

COPY No. 1

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ISSUE \_\_\_\_\_, LISTS \_\_\_\_\_

# TOLL SWITCHBOARD No. 3C OR 3CL

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.

INDEX OF SEQUENCE CHARTS

<u>TITLE</u>	<u>CHART NO.</u>
LEGEND FOR SEQUENCE CHARTS	SC 000-2
SENDER CIRCUIT RECEIVES D-C KEY PULSES - TRANSMITS DIAL PULSES - 10 P.P.S - D-C RINGING SIGNAL	SC 101-1
KEY PULSING SENDER CIRCUIT RECEIVES D-C KEY PULSES - REVERTIVE AND P.C.I. PULSING	SC 102-1
"B" SWITCHBOARD - COMBINED TOLL-DSA-DSB POSITION	SC 103-1
DIAL PULSE TERMINATING SENDER USED WITH LOCAL TEST DESK	SC 104-1

ISSUED	YBM
DATE	3-20-58

INDEX OF  
SEQUENCE CHARTS

## LEGEND FOR SEQUENCE CHARTS

1. RELAY OR OTHER APPARATUS OPERATIONS AND RELEASES ONLY ARE SHOWN.
2. VERTICAL PROGRESSION DOWNWARD SHOWS TIME PHASE OF RELAY OR OTHER APPARATUS MOVEMENTS (OPERATION OR RELEASE).
3. COORDINATES ARE USED TO PROVIDE FOR INDEXING AND REFERENCES. THE HORIZONTAL COORDINATES ARE ALPHABETICAL STARTING WITH A AND THE VERTICAL COORDINATES ARE NUMERICAL STARTING WITH 101 ON SHEET 1, 201 ON SHEET 2, ETC.
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	1 LINE
SLOW RELEASE RELAYS	1 LINE	2 LINES (MIN.)
TIMED RELAYS, COLD CATHODE TUBES, ETC.	SEE NOTE 10	SEE NOTE 10
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:

- (A) A  
INDICATES RELAY A 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.
- (B) T  
INDICATES TUBE T HAS OPERATED.
- (C) (S) TC  
INDICATES INTERRUPTER OR TIMER TC HAS CLOSED ITS BACK CONTACT.

### 6. RELEASE SYMBOLS:

- (A) B  
INDICATES RELAY B 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.
- (B) T  
INDICATES TUBE T HAS RELEASED.
- (C) (PU) T  
INDICATES INTERRUPTER OR TIMER T HAS OPENED ITS PU CONTACT.
7. Z  
INDICATES Z RELAY HAS EITHER OPERATED OR RELEASED.

### 8. SYMBOL NOTATION:

- (A) C-  
INDICATES ONE OR MORE OF THE RELAYS DESIGNATED C0 TO Cn OR CA TO Cn HAVE OPERATED.
- (B) CO-9, CO-n  
INDICATES THAT ALL OF THE RELAYS DESIGNATED C0 TO C9, C0 TO Cn OR FA TO FD, INCLUSIVE, HAVE OPERATED.
- (C) FA-D  
INDICATES THAT ALL OF THE RELAYS DESIGNATED C0 TO C9, C0 TO Cn OR FA TO FD, INCLUSIVE, HAVE OPERATED.
- (D) A, C  
INDICATES BOTH A AND C RELAYS HAVE OPERATED FROM THE SAME CAUSE.
- (E) HG-2  
INDICATES A COMBINATION OF "2 OUT OF 5" RELAYS HAS OPERATED FROM THE SAME CAUSE.
- (F) L/R  
INDICATES THAT EITHER OF THE RELAYS L AND R HAS OPERATED OR ONE OF THE SERIES OF RELAYS L TO R HAS OPERATED.
- (G) (TOP) MC  
INDICATES TOP HALF OF THE MC MULTI-CONTACT RELAY HAS OPERATED.
- (H) (BOT.) MC  
INDICATES BOTTOM HALF OF THE MC MULTI-CONTACT RELAY HAS RELEASED.
- (I) MC  
INDICATES BOTH HALVES OF THE MC MULTI-CONTACT RELAY HAVE OPERATED.
- (J) AR KEY  
INDICATES AR KEY HAS BEEN OPERATED.
- (K) A JACK  
INDICATES PLUG HAS BEEN INSERTED INTO THE A JACK AND JACK CONTACTS ARE CLOSED.
- (L) AL LAMP  
INDICATES AL LAMP HAS LIGHTED.
- (M) T HOLD  
INDICATES T HOLD MAGNET HAS OPERATED.
- (N) J SEL.  
INDICATES J SELECT MAGNET HAS OPERATED.
- (O) U STEP  
INDICATES U STEP MAGNET HAS RELEASED AND THE BRUSHES ARE IN CONTACT WITH BANK TERMINAL 10 OR 20.
- (P) PAC MAG.  
INDICATES PAC MAGNET HAS OPERATED.
- (Q) A2 PERF.  
INDICATES A2 PERFORATOR MAGNET HAS RELEASED.

### 9. CONNECTING LINES:

- (A) VERTICAL LINES ARE USED TO LINK CAUSES WITH EFFECTS ON SUCCEEDING LINES AS:
- LINE 101 A  
INDICATES THAT THE RELAY B HAS OPERATED ON LINE 102 AS RESULT OF RELAY A OPERATION ON LINE 101.
- LINE 102 B
- (B) HORIZONTAL AND OBLIQUE LINES ARE USED TO CONNECT MULTIPLE CAUSES SO AS TO INDICATE THEIR COMMON EFFECT OR TO CONNECT MULTIPLE EFFECTS TO INDICATE THEIR COMMON CAUSE AS:
- LINE 101 A B  
INDICATES THAT THE RELAY C HAS OPERATED ON LINE 102 AS RESULT OF BOTH A AND B RELAY OPERATION ON LINE 101. NEITHER A NOR B RELAY OPERATION ALONE IS SUFFICIENT TO OPERATE C RELAY.
- LINE 102 C
- LINE 101 A B C  
INDICATES THAT THE RELAY D HAS OPERATED ON LINE 102 AS RESULT OF EITHER A, B OR C RELAY OPERATION ON LINE 101 (USED TO SHOW OPTIONS).
- LINE 102 D  
INDICATES THAT THE RELAY TK HAS OPERATED ON LINE 104 AS RESULT OF OPERATION OF BOTH HGK ON LINE 101 AND LCK ON LINE 103. NEITHER THE HGK NOR THE LCK OPERATION ALONE IS SUFFICIENT TO OPERATE THE TK RELAY. THE DIAGONAL LINE MAY BE CONTINUOUS OR AS SHOWN. THE DESIGNATIONS "A104" AND "D101" REFER TO THE COORDINATE POSITIONS OF THE SYMBOLS.
- LINE 101 A B C  
INDICATES THAT THE RELAY D HAS OPERATED ON LINE 102 AS RESULT OF EITHER A, B OR C RELAY OPERATION ON LINE 101 (USED TO SHOW OPTIONS).
- LINE 102 D  
INDICATES THAT THE RELAY TK HAS OPERATED ON LINE 104 AS RESULT OF OPERATION OF BOTH HGK ON LINE 101 AND LCK ON LINE 103. NEITHER THE HGK NOR THE LCK OPERATION ALONE IS SUFFICIENT TO OPERATE THE TK RELAY. THE DIAGONAL LINE MAY BE CONTINUOUS OR AS SHOWN. THE DESIGNATIONS "A104" AND "D101" REFER TO THE COORDINATE POSITIONS OF THE SYMBOLS.
- LINE 103 LCK  
INDICATES THAT THE RELAY TK HAS OPERATED ON LINE 104 AS RESULT OF OPERATION OF BOTH HGK ON LINE 101 AND LCK ON LINE 103. NEITHER THE HGK NOR THE LCK OPERATION ALONE IS SUFFICIENT TO OPERATE THE TK RELAY. THE DIAGONAL LINE MAY BE CONTINUOUS OR AS SHOWN. THE DESIGNATIONS "A104" AND "D101" REFER TO THE COORDINATE POSITIONS OF THE SYMBOLS.
- LINE 104 TK

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

- LINE 101 A  
INDICATES THAT THE T TUBE OPERATES IN 20 TO 35 SEC. AFTER THE A RELAY OPERATES.
- LINE 103 T

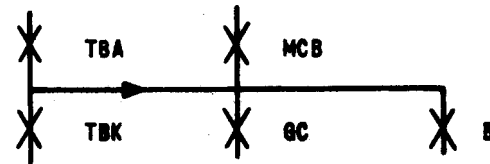
## LEGEND FOR SEQUENCE CHARTS

LEGEND FOR SEQUENCE CHARTS

11. ARROWHEADS:

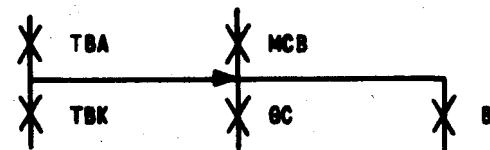
ARROWHEADS ARE USED TO DEFINE THE PRECISE DIRECTION, OR DIRECTION AND POSITION, OF THE CONNECTING LINE.

(A) IF ARROWHEAD IS ON A HORIZONTAL LINE AND IS LOCATED MIDWAY BETWEEN TWO VERTICAL LINES, IT GIVES THE HORIZONTAL LINE DIRECTION INsofar AS CAUSE TO EFFECT IS CONCERNED. FOR EXAMPLE:



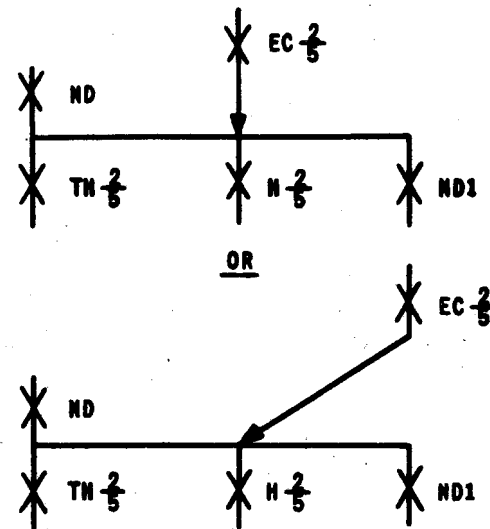
INDICATES B AND GC RELAYS WILL NOT OPERATE UNTIL BOTH THE MCB AND TBA HAVE OPERATED, BUT THE TBK WILL OPERATE INDEPENDENTLY OF THE MCB.

(B) IF ARROWHEAD ON A CONNECTING LINE ADJOINS A VERTICAL OR HORIZONTAL LINE, THE EFFECT OF THE ARROWHEAD IS LIMITED TO THE OPERATION SHOWN DIRECTLY BELOW. FOR EXAMPLE:



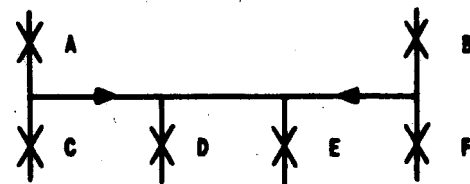
INDICATES B RELAY IS OPERATED FROM MCB ONLY; THE GC FROM THE MCB AND TBA; AND THE TBK FROM THE TBA ONLY.

(C)



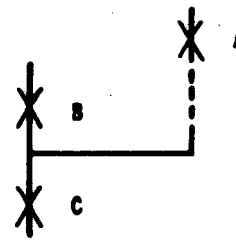
INDICATES H <sup>2</sup>/<sub>5</sub> RELAYS WILL NOT OPERATE UNTIL BOTH ND AND EC <sup>2</sup>/<sub>5</sub> RELAYS HAVE OPERATED. ALSO THE ND1 AND TH <sup>2</sup>/<sub>5</sub> RELAYS WILL OPERATE AFTER THE ND RELAY HAS OPERATED BUT INDEPENDENTLY OF THE EC <sup>2</sup>/<sub>5</sub> RELAYS.

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

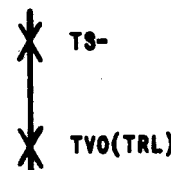


INDICATES D AND E RELAYS ARE DEPENDENT UPON THE OPERATION OF BOTH A AND B RELAYS. ALSO, C RELAY WILL OPERATE INDEPENDENTLY OF B RELAY AND F RELAY WILL OPERATE INDEPENDENTLY OF A RELAY.

12. A DOTTED LINE INDICATES INTERMEDIATE ACTIONS OR INDEFINITE TIME INTERVALS.



13. CB(-1) INDICATES ALL CB RELAYS EXCEPT ONE HAVE OPERATED.



\*TRANSVERTER CIRCUIT SD-25802-01, ISSUE 3.  
TRANSLATOR CIRCUIT SD-25754-01, ISSUE 8.

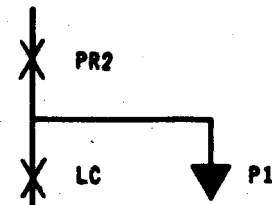
THE ASTERISK OPPOSITE AN SD NUMBER IN THE LIST OF DRAWINGS ABOVE THE TITLE BLOCK INDICATES THE SD ON WHICH MAY BE FOUND THE APPARATUS COVERED IN THE CHART THAT DOES NOT HAVE A CIRCUIT ABBREVIATION FOLLOWING ITS DESIGNATION. THUS, TS- INDICATES THAT THE TS- RELAY IS IN THE TRANSVERTER CIRCUIT, WHILE TVO(TRL) INDICATES THAT THE TVO RELAY IS IN THE TRANSLATOR CIRCUIT.

15. RK

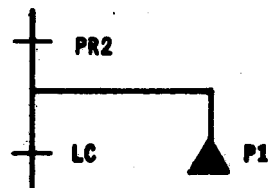


THE SOLID INVERTED TRIANGLE UNDER THE RK RELAY DESIGNATION INDICATES THAT THE LAMP HAVING THE SAME DESIGNATION WILL BE LIGHTED IN THE TROUBLE INDICATOR IF A TROUBLE RECORD IS TAKEN AT THIS TIME.

THE SOLID UPRIGHT TRIANGLE UNDER THE RK RELAY DESIGNATION INDICATES THAT THE LAMP HAVING THE SAME DESIGNATION WILL NOT BE LIGHTED IN THE TROUBLE INDICATOR IF A TROUBLE RECORD IS TAKEN AT THIS TIME.

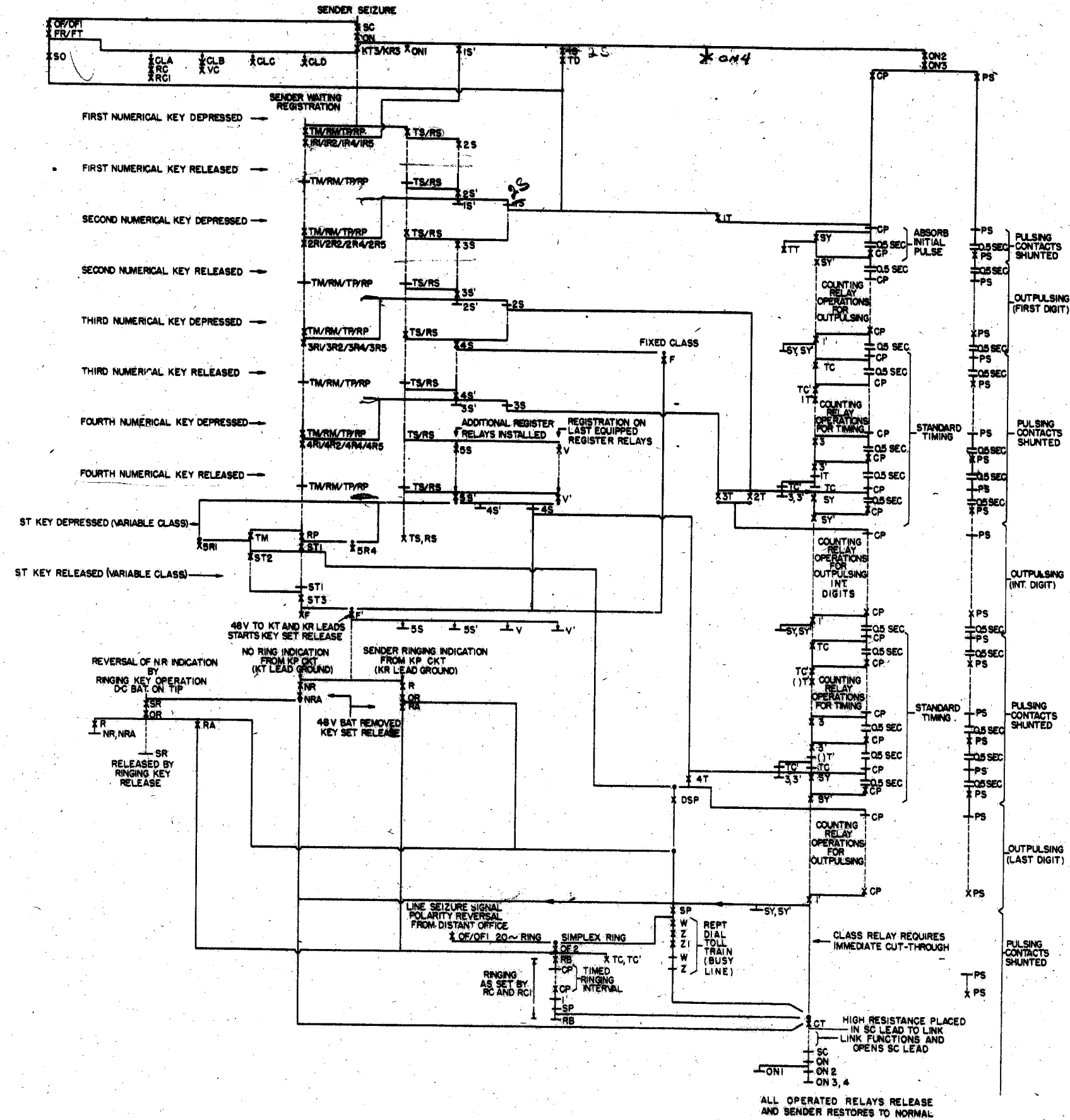


THE SOLID INVERTED TRIANGLE DESIGNATED P1 INDICATES THAT THE LAMP HAVING THIS DESIGNATION WILL BE LIGHTED IN THE TROUBLE INDICATOR UNDER CONTROL OF THE PR2 RELAY IF A TROUBLE RECORD IS TAKEN AT THIS TIME.



THE SOLID UPRIGHT TRIANGLE DESIGNATED P1 INDICATES THAT THE LAMP HAVING THIS DESIGNATION WILL NOT BE LIGHTED IN THE TROUBLE INDICATOR IF A TROUBLE RECORD IS TAKEN AFTER THE PR2 RELAY HAS RELEASED.

ISSUE	1	1	1	1	1
DATE	3-7-58				



REGISTRATION CHART

KEY	1	2	3	4	5	6	7	8	9	0	ST
LEAD 'KT'	H	L	H	L	H	L	H	L	H	L	H
LEAD 'KR'	L	L	L	L	H	H	H	H	H	L	L
(TS)	X	X	X	X	X	X	X	X	X	X	X
(RS)	X	X	X	X	X	X	X	X	X	X	X
(TM)	X	X									
(RM)					X	X	X	X			
(TP)		X	X								
(RP)				X					X		X
(RI)	X	X				X	X				
(R2)		X	X				X	X			
(R4)				X				X	X		X
(R5)					X	X	X	X			

H+ INDICATES LOW RESISTANCE GROUND  
H- INDICATES LOW RESISTANCE 48V BATTERY  
L+ INDICATES HIGH RESISTANCE GROUND  
L- INDICATES HIGH RESISTANCE 48V BATTERY  
X INDICATES RELAY OPERATED

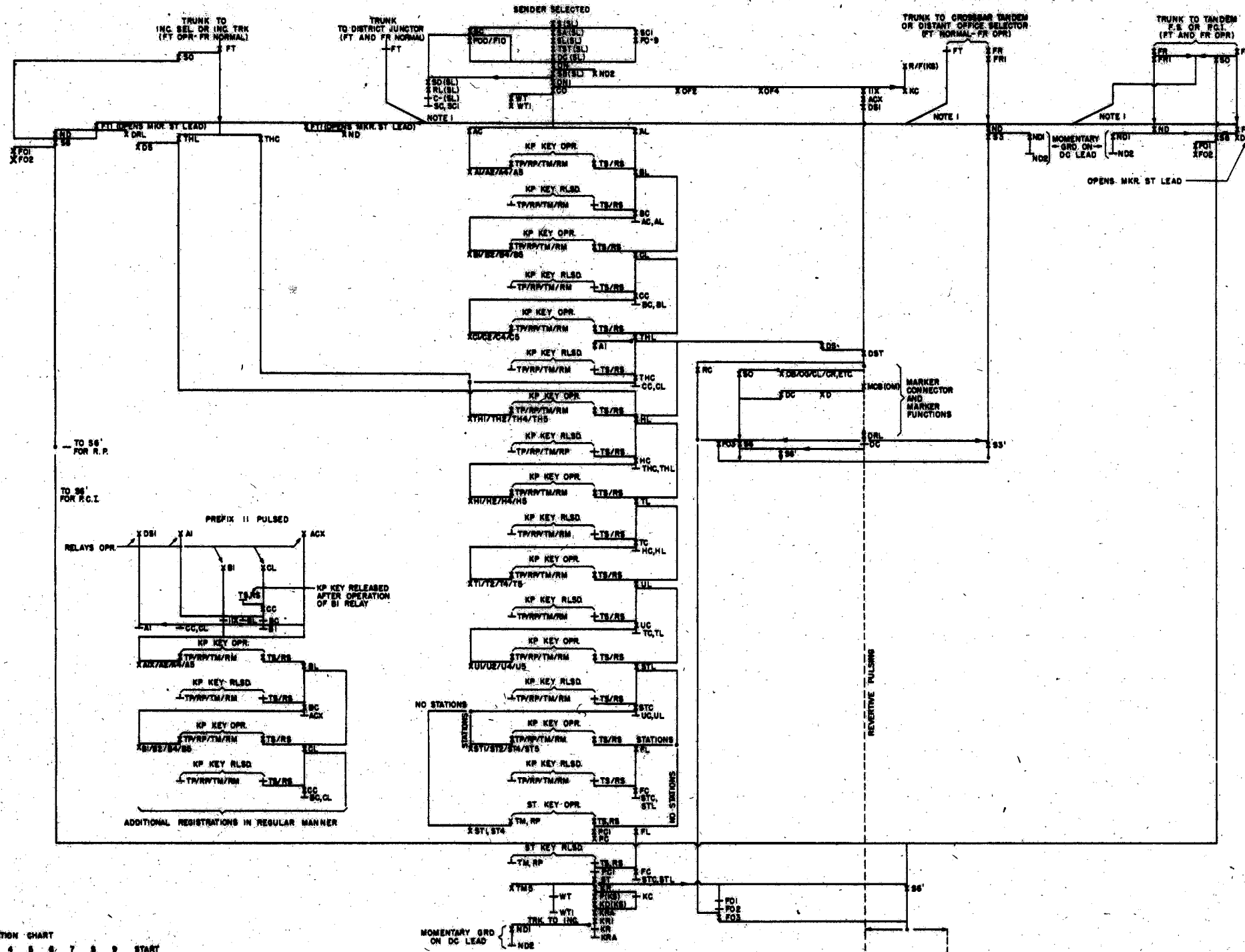
NOTE: SEQUENCE CHART SHOWS OPERATIONS FOR A FOUR-DIGIT CALL  
SIMILAR OPERATIONS ARE INVOLVED FOR ADDITIONAL DIGITS.  
SENDER CIRCUIT SD-95480-01 ISS. 4-B

**SENDER CIRCUIT  
RECEIVES D-C KEY PULSES  
TRANSMITS DIAL PULSES  
10 P.P.S.-D-C RINGING SIGNAL**

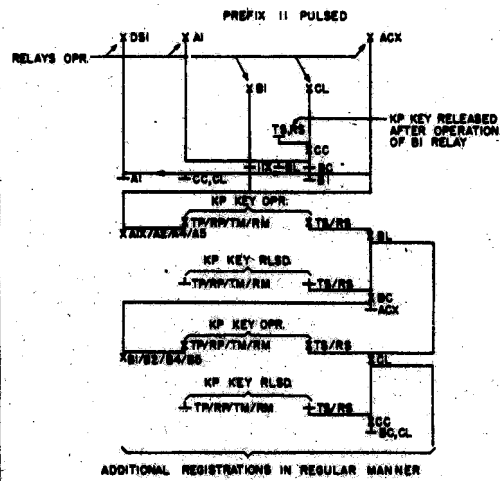
NO 3C OR 3CL TOLL SWBD.

SC 101-1

ISSUE	1	VSAM
DATE	3-6-50	



TO 88' FOR R.P.  
TO 88' FOR R.C.I.



KEY	0	1	2	3	4	5	6	7	8	9	START
LEAD	L	M	N	O	P	Q	R	S	T	U	V
PULSING RELAYS	X	X	X	X	X	X	X	X	X	X	X
AI - BI											
AS - BS											
REVERSE											
AS - BS ETC											
AS - BS ETC											

NO INDICATES LOW RESISTANCE GROUND.  
 M- INDICATES LOW RESISTANCE 48V BATTERY.  
 L- INDICATES HIGH RESISTANCE GROUND.  
 H- INDICATES HIGH RESISTANCE 48V BATTERY.  
 X- INDICATES RELAY OPERATED.

NOTES:  
1. PATH CLOSED FOR OPERATING AC AND AL RELAYS WHEN THE CO RELAY OPERATES.

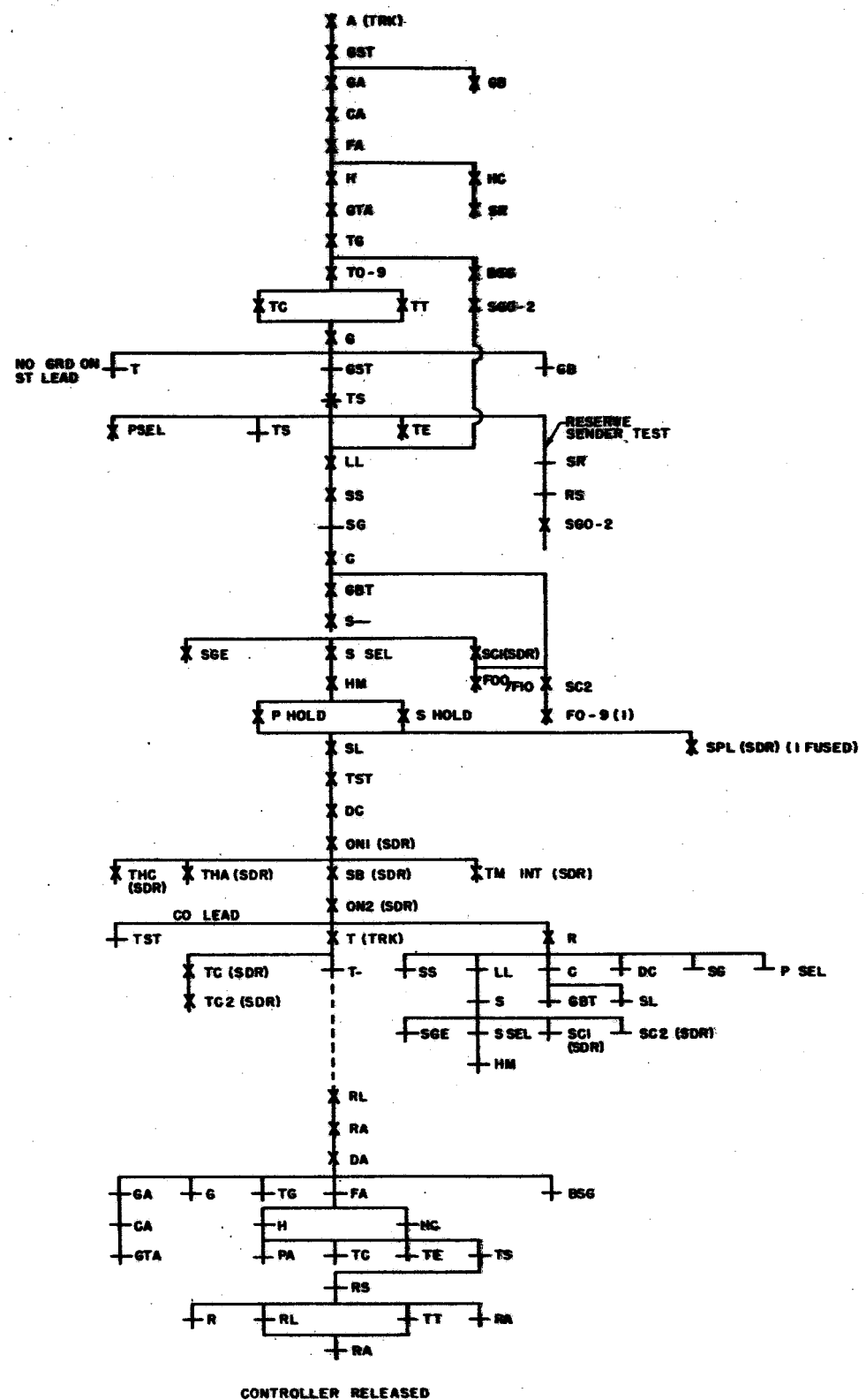
- \* KEY PULSING SENDER CIRCUIT SD-25015-01 ISS. 34-D
- ORIGINATING MARKER CIRCUIT SD-25016-01 ISS. 41-D
- DISTRICT JUNCTION CIRCUIT SD-25021-01 ISS. 8-D
- LINK AND CONTROLLER CIRCUIT SD-25028-01 ISS. 32-D
- ORIGINATING MARKER CONNECTOR SD-25035-01 ISS. 30
- KEY SET CIRCUIT SD-25051-01 ISS. 8-B

KEY PULSING SENDER CIRCUIT  
RECEIVES D-C KEY PULSES  
REVERTIVE AND P.C.I. PULSING



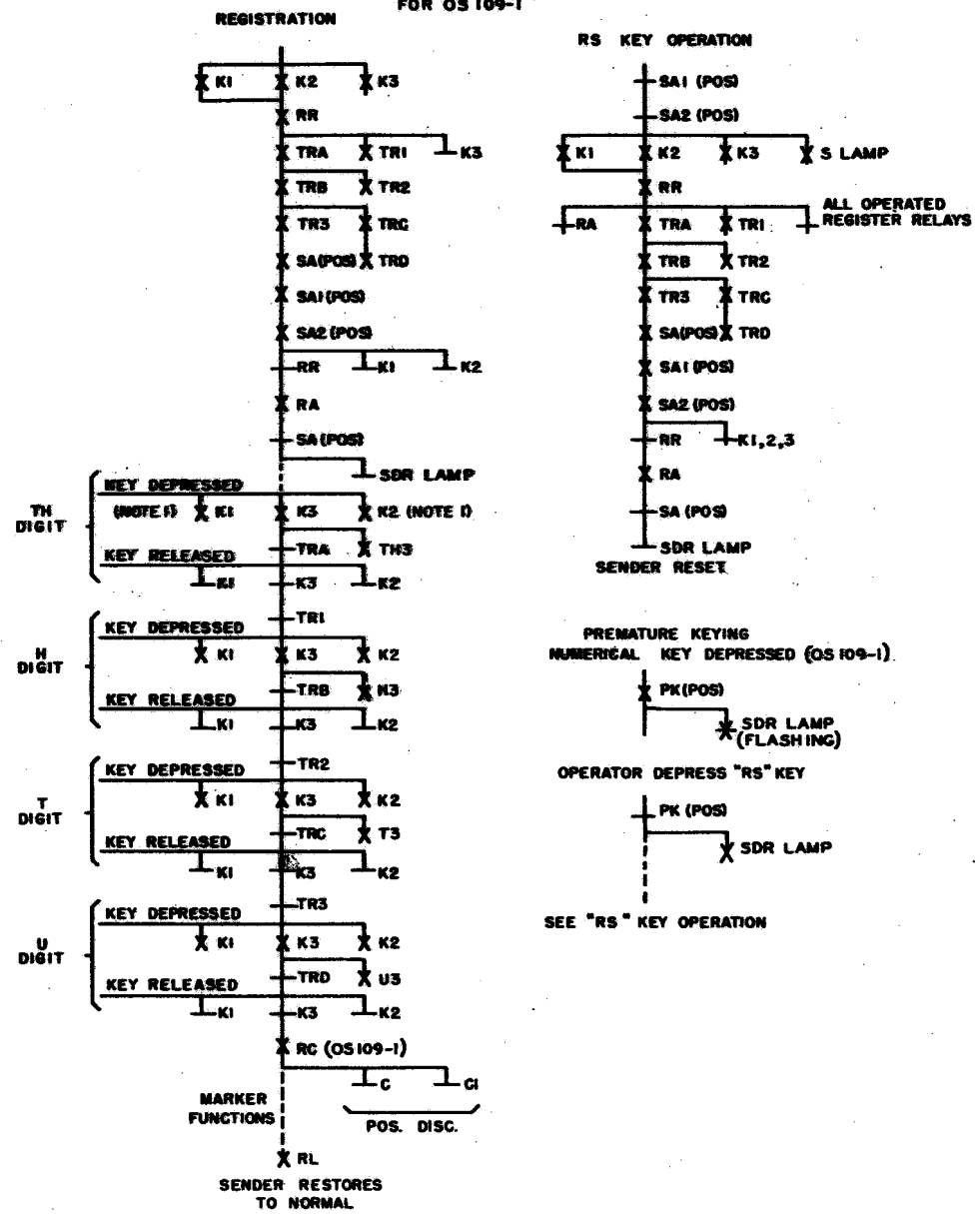
NO. 3C OR 3CL TOLL SWBD.

TERMINATING SENDER LINK AND CONTROLLER  
 "B" SWITCHBOARD INCOMING CALL  
 S/C FROM ORIGINATING OFFICE



CONTROLLER RELEASED

SEQUENCE CHART  
 FOR OS 109-1



"B" SWITCHBOARD  
 COMBINED TOLL-DSA-DSB POSITION

SC 103-1 2 SHEETS, SHEET 1

NO. 3C OR SCL TOLL SWBD

ORDER AS SEP ITEM MP-11502

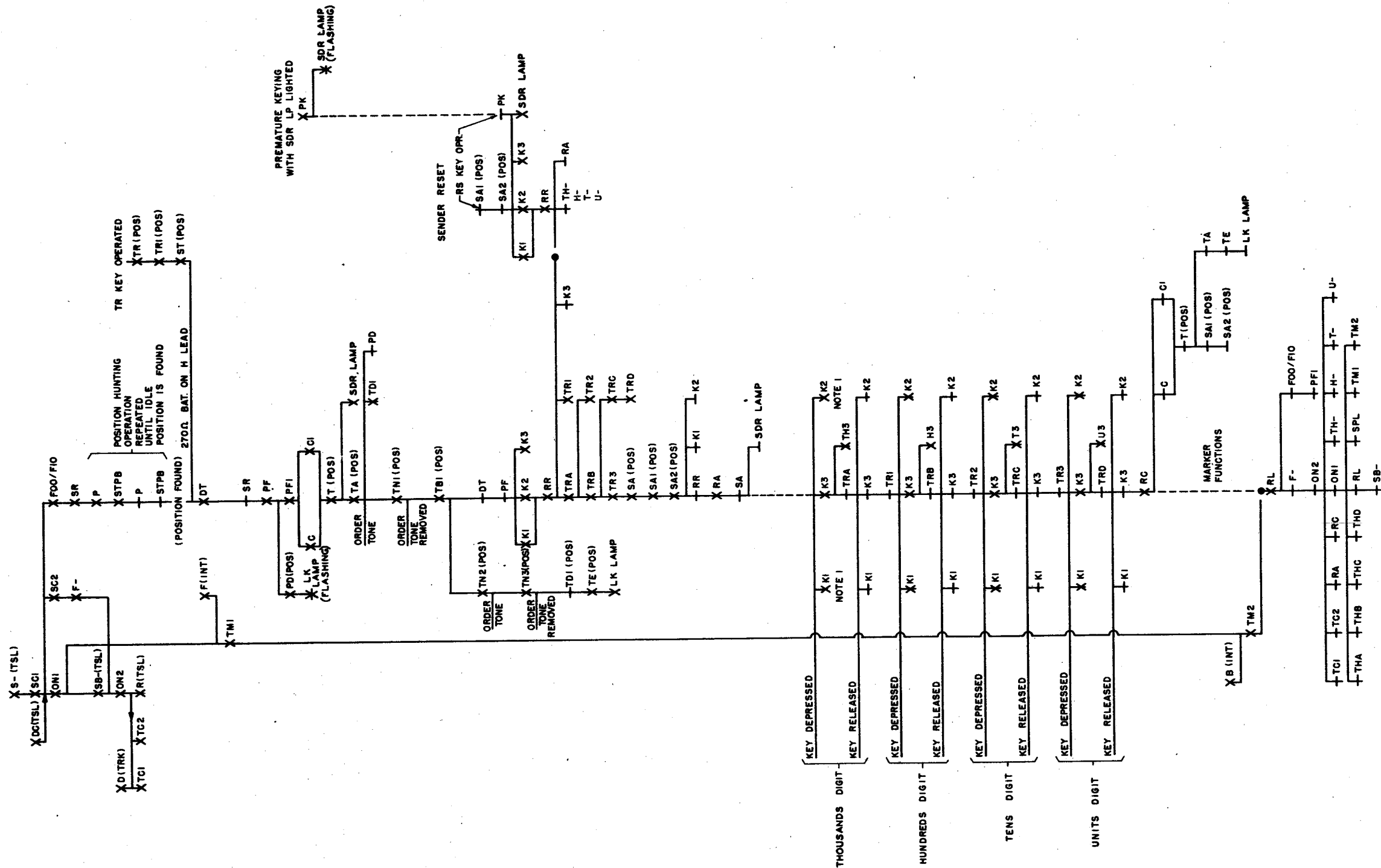
BELL TELEPHONE LABORATORIES, INC.  
 PRINTED IN U.S.A.

REVISION  
 DATE 3-8-60

MP-11502 2 SHEETS, SHEET 1

ISSUE	1	DATE	3-8-50
BY	WAW		

"B" SENDER AND POSITION FINDER



WHEN THE NUMERICAL KEYS ARE DEPRESSED BAT THRU EITHER A HIGH OR LOW RESISTANCE IS CONNECTED TO LEADS "K1", "K2" OR "K3" OPERATING REGISTER RELAYS AS FOLLOWS:  
 L = LOW RESISTANCE      H = HIGH RESISTANCE

LEAD	KEY									
	0	1	2	3	4	5	6	7	8	9
K1		L	H				L	H		
K2				L	H				L	H
K3	L	L	L	L	L	H	H	H	H	H
REGISTER RELAYS OPERATED	TH3	TH1	TH1	TH1	TH1	NONE	TH1	TH1	TH1	TH1
		TH3	TH3	TH2	TH2		TH4		TH2	TH2
		TH4		TH4	TH3				TH4	TH2

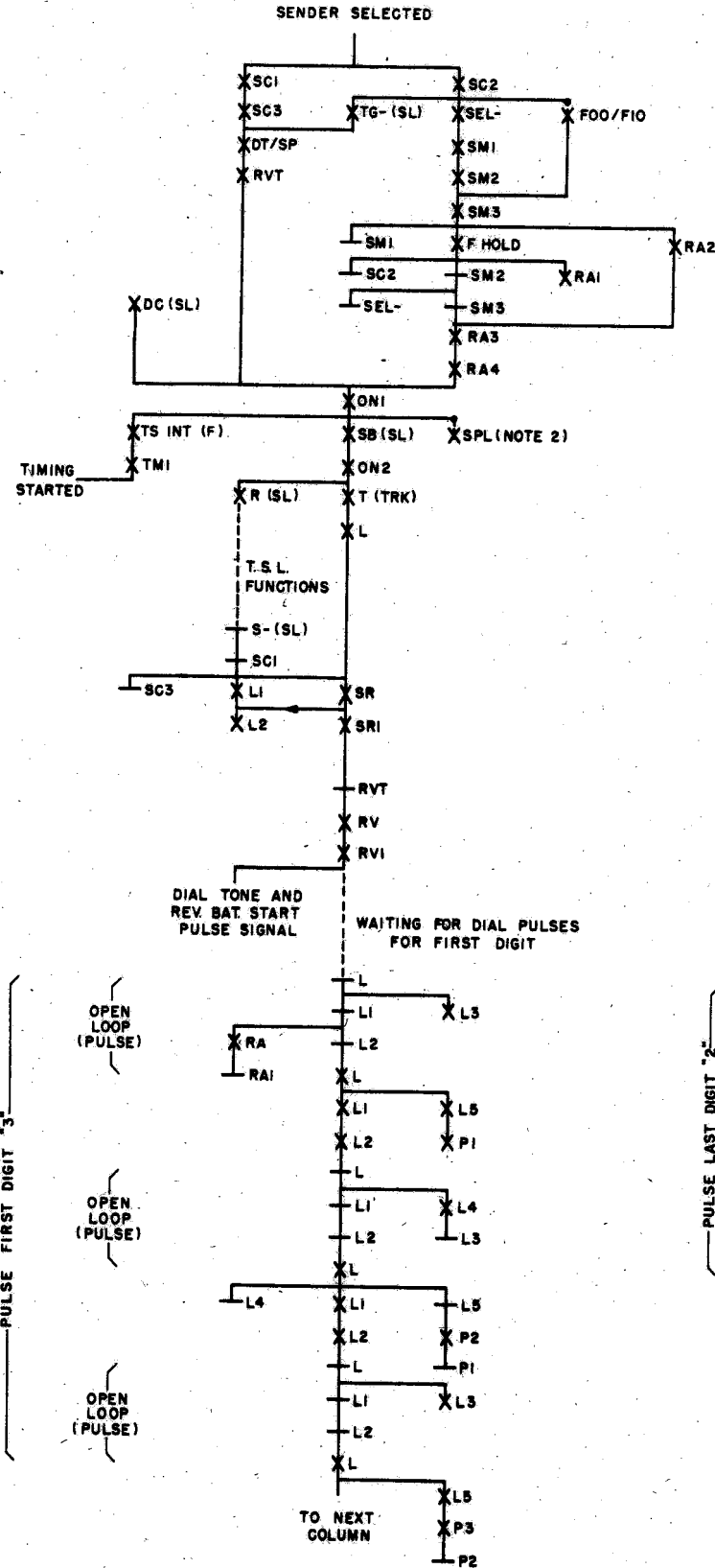
NOTE 1: REFER TO CHART FOR EXACT NUMERICAL KEY COMBINATIONS.  
 NOTE 2: LK LAMP FLASHES WHEN TROUBLE CONDITIONS HOLD UP POSITION CIRCUIT OPERATION.

- \* SENDER AND POSITION FINDER CIRCUIT      SD-25014-01    ISS. 25
- TERMINATING SENDER LINK AND CONTROLLER    SD-25459-01    ISS. 18
- INCOMING TRUNK CIRCUIT                        SD-25875-01    ISS. 2
- POSITION CIRCUIT                                SD-55996-01    ISS. 6
- KEY AND LAMP CIRCUIT                         SD-56029-01    ISS. 6

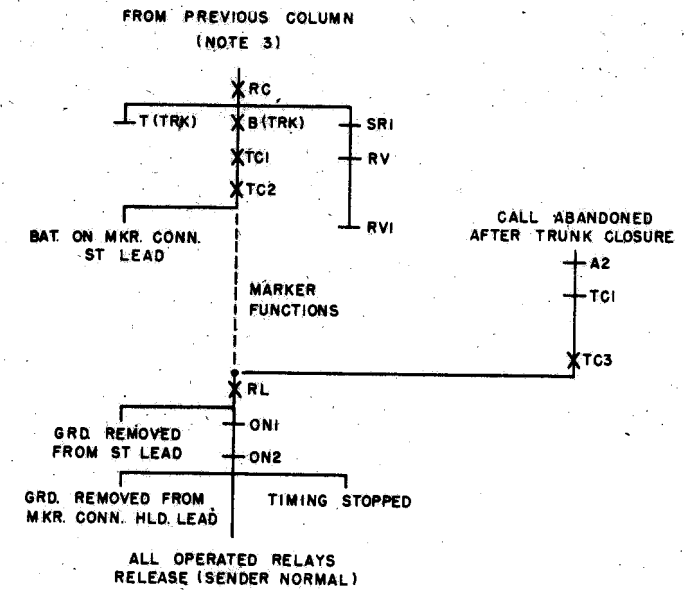
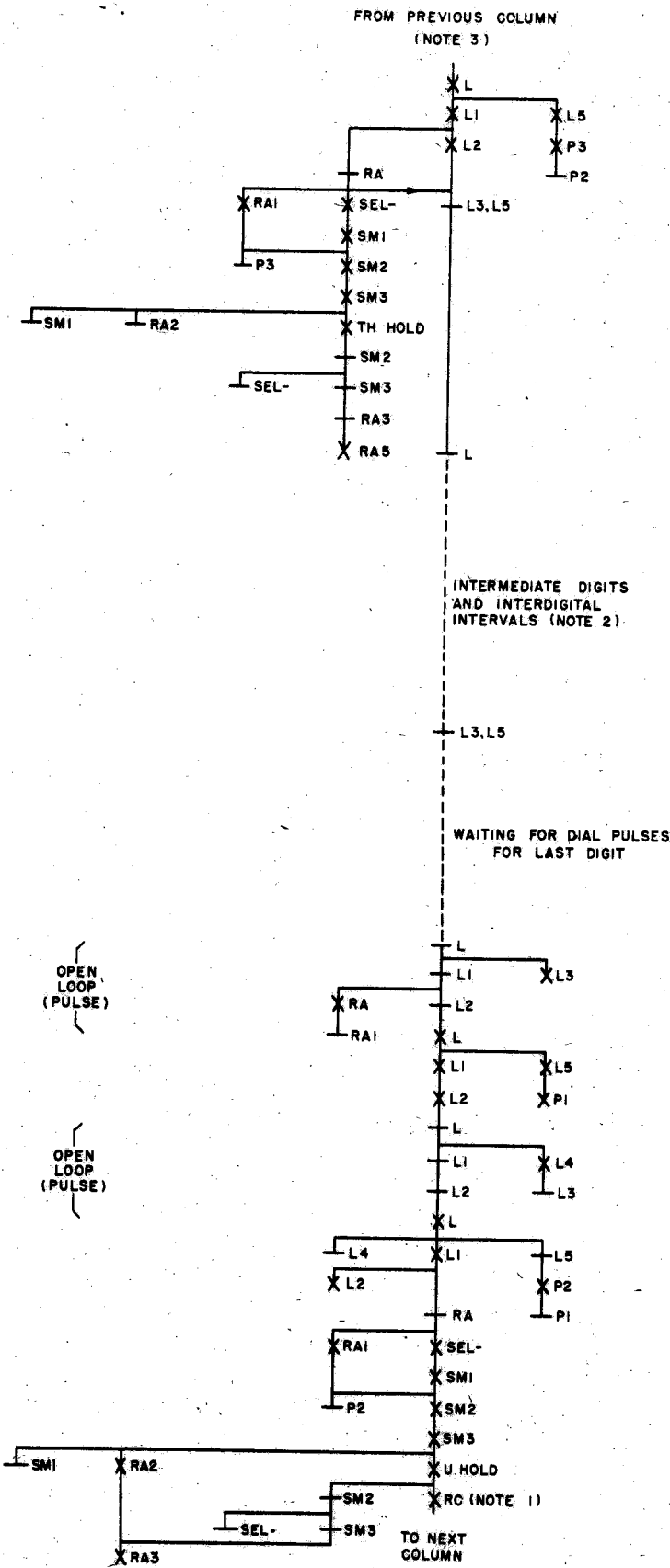
"B" SWITCHBOARD  
 COMBINED TOLL-DSA-DSB POSITION



ISSUE	1	ISSUED
DATE	3-6-50	



INTERDIGITAL INTERVAL



- NOTES:
- 1. RELAY L SHOWN OPERATED WHEN CONTACTS 4 AND 9 ARE MADE.
  - 2. TL RELAY OPERATES AFTER HUNDREDS DIGIT HAS BEEN REGISTERED AND RELEASES SPL RELAY TO PERMIT LATER USE OF FC LEAD FOR THE OPERATION OF THE TRUNK F RELAY.
  - 3. RELAY OPERATIONS DUPLICATED TO CLARIFY THE CONTINUITY OF OPERATION

INCOMING TRUNK CIRCUIT (L.T.D.) SD-25432-01 ISS. 9  
 TERMINATING SENDER LINK AND CONTROLLER CIRCUIT SD-25459-01 ISS. 23  
 \*D.P. TERMINATING SENDER CIRCUIT SD-25434-01 ISS. 22

**DIAL PULSE TERMINATING SENDER  
USED WITH LOCAL TEST DESK**

NO. 3C OR 3CL TOLL FREE

SC 104-1

INDEX OF OPERATIONAL SKETCHES

<u>TITLE</u>	<u>SKETCH NO.</u>
LEGEND FOR OPERATIONAL SKETCHES	OS 000-2
SLEEVE SUPERVISION	OS 101-1
TALKING, MONITORING, AND BUSY TEST	OS 102-1
RINGING AND COIN CONTROL	OS 103-1
D-C AND MF KEYSER CIRCUIT	OS 104-1
MULTIFREQUENCY CURRENT SUPPLY	OS 105-1
LINK CIRCUIT - D-C KEY PULSES - DIAL PULSE SENDER	OS 106-1
SENDER CIRCUIT RECEIVES D-C KEY PULSES - TRANSMITS DIAL PULSES - 10 P.P.S. - D-C RINGING SIGNAL	OS 107-1
KEY PULSING SENDER CIRCUIT RECEIVES D-C KEY PULSES - REVERTIVE AND P.C.I. PULSING	OS 108-1
"B" SWITCHBOARD - COMBINED TOLL-DSA-DSB POSITION	OS 109-1
INTERTOLL DIALING OUTGOING TRUNK CIRCUIT - ONE-WAY OPERATION TO STEP-BY-STEP DIAL OFFICE - COMPOSITE SUPERVISION	OS 110-1
COMPOSITE EQUIPMENT - TYPICAL TEST AND PATCHING JACK ARRANGEMENTS USING NO. 18B TOLL TEST BOARD	OS 111-1
DIAL PULSE TERMINATING SENDER USED WITH LOCAL TEST DESK	OS 112-1

ISSUE 1	YBA
DATE	3-20-54

# LEGEND FOR OPERATIONAL SKETCHES

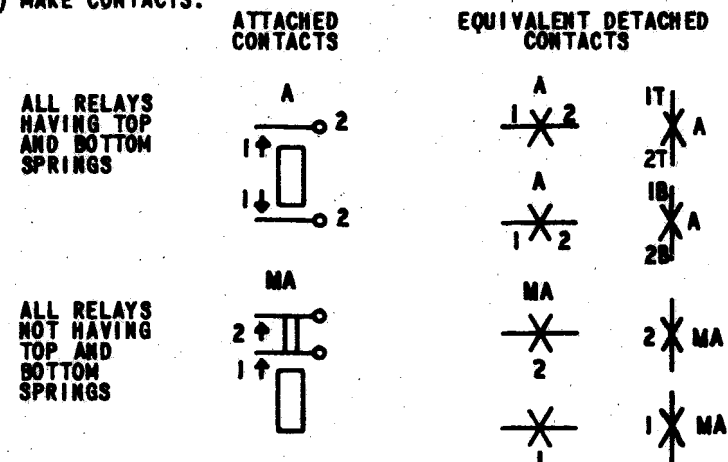
THE SYMBOLS AND CONVENTIONS FOR THE OPERATIONAL SKETCHES ARE THE SAME AS THOSE USED ON THE STANDARD SCHEMATIC DRAWINGS (SD-) WITH THE FOLLOWING EXCEPTIONS:

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

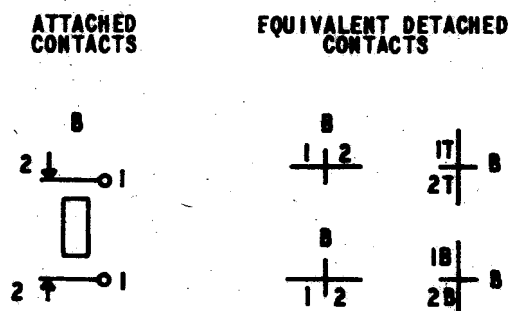


2. DETACHED CONTACT SYMBOLS ARE USED WHENEVER THEY AID IN SIMPLIFYING THE SKETCHES. THEY ARE SHOWN THUS:

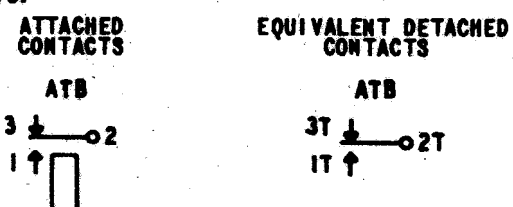
(A) MAKE CONTACTS:



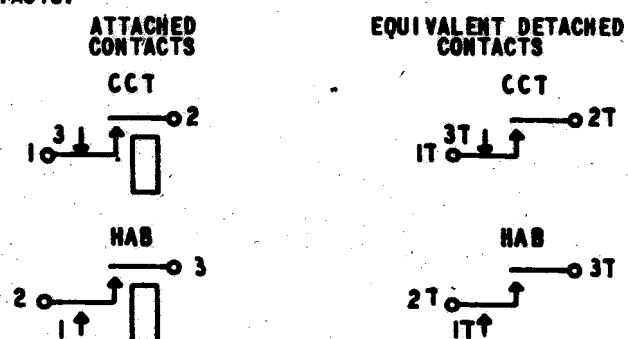
(B) BREAK CONTACTS:



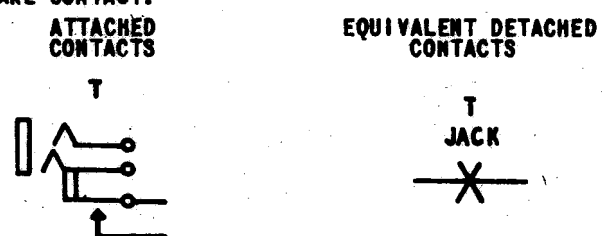
(C) TRANSFER CONTACTS:



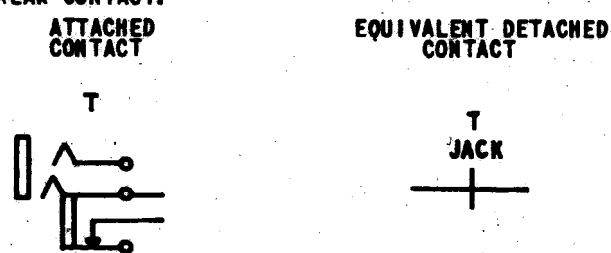
(D) OTHER CONTACTS:



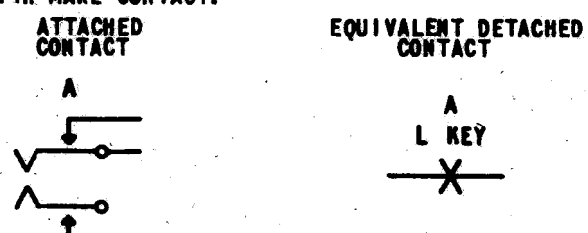
(E) JACK WITH MAKE CONTACT:



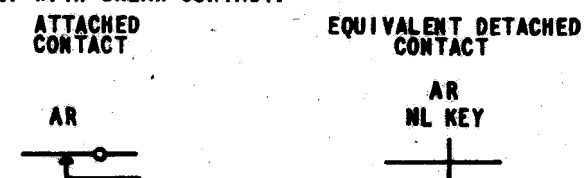
(F) JACK WITH BREAK CONTACT:



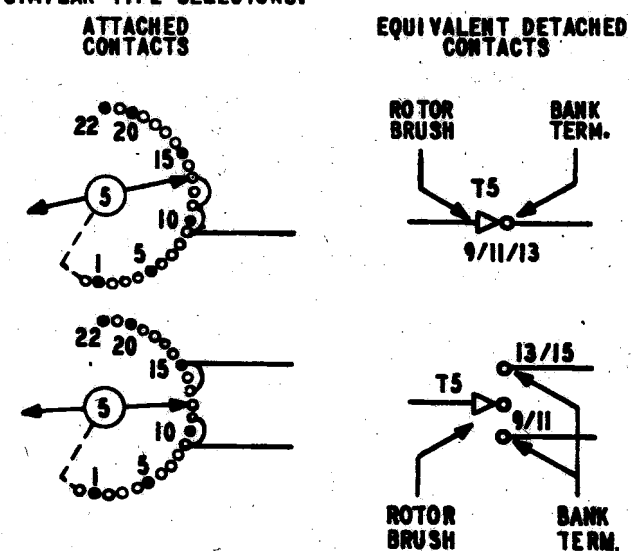
(G) LOCKING KEY WITH MAKE CONTACT:



(H) NON-LOCKING KEY WITH BREAK CONTACT:

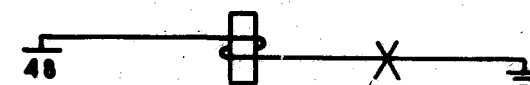


(J) 206 AND SIMILAR TYPE SELECTORS:

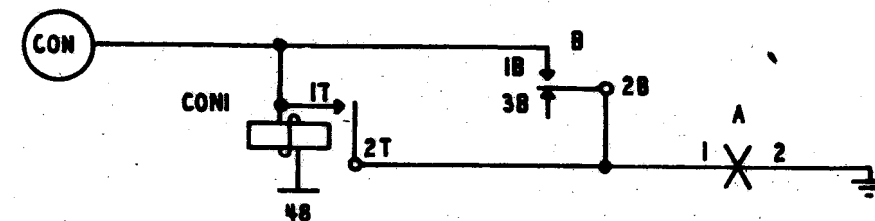


3. INNER ENDS OF WINDINGS ARE OMITTED.

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



5. TROUBLE INDICATOR TAPS ARE SHOWN BY A CIRCLE ENCLOSING INDICATION DESIGNATION. FOR EXAMPLE:



6. CONTACT PROTECTIONS ARE IN GENERAL OMITTED.

7. APPARATUS CODES FOR VACUUM TUBES ONLY ARE SHOWN.

8. POLAR RELAYS WITH BIASING SPRINGS ARE INDICATED WITH B.S. FOLLOWING THE RELAY DESIGNATION. POLAR RELAYS WITHOUT BIASING SPRINGS ARE INDICATED WITH N.B.S. FOLLOWING THE RELAY DESIGNATION.

LEGEND  
FOR  
OPERATIONAL SKETCHES

OS 000-2      2 SHEETS, SHEET 1

ORDER AS BSP ITEM MP-11519

NO. 3C OR 3CL TOLL SWBD.

BELL TELEPHONE LABORATORIES, INC.

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DATE 3-20-58



2 SHEETS, SHEET 1

MP-11519

LEGEND FOR OPERATIONAL SKETCHES



9. SEQUENCE CHARTS ARE IN GENERAL PROVIDED ON EACH SKETCH. THE RELAY MOVEMENTS SHOWN ARE SUFFICIENT TO PERMIT A PROPER UNDERSTANDING OF THE SKETCH. THE DESIGNATIONS FOR ALL RELAYS OF WHICH THE OPERATING PATHS ARE SHOWN ON THE SKETCH ARE IN HEAVY CHARACTERS. ALL OTHERS ARE IN LIGHT CHARACTERS. COORDINATES ARE OMITTED. OTHERWISE THE LEGEND FOR THESE CHARTS IS THE SAME AS FOR THE REGULAR SEQUENCE CHARTS.

10. IN GENERAL, STRAPPING OR MULTIPLE CONVENTIONS  ARE OMITTED.

11.   CH7. INDICATES THAT THE MAKE CONTACTS (ONE EACH) ON  
CH4. RELAYS C0 TO C9 OR ON RE-  
CH2. LAYS CH1, CH2, CH4, AND  
CH1 CH7 ARE WIRED IN PARALLEL.

12.  INDICATES A MAKE CONTACT ON ONE OF A SERIES OF LC RELAYS.

13. FC-/FCA- INDICATES THAT EITHER FC- OR FCA- DESIGNATION APPLIES.

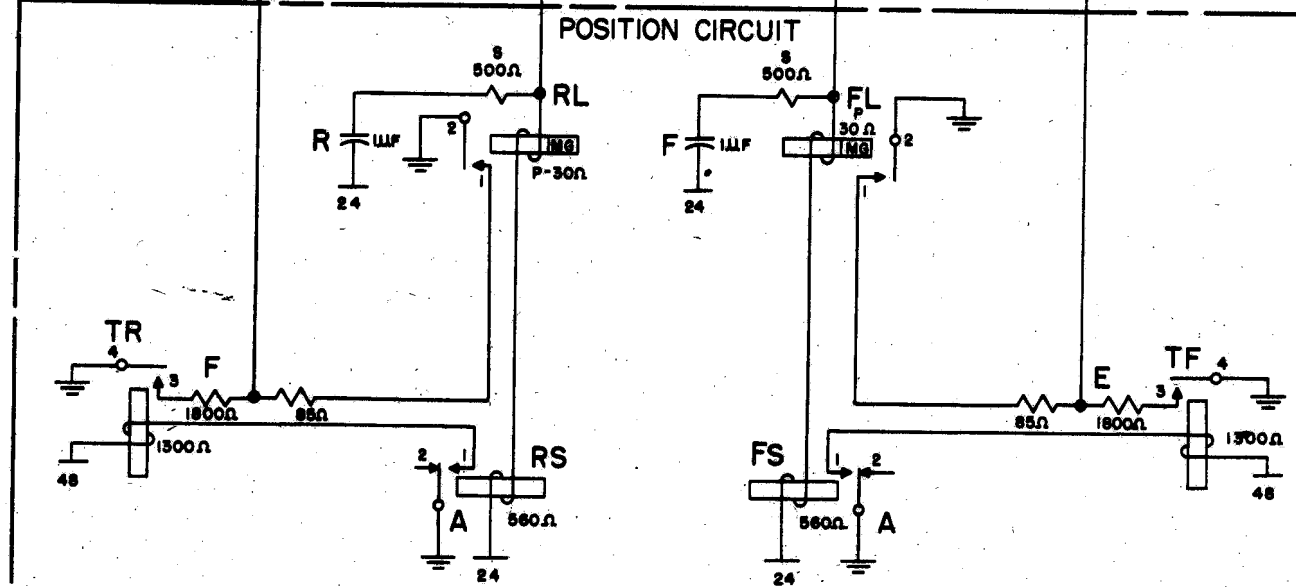
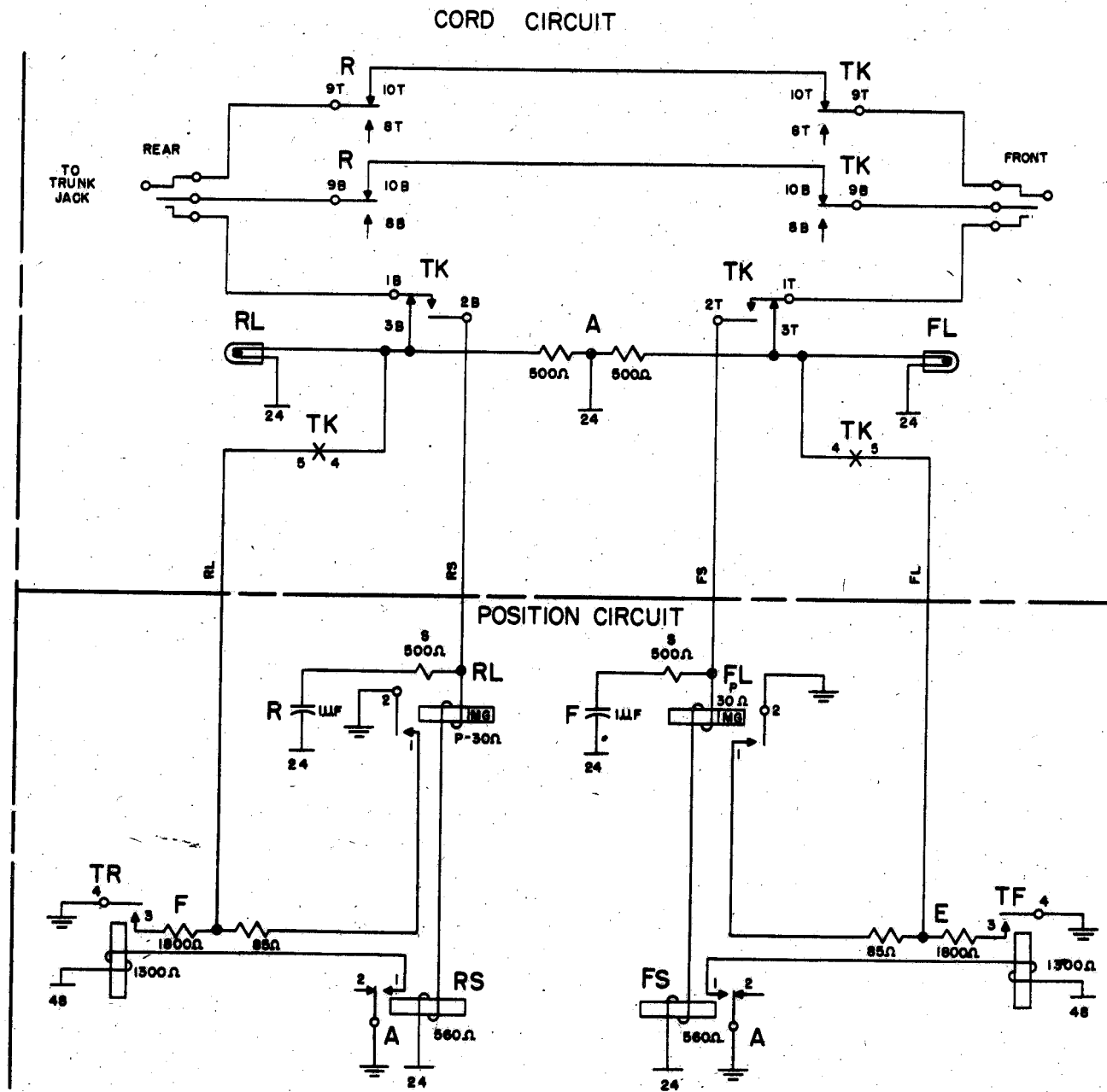
14.  TS-  
 TVO(TRL)  
A SEQUENCE CHART IS GENERALLY INCLUDED AS PART OF AN OS DRAWING. WHEN AN ASTERISK APPEARS OPPOSITE ONE OF THE SD NUMBERS IN THE LIST OF DRAWINGS ABOVE THE TITLE BLOCK IT INDICATES THE SD ON WHICH MAY BE FOUND THE APPARATUS COVERED IN THE CHART THAT DOES NOT HAVE A CIRCUIT ABBREVIATION FOLLOWING ITS DESIGNATION. THUS, TS- INDICATES THAT THE TS- RELAY IS IN THE TRANSVERTER CIRCUIT, WHILE TVO(TRL) INDICATES THAT THE TVO RELAY IS IN THE TRANSLATOR CIRCUIT.

\*TRANSVERTER CIRCUIT SD-25802-01, ISSUE 3.  
TRANSLATOR CIRCUIT SD-25754-01, ISSUE 8.

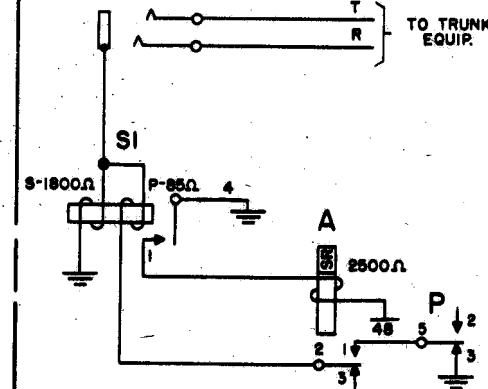
MP-11519 2 SHEETS, SHEET 2  
ISSUE 1 YBM  
DATE 3-20-58

LEGEND  
FOR  
OPERATIONAL SKETCHES  
2 SHEETS, SHEET 2 OS 000-2  
ORDER AS BSP ITEM MP-11519

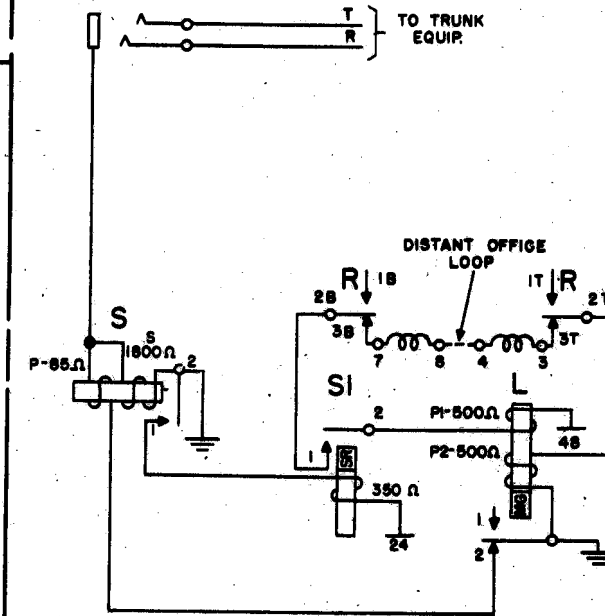
ISSUE	1
DATE	3-6-50



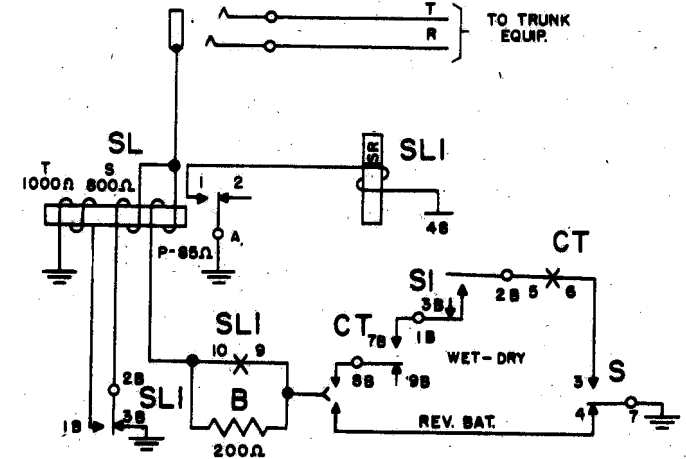
OUT TRUNK TO PANEL AND CROSSBAR EQUIPMENT (REVERSE BATTERY SUPV.)



OUT TRUNK TO TOLL SWBD. (HIGH-LOW SUPERVISION)



OUT TRUNK TO SXS EQUIPMENT (REVERSE BATTERY OR WET-DRY SUPERVISION)



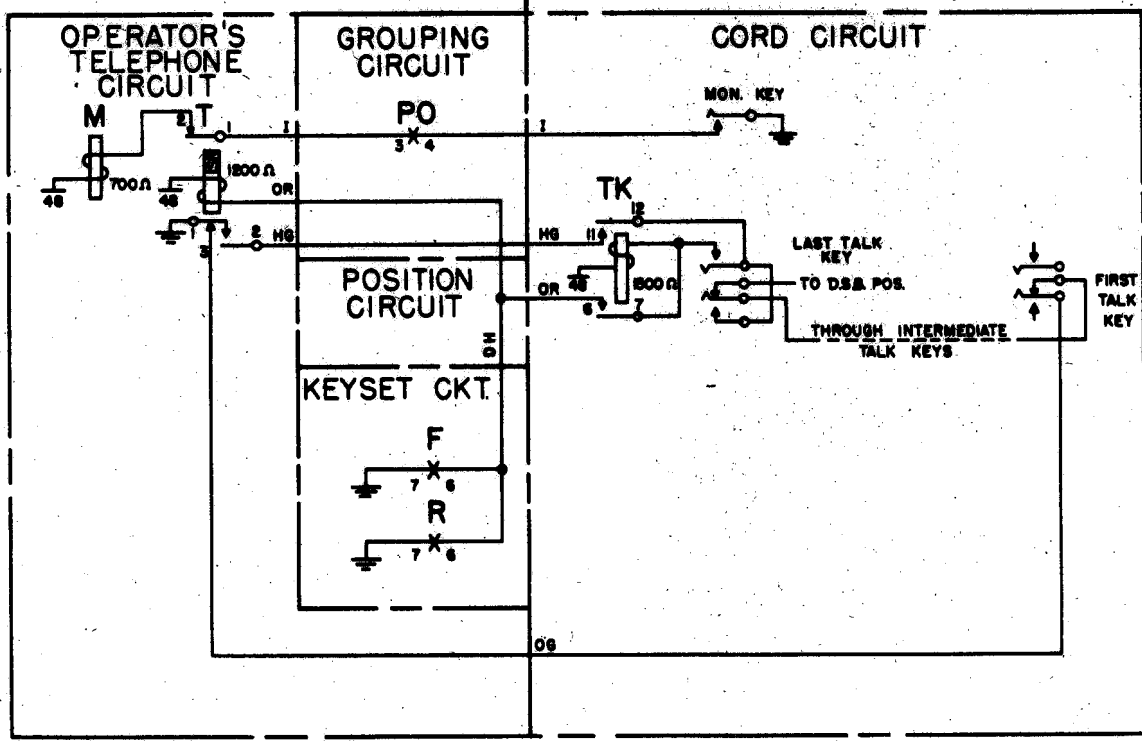
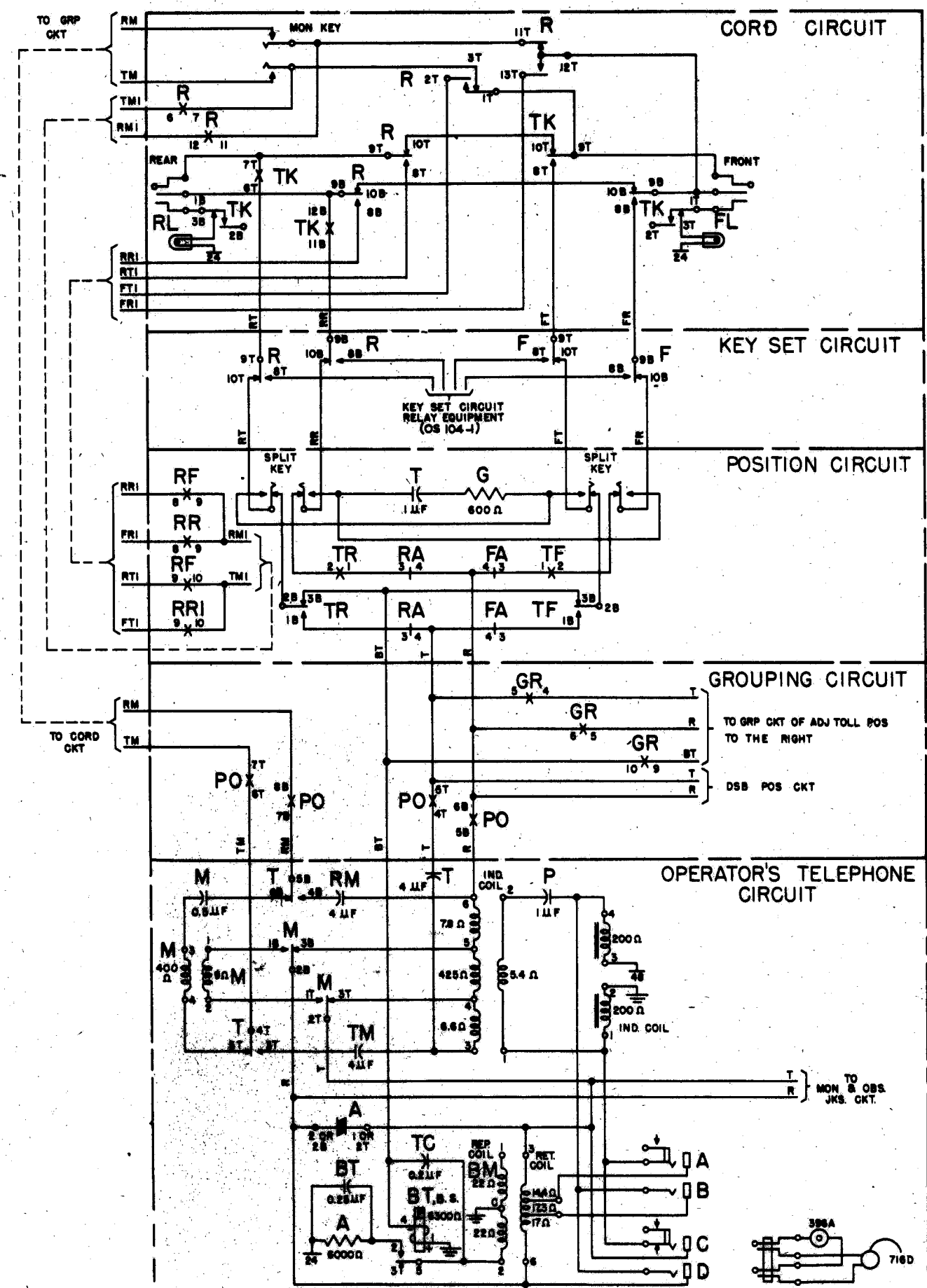
- |  |                        |
|--|------------------------|
| OUTGOING TRUNK CIRCUIT (TO PANEL OR CROSSBAR)    | SD-55191-01, ISS. 8-8  |
| TOLL SWITCHING TRUNK CIRCUIT (KEY PULSING - SXS) | SD-55229-01, ISS. 16-8 |
| OUTGOING TRUNK CIRCUIT (TO TOLL SWITCHBOARD)     | SD-64116-01, ISS. 8-8  |
| * CORD CIRCUIT                                   | SD-64737-01, ISS. 9-0  |
| POSITION CIRCUIT                                 | SD-64738-01, ISS. 18-8 |

SLEEVE SUPERVISION

NO. 3C OR 3CL TOLL SWBD.

OS 101-1

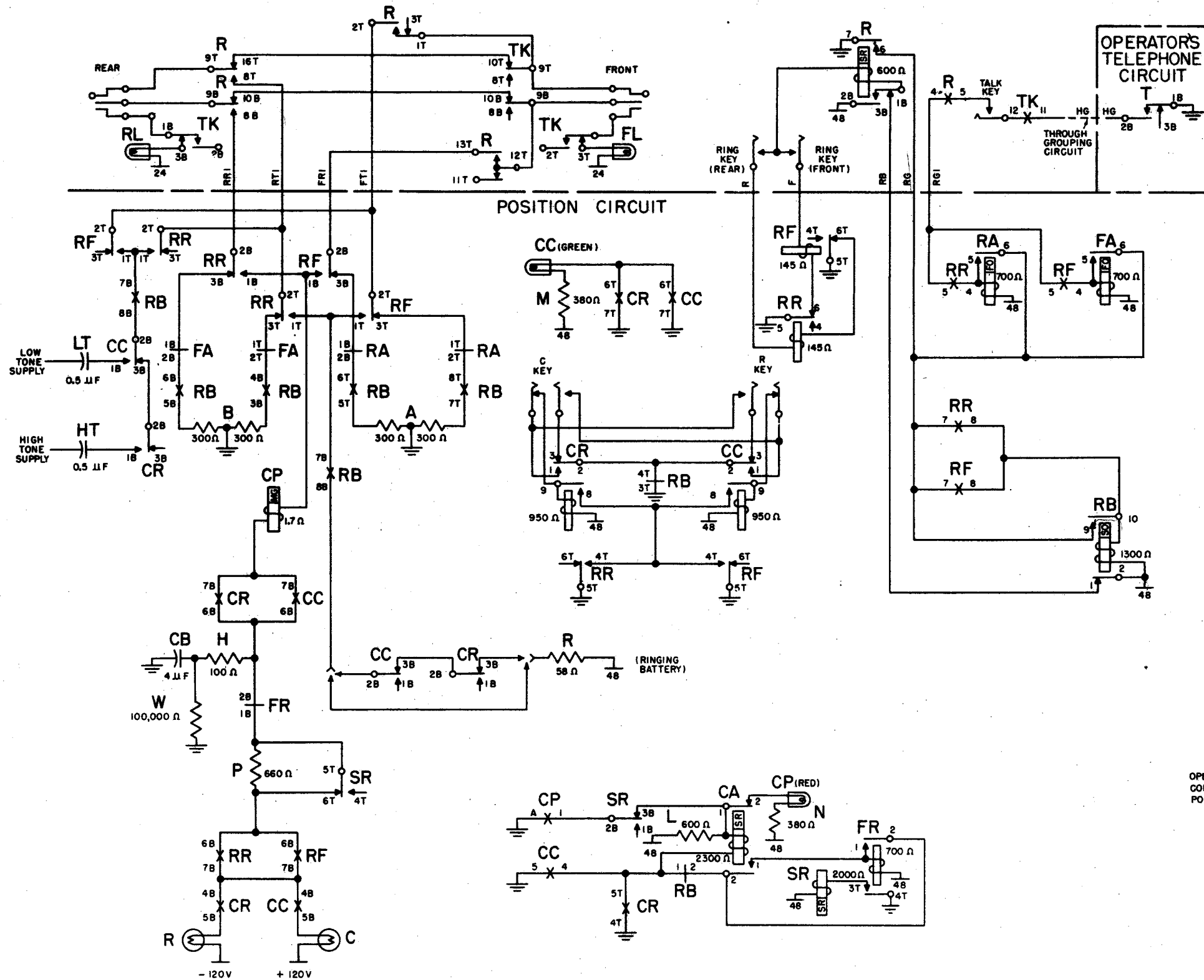
ISSUE	1
DATE	3-9-50



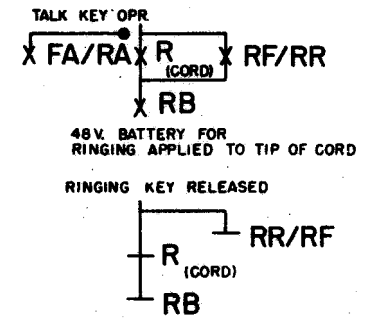
OPERATOR'S TELEPHONE CIRCUIT	SD-55110-01	ISS. 14-D
KEY SET CIRCUIT	SD-56031-01	ISS. 8-B
CORD CIRCUIT	SD-64737-01	ISS. 9-D
POSITION CIRCUIT	SD-64738-01	ISS. 18-B
GROUPING CIRCUIT	SD-64740-01	ISS 10-D

TALKING, MONITORING AND BUSY TEST

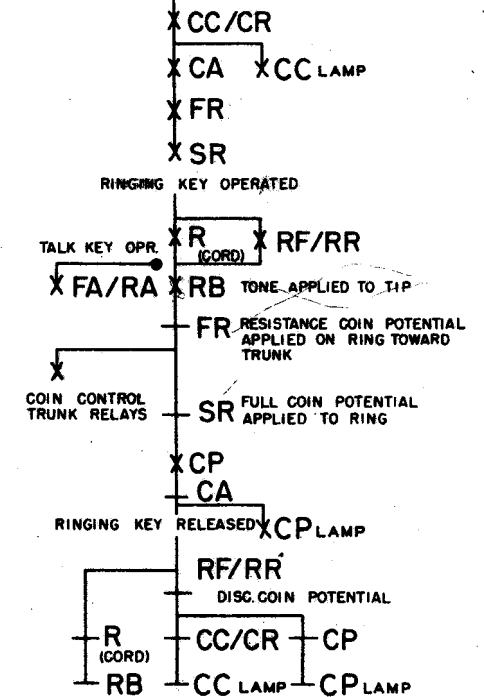
CORD CIRCUIT



SEQUENCE CHART RINGING RINGING KEY OPERATION



COIN CONTROL C/R KEY OPERATED



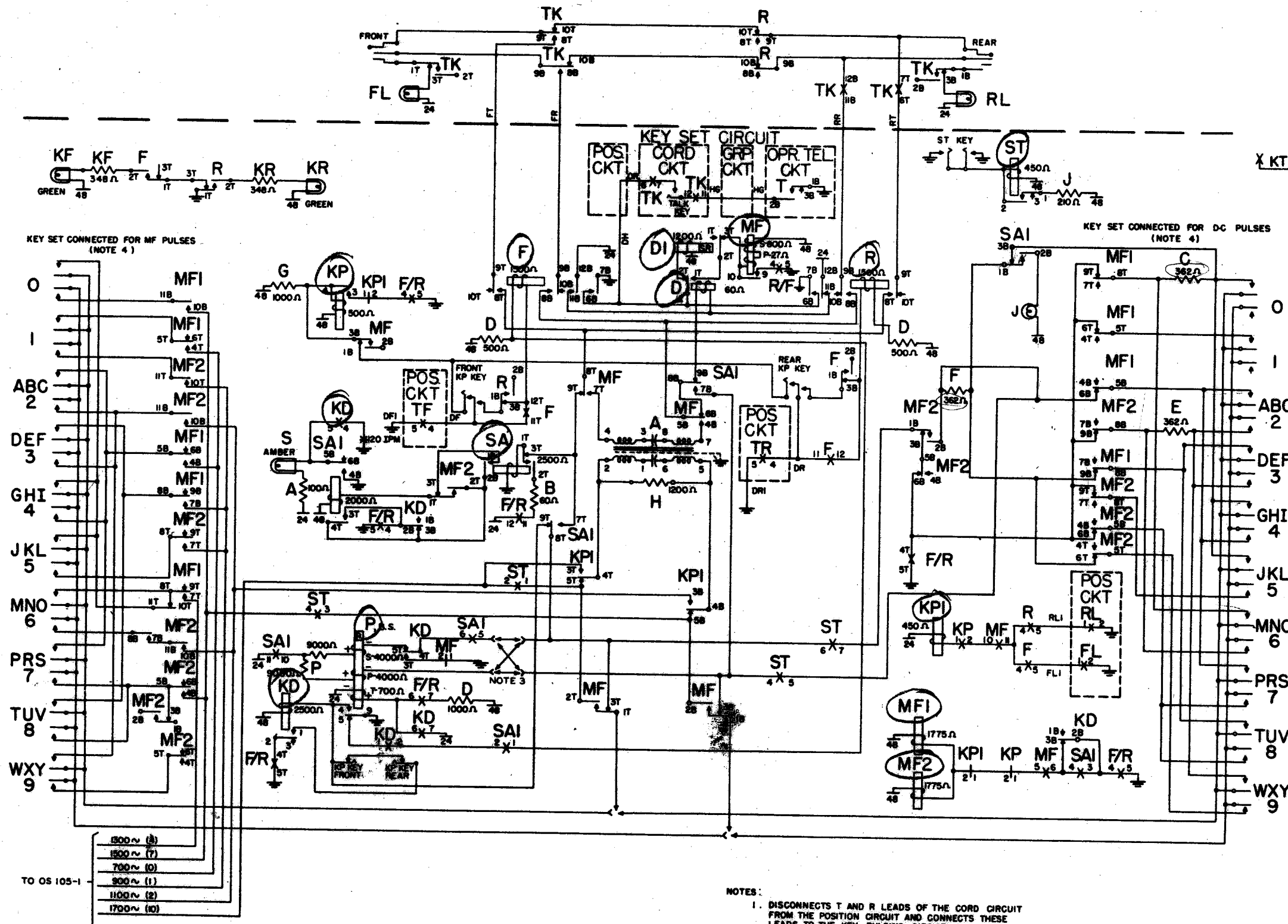
OPERATOR'S TELEPHONE CIRCUIT SD-55110-01 ISS 14-D  
CORD CIRCUIT SD-64737-01 ISS 9-D  
POSITION CIRCUIT SD-64738-01 ISS 18-B

RINGING AND COIN CONTROL

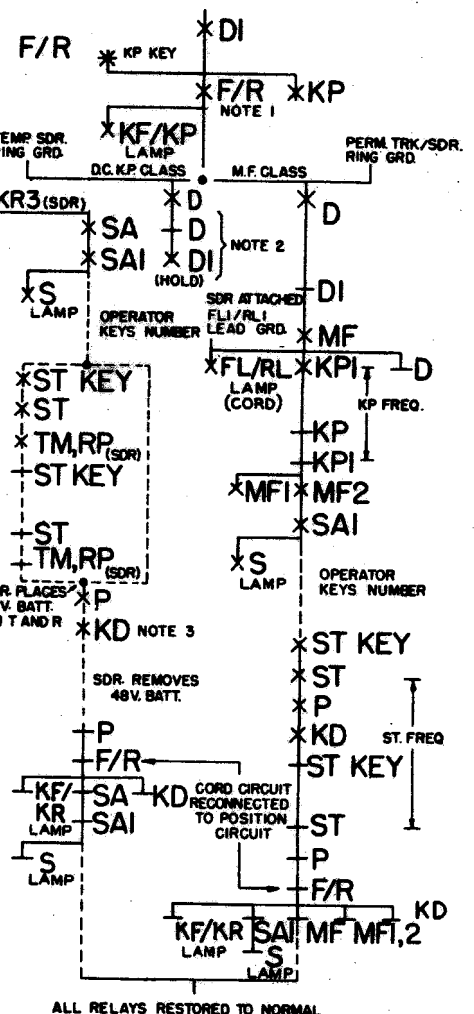
NO. 3C OR 3CL TOLL SWBD.

OS 103-1

CORD CIRCUIT



SEQUENCE CHART



OPERATOR'S TELEPHONE CIRCUIT	SD-55110-01, ISS.14-D
* KEY SET CIRCUIT	SD-56031-01, ISS.8-B
CORD CIRCUIT	SD-64737-01, ISS.9-D
POSITION CIRCUIT	SD-64738-01, ISS.18-B
GROUPING CIRCUIT	SD-64740-01, ISS.10-D
SENDER CIRCUIT	SD-95480-01, ISS.4-B

- NOTES:
1. DISCONNECTS T AND R LEADS OF THE CORD CIRCUIT FROM THE POSITION CIRCUIT AND CONNECTS THESE LEADS TO THE KEY PULSING CIRCUIT.
  2. THE D RELAY DOES NOT REMAIN OPERATED LONG ENOUGH TO PERMIT THE DI RELAY TO RELEASE.
  3. OPERATION OF KD RELAY PLACES A GROUND ON THE TIP WHERE AUTOMATIC START OF MACHINE RINGING IS NOT REQUIRED OR ON THE RING WHERE AUTOMATIC START OF MACHINE RINGING IS REQUIRED. WHERE SPECIFIED, LEADS ARE REVERSIBLE UNDER CONTROL OF A KEY.
  4. CONNECTIONS FOR THE D-C AND MF KEYSET CONNECTIONS ARE SHOWN SEPARATELY.

D-C AND MF KEYSET CIRCUIT

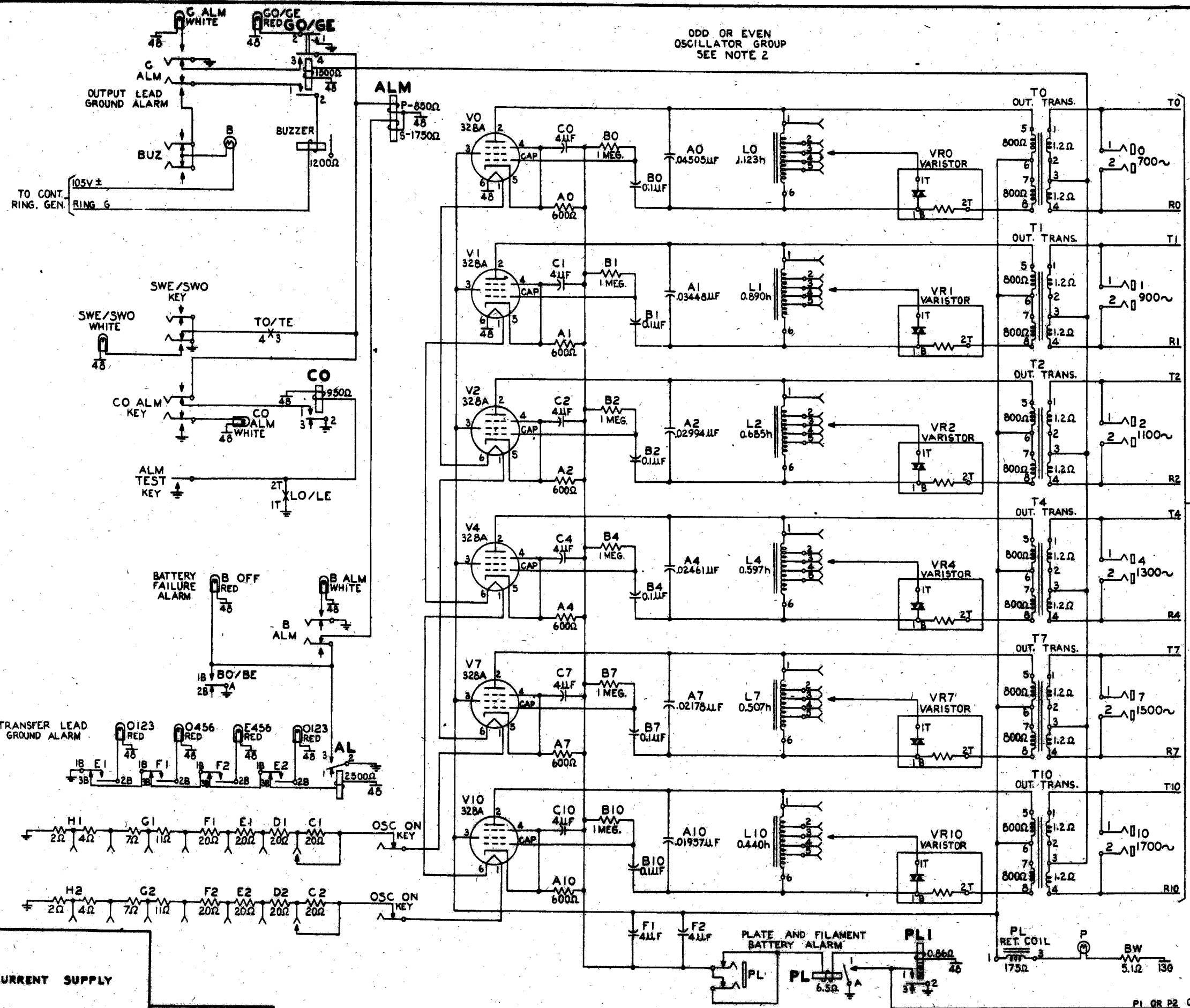
TO OS 105-1

1500~ (3)
1500~ (7)
700~ (10)
900~ (1)
1100~ (2)
1700~ (10)

ISSUE	1	1/28/50
DATE	3-15-50	



ODD OR EVEN  
OSCILLATOR GROUP  
SEE NOTE 2



TO CONT.  
RING. GEN.  
RING G

SWE/SWO  
KEY

CO ALM  
KEY

BATTERY  
FAILURE  
ALARM

TRANSFER LEAD  
GROUND ALARM

MULTIFREQUENCY CURRENT SUPPLY

03 105-1

2 SHEETS, SHEET 1

NO. 30 OR SCL TOLL SWBS

ORDER AS BSP ITEM MP-11508

TO  
PL OR P2 OSCILLATOR VOLTAGE  
ALARM (SHEET 2)

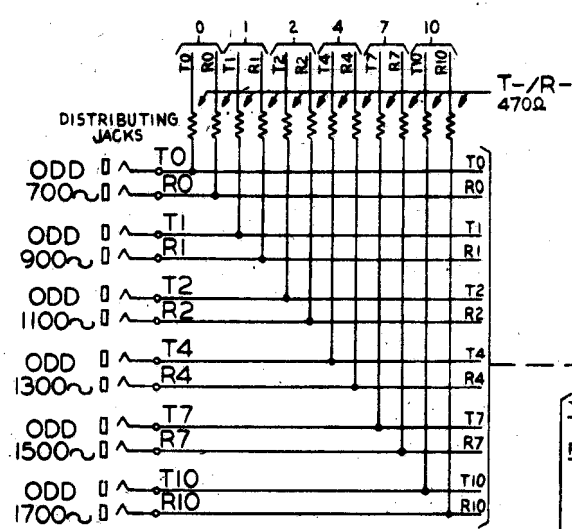
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PRINTED IN U.S.A.

REVISED	DATE
1	3-13-50

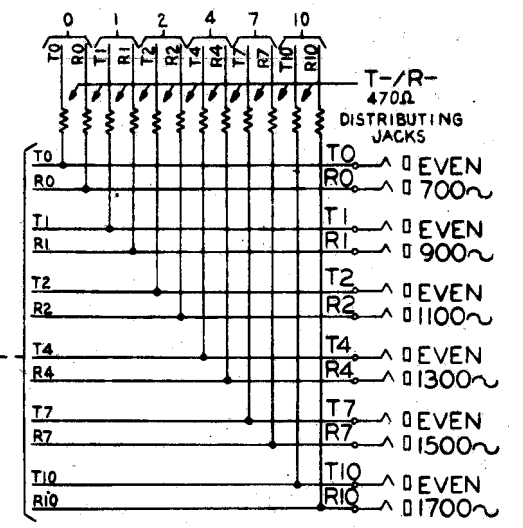
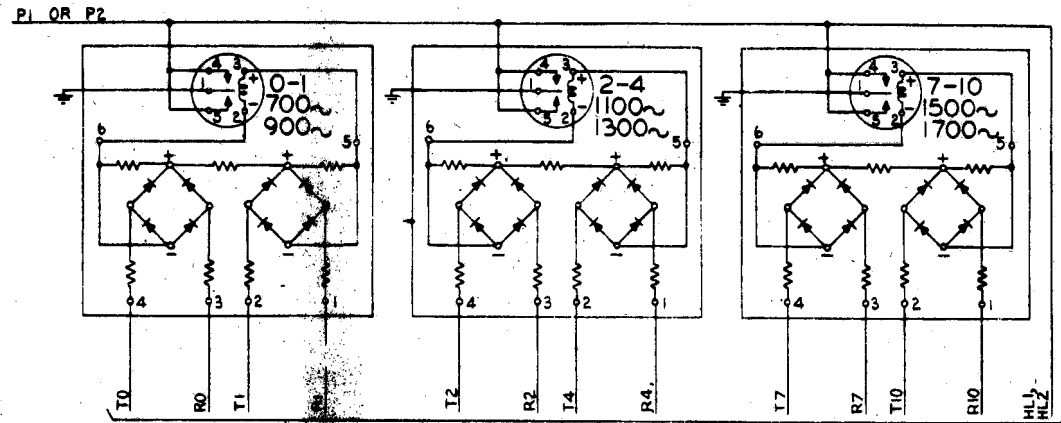
MP-11508 2 SHEETS, SHEET 1

ISSUE	1	V&M
DATE	3-18-50	

ODD OR EVEN OSCILLATOR VOLTAGE ALARM  
VOLTMETER RELAYS

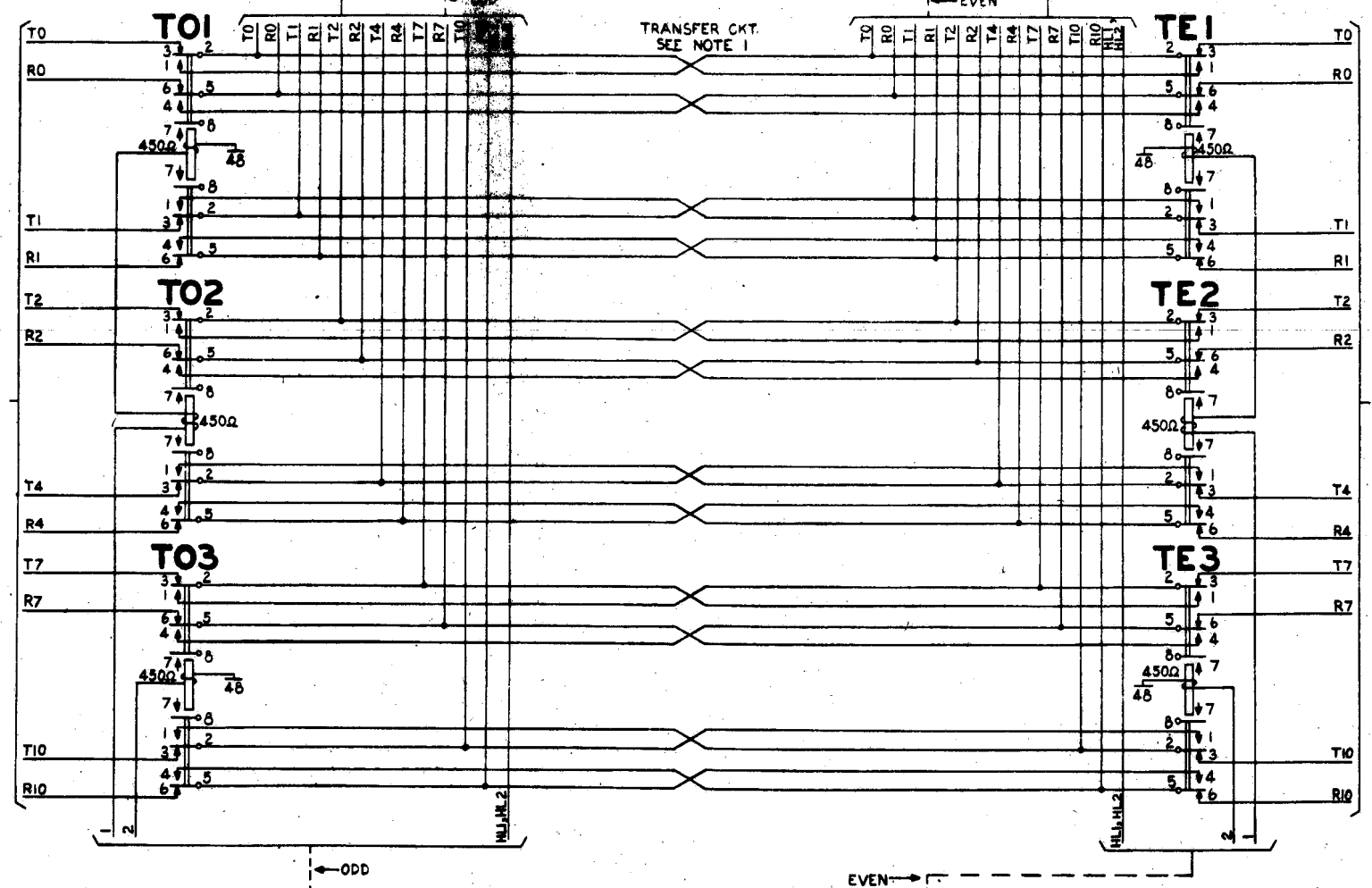


TO  
ODD OR EVEN  
OSCILLATOR  
GROUP CKT.  
(SHEET 1)

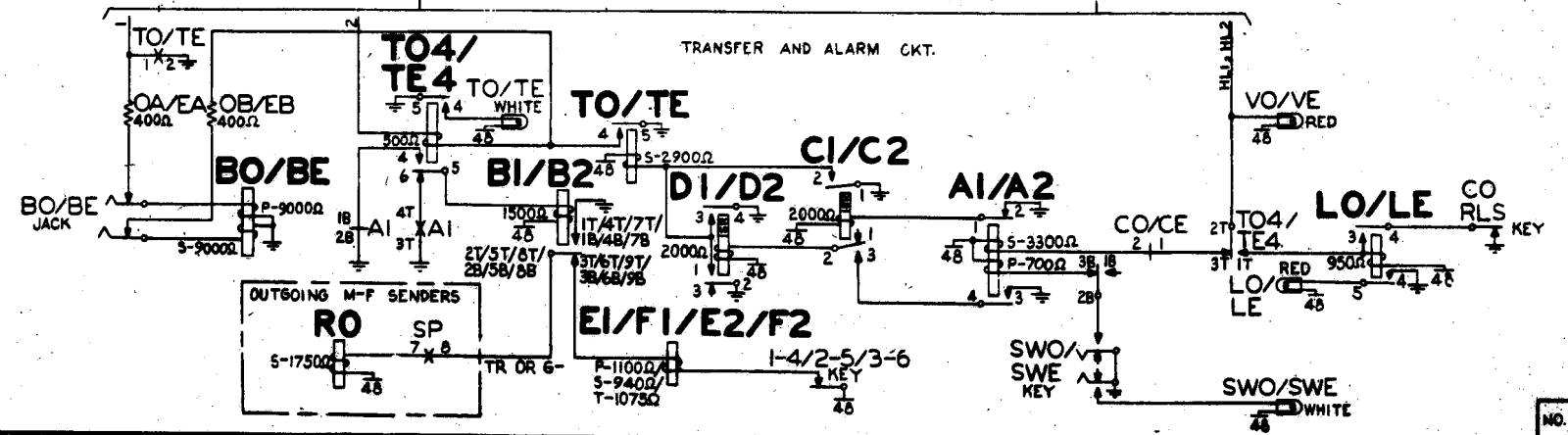
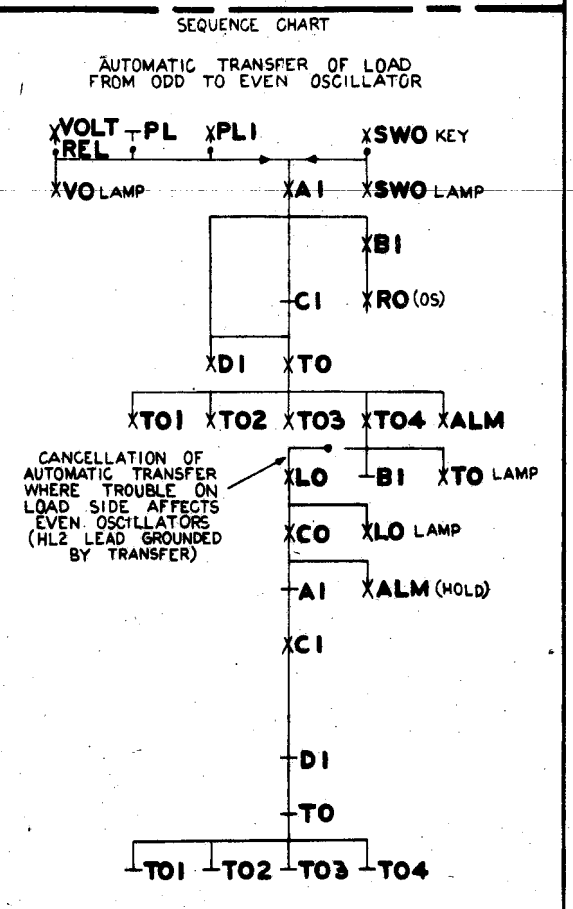


NOTES:  
1. UNDER NORMAL OPERATING CONDITIONS THE LOAD IS DIVIDED BETWEEN THE ODD AND EVEN OSCILLATORS. UNDER TRANSFER CONDITIONS EITHER OSCILLATOR CAN CARRY THE ENTIRE LOAD. EVEN AND ODD OSCILLATOR EQUIPMENT ARRANGEMENTS ARE IDENTICAL.  
2. DIRECT CURRENT SHOULD NOT BE USED TO TEST THIS CIRCUIT (EXCEPT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

TO  
ODD  
OSCILLATOR  
GROUP CKT.  
(SHEET 1)



TO  
EVEN  
OSCILLATOR  
GROUP CKT.  
(SHEET 1)



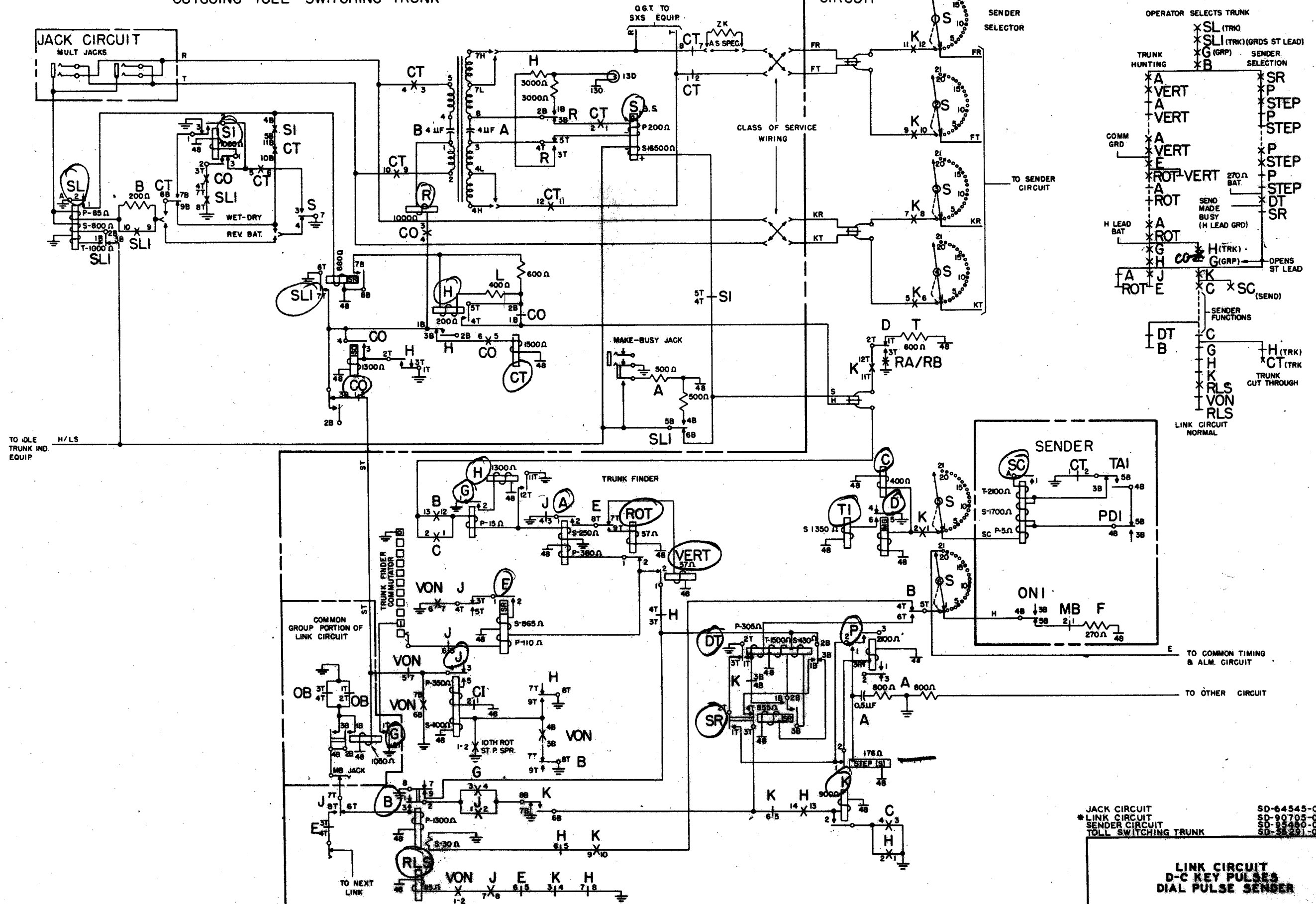
MULTIFREQUENCY SENDER CIRCUIT 5D-25580-01, 155. 8  
MULTIFREQUENCY CURRENT SUPPLY 5D-95391-01, 155. 10

MULTIFREQUENCY CURRENT SUPPLY

OUTGOING TOLL SWITCHING TRUNK

LINK CIRCUIT

SEQUENCE CHART

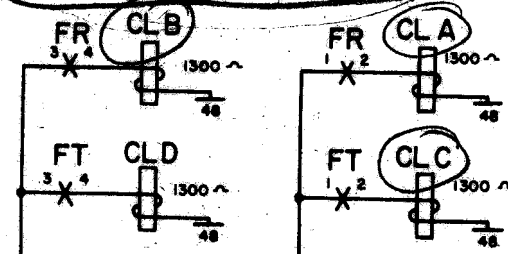


ISSUE	1	VERM.
DATE	3-16-50	

JACK CIRCUIT SD-64545-01, ISS. 13-D  
 \* LINK CIRCUIT SD-90705-01, ISS. 18-D  
 SENDER CIRCUIT SD-95480-01, ISS. 4-B  
 TOLL SWITCHING TRUNK SD-35291-01, ISS. 16-B

LINK CIRCUIT  
 D-C KEY PULSES  
 DIAL PULSE SENSER

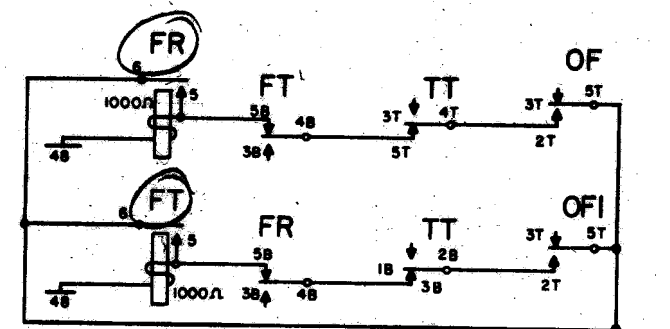
**CLASS REGISTRATION**



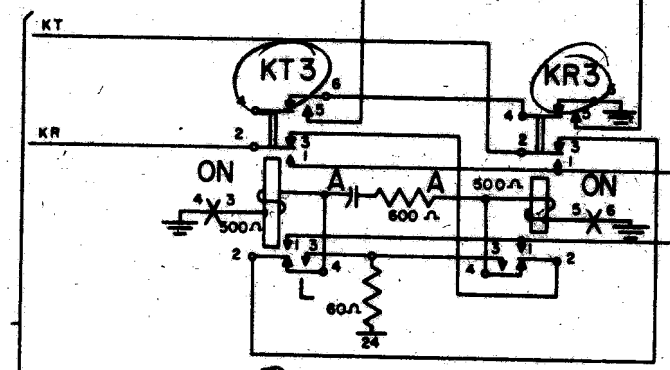
**SETTING SENDER FOR RINGING OR NO RINGING**

**CLASS RELAY OPERATION**

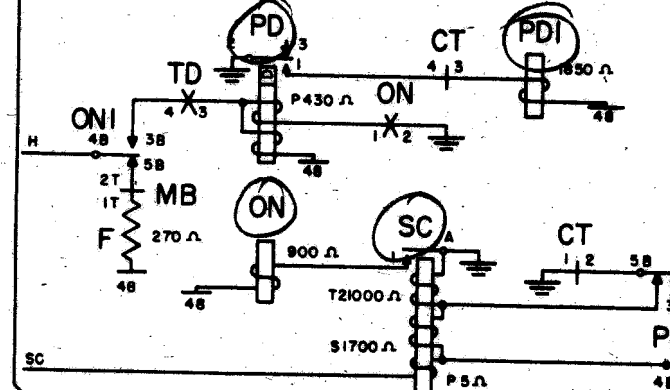
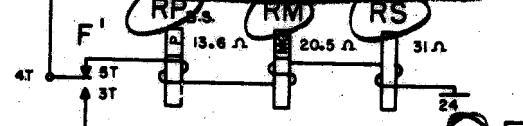
POLARITY ON LEADS				RELAYS OPERATED			
KT	KR	FT	FR	KR3	OF	FR	CLA
+	-	+	-	KR3	OF	FR	CLA
-	+	+	-	KT3	OF	FR	CLB
+	-	-	+	KR3	OF1	FT	CLC
-	+	-	+	KT3	OF1	FT	CLD



TO LINK CIRCUIT

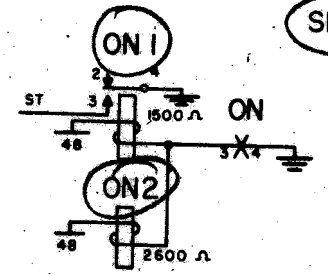


**KEY PULSING RELAYS**



**SENDER CONTROL**

TO COMMON TIMING AND ALARM CKT



SENDER CKT SD-95460-01 155. 4B

SENDER CIRCUIT RECEIVES D-C KEY PULSES TRANSMITS DIAL PULSES 10 P.P.S.-D-C RINGING SIGNAL

OS107-1 3 SHEETS, SHEET 1 NO. 3C OR 3CL TOLL SWBD. ORDER AS SHIP ITEM MP-11510

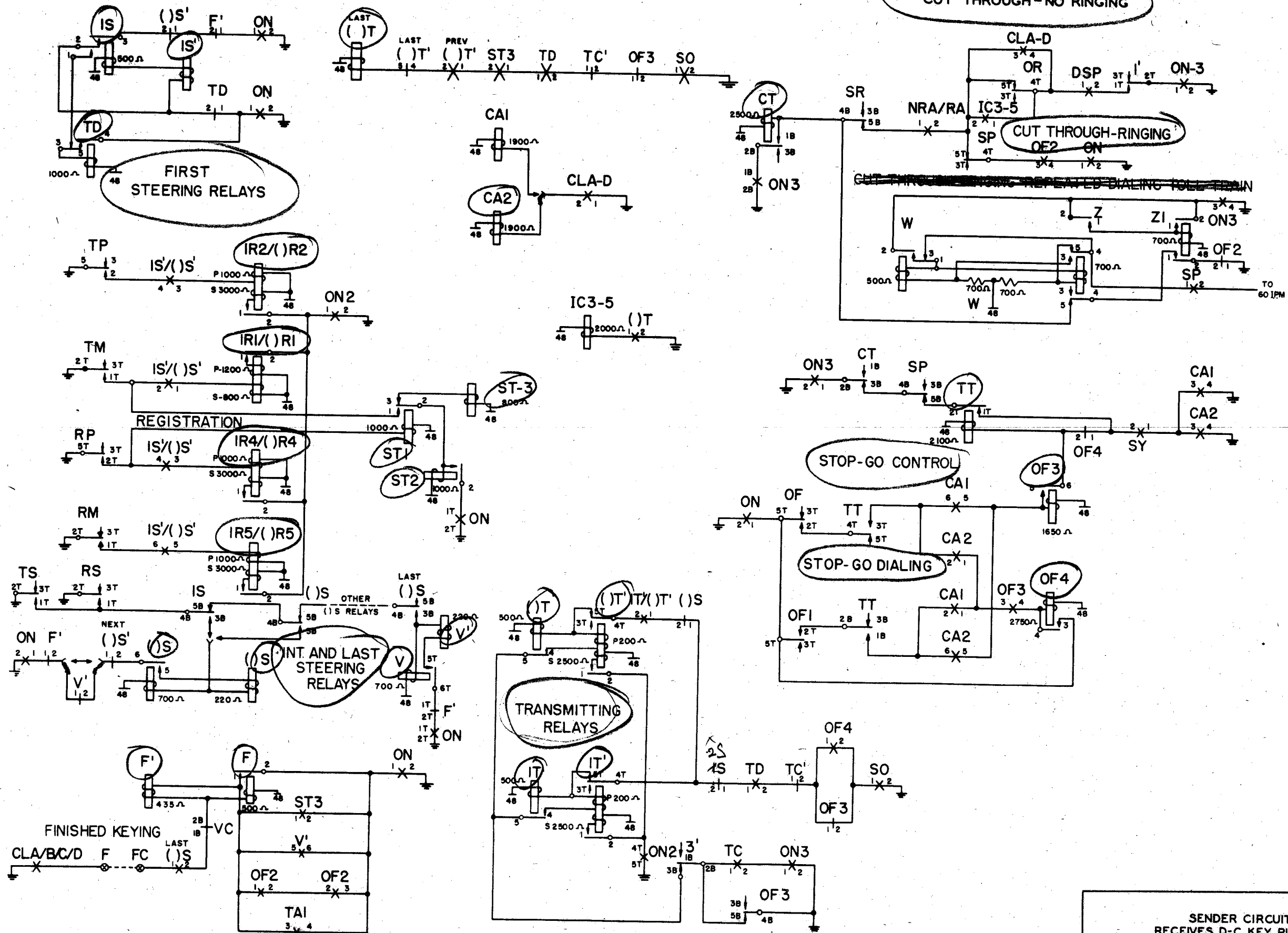
SIMPLEX RINGING SIGNAL

ISSUE 1 1/28/50 DATE 3-14-50

MP-11510 3 SHEETS, SHEET 1

BELL TELEPHONE LABORATORY

ISSUE	1	K.A.W.
DATE	3-14-50	



CUT THROUGH - NO RINGING

CUT THROUGH-RINGING

STOP-GO CONTROL

STOP-GO DIALING

TRANSMITTING RELAYS

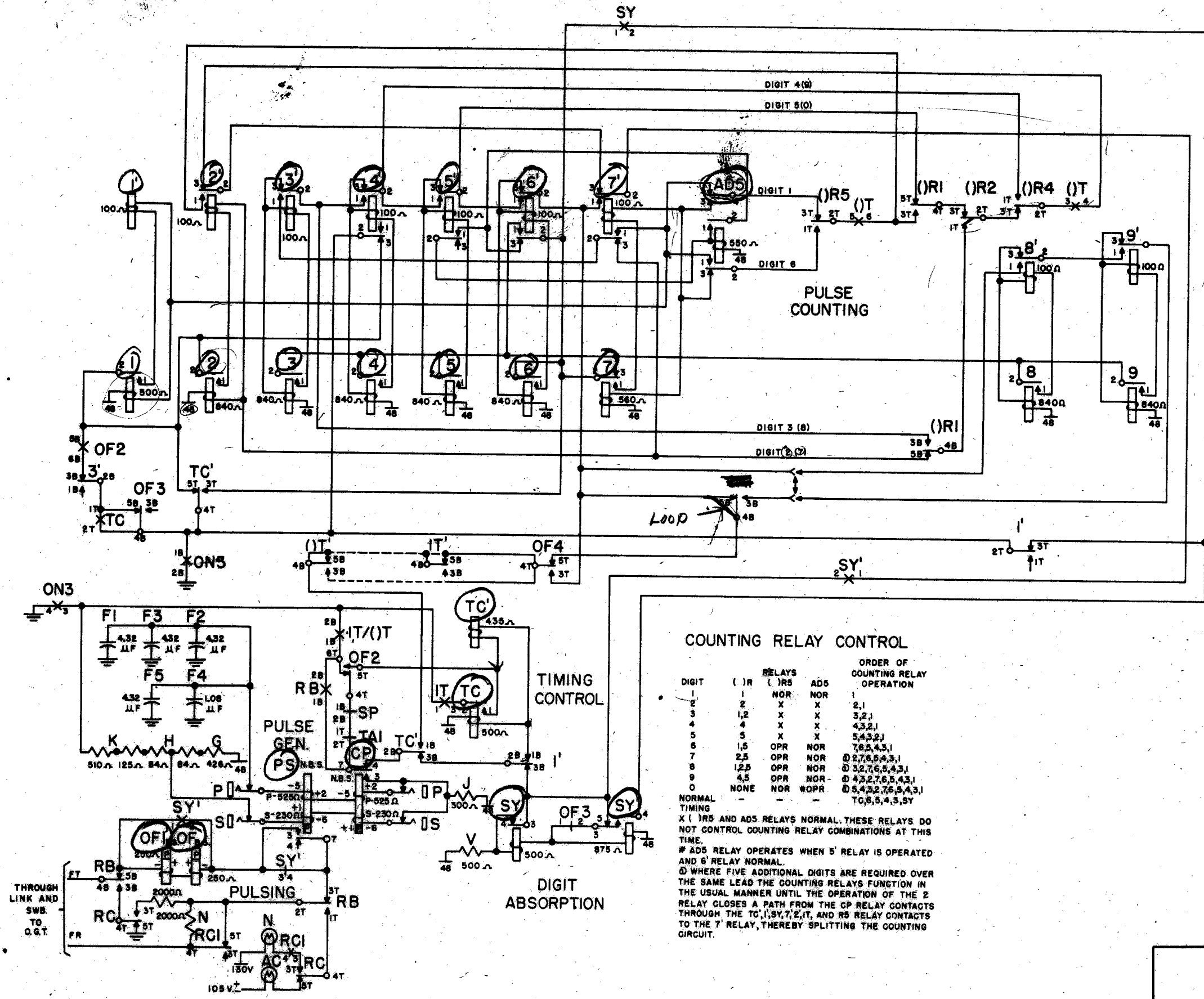
FIRST STEERING RELAYS

INT. AND LAST STEERING RELAYS

FINISHED KEYING

SENDER CIRCUIT  
RECEIVES D-C KEY PULSES  
TRANSMITS DIAL PULSES  
10 P.P.S. - D-C RINGING SIGNAL

ISSUE	1	(REVISED)
DATE	3-14-50	



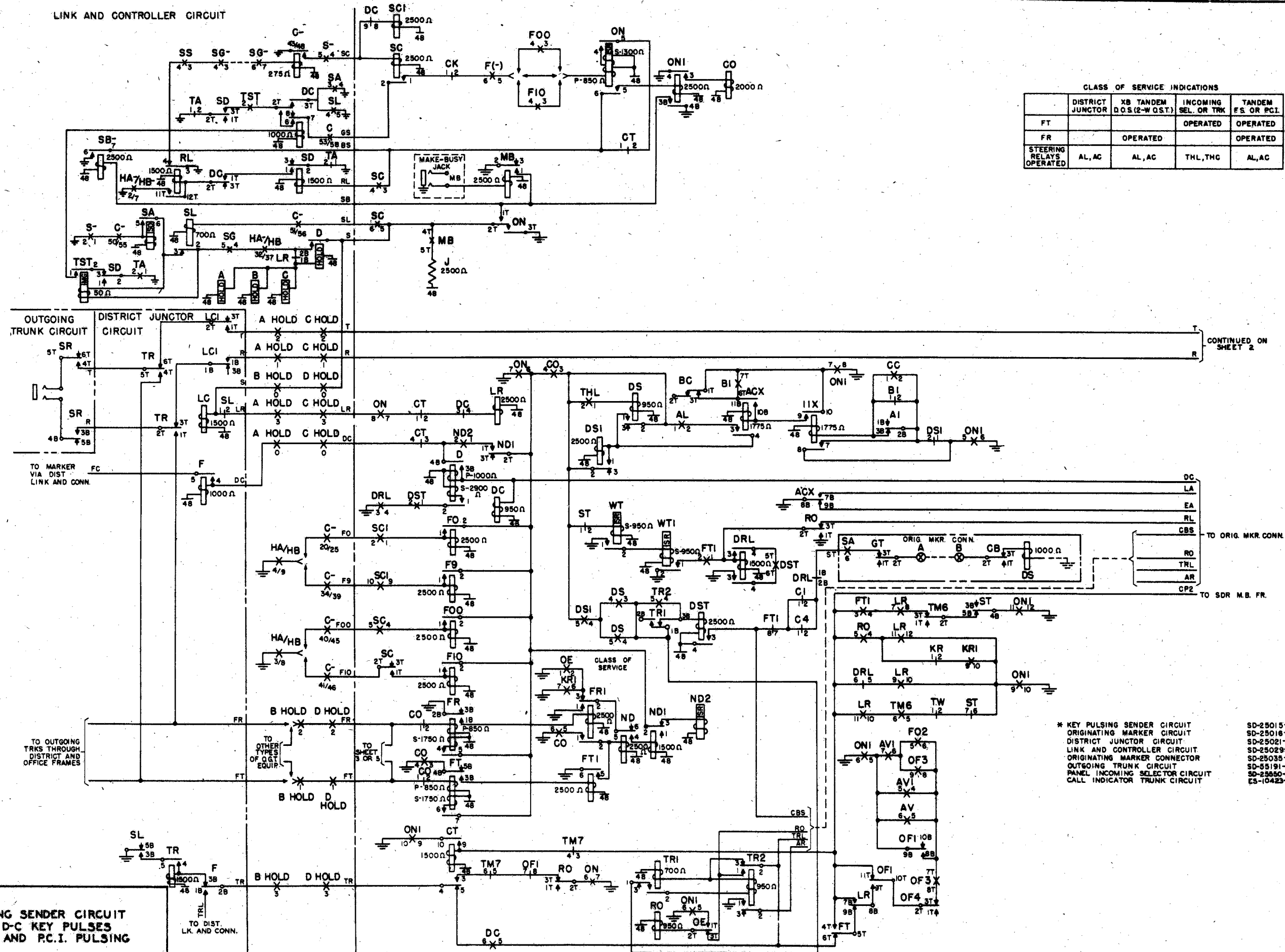
COUNTING RELAY CONTROL

DIGIT	( )R	( )RS	AD5	ORDER OF COUNTING RELAY OPERATION
1	1	NOR	NOR	1
2	2	X	X	2,1
3	1,2	X	X	3,2,1
4	4	X	X	4,3,2,1
5	5	X	X	5,4,3,2,1
6	1,5	OPR	NOR	7,6,5,4,3,1
7	2,5	OPR	NOR	② 2,7,6,5,4,3,1
8	1,2,5	OPR	NOR	③ 3,2,7,6,5,4,3,1
9	4,5	OPR	NOR	④ 4,3,2,7,6,5,4,3,1
0	NONE	NOR	#OPR	⑤ 5,4,3,2,7,6,5,4,3,1
NORMAL TIMING				TC,6,5,4,3,SY

X ( )RS AND AD5 RELAYS NORMAL. THESE RELAYS DO NOT CONTROL COUNTING RELAY COMBINATIONS AT THIS TIME.  
 # AD5 RELAY OPERATES WHEN 5' RELAY IS OPERATED AND 6' RELAY NORMAL.  
 ② WHERE FIVE ADDITIONAL DIGITS ARE REQUIRED OVER THE SAME LEAD THE COUNTING RELAYS FUNCTION IN THE USUAL MANNER UNTIL THE OPERATION OF THE 2 RELAY CLOSES A PATH FROM THE CP RELAY CONTACTS THROUGH THE TC',1',SY',7',E',IT, AND R5 RELAY CONTACTS TO THE 7' RELAY, THEREBY SPLITTING THE COUNTING CIRCUIT.

SENDER CIRCUIT  
 RECEIVES D-C KEY PULSES  
 TRANSMITS DIAL PULSES  
 10 P.P.S. - D-C RINGING SIGNAL

LINK AND CONTROLLER CIRCUIT



CLASS OF SERVICE INDICATIONS

	DISTRICT JUNCTION	XB TANDEM D.O.S. (2-W.O.S.T.)	INCOMING SEL. OR TRK	TANDEM F.S. OR P.C.I.
FT			OPERATED	OPERATED
FR		OPERATED		OPERATED
STEERING RELAYS OPERATED	AL, AC	AL, AC	THL, THG	AL, AC

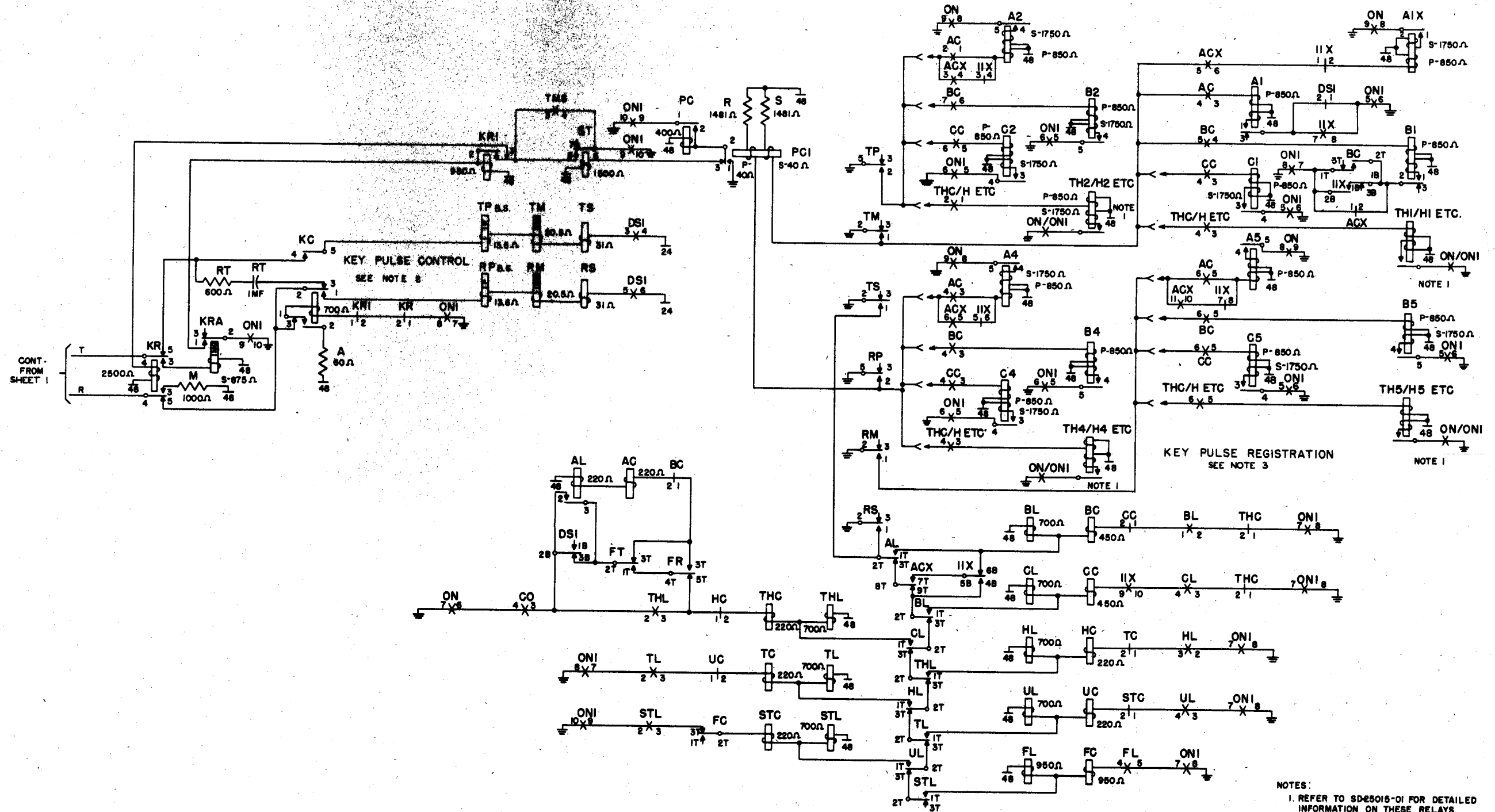
CONTINUED ON SHEET 2

- \* KEY PULSING SENDER CIRCUIT SD-25015-01 ISS. 34
- ORIGINATING MARKER CIRCUIT SD-25016-01 ISS. 41
- DISTRICT JUNCTION CIRCUIT SD-25021-01 ISS. 6
- LINK AND CONTROLLER CIRCUIT SD-25029-01 ISS. 32
- ORIGINATING MARKER CONNECTOR SD-25035-01 ISS. 30
- OUTGOING TRUNK CIRCUIT SD-55191-01 ISS. 8
- PANEL INCOMING SELECTOR CIRCUIT SD-25650-01 ISS. 8
- CALL INDICATOR TRUNK CIRCUIT CS-10423-01 ISS. 9

KEY PULSING SENDER CIRCUIT RECEIVES D-C KEY PULSES REVERTIVE AND P.C.I. PULSING

ISSUE	1	REVISED	
DATE	3-17-50		

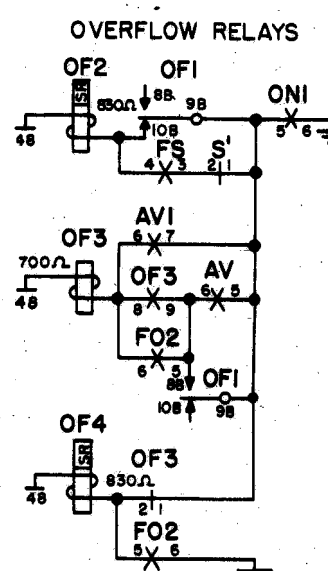
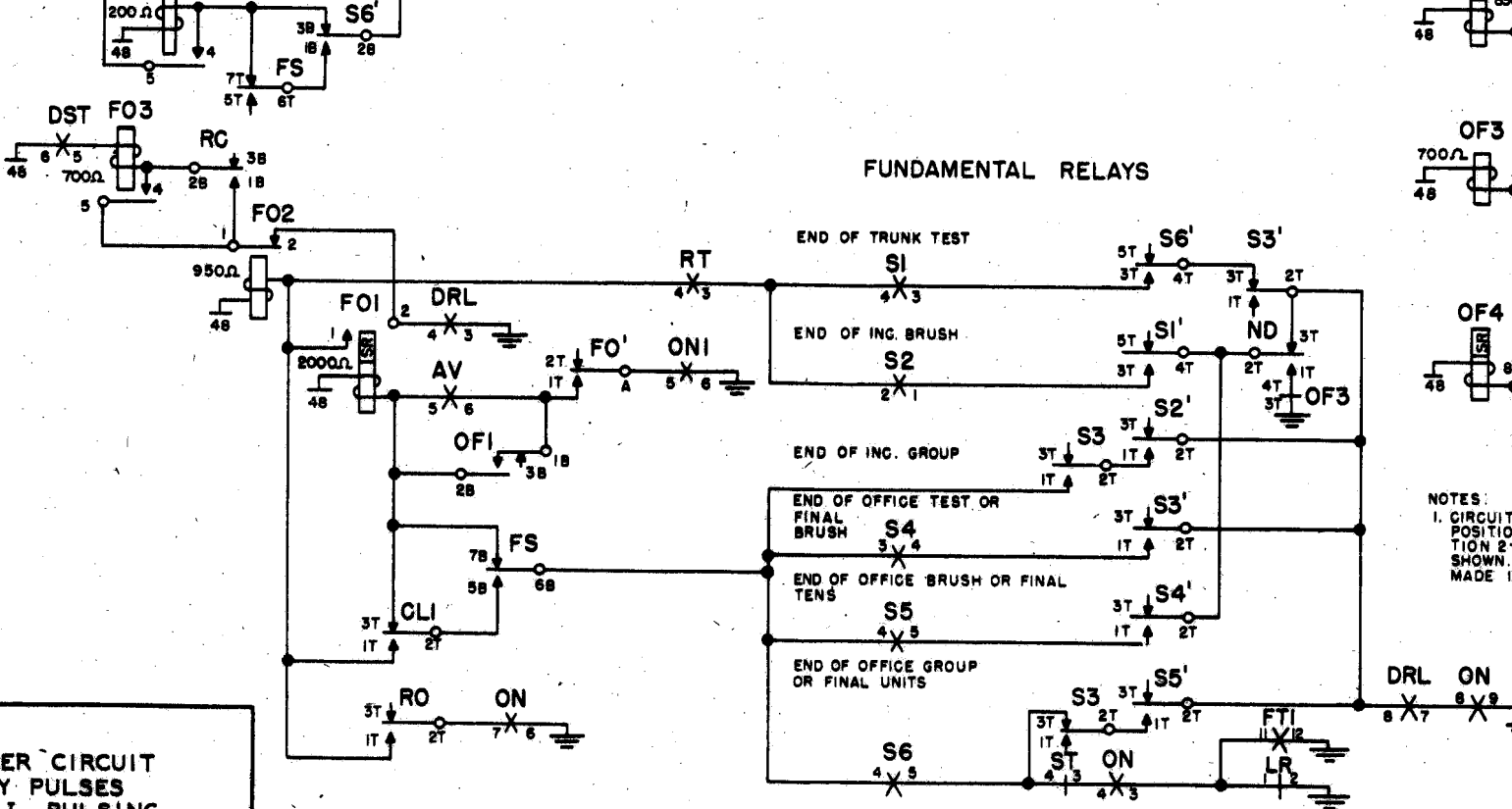
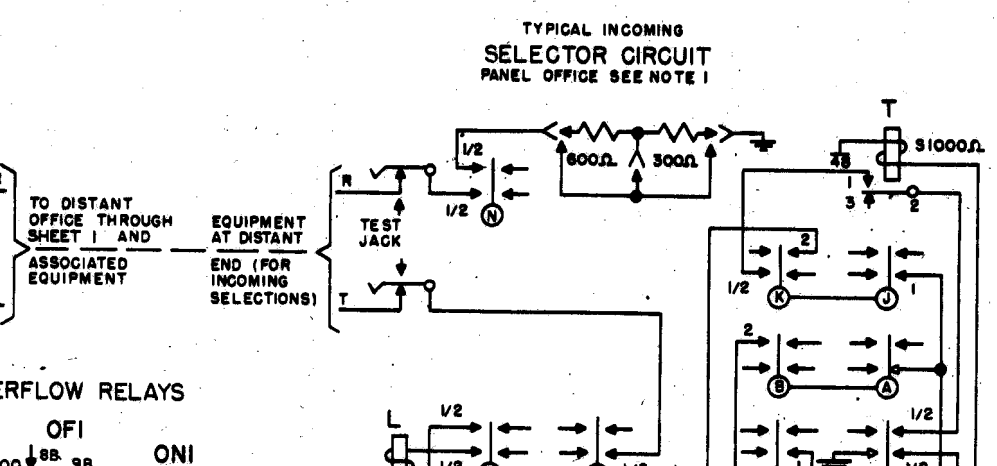
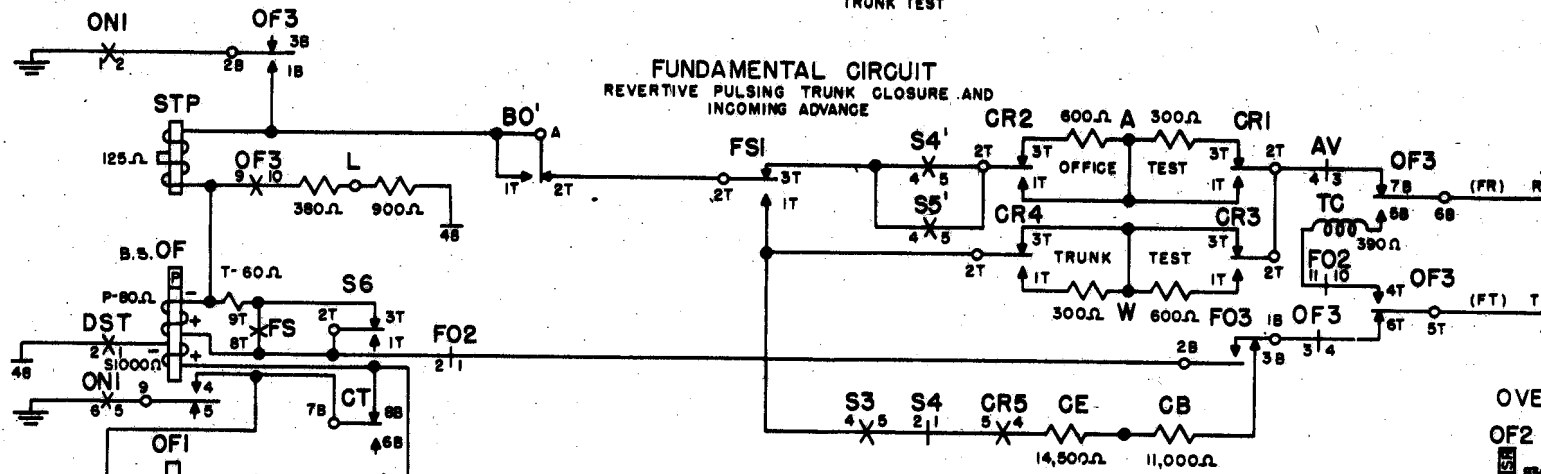
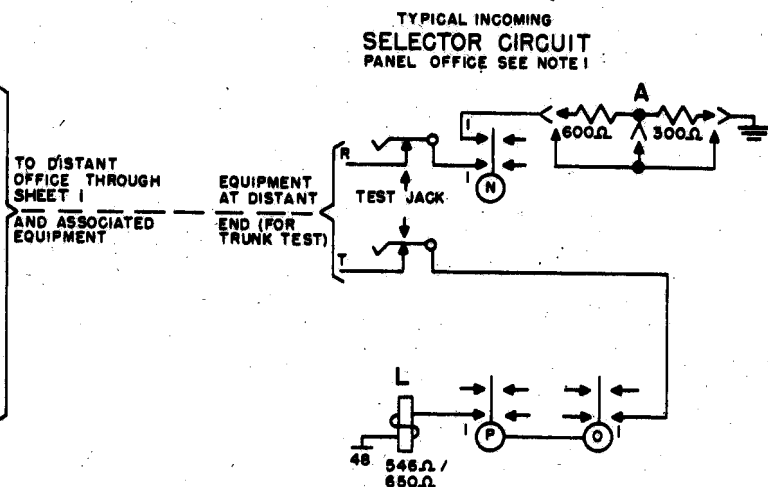
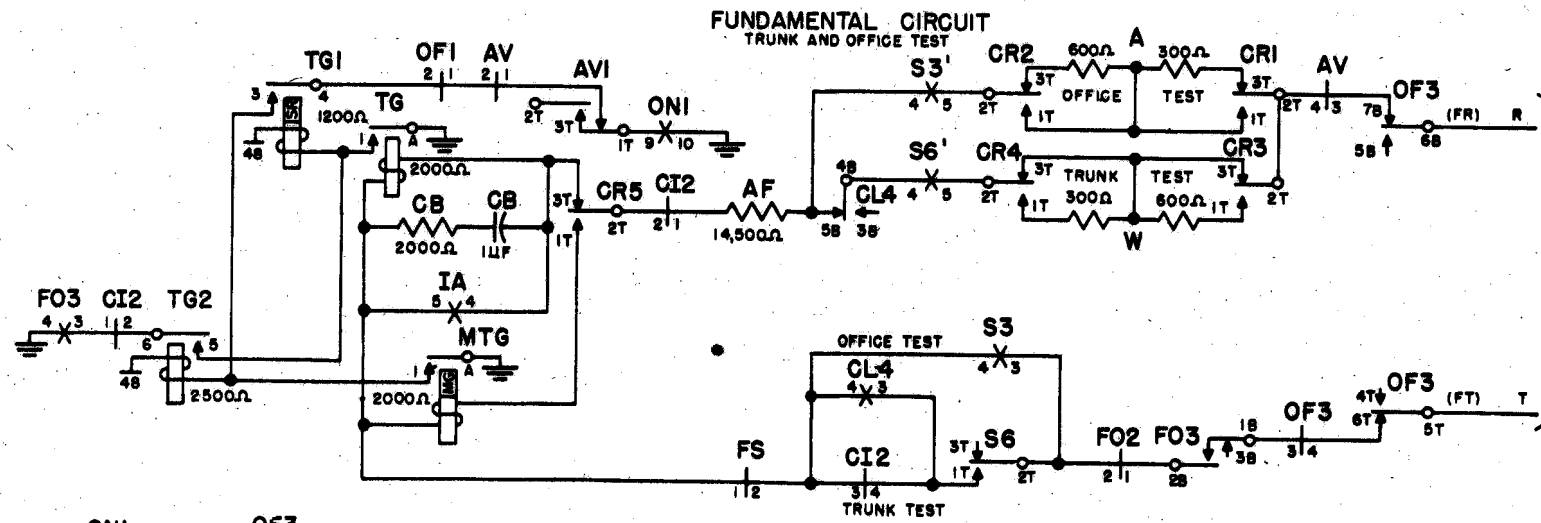
ISSUE	1	KRM
DATE	3-17-50	



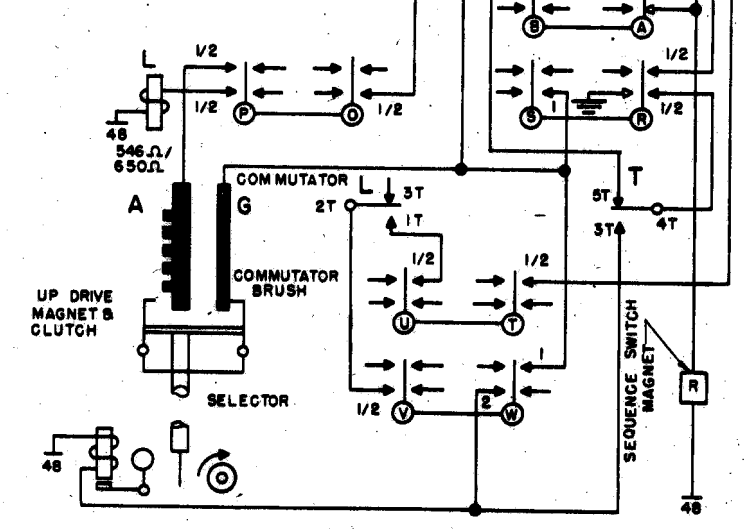
- NOTES:
1. REFER TO SD25015-01 FOR DETAILED INFORMATION ON THESE RELAYS.
  2. FOR KEY REGISTRATION CHART SEE SC 102-1.
  3. ARRANGED FOR PREFIX 11 DIALING.

KEY PULSING SENDER CIRCUIT  
RECEIVES D-C KEY PULSES  
REVERTIVE AND P.C.I. PULSING



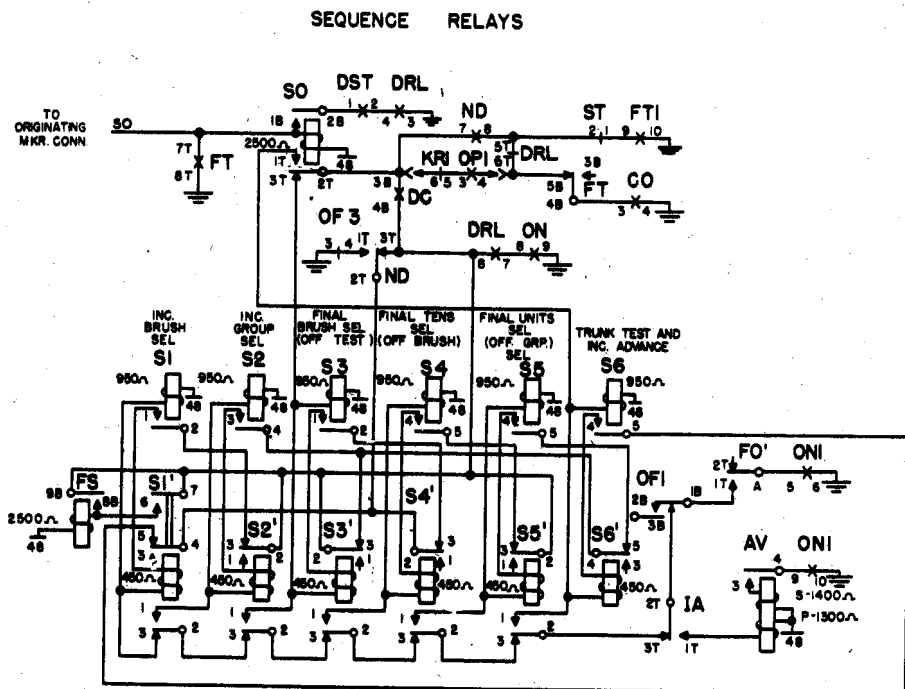
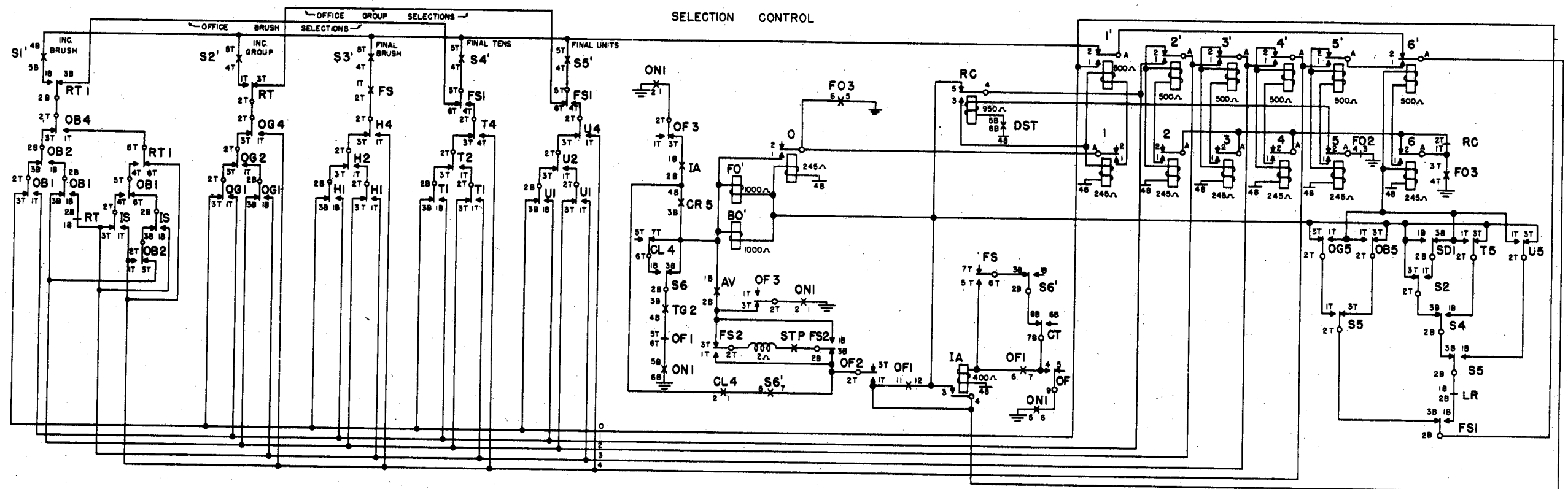


NOTES:  
1. CIRCUIT ARRANGEMENTS FOR POSITION 1-NORMAL AND POSITION 2-BRUSH SELECTION ARE SHOWN. OTHER SELECTIONS MADE IN A SIMILAR MANNER.

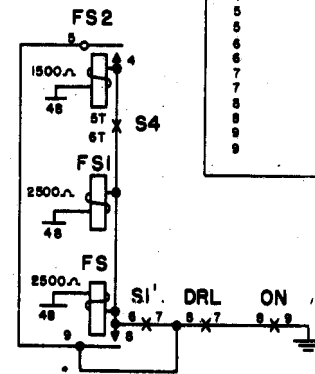
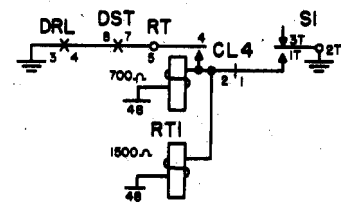
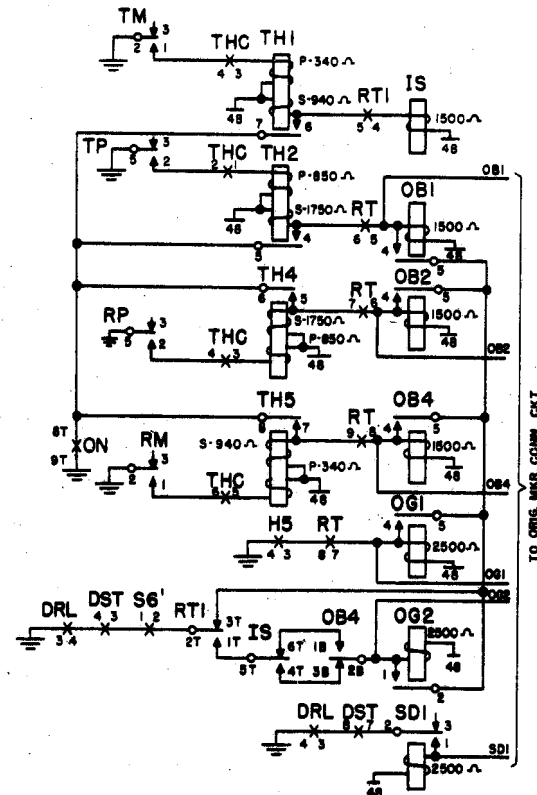


KEY PULSING SENDER CIRCUIT  
RECEIVES D-C KEY PULSES  
REVERTIVE AND P.C.I. PULSING

ISSUE	1
DATE	3-17-50



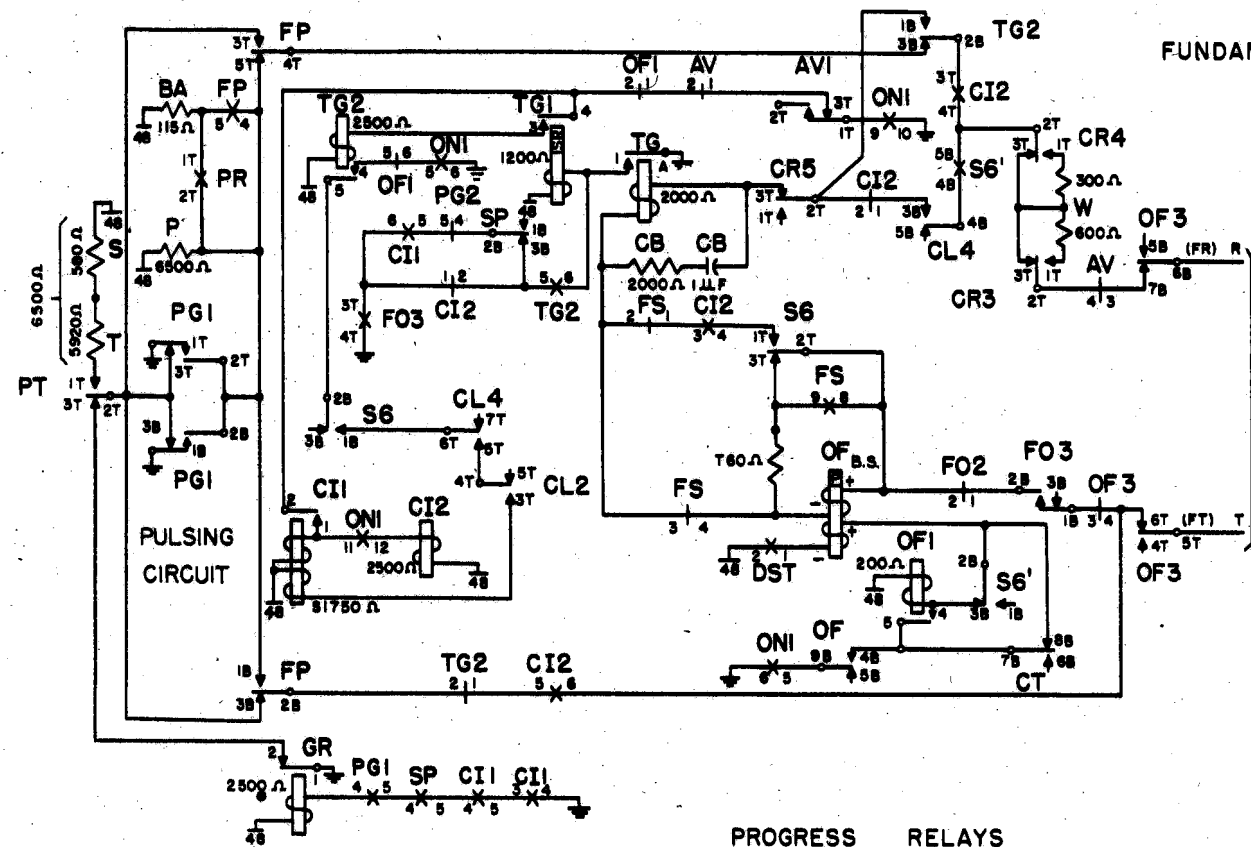
TRANSLATION FOR INCOMING BRUSH AND GROUP SELECTIONS



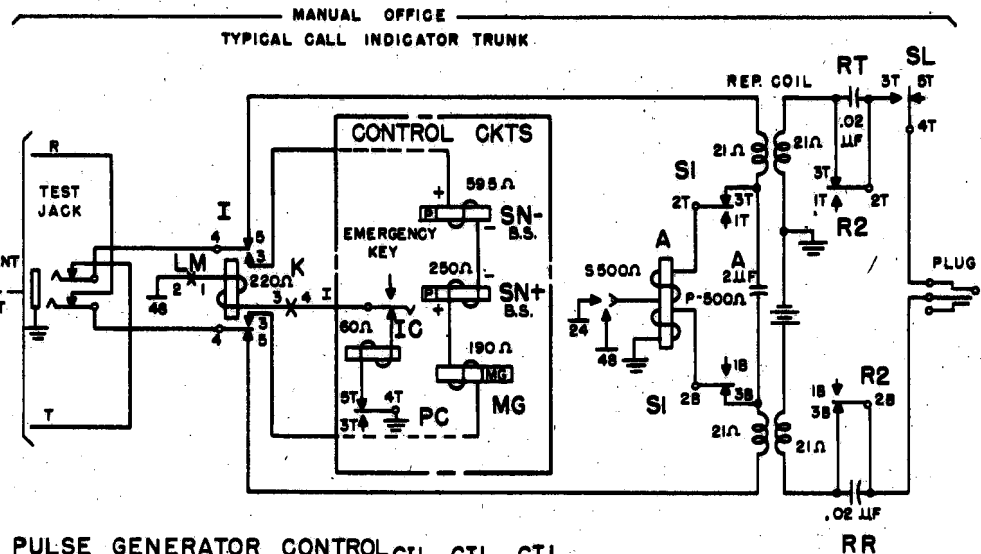
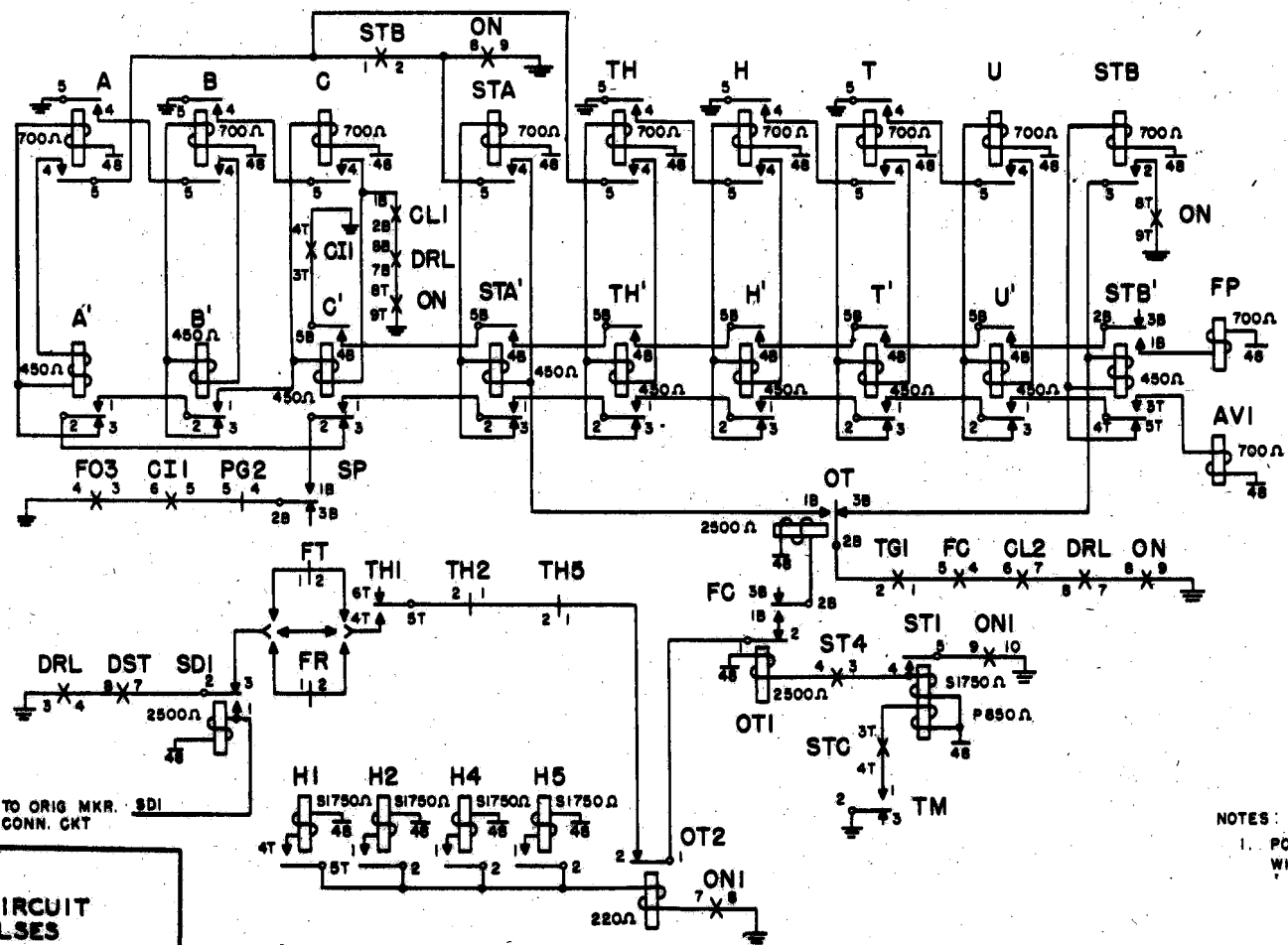
TRANSLATION TABLE				
THOUSANDS DIGIT	HUNDREDS DIGIT	RELAYS OPERATED	BRUSH	GROUP
0	0-4	NONE	0	0
0	5-9	OG1	0	1
1	0-4	IS-OG2	0	2
1	5-9	IS-OG1-OG2	0	3
2	0-4	OB1	1	0
2	5-9	OB1-OG1	1	1
3	0-4	IS-OB1-OG2	1	2
3	5-9	IS-OB1-OG1-OG2	1	3
4	0-4	OB2	2	0
4	5-9	OB2-OG1	2	1
5	0-4	OB4-OG2	2	2
5	5-9	OB4-OG1-OG2	2	3
6	0-4	IS-OB4	3	0
6	5-9	IS-OB4-OG1	3	1
7	0-4	OB1-OB4-OG2	3	2
7	5-9	OB1-OB4-OG1-OG2	3	3
8	0-4	IS-OB1-OB4	4	0
8	5-9	IS-OB1-OB4-OG1	4	1
9	0-4	OB2-OB4-OG2	4	2
9	5-9	OB2-OB4-OG1-OG2	4	3

KEY PULSING SENDER CIRCUIT RECEIVES D-C KEY PULSES REVERTIVE AND P.C.I. PULSING

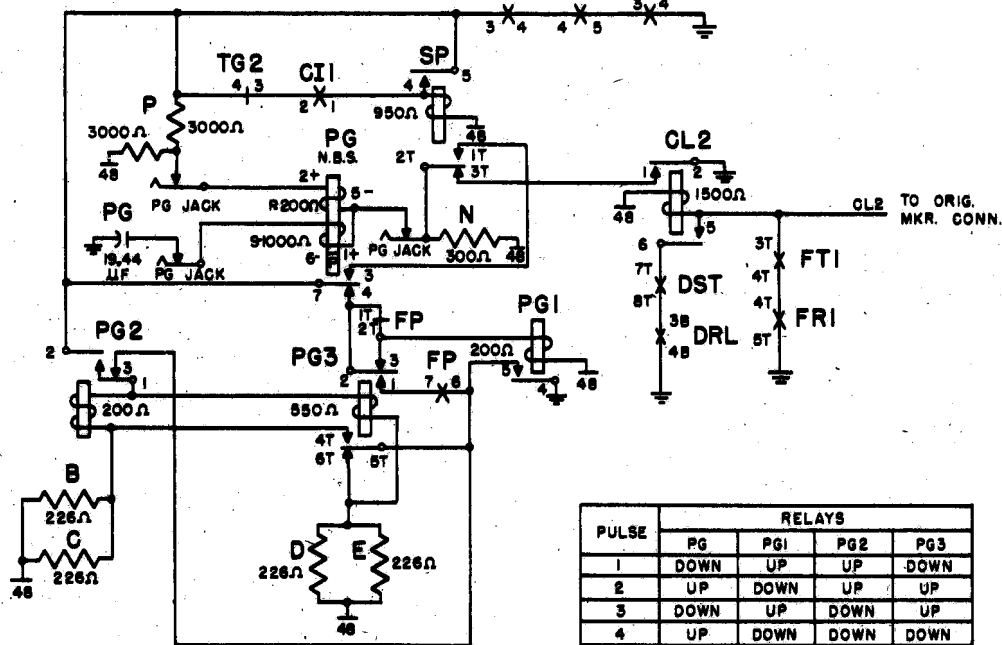
FUNDAMENTAL CIRCUIT - P.C.I.



PROGRESS RELAYS



PULSE GENERATOR CONTROL



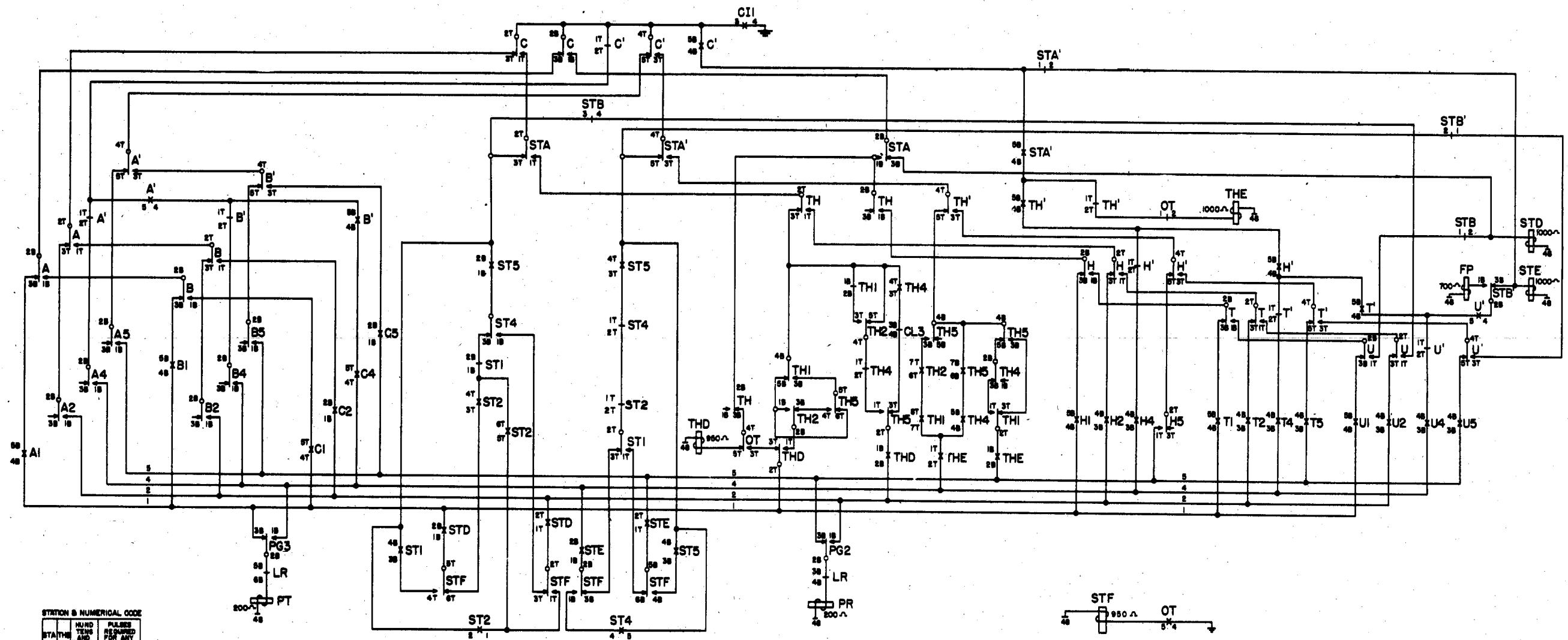
PULSE	RELAYS			
	PG	PG1	PG2	PG3
1	DOWN	UP	UP	DOWN
2	UP	DOWN	UP	UP
3	DOWN	UP	DOWN	UP
4	UP	DOWN	DOWN	DOWN

NOTES:  
1. POLARIZED RELAY PG IS SHOWN OPERATED WHEN CONTACTS 3 AND 7 ARE CLOSED.

KEY PULSING SENDER CIRCUIT RECEIVES D-C KEY PULSES REVERTIVE AND P.C.I. PULSING

ISSUE	1	VAR.
DATE	3-17-50	

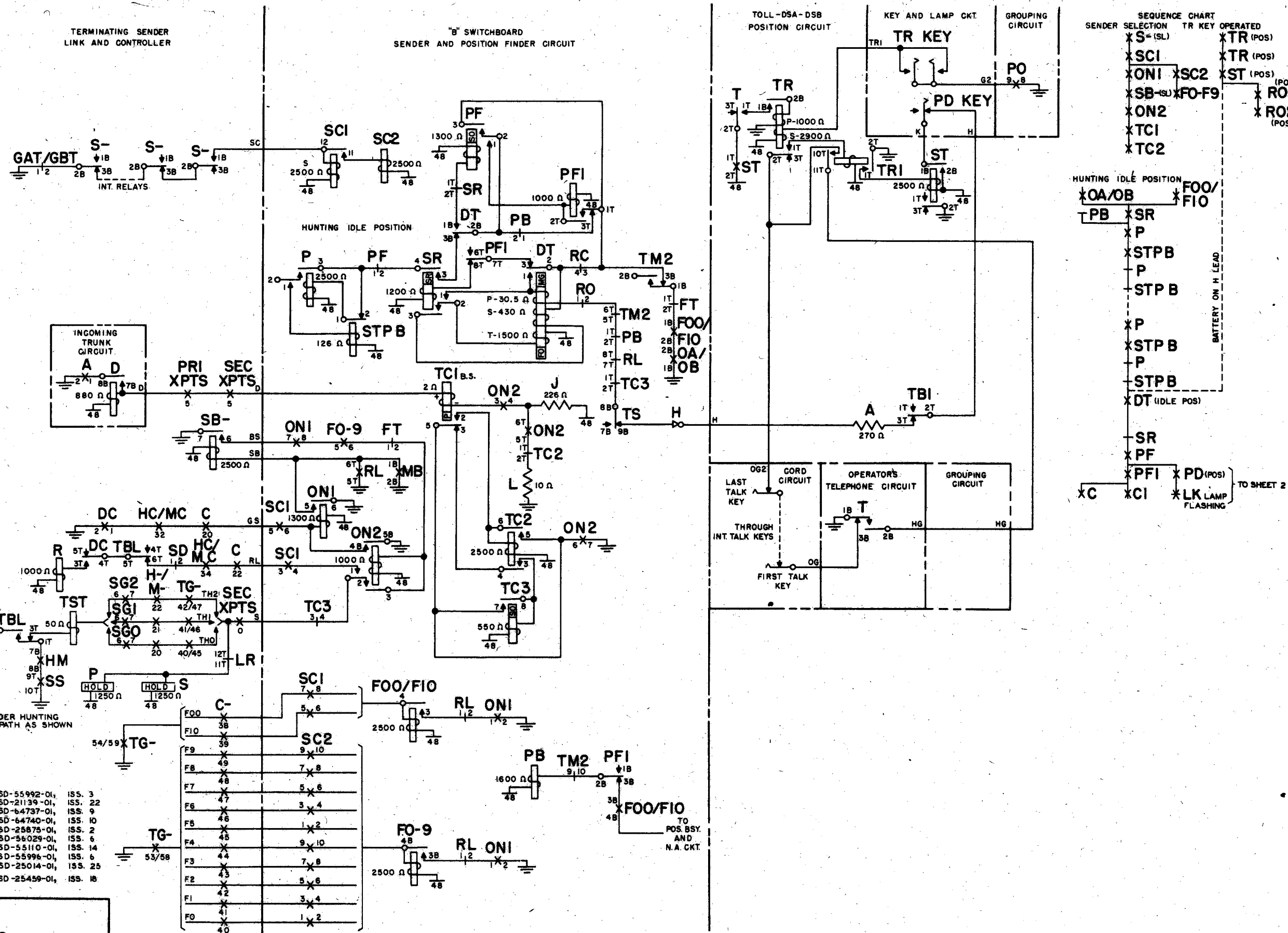
DIGIT TRANSLATION AND CONTROL OF PT AND PR RELAYS



STATION & NUMERICAL CODE

STATION	HUND TENS AND UNITS	PULSES REQUIRED FOR ANY DIGIT
0	0	1
1	1	1
2	2	1
3	3	1
4	4	1
5	5	1
6	6	1
7	7	1
8	8	1
9	9	1

KEY PULSING SENDER CIRCUIT RECEIVES D-C KEY PULSES REVERTIVE AND P.C.I. PULSING



SEQUENCE CHART

SENDER SELECTION	TR KEY	OPERATED
*S-(SL)	*TR	(POS)
*SCI	*TR	(POS)
*ON1	*SC2	*ST (POS)
*SB-(SU)	*FO-F9	*ROI (POS)
*ON2		*R02 (POS)
*TC1		
*TC2		

HUNTING IDLE POSITION

*OA/OB	*FOO/FIO
*PB	*SR
*P	*STPB
*P	*STPB
*P	*STPB
*P	*STPB
*P	*STPB
*DT (IDLE POS)	
*SR	
*PF	
*PFI	*PD (POS)
*XC	*CI
	*LK LAMP FLASHING

BATTERY ON H LEAD

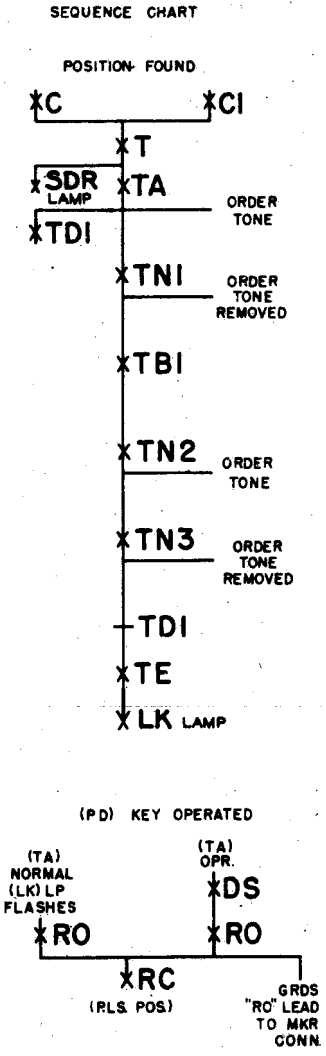
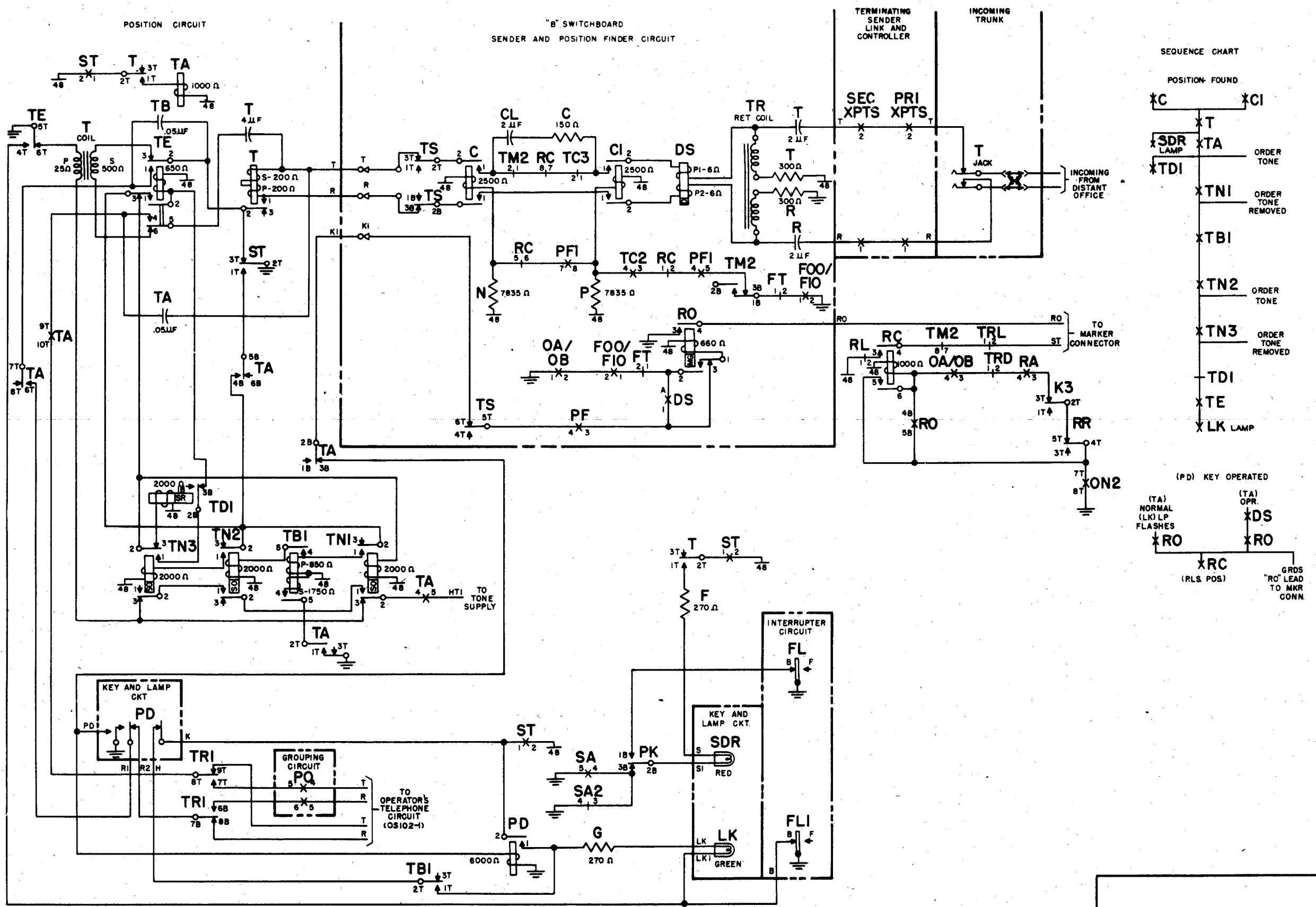
TO SHEET 2

NOTES:  
 1. AN OPERATED PB RELAY PREVENTS SENDER HUNTING BY OPENING THE H LEAD AND P RELAY PATH AS SHOWN ON SHEET 1.  
 2. REFER TO SC103-1 FOR SEQUENCE CHART.

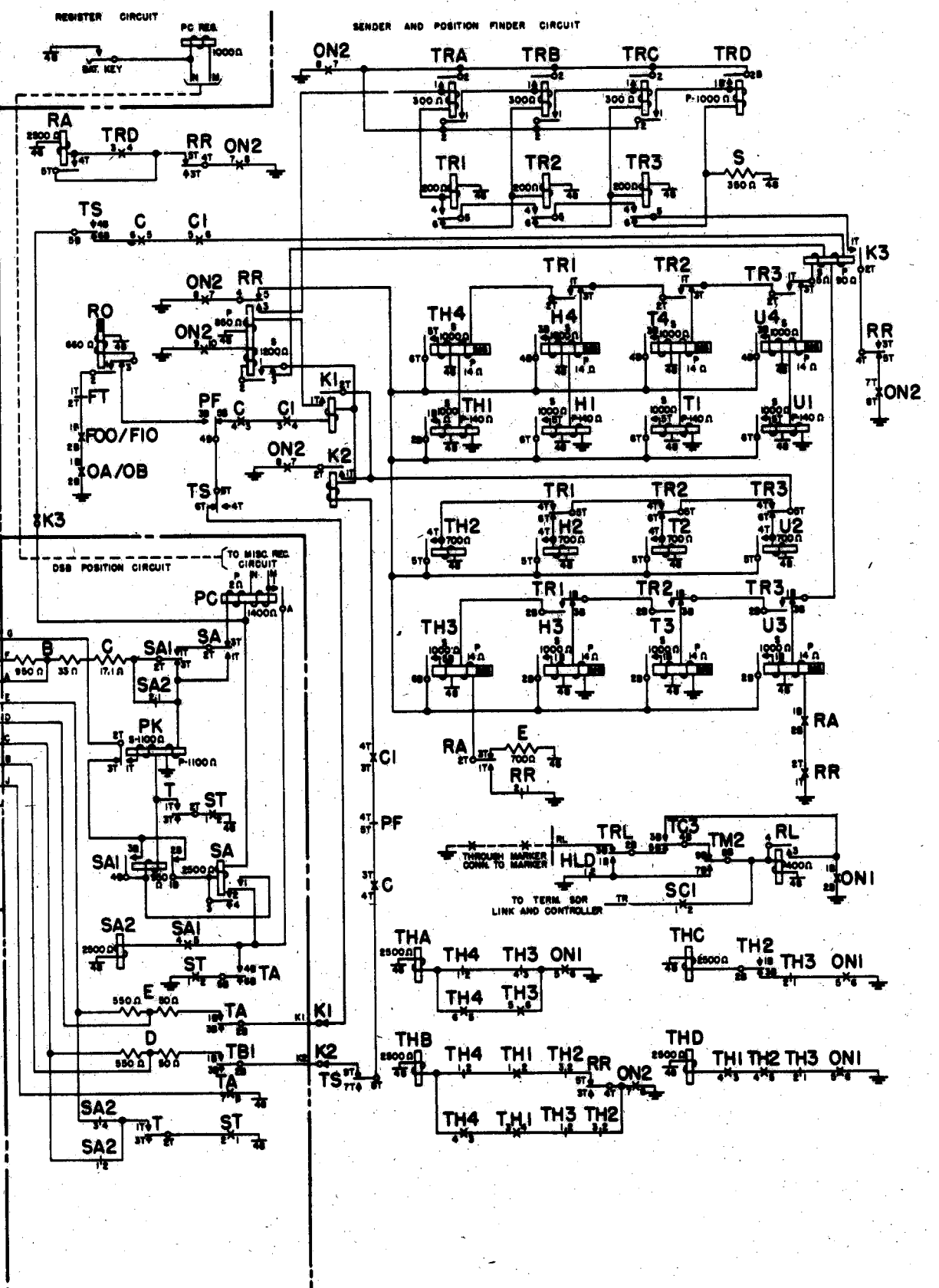
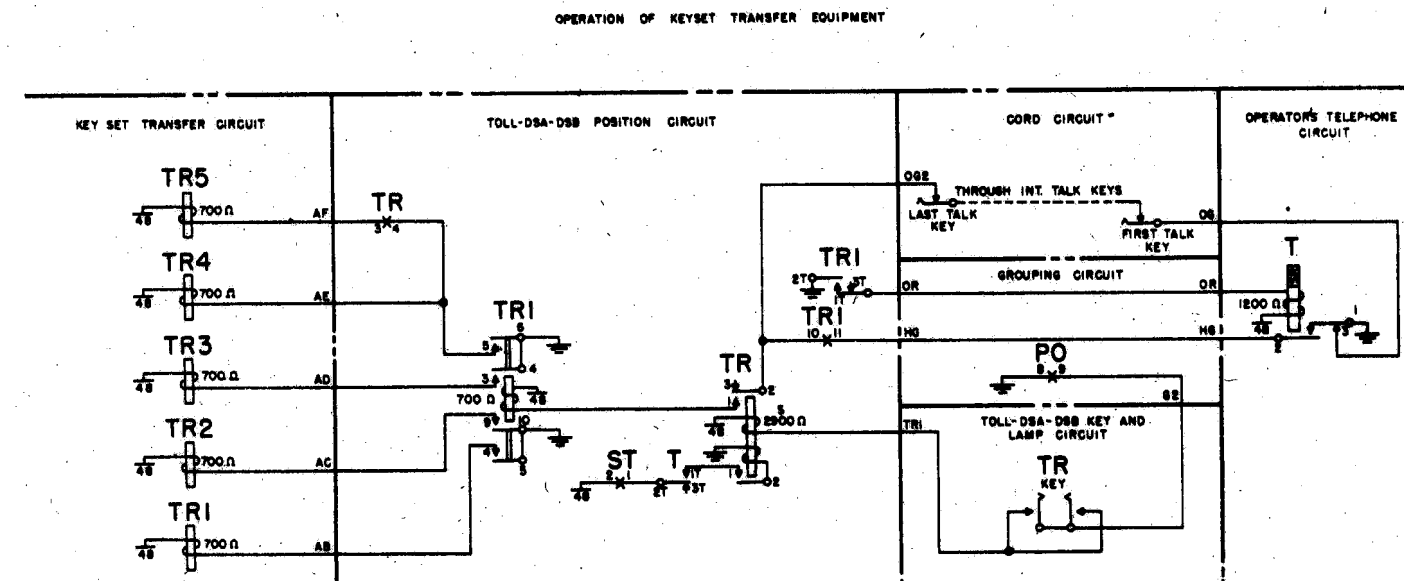
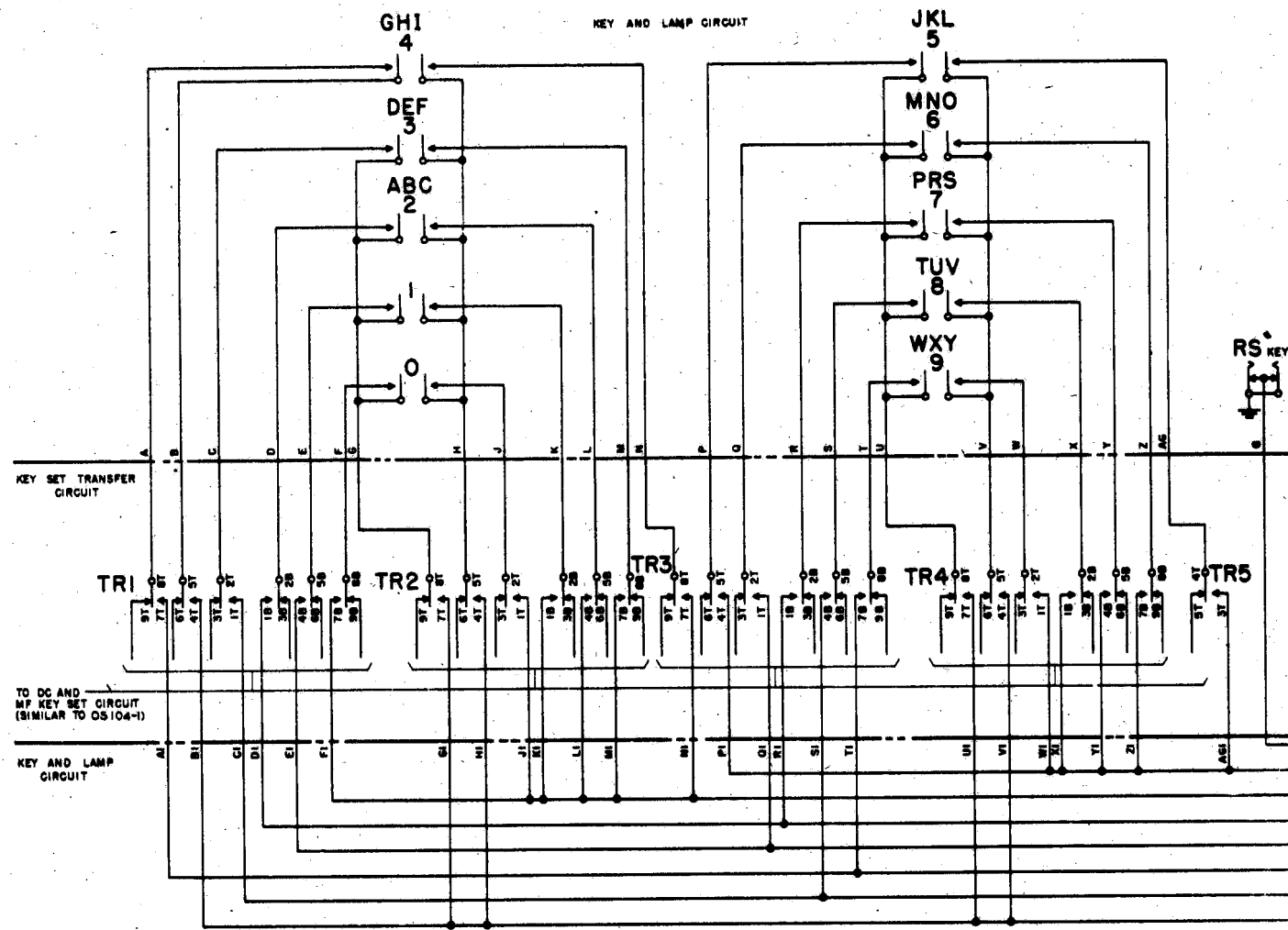
- |   |              |         |
|---|--------------|---------|
| KEY SET TRANSFER                            | SD-55992-01, | ISS. 3  |
| POSITION BUSY AND NIGHT ALARM CKT.          | SD-21139-01, | ISS. 22 |
| CORD CKT.                                   | SD-64737-01, | ISS. 9  |
| GROUPING CKT.                               | SD-64740-01, | ISS. 10 |
| INCOMING TRUNK CKT.                         | SD-25875-01, | ISS. 2  |
| KEY AND LAMP CKT.                           | SD-56029-01, | ISS. 6  |
| OPERATORS TELEPHONE CKT. (TOLL)             | SD-55110-01, | ISS. 14 |
| POSITION CKT.                               | SD-55996-01, | ISS. 6  |
| *SENDER AND POSITION FINDER CKT.            | SD-25014-01, | ISS. 25 |
| TERMINATING SENDER LINK AND CONTROLLER CKT. | SD-25459-01, | ISS. 18 |

"B" SWITCHBOARD  
 COMBINED TOLL-DSA-DSB POSITION

DATE	ISSUE	BY	CHKD
3-16-70	1		



'B' SWITCHBOARD COMBINED TOLL-DSA-DSB POSITION

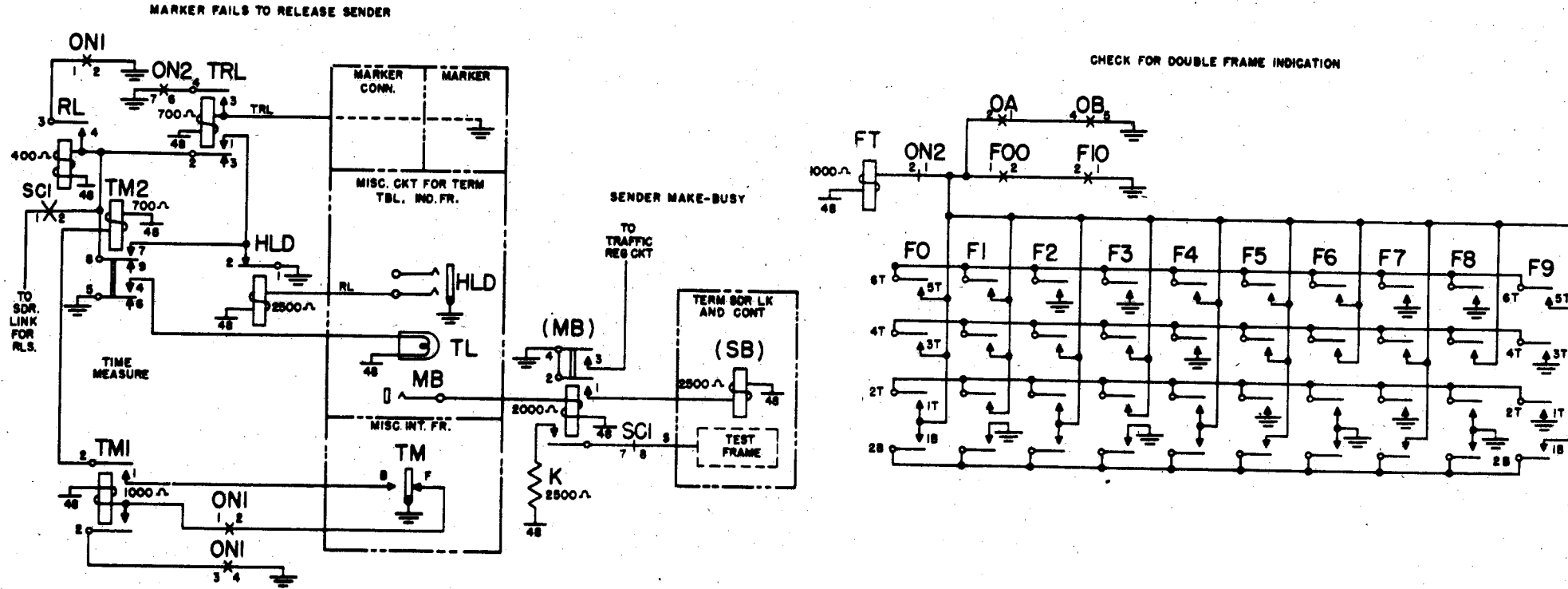


"B" SWITCHBOARD  
COMBINED TOLL-OSA-DSB POSITION

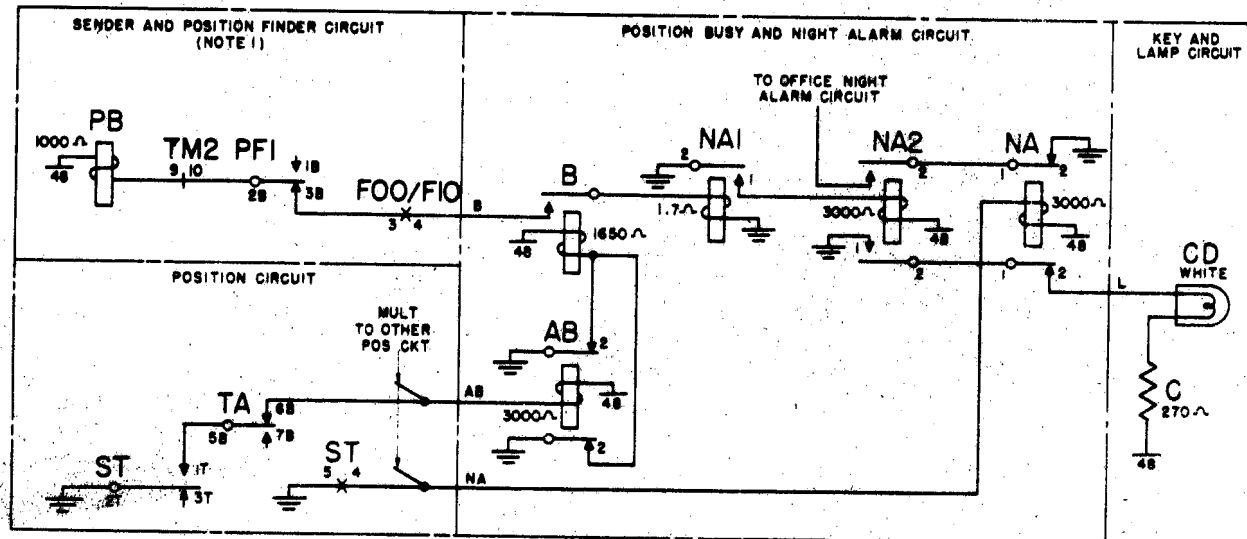
4 SHEETS, SHEET 3  
MP-11512

ISSUE 1	MARKED
DATE	5-16-50

### SENDER AND POSITION FINDER CIRCUIT



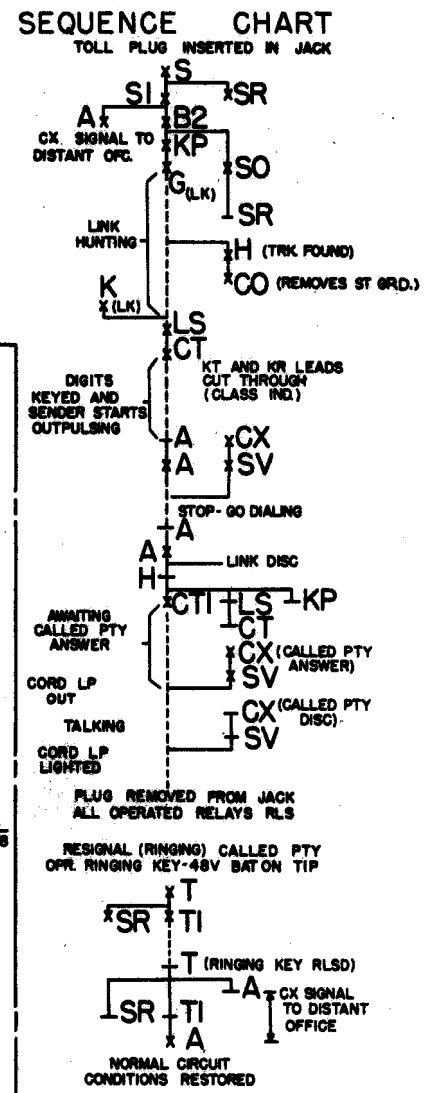
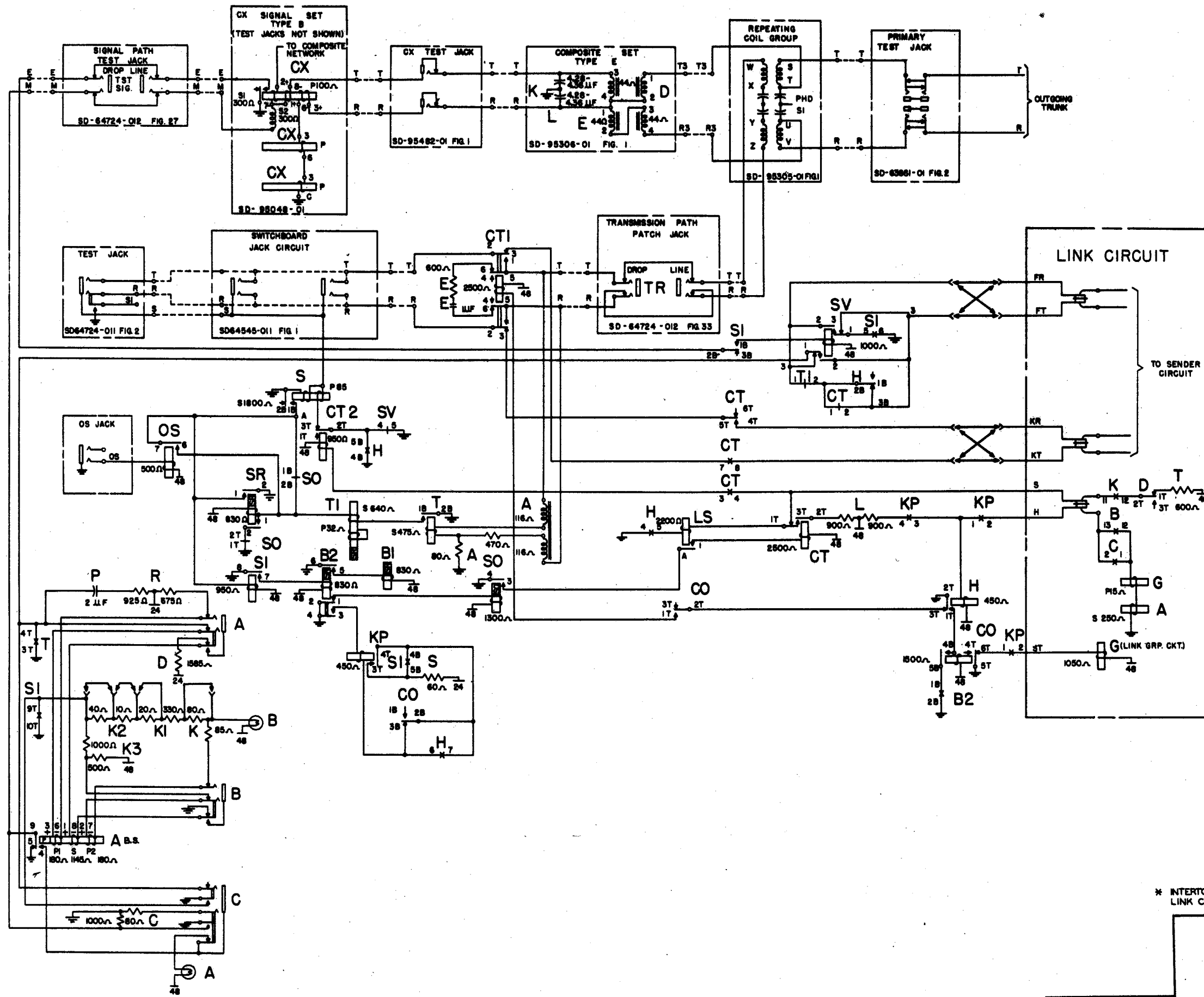
### NIGHT (CALL WAITING) ALARM



\*B\* SWITCHBOARD  
COMBINED TOLL-DSA-DSB POSITION



ISSUE	1	CS&K
DATE	3-11-59	



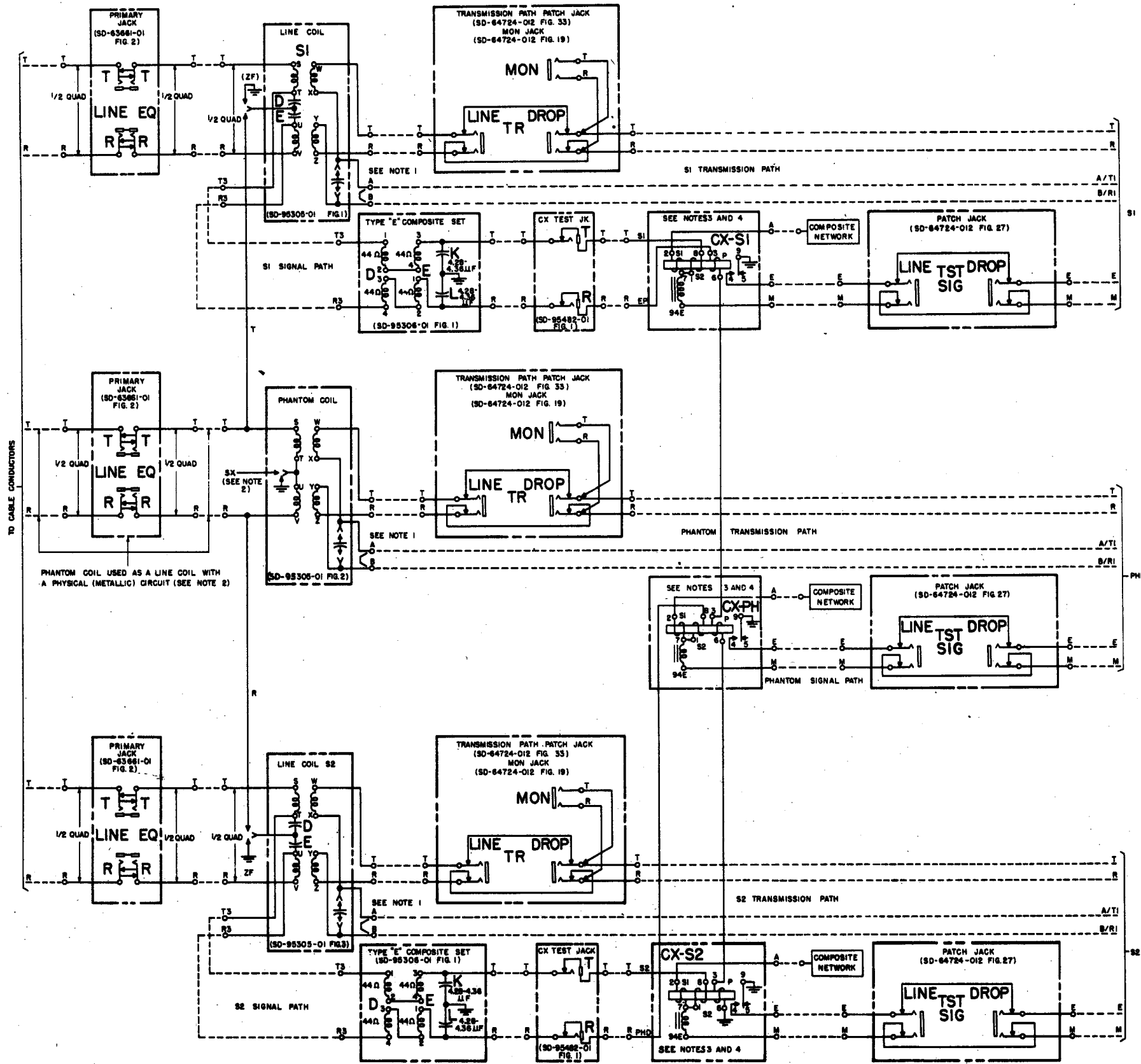
\* INTERTOLL DIALING OUTGOING TRUNK CKT. SD-64538-01 ISS. 13 D  
LINK CKT. SD-90705-01 ISS. 18 D

**INTERTOLL DIALING OUTGOING TRUNK CIRCUIT**  
ONE-WAY OPERATION TO STEP-BY-STEP DIAL OFFICE  
COMPOSITE SUPERVISION

NO. 3C OR 3CL TOLL SWBD.

OS 110-1

ISSUE	1	1	1
DATE	3-17-50		



PHANTOM COIL USED AS A LINE COIL WITH A PHYSICAL (METALLIC) CIRCUIT (SEE NOTE 2)

- NOTE 1: TRUNK CIRCUIT USED DETERMINES WHETHER CONDENSER BRIDGE, STRAP OR TRUNK EQUIPMENT IS TO BE CONNECTED ACROSS X-Y COIL TERMINALS (T-R LEADS).
- NOTE 2: SX WIRING AND PRIMARY TEST JACK REQUIRED WHEN THE PHANTOM COIL IS USED AS A LINE COIL IN A PHYSICAL (METALLIC) CIRCUIT. ZF WIRING FOR SIDE CIRCUITS IN PLACE OF T AND R, WHERE SPECIFIED.
- NOTE 3: LOCAL TEST JACK FOR THE CX RELAY NOT SHOWN.
- NOTE 4: THIS OPERATIONAL SCHEMATIC IS BASED ON THE USE OF TYPE E COMPOSITE SET EQUIPMENT AND TYPE B CX EQUIPMENT. EQUIVALENT TYPES ARE CONNECTED IN A SIMILAR MANNER.

COMPOSITE SIGNALING CIRCUIT TYPE B SD-55415-01 ISS. 5  
 COMPOSITE SIGNALING TYPE B SD-95408-01 ISS. 11

**COMPOSITE EQUIPMENT  
 TYPICAL TEST AND PATCHING JACK ARRANGMENTS  
 USING NO. 18B TOLL TEST BOARD**

NO. 3C OR 3CL TOLL SWBD.

OS III - 1

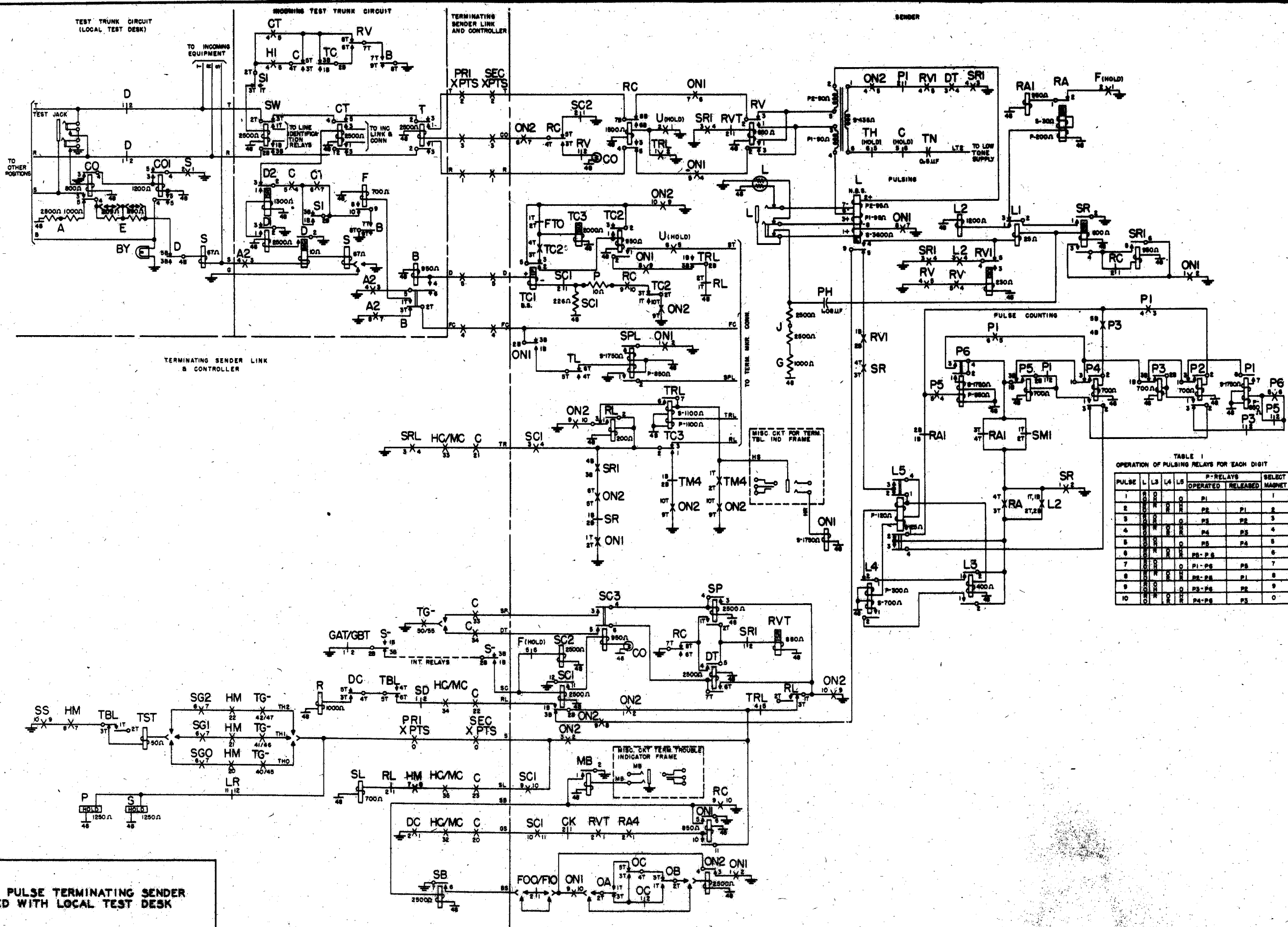


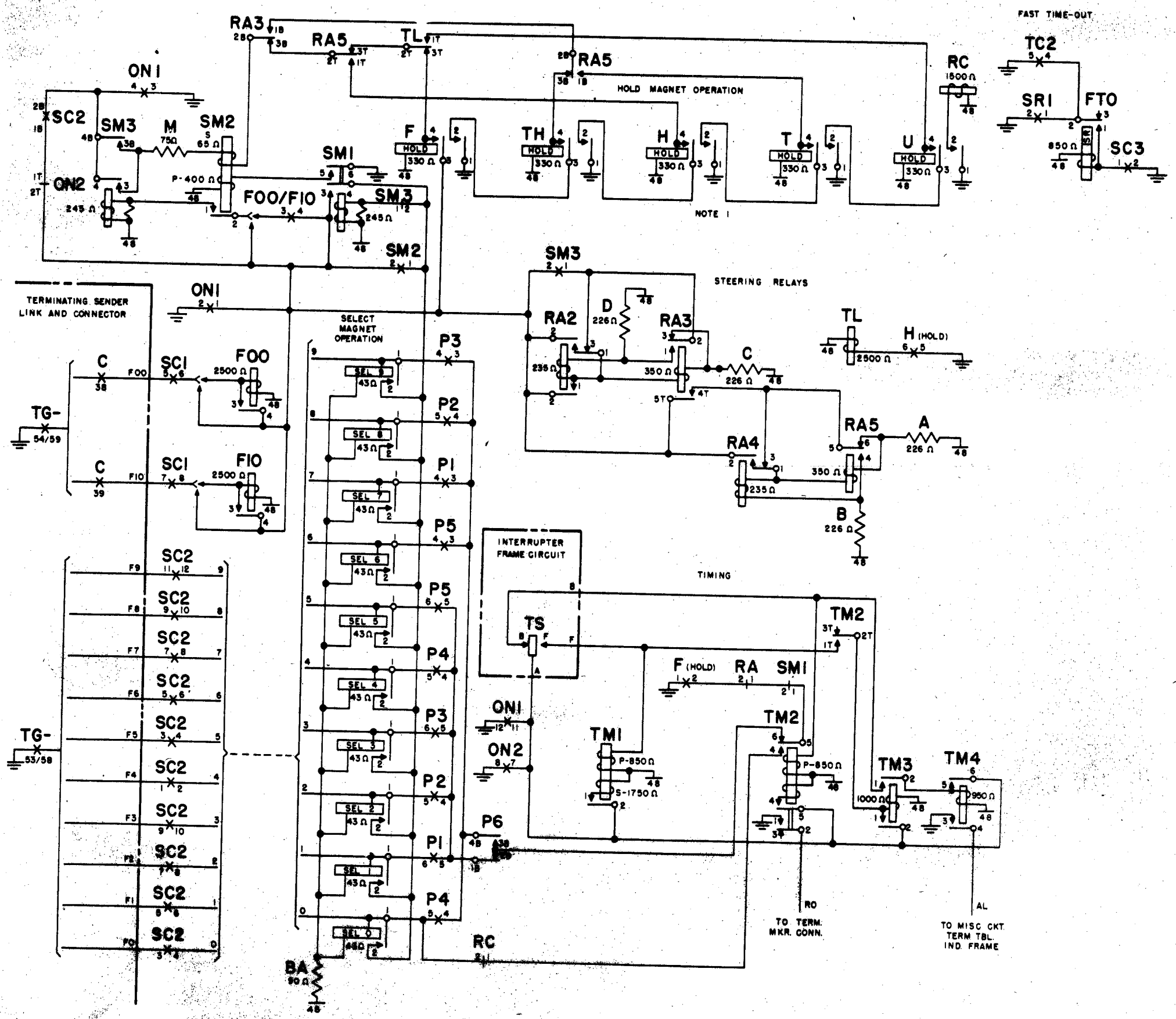
TABLE I  
OPERATION OF PULSING RELAYS FOR EACH DIGIT

PULSE	L RELAYS				P-RELAYS		SELECT MAGNET
	L3	L4	L5	OPERATED	RELEASED		
1				P1		1	
2				P2	P1	2	
3				P3	P2	3	
4				P4	P3	4	
5				P5	P4	5	
6				P6	P5	6	
7				P1-P6	P6	7	
8				P1-P6	P5	8	
9				P1-P6	P4	9	
10				P1-P6	P3	0	

DIAL PULSE TERMINATING SENDER  
USED WITH LOCAL TEST DESK

MP-11515 2 SHEETS, SHEET 1

ISSUE	1	K.B.W.
DATE	3-17-59	



HOLD MAGNET OPERATION

SM3	H.MAG.	RA2	RA3	RA4	RA5
O	F	O	O	O	O
R	H	R	R	R	O
O	TH	R	R	R	O
R	H	O	R	R	O
O	HOLD	O	R	R	H
R	H	R	O	R	H
O	U(HC)	O	R	R	R
R	U(HC)	O	R	R	R

- NOTES:
- OPERATIONAL SCHEMATIC BASED ON USE OF H WIRING TO ARRANGE SENDER TO FURNISH REVERSE BATTERY WITH DIAL TONE UPON SEIZURE.
  - FOR D.P. SENDER CROSSPOINT ARRANGEMENTS AND CONNECTIONS TO TERMINATING MARKER CONNECTOR REFER TO SD-25434-012.

- D.P. TERMINATING SENDER CKT. SD-25434-01, ISS. 22  
 INCOMING TRUNK CKT. (L.T.D.) SD-25432-01, ISS. 9  
 MISCELLANEOUS CIRCUIT-TERM. TROUBLE IND. FR. SD-25064-01, ISS. 24  
 TERMINATING SENDER LINK AND CONTROLLER CKT. SD-25459-01, ISS. 23  
 TEST TRUNK CKT.-LOCAL TEST DESK NO. 14 SD-90018-01, ISS. 15

DIAL PULSE TERMINATING SENDER  
 USED WITH LOCAL TEST DESK

SD-25015-01

KEY PULSING SENDER CIRCUIT

LOCATION			LOCATION			LOCATION			LOCATION		
DESIG.	SD SHEET NO.	OS 108-1 SHEET NO.	DESIG.	SD SHEET NO.	OS 108-1 SHEET NO.	DESIG.	SD SHEET NO.	OS 108-1 SHEET NO.	DESIG.	SD SHEET NO.	OS 108-1 SHEET NO.
0-6	H10- -0101	4	CI1,2	G35- -0103	5	GR	J35 -0103	5	OB1,2,4	B6- -0101	4
1'-6'	H10- -0101	4	CK	C39 -0103					OB5	A9 -0101	
11X	C52 -0104	1	CL	G54 -0104 F64 -0104	2	H	D29 -0102	5	OE	E2 -0101	
			CL1-4	G5- -0101	5	H'	D28 -0102	5	OF	F14 -0101	3,5
A	A27 -0102	5	CO	I45 -0103	1	H1,2	B67- -0105 H69- -0105	2,5	OF1	F13 -0101	3,5
A'	A26 -0102	5	CR1-5	E4- -0101		H4,5	D22- -0102	2,5	OF2	G11 -0101	3
A1,2,4,5	B49- -0104 B58- -0104	2	CT	F31 -0103 A72 -0105 E83 -0111	1	HC	D26 -0102	2	OF3	A69 -0105 C71 -0105	3
A1X	C51 -0104	2				HL	E27 -0102	2	OF4	F11 -0101	3
AC	B52 -0104 B62 -0104	2	D	E3 -0101	1				OG1,2,4,5	B2- -0101	4
ACX	C34 -0104	1	DC	D31 -0103 E31 -0103	1	IA	D14 -0101	4	ON	D44 -0103	1
AL	B54 -0104 B64 -0104	2	DRL	C2 -0101	1	IS	C6 -0101	4	ON1	C40 -0103	1
AV	D17 -0101	4	DS	D39 -0103	1				OP	E68 -0105 C69 -0105 F80 -0111	
AV1	F71 -0105	5	DS1	B54 -0104 C64 -0104	1	KC	A84 -0111 C84 -0111	2	OP1,2	E67- -0105 C67- -0105 G79- -0111	
			DST	C3 -0101	1	KCR	B81 -0111		OT	E21 -0102	5
B	A25 -0101	5				KCT	C80 -0111		OT1,2	E20 -0102	5
B'	A24 -0101	5	F00	C44 -0103	1	KR	C37 -0101	2			
B0'	H17 -0101	4	F0-9	A39- -0103	1	KR1	E66 -0105 C67 -0105 G78 -0111	2	PC	B32 -0103	2
B1,2,4,5	E49- -0104 E58- -0104	2	F0'	G16 -0101	4	KRA	B34 -0103	2	PC1	B32 -0103	2
BC	E52 -0104 E62 -0104	2	F10	C45 -0103	1				PG	I36 -0103	5
BL	E54 -0104 E64 -0104	2	FC	F21 -0102	2	LR	E37 -0103	1	PG1-3	I34- -0103	5
			FL	F20 -0102	2				PR	J34 -0103	6
			FO1-3	F16- -0101	3				PT	J36 -0103	6
			FP	J33 -0103	5,6						
C	A23 -0102	5	FR	I43 -0103	1	MB	E43 -0103	1	RC	H17 -0101	4
C'	A23 -0102	5	FR1	I40 -0103	1	MTG	D16 -0101	3	RM	A35 -0101	2
C1,2,4,5	G49- -0104 F58- -0104	2	FS	D10 -0101	4				RO	F2 -0101	1
CC	G52 -0104 F62 -0104	2	FS1,2	D11- -0101	4	ND	I39 -0103	1	RP	A34 -0103	2
			FT	I44 -0103	1	ND1,2	J39- -0103	1	RS	A36 -0103	2
			FT1	I42 -0103	1				RT	C8 -0101	4
			FTA,B	J45 -0103					RT1	C7 -0101	4

INDEX OF RELAYS ON SD'S & OS'S  
SD-25015-01, ISSUE 36

RM 1-1 2 SHEETS, SHEET 1 NO. 3C OR 3CL TOLL SWED.

ORDER AS BSP ITEM MP-11516

BELL TELEPHONE LABORATORIES, INC.

PRINTED IN U.S.A.

ISSUE 36  
DATE 12-20

MP-11516 2 SHEETS, SHEET 1

## SD-25015-01

## KEY PULSING SENDER CIRCUIT

DESIG.	LOCATION		DESIG.	LOCATION	
	SD SHEET NO.	OS 108-1 SHEET NO.		SD SHEET NO.	OS 108-1 SHEET NO.
S1	B17 -0101	4	TD2.5	C58- -0104	
S2	F69 -0105 H71 -0105	4	TDA	C61 -0104	
S3-6	A11- -0101	4	TG	D14 -0101	3.5
S1'-6'	C11- -0101	4	TG1,2	J31- -0103	3.5
SC	D46 -0103	1	TH	C29 -0102	5
SC1	C46 -0103	1	TH'	C28 -0102	5
SD1	G69 -0105 H71 -0105	4,5	TH1,2,4,5	C22- -0102	2.4
SG5	B66 -0105		THC	C26 -0102	2
SO	D5 -0101	4	THD	C20 -0102	6
SP	I33 -0103	5	THE	D20 -0102	6
SRA	E79 -0111		THL	C27 -0102	2
SRR	G78 -0111		TL	E27 -0102	2
SRT	E78 -0111		TM	A37 -0103	2
ST	C33 -0103	2	TM1-7	G39- -0103	
ST1,2,4,5	H22- -0102	5	TP	A36 -0103	2
STA	A29 -0102	5	TR1,2	C4- -0101	1
STA'	A28 -0102	5	TS	A37 -0103	2
STB	H29 -0102	5	TW	G4 -0101	
STB'	H28 -0102	5			
STC	H26 -0102	2	U	G29 -0102	5
STD	H20 -0102	6	U'	G28 -0102	5
STE	H20 -0102	6	U1,2,4,5	G22 -0102	
STF	H21 -0102		UC	G26 -0102	2
STL	H27 -0102	2	UL	G27 -0102	2
STP	D13 -0101	3			
SXR	C79 -0111		WT	E33 -0103 E34 -0103	1
			WT1.2	E32- -0103	1
T	E29 -0102	5			
T'	E28 -0102	5			
T1,2,4,5	E22- -0102				
TC	E26 -0102	2			
TCR	B79 -0111				
TD	C63 -0104				

INDEX OF RELAYS ON SD'S & OS'S  
SD-25015-01, ISSUE 36

SD-25015-01

KEY PULSING SENDER CIRCUIT

DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING	DESIG.	FUNCTIONAL MEANING
0-6	COUNTING RELAYS	FR	FUNDAMENTAL RING INDICATION	PR	PULSE RING	TD5	TWO-DIGIT PROGRESS
1'-6'	COUNTING RELAYS PRIME	FR1	FR1 AUXILIARY	PT	PULSE TIP	TDA	TWO-DIGIT PROGRESS
11X	ONE-ONE PREFIX	FS	FULL SELECTOR	RC	REGISTER CONTROL	TG	TRUNK GUARD
A	A PROGRESS	FS1,2	FS AUXILIARY	RM	RING MARGINAL	TG1,2	TG AUXILIARY
A'	PROGRESS PRIME	FT	FUNDAMENTAL TIP INDICATION	RO	REORDER	TH	TH PROGRESS
A1,2,4,5	A REGISTER	FT1	FT AUXILIARY	RP	RING POLARIZED	TH'	TH' PROGRESS PRIME
A1X	A1 AUXILIARY	FTA,B	FT AUXILIARY	RS	RING SENSITIVE	TH1,2,4,5	TH REGISTER
AC	A PULSE CUT THROUGH	GR	GROUNDING	RT	REGISTER TRANSFER	THC	THOUSANDS PULSE CUT THROUGH
ACX	AC AUXILIARY	H	H PROGRESS	RT1	RT AUXILIARY	THD,E	THOUSANDS REGISTER AUXILIARY
AL	A PULSE LOCK	H'	H PROGRESS PRIME	S1-6	SEQUENCE RELAY	THL	TH PULSE LOCK
AV,AV1	ADVANCE	H1,2,4,5	H REGISTER	S1'-6'	SEQUENCE PRIME RELAY	TL	T PULSE LOCK
B	B PROGRESS	HC	H PULSE CUT THROUGH	SC	SENDER CONTROL	TM	TIP MARGINAL
B'	PROGRESS PRIME	HL	H PULSE LOCK	SC1	SC AUXILIARY	TM1-7	TIMING
B1,2,4,5	B REGISTER	IA	INCOMING ADVANCE	SD1	STATION DELAY (Incoming group)	TP	TIP POLARIZED
BC	B PULSE CUT THROUGH	IS	INCOMING STEERING (Group selection)	SG5	SPECIAL GROUP	TR1,2	TROUBLE RELEASE
BL	B PULSE LOCK	KC	KEY CONTROL	SO	SKIP OFFICE	TS	TIP SENSITIVE
BO'	BREAK FUNDAMENTAL ZERO PRIME RELAY	KCR	KEY CONTROL RING	SP	START PULSING	TW	TWO-WIRE
C	C PROGRESS	KCT	KEY CONTROL TIP	SRA	STORED RING	U	U PROGRESS
C'	PROGRESS PRIME	KR	KEY RELEASE	SRR	STORED RING-RING	U'	PROGRESS PRIME
C1,2,4,5	C REGISTER	KRA,1	KEY RELEASE AUXILIARY	SRT	STORED RING-TIP	U1,2,4,5	U REGISTER
CC	C PULSE CUT THROUGH	LR	LINE RELEASE	ST	START	UC	U PULSE CUT THROUGH
CI1,2	CALL INDICATOR	MB	MAKE-BUSY	ST1,2,4,5	ST AUXILIARIES	UL	U PULSE LOCK
CK	CHECK	MTG	MARGINAL TRUNK GUARD	STA	STATION CONTROL (Number 10000 or over)	WT	WORK TIMER
CL	C PULSE LOCK	ND	NO DISTRICT (Juncter)	STA'	STA AUXILIARY	WT1,2	WT AUXILIARY
CL1-4	CLASS	ND1,2	ND AUXILIARY	STB	STATION CONTROL (Number under 10000)		
CO	CUT-OFF	OB1,2,4,5	OFFICE BRUSH	STB'	STB AUXILIARY		
CR1-5	COMPENSATING RESISTANCE	OE	OFFICE SELECTIONS END	STC	ST PULSE CUT THROUGH		
CT	CUT THROUGH	OF	OVERFLOW	STD,E	STATION REGISTER AUXILIARY		
D	D PROGRESS	OF1-4	OF AUXILIARIES	STF	STATIONS FIRST		
DC	DISTRICT CUT THROUGH	OG1,2,4,5	OFFICE GROUP	STL	ST PULSE LOCK		
DRL	DECODER (Marker) RELEASE	ON	OFF-NORMAL	STP	STEPPER		
DS	DECODER (Marker) START	ON1	ON AUXILIARY	SXR	SIMPLEX RING		
DS1	DS AUXILIARY	OP	OPERATOR	T	T PROGRESS		
DST	DECODER (Marker) START	OP1,2	OP AUXILIARY	T'	PROGRESS PRIME		
F0-9	FRAME INDICATION	OT	OVER TEN THOUSAND	T1,2,4,5	T REGISTER		
F00,10	FRAME INDICATION	OT1	NO PARTY LETTER	TC	TENS PULSE CUT THROUGH		
FC	F PULSE CUT THROUGH	OT2	UNDER TEN THOUSAND-HUNDREDS OTHER THAN "0" REGISTERED	TCR	TWENTY-CYCLE RING		
FL	F PULSE LOCK	PC	PULSE CONTROL	TD	TWO-DIGIT PROGRESS		
FO'	FUNDAMENTAL ZERO PRIME	PC1	PC AUXILIARY	TD2	TWO-DIGIT PROGRESS		
FO1-3	FUNDAMENTAL OPEN (Auxiliary to FO')	PG	PULSING				
FP	FINAL (Positive) PULSE	PG1-3	PG AUXILIARY				

ISSUE 3  
DATE 3-2-50

FUNCTIONAL DESIGNATIONS  
SD-25015-01, ISSUE 36