

SD-62405-01

BELL TELEPHONE LABORATORIES, INC.

COMMON SYSTEMS SIGNALING LINE, COMPOSITE, SIMPLEX, AND SINGLE FREQUENCY KEY SHEET

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DWG. ISS	C. D. ISSUE	DATE ISSUED	APPROVED	
18	18	9-23-41	W.L.F. I.	D.L.M.
19	19	2-17-43	W.L.F. I.	D.L.M.
20	20	10-21-48	A.J.B. I.	

PRINTED IN U.S.A.

AT&TCO
STANDARD

FOR EXPLANATION OF CONVENTIONS SEE MASTER KEY
SHEET SD-90250-01.

REPLACING SD-62213-01, SD-60017-01, SD-60032-01, SD-62214-01,
SD-62215-01, AND SD-63391-01. REPLACING SD-64102-01
FOR TESTING AND MAINTENANCE.

SD-62405-01

J. J. DARMODY

ADVANCE INFORMATION ON CHANGES AND
ADDITIONS TO BE MADE TO KEY SHEET SD-62405-01, ISSUE 20

COMMON SYSTEMS
SIGNALING
LINE, COMPOSITE, SIMPLEX,
AND SINGLE FREQUENCY

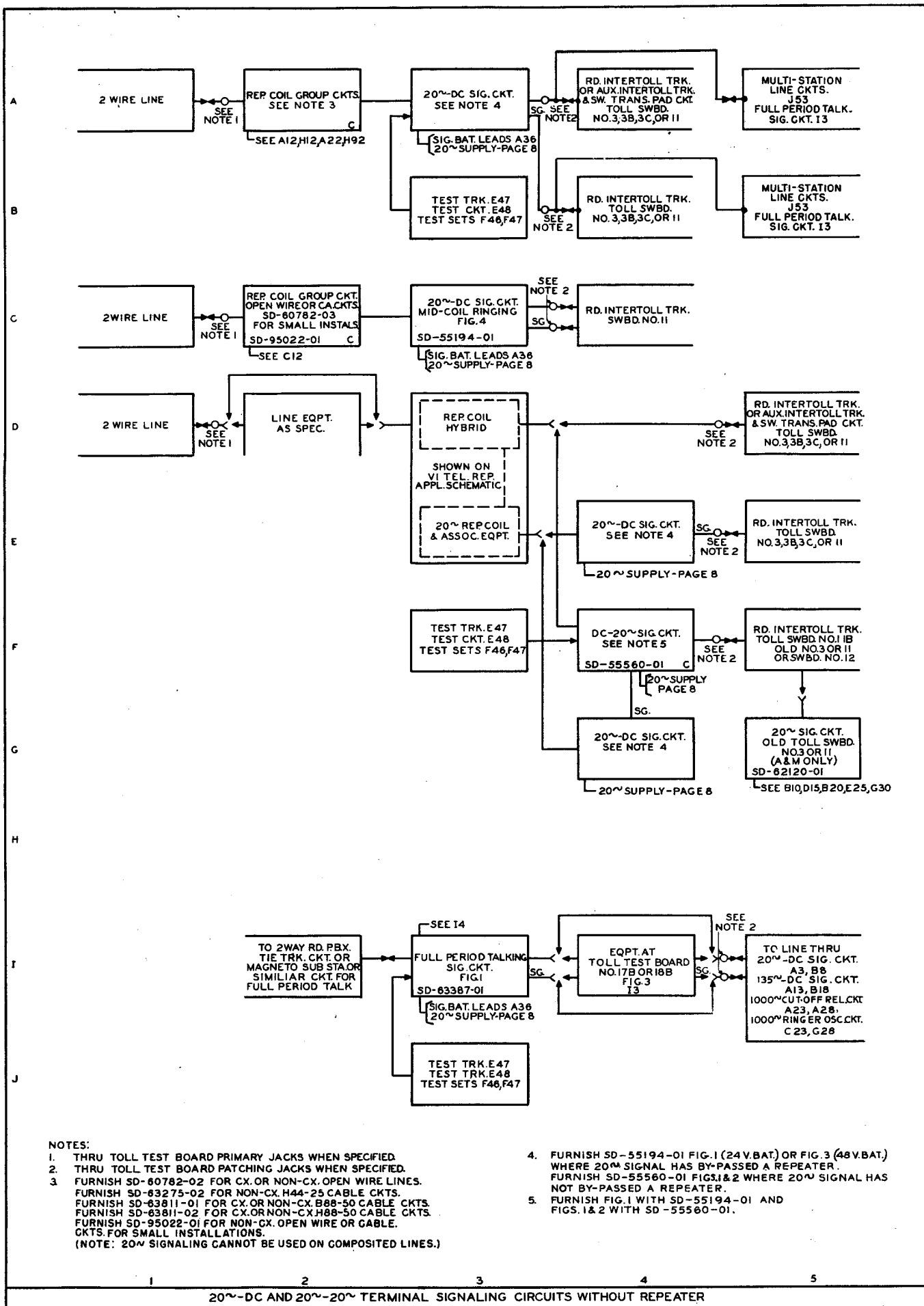
CHANGES

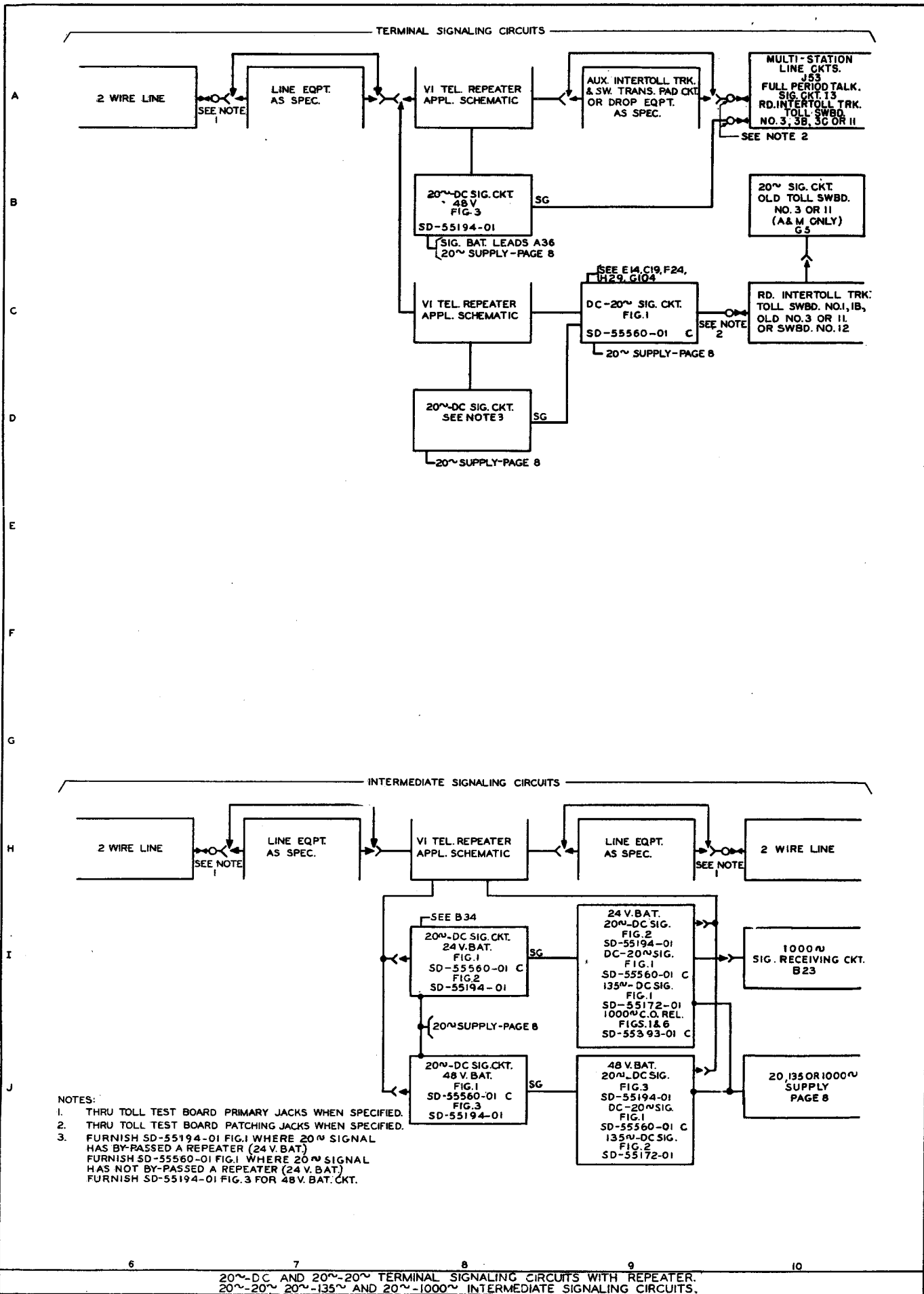
C. CURRENT DRAIN DATA FOR THE CIRCUITS LISTED BELOW WILL BE CHANGED OR ADDED AS FOLLOWS:

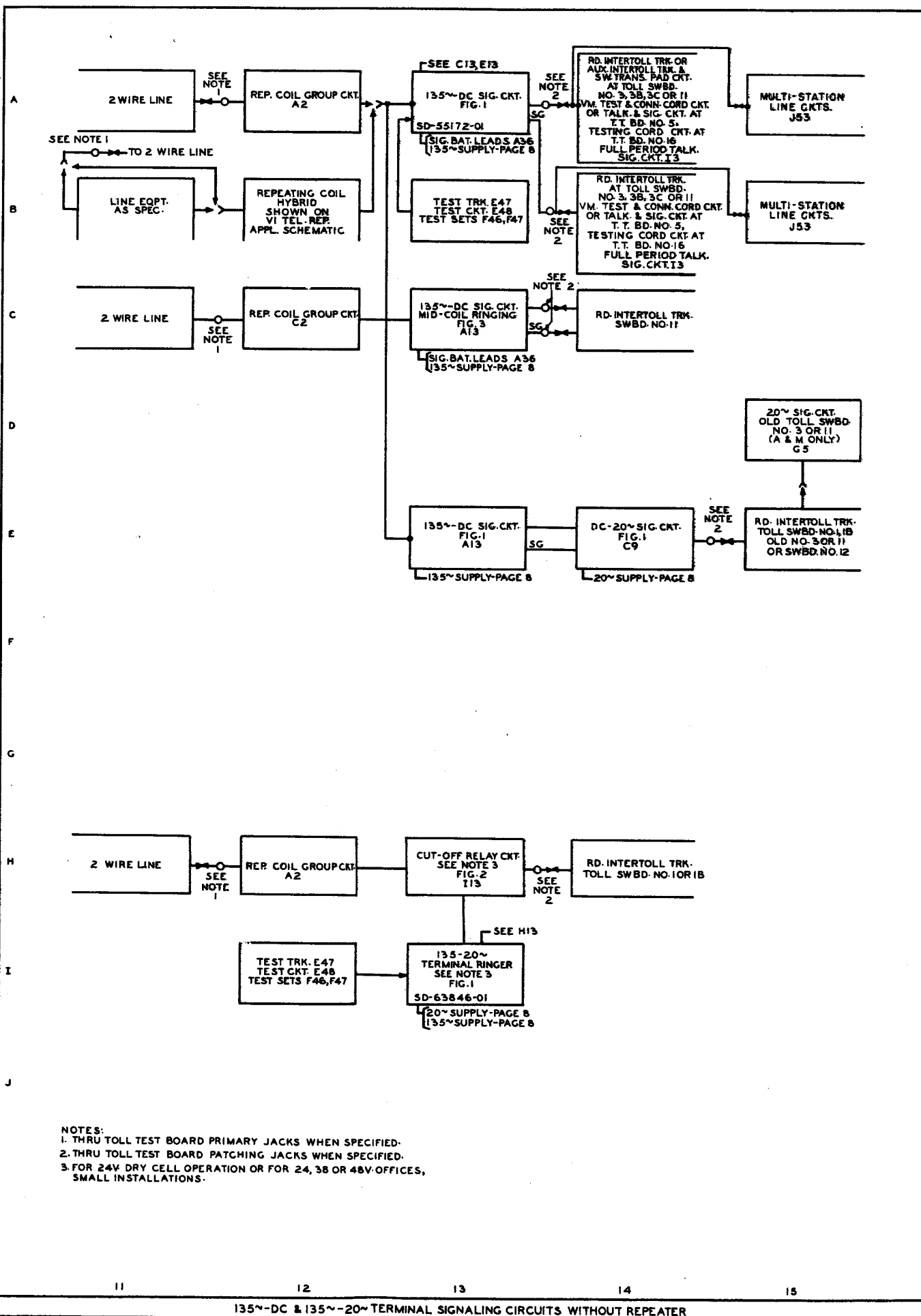
Ckt. Title	Ckt. No.	Drains Lists 1 & 2					Notes
		130V. Plt. Bat.	48V. Bat. Sig.	48V. Grd. R.R.	24V. Bat. Fil.	24V. Grd. Fil.	
Composite Signaling	SD-95048-01		.045	.100			5
Link-Aux. Pulse	SD-95043-01		.100	.070			
Signaling-1000 Cycle-Receiver	SD-55392-01	.017 .011			.275 .525	.275 .525	1 2
Signaling-1600 Or 2000 Cycle-Single Freq.	SD-56202-01	.029 .006	.505 .071	.547 .060		.011	3 4

Notes:

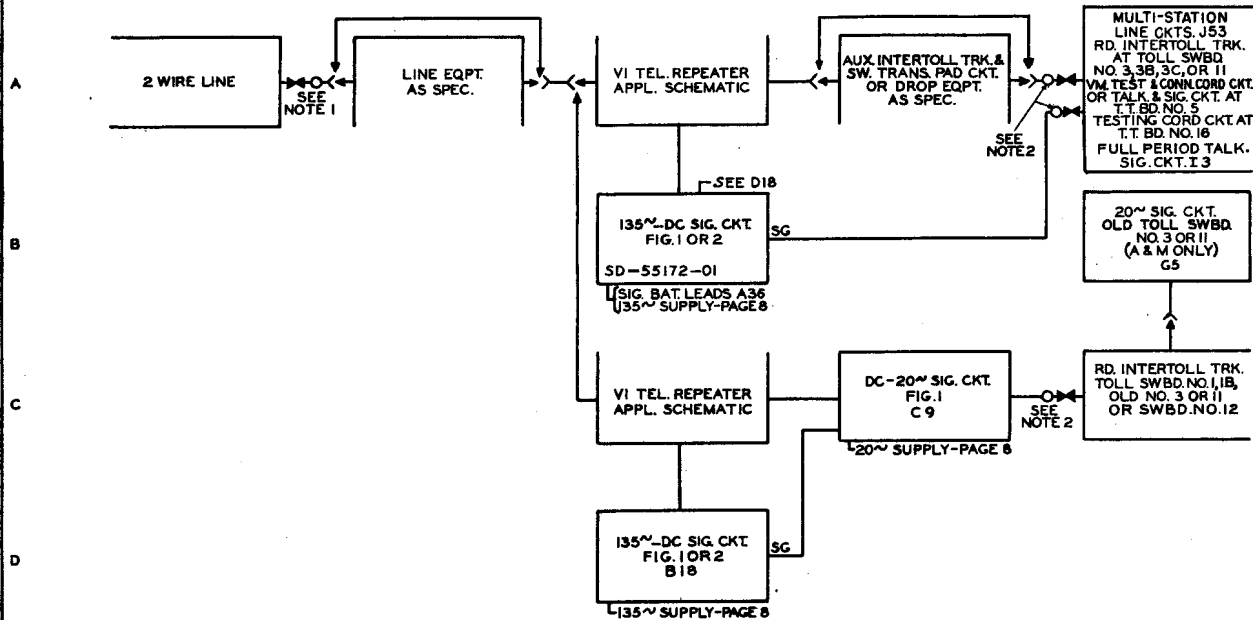
1. Reg. Battery.
 2. Non-Reg. Battery.
 3. For Fig. 1.
 4. For Figs. 3 & 4.
 5. Per Trunk.
- Dept. 3440-BP-EWO-AM



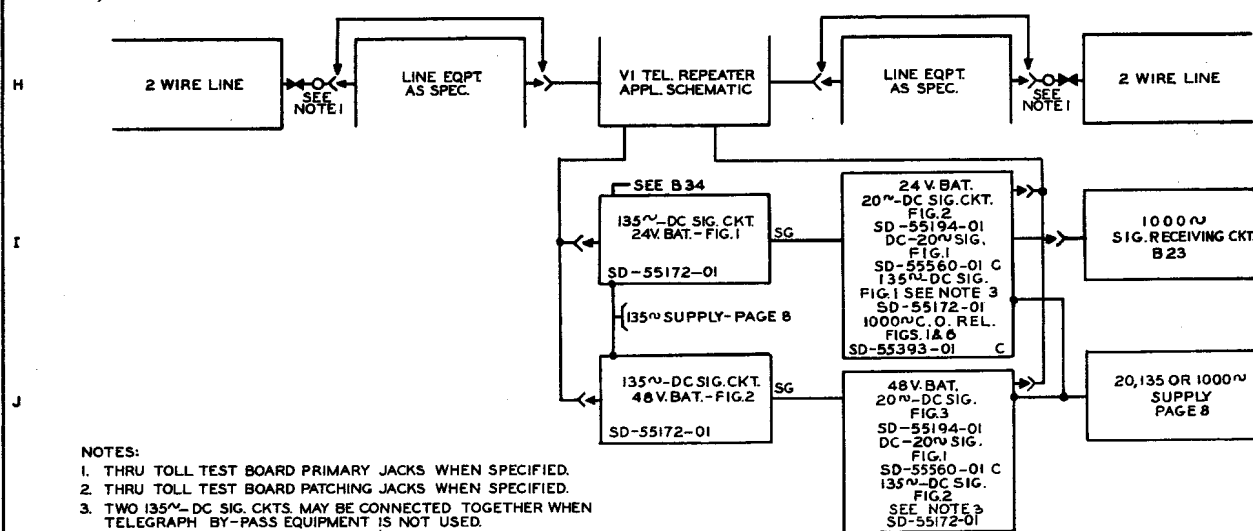




TERMINAL SIGNALING CIRCUITS

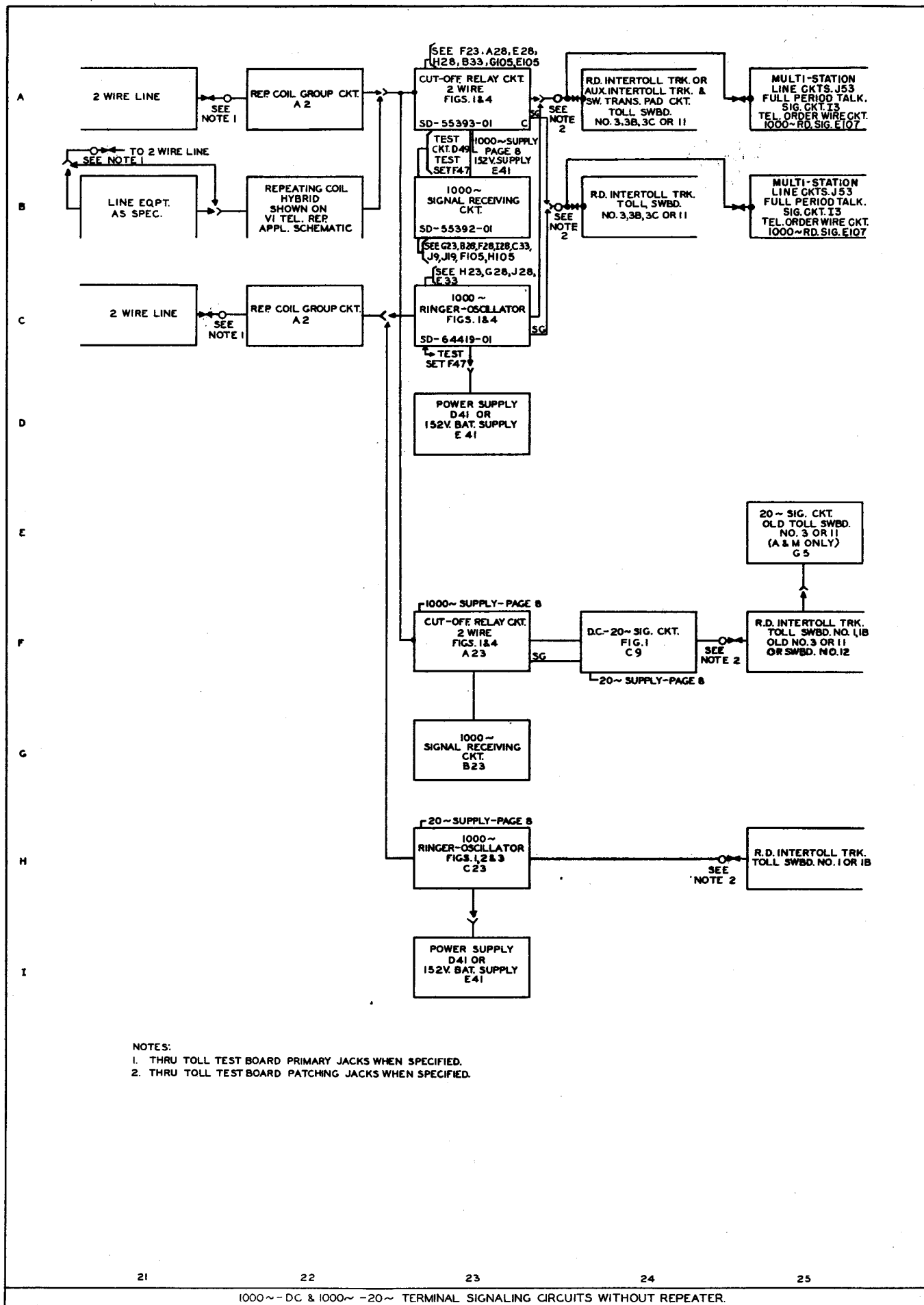


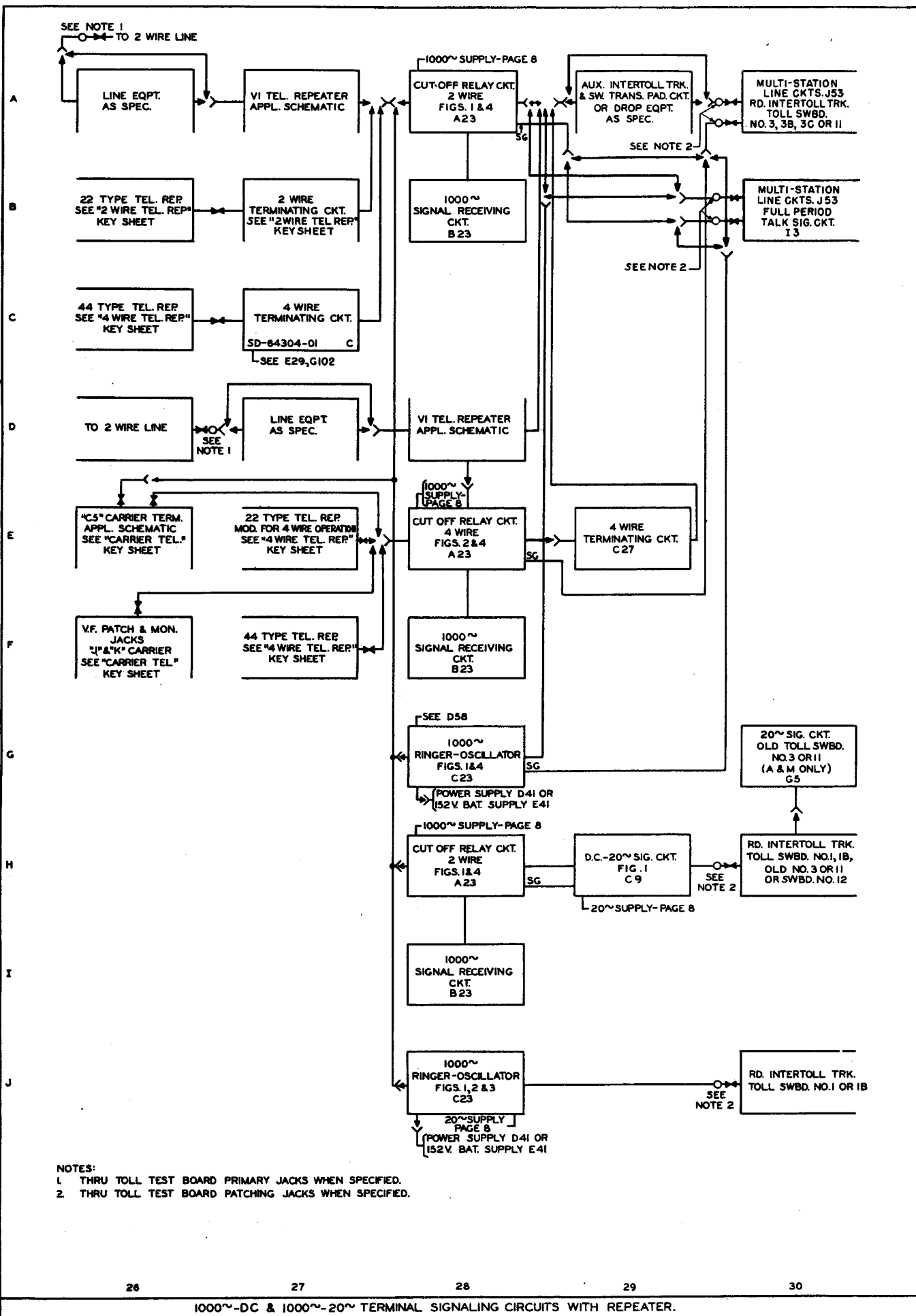
INTERMEDIATE SIGNALING CIRCUITS

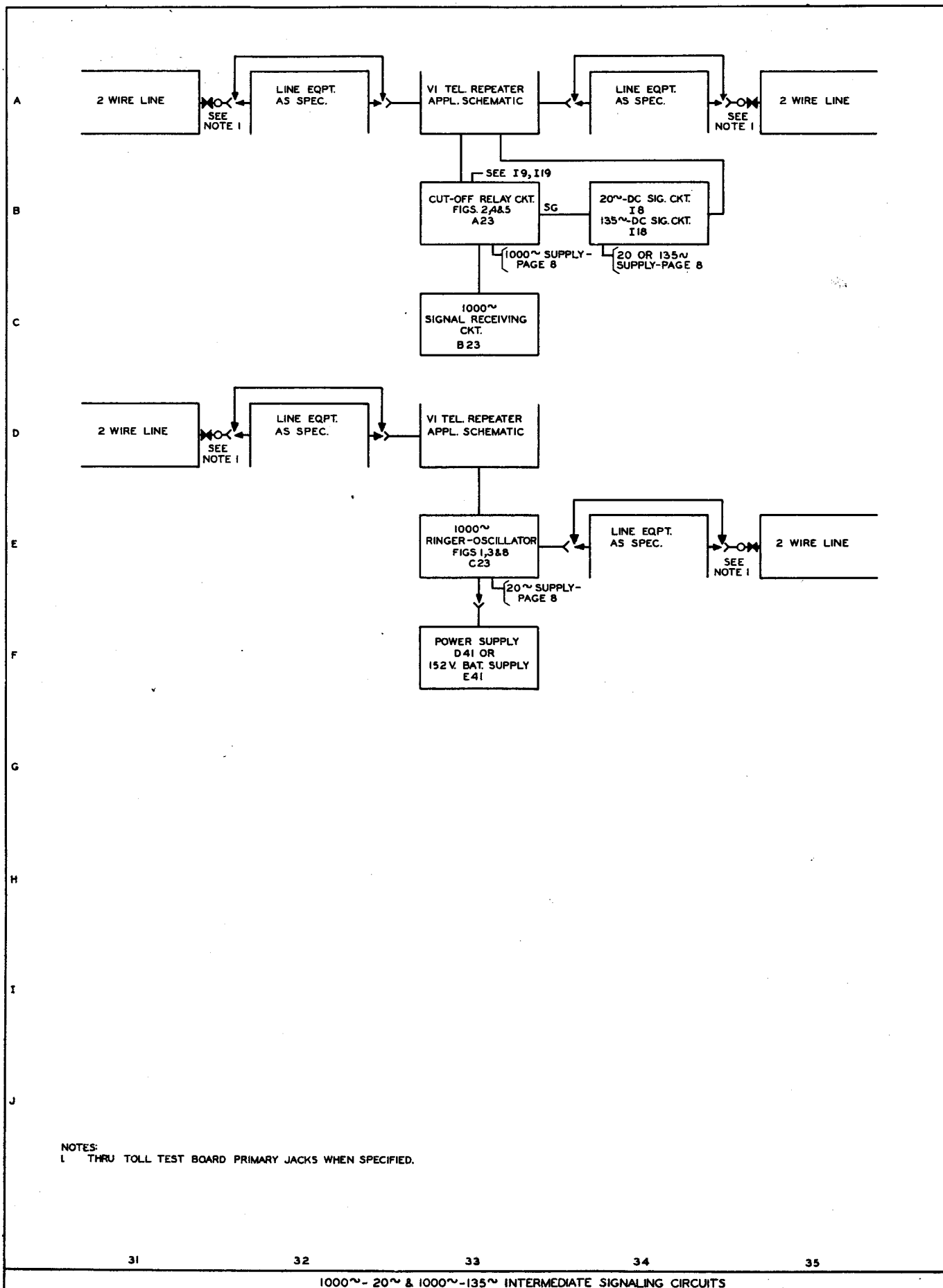


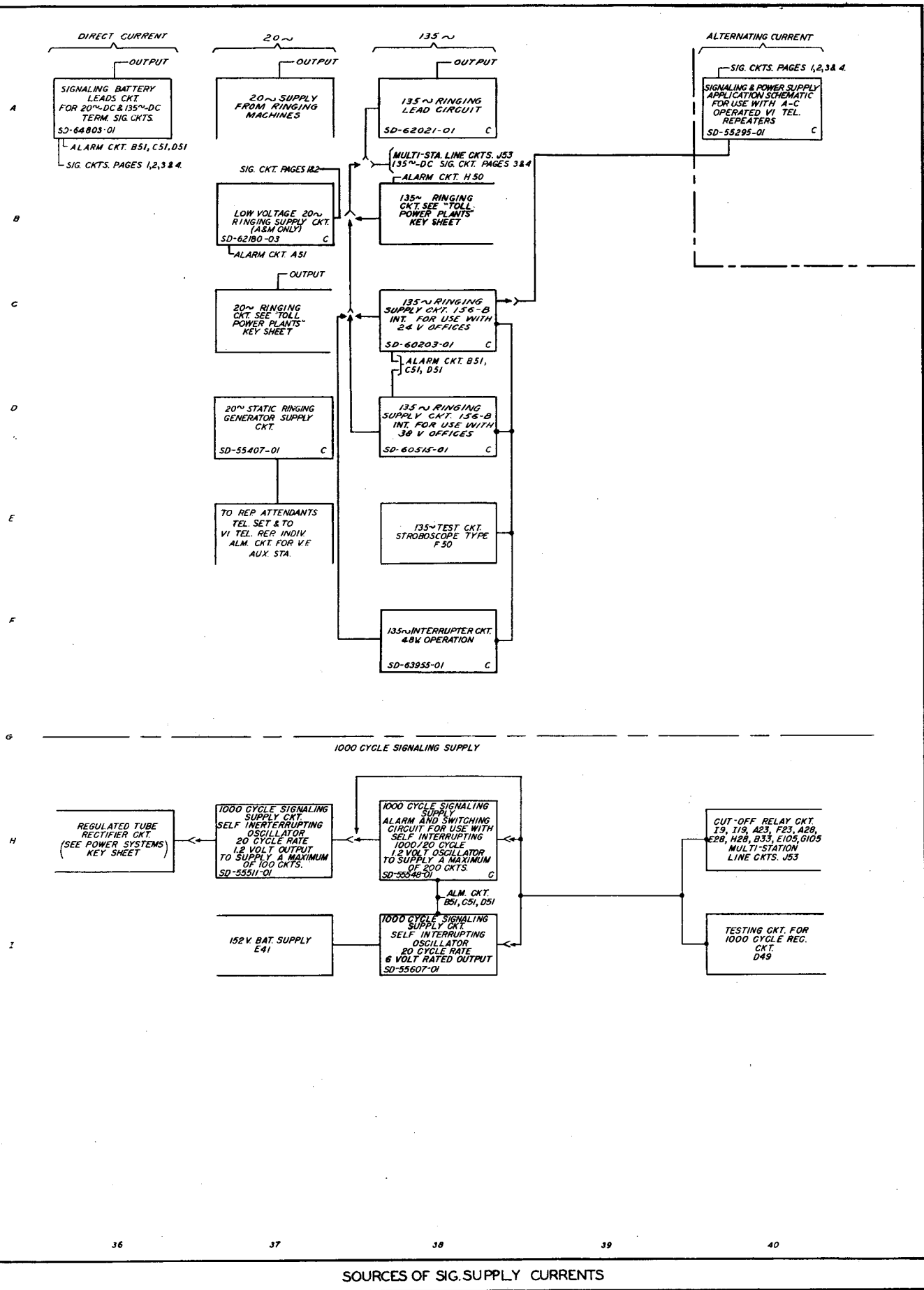
NOTES:

1. THRU TOLL TEST BOARD PRIMARY JACKS WHEN SPECIFIED.
2. THRU TOLL TEST BOARD PATCHING JACKS WHEN SPECIFIED.
3. TWO 135V-DC SIG. CKTS. MAY BE CONNECTED TOGETHER WHEN TELEGRAPH BY-PASS EQUIPMENT IS NOT USED.









SOURCES OF SIG. SUPPLY CURRENTS

A

B

C

130V. 0.1 AMP
POWER SUPPLY
400 TYPE PLANTS
SEE POWER KEY SHEET

D

RINGER-OSCILLATOR PAGES 5,6 & 7

A-C
POWER SUPPLY FOR
1000~ RINGER
OSCILLATORS
SD-64298-01 C

SEE D23 T23,F33

E

1000~S16 REC. CKT. B23

BAT. SUPPLY CKT.
152V. SINGLE
BAT. OFFICE
SD-59001-01

SEE D23, I23, F33 137

F

G

H

I

J

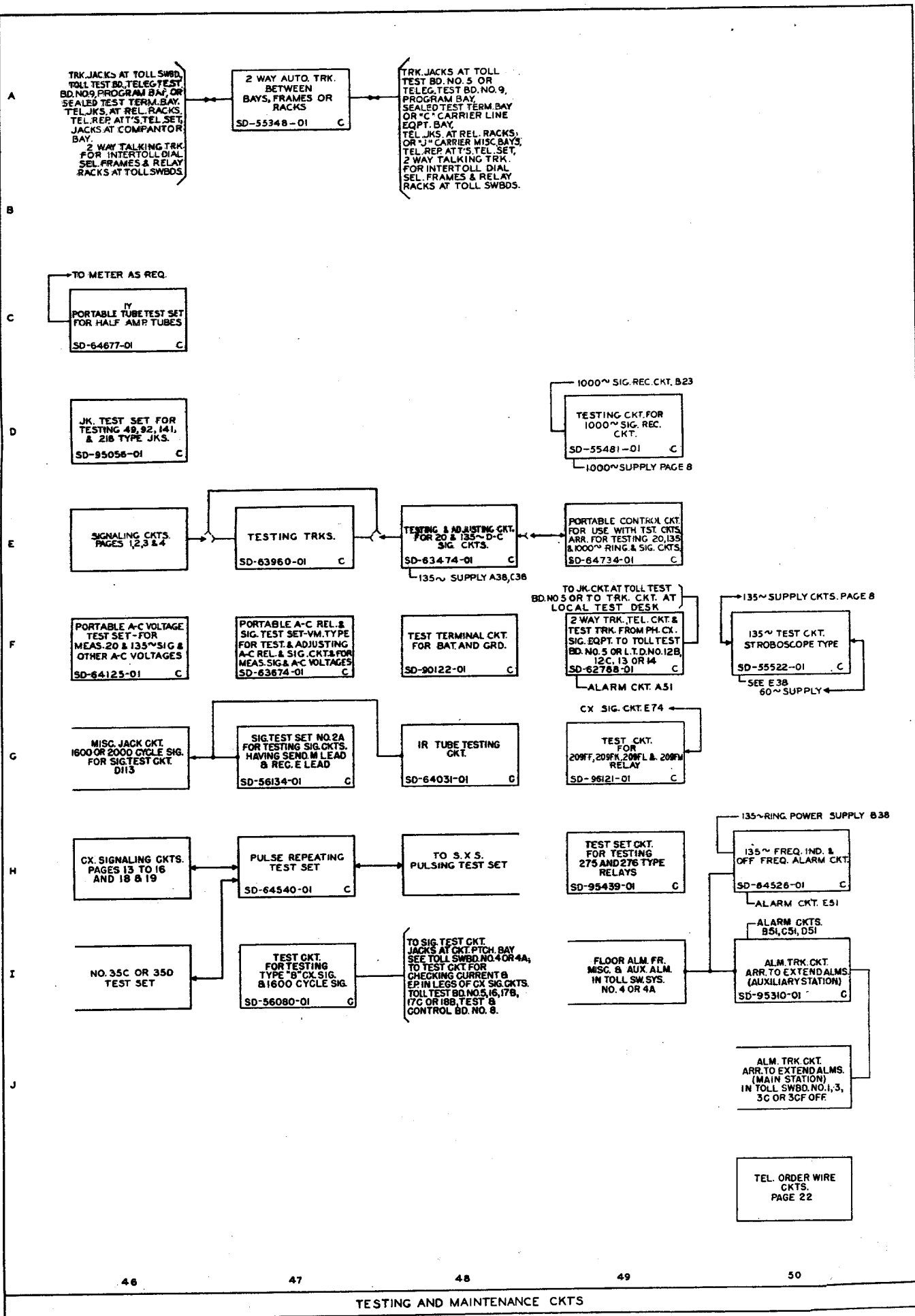
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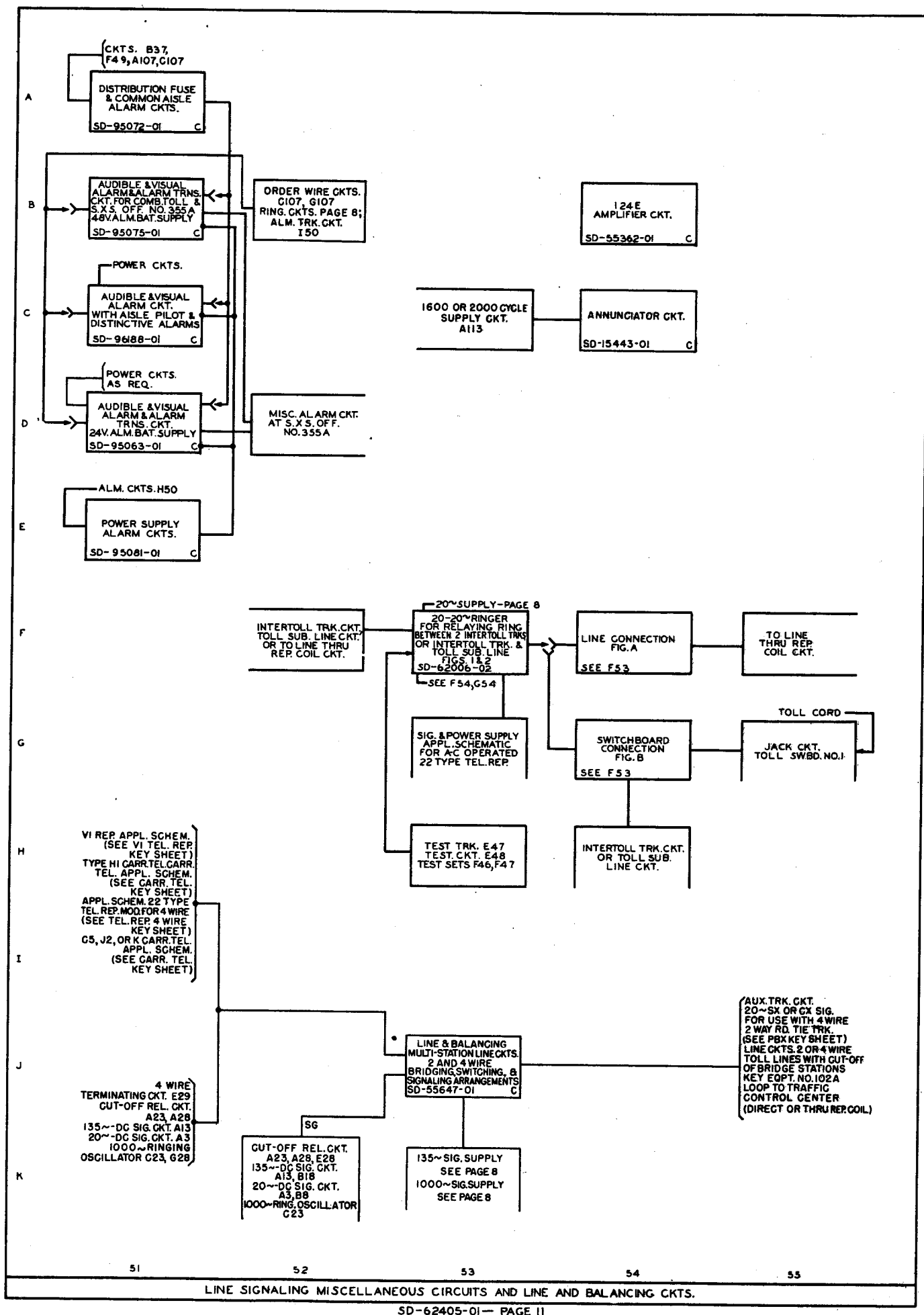
42

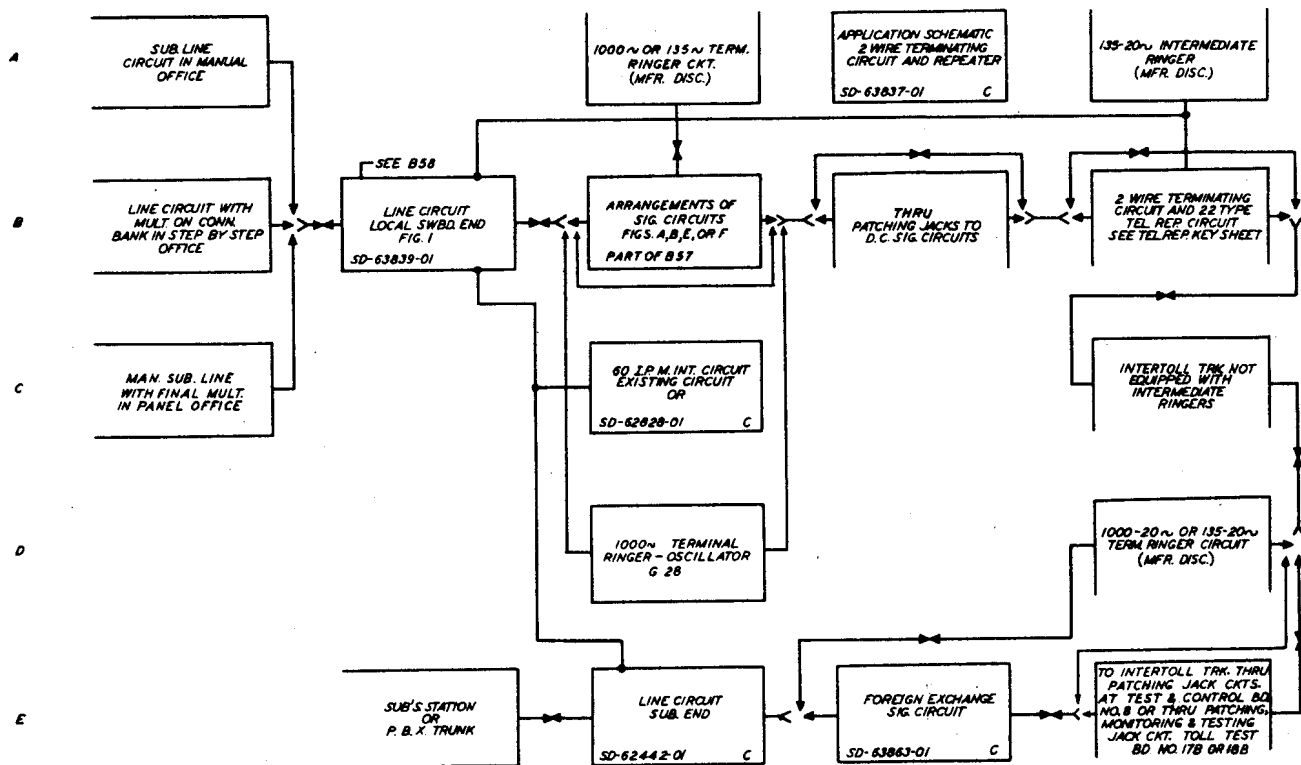
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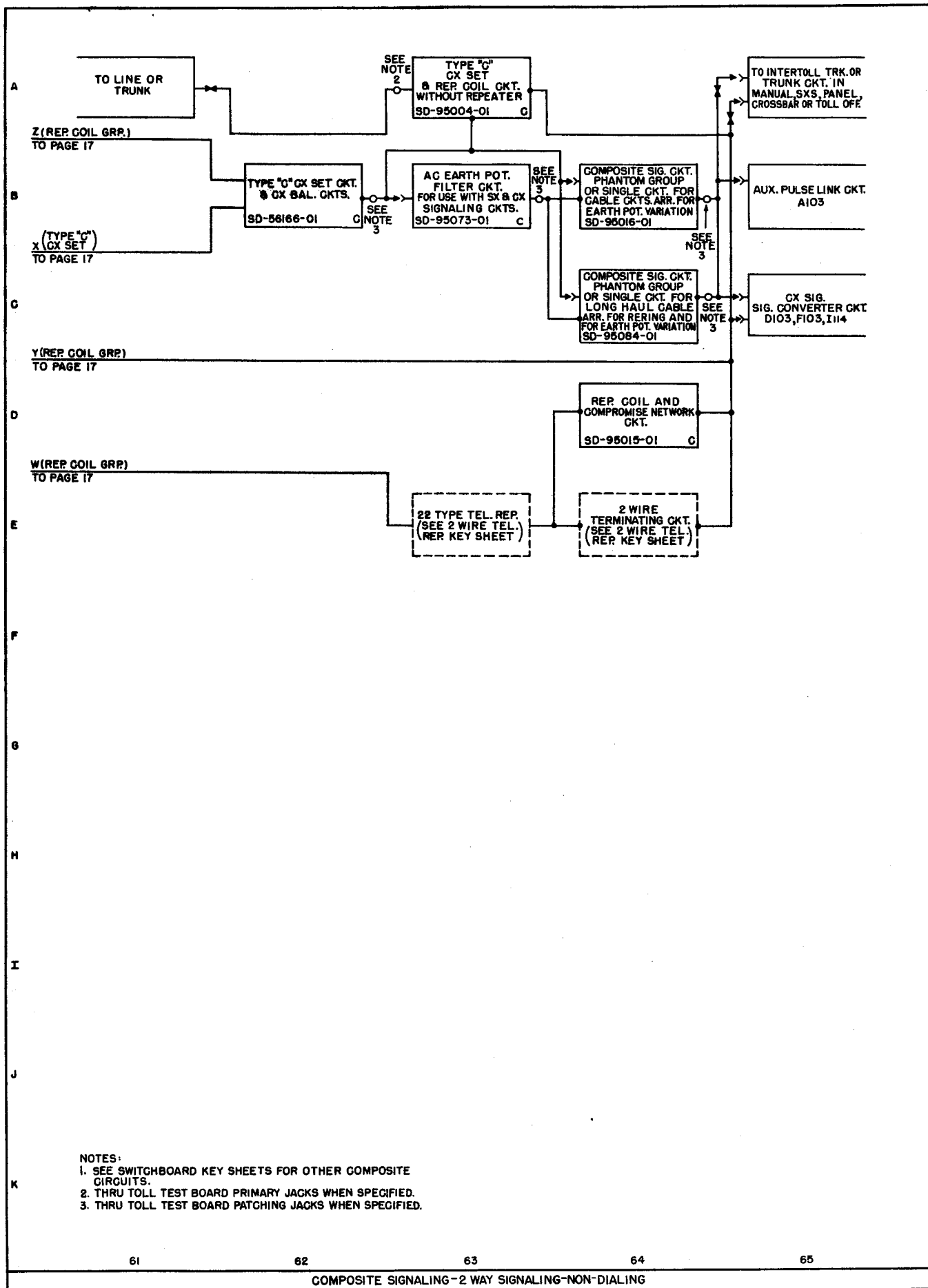
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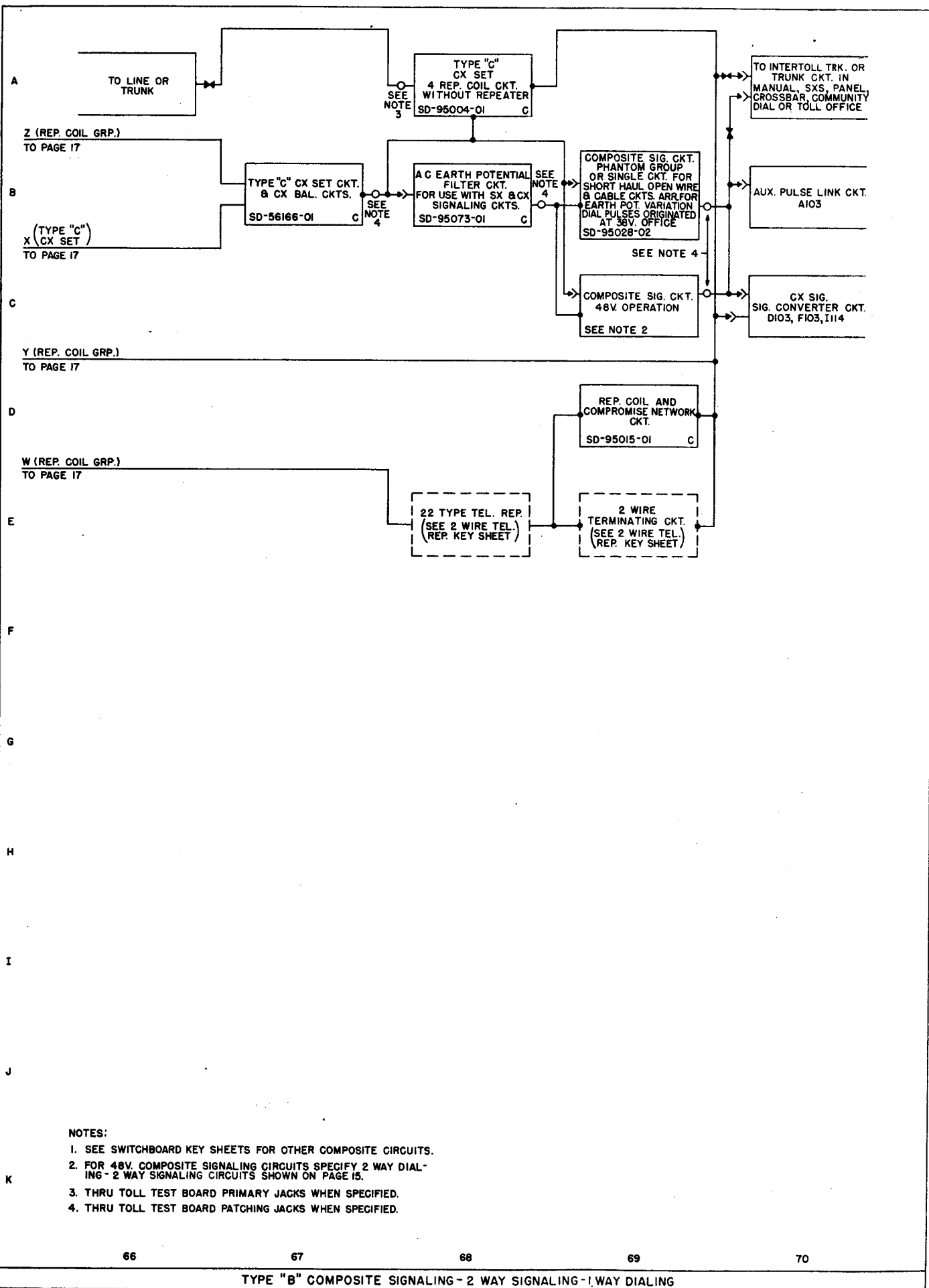
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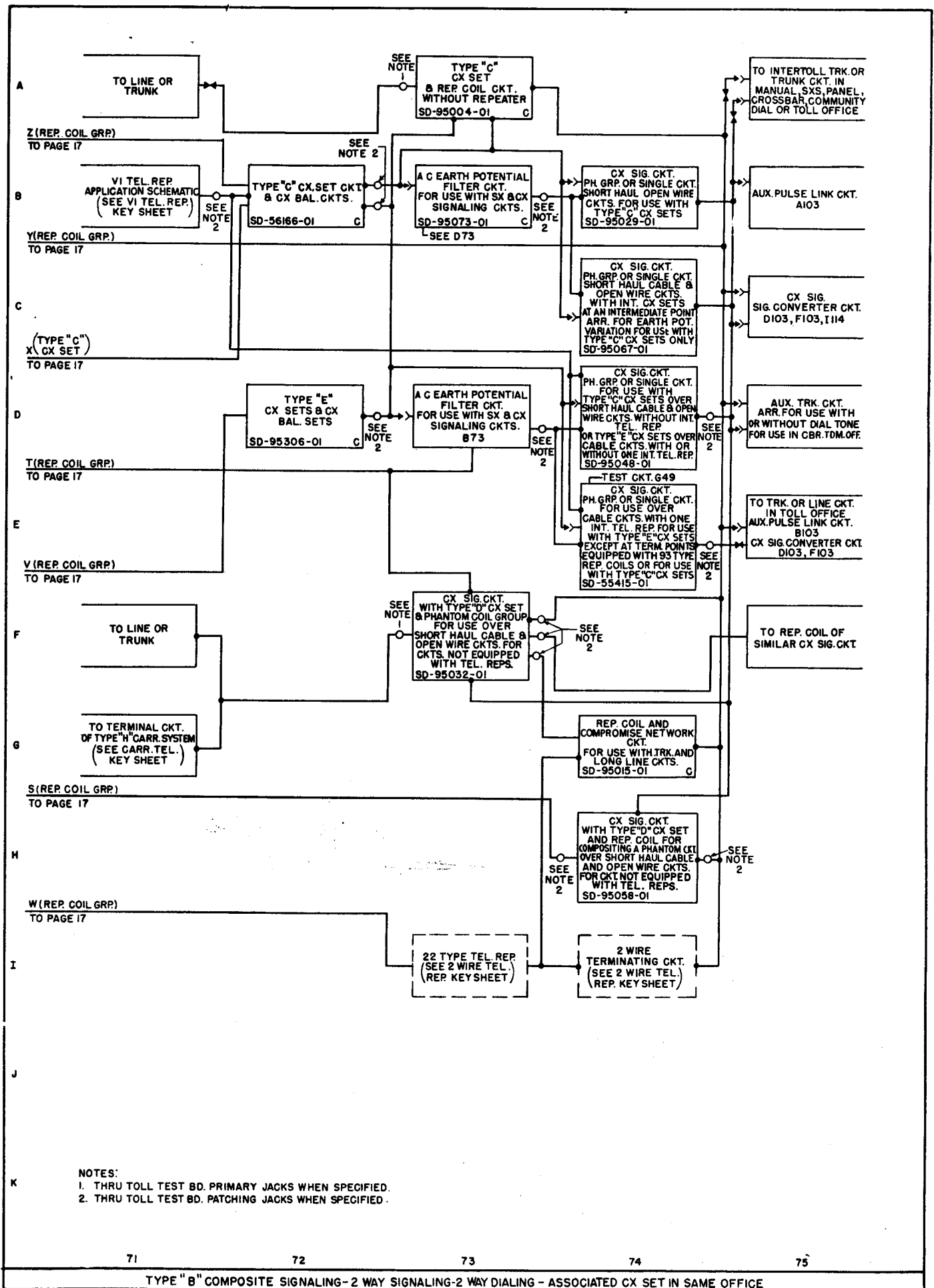


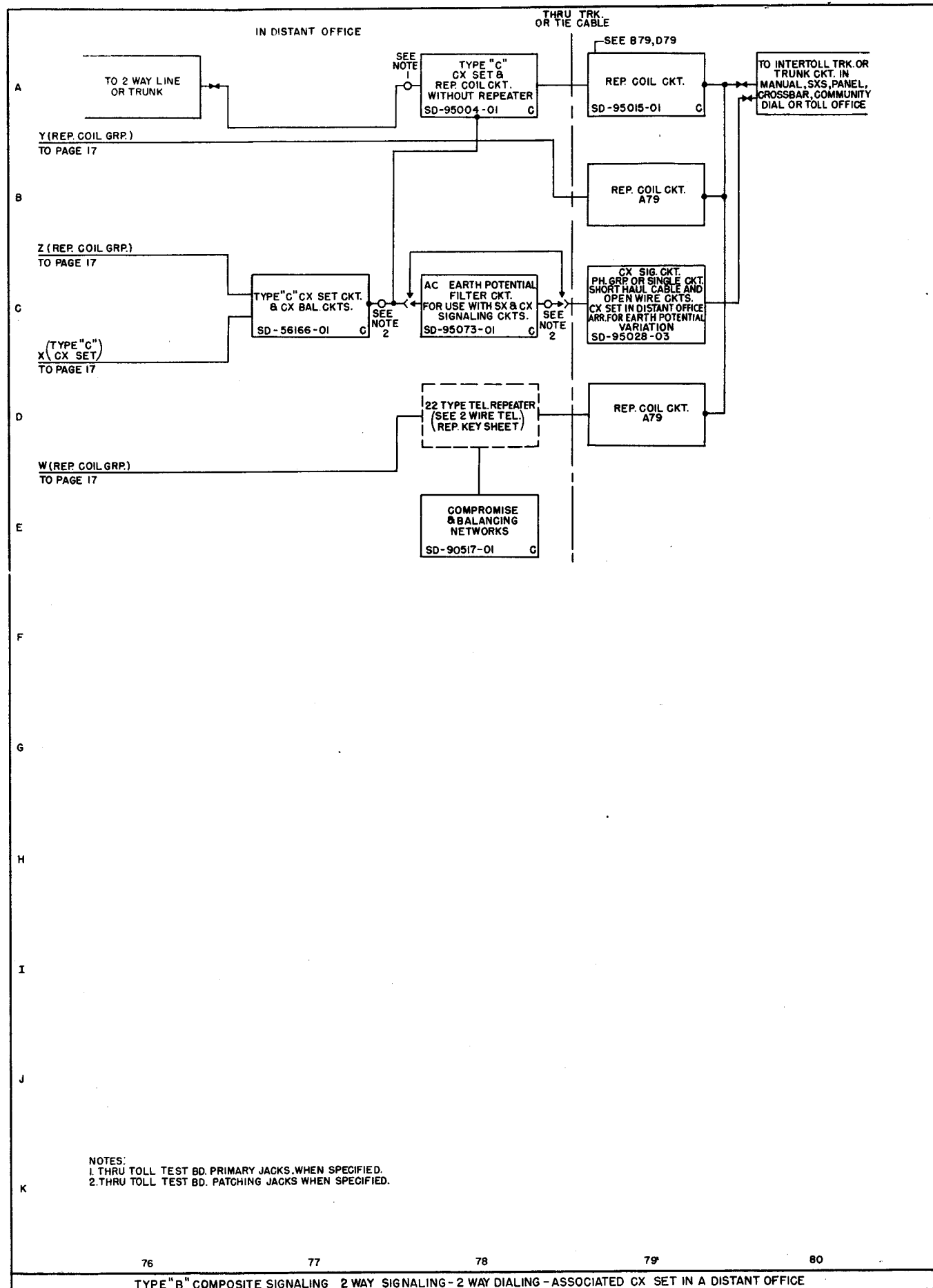


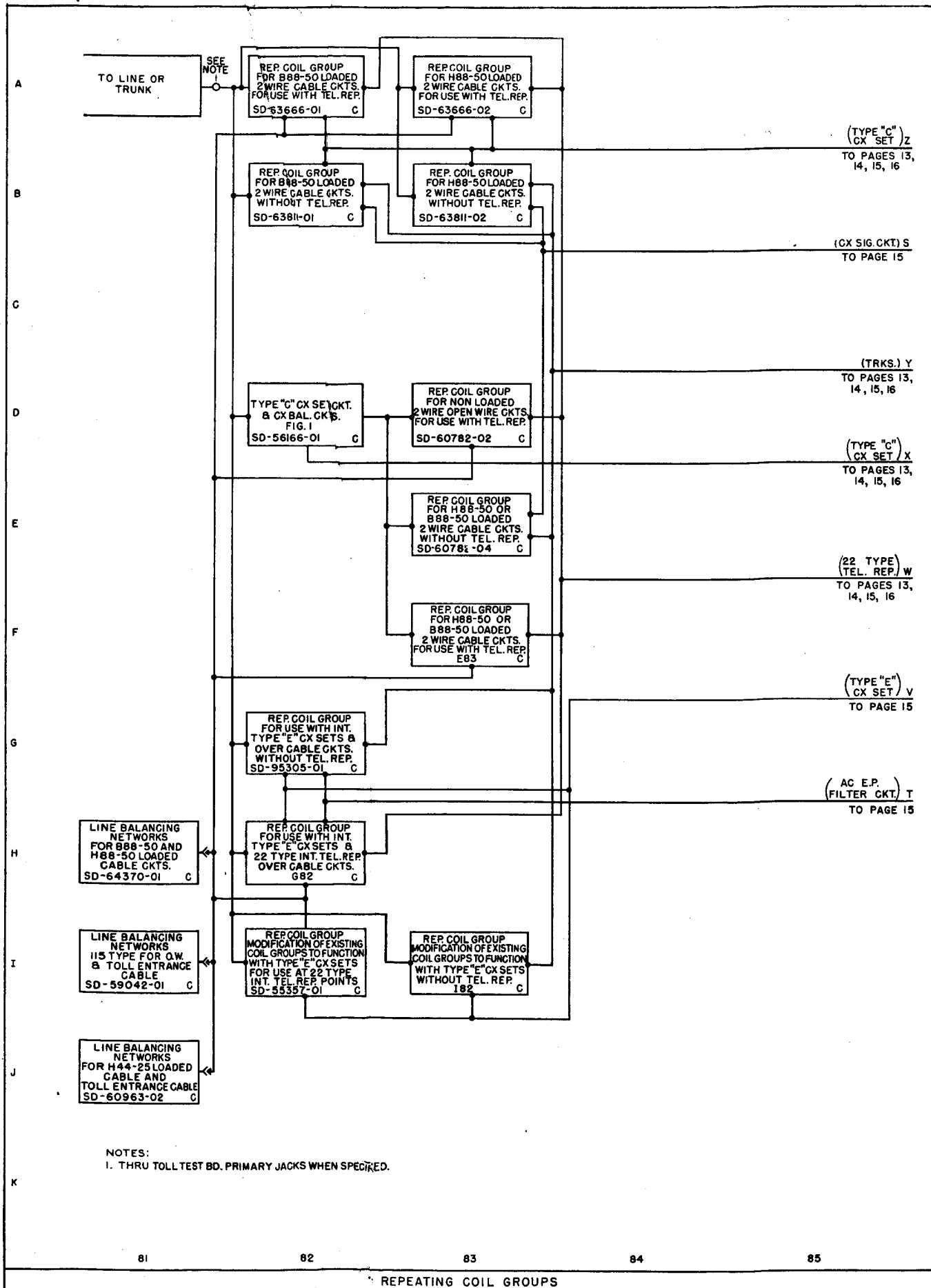


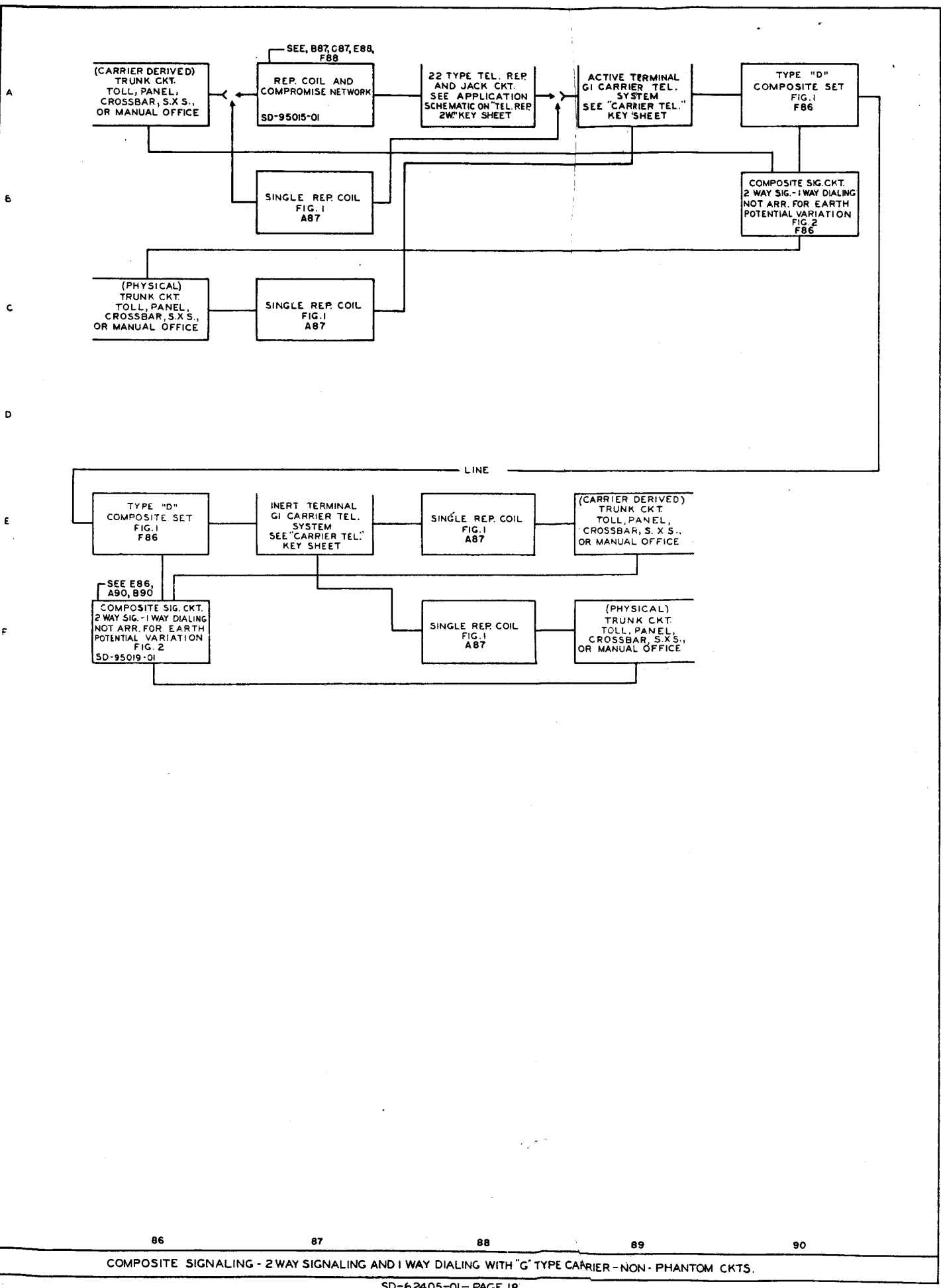


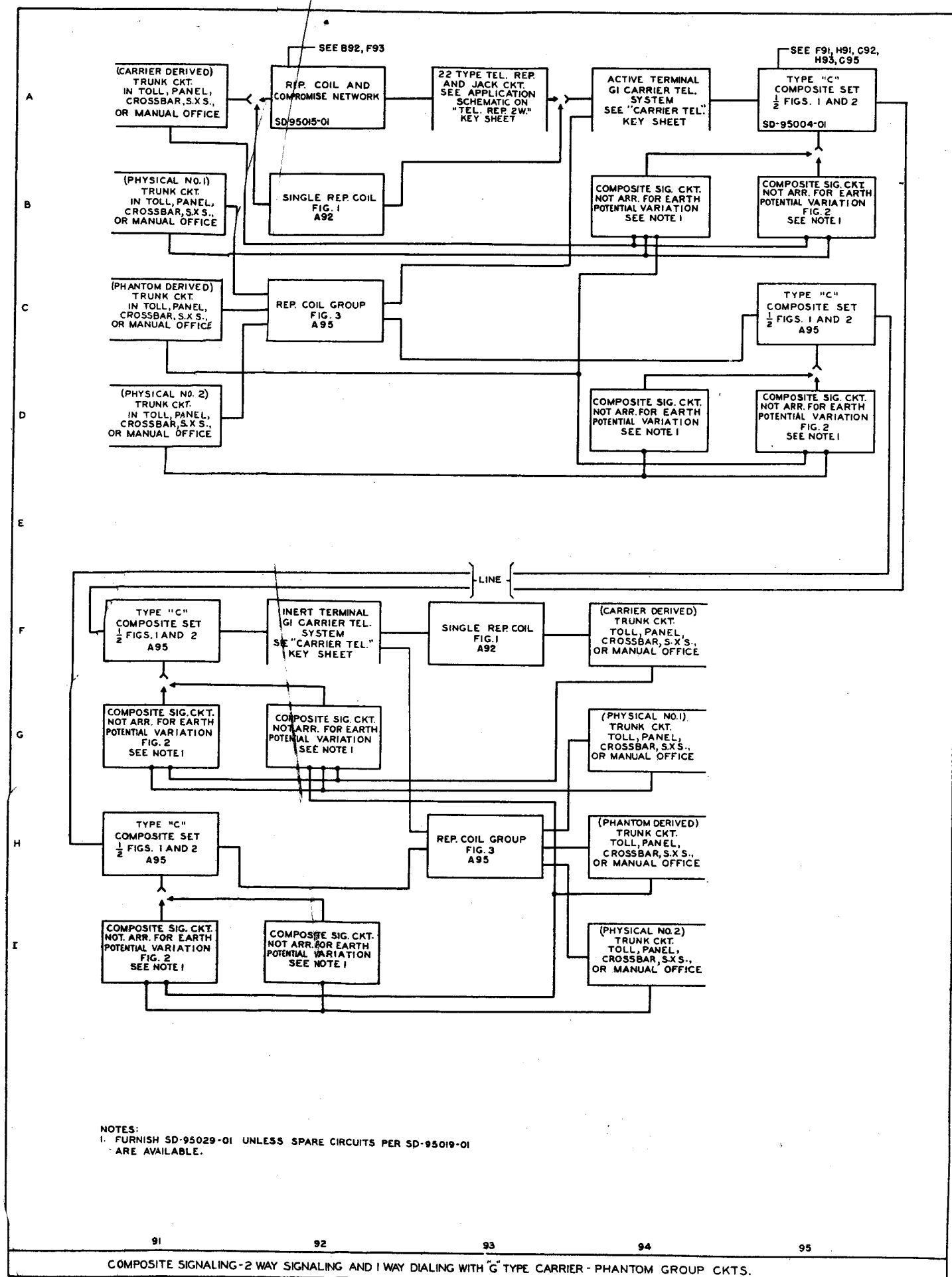




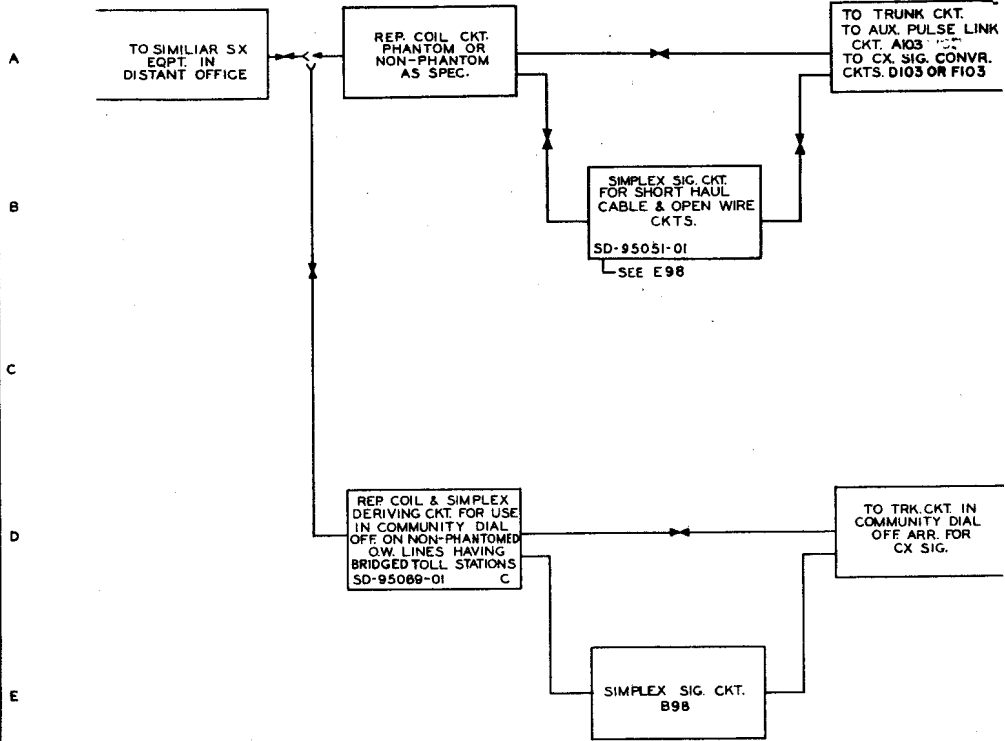


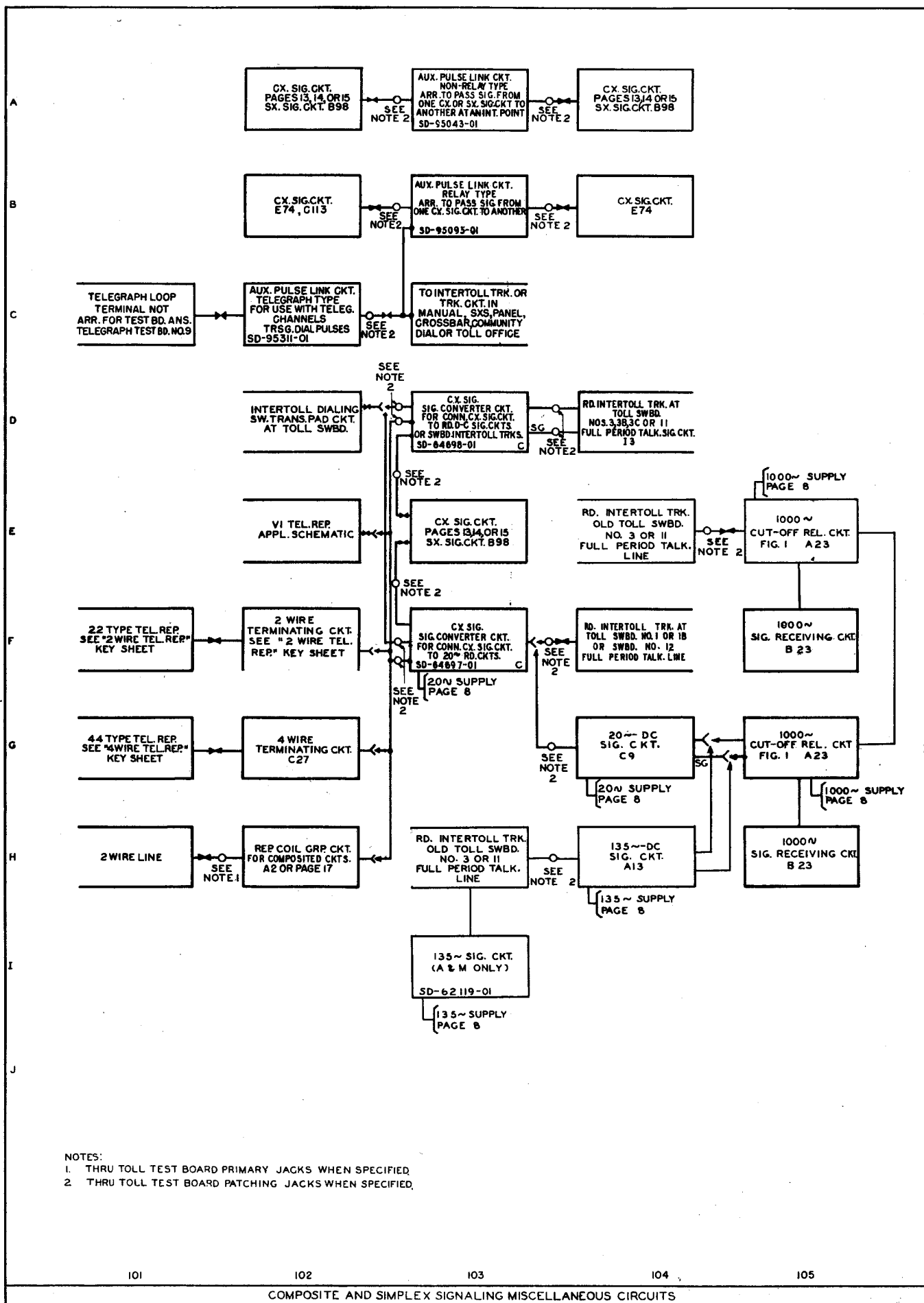


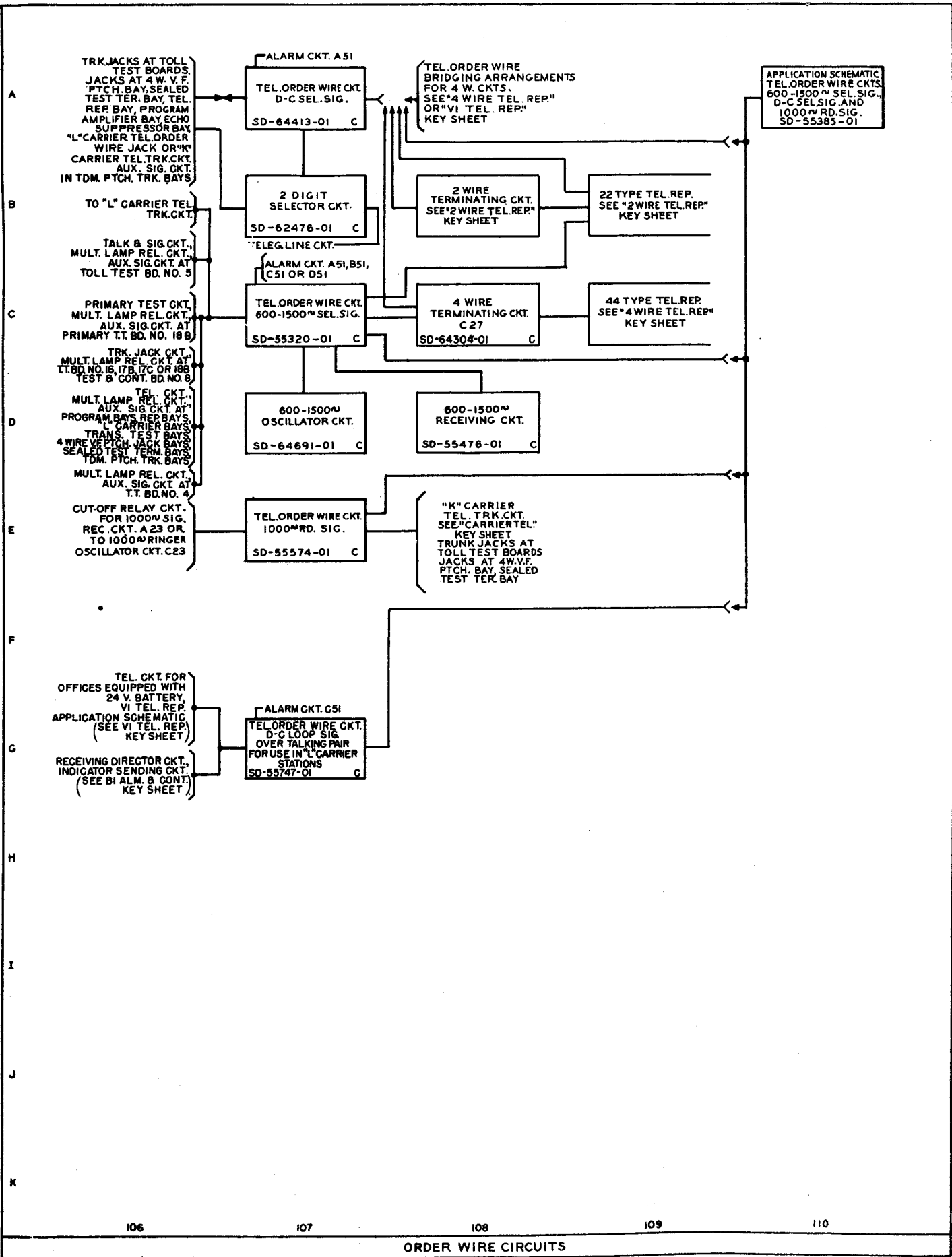


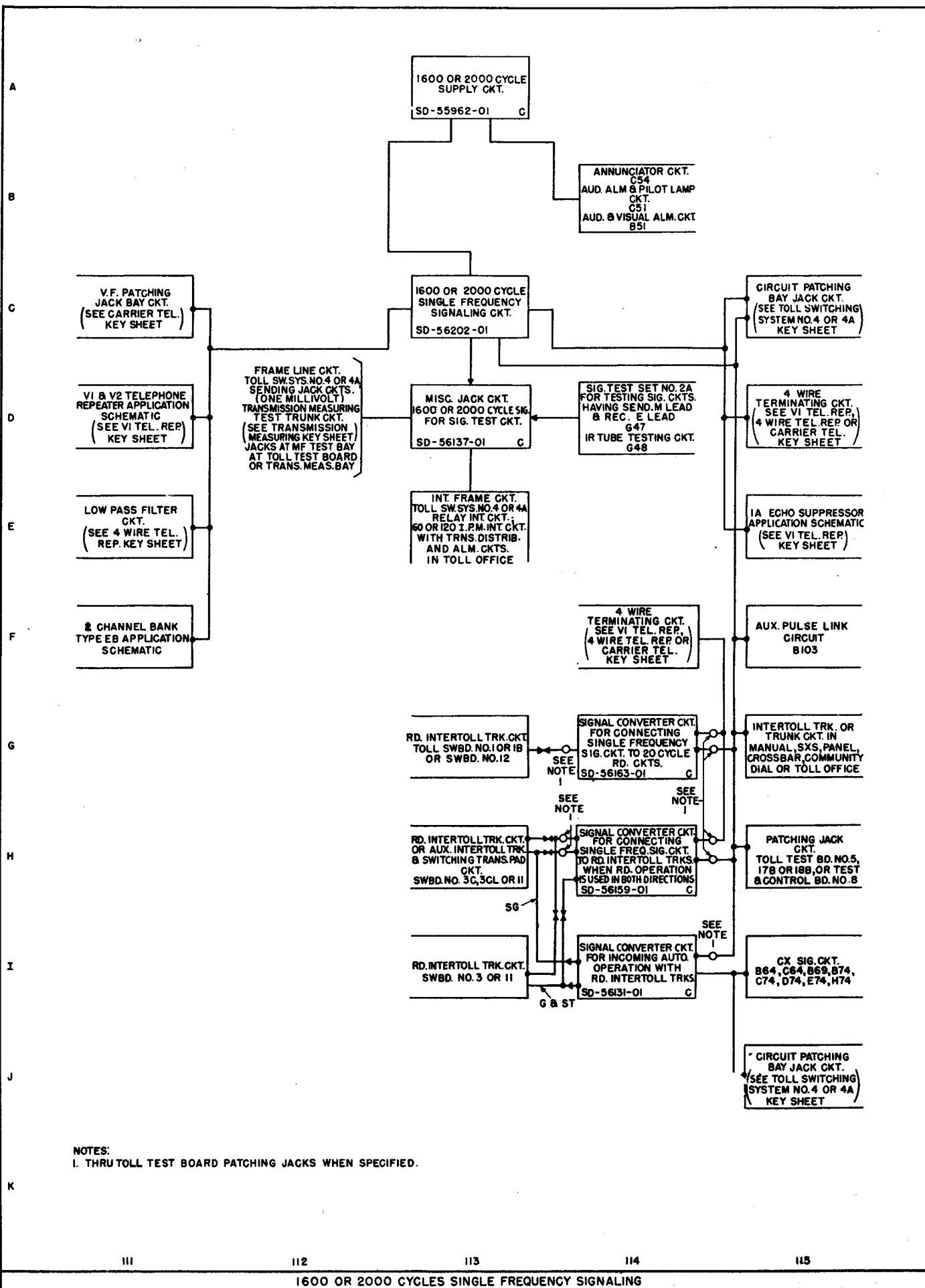


SIMPLEX SIG. CKTS.









**CURRENT DRAIN
AMPERE HOURS PER BUSY HOUR**

CIRCUIT DRAWINGS		SEE NOTE NO.	REMARKS	DRAINS LISTS 1 & 2									
				130V. PLT. BAT.	48V. BAT. SIG. TALK.	48V. GRD. R.R. F.B.	24V. BAT. SIG. FIL.	24 V. GRD. FIL. R.R. F.B.					
CIRCUIT TITLE	CIRCUIT NO.												
BATTERY SUPPLY-1000~SELF-INT. OSC.	SD-556070I		REG. BAT.	.065				.640 .705					
			NON REG. BAT.	.065				.850 .915					
BATTERY SUPPLY-1000~SELF-INT. OSC.	SD-55511-0I		REG. BAT.	.031				.640 .671					
			NON REG. BAT.	.031				.850 .881					
BATTERY SUPPLY-RING OSC.	SD-59001-0I	1	152V. SINGLE BAT. OFF.										
			PER FIG. 1 OR 4					.050			.050		
BATTERY SUPPLY-DC	SD-64803-0I		PER FIG. 2					.127			.127		
			PER FIG. 3					.035			.035		
COMPOSITE SIGNALING	SD-55415-0I		PER PHANTOM GROUP	.100		.220							
			NON-PHANTOM-PER TRK.	.060		.100							
	SD-95016-0I		PER TRUNK			.023							
	SD-95019-0I		PER FIG. 2	.022		.080							
	SD-95028-02		PER TRUNK	.030		.080							
	SD-95028-03		PER TRUNK	.030		.080							
	SD-95029-0I		PER TRUNK	.030		.080							
	SD-95032-0I		PER TRUNK	.030		.055							
	SD-95048-0I		PER TRUNK			.038							
	SD-95058-0I		PER TRUNK	.030		.055							
	SD-95067-0I		PER TRUNK	.030		.080							
	SD-95084-0I		PER TRUNK	.030		.080							
LINE - FOREIGN EX.	SD-63839-0I		PER LINE CKT.					.090			.090		
LINK-AUX. PULSE	SD-95043-0I			.100		.086							
LINK-AUX. PULSE - REL. TYPE	SD-95095-0I			.165		.086							
LINK-AUX. PULSE - TELEG. TYPE	SD-95311-0I			.050		.100							
RINGER - 20-20~	SD-62006-02							.025			.025		
RINGER - TERMINAL	SD-63846-0I	2						.007			.007		
RINGER OSCILLATOR	SD-64419-0I		REG. FIL. BAT.	.012				.320 .320					
			NON-REG. FIL. BAT.					.870 .870					
SIGNALING-135~-DC	SD-55172-0I		24V. CKT.					.026			.026		
			48V. CKT.	.022		.022							
SIGNALING-20~-DC	SD-55194-0I		24V. CKT.					.028			.028		
			48V. CKT.	.024		.024							
SIGNALING-1000~-REC.	SD-55392-0I	3	REG. BAT.	.017				.275 .275					
		4	NON-REG. BAT.	.017				.525 .525					
SIGNALING-1600 OR 2000~ SINGLE FREQ.	SD-56202-0I												
SIGNALING-135~	SD-62119-0I							.009			.009		
SIGNALING-20~	SD-62120-0I							.023			.023		
SIGNALING-FULL PERIOD	SD-63387-0I							.035			.035		
SIMPLEX SIGNALING	SD-95051-0I				.024	.075							

- NOTES:
 1. 152V. BAT., .390 AMP, 152V. F. BD. GRD., .390 AMP.
 2. DRAINS ARE FOR 24V., 38V., OR 48V. BAT.
 3. PER FIG. 2
 4. PER FIG. 4

CURRENT DRAIN FOR CIRCUITS

Alarms

1000 Cycle & Switching Ckt.	SD-55548-01	H38
135 Cycle Freq. Ind. & Off. Freq.	SD-64526-01	H50
Audible & Visual with Alm. Trns. - 24V. Bat.	SD-95063-01	D51
Distrib. Fuse & Common Aisle Audible & Visual with Alm. Trns. for Comb. Toll & 355A - 48V. Bat.	SD-95072-01	A51
Power Supply	SD-95075-01	B51
Audible & Visual with Aisle Pilot & Distinctive Alms.	SD-95081-01	E51
	SD-96188-01	C51
Amplifier - 124E	SD-55362-01	B54
Annunciator	SD-15443-01	C54
Composite Sets & Bal. Sets		B62, B67, B72, C77, D82
Type "C"	SD-56166-01	D72
Type "E"	SD-95306-01	
Composite Set & Repeating Coil Ckt.		A63, A68, A73
Type "C" - With Tel. Rep.	SD-95004-01	F73
Type "D" - Without Tel. Rep.	SD-95032-01	H74
Type "D" - With Tel. Rep.	SD-95058-01	
Composite Signaling		
Ph. Group or Single Ckt. For Use Over Cable Ckts. With One Int. Tel. Rep. For Use With Type "E" CX Sets except at Terminal Points Eqpt. With 93 Type Rep. Coils or For Use With Type "C" Sets - Two-way Sig. - Two-way Dial	SD-55415-01	E74
Ph. Group or Single Ckt. For Cable Ckts. Arr. For E.P. Variation - Two-way Sig. - Non Dial	SD-95016-01	B64
With Type "D" CX Sets For Use with Ckt. Eqpt. with "G" Type Carrier Tel. System Arranged for Two-way Sig. & One-way Dial - Not Arr. for E.P. Variation	SD-95019-01	F86

Ph. Group or Single Ckt. for Short Haul Open Wire & Cable Ckts. Arr. for E.P. Variation - Dial Pulses Originated at 38V. Off. - Two-way Sig. - One-way Dial	SD-95028-02	B69
Ph. Group or Single Ckt. Short Haul Cable & Open Wire Ckts. - CX Set in Distant Off. arr. for E.P. Variation - Two-way Sig. - Two-way Dial	SD-95028-03	C79
Ph. Group or Single Ckt. Short Haul Open Wire Ckts. for Use With Type "C" CX Sets - Two-way Sig. - Two-way Dial	SD-95029-01	B74
With Type "D" CX Set & Ph. Group for Use Over Short Haul Cable & Open Wire Ckts. - With Tel. Rep. - Two-way Sig. - Two-way Dial	SD-95032-01	F73
Ph. Group or Single Ckt. For Use With Type "C" CX Sets Over Short Haul Cable & Open Wire Ckts. Without Int. Tel. Rep. Or Type "E" CX Sets Over Cable Ckts. With Or Without One Int. Tel. Rep. - Two-way Sig. - Two-way Dial	SD-95048-01	D74
With Type "D" CX Set & Rep. Coil For Compositing a Phantom Ckt. Over Short Haul Cable & Open Wire Ckts. - For Ckts. Not Eqpt. With Tel Reps. - Two-way Signaling - Two-way Dial	SD-95058-01	H74
Ph. Group or Single Ckt. Short Haul Cable & Open Wire Ckts. With Int. CX Sets At Intermediate Point Arr. For E.P. Variation For Use With Type "C" CX Sets Only	SD-95067-01	C74
Ph. Group or Single Ckt. For Long Haul Cable Arr. For Rering, and E.P. Variation - Two-way Sig. - Non Dial	SD-95084-01	C64

Composite Signaling (Cont'd)

Converter - Signal	See Fig. Conv.	
Control		
For 20, 135 & 1000 Cycle Test Ckts.	SD-64734-01	E49
Cut-off Relay - 1000 Cycles	See Signaling	
Filter		B63, B68, B73, D73, C78
AC Earth Potential For Use With SX & CX Sig. Ckts.	SD-95073-01	
Frequency Indicator	See Alarms	
Interrupter		
60 I.P.M. Relay for Foreign Exchange 135 Cycle - 48V.	SD-62828-01 SD-63955-01	C58 F38
Jack		
Misc. - 1600-2000 Cycle Sig. for Signal Test Ckt.	SD-56137-01	D113
Leads		
135 Cycle Ringing Signal Bat. for 20 Cycle DC & 135 Cycle DC Term. Signal Ckts.	SD-62021-01 SD-62803-01	A38 A36
Line		
Foreign Exchange - Subscriber End	SD-62442-01	E58
Foreign Exchange - Local Swbd. End	SD-63839-01	B57
Line & Balancing		
Multi-station Lines 2 and 4 Wire Bridging, Switching & Signaling Arrangements	SD-55647-01	J53
Link		
Aux. Pulse - Non-Relay Type - Arr. To Pass Sig. From One CX or SX Sig. Ckt. to Another at An Inter- mediate Point	SD-95043-01	A103
Aux. Pulse - Relay Type To Pass Sig. From One CX Sig. Ckt. to Another	SD-95095-01	B103
Aux. Pulse - Telegraph Type For Use With Telegraph Channels - Transmitting Dial Pulses	SD-95311-01	C102

Networks

115 Type for Open Wire & Toll Entrance Cable For H44-25 Loaded Cable & Toll Entrance Cable Line Balancing For B88- 50 & H88-50 Loaded Cable Ckts.	SD-59042-01 SD-60963-02 SD-64370-01 SD-90517-01	I81 J81 H81 E78
Compromise & Balancing		

Order Wire

600-1500 Cycle Sig. Application Schematic 600-1500 Cycle Sel. Sig. - DC Sel. Sig. & 1000 Cycle RD Sig.	SD-55320-01 SD-55385-01 SD-55574-01	C107 A110 E107
1000 Cycle RD Sig. DC Loop Sig. Over Talking Pair For Use in "L" Carrier Stations	SD-55747-01 SD-64413-01	G107 A107
DC Sel. Sig.		

Oscillator

Self Interrupting - 20 Cycle Rate - 6V. Rated Output 1000 Cycle Ringer - Term. - Without Tel. Rep.	SD-55607-01 SD-64419-01	I38 C23, H23
1000 Cycle Ringer - Term. - With Tel. Rep.	SD-64419-01	G28, J28
1000 Cycle Ringer - Intermediate 600-1500 Cycle	SD-64419-01 SD-64691-01	E33 D107

Receiving

1000 Cycle 600-1500 Cycle	See Signaling SD-55476-01	D108
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Repeating Coil Groups

Modification of exist- ing Coil Groups to Function With Type "E" CX Sets For Use at 22 Type Int. Tel. Rep. Points	SD-55357-01	I82
Modification of exist- ing Coil Groups to Function With Type "E" CX Sets Without Tel. Rep.	SD-55357-01	I83
For Non-loaded - Open Wire Lines - Without Tel. Rep.	SD-60782-02	A2
For Non-loaded 2 Wire - Open Wire Ckts. For Use With Tel. Rep.	SD-60782-02	D83
For H88-50 or B88-50 Loaded - 2 Wire Cable Ckts. - Without Tel. Rep.	SD-60782-04	F83

Repeating Coil Groups (Cont'd)

For H88-50 or B88-50
Loaded - 2 Wire Cable
Ckts. - With Tel. Rep. SD-60782-04 F83

For Non-CX H44-25
Loaded Cable - With-
out Tel. Rep. SD-63275-02 A2

For B88-50 Loaded -
2 Wire Cable Ckts. -
With Tel. Rep. SD-63666-01 A82

For H88-50 Loaded -
2 Wire Cable Ckts.
With Tel. Rep. SD-63666-02 A83

For CX or Non-CX -
B88-50 Loaded Cable -
With Tel. Rep. SD-63811-01 A2,
B82

For CX or Non-CX -
H88-50 Loaded Cable -
Without Tel. Rep. SD-63811-02 A2,
B83

With Type "C" CX Set -
For Open Wire or
Cable - CX or SX Sig.
or Comb. of RD & CX
or SX Sig. - Without
Tel. Rep. SD-95004-01 A63,
A68,
A73,
A78,
A95

For Non-CX Open Wire or
Non-Loaded Cable Ckts.
Without Tel. Rep. -
For Installations
having a small number
of Repeating Coil
Groups SD-95022-01 A2,
C2

Repeating Coil & SX
Deriving Ckt. For
Use in Community
Dial Office on Non-
Ph Open Wire Lines
having bridged Toll
Stations SD-95069-01 D97

For Use With Int. Type
"E" CX Sets & Over
Cable Ckts. - With-
out Tel. Rep. SD-95305-01 G82

For Use With Int. Type
"E" CX Sets & 22 Type
Int. Tel. Rep. Over
Cable Ckts. SD-95305-01 H82,
D64,
D69,
G74,
A79,
A87,
A92

Repeating Coil & Com-
promised Network SD-95015-01

Ringer

20-20 Cycle - For Re-
laying rings between
Intertoll Trks. or
between Intertoll
Trk. & Toll Sub. Line SD-62006-02 F53

135-20 Cycle Terminal
& Assoc. Cut-off Rel.
Ckt. For 24V. Dry
Cell Operation or for
24, 38 or 48V. Off -
For Small Installa-
tions SD-63846-01 H13,
I13

Selector

2 Digit SD-62476-01 B107

Signal Converter

For Incoming Auto.
Operation With RD
Intertoll Trks. SD-56131-01 I114

For Connecting Single
Frequency Sig. Ckt.
to RD Intertoll Trk.
When RD Operation is
Used in both
Directions SD-56159-01 H114

For Connecting Single
Frequency Sig. Ckt.
to 20 Cycle RD Ckts. SD-56163-01 G114

For Connecting CX Sig.
Ckt. to 20 Cycle RD
Ckts. SD-64697-01 F103

For Connecting CX Sig.
Ckt. to RD Sig. Ckts.
or Swbd. Intertoll
Trks. SD-64698-01 D103

Signaling

135 Cycle - DC
Intermediate
Term. - Without Tel.
Rep. SD-55172-01 I9,
I18,
I19

Term. - With Tel. Rep. SD-55172-01 A13
B18

20 Cycle DC When 20
Cycle Sig. has by-
passed a Tel Rep.
Intermediate SD-55194-01 I8

Term. - Without Tel.
Rep. SD-55194-01 A3,
C3,
E3

Term. - With Tel. Rep. SD-55194-01 B8,
D8

1000 Cycle Receiving
Intermediate SD-55392-01 C33

Term. - Without Tel.
Rep. SD-55392-01 B23

Term. - With Tel.
Rep. SD-55392-01 B28

1000 Cycle Cut-off
Relay

Intermediate SD-55393-01 I9,
I19,
B33

Term. - Without Tel. Rep. SD-55393-01 A23

Term. - With Tel. Rep. SD-55393-01 A28

20 Cycle DC When 20
Cycle Sig. has not
by-passed a Tel. Rep.
Intermediate SD-55560-01 I8

Term. - Without Tel.
Rep. SD-55560-01 A3,
E4,
F4

Term. - With Tel. Rep. SD-55560-01 D8,
C9

1600 or 2000 Cycle
Single Frequency SD-56202-01 C113

135 Cycle for Old
No. 3 & 11 Swbds. SD-62119-01 I103

Signaling (Cont'd)

20 Cycle For Old No. 3 & 11 Swbds.	SD-62120-01	G5
Full Period Talking	SD-63387-01	I3
Foreign Exch. - Local Swbd. End	SD-63839-01	B58
Foreign Exch. - between Sub. Line & Toll Sig. Ckts.	SD-63863-01	E59

Supply

Signaling & Power - Appl. Schematic For 20 DC & 135 Cycle DC Sig. Ckts. Used With AC Operated V1 Tel. Rep.	SD-55295-01	A40
20 Cycle Static Ring- ing Generator	SD-55407-01	D37
1000 Cycle - Self Int. Osc. 20 Cycle Rate -1.2V Output to Supply Max. 100 Ckts.	SD-55511-01	H37
1000 Cycle - Alm. & Switching For Use With Self Int. 1000/20 Cycle -1.2V. Osc. to Supply Max. of 200 Ckts.	SD-55548-01	H38
1000 Cycle - Self Int. Osc. 20 Cycle Rate -6V. Rated Output	SD-55607-01	I37
1600 or 2000 Cycle 152V. Bat. For Single Bat. Off.	SD-55962-01	A113
SD-59001-01	E41	
135 Cycle Ringing - 156B Int. - 24V. Bat. Off.	SD-60203-01	C38
135 Cycle Ringing - 156B Int. - 38V. Bat. Off.	SD-60515-01	D38
20 Cycle Ringing - Low Voltage	SD-62180-03	B37
AC Power For 1000 Cycle Ringer Oscillator	SD-64298-01	D41

Simplex Signaling

2 Way Sig. - 2 Way Dial Over Short Haul Open Wire and Cable Ckts.	SD-95051-01	B98
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Telephone

With 2 Way & Test Trks. From Ph. CX Sig. Eqpt. to T.T. Bd. No. 5 or Local Test Desks	SD-62768-01	F49
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Terminal - Test For Bat. & Grd.	SD-90122-01	F48
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Terminating

2 Wire - Appl. Sche- matic With Tel. Rep. Ckt. - For Foreign Exch.	SD-63837-01	A59 C27, E27
4 Wire	SD-64304-01	

Testing

1000 Cycle Sig. Rec. Ckt.	SD-55481-01	D49
135 Cycle Strobo- scope Type For Testing Type B CX Sig. & 1600 Cycle Sig.	SD-55522-01	F50
SD-56080-01	I47	
For Testing & Adjust- ing 20 & 135 Cycle Sig. Ckts.	SD-63474-01	E48
IR Tube Testing Ckt. Terminal For Bat. & Grd.	SD-64031-01	G48
SD-90122-01	F48	
209FF, FK, FL & FM Relays	SD-96121-01	G49

Test Set

No. 2A for Testing Sig. Ckts. having Send. M Lead & Rec. E Lead Portable - VM Type For Testing & Adjusting AC Rel. & Sig. Ckts. & For Meas. AC and Sig. Voltages	SD-56134-01	G47
Portable - For Measur- ing AC Voltages and 20 & 135 Cycle Sig. Voltages	SD-63674-01	F47
Pulse Repeating Portable - No. 1Y For Half Amp. Tubes	SD-64125-01	F46
SD-64540-01	H47	
For Testing 49, 92, 141 & 218 Type Jacks	SD-64677-01	C46
SD-95056-01	D46	
For Testing 275 & 276 Relays	SD-95439-01	H49

Trunk

2 Way Auto. between Bays, Frames or Racks	SD-55348-01	A47
2 Way & Test - With Tel. Ckt. - From Ph. CX Sig. Eqpt. to T.T. Bd. No. 500 Local Test Desk	SD-62768-01	F49

Alarm - Arr. to extend Alms. (Aux. Station)	SD-95310-01	I50
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