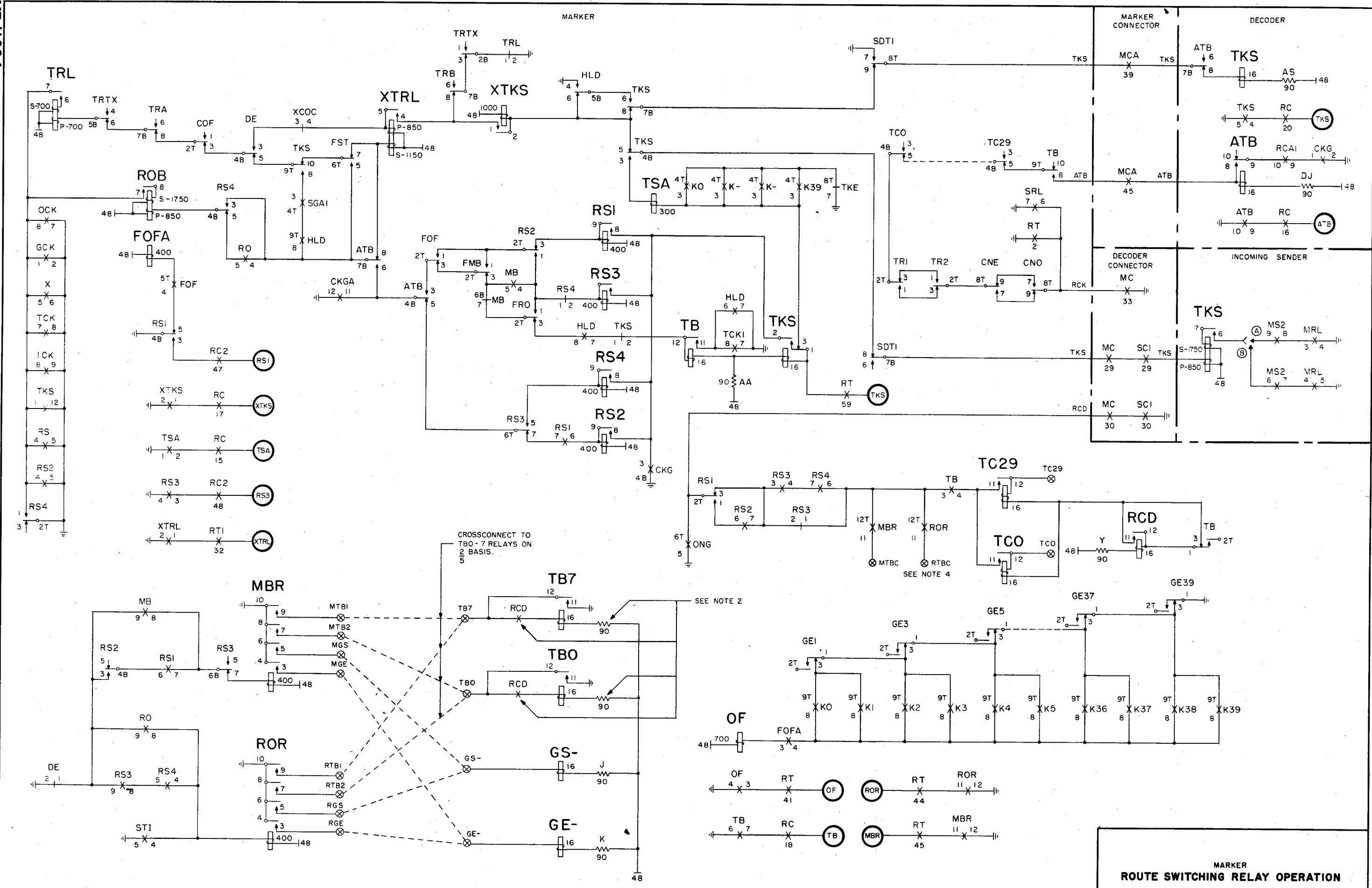
4 CROSS CONNECT MTBC OR RTBC TO TC- AS REQUIRED

- DECODER CKT. SD-68340-01, ISS. 2
- DECODER CONNECTOR CKT. SD-68339-01, ISS. 2
- INCOMING SENDER CKT. DP SD-68221-01, ISS. 12
- INCOMING SENDER CKT. MF SD-68222-01, ISS. 12
- *MARKER CKT. SD-68388-01, ISS. 2
- MARKER CONNECTOR CKT. SD-68395-01, ISS. 2

MARKER
ROUTE SWITCHING RELAY OPERATION

ISSUE	1	2/27/57
DATE		9/20/57

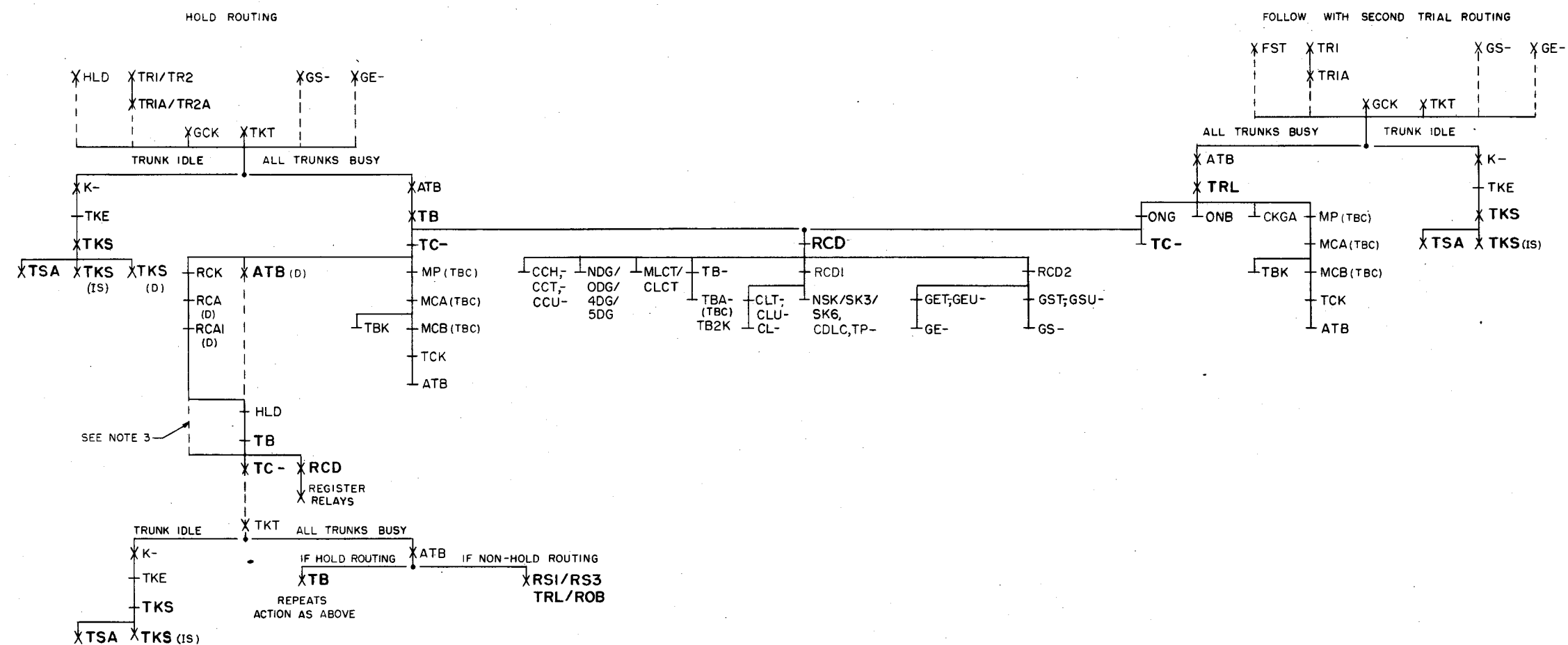
ISSUE	DATE
1	7-21-51
2	



MARKER ROUTE SWITCHING RELAY OPERATION

ISSUE	1	2	3	4	5	6
DATE		10/24				
		9/20/57				

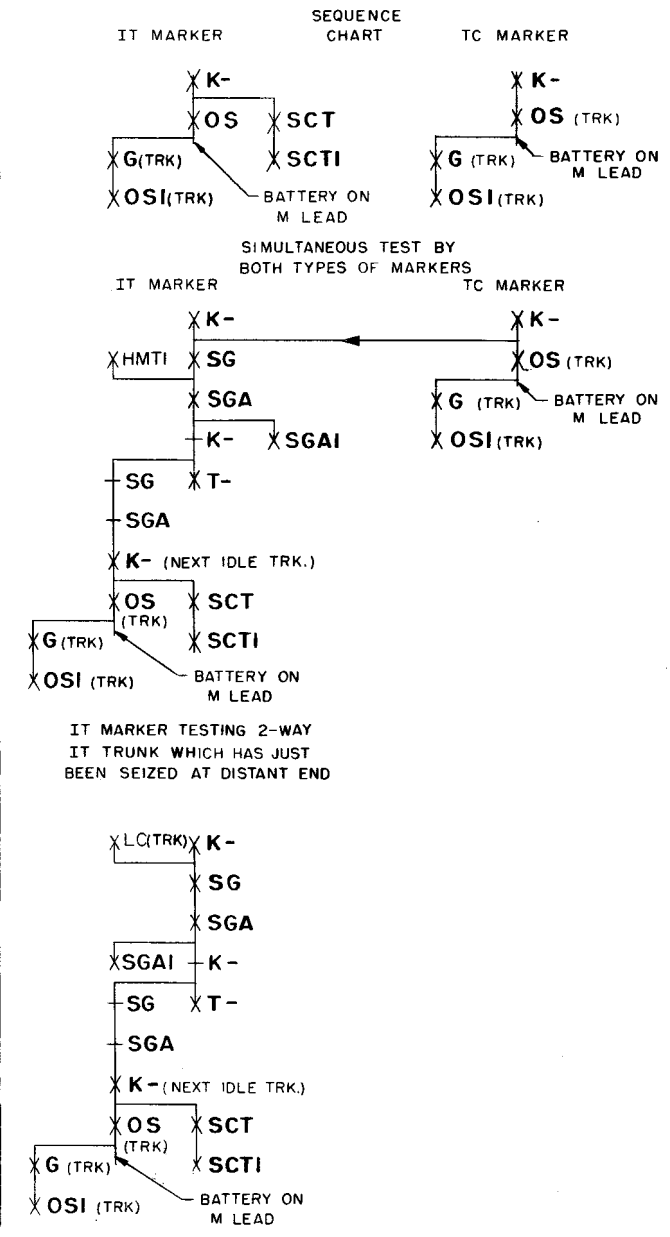
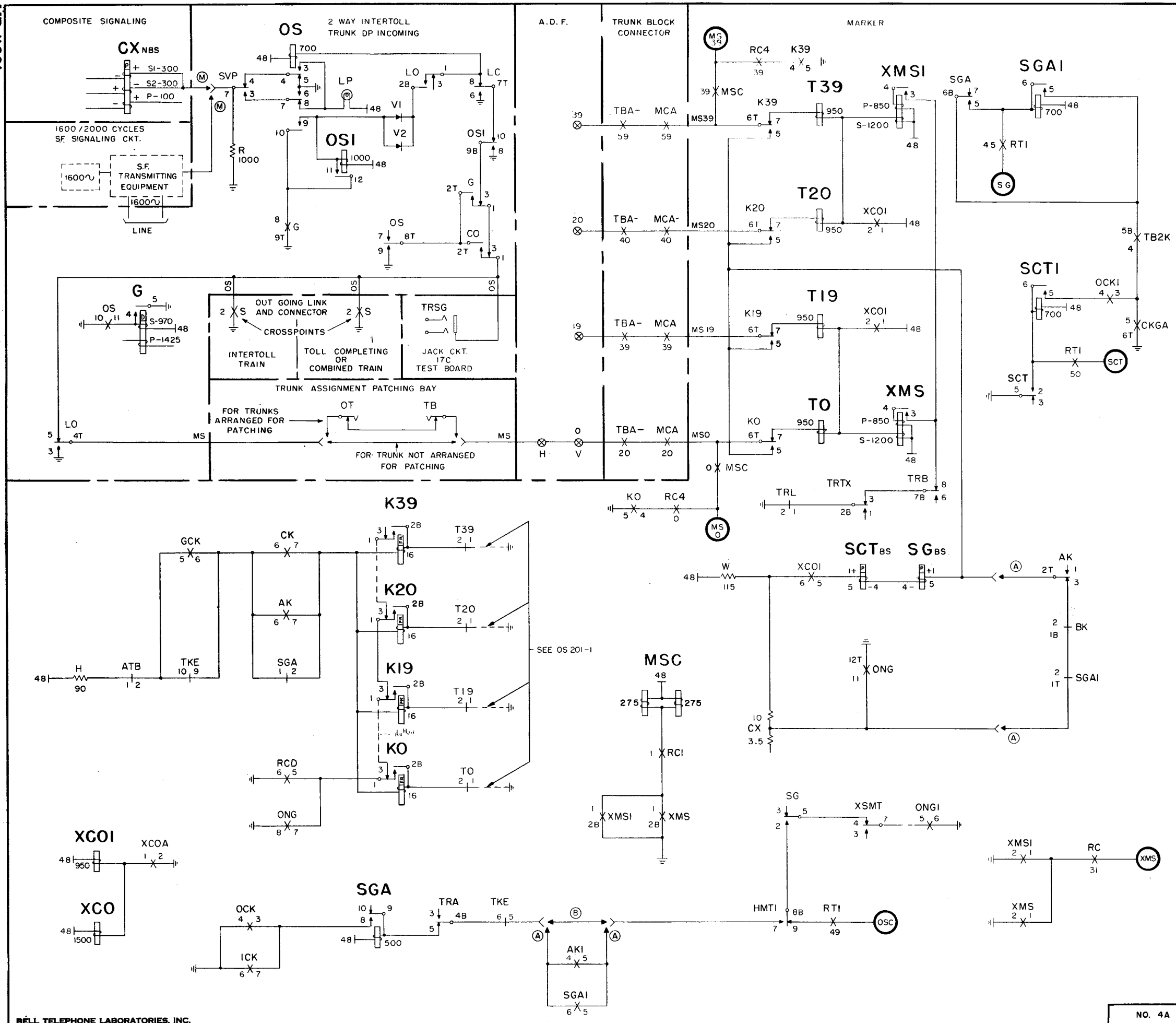
SEQUENCE CHART



MARKER
ROUTE SWITCHING RELAY OPERATION

MP-11691

ISSUE 1
DATE 6-30-51

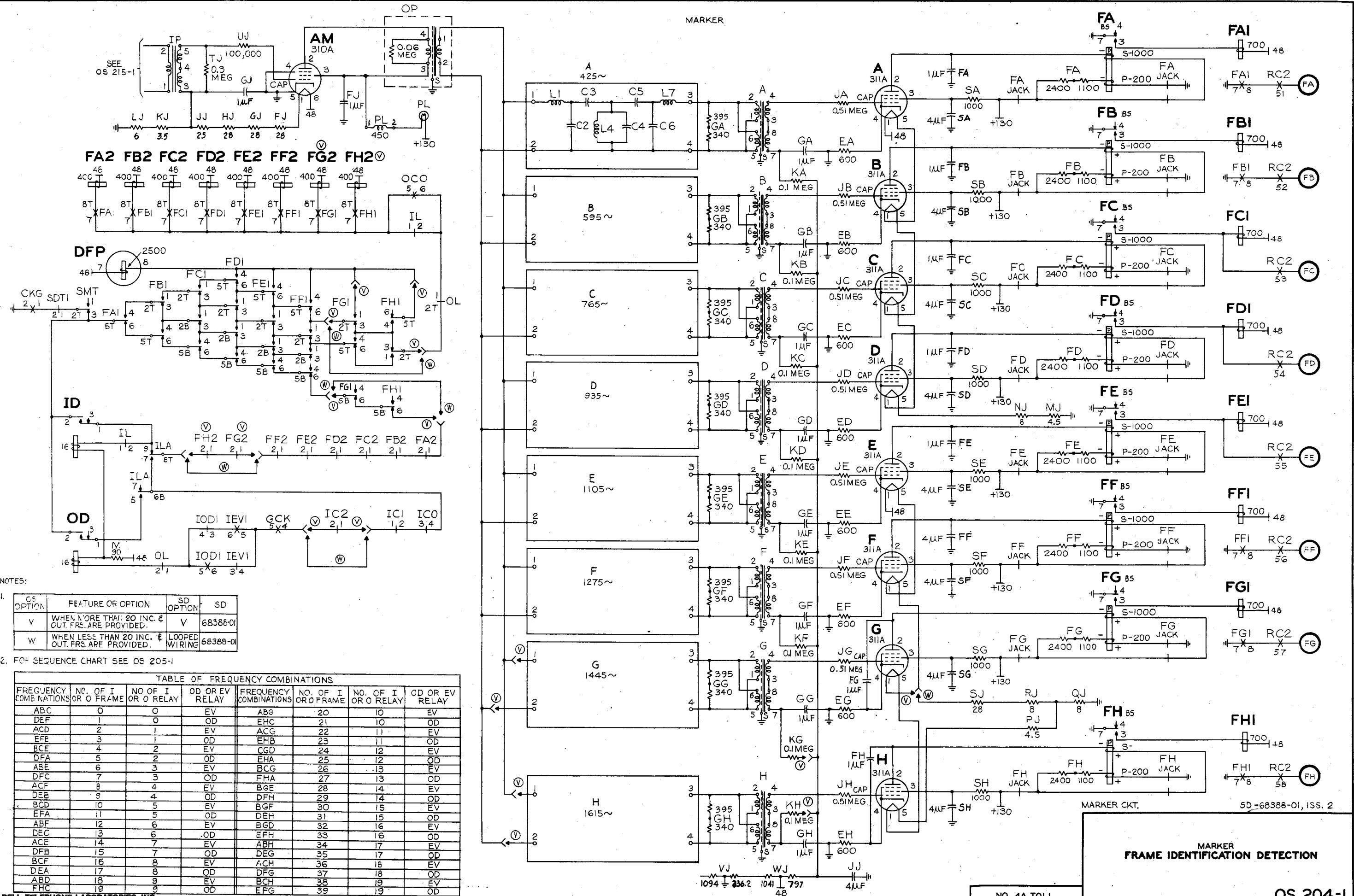


NOTES

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR TOLL COMPLETING MARKERS	Y	68388-01
B	FOR INTERTOLL AND COMBINED MARKERS	X & Z	68388-01

CX SIGNALING CKT. TYPE B SD-95048-01, ISS.12
 JACK CKT. AT 17C TEST BOARD SD-68122-01, ISS.4
 *MARKER CKT. SD-68388-01, ISS.2
 OUTGOING LINK & CONNECTOR CKT. SD-68394-01, ISS.2
 TRUNK BLOCK CONNECTOR CKT. SD-68027-01, ISS.16
 2-WAY INTERTOLL TRUNK CKT. DP INCOMING SD-68232-01, ISS.9
 1600 OR 2000-CYCLE S.F. SIGNALING CKT. SD-56202-01, ISS.6

ISSUE	DATE
1	11-15-51
2	9-24-51



FA2 FB2 FC2 FD2 FE2 FF2 FG2 FH2

DFP

ID

OD

NOTES:

CS OPTION	FEATURE OR OPTION	SD OPTION	SD
V	WHEN MORE THAN 20 INC. & OUT. FR. ARE PROVIDED.	V	68388-01
W	WHEN LESS THAN 20 INC. & OUT. FR. ARE PROVIDED.	LOOPE WIRING	68388-01

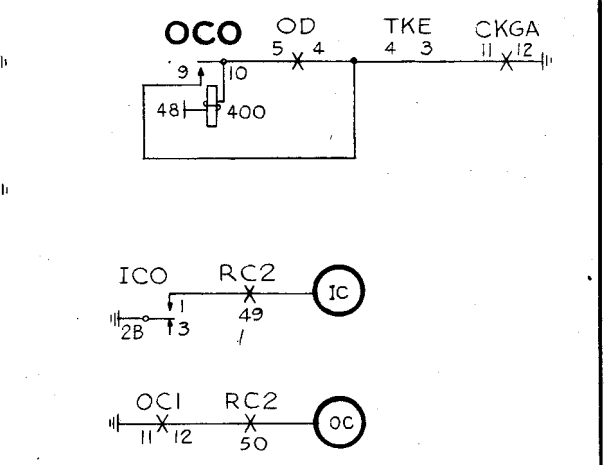
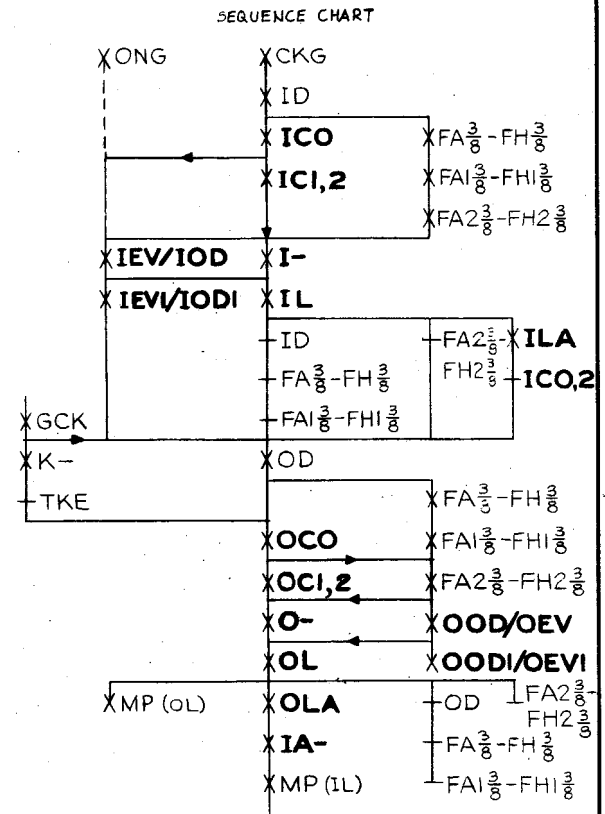
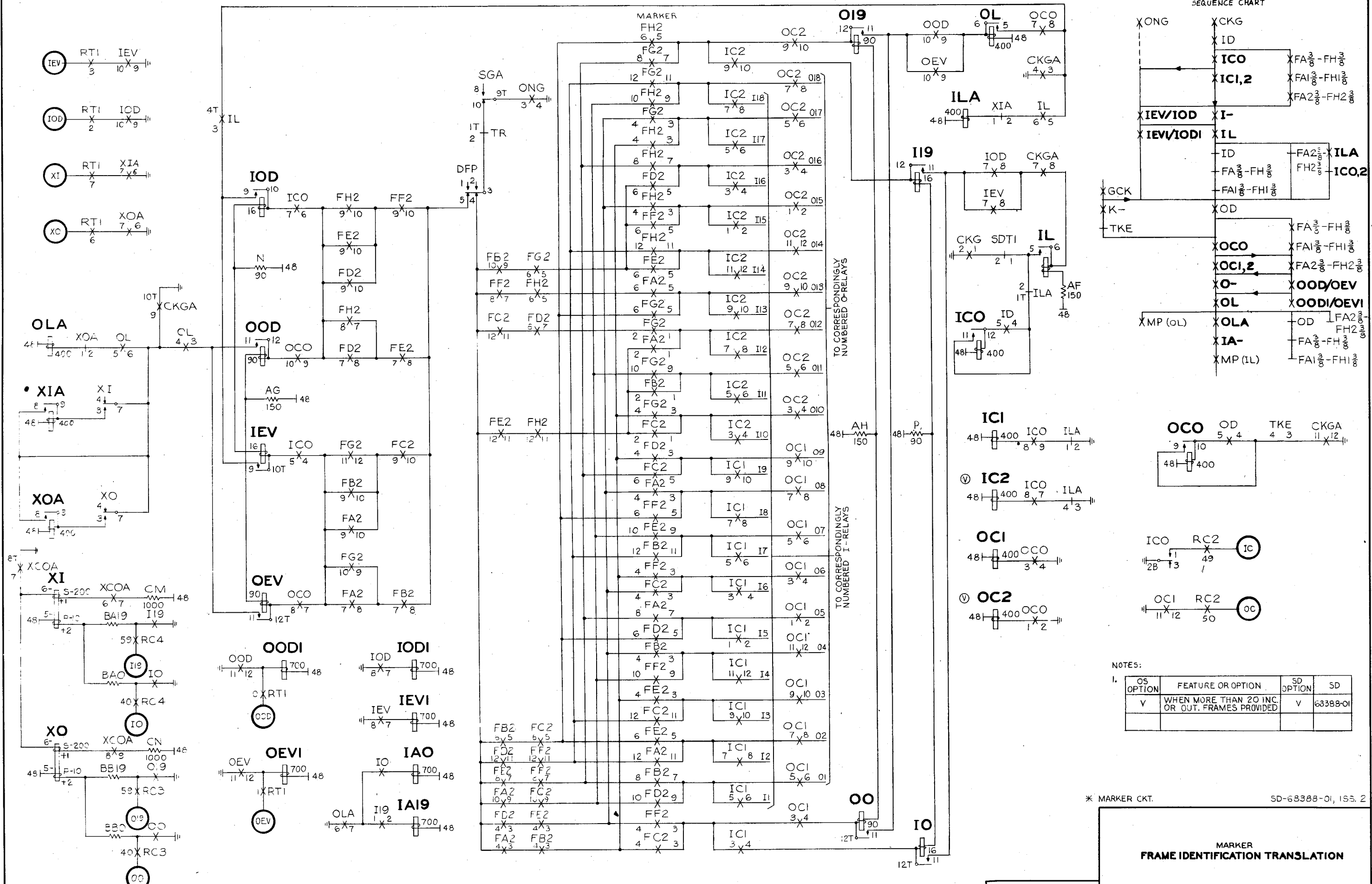
2. FOR SEQUENCE CHART SEE OS 205-1

TABLE OF FREQUENCY COMBINATIONS

FREQUENCY COMBINATIONS	NO. OF I OR O FRAME	NO. OF I OR O RELAY	OD OR EV RELAY	FREQUENCY COMBINATIONS	NO. OF I OR O FRAME	NO. OF I OR O RELAY	OD OR EV RELAY
ABC	0	0	EV	ABG	20	10	EV
DEF	1	0	OD	EHC	21	10	OD
ACD	2	1	EV	ACG	22	11	EV
EFB	3	1	OD	EMB	23	11	OD
BCE	4	2	EV	CGD	24	12	EV
DFA	5	2	OD	EHA	25	12	OD
ABE	6	3	EV	BCG	26	13	EV
DFC	7	3	OD	FHA	27	13	OD
ACF	8	4	EV	BGE	28	14	EV
DEB	9	4	OD	DFH	29	14	OD
BCD	10	5	EV	BGF	30	15	EV
EFA	11	5	OD	DEH	31	15	OD
ABF	12	6	EV	BGD	32	16	EV
DEC	13	6	OD	EFH	33	16	OD
ACE	14	7	EV	ABH	34	17	EV
DFB	15	7	OD	DEG	35	17	OD
BCF	16	8	EV	ACH	36	18	EV
DEA	17	8	OD	DFG	37	18	OD
ABD	18	9	EV	BCH	38	19	EV
FHC	19	9	OD	EFG	39	19	OD

MARKER
FRAME IDENTIFICATION DETECTION

ISSUE	DATE
1	3.31.51
2	4.15.51
3	7.24.51
4	
5	
6	
7	
8	
9	
10	



NOTES:

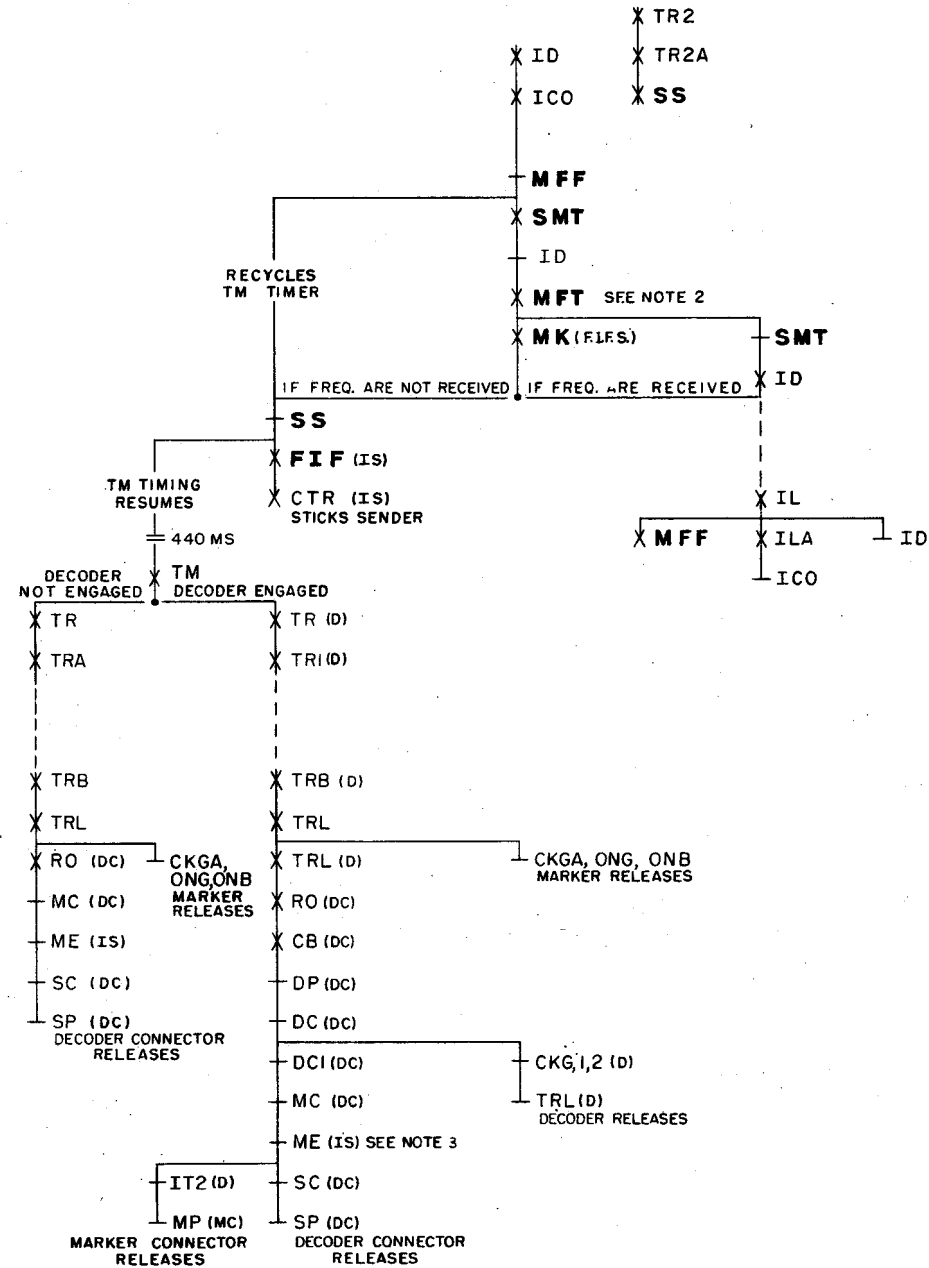
OS OPTION	FEATURE OR OPTION	SD OPTION	SD
V	WHEN MORE THAN 20 INC. OR OUT. FRAMES PROVIDED	V	63388-01

* MARKER CKT. SD-63388-01, ISS. 2

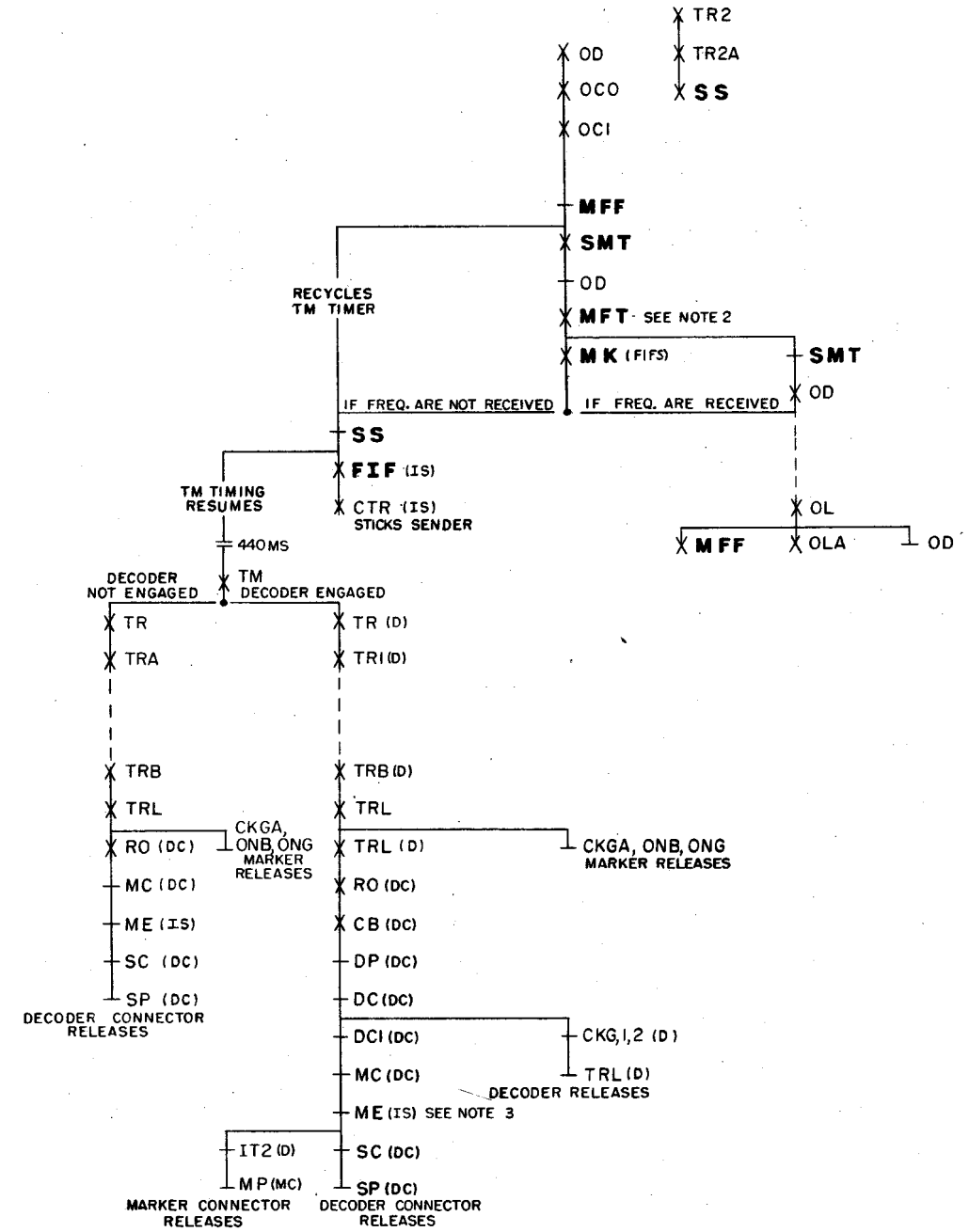
MARKER
FRAME IDENTIFICATION TRANSLATION

SEQUENCE CHART

INCOMING FRAME IDENTIFICATION FAILURE



OUTGOING FRAME IDENTIFICATION FAILURE



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	COMBINED MARKER	X	68388-01
B	TOLL COMPLETING MARKER	Y	68388-01
C	INTERTOLL MARKER	Z	68388-01

2. IF MFT FAILS TO OPERATE, IT INDICATES THE SEL. MAG LEAD OPEN. THE TROUBLE CONDITION WILL BE TREATED THE SAME AS THE FREQ. SUPPLY FAILURE.

3. WITH THE ME RELAY NORMAL AND THE CTR RELAY OPERATED IN THE SENDER, THE INCOMING TRUNK WILL BE LEFT HIGH AND DRY, AND A STUCK SENDER WILL BE INDICATED.

MARKER
FRAME IDENTIFICATION FAILURE
AND
MULTIFREQUENCY THROWOVER

OS 206-1

2 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS BSP ITEM MP-11697

BELL TELEPHONE LABORATORIES, INC.

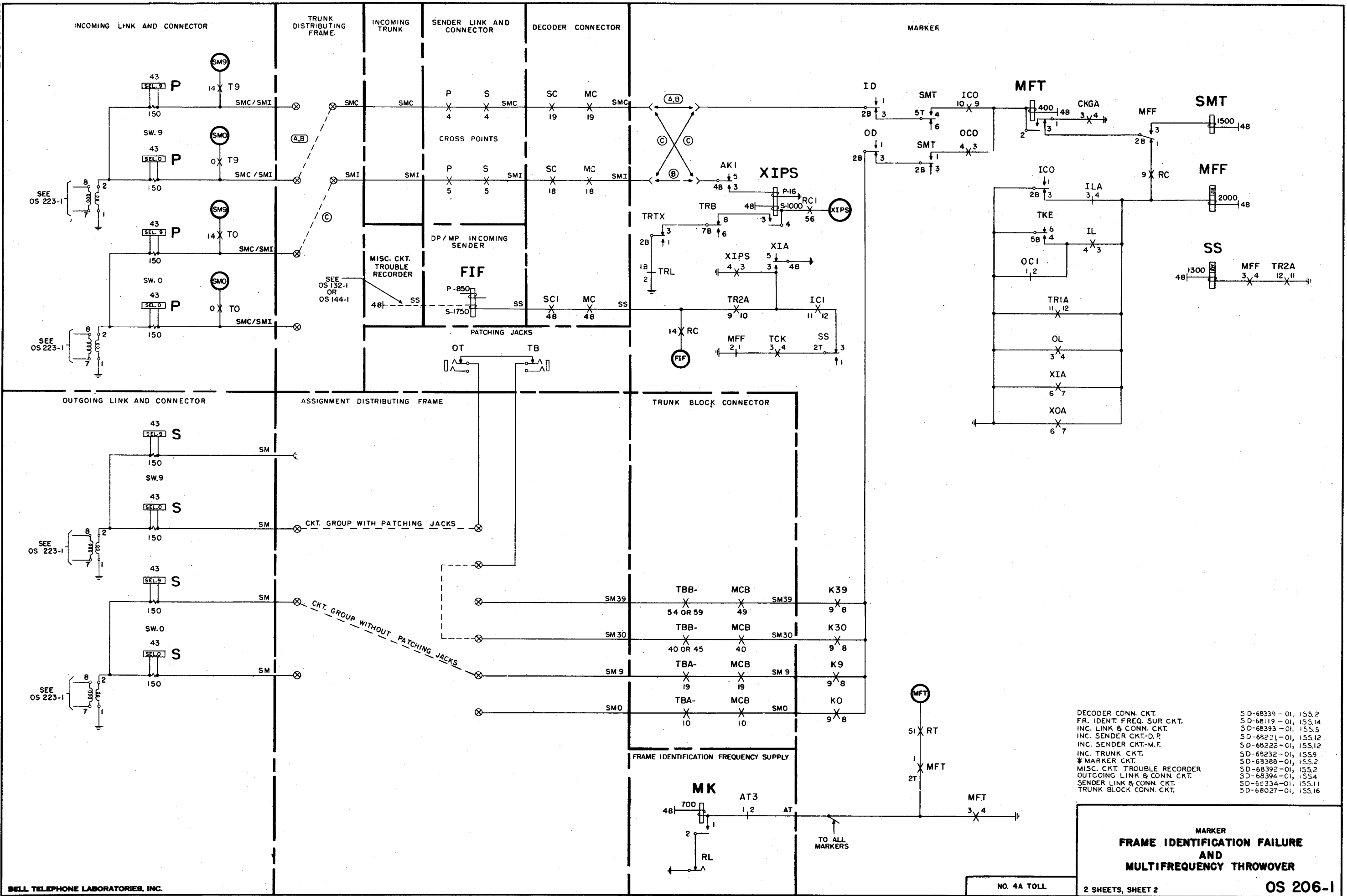
PRINTED IN U. S. A.

REVISION	1	1	1	1	1	1	1	1	1
DATE	9-24-51								

2 SHEETS, SHEET 1

MP-11697

ISSUE	1	2	3
DATE	9-24-51		



- DECODER CONN. CKT. SD-68339-01, ISS.2
- FR. IDENT. FREQ. SUP. CKT. SD-68119-01, ISS.14
- INC. LINK & CONN. CKT. SD-68393-01, ISS.5
- INC. SENDER CKT.-D.P. SD-68221-01, ISS.12
- INC. SENDER CKT.-M.F. SD-68222-01, ISS.12
- INC. TRUNK CKT. SD-68232-01, ISS.9
- * MARKER CKT. SD-68388-01, ISS.2
- MISC. CKT. TROUBLE RECORDER SD-68392-01, ISS.2
- OUTGOING LINK & CONN. CKT. SD-68394-01, ISS.4
- SENDER LINK & CONN. CKT. SD-68334-01, ISS.11
- TRUNK BLOCK CONN. CKT. SD-68027-01, ISS.16

**MARKER
FRAME IDENTIFICATION FAILURE
AND
MULTIFREQUENCY THROWOVER**

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	OUTGOING PRIMARY EXTENSION FRAMES NOT PROVIDED.	Q	68394-01
B	OUTGOING PRIMARY EXTENSION FRAMES PROVIDED.	FIG. 1B	68394-01

- SEQUENCE CHART OPERATION SHOWS TWO MARKERS TRYING TO GAIN ACCESS TO THE SAME FRAME.
- THIS DRAWING ASSUMES THE USE OF "F" AND "J" OPTIONS AND FIGS. B AND 1B.

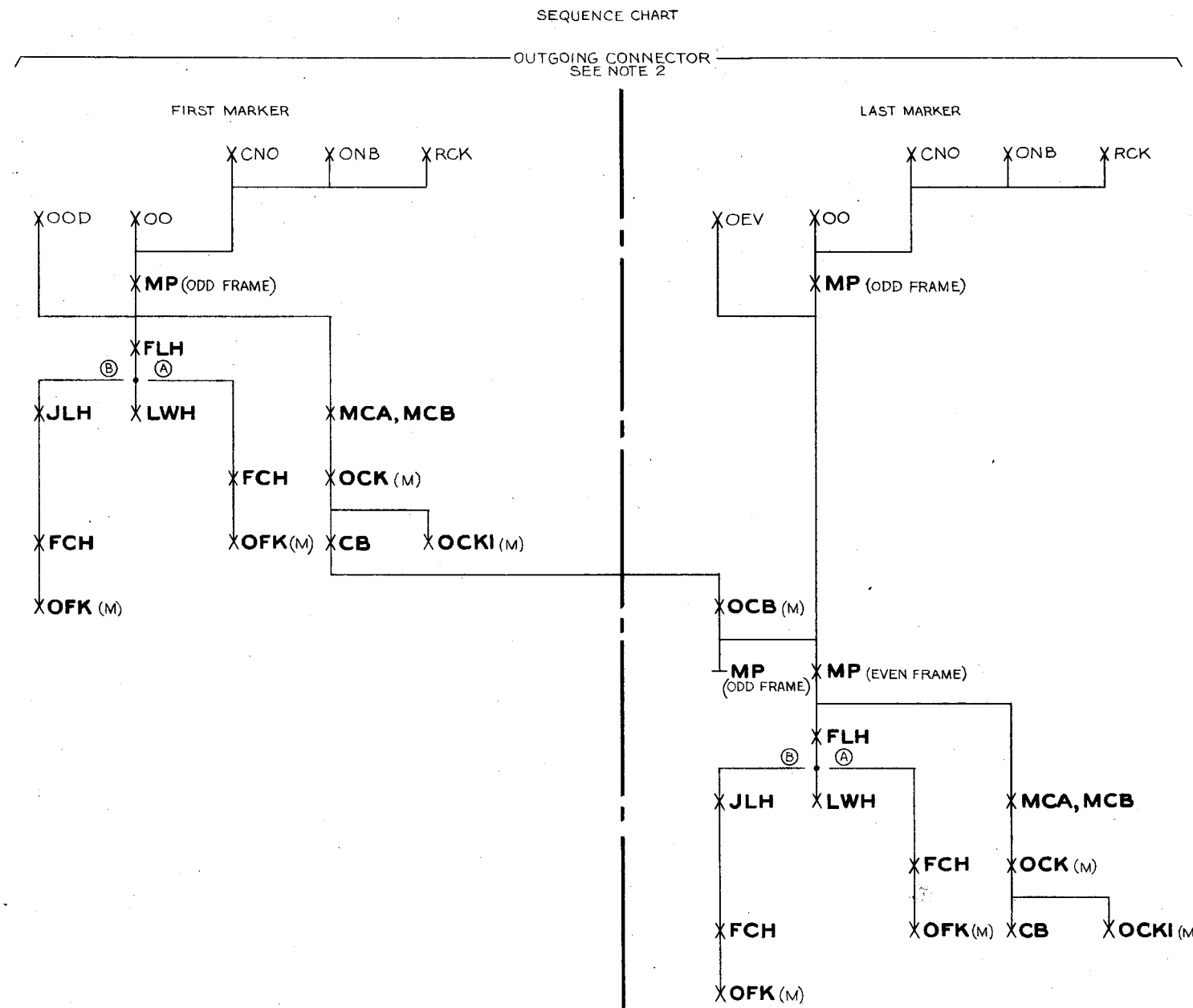
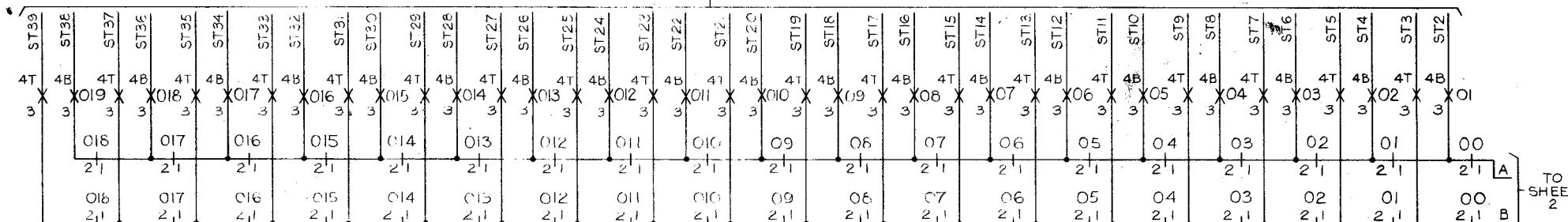


FIG. A
TO LIKE NUMBERED OUTGOING FRAMES

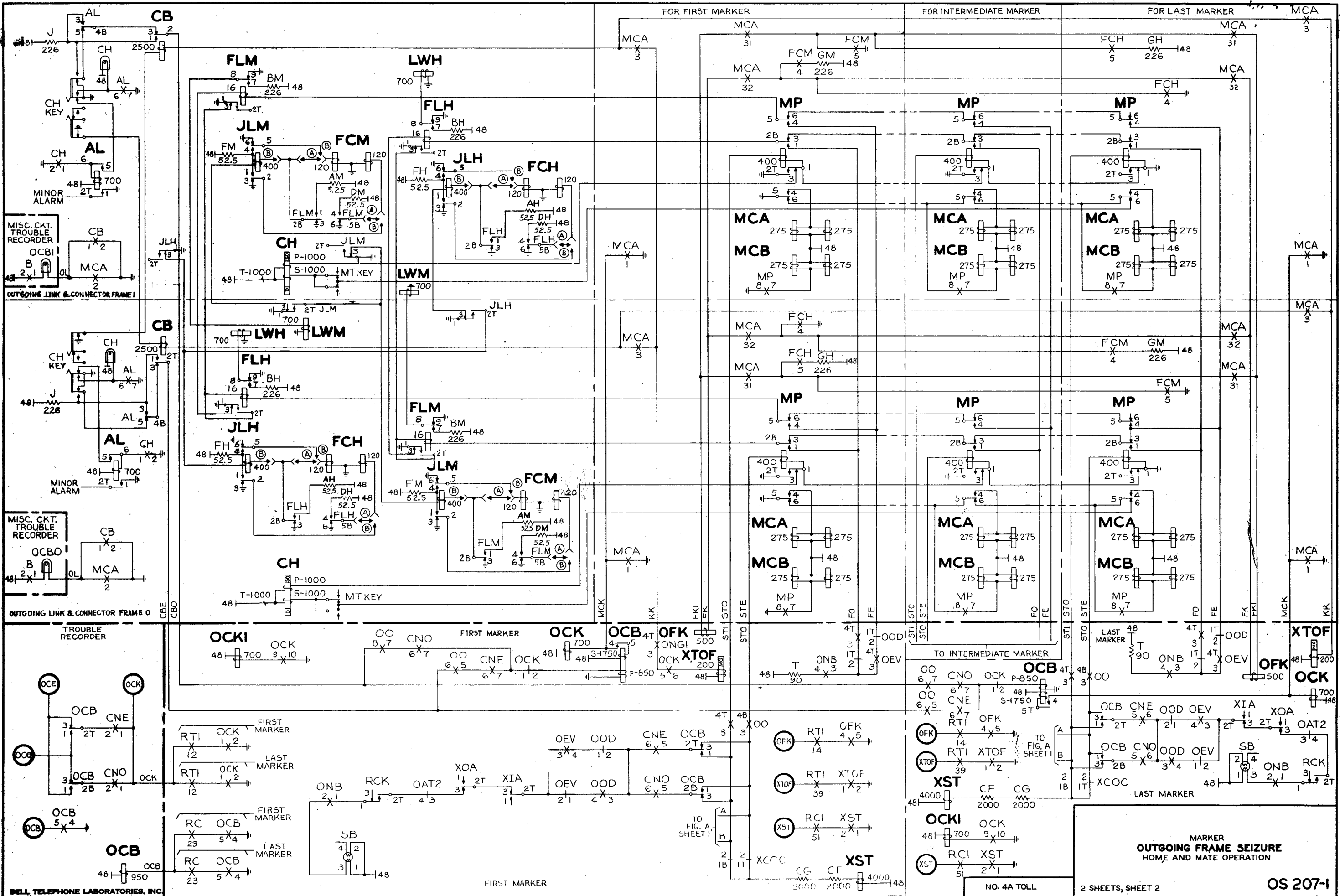


MARKER CKT. SD-68388-01, ISS.2
 MISC. CKT. TROUBLE RECORDER SD-68392-01, ISS.3
 * OUTGOING LINK AND CONNECTOR CKT. SD-68394-01, ISS.4
 TROUBLE RECORDER CKT. SD-68389-01, ISS.2

MARKER
OUTGOING FRAME SEIZURE
 HOME AND MATE OPERATION

ISSUE	1	2	3	4
DATE	10-1-51			

DATE	
TIME	
BY	
CHKD	

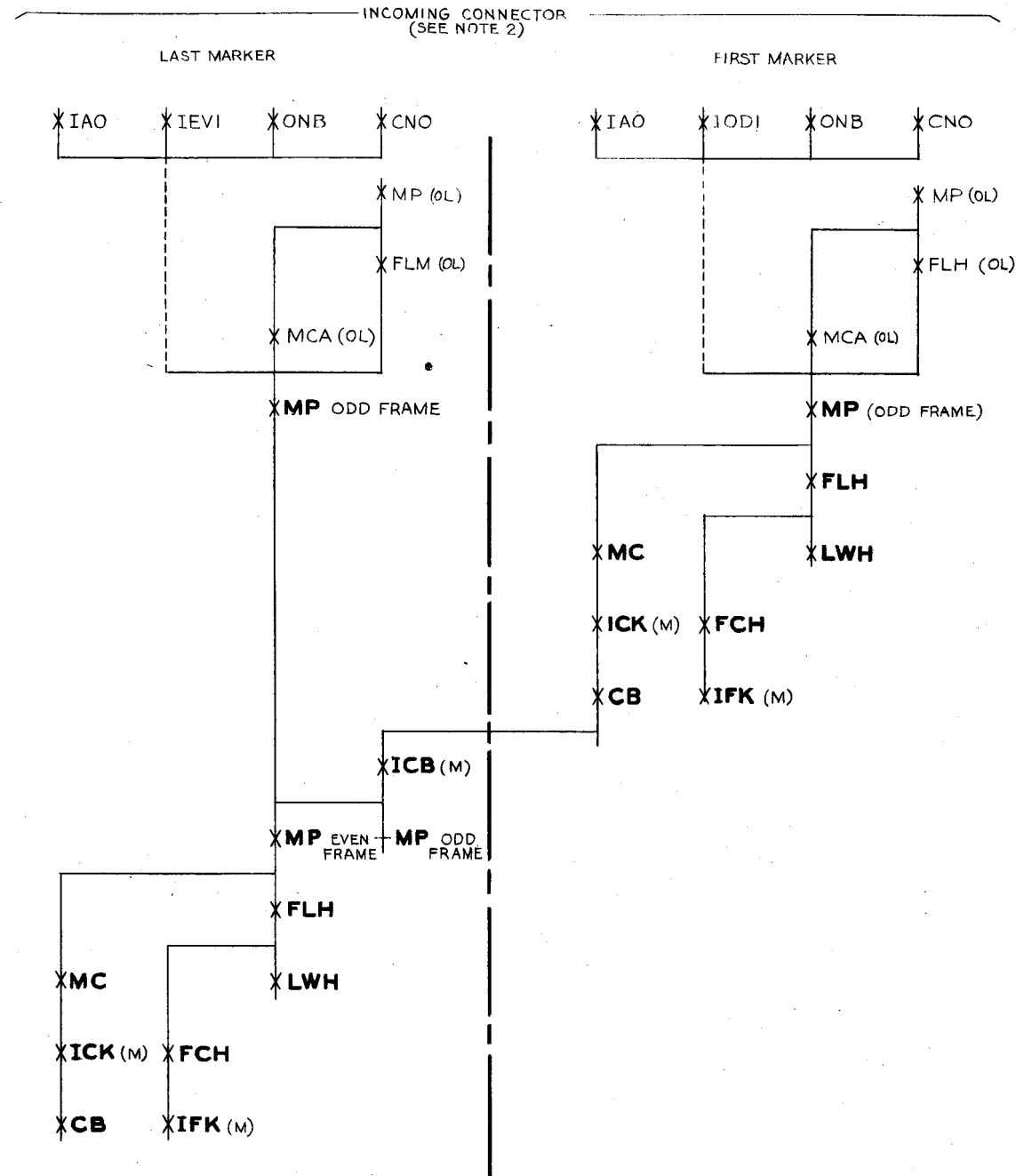


NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	OUTGOING PRIMARY EXTENSION FRAMES NOT PROVIDED	FIG. B	68394-01
B	OUTGOING PRIMARY EXTENSION FRAMES PROVIDED.	FIG. 1B	68394-01

- SEQUENCE CHART OPERATION SHOWS TWO MARKERS TRYING TO GAIN ACCESS TO THE SAME FRAME
- THIS DRAWING ASSUMES THE USE OF N, J, & M OPTIONS.

SEQUENCE CHART



INCOMING LINK AND CONNECTOR CKT. SD-68393-01, ISS. 5.
 MARKER CKT. SD-68388-01, ISS. 2.
 MISCELLANEOUS CKT. TROUBLE RECORDER SD-68392-01, ISS. 3.
 OUTGOING LINK AND CONNECTOR CKT. SD-68394-01, ISS. 4.
 TROUBLE RECORDER CKT. SD-68389-01, ISS. 2.

MARKER
INCOMING FRAME SEIZURE
 HOME AND MATE OPERATION

OS 208-1

2 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS SSP ITEM MP-11703

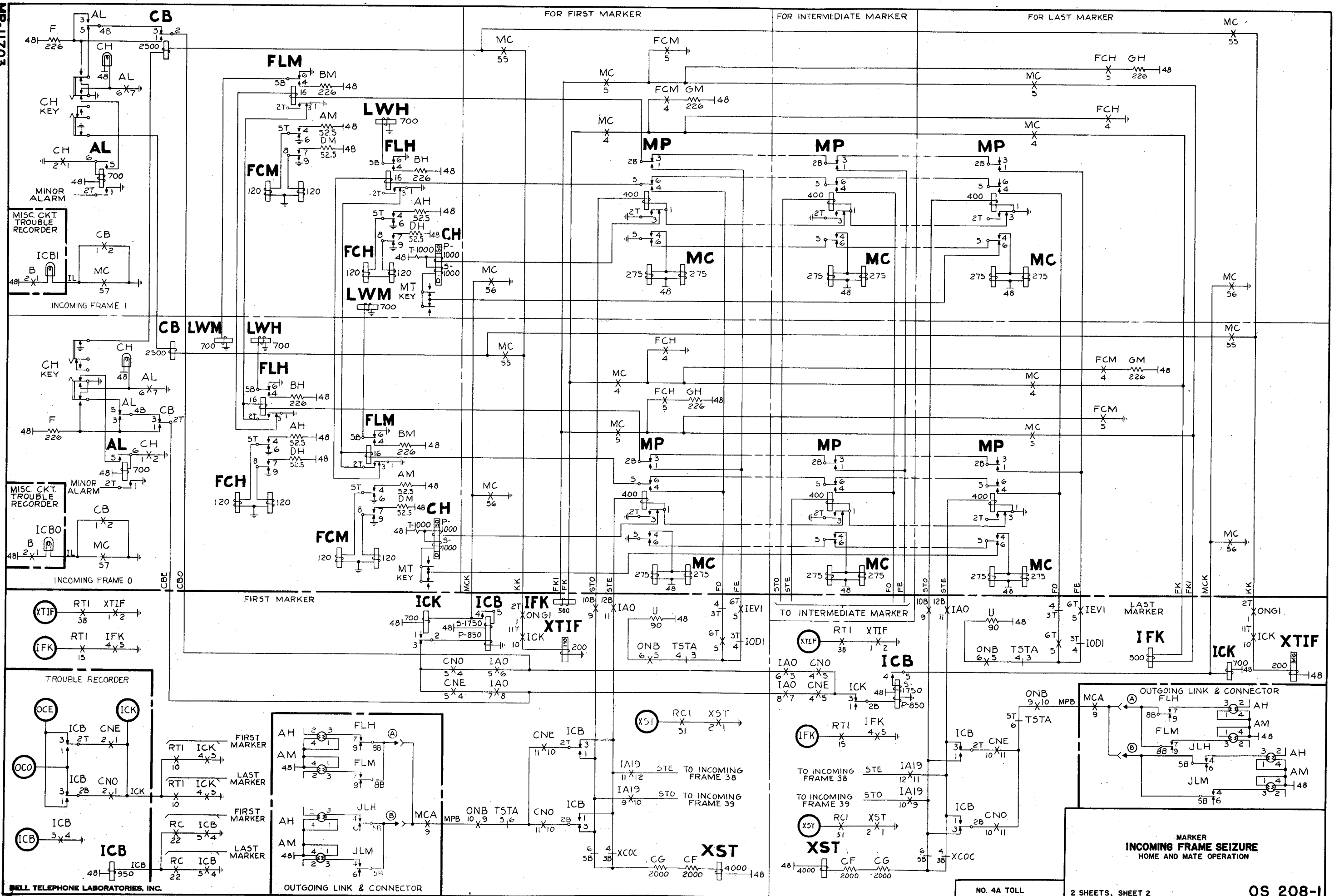
BELL TELEPHONE LABORATORIES, INC.
 PRINTED IN U. S. A.

ISSUE	1	2	3	4
DATE	10-1-51			

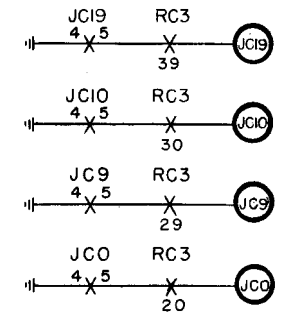
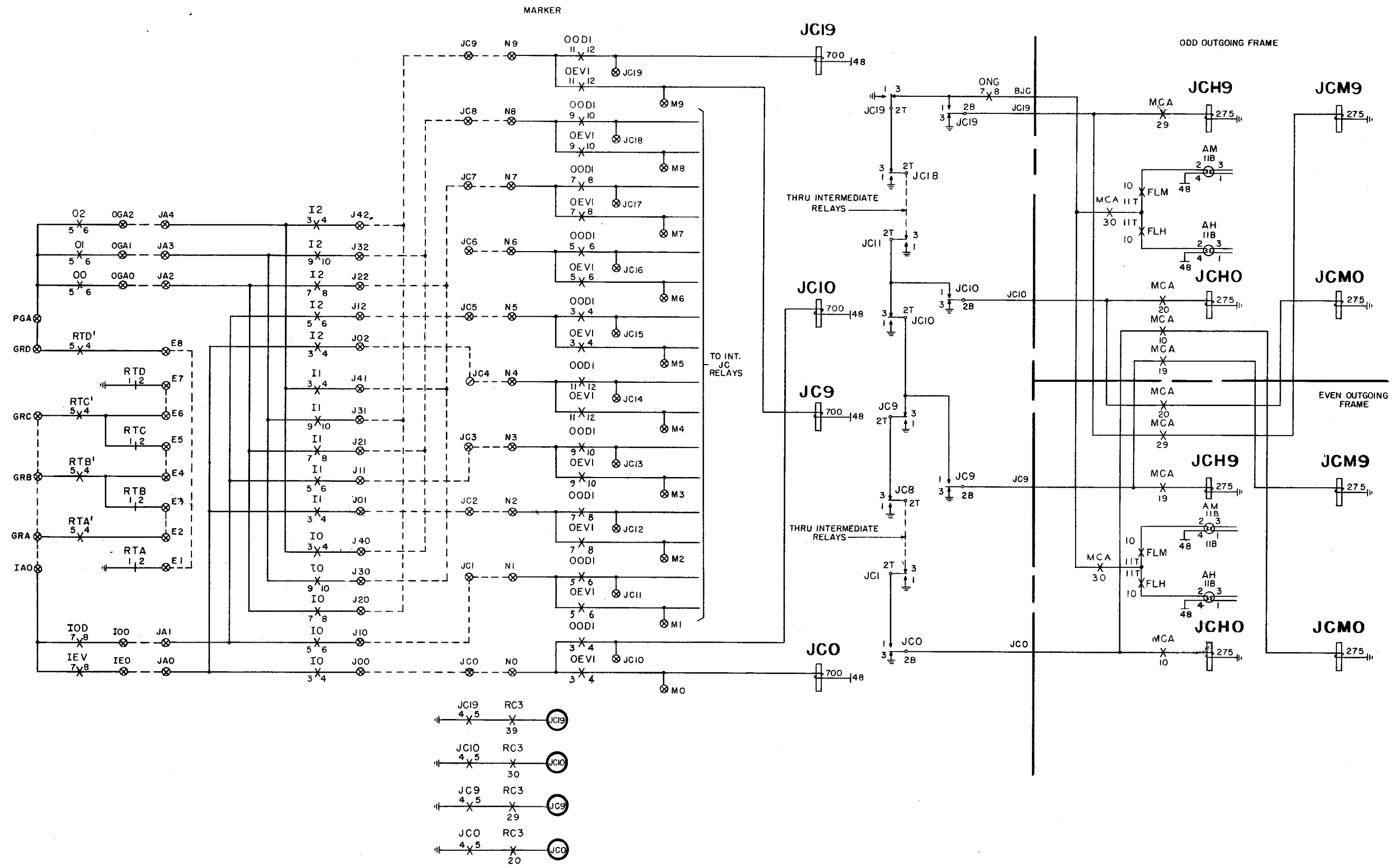
2 SHEETS, SHEET 1

MP-11703

ISSUE	1
DATE	10-1-51



ISSUE	1	3.5.58
DATE	5-24-51	

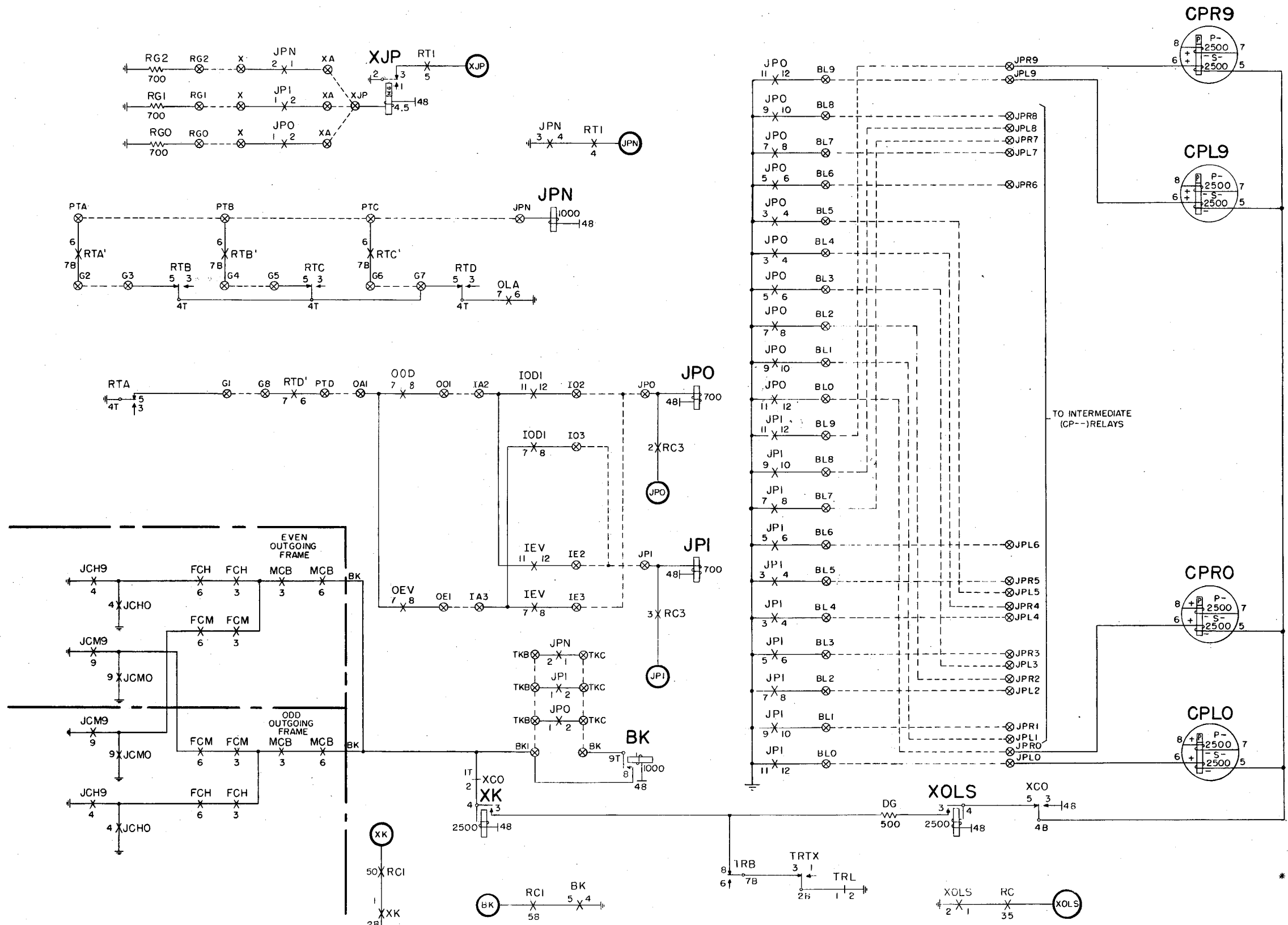


MARKER CKT. SD-68388 -01, ISS. 2
 OUTGOING LINK & CONNECTOR CKT. SD-68394 -01, ISS. 4

MARKER
JUNCTOR GROUP CUT-IN
 PLAN TA-6 INCOMING & 6 OUTGOING FRAMES

NO. 4A TOLL

ISSUE	1	DATE	7-14-51
DATE			



* MARKER CKT.
OUTGOING LINK & CONNECTOR CKT.

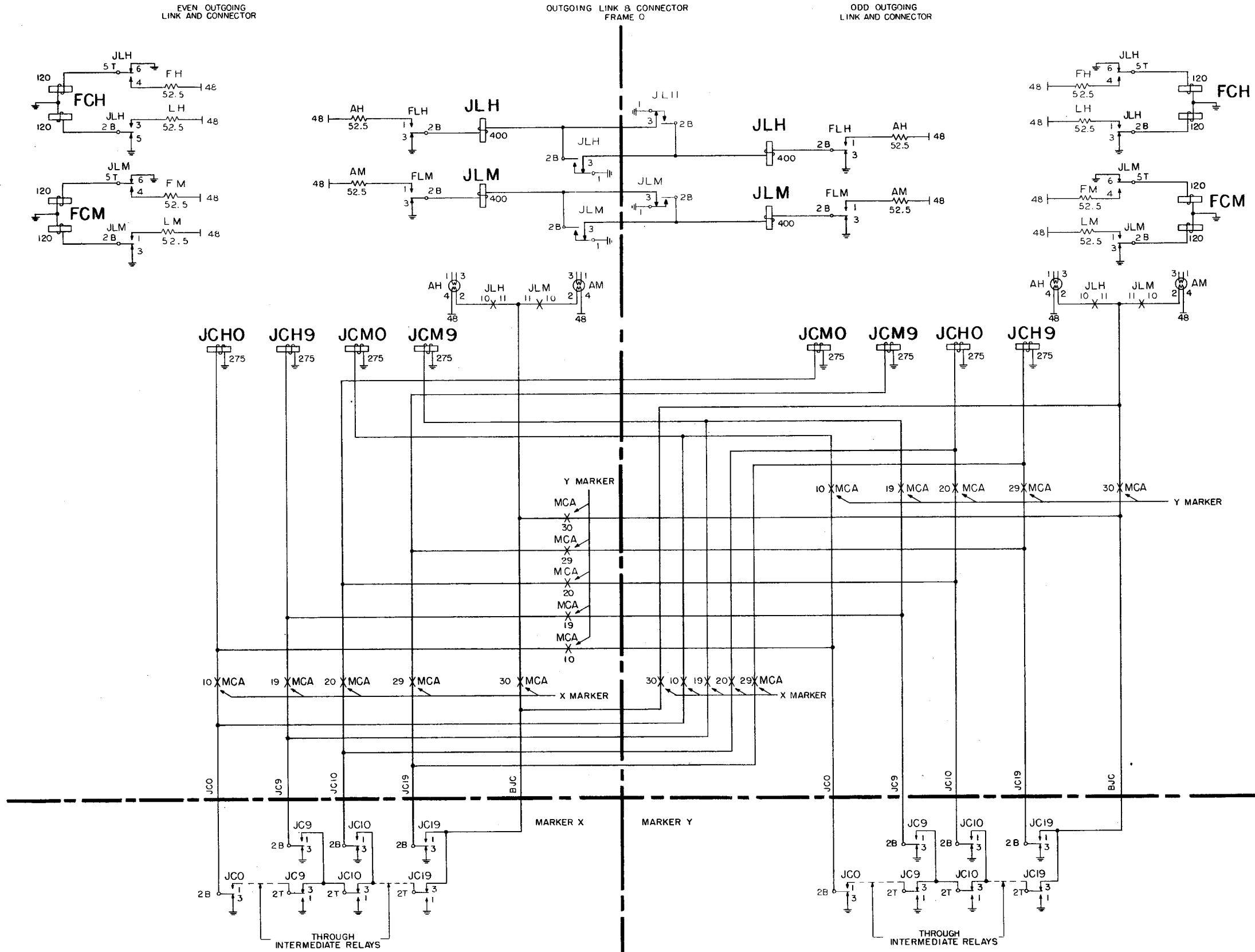
SD-68388-01, ISS. 2
SD-68394-01, ISS. 4

MARKER
JUNCTION PATTERN CONTROL
PLAN TA
6 INCOMING AND 6 OUTGOING FRAMES

NO. 4A TOLL

OS 210-1

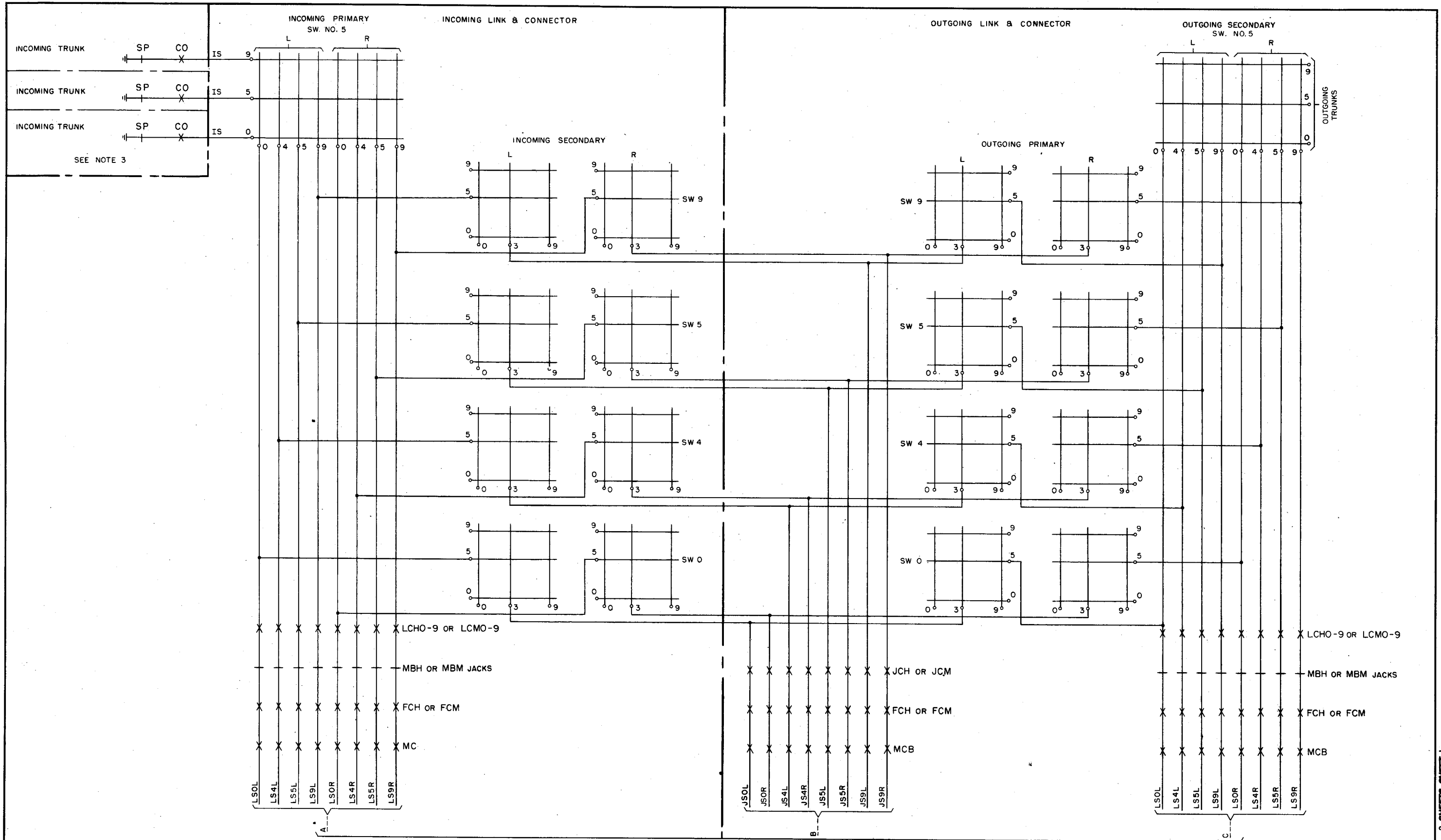
ISSUE	1	2	3
DATE	9-20-51		



NOTES:
 1. WHEN PRIMARY EXTENSIONS ARE PROVIDED, THE JCH0-9 AND JCM0-9 RELAYS ON THE ODD NUMBERED OUTGOING FRAMES ARE NUMBERED JCH10-19 AND JCM10-19.

* MARKER CKT. SD-68388-01, ISS. 2
 OUTGOING LINK AND CONNECTOR CKT. SD-68394-01, ISS. 4

MARKER
 JUNCTION LOCKOUT FOR
 PAIRED OUTGOING FRAMES



MARKER
CHANNEL SELECTION
OS 212-1
2 SHEETS, SHEET 1

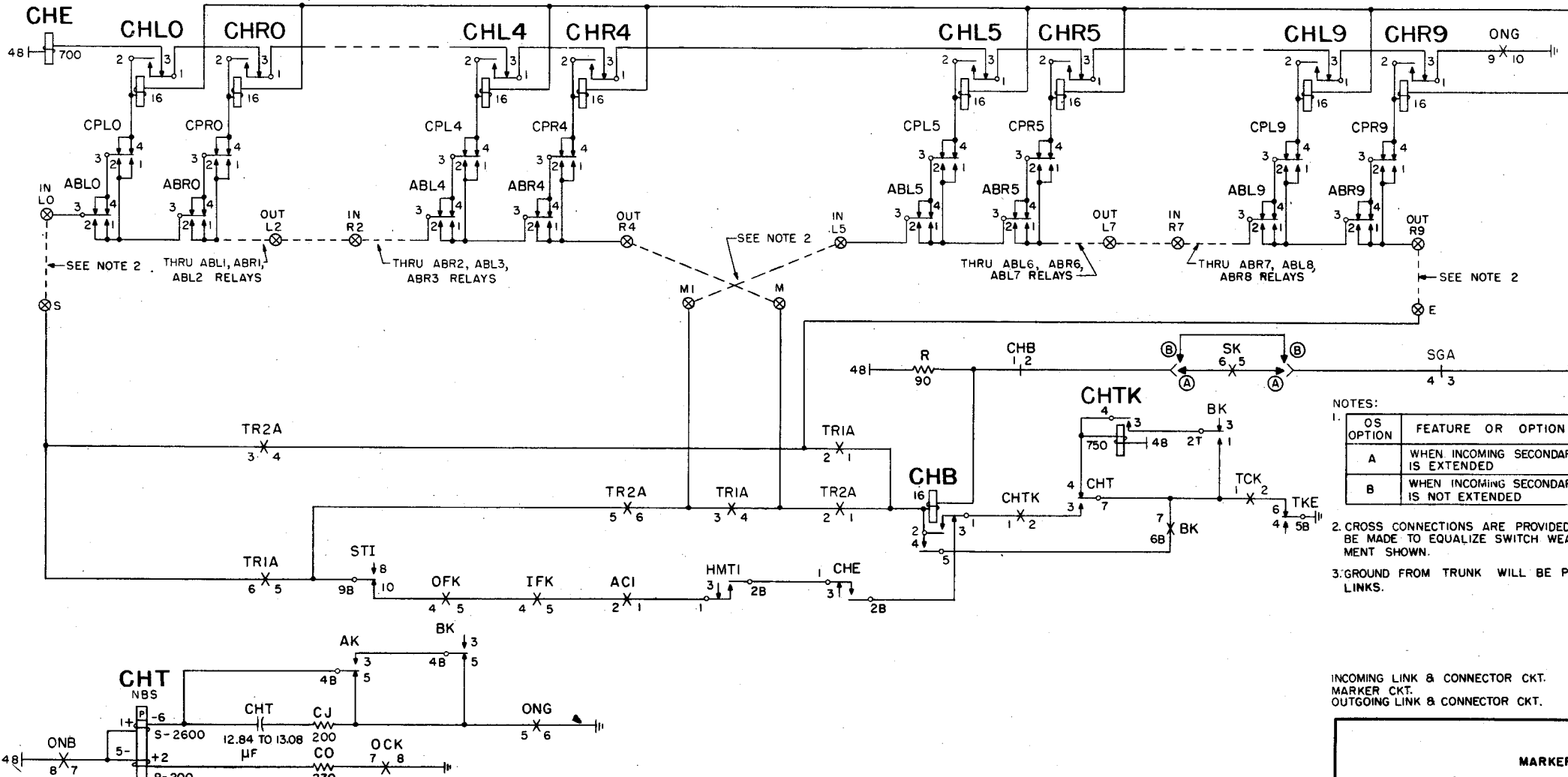
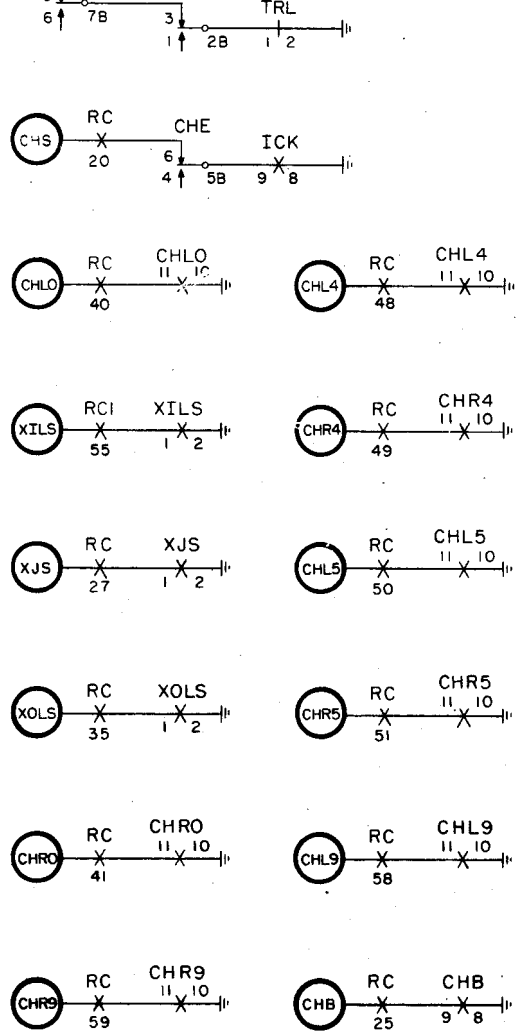
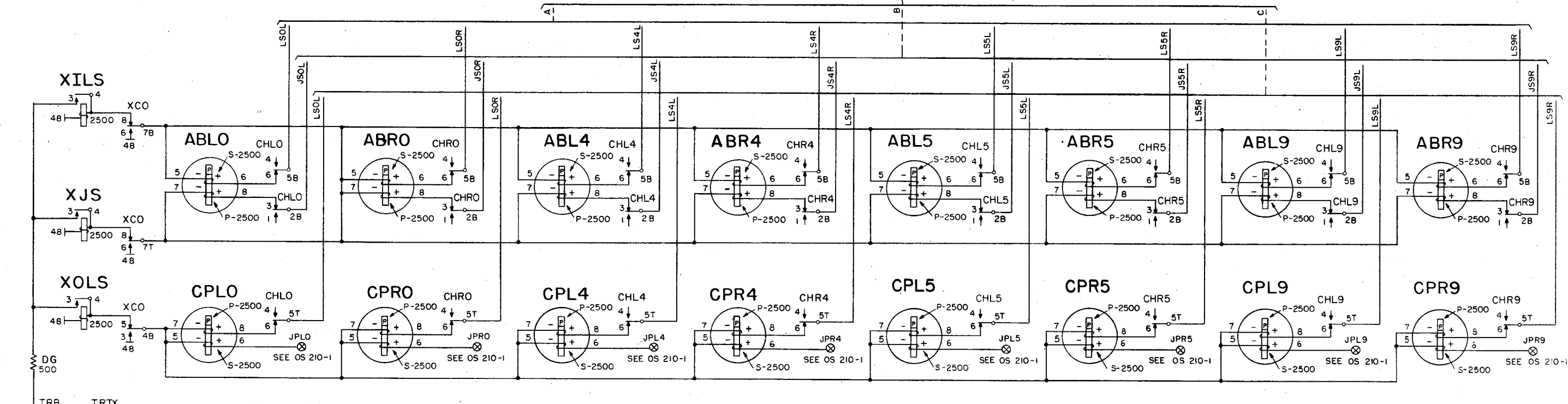
NO. 4A TOLL

ISSUE	1	DATE	9-21-51
REVISION			
DATE			

2 SHEETS, SHEET 1

MP-11698

ISSUE	DATE
1	9-21-51



NOTES:

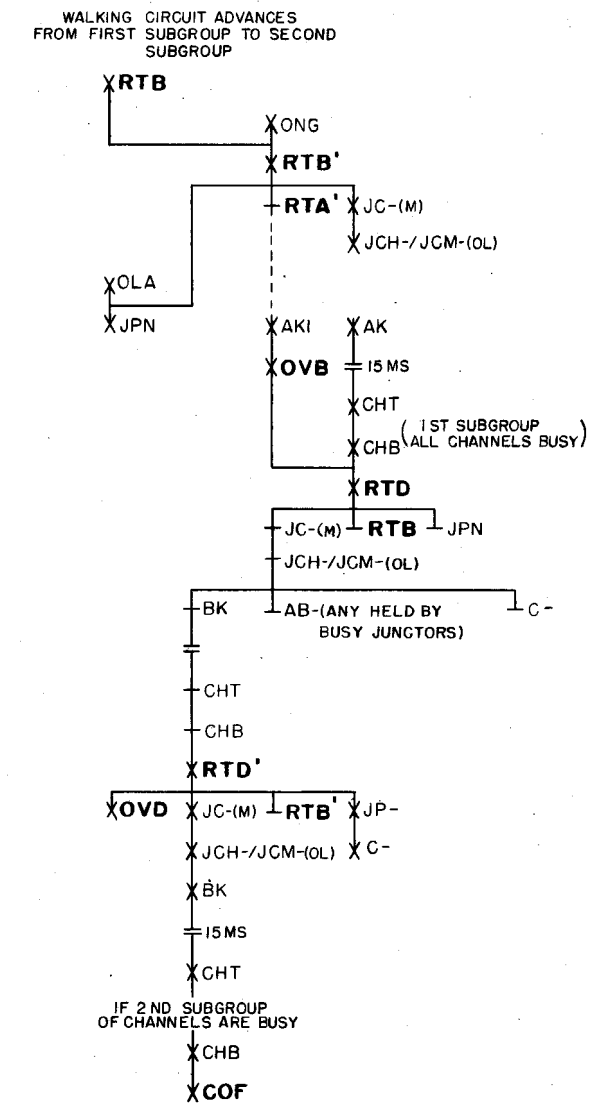
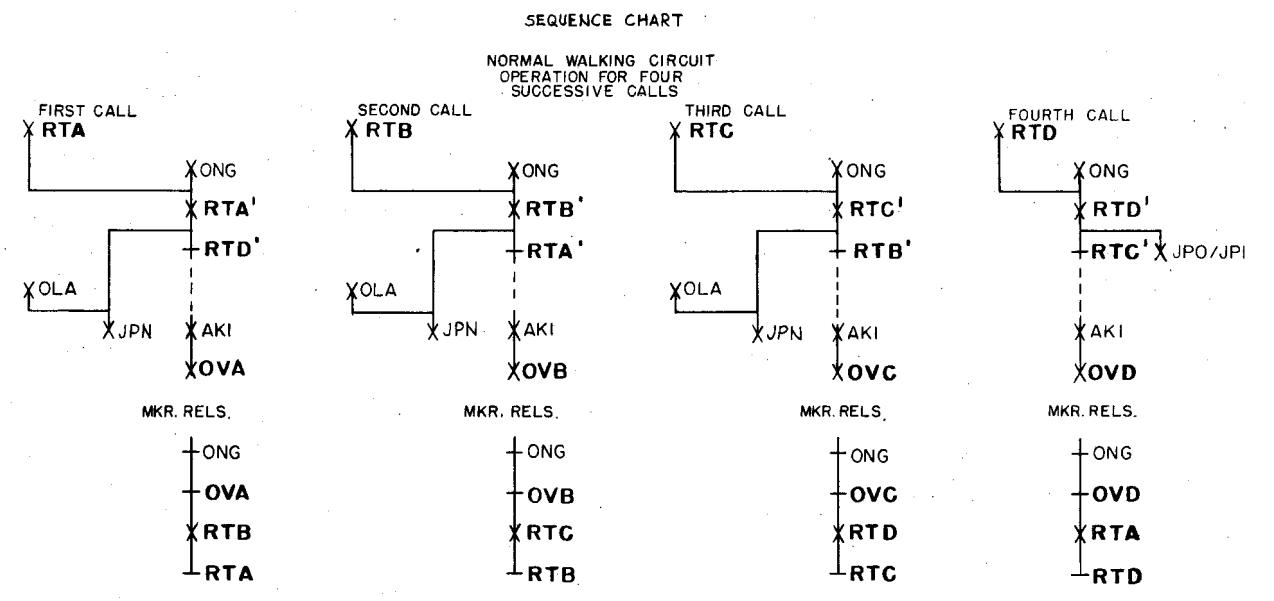
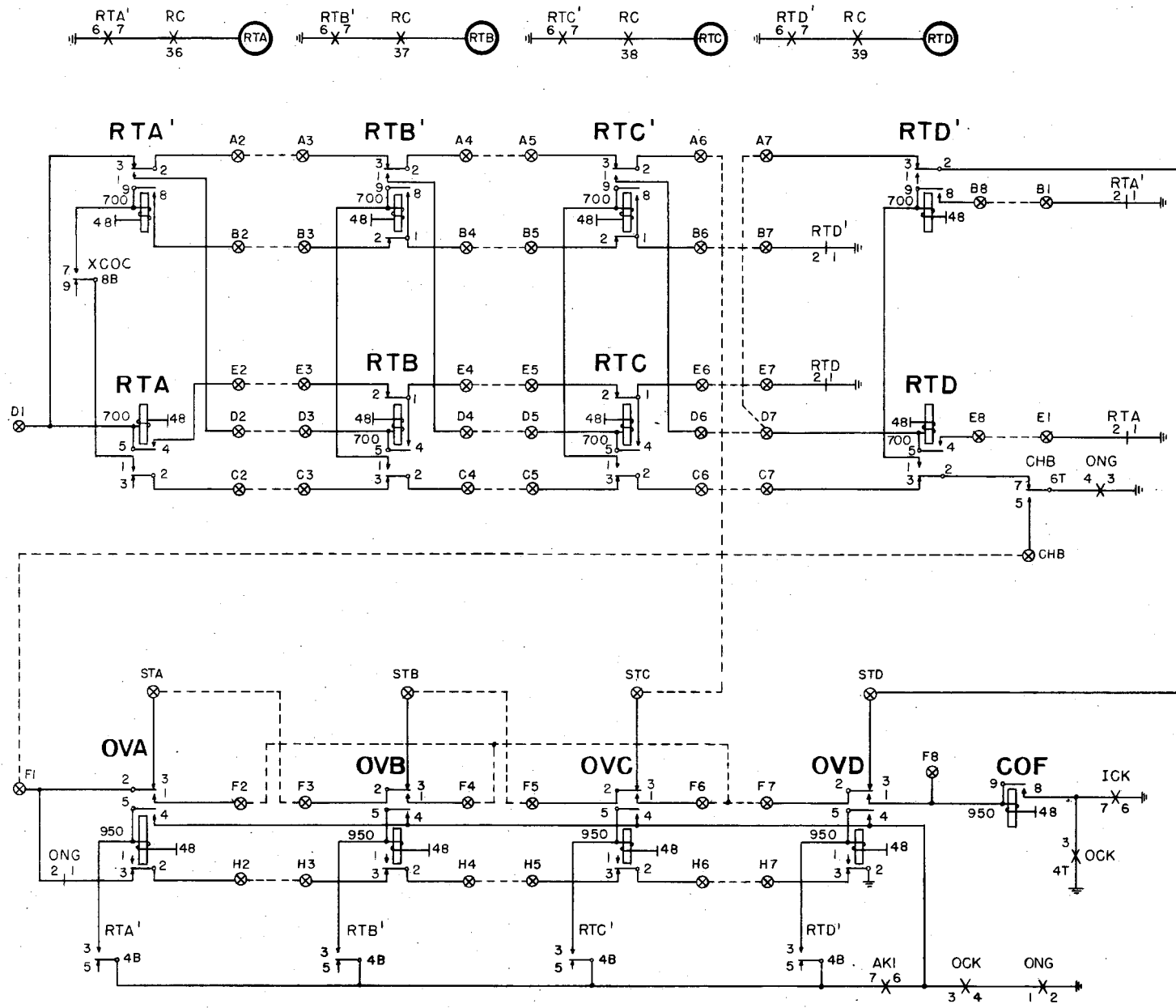
OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	WHEN INCOMING SECONDARY IS EXTENDED	P	68388-01
B	WHEN INCOMING SECONDARY IS NOT EXTENDED	LOOP WIRING	68388-01

2. CROSS CONNECTIONS ARE PROVIDED SO CHANGES MAY BE MADE TO EQUALIZE SWITCH WEAR. INITIAL ARRANGEMENT SHOWN.
3. GROUND FROM TRUNK WILL BE PRESENT ON BUSY LINKS.

INCOMING LINK & CONNECTOR CKT. SD-68393-01, ISS. 5
MARKER CKT. SD-68388-01, ISS. 2
OUTGOING LINK & CONNECTOR CKT. SD-68394-01, ISS. 4

MARKER CHANNEL SELECTION

ISSUE	1	REV.	
DATE	5-14-51		

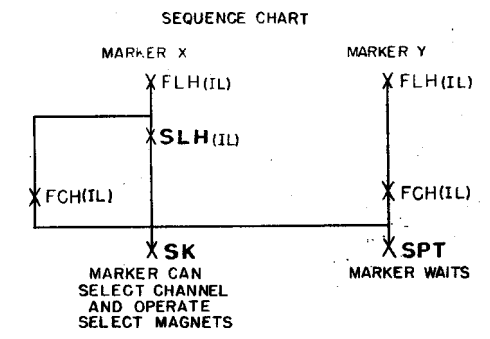
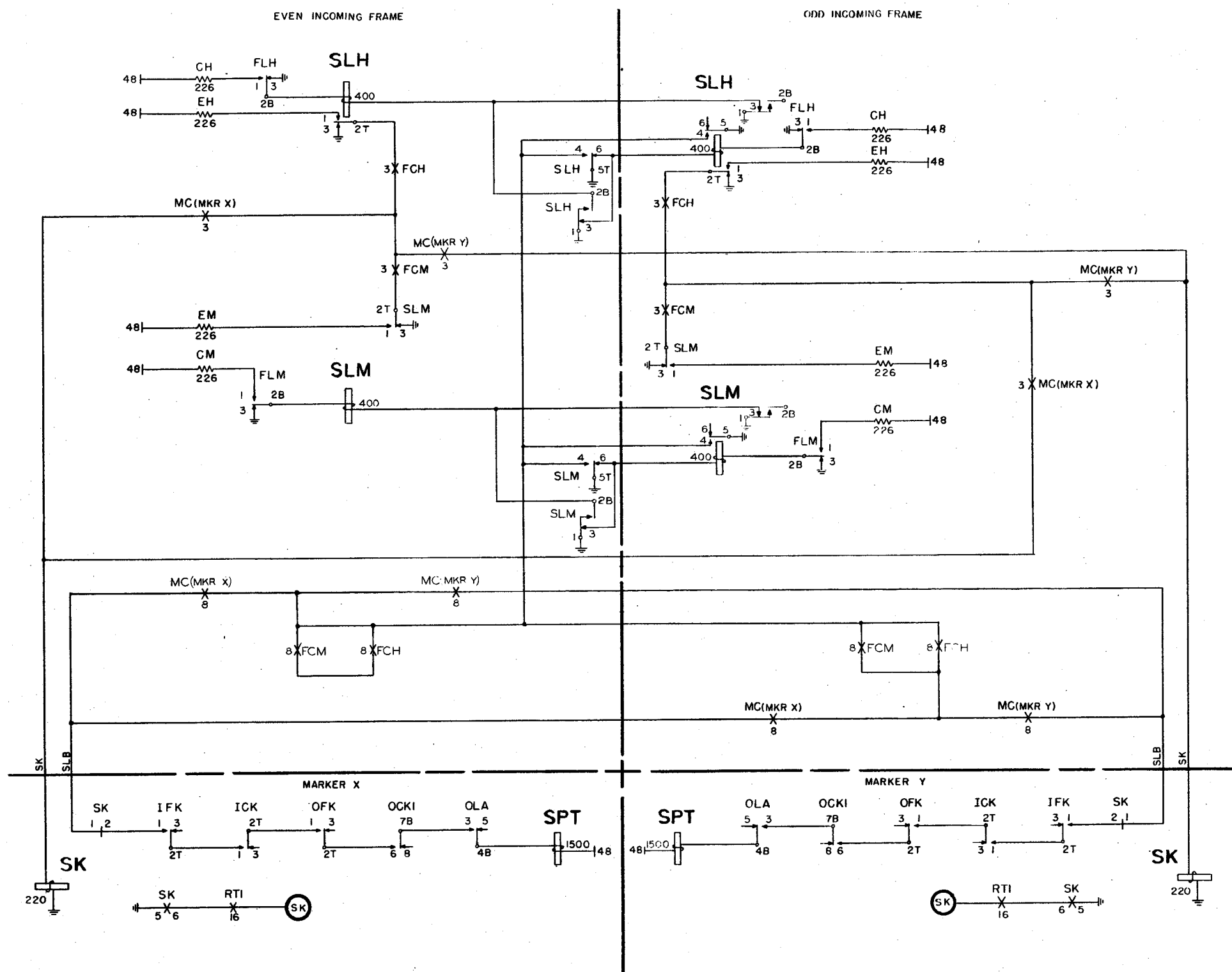


MARKER CKT. SD -68388-01, ISS.2

MARKER CHANNELS BUSY JUNCTOR WALKING CIRCUIT 6 INCOMING AND 6 OUTGOING FRAMES

NO. 4A TOLL

ISSUE	1	2	3	4
DATE	9-17-51			



INCOMING LINK AND CONN. CKT.
 * MARKER CKT. SD-68393-01, ISS. 5
 SD-68386-01, ISS. 2

**MARKER
 SELECT MAGNET LOCKOUT
 PAIRED INCOMING FRAMES**

NO. 4A TOLL

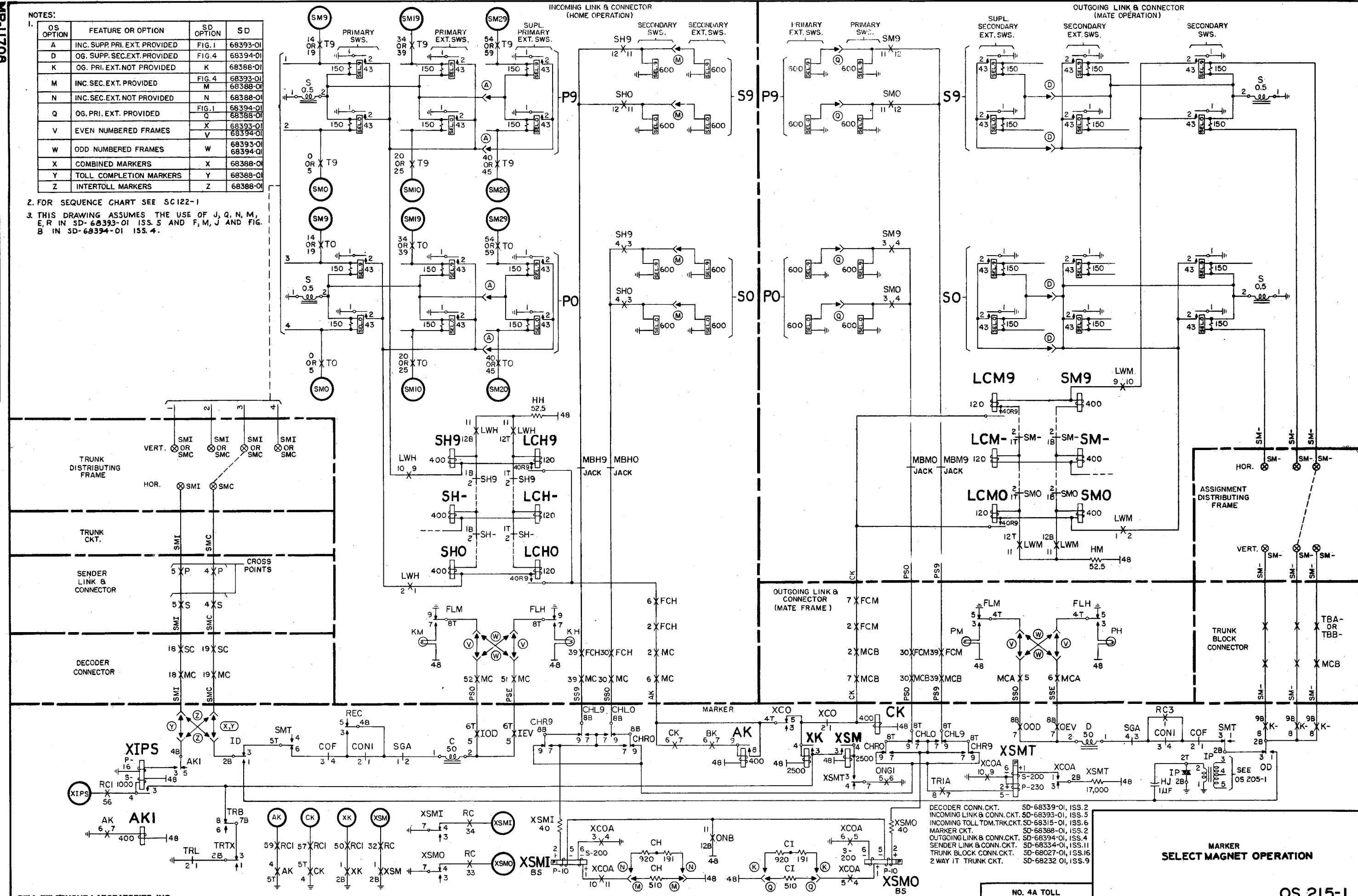
OS 214-1

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	INC. SUPP. PRI. EXT. PROVIDED	FIG. 1	68393-01
D	OG. SUPP. SEC. EXT. PROVIDED	FIG. 4	68394-01
K	OG. PRI. EXT. NOT PROVIDED	K	68388-01
M	INC. SEC. EXT. PROVIDED	FIG. 1	68393-01
N	INC. SEC. EXT. NOT PROVIDED	N	68388-01
Q	OG. PRI. EXT. PROVIDED	FIG. 4	68394-01
V	EVEN NUMBERED FRAMES	V	68393-01
W	ODD NUMBERED FRAMES	W	68394-01
X	COMBINED MARKERS	X	68388-01
Y	TOLL COMPLETION MARKERS	Y	68388-01
Z	INTERTOLL MARKERS	Z	68388-01

2. FOR SEQUENCE CHART SEE SC122-1
 3. THIS DRAWING ASSUMES THE USE OF J, Q, N, M, E, R IN SD-68393-01 ISS. 5 AND F, M, J AND FIG. B IN SD-68394-01 ISS. 4.

ISSUE	DATE
1	10-1-51
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4	
5	



MARKER

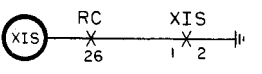
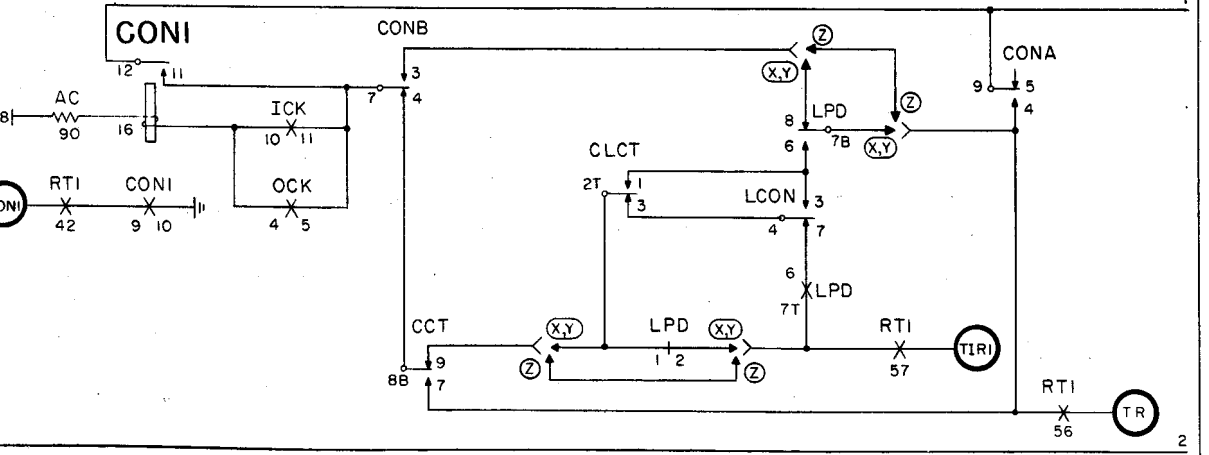
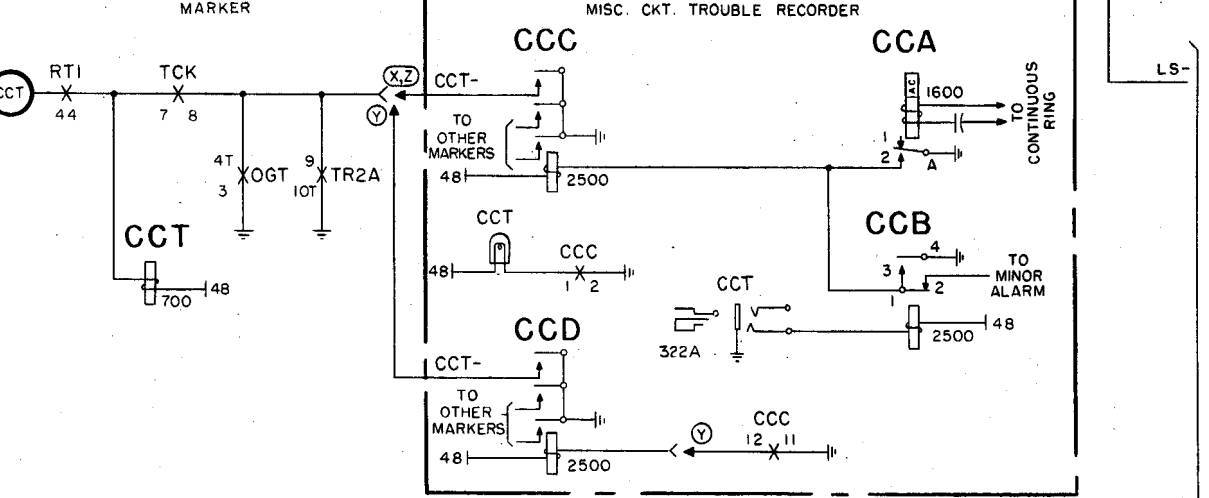
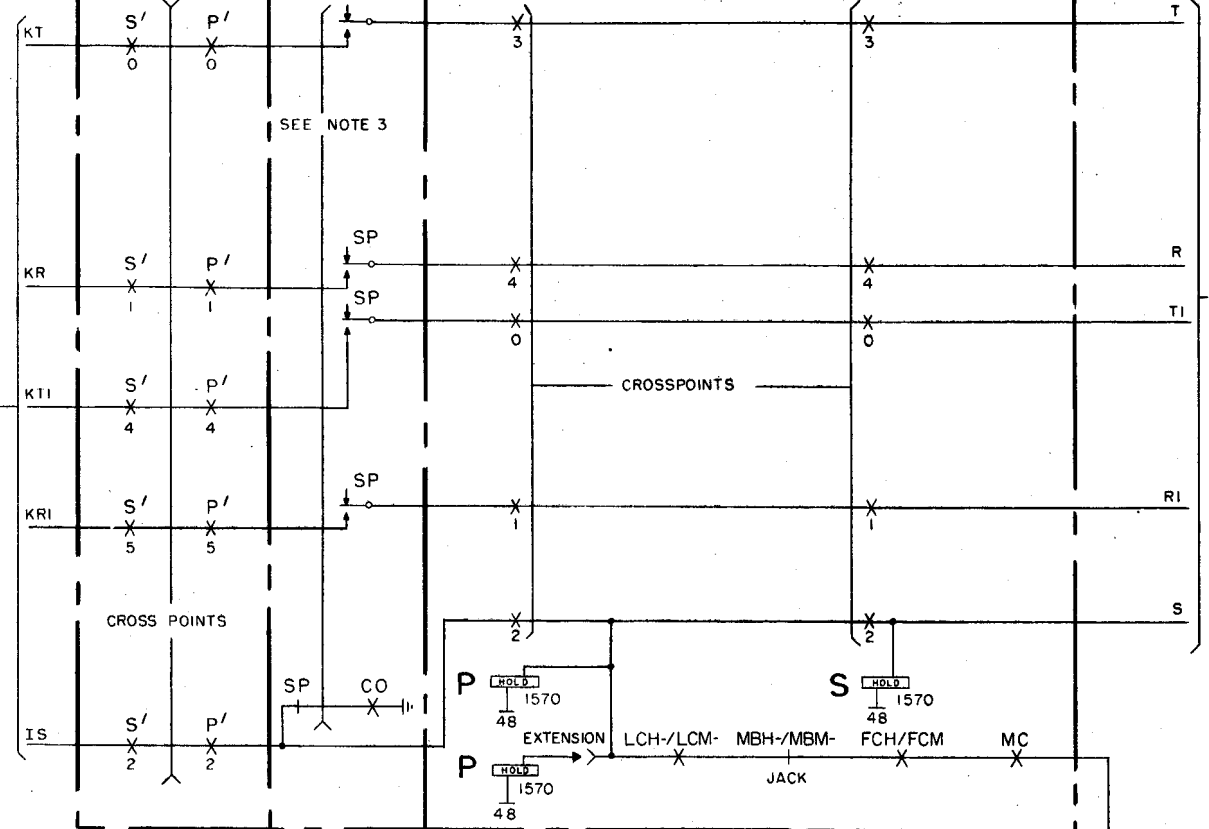
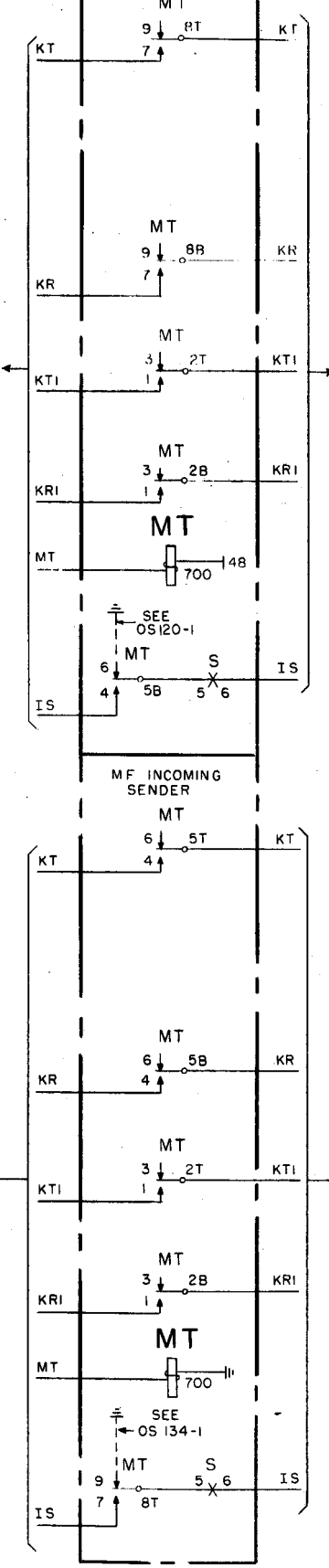
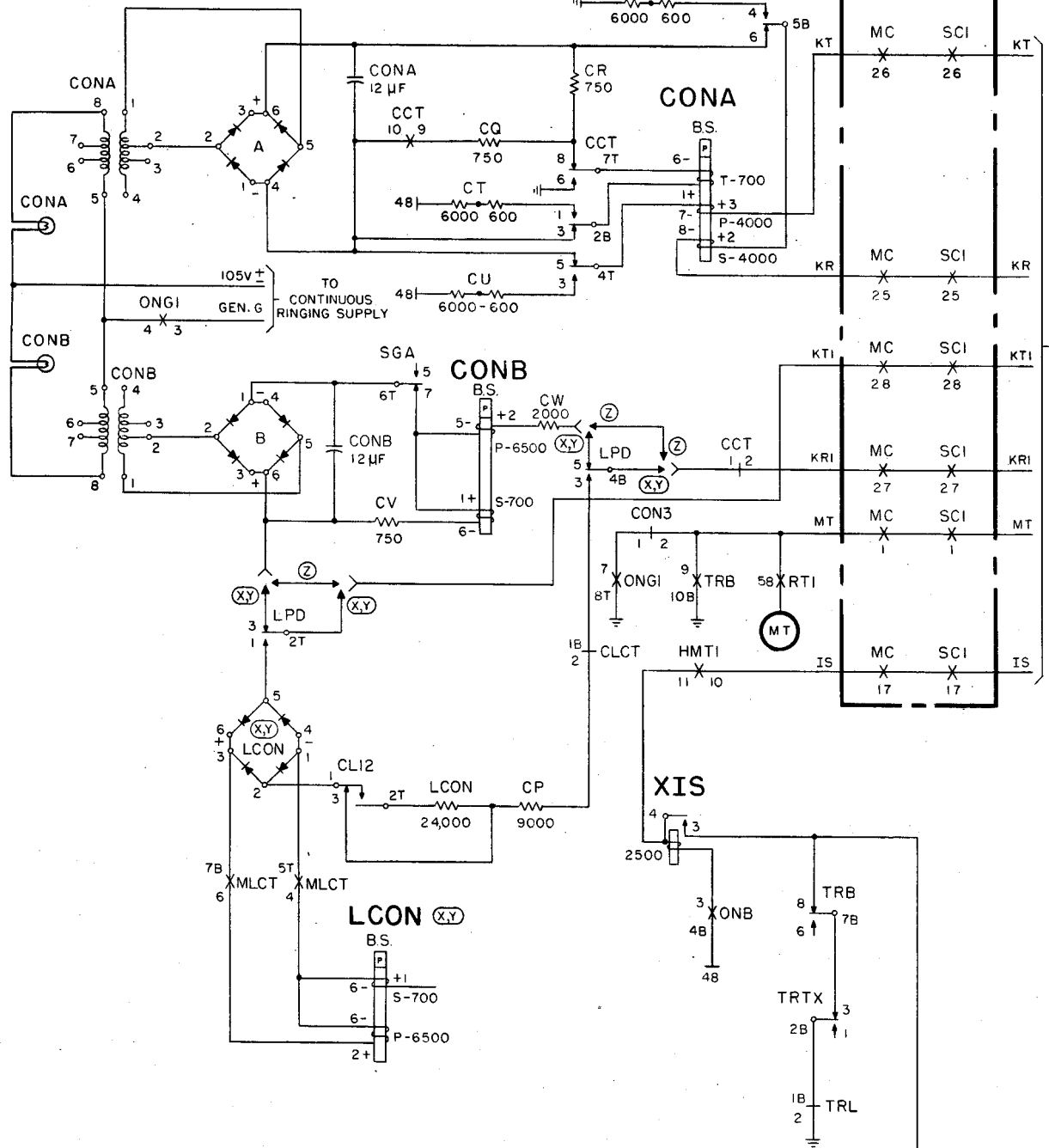
DECODER CONNECTOR

DP INCOMING SENDER

SENDER LINK AND CONNECTOR

I.T. TRUNK

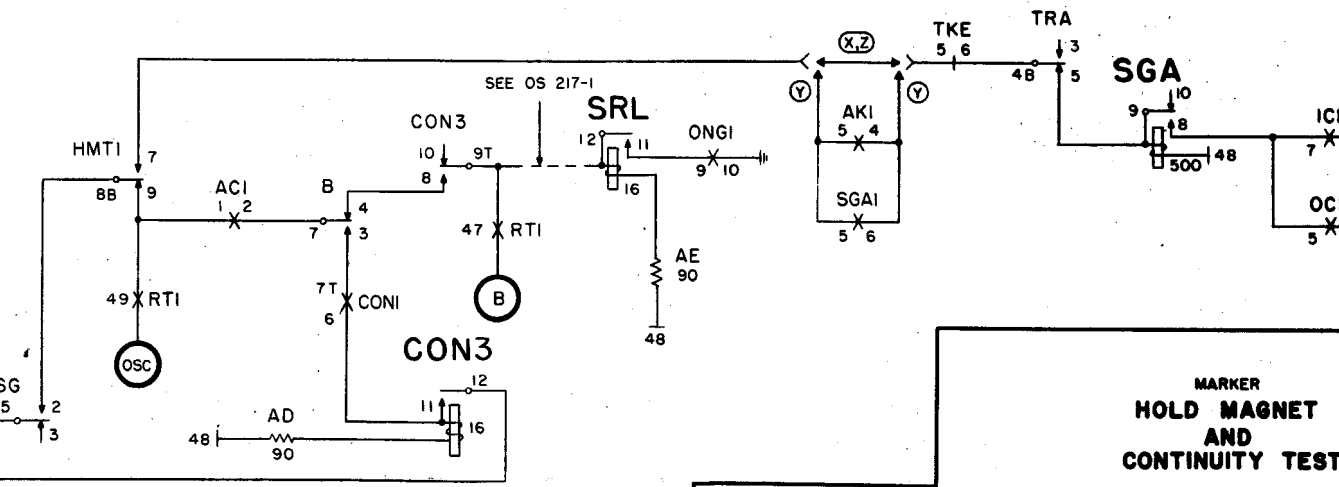
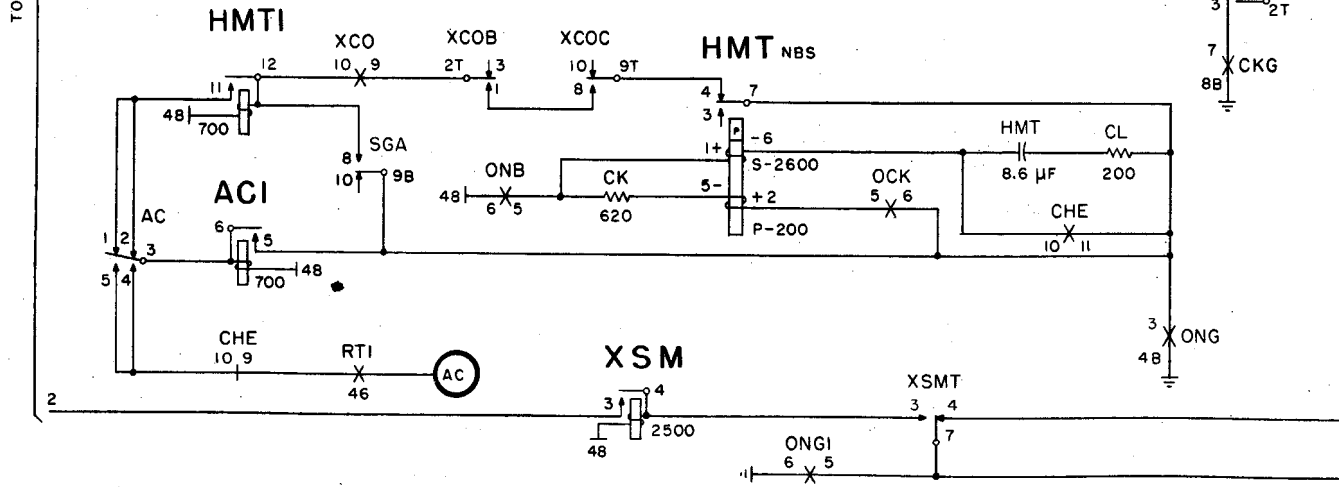
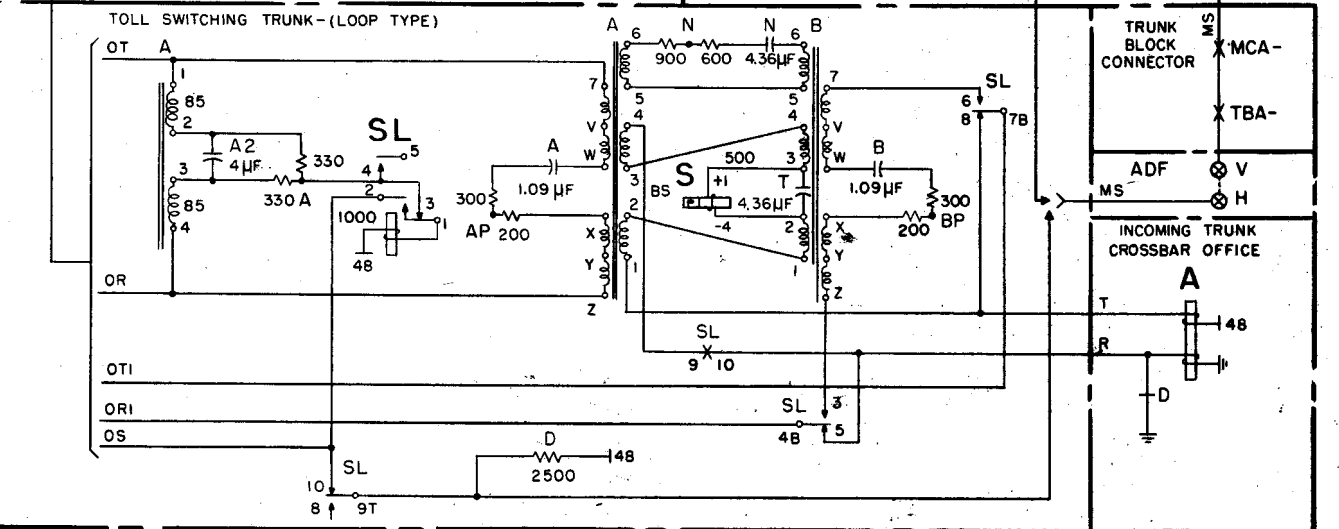
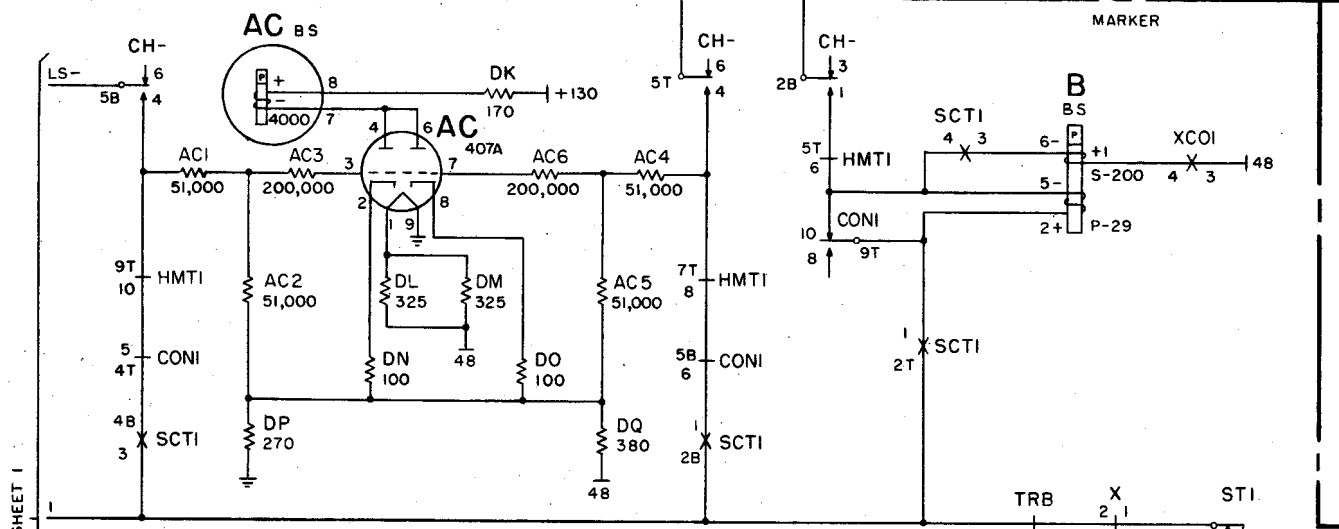
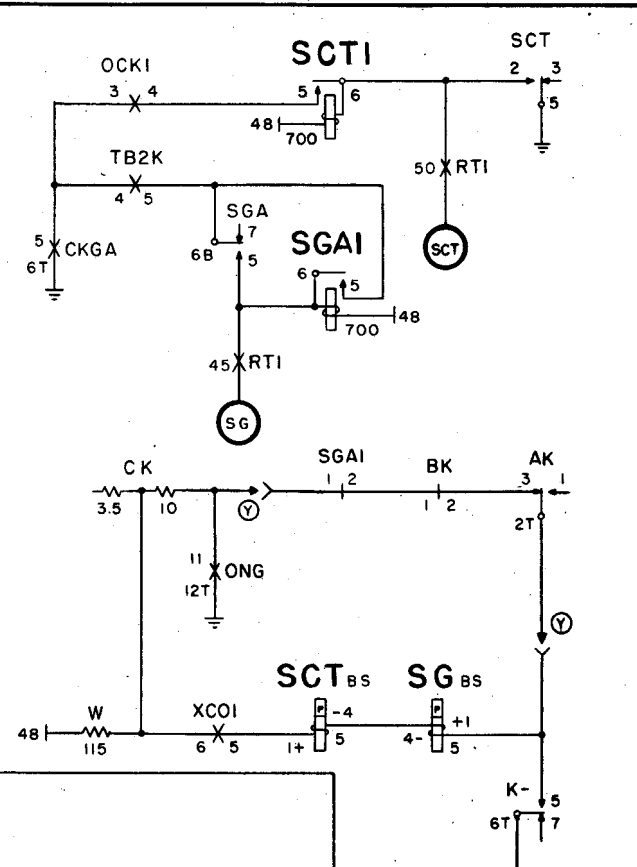
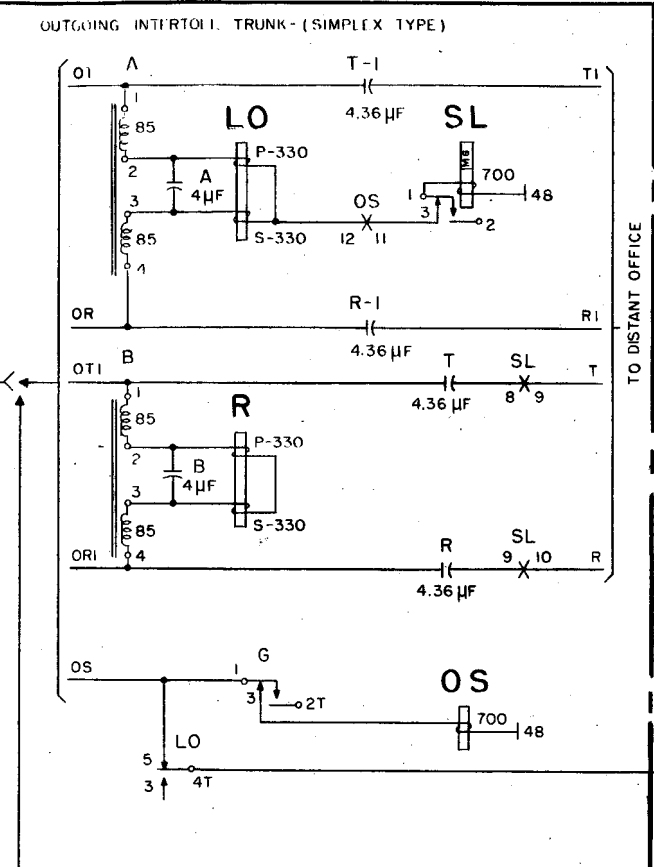
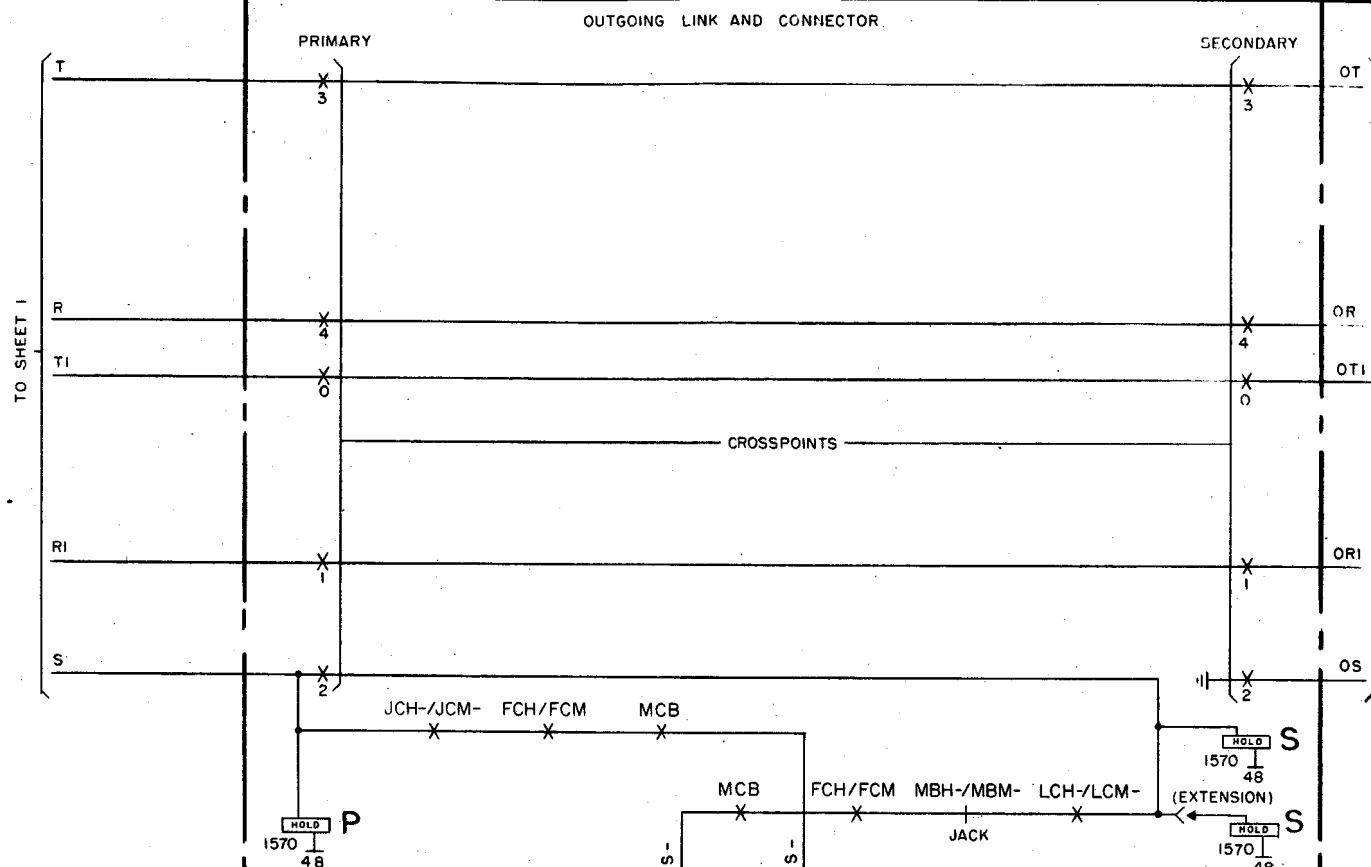
INCOMING LINK AND CONNECTOR



MARKER
HOLD MAGNET
AND
CONTINUITY TEST

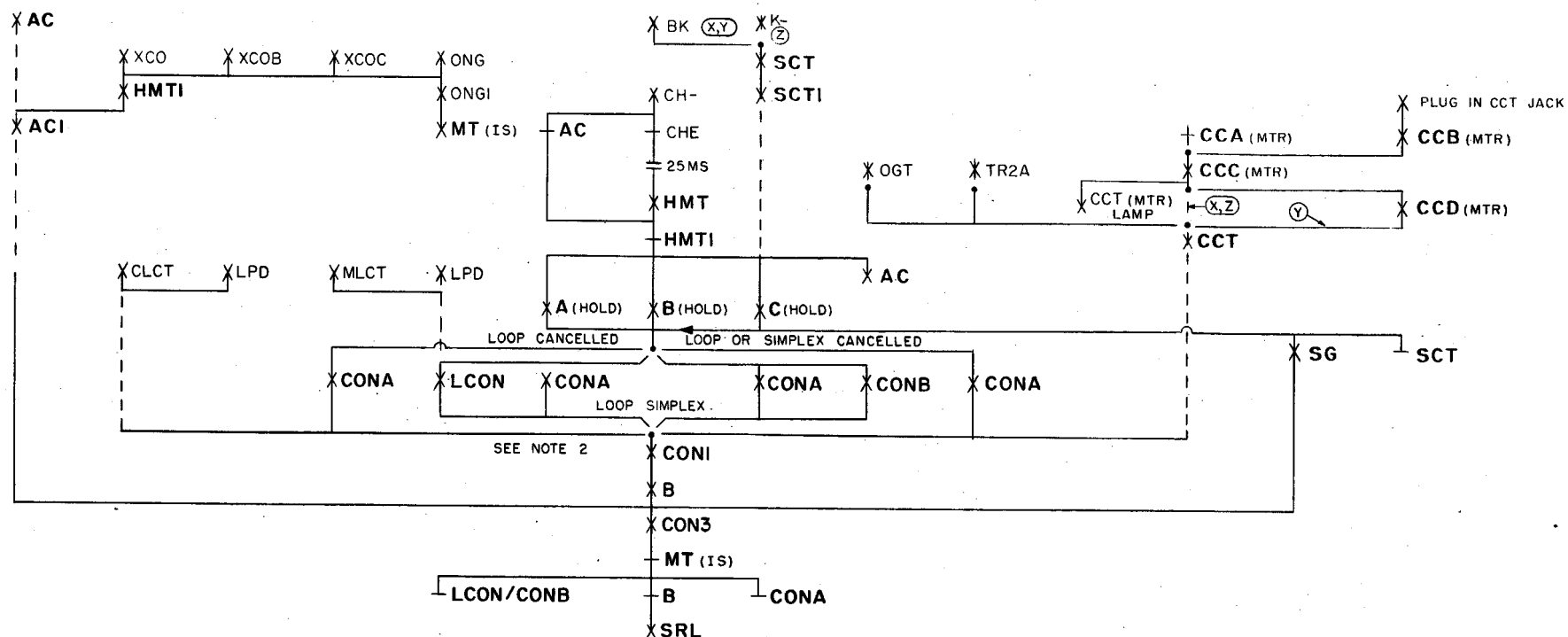
ISSUE	1	DATE	10-1-51
REVISION			
DATE			

REVISION	1	2	3	4
DATE	10-1-51			



MARKER
HOLD MAGNET
AND
CONTINUITY TEST

SEQUENCE CHART



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
X	FOR COMBINED MARKERS	X	68388-01
Y	FOR TOLL COMPLETING MARKERS	Y	68388-01
Z	FOR INTERTOLL MARKERS	Z	68388-01

2.

CONI RELAY OPERATING CONDITIONS				
CLASS RELAYS OPERATED	LPD RELAY OPERATED	TYPE OF OUTGOING TRUNK	CONDITIONS FOR CANCELLATION OF CONTINUITY TEST ON OTI-ORI	RELAY OPERATIONS REQUIRED TO OPERATE CONI RELAY
0-7 AND 14	NO	SIMPLEXED OT-OR & OTI-ORI	NONE-CONTINUITY TEST MADE RINGING SUPPLY FAILURE, OUTGOING TRUNK TEST BY 17-C TESTBOARD, SECOND TRIAL, OR PLUG IN CC JACK	CONA AND CONB CONA AND CCT
8-13	YES	SIMPLEXED OT-OR AND LOOP OTI-ORI	NON-CONTINUITY TEST MADE RINGING SUPPLY FAILURE, OUTGOING TRUNK TEST BY 17-C TESTBOARD, SECOND TRIAL, OR PLUG IN CC JACK CANCEL LOOP CONTINUITY TEST INSTRUCTION FROM DECODER	CONA AND LCON CONA AND CCT CONA AND CLCT

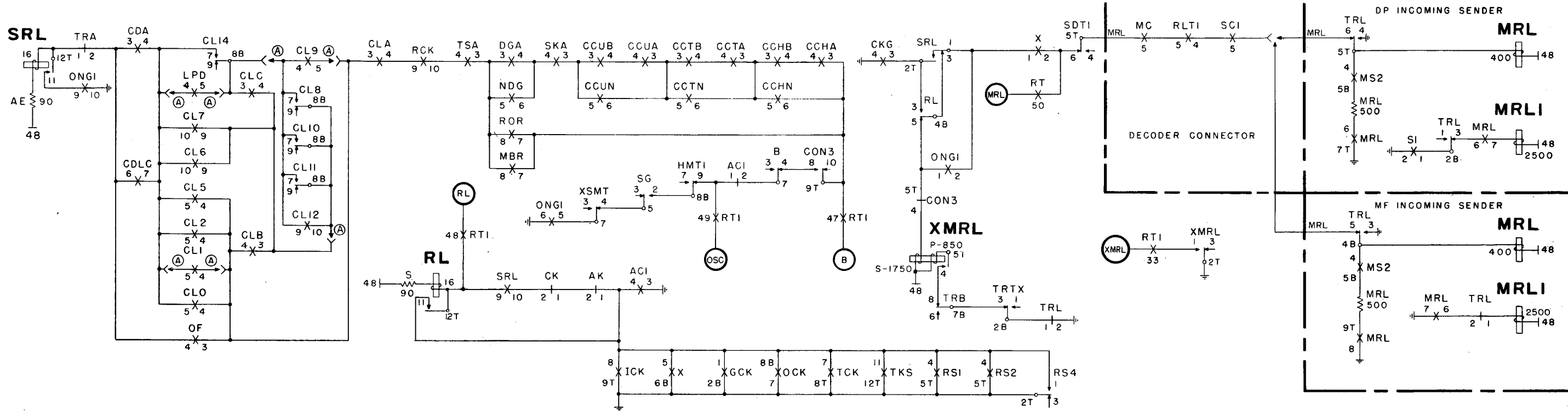
3. CONTACT ARRANGEMENTS VARY DEPENDING ON TYPE OF INTERTOLL TRUNK

- DECODER CONNECTOR CKT. SD-68339-01, ISS. 2
- INCOMING INTERTOLL TRK. CKT. DP SD-68135-01, ISS. 13
- INCOMING INTERTOLL TRK. CKT. MF SD-68230-01, ISS. 4
- INCOMING LINK & CONNECTOR CKT. SD-68393-01, ISS. 5
- INCOMING SENDER CKT. DP SD-68221-01, ISS. 12
- INCOMING SENDER CKT. MF SD-68222-01, ISS. 12
- * MARKER CKT. SD-68388-01, ISS. 2
- MISC. CKT. TROUBLE RECORDER SD-68392-01, ISS. 3
- OUTGOING IT TRUNK CKT DP OR MF CX SIGNAL SD-68231-01, ISS. 5
- OUTGOING LINK & CONNECTOR CKT. SD-68394-01, ISS. 4
- SENDER LINK & CONNECTOR CKT. SD-68334-01, ISS. 11
- TOLL SWITCHING TRUNK CKT. SD-68242-01, ISS. 7
- TRUNK BLOCK CONNECTOR CKT. SD-68027-01, ISS. 16
- 2-WAY INTERTOLL TRK. CKT. DP SD-68232-01, ISS. 9
- 2-WAY INTERTOLL TRK. CKT. MF SD-68233-01, ISS. 11

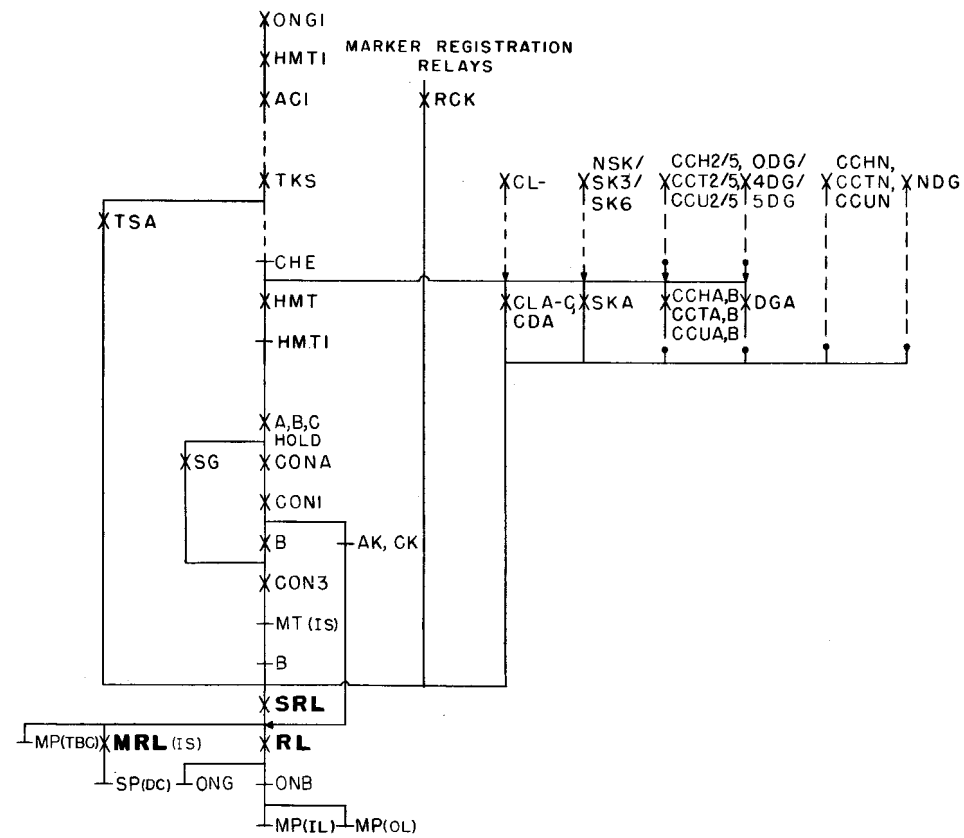
ISSUE	1	2	3	4	5
DATE	10-1-51				

MARKER
HOLD MAGNET
AND
CONTINUITY TEST

ISSUE	1	12/51
DATE	5-21-51	



SEQUENCE CHART



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR COMBINED MARKERS FOR TOLL COMPLETING MKRS.	X Y	68388-01

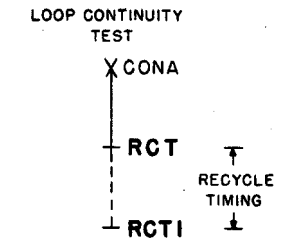
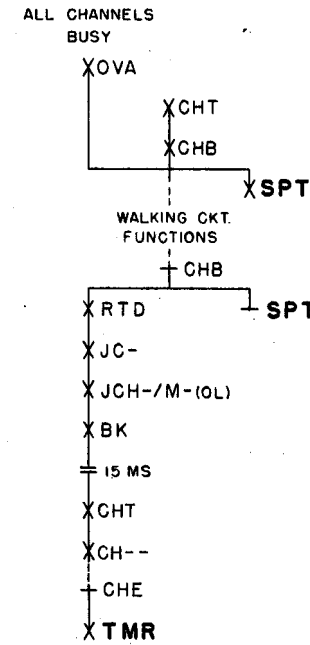
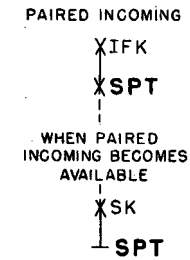
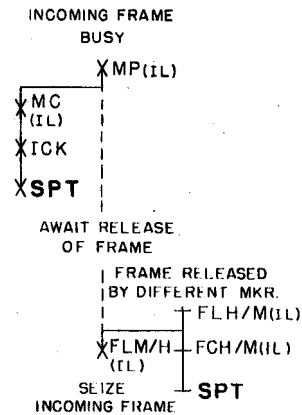
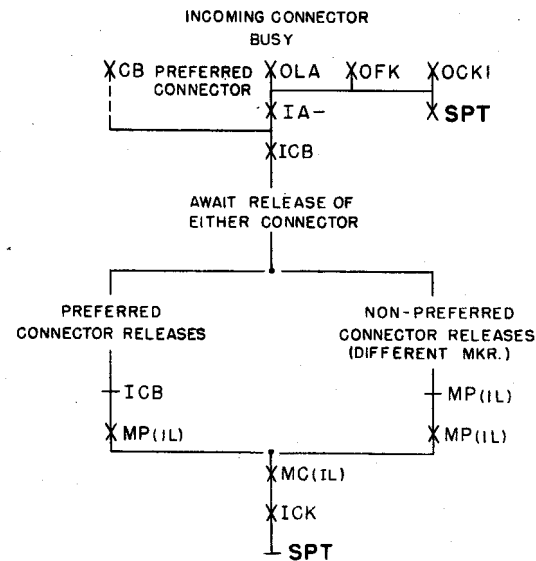
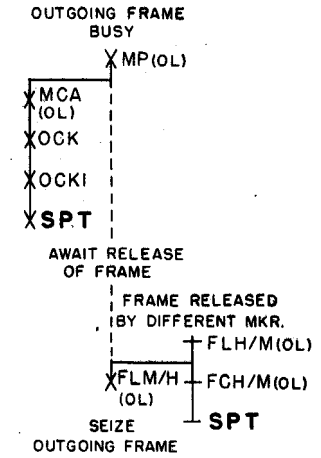
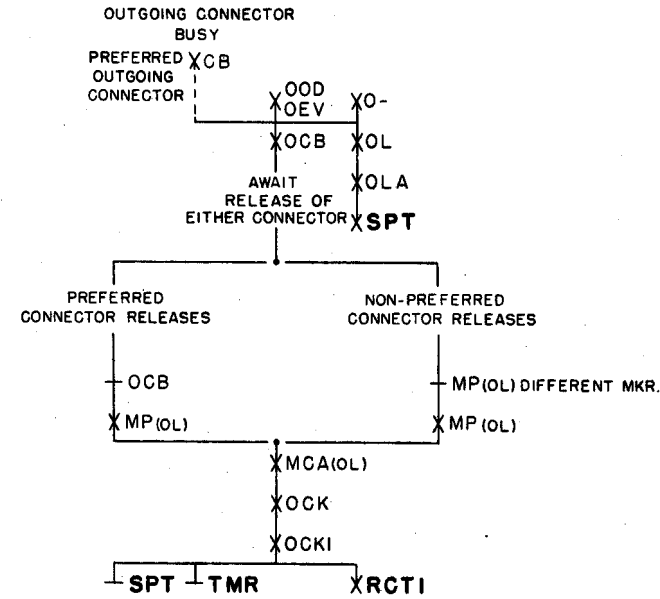
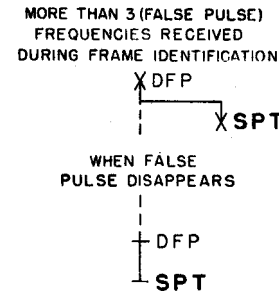
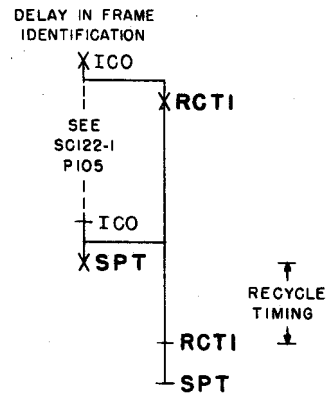
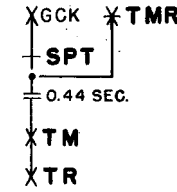
- DP INCOMING SDR. CKT. SD-68221-01, ISS. 12
- * MARKER CKT. SD-68388-01, ISS. 2
- DECODER CONNECTOR CKT. SD-68339-01, ISS. 2
- MF INCOMING SDR. CKT. SD-68222-01, ISS. 12

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR TOLL COMPLETING & COMBINED MARKERS ONLY	X & Y	68388-01
B	FOR INTERTOLL OR COMBINED MARKERS	FIG. 5 & 11	68389-01 68392-01
C	FOR TOLL COMPLETING MARKERS	FIG. 6 & 11	68389-01 68392-01
D	FOR MARKER SHORT TIME-OUT WHEN OUTGOING PRIMARY EXTENSION FRAMES ARE PROVIDED	R R	68022-01 68394-01
E	WHEN INCOMING SECONDARIES ARE PAIRED	P	68388-01

2. IN CASES OF NO FACILITIES DUE TO HEAVY TRAFFIC, TIMING IS STOPPED UNTIL EITHER THE MARKER IS ABLE TO PROCEED OR TMI TIMER TIMES OUT. IF THE DECODER IS STILL ENGAGED, THE DECODER WILL CAUSE A TIME OUT AND RELEASE THE MARKER.

SEQUENCE CHARTS

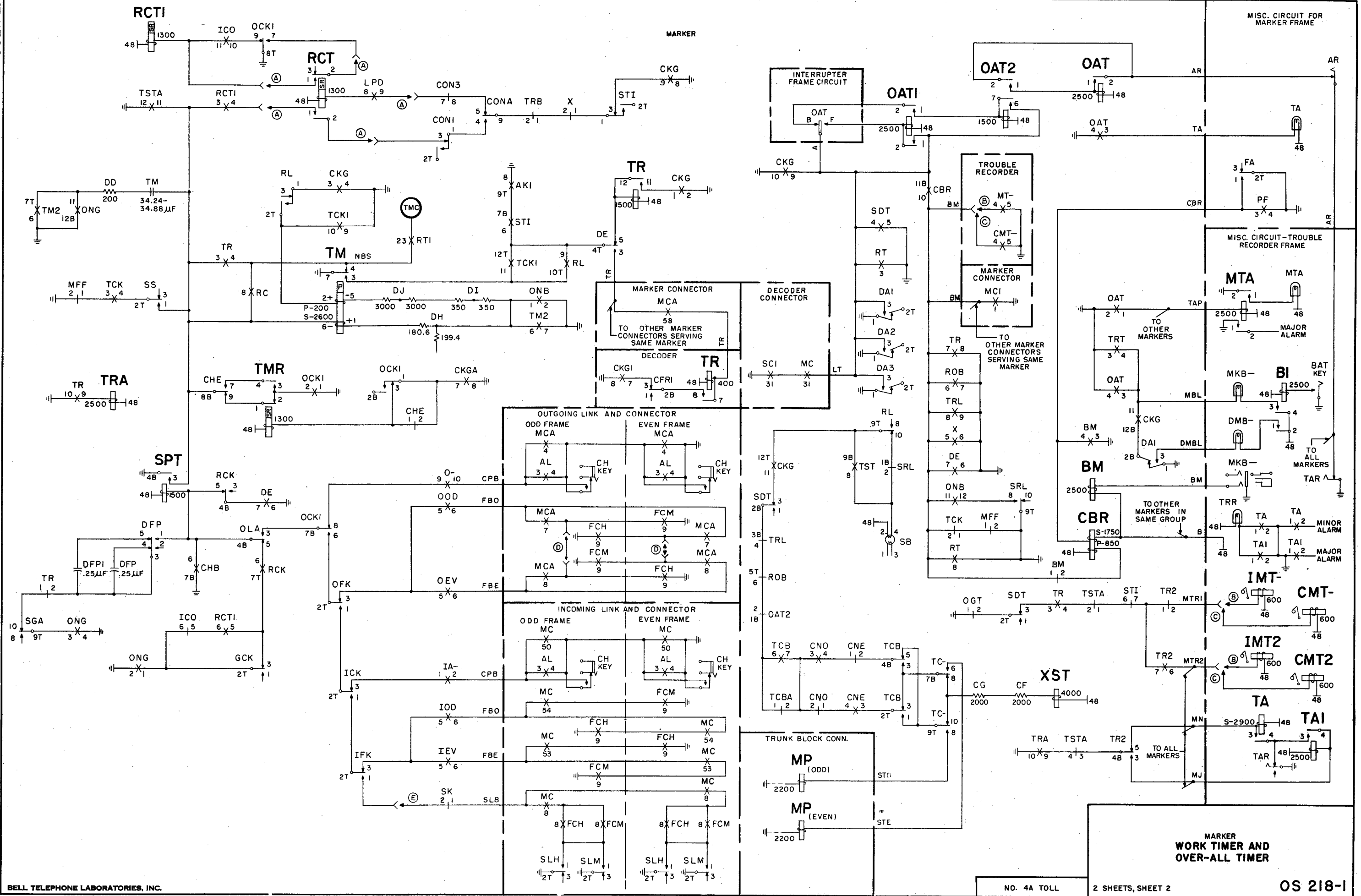


- DECODER CKT. SD-68340-01, ISS. 2
- DECODER CONNECTOR CKT. SD-68339-01, ISS. 2
- INCOMING LINK AND CONNECTOR CKT. SD-68393-01, ISS. 4
- * MARKER CKT. SD-68388-01, ISS. 2
- MARKER CONNECTOR CKT. SD-68395-01, ISS. 2
- MARKER TROUBLE RECORDER CKT. SD-68389-01, ISS. 2
- MISC. CKT. FOR MARKER FR. SD-68410-01, ISS. 2
- MISC. CKT. TROUBLE RECORDER FR. SD-68392-01, ISS. 2
- OUTGOING LINK AND CONNECTOR CKT. SD-68394-01, ISS. 3
- TRUNK BLOCK CONNECTOR CKT. SD-68027-01, ISS. 16

MARKER
WORK TIMER AND
OVER-ALL TIMER

ISSUE	1	1	1	1	1	1	1	1	1	1	1
DATE											1-18-52

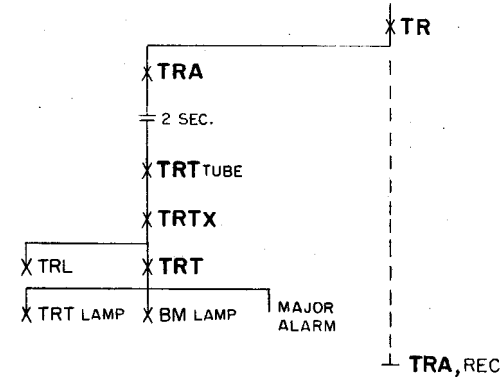
ISSUE	1	2	3	4
DATE	1-18-52			



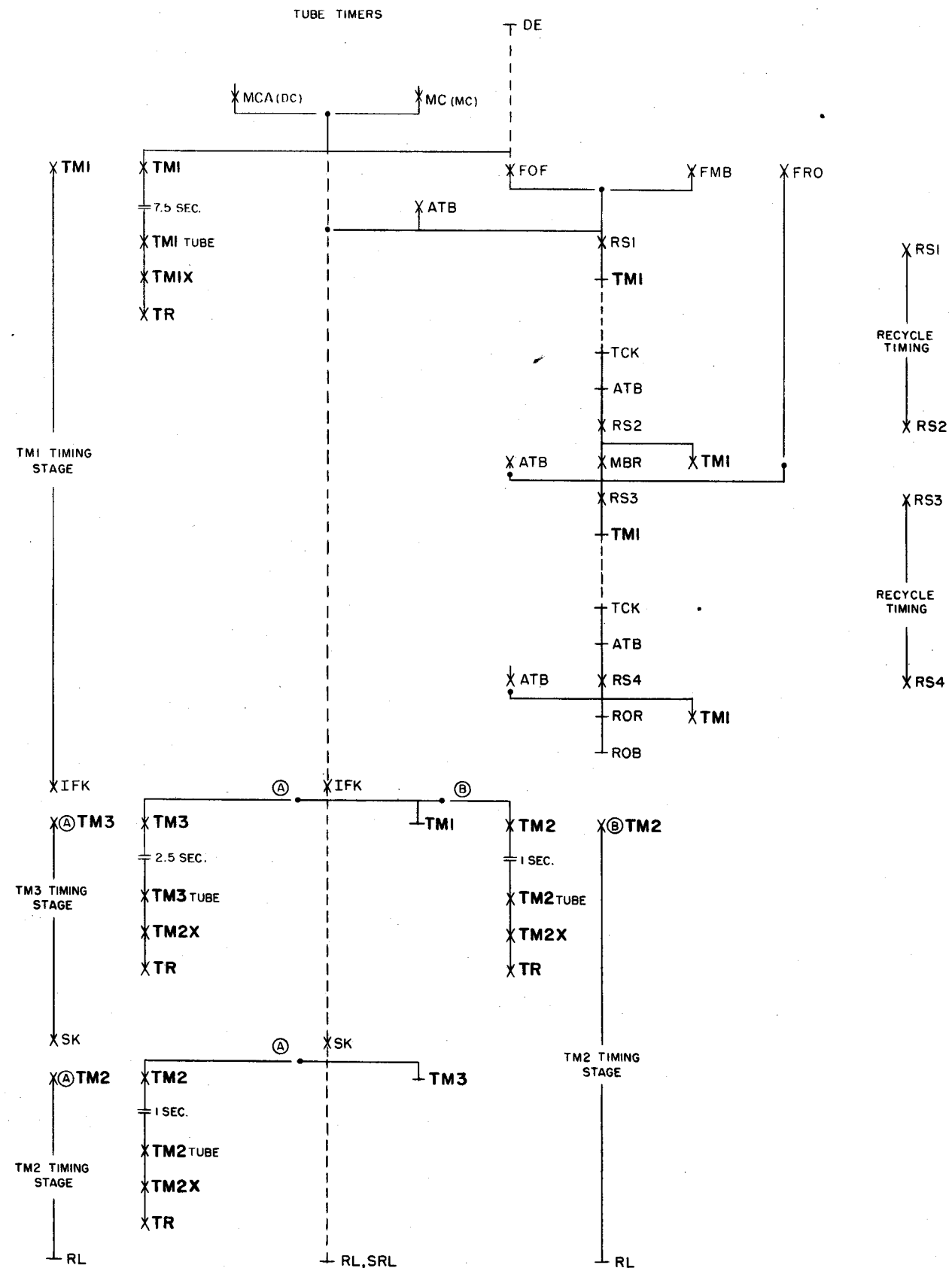
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	WHEN INCOMING SECONDARIES ARE PAIRED	P	68388-01
B	OPTION A NOT USED	LOOP WIRING	68388-01
C	WHEN JUNCTOR PATTERNS ARE FURNISHED	U	68388-01

RECORDER TROUBLE TIMER



SEQUENCE CHART



- DECODER CKT. SD-68340-01, ISS. 2
- DECODER CONNECTOR CKT. SD-68339-01, ISS. 3
- *MARKER CKT. SD-68388-01, ISS. 2
- MARKER CONNECTOR CKT. SD-68395-01, ISS. 2
- MISC. CKT. MARKER FRAME SD-68410-01, ISS. 2
- MISC. CKT. TROUBLE RECORDER SD-68392-01, ISS. 3
- TRAFFIC REG. CKT. SD-68412-01, ISS. 6

MARKER TUBE TIMERS AND TROUBLE CROSS

OS 219-1

2 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS BSP ITEM MP-11764

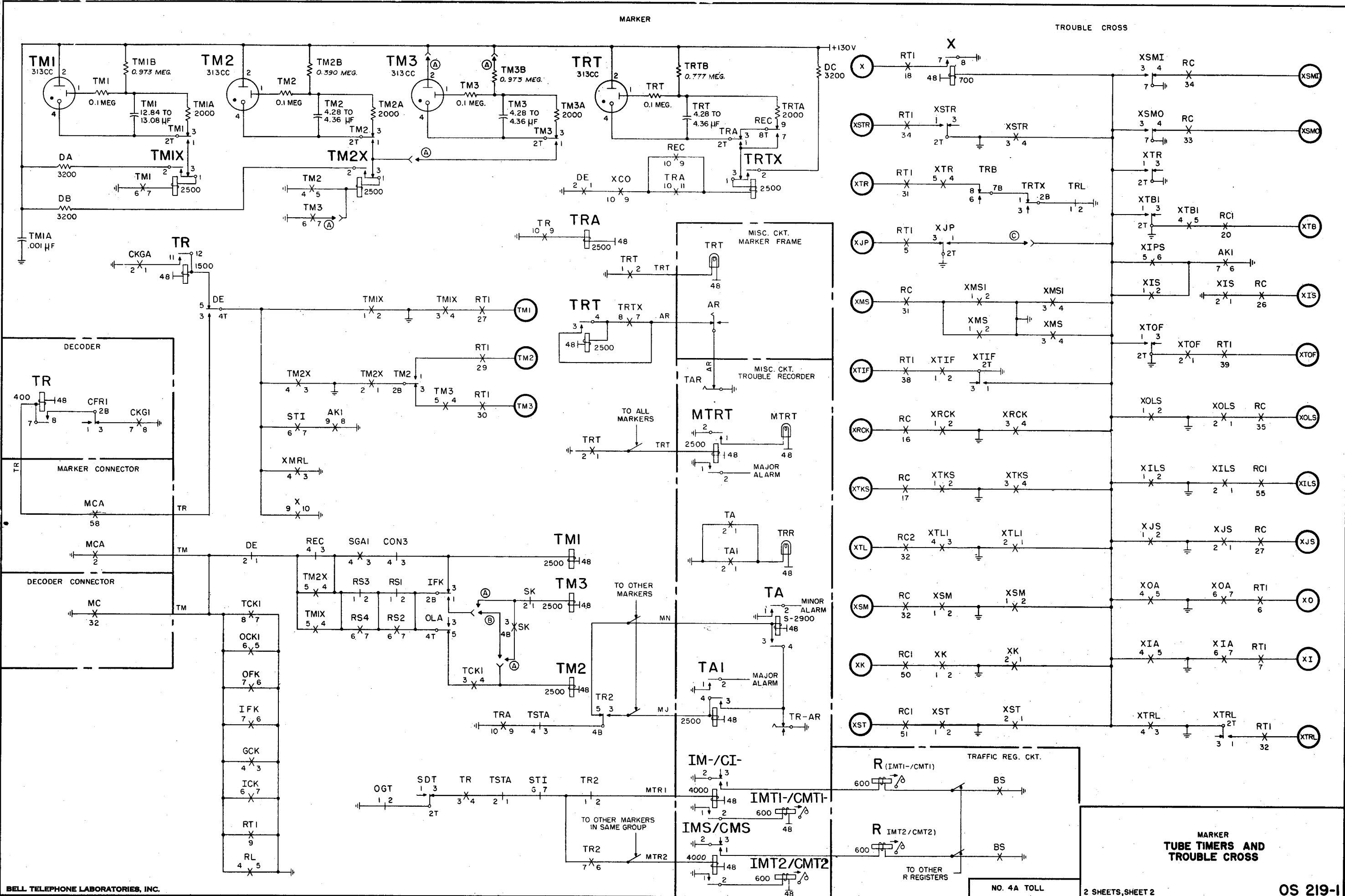
BELL TELEPHONE LABORATORIES, INC. PRINTED IN U. S. A.

ISSUE	1	DATE	7-7-52
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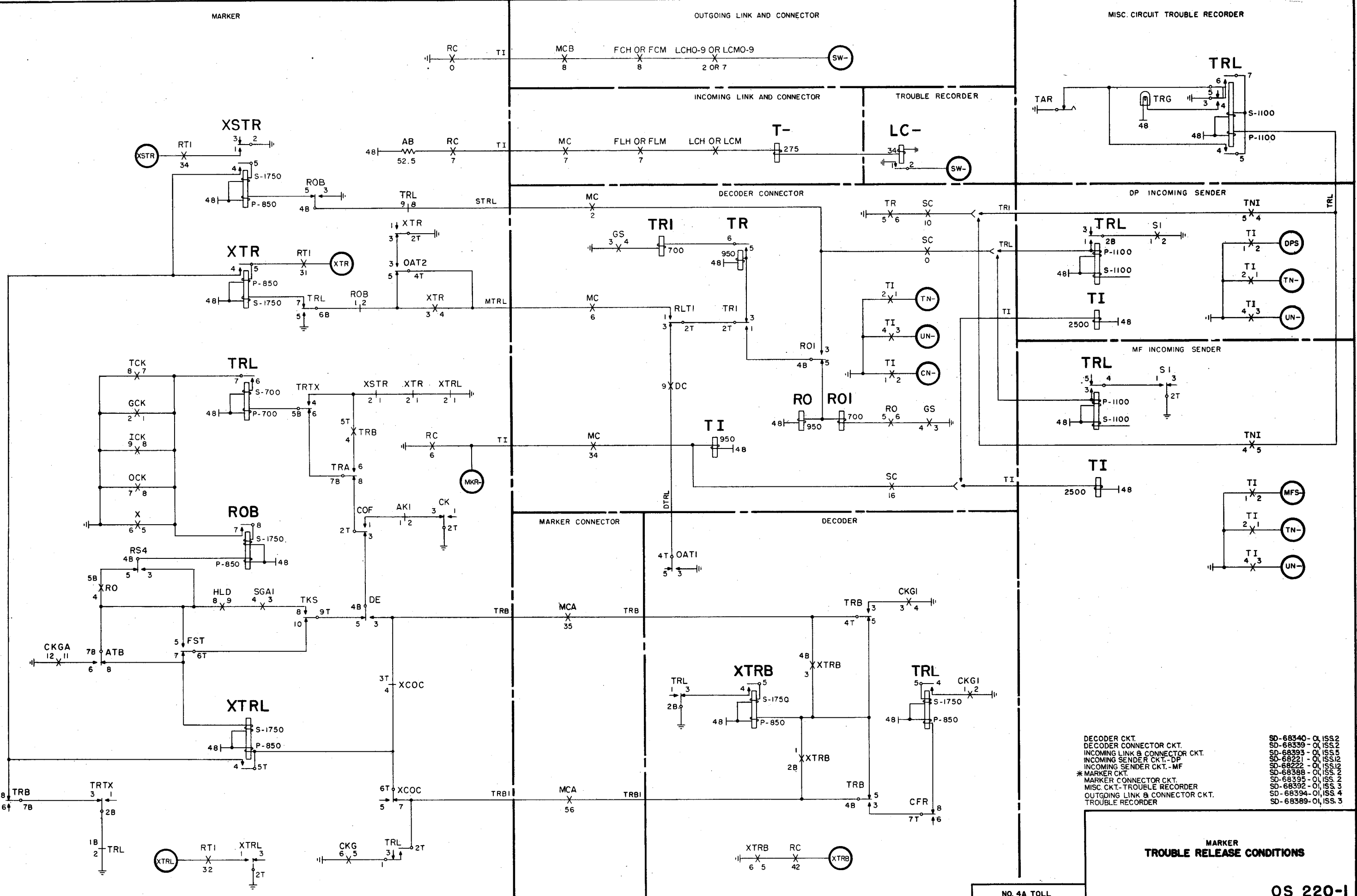
2 SHEETS, SHEET 1

MP-11764

ISSUE	DATE
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2	7/31/52
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7	
8	



ISSUE	1
DATE	1-3-52

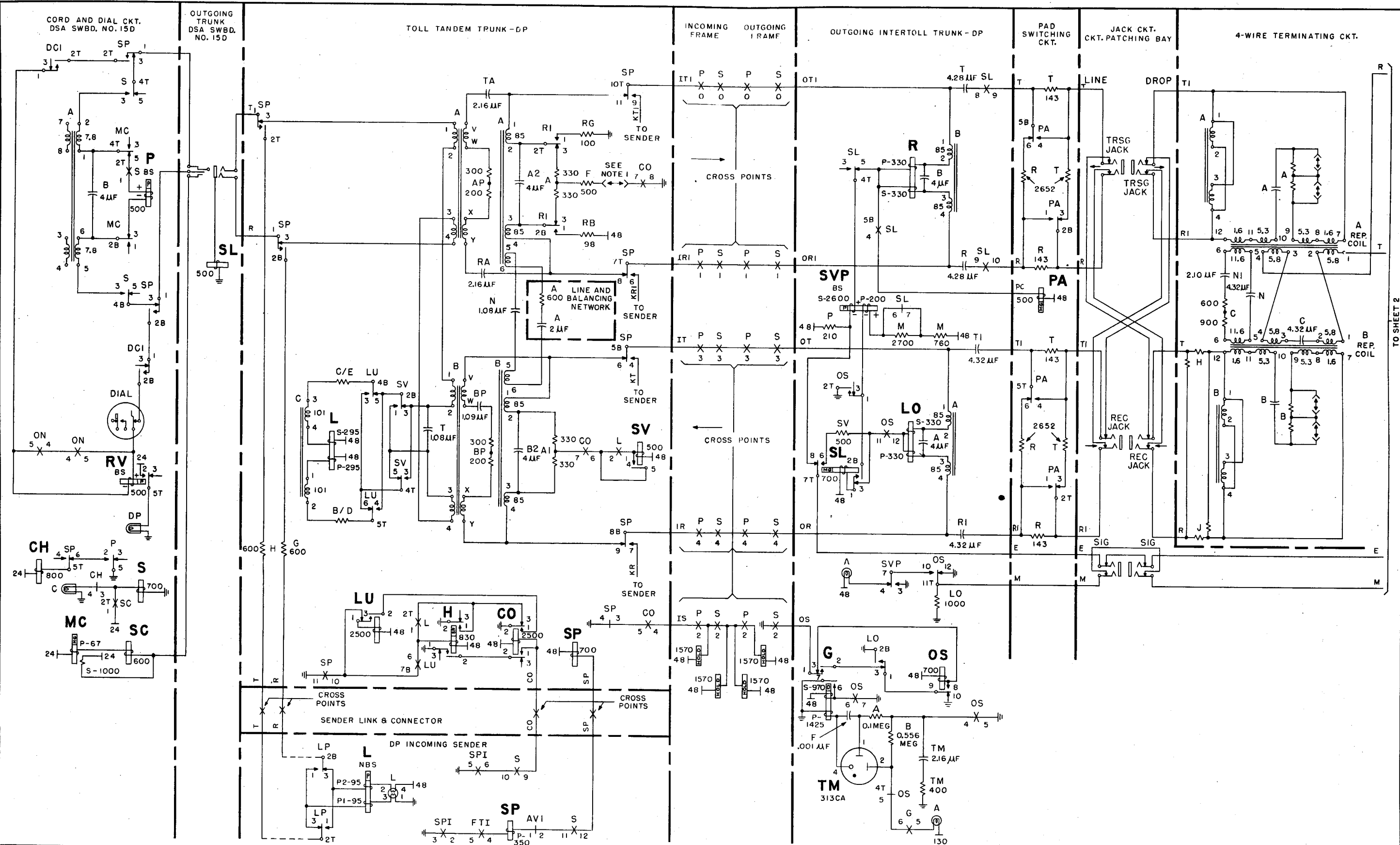


- DECODER CKT. SD-68340-O1, ISS. 2
 DECODER CONNECTOR CKT. SD-68339-O1, ISS. 2
 INCOMING LINK & CONNECTOR CKT. SD-68393-O1, ISS. 5
 INCOMING SENDER CKT.-DP SD-68221-O1, ISS. 2
 INCOMING SENDER CKT.-MF SD-68222-O1, ISS. 2
 * MARKER CKT. SD-68388-O1, ISS. 2
 MARKER CONNECTOR CKT. SD-68395-O1, ISS. 2
 MISC. CKT.-TROUBLE RECORDER SD-68392-O1, ISS. 3
 OUTGOING LINK & CONNECTOR CKT. SD-68394-O1, ISS. 4
 TROUBLE RECORDER SD-68389-O1, ISS. 3

MARKER TRUBLE RELEASE CONDITIONS

OS 220-1

ORDER AS BSP ITEM MP-11760



TO SHEET 2

ISSUE	1	2	3
DATE	9-20-51		

3 SHEETS, SHEET 1

MP-11688

ESTABLISHED CONNECTION
OUTWARD SWITCHBOARD TO
STEP-BY-STEP SUBSCRIBER

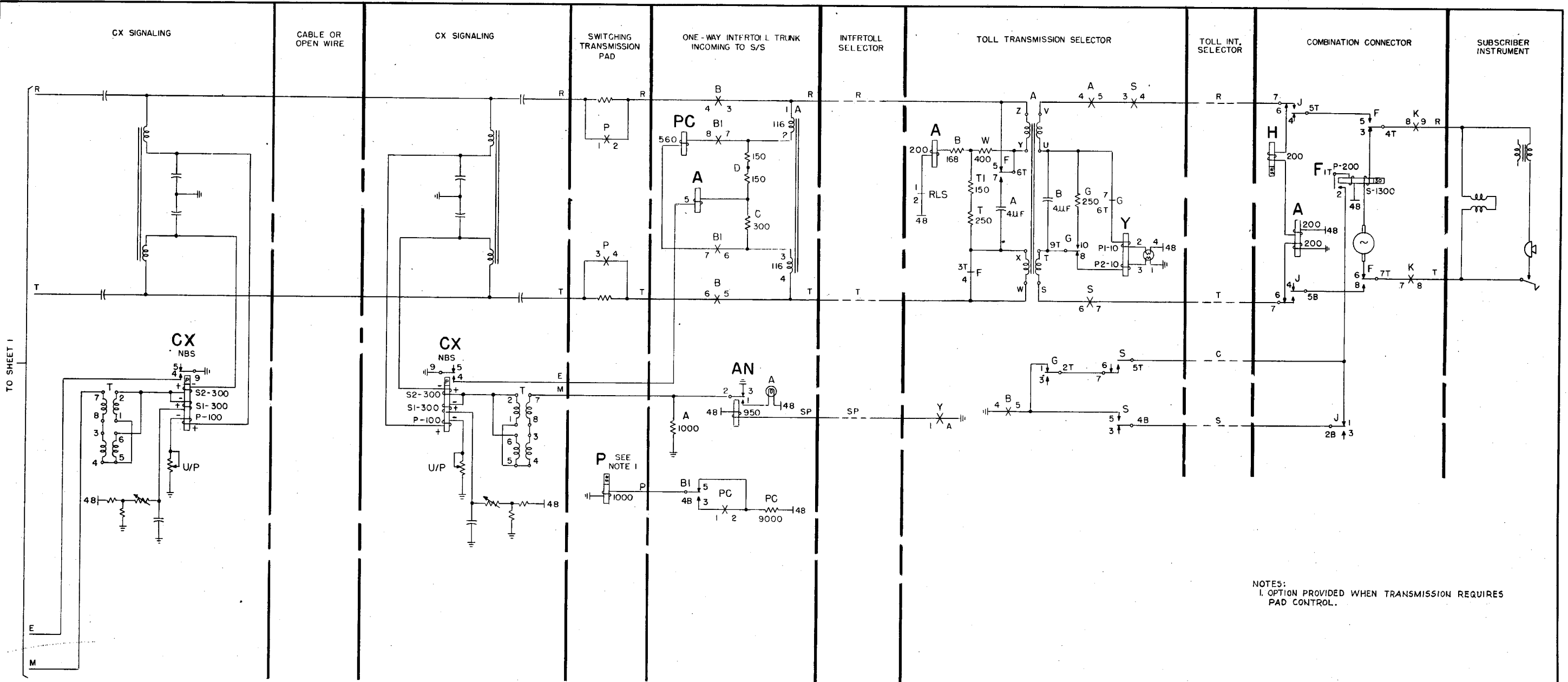
OS 221-1 3 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS BSP ITEM MP-11688

BELL TELEPHONE LABORATORIES, INC.
PRINTED IN U. S. A.

ISSUE	DATE
1	9-20-51



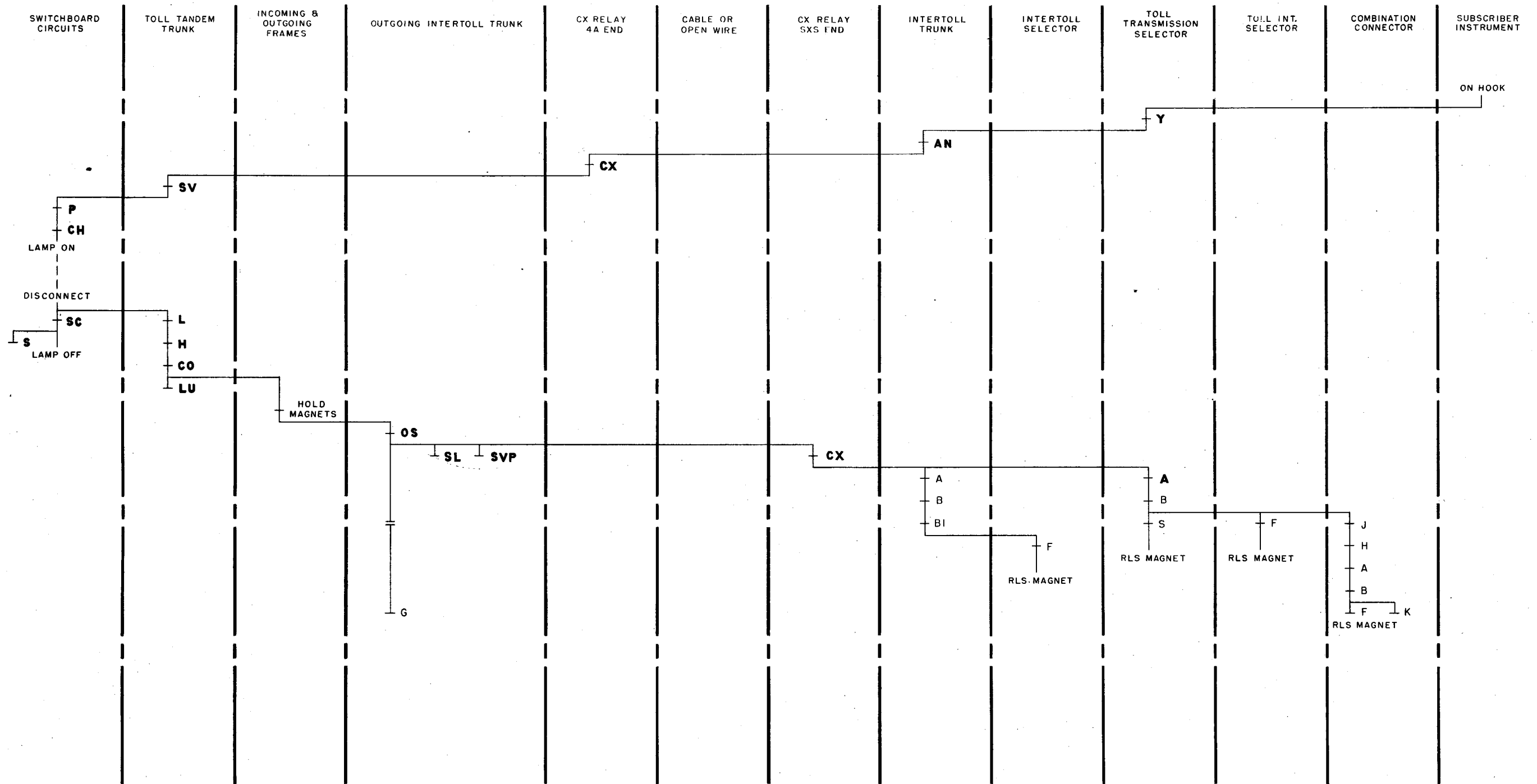
NOTES:
 1. OPTION PROVIDED WHEN TRANSMISSION REQUIRES PAD CONTROL.

- | | |
|---------------------------------------|----------------------|
| COMBINATION CONNECTOR CKT. | SD-30228-01, ISS. 25 |
| CORD CKT. DSA SWBD. NO. 15D | SD-96131-01, ISS. 13 |
| CX SIGNALING CKT. TYPE B | SD-95048-01, ISS. 12 |
| DIAL CKT. DSA SWBD. NO. 15D | SD-96232-01, ISS. 5 |
| DP INCOMING SENDER CKT. | SD-68221-01, ISS. 12 |
| INCOMING LINK & CONN. CKT. | SD-68393-01, ISS. 5 |
| INTERTOLL SELECTOR CKT. | SD-64470-01, ISS. 5 |
| JACK CKT. - CKT. PATCH BAY | SD-68327-01, ISS. 5 |
| LINE & BALANCING NETWORK CKT. | SD-90517-01, ISS. 13 |
| ONE-WAY IT TRUNK CKT. INCOMING TO S/S | SD-64590-01, ISS. 9 |
| OUTGOING IT TRUNK-DP OR MF CX SIG. | SD-68231-01, ISS. 5 |
| OUTGOING LINK & CONN. CKT. | SD-68394-01, ISS. 4 |
| OUTGOING TRUNK CKT. SWBD. NO. 15D | SD-96164-01, ISS. 10 |
| PAD SWITCHING CKT. | SD-68285-01, ISS. 6 |
| SWITCHING TRANSMISSION PAD CKT. | SD-64565-01, ISS. 2 |
| TOLL INTERMEDIATE SELECTOR CKT. | SD-31179-01, ISS. 20 |
| TOLL TANDEM TRUNK CKT. DP | SD-68315-01, ISS. 6 |
| TOLL TRANSMISSION SELECTOR CKT. | SD-31681-01, ISS. 8 |
| 4-WIRE TERMINATING SET (TYPICAL) | SD-95489-01, ISS. 1 |

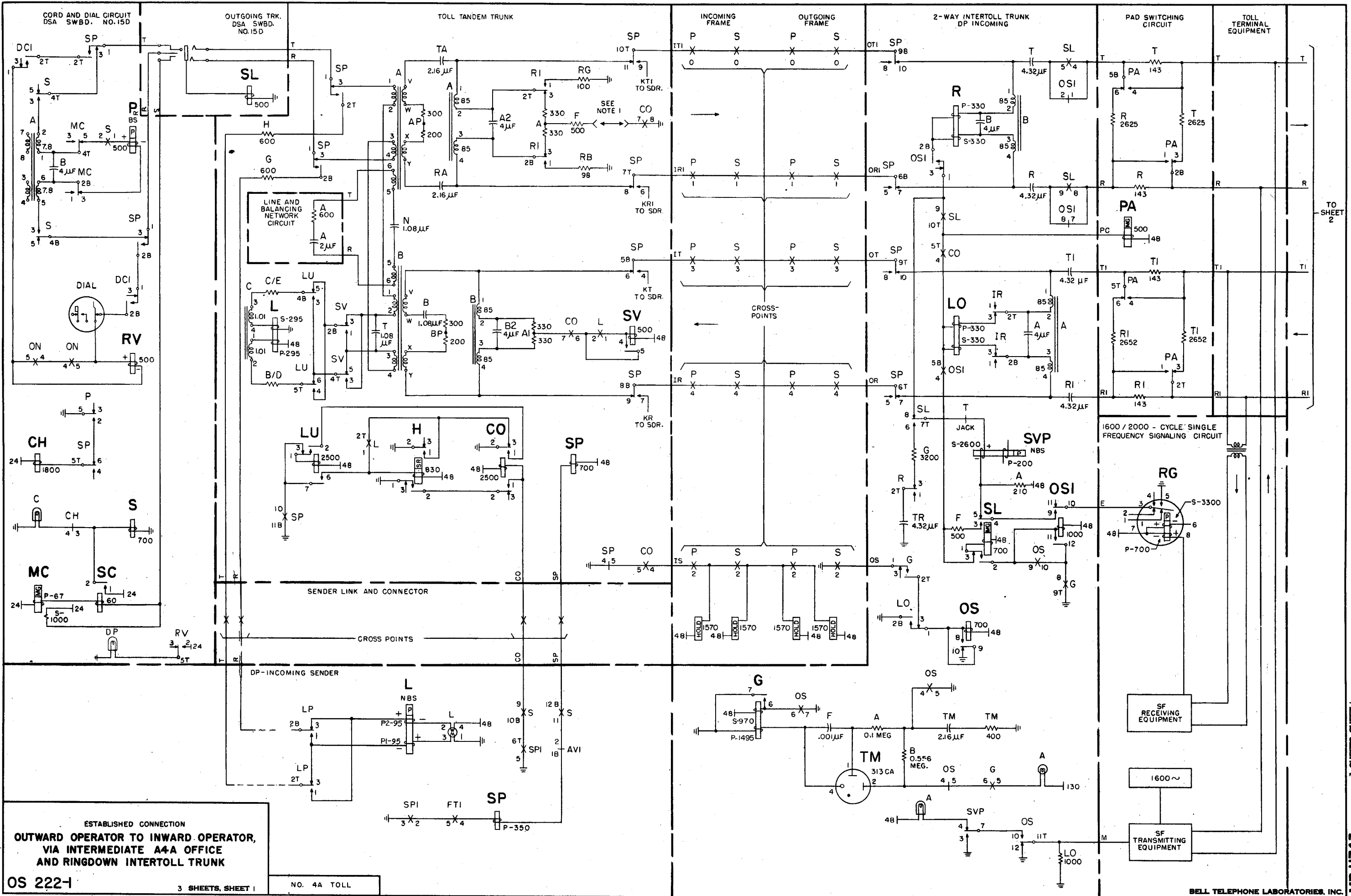
ESTABLISHED CONNECTION
**OUTWARD SWITCHBOARD TO
 STEP-BY-STEP SUBSCRIBER**

ISSUE	1	1/15/58
DATE	5/20/51	

SEQUENCE CHART
RELEASE OF CALL AFTER SUBSCRIBER HANGS UP
FOR CIRCUIT BUILDUP SEE SC 127-1



ESTABLISHED CONNECTION
OUTWARD SWITCHBOARD TO
STEP-BY-STEP SUBSCRIBER



ESTABLISHED CONNECTION
**OUTWARD OPERATOR TO INWARD OPERATOR,
 VIA INTERMEDIATE A4A OFFICE
 AND RINGDOWN INTERTOLL TRUNK**

OS 222-1 3 SHEETS, SHEET 1 NO. 4A TOLL

ORDER AS BSP ITEM MP-11743

BELL TELEPHONE LABORATORIES, INC.
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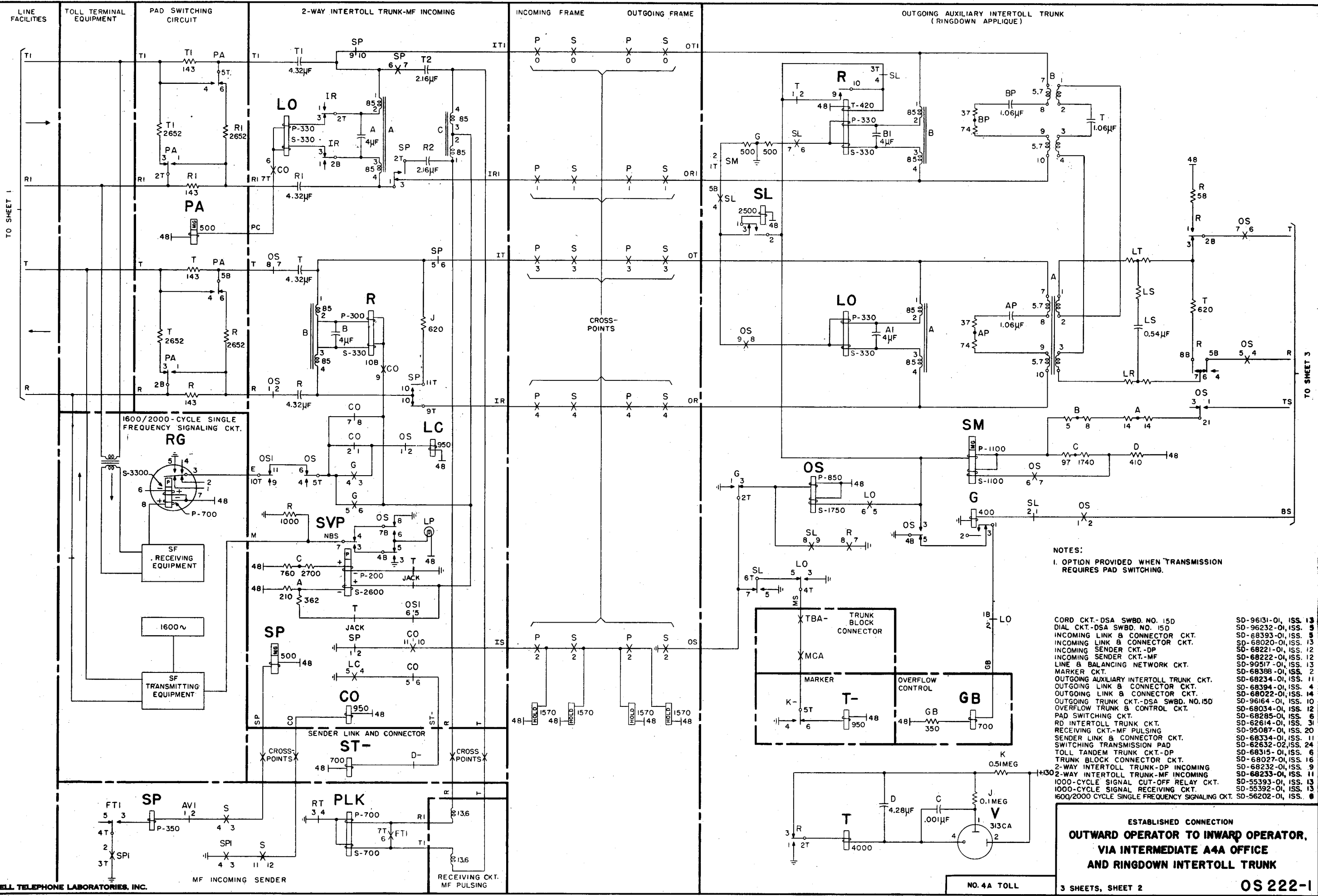
ISSUE	1	DATE	12-6-57
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DATE			

3 SHEETS, SHEET 1

MP-11743

TO SHEET 2

ISSUE	1	2	3
DATE	7-2-57		

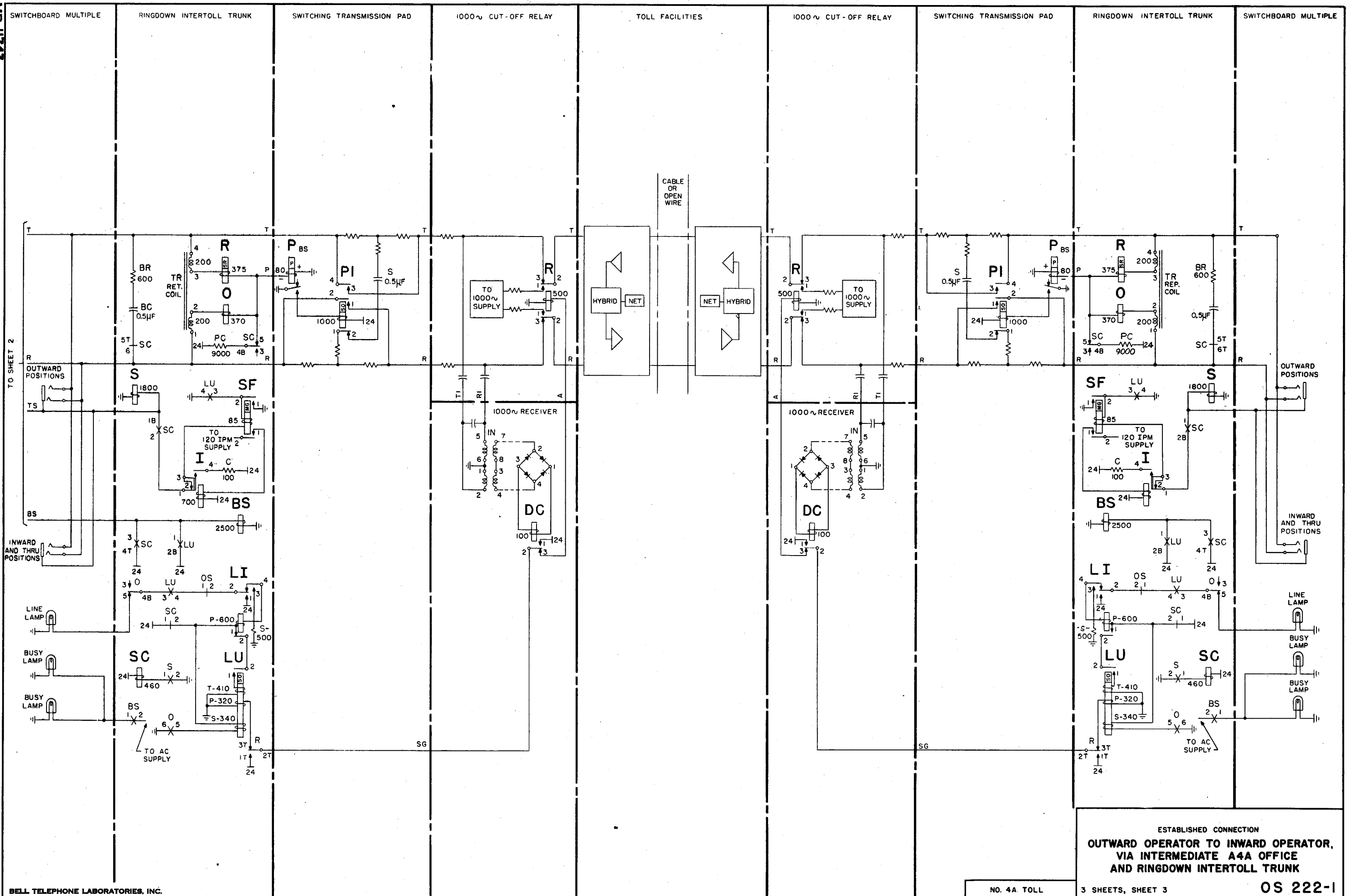


NOTES:
 1. OPTION PROVIDED WHEN TRANSMISSION REQUIRES PAD SWITCHING.

- CORD CKT.-DSA SWBD. NO. 15D
- DIAL CKT.-DSA SWBD. NO. 15D
- INCOMING LINK & CONNECTOR CKT.
- INCOMING LINK & CONNECTOR CKT.
- INCOMING SENDER CKT.-DP
- INCOMING SENDER CKT.-MF
- LINE & BALANCING NETWORK CKT.
- MARKER CKT.
- OUTGOING AUXILIARY INTERTOLL TRUNK CKT.
- OUTGOING LINK & CONNECTOR CKT.
- OUTGOING LINK & CONNECTOR CKT.
- OUTGOING TRUNK CKT.-DSA SWBD. NO. 15D
- OVERFLOW TRUNK & CONTROL CKT.
- PAD SWITCHING CKT.
- RD INTERTOLL TRUNK CKT.
- RECEIVING CKT.-MF PULSING
- SENDER LINK & CONNECTOR CKT.
- SWITCHING TRANSMISSION PAD
- TOLL TANDEM TRUNK CKT.-DP
- TRUNK BLOCK CONNECTOR CKT.
- 2-WAY INTERTOLL TRUNK-DP INCOMING
- 2-WAY INTERTOLL TRUNK-MF INCOMING
- 1000-CYCLE SIGNAL CUT-OFF RELAY CKT.
- 1000-CYCLE SIGNAL RECEIVING CKT.
- 1600/2000 CYCLE SINGLE FREQUENCY SIGNALING CKT.

ESTABLISHED CONNECTION
**OUTWARD OPERATOR TO INWARD OPERATOR,
 VIA INTERMEDIATE A4A OFFICE
 AND RINGDOWN INTERTOLL TRUNK**

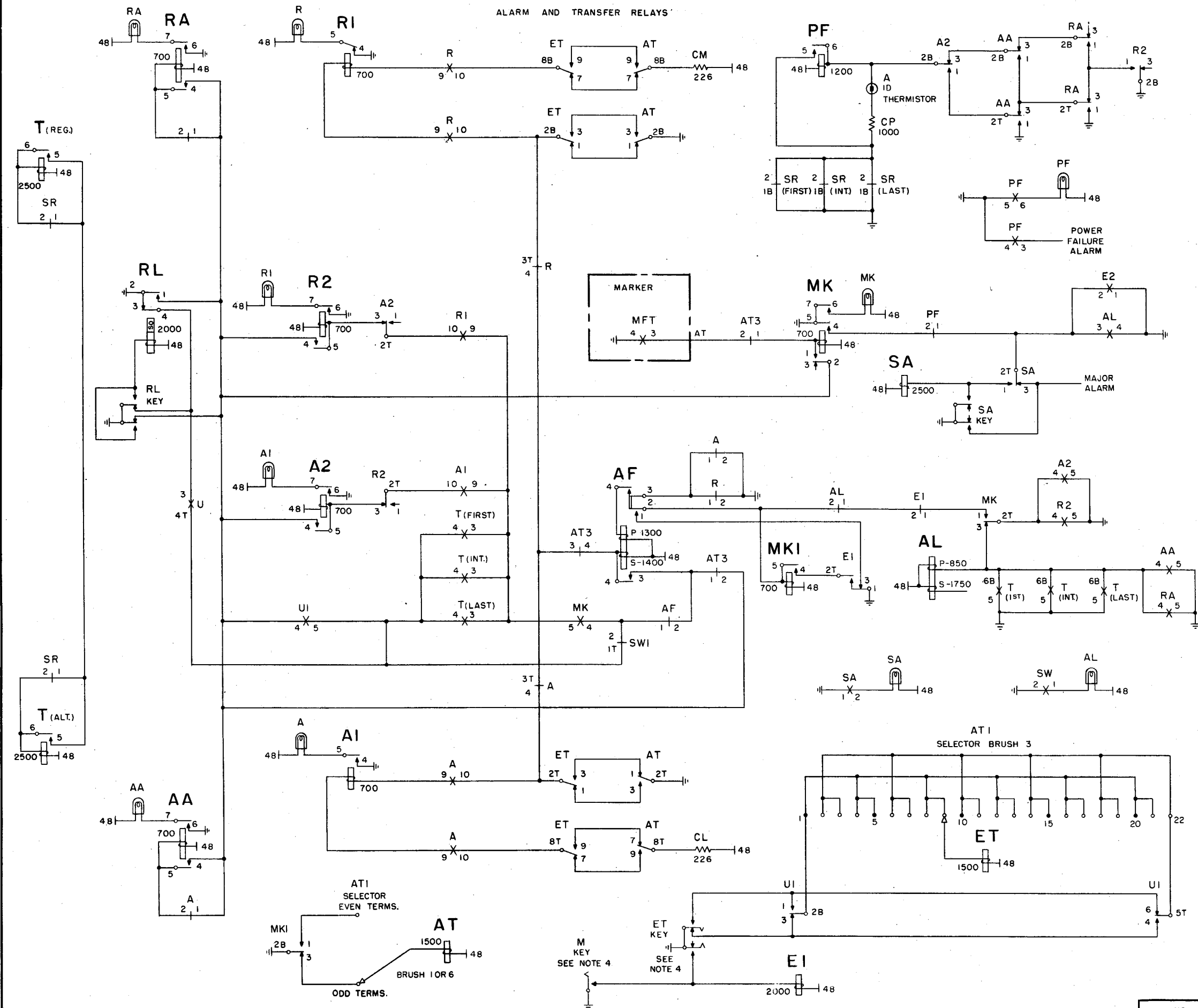
ISSUE	1	2	3
DATE	7-9-37		



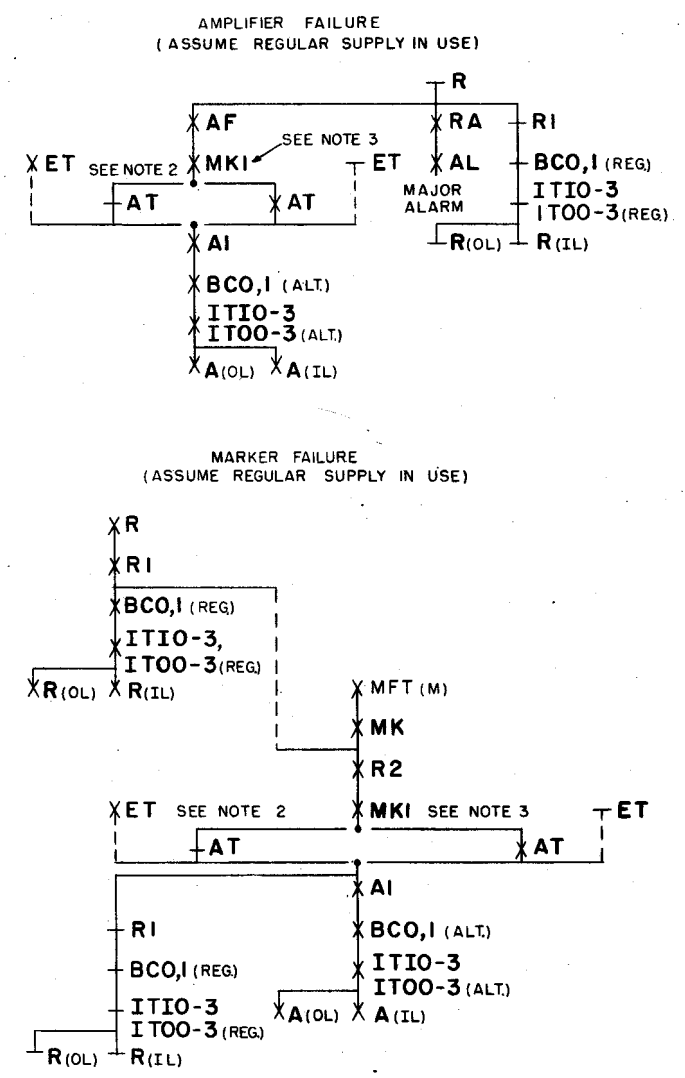
ESTABLISHED CONNECTION
**OUTWARD OPERATOR TO INWARD OPERATOR,
 VIA INTERMEDIATE A4A OFFICE
 AND RINGDOWN INTERTOLL TRUNK**

FRAME IDENTIFICATION FREQUENCY SUPPLY

ALARM AND TRANSFER RELAYS



SEQUENCE CHART



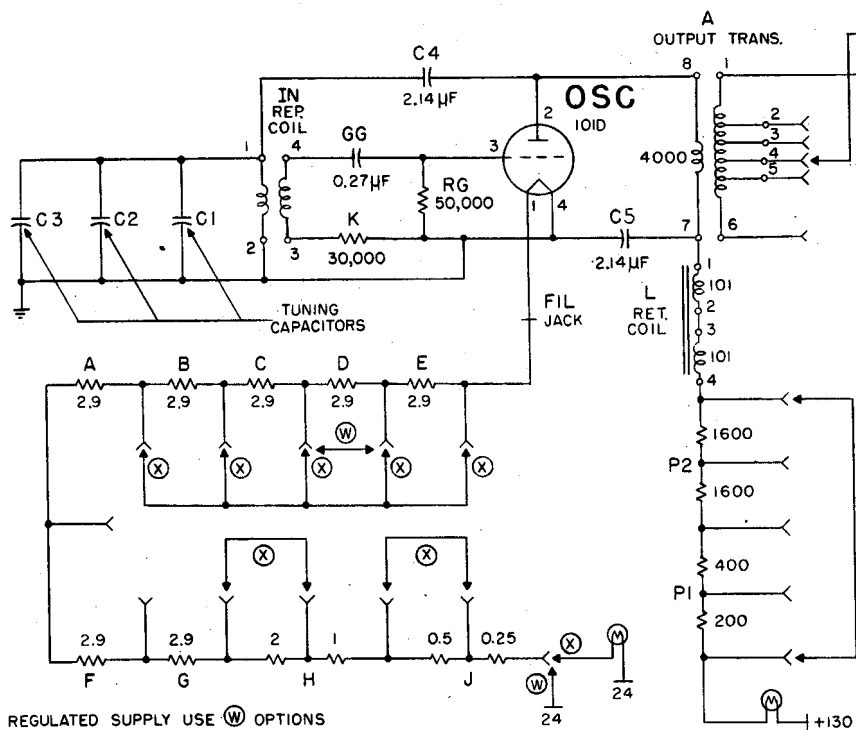
NOTES:

- | OS OPTION | FEATURE OR OPTION | SD OPTION | SD |
|-----------|---------------------------|------------------------|----------|
| A | FOR TWO-TRAIN OFFICE | FIGS 19, 20 | 68119-01 |
| B | FOR COMBINED TRAIN OFFICE | FIG. 19, LOOPED WIRING | 68119-01 |
 - IF MKI RELAY OPERATES WHEN ATI SELECTOR IS ON AN ODD TERM.
 - IF MKI RELAY OPERATES WHEN ATI SELECTOR IS ON AN EVEN TERM.
 - AUTOMATIC THROWOVER FROM ONE SUPPLY TO THE OTHER OCCURS EVERY 88 MINUTES. OPERATION OF ET KEY WILL CAUSE THROWOVER IN EMERGENCY. M KEY SHOULD BE USED TO BLOCK SUPPLY IN TROUBLE WHILE REPAIRS ARE MADE.
 - SR & T RELAYS FURNISHED ONE PER GROUP OF TEN INCOMING FRAMES, OR TEN OUTGOING FRAMES.
- CHANNEL FREQUENCY OSCILLATOR CKT. SD-70217-01, ISS. 12
 *FRAME IDENTIFICATION FREQUENCY SUPPLY CKT. SD-68119-01, ISS. 14
 INCOMING LINK AND CONNECTOR CKT. SD-68393-01, ISS. 5
 MARKER CKT. SD-68388-01, ISS. 2
 OUTGOING LINK AND CONNECTOR CKT. SD-68394-01, ISS. 4

FRAME IDENTIFICATION FREQUENCY SUPPLY

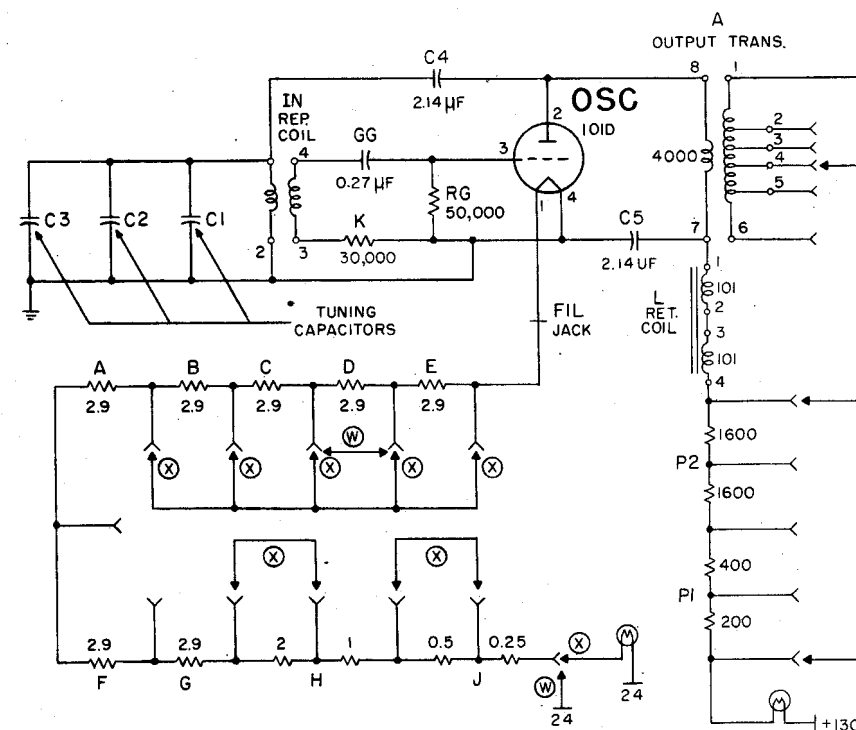
CHANNEL FREQUENCY OSCILLATOR

OSCILLATOR A REGULAR
REGULAR OSCILLATORS B TO H SAME AS A, SHOWN



REGULATED SUPPLY USE (W) OPTIONS
NON-REGULATED SUPPLY USE (X) OPTIONS

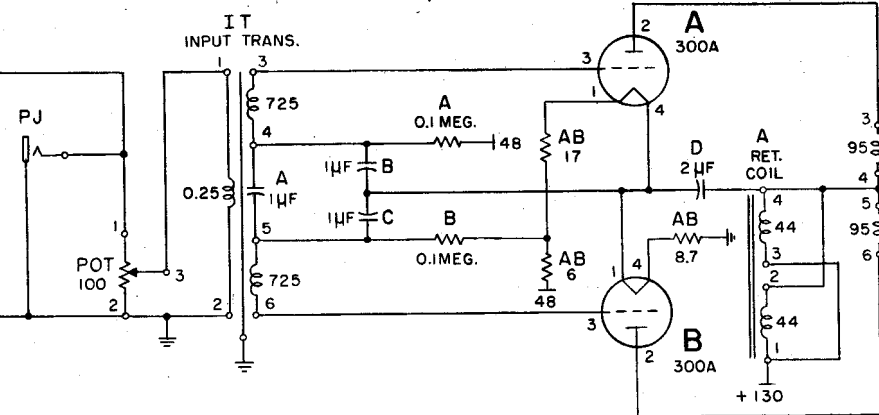
OSCILLATOR A ALTERNATE
ALTERNATE OSCILLATORS B TO H SAME AS A, SHOWN



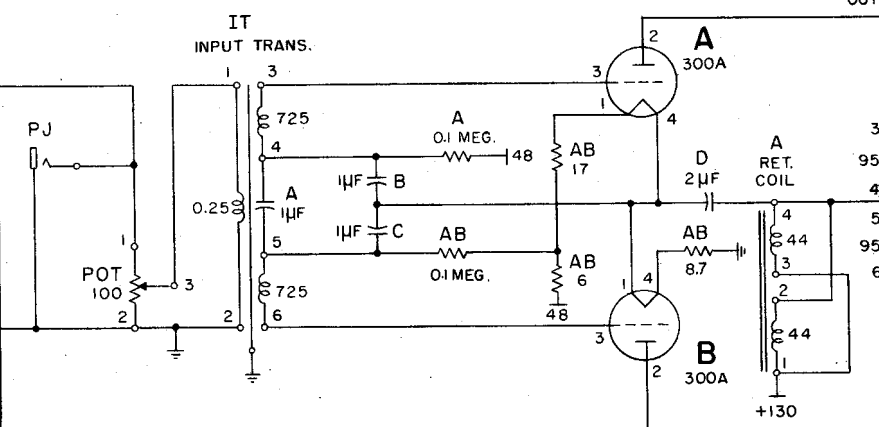
REGULATED SUPPLY USE (W) OPTIONS
NON-REGULATED SUPPLY USE (X) OPTIONS

FRAME IDENTIFICATION
FREQUENCY SUPPLY

REGULAR AMPLIFIER A
REGULAR AMPLIFIERS B TO H SAME AS A, SHOWN

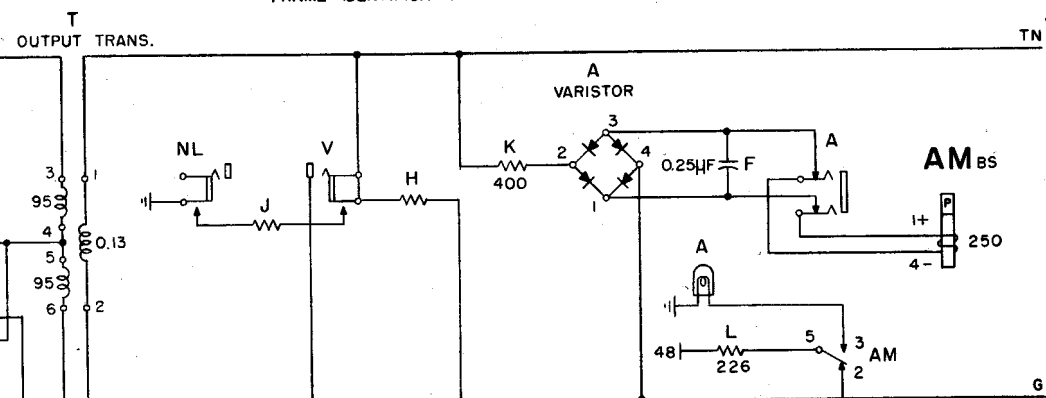


ALTERNATE AMPLIFIER A
ALTERNATE AMPLIFIERS B TO H SAME AS A, SHOWN



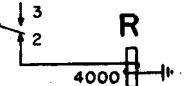
FREQUENCIES	
A	425 CYCLES
B	595 CYCLES
C	765 CYCLES
D	935 CYCLES
E	1105 CYCLES
F	1275 CYCLES
G	1445 CYCLES
H	1615 CYCLES

FRAME IDENTIFICATION FREQUENCY SUPPLY



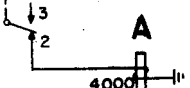
THROUGH CONTACTS OF
OPERATED AM RELAYS
IN REGULAR AMPLIFIERS
B TO G

AM (H AMPLIFIER)



THROUGH CONTACTS OF
OPERATED AM RELAYS
IN ALTERNATE AMPLIFIERS
B TO G

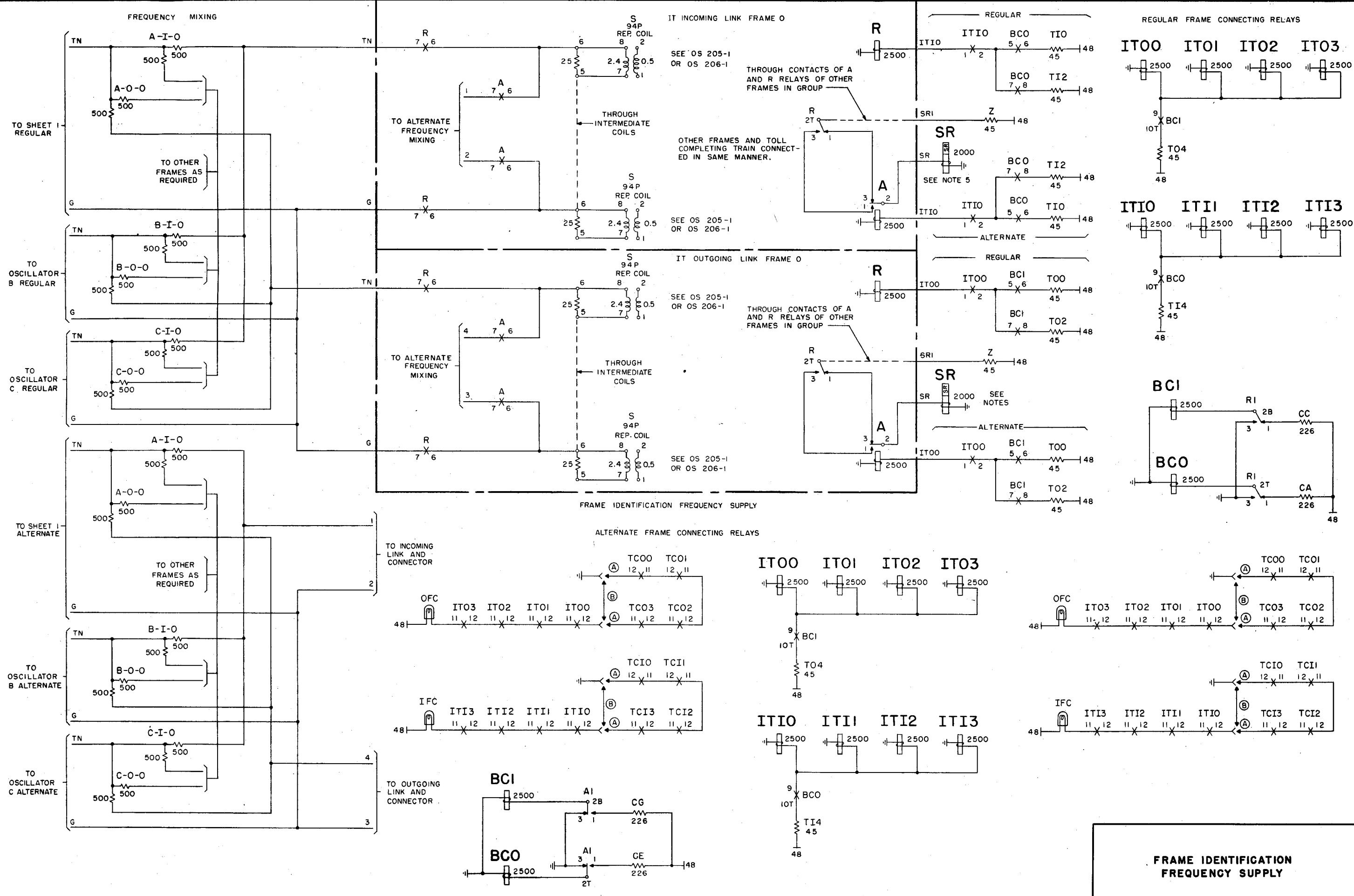
AM (H AMPLIFIER)



TO SHEET 2

TO SHEET 2

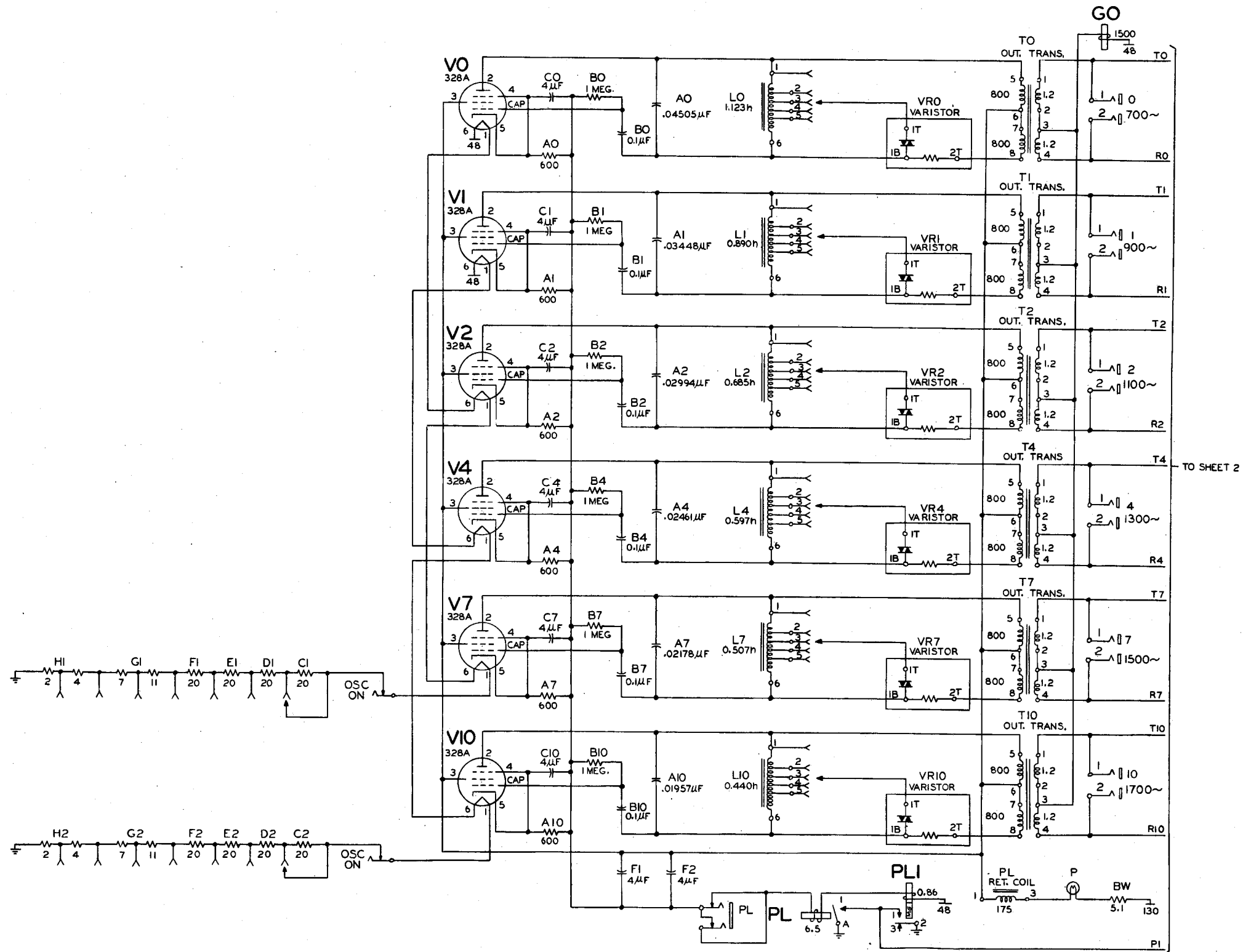
REVISION	1	DATE	10-6-44



**FRAME IDENTIFICATION
FREQUENCY SUPPLY**

MF CURRENT SUPPLY

ODD OSCILLATOR GROUP
SEE NOTES 1 & 2



TO SHEET 2

MF CURRENT SUPPLY
SENDERS AND KEYSETS

OS 224-1

3 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS BSP ITEM MP-11745

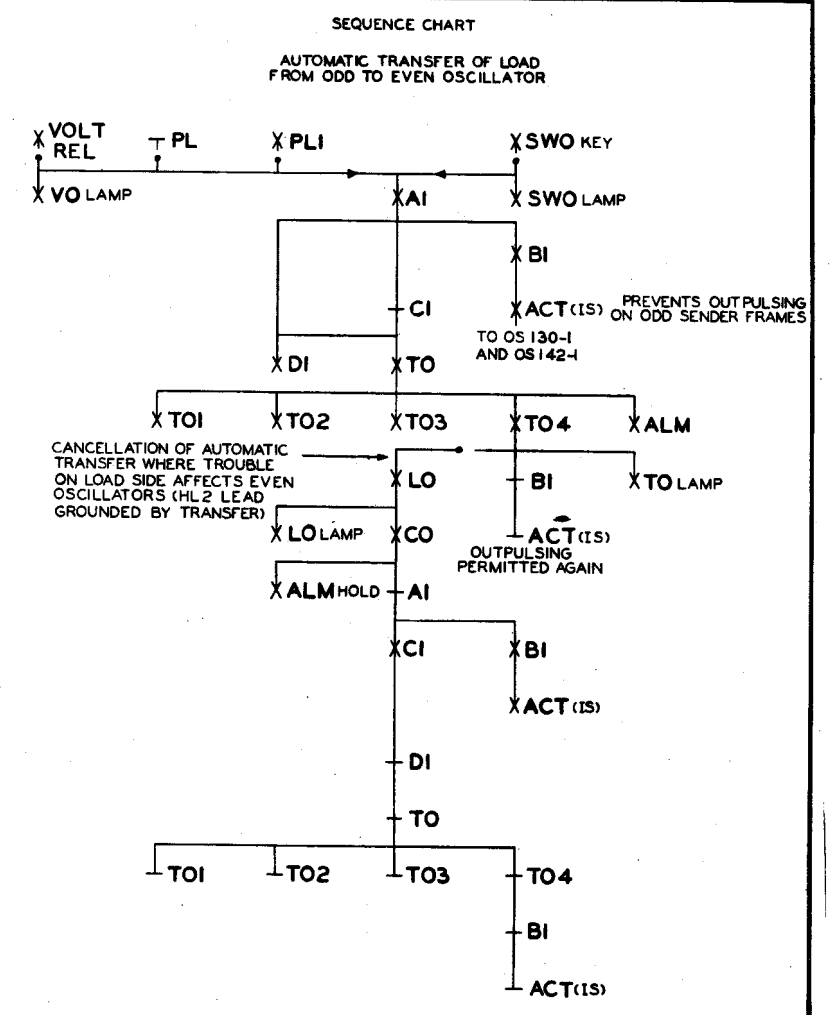
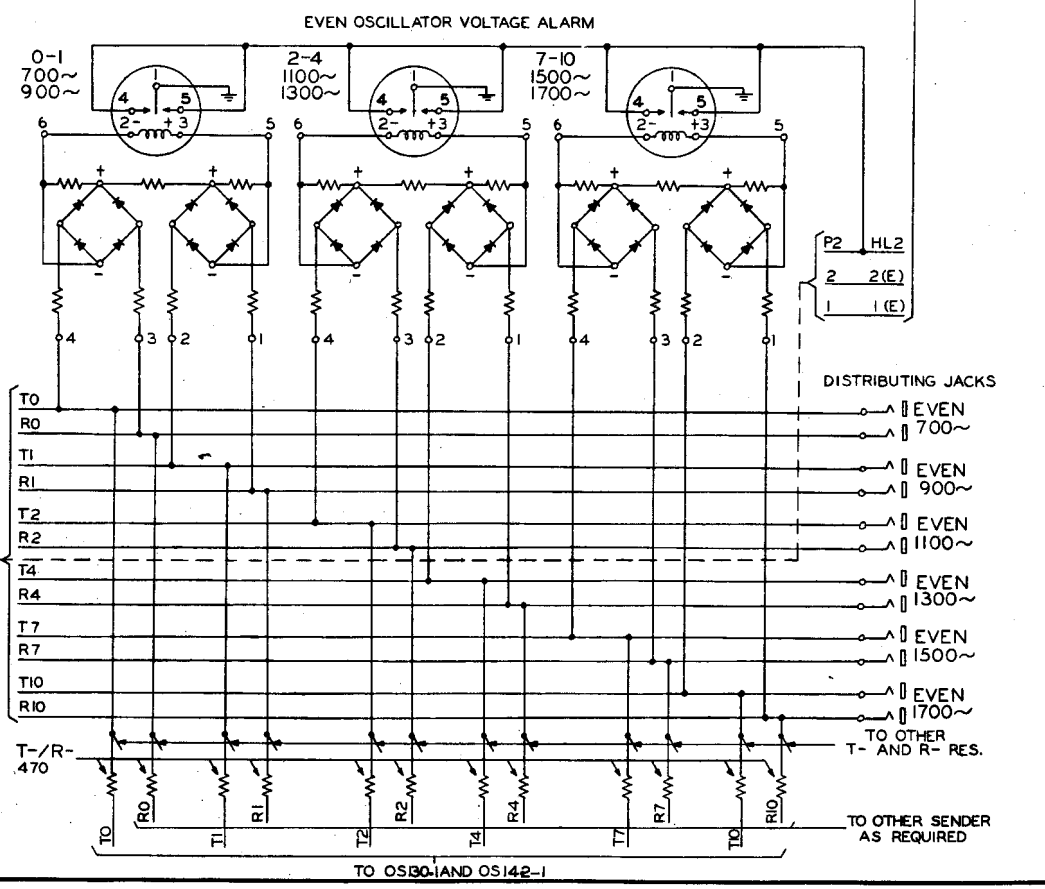
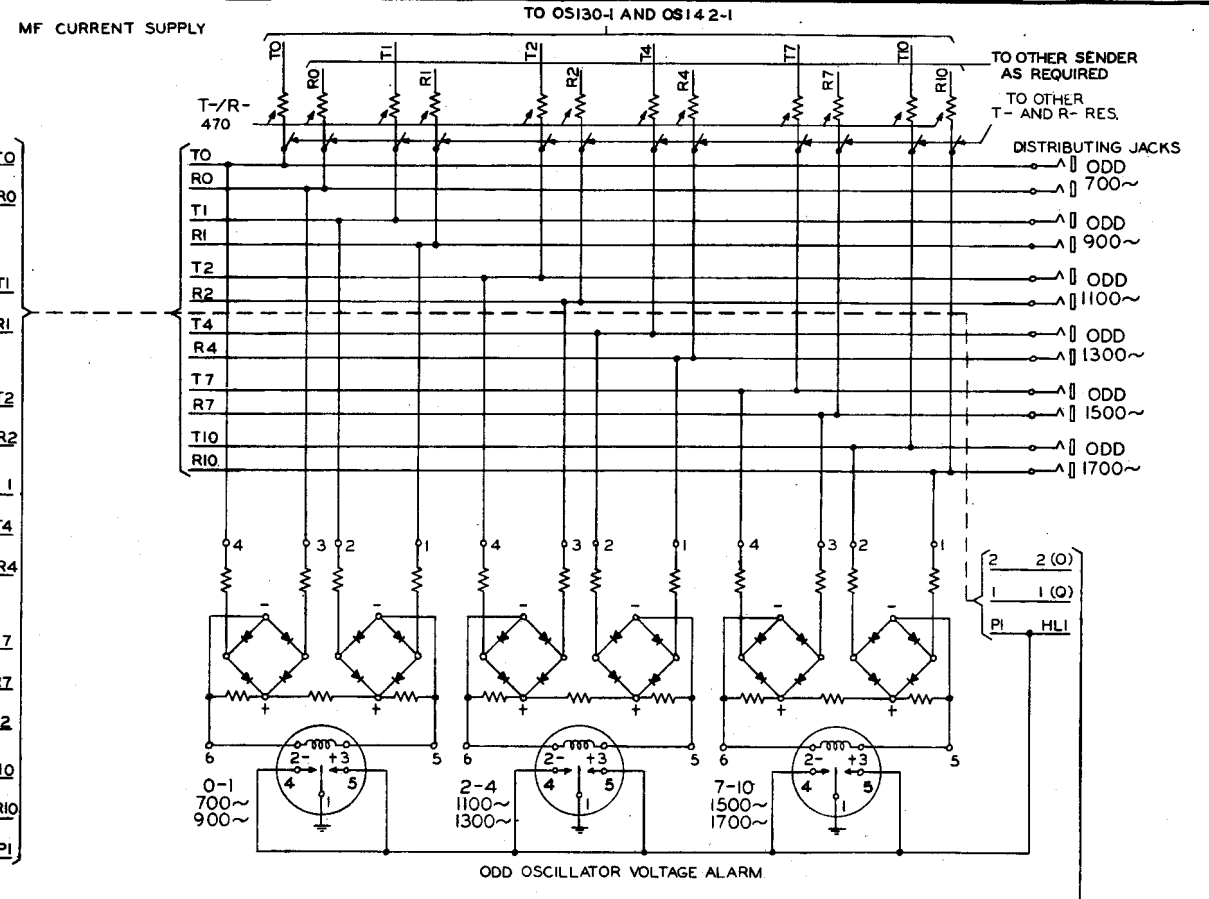
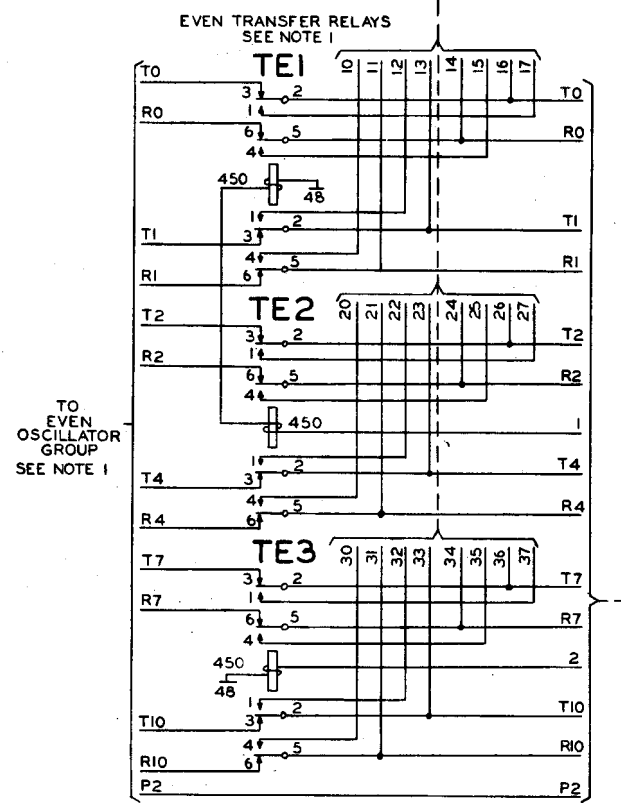
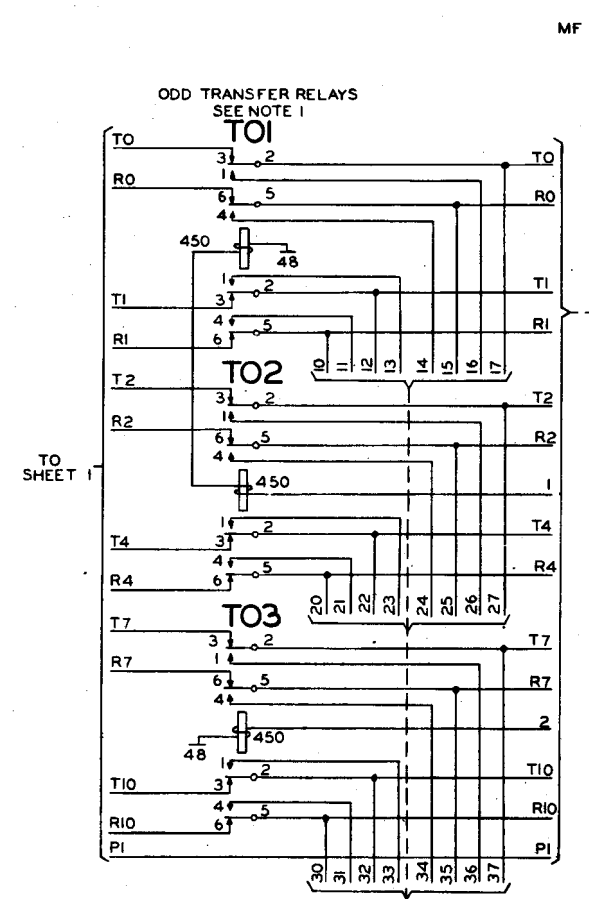
BELL TELEPHONE LABORATORIES, INC.
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DATE	1 2 2 2
TIME	12:30

3 SHEETS, SHEET 1

MP-11745

ISSUE	1	222
DATE	12-5-51	



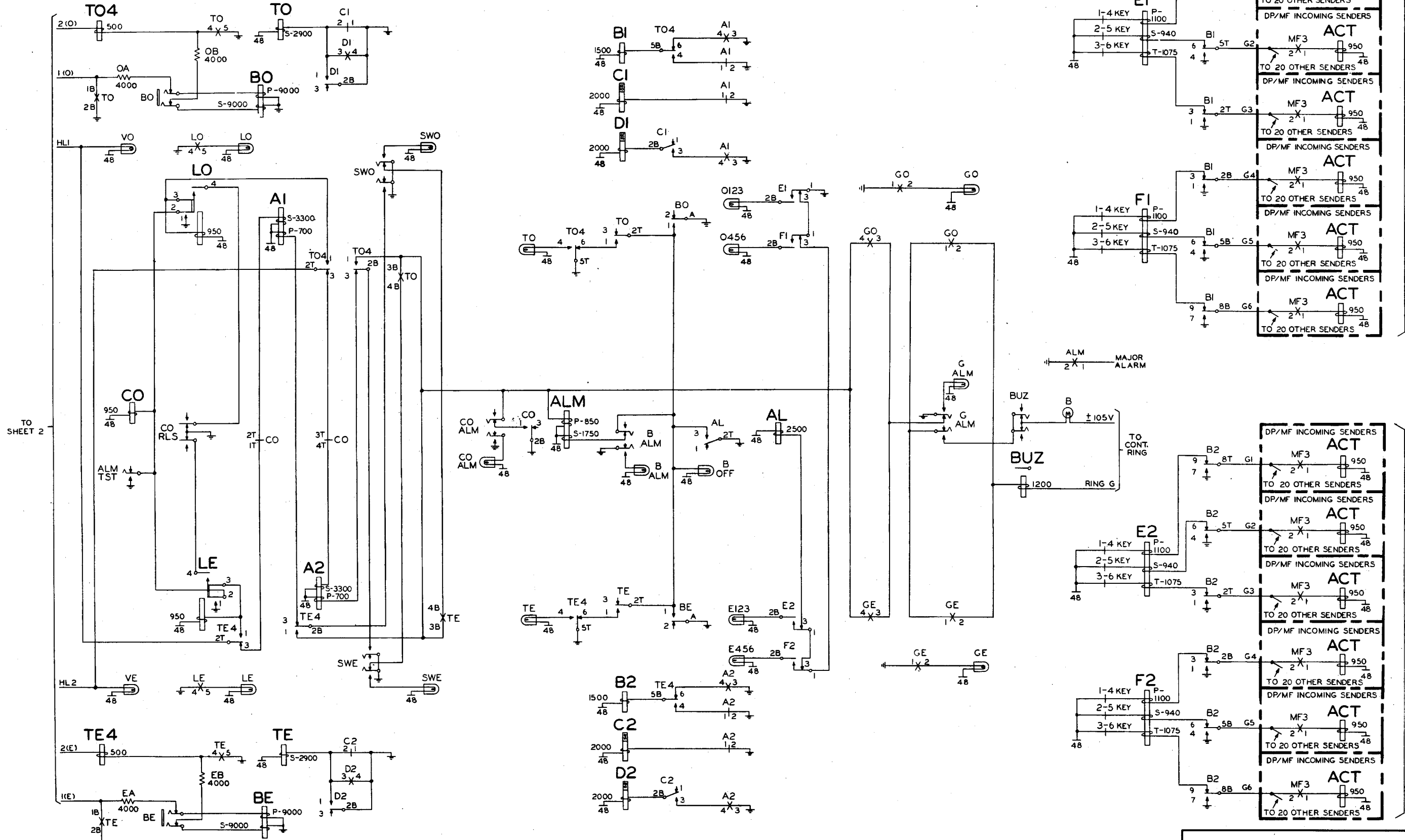
- NOTES:
1. UNDER NORMAL OPERATING CONDITIONS THE LOAD IS DIVIDED BETWEEN THE ODD AND EVEN OSCILLATORS. UNDER TRANSFER CONDITIONS EITHER OSCILLATOR CAN CARRY THE ENTIRE LOAD, EVEN AND ODD OSCILLATOR EQUIPMENT ARRANGEMENTS ARE IDENTICAL.
 2. DIRECT CURRENT SHOULD NOT BE USED TO TEST THIS CIRCUIT (EXCEPT RELAYS) BECAUSE THE APPARATUS MAY BE DAMAGED OR ITS CHARACTERISTICS PERMANENTLY ALTERED BY THE PASSAGE OF DIRECT CURRENT.

DP INCOMING SENDER CKT.	SD-66221-01,	ISS. 12
* MF CURRENT SUPPLY CKT.	SD-95391-01,	ISS. 12
MF INCOMING SENDER CKT.	SD-68222-01,	ISS. 12

**MF CURRENT SUPPLY
SENDERS AND KEYSETS**

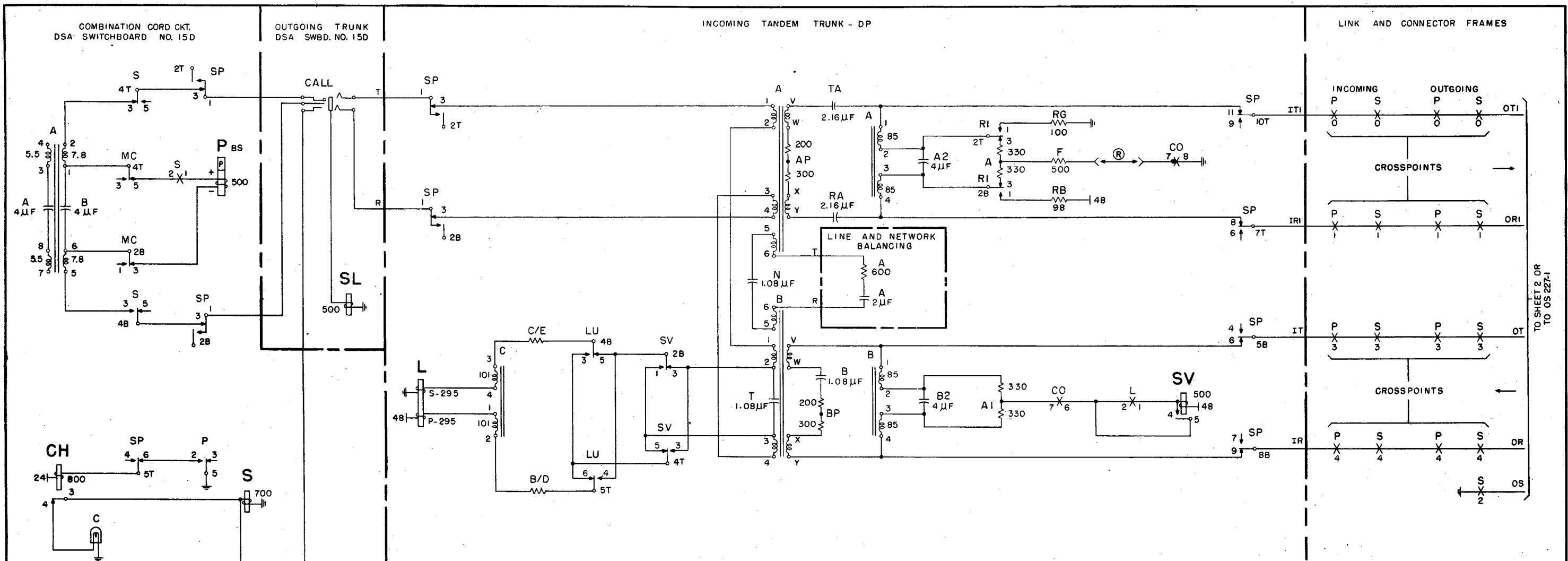
REVISED	1	1/1/57
DATE	1/1/57	

MF CURRENT SUPPLY
TRANSFER AND ALARM RELAYS



TO SHEET 2

MF CURRENT SUPPLY
SENDERS AND KEYSETS



TO SHEET 2 OR
TO OS 227-1

NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	FOR TRUNK GROUPS WITH ASSOCIATED ROUTE RELAYS IN DECODER.	FIGS. 3, 4, 5	68420-01
B	FOR TRUNK GROUPS WITHOUT ASSOCIATED ROUTE RELAYS IN DECODER.	FIG. 6	68420-01
R	TO CUT OUT "A" PAD ASSOCIATED WITH CONNECTED I.T. TRUNK.	R	68315-01
X	REORDER FLASHING ONLY.	X	68420-01
Y	REORDER AND OVERFLOW FLASHING.	Y	68420-01

2. SEE OS 227-1

- CORD CKT. DSA SWITCHBOARD SD-96131-01, ISS. 13
- DELAY QUOTATION TRUNK CKT. SD-68056-01, ISS. 6
- GROUP BUSY CHAIN RELAY CKT., OVERFLOW TRUNK CKT. AND OVERFLOW TRUNK CONTROL CKT. SD-68420-01, ISS. 2
- INCOMING LINK AND CONNECTOR CKT. SD-68020-01, ISS. 12
- INCOMING TANDEM TRUNK CKT.-DP SD-68315-01, ISS. 6
- INTERRUPTER FRAME CKT. SD-68058-01, ISS. 15
- LINE AND NETWORK BALANCING CKT. SD-90517-01, ISS. 13
- MISC. CKT. TRAFFIC SUPV. CABINET SD-68195-01, ISS. 5
- NO. 5 BOARD JACK CKT. SD-68053-01, ISS. 6
- NO. 5 BOARD OVERFLOW IND. CD. CKT. SD-68055-01, ISS. 6
- OUTGOING LINK AND CONNECTOR CKT. SD-68022-01, ISS. 14
- OUTGOING TRUNK CKT.-DSA SWBD. SD-96164-01, ISS. 10

NO. 5 SWITCHBOARD
OVERFLOW TRUNK OPERATION
AND DELAY QUOTATION

OS 226-1

3 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS BSP ITEM MP-11746

BELL TELEPHONE LABORATORIES, INC.

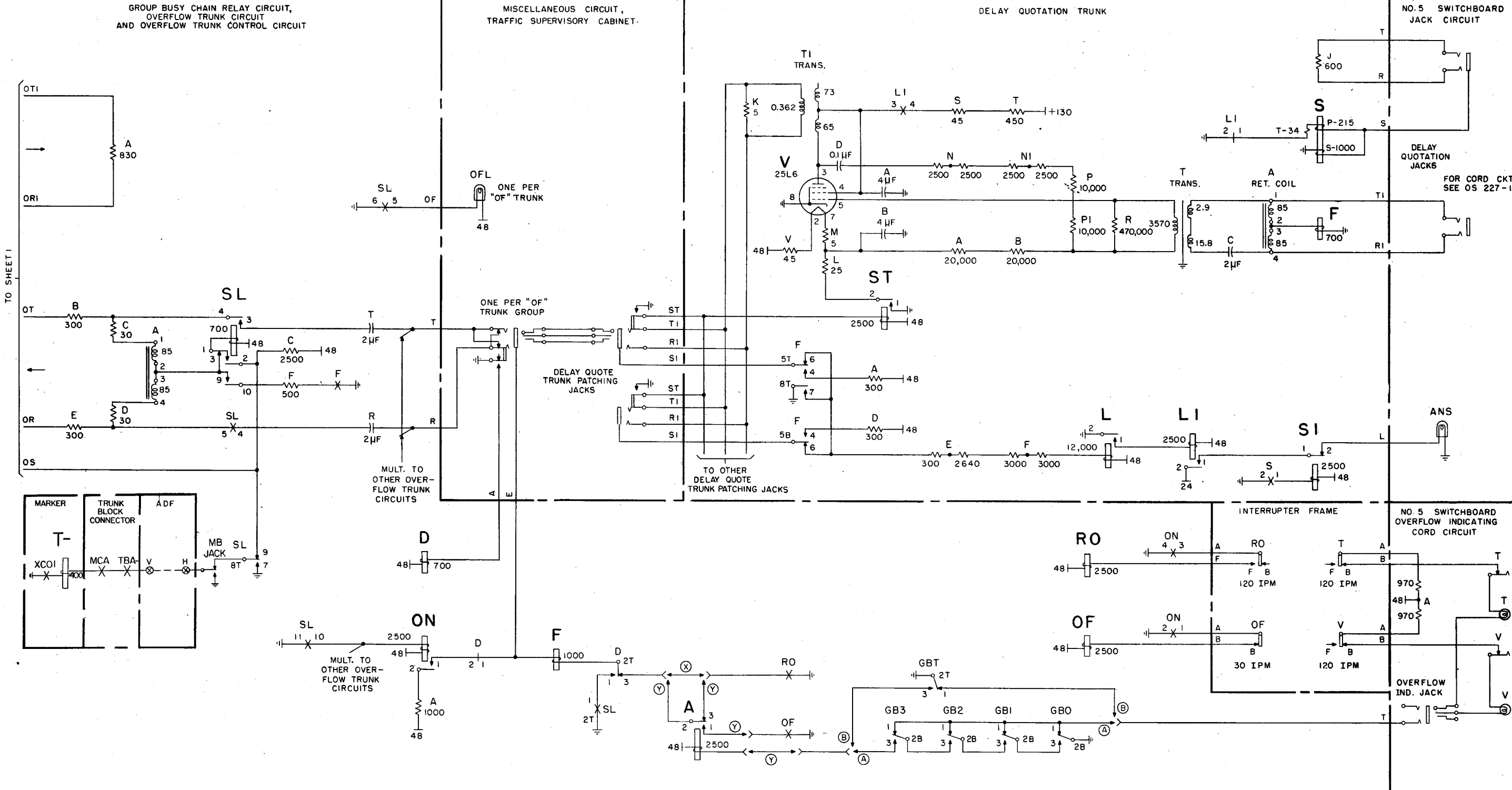
PRINTED IN U. S. A.

ISSUE	1	1/2/52
DATE	12-8-51	

3 SHEETS, SHEET 1

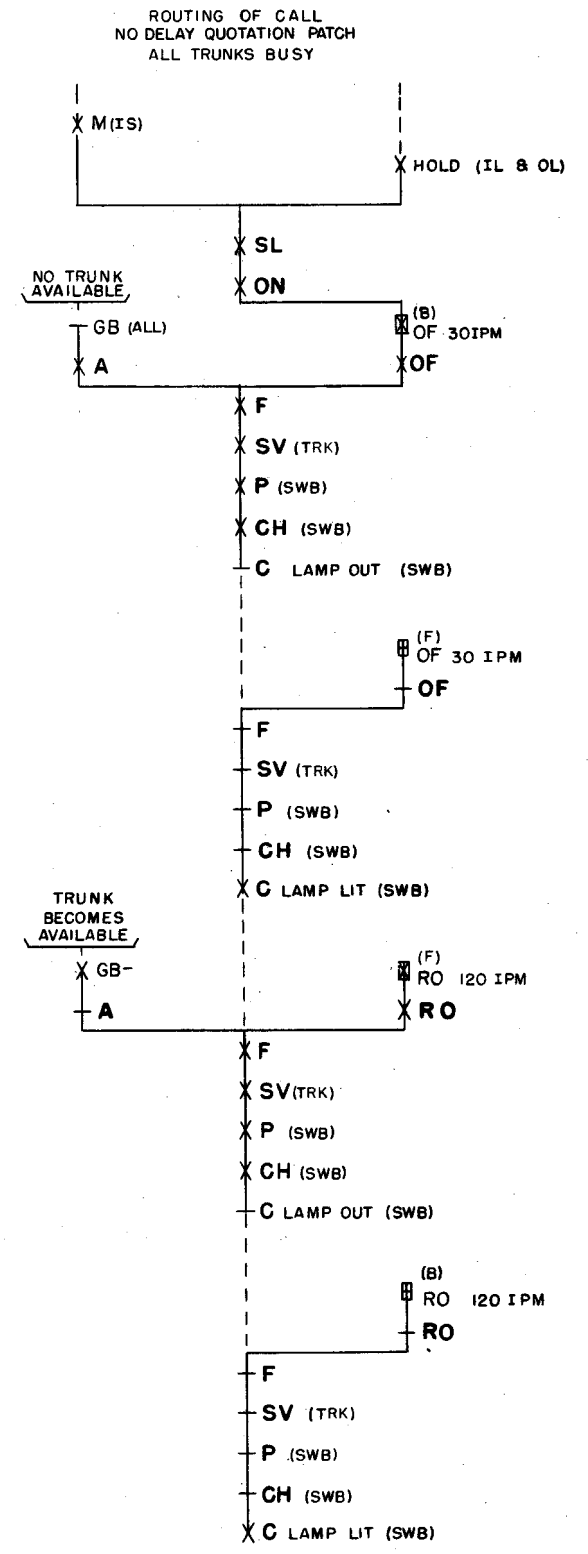
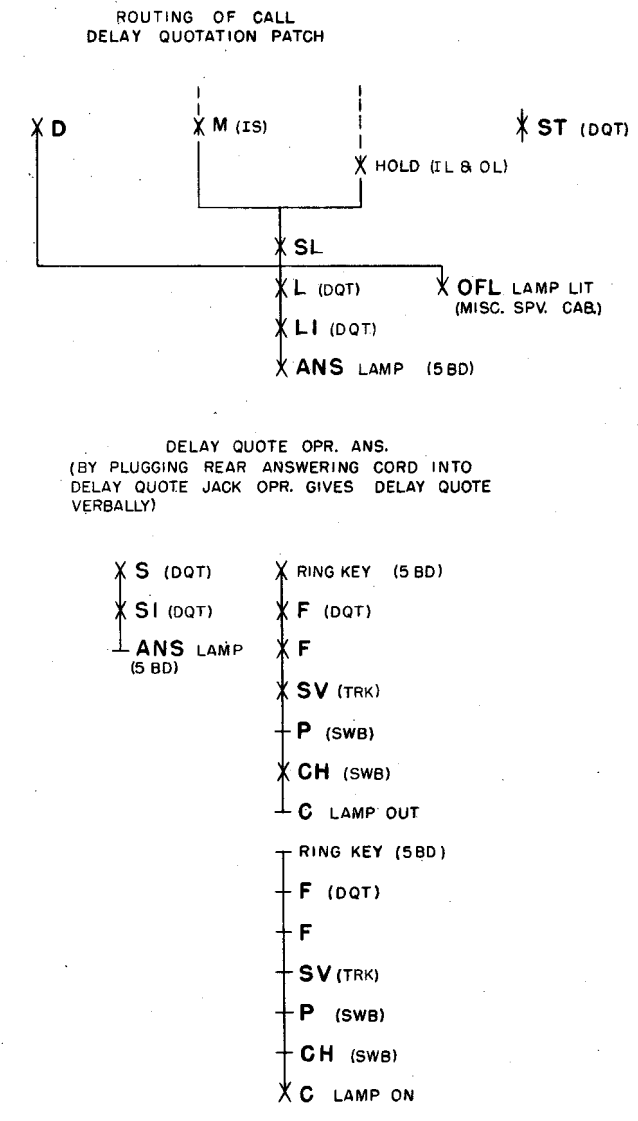
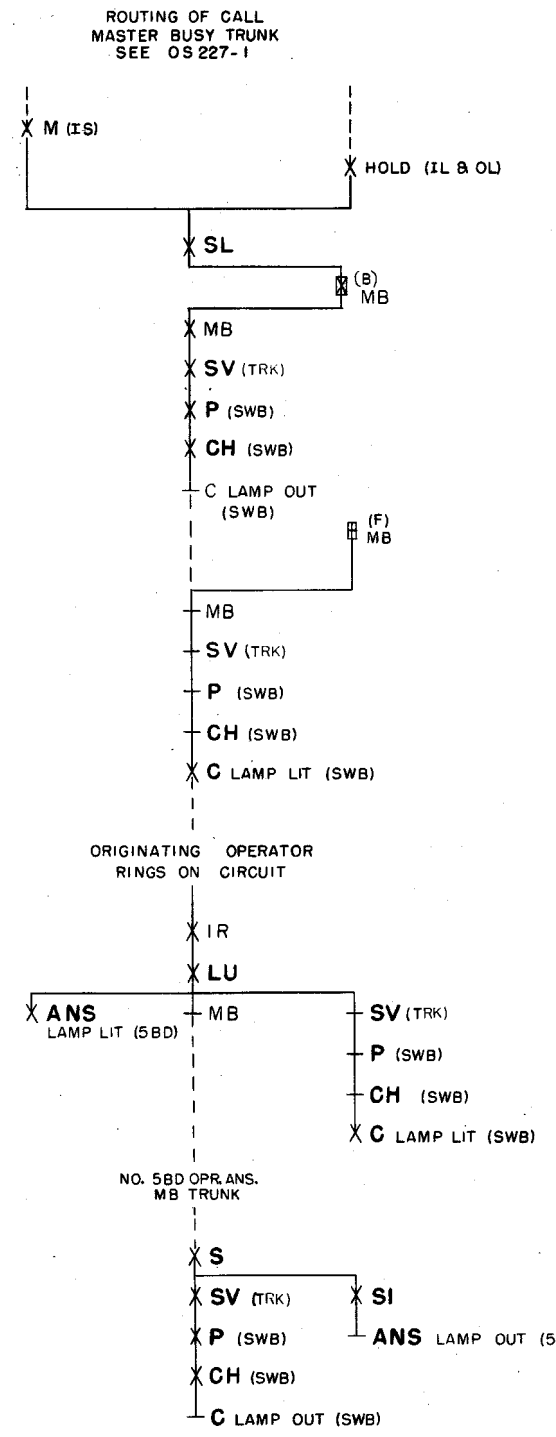
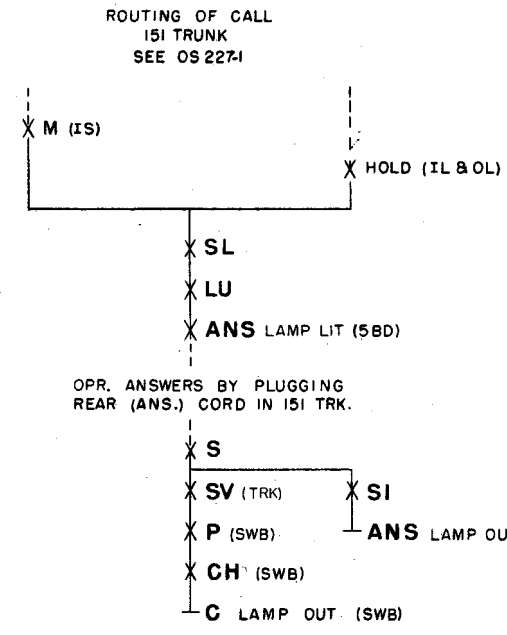
MP-11746

REVISION	DATE
1	12-5-57



NO. 5 SWITCHBOARD
OVERFLOW TRUNK OPERATION
& DELAY QUOTATION

REVISION	1	1/25/51
DATE	1/25/51	

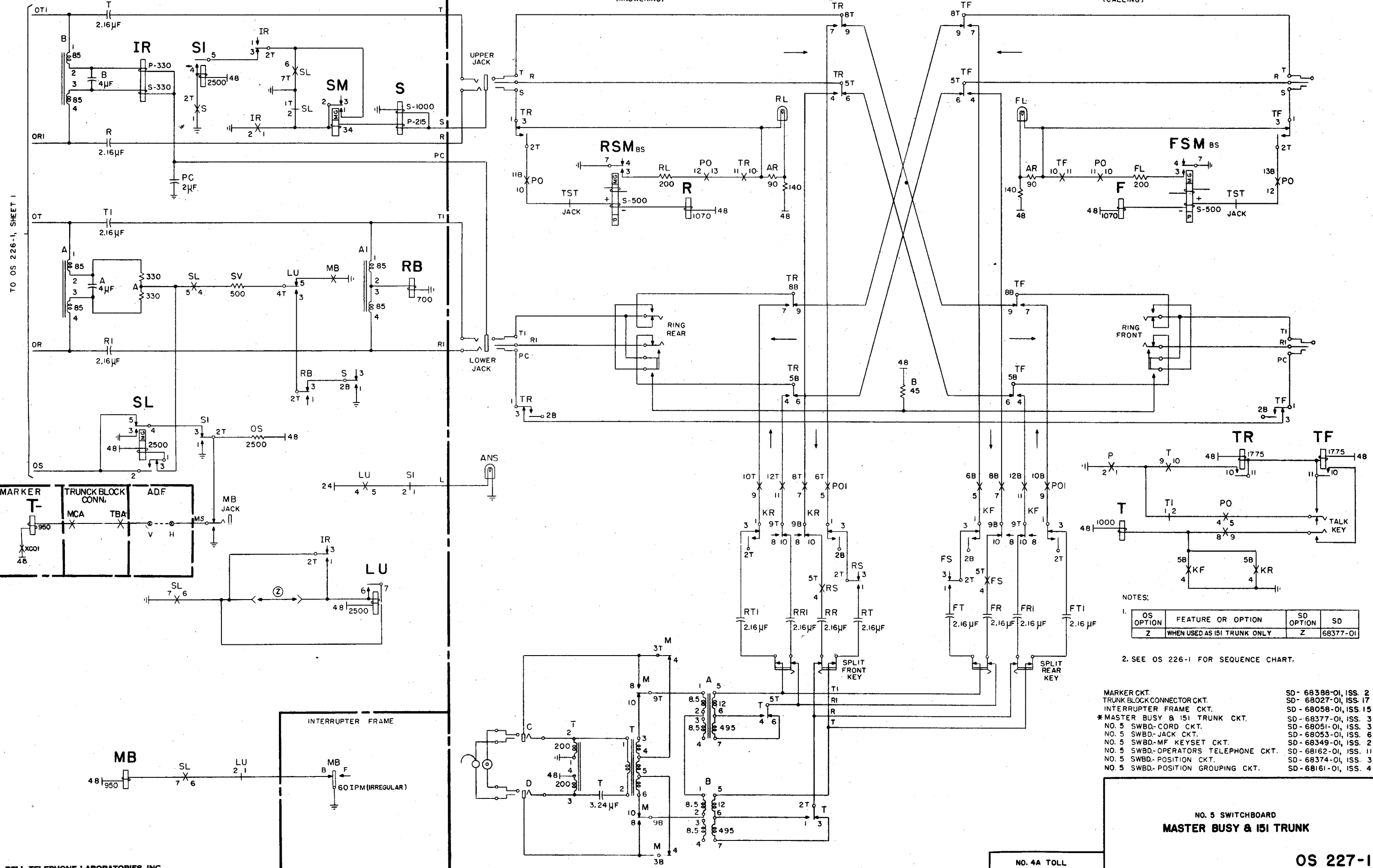


MASTER BUSY OR IS1 TRUNK

NO. 5 SWITCHBOARD

REAR CORD (ANSWERING)

FRONT CORD (CALLING)



REVISION	1	11-22-51
DATE		

TO OS 226-1, SHEET 1

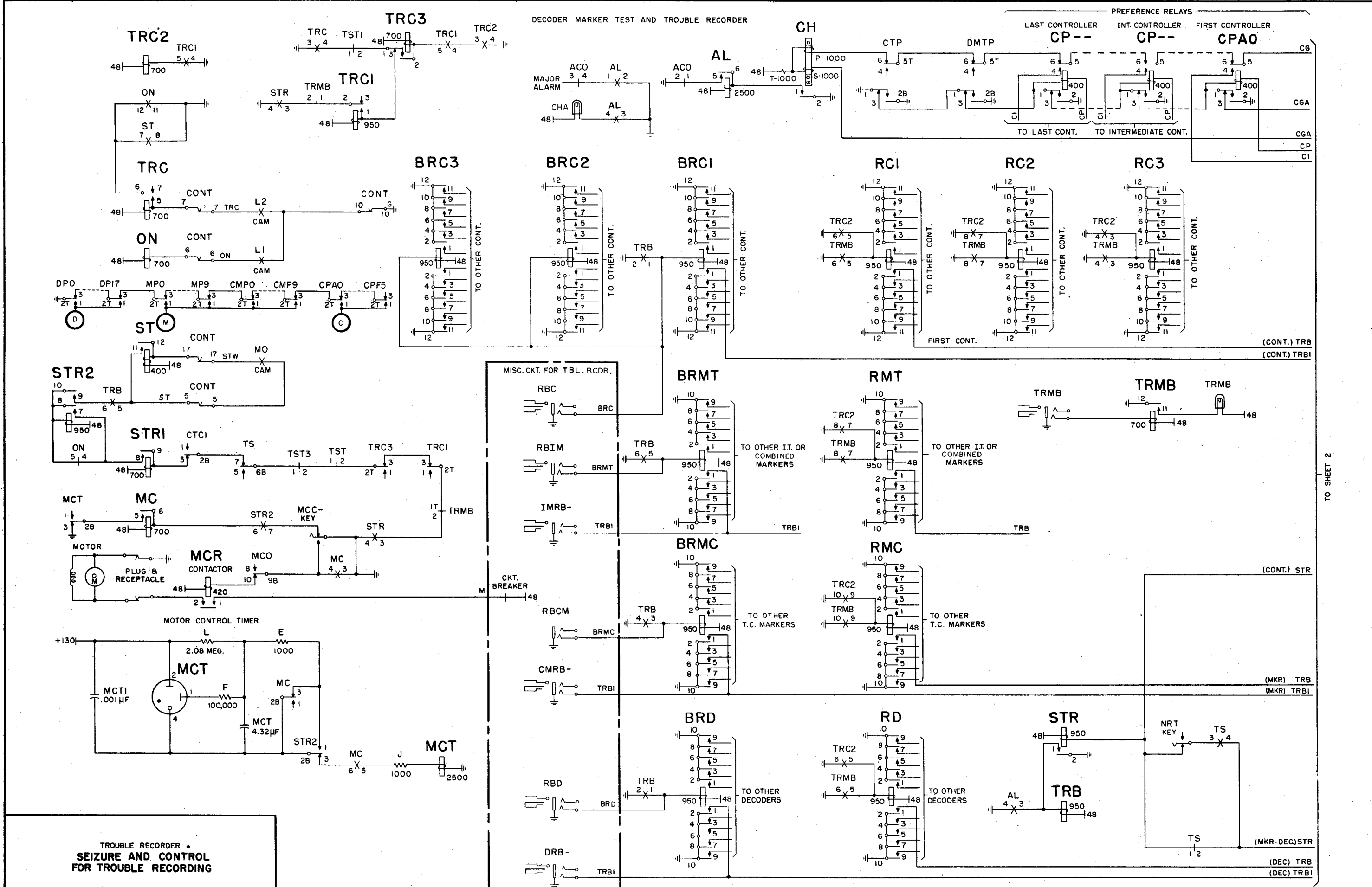
NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
Z	WHEN USED AS IS1 TRUNK ONLY	Z	68377-01

2. SEE OS 226-1 FOR SEQUENCE CHART.
- MARKER CKT. SD - 68388-01, ISS. 2
 - TRUNK BLOCK CONNECTOR CKT. SD - 68027-01, ISS. 17
 - INTERRUPTER FRAME CKT. SD - 68058-01, ISS. 15
 - * MASTER BUSY & IS1 TRUNK CKT. SD - 68377-01, ISS. 3
 - NO. 5 SWBD-CORD CKT. SD - 68051-01, ISS. 3
 - NO. 5 SWBD-JACK CKT. SD - 68053-01, ISS. 2
 - NO. 5 SWBD-MF KEYSET CKT. SD - 68349-01, ISS. 2
 - NO. 5 SWBD-OPERATORS TELEPHONE CKT. SD - 68162-01, ISS. 11
 - NO. 5 SWBD-POSITION CKT. SD - 68374-01, ISS. 3
 - NO. 5 SWBD-POSITION GROUPING CKT. SD - 68161-01, ISS. 4

NO. 5 SWITCHBOARD MASTER BUSY & IS1 TRUNK

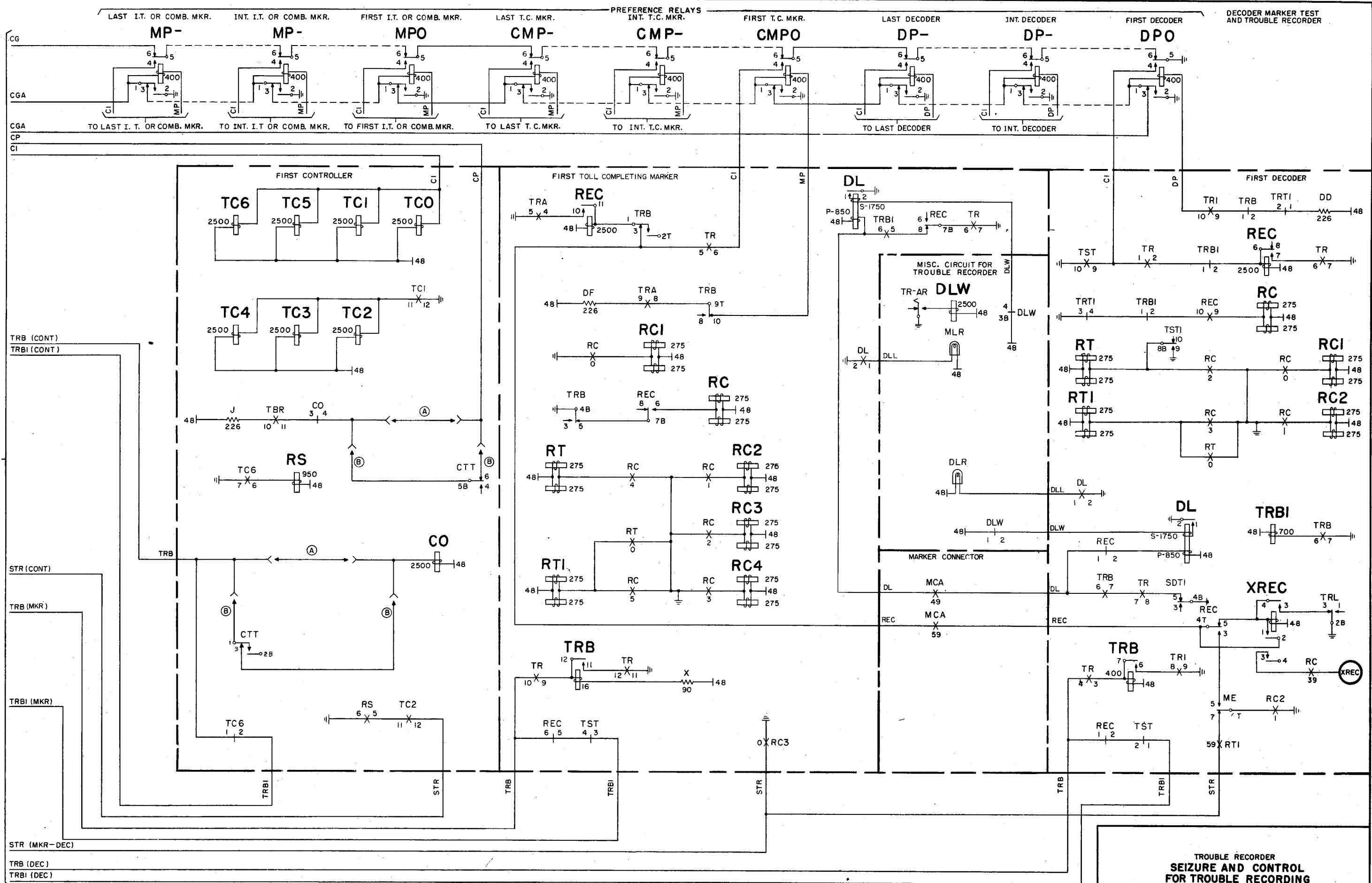
OS 227-1



ISSUE	1	DATE	1-18-52

ISSUE	DATE	BY	REASON
1	1-18-52

TO SHEET 1



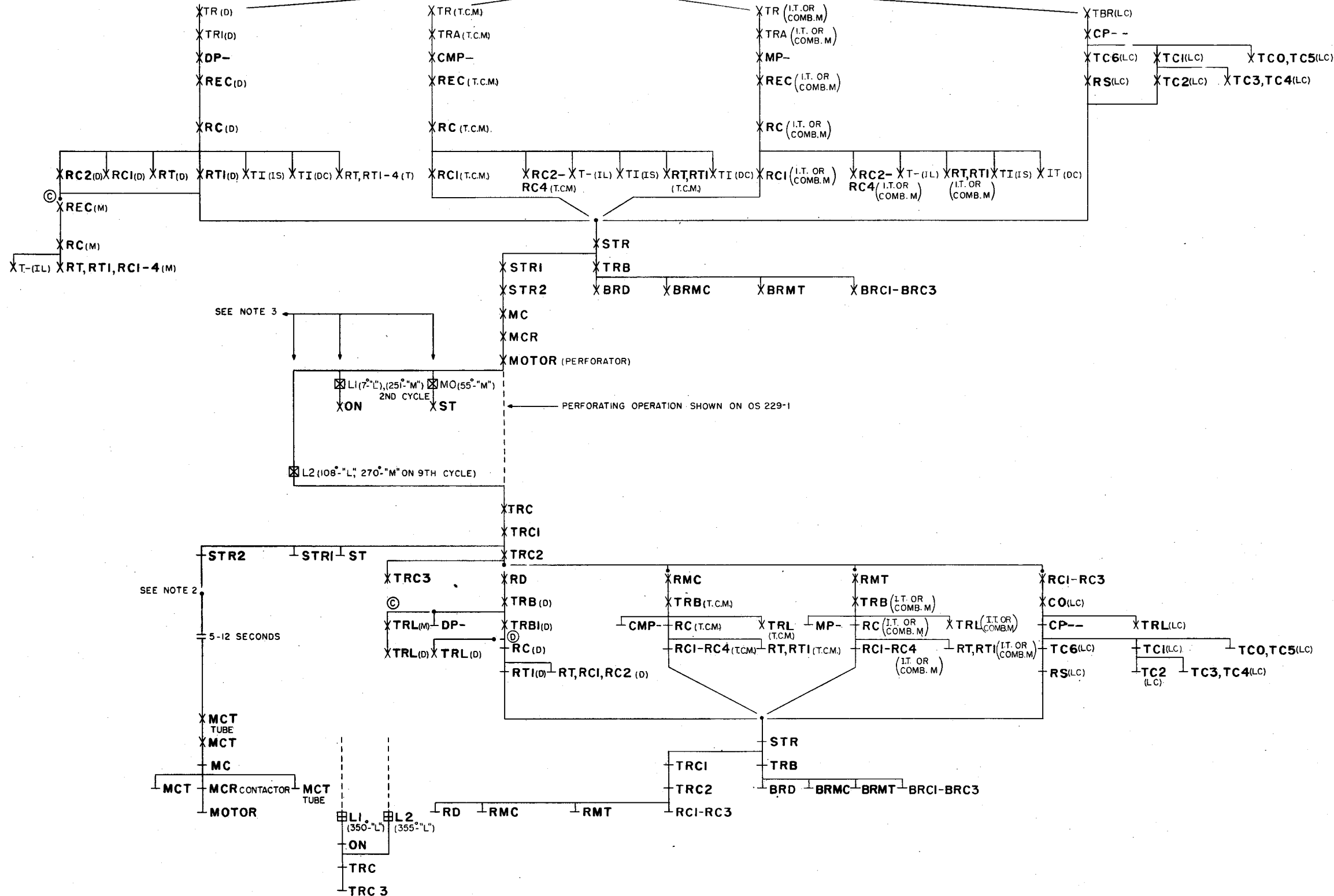
STR (MKR-DEC)
 TRB (DEC)
 TRBI (DEC)

**TROUBLE RECORDER
 SEIZURE AND CONTROL
 FOR TROUBLE RECORDING**

ISSUE	1	1-18-52
DATE		

SEQUENCE CHART

TROUBLE CONDITIONS



NOTES:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	CONT. TEST CKT. IS NOT PROVIDED	YD	68028-01
B	CONT. TEST CKT. IS PROVIDED	YC	
C	WHEN MARKER IS ATTACHED	NONE	68340-01
D	WHEN MARKER IS NOT ATTACHED	NONE	

2 IF THE RECORDER IS RESEIZED IN LESS THAN 5 SECONDS AFTER RELEASE OF STR2, THAT RELAY WILL REOPERATE AND PREVENT THE MOTOR FROM STOPPING.

3 "M" SHAFT MAKES 1 REVOLUTION PER PERFORMING CYCLE (9 CYCLES).
"L" SHAFT MAKES 1 REVOLUTION PER CARD.

- DECODER CKT. SD-68340-01, ISS. 2
- *DECODER MARKER TEST AND TROUBLE RECORDER CKT. SD-68389-01, ISS. 3
- LINK CONTROLLER CKT. SD-68028-01, ISS. 24
- MARKER CKT. SD-68388-01, ISS. 2
- MARKER CONNECTOR CKT. SD-68395-01, ISS. 3
- MISC. CKT. FOR TRBL. REC. FR. SD-68392-01, ISS. 3

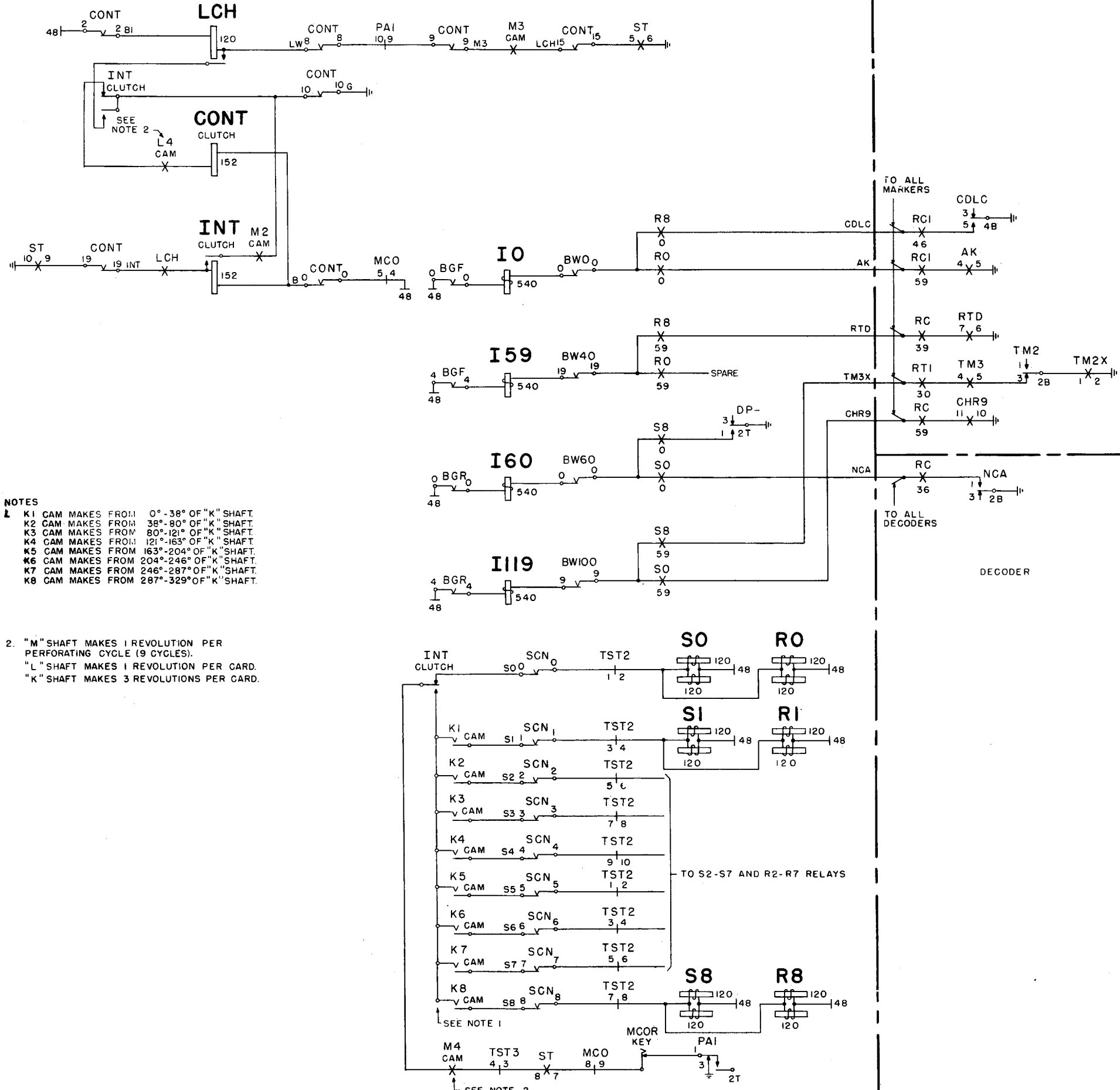
TROUBLE RECORDER
SEIZURE AND CONTROL
FOR TROUBLE RECORDING

ISSUE	1
DATE	7-17-52

DECODER MARKER TEST AND TROUBLE RECORDER

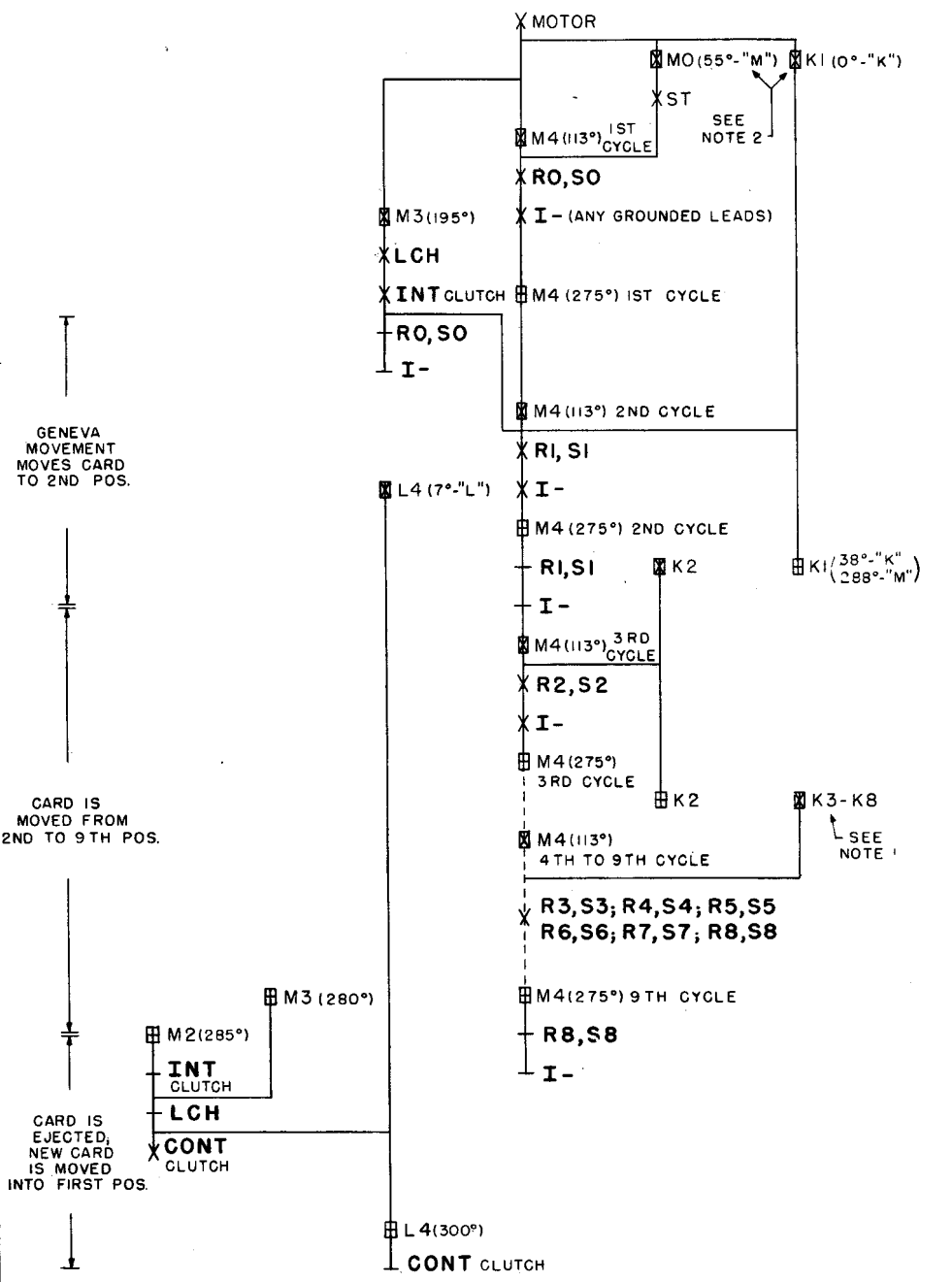
MARKER

SEQUENCE CHART



- NOTES**
- 1. K1 CAM MAKES FROM 0°-38° OF "K" SHAFT
 - K2 CAM MAKES FROM 38°-80° OF "K" SHAFT
 - K3 CAM MAKES FROM 80°-121° OF "K" SHAFT
 - K4 CAM MAKES FROM 121°-163° OF "K" SHAFT
 - K5 CAM MAKES FROM 163°-204° OF "K" SHAFT
 - K6 CAM MAKES FROM 204°-246° OF "K" SHAFT
 - K7 CAM MAKES FROM 246°-287° OF "K" SHAFT
 - K8 CAM MAKES FROM 287°-329° OF "K" SHAFT

- 2. "M" SHAFT MAKES 1 REVOLUTION PER PERFORATING CYCLE (9 CYCLES).
- "L" SHAFT MAKES 1 REVOLUTION PER CARD.
- "K" SHAFT MAKES 3 REVOLUTIONS PER CARD.



DECODER CKT. SD-68340-01, ISS. 2
 * DECODER MARKER TEST AND TROUBLE RECORDER CKT. SD-68389-01, ISS. 3
 MARKER CKT. SD-68388-01, ISS. 2

**TROUBLE RECORDER
PERFORATING TROUBLE RECORD**

SD-12900-01
TYPE E TRUNK EQUIPMENT
INCOMING TRUNK CIRCUIT

DESIG.	OS
A	148-1, 150-1, 152-1
BR	
C	
C1	
GC	
I	
L	
L1	
LS	
R	
RC	
RP	
RV	
S	
SL	
ST	
TP	

SD-21115-01
INCOMING SELECTOR CIRCUIT

DESIG.	OS
A	
D	
L	148-1, 152-1, 153-1
R	
RS	
T	
TC	
TD	
TM	
TS	

SD-25302-01
INCOMING TRUNK CIRCUIT

DESIG.	OS
A	148-1, 152-1, 153-1
CN	
D	
D1	
F	
F1	
MC	
PU	
R	
R1-3	
RA	
RB	
RC	
RM	
RP	
RS	
RV	
T	
TC	

SD-30228-01
CONNECTOR CIRCUIT
COMBINATION TOLL AND LOCAL

DESIG.	OS
A	127-1, 139-1, 221-1
B	
C	
D	
E	
F	221-1
G	
H	127-1, 139-1, 221-1
J	
K	

SD-31681-01
INTERTOLL TRANSMISSION
SELECTOR CIRCUIT

DESIG.	OS
A	127-1, 139-1, 221-1
B	
C	
D	
E	
F	
G	
H	
K	
S	
T	127-1
Y	221-1

SD-31841-01
TOLL TRANSMISSION
SELECTOR CIRCUIT

DESIG.	OS
A	127-1, 139-1
B	
C	
D	
E	
F	
G	
H	
J	
K	
M	
P	
R	
T	
Y	139-1

ISSUE	1	WAD	
DATE	1-18-52		

R.G.B.

INDEX OF RELAYS, ETC. ON SD'S & OS'S		
SD-12900-01,	ISSUE	19
SD-21115-01,	ISSUE	24
SD-25302-01,	ISSUE	20
SD-30228-01,	ISSUE	25
SD-31681-01,	ISSUE	26
SD-31841-01,	ISSUE	26

SD-12900-01
TYPE E TRUNK EQUIPMENT
INCOMING TRUNK CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A	148-1, 150-1, 152-1
BR	
C	
C1	
GC	
I	
L	
L1	
LS	
R	
RC	
RP	
RV	
S	
SL	
ST	
TP	

SD-21115-01
INCOMING SELECTOR CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A	
D	
L	148-1, 152-1, 153-1
R	
RS	
T	
TC	
TD	
TM	
TS	

SD-25302-01
INCOMING TRUNK CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A	148-1, 152-1, 153-1
CN	
D	
D1	
F	
F1	
MC	
PU	
R	
R1-3	
RA	
RB	
RC	
RM	
RP	
RS	
RV	
T	
TC	

SD-30228-01
CONNECTOR CIRCUIT
COMBINATION TOLL AND LOCAL

<u>DESIG.</u>	<u>OS</u>
A	127-1, 139-1, 221-1
B	
C	
D	
E	
F	221-1
G	
H	127-1, 139-1, 221-1
J	
K	

SD-31681-01
INTERTOLL TRANSMISSION
SELECTOR CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A	127-1, 139-1, 221-1
B	
C	
D	
E	
F	
G	
H	
K	
S	
T	127-1
Y	221-1

SD-31841-01
TOLL TRANSMISSION
SELECTOR CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A	127-1, 139-1
B	
C	
D	
E	
F	
G	
H	
J	
K	
M	
P	
R	
T	139-1
Y	

ISSUE	I	WAD
DATE	1-18-52	

R.S.B.

INDEX OF RELAYS, ETC. ON SD'S & OS'S		
SD-12900-01,	ISSUE	19
SD-21115-01,	ISSUE	24
SD-25302-01,	ISSUE	20
SD-30228-01,	ISSUE	25
SD-31681-01,	ISSUE	8
SD-31841-01,	ISSUE	6

SD-55392-01
1000- CYCLE SIGNAL RECEIVING CIRCUIT

<u>DESIG.</u>	<u>OS</u>
DC	222-1

SD-55393-01
CUT-OFF RELAY CIRCUIT
FOR 1000- CYCLE SIGNAL
RECEIVING CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A	
CO	
N	
R	222-1
T	

SD-56202-01
1600- OR 2000- CYCLE
SINGLE FREQUENCY SIGNALING CIRCUIT

<u>DESIG.</u>	<u>OS</u>
CO	
F	
GR	
HL	
M	
R	
RF	
RG	122-1, 222-1
RR	
S	
SR	
T	

SD-62614-01
RD INTERTOLL TRUNK CIRCUIT

<u>DESIG.</u>	<u>OS</u>
BS	222-1
I	222-1
IA	
LI	222-1
LU	222-1
O	222-1
OS	
R	222-1
RS	
S	222-1
SC	222-1
SF	222-1
T	
TBT	
TCO	
TS	

SD-62632-01
AUXILIARY INTERTOLL TRUNK
AND SWITCHING TRANSMISSION PAD CIRCUIT

<u>DESIG.</u>	<u>OS</u>
D	
P	222-1
P1	222-1

SD-64590-01
TRUNK CIRCUIT
INCOMING TO INTERTOLL SELECTOR CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A	127-1, 139-1, 221-1
AN	221-1
B	
B1	
PC	221-1

ISSUE 1 WAD
 DATE 1-18-52
 R.B.

INDEX OF RELAYS, ETC. ON SD'S & OS'S		
SD-55392-01,	ISSUE	13
SD-55393-01,	ISSUE	13
SD-56202-01,	ISSUE	6
SD-62614-01,	ISSUE	31
SD-62632-01,	ISSUE	24
SD-64590-01,	ISSUE	9

NO. 4A TOLL

SD - 68018 - 01

OUTGOING SENDER CIRCUIT - REVERTIVE AND PCI

DESIG.	LOCATION	
	OS	SD
0-6	149-1	J5-
1'-6'	149-1	I5-
AR	154-1, 154-2	A40, D40, A34
AV	149-1, 150-1, 151-1, 153-1	G9
AV1	149-1, 152-1, 153-1	F5
AV2	152-1, 153-1	F5
BO'	149-1, 152-1, 153-1	I9
CH	154-1	A41
CI	146-1	E29
CI1, 2	148-1	I29
CI3	148-1	A25
CIA	146-1	B30
CLA	146-1	D28
CLB	146-1	E27
CLF	153-1	E26
CLK	146-1	D27
CO	146-1	E28
CP	149-1	E7
CR	146-1	G29
CT	152-1	B28
CTR	154-1, 154-2	A42, E42
DR	129-1, 141-1, 147-1	I24
DT	146-1	F34
FC	147-1	K15
FL	147-1	K16
FO'	149-1, 152-1, 153-1	I9
FO1-3	152-1	G7-

DESIG.	LOCATION	
	OS	SD
FP	150-1, 151-1	J24
FS	148-1	F4
GCO	146-1	H29
GR	150-1	J25
H	151-1	E19
H'	151-1	E18
H1, 2, 4, 5	147-1	F11-
HC	147-1	E15
HL	147-1	E17
HLA	147-1	B29
HSS	154-2	A36, E41
IA	149-1, 153-1	F6
IG	147-1	D15
KC1	129-1, 141-1, 147-1	H25
KKC	147-1, 153-1	B24
KR	147-1, 153-1	H24
KR1	147-1, 153-1	H24
LR	146-1	B29
MB	114-1, 154-1, 154-2	A22
O	152-1, 153-1	J9
O5	146-1	G29
OF	148-1, 149-1, 152-1, 153-1	F7
OF1-3	149-1, 152-1, 153-1	G4-
ON	146-1	E22
ON1, 2	146-1	B28-
ONA	146-1	B26

DESIG.	LOCATION	
	OS	SD
OT	151-1	E16
OT1	151-1	K15
OT2	147-1	K16
PC	147-1	H22
PC1	147-1	H22
PG	150-1	I26
PG1-3	150-1	I24-
PR	151-1	J27
PS	150-1	I27
PT	151-1	J26
PX	146-1	G28
R	152-1, 153-1	J3
RC	149-1	J10
RC0-2	152-1, 153-1	I3
RCA	146-1	D29
RM	146-1, 147-1	G25
RO	153-1, 154-1, 154-2	B27
RP	146-1, 147-1	G26
RPT	153-1	E25
RS	146-1, 147-1	G26
S	106-1, 112-1, 112-2, 146-1	D22
S1-6	149-1	B5-
S1'-6'	149-1	D5-
SA	153-1	E23
SB	146-1	C22
SP	146-1	D24
SP1, 2	129-1, 141-1	D23
SPA	146-1	D26
SPK	146-1	D25
SSR	154-1, 154-2	A23
ST	147-1	E24

DESIG.	LOCATION	
	OS	SD
ST1, 2, 4, 5	147-1	I12-
STA	151-1	C19
STA'	151-1	C18
STB	151-1	I19
STB'	151-1	I18
STC	147-1	I15
STD	151-1	J14
STE	151-1	K12
STF	151-1	K14
STL	147-1	I17
STP	149-1, 152-1, 153-1	F8
T	151-1	G19
T'	151-1	G18
T1, 2, 4, 5	147-1	G12-
TC	147-1	G15
TG	148-1	F9
TG1-3	148-1	B27 I28
TH	151-1	D19
TH'	151-1	D18
TH1, 2, 4, 5	147-1	C12-
TH1', 2', 4', 5'	147-1	D12-
THC	146-1, 147-1	B15
THE	151-1	E11
THF	151-1	D17
THL	146-1, 147-1	B17
TL	147-1	G17
TM	129-1, 141-1, 146-1, 147-1	G24
TM1-10	154-1, 154-2	A24-
TP	129-1, 141-1 146-1, 147-1	G23

INDEX OF RELAYS, ETC. ON SD'S & OS'S
SD - 68018 - 01, ISSUE 28

RM 1 - 3 2 SHEETS, SHEET 1 NO. 4A OR 4M TOLL

BELL TELEPHONE LABORATORIES, INC.

ORDER AS BSP ITEM MP-11775

PRINTED IN U.S.A.

ISSUE	1	WAD	2/28/52
DATE	1-18-52	1/2-22-59	

2 SHEETS, SHEET 1

MP-11775

R.B.B.

MP-11775

2 SHEETS, SHEET 2

ISSUE 1	WAD 2	R.B.B.
DATE 1-18-52	1-22-53	

SD-68018-01

OUTGOING SENDER CIRCUIT - REVERTIVE AND PCI

DESIG.	LOCATION	
	OS	SD
TR	146-1	G22
TS	129-1, 141-1, 146-1, 147-1	G23
TST		K8
TST1		K9
U	151-1	H19
U'	151-1	H18
U1, 2, 4, 5	147-1	H12-
UC	147-1	H15
UL	147-1	H17
WA	154-1, 154-2	B25
WA1	154-1, 154-2	B26
XBR	146-1	G28

INDEX OF RELAYS, ETC. ON SD'S & OS'S
SD-68018-01, ISSUE 28

SD-68020-01

INCOMING LINK AND CONNECTOR CIRCUIT

<u>DESIG.</u>	<u>OS</u>
SEE SD-68393-01, ISSUE 4	

SD-68022-01

OUTGOING LINK AND CONNECTOR CIRCUIT

<u>DESIG.</u>	<u>OS</u>
SEE SD-68394-01, ISSUE 3	

SD-68027-01

TRUNK BLOCK CONNECTOR CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A	
AL	198-1
CB	198-1
CH	198-1
GCO, 1	200-1
JB	
JH	
JH1	
JR	
MCA	198-1
MCB	198-1
MP	198-1, 218-1
R	
TBA0-9	199-1
TBB0-9	199-1

ISSUED	WAD
DATE	1-18-52

R.B.B.

SD - 68028 - 01
LINK CONTROLLER CIRCUIT

DESIG.	OS	DESIG.	OS	DESIG.	OS	DESIG.	OS
A	109-1, 109-2	E	109-1, 109-2	P	110-1	T	109-1, 109-2
AA	109-1, 109-2	EA	109-1, 109-2	P0-5	104-1	T0-29	108-1, 108-2
AL1	115-1	EP	104-1	PA	107-1, 107-2	TBR	113-1, 228-1
AP	104-1	FR1-4	113-1	PAO	110-1	TC	108-1, 108-2
AR	105-1	G	105-1	PB	107-1, 107-2	TC0-5	228-1
AR1	105-1	G0-9	105-1	PBO	110-1	TC6	228-1
AS	107-1, 107-2	GE	105-1	PC	107-1, 107-2	TE	107-1, 107-2
AT	109-1, 109-2	GR	106-1	PCA		TR	104-1, 113-1
B	109-1, 109-2	GX	105-1	PG	107-1, 107-2	TR1-3	113-1
BA	109-1, 109-2	GX1	105-1	PR		TR4	
BP	104-1	HA	108-1, 108-2	PSA	110-1	TRC	107-1, 107-2
BS	107-1, 107-2	HB	108-1, 108-2	PSB	110-1	TRL	115-1, 228-1
BT0-5	108-1, 108-2	HM	112-1, 112-2, 121-1, 134-1	PU	115-1	TST	109-1, 109-2
C	109-1, 109-2	HO	112-1, 112-2	PX	110-1	TT	113-1
CA	109-1, 109-2	HP	104-1	PX1	110-1	TT(Tube)	113-1
CK	107-1, 107-2	HT	108-1, 108-2	R1	112-1, 112-2	UC	107-1, 107-2
CL	107-1, 107-2	HX	108-1, 108-2	R2	107-1, 107-2	UM	111-1
CLO	107-1, 107-2	L	106-1, 112-1, 112-2	RC	109-1, 109-2		
CO	228-1	L0-9	106-1, 112-1, 112-2	RL	107-1, 107-2		
CP	104-1	LC	107-1, 107-2	RP			
CT	104-1	LE	106-1	RP1			
CTT		LM	111-1	RS	228-1		
CTT1		LN	106-1, 112-1, 112-2	RT	104-1, 107-1, 107-2		
D	109-1, 109-2	LR	113-1	SAO	111-1		
DA	109-1, 109-2	MA	115-1	SBO	111-1		
DA1,2	103-1, 104-1	MB	103-1, 104-1, 113-1	SC	106-1, 112-1, 112-2, 121-1, 134-1, 146-1		
DA3	104-1	MCB	104-1	SD, SD1			
DG	113-1, 114-1	NX	104-1, 113-1	SNO	110-1		
DG1	113-1	OD	106-1	SSA	110-1		
DL	107-1, 107-2	ON	104-1	SSB	110-1		
DP	104-1	OT	107-1, 107-2	ST	106-1		
DR	110-1, 113-1			SX	111-1		
DT(Tube)	109-1, 109-2			SX1	111-1		
DTC, DTCA	109-1, 109-2						
DU	107-1, 107-2						

ISSUE 1
DATE 1-18-52
R.B.B.

INDEX OF RELAYS, ETC. ON SD'S & OS'S
SD - 68028 - 01, ISSUE 24

SD - 68056 - 01
DELAY QUOTATION TRUNK CIRCUIT
TOLL SWITCHBOARD NO. 5

<u>DESIG.</u>	<u>OS</u>
F	226-1
L	226-1
L1	226-1
S	226-1
S1	226-1
ST	226-1

SD - 68060 - 01 (CONTD.)
TRAFFIC REGISTER CIRCUIT

<u>DESIG.</u>	<u>OS</u>
J	
K	
L	
LD	
LD(M.R.)	
M	
N	114-1
OFL(M.R.)	
P	114-1
PC(M.R.)	
PC(KS-7495 MAG. COUNTER)	
PD(M.R.)	153-1
PH	113-1
PS(M.R.)	
R(M.R.)	
SGB	114-1
TC	
TC(M.R.)	
TD	
W	113-1
Z	113-1

SD - 68119 - 01
FRAME IDENTIFICATION
FREQUENCY SUPPLY CIRCUIT

<u>DESIG.</u>	<u>OS</u>
0-9	
A	223-1
A1-2	223-1
AA	223-1
AF	223-1
AL	223-1
AM	223-1
AT	223-1
AT(MAG.)	
AT1-3	
AT1(MAG.)	
B1-4	
BC0,1(Fig.19)	223-1
C0-4	
CK	
CK(MAG.)	
CK1,2	
E1,2	223-1
ET	223-1
F1-4	
IT10-3	223-1
IT00-3	223-1
MK	206-1, 223-1
MK1	223-1
PF	223-1
R	223-1

SD - 68119 - 01 (CONTD.)
FRAME IDENTIFICATION
FREQUENCY SUPPLY CIRCUIT

<u>DESIG.</u>	<u>OS</u>
R1,2	223-1
RA	223-1
RL	223-1
SA	223-1
SR	223-1
SW	
SW1	
T	223-1
TCI0-3	
TC00-3	
U	
U1,2	

SD - 68060 - 01
TRAFFIC REGISTER CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A	113-1, 153-1
A1	113-1
AL	113-1, 114-1
ALM	113-1
B	
B1	113-1
C	
D	
DA(M.R.)	
DL(M.R.)	113-1
F	
G	
GB(M.R.)	114-1
GBT(M.R.)	
H	

ISSUE 1 WAD
 DATE 1-18-52
 R.B.B.

SD-68221-01
DIAL PULSE INCOMING SENDER CIRCUIT

DESIG.	LOCATION	
	OS	SD
5BD	121-1	D44
6DT	167-1	G32
20C	193-1	A88
20C1	131-1, 143-1	C89
A $\frac{2}{5}$	123-1	D52-
ACT	130-1, 224-1	F97
ADR	123-1	C32
AS	123-1	B52
ASO	126-1	C73
AV	126-1	E35
AV1	126-1	E35
B $\frac{2}{5}$	123-1	D52-
BD	125-1	C97
BS	123-1	B52
BSO	126-1	C74
C $\frac{2}{5}$	123-1	D53-
CA	125-1	A61
CA1	125-1	B61
CA4-6	124-1, 158-1	E33-
CA4A, 5A	124-1	G33-
CB	125-1	A62
CB1	125-1	B62
CC	125-1	A63

DESIG.	LOCATION	
	OS	SD
CC1	125-1	B63
CD	125-1	A65
CD1	125-1	B65
CE	125-1	A66
CE1	125-1	B66
CF	125-1	A66
CF1	125-1	B66
CH	132-1	C46
CH $\frac{2}{5}$	195-1	E61-
CM	121-1	B44
CP	121-1	B44
CRS	121-1	A44
CS	123-1	B53
CSO	126-1	C74
CT $\frac{2}{5}$	195-1	E62-
CTA	132-1, 132-2	D48
CTR	132-1, 132-2	E48
CTS	121-1	A44
CU $\frac{2}{5}$	195-1	E63-
CX	121-1	E38
D $\frac{2}{5}$	123-1	D54-
DC	193-1	B81
DC1, 2	130-1	G74-
DDR	123-1	C33
DE1, 2	125-1	D104-

DESIG.	LOCATION	
	OS	SD
DLC	193-1	C85
DP	125-1	F85
DP1	125-1	G76
DPS	194-1	A75
DRL	124-1, 158-1, 166-1	G103, G106
DRL1	121-1, 124-1	H102, H105
DS	123-1	B54
DSO	126-1	C75
DT		C121
E $\frac{2}{5}$	123-1	D55-
EDR	123-1	C33
EPS	194-1	A76
ES	123-1	B55
ESO	126-1	C76
EV	123-1	B51
EVO	126-1	C71
EX	123-1	B59
EX1	123-1	D59
F $\frac{2}{5}$	123-1	D55-
FDR	123-1	C34
FIF	132-1, 132-2, 178-1, 206-1	F47
FL	131-1	C95
FL1	131-1	E96
FP	126-1	F94
FPP	123-1	E38
FPS	194-1	A76
FS	123-1	B55
FSO	126-1	C76

DESIG.	LOCATION	
	OS	SD
FT	121-1	B45
FT1	121-1	C37
G $\frac{2}{5}$	123-1	D56-
GPS	194-1	A77
GS	123-1	B56
GSO	126-1	C77
H $\frac{2}{5}$	123-1	D56-
HPS	194-1	A77
HS	123-1	B56
HSO	126-1	C77
IS	133-1	F41, H41
IT(Tube)	133-1	F42, H42
ITC	133-1	G41, H41
J $\frac{2}{5}$	123-1	D57-
JPS	194-1	A78
JS	123-1	B57
JSO	126-1	C78
K $\frac{2}{5}$	123-1	D58
KD	129-1	B92
KP	125-1	F83
KS	123-1	B58
KSO	126-1	C78
L	123-1, 221-1, 222-1	B41
L $\frac{2}{5}$	123-1	D59-
LA-E	123-1	B41-

INDEX OF RELAYS, ETC. ON SD'S & OS'S
SD-68221-01, ISSUE 17

RM 1-7 2 SHEETS, SHEET 1

NO. 4A TOLL

BELL TELEPHONE LABORATORIES, INC.

ORDER AS BSP ITEM MP-

PRINTED IN U.S.A.

ISSUE	17
DATE	10-5-53

MP-11779 2 SHEETS, SHEET 1

MP-11779

2 SHEETS, SHEET 2

ISSUE 2 GRS
DATE 10-5-53

SD-68221-01

DIAL PULSE INCOMING SENDER CIRCUIT (CONT.)

DESIG.	LOCATION		DESIG.	LOCATION		DESIG.	LOCATION		DESIG.	LOCATION	
	OS	SD		OS	SD		OS	SD		OS	SD
LIT	121-1	D44	OP	128-1, 129-1	C93	RA1	121-1, 123-1	D40	SXR1	131-1	C89
LP	121-1	E38	OP1, 2	128-1, 129-1	C94-	RCG	132-1, 132-2	C48	SY	126-1	F96
LPD	193-1	B84	OSC	126-1	C80-	RCT	128-1, 131-1, 132-2	B48	T1	129-1	C93
LPS	194-1	A79	OT(Tube)	133-1	G123	RO	132-1, 132-2	D46	TC3, 5	125-1	E86
LR	123-1	E37	OTC	133-1	G123	ROR	128-1, 131-1	E47	TCA	125-1	E85
LS	123-1	B59	OTS	133-1	G123	RR $\frac{2}{5}$	125-1	G71-	TG	127-1, 128-1	C99
LSO	126-1	C79	P	125-1	B101	RS	121-1	D45	TG1	131-1	C98
LSS	131-1	B88	P1-6	123-1	A42-	RSS	132-2	C129	TGT	131-1	E97
M	193-1	B80	P1A	123-1	A43	RT	121-1	C43	TGT1	131-1	E98
MB	114-1	B34	P6A	123-1	B42	RT $\frac{2}{5}$	125-1	F71-	TI	178-1, 220-1	G121
ME	125-1, 132-1	E35	PA	125-1	C103	RTA	123-1	B43	TKS	125-1, 170-1, 172-1, 202-1	C87
MF	193-1	B82	PAO	126-1	C71	S	106-1, 112-1, 112-2, 121-1	D36	TKS1, 2	125-1	D87-
MF1-3	130-1	E83, F74-	PB	125-1	C103	S1	121-1	C36	TM0-6	132-2	E126
MFT	128-1	D93	PBO	126-1	C72	SA	129-1	D92	TM0-9	121-1, 132-1	A47-
MRL	158-1, 178-1, 217-1	G104 H106	PC	125-1	D107	SA1	129-1	E92	TMA	132-2	E126
MRL1	178-1, 217-1	F32	PC1-6	125-1	A103-	SAR		E81	TMB	132-2	E126
MS	124-1, 132-1, 132-2	D31	PCK	125-1	A101	SAR1, 2		F81	TMR	132-2	E126
MS1, 2	121-1, 124-1, 132-1, 132-2	C31-	PCO	126-1	C73	SG1, 2	131-1	C86-	TMS	132-2	E126
MSO	126-1	C79	PD	125-1	C104	SK3, 6	194-1	A61-	TNI	114-1	G121
MT	216-1	E44	PE	125-1	C104	SL	127-1, 128-1, 129-1, 131-1	D93	TR	132-2	C123
NSK	194-1	A67	PFX/PFXB	125-1	D78	SL1	128-1, 129-1	D92	TRL	132-1, 132-2, 158-1, 178-1, 220-1	E33
NV	121-1	D44	PFX1/PFXA	125-1	C78	SP	121-1, 221-1, 222-1	E36	TRM	121-1	C44
NV1	121-1	D43	PFXC	125-1	B78	SP1	121-1	D37	TRP	121-1	C44
OD	123-1	B51	PG	125-1	E101 G101	SR	123-1	A41	TS	121-1	C45
ODO	126-1	C80	PG1	125-1	C100	SR1	123-1	A41	TST		A35
OF	127-1, 128-1	C99	PP	126-1	C91	SRM	132-2	C128	TST1		A36
OF1	128-1, 131-1	C97	PP'	126-1	C90	SST	127-1, 133-1	D31	VO	121-1	D45
ON	121-1	G37	PS	126-1, 129-1	F96	SST1	127-1	C91	W	125-1	D104
ON1	121-1	E37	R	131-1	B89	SXD	193-1	B83	WR	125-1	E103
			R1	129-1	C93	SXR	193-1	A89	XDD	193-1	C86
			RA	123-1	E41				XSG	193-1	C87
									Z	125-1	E103

INDEX OF RELAYS, ETC. ON SD'S & OS'S
SD-68221-01, ISSUE 17

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U.S.A.

NO. 4A TOLL

2 SHEETS, SHEET 2

RM 1-7

ORDER AS BSP ITEM MP-11779

SD-68222-01

MF INCOMING SENDER CIRCUIT

DESIG.	LOCATION		DESIG.	LOCATION		DESIG.	LOCATION		DESIG.	LOCATION	
	OS	SD		OS	SD		OS	SD		OS	SD
5BD	134-1	F32	CC	137-1	A53	DRL	136-1, 158-1, 166-1	G93 G96	H $\frac{2}{5}$		E47-
10A	135-1, 135-2	D41	CC1	137-1	C53	DRL1	134-1, 136-1	H92 H95	HS	135-1, 135-2	C47
20C	193-1	A78	CD	137-1	A54	DS	135-1, 135-2	C44	HSO	138-1	B67
20C1	143-1	C79	CD1	137-1	C54	DSO	138-1	B65	J $\frac{2}{5}$		E47-
A $\frac{2}{5}$	135-1, 135-2	E42-	CE	137-1	A55	DT		C108	JS	135-1, 135-2	C47
ACT	142-1	F87	CE1	137-1	C55				JSO	138-1	B67
ADR	135-1, 135-2	C32	CF	137-1	A56	E $\frac{2}{5}$		E45-	K $\frac{2}{5}$	135-2	E48-
AS	135-1, 135-2	C42	CF1	137-1	C56	EDR	135-1, 135-2	C31	KD	141-1	B82
ASO	138-1	B63	CH	144-1	B38	ES	135-1, 135-2	C45	KP	137-1	F73
AV	138-1, 141-1	D33	CH $\frac{2}{5}$	195-1	F51-	ESO	138-1	B65	KS	135-1, 135-2	C48
AV1	138-1	D33	CM	134-1	F37	EV	135-1, 135-2	B41	KSO	138-1	B68
B $\frac{2}{5}$	135-1, 135-2	E43-	CP	134-1	F37	EV1	135-1, 135-2	C41	L $\frac{2}{5}$	135-1, 135-2	E49-
BD	137-1	C87	CS	135-1, 135-2	C43	EVO	138-1	C61	LIT	134-1	G37
BS	135-1, 135-2	C43	CSO	138-1	B64	F $\frac{2}{5}$		E45-	LPD	193-1	B74
BSO	138-1	B64	CT $\frac{2}{5}$	195-1	E52-	FDR	135-1, 135-2	C31	LS	135-1, 135-2	C49
C $\frac{2}{5}$	135-1, 135-2	E43-	CTA	144-1, 144-2	B38	FIF	144-1, 144-2, 178-1 206-1	C38	LSO	138-1	B68
CA	137-1	A51	CTR	144-1, 144-2	C38	FKP	135-1, 135-2	E41	LSS	143-1	B78
CA1	137-1	C51	CTS	134-1	F36	FL	143-1	C85	M	193-1	B70
CA4-6	136-1, 158-1	D30-	CU $\frac{2}{5}$	195-1	E53-	FL1	143-1	E86	M7	135-1, 135-2	G49
CA4A, 5A	136-1	E30-	D $\frac{2}{5}$	135-1, 135-2	E44-	FP	138-1	F84	MB	114-1	D34
CB	137-1	A52	DC	193-1	B71	FS	135-1, 135-2	C45	ME	137-1, 144-1	F32
CB1	137-1	C52	DC1, 2	142-1	G56 G65	F50	138-1	B66	MF	193-1	B72
			DDR	135-1, 135-2	C30	FT	134-1	E37	MF1-3	14 2-1	F66 F74
			DE1, 2	137-1	D94-	FT1	134-1	E34	MFT	140-1	D83
			DLC	193-1	C75	G $\frac{2}{5}$		E46	MRL	144-1, 158-1, 178-1, 217-1	G94 H96
			DP	137-1	F75	GS	135-1, 135-2	C46			
			DP1	137-1	G67	GSO	138-1	B66			

INDEX OF RELAYS, ETC. ON SD'S & OS'S
SD-68222-01, ISSUE 17

RM 1-8 2 SHEETS, SHEET 1

NO. 4A TOLL

BELL TELEPHONE LABORATORIES, INC.

ORDER AS BSP ITEM MP-11780

PRINTED IN U.S.A.

ISSUE	2	GRS	
DATE	10-8-53		

MP-11780 2 SHEETS, SHEET 1

MF INCOMING SENDER CIRCUIT (CONT.)

DESIG.	LOCATION		DESIG.	LOCATION		DESIG.	LOCATION		DESIG.	LOCATION	
	OS	SD		OS	SD		OS	SD		OS	SD
MRL1	144-1, 178-1, 217-1	E32	PCO	138-1	B62	S1	134-1	D33	TM0-6	144-1, 144-2	G104
MS	136-1, 144-1, 144-2	B33	PD	137-1	C94	SA	141-1	D82	TM0-9	144-1	C39-
MS1, 2	134-1, 136-1, 144-1, 144-2	C32-	PE	137-1	C94	SA1	141-1	E82	TMA	144-2	G104
MSO	138-1	B69	PFX/PFXB	137-1	C57	SAR		E71	TMB	144-2	G104
MT	216-1	C37	PFX1/PFXA	137-1	D57	SAR1, 2		F71	TMR	144-2	G104
MX	135-1, 135-2	C49	PFXC	137-1	D58	SG1, 2	143-1	C76-	TMS	144-2	G104
NSK	194-1	B57	PG	137-1	G91	SK3, 6	194-1	B51 B54	TNI	114-1	B98
NV	134-1	G36	PG1	137-1	G90	SL	139-1, 140-1, 141-1	D83	TP	134-1	E37
NV1	134-1	G37	PLK	128-1, 134-1, 140-1, 222-1	F39	SL1	140-1, 141-1	D82	TR	144-2	G80
OD	135-1, 135-2	B41	PP	138-1	C81	SP	134-1, 222-1	E33	TRL	144-1, 144-2, 158-1, 178-1, 220-1	E32
OD1	135-1, 135-2	D41	PP'	138-1	C80	SP1	134-1	F33	TS	134-1	E36
ODO	138-1	C60	PS	138-1, 141-1	E86	SRM	144-2	D101	TST		B35
OE	135-1, 135-2	B38	R	143-1	B79	SST1	138-1	C81	TST1		B34
OF	139-1, 140-1	C89	R1	141-1	C83	SXD	193-1	B73	VO	134-1	G36
OF1	140-1	C87	RA	135-1, 135-2	C41	SXR	193-1	A79	W	137-1	E94
ON	134-1	D32	RAR		E40	SXR1	143-1	B79	WR	137-1	E93
ON1	134-1	E34	RAR1		E40	SY	138-1	F86	XDD	193-1	C76
OP	140-1, 141-1	C83	RCG	144-1, 144-2	B39	SYN	135-1, 135-2	B41	XSG	193-1	C77
OP1, 2	140-1, 141-1	C84-	RCT	140-1	B39	T1	141-1	C83	Z	137-1	E93
OSC	138-1	B60	RO	144-1, 144-2	E38	TC3, 5	137-1	E76			
OT(Tube)	145-1	H98	ROR	135-1, 135-2, 140-1	E38	TCA	137-1	E75			
OTC	145-1	F98	ROR1	144-1, 144-2	F38	TEN	135-1, 135-2	C40			
OTS	145-1	G98	RR $\frac{2}{5}$	137-1	H62-	TG	139-1, 140-1	C89			
P	137-1	B91	RSS	144-2	C101	TG1	143-1	C88			
PA	137-1	C93	RST	135-1, 135-2	F41	TGT	143-1	E87			
PAO	138-1	B61	RST1, 2	135-1, 135-2	F40-	TGT1	143-1	E88			
PB	137-1	C93	RT	134-1	D37	TI	178-1, 220-1	A99			
PBO	138-1	B62	RT $\frac{2}{5}$	137-1	F62-	TKS	137-1, 170-1, 172-1, 202-1	C75			
PC	137-1	D95	S	106-1, 112-1, 112-2, 134-1	D34	TKS1, 2	137-1	E76-			
PC1-6	137-1	B93-				TM	134-1	E37			
PCK	137-1	A91									

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SD-68222-01, ISSUE 17

ISSUE WAD
DATE 7-18-52
R.B.B.

SD-68231-01
OUTGOING INTERTOLL TRUNK CIRCUIT
DP OR MF CX SIGNALING

DESIG.	OS
G	221-1
LO	127-1, 131-1, 139-1, 143-1, 216-1, 221-1
OS	127-1, 139-1, 216-1, 221-1
R	127-1, 139-1, 216-1 221-1
SL	127-1, 131-1, 139-1, 143-1, 216-1, 221-1
SVP	127-1, 139-1, 221-1

SD-68232-01
2-WAY INTERTOLL TRUNK CIRCUIT
DP INCOMING

DESIG.	OS
CO	121-1
G	101-1, 122-1, 203-1, 222-1
IR	
LC	101-1, 122-1
LO	128-1, 222-1
OS	128-1, 203-1, 222-1
OS1	128-1, 203-1, 222-1
R	128-1, 222-1
SL	128-1, 222-1
SP	121-1
SVP	101-1, 122-1, 128-1, 222-1
TM(Tube)	101-1, 222-1

SD-68233-01
2-WAY INTERTOLL TRUNK CIRCUIT
MF INCOMING

DESIG.	OS
CO	134-1, 222-1
G	
IR	
LC	128-1, 140-1, 222-1
LO	128-1, 140-1, 222-1
OS	140-1
OS1	140-1
R	128-1, 140-1, 222-1
SL	140-1
SP	134-1, 222-1
SVP	128-1, 134-1, 140-1, 222-1

TM(Tube)

SD-68234-01
OUTGOING AUX. INTERTOLL TRUNK

DESIG.	OS
G	
LO	
OS	
R	222-1
SL	
SM	
T	
V(Tube)	

SD-68237-01
INCOMING TRUNK CIRCUIT
FROM NO. 3, 3C OR 3CL SWITCHBOARD

DESIG.	OS
CO	134-1
R	
S	134-1
S1	134-1
SP	134-1
SV	134-1

SD-68242-01
TOLL SWITCHING TRUNK CIRCUIT
DP OR MF

DESIG.	OS
S	127-1, 139-1, 216-1
SL	127-1, 139-1, 216-1

INDEX OF RELAYS, ETC. ON SD'S & OS'S

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SD-68237-01,	ISSUE	3
SD-68242-01,	ISSUE	7

ISSUE 1 WAD
DATE /-8-52
R.B.B.

SD-68285-01
PAD SWITCHING CIRCUIT

DESIG.	OS
PA	221-1, 222-1
PB	
PC	

SD-68315-01
TOLL TANDEM TRUNK CIRCUIT - DP

DESIG.	OS
CO	121-1, 221-1, 222-1
H	101-1, 221-1, 222-1
L	101-1, 221-1, 222-1, 226-1
LU	221-1, 222-1
R	
R1	
SP	121-1, 221-1, 222-1
SV	221-1, 222-1, 226-1

SD-68326-01
TOLL SWITCHING TRUNK CIRCUIT
RP PCI OR DIAL PULSING

DESIG.	OS
CO	146-1
FD	
G	129-1, 141-1
OS	129-1, 141-1
RF	129-1, 141-1
RO	129-1, 141-1, 154-1
S	
S1	
SL	129-1, 141-1
SP	146-1

SD-68334-01
SENDER LINKAND CONNECTOR CIRCUIT

DESIG.	OS
A	101-1
AL	101-1
AR1,2	104-1
B	101-1
CA	103-1
CB	103-1
CC	103-1
D0-9	106-1
DT0-9	109-1, 109-2
EA	101-1
EB	101-1
FC0-9	105-1
L-	101-1, 102-1
LC-	102-1, 103-1
MC	102-1, 103-1
P(Hold)	106-1, 108-1, 108-2, 112-1, 112-2, 121-1, 134-1, 146-1
P'(Hold)	108-1, 108-2, 112-1, 112-2, 121-1, 134-1, 146-1
P(Sel)	110-1
P'(Sel)	
PC	101-1
PF	101-1
PU	101-1
RA	104-1
S(Hold)	106-1, 108-1, 108-2, 112-1, 112-2, 121-1, 134-1, 146-1
S'(Hold)	108-1, 108-2, 112-1, 112-2, 121-1, 134-1, 146-1
S(Sel)	111-1
S'(Sel)	111-1
SC0-9	105-1
SGB	113-1, 114-1
ST0-9	101-1, 106-1, 128-1, 140-1, 146-1
TC	101-1
TL-	107-1, 107-2
TM	101-1
TM1	101-1, 104-1
TU-	107-1, 107-2

SD-68336-01
CONTROLLER CONNECTOR CIRCUIT

DESIG.	OS
AL	104-1
B1,2	103-1, 104-1
CA1,2	103-1
CB1,2	103-1
CBR	104-1
CBT	103-1
CC1,2	103-1
CR	104-1
CS	103-1
CSA	103-1
LA1	102-1, 103-1
LA2	103-1
OC	104-1
PC1,2	104-1
PU	104-1
TC	

SD-68339-01
DECODER CONNECTOR CIRCUIT

DESIG.	OS
ADB	157-1
CA1	155-1
CA2-6	157-1
CB	155-1, 179-1
CF	158-1, 174-1
CHK	177-1
DC	155-1
DC1	155-1
DP	155-1, 156-1
GR	158-1
GR1	158-1
GR2-4	155-1, 158-1
GRA	155-1
GS	155-1
GT	156-1
GT1	156-1
MC	177-1, 188-1, 188-2
RLT	158-1, 177-1
RLT1	177-1
RO	174-1, 178-1, 220-1
RO1	174-1, 178-1, 220-1
SC	155-1
SC1	155-1
SMB	114-1
SP	124-1, 136-1, 155-1, 157-1
TI	178-1, 220-1
TR	158-1, 178-1, 220-1
TR1	174-1, 178-1, 220-1

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SD - 68340 - 01
 DECODER CIRCUIT

LOCATION			LOCATION			LOCATION			LOCATION		
DESIG.	OS	SD	DESIG.	OS	SD	DESIG.	OS	SD	DESIG.	OS	SD
3D	136-1	D41	CA6	164-1	A43	DA1, 2	155-1	F166-G192	HTR	160-1, 161-1	B128
3DB	162-1	E85	CAH	163-1	C42	DA3	160-1	F166-F191	IT	164-1	B64-C197
5BD	160-1	F41	CAK	166-1	F47	DBS	165-1	G108	IT1	168-1	D66-D197
6D	136-1	C41	CBR-W	155-1, 179-1, 184-1	D167	DBS1-4	165-1	C101-C108-	IT2	168-1	D66-D197-E68
6DA	124-1, 136-1, 160-1	C42	CC	170-1	A51	DCB	170-1, 172-1	D55	ITC	164-1	B65
6DB	162-1	E84	CC1-5	161-1	B91-	DCB1, 2	170-1, 172-1	D56-	MBU $\frac{2}{5}$	164-1	C104-
6DT	167-1	D47	CCA	161-1	C74	DCBA	170-1, 172-1	D50	MCCH	176-1	B95
AC	164-1	E92	CCH $\frac{2}{5}$	164-1	B95-	DFB	165-1, 184-1	A47	MCCT	176-1	D95
AFA	164-1	E93	CCHN	164-1	B98	DFE	184-1	B47	MCCU	176-1	F95
AHA	164-1	E92	CCM	163-1	G93	DFTR	161-1	B138	MD	168-1, 179-1	D142
ARB	162-1	E92	CCT $\frac{2}{5}$	164-1	D95	DL	228-1	C153	MD(Tube)	179-1	D142
ARS	173-1	G53	CCTN	164-1	D98	DRL	166-1	G53	MD1	179-1	E142
ARST	171-1	E76	CCU $\frac{2}{5}$	164-1	F95-	FAT	163-1	C43	ME	168-1	F66 B68-G196
ART $\frac{2}{5}$	164-1	A111-	CCUN	164-1	F98	FATH	163-1	C43	MKR	163-1	A62
ARU $\frac{2}{5}$	164-1	A114-	CDC $\frac{2}{5}$	164-1	F170-	FC2-15	161-1	F131-	NAC	164-1	E94
ATB	170-1, 172-1, 202-1	G51	CFM	160-1, 174-1	D84	FMB	167-1	A54	NC	174-1, 175-1	D85
BD	179-1	B77-B71	CFR	163-1, 174-1	H155	FNT		F102	NCA	164-1	A43
BNA-F	165-1	A103-	CFR1, 2	174-1	H155-	FOF	167-1	A54	NCT	162-1, 175-1	C83
BT0-1	164-1	C103	CI0-5	171-1, 173-1	B74	FRO	167-1	A55	NCT1	174-1, 175-1	C86
BU $\frac{2}{5}$	165-1	D103-	CK1-3	160-1	E41-	FST	167-1	A56	NPCR	165-1	F102
BU $\frac{2^1}{5}$	165-1	G103-	CKG	155-1	G48	FTD	179-1	D143	NRO	132-1, 144-1, 160-1	D61
CA	163-1	C43	CKG1	155-1	E47	FTD (Tube)	179-1	D143	NSK	176-1	A94
CA4	164-1	A41	CKG2	155-1	G44	FTD1	179-1	E143	NVO	162-1	A58
CA5	164-1	A42	CO	173-1	C75	GO-3			OAT	179-1	D146
			COP1, 2	163-1, 185-1	E83-	GB	173-1	E74-	OAT1	179-1	E146
			CR	171-1	A52	GPL	173-1	E73	OC	160-1, 163-1	F127
			CR0-9	171-1	E111-	HB		G75	OC1-10	163-1	G120-
			CRA	171-1	B51	HBA	164-1	C44	OCT		C163
			CRK	173-1	G73	HBI	167-1	E44	OFPCR	196-1	C75
			CRP	171-1	C111	HC1-16	172-1	D54	OGT		D161
						HE	184-1	E120-	ORF	162-1	F61
						HTK	161-1	B47			
								B48			

INDEX OF RELAYS, ETC. ON SD'S & OS'S
 SD - 68340 - 01, ISSUE 8

FORM 1 - 11 2 SHEETS, SHEET 1
 ORDER AS BSP ITEM MP- 11783

NO. 4A OR 4M TOLL

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U.S.A.

ISSUE	1	WAD	2	1-18-52
DATE	1-18-52	12-22-52		

MP- 11783 2 SHEETS, SHEET 1

ISSUE 1	WAD 2	M.N.
DATE 1-16-52	12-22-53	
R.B.B.		

SD - 68340 - 01
DECODER CIRCUIT

DESIG.	LOCATION	
	OS	SD
PCR	165-1	G102
PCR1	165-1	B108
PCR2	165-1	F108
PCR3	165-1	B101
PCR4	165-1	F101
PF	160-1	F42
R00-99	171-1, 173-1	A74
R6D	167-1	D46
R6D1	167-1	D44
RA	160-1, 170-1	D51
RA1-3	170-1	D52-
RAMB	171-1, 173-1	G54
RARO	173-1	G55
RAV0-5	173-1	B76
RAV0'-5'	173-1	B76
RB0-5	173-1	B75
RC	228-1	A184
RC1	228-1	A186
RC2	228-1	A188
RCA	167-1, 170-1, 172-1	D57
RCA1	170-1, 172-1	D58
RCC	163-1	H47
RCD	167-1, 172-1	G52
RCRR	173-1	G76
REC	228-1	C152
RHC	167-1	E48
RI	163-1	D48
RI $\frac{2}{5}$	164-1	A170-
RIH	163-1	D47
RLS	173-1	D76
RLT	166-1, 177-1	G50
RO	132-1, 144-1, 160-1, 174-1	B61
ROIT	168-1	D65

DESIG.	LOCATION	
	OS	SD
ROMB	173-1, 191-1	G56
ROTC	168-1	E65, F195
RR	171-1	A53
RR0-9	171-1	F111-
RRA	171-1	A53
RRP	171-1	C112
RT	228-1	A181
RT1	228-1	A183
RTRF	171-1	G158
RYT	179-1	D145
RYT1	179-1	E145
SDT	158-1	G162-G164
SDT1		D163
SMC	168-1	D63
SMC1,2	168-1	D63
SMCO	168-1	C63-C195
SMI	168-1	D63
SMI1,2	168-1	D64
SS	179-1	C64
STI	132-1, 144-1, 160-1	D61
SWT	160-1, 168-1, 179-1	D144
SWT1	179-1	E144
TAL	179-1	E146
TB $\frac{2}{5}$	164-1	B174-
TBD	179-1	D143
TBD(Tube)	179-1	D142
TBD1	179-1	E143
TBY	165-1	D103
TBY1	165-1	E45
TC	164-1	B66, C197
TC1,2	168-1	E66, F197
TCD1,2	176-1	B92-
TCF	169-1	D179

DESIG.	LOCATION	
	OS	SD
TCK	161-1	C58
TCT0-2	164-1	D177-
TCU $\frac{2}{5}$	164-1	A176-
TGS		C75
TID	165-1	E102
TID1	165-1	E44
TKS	170-1, 172-1, 202-1	G54
TPC	164-1	F179
TR	174-1, 179-1, 218-1, 219-1	C154
TR1	179-1	C155
TR2A	160-1, 174-1	F42
TR2B	160-1, 174-1	A46
TR2C	160-1	H41
TRA	179-1	D146
TRB	228-1	C153
TRB1	228-1	C153
TRL	165-1, 174-1, 178-1, 220-1	D157
TRT	179-1	D145
TRT(Tube)	179-1	D145
TRT1	179-1	E145
TS0-2	164-1	F177-
TSA-C	160-1	F174
TSG1-4	180-1	F175-
TST		C156
TST1		C156
VCR1,2	175-1	D86-
VO	162-1	A57
WT(Tube)	179-1	D144
X6DT	167-1	F154
XCA	124-1, 136-1	F157
XCF	174-1	F153

DESIG.	LOCATION	
	OS	SD
XCO	160-1	F157
XDRL	124-1, 136-1, 166-1	F157
XIK	160-1	F156
XREC	228-1	F152
XRLT	177-1	F155
XTRB	178-1, 220-1	F154
XTRL	174-1, 178-1	F153
CB	179-1	E193
CBR1-W1	179-1	B193
CBR2-W2	179-1	B191
HVC	181-1	F86
PRO	181-1, 160-1	G71
RPRO	181-1	G71
RSR	181-1	E71
TR1A	160-1	G41

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SD - 68340 - 01, ISSUE 8

MP-11784

SD - 68341 - 01

TRANSLATOR CONNECTOR CIRCUIT

<u>DESIG.</u>	<u>OS</u>
C	183-1
CO-2	183-1
EMC	183-1
EME	184-1
EME ¹	184-1
EMO	184-1
EMC ¹	184-1
LO	183-1
LO ¹	183-1
P-	183-1

ISSUE	2	REV.	
DATE	9-17-53		

MP-11785

SD-68342-01
CARD TRANSLATOR CIRCUIT

ISSUED GRS
DATE 10-26-53
R.F.C.

DESIG.	LOCATION	
	OS	SD
6DK	162-1	D50
A $\frac{2}{5}$	158-1, 162-1	F36
A $\frac{2}{5}$ (Magnets)	162-1	B38
AC(Tube)	164-1	F31
AFA(Tube)	164-1	F31
AHA(Tube)	164-1	F31
ALM	186-1	E40
ARC	166-1, 167-1, 170-1 172-1, 174-1, 175-1, 177-1	D43
ART $\frac{2}{5}$ (Tubes)	164-1	F31
ARU $\frac{2}{5}$ (Tubes)	164-1	F31
B $\frac{2}{5}$	158-1, 162-1	F36
B $\frac{2}{5}$ (Magnets)	162-1	B38
BTO, 1(Tubes)	164-1	F31
BU $\frac{2}{5}$ (Tubes)	164-1	F31
BZ	186-1	H32
C $\frac{2}{5}$	158-1, 162-1	F36
C $\frac{2}{5}$ (Magnets)	162-1	B38
CA4-6(Tubes)	164-1	F31
CBK	162-1	E44
CCH $\frac{2}{5}$ (Tubes)	164-1	F31
CCHN(Tube)	164-1	F31
CCT $\frac{2}{5}$ (Tubes)	164-1	F31
CCTN(Tube)	164-1	F31

DESIG.	LOCATION	
	OS	SD
CCU $\frac{2}{5}$ (Tubes)	164-1	F31
CCUN(Tube)	164-1	F31
CDC $\frac{2}{5}$ (Tubes)	164-1	F31
CDLC(Tube)	164-1	F31
CGO, 1, 2, 4	162-1	F36
CGO, 1, 2, 4(Magnets)	162-1	B38
CKL		B32
CLTO, 1(Tubes)	164-1	F31
CLU $\frac{2}{5}$ (Tubes)	164-1	F31
CON	161-1	D42
CS1, 2	162-1	F36-
CS1, 2(Magnets)	162-1	B38
CSL	161-1	C44
CSL1, 2(Lifts)	161-1	B34
D $\frac{2}{5}$	158-1, 162-1	F36
D $\frac{2}{5}$ (Magnets)	162-1	B38
DIM		C40
E $\frac{2}{5}$	158-1, 162-1	F36
E $\frac{2}{5}$ (Magnets)	162-1	B38
F $\frac{2}{5}$	158-1, 162-1	F36
F $\frac{2}{5}$ (Magnets)	162-1	B38
GETO, 1(Tubes)	164-1	F31
GEU $\frac{2}{5}$ (Tubes)	164-1	F31
GSTO, 1(Tubes)	164-1	F31

DESIG.	LOCATION	
	OS	SD
GSU $\frac{2}{5}$ (Tubes)	164-1	F31
HB(Tube)	164-1	F31
HE	184-1	F42
IND1, 2	185-1	D41
IND1, 2(Tubes)	185-1	F34
IT(Tube)	164-1	F31
ITC(Tube)	164-1	F31
L1-4(Latches)	161-1	A37
LCH	161-1	C42
MOC		G48
MOC1-4		B48-
NAC(Tube)	164-1	F31
NCA(Tube)	164-1	F31
NSK(Tube)	164-1, 176-1	F31
NVO	158-1, 162-1	F36
NVO(Magnet)	162-1	B38
PD	161-1	C41
PD1-8(Magnets)	161-1	B35
PDS1-8	161-1	A40-
PU1, 2	161-1	C43
PU1-8(Magnets)	161-1	B30
PUS1-8	161-1	A42-
R1, 2(Tubes)	185-1	F35
RD	163-1, 185-1, 186-1	C41
RI $\frac{2}{5}$ (Tubes)	164-1	F31
RT	178-1	G46
RT1-4	178-1	B46-
SA $\frac{2}{5}$	162-1	B51,
SB $\frac{2}{5}$	162-1	B54-
SC $\frac{2}{5}$	162-1	B56

DESIG.	LOCATION	
	OS	SD
SCGO, 1, 2, 4	162-1	G51-
SCS1, 2	162-1	G55
SD $\frac{2}{5}$	162-1	D51-
SE $\frac{2}{5}$	162-1	D54
SF $\frac{2}{5}$	162-1	D56-
SK3(Tube)	164-1, 176-1	F31
SK6(Tube)	164-1, 176-1	F31
SNVO	162-1	G54
SR	162-1, 166-1	E43
SVO	162-1	G53
TB $\frac{2}{5}$ (Tubes)	164-1	F31
TC(Tube)	164-1	F31
TCT0-2(Tubes)	164-1	F31
TCU $\frac{2}{5}$ (Tubes)	164-1	F31
TOS	184-1	H43
TPO-2(Tubes)	164-1	F31
TPC(Tube)	164-1	F31
TS0-2(Tubes)	164-1	F31
VO	158-1, 162-1	F36
VO(Magnet)	162-1	B38

INDEX OF RELAYS, ETC. ON SD'S & OS'S
SD-68342-01, ISSUE 7

SD - 68386 - 01

MISCELLANEOUS CIRCUIT FOR
SENDER MAKE BUSY FRAME

<u>DESIG.</u>	<u>OS</u>
B	132-1, 132-2, 144-1, 144-2
CHS	132-2, 144-2, 154-2
GB	114-1
HSS	154-2
SS (M.R.)	132-1, 132-2, 144-1, 144-2, 154-1, 154-2
SSE	132-1, 132-2, 144-1, 144-2, 154-1, 154-2
TB	154-1, 154-2
TR (M.R.)	113-1
TRE	113-1
WA	154-1, 154-2

ISSUE 1	WAD 2	JBK
DATE /-8-52	/-5-54	

R.B.B. REC.

SD - 68388 - 01
MARKER CIRCUIT

DESIG.	LOCATION		DESIG.	LOCATION		DESIG.	LOCATION		DESIG.	LOCATION	
	OS	SD		OS	SD		OS	SD		OS	SD
ODG	176-1	G85	CHL0-9	212-1	C161-	FG1, FH1	204-1	G131-	JPO-17	210-1	E155
4DG	176-1	G86	CHR0-9	212-1	C162-	FG2, FH2	204-1	G133-	JPN	210-1	F148
5DG	176-1	G86	CHT	212-1	E175	FMB	191-1	C64	K0-39	200-1, 201-1, 203-1	F101
ABL0-9	212-1	F161-	CHTK	212-1	E175	FOF	191-1	C63			
ABR0-9	212-1	F162-	CK	215-1	F174	FOFA	202-1	F63	LCON	216-1	C192
AC	216-1	B171	CKG	188-1, 188-2	F53	FRO	191-1	C65	LPD	193-1	B194
AC1	216-1	C171	CKGA	190-1	F52	FST	191-1	C66	MB	190-1	C64
AK	215-1	C174	CL0-2	193-1	E91-	GCK	200-1	D183			
AK1	215-1	E173	CL5-7	193-1	E93-	GE1-39ODD	192-1, 202-1	B102-	MBR	202-1	F67
ATB	197-1, 201-1	B113	CL8-13	193-1	C94-	GET0-1	164-1	F81-	MFF	206-1	D138
B	216-1	D196	CL14	193-1	E97	GEU $\frac{2}{5}$	164-1	G80-	MFT	206-1	E138
BK	210-1	E174	CLA-C	193-1	G94-	GS0-38EVEN	192-1, 202-1	B101-	MLCT	176-1	B192
BM	188-1, 188-2, 218-1	G116	CLCT	176-1	B193	GST0, 1	164-1	A81-	MSC	203-1	E216
CBR	188-1, 188-2, 218-1	F117	CLT0, 1	164-1	C95-	GSU $\frac{2}{5}$	164-1	C80-	NDG	176-1	G85
CCH $\frac{2}{5}$	195-1	A84-	CLU $\frac{2}{5}$	164-1	B92-	HLD	170-1, 172-1, 191-1	C67			
CCHA, B	195-1	A87	CNE	190-1, 198-1	A116	HMT	216-1	E172	NSK	164-1, 176-1	F85
CCHN	195-1	A86	CNO	190-1, 198-1	A117	HMT1	216-1	C172	OO-19	205-1	F150-
CCT	216-1	F193	COF	213-1	C195	IO-19	205-1	C152	OAT	218-1	F202
CCT $\frac{2}{5}$	195-1	B84-	CON1	216-1	D195	IA0-19	205-1	B152	OAT1, 2	218-1	E202-
CCTA, B	195-1	B87-	CON3	216-1	F195	ICB	208-1	C117	OCO	205-1	C135
CCTN	195-1	B86	CONA, B	216-1	D194-	ICK	208-1	F184	OC1, 2	205-1	D134
CCU $\frac{2}{5}$	195-1	D84	CPL0-9	210-1, 212-1	E161-	ICO	205-1	C134	OCB	207-1	D117
CCUA, B	195-1	D87-	CPR0-9	210-1, 212-1	E162-	IC1, 2	205-1	D136-	OCK	207-1	C185
CCUN	195-1	D86	DA1-3	188-1, 188-2	G117-	ID	204-1	A125	OCK1	207-1	E184
CDA	193-1	G96	DE	190-1	B55	IEV	205-1	D146	OD	204-1	A126
CDLC	164-1	E98	DFP	204-1	A131	IEV1	205-1	D145	OEV	205-1	D144
CHB	212-1	C174	DGA	194-1	G87	IFK	208-1	G185	OEV1	205-1	D142
CHE	212-1	C173	DL	228-1	B202	IL	205-1	B134	OF	202-1	E91
			FA-FF	204-1	B126-	ILA	205-1	A135	OFK	207-1	D185
			FA1-FF1	204-1	B131-	IOD	205-1	B146	OGT		D57
			FA2-FF2	204-1	B133-	IOD1	205-1	B145	OL	205-1	E144
			FG-FH	204-1	G126	JC0-19	209-1	B143-	OLA	205-1	F144
									ONB	190-1	D187
									ONG	190-1	C187
									ONG1	190-1	F187

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SD - 68388 - 01, ISSUE 2

ISSUE 11 WAT
DATE 1-18-52
R.B.S.

S.D - 68388 - 01
MARKER CIRCUIT

LOCATION			LOCATION			LOCATION			LOCATION		
DESIG.	OS	SD	DESIG.	OS	SD	DESIG.	OS	SD	DESIG.	OS	SD
OOD	205-1	B144	SPT	214-1, 218-1	B206	TRB	228-1	D203	XST	198-1, 207-1, 208-1, 218-1	G176
OOD1	205-1	B142	SRL	216-1, 217-1	B182	TRL	178-1, 202-1, 220-1	D205	XSTR	220-1	C206
OVA-D	213-1	D154-	SS	206-1	D137	TRT	219-1	G202	XTB	178-1, 199-1	F78
			STI	190-1	C66	TRT(Tube)	219-1	F203	XTB1	199-1	F79
PC	196-1	G114				TRTX	219-1	F203	XTIF	208-1	G184
PC1,2	196-1	F114	TO-39	141-1, 203-1, 222-1, 227-1	E101	TSA	125-1, 137-1, 170-1, 172-1	B53	XTKS	170-1, 172-1, 202-1	D53
RC	228-1	C210	TB	202-1	B53	TST		B203	XTL	193-1, 194-1, 195-1	B88
RC1-4	228-1	E210-	TB $\frac{2}{5}$	192-1, 202-1	E75-	TSTA		B205	XTL1	193-1, 194-1, 195-1	A88
RCD	169-1, 173-1, 191-1, 197-1, 202-1	F57	TB2K	192-1	E78	X	219-1	F183	XTOF	207-1	G184
RCD1,2	169-1	G55	TBK	199-1	B111	XCO	190-1, 203-1	D175	XTR	220-1	D206
RCK	197-1	D52	TC0-29	169-1, 173-1, 191-1, 202-1	F71-	XCO1	190-1, 203-1	B113	XTRL	202-1, 220-1	G206
RCT	218-1	C195	TCB	198-1	C116	XCOA	190-1	C176			
RCT1	218-1	C195	TCBA	198-1	C116	XCOB	190-1	C176			
REC	228-1	B203	TCK	198-1	C183	XCOC	190-1	F177			
RL	217-1	D183	TCK1	198-1	B183	XI	205-1	G146			
RO	190-1	C65	TKE	200-1, 201-1	A111	XIA	205-1	F146			
ROB	202-1, 220-1	D205	TKS	170-1, 172-1, 202-1	B52	XIS	216-1	E175			
ROR	202-1	F66	TKT	201-1	B112	XILS	212-1	E177			
RS1-4	202-1	F64-	TKTK	201-1	B112	XIPS	206-1, 215-1	G176			
RT	228-1	E213	TM	218-1	C207	XJP	210-1	F147			
RT1	228-1	E213	TM1	219-1	F207	XJS	212-1	E176			
RTA-D	213-1	C154-	TM1(Tube)	219-1	F207	XK	210-1, 215-1	E177			
RTA'-D'	213-1	A154-	TM1X	219-1	F206	XMRL	217-1	D207			
			TM2	219-1	F205	XMS	203-1	B114			
SAR		F84	TM2(Tube)	219-1	F205	XMS1	203-1	B114			
SCT	203-1, 216-1	E197	TM2X	219-1	F204	XO	205-1	G146			
SCT1	203-1, 216-1	E196	TM3	219-1	F206	XOA	205-1	F146			
SDT		D55	TM3(Tube)	219-1	F206	XOLS	210-1, 212-1	E176			
SDT1		D57	TMR	218-1	D207	XOAS	210-1, 212-1	E176			
SG	203-1, 216-1	E197	TP0-2	164-1	G112	XRCK	167-1, 170-1, 172-1, 197-1	E53			
SGA	203-1, 216-1	C196	TR	179-1, 218-1, 219-1	D204	XSM	215-1, 216-1	E177			
SGA1	203-1	C196	TR1	190-1	C62	XSM1	215-1	C177			
SK	214-1	G186	TR1A	190-1	F62	XSMO	215-1	C177			
SK3	164-1, 176-1	F86	TR2	190-1	C62	XSMT	215-1	D177			
SK6	164-1, 176-1	F86	TR2A	190-1	F62						
SKA	194-1	F87	TRA	218-1, 219-1	F204						
SMT	206-1	D137									

ISSUE	DATE	WAD
	/-/-	

INDEX OF RELAYS, ETC. ON SD'S & OS'S
SD - 68388 - 01, ISSUE 2

SD 68389-01
DECODER MARKER TEST AND
TROUBLE RECORDER CIRCUIT

DESIG.	LOCATION		DESIG.	LOCATION		DESIG.	LOCATION		DESIG.	LOCATION	
	OS	SD		OS	SD		OS	SD		OS	SD
ODG		G143	CCT		B103	DC		G143	KC		E64
3D		A146	CCT $\frac{2}{5}$		G143	DL		H147	KC1-8		C60-
3GS		D84	CCU $\frac{2}{5}$		G143	DLC		G143	KCD		C63
3DG		G143	CDL		E154	DMTP	228-1	B56	KCM		C64
4GS		D84	CF		D145	DP0-9	228-1	B53	KTR1		F147
5DG		G143	CG0,1,2,4		G83	DRL		D144	LC0-9	220-1	A147
5GS		D84	CGS		C85	DT		D56	LCON		F104
6D		A146	CH	228-1	B55	DT(Key release mag.)		A156	LDT		F135
6DT		D146	CHK		C105	DT0-9		B53	LCH(Latch)	229-1	G122
6GS		D84	CKL		D152	DTRL		D144	LK		E64
20C		G143	CKR		C104	DU		H147	LMS		F75
ACO		C56	CL1,2		E153	ELT,ELT1		H93	LMS0-3		C73-
AL	228-1	C55	CL12		D104	ELT(Tube)		G93	LPD		F103
AMS		D72	CLCT		F103	ERL		H56	M		G143
AMS1		F72	CMP0-7	228-1	B52	FTT(Key release mag.)		A155	MBR		A145
AR		A145	CMT0-7		D54	FTU(Key release mag.)		A155	MC	228-1	E96
ARG		D154	CNE	198-1	B140	G0-3		A143	MCO		B123
ARG1		D155	CNO	198-1	A140	GMS		C75	MCR	228-1	E121
BRC1-3	228-1	C95-	CON1		F105	GMS0-3		C75-	MCT	228-1	D96
BRD	228-1	C91	CONT(Clutch)	229-1	H122	GR		H147	MCT(Tube)	228-1	F95
BRMC	228-1	C92	CPA0-5	228-1	B51	GSO-5		A142	ME		C65
BRMT	228-1	C94	CPB0-5	228-1	B51	GU0-3		F75-	MF		G143
CA		E152	CPD0-5	228-1	B51	HMG		D103	MFT		C113
CA4		D143	CPE0-5	228-1	B51	HMG1		D103	MKT		E56
CA5		D143	CPF0-5	228-1	B51	ICB		B141	MOCK		E154
CA6		D143	CR		E151	IF0-3(Key release mag.)		E114-	MP0-9		B52
CBH		F151	CR1,2		D151	IND		A150	MRL		F57
CC1-4		A151-	CRC		D153	INT(Clutch)	229-1	H122	MS0-39		B72-
CCH $\frac{2}{5}$		G143	CTCI		G55	ISB		C116	MSK		F74
			CTP	228-1	B55	ISB1		C115	MST		F73
						IT2		F106	MT		E105
									MT0-9		E54
									MTRL		D145

INDEX OF RELAYS, ETC. ON SD'S & OS'S
SD - 68389-01, ISSUE 2

ISSUE	11 WAD
DATE	7-18-52
R.B.B.	

SD - 68389 - 01
 DECODER MARKER TEST AND
 TROUBLE RECORDER CIRCUIT

DESIG.	LOCATION		DESIG.	LOCATION		DESIG.	LOCATION	
	OS	SD		OS	SD		OS	SD
NCF		C105	RTOS		F91	TC2		D106
NR(Tube)		F92	RTR		E57	TCB	198-1	B142
NRS		F92	RTR1		E57	TCK	198-1	E84
NRS1		H92				TICB		A158
NRT		G92	S0-8	229-1	E142	TKS		H72
NRT(Tube)		F93	SCA		C83	TLC1-3		F143-
NSK		G143	SCT		C57	TM		G55
			SG		C158	TM(Tube)		G94
OCB		B141	SK3		G143	TM1,2		F54-
OEV		C114	SK6		G143	TMC		F147
OF		A145	SLPD		G143	TOCB		A157
ON		B124	SMB		C116	TON		F55
OOD		C114	SMB1		D116	TRB	228-1	E91
			SMG		C116	TRC	228-1	B125
P1-3		D85-	SMG1		D115	TRC1-3	228-1	C125-
PA		D134	SM0-9		D147	TRMB		B125
PA1		G133	SM10-19		D147	TS		G55
PFA-E		H147	SM20-29		D147	TSR		B56
			SPC(Mess.Reg.)		C135	TST		E133
R0-8	229-1	E141	SPT		D72	TST1-3		C132-
RA1-3		A144	SR		D72	TTCB		A158
RAC		E86	SR1-3		G72-			
RC1-3	228-1	C97-	SRA		E83	WAR		B122
RD	228-1	C92	SS		C146			
RL		G57	ST	228-1	D122	XDD		G143
RLM		E155	STR	228-1	E95	XJP		F147
RLS		C86	STR1	228-1	G91	XMS		F74
RLT		F56	STR2	228-1	F95	XPS		C115
RLT1		H57	STRL		D145	XSG		G143
RMC	228-1	C93	SXD		G143	XSMI		F147
RMT	228-1	C94	SXR		G143	XSMO		F147
ROR		A145						
RTI		C134	T0-11		D136			
RTM		H95	TBS		C72			
			TC		G56			

ISSUE 1 WAD
 DATE 7-16-52
 R.B.B.

INDEX OF RELAYS, ETC. ON SD'S & OS'S

SD - 68389 - 01, ISSUE 2

MISCELLANEOUS CIRCUIT - TROUBLE RECORDER FRAME

ISSUE 1 WAD
 DATE 7-18-52
 R.B.B.

DESIG.	LOCATION	
	OS	SD
AS	114-1	G24
B	104-1, 157-1, 158-1	C31
B1	218-1	D31
BAA-F	104-1	F31
BA1A-F	104-1	F31
C	156-1	G23
C1	156-1	H23
CCA-D	216-1	H20-
CM0-7		D23
CMS		D23
CMT1 0-7(M.R.)	218-1, 219-1	D23
CMT2(M.R.)	218-1, 219-1	D23
CT	157-1, 158-1	D24
CTA-F	107-1, 107-2	G31
D0-9	179-1	D23
DLW	114-1, 228-1	E22
DS	179-1	D23
DT1 0-9(M.R.)	179-1	D23
DT2(M.R.)	179-1	D23
DTA	179-1	A23
DTRT	179-1	A23
FBE1-19	165-1, 184-1	C27
FBE1'-16'	165-1, 184-1	D33
FBO1-19	165-1, 184-1	B27
FBO1'-16'	165-1, 184-1	D33
GT	157-1	D24
GTA	156-1	H23

DESIG.	LOCATION	
	OS	SD
IM0-9		D23
IMS		D23
IMT1 0-9(M.R.)	218-1, 219-1	D23
IMT2(M.R.)	218-1, 219-1	D23
MG	184-1	G33
MG1	184-1	G33
MTA	218-1, 219-1	A23
MTRT		A23
OCB	207-1	A23
OR		A27
SMA	132-1, 144-1, 178-1	H25
SN	184-1	G33
TA	115-1, 179-1, 218-1, 219-1	F22
TA1	179-1, 218-1, 219-1	F22
TRE(M.R.)		H33
TRL	220-1	B25

MP- 11790

ISSUE DATE 1-18-52
 WAD
 R&B

SD-68393-01
INCOMING LINK AND CONNECTOR CIRCUIT

DESIG.	OS
A	223-1
AL	208-1
CB	208-1
CH	208-1
FCH	208-1
FCM	208-1
FLH	208-1
FLM	208-1
LCH0-9	215-1
LCM0-9	208-1
LWH	208-1
LWM	208-1
MC	208-1
MP	208-1
P(Hold)	216-1
P(Select)	168-1, 206-1, 215-1
R	223-1
S(Hold)	216-1
S(Select)	215-1
SH0-9	215-1
SLH	214-1
SLM	214-1
SM0-9	
T0-9	220-1

SD-68394-01
OUTGOING LINK AND CONNECTOR CIRCUIT

DESIG.	OS
A	223-1
AL	207-1
CB	207-1
CH	207-1
FCH	207-1, 211-1
FCM	207-1, 211-1
FLH	207-1
FLM	207-1
JCH0-9	209-1, 211-1
JCM0-9	209-1, 211-1
JLH	207-1, 211-1
JLM	207-1, 211-1
LCH0-9	
LCM0-9	215-1
LWH	207-1
LWM	207-1
MCA	207-1
MCB	207-1
MP	207-1
P(Hold)	216-1
P(Select)	215-1
R	223-1
S(Hold)	216-1
S(Select)	206-1
SH0-9	215-1
SM0-9	215-1

SD-68395-01
MARKER CONNECTOR CIRCUIT

DESIG.	OS
CB-	188-1, 188-2
MC1-3	188-1, 188-2
MCA	188-1, 188-2
MCB	188-1, 188-2
MP-	168-1, 188-1, 188-2
PMC	
PMI	

SD-68407-01
MISCELLANEOUS CIRCUIT
CARD TRANSLATOR

DESIG.	OS
AC	186-1
FA	186-1
FA1	186-1
LA	186-1
T	186-1

SD-68408-01
ALTERNATE ROUTE TRAFFIC CONTROL CIRCUIT

DESIG.	OS
L	171-1
RT00-99	171-1
RT'00-99	171-1
RTE	171-1
RTO	171-1

SD-68412-01
TRAFFIC REGISTER CIRCUIT

DESIG.	OS
A1	113-1
AL	114-1
ALM	113-1
B1	113-1
BS	180-1, 196-1
C	
DL	113-1
DPO	196-1
FO	
GB	
INC	
LD	
M	114-1
OG	
ORT	
PC(KS-14359 MAG.COUNTER)	
PH	113-1
R(M.R.)	113-1, 114-1, 153-1, 179-1, 180-1, 196-1
SGB	114-1
SO	
TC	
TD	
TW	
VC	
W	113-1
Z	113-1

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SD-68416-01
TIMING CONTROL CIRCUIT

<u>DESIG.</u>	<u>OS</u>
ADB	158-1
B	158-1
B1-3	158-1
F1-3	158-1

SD-68429-01
MISCELLANEOUS CIRCUIT
EMERGENCY TRANSLATOR CONNECTOR
FIF CONTROL FRAME

<u>DESIG.</u>	<u>OS</u>
EA	184-1
FAA	
FAB	
FAE	
FAO	
FFA	
FFB	

SD-95048-01
COMPOSITE SIGNALING TYPE B
PHANTOM GROUP OR SINGLE CIRCUIT

<u>DESIG.</u>	<u>OS</u>
CX	101-1, 122-1, 203-1

SD-95391-01
MF CURRENT SUPPLY AND
DISTRIBUTION CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A1,2	224-1
AL	224-1
ALM	224-1
B1,2	224-1
BE	224-1
BO	224-1
C1,2	224-1
CO	224-1
D1,2	224-1
E1,2	224-1
F1,2	224-1
GE	
GO	224-1
LE	224-1
LO	224-1
PL	224-1
PL1	224-1
TE	224-1
TE1-4	224-1
TO	224-1
TO1-4	224-1

SD-95087-01
RECEIVING CIRCUIT
MULTIFREQUENCY PULSING

<u>DESIG.</u>	<u>OS</u>
$\frac{2}{6}$	135-1
CK1-3	135-1
KP1-3	135-1
SP	135-1

SD-68420-01
GROUP BUSY CHAIN RELAY CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A	226-1
D	226-1
F	226-1
GBO-3	173-1
GBT	
OF	226-1
ON	226-1
RO	226-1
SL	226-1

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SD-95536-01
RECEIVING CIRCUIT - MF PULSING

<u>DESIG.</u>	<u>OS</u>
0	135-2
1	135-2
2	135-2
4	135-2
7	135-2
10	135-2
CK2,3	135-2
FT	
KP	135-2
KP1	135-2
KP2	135-2
LK	135-2
SP	135-2

SD-96131-01
SWITCHBOARD NO. 15D
COMBINATION CORD CIRCUIT

<u>DESIG.</u>	<u>OS</u>
A	
AT	
C	
CH	122-1, 222-1, 226-1
CH1	
CN	
FL	
FR	
HL	
KA	
MA	
MC	122-1, 222-1, 226-1
P	122-1, 222-1, 226-1
PU	
RV	222-1
S	122-1, 222-1, 226-1
SA	
SC	122-1, 222-1, 226-1
SP	
TK	
TL	
TR	

SD-96164-01
SWITCHBOARD NO. 1, 11, 15C OR 15D
OUTGOING TRUNK AND IDLE
TRUNK INDICATING CIRCUITS

<u>DESIG.</u>	<u>OS</u>
L	
MB	
ML	
SL	122-1, 222-1, 226-1

SD-96232-01
SWITCHBOARD NO. 15D
DIAL CIRCUIT

<u>DESIG.</u>	<u>OS</u>
DA	
DC	
DC1	
DL	
DM	
ON	
ON1,2	
RV	122-1
TR	

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SD-68018-01

OUTGOING SENDER CIRCUIT
REVERTING AND P.C.I.

DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING
0-6, 1'-6'	REVERTIVE PULSE COUNTING	ON1, 2	OFF NORMAL AUXILIARIES	STE	STATIONS OUTPULSING (Third and fourth parts)
AR	ALARM RELEASE	ONA	OFF NORMAL AUXILIARY	STF	STATIONS OUTPULSING (Final position)
AV	SENDER ADVANCE	OT	OVER TEN	STL	STATIONS PULSE LOCK
AV1, 2	SENDER ADVANCE AUXILIARIES	OT1, 2	OVER TEN AUXILIARIES	STP	STEPPER
BO'	BREAK FUNDAMENTAL	PC, PC1	PULSING COMPLETED	T, T'	TENS (Call indicator progress)
CH	CHAIN HOLD	PG	PULSE GENERATOR	T1, 2, 4, 5	TENS REGISTER
CI	CALL INDICATOR	PG1-3	PULSE GENERATOR AUXILIARIES	TC	TENS PULSE CUT-THROUGH
CI1-3	CALL INDICATOR AUXILIARIES	PR	PULSE RING	TG	TRUNK GUARD
CIA	CALL INDICATOR AUXILIARY	PS	PULSING START	TG1-3	TRUNK GUARD AUXILIARIES
CLA, B	CLASS CONTROL	PT	PULSE TIP	TH, TH'	THOUSANDS (Call indicator progress)
CLF	CLASS FAILURE	PX	PANEL OR CROSSBAR	TH1, 2, 4, 5	THOUSANDS REGISTER
CLK	CLASS CHECK	R	RING	TH1', 2', 4', 5'	THOUSANDS REGISTER
CO	CLASS CONTROL	RC	RELEASE COUNTER	THC	THOUSANDS PULSE CUT-THROUGH
CP	CONTACT PROTECTION (STP relay contacts)	RC1, 2	RING CONTROL	THE	THOUSANDS OUTPULSING (First and second parts)
CR	CONTROL RINGING	RCA	REGISTRATION CONTROL ADVANCE	THF	THOUSANDS OUTPULSING (Third and fourth parts)
CT	CUT-THROUGH	RCO	RING CUT-OFF	THL	THOUSANDS PULSE LOCK
CTR	CANCEL TIMED RELEASE	RM	RING MARGINAL	TL	TENS PULSE LOCK
DR	DISCONNECT REGISTRATION LEADS	RO	REORDER	TM	TIP MARGINAL
DT	DOUBLE TEST	RP	RING POLARIZED	TM1-10	TIMING
FC	FINAL CUT-THROUGH	RPT	RELEASE PULSE TIMING	TP	TIP POLARIZED
FL	FINAL LOCK	RS	RING SENSITIVE	TR	TRANSFER (After class check)
FO'	FUNDAMENTAL OPEN	S	SLEEVE CONTROL	TS	TIP SENSITIVE
FO1-3	FUNDAMENTAL OPEN AUXILIARIES	S1, S1'	INCOMING BRUSH	TST, TST1	TEST CONNECTOR
FP	FINAL PULSE	S2, S2'	INCOMING GROUP	U, U'	UNITS (Call indicator progress)
FS	FULL SELECTOR	S3, S3'	FINAL BRUSH	U1, 2, 4, 5	UNITS REGISTER
GCO	GROUND CUT-OFF	S4, S4'	FINAL TENS	UC	UNITS PULSE CUT-THROUGH
GR	GROUNDING	S5, S5'	FINAL UNITS	UL	UNITS PULSE LOCK
H, H'	HUNDREDS (Call indicator progress)	S6, S6'	TRUNK TEST - INCOMING ADVANCE	WA	WAITING ASSIGNMENT
H1, 2, 4, 5	HUNDREDS REGISTER	SA	SENDER ABANDONED	WA1	WAITING ASSIGNMENT AUXILIARY
HC'	HUNDREDS PULSE CUT-THROUGH	SB	SENDER BUSY	XBR	CROSSBAR
HL	HUNDREDS PULSE LOCK	SP	SPLITTING (Incoming trunk)		
HLA	HUNDREDS PULSE LOCK AUXILIARY	SP1, 2	SENDER CONTROL		
HSS	HOLD STUCK SENDER	SPA	SPLITTING AUXILIARY		
IA	INCOMING ADVANCE	SPK	SPLITTING CHECK		
IG	INCOMING GROUP	SSR	STUCK SENDER REGISTER		
KC1	KEY CONNECTION	ST	START PULSE RECEIVED		
KKC	KEY KICK-OFF COMPLETION	ST1, 2, 4, 5	STATIONS REGISTER		
KR	KEY RELEASE	STA, STA'	STATIONS - FINAL POSITION (Call indicator progress)		
KR1	KEY RELEASE AUXILIARY	STB, STB'	STATIONS - FIRST POSITION (Call indicator progress)		
LR	LINK RELEASE	STC	STATIONS PULSE CUT-THROUGH		
MB	MAKE BUSY	STD	STATIONS OUTPULSING (First and second parts)		
O5	OVER FIVE (P.C.I. over 10,499)				
OF	OVERFLOW				
OF1-3	OVERFLOW AUXILIARIES				
ON	OFF NORMAL				

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R.B.B.

SD-68020-01

INCOMING LINK AND CONNECTOR CIRCUIT

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
A	ALTERNATE (Frequency cut-in)
AL	ALARM
CB	CONNECTOR BUSY
CH	CHAIN GUARD
FCH	FRAME CONNECTOR (Home)
FCM	FRAME CONNECTOR (Mate)
FLH	FRAME LOCKOUT (Home)
FLM	FRAME LOCKOUT (Mate)
LCH0-9	LINK CONNECTOR CUT-IN (Home)
LCM0-9	LINK CONNECTOR CUT-IN (Mate)
LWH	LINK WANTED (Home)
LWM	LINK WANTED (Mate)
MC	MARKER CONNECTOR
MP	MARKER PREFERENCE
P(Hold)	PRIMARY HOLD MAGNETS
P(Sel)	PRIMARY SELECT MAGNETS
R	REGULAR (Frequency cut-in)
S(Hold)	SECONDARY HOLD MAGNET
S(Sel)	SECONDARY SELECT MAGNET
SH0-9	SELECT MAGNET (Home)
SLH	SELECT MAGNET LOCKOUT (Home)
SLM	SELECT MAGNET LOCKOUT (Mate)
SM0-9	SELECT MAGNET (Mate)
T0-9	TROUBLE INDICATOR (Cut-in)

SD-68022-01

OUTGOING LINK AND CONNECTOR CIRCUIT

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
A	ALTERNATE (Frequency cut-in)
AL	ALARM
CB	CONNECTOR BUSY
CH	CHAIN GUARD
FCH	FRAME CONNECTOR (Home)
FCM	FRAME CONNECTOR (Mate)
FLH	FRAME LOCKOUT (Home)
FLM	FRAME LOCKOUT (Mate)
JCH0-9	JUNCTOR CUT-IN (Home)
JCM0-9	JUNCTOR CUT-IN (Mate)
JLH	JUNCTOR LOCKOUT (Home)
JLM	JUNCTOR LOCKOUT (Mate)
LCH0-9	LINK CONNECTOR CUT-IN (Home)
LCM0-9	LINK CONNECTOR CUT-IN (Mate)
LWH	LINK WANTED (Home)
LWM	LINK WANTED (Mate)
MCA	MARKER CUT-IN
MCB	MARKER CUT-IN
MP	MARKER PREFERENCE
P(Hold)	PRIMARY HOLD MAGNETS
P(Sel)	PRIMARY SELECT MAGNETS
R	REGULAR (Frequency cut-in)
S(Hold)	SECONDARY HOLD MAGNETS
S(Sel)	SECONDARY SELECT MAGNETS
SH0-9	SELECT MAGNET (Home)
SM0-9	SELECT MAGNET (Mate)

SD-68027-01

TRUNK BLOCK CONNECTOR CIRCUIT

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
A	ALTERNATE (Frequency cut-in)
AL	ALARM
CB	CONNECTOR BUSY
CH	CHAIN GUARD
GC0,1	GROUP CONTROL
JB	JUMP HUNT GROUP BUSY
JH	JUMP HUNT
JH1	JUMP HUNT AUXILIARY
JR	JUMP HUNT ROUTE SIGNAL
MCA,B	MARKER CUT-IN
MP	MARKER PREFERENCE
R	REGULAR (Frequency cut-in)
TBA0-9	TRUNK BLOCK
TBB0-9	TRUNK BLOCK

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<u>FUNCTIONAL DESIGNATIONS</u>		
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NO. 4A TOLL

RM 2-2

SD-68028-01
LINK CONTROLLER CIRCUIT

DESIG.	FUNCTIONAL MEANING
A	SECONDARY SWITCH LEVEL (Levels 0 & 5)
AA	A AUXILIARY
AL	CONTROLLER ALARM
AL1	CONTROLLER ALARM AUXILIARY
AP	TRUNK GROUP AND SENDER PREFERENCE (Starting with T0)
AR	AUXILIARY RELEASE
AR1	AUXILIARY RELEASE AUXILIARY
AS	"A" SENDER GROUP (Senders associated T0-T9)
AT	AUXILIARY TEST
B	SECONDARY SWITCH LEVEL (Levels 1 & 6)
BA	B AUXILIARY
BP	TRUNK GROUP AND SENDER PREFERENCE (Starting with T4)
BS	"B" SENDER GROUP (Senders associated T15 - T24)
BT0	BUSY TEST (1st link in A primary switch)
BT1	BUSY TEST (2nd link in A primary switch)
BT2	BUSY TEST
BT3	BUSY TEST (1st link in B primary switch)
BT4	BUSY TEST (2nd link in B primary switch)
BT5	BUSY TEST
C	SECONDARY SWITCH LEVEL (Levels 2 & 7)
CA	C AUXILIARY
CK	CLASS CHECK (CL1 or CL0 operated)
CL	CLASS
CL0	CLASS* (Sender type)
CL1	CLASS* (Sender type)(Z apparatus)
CO	CUT-OFF (Trouble indicator)
CP	TRUNK GROUP AND SENDER PREFERENCE (Starting with T8)
CT	CONNECT TEST (OF TST)
CTT	CONTROLLER TEST (Test call)
CTT1	CONTROLLER TEST (Test call) AUXILIARY
D	SECONDARY SWITCH LEVEL (Levels 3 & 8)
DA	D AUXILIARY
DA1-3	AUXILIARY START SHORT TIMING
DG	DISCONNECT GROUP
DG1	DISCONNECT GROUP AUXILIARY
DL	DOUBLE TEST LOWER (DT0 to DT4)
DP	TRUNK GROUP AND SENDER PREFERENCE (Starting with T17)

DESIG.	FUNCTIONAL MEANING
DR	DELAY REGISTER
DT(Tube)	DOUBLE TEST
DTC	DOUBLE TEST CONNECT
DTCA	DOUBLE TEST CONNECT AUXILIARY
DU	DOUBLE TEST UPPER (DT5 to DT9)
E	SECONDARY SWITCH LEVEL (Levels 4 & 9)
EA	E AUXILIARY
EP	TRUNK GROUP AND SENDER PREFERENCE (Starting with T21)
FR1-4	FRAME RELEASE (Long time-out)
G	TRUNK GROUP SELECTED (S option)
G0-9	TRUNK GROUP IDENTIFICATION
GE	TRUNK GROUP END (Locks out other groups)
GR	RELEASE PORTION OF GROUP NOT USED
GX	GROUP CROSS
GX1	GROUP CROSS AUXILIARY
HA	HOLD MAGNET "A" SUBGROUP EXCLUDED
HB	HOLD MAGNET "B" SUBGROUP EXCLUDED
HM	HOLD MAGNET LOCKED
HO	HOLD MAGNET OPERATED
HP	HOLD MAGNET PATHS CHECK TEST FEATURE WHILE CONTROLLER IS NORMAL
HT	HOLD MAGNET LEAD TRANSFER
HT1	HOLD MAGNET LEAD TRANSFER AUXILIARY
HX	HOLD MAGNET CROSS
L	TRUNK SELECTED
L0-9	PRIMARY SWITCH LEVEL
LC	LOWER CHOICE
LE	LINE END OR GATE RELAY
LM	LOWER MAGNETS
LN	L RELAYS NORMAL
LR	LINE RELEASE
MA	MAJOR ALARM
MB	MAKE BUSY
MCB	MAINTENANCE CENTER BUSY
NX	NORMAL CROSS TEST
OD	OPERATE LINK D (and GR)
ON	OFF NORMAL
OT	OPERATED TL- OR TU-
P	PRIMARY SELECT MAGNET LEADS CLOSED
P0-5	PREFERENCE CHAIN (See AP to EP)
PA	PREFERENCE AUXILIARY
PAO	PRIMARY SELECT MAGNET "A" SWITCH OPERATED

DESIG.	FUNCTIONAL MEANING
PB	PREFERENCE (See PA)
PBO	PRIMARY SELECT MAGNET "B" SWITCH OPERATED
PC	PREFERENCE CONTROL
PCA	PEG COUNT CONTROLLER ATTEMPTS
PG	PROGRESS (Stuck on T.I.)
PR	PRIMED RELEASE
PSA	PRIMARY SELECT MAGNET - "A" GROUP SWITCHES
PSB	PRIMARY SELECT MAGNET - "B" GROUP SWITCHES
PU	PICK UP
PX	PRIMARY SELECT MAGNET CROSS
PX1	PRIMARY CROSS AUXILIARY
R1,2	RELEASE AUXILIARIES
RC	RECYCLE DOUBLE TEST
RL	RELEASE
RP	REPEATER LINK
RP1	REPEATER LINK AUXILIARY
RS	RECORDER START
RT	RELAY TRANSFER OF PREFERENCE PA, PB
SAO	SECONDARY MAGNETS "A" - OPERATED
SBO	SECONDARY MAGNETS "B" - OPERATED
SC	SLEEVE CONTINUITY
SD	SENDER LINK
SD1	SENDER LINK AUXILIARY
SMO	SELECT MAGNET OPERATE
SSA	SECONDARY SELECT MAGNET - "A" SWITCH
SSB	SECONDARY SELECT MAGNET - "B" SWITCH
ST	START
SX	SECONDARY SELECT MAGNET CROSS
SX1	SECONDARY CROSS AUXILIARY
T	SENDER TESTED IDLE
T0-29	SENDER BUSY TEST
TBR	TROUBLE
TC	TEST COMPLETED
TC0-6	TROUBLE CONNECT
TE	TEST END
TL	TROUBLE INDICATOR LOCKOUT
TR	TIME RELEASE
TR1-4	TIME RELEASE AUXILIARIES
TRC	TIMING RECYCLE
TRL	TROUBLE RELEASE
TST	SENDER TEST
TT	TUBE TIMER

DESIG.	FUNCTIONAL MEANING
TT(Tube)	TUBE TIMER
UC	UPPER CHOICE
UM	UPPER SWITCH SELECT MAGNETS

* CL0 and CL1 may be used arbitrarily for any type of sender when two types of senders appear on one frame.

FUNCTIONAL DESIGNATIONS
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R.B.B.

SD-68056-01

DELAY QUOTATION TRUNK CIRCUIT
TOLL SWITCHBOARD NO. 5

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
F	FLASH
L	LINE
L1	LINE AUXILIARY
S	SLEEVE
S1	SLEEVE AUXILIARY
ST	START

SD-68135-01

INTERTOLL OR TOLL TANDEM
INCOMING TRUNK CIRCUIT - DP

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
CO	CUT-OFF
IN	INCOMING CALL
IR	INCOMING RING
LC	LINE CLOSURE
SP	SPLITTING
SV	SUPERVISORY
TM(Tube)	TIMING

SD-68162-01

OPERATORS TELEPHONE CIRCUIT
TOLL SWITCHBOARD NO. 5

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
BT	BUSY TEST
M	MONITOR
P	POSITION
T	TALK
T1	TALK AUXILIARY

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FUNCTIONAL DESIGNATIONS

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SD-68221-01
DIAL PULSE INCOMING SENDER CIRCUIT

DESIG.	FUNCTIONAL MEANING
5DB	NO. FIVE BOARD
6DT	SIX-DIGIT TRANSLATION
20C	20 CYCLE
20C1	20 CYCLE AUXILIARY
A $\frac{2}{5}$	'A' DIGIT REGISTER
AAO,1	'A' DIGIT TRANSLATION
AA4,7	'A' DIGIT ('V' option) TRANSLATION
ABO,1	'B' DIGIT TRANSLATION
AB4,7	'B' DIGIT ('V' option) TRANSLATION
ABC	ABC DIGITS CUT THROUGH
ABC1	ABC DIGITS CUT THROUGH AUXILIARY
ACO,1	'C' DIGIT ('V' option) TRANSLATION
ACT	A-C TRANSFER
ADR	'A' DIGIT REGISTERED
AS	'A' DIGIT INSTEERING
ASO	'A' DIGIT OUTSTEERING
AV	ADVANCE
AV1	ADVANCE AUXILIARY
B $\frac{2}{5}$	'B' DIGIT REGISTER
BD	BETWEEN DIGITS
BS	'B' DIGIT INSTEERING
BSO	'B' DIGIT OUTSTEERING
C $\frac{2}{5}$	'C' DIGIT REGISTER
CA	CONVERT 'A' DIGIT
CA1	CONVERT 'A' DIGIT AUXILIARY

DESIG.	FUNCTIONAL MEANING
CA4	COME AGAIN 4 ('X,B' option)
CA4A	COME AGAIN 4 AUXILIARY ('X,B' option)
CA5	COME AGAIN 5 ('W,B' option)
CA5A	COME AGAIN 5 AUXILIARY ('X,W,B' option)
CA6	COME AGAIN 6
CB	CONVERT 'B' DIGIT
CB1	CONVERT 'B' DIGIT AUXILIARY
CC	CONVERT 'C' DIGIT
CC1	CONVERT 'C' DIGIT AUXILIARY
CD	CONVERT 'D' DIGIT
CD1	CONVERT 'D' DIGIT AUXILIARY
CE	CONVERT 'E' DIGIT
CE1	CONVERT 'E' DIGIT AUXILIARY
CF	CONVERT 'F' DIGIT
CF1	CONVERT 'F' DIGIT AUXILIARY
CH	'C' HOLD
CH $\frac{2}{5}$	CODE CONVERSION HUNDREDS
CM	CLASS MARGINAL
CP	CLASS POLARIZED
CRS	CLASS RING SENSITIVE
CS	'C' DIGIT INSTEERING
CSO	'C' DIGIT OUTSTEERING
CT $\frac{2}{5}$	CODE CONVERSION TENS
CTA	CANCEL TIME ADVANCE
CTR	CANCEL TIME RELEASE
CTS	CLASS TIP SENSITIVE
CU $\frac{2}{5}$	CODE CONVERSION UNITS
CX	COMPOSITE

DESIG.	FUNCTIONAL MEANING
D $\frac{2}{5}$	'D' DIGIT REGISTER
DC	D-C KEY PULSE
DC1,2	D-C KEY PULSE AUXILIARY
DDR	'D' DIGIT REGISTERED
DE1,2	DIGIT END
DLC	DELAYED LOOP CLOSURE
DP	DIAL PULSE
DP1	DIAL PULSE AUXILIARY
DPS	'D' POSITION START
DRL	DECODER RELEASE
DRL1	DECODER RELEASE AUXILIARY
DS	'D' DIGIT INSTEERING
DSO	'D' DIGIT OUTSTEERING
DT	DOUBLE TEST
E $\frac{2}{5}$	'E' DIGIT REGISTER
EDR	'E' DIGIT REGISTERED
EPS	'E' POSITION START ('X,B' option)
ES	'E' DIGIT INSTEERING
ESO	'E' DIGIT OUTSTEERING
EV	EVEN INSTEERING
EVO	EVEN OUTSTEERING
EX	EXTRA DIGIT RECEIVED
EX1	EXTRA DIGIT RECEIVED AUXILIARY
F $\frac{2}{5}$	'F' DIGIT REGISTER
FDR	'F' DIGIT REGISTERED
FIF	FRAME IDENTIFICATION FAILURE
FL	FLASH
FL1	FLASH AUXILIARY
FP	FINAL PULSE

DESIG.	FUNCTIONAL MEANING
FPP	FALSE PULSE PROTECTION
FPS	'F' POSITION START ('W,B' option)
FS	'F' DIGIT INSTEERING
FSO	'F' DIGIT OUTSTEERING
FT	FUNDAMENTAL TRANSFER
FT1	FUNDAMENTAL TRANSFER AUXILIARY
G $\frac{2}{5}$	'G' DIGIT REGISTER
GPS	'G' POSITION START
GS	'G' DIGIT INSTEERING
GSO	'G' DIGIT OUTSTEERING
H $\frac{2}{5}$	'H' DIGIT REGISTER
HPS	'H' POSITION START
HS	'H' DIGIT INSTEERING
HSO	'H' DIGIT OUTSTEERING
IS	INTERDIGITAL TIMING START
IT(Tube)	INTERDIGITAL TIMING
ITC	INTERDIGITAL TIMING COMPLETED
J $\frac{2}{5}$	'J' DIGIT REGISTER
JPS	'J' POSITION START
JS	'J' DIGIT INSTEERING
JSO	'J' DIGIT OUTSTEERING
K $\frac{2}{5}$	'K' DIGIT REGISTER
KD	KEY CIRCUIT DETECTOR
KP	KEY PULSE
KS	'K' DIGIT INSTEERING
KSO	'K' DIGIT OUTSTEERING
L	LINE
L $\frac{2}{5}$	'L' DIGIT REGISTER

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DIAL PULSE INCOMING SENDER CIRCUIT (CONT.)

DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING
LA-E	LINE AUXILIARIES	OP	OUTPULSE	RCG	RECYCLE GO	SXR	SIMPLEX RING
LIT	LONG INCOMING TRUNK (Traffic separation)	OP1,2	OUTPULSE AUXILIARY	RCT	RECYCLE TIME	SXR1	SIMPLEX RING AUXILIARY
LP	LOOP	OSC	OUTSTEERING COCK	RO	REORDER	SY	SYNCHRONIZING
LPD	LOOP DIAL	OT(Tube)	OVERLOAD TIMING	ROA	REORDER AUXILIARY	T1	TIP OUTPULSE
LPS	'L' POSITION START	OTC	OVERLOAD TIMING CONTROL	RR $\frac{2}{5}$	RECAPTURE RING	TC3	TIMING COMPLETED 300 MS
LR	LINE RELEASE	OTS	OVERLOAD TIMING START	RS	RING SENSITIVE	TC5	TIMING COMPLETED 500 MS
LS	'L' DIGIT INSTEERING	P	PULSING	RSS	RECORD STUCK SENDER	TCA	TIMING COMPLETED (DLC timing)
LSO	'L' DIGIT OUTSTEERING	P1-6	PULSE COUNTING	RT	RELAY TRANSFER	TG	TRUNK GUARD (On-hook)
LSS	LINE SEIZURE SIGNAL	P1A	PULSE COUNTING AUXILIARY	RT $\frac{2}{5}$	RECAPTURE TIP	TG1	TRUNK GUARD AUXILIARY
M	MANUAL	P6A	PULSE COUNTING AUXILIARY	RTA	RELAY TRANSFER AUXILIARY	TGT	TRUNK GUARD TIMING
MB	MAKE BUSY	PA	PULSE COUNTING AUXILIARY	S	SLEEVE	TGT1	TRUNK GUARD TIMING AUXILIARY
ME	MARKER ENGAGED	PAO	PREFIX 'A' OUTSTEERING	S1	SLEEVE AUXILIARY	TI	TROUBLE INDICATOR
MF	MULTIFREQUENCY	PB	PULSE COUNTING	SA	SENDER ATTACHED	TKS	TRUNK SELECTED
MF1-3	MULTIFREQUENCY AUXILIARY	PBO	PREFIX 'B' OUTSTEERING	SA1	SENDER ATTACHED AUXILIARY	TKS1,2	TRUNK SELECTED AUXILIARY
MFT	MULTIFREQUENCY TIMING (Before outpulsing)	PC	PULSE COUNTING AUXILIARY	SAR	SEND ALTERNATE ROUTE	TL	TOLL
MRL	MARKER RELEASE	PC1-6	PULSE COUNTING	SAR1,2	SEND ALTERNATE ROUTE AUXILIARY	TM0-9	TIMING
MRL1	MARKER RELEASE AUXILIARY	PCK	PULSE CHECK	SG1,2	STOP-GO AUXILIARY	TN1	TRUNK NUMBER INDICATOR
MS	MARKER START	PCO	PREFIX 'C' OUTSTEERING	SK3	SKIP 3 (Outpulsing starts at 4th registered digit except on code conversion calls)	TR	TROUBLE RECORD
MS1,2	MARKER START AUXILIARY	PD	PULSE COUNTING AUXILIARY	SK6	SKIP 6 (4A only)	TRL	TROUBLE RELEASE
MSO	'M' STEERING OUT	PE	PULSE COUNTING AUXILIARY	SL	SLEEVE OUT	TRM	TRUNK MARGINAL
MT	MARKER TRANSFER	PFX/PFXB	PREFIX (Code conversion digits)	SL1	SLEEVE OUT AUXILIARY	TRP	TRUNK POLAR
NSK	NO SKIP (All digits registered are to be outpulsed)	PFX1/PFXA	PREFIX AUXILIARY	SP	INCOMING TRUNK SPLIT	TS	TIP SENSITIVE
NV	NON VIA	PG	PULSE GENERATING	SP1	INCOMING TRUNK SPLIT AUXILIARY	TST	TEST
NV1	NON VIA AUXILIARY	PG1	PULSE GENERATING AUXILIARY	SR	SLOW RELEASE	TST1	TEST AUXILIARY
OD	ODD INSTEERING	PP	PRELIMINARY PULSE A-C OUTPULSING	SR1	SLOW RELEASE AUXILIARY	TX	TX
ODO	ODD OUTSTEERING	PP'	PRELIMINARY PULSE A-C OUTPULSING	SRM	SENDER RECORD MADE	TXA	TX AUXILIARY
OF	OVERFLOW (Off hook)	PS	PULSE START	SST	SEND START	VO	VIA ONLY
OF1	OVERFLOW AUXILIARY	R	RING	SST1	SEND START AUXILIARY	W	PART OF W-Z RELAY COMBINATION CIRCUIT
ON	OFF NORMAL	R1	RING OUTPULSE	SXD	SIMPLEX DIAL	WR	PART OF W-Z RELAY COMBINATION CIRCUIT
ON1	OFF NORMAL AUXILIARY	RA	REGISTER ADVANCE				
		RA1	REGISTER ADVANCE AUXILIARY				

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DIAL PULSE INCOMING SENDER CIRCUIT (CONT.)

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
XDD	EXPECT DELAY IN DIALING
XSG	EXPECT STOP-GO
Z	PART OF W-Z RELAY COMBINATION CIRCUIT

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MF INCOMING SENDER CIRCUIT

DESIG.	FUNCTIONAL MEANING
5BD	NO. FIVE BOARD
10A	TEN AUXILIARY
20C	20 CYCLE
20C1	20 CYCLE AUXILIARY
A $\frac{2}{5}$	'A' DIGIT REGISTER
AAO, 1	'A' DIGIT TRANSLATION
AA4, 7	'A' DIGIT TRANSLATION
ABO, 1	'B' DIGIT TRANSLATION
AB4, 7	'B' DIGIT TRANSLATION
ABC	ABC DIGITS CUT THROUGH
ABC1	ABC DIGITS CUT THROUGH AUXILIARY
ACO, 1	'C' DIGIT TRANSLATION
ACT	A-C TRANSFER
ADR	'A' DIGIT REGISTERED
AS	'A' DIGIT INSTEERING
ASO	'A' DIGIT OUTSTEERING
AV	ADVANCE
AV1	ADVANCE AUXILIARY
B $\frac{2}{5}$	'B' DIGIT REGISTER
BD	BETWEEN DIGITS
BS	'B' DIGIT INSTEERING
BSO	'B' DIGIT OUTSTEERING
C $\frac{2}{5}$	'C' DIGIT REGISTER
CA	CONVERT 'A' DIGIT
CA1	CONVERT 'A' DIGIT AUXILIARY
CA4	COME AGAIN 4
CA4A	COME AGAIN 4 AUXILIARY
CA5	COME AGAIN 5
CA5A	COME AGAIN 5 AUXILIARY
CA6	COME AGAIN 6
CB	CONVERT 'B' DIGIT
CB1	CONVERT 'B' DIGIT AUXILIARY
CC	CONVERT 'C' DIGIT
CC1	CONVERT 'C' DIGIT AUXILIARY
CD	CONVERT 'D' DIGIT
CD1	CONVERT 'D' DIGIT AUXILIARY
CE	CONVERT 'E' DIGIT

DESIG.	FUNCTIONAL MEANING
CE1	CONVERT 'E' DIGIT AUXILIARY
CF	CONVERT 'F' DIGIT
CF1	CONVERT 'F' DIGIT AUXILIARY
CH	'C' HOLD
CH $\frac{2}{5}$	CODE CONVERSION HUNDREDS
CM	CLASS MARGINAL
CP	CLASS POLARIZED
CS	'C' DIGIT INSTEERING
CSO	'C' DIGIT OUTSTEERING
CT $\frac{2}{5}$	CODE CONVERSION TENS
CTA	CANCEL TIME ADVANCE
CTR	CANCEL TIME RELEASE
CTS	CLASS TIP SENSITIVE
CU $\frac{2}{5}$	CODE CONVERSION UNITS
D $\frac{2}{5}$	'D' DIGIT REGISTER
DC	D-C KEY PULSE
DC1, 2	D-C KEY PULSE AUXILIARY
DDR	'D' DIGIT REGISTERED
DE1, 2	DIGIT END
DLC	DELAYED LOOP CLOSURE
DP	DIAL PULSE
DP1	DIAL PULSE AUXILIARY
DRL	DECODER RELEASE
DRL1	DECODER RELEASE AUXILIARY
DS	'D' DIGIT INSTEERING
DSO	'D' DIGIT OUTSTEERING
DT	DOUBLE TEST
E $\frac{2}{5}$	'E' DIGIT REGISTER
EDR	'E' DIGIT REGISTERED
ES	'E' DIGIT INSTEERING
ESO	'E' DIGIT OUTSTEERING
EV	EVEN INSTEERING
EV1	EVEN INSTEERING AUXILIARY
EVO	EVEN OUTSTEERING
F $\frac{2}{5}$	'F' DIGIT REGISTERED
FDR	'F' DIGIT REGISTERED

DESIG.	FUNCTIONAL MEANING
FIF	FRAME IDENTIFICATION FAILURE
FKP	FALSE KEY PULSE
FL	FLASH
FL1	FLASH AUXILIARY
FP	FINAL PULSE
FS	'F' DIGIT INSTEERING
FSO	'F' DIGIT OUTSTEERING
FT	FUNDAMENTAL TRANSFER
FT1	FUNDAMENTAL TRANSFER AUXILIARY
G $\frac{2}{5}$	'G' DIGIT REGISTER
GS	'G' DIGIT INSTEERING
GSO	'G' DIGIT OUTSTEERING
H $\frac{2}{5}$	'H' DIGIT REGISTER
HS	'H' DIGIT INSTEERING
HSO	'H' DIGIT OUTSTEERING
J $\frac{2}{5}$	'J' DIGIT REGISTER
JS	'J' DIGIT INSTEERING
JSO	'J' DIGIT OUTSTEERING
K $\frac{2}{5}$	'K' DIGIT REGISTER
KD	KEY CIRCUIT DETECTOR
KP	KEY PULSE
KS	'K' DIGIT INSTEERING
KSO	'K' DIGIT OUTSTEERING
L $\frac{2}{5}$	'L' DIGIT REGISTER
LIT	LONG INCOMING TRUNK (Traffic separation)
LPD	LOOP DIAL
LS	'L' DIGIT INSTEERING
LSO	'L' DIGIT OUTSTEERING
LSS	LINE SEIZURE SIGNAL
M	MANUAL
M7	'M' REGISTRATION NO. 7 FREQUENCY
MB	MAKE BUSY
ME	MARKER ENGAGED

DESIG.	FUNCTIONAL MEANING
MF	MULTIFREQUENCY
MF1-3	MULTIFREQUENCY AUXILIARY
MFT	MULTIFREQUENCY TIMING (Before outpulsing)
MRL	MARKER RELEASE
MRL1	MARKER RELEASE AUXILIARY
MS	MARKER START
MS1, 2	MARKER START AUXILIARY
MSO	'M' DIGIT OUTSTEERING (Operates SST)
MT	MARKER TRANSFER
MX	'M' STEERING (Start signal)
NSK	NO SKIP (All digits registered are to be outpulsed)
NV	NON VIA
NV1	NON VIA AUXILIARY
OD	ODD INSTEERING
OD1	ODD INSTEERING AUXILIARY
ODO	ODD OUTSTEERING
OE	OPERATOR'S ERROR
OF	OVERFLOW (Off hook)
OF1	OVERFLOW AUXILIARY
ON	OFF NORMAL
ON1	OFF NORMAL AUXILIARY
OP	OUTPUT PULSE
OP1, 2	OUTPUT PULSE AUXILIARY
OSC	OUTSTEERING COCK
OT(TUBE)	OVERLOAD TIMING
OTC	OVERLOAD TIMING CONTROL
OTS	OVERLOAD TIMING START
P	PULSING
PA	PULSE COUNTING AUXILIARY (Out- going)
PAO	PREFIX 'A' OUTSTEERING
PB	PULSE COUNTING (Outgoing)
PBO	PREFIX 'B' OUTSTEERING
PC	PULSE COUNTING AUXILIARY (Out- going)
PC1-6	PULSE COUNTING (Outgoing)
PCK	PULSE CHECK
PCO	PREFIX 'C' OUTSTEERING
PD	PULSE COUNTING AUXILIARY (Out- going)
PE	PULSE COUNTING AUXILIARY (Out- going)
PFX/PFXB	PREFIX (Code conversion digits)
PFX1/PFXA	PREFIX AUXILIARY
PFXC	PREFIX AUXILIARY
PG	PULSE GENERATING
PG1	PULSE GENERATING AUXILIARY
PLK	PULSE LEAD CHECK
PP	PRELIMINARY PULSE A-C OUTPULSING

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SD-68222-01
MF INCOMING SENDER CIRCUIT (CONT.)

DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING
PP'	PRELIMINARY PULSE A-C OUTPULSING	TG	TRUNK GUARD (On-hook)
PS	PULSE START	TG1	TRUNK GUARD AUXILIARY
R	RING	TGT	TRUNK GUARD TIMING
R1	RING OUTPULSE	TGT1	TRUNK GUARD TIMING AUXILIARY
RA	REGISTER ADVANCE	TI	TROUBLE INDICATOR
RAR	RECEIVING ALTERNATE ROUTE	TKS	TRUNK SELECTED
RAR1	RECEIVING ALTERNATE ROUTE AUXILIARY	TKS1,2	TRUNK SELECTED AUXILIARY
RCG	RECYCLE GO	TL	TOLL
RCT	RECYCLE TIME	TM	TIP MARGINAL
RO	REORDER	TM0-9	TIMING
ROR	REORDER REQUESTED	TNI	TRUNK NUMBER INDICATOR
ROR1	REORDER REQUESTED AUXILIARY	TP	TIP POLAR
RR ² ₅	RECAPTURE RING	TR	TROUBLE RECORD
RSS	RECORD STUCK SENDER	TRL	TROUBLE RELEASE
RST	RECEIVED START	TS	TIP SENSITIVE
RST1,2	RECEIVED START AUXILIARY	TST	TEST
RT	RELAY TRANSFER	TST1	TEST AUXILIARY
RT ² ₅	RECAPTURE TIP	TX	TX
S	SLEEVE	TXA	TX AUXILIARY
S1	SLEEVE AUXILIARY	VO	VIA ONLY
SA	SENDER ATTACHED	W	PART OF W-Z RELAY COMBINATION CIRCUIT
SA1	SENDER ATTACHED AUXILIARY	WR	PART OF W-Z RELAY COMBINATION CIRCUIT
SAR	SEND ALTERNATE ROUTE	XDD	EXPECT DELAY IN DIALING
SAR1,2	SEND ALTERNATE ROUTE AUXILIARY	XSG	EXPECT STOP-GO
SG1,2	STOP-GO AUXILIARY	Z	PART OF W-Z RELAY COMBINATION CIRCUIT
SK3	SKIP 3 (Outpulsing starts at 4th registered digit except on code conver- sion calls)		
SK6	SKIP 6 (4A only)		
SL	SLEEVE OUT		
SL1	SLEEVE OUT AUXILIARY		
SP	INCOMING TRUNK SPLIT		
SP1	INCOMING TRUNK SPLIT AUXILIARY		
SRM	SENDER RECORD MADE		
SST1	SEND START AUXILIARY		
SXD	SIMPLEX DIAL		
SXR	SIMPLEX RING		
SXR1	SIMPLEX RING AUXILIARY		
SY	SYNCHRONIZING		
SYN	SYNCHRONIZING		
T1	TIP OUTPULSE		
TC3	TIMING COMPLETED 300 MS		
TC5	TIMING COMPLETED 500 MS		
TCA	TIMING COMPLETED (DLC timing)		
TEN	TEN		

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R.B.B.

SD - 68230 - 01
INTERTOLL OR TOLL TANDEM
INCOMING TRUNK CIRCUIT - MF

DESIG.	FUNCTIONAL MEANING
CO	CUT-OFF
IN	INCOMING CALL
IR	INCOMING RING
LC	LINE CLOSURE
SP	SPLITTING
SV	SUPERVISORY
TM(Tube)	TIMING

SD - 68233 - 01
2-WAY INTERTOLL TRUNK CIRCUIT -
MF INCOMING

DESIG.	FUNCTIONAL MEANING
CO	CUT-OFF
G	GUARD
IR	INCOMING RING
LC	LINE CLOSURE
LO	LOCKOUT
OS	OUT SEIZURE
OS1	OUT SEIZURE AUXILIARY
R	RINGING (Forward)
SL	SENDING LEAD CONTROL
SP	SPLITTING
SVP	SUPERVISORY AND PULSING
TM(Tube)	TIMING

SD - 68334 - 01
SENDER LINK AND CONNECTOR CIRCUIT

DESIG.	FUNCTIONAL MEANING
A	"A" CHOICE CONNECTOR BUSY
AL	ALARM
AR1	CONNECTOR RELEASE, A SIDE
AR2	CONNECTOR RELEASE, B SIDE
B	"B" CHOICE CONNECTOR BUSY
CA-C	CONTROL (Connector control leads of link frame to controller connector circuit)
D-	DIVIDE START LEADS
DT-	DOUBLE TEST CONNECTOR
EA	EXERCISE A
EB	EXERCISE B
FC-	FIRST CONNECTOR
L	LOCKOUT
LC	CONNECTOR CHOICE LOCKOUT
MC	MULTICONTACT CUT-IN
P(Hold)	PRIMARY HOLD MAGNET
P'(Hold)	PRIMARY HOLD MAGNET
P(Sel)	PRIMARY SELECT MAGNET
P'(Sel)	PRIMARY SELECT MAGNET
PC	PREFERENCE CHAIN
PF	PREFERENCE
PU	PICK-UP (Alarm)
RA	RELEASE ALARMS
S(Hold)	SECONDARY HOLD MAGNET
S'(Hold)	SECONDARY HOLD MAGNET
S(Sel)	SECONDARY SELECT MAGNET
S'(Sel)	SECONDARY SELECT MAGNET
SC	SECOND CONNECTOR
SGB	SENDER GROUP BUSY
ST-	START
TC	TIMED PREFERENCE CHAIN
TL-	TEST LOWER LEVELS
TLO, 1	TEST LOWER LEVELS
TM	TIMING
TM1	TIMING AUXILIARY
TU	TEST UPPER LEVELS
TU0, 1	TEST UPPER LEVELS

SD - 68336 - 01
CONTROLLER CONNECTOR CIRCUIT

DESIG.	FUNCTIONAL MEANING
AL	ALARM
B1, 2	BUSY INDICATION
CA1, 2	CONTROLLER CUT-IN
CB1, 2	CONTROLLER CUT-IN
CBR	CONNECTOR BUSY (For maintenance purposes)
CBT	CONTROLLER BUSY TEST
CC1, 2	CONTROLLER CUT-IN
CR	CONNECTOR RELEASE (Connector time-out)
CS	CONTROLLER SELECTED
CSA	CONNECTOR START
LA1, 2	LINK FRAME LOCKOUT
OC	OCCUPIED CONNECTOR
PC1, 2	PREFERENCE CHANGE
PU	PICK-UP (Alarm)
TC	TEST CALL

SD - 68232 - 01
2-WAY INTERTOLL TRUNK CIRCUIT -
DP INCOMING

DESIG.	FUNCTIONAL MEANING
CO	CUT-OFF
G	GUARD
IR	INCOMING RINGING
LC	LINK CONTROL (Grounds start lead sender link and connector circuit)
LO	LOCKOUT
OS	OUT SEIZURE
OS1	OUT SEIZURE AUXILIARY
R	RINGING (Forward)
SL	SENDING LEAD CONTROL
SP	SPLITTING
SVP	SUPERVISORY AND PULSING - ALSO RINGING ON OUTGOING CALL, AUXILIARY TO R RELAY
TM(Tube)	TIMING

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SD-68339-01

DECODER CONNECTOR CIRCUIT

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
ADB	ALL DECODERS BUSY
CA1-6	CONNECTOR ALARM
CB	CONNECTOR BUSY
CF	CARD FAILURE
CHK	CHECK
DC	DECODER CUT-IN
DC1	DECODER CUT-IN AUXILIARY
DP	DECODER PREFERENCE
GR	GROUND DETECTION
GR1	GROUND DETECTION
GR2-4	GROUND DETECTION AUXILIARIES
GRA	GROUND DETECTION AUXILIARY
GS	GROUND SUPPLY
GT	GATE
GT1	GATE AUXILIARY
MC	MARKER CUT-IN
MTA	MARKER TRAIN A
MTB	MARKER TRAIN B
RLT	RELEASE TRANSFER
RLT1	RELEASE TRANSFER AUXILIARY
RO	REORDER
RO1	REORDER AUXILIARY
SC	SENDER CUT-IN
SC1	SENDER CUT-IN AUXILIARY
SMB	SENDER GROUP MAKE BUSY
SP	SENDER PREFERENCE
TI	TROUBLE RECORDER
TR	TROUBLE RELEASE
TR1	TROUBLE RELEASE AUXILIARY

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3	10-5-53

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SD-68340-01
DECODER CIRCUIT

DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING
3D	3 DIGIT SIGNAL FROM SENDER	CCTN	NO CODE CONVERSION TENS	GO-3	SUBGROUP CHAIN TEST RELAYS	ROO-99	ROUTE RELAYS
3DB	3 DIGIT CARD GROUP	CCU $\frac{2}{5}$	CODE CONVERSION UNITS	GB	ALL SUBGROUPS BUSY	R6D, R6D1	6D CARD
5BD	NO. 5 BOARD SIGNAL FROM SENDER	CCUN	NO CODE CONVERSION UNITS	GPL	SUBGROUP LOCK	RA, RA1-3	ROUTE ADVANCE
6D	6 DIGIT SIGNAL FROM SENDER	CDC $\frac{2}{5}$	CONTINUITY AND DIGIT CONTROL	HB	HOME BOX - 6 DIGIT TRANSLATION IN HOME BOX	RAMB	ROUTE ADVANCE TO MASTER BUSY
6DA	6 DIGITS AVAILABLE IN SENDER	CFM	CARD FAILURE MEMORY	HBA	HOME BOX AUXILIARY	RARO	ROUTE ADVANCE TO REORDER
6DB	6 DIGIT CARD GROUP	CFR, CFR1, 2	CARD FAILURE RECORDING	HBI	HOME BOX INDICATED	RAV0-5	ROUTE ADVANCE TO SUCCEEDING GROUND SUPPLY
6DT	6 DIGIT TRANSLATION	CI0-5	GROUND SUPPLY CUT-IN RELAYS	HC1-16	HOME CONNECTOR CUT-IN	RAV0'-5'	ROUTE ADVANCE TO SUCCEEDING GROUND SUPPLY
AC	AREA CODE	CK1-3	INTEGRITY CHECK SENDER-DECODER LEADS	HE	HOME EMERGENCY	RB0-5	ROUTE BUSY
AFA	ALTERNATE, FOREIGN AREA	CKG, CKG1, 2	DECODER OFF-NORMAL GROUND SUPPLY AND START CIRCUIT	HTK	HOME TRANSLATOR CHECK	RC, RC1, 2	TROUBLE RECORDER CUT-IN
AHA	ALTERNATE, HOME AREA	CO	CUT-OFF TRUNK SUBGROUP TEST	HTR	HOME TRANSLATOR CONNECTOR	RCA, RCA1	RESTORE CARD AND ADVANCE
ARB	ALTERNATE ROUTE CARD GROUP	CR	CARD OPERATED INDICATION	HVC	HOLD CARD ON VACANT CODE ROUTING	RCC	BATTERY SUPPLY FOR ALTERNATE ROUTE PATTERN RELAYS
ARS	ALTERNATE ROUTE SELECTED	CR0-4	'CARD TO RELAY' ROUTE RELAY TENS (00-49)	IT	INTERTOLL MARKER	RCD	RESTORE CARD AND DISCONNECT
ARST	ALTERNATE ROUTE START	CR5-9	'CARD TO RELAY' ROUTE RELAY TENS (50-99)	IT1, 2	INTERTOLL MARKER AUXILIARIES	RCRR	RESTORE CARD - 'RELAY TO RELAY'
ART $\frac{2}{5}$	ALTERNATE ROUTE TENS	CRA	CR RELAY AUXILIARY	ITC	INTERTOLL OR TOLL COMPLETING MARKER	REC	RECORDING SIGNAL FROM TROUBLE RECORDER
ARU $\frac{2}{5}$	ALTERNATE ROUTE UNITS	CRK	CROSS RELAY CHECK	MBU $\frac{2}{5}$	BOX NUMBER MERCURY UNITS	RHC	RESTORE HOME CONNECTOR
ATB	ALL TRUNKS BUSY	CRP	'CARD TO RELAY' PREFERENCE	MCCH	MATCH CODE CONVERSION HUNDREDS	RI	BATTERY SUPPLY FOR ROUTING INSTRUCTION RELAYS
BD	BUSY DECODER	DA1-3	DECODER PREFERENCE CHAIN ALARM	MCCT	MATCH CODE CONVERSION TENS	RI $\frac{2}{5}$	ROUTING INSTRUCTION
BNA-C	BOX NUMBER START (0-9) LEADS	DBS, DBS1-4	DUPLICATE BOX SHIFT	MCCU	MATCH CODE CONVERSION UNITS	RIH	ROUTING INSTRUCTION HOLD
BND-F	BOX NUMBER START (10-19) LEADS	DCB, DCB1, 2	DISCONNECT CODE BARS	*MD	MARKER DELAY TIMING	RLS	RELEASE OF SUBGROUP CI-RELAY
BTO, 1	BOX TENS NUMBER	DCBA	DCB AUXILIARY	MD1	MARKER DELAY TIMING AUXILIARY	RLT	RELEASE AFTER TRANSLATION
BU $\frac{2}{5}$	BOX UNITS NUMBER	DFB	DECODER FOREIGN BOX	ME	MARKER ENGAGED	RO	REORDER SIGNAL
BU $\frac{2}{5}$	BOX UNITS WORKS RELAYS	DFE	DECODER FOREIGN EMERGENCY	MKR	BATTERY SUPPLY - MARKER SELECTION RELAYS	ROIT	REORDER 'IT'
CA	COME AGAIN BATTERY SUPPLY	DFTR	DECODER FOREIGN TRANSLATOR CONNECTOR	NAC	NO AREA CODE	ROMB	REORDER OR MASTER BUSY
CA4-6	COME AGAIN 4, 5 OR 6 DIGITS	DL	DISPLAY LOST	NC	NO CARD DROPPED	ROTC	REORDER 'TC'
CAH	COME AGAIN HOLD	DRL	DECODER RELEASE	NCA	NO COME AGAIN	RPRO	RECORD OVERLOAD ANNOUNCEMENT
CAK	COME AGAIN CHECK	FAT	FOREIGN AREA TRANSLATOR BATTERY SUPPLY	NCT, NCT1	NO CARD TIMING	RR	'RELAY TO RELAY'
CB	CONNECTOR BUSY RELAY	FATH	FOREIGN AREA TRANSLATOR HOLD	NPCR	NO PRINCIPAL CITY ROUTE	RR0-4	'RELAY TO RELAY' ROUTE RELAY SELECTION (00-49)
CBR-W	CONNECTOR BUSY RELAYS	FC2-15	DECODER FOREIGN CONNECTOR RELAYS	NRO	NO REORDER SIGNAL	RR5-9	'RELAY TO RELAY' ROUTE RELAY SELECTION (50-99)
CBR1-W1	CONNECTOR BUSY RELAYS	FMB	FOLLOW WITH MASTER BUSY	NSK	NO SKIP SIGNAL TO MARKER	RRA	RR RELAY AUXILIARY
CBR2-W2	CONNECTOR BUSY RELAYS	FNT	FOREIGN TRANSLATION NO TEST FEATURE	NVO	NO VNO CODE BAR OPERATED	RRP	'RELAY TO RELAY' PREFERENCE
CC	CARD TO CARD	FOF	FOLLOW WITH OVERFLOW	OAT, OAT1	OVER-ALL TIMING	RSR	RECORD SENDER REORDERS
CCA	CODE CONNECTOR ALTERNATE	FRO	FOLLOW WITH REORDER	OC, OC1-10	OUTPUT CONTROL	RT, RT1	TROUBLE RECORD AND TEST RELAYS
CCH $\frac{2}{5}$	CODE CONVERSION HUNDREDS	FST	FOLLOW WITH SECOND TRIAL	OCT	OUTPUT CHANNEL TEST	RTRF	ROUTE TRANSFER OPERATION
CCHN	NO CODE CONVERSION HUNDREDS	*FTD	FOREIGN AREA DELAY TIMING	OF CR	OVERFLOW TRAFFIC REGISTER CONTROL - CARD TO RELAY OPERATION	RYT, RYT1	RECYCLE WORK TIME
CC1-5	CODE CUT-IN RELAYS	FTD1	FOREIGN AREA DELAY TIMING AUXILIARY	ORF	OVER REGISTRATION FAILURE	SDT, SDT1	DECODER OPERATION ON SENDER TEST
CCM	CODE CONVERSION BATTERY SUPPLY			OGT	OUTGOING TRUNK TEST	SMC, SMC1, 2	INCOMING TRUNK ON 'TC' TRAIN
CCT $\frac{2}{5}$	CODE CONVERSION TENS			PCR, PCR1-4	PRINCIPAL CITY ROUTING	SMCO	'SM' LEAD CUT-OFF
				PF	PREFERENCE - CONNECTOR	SMI, SMI1, 2	INCOMING TRUNK ON 'IT' TRAIN
				PRO	OVERLOAD ANNOUNCEMENT SIGNAL FROM SENDER	SS	STUCK SENDER REQUEST
						STI	START TROUBLE RECORDER
						SWT	START WORK TIME
						SWT1	WORK TIME ELAPSED

*RELAY AND TUBE

FUNCTIONAL DESIGNATIONS
SD-68340-01, ISSUE 8

RM 2-9 2 SHEETS, SHEET 1 NO. 4A OR 4M TOLL

ORDER AS BSP ITEM MP-11660

BELL TELEPHONE LABORATORIES, INC.

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MP-11660 2 SHEETS, SHEET 1

SD-68340-01

DECODER CIRCUIT (CONT.)

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
TAL	TIME ALARM
TB $\frac{2}{5}$	TRUNK BLOCK
*TBD	TRUNK BLOCK DELAY TIMING
TBD1	TRUNK BLOCK DELAY TIMING AUXILIARY
TBY, TBY1	FOREIGN AREA TRANSLATOR PLUGGED BUSY
TC, TC1, 2	TOLL COMPLETING MARKER
TCD1, 2	TRANSFER CODE DIGITS
TCF	TRUNK BLOCK CONNECTOR FAILURE
TCK	TRANSLATOR CONNECTOR-CHECK
TCT0-2	TRUNK BLOCK CONNECTOR TENS
TCU $\frac{2}{5}$	TRUNK BLOCK CONNECTOR UNITS
TGS	'G' LEADS TRANSFER RELAY FOR TROUBLE RECORDER TEST
TID, TID1	TRANSLATOR IDLE INDICATION
TKS	TRUNK SELECTED
TPC	THROUGH TRAFFIC PEG COUNT
TR, TR1	TROUBLE RECORDER CONTROL
TR1A	DECODER INDICATES FIRST TRIAL
TR2A, B, C	DECODER INDICATES SECOND TRIAL
TRA	TROUBLE RECORDER TIME-OUT ALARM
TRB, TRB1	TROUBLE RECORDER BUSY OR COMPLETION
TRL	TROUBLE RELEASE
*TRT	TROUBLE RECORDER TIMING
TRT1	TROUBLE RECORDER TIMING AUXILIARY
TS0-2	TRAFFIC SEPARATION PEG COUNT (Outgoing trunk group)
TSA-C	TRAFFIC SEPARATION PEG COUNT (Incoming trunk group)
TSG1-4	TRAFFIC SEPARATION PEG COUNT CONTROL
TST, TST1	TROUBLE RECORDER TEST CALL
VCR1, 2	VACANT CODE ROUTING
VO	'VO' CODE BAR OPERATED
WT(Tube)	WORK TIMING
X6DT	CROSS CHECK ON '6DT' LEAD
XCA	CROSS CHECK ON 'CA' LEADS
XCF	CROSS CHECK ON 'CF' LEAD
XCO	CROSS CHECK CUT-OFF RELAY FOR 'XDRL' AND 'XCA'
XDRL	CROSS CHECK ON 'DRL' LEAD
XIK	CROSS CHECK INTEGRITY OF '5BD' 'CFM', 'PF', 'TSA', 'TSB' AND 'TSC' LEADS

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
XREC	CROSS CHECK ON 'REC' LEAD
XRLT	CROSS CHECK ON 'RLT' LEAD
XTRB	CROSS CHECK ON 'TRB' LEAD
XTRL	CROSS CHECK ON 'TRL' LEAD

*RELAY AND TUBE

SD-68341-01
TRANSLATOR CONNECTOR CIRCUIT

DESIG.	FUNCTIONAL MEANING
C	CONNECTOR
CO-2	CONNECTOR AUXILIARIES
EMC	EMERGENCY CONNECTOR
EME, EME	EMERGENCY (Even)
EMO, EMO	EMERGENCY (Odd)
LO, LO	LOCKOUT
P-	DECODER PREFERENCE

SD-68342-01
CARD TRANSLATOR CIRCUIT

DESIG.	FUNCTIONAL MEANING
6DK	6 DIGITS CHECK
**A $\frac{2}{5}$	'A' DIGIT
AC(Tube)	AREA CODE
AFA(Tube)	ALTERNATE, FOREIGN AREA
AHA(Tube)	ALTERNATE, HOME AREA
ALM	ALARM
ARC	AUTOMATIC RESTORE OF CARD
ART $\frac{2}{5}$ (Tube)	ALTERNATE ROUTE TENS
ARU $\frac{2}{5}$ (Tube)	ALTERNATE ROUTE UNITS
**B $\frac{2}{5}$	'B' DIGIT
BTO, 1(Tubes)	BOX TENS NUMBER
BU $\frac{2}{5}$ (Tubes)	BOX UNITS NUMBER
BZ	BUZZER CONTROL
**C $\frac{2}{5}$	'C' DIGIT
CA4-6(Tubes)	COME AGAIN 4, 5 OR 6 DIGITS
CBK	CODE BAR CHECK
CCH $\frac{2}{5}$ (Tubes)	CODE CONVERSION HUNDREDS
CCHN(Tube)	NO CODE CONVERSION HUNDREDS
CCT $\frac{2}{5}$ (Tubes)	CODE CONVERSION TENS
CCTN (Tube)	NO CODE CONVERSION TENS
CCU $\frac{2}{5}$ (Tubes)	CODE CONVERSION UNITS

SD-68342-01 (CONTD.)
CARD TRANSLATOR CIRCUIT

DESIG.	FUNCTIONAL MEANING
CCUN (Tube)	NO CODE CONVERSION UNITS
CDC $\frac{2}{5}$ (Tubes)	CONTINUITY AND DIGIT CONTROL
CDLC (Tube)	CANCEL DELAYED LOOP CLOSURE
**CGO, 1, 2, 4	CARD GROUP
CKL(Crank Lock)	CRANK LOCK
CLTO, 1(Tubes)	CLASS TENS
CLU $\frac{2}{5}$ (Tubes)	CLASS UNITS
CON	CONNECTOR OFF NORMAL
***CS1, 2	CARD SUPPORT CONTROL
CSL	CARD SUPPORT LIFT
CSL1, 2(Mag's)	CARD SUPPORT LIFT 'D' DIGIT
**D $\frac{2}{5}$	'D' DIGIT
DIM	DIM EXCITER LAMP
**E $\frac{2}{5}$	'E' DIGIT
**F $\frac{2}{5}$	'F' DIGIT
GETO, 1 (Tubes)	GROUP END TENS
GEU $\frac{2}{5}$ (Tubes)	GROUP END UNITS
GSTO, 1(Tubes)	GROUP START TENS
GSU $\frac{2}{5}$ (Tubes)	GROUP START UNITS
HB(Tube)	HOME BOX
HE	HOME EMERGENCY
*IND1, 2	INDEX CHANNEL
IT (Tube)	INTERTOLL
ITC(Tube)	TOLL COMPLETING
L1-4 (Latches)	LATCH
LCH	LATCH
MOC	MANUAL OPERATIONS CONTROL
MOC1-4	MANUAL OPERATIONS CONTROL AUXILIARIES
NAC(Tube)	NO AREA CODE
NCA (Tube)	NO COME AGAIN
NSK(Tube)	NO SKIP
**NVO	NON-VIA ONLY
PD	PULL DOWN
PD1-8(Magnets)	PULL DOWN
PDS1-8	PULL DOWN SLAVE
PU1, 2	PULL UP
PU1-8 (Magnets)	PULL UP
PUS1-8	PULL UP SLAVE

SD-68342-01 (CONTD.)
CARD TRANSLATOR CIRCUIT

DESIG.	FUNCTIONAL MEANING
R1, 2(Tubes)	RECTIFIERS
RD	READ CARDS
RI $\frac{2}{5}$ (Tubes)	ROUTING INSTRUCTION
RT	RECORD AND TEST
RTi-4	RECORD AND TEST AUXILIARIES
SA $\frac{2}{5}$	SLAVE RELAYS - 'A' DIGIT
SB $\frac{2}{5}$	SLAVE RELAYS - 'B' DIGIT
SC $\frac{2}{5}$	SLAVE RELAYS - 'C' DIGIT
SCGO, 1, 2, 4	SLAVE RELAYS - CARD GROUP
SCS1, 2	SLAVE RELAYS - CARD SUPPORT
SD $\frac{2}{5}$	SLAVE RELAYS - 'D' DIGIT
SE $\frac{2}{5}$	SLAVE RELAYS - 'E' DIGIT
SF $\frac{2}{5}$	SLAVE RELAYS - 'F' DIGIT
SK3 (Tube)	SKIP 3 DIGITS
SK6(Tube)	SKIP 6 DIGITS
SNVO	SLAVE RELAY - NON-VIA ONLY
SR	SLOW RELEASE
SVO	SLAVE RELAY - VIA ONLY
TB $\frac{2}{5}$ (Tubes)	TRUNK BLOCK
TC(Tube)	TOLL COMPLETING MARKER
TCTO-2(Tubes)	TRUNK BLOCK CONNECTOR TENS
TCU $\frac{2}{5}$ (Tubes)	TRUNK BLOCK CONNECTOR UNITS
TOS	TRANSLATOR OUT OF SERVICE
TPO-2(Tubes)	TRAFFIC PEG COUNT
TPC (Tube)	THROUGH TRAFFIC PEG COUNT
TS0-2(Tubes)	TRAFFIC SEPARATION PEG COUNT
**VO	VIA ONLY

*Relay and Tube
**Relay and Code Bar Magnet
***Relay and Card Support Magnet

FUNCTIONAL DESIGNATIONS
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ISSUE 2 GRS
DATE 10-26-53
REC

MARKER CIRCUIT

DESIG.	FUNCTIONAL MEANING
0DG	NO NUMERICAL DIGITS
4DG	4 NUMERICAL DIGITS
5DG	5 NUMERICAL DIGITS
ABL0-9	"A" AND "B" LINK NUMBER - LEFT
ABR0-9	"A" AND "B" LINK NUMBER - RIGHT
AC	"A" AND "C" CHANNEL TEST
AC1	"A" AND "C" CHANNEL TEST AUXILIARY
AK	"A" LINK CHECK
AK1	"A" LINK CHECK AUXILIARY
ATB	ALL TRUNKS BUSY
B	"B" LINK CONTINUITY AND FALSE GROUND TEST
BK	"B" LINK (Juncto) CHECK
BM	BUSY MARKER
CBR	CONNECTOR BUSY
CCH $\frac{2}{5}$	CODE CONVERSION HUNDREDS CHECK
CCHA, B	CODE CONVERSION HUNDREDS CHECK
CCHN	NO CODE CONVERSION HUNDREDS CHANGE AND CANCEL CONTINUITY TEST
CCT $\frac{2}{5}$	CODE CONVERSION TENS
CCTA, B	CODE CONVERSION TENS CHECK
CCTN	NO CODE CONVERSION TENS
CCU $\frac{2}{5}$	CODE CONVERSION UNITS
CCUA, B	CODE CONVERSION UNITS CHECK
CCUN	NO CODE CONVERSION UNITS
CDA	CONTINUITY AND DIGIT "A" CHECK
CDLC	CANCEL DELAYED LOOP CLOSURE
CHB	ALL CHANNELS BUSY
CHE	CHANNEL END (Selected)
CHL0-9	CHANNEL NUMBER - LEFT
CHR0-9	CHANNEL NUMBER - RIGHT
CHT	CHANNEL TIMING
CHTK	CHANNEL TIMING CHECK
CK	"C" LINK CHECK
CKG	CIRCUIT GROUNDING
CKGA	CIRCUIT GROUNDING AUXILIARY

DESIG.	FUNCTIONAL MEANING
CL0-2	CLASS
CL5-7	CLASS
CL8-13	CLASS (X and Y options)
CL14	CLASS
CLA-C	CLASS CHECK
CLCT	CANCEL LOOP CONTINUITY TEST
CLT0, 1	CLASS TENS
CLU $\frac{2}{5}$	CLASS UNITS
CNE	CONNECTOR EVEN
CNO	CONNECTOR ODD
COF	CHANNEL OVERFLOW
CON1, 3	CONTINUITY
CONA, B	CONTINUITY TEST
CPL0-9	"C" LINK NUMBER - LEFT
CPR0-9	"C" LINK NUMBER - RIGHT
DA1-3	PREFERENCE CHAIN ALARM
DE	DECODER ENGAGED
DFP	DETECT FALSE PULSE FREQUENCY
DGA	DIGIT CONTROL CHECK
DL	DELAY
FA-FF	FREQUENCY DETECTED
FA1-FF1	FREQUENCY CHECKED
FA2-FF2	FREQUENCY TRANSLATED
FG, FH	FREQUENCY DETECTED (V option)
FG1, FH1	FREQUENCY CHECKED (V option)
FG2, FH2	FREQUENCY TRANSLATED (V option)
FMB	FOLLOW WITH MASTER BUSY
FOF	FOLLOW WITH OVERFLOW
FOFA	FOLLOW WITH OVERFLOW AUXILIARY
FRO	FOLLOW WITH REORDER
FST	FOLLOW WITH SECOND TRIAL
GCK	TRUNK GROUP CUT-OFF CHECK
GE1-39 (Odd)	GROUP END
GET0, 1	GROUP END TENS RECEIVING LEADS CUT-IN
GEU $\frac{2}{5}$	GROUP END UNITS RECEIVING LEADS CUT-IN
GS0-38 (Even)	GROUP START
GST0, 1	GROUP START TENS RECEIVING LEADS CUT-IN
GSU $\frac{2}{5}$	GROUP START UNITS RECEIVING LEADS CUT-IN

DESIG.	FUNCTIONAL MEANING
HLD	HOLD (For other route information)
HMT	HOLD MAGNET TIMING
HMT1	HOLD MAGNET TIMING AUXILIARY
I0-19	INCOMING FRAME
IA0-19	INCOMING FRAME AUXILIARIES
ICB	INCOMING CONNECTOR BUSY
ICK	INCOMING CONNECTOR CHECK
ICO	INCOMING FRAME IDENTIFICATION CUT-IN
IC1, 2	INCOMING FRAME IDENTIFICATION CUT-IN AUXILIARIES
ID	INCOMING FRAME IDENTIFICATION
IEV	INCOMING FRAME EVEN
IEV1	INCOMING FRAME EVEN AUXILIARY
IFK	INCOMING FRAME CHECK
IL	INCOMING IDENTIFIER LOCK
ILA	INCOMING IDENTIFIER LOCK AUXILIARY
IOD	INCOMING FRAME ODD
IOD1	INCOMING FRAME ODD AUXILIARY
JC0-19	JUNCTOR CUT-IN
JP0-17	JUNCTOR PATTERN
JPN	NORMAL JUNCTOR PATTERN (U option)
K0-39	TRUNK SELECTED
LCON	LOOP CONTINUITY (X and Y options)
LPD	LOOP DIAL (X and Y options)
MB	MASTER BUSY
MBR	MASTER BUSY ROUTE
MFF	MULTIFREQUENCY FAILURE
MFT	MULTIFREQUENCY TRANSFER
MLCT	MAKE CONTINUITY TEST (X and Y options)
MSC	MARKER SLEEVE CONTROL
NDG	NO DIGIT CONTROL
NSK	NO SKIP
00-19	OUTGOING FRAME
OAT	OVER-ALL TIMER
OAT1, 2	OVERALL TIMER AUXILIARIES
OC0	OUTGOING FRAME IDENTIFICATION CUT-IN
OC1, 2	OUTGOING FRAME IDENTIFICATION CUT-IN AUXILIARIES
OCB	OUTGOING CONNECTOR BUSY
OCC	OUTGOING CONNECTOR CHECK
OCC1	OUTGOING CONNECTOR CHECK AUXILIARY
OD	OUTGOING FRAME IDENTIFICATION

DESIG.	FUNCTIONAL MEANING
OEV	OUTGOING FRAME EVEN
OEV1	OUTGOING FRAME EVEN AUXILIARY (W option)
OF	OVERFLOW
OFK	OUTGOING FRAME CHECK
OGT	OUTGOING TRUNK TEST
OL	OUTGOING FRAME LOCK
OLA	OUTGOING FRAME LOCK AUXILIARY
ONB	OFF NORMAL BATTERY
ONG	OFF NORMAL GROUND
ONG1	OFF NORMAL GROUND AUXILIARY
OOD	OUTGOING FRAME ODD
OOD1	OUTGOING FRAME ODD AUXILIARY (W option)
OVA-D	JUNCTOR SUBGROUP OVERFLOW AUXILIARIES
PC	PEG COUNT
PC1, 2	PEG COUNT AUXILIARIES
RC	DECODER-MARKER TEST AND TROUBLE RECORDER CUT-IN
RC1-4	DECODER-MARKER TEST AND TROUBLE RECORDER CUT-IN AUXILIARIES
RCD	READ CARD
RCD1, 2	READ CARD AUXILIARIES
RCK	REGISTRATION CHECK
RCT	RECYCLE TIMING
RCT1	RECYCLE TIMING AUXILIARY
REC	TROUBLE RECORDER SEIZED
RL	RELEASE
RO	REORDER
ROB	REORDER TRUNKS BUSY
ROR	REORDER ROUTE
RS1-4	ROUTE SWITCHING
RT, RT1	TROUBLE RECORDER CUT-IN
RTA-D	ROTATE JUNCTOR SUBGROUP CHOICE
RTA'-D'	ROTATE JUNCTOR SUBGROUP CHOICE
SAR	SEND AS RECEIVED
SCT	SLEEVE CONTINUITY TEST
SCT1	SLEEVE CONTINUITY TEST AUXILIARY
SG	SLEEVE GUARD
SGA	SLEEVE GUARD AUXILIARY
SGA1	SLEEVE GUARD AUXILIARY
SK	SELECT MAGNET LOCKOUT CHECK
SK3	SKIP AREA CODE - SPILL OFFICE CODE
SK6	SKIP 6 - NO OFFICE CODE DIGITS
SKA	SKIP CHECK
SMT	SELECT MAGNET TRANSFER

FUNCTIONAL DESIGNATIONS
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 DATE 6-20-51
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 2 SHEETS, SHEET 1
 MP-11662

SD-68388-01

MARKER CIRCUIT

DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING
SPT	STOP TIMING	TRTX	TROUBLE RECORDER TIMING CROSS
SRL	SENDER RELEASE	TSA	TRUNK SELECTED CHECK
SS	STUCK SENDER	TST	TROUBLE RECORDER INDICATES TEST CALL
STI	SEIZE TROUBLE RECORDER	TSTA	TROUBLE RECORDER INDICATES TEST CALL AUXILIARY
T0-39	TRUNK BUSY TEST	X	MASTER CROSS
TB	TRUNKS BUSY (Alternate available)	XCO	CROSS CUT-OFF
TB $\frac{2}{5}$	TRUNK BLOCK RELAY	XCO1	CROSS CUT-OFF AUXILIARY
TB2K	TWO "TB" RELAY CHECK	XCOA-C	CROSS CUT-OFF AUXILIARIES
TBK	TRUNK BLOCK CHECK	XI	CROSS "I" RELAYS
TC0-29	TRUNK BLOCK CONNECTOR	XIA	CROSS "I" RELAYS AUXILIARY
TCB	TRUNK BLOCK CONNECTOR BUSY	XIS	CROSS INCOMING TRUNK SLEEVE
TCBA	TRUNK BLOCK CONNECTOR BUSY AUXILIARY	XILS	CROSS INCOMING LINK SLEEVE
TCK	TRUNK BLOCK CONNECTOR CHECK	XIPS	CROSS INCOMING PRIMARY SELECT MAGNET
TCK1	TRUNK BLOCK CONNECTOR CHECK AUXILIARY	XJP	CROSS JUNCTOR PATTERN (U option)
TKE	TRUNK "K" RELAY STABILIZER, TRUNK END	XJS	CROSS JUNCTOR SLEEVE
TKS	TRUNK SELECTED	XK	CROSS CHECK RELAYS
TKT	TRUNK TEST TIMING	XMRL	CROSS MARKER RELEASE LEAD
TKTK	TRUNK TEST TIMING CHECK	XMS	CROSS MARKER SLEEVE
TM	TIME MEASURE	XMS1	CROSS MARKER SLEEVE AUXILIARY
*TM1	TIME MEASURE AUXILIARY	XO	CROSS "O" RELAYS
TM1X	TIME MEASURE AUXILIARY	XOA	CROSS "O" RELAYS AUXILIARY
*TM2	TIMING - (Marker release after incoming frame check) - INCOMING FRAMES NOT EXTENDED	XOLS	CROSS OUTGOING LINK SLEEVE
TM2X	TIMING - (Marker release after incoming frame check) - INCOMING FRAME NOT EXTENDED - AUXILIARY	XRCK	CROSS RCK LEAD
*TM3	TIMING - (Marker release after incoming frame check) INCOMING FRAMES EXTENDED	XSM	CROSS SELECT MAGNET LEAD
TMR	TIME MEASURE RELEASE	XSM1	CROSS SELECT MAGNET INCOMING SECONDARY
TP0-2	TRUNK PEG COUNT AND OVERFLOW REGISTER CONTROL	XSMO	CROSS SELECT MAGNET OUTGOING PRIMARY
TR	TROUBLE RECORDER	XSMT	CROSS SELECT MAGNET TEST
TR1	FIRST TRIAL	XST	CROSS START LEAD
TR1A	FIRST TRIAL AUXILIARY	XSTR	CROSS STRL LEAD
TR2	SECOND TRIAL	XTB	CROSS TRUNK BLOCK RELAY
TR2A	SECOND TRIAL AUXILIARY	XTB1	CROSS TRUNK BLOCK RELAY AUXILIARY
TRA	TROUBLE RECORDER ALARM	XTIF	CROSS INCOMING START LEAD
TRB	TROUBLE RECORDER INDICATES BUSY OR COMPLETION	XTKS	CROSS TKS LEAD
TRL	TROUBLE RELEASE	XTL	CROSS TRANSMITTING LEAD
*TRT	TROUBLE RECORDER TIMING	XTL1	CROSS TRANSMITTING LEAD AUXILIARY
		XTOF	CROSS OUTGOING START LEAD
		XTR	CROSS MTRL LEAD
		XTRL	CROSS TRL RELAY OPERATING PATH

*Relay and Tube

DECODER MARKER TEST
AND TROUBLE RECORDER CIRCUIT

DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING
ODG	NO DIGITS (Beyond code)	CKL	CRANK LOCK (Translator)	ICB	INCOMING CONNECTOR BUSY	NRS1	NUMBER OF RECORDS START AUXILIARY
3D	3 DIGIT CARD	CKR	CHECK RESISTANCE	IF0-3(Mag)	KEY RELEASE MAGNETS	*NRT	NUMBER OF RECORDS TIME-OUT
3GS	THIRD GROUND SUPPLY	CL1, 2	CARD LIFT (Translator)	IND	INDEX CHANNEL	NSK	NO SKIP
4DG	4 DIGITS (Not more than 4 digits beyond code)	CL12	CLASS 12	INT(Clutch)	INTERMITTENT CARD ADVANCE (Through steps of recording)	OCB	OUTGOING CONNECTOR BUSY
4GS	FOURTH GROUND SUPPLY	CLCT	CANCEL LOOP CONTINUITY TEST	ISB	INCOMING CONNECTOR START BATTERY	OEV	OUTGOING FRAME EVEN
5DG	5 DIGITS (Not more than 5 digits beyond code)	CMP0-7	TOLL COMPLETING MARKER PREFERENCE	ISB1	INCOMING CONNECTOR START BATTERY AUXILIARY	OF	OVERFLOW
5GS	FIFTH GROUND SUPPLY	CMT0-7	TOLL COMPLETING MARKER TEST	IT2	INTERTOLL	ON	OFF-NORMAL
6D	6 DIGIT CARD	CNE	CONNECTOR EVEN	KC	KEY CONTROL	OOD	OUTGOING FRAME ODD
6DT	6 DIGIT TRANSLATION	CNO	CONNECTOR ODD	KC1-8	KEY CONTROL AUXILIARIES	P1-3	PULSE
6GS	SIXTH GROUND SUPPLY	CON1	CONTINUITY	KCD	KEY CONTROL (Decoder stage)	PA	PATTERN (Test)
20C	20 CYCLE RINGING	CONT(Clutch)	CONTINUOUS CARD ADVANCE (Ejection)	KCM	KEY CONTROL (Marker stage)	PA1	PATTERN (Test) AUXILIARY
ACO	ALARM CUT-OFF	CPA0-5 To CPF0-5	CONTROLLER PREFERENCE FOR CONTROLLER GROUPS A TO F	KTR1	CHECK T1 AND R1	PFA-E	PREFERENCE A TO E
AL	ALARM	CR, CR1, 2	CARD REMOVAL	LC0-9	LINK CONNECTOR	R0-8	SCANNING CONNECTOR (0-59 Rows R0 to R8)
AMS	ALL MS RELAYS	CRC	CARD REMOVAL CONTROL	LCH(Latch)	LATCH (Controls card advance mechanism)	RA1-3	ROUTE ADVANCE
AMS1	ALL MS RELAYS AUXILIARY	CTCI	CONTROLLER TEST CUT-IN	LCON	LOOP CONTINUITY	RAC	ROUTE ADVANCE CONTROL
AR	ALTERNATE ROUTE	CTP	CONTROLLER TEST PREFERENCE	LDT	LOAD TEST	RC1-3	RELEASE CONTROLLER
ARG	AUTOMATIC RELEASE GROUND	DC	DC OUTPUTSING	LK	LOCK	RD	RELEASE DECODER
ARG1	AUTOMATIC RELEASE GROUND AUXILIARY	DU	DIRECTED TO UPPER LEVELS	LMS	LOCK MS RELAYS	RL	RELEASE
BRC1-3	BUSY RECORDER TO CONTROLLERS	DL	DIRECTED TO LOWER LEVELS	LMS0-3	LOCK MS RELAYS AUXILIARIES	RLM	RELEASE MANUAL OPERATIONS
BRD	BUSY RECORDER TO DECODERS	DLC	DELAYED LOOP CLOSURE	LPD	LOOP DIAL	RLS	RELEASE
BRMC	BUSY RECORDER TO MARKERS (Toll completing)	DMTF	DECODER MARKER TEST PREFERENCE	M	MANUAL	RLT	RELEASE AFTER TRANSLATION
BRMT	BUSY RECORDER TO MARKERS (Intertoll)	DP0-9	DECODER PREFERENCE	MBR	MASTER BUSY ROUTE	RLT1	RELEASE AFTER TRANSLATION AUXILIARY
CA	CARD ACCESS	DRL	DECODER RELEASE	MC	MOTOR CONTROL	RMC	RELEASE MARKER (Toll completing)
CA4-6	COME AGAIN 4, 5 OR 6	DT	DECODER TEST CLASS	MCO	MOTOR CUT-OFF	RMT	RELEASE MARKER (Intertoll)
CBH	CODE BAR HOLD	DT(Mag)	KEY RELEASE MAGNET	MCR	MASTER CONTROL	ROR	REORDER ROUTE
CC1-4	CODE CONNECTOR AUXILIARY	DT0-9	DECODER TEST	*MCT	MOTOR CONTROL TIMING	RTI	RELEASE TEST (Interposers)
CCH $\frac{2}{5}$	CODE CONVERSION HUNDREDS	DTRL	DECODER TROUBLE RELEASE	ME	MARKER ENGAGED	RTM	REORDER TIME-OUT
CCT	CANCEL CONTINUITY TEST	*ELT	EXCITER LAMP TIMING (Start)	MF	MULTIFREQUENCY OUTPUTSING	RTOS	RECORDER TEMPORARILY OUT OF SERVICE
CCT $\frac{2}{5}$	CODE CONVERSION TENS	ELT1	EXCITER LAMP TIMING (End)	MFT	MULTIFREQUENCY TRANSFER	RTR	RECORD TEST RESULTS
CCU $\frac{2}{5}$	CODE CONVERSION UNITS	ERL	END RESULT LOCK	MKT	MARKER TEST	RTR1	RECORD TEST RESULTS AUXILIARY
CDL	CARD LIFT	FTT(Mag)	KEY RELEASE MAGNET	MOCK	MANUAL OPERATIONS CONTROL CHECK	S0-8	SCANNING CONNECTOR (0-59 Rows S0 to S8)
CF	CARD FAILURE	FTU(Mag)	KEY RELEASE MAGNET	MP0-9	MARKER PREFERENCE	SCA	STOP CHAIN ADVANCE
CG0, 1, 2, 4	CARD GROUP	HMG	HOLD MAGNET GROUND	MRL	MARKER RELEASE	SCT	SEIZE CHAIN FOR TEST
CGS	CONTROL GROUND SUPPLIES	HMG1	HOLD MAGNET GROUND AUXILIARY	MS0-39	MARKER SLEEVE	SG	SLEEVE GUARD
CH	CHAIN	GO-3	GROUPS 0-3	MSK	MARKER SLEEVE CHECK	SK3, 6	SKIP 3, SKIP 6
CHK	CHECK	GMS	GROUND MARKER SLEEVE LEADS	MST	MARKER SLEEVE TEST	SLPD	SENDER LOOP DIALING
		GMS0-3	GROUND MARKER SLEEVE LEADS AUXILIARY	MT	MARKER TRANSFER	SMB	SELECT MAGNET LEADS BATTERY
		GR	GROUP RELEASE	MT0-9	MARKER TEST	SMB1	SELECT MAGNET LEADS BATTERY AUXILIARY
		GS0-5	GROUND SUPPLIES 0-5	MTRL	MARKER TROUBLE RELEASE	SMG	SELECT MAGNET LEADS GROUND
		GU0-3	GROUND UNITS	NCF	NON-OPERATE CONTINUITY FAILURE	SMG1	SELECT MAGNET LEADS GROUND AUXILIARY
				NR(Tube)	NUMBER OF RECORDS TIMING	SM0-29	SELECT MAGNET NUMBER
				NRS	NUMBER OF RECORDS START		

*Relay and Tube

FUNCTIONAL DESIGNATIONS

SD - 68389 - 01, ISSUE 2

RM 2-12 2 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS BSP ITEM MP-11663

BELL TELEPHONE LABORATORIES, INC.

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MP-11663 2 SHEETS, SHEET 1

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R.8.B.

SD-68389-01

DECODER MARKER TEST
AND TROUBLE RECORDER CIRCUIT

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
SPC(M.R.)	SPEED CHECK (Perforator motor)
SPT	SELECT PARTICULAR TRUNK
SR	SLOW RELEASE
SR1-3	SLOW RELEASE 1, 2, 3
SRA	STOP ROUTE ADVANCE
SS	STUCK SENDER
ST	START
STR	START
STR1,2	START 1, 2
STRL	SENDER TROUBLE RELEASE
SXD	SIMPLEX DIALING
SXR	SIMPLEX RINGING
T0-11	TENS NUMBER
TBS	TRUNK BLOCK SIMULATED
TC	TEST COMPLETE
TC2	TOLL COMPLETING
TCB	TRUNK BLOCK CONNECTOR BUSY
TCK	TRUNK BLOCK CONNECTOR CHECK
TICB	TEST INCOMING CONNECTOR BUSY
TKS	TRUNK SELECTED
TOCB	TEST OUTGOING CONNECTOR BUSY
TLC1-3	TRANSMITTING LEAD CONNECTOR 1-3
*TM	TIMING
TM1,2	TIMING 1, 2
TMC	TM (Relay) CONTACT
TON	TEST OFF-NORMAL
TRB	TROUBLE RECORDER BUSY
TRC	TROUBLE RECORD COMPLETE
TRC1-3	TROUBLE RECORD COMPLETE 1, 2, 3
TRMB	TROUBLE RECORDER MADE BUSY
TS	TEST START
TSR	TRAFFIC SEPARATION REGISTER
TST	TEST
TST1-3	TEST 1, 2, 3
TTCB	TEST TRUNK BLOCK CONNECTOR BUSY
WAR	WARNING (Low supply of unused cards in bin)
XDD	EXPECT DIAL DELAY
XJP	CROSSED JUNCTOR PATTERN

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
XMS	CROSSED MARKER SLEEVE
XPS	CROSSED PRIMARY SELECT MAGNET
XSG	EXPECT STOP-GO
XSMI	CROSSED SECONDARY SELECT MAGNET INCOMING
XSMO	CROSSED PRIMARY SELECT MAGNET OUTGOING

*Relay and Tube

SD - 68393 - 01

INCOMING LINK AND CONNECTOR CIRCUIT

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
A	ALTERNATE (Frequency cut-in)
AL	ALARM
CB	CONNECTOR BUSY
CH	CHAIN GUARD
FCH	FRAME CONNECTOR (Home)
FCM	FRAME CONNECTOR (Mate)
FLH	FRAME LOCKOUT (Home)
FLM	FRAME LOCKOUT (Mate)
LCH0-9	LINK CONNECTOR CUT-IN (Home)
LCM0-9	LINK CONNECTOR CUT-IN (Mate)
LWH	LINK WANTED (Home)
LWM	LINK WANTED (Mate)
MC	MARKER CONNECTOR
MP	MARKER PREFERENCE
P(Hold)	PRIMARY HOLD MAGNETS
P(Select)	PRIMARY SELECT MAGNETS
R	REGULAR (Frequency cut-in)
S(Hold)	SECONDARY HOLD MAGNETS
S(Select)	SECONDARY SELECT MAGNETS
SH0-9	SELECT MAGNET (Home)
SLH	SELECT MAGNET LOCKOUT (Home)
SLM	SELECT MAGNET LOCKOUT (Mate)
SM0-9	SELECT MAGNET (Mate)
T0-9	TROUBLE RECORDER OR TROUBLE INDICATOR (Cut-in)

SD - 68394 - 01

OUTGOING LINK AND CONNECTOR CIRCUIT

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
A	ALTERNATE (Frequency cut-in)
AL	ALARM
CB	CONNECTOR BUSY
CH	CHAIN GUARD
FCH	FRAME CONNECTOR (Home)
FCM	FRAME CONNECTOR (Mate)
FLH	FRAME LOCKOUT (Home)
FLM	FRAME LOCKOUT (Mate)
JCH0-9	JUNCTOR CUT-IN (Home)
JCM0-9	JUNCTOR CUT-IN (Mate)
JLH	JUNCTOR LOCKOUT (Home)
JLM	JUNCTOR LOCKOUT (Mate)
LCH0-9	LINK CONNECTOR CUT-IN (Home)
LCM0-9	LINK CONNECTOR CUT-IN (Mate)
LWH	LINK WANTED (Home)
LWM	LINK WANTED (Mate)
MCA	MARKER CUT-IN
MCB	MARKER CUT-IN
MP	MARKER PREFERENCE
P(Hold)	PRIMARY HOLD MAGNETS
P(Select)	PRIMARY SELECT MAGNETS
R	REGULAR (Frequency cut-in)
S(Hold)	SECONDARY HOLD MAGNETS
S(Select)	SECONDARY SELECT MAGNETS
SH0-9	SELECT MAGNET (Home)
SM0-9	SELECT MAGNET (Mate)

SD - 68395 - 01

MARKER CONNECTOR CIRCUIT

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
CB-	CONNECTOR BUSY
MC1-3	MARKER CUT-IN AUXILIARIES
MCA,B	MARKER CUT-IN
MP-	MARKER PREFERENCE
PMC	PARTICULAR MARKER (Toll completing) - TEST CALL
PMI	PARTICULAR MARKER (Intertoll) - TEST CALL

SD - 68420 - 01

GROUP BUSY CHAIN RELAY CIRCUIT -
OVERFLOW TRUNK CIRCUIT
AND OVERFLOW TRUNK CONTROL CIRCUIT

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
A	FLASH CONTROL
D	DELAY QUOTATION
F	FLASH
GB0-3	GROUP BUSY
GBT	GROUP BUSY TERMINAL
OF	OVERFLOW
ON	OFF NORMAL
RO	REORDER
SL	SENDING LEAD CONTROL

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FUNCTIONAL DESIGNATIONS		
SD - 68393 - 01,	ISSUE	4
SD - 68394 - 01,	ISSUE	3
SD - 68395 - 01,	ISSUE	2
SD - 68420 - 01,	ISSUE	1

SD-95087-01

SIGNALING RECEIVING CIRCUIT
MULTIFREQUENCY PULSING

<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
$\frac{2}{6}$	CHANNEL
CK1-3	CHECK
KP1-3	KEY PULSE
SP	SIGNAL PRESENT

SD-95536-01

SIGNALING RECEIVING CIRCUIT
MULTIFREQUENCY PULSING

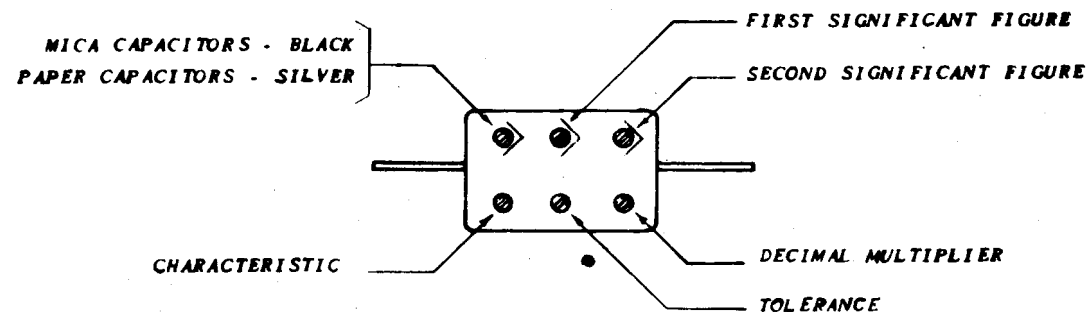
<u>DESIG.</u>	<u>FUNCTIONAL MEANING</u>
$\frac{2}{6}$	CHANNEL
CK2,3	CHECK
FT	FILAMENT TRANSFER
KP	KEY PULSE
KP1,2	KEY PULSE AUXILIARIES
LK	LOCK
SP	SIGNAL PRESENT

ISSUE 1 QDS
DATE 6-20-51

R.B.B.

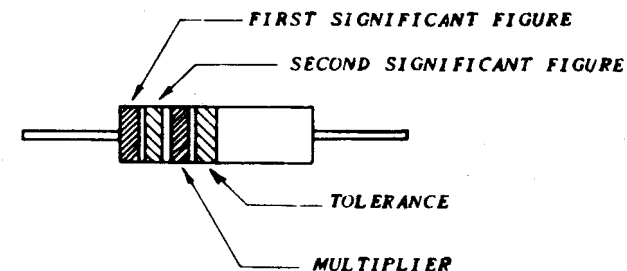
COLOR CODES FOR CAPACITORS AND RESISTORS

JAN* COLOR CODES FOR FIXED CAPACITORS
(CAPACITANCE VALUES IN MICROMICROFARADS)



COLOR	SIGNIFICANT FIGURE	DECIMAL MULTIPLIER	TOLERANCE	CHARACTERISTIC (SEE TABLE A)
BLACK	0	1	20%	A
BROWN	1	10	-	B
RED	2	100	2%	C
ORANGE	3	1000	-	D
YELLOW	4	-	-	E
GREEN	5	-	-	F
BLUE	6	-	-	G
VIOLET	7	-	-	
GRAY	8	-	-	
WHITE	9	-	-	
GOLD	-	0.1	5%	
SILVER	-	0.01	10%	

JAN* AND RMA+ COLOR CODES FOR FIXED COMPOSITION RESISTORS
(RESISTANCE VALUES IN OHMS)



COLOR	SIGNIFICANT FIGURE	MULTIPLIER	TOLERANCE
BLACK	0	1.0	-
BROWN	1	10	-
RED	2	100	-
ORANGE	3	1,000	-
YELLOW	4	10,000	-
GREEN	5	100,000	-
BLUE	6	1,000,000	-
VIOLET	7	10,000,000	-
GRAY	8	100,000,000	-
WHITE	9	1,000,000,000	-
GOLD	-	0.1	± 5 per cent
SILVER	-	0.01	± 10 per cent
NO COLOR	-	-	± 20 per cent

TABLE A

CHARACTERISTIC	Q	TEMPERATURE COEFFICIENT PARTS/MILLION/DEGREE C	MAXIMUM CAPACITANCE DRIFT
A	NOT SPECIFIED	NOT SPECIFIED	NOT SPECIFIED
B	SPECIFIED	NOT SPECIFIED	NOT SPECIFIED
C	SPECIFIED	-200 to +200	0.5 per cent
D	SPECIFIED	-100 to +100	0.2 per cent
E	SPECIFIED	0 to +100	0.05 per cent
F	SPECIFIED	0 to +50	0.025 per cent
G	SPECIFIED	0 to +50	0.025 per cent

* JOINT ARMY-NAVY

+ RADIO MANUFACTURERS ASSOCIATION

COLOR CODES FOR
CAPACITORS AND RESISTORS

RM 3-1

ISSUE 11-1-58
DATE 11-28-50

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DATE	8-30-51	12-15-53		

ITEM NO.	OUTGOING TRUNK*		CLASS OF OUTPULSING FROM I.S.	OUTPULSE CLASS RELAYS OPERATED							START PULSING SIGNAL REQUIRED	START PULSING SIGNAL	STOP PULSING SIGNAL	TIMING INTERVALS				NOTES	TYPE OF EQUIPMENT RECEIVING SIGNALS OR PULSES		
	TYPE	GUARDED OR UNGUARDED		M	MF	DC	DP	LPD	SXD	DLC				XDD	XSG	RTT	DLC			MFT	TGT
1	INTERTOLL-MANUAL	GUARDED	NONE	X												**NONE				UPON MARKER RELEASE THE SENDER MAKES "SL" CHECK AND RELEASES.	MANUAL SWITCHBOARD AT DISTANT TOLL OFFICE.
2	TOLL COMPLETING-MANUAL	UNGUARDED	NONE	X					X								575 MS			UPON MARKER RELEASE THE SENDER TIMES FOR DLC, MAKES "SL" CHECK AND RELEASES.	SERVICE TRUNKS SUCH AS 121, 101; TX TRUNKS, 11EX; REORDER, OVERFLOW AND MASTER BUSY.
3	TOLL COMPLETING PCI OR REVERTIVE	GUARDED	DC KEY PULSING					X												UPON MARKER RELEASE THE INCOMING SENDER MAKES "SL" CHECK, A CHECK IS THEN MADE BETWEEN THE INCOMING AND OUTGOING SENDERS VIA THE KT1 AND KR1 LEAD WHICH RESULTS IN A START PULSING SIGNAL TO THE INCOMING SENDER.	OUTGOING SENDER AT SAME 4A INSTALLATION.
4	INTERTOLL-MF PULSING	GUARDED	MF PULSING		X												375 MS	50 MS		SENDER CHECKS FOR START PULSING SIGNAL PRIOR TO "SL" CHECK, MAKES "SL" CHECK AND TRANSFERS SUPERVISORY CIRCUIT FROM KT1 AND KR1 LEADS TO KT AND KR LEADS. IF INITIAL SIGNAL IS STOP PULSING AND PERSISTS FOR DURATION OF SENDER TIMING (30-40 SEC.), A DOUBLE CONNECTION IS INDICATED AND SENDER SENDS FLASH AHEAD. IF STOP PULSING SIGNAL IS RECEIVED DURING OUTPULSING THE CALL IS ROUTED TO REORDER.	INCOMING MF SENDER AT DISTANT TOLL OFFICE.
5	TOLL COMPLETING-MF PULSING	UNGUARDED	MF PULSING		X					X							575 MS	50 MS		SENDER DOES NOT WAIT FOR START PULSING SIGNAL TO MAKE "SL" CHECK. RECEIVES STOP PULSING SIGNAL PRIOR TO START PULSING SIGNAL. ABSENCE OF INITIAL STOP PULSING SIGNAL INDICATES AN OPEN TRUNK AND SENDER WILL TIME OUT.	1. MF TERMINATING SENDER AT NO. 1 CROSSBAR OFFICE. 2. MF SENDER AT CROSSBAR TANDEM OFFICE. 3. MF INCOMING REGISTER AT NO. 5 CROSSBAR OFFICE.
6	INTERTOLL-SIMPLEX DIALING	GUARDED	SX DIALING							X							375 MS			START PULSING SIGNAL IS WAITING WHILE ROUND TRIP TRANSIT TIMING TAKES PLACE. IF STOP PULSING SIGNAL IS RECEIVED INITIALLY THIS INDICATES TROUBLE; FOR EXAMPLE, A DOUBLE CONNECTION ON A 2-WAY TRUNK OR A REVERSED 1-WAY TRUNK.	INTERTOLL S/S EQUIPMENT IN DISTANT TOLL OFFICE.
7	INTERTOLL-SIMPLEX DIALING	GUARDED	SX DIALING							X		X					375 MS			PRELIMINARY STOP PULSING SIGNAL IS ACCEPTED WITHOUT INDICATING TROUBLE, BECAUSE OF EXPECTED DIAL DELAY (XDD).	1. DP INCOMING SENDER AT DISTANT TOLL OFFICE. 2. INTERTOLL S/S TRUNK FINDING EQUIPMENT.
8	INTERTOLL-SIMPLEX DIALING	GUARDED	SX DIALING							X			X				375 MS			DURING OUTPULSING THE SENDER EXPECTS ONE STOP PULSING SIGNAL FROM THE EQUIPMENT AHEAD. OUTPULSING CONTINUES AFTER START PULSING SIGNAL IS AGAIN RECEIVED.	INTERTOLL S/S EQUIPMENT WHICH CONNECTS TO LINK TYPE OFFICES.
9	INTERTOLL-SIMPLEX DIALING	GUARDED	SX DIALING							X		X	X				375 MS			PRELIMINARY STOP PULSING SIGNAL ACCEPTED (XDD), AND IN ADDITION, ONE STOP PULSING SIGNAL IS EXPECTED DURING OUTPULSING. OUTPULSING IS RESUMED UPON RECEIPT OF A START PULSING SIGNAL.	INTERTOLL S/S TRUNK FINDING EQUIPMENT WHICH CONNECTS TO LINK TYPE OFFICES.
10	TOLL COMPLETING-LOOP DIALING	UNGUARDED	LOOP DIALING							X		X					775 MS			START PULSING SIGNAL IS RECOGNIZED BY OPERATION OF TG AND TGI RELAYS IN THE SENDER AFTER DLC TIMING. A STOP PULSING SIGNAL INDICATES A REVERSED TRUNK, AND THE SENDER WILL TIME OUT.	LOCAL S/S OFFICE WHERE CONTROLLED RING (20 CYCLE) MAY BE REQUIRED.
11	TOLL COMPLETING-LOOP DIALING	UNGUARDED	LOOP DIALING							X		X	X				775 MS			START PULSING SIGNAL IS RECOGNIZED BY OPERATION OF THE TG AND TGI RELAYS AFTER DLC TIMING. THE SENDER EXPECTS ONE STOP PULSING SIGNAL DURING OUTPULSING. OUTPULSING IS RESUMED UPON RECEIPT OF A START PULSING SIGNAL.	LOCAL S/S OFFICE WHICH CONNECTS TO LINK TYPE OFFICES.
12	TOLL COMPLETING-LOOP DIALING	UNGUARDED	LOOP DIALING							X		X	X				775 MS	75 MS		SUPERVISION TO THE SENDER MAY CHANGE RAPIDLY DURING SEIZURE OF THE TRUNK AT THE DISTANT END. SINCE THE SENDER IS UNABLE TO RECOGNIZE SOME OF THESE CHANGES, THE START PULSING SIGNAL IS TIMED WHEN RECEIVED (TGT).	LOCAL LINK TYPE OFFICE.
13	TOLL COMPLETING-LOOP DIALING	UNGUARDED	LOOP DIALING							X		X	X	X			775 MS	75 MS		SAME AS ABOVE EXCEPT THAT THE SENDER EXPECTS ONE STOP PULSING SIGNAL DURING OUTPULSING. OUTPULSING IS RESUMED UPON RECEIPT OF A START PULSING SIGNAL.	LINK TYPE OFFICE WHICH CONNECTS TO OTHER LINK TYPE OFFICES.
14	TOLL COMPLETING-LOOP DIALING	GUARDED	LOOP DIALING							X			X				175 MS	75 MS		SUPERVISION TO THE SENDER MAY CHANGE RAPIDLY DURING SEIZURE OF THE TRUNK AT THE DISTANT END. SINCE THE SENDER IS UNABLE TO RECOGNIZE SOME OF THESE CHANGES, THE START PULSING SIGNAL IS TIMED WHEN RECEIVED (TGT).	C.O.O. TYPE OFFICE.

X = OPERATED RELAY.
 * = 1-WAY OUTGOING TRUNK OR OUTGOING PORTION OF 2-WAY TRUNK.
 *** THE INCOMING SENDER DOES NOT EXPECT RETURN SUPERVISION, THEREFORE NO RTT TIMING IS REQUIRED.
 **** THE NATURE OF THE CHECK BETWEEN THE INCOMING AND OUTGOING SENDERS MAKES RTT TIMING UNNECESSARY.

INCOMING SENDER CKT-DP
 INCOMING SENDER CKT-MF

SD-68221-01, ISS. 18
 SD-68222-01, ISS. 18

INCOMING SENDER-OUTPULSING

NO. 4A TOLL

RM 3-3

ISSUE	1	2	3
DATE	1-18-52	10-8-53	

TYPICAL CARDS FOR CALL REQUIRING													
TAB DESIGNATION	TRANSLATION OF AN AREA CODE ONLY	TRANSLATION OF AN AREA CODE REQUIRING TRANSLATION OF BOTH AREA AND NATIONAL OFFICE CODE (PRINCIPAL CITY ROUTE AVAILABLE) (NO PRINCIPAL CITY ROUTE AVAILABLE)		TRANSLATION OF A NATIONAL OFFICE CODE ONLY	TRANSLATION OF A SERVICE CODE OR A 1 DIGIT TX CODE ONLY	TRANSLATION OF A HOME TOLL CENTER CODE ONLY	TRANSLATION OF THE 1ST THREE DIGITS OF A 2 DIGIT TX CODE	TRANSLATION OF THE 1ST THREE DIGITS OF A 3 DIGIT TX CODE	TRANSLATION OF AN ALTERNATE ROUTE CARD	TRANSLATION OF A 2 DIGIT OR 3 DIGIT TX CODE	TRANSLATION OF A HOME TOLL CENTER + SERVICE OR 1 DIGIT TX CODES	TRANSLATION OF A HOME TOLL CENTER CODE AND 1ST THREE DIGITS OF A 2 DIGIT OR 3 DIGIT TX CODE	TRANSLATION OF AREA AND NATIONAL OFFICES CODES
A 2/5	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
B 2/5	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
C 2/5	YES	YES	YES	YES	YES	YES	SEE NOTE 1	SEE NOTE 1	YES	YES	YES	YES	YES
D 2/5	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES
E 2/5	NO	NO	NO	NO	NO	NO	NO	NO	NO	SEE NOTE 7	YES	YES	YES
F 2/5	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES
CG 0 & 2 (AR)	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
CG 0 + 1 (RA)					SEE NOTE 2				NO	SEE NOTE 2			
CG 1 + 2 (RA2)					SEE NOTE 3				NO	SEE NOTE 3			
CG 0 + 4 (RA3)					SEE NOTE 4				NO	SEE NOTE 4			
CG 1 + 4 (3D)	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO
CG 2 + 4 (6D)	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES
VO	SEE NOTE 5	SEE NOTE 5	NO	SEE NOTE 5	NO	NO	NO	NO	NO	NO	NO	NO	SEE NOTE 5
NVO			NO		NO	NO	NO	NO	NO	NO	NO	NO	
CARD LOCATED IN	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB OR DFAT OR FAT	HB OR DFAT OR FAT	HB OR DFAT OR FAT	HB OR DFAT OR FAT
EXHIBIT NO.	1	2	3	4	5	6	7	8	9	10	11	12	13

SEE NOTE 6

YES= TABS RETAINED
NO= TABS REMOVED

- NOTES
1. NO WHEN OFFICE HAS EITHER 2- OR 3-DIGIT TX CODES.
YES WHEN OFFICE HAS BOTH 2- AND 3-DIGIT TX CODES.
 2. YES WHEN ROUTING INSTRUCTION ON THE FIRST CARD IS CARD TO CARD AND TRUNK GROUP CONTAINS MORE THAN 40 TRUNKS; OTHERWISE NO.
 3. YES WHEN ROUTING INSTRUCTION ON THE SECOND CARD IS CARD TO CARD AND TRUNK GROUP CONTAINS MORE THAN 80 TRUNKS; OTHERWISE NO.
 4. YES WHEN ROUTING INSTRUCTION ON THE THIRD CARD IS CARD TO CARD AND TRUNK GROUP CONTAINS MORE THAN 120 TRUNKS; OTHERWISE NO.
 5. ROUTING WITH BOTH COMMON AND TERMINAL GRADE TRUNKS, RETAIN VO TAB ON CARDS FOR CODES REQUIRING COMMON GRADE TRUNKS AND NVO TAB FOR TERMINAL GRADE TRUNKS. OTHERWISE REMOVE BOTH TABS.
 6. NO IN THESE POSITIONS MEANS TABS NOT CODED I.E. FOR ANY GIVEN CARD THE REMAINING TABS ARE REMOVED.
 7. NO FOR TWO DIGIT TX CODE.
YES FOR THREE DIGIT TX CODE.

TRAFFIC SEPARATION REGISTER LEADS GROUNDED

TS POSITIONS PUNCHED	TRAFFIC SEPARATION REGISTER GROUP (FROM INCOMING TRUNKS, SEE OS 120-1)			
	1	2	3	4
0	A1	A2	A3	A4
1	B1	B2	B3	B4
2	C1	C2	C3	C4
0 AND 1	D1	D2	D3	D4
0 AND 2	E1	E2	E3	E4
1 AND 2	F1	F2	F3	F4
0, 1, AND 2	G1	G2	G3	G4

PEG COUNT AND OVERFLOW

TP POSITIONS PUNCHED	PEG COUNT REGISTER GROUP SEE OS 196-1	OVERFLOW REGISTER GROUP SEE OS 196-1
0	0	0
1	1	1
2	2	2
0 AND 1	3	3
0 AND 2	4	4
1 AND 2	0	NONE
0, 1, AND 2	NONE	0

CLASS AND CANCEL DELAY LOOP CLOSURE

CL POSITIONS PUNCHED	TENS	UNITS	OUTPULSE CLASS INFORMATION	CDC POSITION PUNCHED
0	0,1	DC KEY PULSE	YES	
0	0,2	MULTIFREQUENCY	NOTE 10	
0	1,4	SX DIAL	YES	
0	2,4	SX DIAL, EXPECT DELAY DIAL	YES	
0	0,7	SX DIAL, EXPECT STOP-GO	YES	
0	1,7	LOOP DIAL, SIMPLEX RING	NO	
0	2,7	LOOP DIAL, C.D.O. OFFICE	YES	
1	4,7	LOOP DIAL, EXPECT STOP-GO	NO	
1	0,1	LOOP DIAL, 20 CYCLE RING	NO	
1	0,2	LOOP DIAL, EXPECT DELAY DIAL	NO	
1	1,2	LOOP DIAL, EXPECT DELAY DIAL, EXPECT STOP-GO	NO	
1	0,4	SX DIAL, EXPECT DELAY DIAL, EXPECT STOP-GO	YES	

ROUTING INSTRUCTIONS

RI POSITIONS PUNCHED	INSTRUCTION	ALSO INDICATES PRINCIPAL CITY ROUTING ON 3D CARD USED IN PRETRANSLATION
4, 7	CARD TO CARD	
0, 1	CARD TO RELAY	
0, 2	RELAY TO RELAY	
1, 2	FOLLOW WITH OVERFLOW	
0, 4	FOLLOW WITH REORDER	
1, 4	FOLLOW WITH MASTER BUSY	
2, 4	FOLLOW WITH SECOND TRIAL	
0, 7	NO PRINCIPAL CITY ROUTING	

CONTINUITY AND DIGIT CONTROL

CDC POSITION PUNCHED	NUMBER OF NUMERICAL DIGITS EXPECTED	LOOP CONTINUITY TEST
4 AND 7	VARIABLE	CANCELLED
0 AND 1	VARIABLE	MADE
0 AND 2	NONE	CANCELLED
1 AND 2	NONE	MADE
0 AND 4	4	CANCELLED
1 AND 4	4	MADE
2 AND 4	5	CANCELLED
0 AND 7	5	MADE

TRANSLATOR CARD CODING
OUTPUT INFORMATION

RM3-5

2 SHEETS, SHEET 1

NO. 4A OR 4M TOLL

ORDER AS BSP ITEM MP-11713

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U. S. A.

ISSUE 1 2 3 4 5 6 7 8 9 10 11 12
DATE 1-18-52 10-15-53

2 SHEETS, SHEET 1

MP-11713

TYPICAL CARDS

EXHIBIT NO.	HOLE DESIGNATION	IN HOME BOX									IN HOME BOX, DECODER F.A. BOX OR F.A.T. BOX			
		1	2	3	4	5	6	7	8	9	10	11	12	13
OUTPUT INFORMATION		AREA CODES-3D 3-DIGIT TRANSLATION	AREA CODES-3D PRIN. CITY ROUTING	AREA CODES-3D PRIN. CITY ROUTING	NAT. OFF. CODES-3D 3 DIGIT TRANSLATION	SERVICE CODE-3D 3-DIGIT TRANSLATION	HOME TOLL CEN. CODE-3D	TX CODE 3D 2-DIGIT TX CODES	TX CODES 3D 3-DIGIT TX CODES	ALTERNATE ROUTE AR	TX CODES 6D 4- OR 5-DIGIT TRANSLATION	HOME TC + SERVICE OR 1-D TX CODE 6-DIGIT TRANSLATION	TC CODES 6D 2-& 3-DIGIT TX CODES	FOREIGN AREA 6D 6 DIGIT TRANSLATION
PRETRANSLATION	NCA	YES	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	
	CA-4	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	
	CA-5	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	
	CA-6	NO	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	
OGT APPEARANCE (TWO TRAIN OFFICES ONLY)	IT	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	
	TC	SEE NOTE 1	YES	NO	YES	YES	NO	NO	NO	NO	YES	YES	YES	
	ITC	SEE NOTE 2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
AREA CODE CONTROL	NAC	NO	NO	NO	YES	YES	YES	YES	YES	NO	NO	NO	NO	
	AC	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	
	AHA	NO	NO	NO	NO	NO	NO	NO	NO	SEE NOTE 3	NO	NO	NO	
	AFA	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
ALTERNATE ROUTE PATTERN NUMBERS	ART-2/5 AND ARU-2/5	SEE NOTE 4	SEE NOTE 4	NO	SEE NOTE 4	NO	NO	NO	NO	NO	YES - IF REACHED THROUGH TANDEM	NO	SEE NOTE 4	
ROUTING INSTRUCTIONS SH. 1	RI-2/5	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
CODE CONVERSION	CCHN	SEE NOTE 5	YES	NO	SEE NOTE 5	YES	NO	NO	NO	NO	YES	YES	SEE NOTE 5	
	CCUN	SEE NOTE 5	YES	NO	SEE NOTE 5	YES	NO	NO	NO	NO	YES	YES	SEE NOTE 5	
	CCH-2/5	SEE NOTE 6	NO	NO	SEE NOTE 6	NO	NO	NO	NO	YES - FOR CODE MATCHING	NO	NO	SEE NOTE 6	
	CCT-2/5	SEE NOTE 6	NO	NO	SEE NOTE 6	NO	NO	NO	NO	YES - FOR CODE MATCHING	NO	NO	SEE NOTE 6	
	CCU-2/5	SEE NOTE 6	NO	NO	SEE NOTE 6	NO	NO	NO	NO	YES - FOR CODE MATCHING	NO	NO	SEE NOTE 6	
VARIABLE SPILLING CONTROL	NSK	AS REQ.	AS REQ.	NO	AS REQ.	NO	NO	NO	NO	NO	NO	NO	AS REQ.	
	SK-3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	AS REQ.	
	SK-6	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	
TBC GROUP START GROUP END	TCT-1/3	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	
	TB-2/5	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	
	GBT-1/2	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	
	GBT-2/5	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	
	GET-1/2	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	
	GEU-2/5	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	
TRANSLATOR BOX NUMBER	HB	NO	YES	YES	NO	NO	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	NO	NO	NO	NO	
	BU-2/5	NO	YES	YES	NO	NO	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	NO	NO	NO	NO	
CLASS	CLT-1/2	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	
	CLU-2/5	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	
	CDLC	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	
CONTINUITY AND DIGIT CONTROL	CDC-2/5	YES	YES	NO	YES	YES	NO	NO	NO	NO	YES	YES	YES	
	TS-0	YES	YES	SEE NOTE 8	YES	YES	NO	NO	NO	NO	YES	YES	SEE NOTE 9	
	TS-2	YES	YES	SEE NOTE 8	YES	YES	NO	NO	NO	NO	YES	YES	SEE NOTE 9	
THROUGH TRAFFIC PEG COUNT SEE SH. 1	TPC	YES	YES	YES	YES - EXCEPT WHEN CODE IS IN LOCAL SERVICE AREA OF CSP	NO	NO	NO	NO	NO	NO	NO	NO	
TRK. GROUP PEG COUNT & OVERFLOW	TP-0	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	
	TP-2	YES	YES	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	

YES = HOLE PUNCHED
NO = HOLE NOT PUNCHED

- NOTES:
1. IT OR TC PUNCHED DEPENDING UPON TRAIN LOCATIONS OF OG TRUNK.
 2. ITC PUNCHED WHEN SERVICE TRUNKS APPEAR ON BOTH TRAINS.
 3. USE AFA WHEN TRUNKS TERMINATE IN A FOREIGN AREA. USE AHA WHEN TRUNKS TERMINATE IN THE HOME AREA.
 4. YES WHEN RR OR CR ROUTING INSTRUCTION IS USED; OTHERWISE NO.
 5. NO FOR DIGITS REQUIRING CODE CONVERSION OR PREFIXING; OTHERWISE YES.
 6. YES FOR DIGITS REQUIRING CODE CONVERSION OR PREFIXING; OTHERWISE NO.
1, 2, OR 3 DIGITS MAY BE CONVERTED OR PREFIXED.
 7. HB OR DFA PUNCHED DEPENDING ON LOCATION OF 6D CARD.
 8. YES IF ONLY ONE TRAFFIC SEPARATION IS REQUIRED FOR THE CALLED AREA.
NO IF TWO OR MORE TRAFFIC SEPARATIONS ARE REQUIRED FOR THE CALLED AREA.
 9. NO IF ONLY ONE TRAFFIC SEPARATION IS REQUIRED FOR THE CALLED AREA.
YES IF TWO OR MORE TRAFFIC SEPARATIONS ARE REQUIRED FOR THE CALLED AREA.
 10. CDLC POSITION IS PUNCHED IF OUTGOING TRUNK IS GUARDED.
CDLC POSITION IS NOT PUNCHED IF OUTGOING TRUNK IS UNGUARDED.
FOR #14M OUTGOING TRUNK TOLL COMPLETING MF REQUIRES CDLC PUNCH.

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ISSUE	1	1	2
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TYPE OF INFORMATION	HOLE DESIGNATION	+130 VOLT BATTERY SUPPLIED BY RELAY OS NO.		INFORMATION READ BY CIRCUIT OS NO.		INFORMATION SENT TO CIRCUIT OS NO.		INFORMATION USED BY CIRCUIT OS NO.	
		RELAY	OS NO.	CIRCUIT	OS NO.	CIRCUIT	OS NO.	CIRCUIT	OS NO.
PRETRANSLATION	NCA	CA	163-1	DECODER	164-1			DECODER	166-1
	CAA	CA	163-1	DECODER	164-1			SENDER	124-1
	CAS	CA	163-1	DECODER	164-1			SENDER	124-1
OUTGOING TRUNK APPEARANCE	IT	MKR	163-1	DECODER	164-1			DECODER	168-1
	TC	MKR	163-1	DECODER	164-1			DECODER	168-1
	ITC	MKR	163-1	DECODER	164-1			DECODER	168-1
TRAFFIC SEPARATION PEG COUNT	TS-	FAT	163-1	DECODER	164-1			DECODER	180-1
	TPC	FAT	163-1	DECODER	164-1			DECODER	180-1
TRUNK GROUP PEG COUNT AND OVER FLOW	TP-	RCD1	169-1	MARKER	164-1			MARKER	196-1
TRANSLATOR BOX NUMBER	HB	FAT	163-1	DECODER	164-1			DECODER	183-1
	BT-	FAT	163-1	DECODER	164-1			DECODER	183-1
	BU-	FAT	163-1	DECODER	164-1			DECODER	183-1
INDEX CHANNELS	IND1,2	ALWAYS	185-1	DECODER	185-1			DECODER	163-1
		PRESENT	185-1	DECODER	185-1			DECODER	163-1
CLASS	CLT-	RCD1	169-1	MARKER	164-1			SENDER	193-1
	CLU-	RCD1	169-1	MARKER	164-1			SENDER	193-1
	CDLC	RCD1	169-1	MARKER	164-1			SENDER	193-1
ALTERNATE ROUTE PATTERN NUMBER	ART-	RCC	163-1	DECODER	164-1			DECODER	171-1
	ARU-	RCC	163-1	DECODER	164-1			DECODER	171-1
AREA CODE CONTROL	NAC	FAT	163-1	DECODER	164-1			DECODER	176-1
	AC	FAT	163-1	DECODER	164-1			DECODER	176-1
	AHA	FAT	163-1	DECODER	164-1			DECODER	176-1
ROUTING INSTRUCTIONS	RI-	RI	163-1	DECODER	164-1			DECODER	167-1
								DECODER	170-1
CONTINUITY AND DIGIT CONTROL	CDC-	RCC	163-1	DECODER	164-1	MARKER	176-1	SENDER	194-1
CODE CONVERSION	CCMN	CCM	163-1	DECODER	164-1	MARKER	195-1	SENDER	195-1
	CCTN	CCM	163-1	DECODER	164-1	MARKER	195-1	SENDER	195-1
	CCUN	CCM	163-1	DECODER	164-1	MARKER	195-1	SENDER	195-1
	CCM-	CCM	163-1	DECODER	164-1	MARKER	195-1	SENDER	195-1
	CCT-	CCM	163-1	DECODER	164-1	MARKER	195-1	SENDER	195-1
	CCU-	CCM	163-1	DECODER	164-1	MARKER	195-1	SENDER	195-1
VARIABLE SPILL CONTROL	NSK	RCD1	169-1	MARKER	164-1			SENDER	194-1
	SK3	RCD1	169-1	MARKER	164-1			SENDER	194-1
	SK6	RCD1	169-1	MARKER	164-1			SENDER	194-1
TRUNK BLOCK CONNECTOR NUMBER	TCT-	MKR	163-1	DECODER	164-1			MARKER	191-1
	TQU-	MKR	163-1	DECODER	164-1			MARKER	191-1
TRUNK BLOCK RELAY NUMBER	TB-	MKR	163-1	DECODER	164-1	MARKER	192-1	MARKER	192-1
GROUP START	GST-	RCD2	169-1	MARKER	164-1			MARKER	192-1
	GSU-	RCD2	169-1	MARKER	164-1			MARKER	192-1
GROUP END	GET-	RCD2	169-1	MARKER	164-1			MARKER	192-1
	GEU-	RCD2	169-1	MARKER	164-1			MARKER	192-1

TRANSLATOR CARD CODING
READING AND USING INFORMATION

NO. 4A OR 4M TOLL

RM 3-7

TABLE I: ARRANGEMENT FOR EACH DECODER AT A PRIMARY OUTLET (POI)
(GROUND SUPPLY CIRCUITS 0,1,2,4,5 PROVIDED)

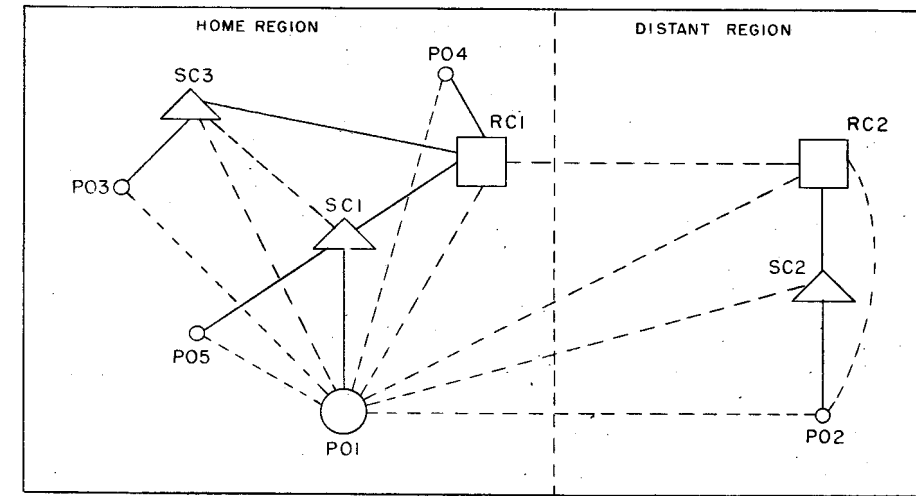
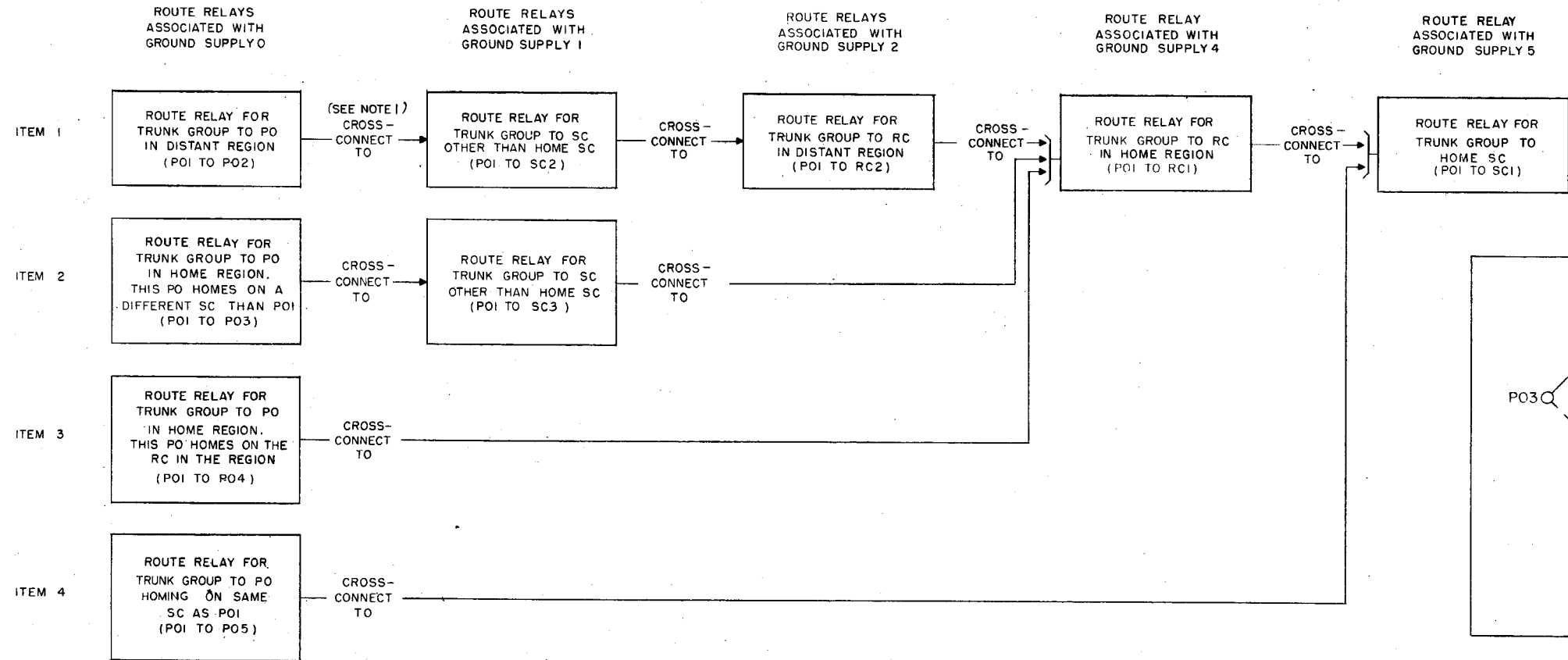
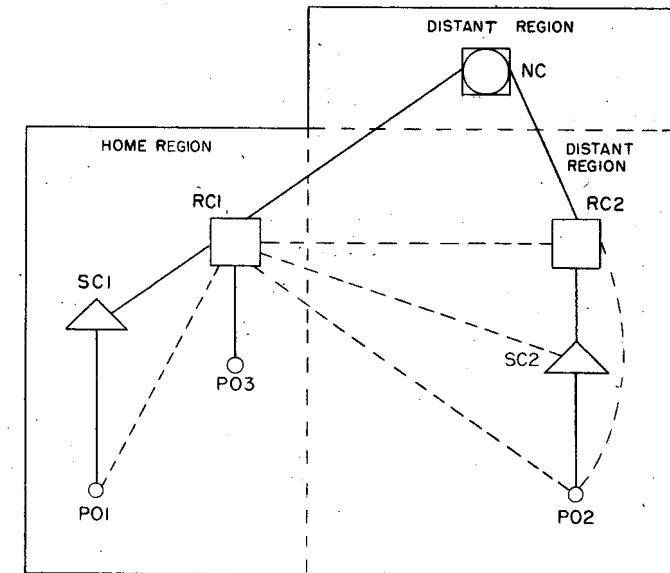
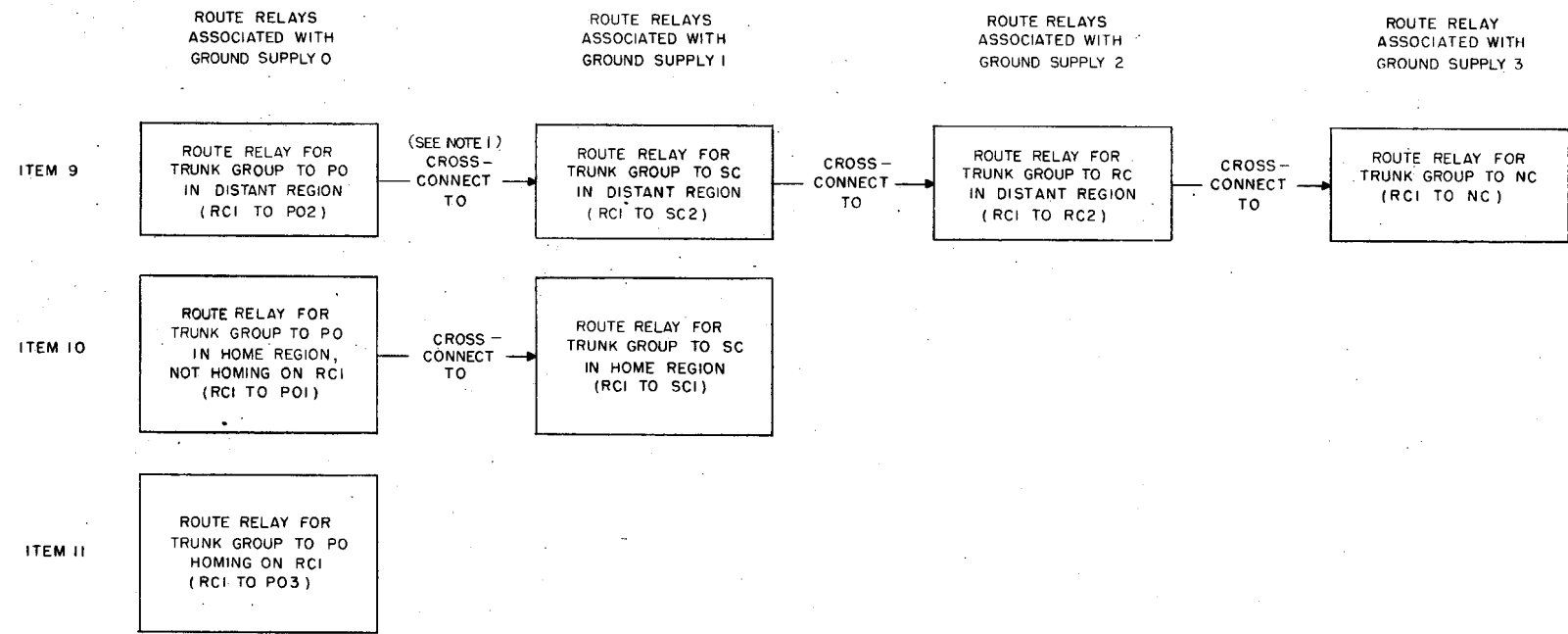


TABLE III: ARRANGEMENT FOR EACH DECODER AT A REGIONAL CENTER (RCI)
(GROUND SUPPLY CIRCUITS 0,1,2,3 PROVIDED)



ASSOCIATION OF ROUTE RELAYS AND GROUND SUPPLY CIRCUITS, AND TYPICAL CROSS-CONNECTIONS BETWEEN ROUTE RELAYS ACCORDING TO DIFFERENT ORDERS OF CSP'S

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TABLE II: ARRANGEMENT FOR EACH DECODER AT A SECTIONAL CENTER (SCI)
(GROUND SUPPLY CIRCUITS 0,1,2,4 PROVIDED)

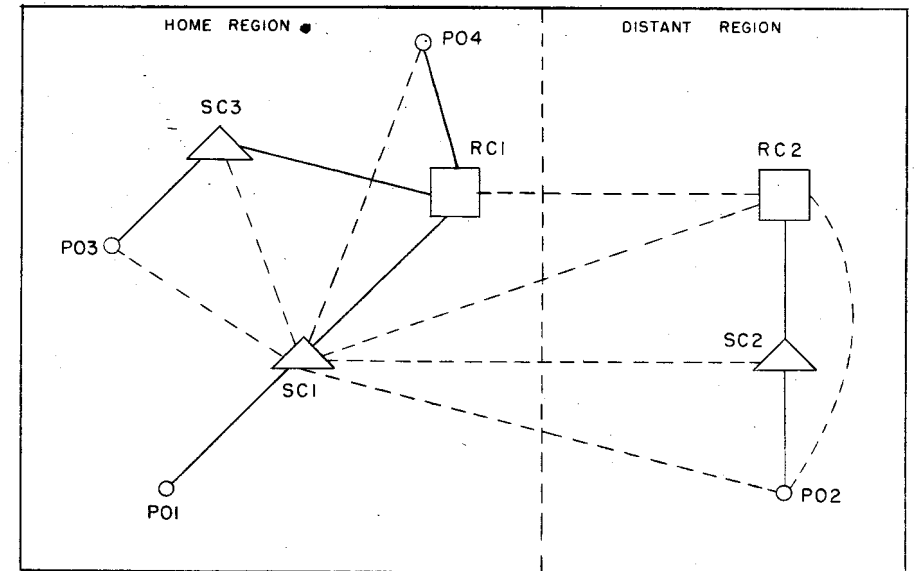
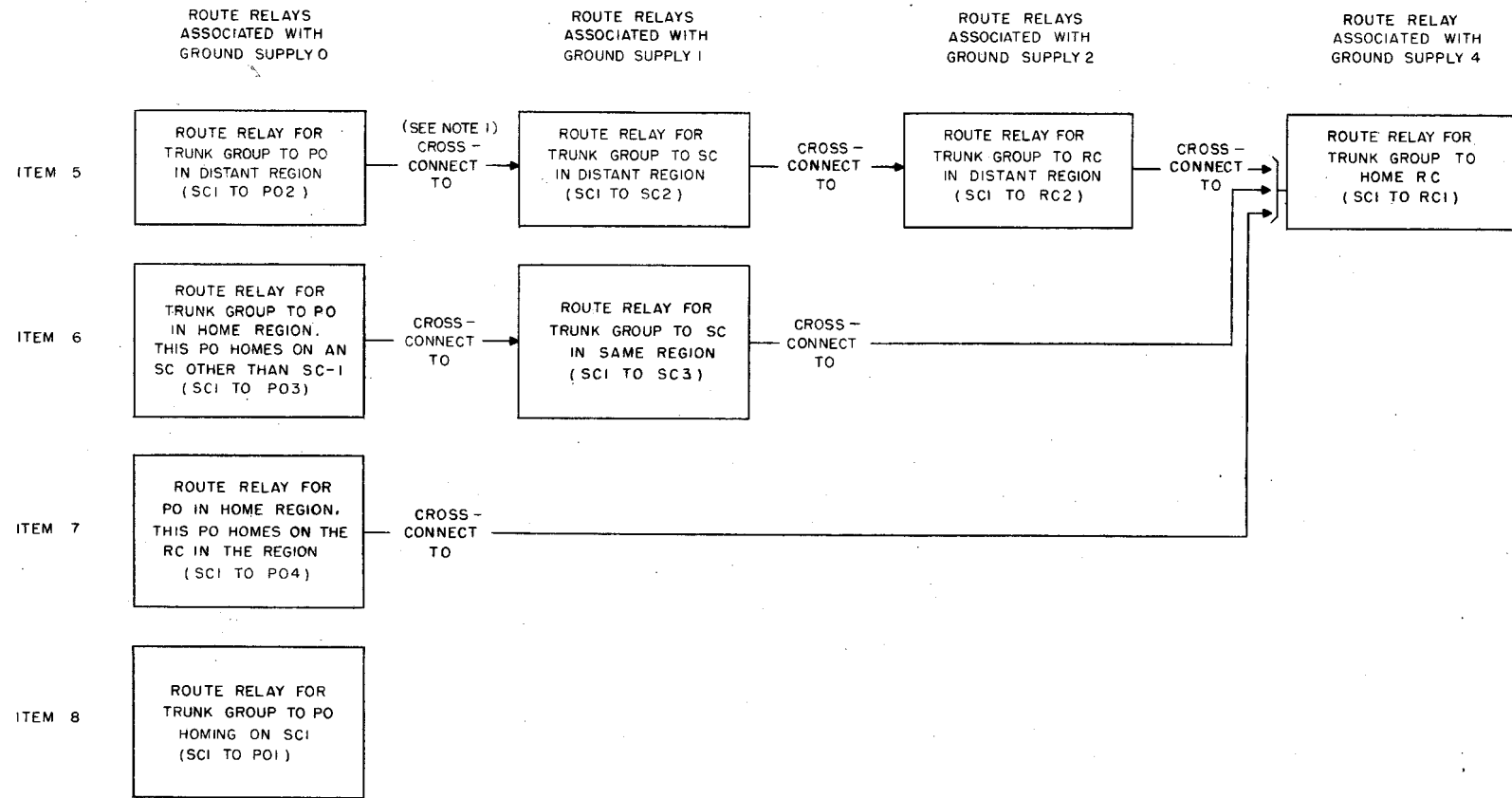
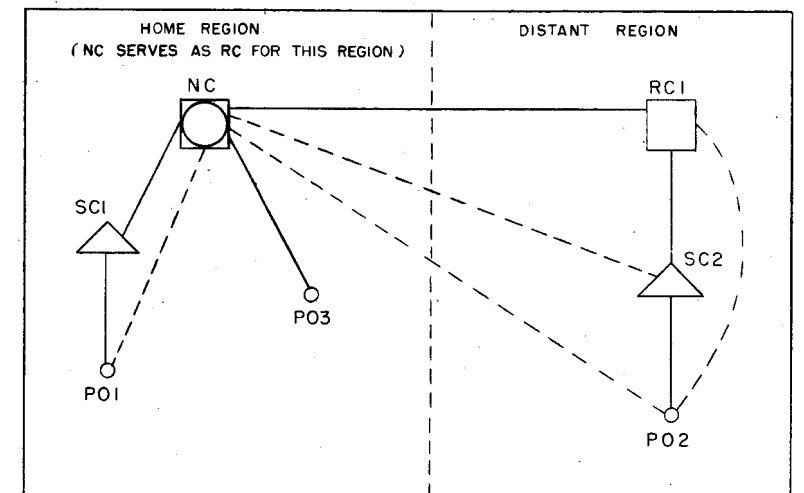
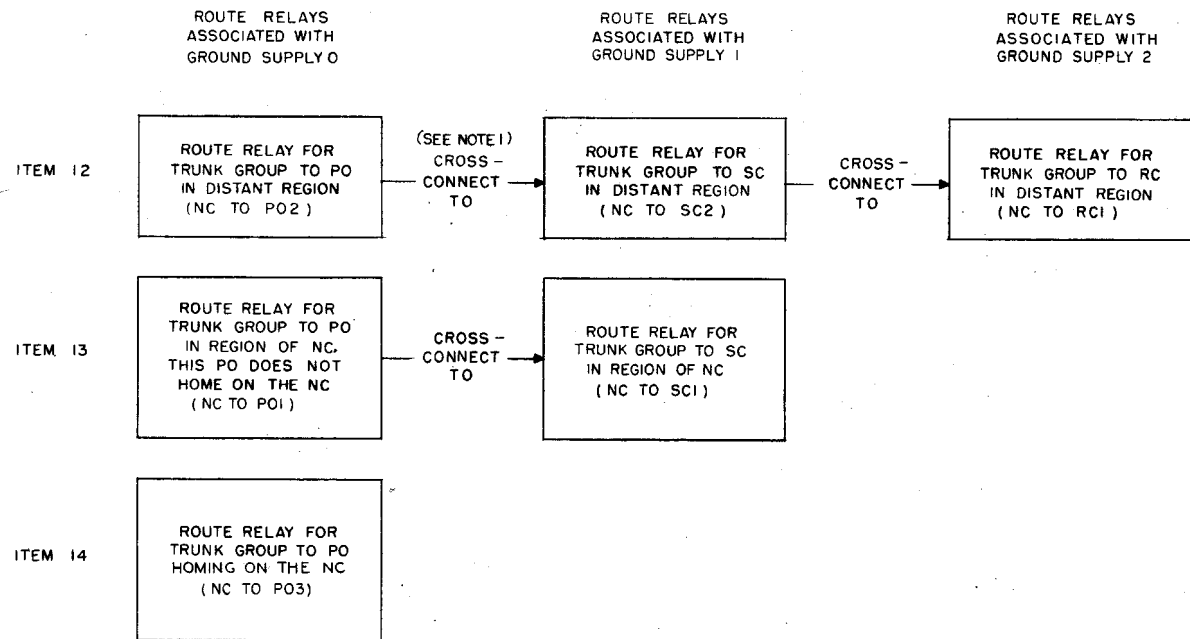


TABLE IV: ARRANGEMENT FOR EACH DECODER AT THE NATIONAL CENTER (NC)
(GROUND SUPPLY CIRCUITS 0,1,2 PROVIDED)



NOTES:
1 ALL CROSS-CONNECTIONS INDICATED ON THIS RM. REFER TO CROSS CONNECTIONS AT THE ALTERNATE ROUTE TRAFFIC CONTROL FRAME.

ASSOCIATION OF ROUTE RELAYS AND GROUND SUPPLY CIRCUITS, AND TYPICAL CROSS-CONNECTIONS BETWEEN ROUTE RELAYS ACCORDING TO DIFFERENT ORDERS OF CSP'S

ALARM DATA

EQUIPMENT	TYPE OF ALARM	LAMP S		TROUBLE RECORDER FRAME	OS	ALARM RELEASE	EXPLANATION
		FRAME	AISLE				
SENDER LINK AND CONNECTOR	MAJOR	AL (RED)	GREEN		101-1	AR KEY	CALL NOT SERVED IN ONE TO TWO SECONDS WITH AN IDLE LINK CONTROLLER AND AN IDLE CONTROLLER CONNECTOR AVAILABLE.
SENDER LINK AND CONNECTOR	MAJOR	DLG (AT SENDER MAKE-BUSY)	GREEN		113-1	DL KEY	SENDER LINK NOT SERVED DUE TO LACK OF FACILITIES.
CONTROLLER CONNECTOR	MINOR	CB (WHITE)	GREEN		104-1	AR KEY	ALL LINK CONTROLLERS BUSY FOR 28 TO 58 SECONDS; OR CONTROLLER CONNECTOR FAILED TO RESTORE TO NORMAL.
CONTROLLER CONNECTOR	MAJOR	B (WHITE)	GREEN	BA:S-	104-1	BA KEY	TWO OR MORE CONNECTORS MADE BUSY IN THE SAME GROUP; OR A MAKE-BUSY PLUG IN AN EA OR EB JACK OF A LINK AND CONNECTOR FRAME WHEN A MAKE-BUSY PLUG IS IN THE ASSOCIATED CONNECTOR CBR JACK.
LINK CONTROLLER	MINOR		AMBER	TRR, CLR-	115-1	TR-AR KEY	CONTROLLER REQUESTED A TROUBLE RECORD WHILE RECORDER WAS BUSY.
LINK CONTROLLER	MAJOR	TA (WHITE)	GREEN		115-1	AR KEY	CONTROLLER FAILED TO RELEASE FROM THE TROUBLE RECORDER.
INCOMING SENDER	MINOR	SS (AT SENDER MAKE-BUSY)	GREEN		132-1 144-1	SSA KEY	STUCK SENDER.
OUTGOING SENDER	MINOR	SS (AT SENDER MAKE-BUSY)	AMBER		154-1	SSA KEY	STUCK SENDER.
INCOMING AND OUTGOING SENDERS	MINOR	GB (AT SENDER MAKE-BUSY)	NONE		114-1	GB KEY	ALL SENDERS IN GROUP BUSY.
INCOMING AND OUTGOING SENDERS	MAJOR		GREEN	GGB-	114-1	TR-AR KEY	FALSELY GROUNDED SENDER GROUP BUSY LEAD.
DECODER CONNECTOR	MAJOR		GREEN	DGR,CT,DCB-	158-1	DCA KEY	FALSE GROUND ON LEADS DRL, MRL, DTRL, MTRL, TRL, RLT, CF, CA4, CA5, OR CA6.
DECODER CONNECTOR	MAJOR		GREEN	DGR1,CT,DCB-	158-1	DCA KEY	FALSE GROUND ON LEADS A-, B-, C-, D-, E-, F-, SDTI, VO OR NVO.
DECODER CONNECTOR	MAJOR		GREEN	CT, DCB-	157-1	GT KEY	CONNECTOR HAS TIMED OUT.
DECODER CONNECTOR	MINOR		GREEN	GT, DCB-	157-1	GT KEY	CONNECTOR HAS TIMED OUT AND ITS TRAFFIC SEQUENCE FEATURE IS CANCELLED.
DECODER CONNECTOR	MINOR		GREEN	CGT	156-1	GT KEY	TRAFFIC SEQUENCE FEATURE CANCELLED IN ALL DECODER CONNECTORS.
DECODER	MAJOR	TA	GREEN	DTA, DB-DTRT	179-1	TR-AR KEY	A) DECODER HAS TIMED OUT AND FAILED IN ONE OF THESE FUNCTIONS: 1. TO SUMMON THE TROUBLE RECORDER. 2. TO SEND A TROUBLE RELEASE SIGNAL. 3. TO RESTORE TO NORMAL. B) THE DECODER BD LEAD IS FALSELY GROUNDED.

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ALARM DATA

LAMPS ALARM DATA

EQUIPMENT	TYPE OF ALARM	FRAME	LAMPS		ALARM DATA		EXPLANATION
			AISLE	TROUBLE RECORDER FRAME	OS	ALARM RELEASE	
DECODER	MINOR		AMBER	TRR	179-1	TR-AR KEY	DECODER REQUESTED A TROUBLE RECORD ON 1ST TRIAL.
DECODER	MAJOR			TRR	179-1	TR-AR KEY	DECODER REQUESTED A TROUBLE RECORD ON 2ND TRIAL.
DECODER	MINOR		GREEN	DBA	158-1	ADB KEY	ALL DECODERS IN GROUP BUSY FOR 41 TO 60 SECONDS.
INCOMING LINK AND CONNECTOR	MINOR	CH (WHITE)	GREEN		208-1	CH KEY	OPEN OR CROSS IN MP- RELAY CHAIN, CIRCUITS; IF ALARM PERSISTS AFTER OPERATING CH KEY, OPERATE MT KEY TO DETERMINE WHICH CHAIN CIRCUIT IS DEFECTIVE.
OUTGOING LINK AND CONNECTOR	MINOR	CH (WHITE)	GREEN		207-1	CH KEY	SAME AS INCOMING LINK AND CONNECTOR.
TRUNK BLOCK CONNECTOR	MINOR	CH (WHITE)	GREEN		198-1	CH KEY	SAME AS INCOMING LINK AND CONNECTOR.
CARD TRANSLATOR	MAJOR	AL		ETB/HTB/ FTB/DFTB	186-1	AR KEY	CARD TRANSLATOR HAS ONE OF FOLLOWING TROUBLES: 1. LAMP SWITCH IN INCORRECT POSITION. 2. TRANSLATOR RESTORED TO SERVICE WITH CRANK, OR CARD LIFTS OFF-NORMAL, OR GUIDE BAR NOT PROPERLY SEATED. 3. EITHER INDEX CHANNEL OPERATES WHILE TRANSLATOR IS IDLE. THIS INDICATES EITHER A MOTOR OR LAMP FAILURE.
MARKER	MAJOR	TA	GREEN	MTA, MB-, DMB-, MTRT	218-1	TAR KEY	A) MARKER HAS TIMED OUT AND FAILED IN ONE OF THESE FUNCTIONS: 1. TO SUMMON THE TROUBLE RECORDER. 2. TO SEND A TROUBLE RELEASE SIGNAL. 3. TO RESTORE TO NORMAL. B) THE MARKER BM LEAD IS FALSELY GROUNDED.
MARKER	MINOR			TRR	218-1 219-1	TAR KEY	MARKER REQUESTED A TROUBLE RECORD ON 1ST TRIAL.
MARKER	MAJOR			TRR	218-1 219-1	TAR KEY	MARKER REQUESTED A TROUBLE RECORD ON 2ND TRIAL.
MARKER	MINOR		GREEN	MBA		AMB KEY	ALL MARKERS IN GROUP BUSY FOR 41 TO 60 SECONDS.
OVERFLOW TRUNKS	MINOR		AMBER	ORA		ORA KEY	OVERFLOW REGISTER SCORED ON OVERFLOW OR REORDER TRUNK GROUPS.
REORDER TRUNKS	MINOR	RO (AT SENDER MAKE-BUSY)	AMBER			ROA KEY	REORDER TRUNK HELD TOO LONG.

ALARM DATA

ALARM DATA

<u>EQUIPMENT</u>	<u>TYPE OF ALARM</u>	<u>LAMPS</u>			<u>OS</u>	<u>ALARM RELEASE</u>	<u>EXPLANATION</u>
		<u>FRAME</u>	<u>AISLE</u>	<u>TROUBLE RECORDER FRAME</u>			
FRAME IDENTIFICATION FREQUENCY SUPPLY	MAJOR	RED	GREEN		223-1	SA KEY	FRAME IDENTIFICATION FREQUENCY SUPPLY FAILURE. CAUSE OF TROUBLE CAN BE DETERMINED BY RED LAMPS AS EXPLAINED IN THE B.S.P.
FUSES	MINOR	FA(RED)	RED				1-1/3 AMPERE FUSE BLOWN.
FUSES	MAJOR	20A (RED)	RED				20 AMPERE FUSE BLOWN.
CARD TRANSLATOR	MAJOR			TTB	184-1		TWO OR MORE TRANSLATORS PLUGGED BUSY FOR SUBSTITUTION OF EMERGENCY TRANSLATOR.

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R.B.B.

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ALARM DATA

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NO. 4A TOLL

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U.S.A.

ALARM DATA

IN USE LAMPS

LAMP DESIGNATION	OS	FUNCTIONAL MEANING
DB0-17	179-1	DECODER BUSY.
DCB0-19:0-2	157-1, 158-1	DECODER CONNECTOR.
DFTB0-17	186-1	DECODER FOREIGN AREA TRANSLATOR BUSY.
DFTS0-17	186-1	DECODER FOREIGN AREA TRANSLATOR EMERGENCY A-C SUPPLY.
DMB0-19	190-1	DECODER-MARKER BUSY.
ETB	186-1	EMERGENCY TRANSLATOR BUSY.
ETS	186-1	EMERGENCY TRANSLATOR EMERGENCY A-C SUPPLY.
FTB1-19	186-1	FOREIGN AREA TRANSLATOR BUSY.
FTS1-19	186-1	FOREIGN AREA TRANSLATOR EMERGENCY A-C SUPPLY.
HTB0-17	186-1	HOME TRANSLATOR BUSY.
HTS0-17	186-1	HOME TRANSLATOR EMERGENCY A-C SUPPLY.
ICB0-19	208-1	INCOMING CONNECTOR.
MKB IT OR C0-9 TC0-7	190-1, 218-1, 219-1	MARKER BUSY.
OCB0-19	207-1	OUTGOING CONNECTOR.
RO (AT SENDER MAKE-BUSY)		REORDER TRUNK.
RTO0-99	171-1	ALTERNATE TRUNK ROUTE.
S0-4	155-1	SENDER.
SLD0-29:A-F	101-1	SENDER LINK DELAY.
TBB0-14	198-1	TRUNK BLOCK CONNECTOR.

MISCELLANEOUS LAMPS

LAMP DESIGNATION	OS	FUNCTIONAL MEANING
ADB	158-1	ALL DECODERS BUSY.
AMB		ALL MARKERS BUSY.
BLC0-5:A-F	101-1	LINK AND CONNECTOR MADE BUSY.
CCB0-5:A-F	103-1	CONTROLLER CONNECTOR BUSY.
DLR0-17	228-1	DECODER LOST TROUBLE RECORD.
GBG (AT SENDER MAKE-BUSY)	114-1	GB KEY THROWN TO SILENCE GB ALARM.
LCB0-5:A-F	104-1	LINK CONTROLLER BUSY.
LF0-29:A-F (AT SENDER MAKE-BUSY)	114-1	LF PLUG IN SENDER MB JACK.
MLR IT OR C0-9 TC0-7	228-1	MARKER LOST TROUBLE RECORD.
ORG		ORA KEY THROWN TO SILENCE OR ALARM.
SMA	178-1, 132-1, 144-1	OPEN OR CROSSED SELECT MAGNET LEAD.
SSG	132-1, 144-1, 154-1	SS KEY THROWN TO SILENCE SS ALARM.
TRG	178-1, 220-1	RELEASE AFTER TRUNK NUMBER IDENTIFICATION.
WAG (AT SENDER MAKE-BUSY)	154-1	WA KEY THROWN TO CANCEL WAITING ASSIGNMENT FEATURE IN OUTGOING SENDERS.

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ALARM DATA

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TABLE A
TRAFFIC SEPARATION REGISTERS

TRAFFIC SEPARATION RELAYS OPERATED DECODER INPUT ROW S2 11,12,13 OS 186-1	GROUP RELAYS OPERATED IN DECODER	TS RELAYS OPERATED FROM CARD ROW S0 7,8, AND 9 OS 180-1							
		TS0	TS1	TS2	TS0 AND TS1	TS0 AND TS2	TS1 AND TS2	TS0, TS1, AND TS2	TS0, TS1, AND TS2
TSA	TSG1	A1	B1	C1	D1	E1	F1	G1	
TSB	TSG2	A2	B2	C2	D2	E2	F2	G2	
TSA AND TSB	TSG3	A3	B3	C3	D3	E3	F3	G3	
TSA AND TSC	TSG4	A4	B4	C4	D4	E4	F4	G4	

TABLE B
TRUNK GROUP PEG COUNT AND
OVERFLOW REGISTER CONTROL

TP RELAY OPERATED ROW S0 11, 12, 13 OS 196-1	PEG COUNT REGISTER LEAD GRD. OS 196-1	OVERFLOW REGISTER LEAD GRD. OS 196-1
0	PC0	OF0
1	PC1	OF1
2	PC2	OF2
0 AND 1	PC3	OF3
0 AND 2	PC4	OF4
1 AND 2	PC0	NONE
0,1 AND 2	NONE	OF0

TABLE C
CLASS INFORMATION

CLASS RECEIVING RELAYS READ BY MARKER FROM CARD T. ROW S0 22-29 OS 163-1 AND OS 164-1	CLASS REL. OPR. BY REC. RELAYS OS 193-1	CLASS SIG. TO SDR. TYPE OF PULSING ROW R3 0-4 OS 193-1	CLASS CHECK ROW R0 OS 193-1	CLASS SIG. TO SDR. TRUNK CONDITION ROW R3 5-9 OS 193-1	CLASS CHECK ROW R0 OS 193-1	CLASS SIG. TO SDR. TRUNK CONDITION ROW R3 6 OS 193-1	CLASS CHECK ROW R0 OS 193-1	CDLC RELAY READ BY MKR. FROM C.T. ROW R8 0 OS 193-1	DLC CLASS SIG. TO SDR. ROW R3 7 OS 193-1
CLT	CLU								
TO	U4 AND U7	CL0	M	CLA			*	SEE NOTE	
TO	U0 AND U1	CL1	DC	CLA			CDLC	-	
TO	U0 AND U2	CL2	MF	CLA			*	SEE NOTE	
TO	U1 AND U2	-	-	-			-	-	
TO	U0 AND U4	-	NOT USED	-			-	-	
TO	U1 AND U4	CL5	SXD	CLA			CDLC	-	
TO	U2 AND U4	CL6	SXD	CLA	XDD	CLB	CDLC	-	
TO	U0 AND U7	CL7	SXD	CLA	XSG	CLB	CDLC	-	
TO	U1 AND U7	CL8	LPD	CLA	SXR	CLB	*	SEE NOTE	
TO	U2 AND U7	CL9	LPD	CLA			*	SEE NOTE	
TI	U4 AND U7	CL10	LPD	CLA	XSG	CLB	*	SEE NOTE	
TI	U0 AND U1	CL11	LPD	CLA	20C	CLB	*	SEE NOTE	
TI	U0 AND U2	CL12	LPD	CLA	XDDD	CLB	*	SEE NOTE	
TI	U1 AND U2	CL13	LPD	CLA	XDD	CLB	XSG	CLC	
TI	U0 AND U4	CL14	SXD	CLA	XDD	CLB	XSG	CLC	

NOTE - THE MARKER NORMALLY GOUNDS THE DLC LEAD TO THE SENDER
TO OPERATE DLC RELAY, IF CDLC IS OPERATED - DLC WILL BE NORMAL
FOR CLASSES MARKED * CDLC OPERATION IS OPTIONAL

TABLE D
CONTINUITY AND DIGIT CONTROL

CDC - CONTINUITY AND DIGIT CONTROL RECORDED IN DEC. FROM CARD TRNSL. TBL. REC. CARD ROW R8 25-29 OS 164-1	DIGIT CONT. RECORDED IN MARKER FROM DECODER TBL. REC. CARD ROW R4 11-14 OS 176-1	CONTINUITY CONTROL RECORDED IN MKR. FROM DECODER TBL. REC. CARD ROW R4 9-10 OS 176-1	DIGIT CONT. TRANSMITTED FROM MARKER TO SENDER TBL. REC. CARD ROW R3 11-13 OS 194-1	DIGIT CONT. CHECK MKR. - SDR. TRANSMITTING TBL. REC. CARD ROW R0 28 OS 194-1
CDC4 AND CDC7	NDG	CLCT	-	-
CDC0 AND CDC1	NDG	MLCT	-	-
CDC0 AND CDC2	ODG	CLCT	ODG	DGA
CDC1 AND CDC2	ODG	MLCT	ODG	DGA
CDC0 AND CDC4	4DG	CLCT	4DG	DGA
CDC1 AND CDC4	4DG	MLCT	4DG	DGA
CDC2 AND CDC4	5DG	CLCT	5DG	DGA
CDC0 AND CDC7	5DG	MLCT	5DG	DGA
CDC1 AND CDC7	NOT USED	CLCT	-	-
CDC2 AND CDC7	NOT USED	CLCT	-	-

NOTE - NDG OR DGA MUST BE INDICATED FOR REGULAR MARKER RELEASE

TABLE E
ROUTING INSTRUCTION

ROUTING INSTRUCTION READING RELAYS AS READ BY DECODER ROW R8 20-25 OS 164-1	DECODER ROUTING RELAYS OPERATED ROW R5 0-10 OS 167-1	PRINCIPAL CITY ROUTING TAKEN FROM 3D CARD ROW R5 9, 10 OS 165-1
R14 AND R17	CC	PCR
R10 AND R11	CR	PCR
R10 AND R12	RR	PCR
R11 AND R12	F0F	PCR
R10 AND R14	FRO	PCR
R11 AND R14	FMB	PCR
R12 AND R14	FST	PCR
R10 AND R17	NPCR	NPCR
R11 AND R17	SPARE	
R12 AND R17	SPARE	

TABLE F
VARIABLE SPILLING CONTROL

VARIABLE SPILLING CONTROL AS READ BY MARKER OR BY CODE MATCHING ROW R7 9-11 OS 176-1	VARIABLE SPILLING CONTROL LEADS GROUNDED TO SENDER ROW R3 15-17 OS 194-1	VARIABLE SPILL CONTROL CHECK RELAY OPERATED ROW R0 20 OS 194-1
MSK	MSK	SKA
SK3	SK3	SKA
SK6	SK6	SKA

TABLE G
FRAME IDENTIFICATION AND SELECTION

FRAME IDENTIFICATION FREQUENCY COMBINATIONS ROW R3 22-29 OS 204-1	FRAME NUMBER	INC. FRAME GROUP ROW S4 30-49 OS 205-1	INC. FRAME ODD OR EVEN ROW S1 30-31 OS 205	OUT. FRAME GROUP ROW S2 30-49 OS 205-1	OUT. FRAME ODD OR EVEN ROW S1 32,33 OS 205
FA FB FC	0	0	E	0	E
FA FB FD	18	9	E	9	E
FA FB FE	6	3	E	3	E
FA FB FF	12	6	E	6	E
FA FB FH	20	10	E	10	E
FA FC FD	34	17	E	17	E
FA FC FE	2	1	E	1	E
FA FC FF	14	7	E	7	E
FA FC FH	8	4	E	4	E
FA FC FG	22	11	E	11	E
FA FC FN	36	18	E	18	E
FA FD FE	17	8	0	8	0
FA FD FF	5	2	0	2	0
FA FE FF	11	5	0	5	0
FA FE FH	25	12	0	12	0
FA FF FH	27	13	0	13	0
FB FC FD	10	5	E	5	E
FB FC FE	4	2	E	2	E
FB FC FF	16	8	E	8	E
FB FC FG	26	13	E	13	E
FB FC FH	38	19	E	19	E
FB FD FE	9	4	0	4	0
FB FD FF	15	7	0	7	0
FB FD FG	32	16	E	16	0
FB FE FF	3	1	0	1	0
FB FE FG	28	14	E	14	E
FB FE FH	23	11	0	11	0
FB FF FG	30	15	E	15	E
FC FD FE	13	6	0	6	0
FC FD FF	7	3	0	3	0
FC FD FG	24	12	E	12	E
FC FE FF	19	9	0	9	0
FC FE FH	21	10	0	10	0
FD FE FF	1	0	0	0	0
FD FE FG	35	17	0	17	0
FD FE FH	31	15	0	15	0
FD FF FG	37	18	0	18	0
FD FF FH	29	14	0	14	0
FE FF FG	39	19	0	19	0
FE FF FH	33	16	0	16	0

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PUNCH DESIGNATION	OS	CARD COORDINATES	PUNCH SOURCE	FUNCTIONAL MEANING
6D TRANSLATOR				
H	164-1	S0 14	D	HOME BOX
To, 1	164-1	S0 15	D	TRANSLATOR TENS
U $\frac{2}{5}$	165-1	S0 17	D	TRANSLATOR UNITS
AC				
AC	164-1	R8 2	D	AREA CODE
AFA				
AFA	164-1	R8 4	D	ALTERNATE FOREIGN AREA
AHA				
AHA	164-1	R8 3	D	ALTERNATE HOME AREA
ALTERNATE ROUTE				
T $\frac{2}{5}$	164-1	R8 5	D	TENS
U $\frac{2}{5}$	164-1	R8 10	D	UNITS
CA4				
CA4	124-1, 136-1	S0 1	D	COME AGAIN - 4 DIGITS
CA5				
CA5	124-1, 136-1	S0 2	D	COME AGAIN - 5 DIGITS
CA6				
CA6	124-1, 136-1	S0 3	D	COME AGAIN - 6 DIGITS
CDC				
CDC $\frac{2}{5}$	164-1	R8 25	D	CONTINUITY AND DIGIT CONTROL
CDLC				
CDLC	164-1	R8 0	M	CANCEL DELAY LOOP CLOSURE
CHANNEL				
L0-9	212-1	S0 50	M	LEFT
R0-9	212-1	R8 50	M	RIGHT
CHK				
CHK	177-1	R1 12	DC	CHECK
CLASS				
To, 1	164-1	S0 22	M	CLASS TENS
$\frac{2}{5}$	164-1	S0 25	M	CLASS UNITS

PUNCH DESIGNATION	OS	CARD COORDINATES	PUNCH SOURCE	FUNCTIONAL MEANING
CODE BARS				
A $\frac{2}{5}$	162-1	S3 0	CT	"A" DIGIT
B $\frac{2}{5}$	162-1	S3 5	CT	"B" DIGIT
C $\frac{2}{5}$	162-1	S3 10	CT	"C" DIGIT
D $\frac{2}{5}$	162-1	S3 15	CT	"D" DIGIT
E $\frac{2}{5}$	162-1	S3 20	CT	"E" DIGIT
F $\frac{2}{5}$	162-1	S3 25	CT	"F" DIGIT
CODE BARS				
CG $\frac{2}{4}$	162-1	S2 22	CT	CARD GROUP
NVO	162-1	S2 21	CT	NOT VIA ONLY
VO	162-1	S2 20	CT	VIA ONLY
CODE CONVERSION				
HN	164-1	R7 12	D	NO CODE CONVERSION HUNDREDS
TN	164-1	R7 13	D	NO CODE CONVERSION TENS
UN	164-1	R7 14	D	NO CODE CONVERSION UNITS
H $\frac{2}{5}$	164-1	R7 15	D	CODE CONVERSION HUNDREDS
T $\frac{2}{5}$	164-1	R7 20	D	CODE CONVERSION TENS
U $\frac{2}{5}$	164-1	R7 25	D	CODE CONVERSION UNITS
CONNECTOR PREFERENCE CONTROL				
CNE	190-1, 198-1	S2 51	M	CONNECTOR EVEN
CNO	190-1, 198-1	S2 50	M	CONNECTOR ODD
ICB	208-1	S2 54	M	INCOMING CONNECTOR BUSY
OCB	207-1	S2 53	M	OUTGOING CONNECTOR BUSY
TCB	198-1	S2 52	M	TRUNK BLOCK CONNECTOR BUSY
CS1, 2				
CS1, 2	162-1	S2 28	CT	CARD SUPPORT

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PUNCH DESIGNATION	OS	CARD COORDINATES	PUNCH SOURCE	FUNCTIONAL MEANING
DIM				
DIM		R6 0	CT	DIM EXCITER LAMP
D				
TR1	160-1, 174-1	S8 8	D	DECODER FIRST TRIAL
TR2	160-1, 174-1	S8 9	D	DECODER SECOND TRIAL
DECODER				
	0-17	178-1	D	DECODER NUMBER
DECODER CONNECTOR				
C0-2	178-1, 220-1	S5 27	DC	CONNECTOR
T0-2	178-1, 220-1	S5 14	DC	TENS
U0-9	178-1, 220-1	S5 17	DC	UNITS
DECODER CROSS				
X 6DT	167-1, 179-1	S8 34	D	CROSS 6 DIGIT TRANSLATION
X CA	124-1, 136-1, 179-1	S8 30	D	CROSS COME AGAIN
X CF	174-1, 179-1	S8 36	D	CROSS CARD FAILURE
X CRK	173-1	S8 33	D	CROSS RELAY CHECK
X DRL	124-1, 136-1, 166-1, 179-1	S8 38	D	CROSS DECODER RELEASE
X IK	160-1, 179-1	S8 32	D	CROSS INTEGRITY CHECK
X REC	179-1	S8 31	D	CROSS RECORDING SIGNAL
X RLT	177-1, 179-1	S8 39	D	CROSS RELEASE AFTER TRANSLATION
X TRB	178-1, 179-1, 220-1	S8 35	D	CROSS TROUBLE RECORDER BUSY
X TRL	178-1, 179-1	S8 37	D	CROSS TROUBLE RELEASE
DECODER INPUT				
3D	124-1, 136-1	S2 0	D	3 DIGIT
5BD	160-1	S2 14	D	NO. 5 BOARD
6D	124-1, 136-1	S2 1	D	6 DIGITS
6DA	124-1, 136-1, 160-1	S2 2	D	6 DIGITS AVAILABLE
CFM	160-1, 175-1	S2 8	D	CARD FAILURE MEMORY
CK1	160-1	S2 7	D	INTEGRITY CHECK
NR0	160-1	S2 6	D	NO REORDER
NV0	162-1	S2 4	D	NOT VIA ONLY

PUNCH DESIGNATION	OS	CARD COORDINATES	PUNCH SOURCE	FUNCTIONAL MEANING
DECODER INPUT (Contd.)				
PF	160-1	S2 9	D	SENDER PREFERENCE
TSA	160-1, 202-1	S2 11	D	TRAFFIC SEPARATION
TSB	160-1	S2 12	D	TRAFFIC SEPARATION
TSC	160-1	S2 13	D	TRAFFIC SEPARATION
VO	162-1	S2 3	D	VIA ONLY
DECODER INPUT CODE				
A $\frac{2}{5}$	162-1	S4 0	D	"A" DIGIT
B $\frac{2}{5}$	162-1	S4 5	D	"B" DIGIT
C $\frac{2}{5}$	162-1	S4 10	D	"C" DIGIT
D $\frac{2}{5}$	162-1	S4 15	D	"D" DIGIT
E $\frac{2}{5}$	162-1	S4 20	D	"E" DIGIT
F $\frac{2}{5}$	162-1	S4 25	D	"F" DIGIT
DECODER PROGRESS				
6DK	162-1	R2 22	CT	6 DIGIT CHECK
ATB	170-1, 172-1	R1 2	D	ALL TRUNKS BUSY
ARS	173-1	R1 4	D	ALTERNATE ROUTE SELECTED
ARST	171-1	R2 12	D	ALTERNATE ROUTE START
CAK	166-1	R2 13	D	COME AGAIN CHECK
CBK	162-1	R2 6	CT	CODE BAR CHECK
CCK	161-1	R2 5	D	CODE CUT-IN CHECK
CK3	160-1	R2 4	D	INTEGRITY CHECK
CKG	155-1, 177-1	R2 0	D	CIRCUIT GROUNDING
COP1	163-1	R2 10	D	CARD OPERATED INDICATION
COP2	163-1	R2 11	D	CARD OPERATED INDICATION

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<u>PUNCH DESIGNATION</u>	<u>OS</u>	<u>CARD COORDINATION</u>	<u>PUNCH SOURCE</u>	<u>FUNCTIONAL MEANING</u>
DECODER PROGRESS (Contd.)				
DBS	165-1	R2 18	D	DUPLICATE F.A.T. BOX SHIFT
DCB	170-1, 172-1	R1 0	D	DISCONNECT CODE BARS
DCB2	170-1, 172-1	R1 1	D	DISCONNECT CODE BARS AUXILIARY
DRL	124-1, 136-1, 166-1	R1 8	D	DECODER RELEASE
GPL	173-1	R1 3	D	SUBGROUP LOCK
HBA	167-1	R2 14	D	HOME BOX AUXILIARY
HBI	172-1	R2 29	D	HOME BOX INDICATED
HTK	161-1	R2 1	D	HOME TRANSLATOR CHECK
IT	188-1, 188-2	R2 23	D	INTERTOLL MARKER
ME	168-1	R2 26	D	MARKER ENGAGED
NC	174-1, 175-1	R2 8	D	NO CARD
NCT	162-1, 174-1, 175-1	R2 7	D	NO CARD TIMING
R6D	167-1	R2 20	D	READ 6 DIGITS
RCA	167-1, 170-1, 172-1	R2 28	D	RESTORE CARD ADVANCE
RCD	167-1, 172-1	R2 27	D	RESTORE CARD AND DISCONNECT DECODER
RCRR	173-1	R2 25	D	RESTORE CARD RELAY-TO-RELAY OPERATION
RDRL	166-1	R1 7	D	RESTORE AND DECODER RELEASE
RHC	167-1	R2 19	D	RESTORE HOME CONNECTOR
RLT	177-1	R1 9	D	RELEASE AFTER TRANSLATION
SMC	168-1	R2 3	D	INCOMING TRUNK ON "TC" TRAIN
SMC0	168-1	R2 15	D	SELECT MAGNET CUT-OFF
SMI	168-1	R2 2	D	INCOMING TRUNK ON "IT" TRAIN
TBY	165-1	R2 17	D	TRANSLATOR BUSY
TC	188-2	R2 24	D	TOLL COMPLETING MARKER
TID	165-1	R2 16	D	TRANSLATOR IDLE
TCD	176-1	R1 5	D	TRANSFER CODE DIGITS
TCK	161-1	R2 21	D	TRANSLATOR CONNECTOR CHECK

<u>PUNCH DESIGNATION</u>	<u>OS</u>	<u>CARD COORDINATES</u>	<u>PUNCH SOURCE</u>	<u>FUNCTIONAL MEANING</u>
DECODER PROGRESS (Contd.)				
TKS	170-1, 172-1	R1 6	D	TRUNK SELECTED
VCR	175-1	R2 9	D	VACANT CODE ROUTING
DECODER ROUTE ADVANCE				
GO-3	173-1	S1 10	D	SUBGROUP CHAIN TEST
GB	173-1	S1 14	D	SUBGROUP BUSY
GS0-5	173-1	S1 4	D	TRUNK GROUP GROUND SUPPLY
MB	173-1	S1 16	D	MASTER BUSY
RA	160-1, 170-1	S1 0	D	ROUTE ADVANCE
RA1-3	170-1	S1 1	D	ROUTE ADVANCE CARD TO CARD
RLS	173-1	S1 15	D	CHECK RELEASE OF SUBGROUP "GB" RELAY
RO	173-1	S1 17	D	REORDER
ROIT	168-1	S1 18	D	REORDER REQUEST ON "IT" TRAIN
ROTC	168-1	S1 19	D	REORDER REQUEST ON "TC" TRAIN
DECODER ROUTING INSTRUCTIONS				
CC	170-1	R5 0	D	CARD-TO-CARD
CR	171-1	R5 1	D	CARD-TO-RELAY
FOF	167-1, 191-1	R5 3	D	FOLLOW-WITH-OVERFLOW
FMB	167-1, 191-1	R5 4	D	FOLLOW-WITH-MASTER BUSY
FRO	167-1, 191-1	R5 5	D	FOLLOW-WITH-REORDER
FST	167-1, 191-1	R5 6	D	FOLLOW-WITH-SECOND TRIAL
NPCR	165-1	R5 10	D	NO PRINCIPAL CITY ROUTING
PCR	165-1	R5 9	D	PRINCIPAL CITY ROUTING
RR	171-1	R5 2	D	RELAY-TO-RELAY
DECODER TIME-OUT				
FTD	179-1	S8 52	D	FOREIGN TRANSLATOR DELAY TIMING
MD	179-1	S8 53	D	MARKER DELAY TIMING
TBD	179-1	S8 54	D	TRUNK BLOCK DELAY TIMING
WT	179-1	S8 51	D	WORK TIMER

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<u>PUNCH DESIGNATION</u>	<u>OS</u>	<u>CARD COORDINATION</u>	<u>PUNCH SOURCE</u>	<u>FUNCTIONAL MEANING</u>
DP SDR	0-2	178-1, 220-1	S6 24	DPS DIAL PULSE SENDER
FRAME IDENTIFICATION				
FA-FH	204-1	R3 22	M	FRAME IDENTIFICATION FREQUENCIES LOCKED-IN
IC	205-1	R3 20	M	INCOMING FRAME CUT-IN
OC	205-1	R3 21	M	OUTGOING FRAME CUT-IN
GROUP END				
T0, 1	164-1	R6 23	M	GROUP END TENS
U $\frac{2}{5}$	164-1	R6 25	M	GROUP END UNITS
GROUP START				
T0, 1	164-1	R6 16	M	GROUP START TENS
U $\frac{2}{5}$	164-1	R6 18	M	GROUP START UNITS
INCOMING FRAME GROUP				
I 0-19	205-1	S4 30	M	INCOMING FRAME GROUP
INCOMING FRAME-OUTGOING FRAME				
EV	205-1	S2 40	M	EVEN
OD	205-1	S2 41	M	ODD
EV	205-1	S2 42	M	EVEN
OD	205-1	S2 43	M	ODD
INCOMING SWITCH				
SW 0-9	220-1	S4 50	IL	INCOMING SWITCH
JUNCTOR CONTROL				
JC 0-19	209-1	S0 30	M	JUNCTOR CUT-IN
JUNCTOR PATTERN				
JP 0-17	210-1	R8 30	M	JUNCTOR PATTERN
JPN	210-1	R8 49	M	NORMAL JUNCTOR PATTERN

<u>PUNCH DESIGNATION</u>	<u>OS</u>	<u>CARD COORDINATION</u>	<u>PUNCH SOURCE</u>	<u>FUNCTIONAL MEANING</u>
JUNCTOR WALKING				
CHB	212-1	S 2 55	M	ALL CHANNELS BUSY
RTA-RTD	213-1	S 2 56	M	CHANNEL RETEST
LATCH MAGNETS				
L 1-4	161-1	S2 15	CT	LATCH MAGNETS
M				
M TR1	190-1	S8 10	M	MARKER FIRST TRIAL
M TR2	190-1	S8 11	M	MARKER SECOND TRIAL
MARKER CROSS				
X	219-1	S7 30	M	MASTER CROSS
XI	205-1, 219-1	S7 38	M	CROSS INCOMING FRAME
XILS	212-1, 219-1	S7 40	M	CROSS INCOMING LINK SLEEVE
XIPS	206-1, 215-1	S7 32	M	CROSS INCOMING PRIMARY SELECT MAGNET
XIS	216-1, 219-1	S7 31	M	CROSS INCOMING TRUNK SLEEVE
XJP	210-1, 219-1	S7 39	M	CROSS JUNCTOR PATTERN
XJS	212-1, 219-1	S7 42	M	CROSS JUNCTOR SLEEVE
XK	210-1, 215-1, 219-1	S7 36	M	CROSS CHECK
XMRL	217-1	S7 53	M	CROSS MARKER RELEASE LEAD
XMS	203-1, 219-1	S7 35	M	CROSS MARKER SLEEVE
XO	205-1, 219-1	S7 37	M	CROSS OUTGOING FRAME
XOLS	210-1, 212-1, 219-1	S7 41	M	CROSS OUTGOING LINK SLEEVE
XRCK	167-1, 170-1, 172-1, 197-1, 219-1	S7 47	M	CROSS REGISTER CHECK LEAD
XSM	215-1, 219-1	S7 43	M	CROSS SELECT MAGNET
XSMI	215-1, 219-1	S7 44	M	CROSS SELECT MAGNET INCOMING
XSMO	215-1, 219-1	S7 45	M	CROSS SELECT MAGNET OUTGOING
XST	198-1, 207-1, 208-1, 219-1	S7 34	M	CROSS START LEAD
XSTR	219-1, 220-1	S7 52	M	CROSS SENDER TROUBLE RELEASE

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MARKER CROSS (Contd.)				
XTB	199-1, 219-1	S7 33	M	CROSS TRUNK BLOCK
XTIF	208-1, 219-1	S7 54	M	CROSS TWO INCOMING FRAMES
XTKS	170-1, 172-1, 202-1, 219-1	S7 48	M	CROSS TRUNK SELECTED LEAD
XTL	193-1, 194-1, 195-1, 219-1	S7 46	M	CROSS TRANSMITTING LEAD
XTOF	207-1, 219-1	S7 55	M	CROSS TWO OUTGOING FRAMES
XTR	219-1, 220-1	S7 50	M	CROSS MARKER TROUBLE RELEASE LEAD
XTRL	174-1, 202-1, 219-1, 220-1	S7 51	M	CROSS TROUBLE RELEASE RELAY OPERATE PATH
MARKER - IT OR COMB.				
0-9	220-1	S7 10	M	MARKER "IT" OR "COMB"
MARKER PROGRESS				
A	216-1	R0 4	M	"A" CHANNEL TEST
AK	215-1	R0 0	M	"A" LINK CHECK
ATB	201-1, 202-1	R1 22	M	ALL TRUNKS BUSY
B	216-1, 217-1	R0 12	M	"B" LINK CONTINUITY AND FALSE GROUND TEST
EK	210-1	R0 1	M	"B" LINK CHECK
C	216-1	R0 5	M	"C" CHANNEL TEST
CCT	216-1	R0 7	M	CHANGE AND CANCEL CONTINUITY TEST
CHS	212-1	R0 3	M	CHANNEL SELECTED
CK	215-1	R0 2	M	"C" LINK CHECK
CKG	190-1	R1 15	M	CHECKING GROUND
CON1	216-1	R0 10	M	CONTINUITY
GCK	200-1	R1 19	M	TRUNK GROUP CUT-OFF CHECK
HMG	216-1	R0 6	M	HOLD MAGNETS GROUNDED
ICK	208-1	R1 26	M	INCOMING CONNECTOR CHECK
IFK	208-1	R1 28	M	INCOMING FRAME CHECK

<u>PUNCH DESIGNATION</u>	<u>OS</u>	<u>CARD COORDINATION</u>	<u>PUNCH SOURCE</u>	<u>FUNCTIONAL MEANING</u>
MARKER PROGRESS (Contd.)				
MRL	217-1	R0 14	M	MARKER RELEASE
MT	216-1	R0 11	M	MARKER TRANSFER
OCK	207-1	R1 25	M	OUTGOING CONNECTOR CHECK
OFK	207-1	R1 27	M	OUTGOING FRAME CHECK
OSC	203-1, 216-1, 217-1	R0 13	M	OUT SLEEVE CONTINUITY
RCK	197-1	R1 16	M	ROUTE REGISTRATION CHECK
RL	217-1	R0 15	M	RELEASE
SCT	203-1, 216-1	R1 21	M	SLEEVE CONTINUITY TEST
SG	203-1, 216-1	R1 24	M	SLEEVE GUARD
SK	214-1	R1 29	M	SELECT MAGNET LOCK-OUT CHECK
T1R1	216-1	R0 9	M	"T1" AND "R1" CONTINUITY TEST "OK"
TB	202-1	R1 23	M	TRUNKS BUSY
TBK	199-1	R1 18	M	TRUNK BLOCK CHECK
TCK	198-1	R1 17	M	TRUNK BLOCK CONNECTOR CHECK
TKS	170-1, 172-1, 202-1	R1 20	M	TRUNK SELECTED
TR	216-1	R0 8	M	"T" AND "R" CONTINUITY TEST "OK"
MARKER REGISTRATION				
ODG	176-1	R4 11	M	"0" DIGITS
4DG	176-1	R4 12	M	"4" DIGITS
5DG	176-1	R4 13	M	"5" DIGITS
CLCT	176-1	R4 10	M	CANCEL LOOP CONTINUITY TEST
FOF	191-1	R4 3	M	FOLLOW-WITH-OVERFLOW
FMB	191-1	R4 4	M	FOLLOW-WITH-MASTER BUSY
FRO	191-1	R4 5	M	FOLLOW-WITH-REORDER
FST	191-1	R4 6	M	FOLLOW-WITH-SECOND TRIAL
HLD	170-1, 172-1, 191-1	R4 7	M	HOLD
MB	171-1, 190-1	R4 0	M	MASTER BUSY
MLCT	176-1	R4 9	M	MAKE LOOP CONTINUITY TEST
NDG	176-1	R4 14	M	NO DIGITS
PRO	181-1	R4 2	M	OVERLOAD ANNOUNCEMENT

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RM 3-11

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NO. 4A OR 4M TOLL

ORDER AS BSP ITEM MP-11771

BELL TELEPHONE LABORATORIES, INC.

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<u>PUNCH DESIGNATION</u>	<u>OS</u>	<u>CARD COORDINATION</u>	<u>PUNCH SOURCE</u>	<u>FUNCTIONAL MEANING</u>	<u>PUNCH DESIGNATION</u>	<u>OS</u>	<u>CARD COORDINATION</u>	<u>PUNCH SOURCE</u>	<u>FUNCTIONAL MEANING</u>
MARKER REGISTRATION (Contd.)					MARKER-SENDER TRANSMITTING (Contd.)				
RO	190-1	R4 1	M	REORDER	SKA	194-1	R0 20	M	SKIP CHECK
MARKER REGISTRATION CODE CONVERSION					TA	195-1	R0 23	M	CODE CONVERSION TENS CHECK
CC H $\frac{2}{5}$	195-1	R5 15	M	CODE CONVERSION HUNDREDS	TB	195-1	R0 24	M	CODE CONVERSION TENS CHECK
CC HN	195-1	R5 12	M	NO CODE CONVERSION HUNDREDS	TSA	170-1, 172-1	R0 27	M	TRUNK SELECTED CHECK
CC T $\frac{2}{5}$	195-1	R5 20	M	CODE CONVERSION TENS	UA	195-1	R0 25	M	CODE CONVERSION UNITS CHECK
CC TN	195-1	R5 13	M	NO CODE CONVERSION TENS	UB	195-1	R0 26	M	CODE CONVERSION UNITS CHECK
CC U $\frac{2}{5}$	195-1	R5 25	M	CODE CONVERSION UNITS	MARKER TIME-OUT				
CC UN	195-1	R5 14	M	NO CODE CONVERSION UNITS	TM1	219-1	S8 57	M	TIME MEASURE "1"
MARKER ROUTE ADVANCE					TM2	219-1	S8 58	M	TIME MEASURE "2"
OF	202-1	S1 27	M	OVERFLOW	TM3	219-1	S8 59	M	TIME MEASURE "3"
MBR	202-1	S1 28	M	MASTER BUSY ROUTE	TMC	218-1	S8 56	M	TIMING CONTROL
ROR	202-1	S1 29	M	REORDER ROUTE	MARKER - TC				
RS1	202-1	S1 25	M	ROUTE SWITCHING	0-9	220-1	S7 20	M	MARKER "TC"
RS3	202-1	S1 26	M	ROUTE SWITCHING	MFP SENDER				
MARKER-SENDER TRANSMITTED CODE CONVERSION					0-2	178-1, 220-1	S6 27	MFS	MULTIFREQUENCY SENDER
CC H $\frac{2}{5}$	195-1	R4 15	M	CODE CONVERSION HUNDREDS	MS				
CC T $\frac{2}{5}$	195-1	R4 20	M	CODE CONVERSION TENS	MS 0-19	203-1	S6 40	M	MARKER SLEEVE
CC U $\frac{2}{5}$	195-1	R4 25	M	CODE CONVERSION UNITS	MS 20-39	203-1	S5 40	M	MARKER SLEEVE
MARKER-SENDER TRANSMITTING					NAC				
CDA	193-1	R0 19	M	CONTINUITY AND DIGIT "A" CHECK	NAC	164-1	R8 1	D	NO AREA CODE
CLA	193-1	R0 16	M	FIRST CLASS CHECK	NCA				
CLB	193-1	R0 17	M	SECOND CLASS CHECK	NCA	166-1	S0 0	D	NO COME AGAIN
CLC	193-1	R0 18	M	THIRD CLASS CHECK	NSK				
DGA	194-1	R0 28	M	DIGIT CONTROL CHECK	NSK	164-1, 176-1	R7 9	M	NO SKIP
HA	195-1	R0 21	M	CODE CONVERSION HUNDREDS CHECK					
HB	195-1	R0 22	M	CODE CONVERSION HUNDREDS CHECK					

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PUNCH DESIGNATION	OS	CARD COORDINATION	PUNCH SOURCE	FUNCTIONAL MEANING
OGT APP.				
IT	164-1	S0 4	D	INTERTOLL
ITC	164-1	S0 6	D	INTERTOLL AND TOLL COMPLETING
TC	164-1	S0 5	D	TOLL COMPLETING
OUTGOING FRAME GROUP				
O 0-19	205-1	S1 30	M	OUTGOING FRAME GROUP
OUTGOING SWITCH				
SW 0-9	220-1	S1 50	OL	OUTGOING SWITCH
R6DT				
R6DT	167-1	R0 29	D	RECORDED 6 DIGIT TRANSLATION
RD				
RD	185-1	R6 1	CT	READ RELAY
ROUTING INST.				
RI $\frac{2}{5}$	164-1	R8 20	D	ROUTING INSTRUCTION
SDR. FR. TENS				
TO-9	178-1, 220-1	S6 4	DPS MFS	SENDER FRAME TENS
SDR. FR. UNITS				
UO-9	178-1, 220-1	S6 14	DPS MFS	SENDER FRAME UNITS
SELECT MAGNET				
0-9	206-1, 215-1	S3 30	M	SELECT MAGNET INCOMING PRIMARY BAY
10-19	206-1, 215-1	S3 40	M	SELECT MAGNET INCOMING FIRST PRIMARY EXTENSION BAY
20-29	206-1, 215-1	S3 50	M	SELECT MAGNET INCOMING SECOND PRIMARY EXTENSION BAY
30-39		S2 30	M	SELECT MAGNET INCOMING THIRD PRIMARY EXTENSION BAY

PUNCH DESIGNATION	OS	CARD COORDINATION	PUNCH SOURCE	FUNCTIONAL MEANING
SK3				
SK3	164-1, 176-1	R7 10	M	SKIP "3"
SK6				
SK6	164-1, 176-1	R7 11	M	SKIP "6"
SOURCE OF RECORD				
C	228-1	S8 2	TR	CONTROLLER
CT		S8 6	TR	CONTROLLER TESTING
D	228-1	S8 0	TR	DECODER
DT		S8 3	TR	DECODER TEST
M	228-1	S8 1	TR	MARKER
MT		S8 4	TR	MARKER TEST
TV		S8 5	TR	TRANSLATION VERIFICATION
TB				
TB $\frac{2}{5}$	192-1	S6 35	M	TRUNK BLOCK RELAY
T.B. CONN.				
OUT. CONN. INC. CONN.				
IC E	208-1	S2 48	M	EVEN
IC O	208-1	S2 49	M	ODD
OC E	207-1	S2 46	M	EVEN
OC O	207-1	S2 47	M	ODD
TBC E	198-1	S2 44	M	EVEN
TBC O	198-1	S2 45	M	ODD
TC				
T 0-2	191-1	S6 30	M	TRUNK BLOCK CONNECTOR TENS
U 0-9	191-1	S5 30	M	TRUNK BLOCK CONNECTOR UNITS
TP				
TP 0-2	164-1	S0 11	M	TRUNK PEG COUNT AND OVERFLOW REGISTER CONTROL

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<u>PUNCH DESIGNATION</u>	<u>OS</u>	<u>CARD COORDINATION</u>	<u>PUNCH SOURCE</u>	<u>FUNCTIONAL MEANING</u>
TPC				
TPC	164-1	S0 10	D	THROUGH TRAFFIC PEG COUNT
TRANSLATOR ENGAGED				
EM	178-1	S5 1	CT	TRANSLATOR EMERGENCY
H	178-1	S5 0	CT	TRANSLATOR HOME
T0, 1	178-1	S5 2	CT	TRANSLATOR TENS
U0-9	178-1	S5 4	CT	TRANSLATOR UNITS
TRANSMITTED MARKER TO SENDER				
ODG	194-1	R3 11	M	"0" DIGITS
4DG	194-1	R3 12	M	"4" DIGITS
5DG	194-1	R3 13	M	"5" DIGITS
20C	193-1	R3 9	M	20 CYCLE RING (TOLL COMPLETING)
DC	193-1	R3 1	M	DC KEY PULSE
DLC	193-1	R3 7	M	DELAYED LOOP CLOSURE
LPD	193-1	R3 4	M	LOOP DIAL
M	193-1	R3 0	M	MANUAL
MF	193-1	R3 2	M	MULTIFREQUENCY PULSE
NSK	194-1	R3 15	M	NO SKIP
SK3	194-1	R3 16	M	SKIP 3
SK6	194-1	R3 17	M	SKIP 6
SXD	193-1	R3 3	M	SIMPLEX DIAL
SXR	193-1	R3 8	M	SIMPLEX (TOLL COMPLETING)
XDD	193-1	R3 5	M	EXPECT DELAY DIAL
XSG	193-1	R3 6	M	EXPECT STOP-GO

<u>PUNCH DESIGNATION</u>	<u>OS</u>	<u>CARD COORDINATION</u>	<u>PUNCH SOURCE</u>	<u>FUNCTIONAL MEANING</u>
TRUNK BLOCK				
TB $\frac{2}{5}$	164-1	R6 11	D	TRUNK BLOCK RELAY NUMBER
TRUNK BLOCK CONNECTOR				
T0-2	164-1	R6 3	D	TRUNK BLOCK CONNECTOR TENS
U $\frac{2}{5}$	164-1	R6 6	D	TRUNK BLOCK CONNECTOR UNITS
TS				
TS 0-2	164-1	S0 7	D	TRAFFIC SEPARATION
TYPE OF RECORD				
CFR	163-1, 174-1, 179-1	S7 2	D	CARD FAILURE
DSTI	160-1	S7 3	D	SENDER REQUEST FOR TRUNK INDICATION
FIF	206-1, 220-1	S7 0	DM	FRAME IDENTIFICATION FAILURE
MFT	206-1	S7 1	M	MULTIFREQUENCY TRANSFER
MSTI	190-1	S7 4	M	SENDER REQUEST FOR TRUNK INDICATION OR OVER REGISTRATION OF INCOMING CODE.
OGT		S7 9	DM	OUTGOING TRUNK TEST
PRO	181-1	S6 1	D	OVERLOAD ANNOUNCEMENT
RO	160-1, 175-1	S6 0	D	RECORDER
RTRF	171-1	S7 5	D	ROUTE TRANSFER
SDT		S7 7	DM	SENDER TEST
TST		S7 6	M	TEST

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<u>PUNCH DESIGNATION</u>	<u>OS</u>	<u>CARD COORDINATES</u>	<u>PUNCH SOURCE</u>	<u>FUNCTIONAL MEANING</u>
CONTROLLER GROUP CG A-F	115-1	R4 30	C	CONTROLLER GROUP
CONTROLLER C 0-5	115-1	R4 36	C	CONTROLLER
CONTROLLER CONNECTOR CC 0-5	115-1	R4 42	CC	CONTROLLER CONNECTOR
CONTROLLER PROGRESS CL 0, 1	107-1, 107-2	R1 33	C	CL0, 1 OPERATED
DTC	109-1, 109-2	R1 37	C	DOUBLE TEST CONNECT
FR	113-1	R1 31	C	FRAME RELEASE
GR	106-1	R1 32	C	GROUP RELEASE
HO	112-1, 112-2	R1 44	C	HO OPERATED
HM	112-1, 112-2	R1 45	C	HM OPERATED
OT	107-1, 107-2	R1 35	C	OPERATED TL- OR TU-
OTC	108-1, 108-2	R1 38	C	OPERATED TC
PA	110-1	R1 39	C	PRIMARY "A"
PB	110-1	R1 40	C	PRIMARY "B"
PC	107-1, 107-2	R1 36	C	PREFERENCE CHANGE
SA	111-1	R1 41	C	SECONDARY "A"
SB	111-1	R1 42	C	SECONDARY "B"
SC	106-1, 112-1, 112-2	R1 43	C	SLEEVE CONTINUITY
TT	113-1	R1 30	C	TUBE TIMER
CROSS GX	105-1	R1 47	C	GROUP LEAD CROSS
HX	108-1, 108-2	R1 50	C	HOLD MAGNET LEAD CROSS
PX	110-1	R1 48	C	PRIMARY SELECT LEAD CROSS
SX	111-1	R1 49	C	SECONDARY SELECT LEAD CROSS
DL DL	107-1, 107-2	R2 59	C	DOUBLE TEST LOWER
DU DU	107-1, 107-2	R2 58	C	DOUBLE TEST UPPER

<u>PUNCH DESIGNATION</u>	<u>OS</u>	<u>CARD COORDINATES</u>	<u>PUNCH SOURCE</u>	<u>FUNCTIONAL MEANING</u>
LK. FR. - TENS LFT $\frac{2}{5}$	115-1	R4 48	SL	LINK FRAME TENS
LK. FR. - UNITS LFU $\frac{2}{5}$	115-1	R4 53	SL	LINK FRAME UNITS
PREFERENCE PF A	104-1	R2 30	C	PREFERENCE "A"
PF B	104-1	R2 32	C	PREFERENCE "B"
PF C	104-1	R2 34	C	PREFERENCE "C"
PF D	104-1	R2 36	C	PREFERENCE "D"
PF E	104-1	R2 38	C	PREFERENCE "E"
SDR. TYPE DP	115-1	R3 56	SL	DIAL PULSE INCOMING SENDER
MFP	115-1	R3 57	SL	MULTIFREQUENCY INCOMING SENDER
OS	115-1	R3 58	SL	OUTGOING SENDER
SEC. SWITCH SS A0, 1	107-1, 107-2	R3 50	C	SECONDARY SWITCH
SS B0, 1	107-1, 107-2	R3 53	C	SECONDARY SWITCH
SEC. SW. LEVEL SSL 0-4	109-1, 109-2	R2 50	C	SECONDARY SWITCH LEVEL
TRUNK GROUP TG 0-9	105-1	R3 30	C	TRUNK GROUP
TRUNK LEVEL TL 0-9	106-1	R3 40	C	TRUNK LEVEL

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LIST OF ABBREVIATIONS FOR MAJOR CIRCUITS
AS USED ON SEQUENCE CHARTS AND OPERATIONAL SKETCHES

<u>ABBREVIATION</u>	<u>CIRCUIT</u>	<u>SD-DRAWING</u>
CC	CONTROLLER CONNECTOR CIRCUIT	68336-01
D	DECODER CIRCUIT	68340-01
DC	DECODER CONNECTOR CIRCUIT	68339-01
ETC	EMERGENCY TRANSLATOR CONNECTOR CIRCUIT	68429-01
GBC	GROUP BUSY CHAIN RELAY CIRCUIT	68420-01
IL	INCOMING LINK AND CONNECTOR CIRCUIT	68393-01
IS) IS-DP)	INCOMING SENDER CIRCUIT - DIAL PULSING	68221-01
IS) IS-MF)	INCOMING SENDER CIRCUIT - MULTIFREQUENCY	68222-01
LC	LINK CONTROLLER CIRCUIT	68028-01
M	MARKER CIRCUIT	68388-01
MC	MARKER CONNECTOR CIRCUIT	68395-01
MTR	MISCELLANEOUS CIRCUIT TROUBLE RECORDER FRAME	68392-01
OL	OUTGOING LINK AND CONNECTOR CIRCUIT	68394-01
OS	OUTGOING SENDER CIRCUIT	68018-01
SL	SENDER LINK AND CONNECTOR CIRCUIT	68334-01
SMB	SENDER MAKE BUSY FRAME CIRCUIT	68386-01
T	CARD TRANSLATOR CIRCUIT	68342-01
DFAT	CARD TRANSLATOR WHEN USED AS DECODER FOREIGN AREA TRANSLATOR	
ET	CARD TRANSLATOR WHEN USED AS EMERGENCY TRANSLATOR	
FAT	CARD TRANSLATOR WHEN USED AS FOREIGN AREA TRANSLATOR	
HT	CARD TRANSLATOR WHEN USED AS HOME TRANSLATOR	
TBC	TRUNK BLOCK CONNECTOR CIRCUIT	68027-01
TRK	TRUNK CIRCUIT	68232-01, 68233-01, etc.

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TRUNK DESIGNATIONS

<u>CODE</u>	<u>TITLE</u>	<u>CIRCUIT</u>
2IA	TWO-WAY INTERTOLL TRUNK - INCOMING DP, OUT-GOING DP, MFP, OR AUTOMATIC - CX SUPERVISION TYPE B	SD-68232-01
2IB	TWO-WAY INTERTOLL TRUNK - INCOMING MFP, OUT-GOING DP, MFP, OR AUTOMATIC - CX SUPERVISION TYPE B	SD-68233-01
121A OR 151A	121 OR 151 TRUNK - TOLL SWITCHBOARD NO.3, 3C, OR 3CL	SD-68282-01
121B	121 OR 151 TRUNK - TOLL SWITCHBOARD NO.5	SD-68291-01
131, 141, 181 OR 191	INFORMATION AND ROUTE OPERATOR	SD-68304-01
151B	MB OR 151 TRUNK - TOLL SWITCHBOARD NO.5	SD-68377-01
151C	MB OR 151 TRUNK - TOLL SWITCHBOARD NO.3, 3C, OR 3CL	SD-68441-01
IIA	INCOMING INTERTOLL TRUNK - DIAL PULSING - CX SUPERVISION TYPE B	SD-68135-01
IIB	INCOMING INTERTOLL TRUNK - MF PULSING - CX SUPERVISION TYPE B	SD-68230-01
ITA	INCOMING TRUNK FROM TOLL SWITCHBOARD NO.3, 3C, OR 3CL IN SAME BUILDING - MF PULSING	SD-68237-01
ITB	INCOMING TRUNK FROM TOLL SWITCHBOARD NO.3, 3C, OR 3CL THROUGH POSITION IN SAME BUILDING - MF PULSING	SD-68238-01
ITC	INCOMING TANDEM TRUNK 4-WIRE TALKING - MF PULSING - REVERSE BATTERY SUPERVISION AND SIMPLEX D-C RINGING ON SIGNALING PHANTOM	SD-68290-01

<u>CODE</u>	<u>TITLE</u>	<u>CIRCUIT</u>
ITD	INCOMING TANDEM TRUNK FROM SWITCHBOARD NO.1, 11, 15C, OR 15D - DIAL PULSING - REVERSE BATTERY SUPERVISION WITH 20-CYCLE RINGING	SD-68315-01
ITE	INCOMING TANDEM TRUNK FROM TOLL SWITCHBOARD NO.1 IN SAME BUILDING - MF PULSING SLEEVE SUPERVISION	SD-68317-01
ITF	INCOMING TANDEM TRUNK FROM NO. 13D, 15C, OR 15D SWITCHBOARD - MF PULSING - REVERSE BATTERY SUPERVISION WITH 20-CYCLE RINGING	SD-68318-01
ITG	INCOMING TRUNK FROM TOLL SWITCHBOARD NO.1 IN SAME BUILDING - MF PULSING, WET-DRY SUPERVISION WITH TRANSMISSION SWITCHING PAD	SD-68322-01
ITJ	INCOMING TRUNK FROM TOLL SWITCHBOARD NO.5 - MF PULSING	SD-68348-01
ITK	INCOMING TRUNK FROM TOLL TEST BOARD NO.17C TO THE INCOMING LINK FRAMES	SD-68141-01
ITL	INCOMING TANDEM TRUNK FROM NO.1 SWITCHBOARD - THROUGH TYPE - DIAL PULSING	SD-68375-01
ITM	INCOMING TANDEM TRUNK FROM NO.1 SWITCHBOARD - TERMINAL TYPE - DIAL PULSING	SD-68376-01
ITR	INCOMING TANDEM TRUNK FROM NO.1 SWITCHBOARD - MF PULSING - TYPE A CORDS	SD-68369-01
ITS	INCOMING TANDEM TRUNK FROM NO.1 SWITCHBOARD - REVERSE BATTERY SUPERVISION	SD-68358-01
ITT	INCOMING TRUNK FROM NO.5 SWITCHBOARD - MF OR DC PULSING	SD-68292-01
ITU	INCOMING TANDEM TRUNK - DIAL PULSING - REVERSE BATTERY SUPERVISION	SD-68357-01
ITW	INCOMING TOLL TANDEM TRUNK - DIAL PULSING - CX SUPERVISION TYPE B	SD-68135-01

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TRUNK DESIGNATIONS

<u>CODE</u>	<u>TITLE</u>	<u>CIRCUIT</u>	<u>CODE</u>	<u>TITLE</u>	<u>CIRCUIT</u>
ITY	INCOMING INTERTOLL TRUNK - MF PULSING - CX SUPERVISION TYPE B	SD-68230-01	OTA	OUTGOING TRUNK TO TOLL TANDEM SWITCHBOARD NO.1 IN SAME BUILDING - TOLL TANDEM STRAIGHTFORWARD	SD-68320-01
ODA	OUTGOING TRUNK TO DESKS	SD-68332-01	OTB	OUTGOING TRUNK TOLL TANDEM, MFP OR SF 4-WIRE TALKING - REVERSE BATTERY SUPERVISION AND SIMPLEX D-C RINGING ON SIGNALING PHANTOM	SD-68309-01
OIA	OUTGOING INTERTOLL TRUNK - DP, MFP, OR AUTOMATIC - CX SUPERVISION TYPE B	SD-68231-01	OTC	OUTGOING TRUNK TOLL TANDEM SWITCHBOARD IN SAME BUILDING - TOLL TANDEM STRAIGHTFORWARD	SD-68321-01
OIB	OUTGOING INTERTOLL TRUNK AUXILIARY FOR USE WITH RINGDOWN INTERTOLL TRUNK CIRCUIT IN TOLL SWITCHBOARD NO. 3, 3C, OR 3CL	SD-68234-01	OTD	OUTGOING TRUNK TOLL TANDEM TO TOLL SWITCHBOARD NO.1B OR 3B IN SAME BUILDING	SD-68367-01
OIC	OUTGOING INTERTOLL TRUNK - RINGDOWN	SD-68260-01	OXA	OUTGOING TRUNK TO TOLL SWITCHBOARD NO.3, 3C, OR 3CL IN SAME BUILDING - TX WITH TRANSMISSION SWITCHING PAD	SD-68282-01
OID	OUTGOING INTERTOLL TRUNK AUXILIARY FOR USE WITH RINGDOWN INTERTOLL TRUNK CIRCUIT IN TOLL SWITCHBOARD NO.1	SD-68364-01	OXB	OUTGOING TRUNK - TX OR COMBINED TX AND TOLL SWITCHING DP, MFP, OR AUTOMATIC - REVERSE BATTERY SUPERVISION - ARRANGED FOR SIMPLEX D-C RERING	SD-68239-01
OSA	OUTGOING TRUNK - TOLL SWITCHING DP, WET-DRY SUPERVISION - AUTOMATIC START RINGING TO REPEATED DIAL TOLL TRAIN OR COMBINATION LOOP AND REPEATED DIAL TOLL TRAIN	SD-68240-01	OXC	OUTGOING TRUNK TX - 4-WIRE TALKING - REVERSE BATTERY SUPERVISION AND SIMPLEX D-C RINGING ON SIGNALING PHANTOM	SD-68289-01
OSB	OUTGOING TRUNK TOLL SWITCHING - DP, MFP, OR SF WET-DRY, HIGH-LOW OR REVERSE BATTERY SUPERVISION	SD-68242-01	OXD	OUTGOING TRUNK TO TOLL SWITCHBOARD NO.3, 3C, OR 3CL IN SAME BUILDING - TX	SD-68304-01
OSC	OUTGOING TRUNK TOLL SWITCHING - RP, PCI, OR DP, WET-DRY OR REVERSE BATTERY SUPERVISION	SD-68326-01	OXE	OUTGOING TRUNK TO TOLL SWITCHBOARD NO.1, IN SAME BUILDING - TX - SLEEVE SUPERVISION	SD-68305-01
OSD	OUTGOING TRUNK TOLL SWITCHING - EQUIPPED WITH REPEATER, RP OR PCI PULSING, WET-DRY OR REVERSE BATTERY SUPERVISION	SD-68366-01	OXF	OUTGOING TRUNK TO TOLL SWITCHBOARD NO.1 IN SAME BUILDING - TX WITH TRANSMISSION SWITCHING PAD, WET-DRY SUPERVISION	SD-68306-01
OSE	OUTGOING TRUNK AUXILIARY - REVERSE BATTERY SUPERVISION FOR USE WITH 2-WAY OPERATOR'S OFFICIAL TRUNK IN SAME BUILDING	SD-68371-01	OXG	OUTGOING TRUNK - TX, WET-DRY SUPERVISION TO TOLL SWITCHBOARD NO.1 IN SAME BUILDING EQUIPPED WITH A CORDS	SD-68368-01
OSF	OUTGOING TRUNK AUXILIARY - CX SUPERVISION FOR USE WITH 2-WAY OPERATOR'S OFFICIAL TRUNK IN SAME BUILDING	SD-68378-01	OXK	OUTGOING TRUNK - TX, RINGDOWN SUPERVISION TO TOLL SWITCHBOARD NO.1 IN SAME BUILDING	SD-68417-01

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TRUNK DESIGNATIONS

TRUNK DESIGNATIONS

<u>CODE</u>	<u>TITLE</u>	<u>CIRCUIT</u>
	<u>MISCELLANEOUS</u>	
100	TEST LINE (BALANCE AND NOISE)	SD-68299-01
101	OUTGOING TRUNK TO 17C TESTBOARD	SD-68299-01
102 OR 959	TEST LINE TO MILLIWATT SUPPLY	SD-68095-01
103	TEST LINE TRUNK (RINGING FEATURE)	SD-68399-01
DQ	DELAY QUOTE TRUNK	SD-68056-01
MB	MASTER BUSY	SD-68083-01
MBT	MASTER BUSY TRAINING	SD-68083-01
OFLA	OVERFLOW TRUNK AND OVERFLOW TRUNK CONTROL CIRCUIT	SD-68420-01
OFLT	OVERFLOW TRAINING	SD-68083-01
RO	REORDER TRUNK	SD-68247-01
ROM	REORDER MONITOR AT TOLL SWITCHBOARD NO.5	SD-68249-01
ROMB	REORDER MONITOR AT TOLL SWITCHBOARD NO.3, 3C, OR 3CL	SD-68438-01

NOTES:

1. THE FIRST LETTER OR NUMERAL INDICATES DIRECTION, AS FOLLOWS:
 - I - INCOMING
 - O - OUTGOING
 - 2 - TWO-WAY
2. THE SECOND LETTER INDICATES THE TYPE OF TRUNK, AS FOLLOWS:
 - I - INTERTOLL
 - T - TANDEM
 - X - TX
 - S - TOLL SWITCHING
3. THE THIRD LETTER INDICATES A PARTICULAR SD NUMBER IN ORDER TO DIFFERENTIATE BETWEEN SIMILAR TYPES OF TRUNKS.

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ABBREVIATIONS FOR CLASS 1 OFFICES

ABBR.	OFFICE	ABBR.	OFFICE	ABBR.	OFFICE	ABBR.	OFFICE	ABBR.	OFFICE
ABER	Aberdeen, S.D.	CAL	Calgary, Alta.	ELMI	Elmira, N.Y.	HLN	Helena, Mont.	MCN	Macon, Ga.
AKR	Akron, O.	C T S	*Cambridge, T.S., O.	EL P	El Paso, Tex.	H PK	Highland Park, Ill.	MDSN	Madison, Wis.
ALBY	Albany, N.Y.	CNAN	Canaan, Conn.	ERIE	Erie, Pa.	HLND	Holland, Mich.	MANS	Mansfield, O.
ALBQ	Albuquerque, N.M.	CANT	Canton, O.	EVSVL	Evansville, Ind.	H S	Hot Springs, Ark.	MRETA	Marietta, O.
ALTWN	Allentown, Pa.	CPR	Casper, Wyo.			HOUS	Houston, Tex.	MRON-I	Marion, Ind.
ALNC	Alliance, O.	CED R	Cedar Rapids, Ia.			HTGTN	Huntington, W.Va.	MRON-O	Marion, O.
ATOON	Altoona, Pa.	CENT	Centralia, Ill.	FRMT	Fairmont, W.Va.			MARQ	Marquette, Mich.
AMAR	Amarillo, Tex.	CHAM	Champaign, Ill.	F RIV	Fall River, Mass.			MTOWN	Marshalltown, Ia.
AND	Anderson, Ind.	CHAS-S	Charleston, S.C.	FGO	Fargo, N.D.	IPLS	Indianapolis, Ind.	MA CY	Mason City, Ia.
ANNP	Annapolis, Md.	CHAS-W	Charleston, W.Va.	FDLY	Findlay, O.	IA CY	Iowa City, Ia.	MDVL	Meadville, Pa.
ANN	Ann Arbor, Mich.	CHLOT	Charlotte, N.C.	FLT	Flint, Mich.	ITH	Ithaca, N.Y.	MEMP	Memphis, Tenn.
APPL	Appleton, Wis.	CHARVL	Charlottesville, Va.	FLRC	Florence, S.C.			MERD	Meriden, Conn.
A PK	Asbury Park, N.J.	CHATT	Chattanooga, Tenn.	F DU L	Fond du Lac, Wis.			MMI	Miami, Fla.
ASVL	Asheville, N.C.	CGO	Chicago, Ill.	FT D	Fort Dodge, Ia.	JKN-MH	Jackson, Mich.	MICH CY	Michigan City, Ind.
ASHD	Ashland, Ky.	CIN	Cincinnati, O.	FT SM	Fort Smith, Ark.	JKN-MS	Jackson, Miss.	MDTN-C	Middletown, Conn.
ASHTA	Ashtabula, O.	CLKSBG	Clarksburg, W.Va.	FT WN	Fort Wayne, Ind.	JKVL	Jacksonville, Fla.	MDTN-N	Middletown, N.Y.
ATLA	Atlanta, Ga.	CLEV	Cleveland, O.	FT WH	Fort Worth, Tex.	JMTN	Jamestown, N.Y.	MILW	Milwaukee, Wis.
A CY	Atlantic City, N.J.	CLIN	Clinton, Ia.	FRED	Frederick, Md.	JNVL	Janesville, Wis.	MPLS	Minneapolis, Minn.
AUB-I	Auburn, Ind.	CLBA	Columbia, S.C.	FR LK	French Lick, Ind.	JNTN	Johnstown, Pa.	MINOT	Minot, N.D.
AUB-N	Auburn, N.Y.	COLS	Columbus, O.			JOL	Joliet, Ill.	MOBI	Mobile, Ala.
AUG	Augusta, Ga.	C CH	Corpus Christi, Tex.					MRO-L	Monroe, La.
		COVI	Covington, Va.	GALES	Galesburg, Ill.			MRO-M	Monroe, Mich.
		CUMB	Cumberland, Md.	G CY	Garden City, N.Y.	KZOO	Kalamazoo, Mich.	MTG	Montgomery, Ala.
BALT	Baltimore, Md.			GARY	Gary, Ind.	KANE	Kane, Pa.	MONTI	Monticello, N.Y.
BANG	Bangor, Me.	DLS	Dallas, Tex.	GL F	Glens Falls, N.Y.	K C	Kansas City, Mo.	MTRL	Montreal, Que.
BT RU	Baton Rouge, La.	DANB	Danbury, Conn.	GLBO	Goldsboro, N.C.	KENO	Kenosha, Wis.	MORGN	Morgantown, W.Va.
B CK	Battle Creek, Mich.	DANV-I	Danville, Ill.	G IS	Grand Island, Neb.	KEO	Keokuk, Ia.	MRSTN	Morristown, N.J.
B HR	Benton Harbor, Mich.	DANV-V	Danville, Va.	G RPS	Grand Rapids, Mich.	KGTN	Kingston, N.Y.	MT V	Mount Vernon, N.Y.
BLG	Billings, Mont.	DVPT	Davenport, Ia.	GT BN	Great Barrington, Mass.	KXVL	Knoxville, Tenn.	MUN	Muncie, Ind.
BNGTN	Binghamton, N.Y.	DAYT	Dayton, O.	GT FS	Great Falls, Mont.	KOK	Kokomo, Ind.	MUSK	Muskegon, Mich.
BHAM	Birmingham, Ala.	DEC	Decatur, Ill.	GN BY	Green Bay, Wis.			MSKGE	Muskogee, Okla.
BIS	Bismarck, N.D.	DNVR	Denver, Colo.	GNFD	Greenfield, Mass.	L CRS	La Crosse, Wis.	NHVL	Nashville, Tenn.
BLM-IL	Bloomington, Ill.	DES M	Des Moines, Ia.	GNBO	Greensboro, N.C.	LA F	La Fayette, Ind.	NWRK	Newark, N.J.
BLM-IN	Bloomington, Ind.	DET	Detroit, Mich.	GNVL	Greenville, S.C.	LANC	Lancaster, Pa.	N BED	New Bedford, Mass.
BLUE	Bluefield, W.Va.	DODGE	Dodge City, Kans.			LANS	Lansing, Mich.	N BTN	New Britain, Conn.
BSE	Boise, Ida.	DBQ	Dubuque, Ia.	HGRSTN	Hagerstown, Md.	LEX	Lexington, Ky.	N BWK	New Brunswick, N.J.
BOS	Boston, Mass.	DULH	Duluth, Minn.	HFX	Halifax, N.S.	LIMA	Lima, O.	NWB	Newburgh, N.Y.
BRFD	Bradford, Pa.	DNK	Dunkirk, N.Y.	HAM-O	Hamilton, O.	LINC	Lincoln, Neb.	N CAS	New Castle, Pa.
BPT	Bridgeport, Conn.	DHAM	Durham, N.C.	HAM-ON	Hamilton, Ont.	L R	Little Rock, Ark.	N HN	New Haven, Conn.
BRIS-C	Bristol, Conn.			HAMD	Hammond, Ind.	LGPT	Logansport, Ind.	N LN	New London, Conn.
BRIS-T	Bristol, Tenn.	ESTN	Easton, Pa.	HBG	Harrisburg, Pa.	LOR	Lorain, O.	N O	New Orleans, La.
BUF	Buffalo, N.Y.	EU CL	Eau Claire, Wis.	HFD	Hartford, Conn.	L A	Los Angeles, Calif.	NEWP	Newport, R.I.
BURL-I	Burlington, Ia.	ELK	Elkhart, Ind.	HZTN	Hazelton, Pa.	LSVL	Louisville, Ky.	N NEWS	Newport News, Va.
BURL-V	Burlington, Vt.					LYNCH	Lynchburg, Va.	N Y	New York, N.Y.
BTE	Butte, Mont.							NIA	Niagara Falls, N.Y.

*Test Station

ABBREVIATIONS FOR CLASS 1 OFFICES

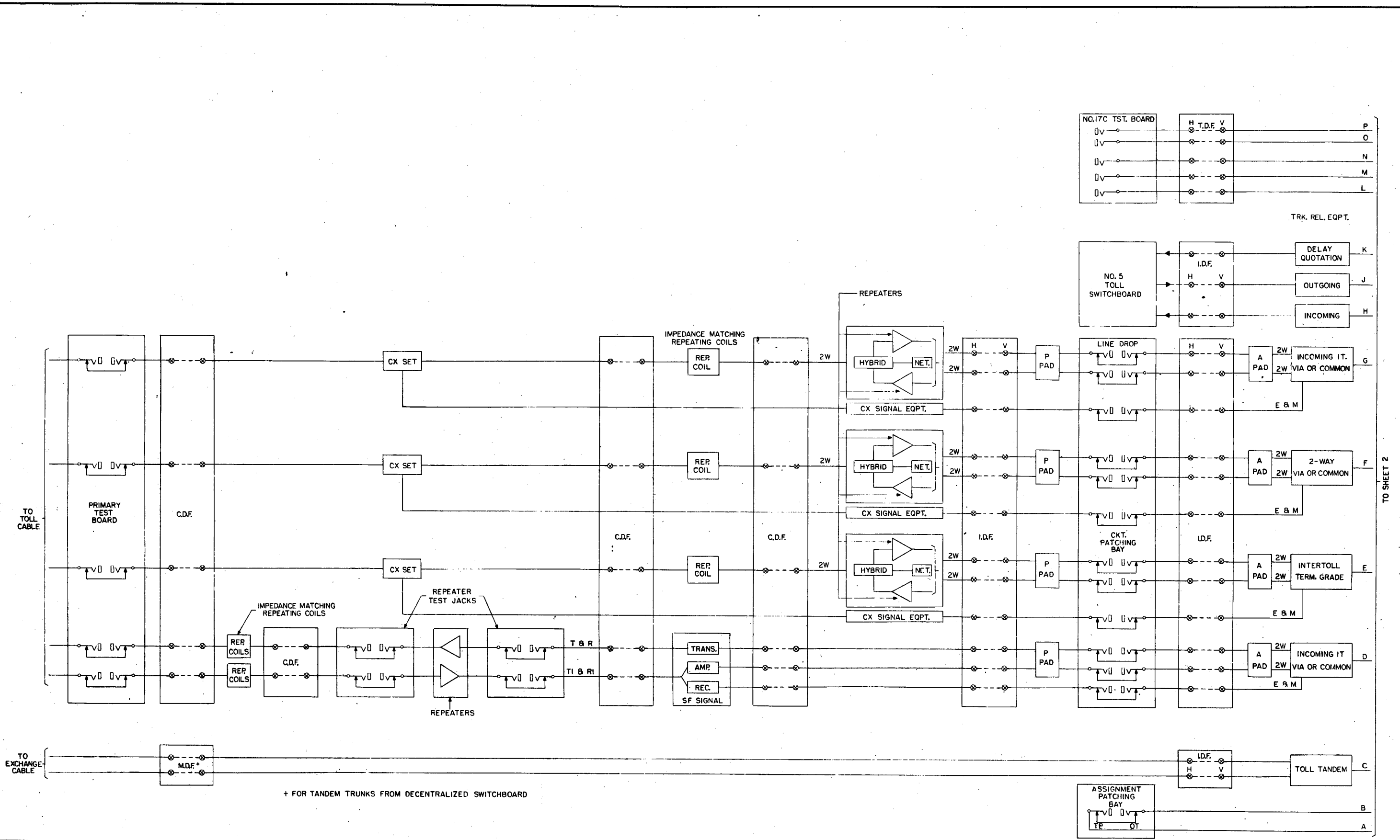
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ABBREVIATIONS FOR CLASS 1 OFFICES (Contd.)

ABBR.	OFFICE	ABBR.	OFFICE	ABBR.	OFFICE	ABBR.	OFFICE
NORF-N	Norfolk, Neb.	RAC	Racine, Wis.	SX FS	Sioux Falls, S.D.	WKN	Waukegan, Ill.
NORF-V	Norfolk, Va.	RLGH	Raleigh, N.C.	S BD	South Bend, Ind.	W P B	West Palm Beach, Fla.
N AD	North Adams, Mass.	RPD CY	Rapid City, S.D.	SPBG	Spartanburg, S.C.	WHLG	Wheeling, W. Va.
NHAM	Northampton, Mass.	RDG	Reading, Pa.	SPO	Spokane, Wash.	WH P	White Plains, N.Y.
NORT	Norton, Va.	REG	Regina, Sask.	SPFD-I	Springfield, Ill.	W R JC	White River Jct., Vt.
NWLK	Norwalk, Conn.	RENO	Reno, Nev.	SPFD-M	Springfield, Mass.	WICH	Wichita, Kans.
NWCH	Norwich, Conn.	RHINE	Rhineland, Wis.	SPFD-MO	Springfield, Mo.	WC FS	Wichita Falls, Tex.
		RICH-I	Richmond, Ind.	SPFD-O	Springfield, O.	WK BR	Wilkes Barre, Pa.
OAK	Oakland, Calif.	RICH-V	Richmond, Va.	STAM	Stamford, Conn.	WMPT	Williamsport, Pa.
OIL C	Oil City, Pa.	ROAN	Roanoke, Va.	STN	Staunton, Va.	WMTC	Willimantic, Conn.
OK CY	Oklahoma City, Okla.	ROCH-M	Rochester, Minn.	STEUB	Steubenville, O.	WILM	Wilmington, Del.
OLEAN	Olean, N.Y.	ROCH-N	Rochester, N.Y.	S PT	Stevens Point, Wis.	WPG	Winnipeg, Man.
OMA	Omaha, Neb.	ROCH-P	Rochester, Pa.	SDBG	Stroudsburg, Pa.	W SAL	Winston-Salem, N.C.
ORL	Orlando, Fla.	RKFD	Rockford, Ill.	SYR	Syracuse, N.Y.	WORC	Worcester, Mass.
OTWA	Ottawa, Ont.	R I	Rock Island, Ill.				
OTUM	Ottumwa, Ia.	RUTL	Rutland, Vt.	TPA	Tampa, Fla.	YORK	York, Pa.
				T HT	Terre Haute, Ind.	YGTN	Youngstown, O.
		SAC	Sacramento, Calif.	TOL	Toledo, O.		
		SAG	Saginaw, Mich.	TOP	Topeka, Kans.	ZAN	Zanesville, O.
PDUC	Paducah, Ky.	ST J	Saint John, N.B.	TORO	Toronto, Ont.		
PKBG	Parkersburg, W. Va.	ST JO	St. Joseph, Mo.	TORR	Torrington, Conn.		
PAT	Paterson, N.J.	ST L	St. Louis, Mo.	TREN	Trenton, N.J.		
PEEK	Peekskill, N.Y.	ST P	St. Paul, Minn.	TRND	Trinidad, Colo.		
PEOR	Peoria, Ill.	ST PBG	St. Petersburg, Fla.	TROY	Troy, N.Y.		
PTRBG	Petersburg, Va.	SAL	Salem, Mass.	TSN	Tucson, Ariz.		
PTKY	Petoskey, Mich.	SLNA	Salina, Kans.	TULSA	Tulsa, Okla.		
PHLA	Philadelphia, Pa.	SALIS	Sallisbury, Md.				
PNX	Phoenix, Ariz.	S LK	Salt Lake City, Utah	UTI	Utica, N.Y.		
PITB	Pittsburgh, Pa.	S A	San Antonio, Tex.				
PTFD	Pittsfield, Mass.	S D	San Diego, Calif.				
PLAT	Plattsburg, N.Y.	SDKY	Sandusky, O.				
POCA	Pocatello, Ida.	S F	San Francisco, Calif.				
PON	Pontiac, Mich.	ST S	Saratoga Springs, N.Y.				
PT HN	Port Huron, Mich.	SVAN	Savannah, Ga.	VAN	Vancouver, B.C.		
PTLD-M	Portland, Me.	SAYB	Saybrook, Conn.	VICK	Vicksburg, Miss.		
PTLD-O	Portland, Ore.	SCDY	Schenectady, N.Y.	VINC	Vincennes, Ind.		
PORTS	Portsmouth, O.	SCRN	Scranton, Pa.				
POUGH	Poughkeepsie, N.Y.	SEAT	Seattle, Wash.	WRN-O	Warren, O.		
PRCT	Prescott, Ariz.	SHRN	Sharon, Pa.	WRN-P	Warren, Pa.		
PROV	Providence, R.I.	SHRV	Shreveport, La.	WASH-DC	Washington, D.C.		
		SHRV	Shreveport, La.	WASH-P	Washington, Pa.		
QUE	Quebec, Que.	SHRV	Shreveport, La.	WBY	Waterbury, Conn.		
QCY	Quincy, Ill.	SID	Sidney, Neb.	WLOO	Waterloo, Ia.		
		SX CY	Sioux City, Ia.	WTWN	Watertown, N.Y.		

NOTE: The above abbreviations are for class 1 offices and are assigned by the Long Lines Department. Abbreviations for other offices are assigned by the associated companies who keep the Long Lines Department informed.

MP-11711
2 SHEETS, SHEET 2
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DATE 1-8-52
R.B.B.



TYPICAL EQUIPMENT LAYOUT
TWO-TRAIN OFFICE WITH
INTERTOLL AND TOLL COMPLETING TRAINS

RM 3-16 2 SHEETS, SHEET 1

NO. 4A TOLL

ORDER AS BSP ITEM MP-11795

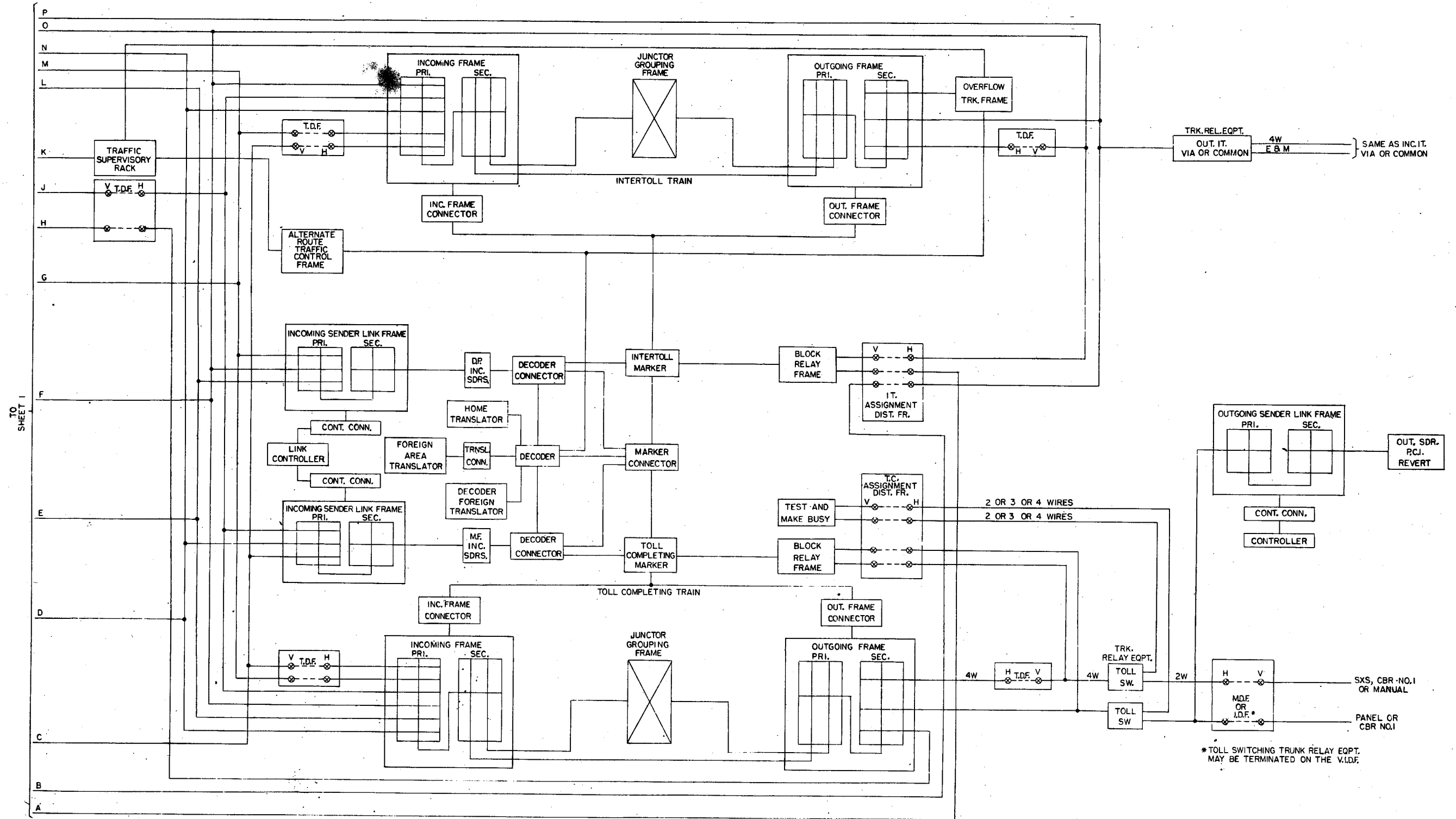
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ISSUE	1	2	3	4
DATE	2-21-51			

2 SHEETS, SHEET 1

MP-11795

ISSUE	1	1	1	1	1
DATE	2-21-52				



TYPICAL EQUIPMENT LAYOUT
TWO TRAIN-OFFICE WITH
INTERTOLL AND TOLL COMPLETING TRAINS