

SD-68400-01

BELL TELEPHONE LABORATORIES, INC.

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TOLL SYSTEMS
TOLL SWITCHING SYSTEM NO.4A
AND ASSOCIATED
TOLL SWITCHBOARD NO.5
AND TOLL TEST BOARD NO.17C
KEY SHEET

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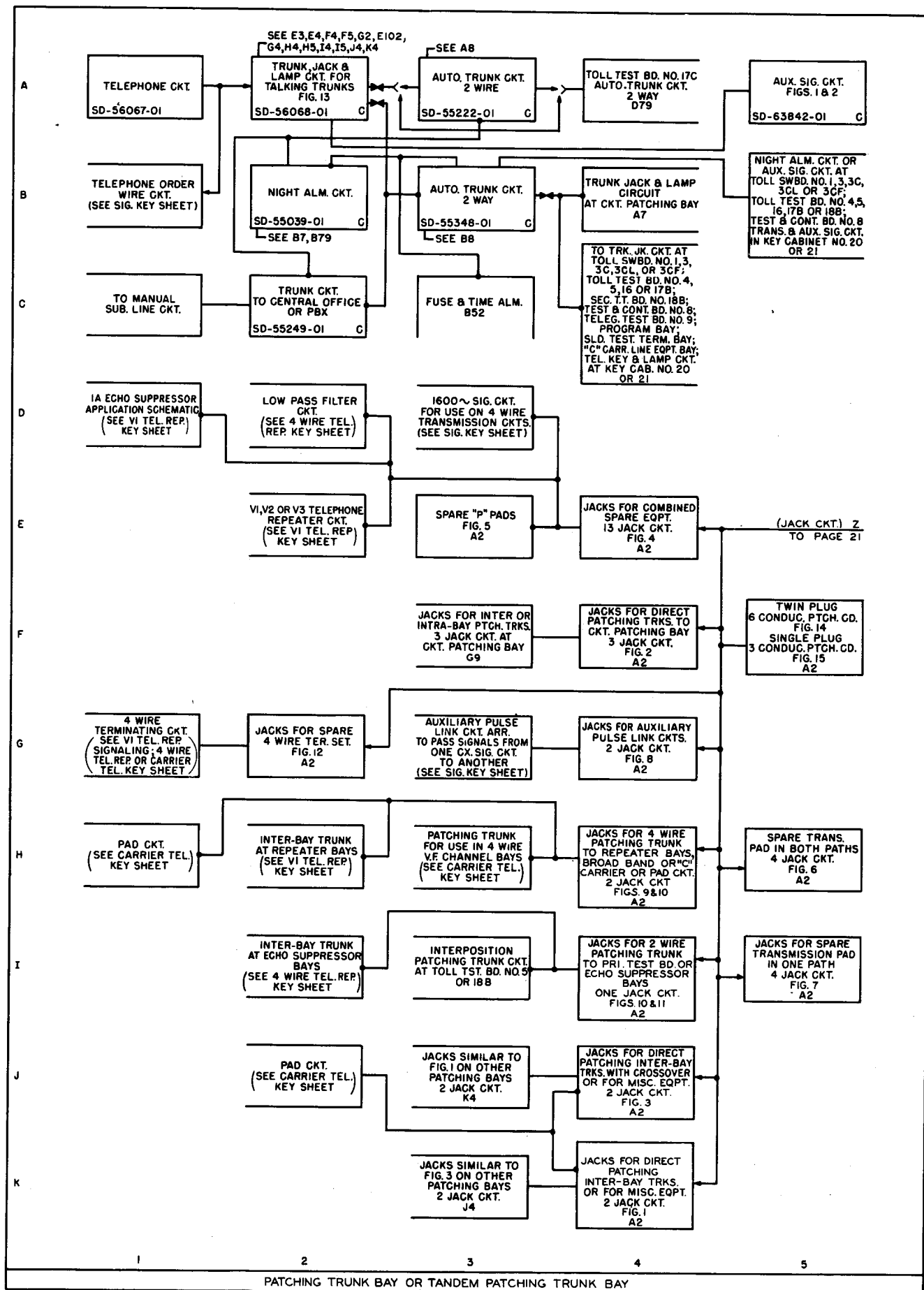
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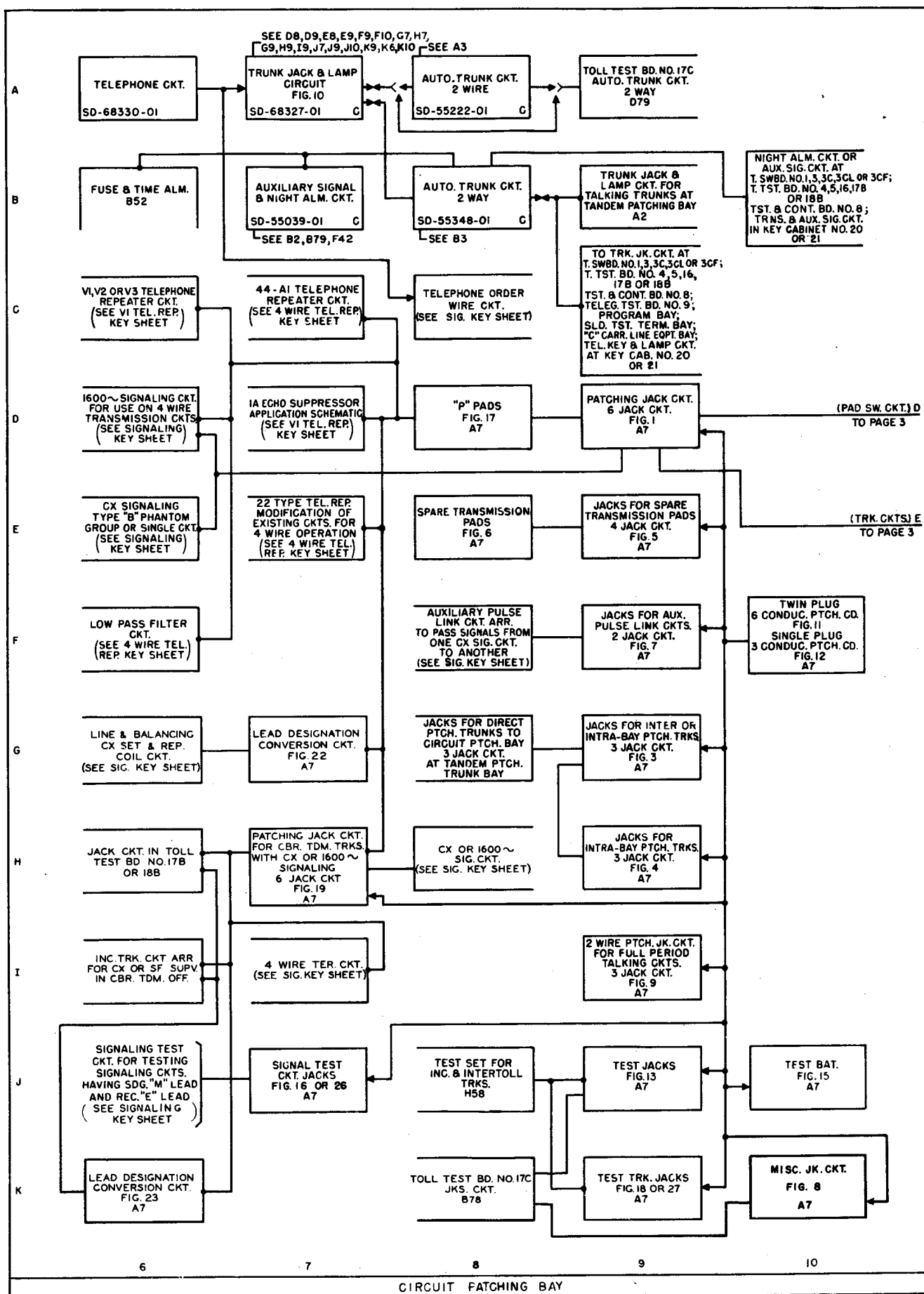
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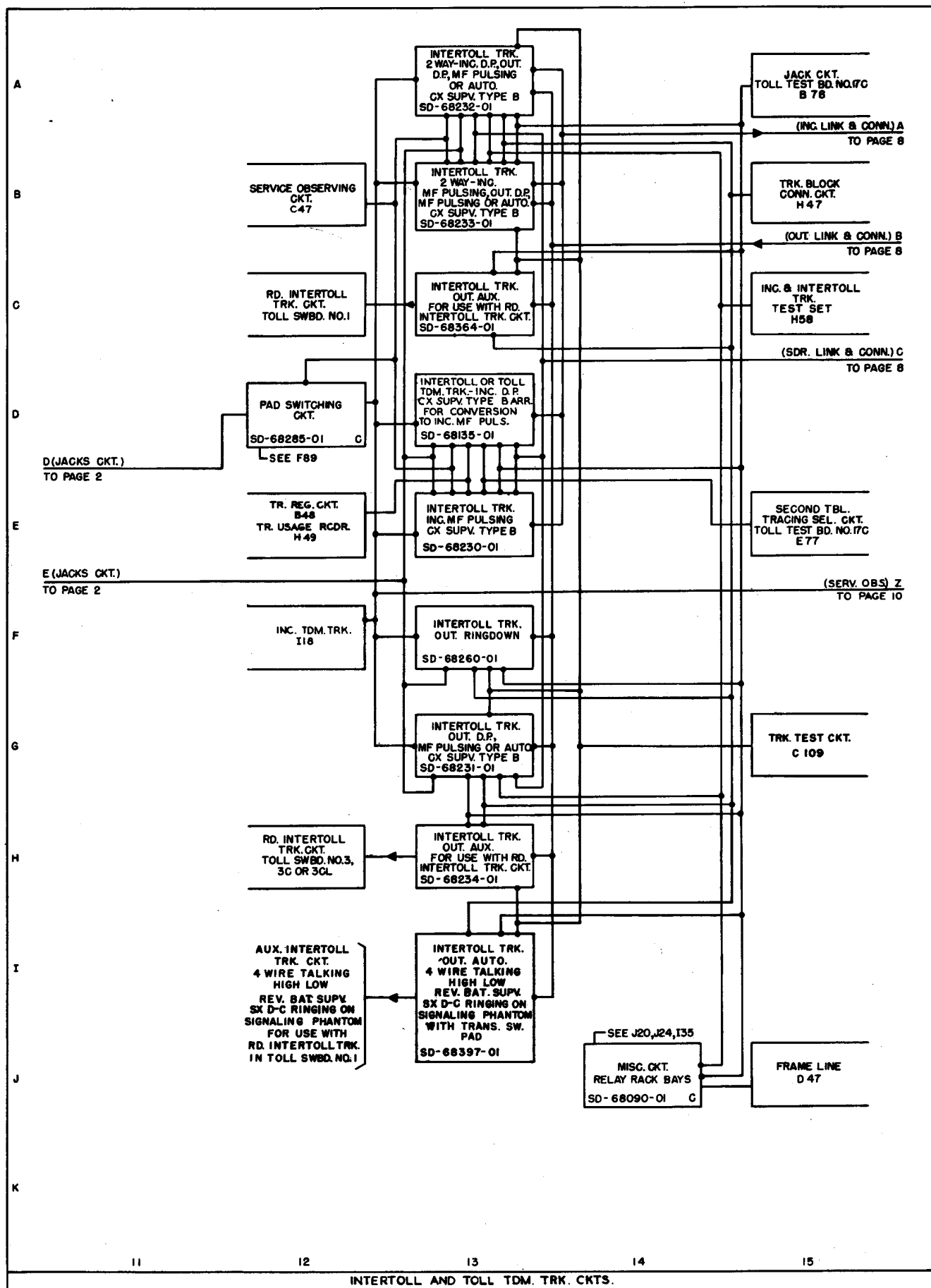
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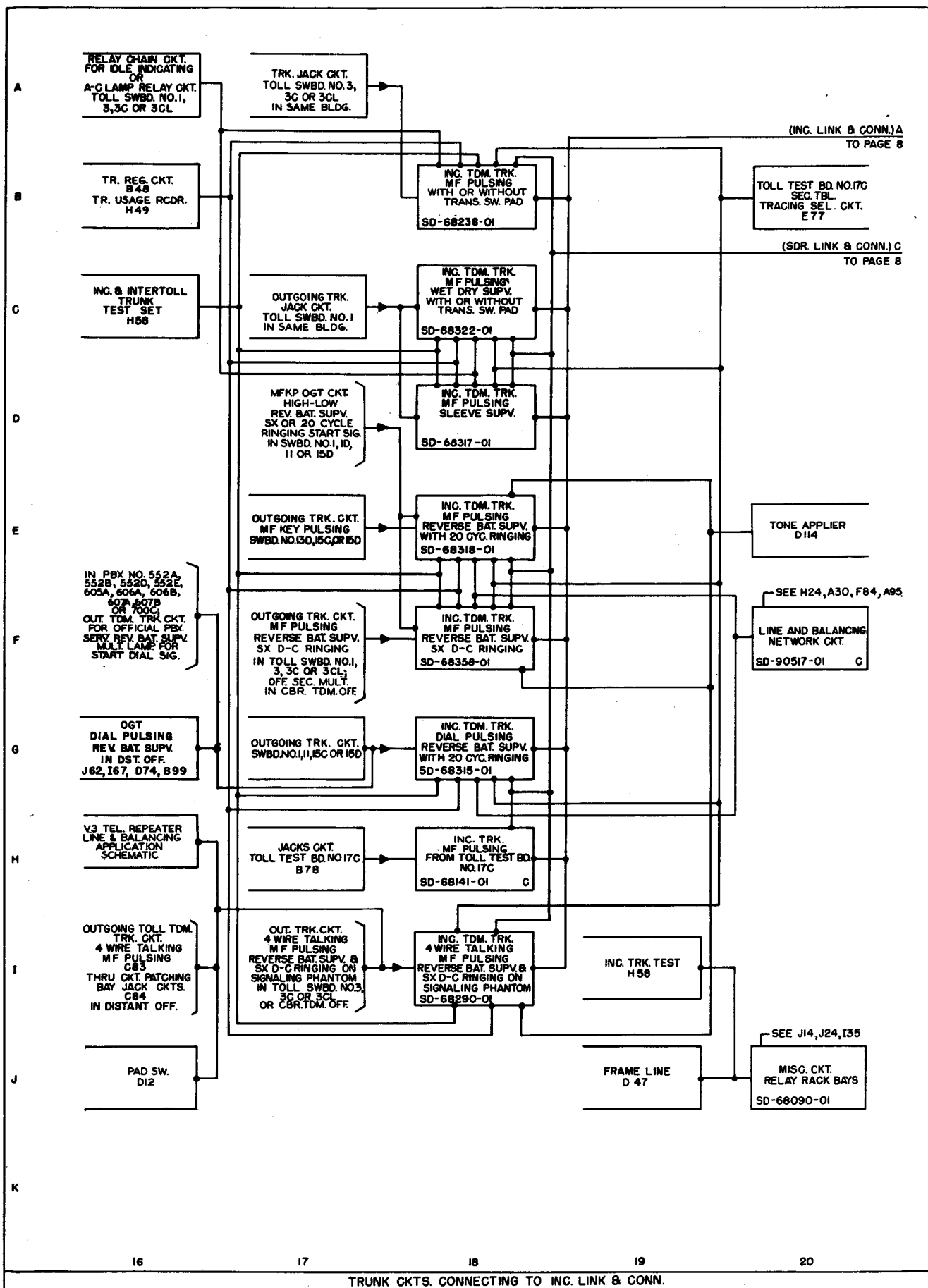
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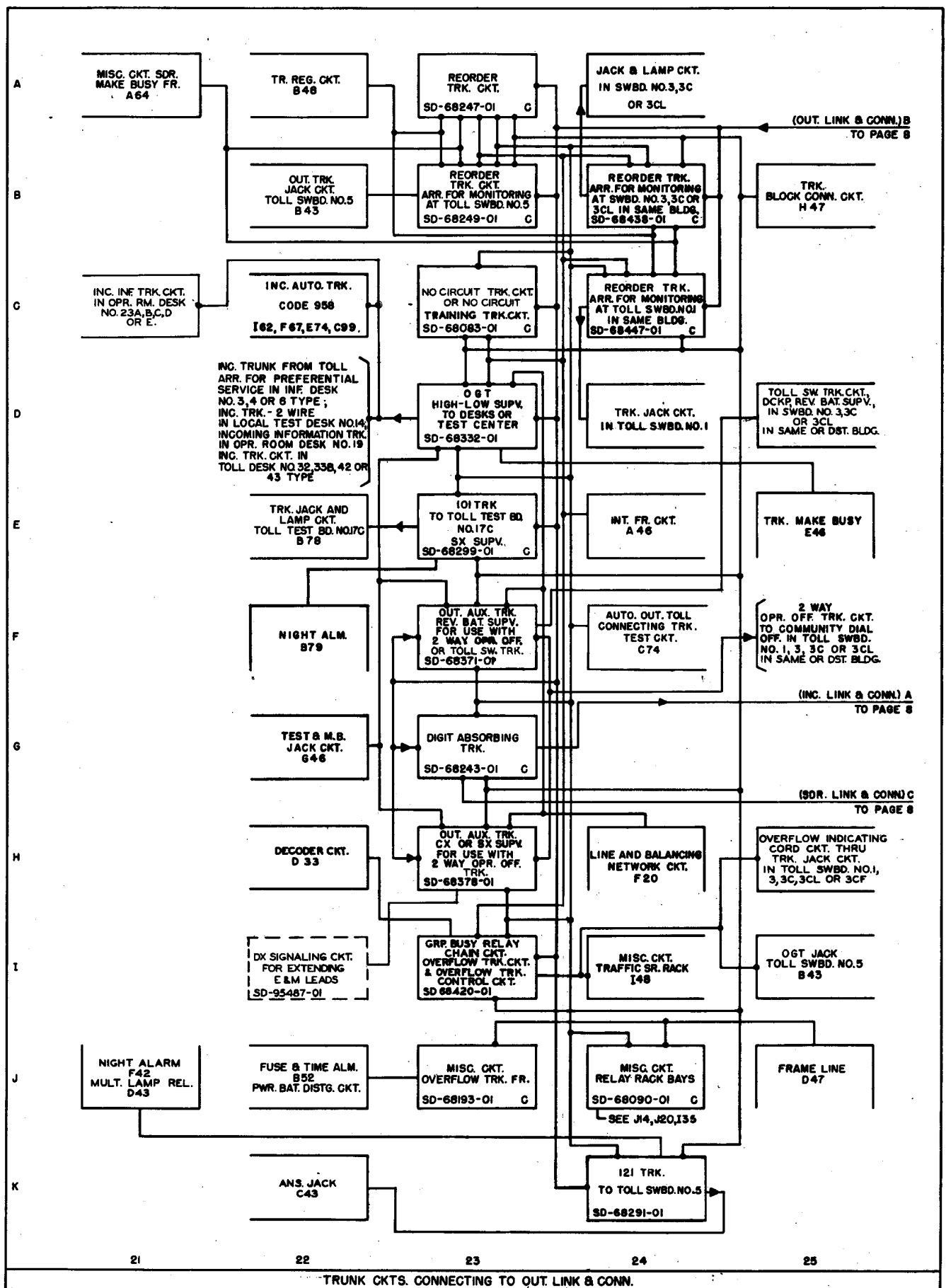
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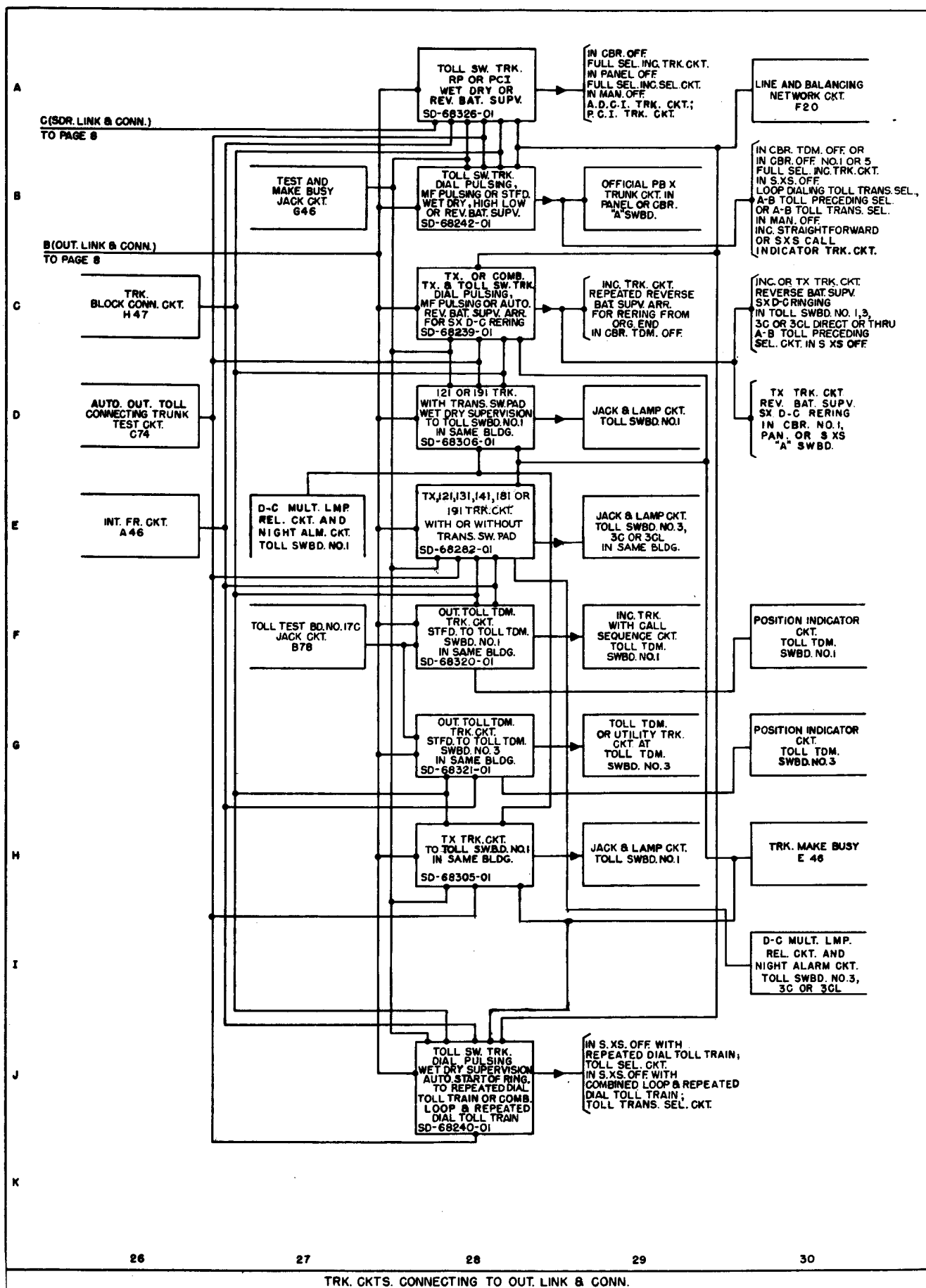


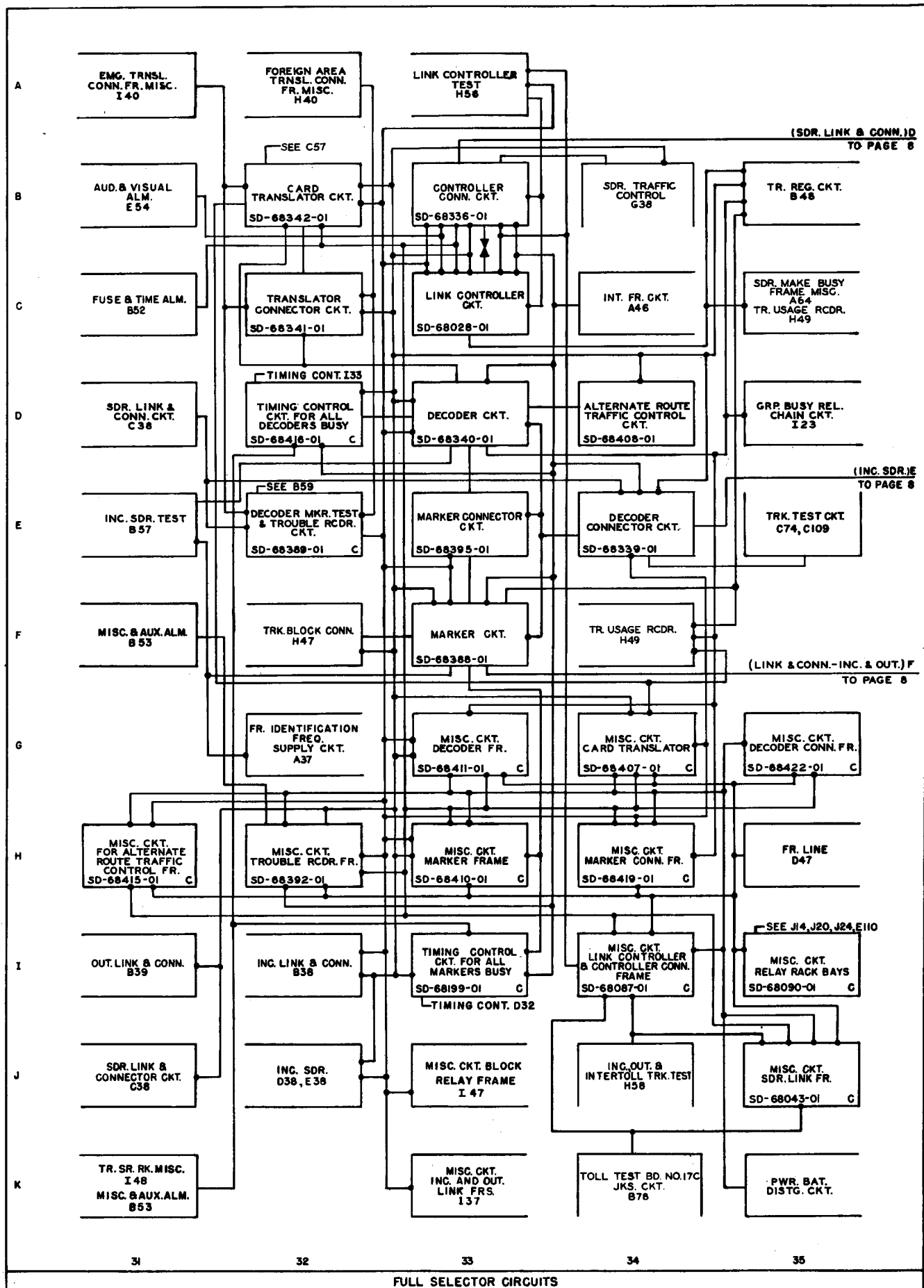


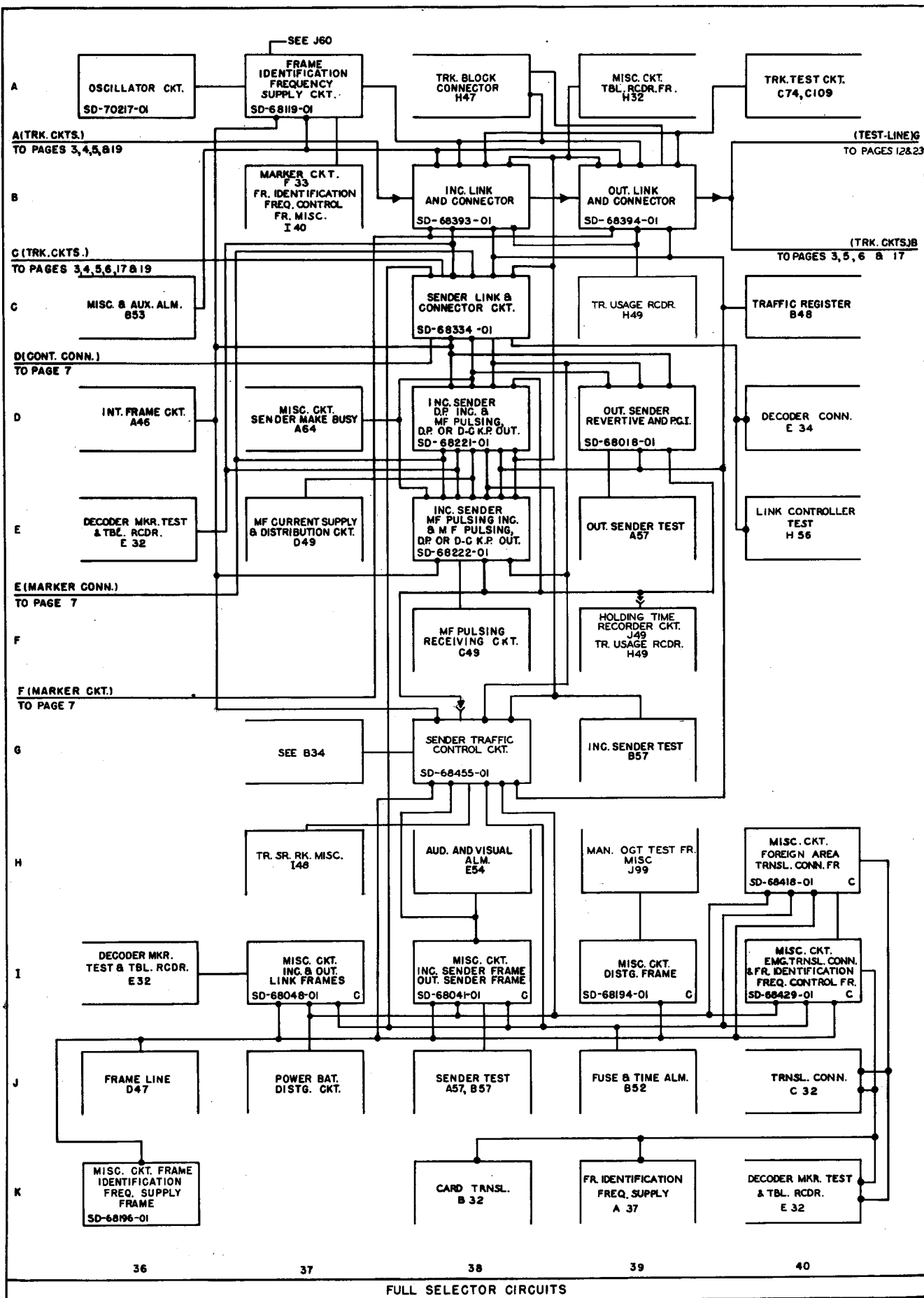


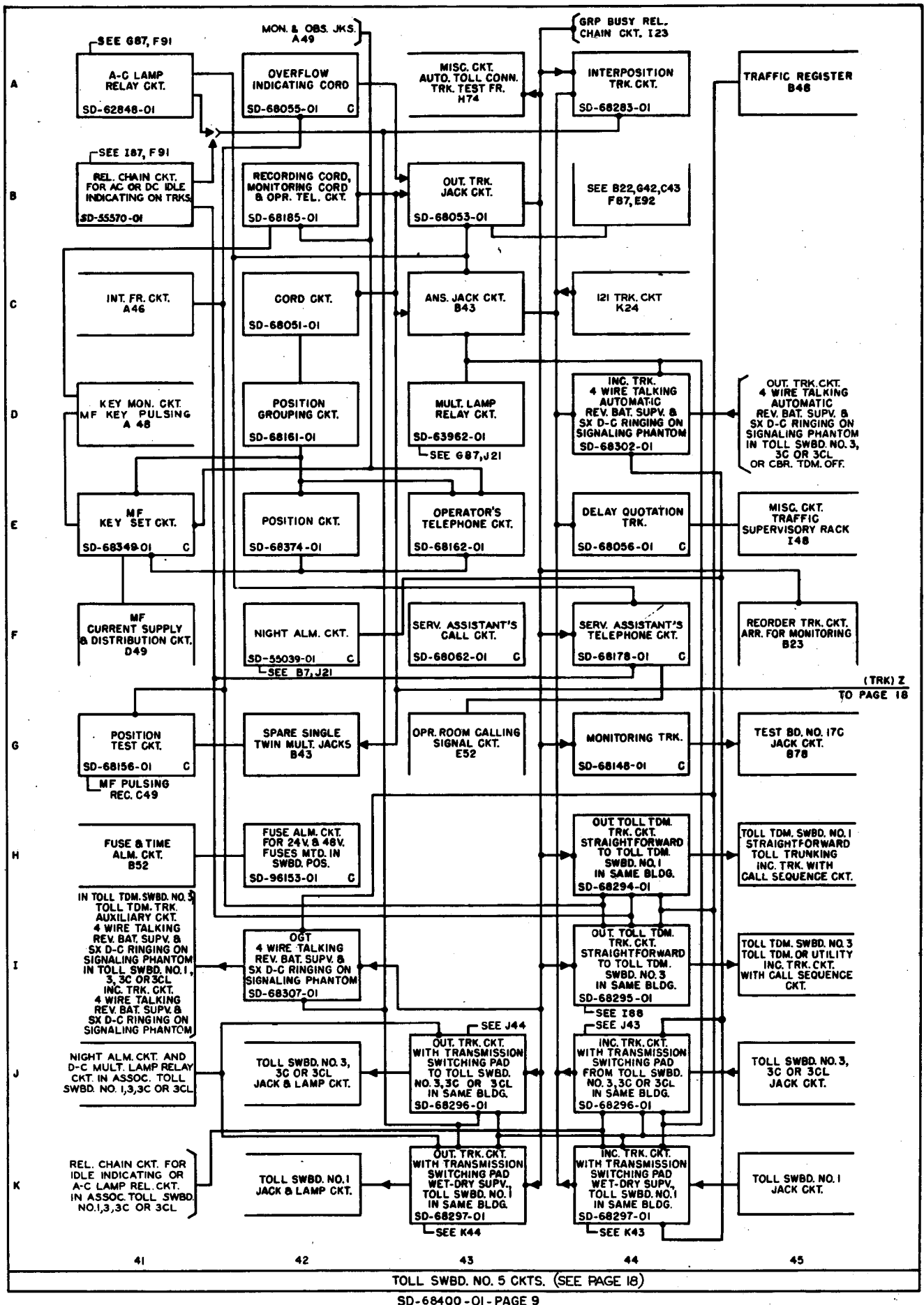


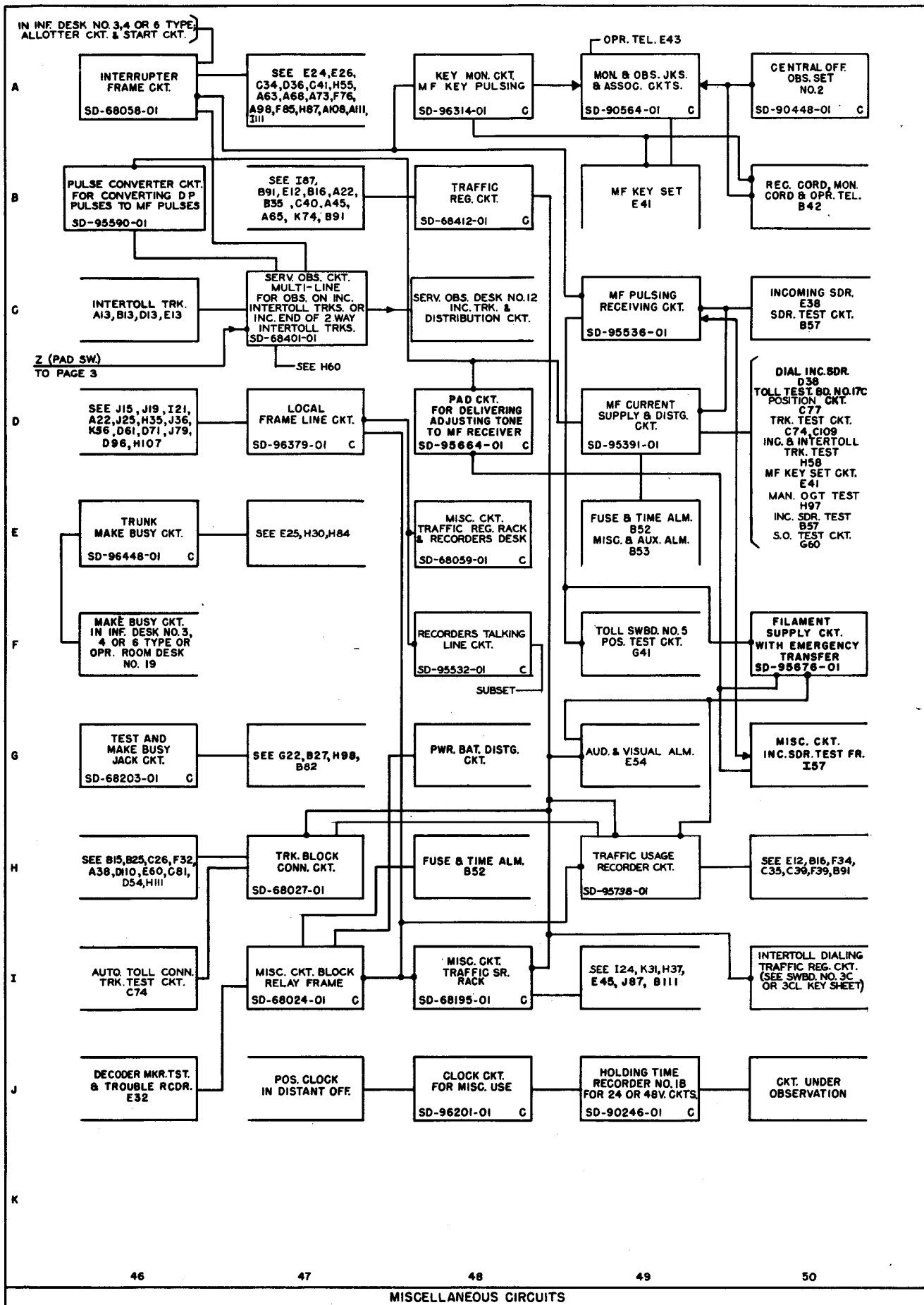


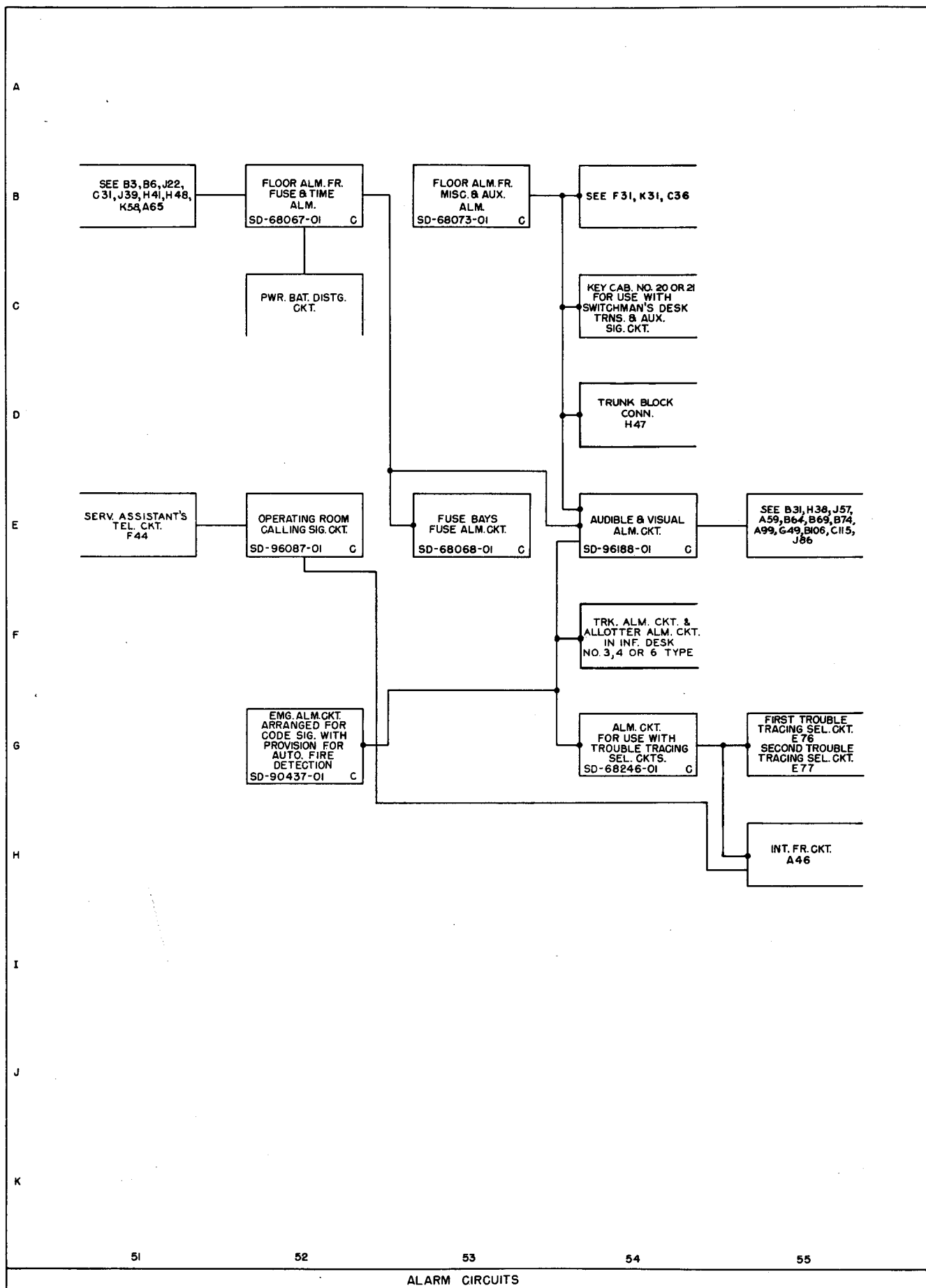


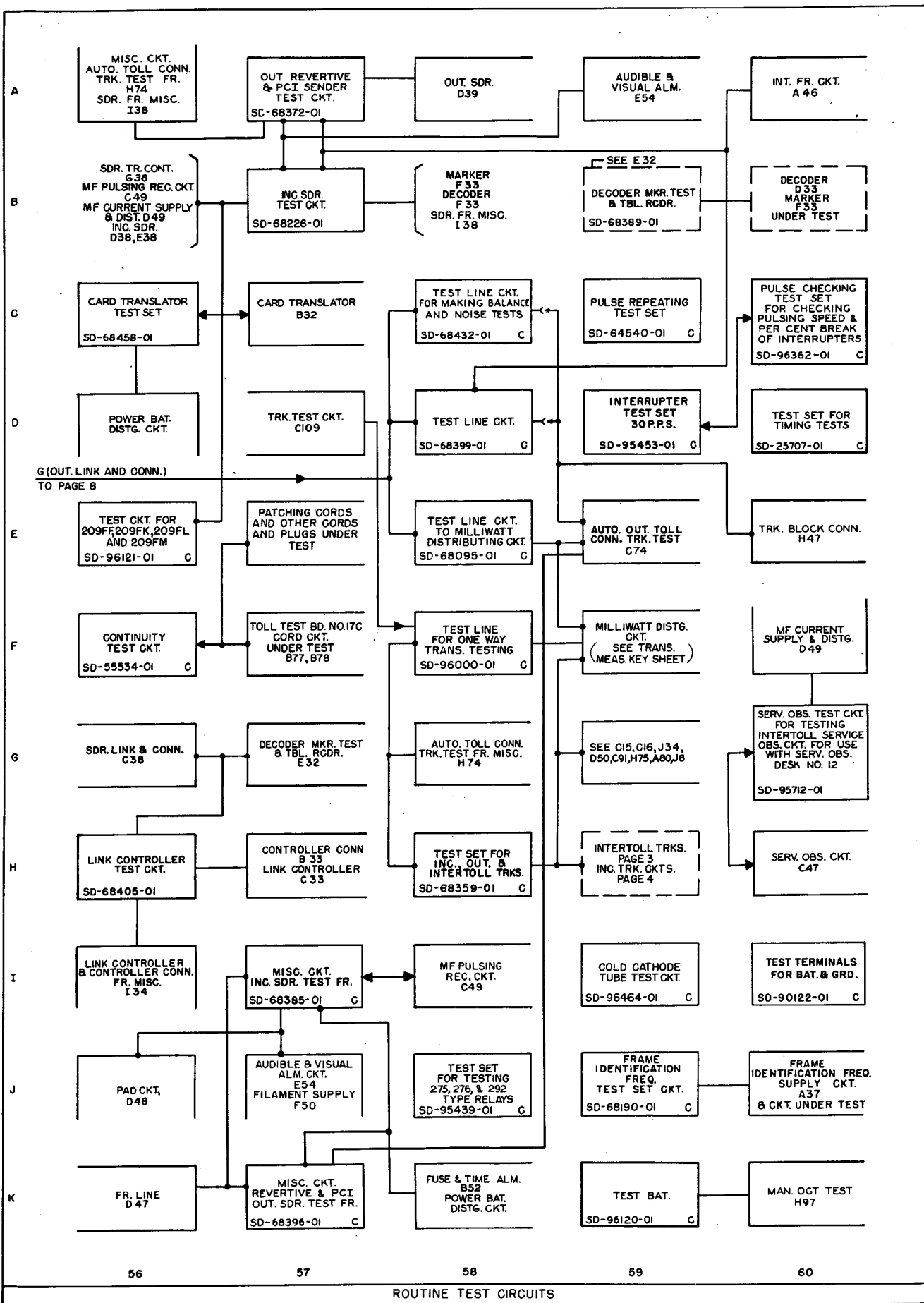


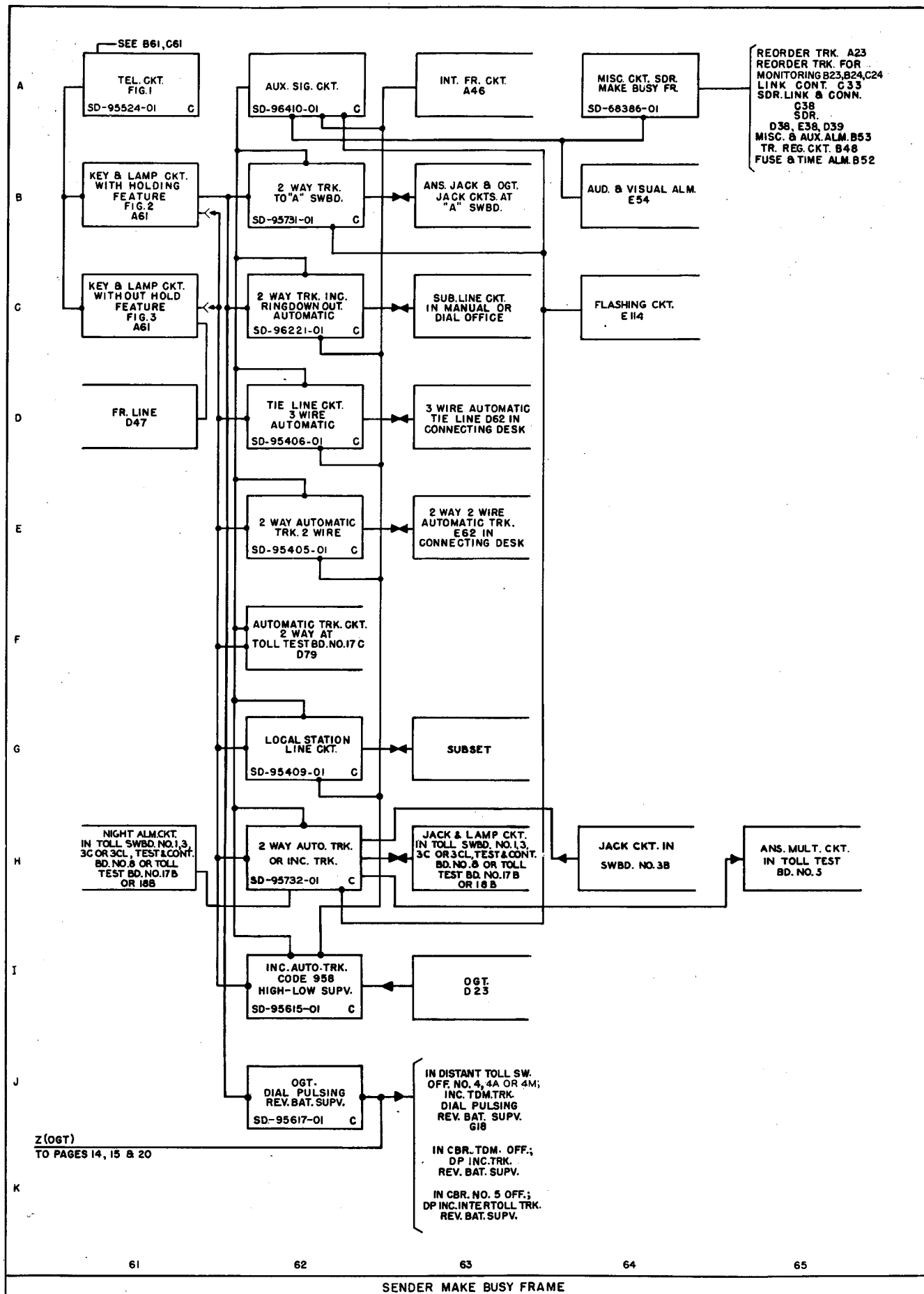


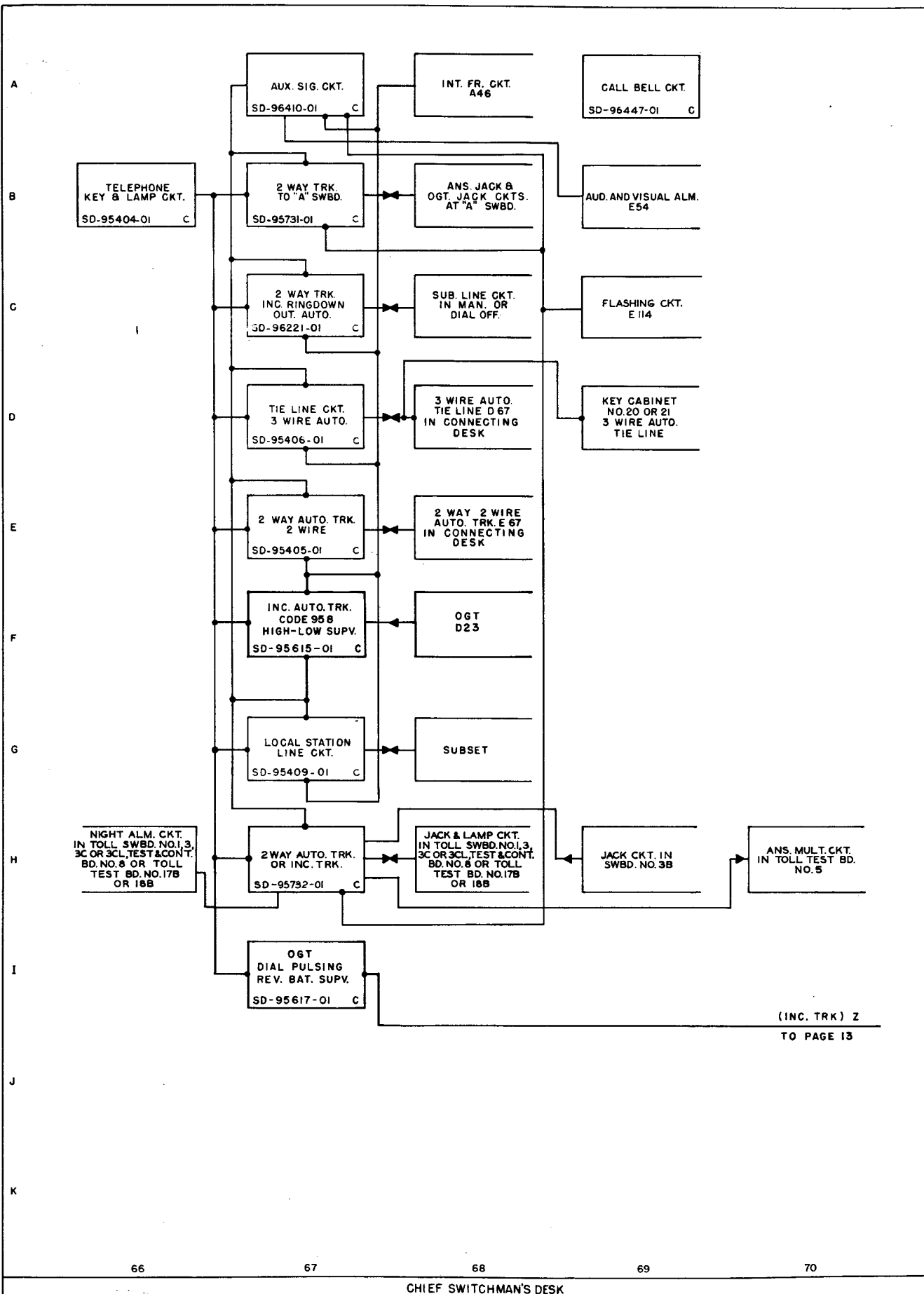


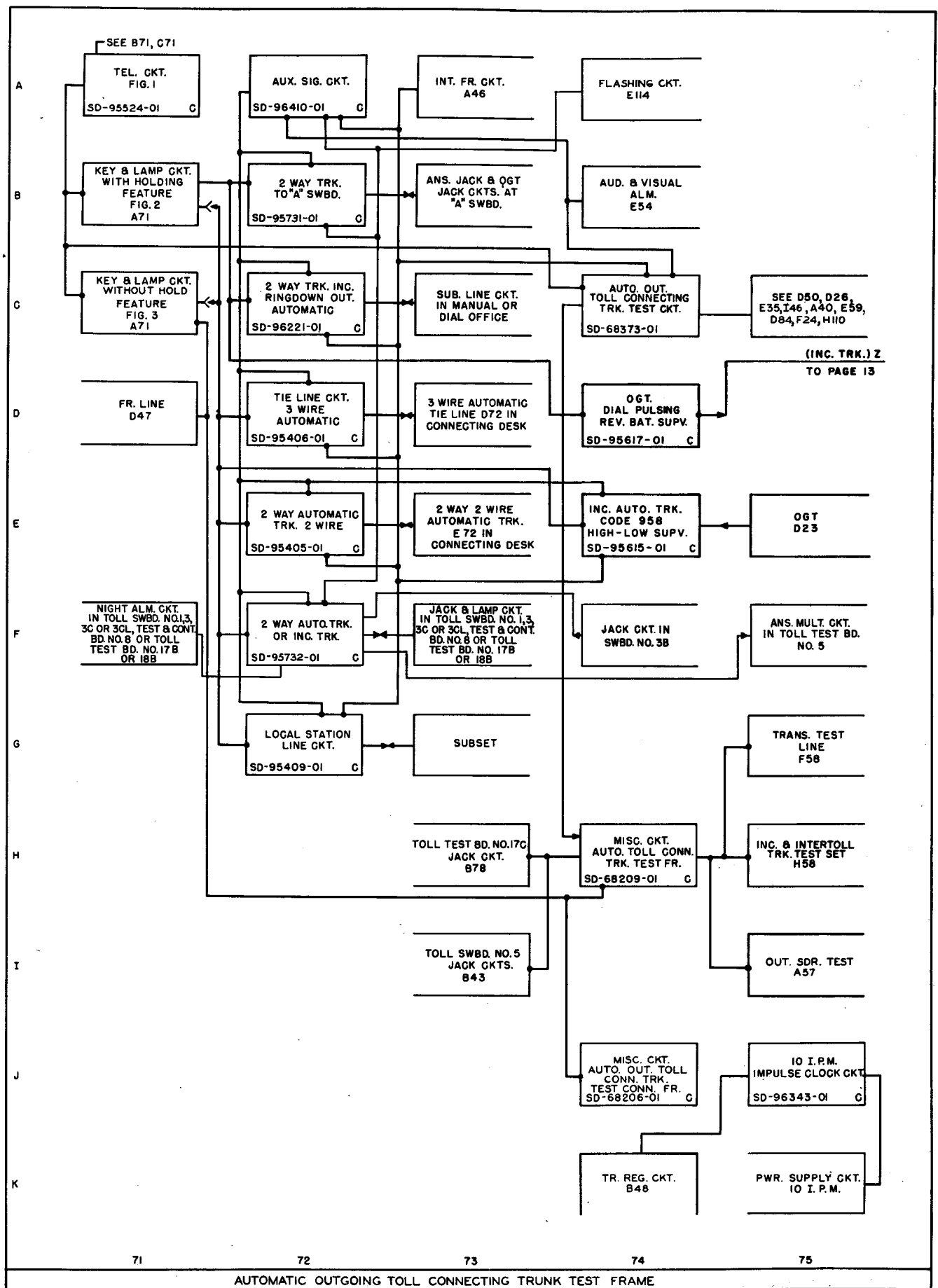


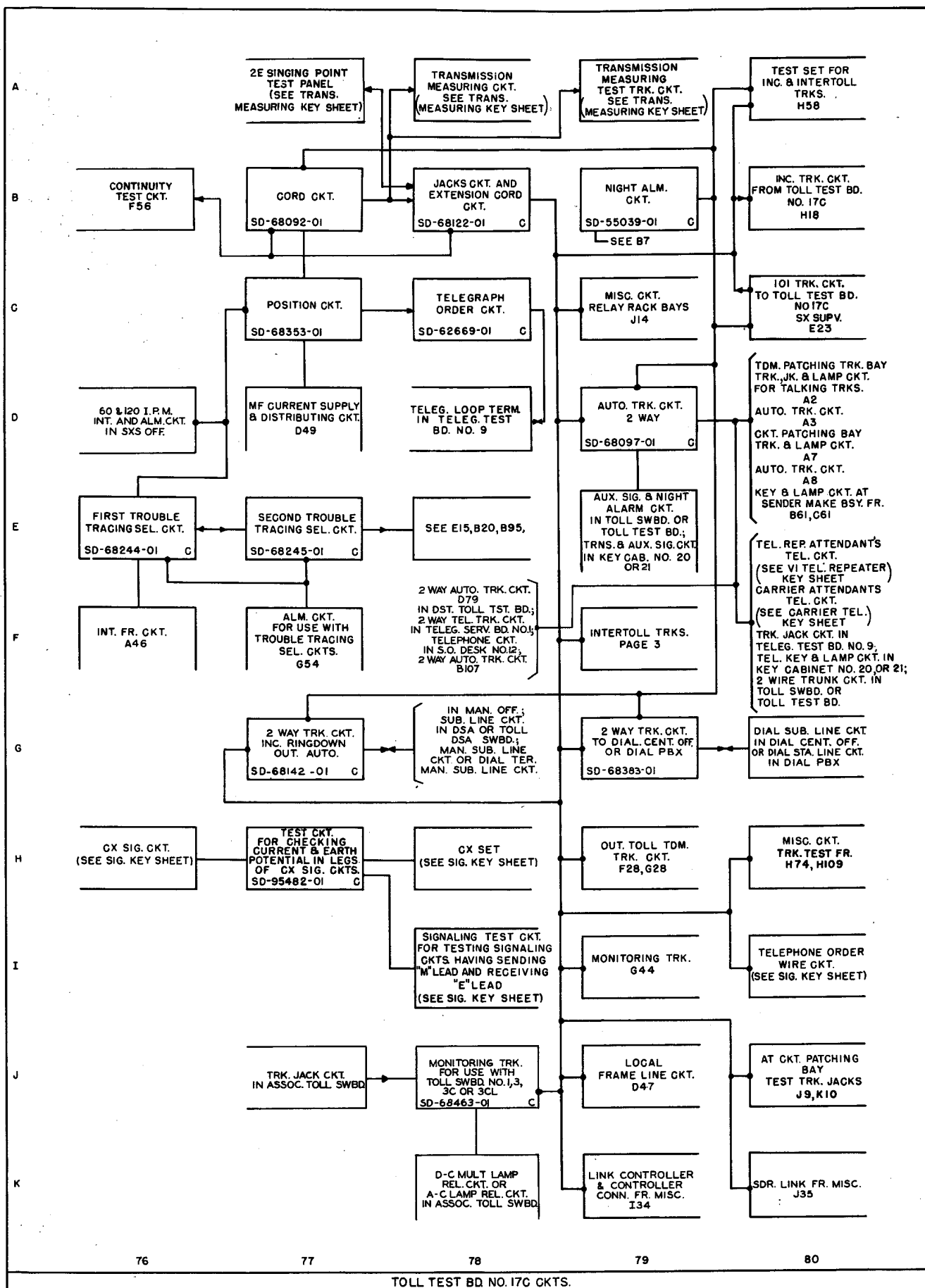


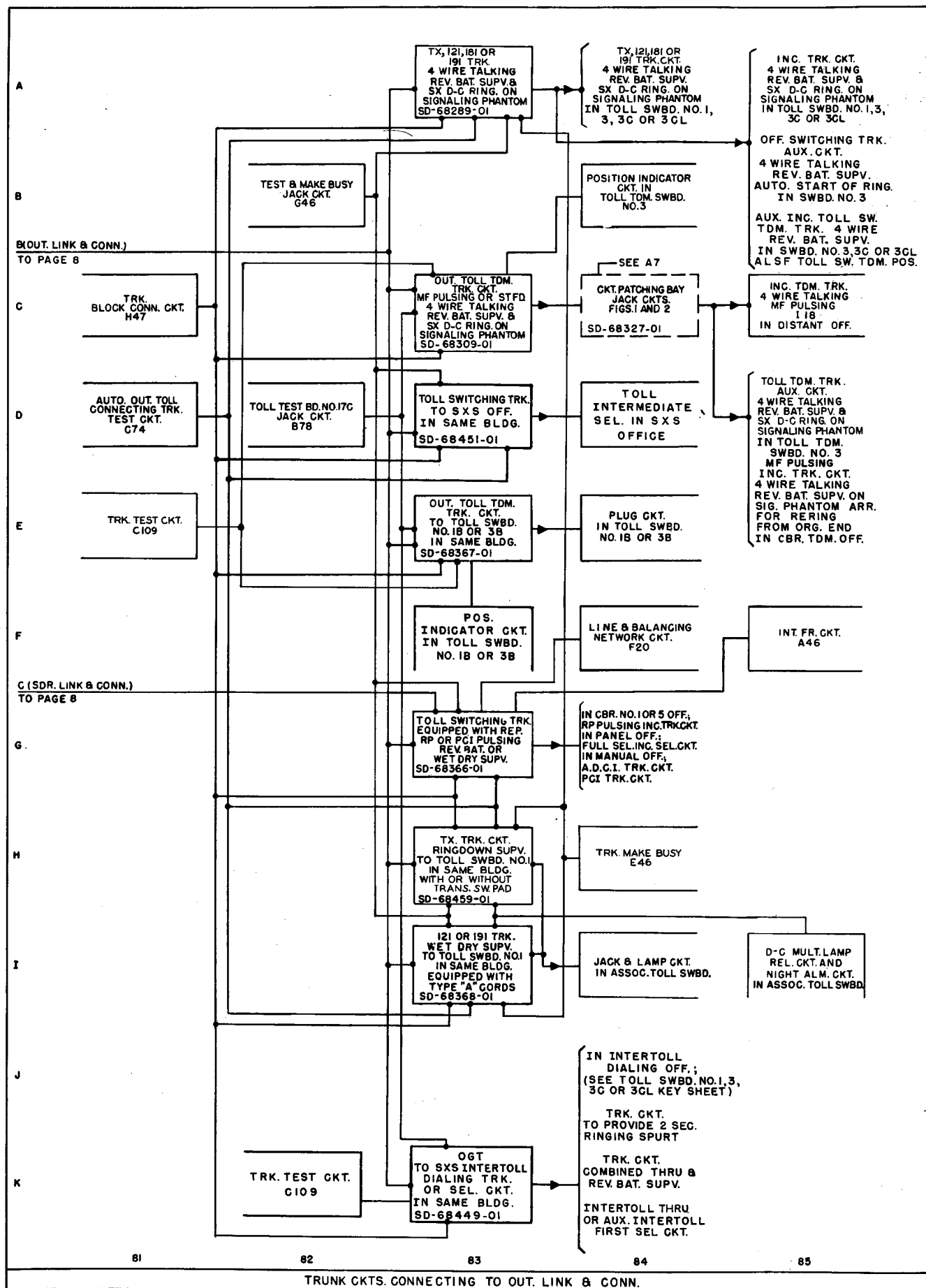




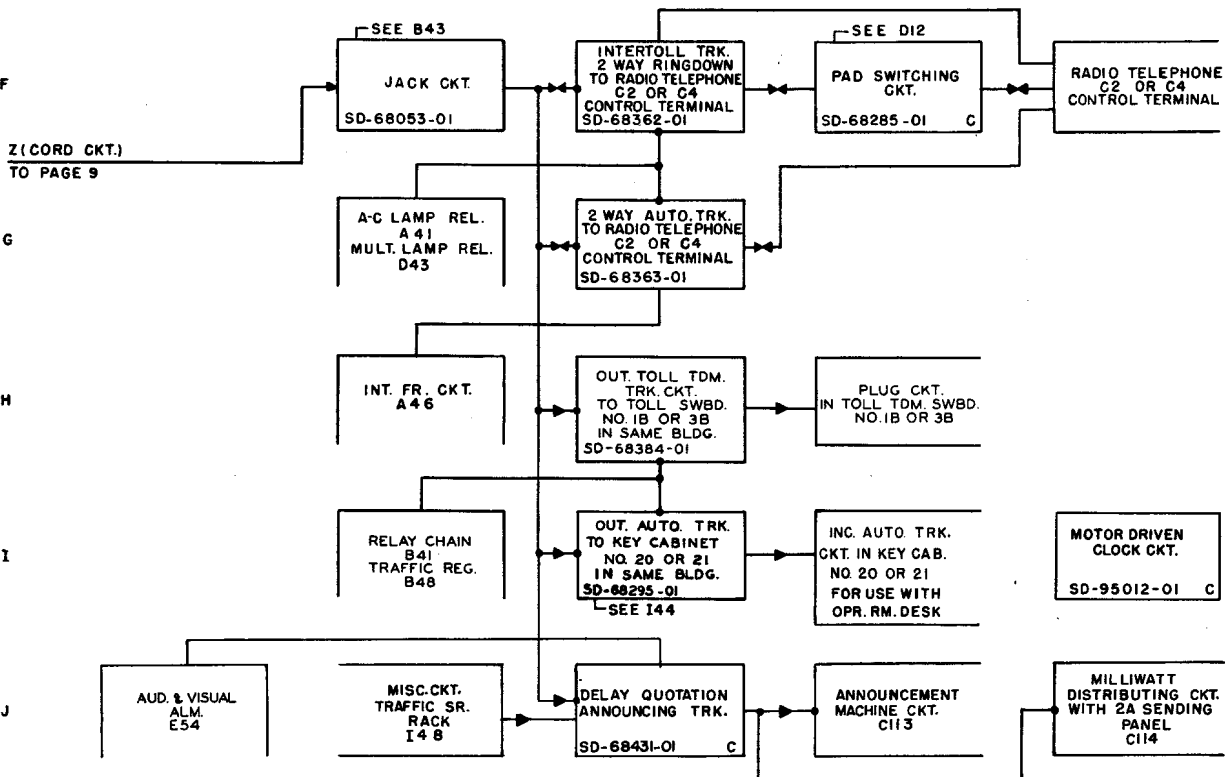


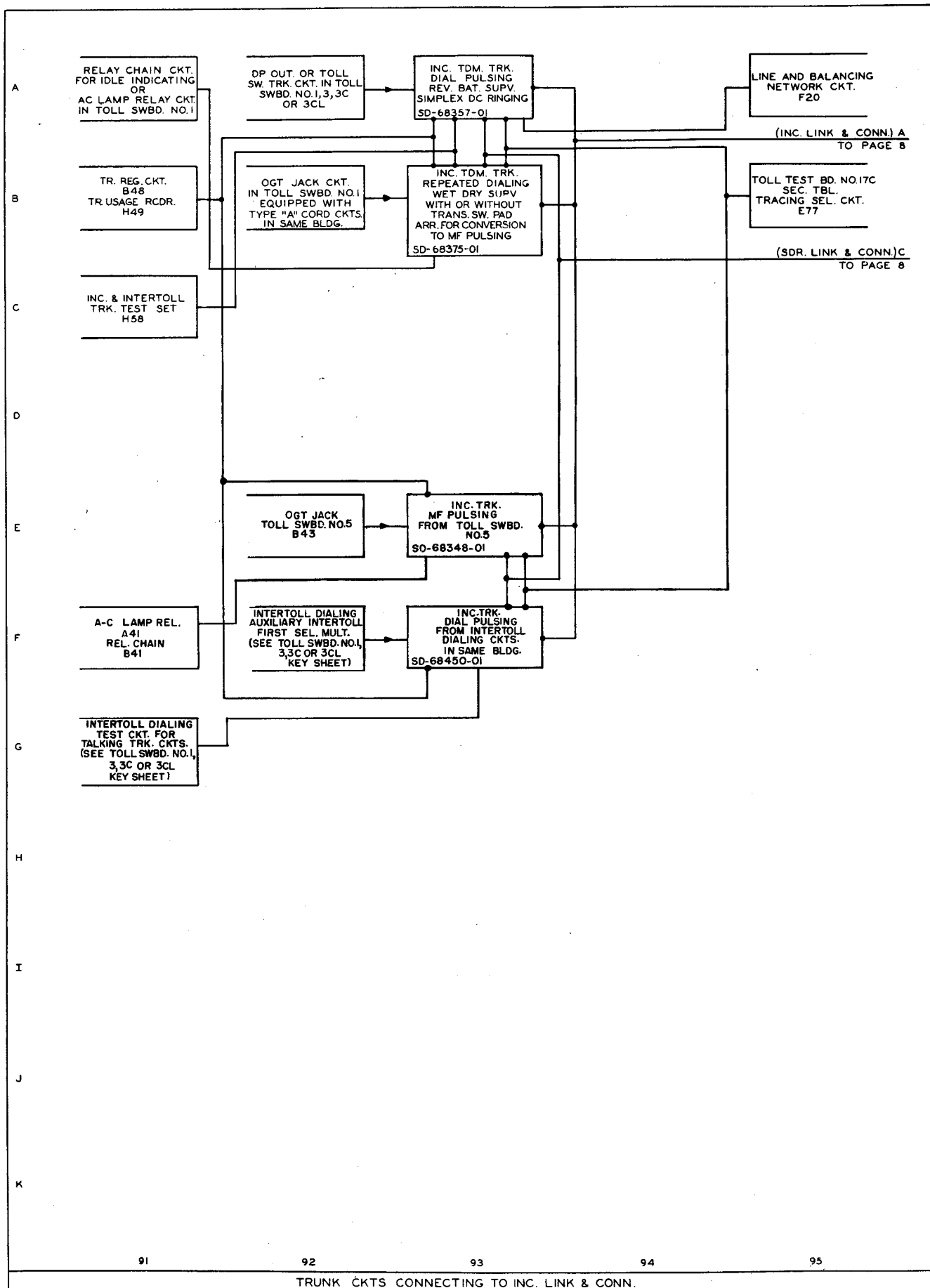




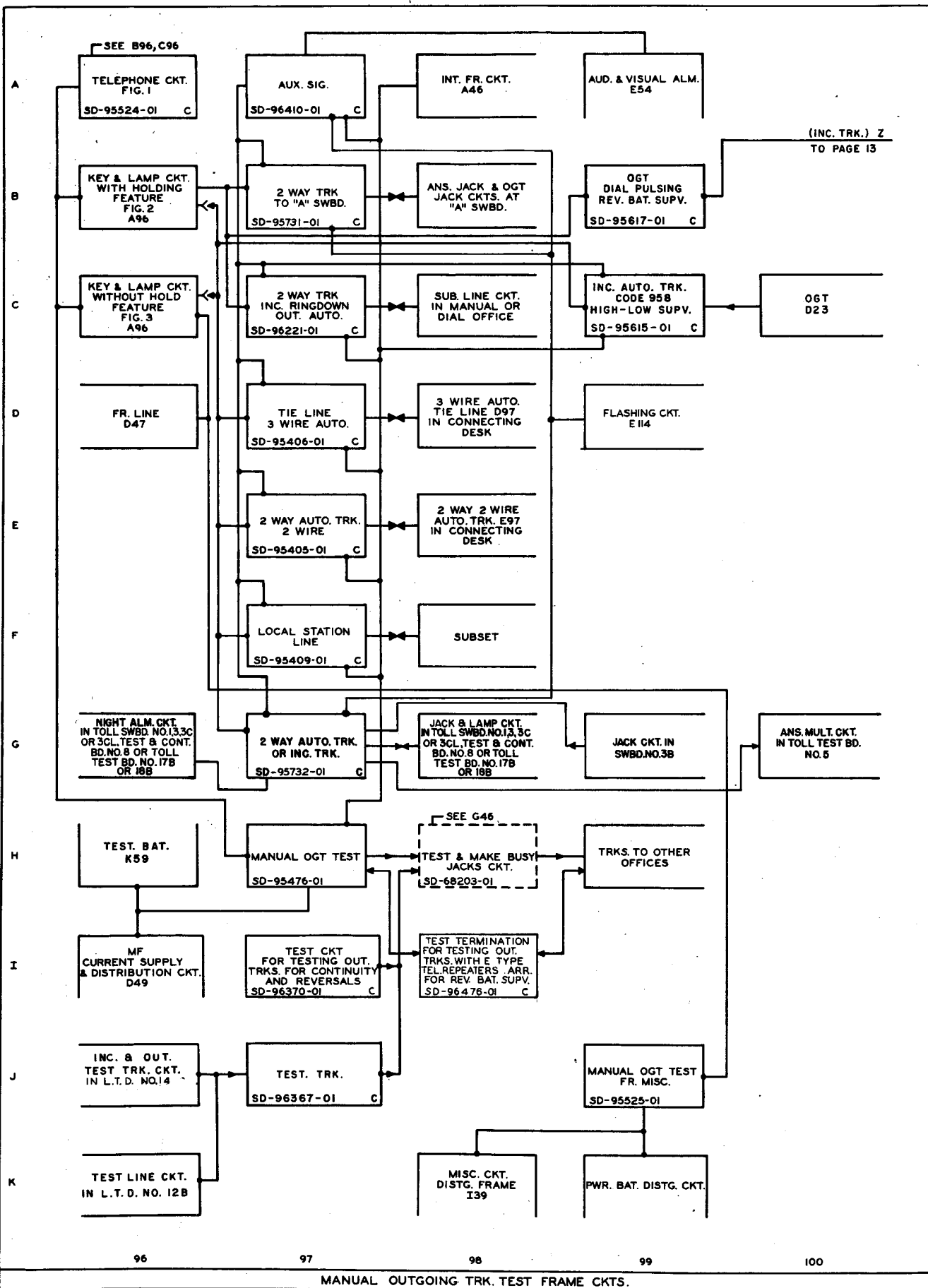


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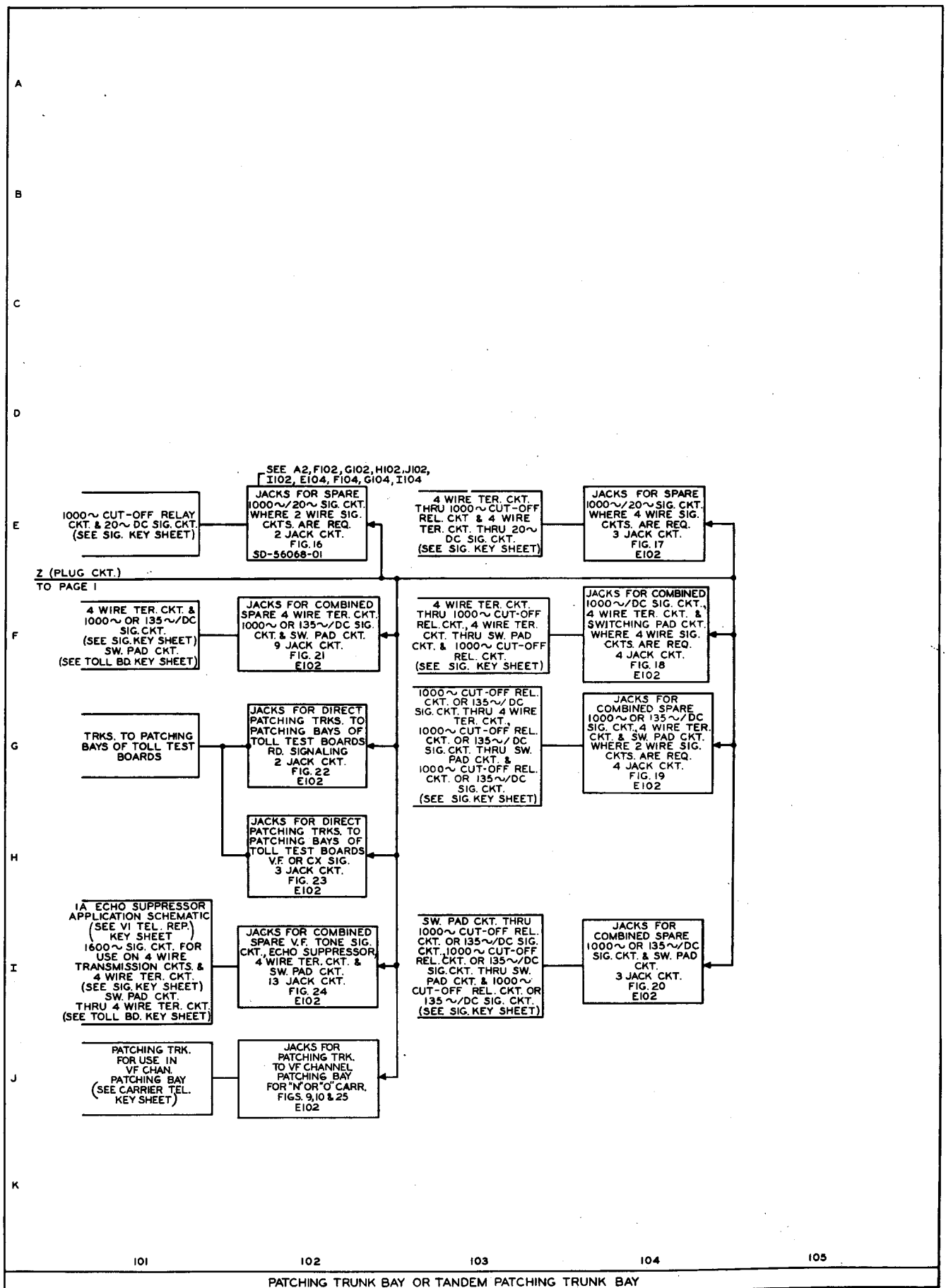


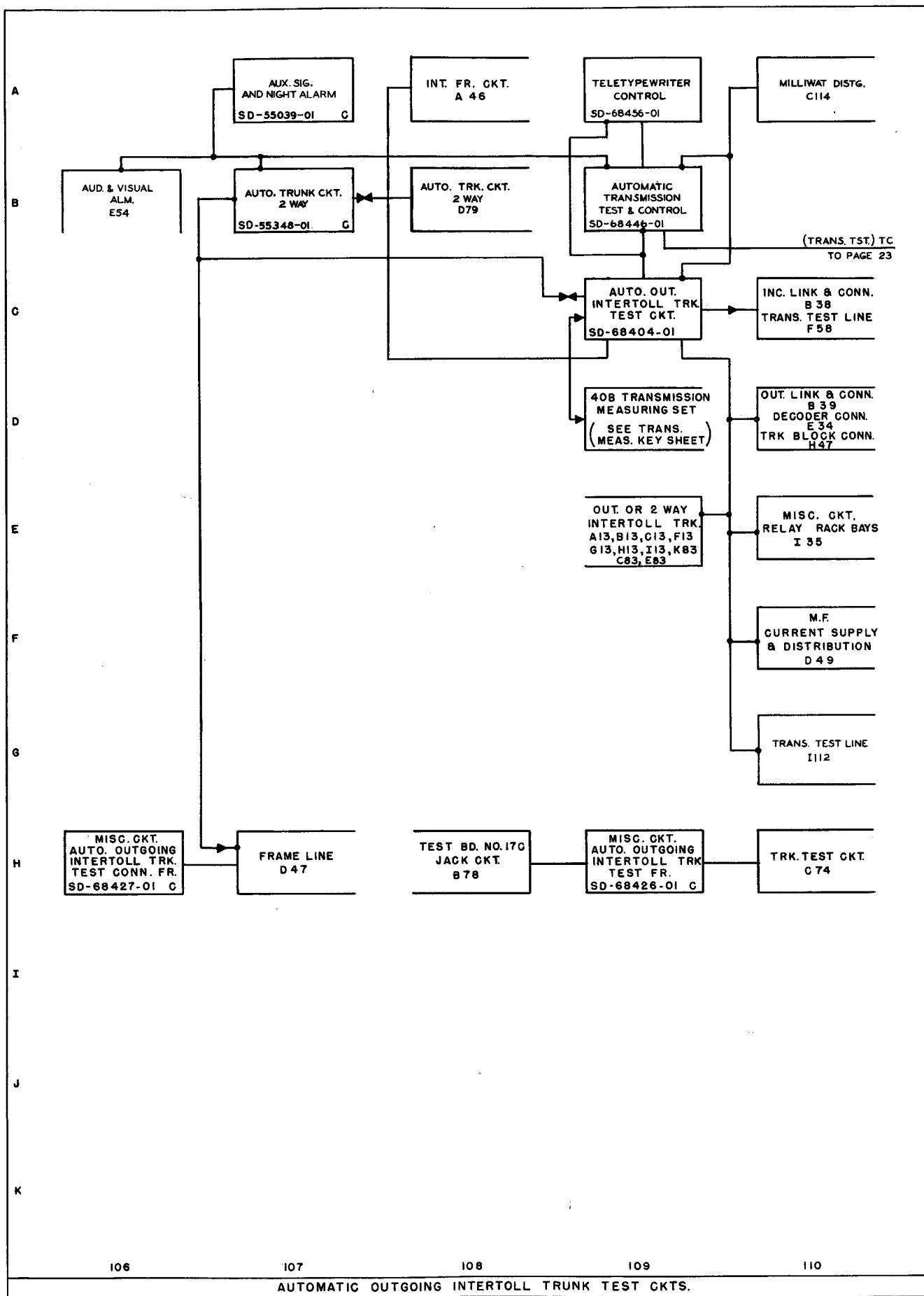


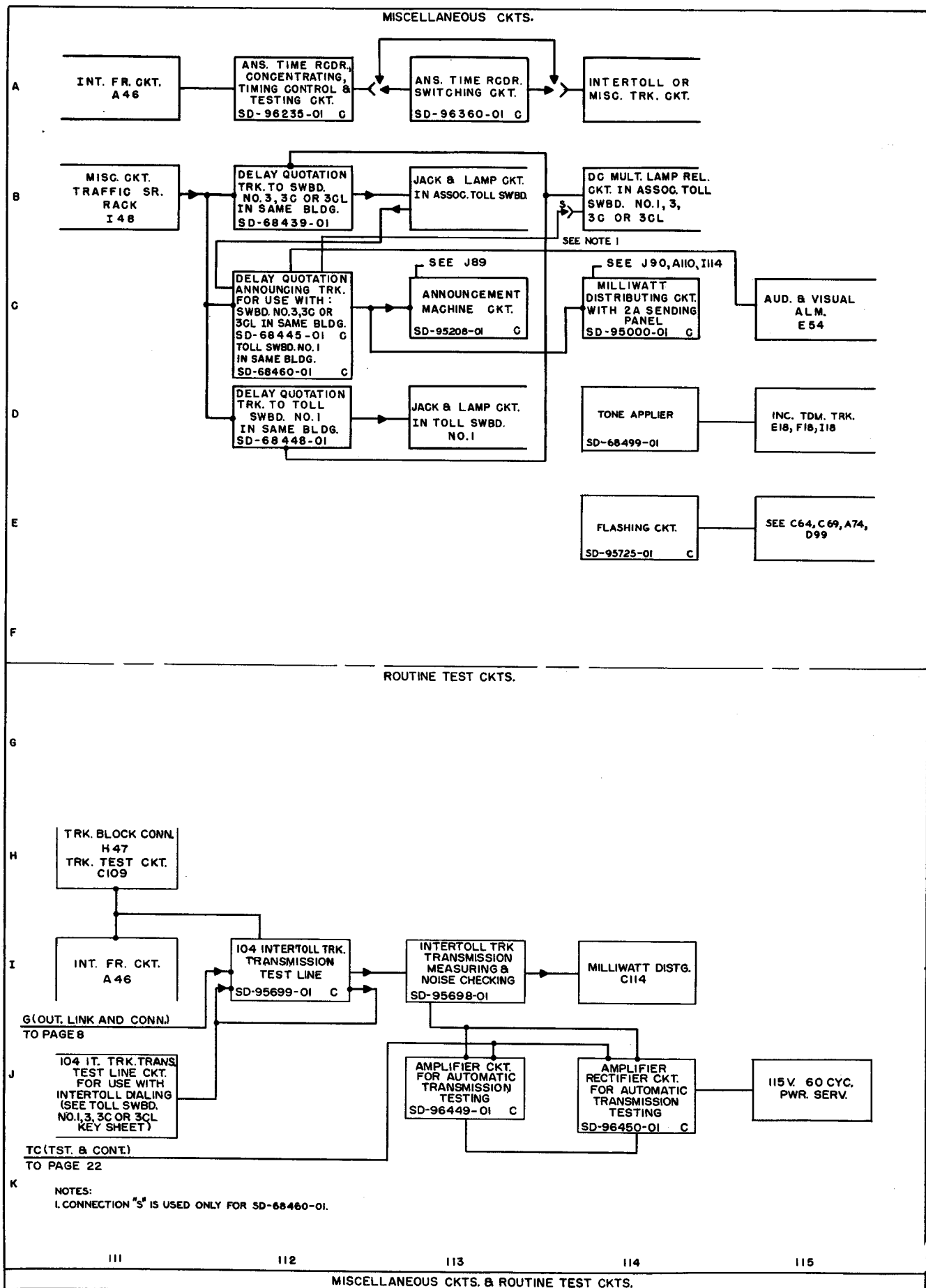
TRUNK CKTS. CONNECTING TO INC. LINK & CONN.



MANUAL OUTGOING TRK. TEST FRAME CKTS.







CURRENT DRAIN AMPERE HOURS PER BUSY HOUR														
CIRCUIT DRAWINGS		SEE NOTE NO.	DRAINS LIST 1				DRAINS LIST 2							
			48V BAT.		24V BAT.		48V BAT.		48V GRD.		24V BAT.		24V GRD.	
CIRCUIT TITLE	CIRCUIT NO.		SIG	TALK	SIG	TALK	SIG	TALK	SIG	TALK	SIG	TALK	SIG	TALK
APPLIER, TONE	SD-68499-01													
CONNECTOR														
TRK BLOCK	SD-68027-01	3					.850		.850					
LINK CONTROLLER	SD-68336-01		1.890				1.720		1.720					
DECODER	SD-68339-01	4	.428				.680		.790					
		5	.031				.028		.031					
TRANSLATOR	SD-68341-01	6	2.540				2.040		2.170					
MARKER	SD-68395-01	4	2.080				1.740		1.180					
CONTROL														
			.040				.022		.022					
ALTERNATE ROUTE TRAFFIC	SD-68408-01	1	.260				.145		.145					
		2	.360				.200		.400					
TMG FOR ALL DECODERS BUSY	SD-68416-01		.085				.085		.154					
SENDER TRAFFIC	SD-68455-01	7	.056				.042		.018					
		8	.358				.268		.168					
CONTROLLER, LINK	SD-68028-01		1.230				2.270		2.270					
CONVERTER														
PULSE, FOR CONVERTING DP TO MF	SD-95590-01	9	.052	E.014			.260	E.014	.196					
CORD														
TOLL SWBD NO. 5	SD-68051-01		.067				.076		.011					
TOLL TEST BD NO. 17C	SD-68092-01	10					.500		.500					

NOTES:

1. ADD PER 10 ROUTE TRANSFER RELAYS.
2. ADD PER 10 ROUTE TRANSFER LAMPS OF FIG. 9.
3. DRAIN PER BAY OF TRK BLOCK CONN FRAME.
4. DRAIN PER DECODER.
5. ADD PER CONN PER DECODER.
6. MAXIMUM DRAIN ON ANY ONE POWER LEAD IS LIST 2 DRAIN MULTIPLIED BY TWICE THE NUMBER OF DECODERS IN THE OFFICE.
7. DRAIN PER SENDER GROUP OF 40 OR LESS SENDERS ULTIMATELY.
8. DRAIN PER SENDER GROUP OF OVER 40 SENDERS ULTIMATELY.
9. "E" INDICATES 130V PLATE DRAIN.
10. DRAINS PER POSITION.

CURRENT DRAIN AMPERE HOURS PER BUSY HOUR													
CIRCUIT DRAWINGS		SEE NOTE NO.	DRAINS LIST 1				DRAINS LIST 2						
CIRCUIT TITLE	CIRCUIT NO.		48V. BAT.		24V. BAT.		48V. BAT.		48V. GRD.		24V. BAT.		24V. GRD.
		SIG.	TALK.	SIG.	TALK.	SIG.	TALK.	SIG.	TALK.	SIG.	TALK.	SIG.	TALK.
POSITION													
TOLL TEST BD. NO. 17C	SD-68353-01	2,8,9			H.500	A.007					H.280	A.007	J.280
TOLL SWBD. NO. 5	SD-68374-01		.089				.066		.134				
RECEIVING, MF PULSING													
RECORDER, TRAFFIC USAGE	SD-95536-01	2	.094		A.069		.098		.215		A.156		
	SD-95738-01						1.28		1.28				
RELAY													
AC LAMP	SD-62848-01	12,14 15	.042				.038		.038				
		15			.006						.006		.006
MULTIPLE LAMP	SD-63962-01	2,3,16			.032						.027		.027
		12,13,17			.028						.023		.023
		2,3,16			.073						.061		.061
RELAY CHAIN													
AC OR DC IDLE IND. ON TRKS.	SD-55570-01	10,12 11,12	.013				.011		.011		.049		
		15	.042				.034		.034				
GRP BUSY, OVERFLOW TRK. CKT. & OVERFLOW TRK. CONTROL CKT.	SD-68420-01	19	.081				.081		.014				
		20	.052				.035		.098				
SENDER													
OUT. RP & PCI	SD-68018-01		1.80				1.44		1.62		.400		.400
DP INC.	SD-68221-01		1.95				2.87		3.02		.200		.200
MFP INC.	SD-68222-01		2.25				3.22		2.90		.200		.200
SUPPLY													
FR. IDENTIFICATION FREQ.	SD-68119-01	1,2	19.20	A.500			19.20	A.500	19.70				
		3	.019				.019						
		4	2.94				2.94	2.94					
MF CURRENT & DISTRIBUTION	SD-95591-01	2,5,6	B.850		A.033	B.1275	B.473		B.473		A.033	B.710	C.710
FILAMENT, FOR MF RECEIVERS	SD-95676-01		.132				.396		.230				
		24	1.312				3.940		3.940				
TELEPHONE													
TOLL SWBD. NO. 5	SD-68162-01		.150				.140		.140				
REC. & MON. CORD	SD-68165-01		.158				.088		.081				
CKT. PTCH. BAY	SD-68330-01		.083		.114		.046		.046		.063		
TEST													
CARD TRANSLATOR	SD-68458-01						3.50		3.50				
INC. SDR.	SD-68226-01		2.000		.100		5.000		5.000		.100		.100
OUT. RP & PCI SDR.	SD-68372-01		2.000		.100		5.000		5.000		.100		.100
AUTO. OUT. TOLL. CONNECTING TRK.	SD-68373-01	7					3.000	C.100	3.000		1.000		1.000
LINK CONTROLLER	SD-68405-01						6.67		6.67				
MAN. OGT FOR MAN. OGT TEST FR.	SD-95476-01						4.450		4.450				
DECODER MARKER AND TROUBLE RECORDER	SD-68389-01						24.00		24.00				
OUT. AUTO. INTERTOLL TRK.	SD-68404-01	2					16.00		16.00		1.00	A.060	1.00
TRANSLATOR CARD	SD-68342-01	21,22,23	.0064				25.0	E.010	22.2	E.010			

NOTES:

1. AMPLIFIER DRAIN PER OFF FUSES ARE ON DISTG. FUSE PANEL.
2. "A" INDICATES 130V. PLATE DRAIN.
3. ADDITIONAL PER LINK FRAME (OUT. OR INC.) AND JUMP HUNT GRP FUSES ARE ON CONT. FR. DRAIN ON CONT. FR.
4. ADDITIONAL PER OFFICE. FUSES ARE ON CONTROL FRAME.
5. "B" INDICATES 24V. OR 48V. FIL. BAT. DRAIN AS SPECIFIED.
6. "C" INDICATES 24V. OR 48V. FIL. GRD. DRAIN AS SPECIFIED.
7. DRAIN IS PER OSCILLATOR.
8. "C" INDICATES 130V. SIG. BAT. DRAIN.
9. "H" INDICATES 24V. SIG. OR 24V. FIL. BAT. DRAIN AS SPECIFIED.
10. "J" INDICATES 24V. SIG. OR 24V. FIL. GRD. DRAIN AS SPECIFIED.
11. PER (LP) RELAY (DELAY FIGS. 11, 12 & 13).
12. BAT. DRAIN SHOWN ON THIS CKT. IS FUSED ON CONNECTING CKT.
13. DRAINS FOR LAMPS FUSED WITH TRK. CKTS. OR MULT. LAMP RELAY CKTS. ARE SHOWN ON CONNECTING JK. CKT.
14. PER FIG. 4.
15. PER FIG. 1.
16. PER (LP) RELAY (FIG. 1).
17. PER (LP1) RELAY (FIG. 2).
18. PER (LP2) RELAY (FIG. 3).
19. PER FIG. 2.
20. PER FIG. 3, 4, 5 OR 6.
21. "E" INDICATES +130V. SIG. BAT. AND GRD. DRAIN.
22. THE LIST 1 DRAIN IS PER BUSY HOUR CARD TRANSLATOR USE.
23. THE MAXIMUM DRAIN ON ANY ONE POWER LEAD IS THE LIST 2 DRAIN TIMES THE NUMBER OF DECODERS PLUS 2, IN THE OFFICE.
24. ADD FOR EACH FIG. 4 (EMERGENCY BAT. SUPPLY).

CURRENT DRAIN AMPERE HOURS PER BUSY HOUR														
CIRCUIT DRAWINGS		SEE NOTE NO.	DRAINS LIST 1				DRAINS LIST 2							
			48V. BAT.		24V. BAT.		48V. BAT.		48V. GRD.		24V. BAT.		24V. GRD.	
CIRCUIT TITLE	CIRCUIT NO.		SIG.	TALK.	SIG.	TALK.	SIG.	TALK.	SIG.	TALK.	SIG.	TALK.	SIG.	TALK.
TRUNK														
INTERTOLL, INC. DP, CX SUPV.	SD-68135-01		.185				.133		.259					
INTERTOLL, INC. MFP, CX SUPV.	SD-68230-01		.178				.128		.255					
INTERTOLL, OUT. DP, MFP OR AUTO, CX SUPV.	SD-68231-01		.203				.145		.096					
INTERTOLL, 2 WAY, INC. DP, OUT. DP, MFP OR AUTO, CX SUPV.	SD-68232-01		.239				.174		.199					
INTERTOLL, 2 WAY, INC. MFP, OUT. DP, MFP OR AUTO, CX SUPV.	SD-68233-01		.231				.169		.197					
INTERTOLL, OUT. AUX. FOR USE WITH RD. INTERTOLL TRK. CKT.	SD-68234-01		.047				.062		.040					
INC. TDM, MFP, FROM SWBD. NO. 3, 3C OR 3CL IN SAME BLDG.	SD-68238-01		.094				.052		.228				.028	
OUT. TX OR COMB. TX & TOLL SW, DP, MFP OR AUTO., REV. BAT. SUPV., ARR. FOR SIMPLEX DC RERING	SD-68239-01		.037				.037		.033					
TOLL SW, DP, WET DRY SUPV. AUTO. START OF RINGING TO REPEATED DIAL TOLL TRAIN OR COMB. LOOP & REPEATED DIAL TOLL TRAIN	SD-68240-01		.144				.144		.125					
TOLL SW, DP, MFP OR STFD., WET DRY, HIGH LOW OR REV. BAT. SUPV.	SD-68242-01	1	.037				.037		.029					
		2	.057				.065		.057					
INTERTOLL, OUT. RINGDOWN	SD-68260-01		.021				.021		.011					
TX, 121, 131, 141, 181, OR 191 TO SWBD. NO. 3, 3C OR 3CL IN SAME BLDG.	SD-68282-01	3	.111				.089		.081				.030	
TX, 121, 181 OR 191, 4 WIRE TALKING, REV. BAT. SUPV. & SIMPLEX DC RINGING ON SIGNALING PHANTOM	SD-68289-01		.019				.037		.020					
INC. TDM, 4 WIRE TALKING, MFP, REV. BAT. SUPV. & SIMPLEX DC RINGING ON SIGNALING PHANTOM	SD-68290-01		.091				.061		.212					
121 - TO TOLL SWBD. NO. 5	SD-68291-01	3	.040				.032		.073					
OUT. TOLL TDM, STFD. TO TOLL TDM SWBD. NO. 1 IN SAME BLDG.	SD-68294-01		.105				.084		.042					
OUT. TOLL TDM. STFD. TO TOLL TDM SWBD. NO. 3 IN SAME BLDG.	SD-68295-01		.034				.027		.050					
INC. OR OUT. WITH TRANS. SW. PAD FOR USE WITH SWBD. NO. 3, 3C OR 3CL IN SAME BLDG.	SD-68296-01	3	.107				.070		.092				.028	
INC. OR OUT. WITH TRANS. SW. PAD, WET DRY SUPV., FOR USE WITH TOLL SWBD. NO. 1 IN SAME BLDG.	SD-68297-01		.107				.070		.092				.018	
INC., 4 WIRE TALKING, AUTO., REV. BAT. SUPV. & SIMPLEX DC RINGING ON SIGNALING PHANTOM	SD-68302-01		.016				.032		.064					
OUT. TX TO TOLL SWBD. NO. 1 IN SAME BLDG.	SD-68305-01		.018				.035		.044				.013	
121 OR 191 WITH TRANS. SW. PAD, WET DRY SUPV. TO TOLL SWBD. NO. 1 IN SAME BLDG.	SD-68306-01		.033				.066		.074				.038	
INTERPOSITION-TOLL SWBD. NO. 5	SD-68283-01	3					.080		.070					

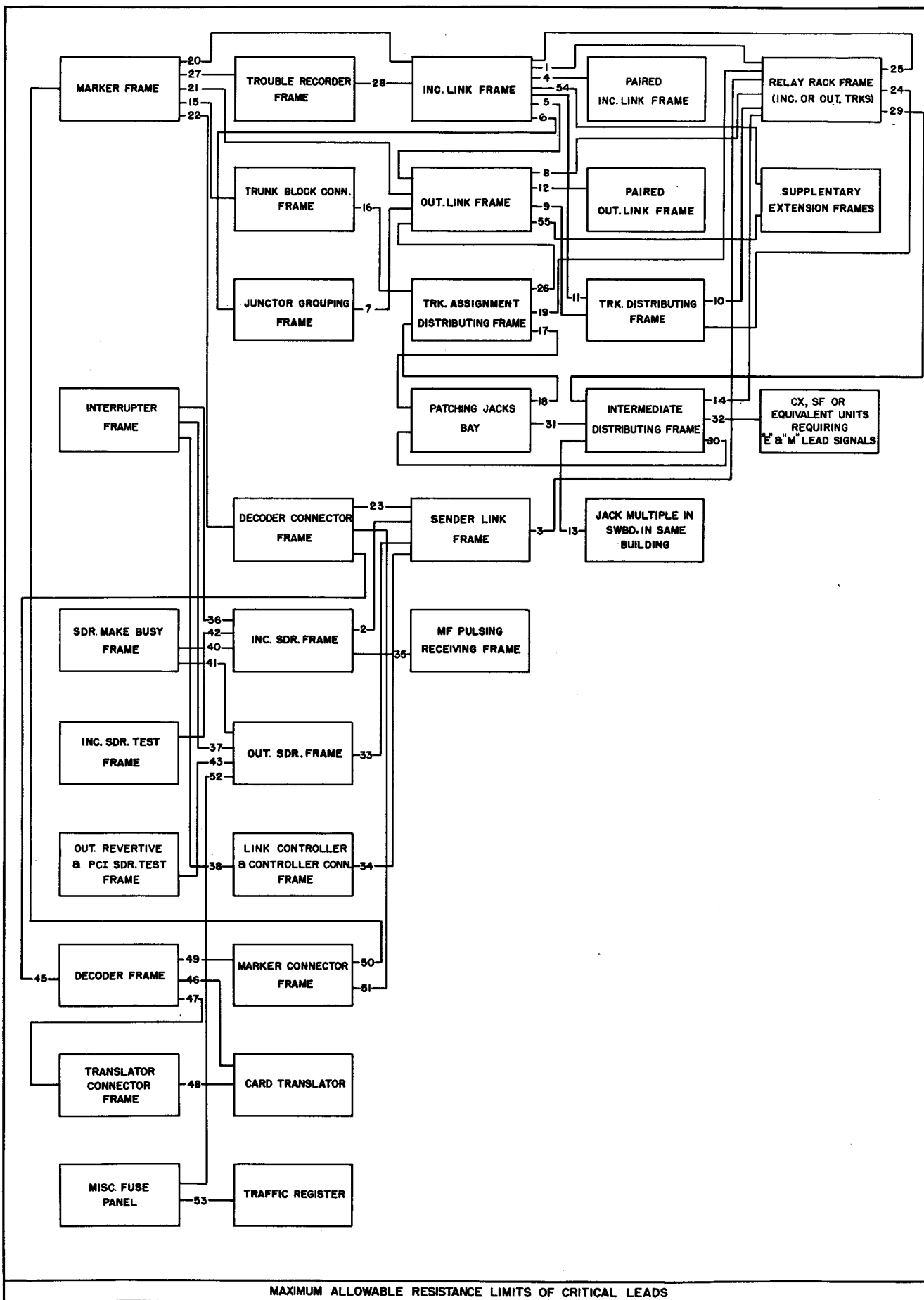
NOTES:

1. DIAL OFFICE TERMINATION.
2. MANUAL OFFICE TERMINATION.
3. ADDITIONAL 24V. SIG. BAT. DRAIN FUSED ON THIS CKT. IS SHOWN ON JACK CKT., REL. CHAIN CKT. OR MULT. LAMP REL. CKT. AND MUST BE ADDED TO TRK. DRAIN.

CURRENT DRAIN AMPERE HOURS PER BUSY HOUR														
CIRCUIT DRAWINGS		SEE NOTE NO.	DRAINS LIST 1				DRAINS LIST 2							
			48V. BAT.		24V. BAT.		48V. BAT.		48V. GRD.		24V. BAT.		24V. GRD.	
CIRCUIT TITLE	CIRCUIT NO.		SIG.	TALK.	SIG.	TALK.	SIG.	TALK.	SIG.	TALK.	SIG.	TALK.	SIG.	TALK.
TRUNK														
OUT. 4 WIRE TALKING, REV. BAT. SUPV. & SIMPLEX DC RINGING ON SIGNALING PHANTOM	SD-68307-01								.031					
OUT. TOLL TDM., MFP OR STFD., 4 WIRE TALKING, REV. BAT. SUPV. & SIMPLEX DC RINGING ON SIGNALING PHANTOM	SD-68309-01	1,9	.046				.037		.064					
		2,9	.054				.043		.070					
		8	.072				.058		.085					
INC. TDM., DP, REV. BAT. SUPV., WITH 20 CYCLE RINGING	SD-68315-01		.078				.078		.245					
INC. TDM., MFP, SLEEVE SUPV. FROM TOLL SWBD. NO.1 IN SAME BLDG.	SD-68317-01		.060				.040		.205				.031	
INC. TDM., MFP, REV. BAT. SUPV., WITH 20 CYCLE RINGING	SD-68318-01		.085				.085		.253					
OUT. TOLL TDM., STFD. TO TOLL TDM. SWBD. NO.1 IN SAME BLDG.	SD-68320-01		.170				.136		.070					
OUT. TOLL TDM., STFD. TO TOLL TDM. SWBD. NO.3 IN SAME BLDG.	SD-68321-01		.070				.056		.042					
INC. TDM., MFP, WET DRY SUPV., FROM TOLL SWBD. NO.1 IN SAME BLDG.	SD-68322-01		.102				.067		.233				.018	
TOLL SW., RP OR PCI, WET DRY OR REV. BAT. SUPV.	SD-68326-01	3	^D .068				^D .068		^D .077					
OUT. TO DESKS OR TEST CENTER	SD-68332-01		.096				.087		.085					
INC., MF PULSING FROM TOLL SWBD. NO. 5	SD-68348-01		.063				.063		.050				.032	
INC. TDM., DP, REV. BAT. SUPV., SIMPLEX DC RINGING	SD-68357-01		.064				.064		.230					
INC. TDM., MFP, REV. BAT. SUPV., SIMPLEX DC RINGING	SD-68358-01		.099				.066		.234					
INTERTOLL, 2 WAY RINGDOWN TO RADIO TEL. C2 OR C4 CONTROL TERMINAL	SD-68362-01	7	.126				.126		.148					
2 WAY AUTO. TO RADIO TEL. C2 OR C4 CONTROL TERMINAL	SD-68363-01	7	.079				.079		.061				.035	
INTERTOLL, OUT. AUX., FOR USE WITH RINGDOWN INTER-TOLL TRK. CKT.	SD-68364-01		.028				.020		.020				.017	
TOLL SW. EQUIPPED WITH REPEATER, RP OR PCI, REV. BAT. OR WET DRY SUPV.	SD-68366-01	4,5		^A .010	^B .120		.068		.077		^A .010		^B .067	^C .067
121 OR 191, WET DRY SUPV., TO TOLL SWBD. NO.1 IN SAME BLDG. EQUIPPED WITH TYPE "A" CORDS	SD-68368-01	6	.018		.003		.035		.044		.006		.024	
OUT. AUX., REV. BAT. SUPV., FOR USE WITH 2 WAY OPR. OFF. TRK.	SD-68371-01		.074				.164		.126					
INC. TDM., REPEATED DIALING, WET DRY SUPV. FROM TOLL SWBD. NO.1 IN SAME BLDG. ARR. FOR CONVERSION TO MFP	SD-68375-01		.122				.080		.077				.077	
OUT. TOLL TDM. TO TOLL SWBD. NO. 18 OR 38 IN SAME BLDG.	SD-68367-01	1,6	.095		.022		.076		.076		.018		.058	
		2,6	.100		.022		.080		.080		.018		.058	
		10			.015						.012			

NOTES:

- WITHOUT POS. IDLE INDICATING.
- WITH POS. IDLE INDICATING.
- "D" ADD .015 IF FIG. A IS USED.
- "A" INDICATES 130V. PLATE DRAIN.
- "B" INDICATES 24V. FIL. BAT. DRAIN.
"G" INDICATES 24V. FIL. GRD. DRAIN.
- THE 24V. SIG. BAT. SHALL BE TAKEN FROM THE CENTRAL OFF. BAT. WHICH SUPPLIES THE TOLL SWBD.
- ADDITIONAL 24V. SIG. BAT. DRAIN FUSED ON THIS CKT. IS SHOWN ON JACK CKT., REL. CHAIN CKT. OR MULT. LAMP REL. CKT. AND MUST BE ADDED TO TRK. DRAIN.
- FOR MF PULSING.
- FOR STFD. OPERATION.
- ADD WHEN PAD CONTROL RES. IS NOT FURNISHED IN THE PLUG CKT.



MAXIMUM ALLOWABLE RESISTANCE LIMITS OF CRITICAL LEADS

[illegible]

1. THE RESISTANCE OF THE "IS" LEAD FROM THE INC. SDR. FR. TO THE RELAY RACK FR. MAY BE INCREASED BEYOND THE MAXIMUM OF 20 OHMS BY A CORRESPONDING REDUCTION IN THE 8.6 OHM "IS" LEAD RESISTANCE FROM THE INC. LINK FR. TO THE RELAY RACK FRAME.
2. THESE LEAD DESIGNATIONS APPLY TO INT. DESIGNATED TM, FIF, RO, WA.
3. THESE LEAD DESIGNATIONS APPLY TO INT. DESIGNATED TA, TR, FR.
4. THE OUTPUT CHANNEL LEAD DESIGNATIONS ARE NCA, CA-, IT, TC, ITC, TS-, TPC, TP-, HB, BT-, BU-, CLT-, CLU-, CDC-, NAC, AC, AHA, AFA, ART-, ARU-, RT-, CDC-, CCHN, CCTN, CCUN, CCH-, CCT-, CCU-, NSK, SK3, SK6, TGT-, TCU-, TB-, GST-, GSU-, GET- AND GEU-.

ALARM

Night, and Aux. Sig.	SD-55039-01	B2, B7, F42, B79, A107,
Floor Alm. Fr. Fuse & Time	SD-68067-01	B52
Fuse Bays Fuse	SD-68068-01	E53
Floor Alm. Fr. Misc. & Aux.	SD-68073-01	B53
For Use with Trouble Tracing Sel. Ckts.	SD-68246-01	G54
Code Sig. & Auto.	SD-90437-01	G52
Fire Detection Emg.		
Fuse - For 24V & 48V		
Fuses Mtd. in Swbd.		
Pos.	SD-96153-01	H42
Aud. & Visual	SD-96188-01	E54

AMPLIFIER

For Auto. Trans. Testing	SD-96449-01	J113
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AMPLIFIER-RECTIFIER

For Auto. Trans. Testing	SD-96450-01	J114
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ANNOUNCEMENT MACHINE	SD-95208-01	C113
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BATTERY

Test	SD-96120-01	K59
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BELL

Ch. Swmn's Desk Call	SD-96447-01	A69
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CALL CKT.

Toll Swbd. No. 5 Serv. Assistant's	SD-68062-01	F43
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CLOCK

Motor Driven	SD-95012-01	I90
Misc. Use	SD-96201-01	J48
10 I.P.M.	SD-96343-01	J75

CONNECTOR

Trk. Block	SD-68027-01	H47
Sender	SD-68334-01	C38
Controller	SD-68336-01	B33
Decoder	SD-68339-01	E34
Translator	SD-68341-01	C32
Inc.	SD-68393-01	B38
Out.	SD-68394-01	B39
Marker	SD-68395-01	E33

CONTROL

Timing, For All Markers Busy	SD-68199-01	I33
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CONTROL (Cont'd)

Traffic, For Alternate Route Timing, For All Decoders Busy Overflow Trk. Auto. Trans. Sender Traffic Teletypewriter	SD-68408-01	D34
	SD-68416-01	D32
	SD-68420-01	I23
	SD-68446-01	B109
	SD-68455-01	G38
	SD-68456-01	A109

CONTROLLER

Link	SD-68028-01	C33
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CONVERTER

Pulse, for Covert- ing Dial Pulses to MF Pulses	SD-95590-01	B46
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CORD

Tdm. Patching Trk. Bay - Patching Toll Swbd. No. 5 - Pos.	SD-56068-01	F5
	SD-68051-01	C42
Toll Swbd. No. 5 Overflow Indicating	SD-68055-01	A42
Toll Test Bd. No. 17C	SD-68092-01	B77
Toll Swbd. No. 5 - Recording & Mon.	SD-68185-01	B42
Ckt. Patching Bay - Patching	SD-68327-01	F10

DECODER

SD-68340-01	D33
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FLASHING

SD-95725-01	E114
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GROUPING

Toll Swbd. No. 5 Position	SD-68161-01	D42
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JACKS

Tdm. Patching Trk. Bay	SD-56068-01	A2
Toll Swbd. No. 5 Out. & Ans.	SD-68053-01	B43
Toll Test Bd. No. 17C	SD-68122-01	B78
Test & Make Busy	SD-68203-01	G46
Ckt. Patching Bay - Trk. & Lamp	SD-68327-01	A7
Monitoring & Obser- ving, & Associ- ated Ckts.	SD-90564-01	A49

KEY & LAMP

Ch. Swmn's Desk	SD-95404-01	B66 B61, C61
Sdr. M.B. Fr.	SD-95524-01	
Auto. Out. Toll Connecting Trk.		B71, C71
Test Fr.	SD-95524-01	
Man. OGT Test Fr.	SD-95524-01	A96

KEY SET

Toll Swbd. No. 5-MF	SD-68349-01	E41
LINE		
Test, to Milliwatt	SD-68095-01	E58
Distributing Ckt.	SD-68399-01	D58
Test		
Test, for Balance	SD-68432-01	C58
& Noise Tests		
Sdr. M.B. Fr. -	SD-95406-01	D62
3 Wire Auto. Tie		
Ch. Swmn's Desk -	SD-95406-01	D67
3 Wire Auto. Tie		
Auto. Out. Toll		
Connecting Trk.		
Test Fr. - 3 Wire		
Auto. Tie	SD-95406-01	D72
Man. OGT Test Fr. -		
3 Wire Auto. Tie	SD-95406-01	D97
Sdr. M.B. Fr. -		
Local Sta.	SD-95409-01	G62
Ch. Swmn's Desk -		
Local Sta.	SD-95409-01	G67
Auto. Out. Toll		
Connecting Trk.		
Test Fr. Local		
Station	SD-95409-01	G72
Man. OGT Test Fr.		
Local Sta.	SD-95409-01	F97
Recorder's Talking	SD-95532-01	F48
It. Trk. Trans. Test	SD-95699-01	I112
One Way Trans. Test	SD-96000-01	F58
Local Frame	SD-96379-01	D47

LINK

Sender	SD-68334-01	C38
Inc.	SD-68393-01	B38
Out.	SD-68394-01	B39
MAKE BUSY TRUNK	SD-96448-01	E46
MARKER	SD-68388-01	F33
MEASURING		
It. Trk. Trans., &		
Noise Checking	SD-95698-01	I113
MISC. FRAME		
Block Relay Fr.	SD-68024-01	I47
Inc. Sdr. & Out.		
Sdr.	SD-68041-01	I38
Sdr. Link Fr.	SD-68043-01	J35
Inc. & Out. Link	SD-68048-01	I37
Interrupter	SD-68058-01	A46
Traffic Reg. Rack		
& Rcdr's Desk	SD-68059-01	E48
Link Controller &		
Controller Conn.	SD-68087-01	I34
		J14,
		J20,
		J24,
Relay Rack Bays	SD-68090-01	I35
Overflow Trk.	SD-68193-01	J23
Distg.	SD-68194-01	I39
Traffic Supervisory		
Rack	SD-68195-01	I48

MISC. FRAME (Cont'd)

Frame Identifica-	SD-68196-01	K36
tion Freq. Supply		
Auto. Out. Toll		
Connecting Trk.		
Test Conn.	SD-68206-01	J74
Auto. Out. Toll		
Conn. Trk. Test	SD-68209-01	H74
Inc. Sdr. Test	SD-68385-01	I57
Sdr. M.B.	SD-68386-01	A64
Trouble Recorder	SD-68392-01	H32
Out. Revertive &		
PCI Sdr. Test	SD-68396-01	K57
Card Translator	SD-68407-01	G34
Marker	SD-68410-01	H33
Decoder	SD-68411-01	G33
Alternate Route		
Traffic Control	SD-68415-01	H31
Foreign Area		
Translator Con-		
connector	SD-68418-01	H40
Mkr. Conn.	SD-68419-01	H34
Decoder Conn.	SD-68422-01	G35
Auto. Out. Intertoll		
Trk. Test	SD-68426-01	H109
Auto. Out. Intertoll		
Trk. Test Conn.	SD-68427-01	H106
Emergency Trans-		
lator Conn. & Fr.		
Ident. Freq. Control	SD-68429-01	I40
Man. OGT Test	SD-95525-01	J99

MONITORING

Key, for Monitoring	SD-96314-01	A48
on MF Key Sets		

NETWORK	SD-90517-01	F20
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OBSERVING & SERV. OBS.

Multi-Line Serv.Obs.,		
for Observing on		
Inc. Intertoll Trks.		
or Inc. End of 2 Way		
Intertoll Trks. for		
Use with Serv. Obs.		
Desk No. 12	SD-68401-01	C47
Central Off. Obs.		
Set. No. 2	SD-90448-01	A50

OSCILLATOR	SD-70217-01	A36
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PAD

For Delivering Ad-		
justing Tone to		
MF Receiver	SD-95664-01	D48

POSITION

Toll Test Bd.		
No. 17C	SD-68353-01	C77
Toll Swbd. No. 5	SD-68374-01	E42

PULSE CONVERTER (See Converter)

RECEIVING			TELEGRAPH ORDER	SD-62669-01	C78
MF Pulsing	SD-95536-01	C49	TELEPHONE		
RECORDER			Tdm. Patching		
Trouble	SD-68389-01	B59, E32	Trk. Bay	SD-56067-01	A1
Holding Time No. 1B	SD-90246-01	J49	Opr's. - Toll Swbd.		
Traffic Usage	SD-95738-01	H49	No. 5	SD-68162-01	E43
Ans. Time, Con-			Serv. Assistant's,		
centrating, Timing			Toll Swbd. No. 5	SD-68178-01	F44
Control & Testing	SD-96235-01	A112	Recording - Toll		
REGISTER			Swbd. No. 5	SD-68185-01	B42
Traffic	SD-68412-01	B48	Ckt. Patching Bay	SD-68330-01	A6
RELAY			Ch. Swmn's Desk	SD-95404-01	B66
AC Lamp	SD-62848-01	A41	Sdr. M.B. Fr.	SD-95524-01	A61
Multiple Lamp	SD-63962-01	D43	Auto. Out. Toll		
RELAY CHAIN			Connecting Trk.		
AC or DC Idle			Test Fr.	SD-95524-01	A71
Indicating	SD-55570-01	B41	Man. OGT Test Fr.	SD-95524-01	A96
Group Busy	SD-68420-01	I23	TEST BATTERY (See Battery)		
SELECTOR			TEST CKT.		
First Tbl. Tracing	SD-68244-01	E76	Continuity	SD-55534-01	F56
Second Tbl. Tracing	SD-68245-01	E77	Position - Toll		
SENDER			Swbd. No. 5	SD-68156-01	G41
Out., RP and P.C.I.	SD-68018-01	D39	Inc. Sdr.	SD-68226-01	B57
Inc., DP Inc., &			Out. Revertive &		
MFP, DP or DCKP Out.	SD-68221-01	D38	PCI Sender	SD-68372-01	A57
Inc., MFP Inc. & MFP,			Auto. Out. Toll		
DP or DCKP Out.	SD-68222-01	E38	Connecting Trk.	SD-68373-01	C74
SERVICE OBSERVING (See Observing)			Decoder - Marker	SD-68389-01	E32
SIGNAL			Auto. Out. Inter-		
Aux.	SD-55039-01	B7, A107	toll Trk.	SD-68404-01	C109
Aux. - Patching Trk.			Link Controller	SD-68405-01	H56
Bay or Tdm. Patch-	SD-63842-01	A5	Automatic Trans.	SD-68446-01	B109
ing Trk. Bay	SD-96087-01	E52	Bat. & Grd. Test		
Opr. Room Calling	SD-96410-01	A62	Terminals	SD-90122-01	I60
Aux. - Sdr. M.B. Fr.	SD-96410-01	A67	2A Sending Panel,		
Aux. - Swmn's Desk			Trans.	SD-95000-01	C114
Aux. - Auto. Out.			Man. OGT for Man.		
Toll Connecting			OGT Test Fr.	SD-95476-01	H97
Trk. Test Fr.	SD-96410-01	A72	For Checking Current		
Aux. Man OGT			& Earth Potential		
Test Fr.	SD-96410-01	A97	in Legs of CX		
SUPPLY			Signaling Ckts.	SD-95482-01	H77
Frame Identifica-			Serv. Obs., for		
tion Frequency	SD-68119-01	A37	Testing It. Serv.		
MF Current &	SD-95391-01	D49	Obs. Ckt., for Use		
Distribution			with Serv. Obs.		
Filament, with			Desk No. 12	SD-95712-01	G60
Emg. Trns.	SD-95676-01	F50	209FF, 209FK, 209FL		
SWITCHING			and 209FM Relays	SD-96121-01	E56
Pad Switching	SD-68285-01	D12	For Testing Out.		
Ans. Time Recorder	SD-96360-01	A113	Trks. for Contin-		
			uity and Reversals		
			for Man. OGT Test	SD-96370-01	I97
			Fr.	SD-96464-01	I59
			Cold Cathode Tube		
			TEST SET		
			For Timing Tests	SD-25707-01	D60
			Pulse Repeating	SD-64540-01	C59
			Frame Identifica-		
			tion Frequency	SD-68190-01	J59

TEST SET (Cont'd)

For Testing Inc., Out. & Intertoll Trk. Ckts.	SD-68359-01	H58
Card Translator	SD-68458-01	C56
For 275, 276 & 292 Type Relays	SD-95439-01	J58
Interrupter, 30 P.P.S.	SD-95453-01	D59
Pulse Checking, for Checking Speed & Per Cent Break of Interrupters	SD-96362-01	C60

TEST TERMINATION

For Testing Out. Trks. with E Type Tel. Repeater Arr. for Rev. Bat. Supv.	SD-96476-01	G60
TONE APPLIER	SD-68499-01	D114

TRANSLATOR

Card	SD-68342-01	B32
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TRUNKS

Incoming

From Toll Test Bd. No. 17C, MF Pulsing	SD-68141-01	H18
From Swbd. No. 3, 3C or 3CL in Same Bldg. - MF Puls- ing, with or without Trans. Sw. Pad.	SD-68238-01	B18
Tdm. - 4 Wire Talk- ing - MF Pulsing - Rev. Bat. Supv. & SX D-C Ringing on Signaling Phantom	SD-68290-01	I18
From Swbd. No. 3, 3C or 3CL In Same Bldg. - With Trans. Sw. Pad. - To Toll Bd. No. 5	SD-68296-01	J44
From Toll Swbd. No. 1 In Same Bldg. - With Trans. Sw. Pad. - To Toll Bd. No. 5	SD-68297-01	K44
To Toll Bd. No. 5 - 4 Wire Talking - Auto. - Rev. Bat. Supv. & SX D-C Ringing on Signal- ing Phantom	SD-68302-01	D44
From Man. Swbd. No. 1, 11, 15C or 15D - Tdm. - Dial Pulsing - Rev. Bat. Supv. - With 20 Cycle Ring.	SD-68315-01	G18
From Toll Swbd. No. 1 In Same Bldg. - MF Plsg. - Sleeve Supv.	SD-68317-01	D18

TRUNKS (Cont'd)

Incoming (Cont'd)

From Man. or DSA Swbd. - MF Puls- ing - Tdm. - Rev. Bat. Supv. - With 20 Cycle Ring.	SD-68318-01	E18
From Toll Swbd. No. 1 In Same Bldg. MF Plsg. - Wet Dry Supv. - With or with- out Trans. Sw Pad	SD-68322-01	C18
From Toll Swbd. No. 5, MF Pulsing	SD-68348-01	E93
From Toll Swbd. No. 1, 3, 3C or 3CL, Dial Pulsing, Rev. Bat. Supv., Simplex DC Ringing	SD-68357-01	A93
From Man., Toll or DSA Swbd. or Cbr. Tdm. Off. Tdm., MF Plsg., Rev. Bat. Supv. Simplex DC Ringing	SD-68358-01	F18
From Toll Swbd. No. 1 In Same Bldg. Equip- ped with Type "A" Cord Ckts., Tdm., Repeated Dialing, Wet Dry Supv., with or without Trans. Sw. Pad, Arr. for Con- version to MFP	SD-68375-01	B93
DP from Intertoll Dialing Ckts. In Same Bldg.	SD-68450-01	F93
Auto., Code 958, High-Low Supv., for Sender M.B. Fr., Ch. Swmn's Desk, Auto. Out. Toll Con- necting Trk. Test Fr. or Man. OGT Test Fr.	SD-95615-01	I62, F67, E74, C99
From Swbd. No. 3B in Same Bldg.	SD-95732-01	H62, H67, F72, G97

Intertoll

Inc., or Inc. Toll Tdm., Dial Pulsing CX Supv. Type B, Arr. for Conversion to MFP	SD-68135-01	D13
Inc. MFP - CX Supv. Type B	SD-68230-01	E13
Out. DP, MFP or Auto., CX Supv. Type B	SD-68231-01	G13
2 Way - Inc. DP - Out. DP, MFP or Type B	SD-68232-01	A13
2 Way - Inc. MFP - Out. DP, MFP or Auto. - CX Supv. Type B	SD-68233-01	B13

TRUNKS (Cont'd)

Intertoll (Cont'd)

Out. Aux. - For Use With Ringdown In- tertoll Trk. Ckt. In Swbd. No. 3, 3C or 3CL	SD-68234-01	H13
Out. Ringdown	SD-68260-01	F13
2 Way RD to Radio Tel. C2 or C4 Control Term.	SD-68362-01	F88
Out. Aux. - For Use With Ringdown In- tertoll Trk. Ckt. In Toll Swbd. No.1	SD-68364-01	C13
Out. Auto., 4 Wire Talking, High-Low Rev. Bat. Supv., SX D-C Ringing on Sig. Phantom with Trans. Sw. Pad	SD-68397-01	I13

Outgoing

TX or Comb. TX and Toll Sw. - DP, MFP or Auto. - Rev. Bat. Supv. - Arr. for SX DC Rering Toll Sw. - DP - Wet Dry Supv. - Auto. Start of Ring. - To Repeated Dial Toll Train or Com- bined Loop & Rep. Dial Toll Train	SD-68239-01	C28
Toll Sw. - DP, MFP or SF - Wet Dry, High Low or Rev. Bat. Supv.	SD-68242-01	B28
To Swbd. No. 3, 3C or 3CL In Same Bldg. - TX, 121, 131, 141, 181 or 191 - With or Without Trans. Sw. Pad	SD-68282-01	E28
TX, 121, 181 or 191 - 4 Wire Talking - Rev. Bat. Supv. & SX D-C Ringing on Signaling Phantom	SD-68289-01	A83
121, to Toll Swbd. No. 5	SD-68291-01	K24
From Toll Swbd. No. 5 to Toll Tdm. Swbd. No. 1 In Same Bldg. - Toll Tdm. - Stfd.	SD-68294-01	H44
From Toll Swbd. No. 5 to Tdm. Swbd. No. 3 In Same Bldg. - Toll Tdm. - Stfd.	SD-68295-01	I44
Auto., from Toll Swbd. No. 5 to Key Cabinet No. 20 or 21 In Same Bldg.	SD-68295-01	I88

TRUNKS (Cont'd)

Outgoing (Cont'd)

From Toll Swbd. No. 5 to Swbd. No. 3, 3C or 3CL In Same Bldg. - With Trans. Sw. Pad	SD-68296-01	J43
From Toll Swbd. No. 5 to Toll Swbd. No. 1 In Same Bldg. - With Trans. Sw. Pad. - Wet-Dry Supv.	SD-68297-01	K43
To Toll Test Bd. No. 17C, 101 Trk., SX Supv.	SD-68299-01	E23
To Toll Swbd. No. 1 In Same Bldg. - TX - Sleeve Supv.	SD-68305-01	H28
To Toll Swbd. No. 1 In Same Bldg. - 121 or 191 Trk. - With Trans. Sw. Pad - Wet-Dry Supv.	SD-68306-01	D28
From Toll Bd. No. 5 - 4 Wire Talking - Rev. Bat. Supv. & SX D-C Ringing on Signaling Phantom	SD-68307-01	I42
Toll Tdm. - MFP or SF-4 Wire Talk- ing - Rev. Bat. Supv. & SX D-C Ringing On Signal- ing Phantom	SD-68309-01	C83
To Toll Tdm. Swbd. No. 1 In Same Bldg. - Toll Tdm. Stfd.	SD-68320-01	F28
To Tdm. Swbd. No. 3 In Same Bldg. - Toll Tdm. - Stfd.	SD-68321-01	G28
Toll Sw. - RP or PCI - Wet-Dry or Rev. Bat. Supv.	SD-68326-01	A28
To Desks or Test Center High-Low Supv.	SD-68332-01	D23
Toll Sw., Equip- ped with Repeater, RP or PCI Pulsing, Rev. Bat. or Wet- Dry Supv.	SD-68366-01	G83
Toll Tdm., to Toll Swbd. No. 1B or 3B In Same Bldg.	SD-68367-01	E83
121 or 191 - Wet- Dry Supv. to Toll Swbd. No. 1 In Same Bldg. Equipped with Type "A" Cords	SD-68368-01	I83
Aux., Rev. Bat. Supv. For Use With 2 Way Opr. Off. Trk. In Same Or Dst. Bldg.	SD-68371-01	F23

TRUNKS (Cont'd)

Outgoing (Cont'd)

Aux., CX or SX Supv. For Use with 2 Way Opr. Off. or Toll Sw. Trk. in Same or Dst. Bldg.	SD-68378-01	H23
From Toll Swbd. No. 5 to Toll Tdm. Swbd. No. 1B or 3B in Same Bldg. Toll Tdm.	SD-68384-01	H88
To SXS Intertoll Dialing Trk. or Sel. Ckt. in Same Bldg.	SD-68449-01	K83
Toll Sw., to SXS Off. in Same Bldg.	SD-68451-01	D83
To Toll Swbd. No. 1 in Same Bldg., TX, with or Without Trans. Sw. Pad, RD. Supv.	SD-68459-01	H83
Dial Pulsing, Rev. Bat. Supv., for Ch. Swmn's Desk, Sdr. M.B. Fr., Man.		
OGT Test Fr. or Auto. Out. Toll Connecting Trk.		J62, I67, D74,
Test Fr.	SD-95617-01	B99

2 Way

Auto. - 2 Wire - Between Tdm. Patching Trk. Bay & Toll Test Bd. No. 17C From Tdm. Patching Trk. Bay to Cent. Off. or P.B.X.	SD-55222-01	A3, A8
Auto. - to or from Tdm. Patching Trk. Bay, Ckt. Patching Bay, Toll Swbd. No. 1 3, 3C, 3CL or 3CF Toll Test Bd. No. 4, 5, 16, 17B or 18B, Tst. & Cont. Bd. No. 8, Teleg. Tst. Bd. No. 9, Program Bay, Sld. Tst. Term. Bay, "C" Carr. Line Eqpt. Bay and Key Cab. No. 20 or 21	SD-55249-01	C2
Auto. Out. It. Trk. Test Fr. to "A" Swbd.	SD-55348-01	B3, B8
	SD-55348-01	B107

TRUNKS (Cont'd)

2 Way (Cont'd)

Toll Test Bd. No. 17C to and from Tdm. Patching Trk. Bay, Ckt. Patching Bay, Teleg. Tst. Bd. No. 9 Key Cabinet No. 20 or 21, Toll Swbd. or Toll Test Bd.	SD-68097-01	D79
Toll Test Bd. No. 17C, Incoming Ringdown, Out. Automatic	SD-68142-01	G77
Auto., 2 Way to Radio Tel. C2 or C4 Control Ter- minal	SD-68363-01	G88
Toll Test Bd. No. 17C, to Dial Cent. Off. or Dial PBX	SD-68383-01	G79
Sdr. M.B. Fr. - Auto. - Between Desks	SD-95405-01	E62
Ch. Swmn's Desk - Auto. - Between Desks	SD-95405-01	E67
Auto. Out. Toll Connecting Trk. Test Fr., Auto., Between Desks	SD-95405-01	E72
Man. OGT. Test Fr., Auto., Between Desks	SD-95405-01	E97
Sdr. M.B. Fr. to "A" Swbd.	SD-95731-01	B62
Ch. Swmn's Desk to "A" Swbd.	SD-95731-01	B67
Auto. Out. Toll Connecting Trk. Test Fr. to "A" Swbd.	SD-95731-01	B72
Man. OGT Test Fr. to "A" Swbd.	SD-95731-01	B97
Auto. to Toll Swbd. No. 1, 3, 3C or 3CL Toll Test Bd. No. 5, Test & Control Bd. No. 8 or Toll Test Bd.		H62, H67, F72,
No. 17B or 18B Sdr. M.B. Fr. to Sub. Line Ckt.	SD-95732-01	G97
Ch. Swmn's Desk to Sub. Line Ckt.	SD-96221-01	C62
Auto. Out. Toll Connecting Trk. Test Fr., to Sub. Line Ckt.	SD-96221-01	C67
Man. OGT Test Fr. to Sub. Line Ckt.	SD-96221-01	C72
	SD-96221-01	C97

TRUNKS (Cont'd)

Miscellaneous

Delay Quotation - Toll Swbd. No. 5 No Circuit or No Circuit Training Monitoring - Toll Swbd. No. 5	SD-68056-01	E44
Digit Absorbing Reorder	SD-68083-01	C23
Reorder Arr. for Monitoring at Toll Swbd. No. 5	SD-68148-01	G44
Toll Bd. No. 5	SD-68243-01	G23
Interposition	SD-68247-01	A23
Overflow	SD-68249-01	B23
Delay Quotation Announcing, for Toll Swbd. No. 5	SD-68283-01	A44
Reorder, Arr. for Monitoring at Swbd. No. 3, 3C or 3CL in Same Bldg.	SD-68420-01	I23
Delay Quotation, for Use with Swbd. No. 3, 3C or 3CL in Same Bldg.	SD-68431-01	J88
	SD-68438-01	B24
	SD-68439-01	B112

TRUNKS (Cont'd)

Miscellaneous (Cont'd)

Delay Quotation Announcing, for Use with Swbd. No. 3, 3C or 3CL in Same Bldg.	SD-68445-01	C112
Reorder, Arr. for Monitoring at Toll Swbd. No. 1 in Same Bldg.	SD-68447-01	C24
Delay Quotation, for Use with Toll Swbd. No. 1 in Same Bldg.	SD-68448-01	D112
Delay Quotation Announcing, for Use with Toll Swbd. No. 1 in Same Bldg.	SD-68460-01	C112
Toll Test Bd. 17C Monitoring Trk., for Use with Toll Swbd. No. 1, 3, 3C or 3CL	SD-68463-01	J78
Test Trk. for Man. OGT Test Fr.	SD-96367-01	J97

<u>AA 261.477 = CONDUCTOR RESISTANCE</u>		
	<u>RESISTANCE (OHMS)</u>	
<u>GAUGE OF WIRE</u>	<u>PER 100 FEET</u>	<u>PER 5 FEET</u>
19	0.899	0.04494
20	1.13	0.0565
22	1.78	0.089
24	2.86	0.143