

BELL TELEPHONE LABORATORIES, INC.

STEP BY STEP SYSTEMS NO. 1 KEY SHEET

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FOR CURRENT DRAIN DATA SEE SD-31359-02
FOR EXPLANATION OF CONVENTIONS
SEE MASTER KEY SHEET SD-90250-01

REPLACING ES-262969 & ES-262975. REPLACED BY
SD-31377-01 FOR INF. DESK NO. 17MC, SD-90265-01 FOR
INF. DESK NO. 1. SD-90267-01 FOR INF. DESK NO. 2.

DWG. ISS.	C.D. ISSUE	DATE ISSUED	APPROVED
29	29	2-28-40	W.L.F. _I O.A.F.
30	30	12-16-40	W.L.F. _I O.A.F.
31	31	7-10-41	W.L.F. _I O.A.F.
32	32	10-1-41	W.L.F. _I O.A.F.
33	33	1-30-42	W.L.F. _I O.A.F.
34	34	6-12-42	W.L.F. _I O.A.F.
35	35	6-20-46	W.L.F. _I
36	36	12-6-48	A.J.B. _I
37	37	9-16-49	A.J.B. _I
38	38	4-15-53	E.E.G. B.P. F.C.R. E.W.O.
39	39	1-25-56	G.F.C. B.P. L.S.H. E.W.O.
40	40	8-3-59	CAS G.R.S. M.R. E.W.O.

A.T.C.

T.E.B.

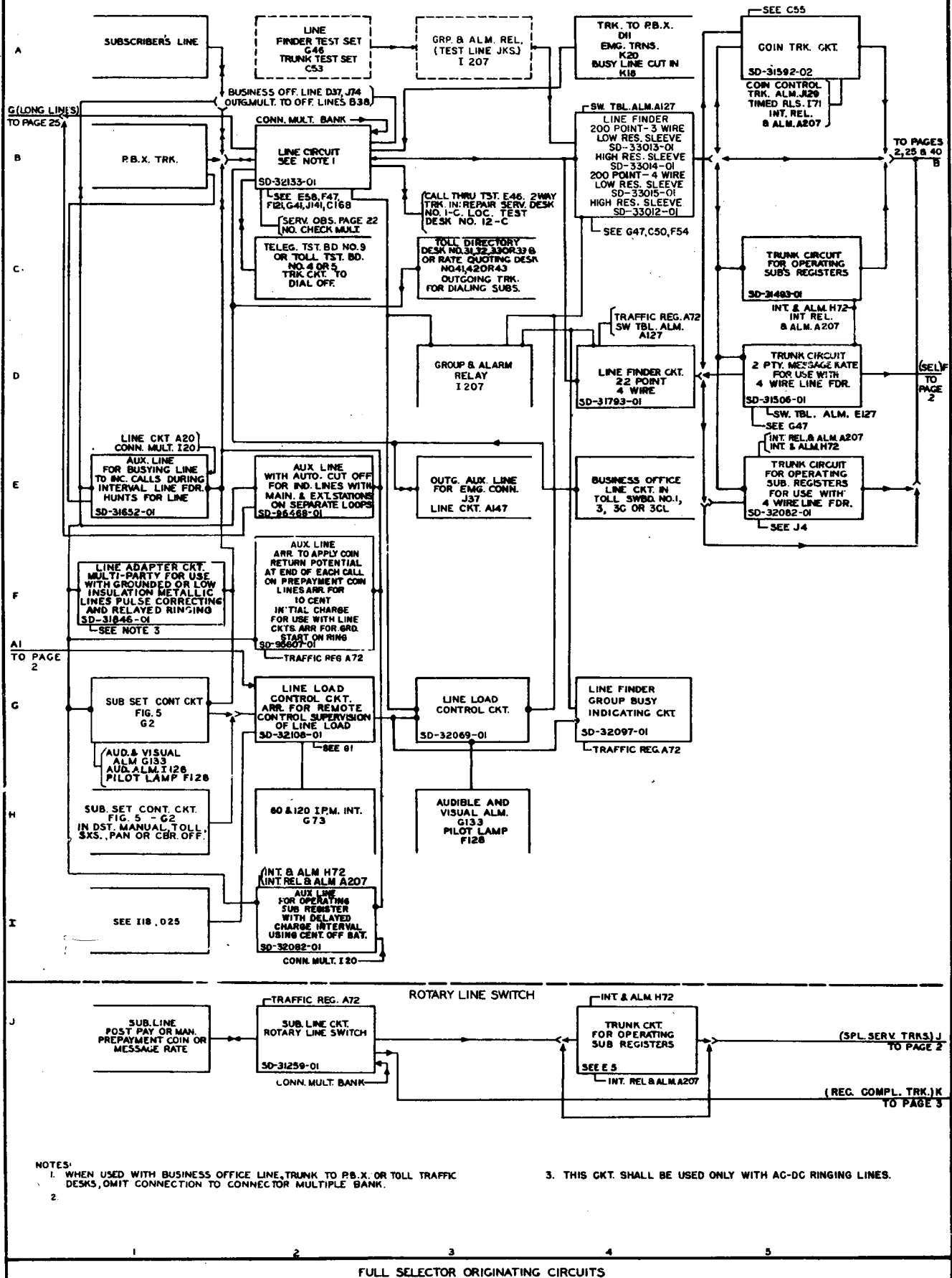
PRINTED IN U.S.A.

AT&TCO
STANDARD

A & M ONLY FOR
SWBD NO. 15C

SD-31359-01

22,100 OR 200 POINT LINE FINDER CKTS.



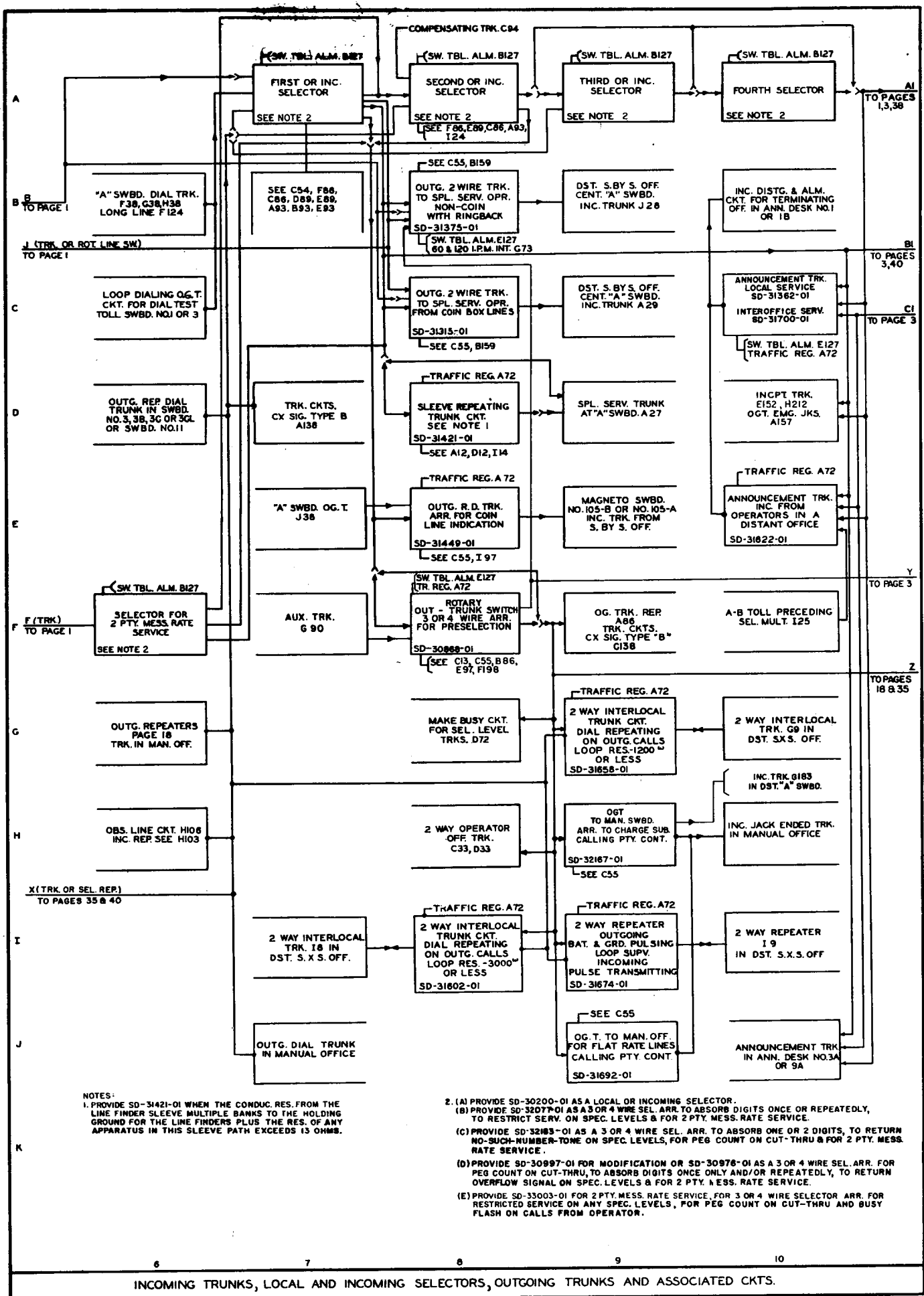
NOTES:

1. WHEN USED WITH BUSINESS OFFICE LINE, TRUNK TO P.B.X. OR TOLL TRAFFIC DESKS, OMIT CONNECTION TO CONNECTOR MULTIPLE BANK.

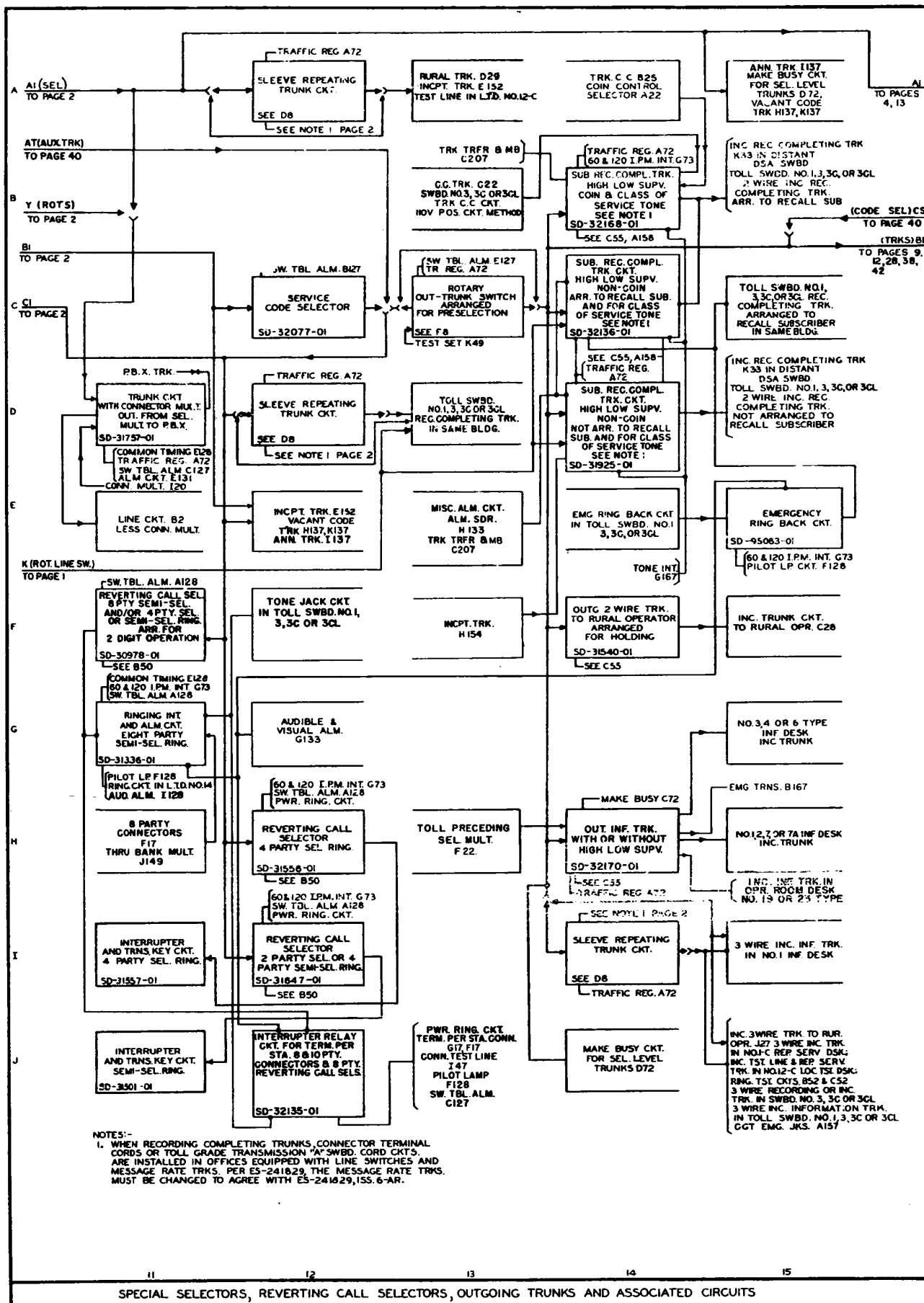
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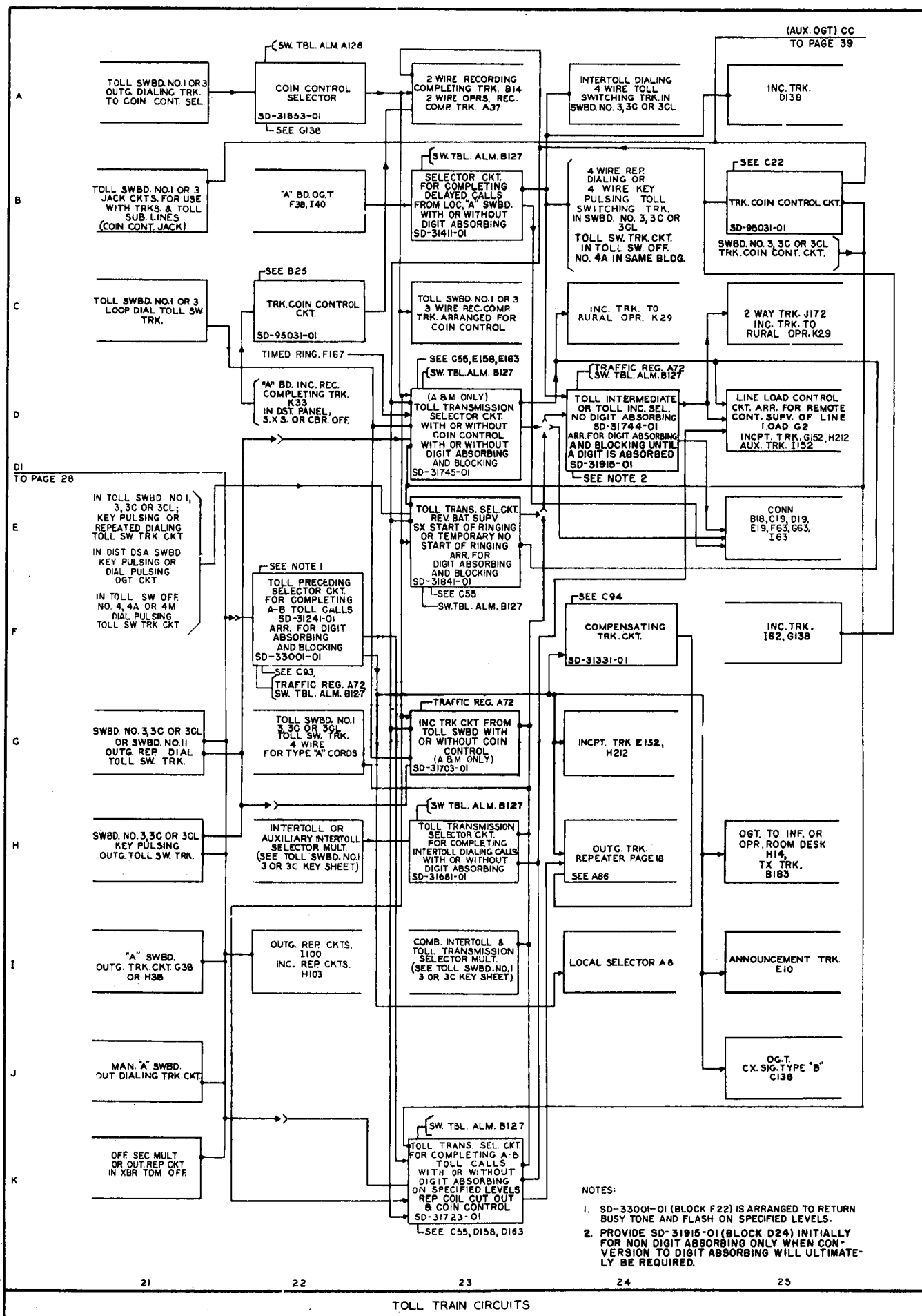
3. THIS CKT. SHALL BE USED ONLY WITH AC-DC RINGING LINES.

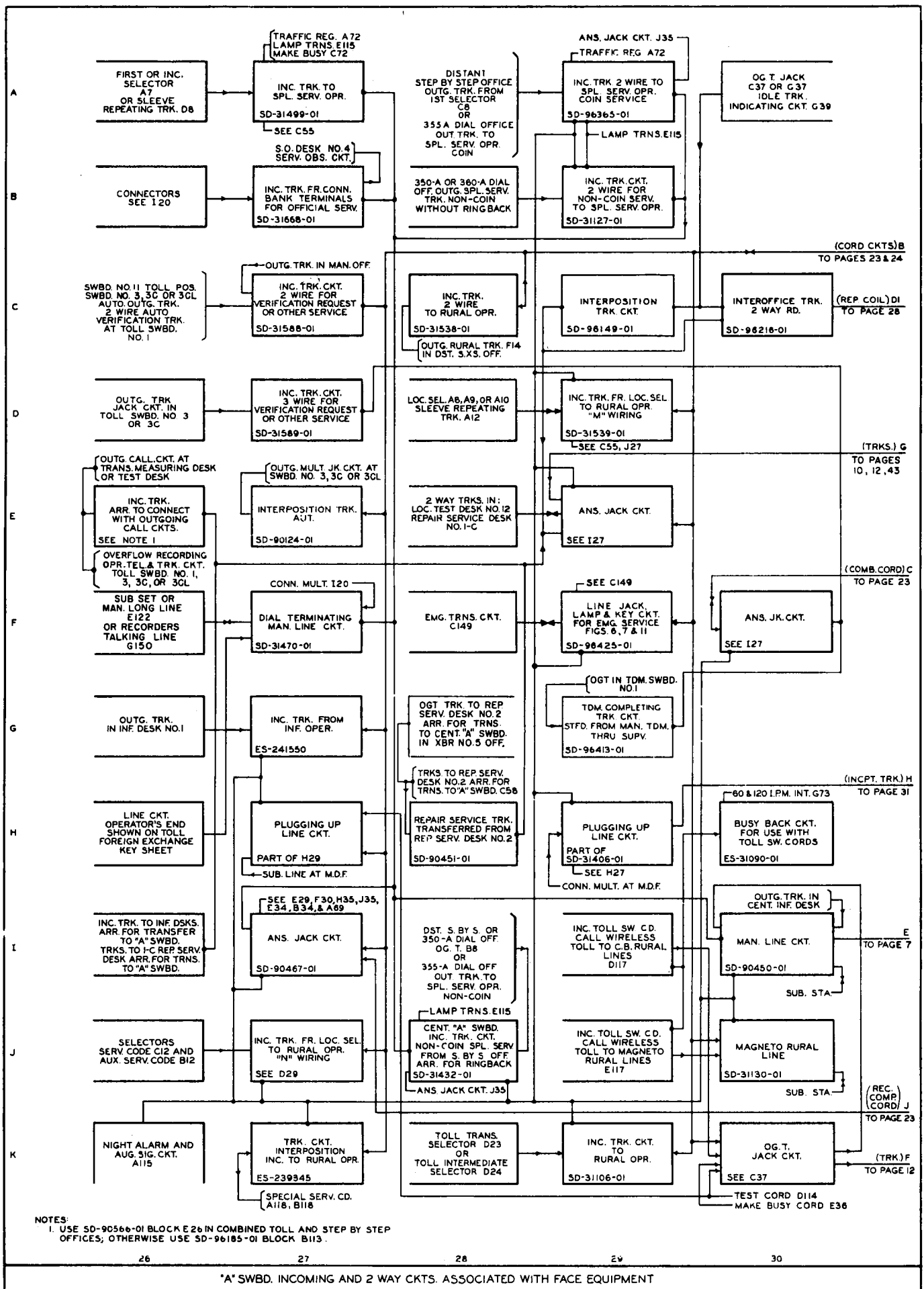
FULL SELECTOR ORIGINATING CIRCUITS

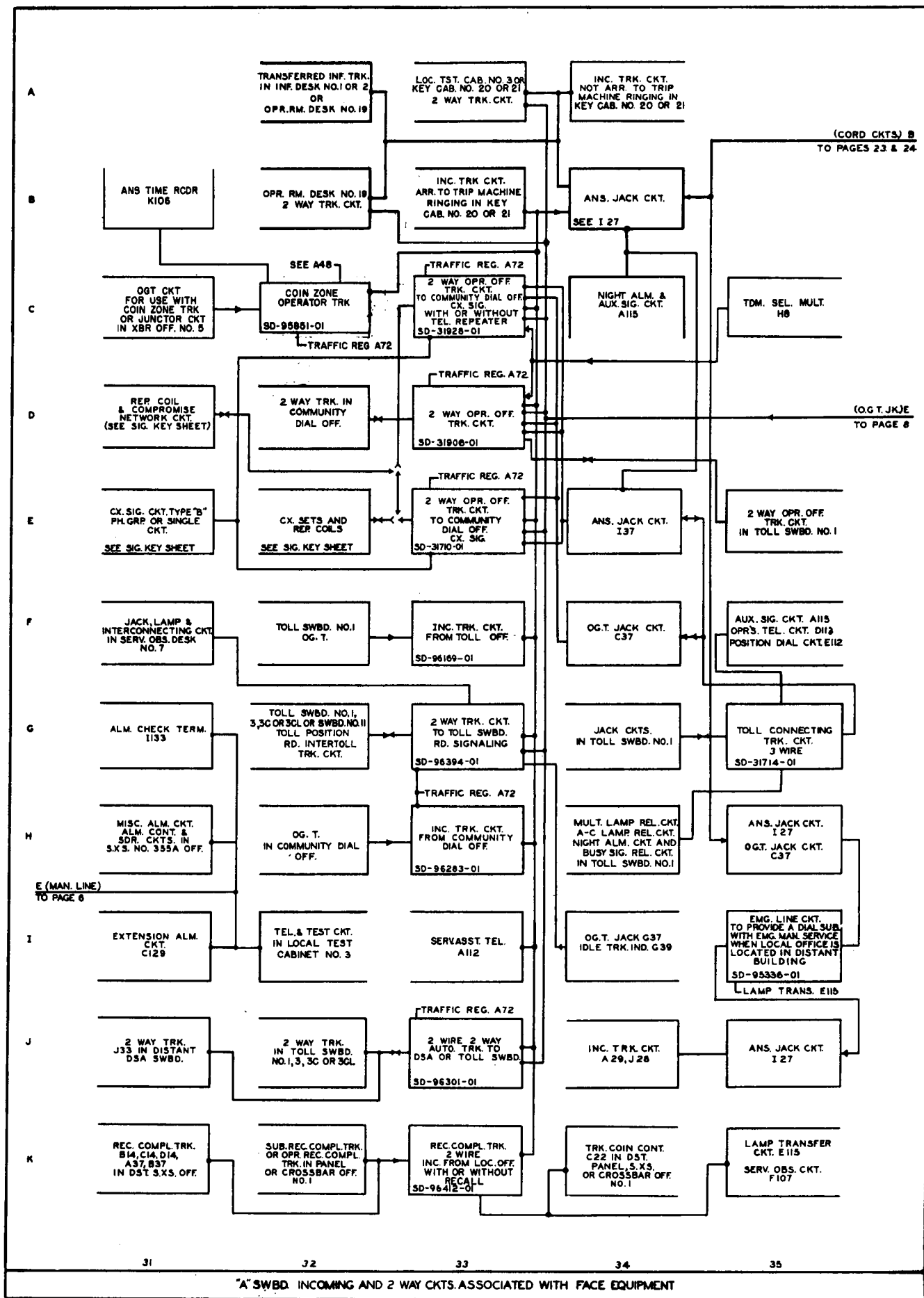


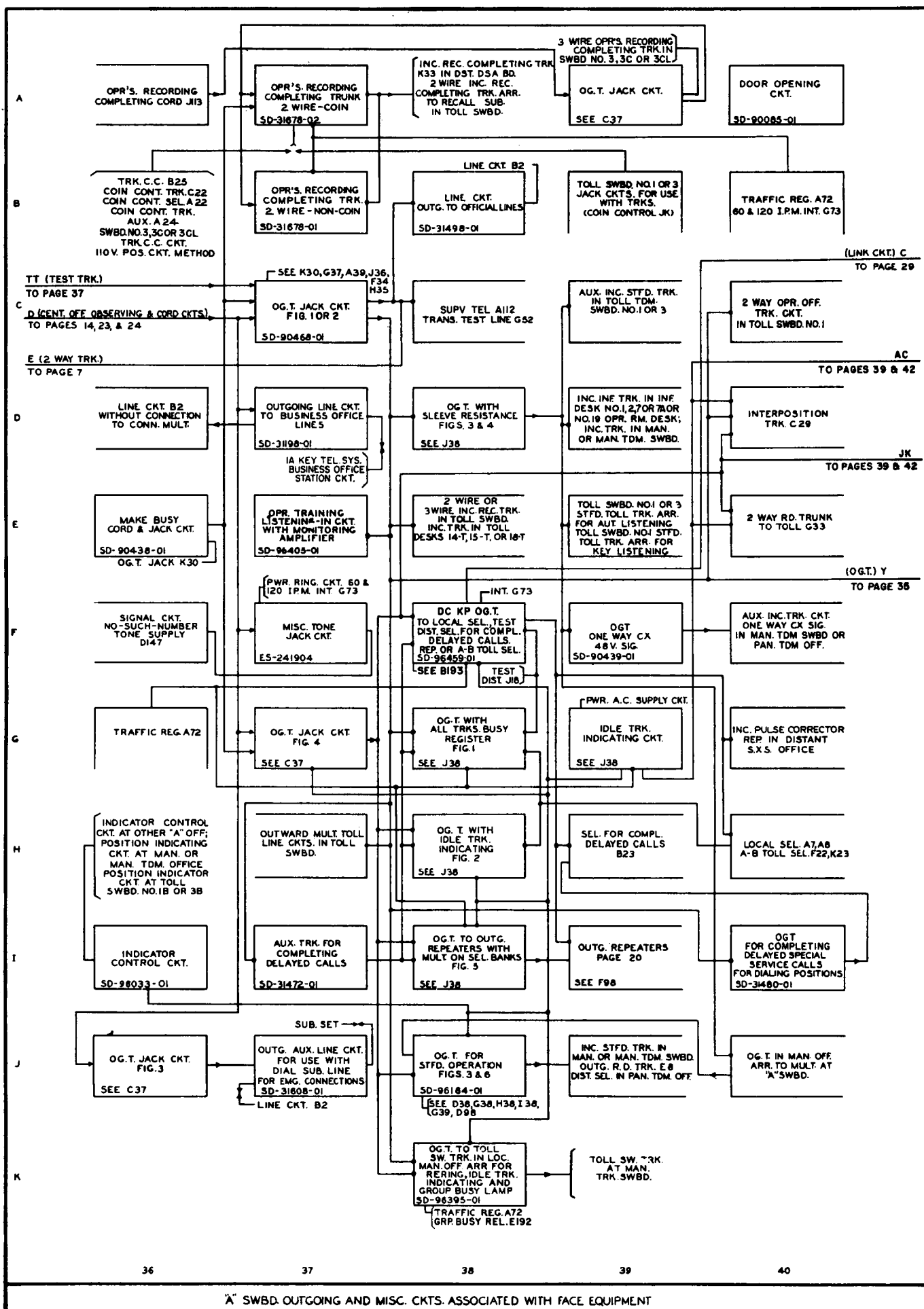
INCOMING TRUNKS, LOCAL AND INCOMING SELECTORS, OUTGOING TRUNKS AND ASSOCIATED CKTS.

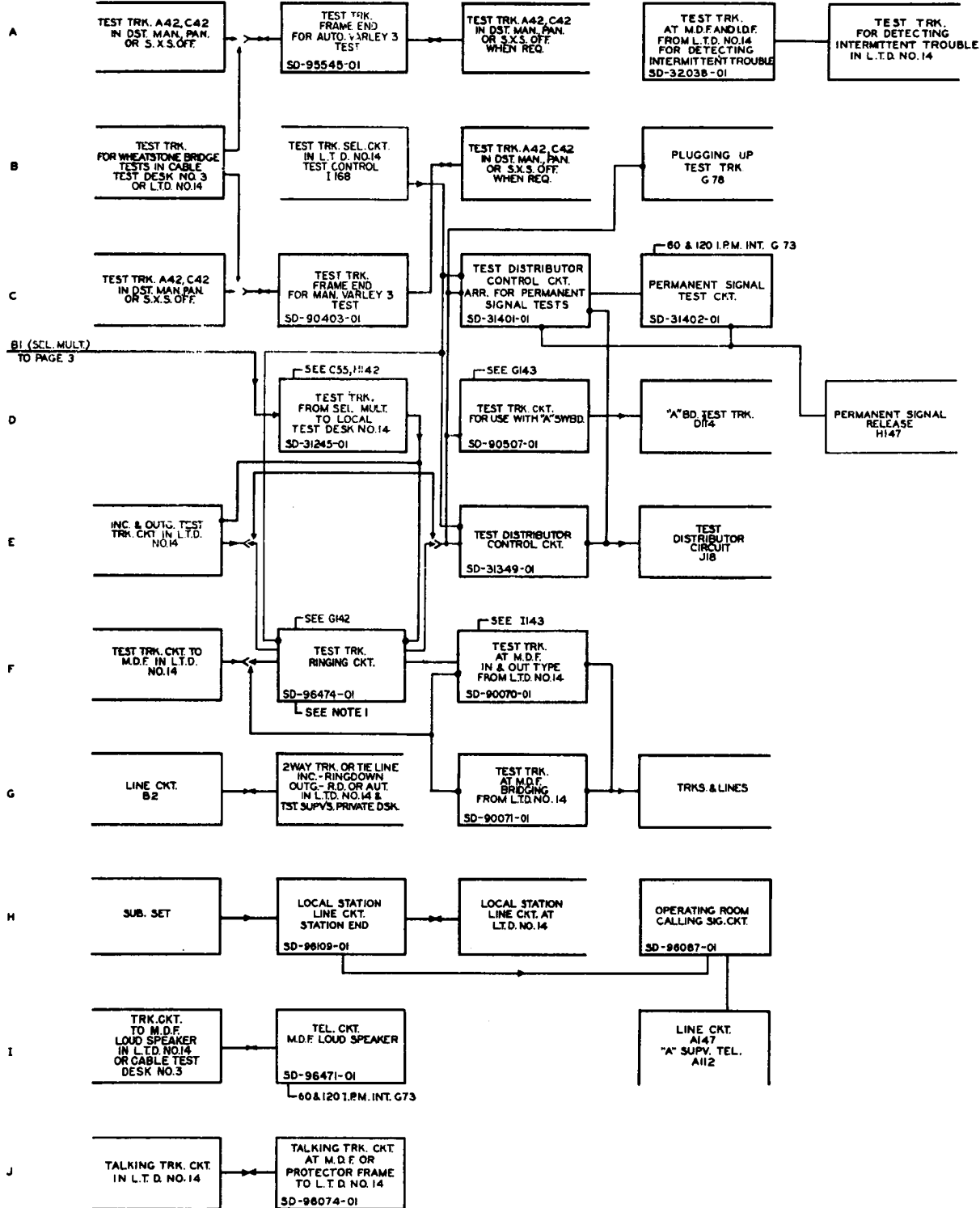












NOTES:

1. PROVIDE THE TEST TRK. RINGING CKT. F42 WHEN THE TRUNK CONDUCTOR LOOP EXCEEDS 300 OHMS IN SEMI-SELECTIVE OFFICES OR FULL SELECTIVE OFFICES IN WHICH ALL THE 4 PTY. LINES ARE EQUIPPED WITH TUBE SETS AND WHEN THE TRUNK CONDUCTOR LOOP EXCEEDS 200 OHMS IN FULL SELECTIVE OFFICES IN WHICH SOME OF THE LINES HAVE RELAY SETS REGARDLESS OF THE LENGTH OF THE MAX. SUB. LOOP IN THE OFFICE.

41

42

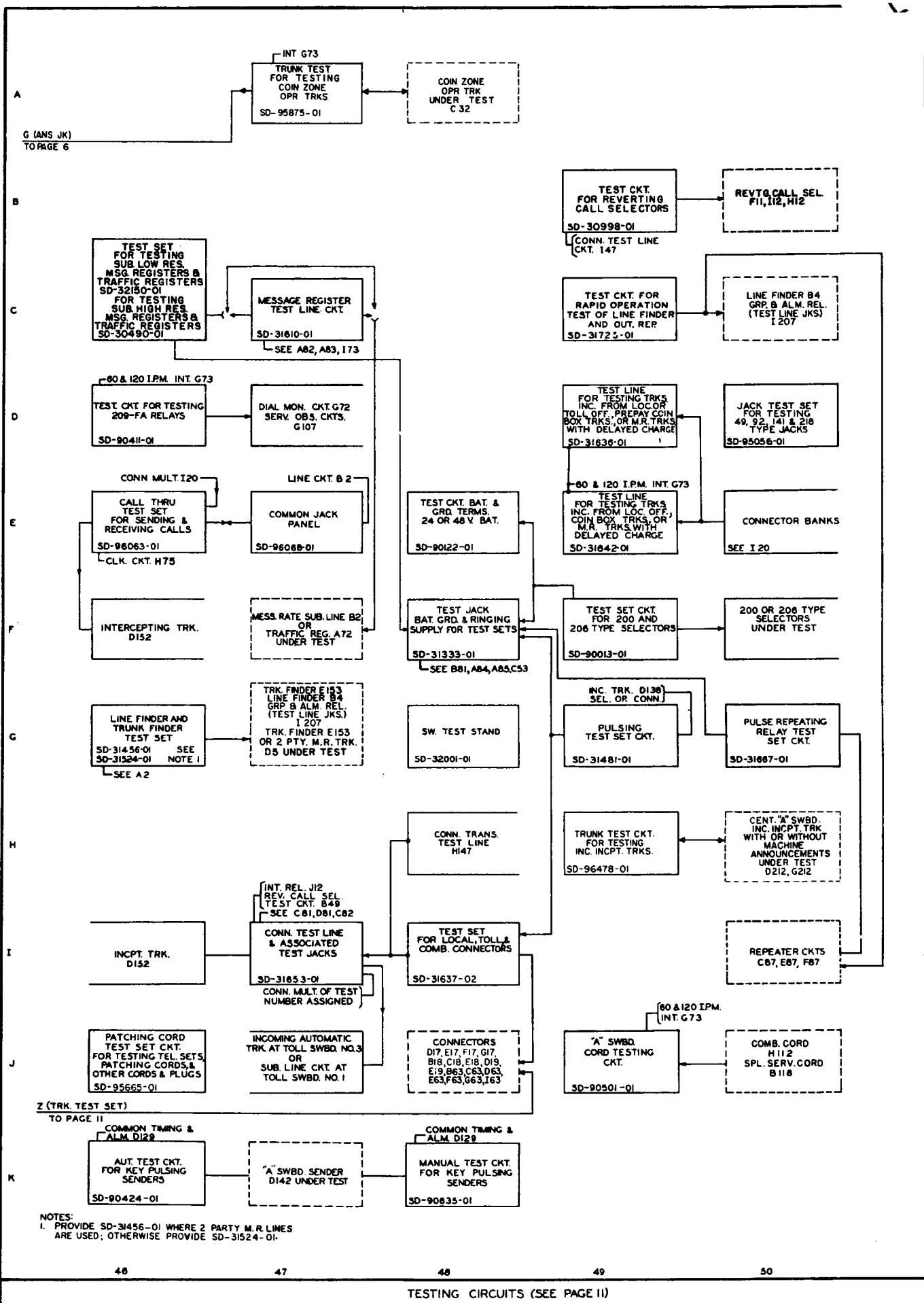
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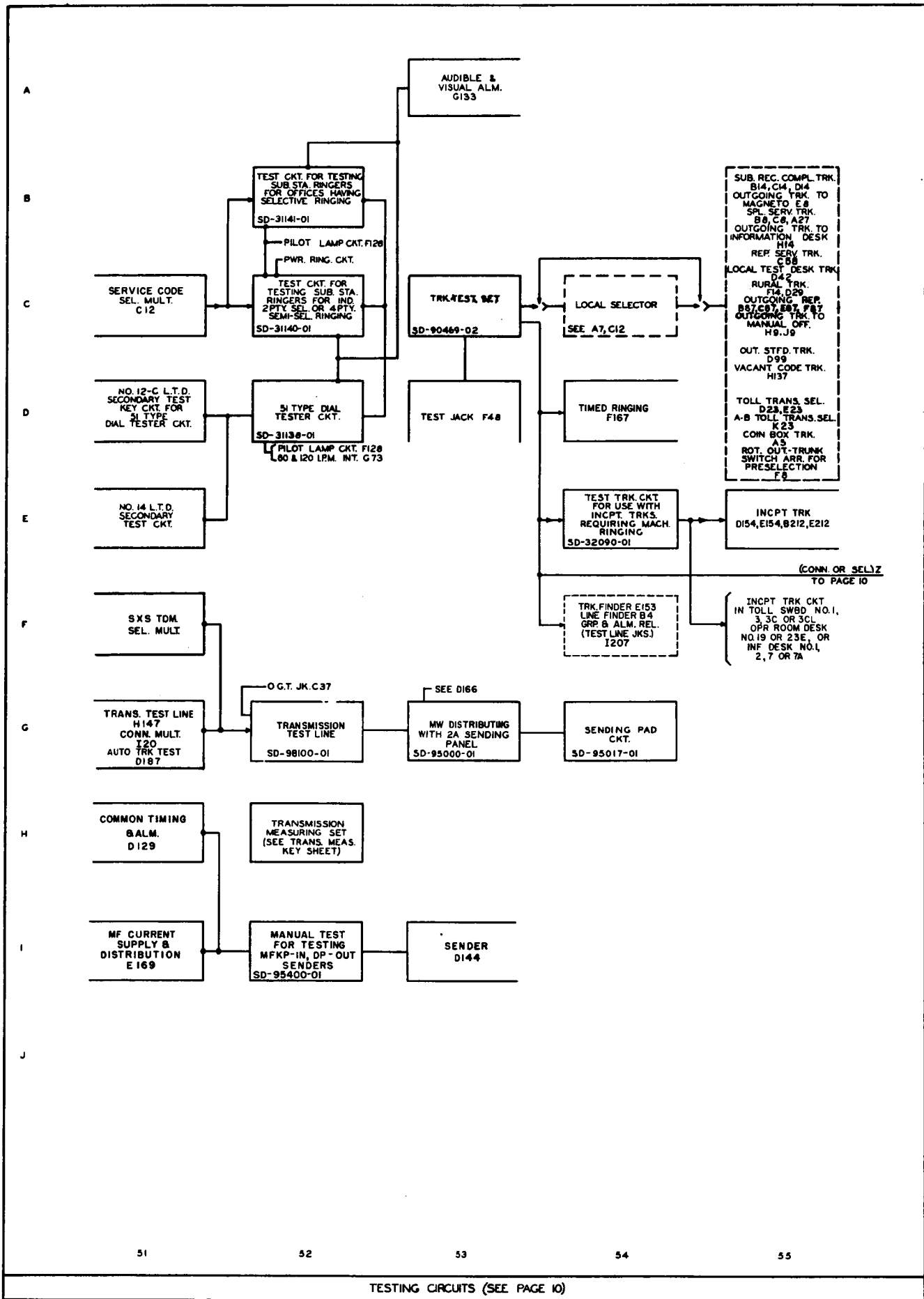
44

45

CKTS. CONNECTING WITH LOCAL TEST DESK NO. 14 AND CABLE TEST DESK NO. 3

SD-31359-01 - PAGE 9





CIRCUITS CONNECTING WITH REPAIR SERVICE DESK NO. 2

A

B

C

D

E

F

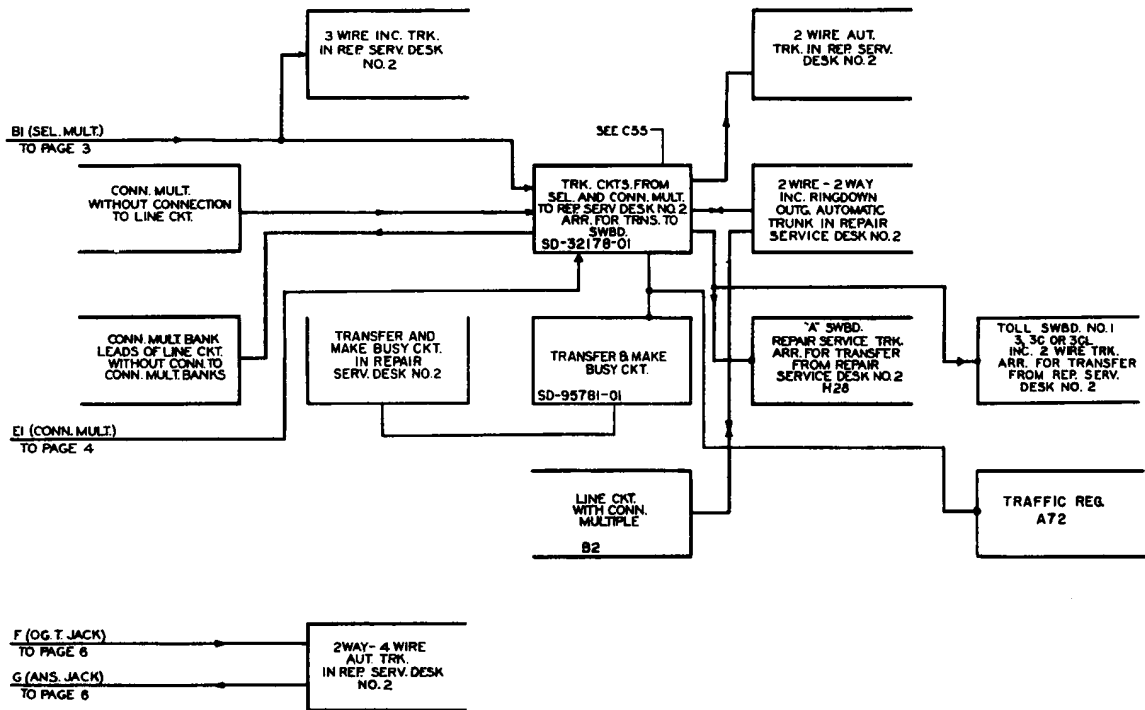
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H

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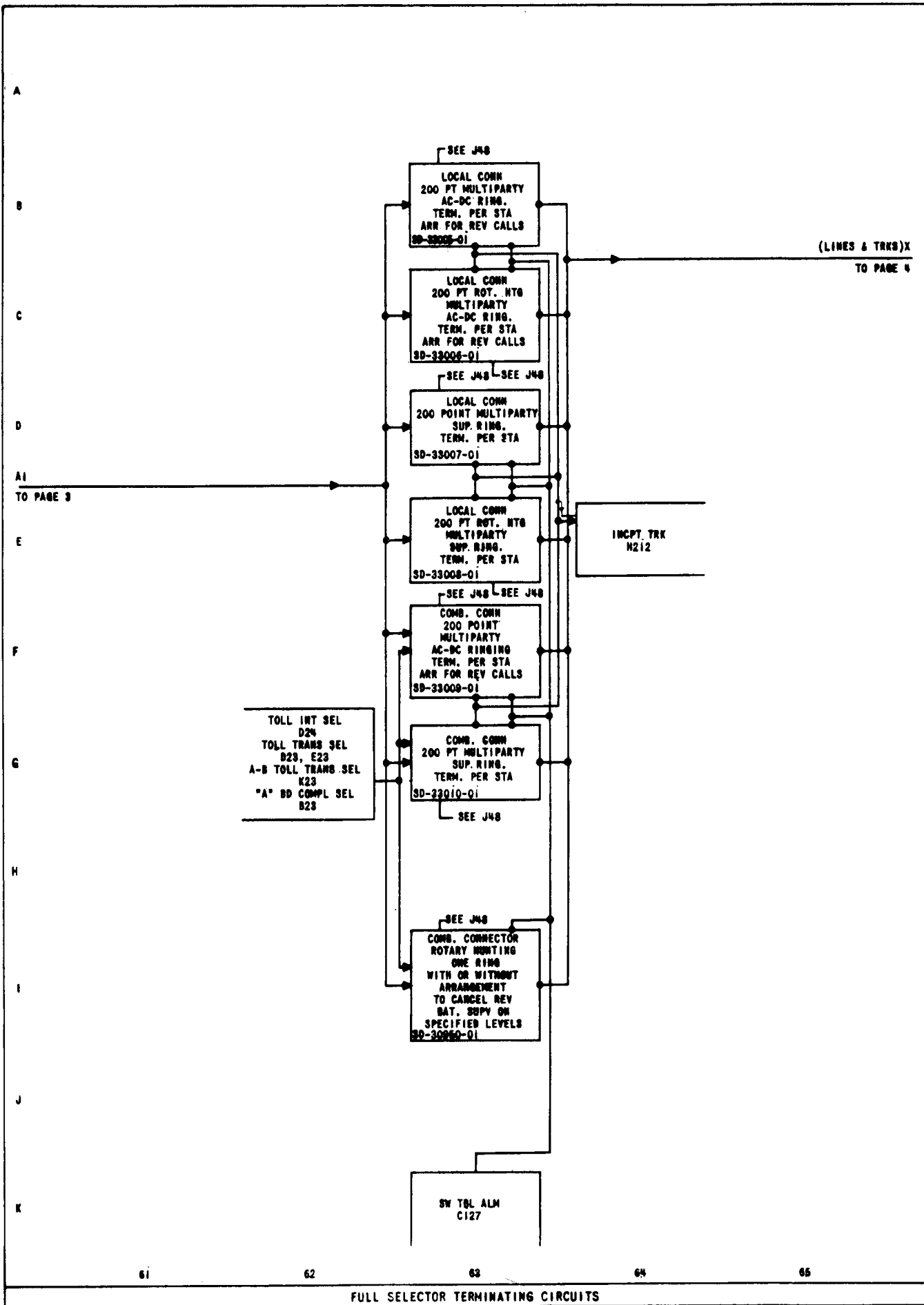
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58

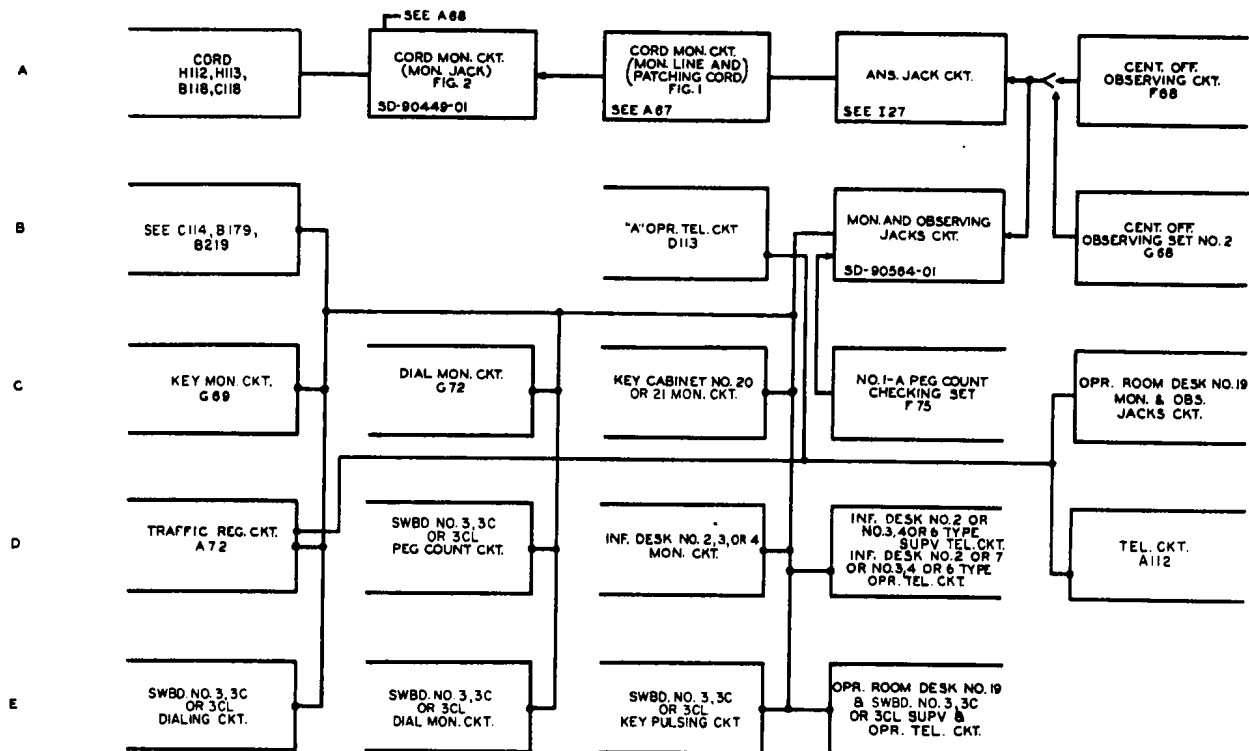
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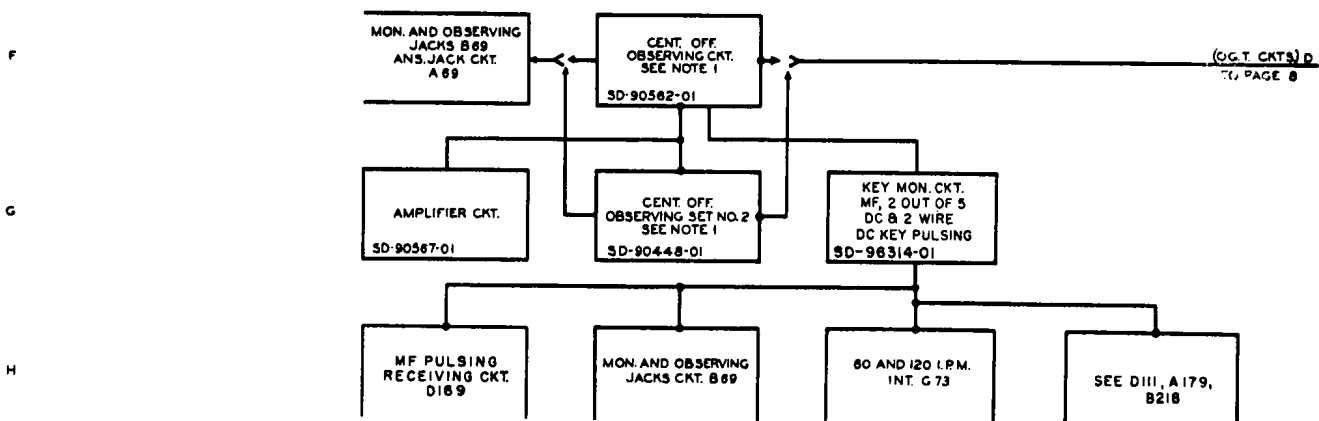


FULL SELECTOR TERMINATING CIRCUITS

CENT. OFF. OBSERVING CKTS. AT "A" SWBD. (FACE EQPT)



"A" SWBD. MON. POS.



NOTES:

- I. USE SD-90562-01 FOR KEY PULSING "A" SWBD. IN WHICH THERE ARE NO TOLL POSITIONS.
- USE SD-90448-01 FOR COMBINED KEY PULSING TOLL AND "A" SWBD. AND FOR DIALING SWBD.

66

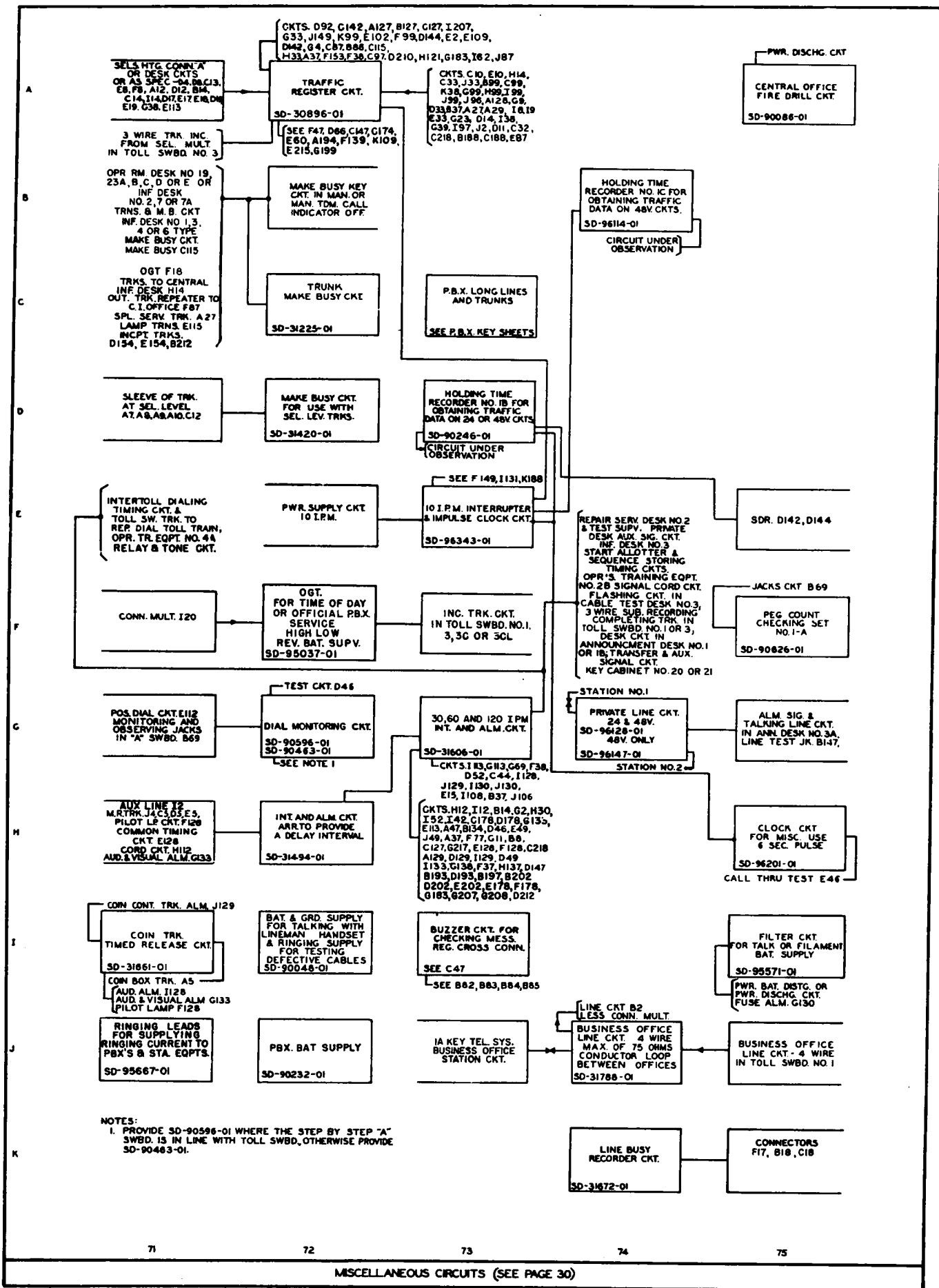
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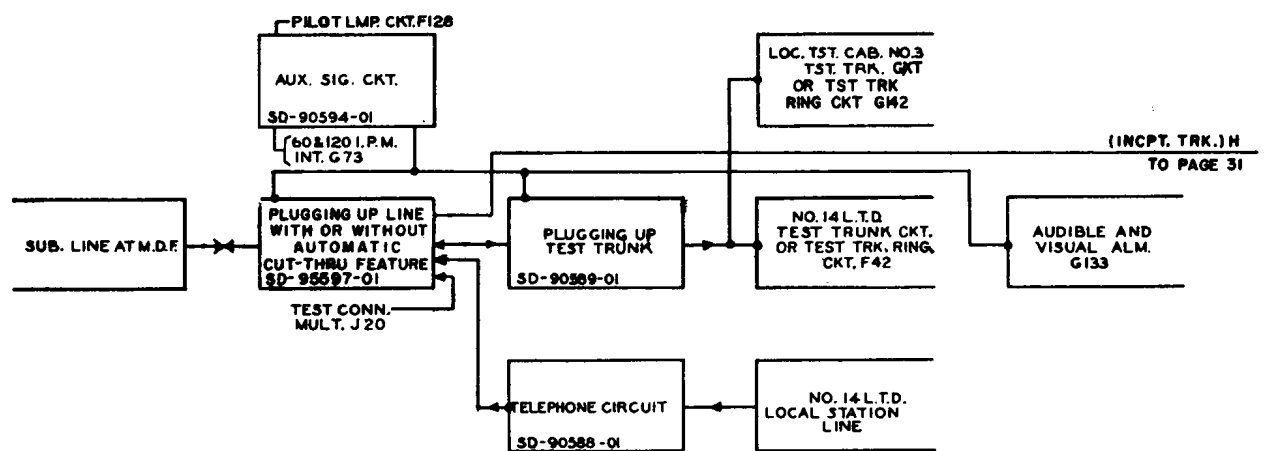
70

"A" SWBD. MON. POS. AND "A" SWBD. CKTS. ASSOCIATED WITH FACE EQPT. FOR CENT. OFF. OBSERVING



MISCELLANEOUS CIRCUITS (SEE PAGE 30)

A
B
C
D
E
F
G
H
I
J



A
B
C
D
E
F

TEST LINE JACKS
FOR TESTING
MESSAGE REGISTERS
FIG. 5
JACKS DESIG. (T) & (TI)
SEE C 47

TEST LINE JACKS
FOR TESTING
MESSAGE REGISTERS
FIG. 6B
JACKS DESIG. (T) & (HS)
SEE C 47

48V. BATTERY JACK
FIG. 1
JACK DESIG. (48V)
SEE F 48

RINGING CURRENT
SUPPLY JACK
FIG. 2
JACK DESIG. (±) OR (GEN)
SEE F 48

64V. BATTERY JACK
FIG. 3
JACK DESIG. (64V)
SEE F 48

BUZZER CIRCUIT
FOR TESTING MESSAGE
REGISTER CROSS-CONN.
AT I.D.F.
FIG. 1 (V.I.D.F.)
JACK DESIG. (BUZ 1)
SEE I 73

BUZZER CIRCUIT
FOR TESTING MESSAGE
REGISTER CROSS-CONN.
AT I.D.F.
FIG. 1 (H.I.D.F.)
JACK DESIG. (BUZ 2)
SEE I 73

BUZZER CIRCUIT
FOR TESTING MESSAGE
REGISTER CROSS-CONN.
AT I.D.F.
FIG. 2 (V.I.D.F.)
JACK DESIG. (BUZ 2)
SEE I 73

BUZZER CIRCUIT
FOR TESTING MESSAGE
REGISTER CROSS-CONN.
AT I.D.F.
FIG. 4
JACK DESIG. (BUZ 2)
SEE I 73

TEST LINE JACKS
CONNECTOR TEST
JACKS
FIG. 2
JACKS DESIG. (3) & (4)
SEE I 47

TEST LINE JACKS
8 PARTY SEMI-SEL
CONN. RING TEST
JACK
FIG. 3, 4 OR 5
JACKS DESIG. (8 PTY)
SEE I 47

TEST LINE JACKS
FOR USE WITH LEVEL
HUNTING CONNECTORS
FIG. 6
JACKS DESIG. (3) & (4)
SEE I 47

SWITCHMAN TALKING
LINE
FIG. 2
JACKS A.E. INC. TYPE
SEE H 147

SWITCHMAN TALKING
LINE
FIG. 10
JACK DESIG. (8)
SEE H 147

SWITCHMAN TALKING
LINE
FIG. 7
JACKS DESIG. (A) & (B)
SEE H 147

SWITCHMAN TALKING
LINE
FIG. 2 OR 5
JACKS A.E. INC. TYPE
SEE H 147

JACK ASSIGNMENT TABLE

FRAME OR RACK	JACK DESIGNATION AND BLOCK NUMBER															
	A	B	T	TI	± OR GEN	48V	64V	BUZ1	BUZ2	HS	3	4	6	8PTY	A.E. INC. TYPE	
LINE FINDER FRAME						A84									D84	
LOCAL SELECTOR FRAME						A84										
SPECIAL SERVICE SELECTOR FRAME						A84									D84	
TOLL SELECTOR FRAME						A84									D84	
TOLL TRANSMISSION SELECTOR FRAME					A85	A84							D85		D84	
CONNECTOR FRAME						A84					C81 AND D81	C81 AND D81		C82	E84	
MISCELLANEOUS FRAME						A84							D85		D84	
REPEATER FRAME						A84									D84	
COIN BOX TRUNK RELAY RACK						A84									D84	
MESSAGE REGISTER RACK	E81	E81	A83	A83		A84	B81		B83	A83						
TRAFFIC REGISTER RACK	E81	E81														
INTERMEDIATE DISTRIBUTING FRAME	E81	E81	A82	A82		A84	B81	B82	B83 AND B84							
TRUNK FINDER FRAME						A84										
MISCELLANEOUS RELAY RACK						A84										

81

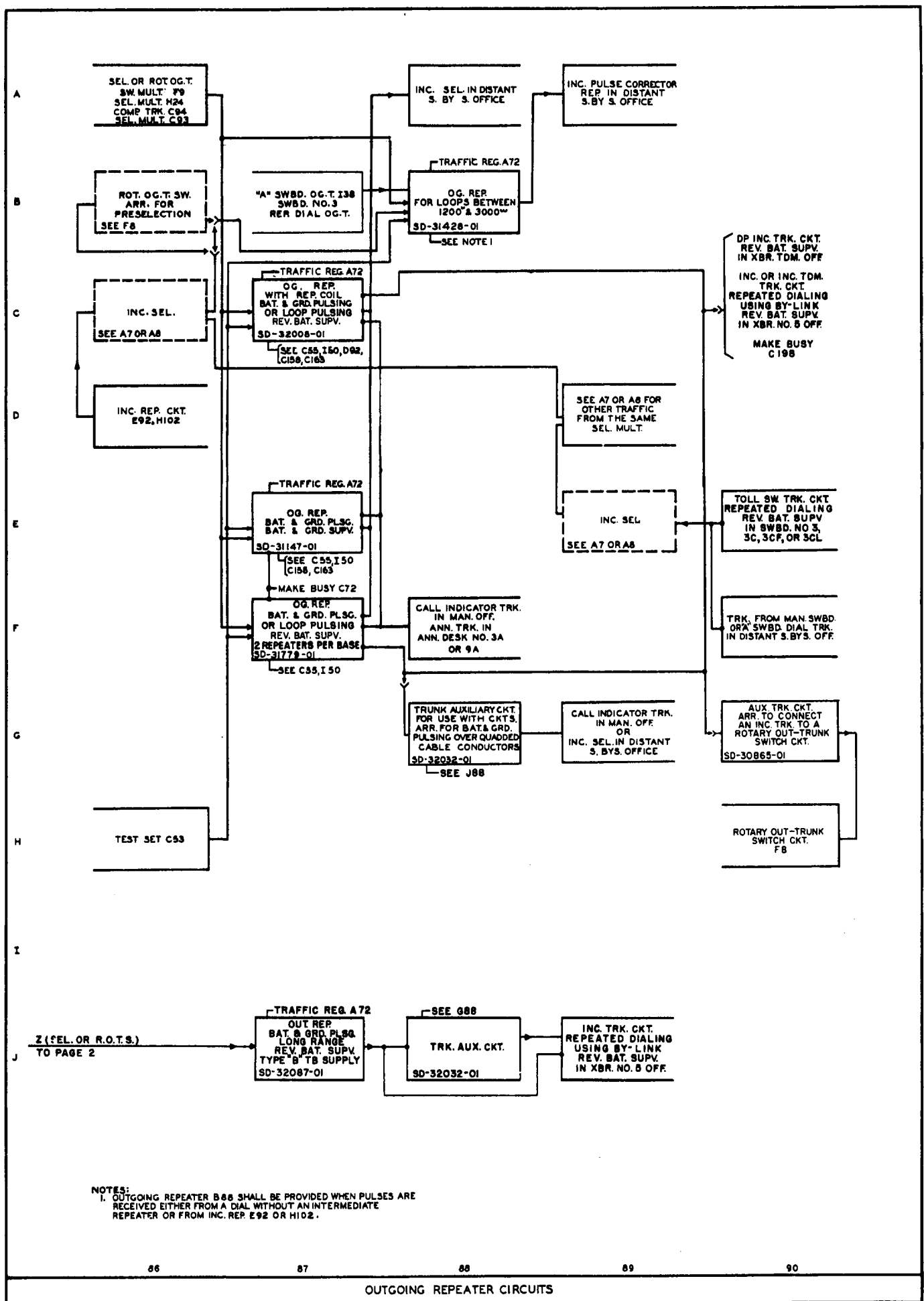
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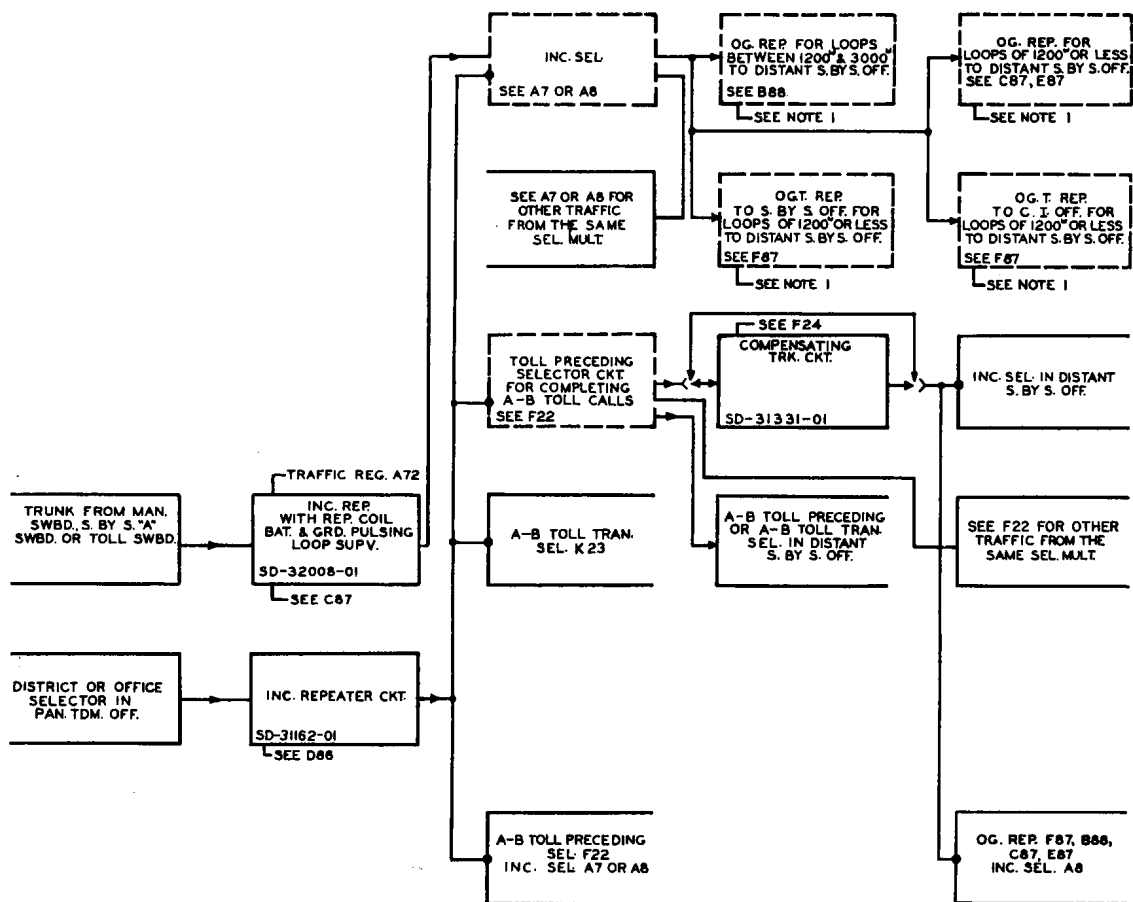
83

84

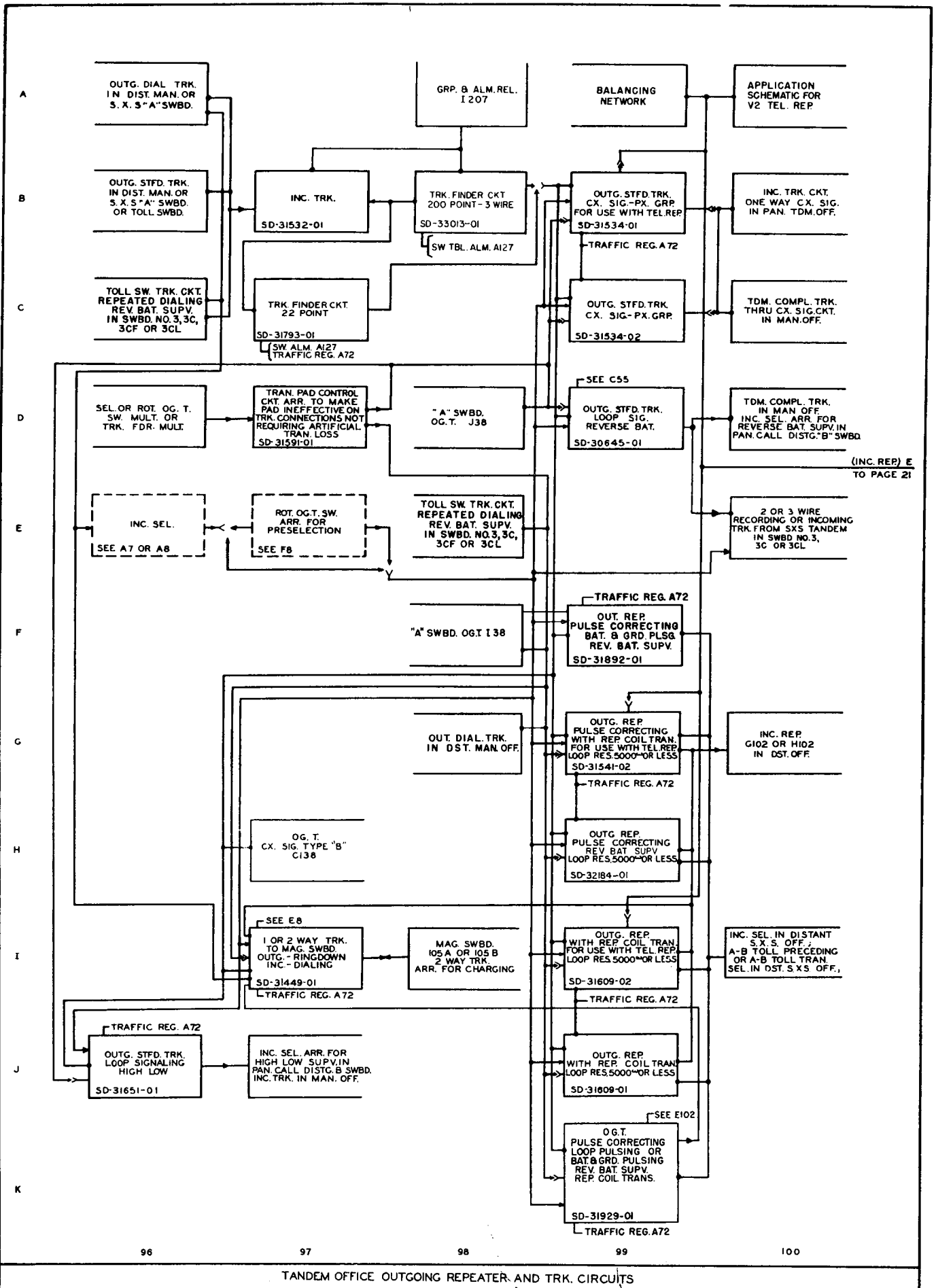
85

JACK ASSIGNMENTS AND LOCATION FOR TEST AND TALKING LINE JACKS





NOTES:
 1. THESE OUTGOING REPEATERS ARE FURNISHED BECAUSE OF OTHER TRAFFIC FROM THE SAME SELECTOR MULTIPLE.



A

B

C

D

E (TEL REP)
TO PAGE 23

E

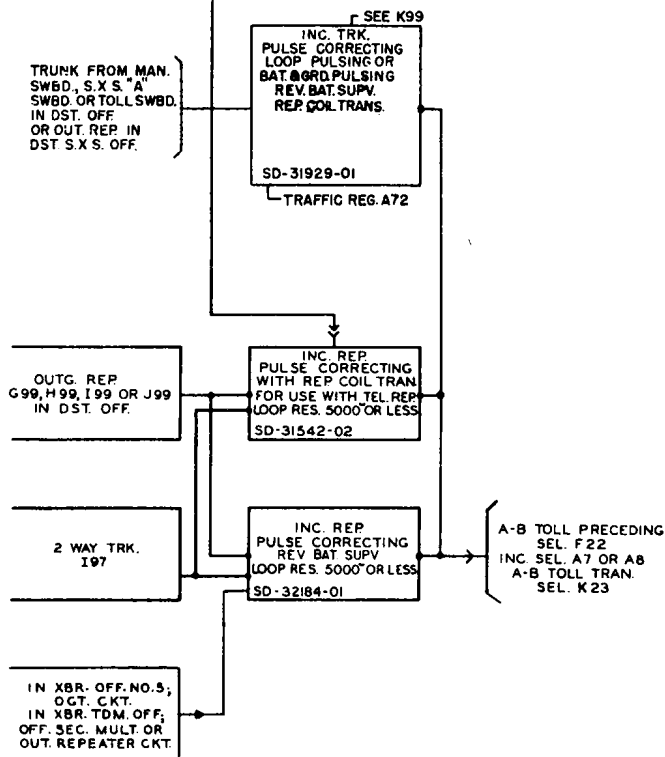
F

G

H

I

J



101

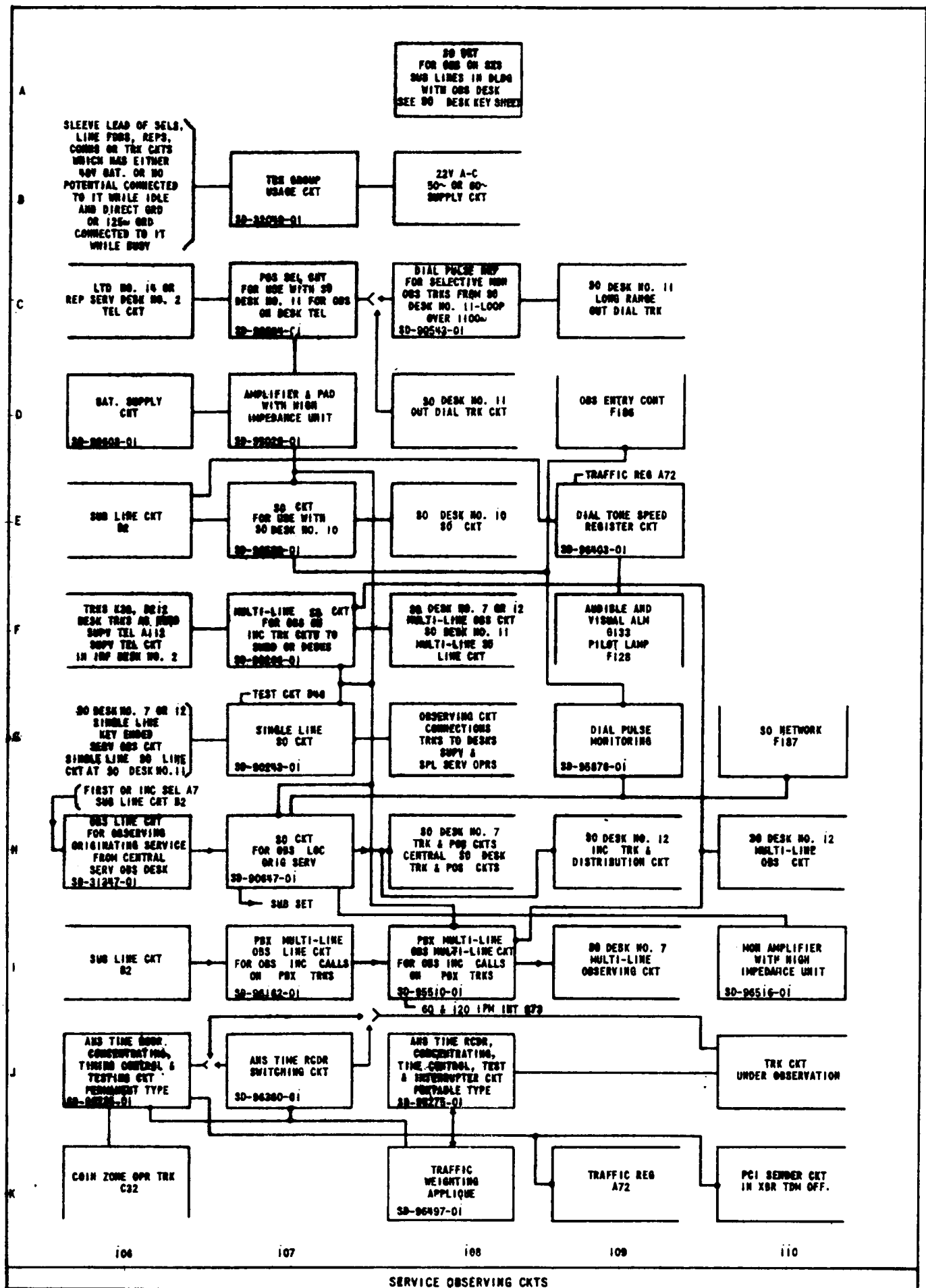
102

103

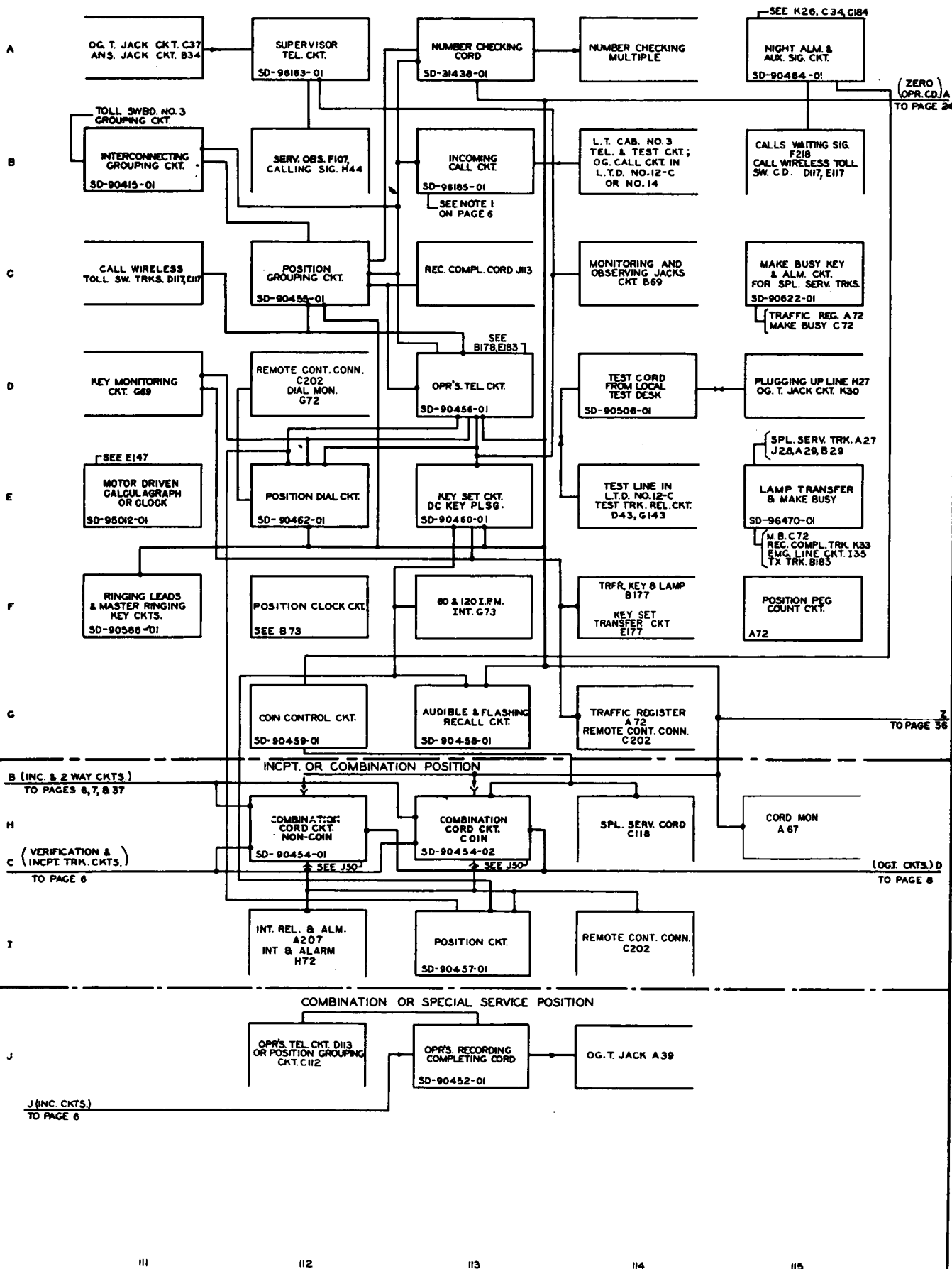
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105

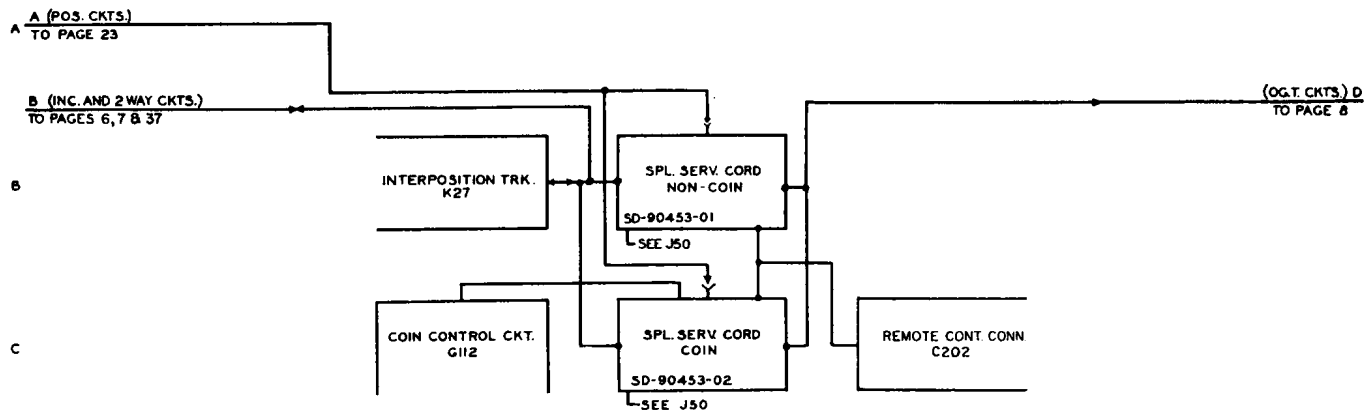
TANDEM OFFICE INCOMING REPEATER AND TRK. CIRCUITS



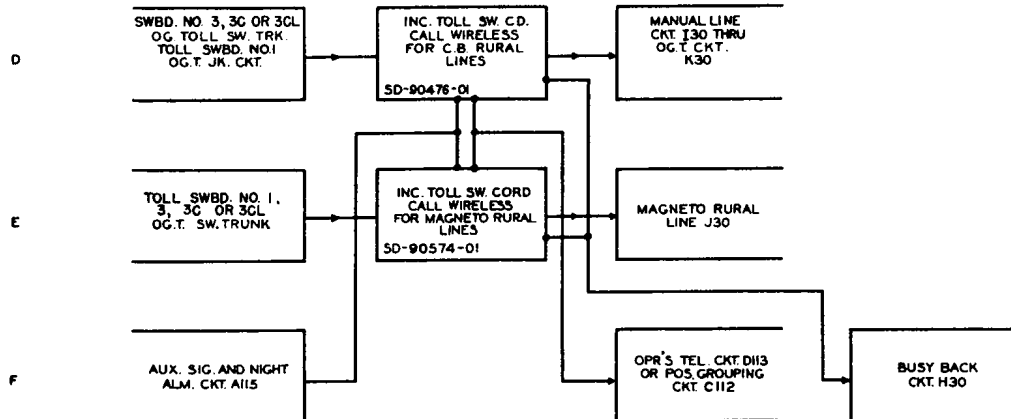
CIRCUITS FOR USE IN ALL POSITIONS

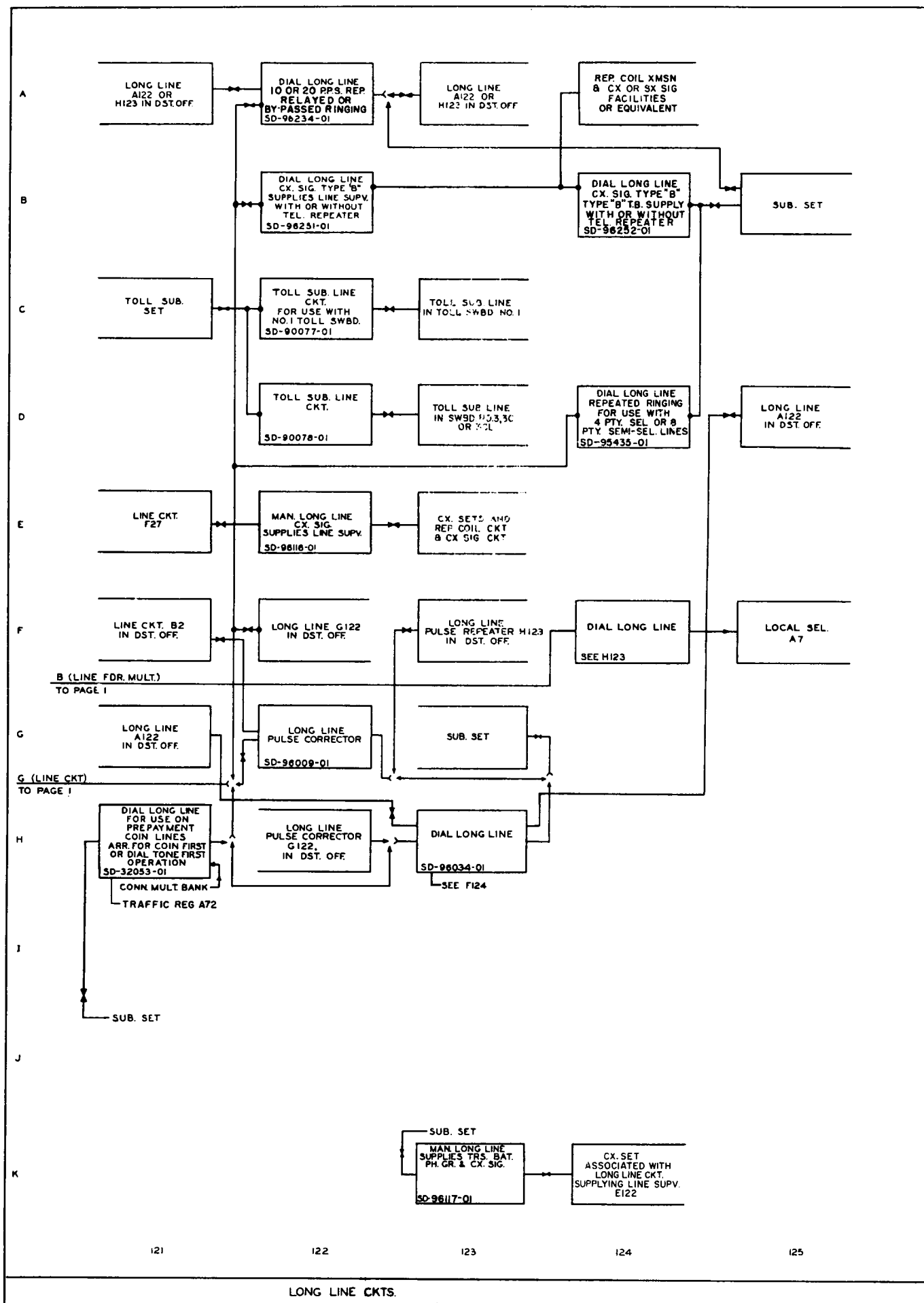


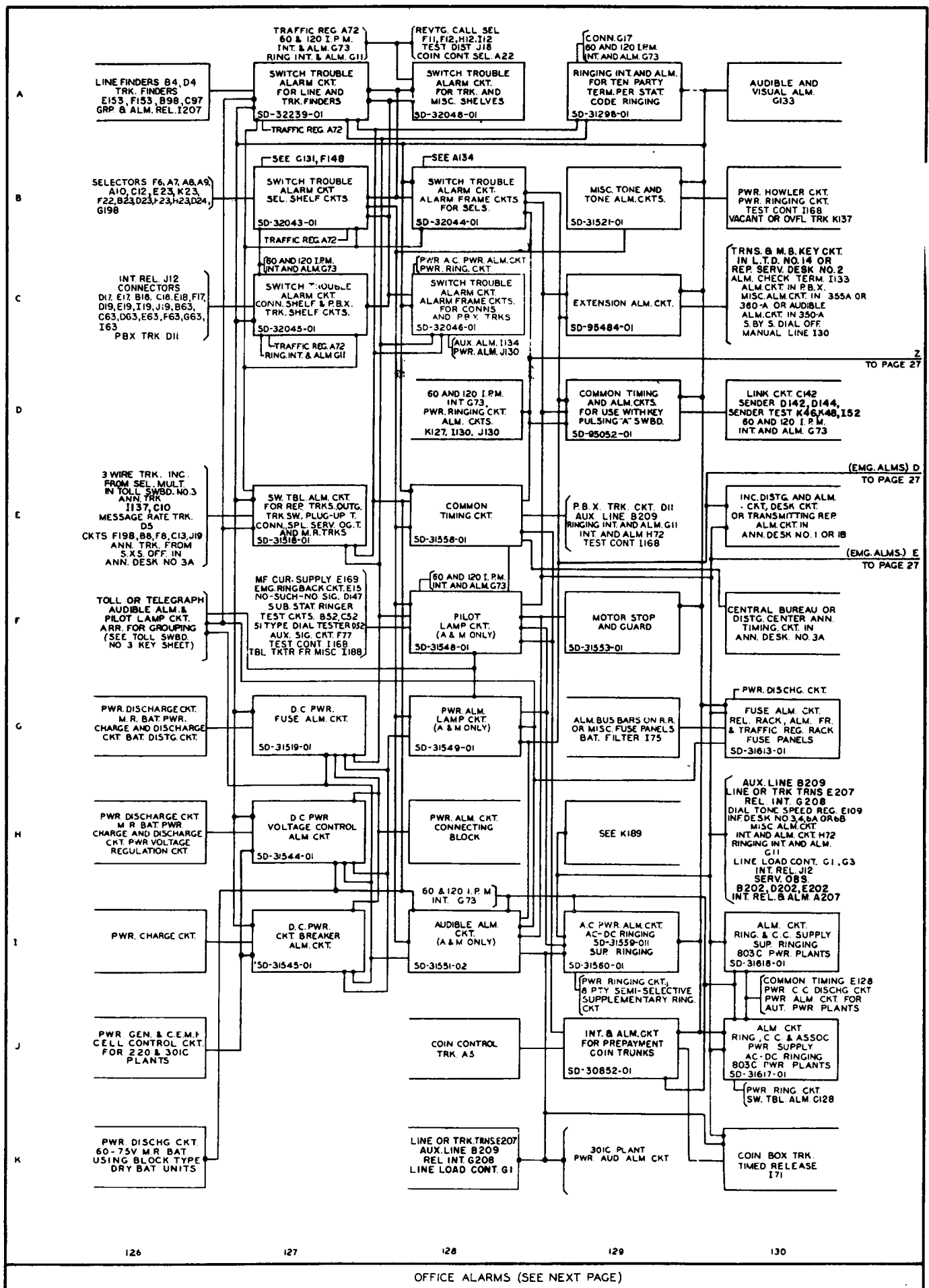
"A" SWBD. CKTS. FOR USE IN ALL POSITIONS AND CKTS. FOR INCRPT. & COMBINATION POSITION



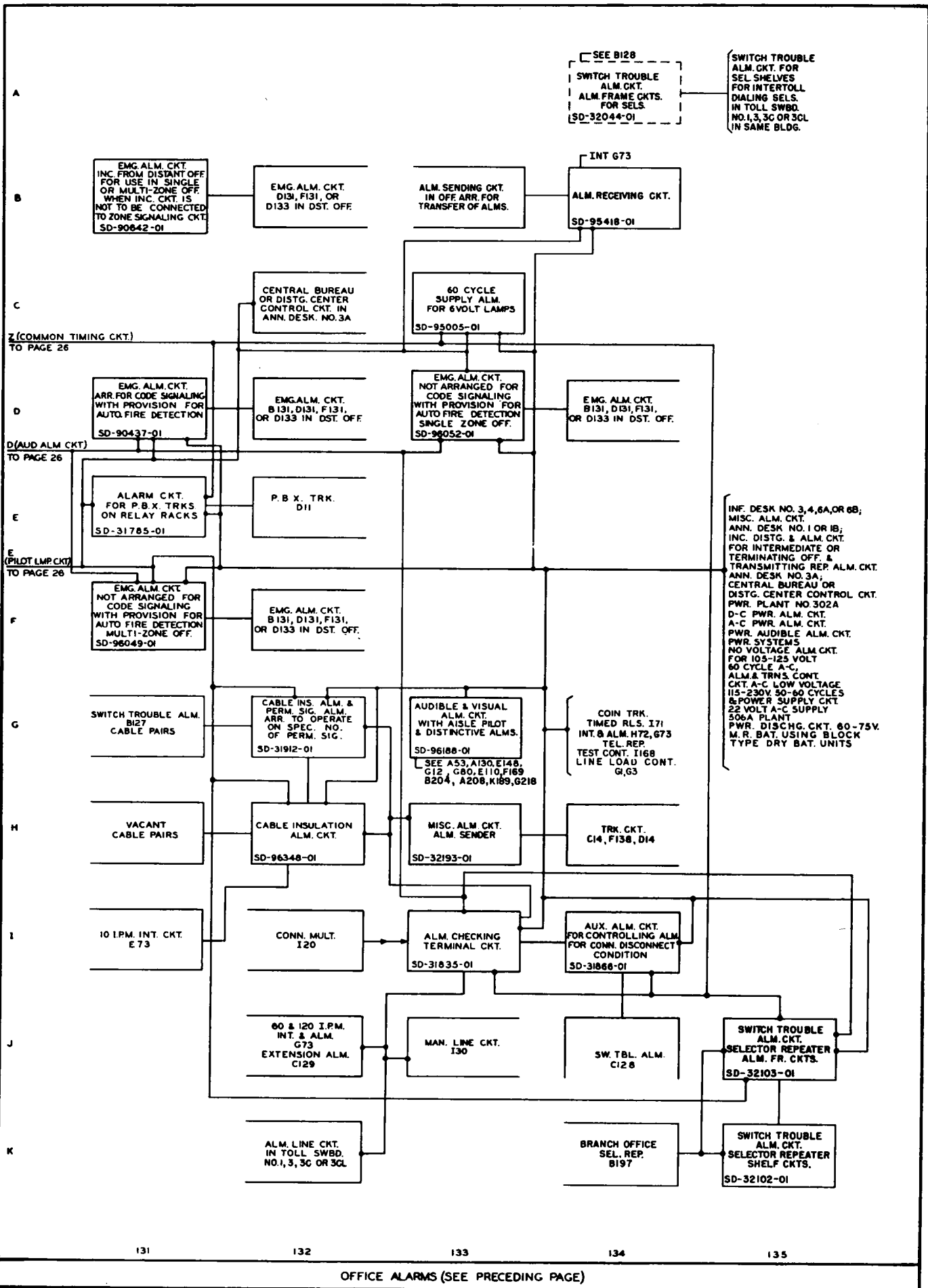
RURAL FEATURES IN SPL. SERV. POS.

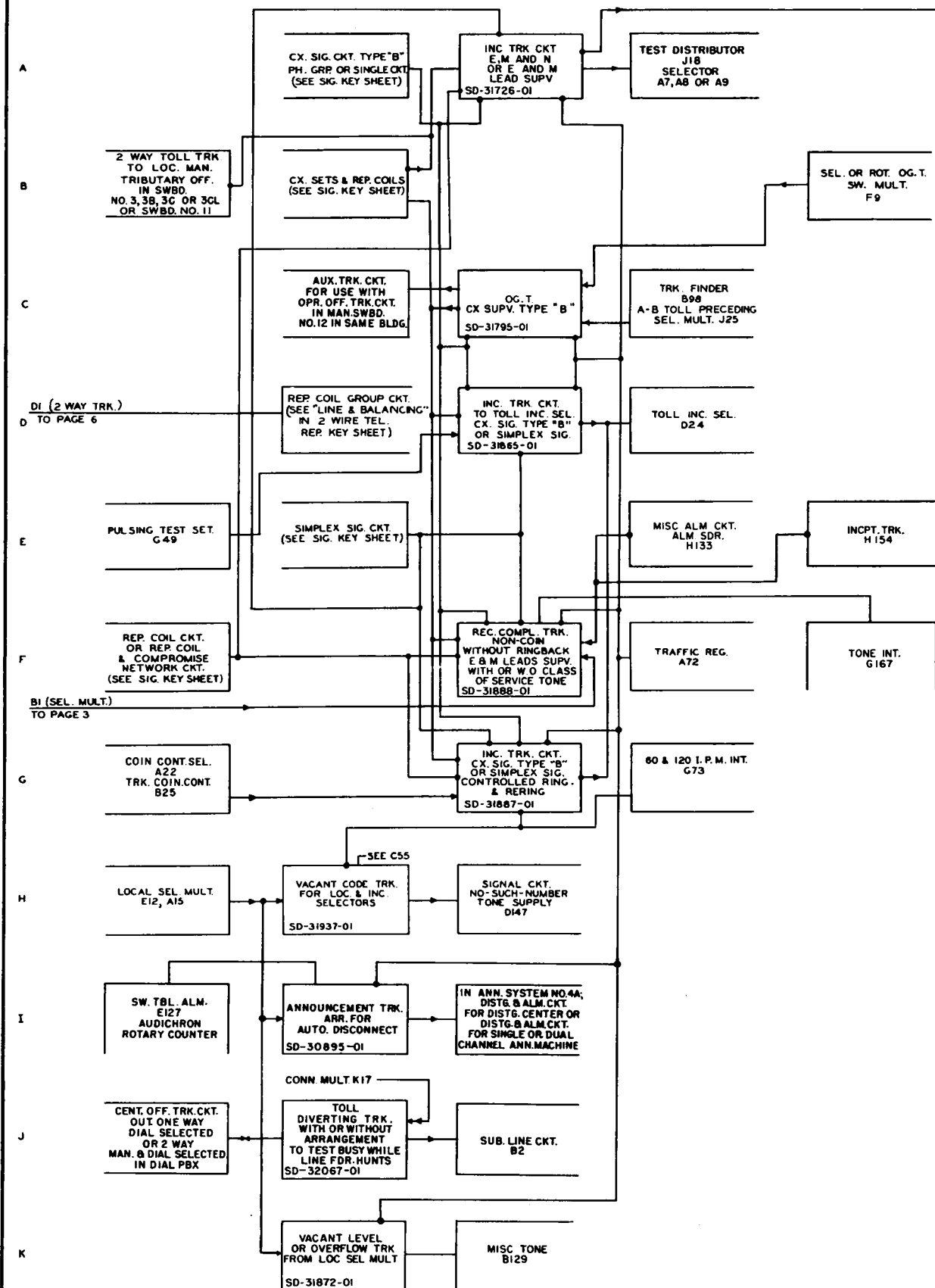






OFFICE ALARMS (SEE NEXT PAGE)





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TRUNK CIRCUITS

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"A" SWBD. SDR., LINK AND MISC. CKTS.

A

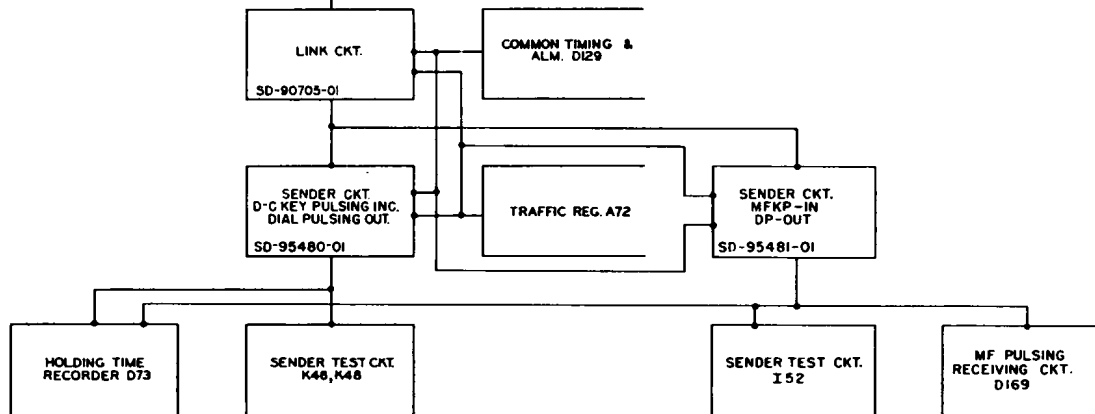
B

C (OUTG & INC TRKS)
TO PAGE 3 B & 39

C

D

E



CKTS. CONNECTING WITH LOCAL TEST CABINET NO. 3

F

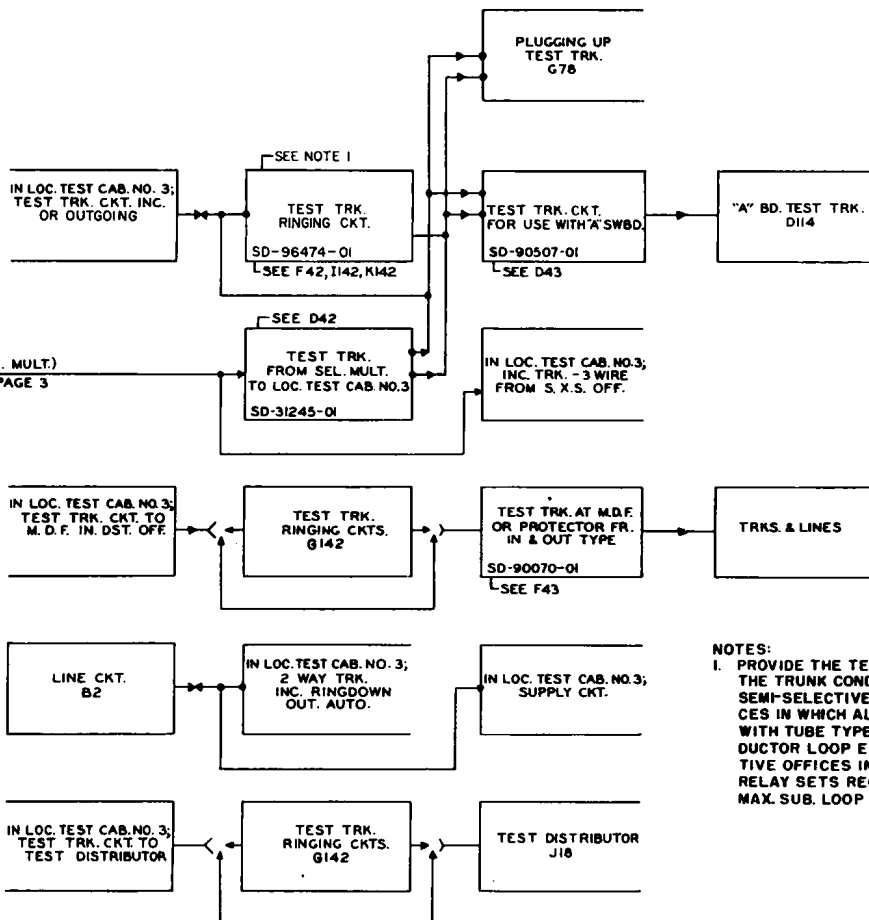
G

H (SEL. MULT.)
TO PAGE 3

I

J

K



NOTES:

- I. PROVIDE THE TEST TRUNK RINGING CKT. G142 WHEN THE TRUNK CONDUCTOR LOOP EXCEEDS 300 OHMS IN SEMI-SELECTIVE OFFICES OR FULL SELECTIVE OFFICES IN WHICH ALL THE 4 PTY. LINES ARE EQUIPPED WITH TUBE TYPE SETS, AND WHEN THE TRUNK CONDUCTOR LOOP EXCEEDS 200 OHMS IN FULL SELECTIVE OFFICES IN WHICH SOME OF THE LINES HAVE RELAY SETS REGARDLESS OF THE LENGTH OF THE MAX. SUB. LOOP IN THE OFFICE.

141

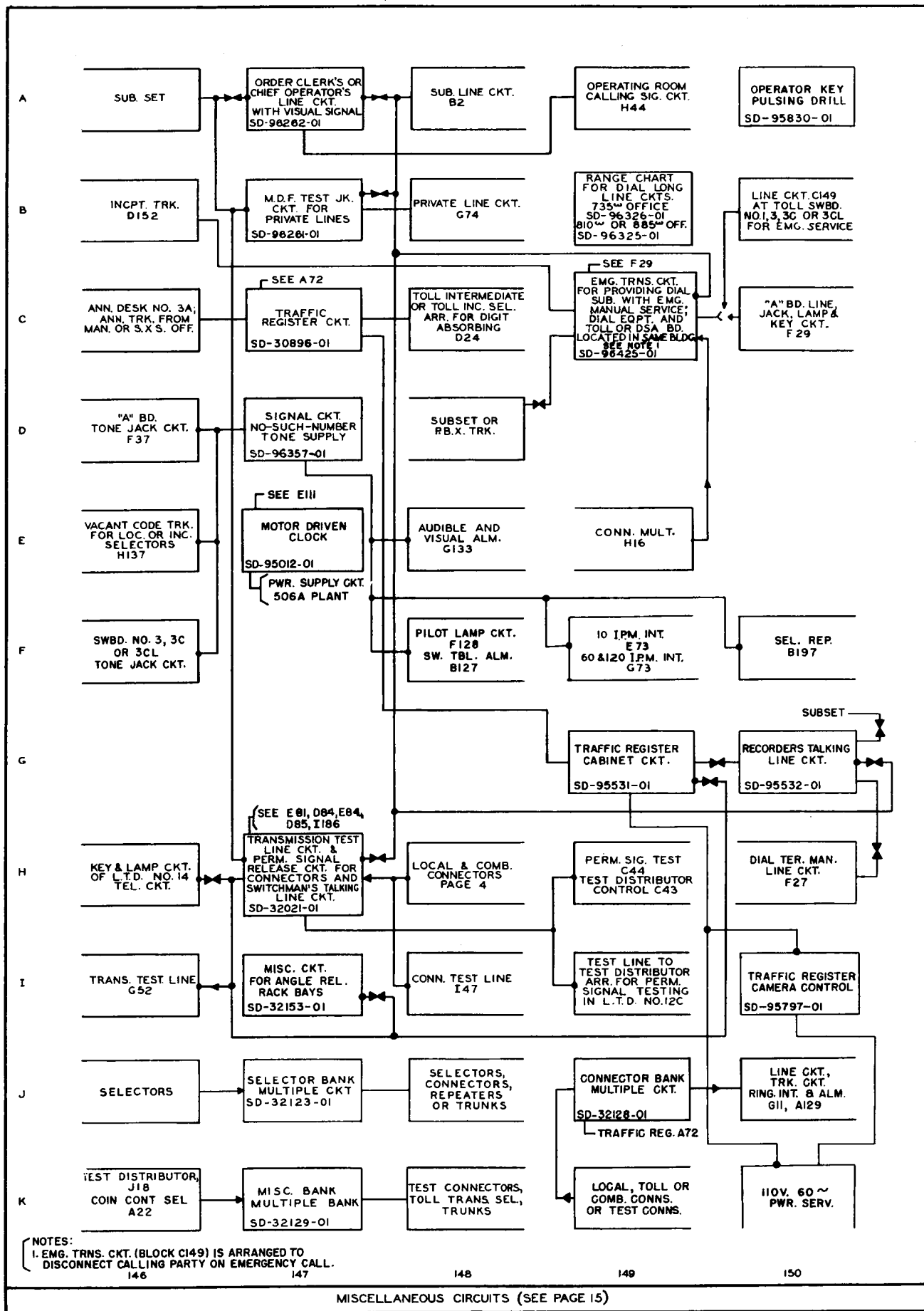
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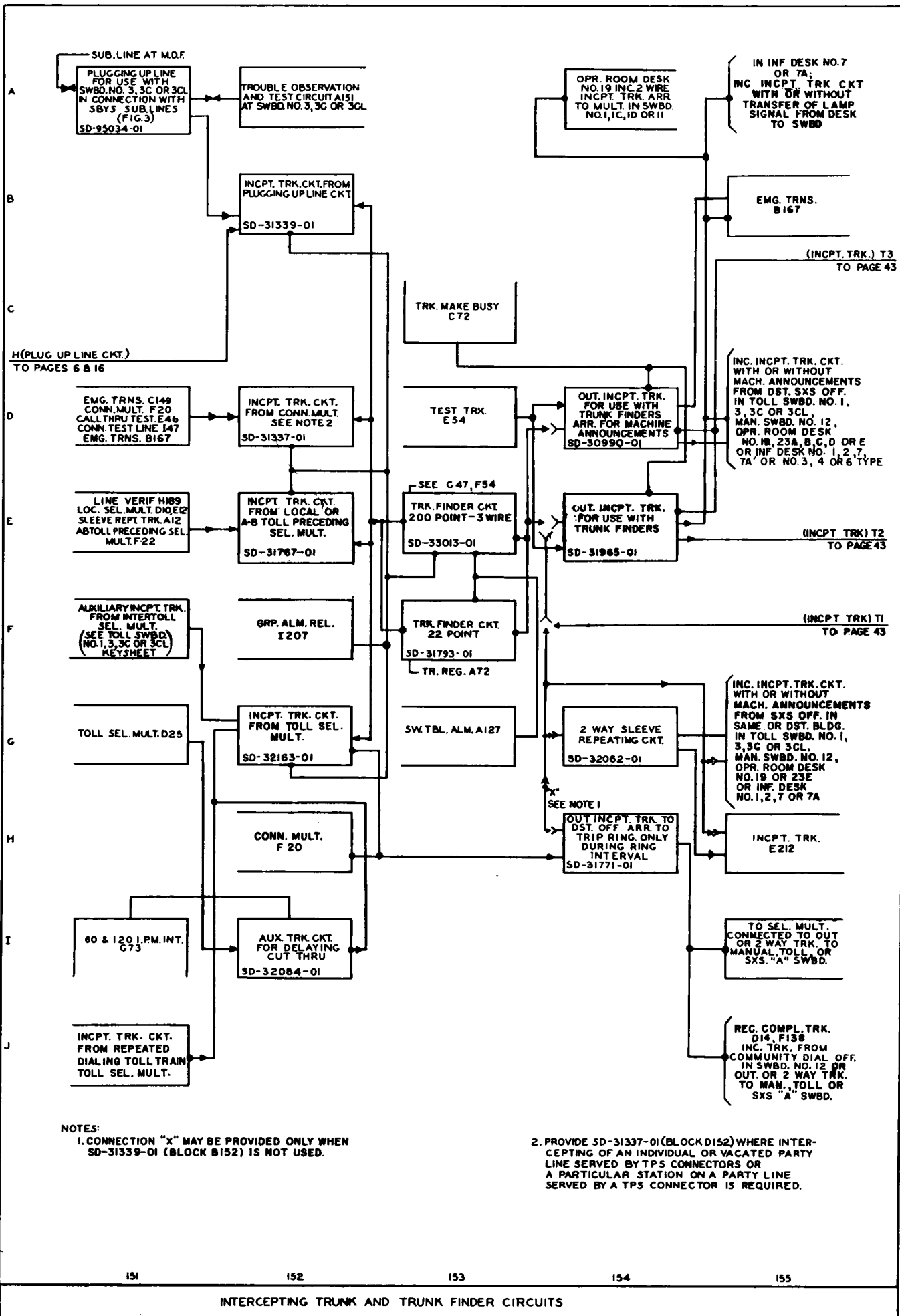
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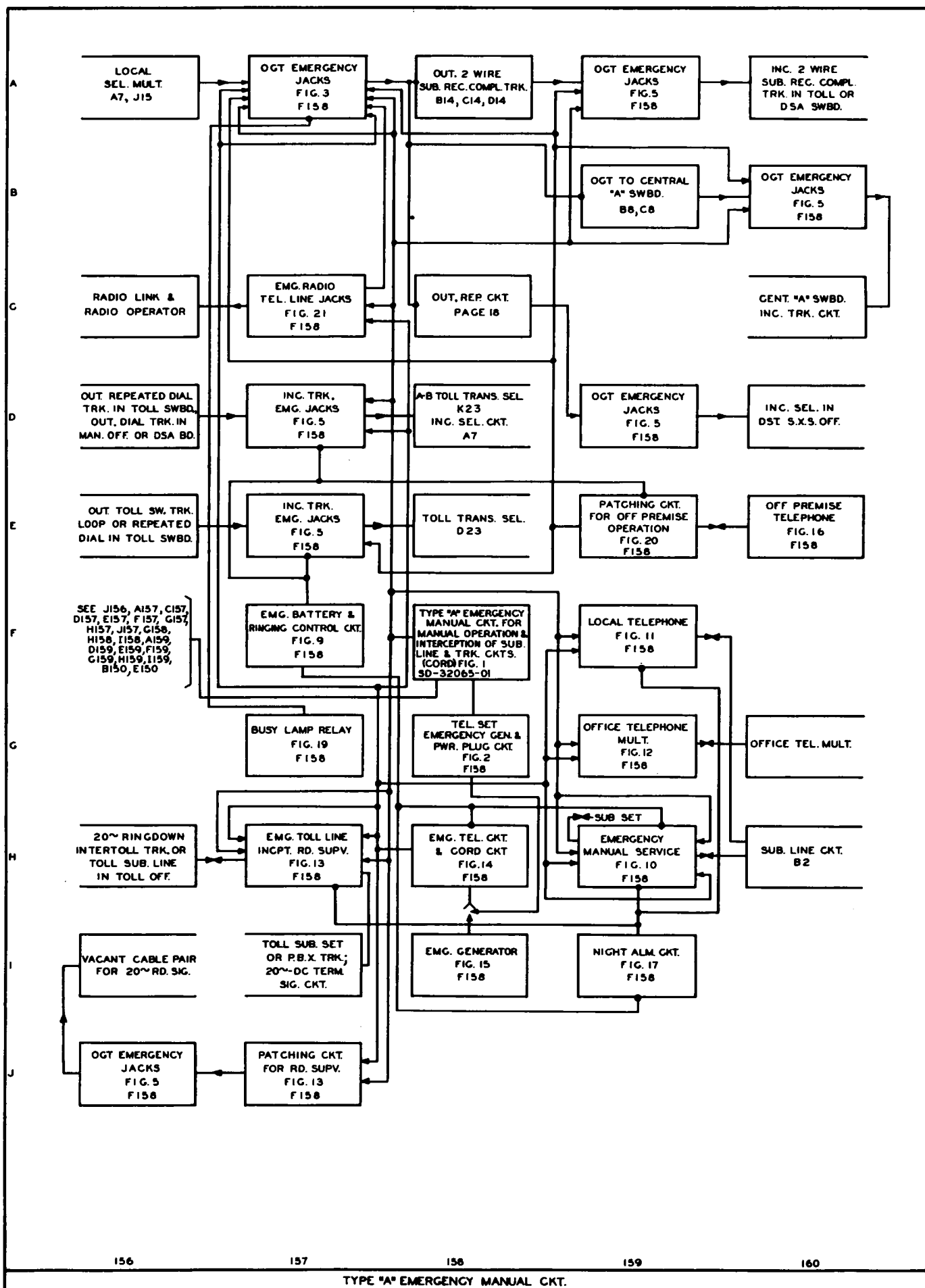
144

145

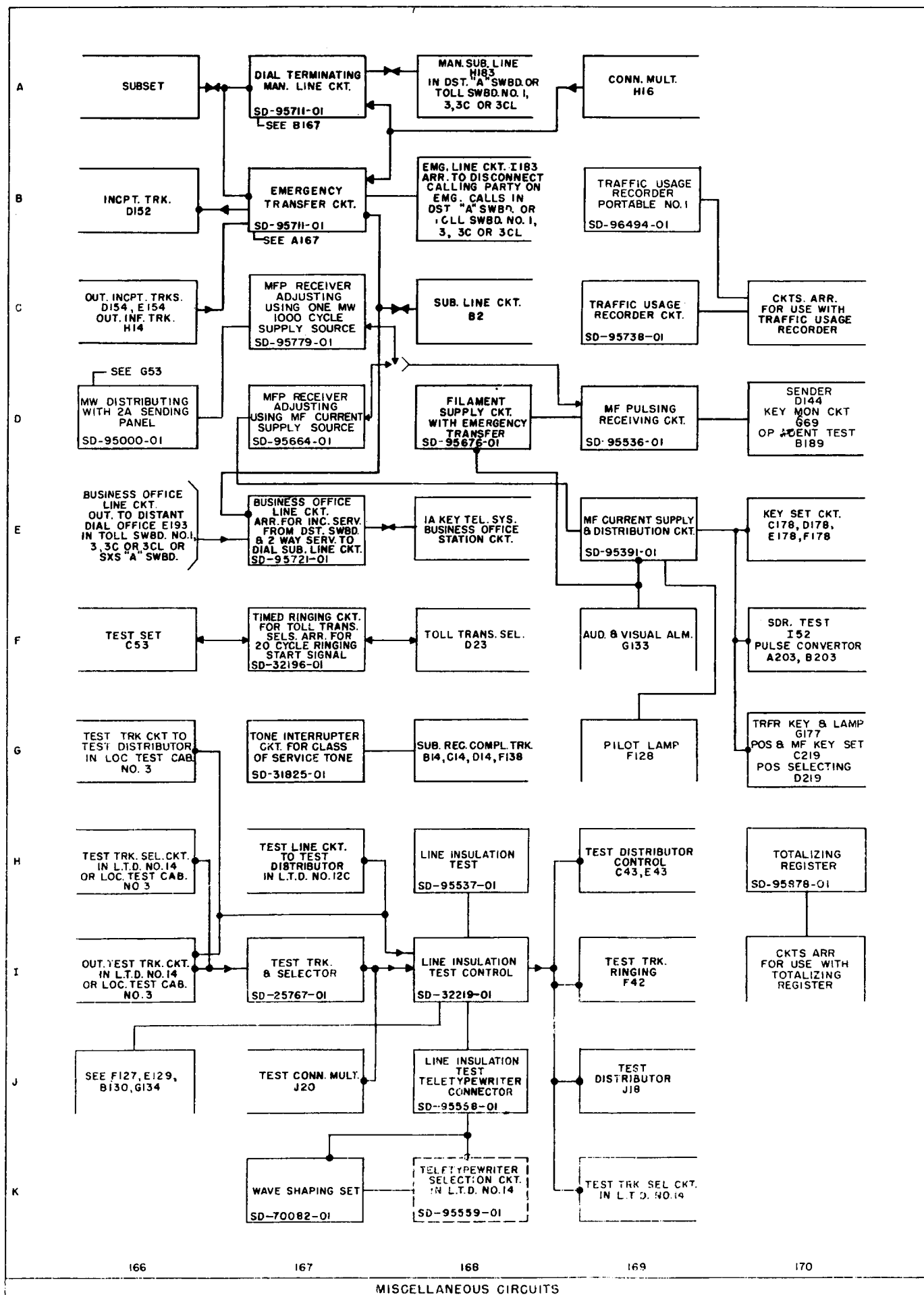
"A" SWBD. SDR., LINK AND MISC. CKTS. AND CKTS. CONNECTING WITH LOCAL TEST CABINET NO. 3

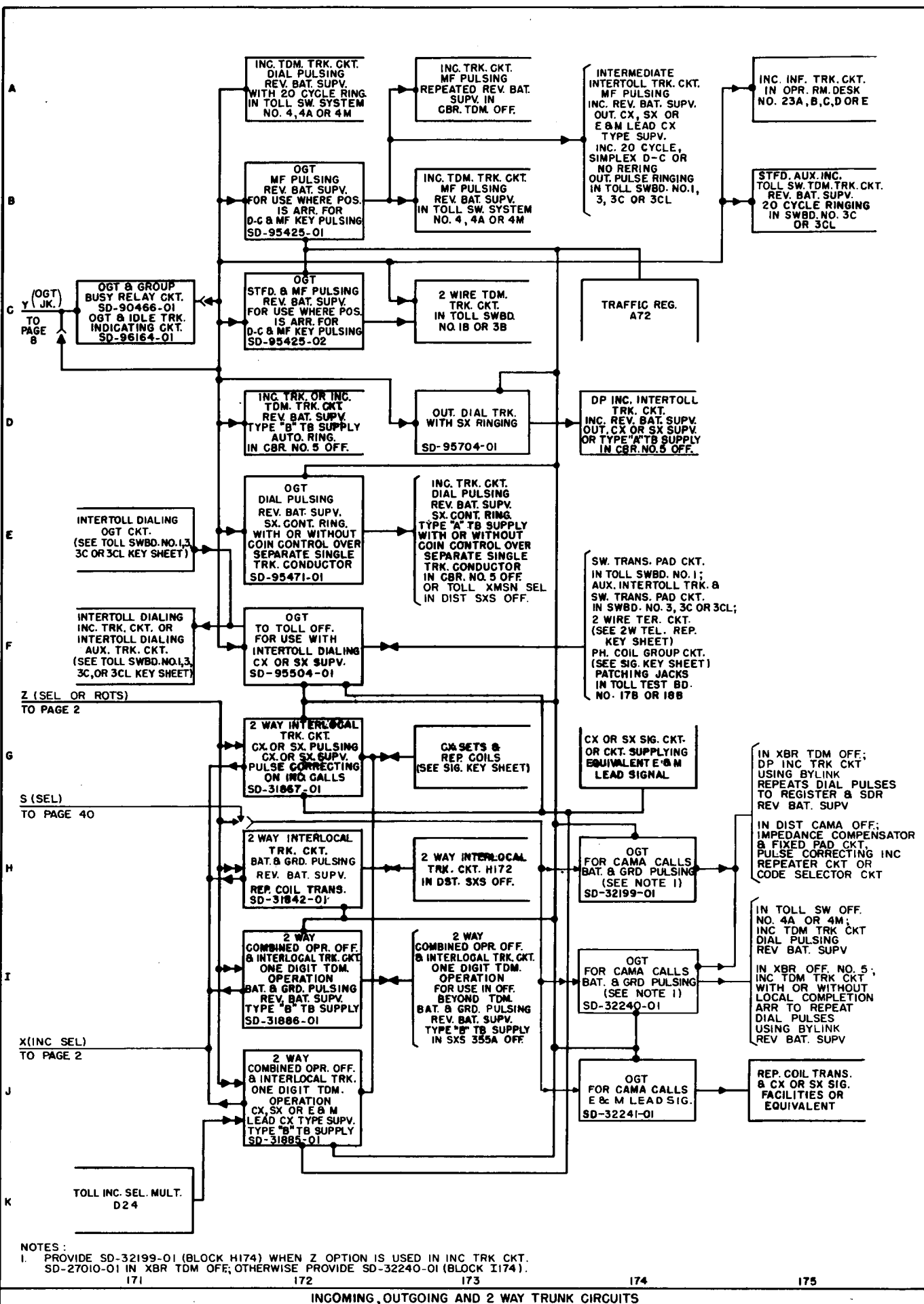




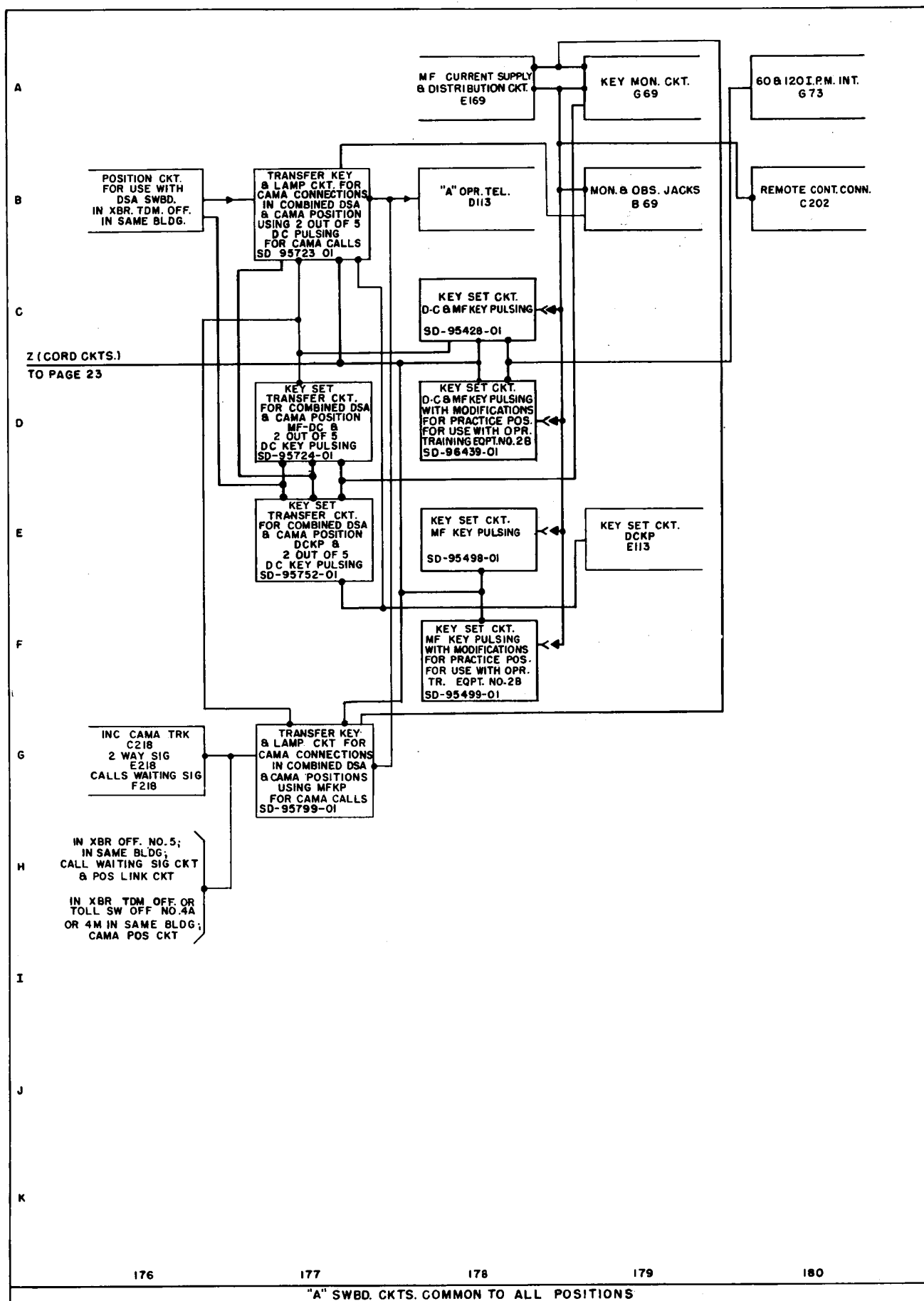


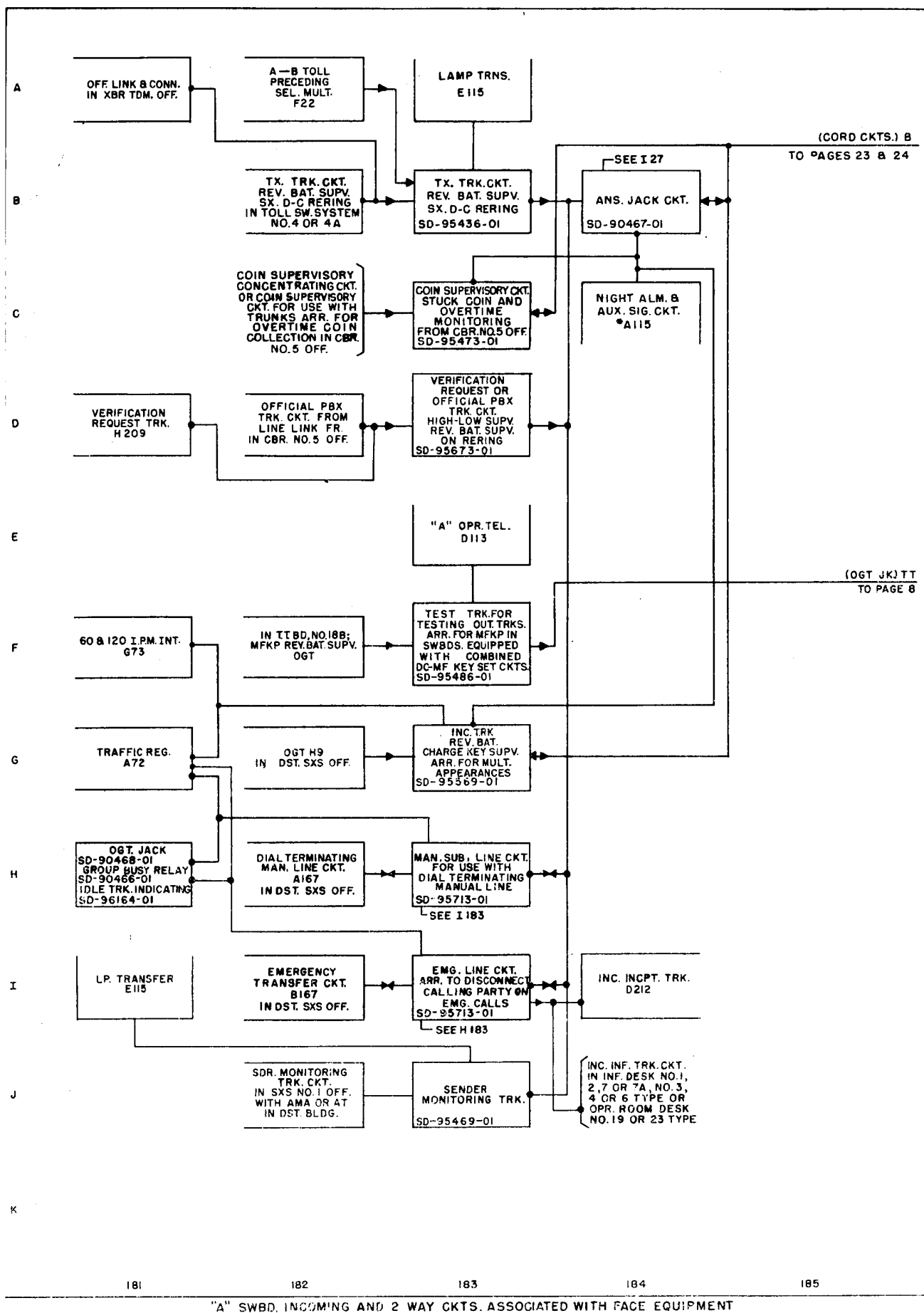
TYPE "A" EMERGENCY MANUAL CKT.



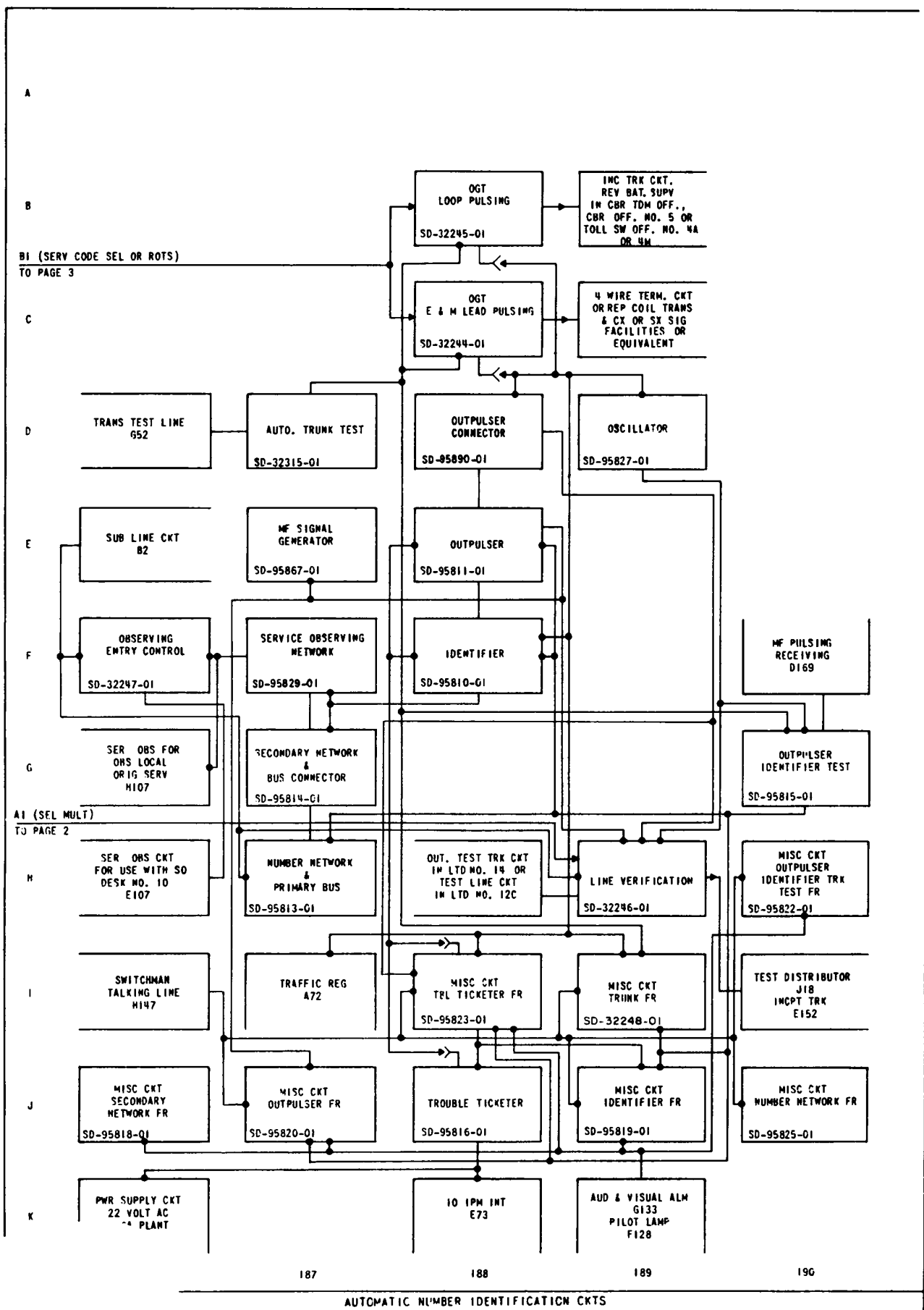


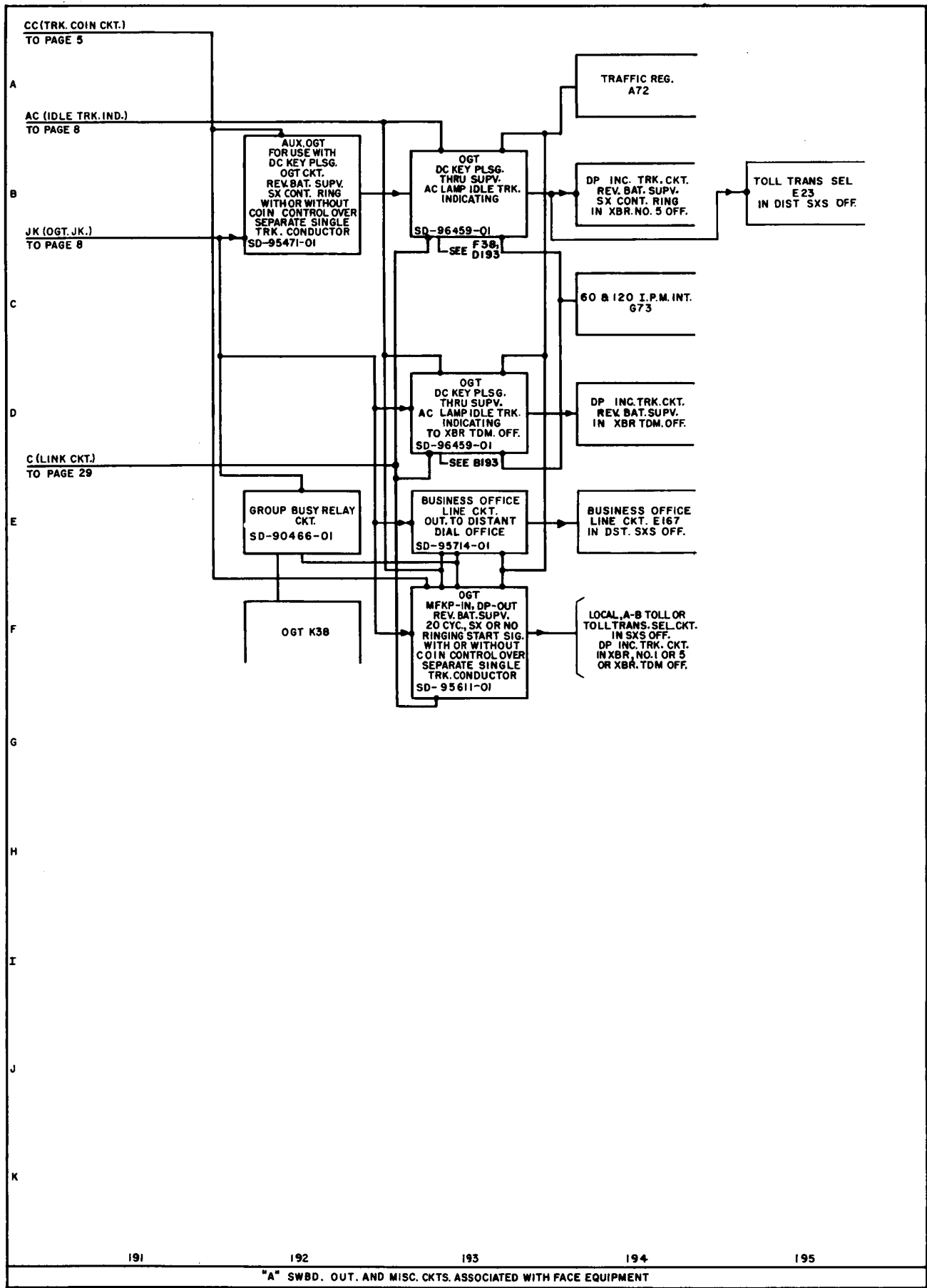
INGOMING, OUTGOING AND 2 WAY TRUNK CIRCUITS

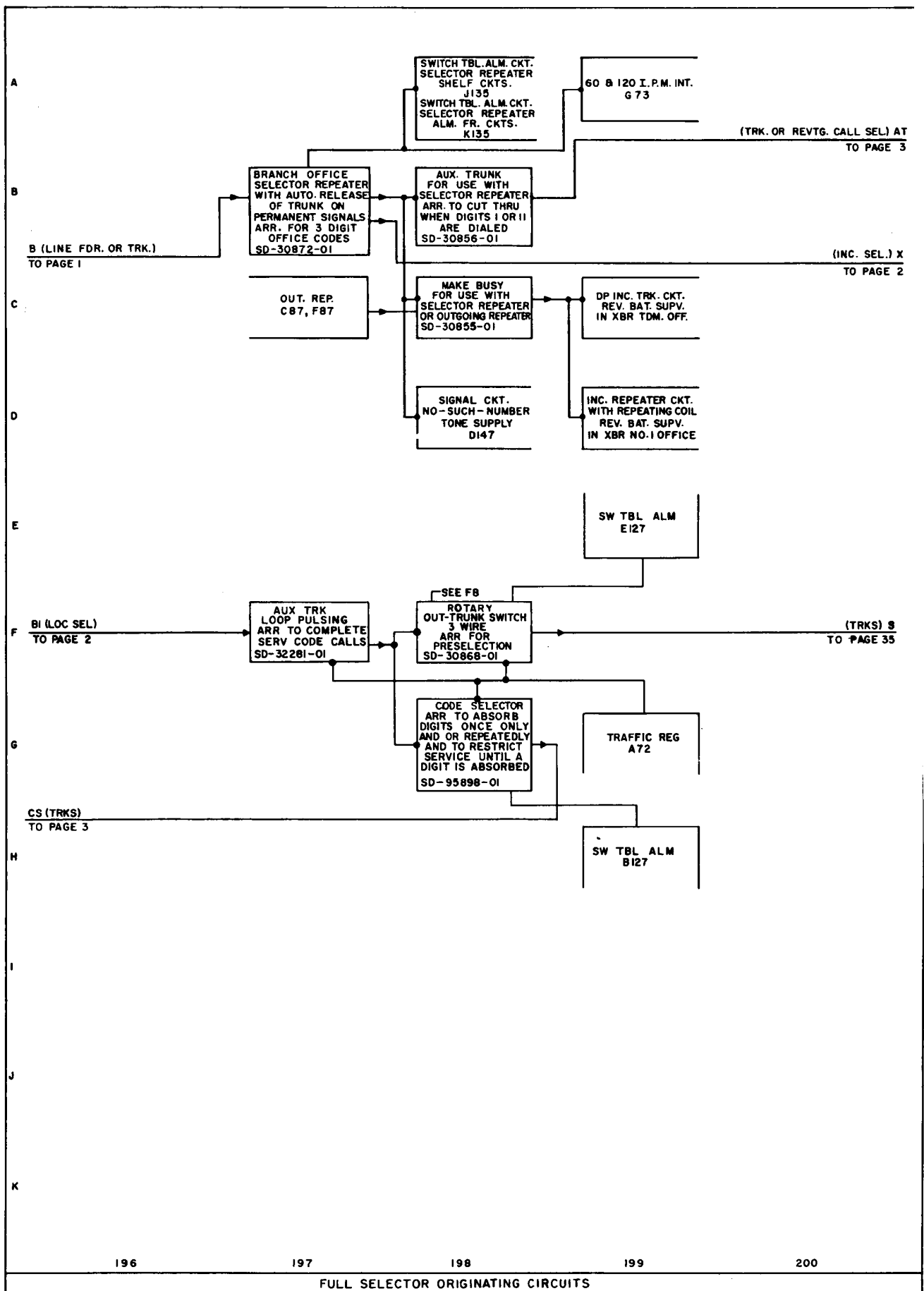


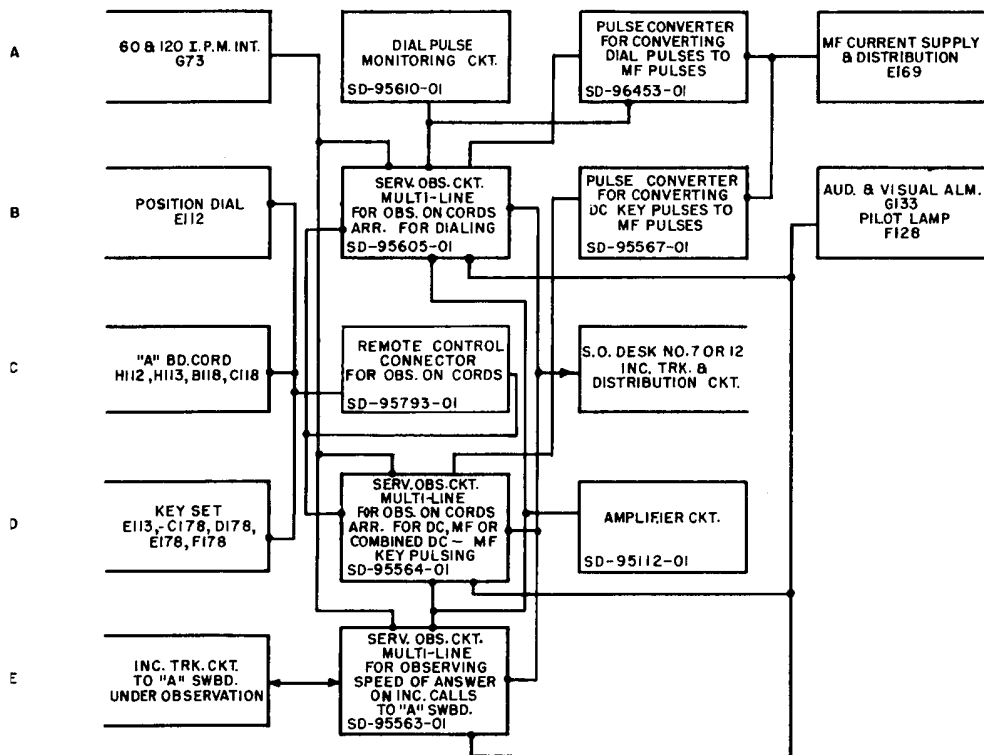


"A" SWBD, INCOMING AND 2 WAY CKTS. ASSOCIATED WITH FACE EQUIPMENT









201

202

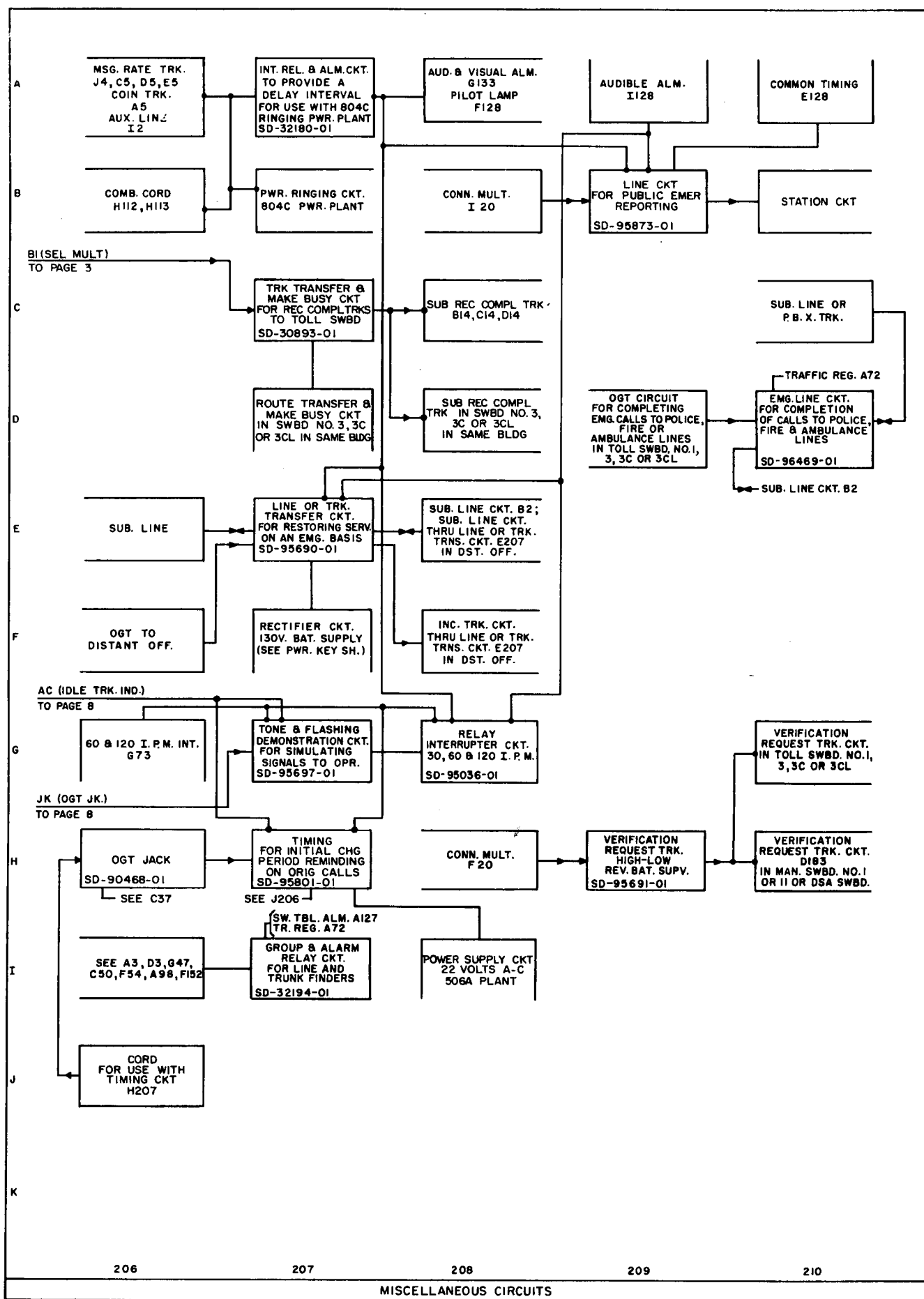
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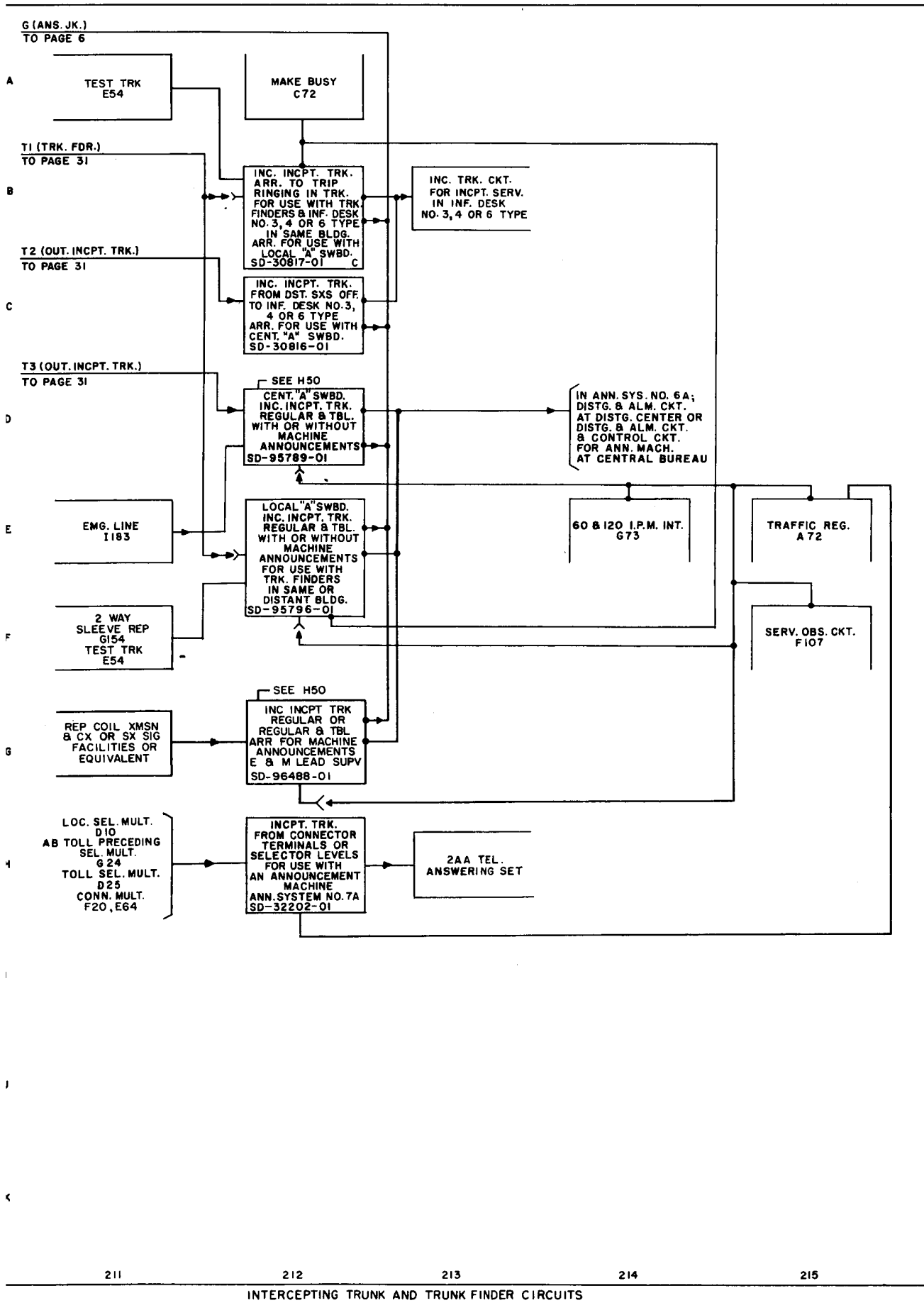
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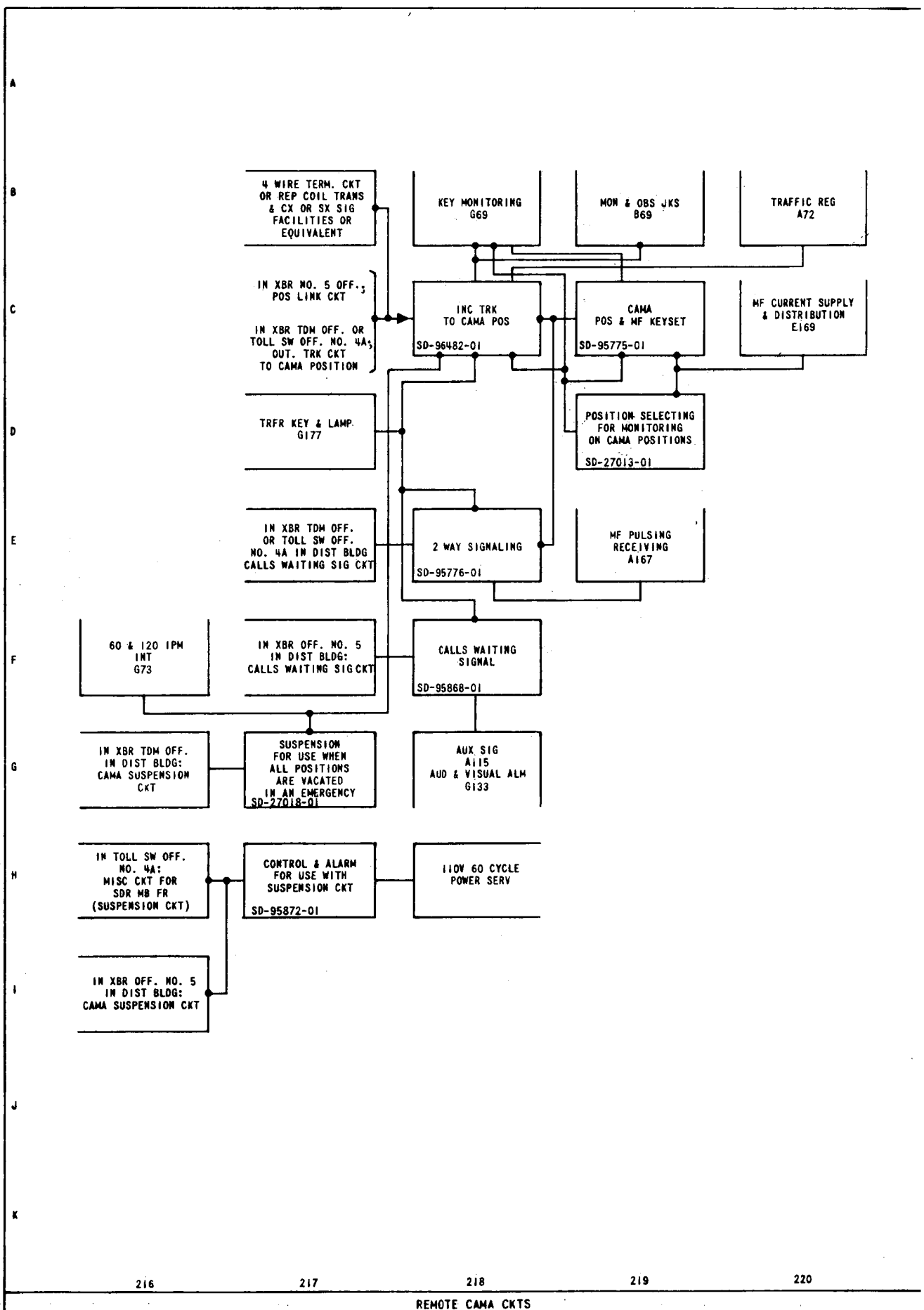
205

SERVICE OBSERVING CKTS.

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NOTES:

1. FOR LINES WHERE THERE IS NO DC PATH TO GROUND AT THE STATION.

- (A) THE 535 OR 735 OHM RANGE CAN BE OBTAINED IN AC-DC, SUPERIMPOSED 42A, SUPERIMPOSED TUBE, INVERTED 42A OR A MIXTURE OF SUPERIMPOSED TUBE AND INVERTED 42A DISTRICTS. THE 885 OHM RANGE CAN BE OBTAINED ONLY IN AC-DC, SUPERIMPOSED TUBE, INVERTED 42A OR A MIXTURE OF SUPERIMPOSED TUBE AND INVERTED 42A DISTRICTS. THE 1000 OR HIGHER OHM RANGE CAN BE OBTAINED ONLY IN AC-DC OR SUPERIMPOSED TUBE DISTRICTS. FOR RANGES EXCEEDING 635 OHMS IT IS ASSUMED THAT THE INFORMATION SHOWN ON THE DRAWINGS FOR EXTENDED RANGES ARE EMPLOYED.
- (B) VALUES IN THE FOLLOWING TABLES ARE SHOWN IN TERMS OF CONDUCTOR LOOP BETWEEN THE CENTRAL OFFICE LINE CKT. AND THE STATION RESISTANCE. A MAXIMUM OF 115 OHMS IS ALLOWED IN THE STATION RESISTANCE IN CONDUCTOR LOOPS UP TO 1000 OHMS. WHERE EXTERNAL CKT. RESISTANCE IS IN EXCESS OF 1115 OHMS (1000 OHM CONDUCTOR LOOP + 115 OHMS STATION RES.), THE ADDITIONAL EXTERNAL CKT. RESISTANCE OVER 1115 OHMS IS CONSIDERED AS A PART OF THE STATION RESISTANCE UP TO 200 OHMS STATION RESISTANCE. AFTER THE STATION RES. HAS REACHED 200 OHMS, FURTHER INCREASES IN THE EXTERNAL CKT. LOOP WILL BE CONSIDERED AS AVAILABLE FOR INCREASING THE CONDUCTOR LOOP.

1.1 SINGLE CENTER AREAS

THE SUBSCRIBER CONDUCTOR LOOP RANGE FOR ANY SINGLE OFFICE AREA WITH THE DIFFERENT TYPES OF DIALS AND CENTRAL OFFICE VOLTAGES OF 45-50 AND 48-50 IS AS FOLLOWS: IT IS ASSUMED THAT LEAK "B" IS USED WITH THE 1000 OHM LOOP PULSING TEST AND LEAK "A" WITH THE 1200 AND 1400 OHM LOOP PULSING TESTS AND THAT A SWITCH WILL REQUIRE A 248 TYPE OR THE EQUIVALENT, OR A 222 TYPE MODIFIED WITH A 1:1 RATIO ARMATURE "B" FUNCTIONAL RELAY FOR THE 1400 OHM LOOP PULSING TEST.

LOOP TEST (OHMS)	CENT. OFF. VOLTAGE	SUB. CONDUCTOR LOOP (OHMS)		
		5 OR EARLIER TYPE DIAL	6-TYPE DIAL	7-TYPE DIAL
1000	45-50	635	1000	900
1000	48-50	735	1300	1200
1200	45-50	735	1200	1100
1200	48-50	885	1300	1300
1400	45-50	885	1200	1200
1400	48-50	1000	1300	1300

1.2 MULTI-CENTER AREAS

THE SUBSCRIBER CONDUCTOR LOOP RANGE FOR ANY OFFICE IN A MULTI-OFFICE AREA IS DETERMINED BY THE TYPE OF DIAL USED, THE PULSING TESTS USED FOR MAINTENANCE IN ALL OFFICES REACHED WITHOUT USING PULSE CORRECTING REPEATERS, THE TYPES OF OUTGOING REPEATERS, THE CENTRAL OFFICE BATTERY REGULATION AND IN SOME CASES THE EARTH POTENTIAL BETWEEN OFFICES. THE TABLES FOLLOWING SHOW THE SUB. CONDUCTOR LOOP RANGES OBTAINABLE IN THE ORIGINATING OFFICE WITH 5 OR EARLIER TYPE, 6 OR 7-TYPE DIALS FOR VARIOUS COMBINATIONS OF LOOP TESTS, BATTERY VOLTAGES, AND REPEATERS IN THE ORIGINATING AND TERMINATING OFFICE. IN THE TABLES IT IS ASSUMED LEAK "B" IS USED WITH THE 1000 OHM LOOP PULSING TEST AND LEAK "A" WITH THE 1200 OR 1400 OHM LOOP PULSING TESTS AND THAT A SWITCH WILL REQUIRE A 248 TYPE OR THE EQUIVALENT, OR A 222 TYPE MODIFIED WITH A 1:1 RATIO ARMATURE "B" FUNCTIONAL RELAY FOR THE 1400 OHM LOOP PULSING TEST.

- 1.21 45 VOLTS IN ORIGINATING OFFICE WITH OUTGOING REPEATERS ADJUSTED TO 44 TO 80 OR 45 TO 80 PER CENT BREAK, AND EARTH POTENTIAL WITH RESPECT TO THE TERMINATING OFF. NOT EXCEEDING + 20, -8 VOLTS FOR REPEATERS OF THE BATTERY AND GROUND PULSING TYPE.

ORG. OFF. LOOP TEST (OHMS)	TERMINATING OFF.		ORG. SUB. CONDUCTOR LOOP (OHMS)			SEE NOTE
	LOOP TEST (OHMS)	CENT. OFF. VOLTAGE	5 OR EARLIER TYPE DIAL	6-TYPE DIAL	7-TYPE DIAL	
1000	1000	45-50	635	1000	900	2,3
	1200	OR				
	OR	48-50				
	1400					
1200	1000	45-50	635	1100	900	2,3
	1000	48-50	735	1200	1100	
	1200	45-50	735	1200	1100	3
	OR	OR				
	1400	48-50				
1400	1000	45-50	635	1100	900	2,3
	1200	45-50	735	1200	1100	
	1000	48-50	735	1200	1200	3
	1200	48-50	885	1200	1200	
	1400	45-50	885	1200	1200	3
	OR					
	48-50					

NOTES (CONT.)

1.22 48 VOLTS IN ORIGINATING OFFICE WITH OUTGOING REPEATERS ADJUSTED TO 48 TO 80 OR 45 TO 80 PER CENT BREAK, AND EARTH POTENTIAL WITH RESPECT TO THE TERMINATING OFFICE NOT EXCEEDING + 20, -8 VOLTS FOR REPEATERS OF THE BATTERY AND GROUND PULSING TYPE.

ORG. OFF. LOOP TEST (OHMS)	TERMINATING OFF.		ORG. SUB. CONDUCTOR LOOP (OHMS)			SEE NOTE
	LOOP TEST (OHMS)	CENT. OFF. VOLTAGE	5 OR EARLIER TYPE DIAL	6-TYPE DIAL	7-TYPE DIAL	
1000	1000	45-50	635	1000	900	2
	1200	45-50	735	1300	1100	
	1400	45-50	735	1300	1200	
	1000	48-50	735	1300	1200	
	1200					
	OR 1400					
1200	1000	45-50	635	1100	900	2
	1200	45-50	735	1300	1100	
	1000	48-50	735	1300	1200	
	1400	45-50	885	1300	1300	
	1200	48-50	885	1300	1300	
	OR 1400					
1400	1000	45-50	635	1100	900	2
	1200	45-50	735	1300	1100	
	1000	48-50	735	1300	1200	
	1200	48-50	885	1300	1300	
	1400	45-50	885	1300	1300	
	1400	48-50	1000	1300	1300	

1.23 45 VOLTS IN ORIGINATING OFFICE WITH BATTERY AND GROUND PULSING TYPE OUTGOING REPEATERS ADJUSTED TO 48 TO 78 PER CENT BREAK AND EARTH POTENTIAL WITH RESPECT TO THE TERMINATING OFFICE NOT EXCEEDING + 20, -6 VOLTS. WHEN THE REPEATERS ARE REQUIRED TO OPERATE WITH HIGHER EARTH POTENTIALS NOT EXCEEDING ± 20 VOLTS, THE SUB. LOOP RANGE VALUES ARE THE SAME AS SHOWN IN NOTE 1.21.

ORG. OFF. LOOP TEST (OHMS)	TERMINATING OFF.		ORG. SUB. CONDUCTOR LOOP (OHMS)			SEE NOTE
	LOOP TEST (OHMS)	CENT. OFF. VOLTAGE	5 OR EARLIER TYPE DIAL	6-TYPE DIAL	7-TYPE DIAL	
1000	1000	45-50	635	1000	900	2,3
	1200	OR				
	OR	48-50				
	1400					
1200	1000	45-50	735	1200	1100	3
	1200	OR				
	OR	48-50				
	1400					
1400	1000	45-50	735	1200	1100	3
	1000	48-50	885	1200	1200	
	1200	45-50	885	1200	1200	
	OR	OR				
	1400	48-50				

NOTES (CONT.)

- 1.24 48 VOLTS IN ORIGINATING OFFICE WITH BATTERY AND GROUND PULSING TYPE OUTGOING REPEATERS ADJUSTED TO 48 TO 78 PER CENT BREAK AND EARTH POTENTIAL WITH RESPECT TO THE TERMINATING OFFICE NOT EXCEEDING ± 20 , -6 VOLTS. WHEN THE REPEATERS ARE REQUIRED TO OPERATE WITH HIGHER EARTH POTENTIALS NOT EXCEEDING ± 20 VOLTS, THE SUBSCRIBER LOOP RANGE VALUES ARE THE SAME AS SHOWN IN NOTE 1.22.

ORG. OFF. LOOP TEST (OHMS)	TERMINATING OFF.		ORG. SUB. CONDUCTOR LOOP (OHMS)		
	LOOP TEST (OHMS)	CENT. OFF. VOLTAGE	5 OR EARLIER TYPE DIAL	6-TYPE DIAL	7-TYPE DIAL
1000	1000	45-50	735	1300	1100
	1000	48-50	735	1300	1200
	1200	45-50	735	1300	1200
	OR	OR			
	1400	48-50			
1200	1000	45-50	735	1300	1100
	1000	48-50	885	1300	1300
	1200	45-50	885	1300	1300
	OR	OR			
	1400	48-50			
1400	1000	45-50	735	1300	1100
	1000	48-50	885	1300	1300
	1200	45-50	885	1300	1300
	1400	45-50	1000	1300	1300
	1200	48-50	1000	1300	1300
	OR				
	1400				

1.25. PULSE CORRECTING REPEATERS

IF THE OUTGOING REPEATER IS A PULSE CORRECTING TYPE OR IF AN INCOMING REPEATER OF THE PULSE CORRECTING TYPE IS USED AT THE TERMINATING OFFICE, THE ORIGINATING SUBSCRIBER PULSING LOOP RANGES ARE THE SAME AS THOSE LISTED IN NOTE 1.1 FOR SINGLE CENTER AREAS.

- A SWITCH WHICH JUST PASSES THE 1000 OHM LOOP MAY FAIL AT 45 VOLTS ON 635 OHM LOOPS, WHEN USING A 5 OR EARLIER TYPE DIAL.
- RANGES SHOWN FOR 45-50 VOLTS IN BOTH ORIGINATING AND TERMINATING OFFICES ARE BASED ON THE ASSUMPTION THAT IF THE VOLTAGE DROPS TO 45 VOLTS IN ONE OFFICE, THE VOLTAGE IN THE OTHER OFFICE WILL BE 48-50 VOLTS AT THE EQUIPMENT.
- FOR LINES HAVING A DC PATH TO GROUND AT THE STATION

4.1 COIN AND 2 PARTY LINES

VALUES ARE SHOWN IN TERMS OF CONDUCTOR LOOP BETWEEN THE CENTRAL OFFICE LINE CKT. AND THE STATION RESISTANCE ALLOWING FOR A MAXIMUM OF 115 OHMS IN ALL CASES EXCEPT FOR THE 191 COIN COLLECTOR, FOR WHICH A MAXIMUM OF 215 OHMS IS ALLOWED.

4.11 DIAL COIN LINES IN A 635 OHM RANGE OFFICE

THE EARTH POTENTIAL LIMITS SHALL NOT EXCEED $-10V$. AND $+12 V$. THE CONDUCTOR LOOP SHALL NOT EXCEED THE VALUE OBTAINED FROM THE FOLLOWING FORMULA AND IN NO CASE SHALL THIS VALUE EXCEED 635 OHMS. THE VALUE 1865 ASSUMES THE USE OF THE 12L OR 13L RESISTANCE LAMPS IN THE COIN CONTROL CIRCUITS. WHERE THE 12E OR 13E RESISTANCE LAMPS ARE USED IN THE COIN CONTROL CKTS. USE THE VALUE 2065 INSTEAD OF 1865.

$$\begin{aligned} \text{CONDUCTOR LOOP (OHMS)} &= 28 (V-E.P.) - 1865 \\ \text{WHERE } V &= \text{COIN CONTROL VOLTAGE} \\ E.P. &= + \text{ OR } - \text{ EARTH POTENTIAL} \end{aligned}$$

4.12 DIAL COIN LINES IN A 735 OHM RANGE OFFICE

THE EARTH POTENTIAL LIMITS SHALL NOT EXCEED ± 10 VOLTS. THE CENTRAL OFFICE VOLTAGE LIMITS SHALL BE 47.5 TO 50 VOLTS. THE CONDUCTOR LOOP SHALL BE OBTAINED FROM THE FORMULA IN NOTE 4.11 AND IN NO CASE SHALL THIS VALUE EXCEED 735 OHMS.

4.13 DIAL COIN LINES IN A 885, 1000 OR OVER 1000 OHM RANGE OFFICE

THE EARTH POTENTIAL LIMITS SHALL NOT EXCEED ± 6 VOLTS. THE CENTRAL OFFICE VOLTAGE LIMITS SHALL BE 47.5 TO 50 VOLTS. THE CONDUCTOR LOOP SHALL BE OBTAINED FROM THE FORMULA IN NOTE 4.11 AND IN NO CASE SHALL THIS VALUE EXCEED 885 OHMS.

4.14 MANUAL COIN LINES

THE EARTH POTENTIAL LIMITS SHALL NOT EXCEED ± 20 VOLTS. THE CONDUCTOR LOOP SHALL BE OBTAINED FROM THE FORMULA IN NOTE 4.11 BUT IN NO CASE SHALL THIS VALUE EXCEED THE VALUE BELOW FOR THE TYPE OF DISTRICT AND OHM RANGE OFFICE.

TYPE OF DISTRICT	CONDUCTOR LOOP (OHMS)	OHM RANGE OFFICE
SUP. 42A	785	635 OR 735
AC-DC	915	635, 735 OR 885
INVERTED 42A & TUBE	925	635, 735 OR 885
AC-DC OR TUBE	1000	1000
AC-DC OR TUBE	1200	1200
AC-DC OR TUBE	1300	1300

NOTES (CONT)

4.15 2 PARTY MESSAGE RATE LINES

THE EARTH POTENTIAL LIMITS SHALL NOT EXCEED +6, -16 VOLTS. THE CONDUCTOR LOOP (OHMS) WITH THE DIFFERENT LINE RELAYS AND CENTRAL OFFICE VOLTAGES OF 45-60 AND 48-50 VOLTS IS AS FOLLOWS: IN NO CASE SHALL THE VALUE EXCEED THE OHM RANGE OFFICE.

R913,R1316 AND R1885 LINE RELAYS			
45V		48V	
EARTH POTENTIAL		EARTH POTENTIAL	
0	+6	0	+6
1135	1100	1260	1200

EAS LINE RELAY			
45V		48V	
EARTH POTENTIAL		EARTH POTENTIAL	
0	+6	0	+6
1060	1000	1175	1100

4.16 2 PARTY FLAT RATE FOR AUTOMATIC TICKETING

THE EARTH POTENTIAL LIMITS SHALL NOT EXCEED +6, -20 VOLTS. THE CONDUCTOR LOOP (OHMS) WITH THE DIFFERENT LINE RELAYS AND CENTRAL OFFICE VOLTAGES OF 45-50 AND 48-50 VOLTS IS AS FOLLOWS: IN NO CASE SHALL THE VALUE EXCEED THE OHM RANGE OFFICE.

R913, R1316 AND R1885 LINE RELAYS				
TYPE TELEPHONE SET	45V		48V	
	EARTH POTENTIAL		EARTH POTENTIAL	
	0	+6	0	+6
	500	1200	1190	1300
OTHER THAN 500	1200	1200	1300	1300

EAS LINE RELAY				
TYPE TELEPHONE SET	45V		48V	
	EARTH POTENTIAL		EARTH POTENTIAL	
	0	+6	0	+6
	500	1180	1140	1300
OTHER THAN 500	1200	1180	1300	1300

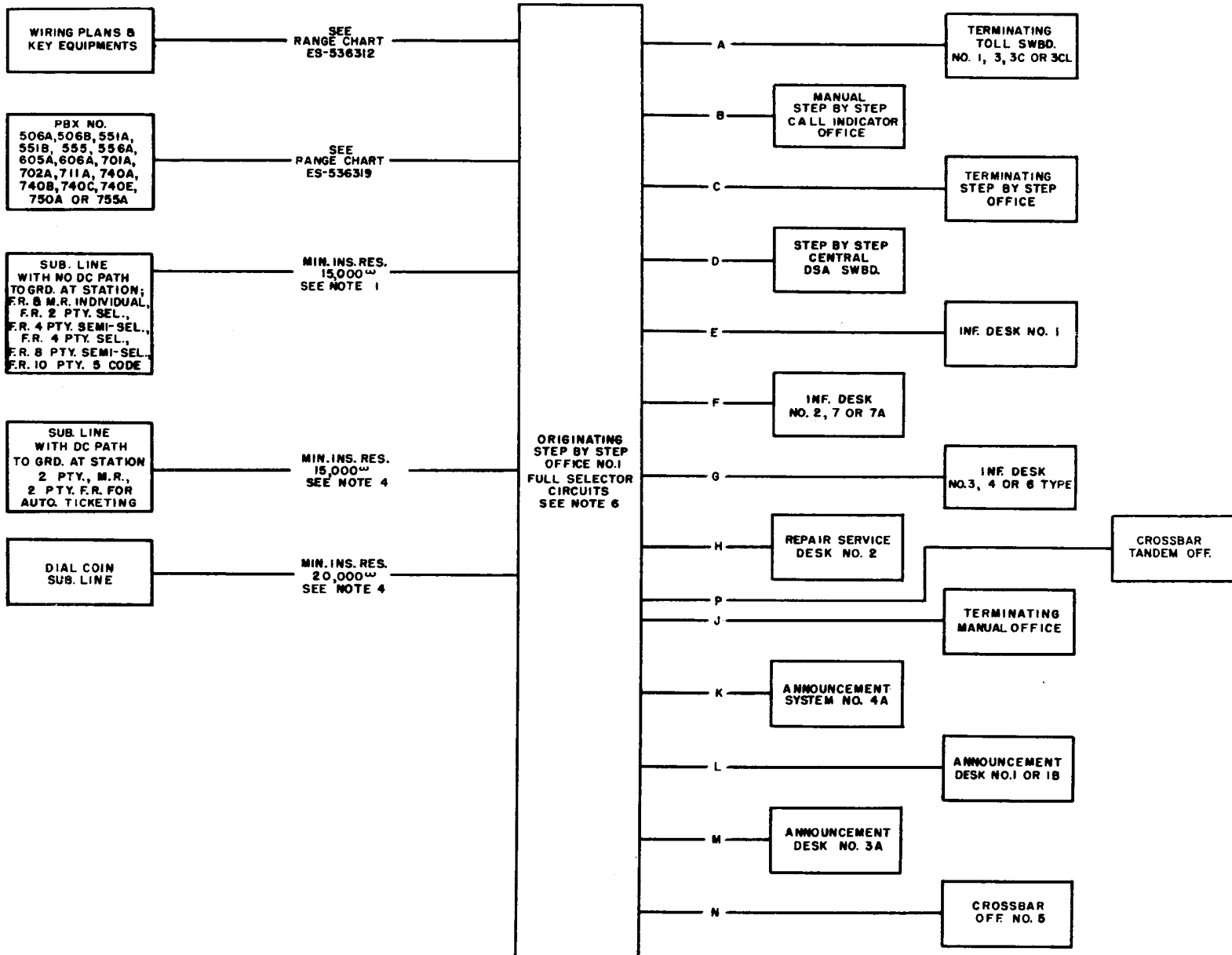
5.

6. ALL INTEROFFICE CONDUCTOR LOOP VALUES SHOWN ON THE RANGE CHART INCLUDE THE RESISTANCE OF THE OUTSIDE CABLING, THE CENTRAL OFFICE WIRING AND THE HEAT COILS. THE RESISTANCE OF THE CENTRAL OFFICE APPARATUS IS NOT INCLUDED. WHERE DIFFERENT CODED REP. COILS ARE IN A CKT, THE REP COIL WITH THE HIGHEST WINDING RES VALUES WAS CHOSEN IN ESTIMATING THE RANGE: USE OF REP COIL WITH LOWER WDG RES VALUES INCREASES THE ESTIMATED RANGE BY THE DIFFERENCE IN THE RES VALUES.
7. WHERE THE ENTIRE LENGTH OF THE CABLE IS 19 GAUGE, THE MAX MILES OF CABLE IS 32: IN ALL OTHER CASES THE MAX MILES OF CABLE IS 24.
8. THE CONDUCTOR LOOP SHALL NOT EXCEED THE VALUE BELOW FOR THE TYPE OF DISTRICT AND OHM RANGE OFFICE.

TYPE OF DISTRICT	CONDUCTOR LOOP(OHMS)	OHM RANGE OFFICE
SUP 42A	785	635 OR 735
AC-DC	915	635,735 OR 885
INVERTED 42A & TUBE	925	635,735 OR 835
AC-DC OR TUBE	1000	1000
AC-DC OR TUBE	1200	1200
AC-DC OR TUBE	1300	1300

9. THIS RANGE SHALL NOT INCLUDE MORE THAN 30 MILES OF CABLE.

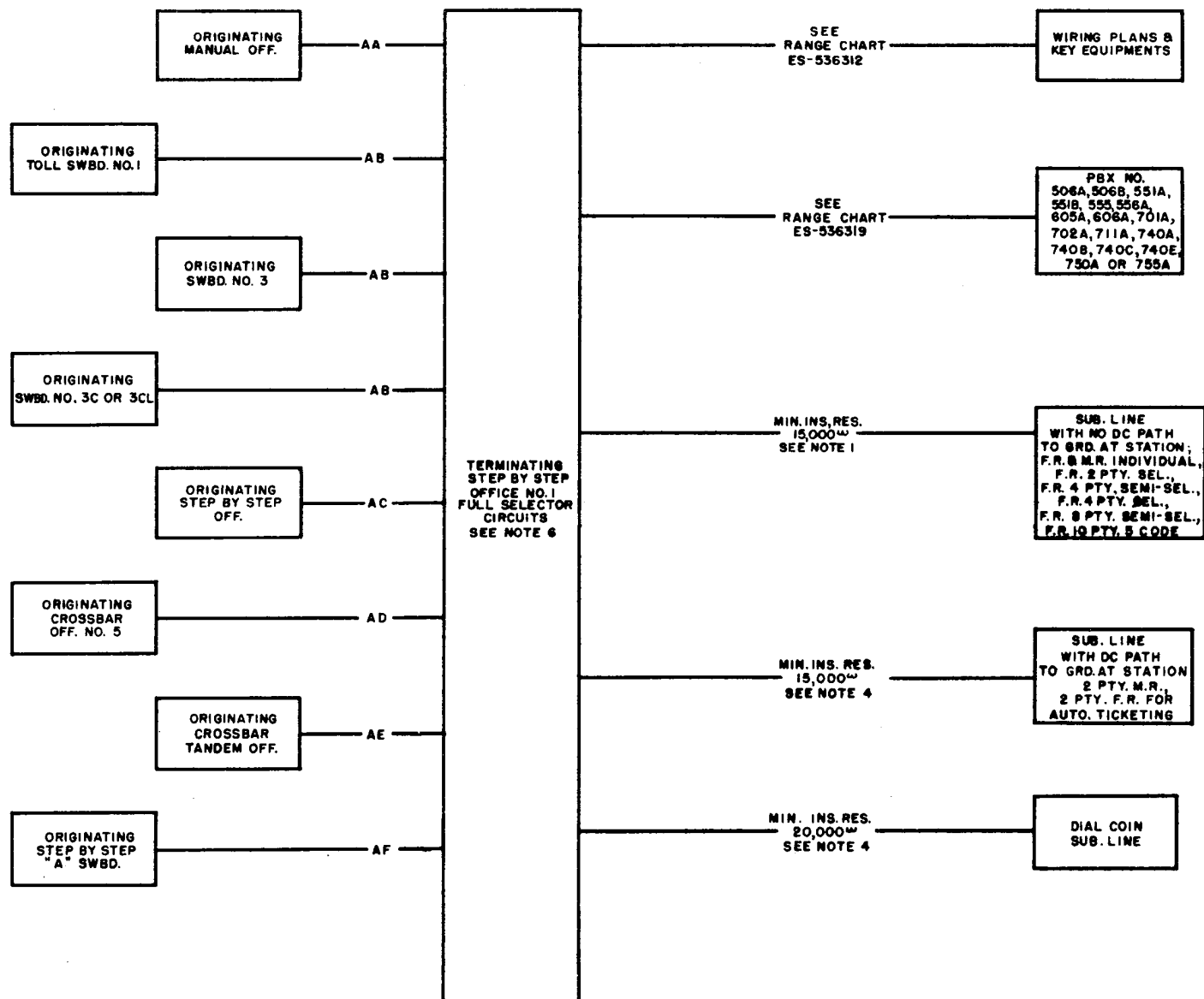
RANGE CHART



LOOP DESIG.	SXS NO. I OFF. CKT.	SD- DWG. NO.	OHMS MAX. EXT. CKT. LOOP			OHMS MAX. CONDUCTOR LOOP			OHMS MIN. INS. RES.	SEE NOTE	REMARKS
			PLSG.	SUPV.	RING.	PLSG.	SUPV.	RING.			
A	SUB. REC. COMPL. TRK., COIN	32168-01		2475			2315	2500	30,000		DST. OFF. RING. VOLTAGE SHALL BE MIN. 95V. IN SERIES WITH 13 TYPE RES. LAMP
	SUB. REC. COMPL. TRK., NON-COIN WITH RECALL	32136-01		3050			2890	2500	30,000		DST. OFF. RING. VOLTAGE SHALL BE MIN. 95V. IN SERIES WITH 13 TYPE RES. LAMP
	SUB. REC. COMPL. TRK., NON-COIN WITHOUT RECALL	31925-01		5500			3410		30,000		
	OUT. INCP. TRK.	31965-01		3550			3000		30,000		40-56V. AT DST. OFF.
B	OUT. REP. BAT. & GRD. PLSG., LOOP SUPV.	31779-01		2560		2000	1840		30,000		45-50V. AT DST. OFF.
	OUT. REP. BAT. & GRD. PLSG., BAT. & GRD. SUPV.	31147-01				2400	2400		30,000		45-50V. AT DST. OFF.
C	OUT. REP. BAT. & GRD. PLSG. LOOP SUPV., CONDENSER TRANS.	31779-01		2560		2000	1985		30,000		
	OUT. REP. BAT. & GRD. PLSG., BAT. & GRD. SUPV.	31147-01				2400	2400		30,000		
	OUT. REP. PULSE CORRECTOR	32184-01	5000	6800		5000	5000			9	DIAL SPEED 8-11 P.P.S.
	OUT. REP. BAT. & GRD. PLSG., LOOP SUPV., REP. COIL TRANS.	32008-01		2530		2000	1900		30,000		
D	OUT. SPL. SERV. TRK., COIN	31315-01		3600			3000		30,000		40-56V. AT DST. OFF.
	OUT. SPL. SERV. TRK., NON-COIN	31375-01		3550			3000		30,000		40-56V. AT DST. OFF.
	OUT. INCP. TRK.	31965-01		3550			3000		30,000		40-56V. AT DST. OFF.
	OUT. TRK. TO RURAL OPR.	31540-01		3550			3000		30,000		40-56V. AT DST. OFF.
	OUT. REP. SERV. TRK.	32178-01		4650			3000		30,000		
E	OUT. INF. TRK.	32170-01		3500			1850		30,000		
F	OUT. INF. TRK.	32170-01		3500			2550		30,000		
G	OUT. INF. TRK.	32170-01		3500			2200		30,000		
H	OUT. REP. SERV. TRK.	32178-01		4650			2900		30,000		(B) REL. LIMIT
				4990			2855		30,000		(MS) REL. LIMIT
J	OGT TO MAN. SWBD. NO. I, IC, ID OR II ARR. TO CHARGE SUB.	32167-01		4125			3245		30,000		
	OGT TO MAN. SWBD. NO. I, IC, ID OR II NOT ARR. TO CHARGE SUB.	31692-01		NONE			3300				RETARDATION COIL ONLY USE
	OGT TO SWBD. NO. 12 ARR. TO CHARGE SUB. - CONDENSER TRANS.	32167-01		4125			2235		30,000		
	OGT TO SWBD. NO. 12 ARR. TO CHARGE SUB. - REP. COIL TRANS.	32167-01		4125			2190		30,000		
K	OUT. ANNOUNCEMENT TRK. - ANN. SYS. DWG. SD-95546-01	30895-01		4450 EACH PAIR			3785 EACH PAIR		30,000		LIMITS APPLY TO SD-95546-01
L	OUT. ANNOUNCEMENT TRK. - ANN. DESK DWG. SD-90260-01	31362-01		6700			4580		30,000		LIMITS APPLY TO SD-90260-01
M	OUT. REP. BAT. & GRD. PLSG., LOOP SUPV. - ANN. DESK IN DST. OFF.	31779-01		2560			1935		30,000		
	SEL. - ANN. DESK DWGS. SD-96268-01 & SD-96249-01 IN SAME BLDG.	30200-01		4450			3265		30,000		LIMITS APPLY TO SD-96249-01
N	OUT. REP. BAT. & GRD. PLSG., LOOP SUPV.	31779-01		2560		2000	2120		30,000		
		32008-01		2530		2000	2090		30,000		
	OUT. REP. BAT. & GRD. PLSG., BAT. & GRD. SUPV.	31147-01				2400	2400		30,000		
	OUT. REP. BAT. & GRD. PLSG., LONG RANGE REV. BAT. SUPV.	32087-01		8000		4200	4125		30,000	7	
P	OUT. REP	31779-01									RANGES ARE SHOWN ON SD-25435-01 XBR TDM OFF. KEY SHEET
		32008-01									
	SEL. REP & TRK MB	30872-01									
		30855-01									
	OUT. TRK	32199-01									
		32240-01									
		32241-01									

RANGE CHART TABLE

RANGE CHART



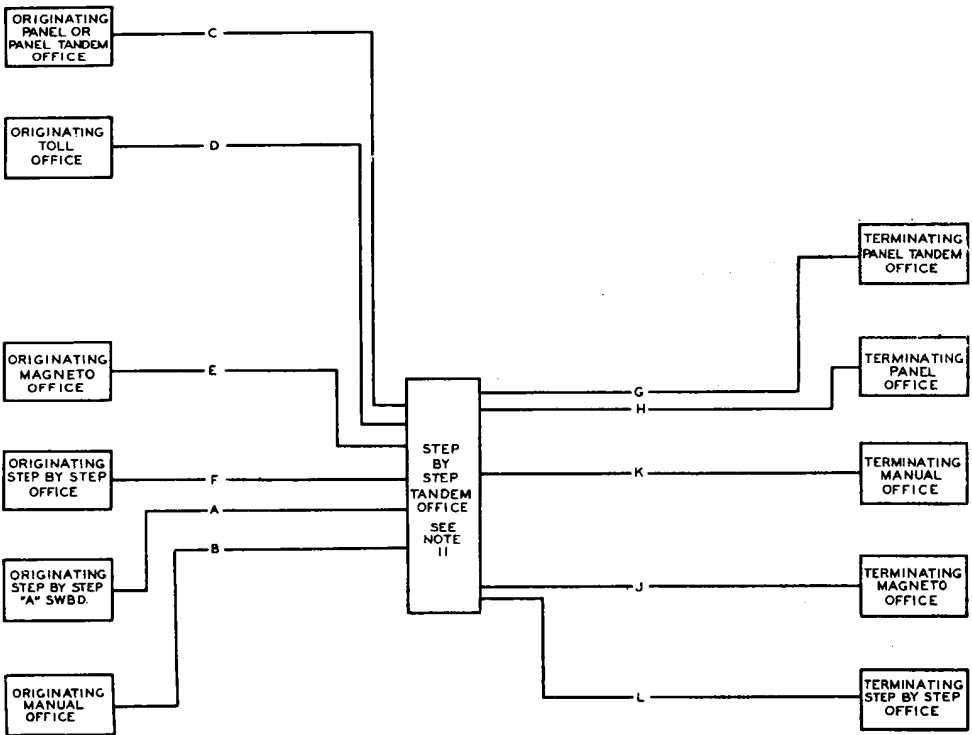
LOOP DESIG.	SXS NO. I OFF. CKT.	SD- DWG. NO.	OHMS. MAX. EXT. CKT. LOOP			OHMS. MAX. CONDUCTOR LOOP			MIN. INS. RES. OHMS	SEE NOTE NO.	REMARKS
			PLSG.	SUPV.	RING.	PLSG.	SUPV.	RING.			
AA	INC. LOCAL SEL.	30200-01 (TYPICAL)		2400		1200	1200		30,000		
	INC. PULSE CORRECTOR REP.	32184-01	5000			5000	5000		30,000	9	8-11 P.P.S.
AB	TOLL TRANS. SEL., WET DRY SUPV.	31745-01				1200	1200	1200	30,000		DST. OFF. RINGING VOLTAGE SHALL BE MIN. 75V. IN SERIES WITH A 13 TYPE RES. LAMP
	TOLL TRANS. SEL., REV. BAT. SUPV. WITH 221 FAE PLSG. REL.	31841-01				1200	1200		30,000		
	TOLL TRANS. SEL., REV. BAT. SUPV. WITH 221 FAF PLSG. REL.	31841-01				2000	2000		30,000		
	A-B TOLL PRECEDING OR TOLL TRANS. SEL. WITH 221 FAE PLSG. REL.	31241-01 OR 31723-01		2100 OR 2200		1200	1200		30,000		2100 APPLIES TO SD-31241-01 & 2200 TO SD-31723-01
	A-B TOLL PRECEDING SEL. WITH 221 FAC OR A-B TOLL TRANS. SEL. WITH 221 FAF PLSG. REL.	31241-01 OR 31723-01		2690		2000	2000		30,000		
	TEST DISTRIBUTOR	32007-01		2750		2000	2000		30,000		
	INC. LOC. SEL.	30200-01		2400		1200	1200		30,000		
AC	LOC. SEL. INC. FROM OUT. REP. ARR. FOR BAT. & GRD. PLSG. & LOOP SUPV. WITH REP. COIL TRANS.	30200-01 (TYPICAL)		2400		1900	1900		30,000		
	LOC. SEL. INC. FROM OUT. REP. ARR. FOR BAT. & GRD. PLSG. WITH CONDENSER TRANS.	30200-01 (TYPICAL)		2400		1985	1985		30,000		
	LOC. SEL. INC. FROM OUT. REP. ARR. FOR BAT. & GRD. PLSG. & BAT. & GRD. SUPV.	30200-01 (TYPICAL)				2400	2400		30,000		
	INC. PULSE CORRECTOR REP. FROM OUT. PULSE CORRECTOR REP.	32184-01	5000			5000	5000		30,000	9	8-11 P.P.S.
AD	INC. LOC. SEL. LOOP PLSG.	30200-01 (TYPICAL)		2400		1200	1200		30,000		
	INC. LOC. SEL. BAT. & GRD. PLSG.	30200-01 (TYPICAL)		2400		1900	1900		30,000		
	INC. PULSE CORRECTOR REP.	32184-01	5000			5000	5000		30,000	9	8-11 P.P.S.
	TOLL TRANS. SEL., REV. BAT. SUPV., WITH 221 FAE PLSG. REL.	31841-01				1200	1200		30,000		
	TOLL TRANS. SEL., REV. BAT. SUPV., WITH 221 FAF PLSG. REL.	31841-01				2000	2000		30,000		
AE	INC. LOC. SEL., LOOP PLSG.	30200-01 (TYPICAL)		2400		1200	1200		30,000		
	INC. LOC. SEL., BAT. & GRD. PLSG.	30200-01 (TYPICAL)		2400		1910	1910		30,000		
	INC. PULSE CORRECTOR REP., LOOP PLSG.	32184-01	5000			5000	5000		30,000	9	
	A-B TOLL PRECEDING OR TOLL TRANS. SEL. WITH 221 FAE PLSG. REL.	31241-01 OR 31723-01		2100 OR 2200		1200	1200		30,000		2100 APPLIES TO SD-31241-01 & 2200 TO SD-31723-01
	A-B TOLL PRECEDING OR TOLL TRANS. SEL. WITH 221 FAF PLSG. REL.	31241-01 OR 31723-01		2690		2000	2000		30,000		
AF	TEST DISTRIBUTOR	32007-01		2750		2000	2000		30,000		
	INC. PULSE CORRECTOR REP.	32184-01	5000			5000	5000		30,000	9	8-11 P.P.S.
	TOLL TRANS. SEL., REV. BAT. SUPV. WITH 221 FAE PLSG. REL.	31841-01				1200	1200		30,000		
	TOLL TRANS. SEL., REV. BAT. SUPV. WITH 221 FAF PLSG. REL.	31841-01				2000	2000		30,000		
	INC. LOC. SEL.	30200-01 (TYPICAL)		2400		1200	1200		30,000		
	A-B TOLL PRECEDING OR TOLL TRANS. SEL. WITH 221 FAE PULS. REL.	31241-01 OR 31723-01		2100 OR 2200		1200	1200		30,000		2100 APPLIES TO SD-31241-01 & 2200 TO SD-31723-01
	A-B TOLL PRECEDING OR TOLL TRANS. SEL. WITH 221 FAF PULS. REL.	31241-01 OR 31723-01		2690		2000	2000		30,000		

RANGE CHART TABLE

LOOP DESIG.	S X S NO. I OFF. CKT.	SD- DWG. NO.	OHMS MAX. EXT. CKT. LOOP			OHMS MAX. CONDUCTOR LOOP			MIN. INS. RES. OHMS	SEE NOTE NO.	REMARKS
			PLSG.	SUPV.	RING.	PLSG.	SUPV.	RING.			
CA+CB	INC. TDM. COMPL. TRK. - CONDENSER TRANS.	96413-01		6550			5310		60,000		
	INC. TDM. COMPL. TRK. -REP. COIL TRANS.	96413-01		6550			5370		60,000		
CC	CALL WIRELESS TOLL SW. CORD FOR MAGNETO RURAL LINES	90574-01		3100			1510		30,000		
	CALL WIRELESS TOLL SW. CORD FOR COMMON BAT. RURAL LINES	90476-01		2900			2655		30,000		
	INC. TRK. - 24V. SIG.	96169-01		1250			1000		30,000		
	INC. TRK. - 48V. SIG.	96169-01		3050			2800		30,000		
	INC. VERIFICATION REQUEST TRK.	31588-01		1480			1070		30,000		
CD	CALL WIRELESS TOLL SW. CORD FOR MAGNETO RURAL LINES	90574-01		3100			1510		30,000		
	CALL WIRELESS TOLL SW. CORD FOR COMMON BAT. RURAL LINES	90476-01		2900			2755		30,000		
	INC. VERIFICATION REQUEST TRK. - 24V. SIG.	31588-01		1480			1255		30,000		
	INC. VERIFICATION REQUEST - 48V. SIG.	31588-01		3000			2410		30,000		
CE	INC. TRK. FROM COMMUNITY DIAL OFF.	96283-01		4800			1975		30,000		
CF	INC. TRK. FROM COMMUNITY DIAL OFF.	96283-01		4800			4210		30,000		
CG	OPR. REC. COMPL. TRK.	96412-01		3000			1235		30,000		
CH	OFFICIAL PBX TRK.	95673-01		5150			2750		30,000		
CI	TX TRK.	95436-01		5600			3930		30,000		
CJ	TX TRK.	95436-01		5600			5225		30,000		
CK	COMMON BAT. RURAL LINE	90480-01		3100			1150		10,000		
CL	MAG. RURAL LINE - 8, 1500 OHM RINGERS WITH 3 BAR GEN.	31130-01					800		10,000		
	MAG. RURAL LINE - 20, 2500 OHM RINGERS WITH 5 BAR GEN.	31130-01					2000		10,000		
	MAG. RURAL LINE - 16, 2500 OHM RINGERS WITH 5 BAR GEN.	31130-01					2500		10,000		

RANGE CHART TABLE

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TANDEM OFFICE RANGE CHART

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NOTES:

1. ALL INTEROFFICE LOOP VALUES GIVEN ON THIS DRAWING INCLUDE ONLY THE RESISTANCE OF OUTSIDE CABLING AND OFFICE WIRING AND THE HEAT COILS. THE RESISTANCE OF THE APPARATUS AT THE CENTRAL OFFICE IS NOT INCLUDED.
2. WHEN PULSING INTO INC. SEL. WITHOUT OUTGOING REPEATER.
- 3.
- 4.
5. WHEN THRU SUPERVISION IS PROVIDED BY THE CIRCUITS.
6. WHEN REPEATED SUPERVISION IS PROVIDED BY THE CIRCUITS.
7. WHEN PULSING INTO PULSE CORRECTING REPEATER.
- 8.
- 9.
- 10.
11. ON TANDEM OPERATION OF REPEATERS, ALL SWITCHES AND REPEATERS SHALL MEET LEAK "A" AND EITHER THE 1200^W OR 1400^W LOOP PULSING TESTS.
12. WHEN BAT. TO GRD. PULSING AND LOOP SUPERVISION REPEATER IS USED IN ORIGINATING OFFICE.
13. WHEN LOOP PULSING AND LOOP SUPERVISION REPEATER IS USED IN ORIGINATING OFFICE.
14. WHEN BAT. TO GRD. PULSING AND BAT. TO GRD. SUPERVISION REPEATER IS USED IN ORIGINATING OFFICE.
15. THIS RANGE VALUE SHALL BE USED ONLY WITH NON-PULSE-CORRECTING REPEATER AT THE TANDEM OFFICE.
16. WHEN BAT. TO GRD. PULSING AND LOOP SUPERVISION REPEATER IS USED IN TANDEM OFFICE.
17. WHEN BAT. TO GRD. PULSING AND BAT. TO GRD. SUPERVISION REPEATER IS USED IN TANDEM OFFICE.
18. WHEN LOOP PULSING AND LOOP SUPERVISION REPEATER IS USED IN TANDEM OFFICE.

LOOP DESIG.	LOOP RES. NOT TO EXCEED	MIN. INS. RES.	SEE NOTE NO.	REMARKS
A	1200 ^W	30000 ^W	2	
A	5000 ^W	30000 ^W	7	
B	1200 ^W	30000 ^W	9	WHEN DIALING INTO INC. SEL.
B	5000 ^W	30000 ^W	7	
C	4945 ^W	30000 ^W		LOOP SIGNALING
D	1200 ^W	30000 ^W		WHEN DIALING INTO INC. SEL.
D	5000 ^W	30000 ^W	7	
E	1200 ^W	30000 ^W		WHEN DIALING INTO INC. SEL.
E	5000 ^W	30000 ^W	7	
F	1800 ^W	30000 ^W	12	WHEN PULSING INTO INC. SEL.
F	1000 ^W	30000 ^W	13	WHEN PULSING INTO INC. SEL.
F	5000 ^W	30000 ^W	7	
F	2400 ^W	30000 ^W	14,15	
G	8200 ^W	30000 ^W		CX. SIGNALING - STFD. - E.P. 62V ±
H	4480 ^W	30000 ^W	6	48V. STFD. REVERSE BAT.
D+H	4900 ^W	30000 ^W	5	48V. STFD. REVERSE BAT.
F+H	4900 ^W	30000 ^W	5	48V. STFD. REVERSE BAT.
H	1805 ^W	30000 ^W		48V. STFD. HIGH LOW
J	3000 ^W	30000 ^W		
K	8200 ^W	30000 ^W		48V. CX. SIGNALING - STFD. - E.P. 62V ±
K	3000 ^W	30000 ^W		38V. CX. SIGNALING - STFD. - E.P. 37V ±
K	4210 ^W	30000 ^W	6	24V. STFD. - REVERSE BAT.
K	5155 ^W	30000 ^W	6	38V. STFD. - REVERSE BAT.
K	5780 ^W	30000 ^W	6	48V. STFD. - REVERSE BAT.
K	3045 ^W	30000 ^W	5	24V. STFD. - REVERSE BAT.
K	3900 ^W	30000 ^W	5	38V. STFD. - REVERSE BAT.
K	4900 ^W	30000 ^W	5	48V. STFD. - REVERSE BAT.
K	1505 ^W	30000 ^W		48V. STFD. - HIGH LOW
L	2000 ^W	30000 ^W	16	WHEN PULSING INTO INC. SEL.
L	2400 ^W	30000 ^W	17	WHEN PULSING INTO INC. SEL.
L	1200 ^W	30000 ^W	18	WHEN PULSING INTO INC. SEL.
L	5000 ^W	30000 ^W	7	

SWITCH TRAINS FOR COMPLETING CALLS FROM OTHER OFFICES									
FACILITIES FOR COMPLETING CALLS	LOCATION OF TYPICAL CKTS. IN SWITCH TRAIN ON KEY SHEET	INC. TIP & RING LEADS	TRUNK NORMAL	KIND OF RING. START SIGNAL	AWTG. SUB. ANS.	RECEIVER OFF HOOK	KIND OF SUPV.	TRANSMITTER BATTERY SUPPLY TYPE	SEE NOTE
LOCAL TRAIN	INC. SEL. A7	T	GRD.	NONE	GRD.	BAT.	REV. BAT.	B	5
	COMB. CONN. C18	R	BAT.		BAT.	GRD.			
A-B TOLL TRAIN	A-B TOLL PRECEDING SEL. F22	T	GRD.	NONE	GRD.	BAT.	REV. BAT.	A	5
	A-B TOLL TRANS. SEL. K23 TOLL INTERMEDIATE SEL. D24 COMB. CONN. C18	R	BAT.		BAT.	GRD.			
LOOP DIALING TOLL TRAIN (WET-DRY SUPERVISION)	TOLL TRANS. SEL. D23	T	GRD.	20 CYCLE	BAT.	DRY	WET-DRY	A	4,5
	TOLL INTERMEDIATE SEL. D24 COMB. CONN. C18	R	BAT.		GRD.	DRY			
LOOP DIALING TOLL TRAIN (REV. BAT. SUPERVISION)	TOLL TRANS. SEL. E23	T	GRD.	SIMPLEX OR NONE	GRD.	BAT.	REV. BAT.	A	1,4,5
	TOLL INTERMEDIATE SEL. D24 COMB. CONN. C18	R	BAT.		BAT.	GRD.			
TEST TRAIN OR VERIFICATION TRAIN	TEST DISTRIBUTOR J18 TEST CONN. J19	LINE T	GRD.	NONE	GRD.	GRD.	NONE	NONE	3,5
		LINE R	BAT.		BAT.	BAT.			
		TEST T	DRY	NONE	DRY	DRY	BRIDGED	X	2
		TEST R	DRY		DRY	DRY			
OUTGOING REPEATER OR TRUNK CIRCUITS									
REP. OR TRK. CKT.	LOCATION OF TYPICAL CKT. ON KEY SHEET	OUT. TIP & RING LEADS			AWTG. SUB. ANS. FROM DST. OFF	RECEIVER OFF HOOK FROM DST. OFF	KIND OF SUPV.		SEE NOTE
OUT. REP.	C87, F87	T			GRD.	BAT.	REV. BAT.		
		R			BAT.	GRD.			

NOTES:

- THIS TOLL TRAIN MAY ALSO BE USED FOR AUTOMATIC START OF RINGING ON SEIZURE OF AN IDLE LINE UNDER WHICH CONDITION NO RINGING SIGNAL IS REQUIRED.
- RINGING OF THE SUBSCRIBER IS UNDER MANUAL CONTROL OF RINGING KEY BY TESTMAN ONLY. TRANSMITTER BATTERY IS FURNISHED FROM THE TEST DESK OR LOCAL TEST CABINET ONLY.
- WHEN THE CALLED LINE IS BUSY THE TRUNK NORMAL POLARITY IS REVERSED AND THE TALKING CKT. IS CLOSED. WHEN THE CALLED LINE IS IDLE, THE TALKING CKT. IS CLOSED BUT THE TRK. NORMAL POLARITY IS NOT REVERSED.
- A SEPARATE SINGLE TRUNK CONDUCTOR CONNECTING TO TRUNK COIN CONTROL CKT. (BLOCK 825) IS REQUIRED WHEN THE 110 V. POSITION CKT. METHOD IS USED IN THE TOLL OFFICE FOR DISPOSAL OF COINS. OTHERWISE 2 TRUNK CONDUCTORS CONNECTING TO COIN CONTROL SELECTOR (BLOCK A82) IS REQUIRED FOR DISPOSAL OF COINS.
- PULSES INTO THE STEP-BY-STEP SWITCHES SHALL BE BETWEEN THE LIMITS OF 8-11 PULSES PER SECOND. THE INTERDIGITAL TIMING SHALL BE 0.8 SECOND BETWEEN DIGITS FOR TRUNK SELECTION AND A MINIMUM OF 0.4 SECOND FOR THE DIGITS PULSED INTO THE CONNECTOR.

TRK. CKTS., INCOMING & OUTGOING CKT. DETAILS

General

The table on the preceding page shows the principal operating features of a step-by-step office from the viewpoint of interoffice operation and is intended primarily to facilitate the selection of options in the connecting circuits in other offices. These features are listed by types of circuits and are stated in terms of the functional names of circuit options. These options in turn indicate what kinds of circuits are required in the connecting offices and what options are required in these circuits. Heretofore this information was shown only on the circuit drawings and circuit descriptions of the particular circuits involved. This kind of information will facilitate the general understanding of interoffice operation. It will be particularly useful on engineering new jobs and additions which connect with step-by-step because it eliminates much of the need of examining details on numerous circuits and in circuit descriptions.

Let it be assumed, for example, that SD-55346-01, switchboard No. 3CL toll switching trunk circuit arranged for repeated dialing, is used to complete calls to subscribers in the step-by-step office requiring the following features.

1. Simplex start of ringing.
2. Rering of the called line with receiver off-hook.
3. Coin control with positive coin battery used for coin collect.

Referring to the table on the key sheet, it is shown that the following features or options are furnished by the toll transmission selector circuit SD-31841-01 in the step-by-step office.

1. Ground on tip and battery on ring when trunk is normal.
2. Simplex start of ringing or none.
3. Rering or no rering of the called line with receiver off-hook.
4. Ground on tip and battery on ring for awaiting subscriber answer signal.
5. Battery on tip and ground on ring for receiver off-hook.

6. Reverse battery supervision
7. Type "A" TB supply.
8. No coin control or coin control over separate single trunk conductor where the disposal of coins is controlled without dialing or over 2 conductors where dialing of 2 digits into the coin control selector is employed.

Referring to the drawing title and feature and option table on SD-55346-01 toll switching trunk circuit, it is shown that:

1. No option is furnished for polarity of T and R leads when circuit is normal since this required feature is not shown in the feature or option table.
2. Figure E is furnished for simplex start of ringing as covered in the feature and option table.
3. No option is furnished for rering of the called line with receiver off-hook since this required feature is not shown in the feature and option table.
4. No option is furnished for polarity of T and R leads for awaiting subscriber answer signal since this required feature is not shown in the feature and option table.
5. No option is furnished for polarity of T and R leads for receiver off-hook since this required feature is not shown in the feature and option table.
6. Figure C is furnished for reverse battery supervision without start dial signal or Figure J is furnished for reverse battery supervision with start dial signal, as covered in the feature and option table.
7. No option is furnished for coin control over separate single trunk conductor as the drawing title indicates that the circuit is arranged for this feature. The use of positive coin battery for coin collect is covered on the switchboard No. 3CL position circuit SD-64738-01.

ADAPTER		30, 60 & 120 I.P.M. Relay, to Provide a Delay Interval, for Use with 804C Ring- ing Pwr. Plant	SD-31606-01 G73
Multi-Party Line For use with Grounded or Low Insulation Metallic Lines - Pulse Correcting and Relayed Ringing	SD-31848-01 F1	Miscellaneous Alarm Sender For Use with Suspension Ckt. Motor Stop and Guard Permanent Signal - Arr. to Operate on Spec. Number of Perm. Signals	SD-32180-01 A207 SD-32193-01 H133 SD-95872-01 H217 SD-31553-01 F129
ADJUSTING		Power - D-C Fuse Voltage Control Ckt. Breaker	SD-31912-01 G132 SD-31519-01 G127 SD-31544-01 H127 SD-31545-01 I127
MF Pulsing Receiver, Using MF Current Supply Source	SD-95644-01 D167	Power - A-C AC-DC Ring. Sup. Ring. 60 Cycle Supply for 6V Lamps	SD-31559-01 I129 SD-31560-01 I129 SD-95005-01 C133
MF Pulsing Receiver, Using One Milliwatt 1000 Cycle Supply Source	SD-95779-01 C167	Power Plant - 803C AC-DC Ring. & C.C. Supply Sup. Ring. & C.C. Supply Switchboard	SD-31617-01 J130 SD-31618-01 I130
ALARMS		"A" Bd. Night "A" Bd. Key Pulsing Switch Trouble Rep., Trks., Out. Trk. Sw., Plug Up Trk. Conn., Spl. Serv. O.G.T., and M.R. Trks.	SD-90464-01 A115 SD-95052-01 D129
Audible & Visual Pilot Lamp	SD-31548-01 F128	Sel. Shelf Ckts. Alm. Frame Ckts. for Selectors	SD-31516-01 E127 SD-32043-01 B127
Power Alm. Lamp	SD-31549-01 G128	Conn. Shelf & PBX Trk. Shelf Ckts. Alm. Frame Ckts. for Conns. & PBX	SD-32044-01 B128 SD-32045-01 C127
Audible	SD-31551-02 I128	Trks. For Trk. & Misc. Shelves Sel. Rep. Shelf Ckts.	SD-32046-01 C127 SD-32048-01 A128 SD-32102-01 K135
Aud. & Visual with Aisle Pilot and Distinctive Alms.	SD-96188-01 G133	Alm. Frame Ckts. for Sel. Repeaters Line Fdr. & Trk. Fdr.	SD-32103-01 J135 SD-32239-01 A127
Auxiliary		Tone	SD-31521-01 B129
For Controlling Alm. for Conn. Discon- nect Condition	SD-31866-01 I134	Trunk Prepayment Coin Trks. For P.B.X. Trks. on Relay Racks Special Service Trk.	SD-30852-01 J129 SD-31785-01 E131 SD-90622-01 G115
Cable Insulation	SD-31912-01 G132	ALARM RECEIVING	
Cable Insulation	SD-96348-01 H132	AMPLIFIER	
Checking Terminal (also see Terminal)	SD-31835-01 I133	Cent. Off. Observing Amplifier & Pad, with High Impedance Unit	SD-90567-01 G67
Emergency		For Use with S.O. Ckts. Connecting to S.O. Desk No. 7 or 12 Monitoring, with High Impedance Unit	SD-95026-01 D107 SD-95112-01 D203 SD-96516-01 I110
Code Sig. & Auto. Fire Detection Inc. from Dist. Off Where Inc. Ckt. is not to be Connected to Zone Sig. Ckt. Emer.	SD-90437-01 D131	ADAPTER	
Auto. Fire Detection 48V Multi Zone	SD-96042-01 B131	Multi-Party Line For use with Grounded or Low Insulation Metallic Lines - Pulse Correcting and Relayed Ringing	
Auto. Fire Detection 48V Single Zone Emer.	SD-96049-01 F131	Relay, to Provide a Delay Interval, for Use with 804C Ring- ing Pwr. Plant	
SD-96052-01 D133		Miscellaneous Alarm Sender For Use with Suspension Ckt. Motor Stop and Guard Permanent Signal - Arr. to Operate on Spec. Number of Perm. Signals	
Extension, for		Power - D-C Fuse Voltage Control Ckt. Breaker	
Receiving Alm. Indications Over Separate Cable Pair from Distant Office or PBX	SD-95484-01 C129	Power - A-C AC-DC Ring. Sup. Ring. 60 Cycle Supply for 6V Lamps	
Fuse		Power Plant - 803C AC-DC Ring. & C.C. Supply Sup. Ring. & C.C. Supply Switchboard	
Relay Rack, Alarm Frame and Traffic Register Rack	SD-31613-01 G130	"A" Bd. Night "A" Bd. Key Pulsing Switch Trouble Rep., Trks., Out. Trk. Sw., Plug Up Trk. Conn., Spl. Serv. O.G.T., and M.R. Trks.	
Interrupter		Sel. Shelf Ckts. Alm. Frame Ckts. for Selectors	
Code Ringing - 10 Pty. TPS	SD-31298-01 A129	Conn. Shelf & PBX Trk. Shelf Ckts. Alm. Frame Ckts. for Conns. & PBX	
Ringling - 8 Pty. Semi-Sel.	SD-31336-01 G11	Trks. For Trk. & Misc. Shelves Sel. Rep. Shelf Ckts.	
Arr. to Provide a Delay Interval	SD-31494-01 G72	Alm. Frame Ckts. for Sel. Repeaters Line Fdr. & Trk. Fdr.	

APPLIQUE Traffic Weighting, for Use with Ans. Time Recorders	SD-96497-01 K108	Local, 200 Point, Rot. Hunting, Multi- Party, AC-DC Ringing, Term. per Station, Arr. for Reverting Calls.	SD-33006-01 C63
BANK MULTIPLE Selector	SD-32123-01 J147	Local, 200 Point, Multi-party, Super- imposed Ringing, Term. per Station	SD-33007-01 D63
Connector	SD-32128-01 J149	Local, 200 Point, Rot. Hunting, Multiparty Superimposed Ringing, Term. per Station	SD-33008-01 E63
Miscellaneous	SD-32129-01 K147	Comb., 200 Point, Multiparty, AC-DC Ringing, Term. per Station, Arr. for Reverting Calls	SD-33009-01 F63
BATTERY SUPPLY Bat. & Grd. at M.D.F.	SD-90048-01 I72	Comb., 200 Point, Multiparty, Super- imposed Ringing, Term. per Station	SD-33010-01 G63
PBX	SD-90232-01 J72	200 Point Test	SD-33011-01 I19
Amplifier	SD-90608-01 D106	Line Insulation Test Teletypewriter Remote Control, for Use with S.O. Desk No. 7 or 12 for Observing on Cords	SD-95558-01 J168
BUSY BACK "A" Bd. Toll Sw. Cord	ES-31090-01 H30	Output, for ANI	SD-95793-01 C202 SD-95890-01 D188
BUSY LINE CUT-IN	SD-31728-01 K19	CONTROL Test Distributor	SD-31349-01 E43
BUZZER M.R. Crossconnections Checking	SD-31610-01 I73	Permanent Signal Test	SD-31401-01 C43
CABINET Traffic Register	SD-95531-01 G149	Transmission Pad	SD-31591-01 D97
CALCULAGRAPH Motor Driven	SD-95012-01 E111	Line Load	SD-32069-01 G3
CALL "A" Bd. Inc. from L.T.D.	SD-96185-01 B113	Line Load Arr. for Remote Control and Supervision of Line Load	SD-32108-01 G2
CLOCK Motor Driven	SD-95012-01 E111, E147	Line Insulation Test	SD-32219-01 I168
Misc. Use	SD-96201-01 H75	Obs. Entry, for ANI	SD-32247-01 F186
10 I.P.M. Impulse	SD-96343-01 E73	"A" Board Coin	SD-90459-01 G112
CONNECTOR Local Rotary Hunting	SD-30215-01 D17	Trunk Coin	SD-95031-01 C22, B25
2 Ring Combination	SD-30220-01 B18	Traffic Reg. Camera For Use with Suspension Ckt.	SD-95797-01 I150
1 Ring Combination	SD-30228-01 C18	"A" Board Indicator	SD-95872-01 H217 SD-96033-01 I36
Test, for Testing Sub. Lines and for Veri- fication Request Service	SD-30243-01 J19	CONVERTER Pulse, for Converting DC Key Pulses to MF Pulses	SD-95567-01 B203
8 Pty. Terminal per Station Combination	SD-30862-01 F17	Dial Pulses to MF Pulses	SD-96453-01 A203
1 Ring Comb. Rotary Hunting with or without Arrangement to Cancel Rev. Bat. Supv. on Specified Levels	SD-30950-01 I63		
Local Level Hunting	SD-31088-01 E18		
Toll Rotary Hunting	SD-31114-01 D19		
Toll Level Hunting	SD-31527-01 E19		
Loc. Rot. Htg. Arr. to Cancel Rev. Bat. Supv. on Spec. Levels	SD-31656-01 E17	CORD "A" Board No. Checking	SD-31438-01 A113
10 Pty. Terminal per Sta. Comb., 5 Code Ringing, Arr. for Reverting Calls and Calling Pty. Control	SD-31811-01 G17	"A" Board Make Busy	SD-90438-01 E36
Local, 200 Point, Multiparty, AC-DC Ringing, Term. per Sta., Arr. for Reverting Calls	SD-33005-01 B63	"A" Board Rec. Com- pleting	SD-90452-01 J113
		"A" Board Spl. Serv. Non-Coin	SD-90453-01 B118
		"A" Board Spl. Serv. Coin	SD-90453-02 C118
		"A" Board Combination Non-Coin	SD-90454-01 H112

CORD (Cont'd.)

"A" Board Combination Coin	SD-90454-02 H113
"A" Board Call Wireless Toll Switching for C.B. Rural Lines	SD-90476-01 D117
"A" Board Test, from Loc. Test Desk	SD-90506-01 D114
"A" Board - Call Wireless Toll Switching for Magneto Rural Lines	SD-90574-01 E117

DEMONSTRATION

Tone & Flashing, for Simulating Signals to Operators	SD-95697-01 G207
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DIAL

"A" Board Position	SD-90462-01 E112
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DISTRIBUTOR

Test	SD-32007-01 J18
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DOOR OPENING

	SD-90085-01 A40
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DRILL

Operator Key Pulsing	SD-95830-01 A150
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FILTER

Talk or Filament Bat. Supply	SD-95571-01 I75
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FINDER

22 Point Line and Trunk, 4 Wire	D4, C97, SD-31793-01 F153
200 Point Line, 4 Wire, Arr. to Operate with High Res. Sleeve	SD-33012-01 B4
200 Point Line or Trk., 3 Wire, Arr. to Operate with Low Res. Sleeve	SD-33013-01 B4, B98, E153

200 Point Line, 3 Wire Arr. to Operate with High Res. Sleeve	SD-33014-01 B4
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200 Point Line, 4 Wire, Arr. to Operate with Low Res. Sleeve	SD-33015-01 B4
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FIRE DRILL

	SD-90086-01 A75
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GENERATOR

MF Signal, for Supplying the 6 Frequencies Required for MF Pulsing	SD-95867-01 E187
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GROUPING

"A" Board, Interconnecting with No. 3 Toll	SD-90415-01 B111
"A" Board Position	SD-90455-01 C112

IDENTIFIER

For ANI	SD-95810-01 F188
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INDICATING

Line Finder Group Busy	SD-32097-01 G4
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INTERRUPTER

Ring and Alarm for 10 Pty. Term. per Station Code Ringing	SD-31298-01 A129
8 Pty. Semi-Sel. Ringing	SD-31336-01 G11
Arranged to Provide a Delay Interval	SD-31494-01 H72
Reverting Call Semi-Sel.	SD-31501-01 J11
Reverting Call Sel.	SD-31557-01 I11
30, 60, & 120 I.P.M. Tone, for Class of Service Tone	SD-31606-01 G73
Relay, for Furnishing 30, 60 & 120 I.P.M. 10 I.P.M.	SD-31825-01 G167
	SD-95036-01 G208
	SD-96343-01 E73

JACK

"A" Board Misc. Tone Bat., Grd. & Ringing Supply Test	ES-241904 F37
Connector Test	SD-31333-01 F48
"A" Board Make Busy	SD-31653-01 I47
"A" Board Answering	SD-90438-01 E36
"A" Board Out. Trk.	SD-90467-01 I27
Monitoring & Observing Common Panel	SD-90468-01 C37
M.D.F. Test - For Private Lines	SD-90564-01 B69
	SD-96068-01 E47
	SD-96261-01 B147

KEY

Reverting Call Semi-Sel. Transfer	SD-31501-01 J11
Reverting Call Sel. Transfer	SD-31557-01 I11
"A" Board Master Ringing	SD-90586-01 F111
"A" Board Spl. Serv. Trk. Make Busy	SD-90622-01 C115

KEY SET

DC Key Puls.	SD-90460-01 E113
DC & MF Key Puls.	SD-95428-01 C178
MF Key Puls.	SD-95498-01 E178
MF Key Puls., with Modifications for Practice Pos. for Use with Opr. Training Equip. No. 2B	SD-95499-01 F178
Position and MF, for CAMA	SD-95775-01 C219
DC & MF Puls. with Modifications for Practice Pos. for Use with Opr. Tng. Equip. No. 2B	SD-96439-01 D178

LAMP

Pilot	SD-31548-01 F128
Power Alarm	SD-31549-01 G128

LEADS

"A" Board Ringing Ringing, to PBX's & Sta. Equip.	SD-90586-01 F111
	SD-95667-01 J71

LINE (Also See Long Line)

"A" Board Magneto Rural	SD-31130-01 J30
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LINE (Cont'd.)

"A" Board Business Office SD-31198-01 D37
Terminating Service SD-31224-01 A20
Rotary Line Switch SD-31259-01 J2
"A" Board Plugging Up SD-31406-01 H29
Dial Terminating Manual SD-31470-01 F27
"A" Board Official SD-31498-01 B38
"A" Bd. Aux. for Emer. Connections SD-31608-01 J37
Message Register Test SD-31610-01 C47
Loc. or Toll Inc., Coin Box or M.R. Trk. Test SD-31636-01 D49
Loc. Inc., Coin Box or M.R. Trk. Test SD-31642-01 E49
Busy Line Fdr. SD-31652-01 E1
During Hunting Aux. Connector Test SD-31653-01 I47
Business Office, 4 Wire to Toll Swbd. No. 1 SD-31788-01 J74
Transmission Test and Swmn. Talking for Connectors SD-32021-01 H147
Aux. - for Operating Sub. Reg. with Delayed Charge Interval Using Cent. Off. Battery SD-32082-01 I2
Dial Sub. SD-32133-01 B2
Toll Sub. - For Use with No. 1 Toll Swbd. SD-90077-01 C122
Toll Sub., for use with Swbd. No. 3, 3C or 3CL SD-90078-01 D122
"A" Board Man. SD-90450-01 I30
Plugging Up - For Use with No. 3, 3C or 3CL Swbd. in Connection with S. By S. Sub. Lines SD-95034-01 A151
Emergency SD-95336-01 I35
Recorder Talking SD-95532-01 G150
Plugging Up, with or without Auto. Cut-thru Feature for Plugging Up Fr. SD-95597-01 G77
Aux. - Arr. to Apply Coin Return Potential At End of Each Call On Prepayment Coin Lines Arr. for 10 Cent Initial Charge for Use with Line Ckt. Arr. for Ground Start on Ring SD-95607-01 F2
Dial Terminating Manual, for Use with Central Swbd. SD-95711-01 A167
Man. Sub. for Use with Dial Terminating Manual Line Ckt. in Dist. Off. SD-95713-01 H183
Cent. Swbd. Emer., Arr. to Disconnect Calling. Pty. on Emer. Calls SD-95713-01 I183
"A" Swbd. Business Off. Out. to Dist. Dial Office SD-95714-01 E193

Business Off., Arr. for Inc. Serv. from Dist. Swbd. and 2 Way Serv. to Sub. Line Ckt. SD-95721-01 E167
For Public Emergency Reporting SD-95873-01 B209
Local Station - Station End SD-96109-01 H42
Private 24 & 48 V. SD-96128-01 G74
Private 48V Only SD-96147-01 G74
Order Clerk or Chief Operator with Visual Line Signal SD-96262-01 A147
Aux. with Auto. Cut Off - Main & Extension Stations on Separate Loops SD-96468-01 E2
Emerg., for Completion of Calls to Police, Fire & Ambulance Lines SD-96469-01 D210
Transmission Test SD-98100-01 G52
LINE VERIFICATION for ANI SD-32246-01 H189
LINK
"A" Board SD-90705-01 C142
LISTENING-IN
Opr. Training, with Monitoring Amplifier SD-96405-01 E37
LONG LINE
Dial - For Use on Pre-payment Coin Lines SD-32053-01 H121
Dial, Repeated Ring., for Use with 4 Pty. Sel. or 8 Pty. Semi-Sel. Lines SD-95435-01 D124
Pulse Correcting SD-96009-01 G122
By Pass or Repeated Ringing SD-96034-01 H123
Manual - CX Sig. - Supplies Line Supv. SD-96116-01 E122
Manual - Ph. Grp. with CX Sig. 48V offices Supplies Xmtr. Bat. SD-96117-01 K123
Dial, 10 or 20 PPS Repeating, Relayed or By-Passed Ringing SD-96234-01 A122
Dial, CX Sig. Type B Supplies Line Supv. SD-96251-01 B122
Dial - CX Sig. Type B with Type "B" T.B. Supply SD-96252-01 B124
MAKE BUSY
For Use With Sel. Rep. For Rec. Compl. Trks. to Toll Swbd. SD-30855-01 C198
Trunk SD-30893-01 C207
Trk. - For Trks. from Selector Levels SD-31225-01 C72
For Use with Trks. to Rep. Serv. Desk No. 2 SD-31420-01 D72
For "A" Bd. SD-95781-01 D58
SD-96470-01 E115
MANUAL
Type "A" Emergency SD-32065-01 F158
Type "B" Emergency SD-32093-01 F163

MISCELLANEOUS

For Angle Rel. Rack
Bays SD-32153-01 I147

MISCELLANEOUS FRAME

Trunk Fr., for ANI SD-32248-01 I189
Sec. Network Fr.,
for ANI SD-95818-01 J186
Identifier Fr., for
ANI SD-95819-01 J189
Outputser Fr., for
ANI SD-95820-01 J187
Outputser-Identifier
Trk. Test Fr., for
ANI SD-95822-01 H190
Tbl. Ticketer Fr.,
for ANI SD-95823-01 I188
Number Network Fr.,
for ANI SD-95825-01 J190

MONITORING

Cent. Off. Observing
Cord SD-90449-01 A67
Dial, Local SD-90463-01 G72
Dial, Local & Toll
Dial Pulse, for Use
with S.O. Ckts.
Connecting to S.O.
Desk No. 7 and 12 SD-95610-01 A202
Dial Pulse SD-95876-01 G109
"A" Swbd. Key SD-96314-01 G69

NETWORK

Number, & Primary
Bus, for ANI SD-95813-01 H187
Secondary, & Bus
Connector, for ANI SD-95814-01 G187
Serv. Obs., for ANI SD-95829-01 F187

OBSERVING

Obs. Line - Orig. Serv.
Obs. SD-31347-01 H106
Single Line Serv. Obs.
Multi-Line Serv. Obs.
for Trks. Arr. for
Obs. on Inc. Trk.
Ckts. to Swbd. or
Desks SD-90266-01 F107
Cent. Off. Obs. Set
No. 2 SD-90448-01 G68
Dial Pulse Rep. for
Selective Mon. Obs.
Trks. from S.O. Desk
No. 11 SD-90543-01 C108
Pos. Sel. for Obs.
on Desk Tel. from
S.O. Desk No. 11 SD-90544-01 C107
Dial Pulse Amplifier
Cent. Off. Obs.
S.O. for use with S.O.
Desk No. 10 SD-90580-01 E107
S.O. Ckt. for Loc.
Orig. Serv. SD-90647-01 H107
PBX Multi-Line Obs.
Multi-Line SD-95510-01 I108
Multi-Line, for Obs.
Speed of Answer on
Inc. Calls to "A"
Swbd., for Use with
S.O. Desk SD-95563-01 E202

Multi-Line, for Obs.

on Cords Arr. for
DC, MF or Combined
DC-MF Key Puls. SD-95564-01 D202
Multi-Line, for Obs.
on Cords Arr. for
Dialing for Use
with S.O. Desk SD-95605-01 B202
PBX Multi-Line Obs.
Line SD-96162-01 I107

OSCILLATOR

For ANI SD-95827-01 D189

OUTPUTSER

For ANI SD-95811-01 E188

POSITION

"A" Board SD-90457-01 I113

RANGE CHART

For Dial Long Line
Ckts. for Use in
Connection with 810
or 885 Ohm Off. SD-96325-01 B149
For Dial Long Line
Ckts. for Use in
Connection with 735
Ohm. Off. SD-96326-01 B149

RECALL

Aud. & Flashing SD-90458-01 G113

RECEIVING

MF Pulsing SD-95536-01 D169

RECORDER

Line Busy SD-31672-01 K74
Holding Time No. 1B SD-90246-01 D73
Traffic Usage SD-95738-01 C169
Holding Time No. 1C SD-96114-01 B74
Permanent Type Ans.
Time SD-96235-01 J106
Ans. Time, Concentrat-
ing, Time Control,
Test & Int. SD-96275-01 J108
Traffic Usage,
Portable No. 1 SD-96494-01 B169

REGISTER

Traffic SD-30896-01 A72
Totalizing SD-95878-01 H169
Dial Tone Speed SD-96403-01 E109

RELAY

Interrupter, for Term.
per Station 8 and 10
Pty. Connectors and
8 Pty. Revtg. Call
Selectors SD-32135-01 J12
Interrupter, to Provide
a Delay Interval, for
Use with 804C Ringing
Pwr. Plant SD-32180-01 A207
Group and Alarm, for
Line and Trunk Finders SD-32194-01 I207
Group Busy SD-90466-01 C171

RELEASE

Coin Trk. Timed SD-31861-01 I71
 Perm. Sig., for SD-32021-01 H147
 Connectors

REPEATING (Also See Trk., Sleeve Repeating)

Sleeve - 2 Way SD-32062-01 A18, G154

REPEATER (Also See Sel. Rep.)

Incoming
 From Panel Sdr. Tdm. Off. SD-31162-01 E92

From Dist. SXS Off., Pulse Correcting, Rep. Coil Xmsn., Tel. Rep. SD-31542-02 G102

With Rep. Coil - Bat. and Grd. Pulsing - Loop Supv. SD-32008-01 D92

Pulse Correcting, Rev. Bat. Supv., Loop Res. 5000 Ohms or Less SD-32184-01 H102

Outgoing

To SXS or C.I. Off. Bat. & Grd. Puls. - Bat. & Grd. Supv. SD-31147-01 E87

To SXS - Loop Res. 1200 Ohms to 3000 Ohms SD-31428-01 B88

To SXS - Pulse Correcting - Rep. Coil Xmsn. SD-31541-02 G99

To SXS - Rep. Coil Xmsn. SD-31609-01 J99

To SXS - Rep. Coil Xmsn. - Tel. Rep. SD-31609-02 I99

Bat. & Grd. Puls. or Loop Puls., Rev. Bat. Supv., 2 Repeaters per Base SD-31779-01 F87

To SXS Off., Pulse Correcting, Rev. Bat. Supv. SD-31892-01 F99

With Rep. Coil, Bat. & Grd. Puls. or Loop Puls., Rev. Bat. Supv. SD-32008-01 C87

To XBR No. 5 Off., Bat. & Grd. Puls., Long Range Supv., Type "B" TB Supply SD-32087-01 J87

Pulse Correcting, Rev. Bat. Supv., Loop Res. 5000 Ohms or Less SD-32184-01 H99

2 Way

Out. Bat. and Grd. Pulsing, Loop Supv., Inc. Pulse Transmitting SD-31674-01 I9

RINGBACK

Emergency SD-95083-01 E15

RINGING

Timed, for Toll Transmission Sel. Arr. for 20 Cycle Ringing Start Signal SD-32196-01 F167
 Test Trunk SD-96474-01 F42, G142

SELECTING

Position, for Mon. on CAMA Positions SD-27013-01 D219

SELECTOR

With Test Trunk, from Loc. Test Desk No. 14 or Loc. Test Cab. No. 3 SD-25767-01 I167
 Local or Incoming SD-30200-01 A7

3 or 4 Wire, Arr. for Peg Count on Cut-Thru, to Absorb Digits Once Only and/or Repeatedly, to Return Overflow Signal on Specified Levels and for 2 Party Message Rate Service SD-30976-01 F6

Reverting Call, 8 Pty. Semi-Sel. and/or 4 Pty. Sel. Serv. Arr. for 2 Digit Operation SD-30978-01 F11

3 or 4 Wire, Arr. for Peg Count on Cut-Thru, to Absorb Digits Once Only and/or Repeatedly, to Return Overflow Signal on Specified Levels and for 2 Party Message Rate Service for Modification of Existing Equip. SD-30997-01 F6
 A-B Toll Preceding SD-31241-01 F22

"A" Board Completing, with or without Digit Absorbing SD-31411-01 B23

Reverting Call, 4 Pty. Sel. Ring. SD-31556-01 H12

Reverting Call, 2 Pty. Sel. or 4 Pty Semi-Sel. SD-31647-01 I12

Toll Transmission for Completing Intertoll Dialing Calls with or without Digit Absorbing SD-31681-01 H23

A-B Toll Transmission with or without Digit Abs. on Specified Levels, Rep. Coil Cut Out & Coin Control SD-31723-01 K23

Toll Intermediate or Inc. SD-31744-01 D24

Toll Transmission, with or without Coin Control, with or without Digit Absorbing & Blocking SD-31745-01 D23

SELECTOR (Cont'd.)

Toll Transmission, Rev.
 Bat. Supv., Simplex
 Start of Ringing or
 Temporary Auto. Start
 of Ringing, Type "A"
 TB Supply, with or
 without Coin Control,
 Arr. for Digit Absorb-
 ing & Blocking SD-31841-01 E23
 Coin Control SD-31853-01 A22
 Toll Intermediate or
 Inc. - Arr. for Digit
 Absorbing & Blocking
 Until a Digit is
 Absorbed SD-31915-01 D24
 3 or 4 Wire, Arr. to
 Absorb Digits Once
 or Repeatedly, to
 Restrict Serv. on
 Specified Levels &
 for 2 Pty. Message
 Rate Serv. SD-32077-01 A7,
 A8,
 A9
 C12
 Service Code SD-32077-01 C12
 3 or 4 Wire, Arr.
 to Absorb One or 2
 Digits, to Return No-
 Such-Number-Tone on
 Specified Levels, for
 Peg Count on Cut-Thru
 and for 2 Party Message
 Rate Service SD-32183-01 F6
 Toll Preceding, for Com-
 pleting A-B Toll Calls,
 Arr. for Digit Absorb-
 ing & Blocking & to
 Return Busy Tone &
 Flash on Specified
 Levels SD-33001-01 F22
 Local, Inc. or 2 Pty.
 Message Rate, 3 or 4
 Wire, Arr. to Restrict
 Service Over Any Speci-
 fied Levels, for Peg F6,
 Count on Cut-Thru and A7,
 Busy Flash on Calls from A8,
 Operator SD-33003-01 A9
 Code, Arr. to Absorb
 Digits Once Only and/
 or Repeatedly, and to
 Restrict Service until
 a Digit is Absorbed SD-95898-01 D98

SELECTOR REPEATER

Branch Off., with Auto.
 Release of Trk. on
 Perm. Sig., Arr. for
 3 Digit Off. Code SD-30872-01 B197

SENDER

"A" Board, DC Key
 Puls. Inc., Dial
 Puls. Outgoing SD-95480-01 D142
 MFKP-In, DP-Out SD-95481-01 D144

SERVICE OBSERVING (See Observing)

SET

Wave Shaping SD-70082-01 K167
 No. 1A Peg Count
 Checking SD-90626-01 F75

SIGNAL

"A" Board Aux. SD-90464-01 A115
 Plugging Up Frame Aux. SD-90594-01 F77
 Operating Room Calling SD-96087-01 H44
 No-Such-Number Tone
 Supply SD-96357-01 D147
 Calls Waiting, for
 CAMA SD-95868-01 F218

SIGNALING

2 Way, for CAMA SD-95776-01 E218

SUPERVISORY

Stuck Coin & Overtime
 Monitoring SD-95473-01 C183

SUPPLY

Bat., Grd. & Ringing
 at M.D.F. SD-90048-01 I72
 MF Current SD-95391-01 E169
 Filament, with Emer.
 Transfer SD-95676-01 D168

SUSPENSION

For Use When all
 Positions are
 Vacated in an
 Emer., for CAMA SD-27018-01 G217

SWITCH

Rotary Out. Trk.,
 3 or 4 Wire Arr.
 for Preselection SD-30868-01 F8,
 F198

SWITCHING

Ans. Time Redr. SD-96360-01 J107

TELEPHONE

"A" Operator's SD-90456-01 D113
 Plugging Up Frame SD-90588-01 H78
 "A" Supervisor SD-96163-01 A112
 M.D.F. Loud Speaker SD-96471-01 I42

TERMINAL

Alm. Checking SD-31835-01 I133

TEST

For Reverting Call Sel. SD-30998-01 B49
 51 Type Dial SD-31138-01 D52
 Station Ringer - Semi-
 Sel. SD-31140-01 C52
 Station Ringer - Sel.
 Ringing SD-31141-01 B52
 Permanent Sig. SD-31402-01 C44
 Auto. Trk., for ANI SD-32315-01 D187
 Bat. & Grd. Terminals SD-90122-01 E48
 209FA Relay SD-90411-01 D46
 Key Pulsing Sender Auto. SD-90424-01 K46
 "A" Cord SD-90501-01 J49
 Key Pulsing Sender
 Manual SD-90635-01 K48

TEST (Cont'd.)			Key Set, for Combined	
2A Sending Panel			DSA & CAMA Pos.,	
Transmission	SD-95000-01	G53	MF-DC and 2 Out of	
Sending Pad Trans-			5 DC Key Pulsing	SD-95724-01 D177
mission	SD-95017-01	G54	Key Set, for Combined	
Manual, for Testing			DSA & CAMA Pos., DC	
MFKP-In, DP-Out			KP and 2 Out of 5 DC	
Senders	SD-95400-01	I52	Key Pulsing	SD-95752-01 E177
Line Insulation	SD-95537-01	H168	For Use with Trks. to	
Outpulser-Identifier,			Rep. Serv. Desk No. 2	SD-95781-01 D58
for ANI	SD-95815-01	G190	Emergency - To Provide	
Trk., for Testing Coin			Dial Sub. with Emer.	
Zone Opr. Trk. Ckts.	SD-95875-01	A47	Manual Service	SD-96180-01 K20
Tone - For Use with			Emergency - Provides a	
Call Thru Test Set	SD-96238-01	H19	Dial Sub. with Emer.	
Trk., for Testing Inc.			Man. Serv. When Loc.	
Incpt. Trk. Ckts.	SD-96478-01	H49	Off. is located in	
			same Bldg. as Toll or	F29,
			SXS "A" Swbd.	SD-96425-01 C149
			Lamp	SD-96470-01 G90
TEST SET			TRANSFER KEY & LAMP	
Sub. M.R. & Traffic			For CAMA Connections in	
Reg.	SD-30490-01	C46	Combined DSA and CAMA	
Line Finder & Trk.			Position Using 2 Out	
Finder	SD-31456-01	G46	of 5 DC Key Pulsing	
Pulsing	SD-31481-01	G49	for CAMA Calls	SD-95723-01 B177
Line Finder & Trk.			For CAMA Connections in	
Finder	SD-31524-01	G46	Combined DSA & CAMA	
For Local, Toll & Com-			Positions Using MF Key	
bination Connectors	SD-31637-02	I48	Pulsing for CAMA Calls	SD-95799-01 G117
Pulse Repeating Relay	SD-31667-01	G50		
Rapid Operation Line				
Finder & Out. Rep.	SD-31725-01	C49		
For Testing Sub. Low				
Res. Msg. Registers				
& Traffic Registers	SD-32150-01	C46		
206 Type Selector	SD-90013-01	F49		
Sub. Rec. Compl. Trk.,			TROUBLE TICKETER	
Out. Trks. from Sel.,			For ANI	SD-95816-01 J188
Coin Trks., Line				
Finders, Selectors,			TRUNKS	
Connectors, Out. Re-			Announcement	
peaters and Rotary			From Sel. Mult., Arr.	
Out-Trunk Switch	SD-90469-02	C53	for Auto. Disconnect	
Jack - For Testing 49,			for Use with Ann.	
92, 141 & 218 Type			System No. 4A	SD-30895-01 I137
Jacks	SD-95056-01	D50	For Local Office	SD-31362-01 C10
Patching Cord	SD-95665-01	J46	Inc. from Operators	
Call Thru	SD-96063-01	E46	in a Distant Office	SD-31622-01 E10
			For Interoffice	
			Service	SD-31700-01 K10
			Auxiliary	
TEST STAND			For Use with Sel. Rep.,	
Switch	SD-32001-01	G48	Arr. to Cut Thru When	
			Digit 1 or Digits 11	
			are Dialed	SD-30856-01 B198
TIMING			Arr. to Connect an	
Common	SD-31558-01	E128	Inc. Trk. to a Rotary	
Key Pulsing "A" Common	SD-95052-01	D129	Out Trunk Switch	SD-30865-01 G90
For Initial Charge			For Completing De-	
Period Reminding on			layed Calls from	
Originating Calls	SD-95801-01	H207	"A" Swbd.	SD-31472-01 I37
			For Use with Ckts.	
TONE			Arr. for Bat. &	
Miscellaneous	SD-31521-01	B129	Grd. Pulsing Over	
			Quadded Cable	
			Conductors	SD-32032-01 G88
TRANSFER			For Use Between Toll	
Trk., for Rec. Compl.			Sel. Mult. & Incpt.	
Trks. to Toll Swbd.	SD-30893-01	C207	Trk. Ckt. for De-	
Line or Trk., for			laying Cut-Thru	SD-32084-01 I152
Restoring Service			Loop Pulsing, Arr. to	
on an Emer. Basis	SD-95690-01	E207	Complete Service	
Emergency, for Use with			Code Calls	SD-32281-01 F197
Central Swbd.	SD-95711-01	B167		

TRUNKS (Cont'd.)

"A" Swbd. OGT, for Use with DC Key Puls. OGT, Rev. Bat. Supv., SX Cont. Ring., with or without Coin Control Over Sepa- rate Single Trk. Conductor	SD-95471-01 B192 SD-31331-01 F24, C94	Local Off. for Rec. Compl. Serv., with or without Recall Man. Tdm. Off. for Stfd. Tdm. Com- pleting	SD-96412-01 K33 SD-96413-01 G29 SD-96482-01 C218
Compensating		Inc. to CAMA Position Inc. to Dial Equipment From Magneto Off. to Local Selector	SD-31449-01 I97
Coin, for Use Preced- ing First Selector	SD-31592-02 A5	From Toll Swbd. with or without Coin Control	SD-31703-01 G23
Coin Control	SD-95031-01 B25	E, M & N or E&M Lead Supervision	SD-31726-01 A138
Inc. to "A" Swbd. from Inf. Desk No. 1	ES-241550 G27	To Toll Inc. Sel. - CX Sig. Type "B" or Simplex Sig.	SD-31865-01 D138
Toll Sel. Mult. to Rural Opr.	SD-31106-01 K29	To Toll Inc. Sel. - CX Sig. Type "B" or Simplex Sig. - Controlled Ring. & Rering - Coin Control	SD-31887-01 G138
350A or 360A Dial Off. to Spl. Serv. Oper.	SD-31127-01 B29	Pulse Correcting, Loop Puls. or Bat. & Grd. Puls., Rev. Bat. Supv., Rep. Coil Transmission	SD-31929-01 E102
SXS Off. to Cent. "A" Bd. Opr. Non- Coin with Ringback	SD-31432-01 J28	Inc. to SXS Tandem from Distant Man. or SXS "A" Swbd. or Toll Swbd.	SD-31532-01 B97
Loc. Sel. Mult. to Spl. Serv. Opr.	SD-31499-01 A27	Intercepting Inc., from Dist. SXS Off. to Info. Desk No. 3, 4 or 6 Type, Arr. for Use with Cent. "A" Swbd.	SD-30816-01 C212
SXS Off. to Rural Opr. - 2 Wire	SD-31538-01 C28	Inc. Arr. to Trip Ringing in Trk., for Use with Trk. Finders & Info. Desk No. 3, 4 or 6 Type in same Bldg., Arr. for Use with Local "A" Swbd.	SD-30817-01 B212
Local Sel. to Rural Opr.	SD-31539-01 D29	Out., for Use with Trk. Fdrs. Arr. for Machine Announce- ments	SD-30990-01 D154 SD-31337-01 D152 SD-31339-01 B152 SD-31767-01 E152
Toll for Verification Request or Other Serv. - 2 Wire	SD-31588-01 C27	Loc. Sel. Mult. Out. to Distant Off. Arr. to Trip Ring- ing Only During Ringing Interval	SD-31771-01 H154
Toll for Verification Request or Other Serv. - 3 Wire	SD-31589-01 D27	Vacant Level or Over- flow from Local Sel. Mult.	SD-31872-01 K137
Conn. Mult. for Official Serv.	SD-31668-01 B27	Vacant Code, for Local & Inc. Selectors	SD-31937-01 H137
Rep. Serv. Desk No.2 for Trks. Trans- ferred	SD-90451-01 H28	Out., for Use with Trk. Finders	SD-31965-01 E154 SD-32163-01 G152
Transmission Measur- ing Desk or Test Desk - Arr. to Con- nect with Outg. Call Ckts.	SD-90566-01 E26		
Toll Off. to TX Pos. Arr. for Rev. Bat. Supv. & SX DC Rering	SD-95436-01 B183		
Dist. SXS Off., Rev. Bat. Charge Key Supv., Arr. for Mult. Appearances	SD-95569-01 G183		
Crossbar No. 5 Off. for Verification Request or Official PBX Serv., High-Low Supv., Rev. Bat. Supv. on Rering	SD-95673-01 D183		
Coin Zone Operator, from Xbr. Off. No. 5	SD-95851-01 C32 SD-96169-01 F33 SD-96283-01 H33		
Toll Swbd. No. 1 Community Dial Off. SXS-Off. to Cent. "A" Opr. Coin 2 Wire	SD-96365-01 A29		

TRUNKS (Cont'd.)

From Conn. Terminals or Sel. Levels for Use with Announce- ment Machine, An- nouncement Sys.		E&M Lead Pulsing, for ANI	SD-32244-01 C188
No. 7A	SD-32202-01 H212	Loop Pulsing, for ANI	SD-32245-01 B188
Central "A" Bd. Inc., Regular and Trouble, with or without Machine Announce- ments	SD-95789-01 D212	MF Puls., Rev. Bat. Supv., for Use Where Pos. is Arr. for DC and MF Puls.	SD-95425-01 B172
Local "A" Bd. Inc., Regular and Trouble, with or without Machine Announce- ments, for Use with Trk. Finders in same or Dist. Bldg.	SD-95796-01 E212	Dial Puls., Rev. Bat. Supv., 20 Cycle or SX Start of Ringing, with or without Coin Control over Separate Single Trk. Con- ductor	SD-95471-01 E172
Interposition		MPKP-In, DP-Out, Rev. Bat. Supv. 20 Cycle, SX or No. Ring. Start Sig., with or without Coin Control over Separate Single Trk. Conductor	SD-95611-01 F193
"A" Bd. - Between Spl. Serv. & Rural Oprs.	SD-239345 K27	Dial, with SX Ringing to XBR No. 5 Off.	SD-95704-01 D173
Auto. Between "A" Bd. & No. 3, 3C or 3CL Swbd.	SD-90124-01 E27	From "A" Swbd. - with Idle Trk. Indicating	SD-96164-01 J38
"A" Swbd.	SD-96149-01 C29	DCKP to Local Sel., Test Distributor, Selector for Compl. Delayed Calls, Rep. or A-B Toll Sel.	SD-96459-01 F38
Message Register		DCKP, Thru Supv., to XBR No. 5 Off.	SD-96459-01 B193
For Use with 100 or 200 Pt. Line Fdr.	SD-31493-01 C5	DCKP, Thru Supv., to XBR Tdm. Off.	SD-96459-01 D193
2 Pty. for Use with 4 Wire Line Fdr.	SD-31506-01 D5	Out. to Information Desk	
For Use with 4 Wire Line Fdr.	SD-32082-01 E5	No. 1, 2, 7 or 7A, 3, 4 or 6 Type or Opr. Room Desk No. 19 or 23 Type from Sel. Mult., with or without High-Low Supv.	SD-32170-01 H14
Out. to Cent. "A" Swbd. 2 Wire		No. 2, 7 or 7A or No. 3, 4, 6 or 23 Type or to Opr. Room Desk No. 19 from Conn. Mult.	SD-90275-01 H20
To Spl. Serv. Opr. from Coin Box Lines	SD-31315-01 C8	No. 1, 2, 7 or 7A or Opr. Room Desk No. 19 from "A" Swbd. - with Sleeve Resistance	SD-96164-01 J38
To Spl. Serv. Opr. from Non-Coin Lines - with Ringback	SD-31375-01 B8	Out. to Manual Office Stfd. - Loop Sig.	
To Rural Opr. Arr. for Holding	SD-31540-01 F14	Rev. Bat.	SD-30645-01 D99
From Incpt. Trk. Fdr.	SD-31965-01 E154	Stfd. - CX Sig. - Ph. Grp. - Tel. Rep. to Man.	SD-31534-01 B99
Verification Request, High-Low Rev. Bat. Supv.	SD-95691-01 H209	Tdm. Off.	SD-31534-01 C99
Out. to SXS "B" Swbd. from "A" Swbd., One Way CX 48V Sig.	SD-90439-01 F39	Stfd. - CX Sig. - Ph. Grp. - To Man. Tdm. Off.	SD-31651-01 J96
Out. to Full Selector Offices		Stfd. - High-Low Loop Sig.	SD-31692-01 J9
From Dialing "A" Posi- tions for Completing Delayed Calls	SD-31480-01 I40	For Flat Rate Lines From Sel. Mult.	SD-32167-01 H9
From Sel. Mult. with Mult. at Swbd. - CX Signaling, Type "B"	SD-31795-01 C138	Arr. to Charge Sub., and Calling Party Control	
Pulse Correcting, Loop Puls. or Bat. & Grd. Puls., Rev. Bat. Supv., Rep.	SD-31929-01 K99		
Coil Transmission	SD-31929-01 K99		
For CAMA Calls, Bat. & Grd. Pulsing	SD-32199-01 H174		
For CAMA Calls, Bat. & Grd. Pulsing	SD-32240-01 I174		
For CAMA Calls, E&M Lead Signaling	SD-32241-01 J174		

TRUNKS (Cont'd.)

To Man. Tdm. from "A" Bd. 1 Way CX 48V Sig.	SD-90439-01 F39	Rec. Compl., Non-Coin, without Ringback, E&M Lead Supv., with or without Class of Service Tone	SD-31888-01 F138
Verification Request, High-Low Rev. Bat. Supv.	SD-95691-01 H209	Sub. Rec. Compl., High-Low Supv., Non-Coin, Not Arr. to Recall Sub. and for Class of Service Tone	SD-31925-01 D14
Stfd. - with Idle Trk. Indicating to Man. or Man. Tdm.	SD-96164-01 J38	Rec. Compl., High- Low Supv., Non-Coin, Arr. to Recall Sub. and for Class of Service Tone	SD-32136-01 C14
To Toll Sw. Trk. Arr. for Rering, Idle Trk. Indicating and Grp. Busy Lamp	SD-96395-01 K38	Sub. Rec. Compl., High-Low Supv., Coin, Arr. for Class of Service Tone	SD-32168-01 B14
Out. to Magneto Office, Ringdown, Arr. for Coin Line Indi- cation	SD-31449-01 E8	For Official PBX or Repair Serv. from Sel. Mult., E&M Lead Supv.	SD-32311-01 G18
Out. to Opr. Room Desk No. 23A, B, C or D From Sel. Mult., E&M Lead Supv.	SD-32311-01 G18	For Official PBX, Verification Request or Repair Serv. from Conn. Mult., E&M Lead Supv.	SD-32312-01 F18
From Conn. Mult., E&M Lead Supv.	SD-32312-01 F18	Time of Day or Official PBX High- Low Rev. Bat. Supv.	SD-95037-01 F72
Out. to Panel Office Stfd. - Loop Sig. - Rev. Bat. - To Panel "B" Bd.	SD-30645-01 D99	Arr. for SF Operation, MF Puls. & Rev. Bat. Supv. for use where Pos. is Arr. for DC & MF Puls.	SD-95425-02 C172
Stfd. - CX Sig. - Ph. Grp. - Tel. Rep. - To Panel Sdr. Tdm. Off.	SD-31534-01 B99	For Use with Intertoll Dialing, CX or SX Supv.	SD-95504-01 F172
Stfd. - CX Sig. - Ph. Grp. to Panel Sdr. Tdm. Off.	SD-31534-02 C99	Verification Request, High-Low Rev. Bat. Supv.	SD-95691-01 H209
Stfd., High-Low Loop Sig. - To Panel "B" Bd.	SD-31651-01 J96	Stfd. - with Idle Trk. Indicating	SD-96164-01 J38
From "A" Swbd. 1 Way CX 48V Sig.	SD-90439-01 F39	Sender Monitoring	SD-95469-01 J183
From "A" Swbd. to Dist. Sel. in Panel Tdm. Off.	SD-96164-01 J38	Sleeve Repeating	SD-31421-01 D8
Out. to PBX from Sel. Mult. with Connector Mult.	SD-31757-01 D11	Talking at MDF or Protector Frame to LTD No. 14	SD-96074-01 J42
Out. to Repair Service Desk No. 2 From Sel. & Conn. Mult. Arr. for Trfr. to Swbd.	SD-32178-01 C58	Test	
From Sel. Mult., E&M Lead Supv.	SD-32311-01 G18	From Loc. Sel. Mult. to LTD No. 14	SD-31245-01 D42
From Conn. Mult. E&M Lead Supv.	SD-32312-01 F18	From Loc. Sel. Mult. to Loc. Tst. Cab. No. 3	SD-31245-01 H142
Out. to Toll Swbd. 2 Wire from "A" Bd. for Opr. Rec. Completing Serv. (Non-Coin)	SD-31678-01 B37	Inc. from LTD No. 14 to MDF & IDF for Detecting Inter- mittent Trouble	SD-32038-01 A44
2 Wire from "A" Bd. for Opr. Rec. Completing Serv. (Coin)	SD-31678-02 A37	For Use with Incpt. Trk. Ckts. Requir- ing Mach. Ring.	SD-32090-01 E54
2 Wire from Overflow Conn. Terminals for Hospital, Fire & Police Serv. Arr. to Trip Mach. Ring. without Charging	SD-31840-01 H18	From LTD No. 14 to MDF or Protector Fr. for Testing Trks. & Lines - In & Out Type	SD-90070-01 F43

TRUNKS (Cont'd.)

From Loc. Test Cab. No. 3 to MDF or Protector Fr. for Testing Trks. & Lines - In & Out Type	SD-90070-01 I143	Interlocal - Dial Repeating on Out. Calls - Loop Res. 1200 Ohms Max.	SD-31658-01 G9
From LTD No. 14 to MDF for Testing Trks. & Lines - Bridging	SD-90071-01 G43	"A" Bd. 2 Way Opera- tor Off. to Com- munity Dial Off. CX Sig.	SD-31710-01 E33
Test, Frame End from Cable Test Desk No. 3 or LTD No. 14 Arr. for Man. Varley 3 Test	SD-90403-01 C42	Toll Connecting - 3 Wire - For Use with Toll Swbd. No. 1	SD-31714-01 G35
"A" Board Test Trk. from LTD No. 14	SD-90507-01 D43	Interlocal, Bat. & Grd. Puls., Rev. Bat. Supv., Rep. Coil Transmission	SD-31842-01 H172
"A" Board Test Trk. from Loc. Test Cab. No. 3	SD-90507-01 G143	Interlocal - CX or SX Puls., CX or SX Supv., Arr. for Pulse Correcting on Inc. Calls	SD-31867-01 G172
Plugging Up Frame	SD-90589-01 G78	Combined Opr. Office & Interlocal, One Digit Tdm. Opera- tion, Bat. & Grd. Puls., Rev. Bat. Supv., Type "B"	SD-31886-01 I172
"A" Board Test Trk., from Toll Test Bd. No. 18B for Test- ing Out. Trks. Arr. for MF Key Puls. in Swbds. Equipped with Combined DC-MF Key Set Ckts.	SD-95486-01 F183	TB Supply Combined Opr. Office & Interlocal, One Digit Tdm. Opera- tion, CX, SX or E and M Lead CX Type Supv., Type "B"	SD-31885-01 J172
Test, Frame End from Cable Test Desk No. 3 or LTD No. 14 Arr. for Auto. Varley 3 Test	SD-95545-01 A42	"A" Bd. 2 Way Operator Off. to Community Dial Off.	SD-31906-01 D33
Talking at MDF or Protector Frame to LTD No. 14	SD-96074-01 J42	"A" Bd. 2 Way Opera- tor Off. with Tandem Sel. Mult. to Community Dial Off. - CX Sig.	SD-31928-01 C33
Toll Diverting, for Dial Selected PBX Trks. with or with- out Arrangement to Test Busy While Line Finder Hunts	SD-32067-01 J137	Type B - with or without Tel. Rep.	SD-96216-01 C30
2 Way		Ringdown Interoffice 2 Wire Auto. to DSA or Toll Swbd.	SD-96301-01 J33
To Mag. Swbd. Out. Ringdown - Inc. Dialing	SD-31449-01 I97	Ringdown to Toll Swbd.	SD-96394-01 G33
Interlocal - Dial Repeating on Out. Calls - Loop Res. 3000 Ohms Max.	SD-31602-01 I8	USAGE Trunk Group	SD-32049-01 B107