

SD-15120-01

BELL TELEPHONE LABORATORIES, INC.

MANUAL SYSTEMS
SWITCHBOARD NO. 12
KEY SHEET

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DWG. ISS.	C.D. ISSUE	DATE OF ISSUE	APPROVED	
1	1	8-18-31	W.H.M. I	W.E.P. 12-2-31
2	2	12-16-31	W.H.M. I	W.E.P. 1-9-32
3	3	2-5-35	W.L.F. I	W.E.D.
4	4	6-17-35	W.L.F. I	W.E.D.
5	5	7-27-37	W.L.F. I	W.E.D.
6	6	8-11-38	W.L.F. I	W.E.D.
7	7	6-14-39	W.L.F. I	W.E.D.
8	8	8-27-40	W.L.F. I	W.E.P.
9	9	6-28-41	W.L.F. I	W.E.D.
10	10	9-19-41	W.L.F. I	W.E.D.
11	11	1-28-42	W.L.F. I	W.E.D.
12	12	6-26-42	W.L.F. I	B.C.B.
13	13	7-3-50	D.S. C.J.S.	P.H.T. R.L.L.
14	14	12-4-53	F.E.CO L.S.H.	B.P. E.W.D.

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AT&TCO
STANDARD

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

SD-15120-01

General Description of Switchboard No. 12

The switchboard No. 12 provides common battery service in small centers generally served heretofore by magneto switchboards or common battery switchboards of corresponding size. It may be used as a purely local board in full tributary offices or as a combined local and toll board in partial tributaries or toll centers.

This board is available in two general arrangements known as the 640-line and 1440-line boards which indicate the ultimate capacities. It is composed of single position, two panel section with a maximum of 15 cord pairs per position. The common battery lines, magneto rural lines, ringdown trunks and toll lines are multiplied on a four panel basis. Lamps are employed for common battery lines, drops or lamps for magneto rural lines, ringdown trunks and toll lines and lamp busy signals if required for intertoll trunks.

Trunk positions are available as an optional standard. Type "F" or "G" key listening straightforward local, tandem completing and call announcer trunks, type "F" toll switching trunks and type "G" call indicator trunks may be used. AC-DC or superimposed manual ringing may be provided.

For the majority of offices the 105C power plant, with busy hour ratings of 3 and 10 amperes will be adequate for the 40-56 volts d-c supply. However, the 106A power plant is available for any office having a busy hour load in excess of 10 amperes. Both of these power plants are automatic in operation and employ regulated tube rectifiers for floating the batteries.

Two arrangements are available for furnishing 24 volt current for PBXs, etc. One employs a 24 volt battery floated from the 48 volt battery, and the second employs counter cells to reduce the 48 volts to 24.

Ringing current will be supplied normally of a static ringing generator of 0.2 ampere capacity. Reserve ringing equipment consisting of 0.2 ampere motor driven generator may be furnished if specified.

Dry cells are used for coin control battery.

Other facilities which may be provided are:

1. Interposition trunks for use in connection with delayed toll or information calls.

2. Incoming jack ended trunks from manual local offices.
3. Outgoing straightforward trunks to manual local offices.
4. Outgoing trunks to toll offices.
5. Outgoing straightforward trunks to manual tandem or panel tandem offices.
6. Incoming trunks from manual tandem offices.
7. Incoming jack ended call announcer trunks from panel tandem offices.
8. Incoming operator office trunks from community dial offices.
9. Incoming trunks 4 wire from selector levels in 355A dial office.
10. Incoming trunks 2 wire from S. by S. offices.
11. Outgoing dialing trunks to S. by S. offices.
12. Incoming trunks from intertoll selector multiple or intertoll trunk circuit.
13. Outgoing trunks for use with intertoll dialing.
14. Two-way operator office trunks to community dial offices.
15. Intercepting trunks from type "F" or "G" trunk positions.
16. Two-way trunks to toll switchboards or toll positions in manual offices.
17. Two-way toll trunks to local manual tributary offices.
18. Means for answering transferred information trunks from information desk No. 7 or 7A.
19. Test trunks from local test cabinet No. 3 in same building.
20. Waltham clocks or No. 33 calculagraphs for timing toll calls.
21. Dial cord dialing at subscriber positions.
22. Coin line service on prepayment basis.
23. A test circuit for switchboard equipment, and a voltmeter test circuit and a No. 2 local test cabinet are available for testing trunks and subscriber lines.

A

COMMON BAT SUB SET
OR P.B.X TRK.

SERVICE ASSISTANTS TEL.
SD-15170-01 C

TOLL LINE CKT.
WITH LINE DROP &
WITH BUSY LAMPS
SD-15173-01

(TRKS)AB
TO PAGES 4 & 6

B

LONG LINE
CKT.
SD-12287-01 C

SEE IT7, J17
SUB LINE CKT.
WITH
LINE RELAY
SD-15021-02 C

SUB LINE CKT.
WITHOUT LINE RELAY
SD-15021-01 C
SEE IT7, J17

(FUSE ALM.)FA
TO PAGE 5

(EXT.
SL ALM.)
TO PAGE 5

C

AUX. LINE CKT.
FOR EXTENDING THE
COIN OR COIN & SR
RANGE OF COIN LINES
SD-15466-01

AUX. LINE
WITH AUTO CUT OFF
FOR IND. LINES WITH
MAIN EXT. STATIONS
ON SEPARATE LOOPS
SD-96468-01 C

RING DOWN TRK.
INTERTOLL TRK. OR
RURAL LINE CKT.
WITH LINE DROP
SD-15022-01 C

LINE LOAD
CONTROL CKT. &
BAT. SUPPLY
SWITCHING CKT.
SD-15451-01 C

TO PAGE 8

D

2 WAY RING DOWN TRK.
IN MAN. OFF. OR
MAG. RURAL SUB. SET

RING DOWN TRK.
RURAL LINE CKT.
WITH LINE LAMPS
SD-15180-01
GRP. BUSY REG. G17

IN TOLL TEST BD.
NO. 18B;
TEST & O.S. JACK CKT.

FOR STFD. OPERATION;
DIST. SELECTOR IN PAN.
SDR. TANDEM OFF,
INC. TRK. IN MAN. TDM.
OFF. OR "B" SWBD., INC.
TRK. IN DIAL OFF.

FOR MF.K.P. OPERATION;
INC. TRK. IN CBR. NO. 1,
CBR. NO. 5 OR CBR.
TANDEM OFF.

E

INTERTOLL TRK.

REP. COIL GROUP CKT.
SD-95022-01 C

LONG RING DOWN
INTERTOLL TRK. CKT.
WITH OR WITHOUT
AC OR DC BUSY LAMPS
SD-15507-01

OG T.
STFD. OR MF.K.P.
REV. BAT. SUPV.
WITH REP. COIL OR
BRIDGED IMPEDANCE
TRANS.
SEE NOTE 1
SD-15193-01

F

INTERTOLL DIALING
AUXILIARY
INTERTOLL SEL. MULT.
(SEE TOLL SWBD. NO. 1,
3, 3C OR 3CL
KEY SHEET)

OG T. IN
MAN. LOCAL OR
MAN. TANDEM OFF.

INC. TRK. FROM
MAN. LOCAL
OR TANDEM OFF.
REV. BAT. HIGH LOW OR
E, M, & F LEADS SUPV.
SD-15327-01

GRP. BUSY REG. G17
OG T.
DP TRANSMITTING
4 WIRE COIN &
NON-COIN DIAL
CORD DIALING
CONTROLLED RINGING
SD-15342-01

(FLASHING) F
TO PAGE 5

G

INCOMING SELECTOR
IN S.X.S. OFF.

IN PAN. SDR. TANDEM OFF,
DIST. OFF. SELECTOR MULT.
IN PAN. OFF. SELECTOR
TANDEM OFF.
DST. OFF. SELECTOR MULT.
IN TOLL SW. OFF. NO. 4,
TOLL SW. TRK. CKT.

INTERPOSITION
TRUNK CKT.
SD-15165-01 C

IN TOLL CABINET NO. 2A;
KEY, LAMP & REL. CKT.

(JACK) JK
TO PAGE 7

H

SEE 838
AUX. TRK.
CONNECTS TO OUT.
OR OPR. OFF. TRK. &
TRK. FROM INTERTOLL
OR S.X.S. TDM. TRAIN
SD-96384-01 C

GRP. BUSY REG. G17
OUT. DIALING TRK.
TO S.X.S. OFF.
E & M OR E, M, & F LEADS
OR REV. BAT. SUPV.
SD-15334-01

INC. TRK.
CALL ANNOUNCER
REV. BAT. OR
E & M LEADS SUPV.
SD-14209-01

INTERCEPTING
TRK.
SD-15222-01

(N.ALM.) NA
TO PAGE 5

I

OUT. OR 2 WAY
TRK. CKT.
IN COMMUNITY
DIAL OFF.

GRP. BUSY REG. G17
OPERATOR OFF TRK.
INC. OR 2 WAY
TIP & RING
DIAL. CORD DIALING
HIGH LOW REV. BAT. SUPV.
OR E & M LEADS SUPV.
SD-15333-01

INC. TRK.
FROM LOCAL OFF.
JACK ENDED
SD-15234-01

OG.T. IN MAN. LOC. OFF.

(DIAL CD.) DC
TO PAGE 7

J

2 WAY TRK.
C7
IN DISTANT OFF

IN TOLL TEST BD.
NO. 18B;
TEST & O.S. JACK CKT.

LONG OG.T.
HIGH LOW SUPV.
WITH OR WITHOUT
BUSY LAMPS
SD-15235-01

INC. TRK. IN
MAN. LOCAL OFF.

K

INTERTOLL DIALING
OG T OR SEL. MULT.
(SEE TOLL SWBD. NO. 1, 3,
3C OR 3CL KEY SHEET)
OR S.X.S. TDM. SEL.

OGT CKT.
E & M LEADS SUPV.
IN SXS OFF.
IN SAME BLDG.

REP. COIL TRANS.
& CX. OR SX. SIG.
FACILITIES OR
EQUIVALENT

2 WAY TOLL TRK.
TO LOCAL MAN.
TRIBUTARY OFF.
E, M, & F LEADS OR
REV. BAT. SUPV.
SD-15298-01

NOTES:
1. PROVIDE REPEATING COIL TRANSMISSION IN AREAS
SUBJECT TO POWER INTERFERENCE.

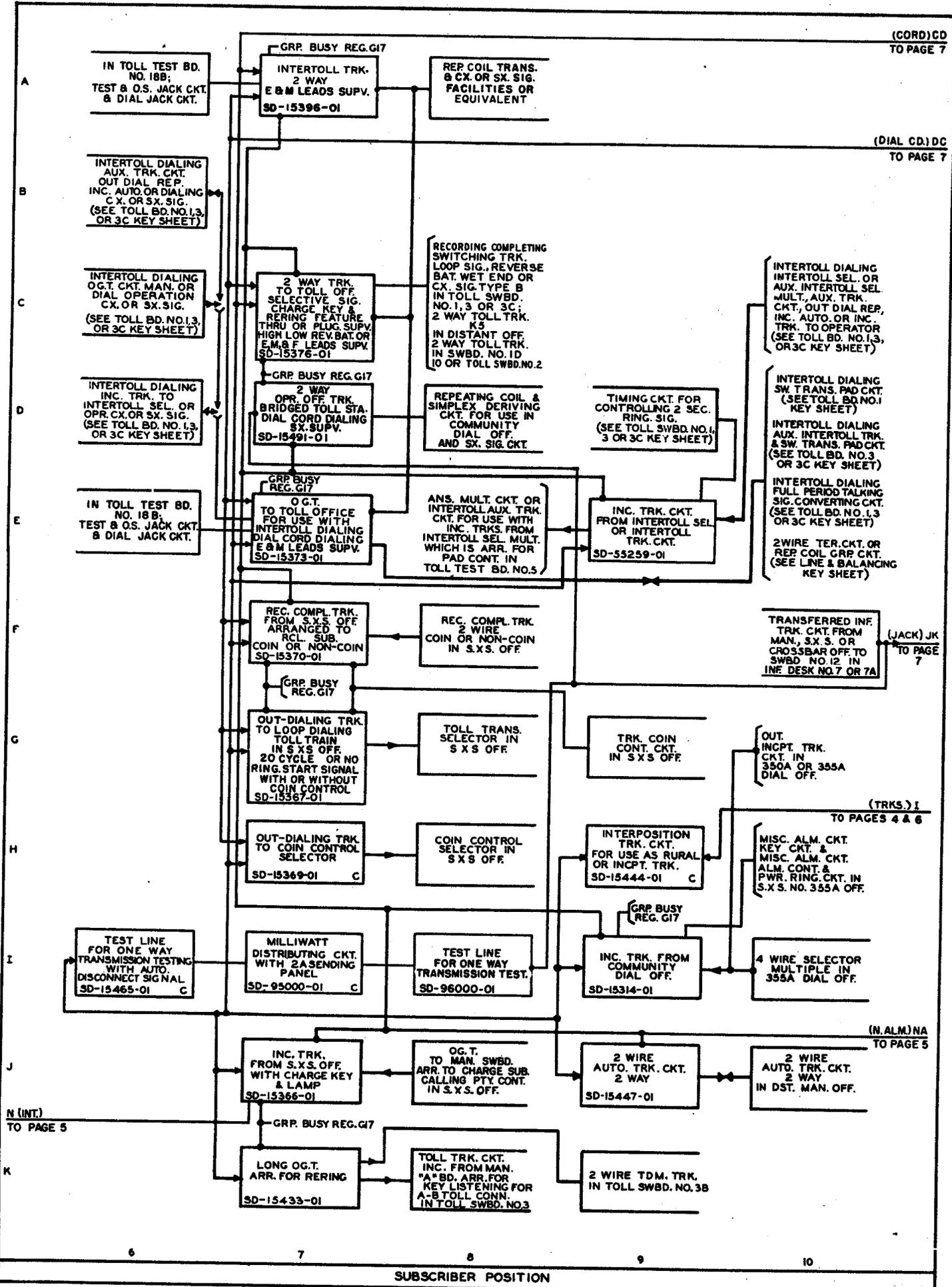
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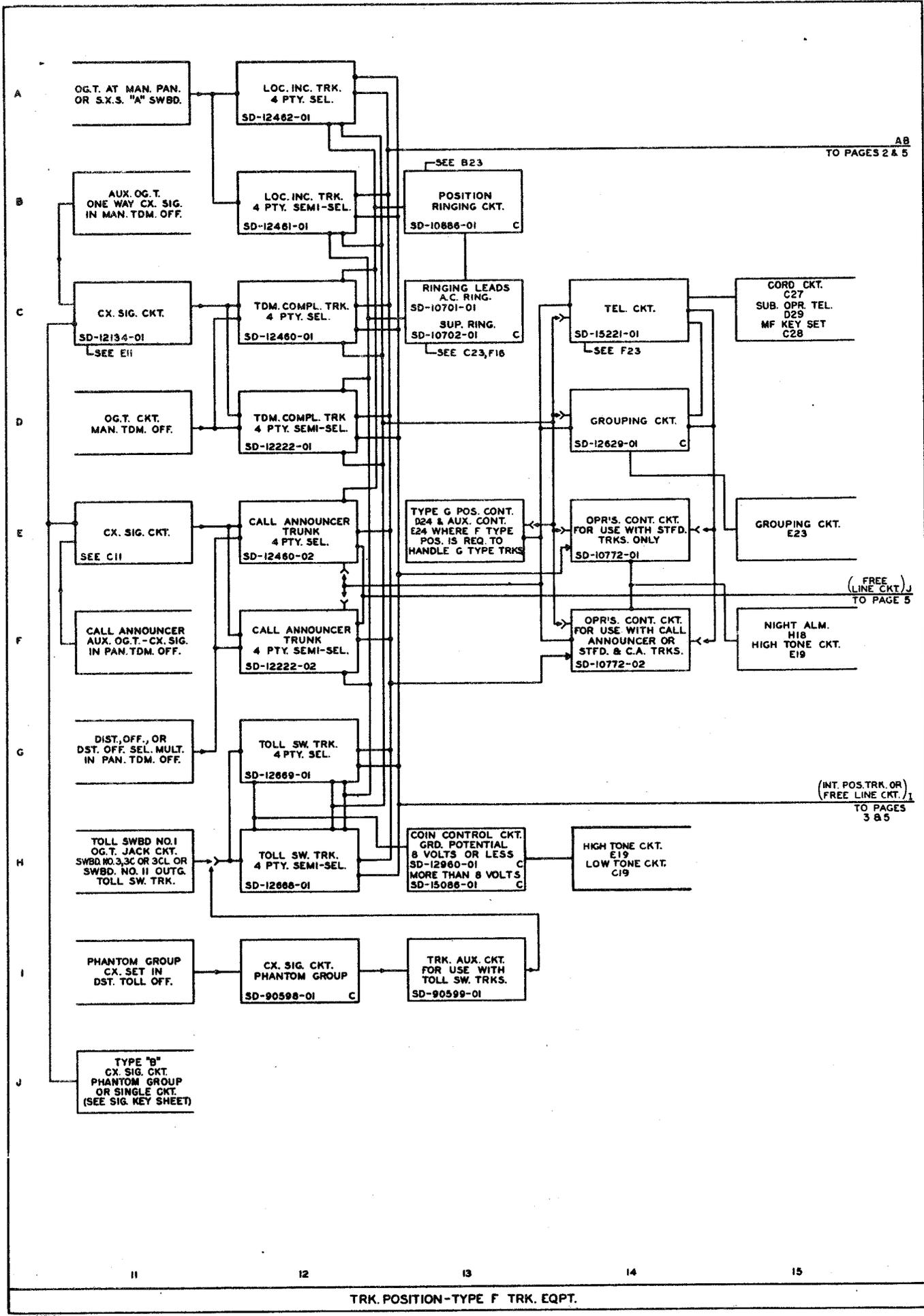
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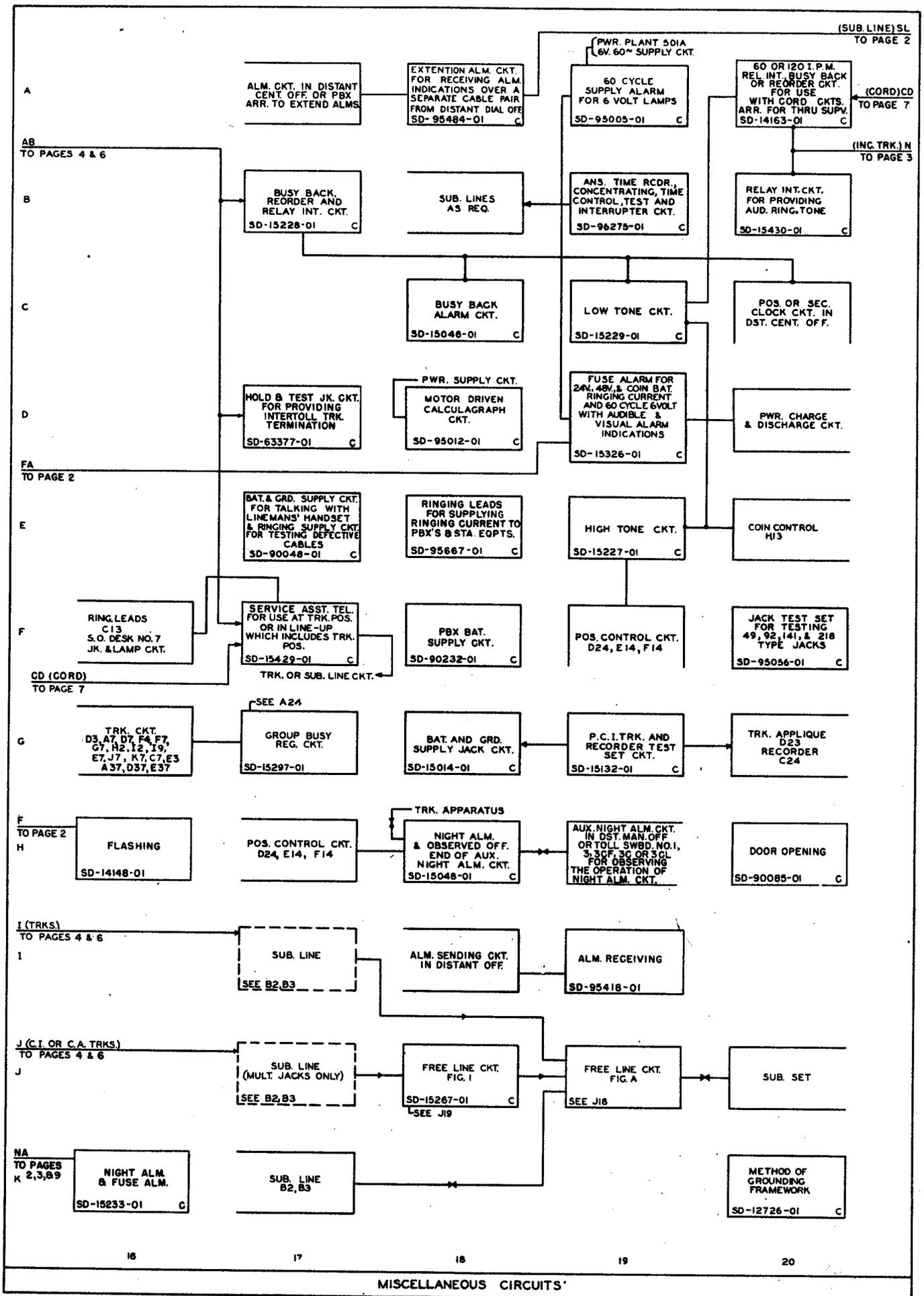


N (INT.)
TO PAGE 5

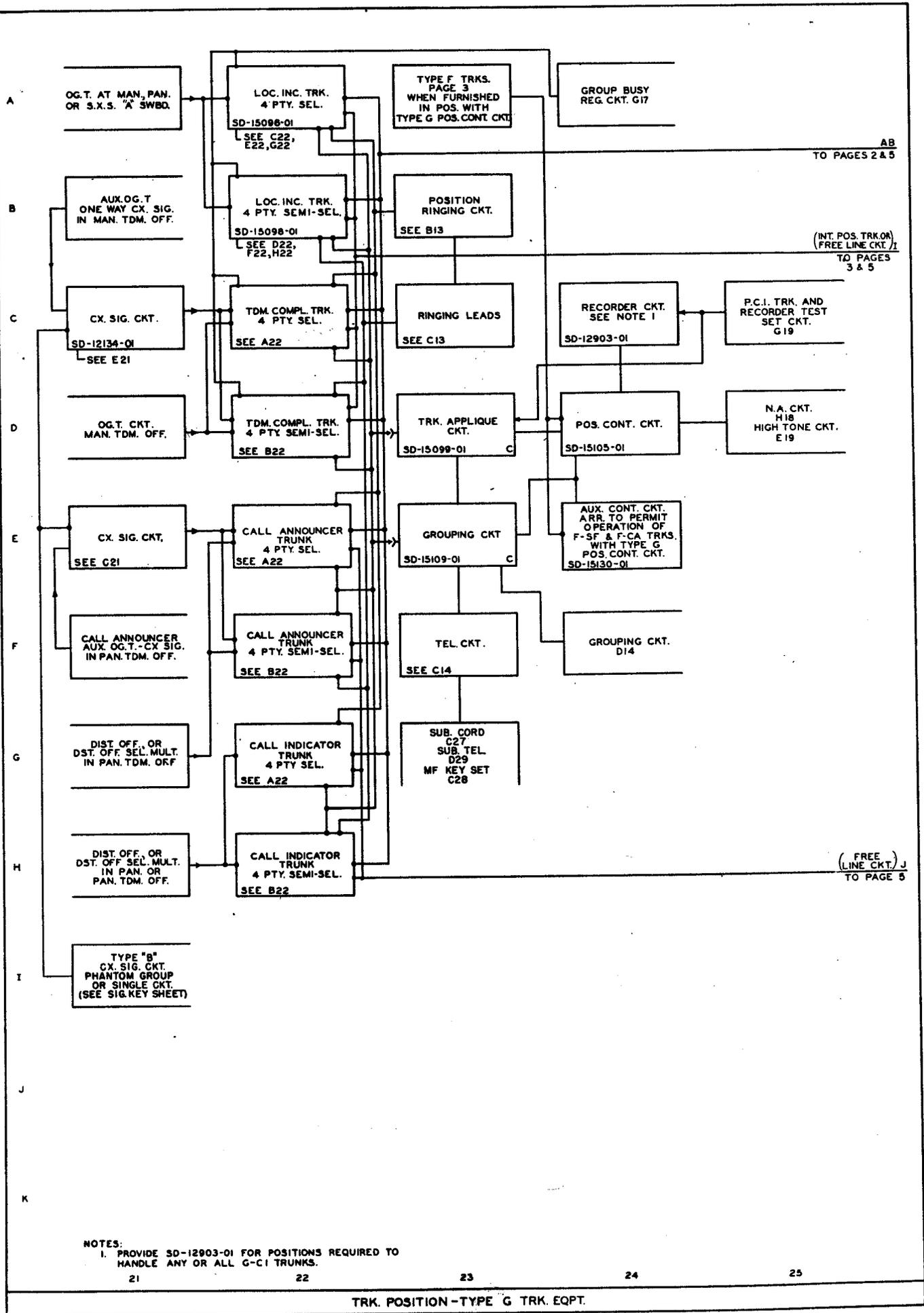
(N. ALM.) NA
TO PAGE 5



TRK. POSITION-TYPE F TRK. EQPT.



MISCELLANEOUS CIRCUITS*



NOTES:
 I. PROVIDE SD-12903-01 FOR POSITIONS REQUIRED TO HANDLE ANY OR ALL G-C1 TRUNKS.

21

22

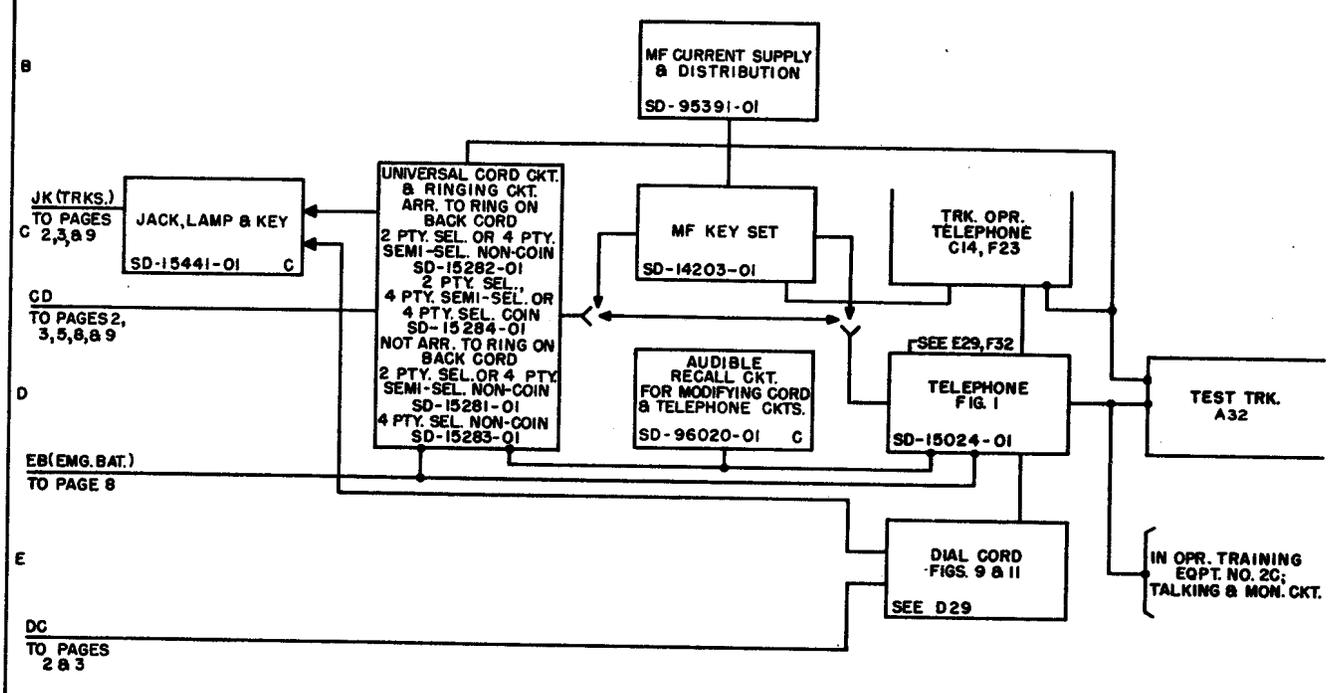
23

24

25

TRK. POSITION - TYPE G TRK. EQPT.

A
B
C
CD
D
E
DC
F
G
H
I
J
K



L (LINE)
TO PAGE 2

A
B
C
D
E
F
G
H
I
J
K

TEST TRK.
SD-15343-01 C

IN LOC. TEST CAB. NO.3
NOT IN SAME BLDG.;
TEST TRK. CKT.
INC. & OUT.

CORD
C27
TELEPHONE
D29

TEST TRK.
SD-15438-01 C

IN LOC. TEST CAB. NO.3
IN SAME BLDG.;
TEST TRK. CKT. &
TEL. & TEST CKT.

(CORD) CD
TO PAGE 7

TEST CKT.
FOR SWBD. EQPT.
SD-15174-01 C

VOLTMETER
TEST CKT.
SD-15118-01 C

SEE D29

EMERGENCY
BATTERY
FIG. 5 OR 7
SD-15024-01

EB
TO PAGE 7

LINE JACKS FOR
SUB. LINE OR TRK.

TEST SET CKT.
LOC. TEST CAB. NO. 2
FOR TESTING SUB.
LINES & TRKS.
SD-96002-01 C

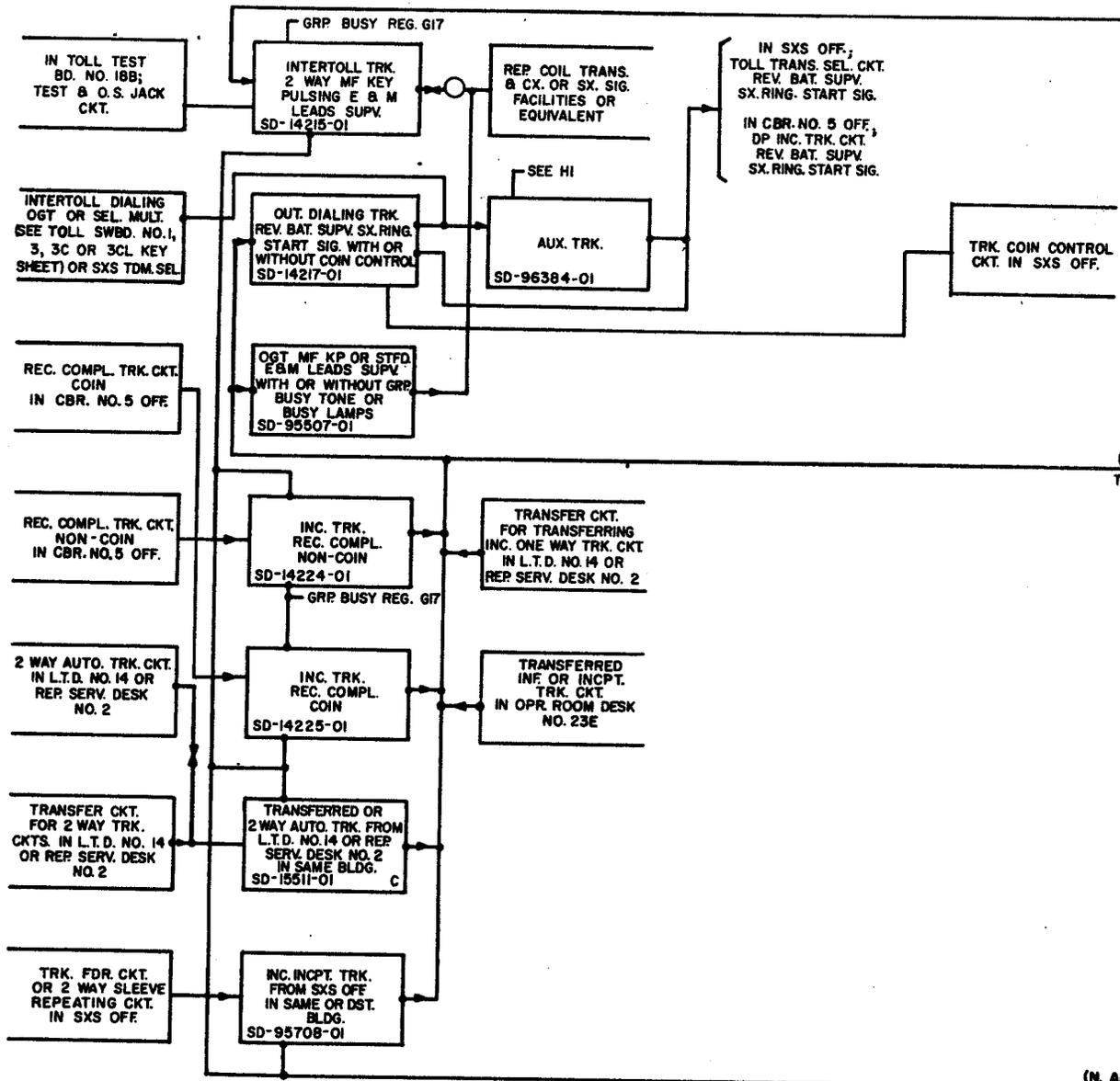
(LINE) LI
TO PAGE 2

AUX. LINE CKT.
FOR PUBLIC EMG.
REPORTING
SD-95661-01 C

302AA SUB. SET
& KS-7340
AUX. REL. SET

J
J
D

A
B
C
D
E
F
G
H
I
J
K



(JACK) JK
TO PAGE 7

(N. ALM) NA
TO PAGE 5

✓
✓
D

**CURRENT DRAIN
AMPERE HOURS PER BUSY HOUR**

CIRCUIT DRAWINGS		SEE NOTE NO.	DRAINS LIST 1 (SEE NOTE 1)				DRAINS LIST 2			
			48V.		24V.		48V.		24V.	
CIRCUIT TITLE	CIRCUIT NO.		BAT.	GRD.	BAT.	GRD.	BAT.	GRD.	BAT.	GRD.
			CONTROL							
TYPE "F" OPR., FOR STFD. TRKS. ONLY	SD-10772-01				.020	.018			.015	.013
TYPE "F" OPR., FOR C.A. OR STFD. & C.A. TRKS.	SD-10772-02				.028	.028			.021	.021
POSITION	SD-15105-01				.400	.350			.300	.264
AUXILIARY	SD-15130-01				.130	.140			.097	.104
CORD & RINGING										
NON-COIN	SD-15281-01		.105	.105			.125	.125		
NON-COIN	SD-15282-01		.105	.105			.125	.125		
NON-COIN	SD-15283-01		.105	.105			.125	.125		
COIN	SD-15284-01		.105	.105			.125	.125		
KEY SET, MF	SD-14203-01	3 4,5	P.016 F.066	F.050	F.116	F.100	F.037	F.028	F.064	F.056
LINE										
TOLL	SD-15173-01		.050	.050			.063	.063		
AUXILIARY COIN	SD-15466-01		.110	.110			.089	.089		
RECORDER, TYPE "G" TRK.										
	SD-12903-01				.430	.430			.637	.637
REGISTER, GROUP BUSY										
	SD-15297-01		.024	.024			.013	.013		
SIGNALING, CX.										
48V.	SD-12134-01		.030	.030	.017	.017	.075	.075	.042	.042
24V.	SD-12134-01		.002	.002	.035	.035	.005	.005	.087	.087
SUPPLY, MF CURRENT										
	SD-95391-01	2,3,4	P.033 F.850	F.850	F1.275	F1.275	P.033 F.470	F.470	F.710	F.710
TELEPHONE										
SUB. OPR.	SD-15024-01		.125	.125			.150	.150		
TRK. OPR.	SD-15221-01		.085	.085			.047	.047		
TRK., INCOMING										
TYPE "F", 4 PTY. SEMI-SEL., TDM. COMPL.										
CX. SIG.	SD-12222-01				.065	.045			.121	.084
24V. LOOP SIG., 48V. TRANS.	SD-12222-01		.037	.037	.070	.044	.069	.069	.130	.082
TYPE "F", 4 PTY. SEMI-SEL., C.A.										
CX. SIG.	SD-12222-02		.014	.014	.095	.071	.026	.026	.177	.132
48V. LOOP SIG., 48V. TRANS.	SD-12222-02		.059	.059	.102	.078	.110	.110	.190	.145
48V. LOOP SIG., 24V. TRANS.	SD-12222-02		.022	.022	.131	.125	.041	.041	.244	.232
TYPE "F", 4 PTY. SEL., TDM. COMPL.										
CX. SIG.	SD-12460-01				.075	.050			.140	.093
48V. LOOP SIG.	SD-12460-01		.003	.003	.100	.080	.006	.006	.186	.149
24V. LOOP SIG.	SD-12460-01				.105	.085			.195	.158
TYPE "F", 4 PTY. SEL., C.A.										
CX. SIG.	SD-12460-02		.014	.014	.076	.056	.026	.026	.141	.104
48V. LOOP SIG., 48V. TRANS.	SD-12460-02		.058	.058	.082	.062	.108	.108	.153	.115
48V. LOOP SIG., 24V. TRANS.	SD-12460-02		.025	.025	.105	.085	.046	.046	.195	.158
TYPE "F", 4 PTY. SEMI-SEL., LOC.										
	SD-12461-01				.117	.090			.173	.133
TYPE "F", 4 PTY. SEL., LOC.										
	SD-12462-01				.129	.096			.160	.117

- NOTES:
- GROUND DRAINS IN LIST I ARE FOR USE WHERE ADDITIONS ARE MADE TO CENTRALIZED FUSE PANELS.
 - PER OSCILLATOR GROUP CIRCUIT.
 - "P" DENOTES 130V. PLATE DRAIN.
 - "F" DENOTES 24V. OR 48V. FILAMENT BAT. & GRD. DRAINS AS SPECIFIED.
 - FILAMENT GRD. IS FROM THE TEL. CIRCUIT.

CURRENT DRAIN
AMPERE HOURS PER BUSY HOUR

CIRCUIT DRAWINGS		SEE NOTE NO.	DRAINS LIST 1 (SEE NOTE 1)				DRAINS LIST 2			
CIRCUIT TITLE	CIRCUIT NO.		48V.		24V.		48V.		24V.	
			BAT.	GRD.	BAT.	GRD.	BAT.	GRD.	BAT.	GRD.
TRUNK, INCOMING (CONTINUED)										
TYPE "F," 4 PTY. SEMI-SEL., TOLL SW.	SD-12668-01		.030	.030	.057	.041	.065	.065	.125	.092
TYPE "F," 4 PTY. SEL., TOLL SW.	SD-12669-01		.036	.036	.061	.043	.080	.080	.135	.095
CA, E, & M LEADS OR REV. BAT. SUPV.	SD-14209-01		.070	.060			.155	.133		
TYPE "G," 4 PTY. SEL.										
CX. SIG.	SD-15096-01				.157	.121			.176	.136
LOOP SIG., 48V. TRANS.										
LOCAL	SD-15096-01		.059	.059	.133	.097	.065	.065	.149	.109
C.A., C.I. OR TDM. COMPL.	SD-15096-01		.079	.079	.133	.097	.087	.087	.149	.109
LOOP SIG., 24V. TRANS.										
LOCAL	SD-15096-01				.179	.143			.200	.159
C.A., C.I. OR TDM. COMPL.	SD-15096-01		.020	.023	.179	.143	.022	.026	.200	.159
TYPE "G," 4 PTY. SEMI-SEL.										
CX. SIG.	SD-15098-01				.172	.136			.191	.151
LOOP SIG., 48V. TRANS.										
LOCAL	SD-15098-01		.059	.059	.148	.112	.065	.065	.164	.124
C.A., C.I. OR TDM. COMPL.	SD-15098-01		.079	.079	.148	.112	.087	.087	.164	.124
LOOP SIG., 24V. TRANS.										
LOCAL	SD-15098-01				.194	.158			.215	.174
C.A., C.I. OR TDM. COMPL.	SD-15098-01		.020	.023	.194	.158	.022	.026	.215	.174
INTERCEPTING										
FROM LOC. OFF., JACK ENDED	SD-15234-01		.028	.028			.070	.070		
FROM COMMUNITY DIAL OFF.	SD-15314-01	2	.058	.058			.143	.143		
FROM LOCAL OFF.	SD-15327-01	2	.056	.035			.139	.088		
FROM MANUAL TDM. OFF.	SD-15327-01	2	.059	.037			.146	.092		
FROM SXS OFF.										
E, M, & F LEADS SUPV.	SD-15333-01	2	.068	.060			.090	.080		
LOOP SUPV.	SD-15333-01	2	.043	.043			.052	.052		
E & M LEADS SUPV.	SD-15333-01	2	.095	.060			.128	.080		
FROM SXS OFF.	SD-15366-01	2	.042	.042			.100	.100		
REC. COMPL. FROM SXS OFF.										
COIN	SD-15370-01	2	.032	.032			.056	.056		
NON-COIN	SD-15370-01	2	.076	.076			.056	.056		
INTERTOLL DIALING										
SD-55259-01	2	.082	.059			.102	.079			
REC. COMPL. FROM CBR. NO. 5 OFF.										
COIN	SD-14225-01	2	.016	.016			.047	.047		
NON-COIN	SD-14224-01	2	.040	.040			.047	.047		
INCPT., FROM SXS OFF										
SD-95708-01	2	.100	.077	.023	.023	.168	.129	.038	.038	

- NOTES:
1. GROUND DRAINS IN LIST 1 ARE FOR USE WHERE ADDITIONS ARE MADE TO CENTRALIZED FUSE PANELS.
 2. ADD THE FOLLOWING BAT. & GRD. DRAINS PER ANS. LAMP TO THE DRAINS OF THE CIRCUIT ON WHICH THE LAMPS ARE FUSED OR GROUNDED: FOR LAMPS C2, K1, 2Y, OR 2U, LIST 1, .002, LIST 2, .004; FOR LAMP 2K, LIST 1, .0005, LIST 2, .001; FOR LAMP 2E, LIST 1, .005, LIST 2, .010.

**CURRENT DRAIN
AMPERE HOURS PER BUSY HOUR**

CIRCUIT DRAWINGS		SEE NOTE NO.	DRAINS LIST 1 (SEE NOTE 1)				DRAINS LIST 2			
			48 V.		24 V.		48 V.		24 V.	
CIRCUIT TITLE	CIRCUIT NO.		BAT.	GRD.	BAT.	GRD.	BAT.	GRD.	BAT.	GRD.
			TRUNK, OUTGOING							
STFD. OR MF. KP	WITHOUT MF. KP PAD	SD-15193-01	.013	.013			.026	.026		
REV. BAT. SUPV.	WITH MF. KP PAD	SD-15193-01	.032	.032			.064	.064		
LONG		SD-15235-01	.021	.021			.053	.053		
DIALING, TO SXS OFF, WITH BUSY LAMPS										
WITH AUX. TRK.										
E, M, & F LEADS SUPV.		SD-15334-01	2,3,4	K.187	K.146		L.209	L.163		
REV. BAT. SUPV.		SD-15334-01	2	K.125	K.088		L.140	L.098		
WITHOUT AUX. TRK.										
E, M, & F LEADS SUPV.		SD-15334-01	2,3,4	C.127	C.130		L.182	L.185		
REV. BAT. SUPV.		SD-15334-01	2	C.076	C.076		L.109	L.109		
DIALING, TO SXS OFF, WITHOUT BUSY LAMPS										
WITH AUX. TRK.										
E, M, & F LEADS SUPV.		SD-15334-01	3,4	.142	.111		.157	.123		
REV. BAT. SUPV.		SD-15334-01		.090	.053		.100	.058		
WITHOUT AUX. TRK.										
E, M, & F LEADS SUPV.		SD-15334-01	3,4	.099	.101		.141	.145		
REV. BAT. SUPV.		SD-15334-01		.048	.048		.069	.069		
DIALING, 4 WIRE, TO SXS OFF.										
WITH BUSY LAMPS										
		SD-15342-01	2	E.081	E.081		L.096	L.096		
WITHOUT BUSY LAMPS										
		SD-15342-01		.048	.048		.066	.056		
TO TOLL TRANS. SEL. IN SXS OFF.										
		SD-15367-01		.034	.064		.075	.075		
TO TOLL OFF, E & M LEADS SUPV.										
WITH CONN. TO INTERTOLL DIALING TRK.										
WITH BUSY LAMPS		SD-15373-01	2	L.278	L.263		L.278	L.263		
WITHOUT BUSY LAMPS		SD-15373-01		.259	.244		.259	.244		
WITHOUT CONN. TO INTERTOLL DIALING TRK.										
WITH BUSY LAMPS		SD-15373-01	2	H.243	H.234		L.303	L.292		
WITHOUT BUSY LAMPS		SD-15373-01		.227	.218		.284	.273		
DIALING, REV. BAT. SUPV., WITH BUSY LAMPS										
WITH AUX. TRK.		SD-14217-01	2	K.120	K.049		L.222	L.100		
WITHOUT AUX. TRK.		SD-14217-01	2	K.098	K.038		L.109	L.043		
DIALING, REV. BAT. SUPV., WITHOUT BUSY LAMPS										
WITH AUX. TRK.		SD-14217-01		.101	.031		.184	.062		
WITHOUT AUX. TRK.		SD-14217-01		.062			.069			
LONG, TO SWBD. NO. 3 OR 3B										
WITH BUSY LAMPS		SD-15433-01	2	H.065	H.065		L.076	L.076		
WITHOUT BUSY LAMPS		SD-15433-01		.048	.048		.056	.056		
STFD. OR MF. KP, E & M LEADS SUPV.		SD-95507-01	2	N.053	N.040		P.152	P.116		

- NOTES:**
- GROUND DRAINS IN LIST 1 ARE FOR USE WHERE ADDITIONS ARE MADE TO CENTRALIZED FUSE PANELS.
 - "A" ADD .010 PER BUSY LAMP.
"C" ADD .012 PER BUSY LAMP.
"E" ADD .014 PER BUSY LAMP.
"H" ADD .016 PER BUSY LAMP.
"K" ADD .018 PER BUSY LAMP.
"L" ADD .020 PER BUSY LAMP.
"N" ADD .008 PER BUSY LAMP.
"P" ADD .022 PER BUSY LAMP.
 - FOR E & M LEADS SUPV. (FIG. 6) ADD THE FOLLOWING TO 48V. BATTERY: LIST 1, .027, LIST 2, .038.
 - WHEN VF TERMINATION IS REQUIRED DURING IDLE CONDITION (FIG. 7) ADD THE FOLLOWING TO 48V. BATTERY: LIST 1, .008, LIST 2, .010.

**CURRENT DRAIN
AMPERE HOURS PER BUSY HOUR**

CIRCUIT DRAWINGS		SEE NOTE NO.	DRAINS LIST 1 (SEE NOTE 1)				DRAINS LIST 2			
CIRCUIT TITLE	CIRCUIT NO.		48 V.		24 V.		48 V.		24 V.	
			BAT.	GRD.	BAT.	GRD.	BAT.	GRD.	BAT.	GRD.
TRUNK, 2 WAY										
RD., INTERTOLL OR RURAL LINE										
WITH BUSY LAMPS	SD-15180-01	2,4	K.031	K.031			L.034	L.034		
WITHOUT BUSY LAMPS	SD-15180-01	4	.013	.013			.014	.014		
TOLL										
WITH BUSY LAMPS	SD-15298-01	2,4	E.079	E.079			L.106	L.106		
WITHOUT BUSY LAMPS	SD-15298-01	4	.064	.064			.086	.086		
OPR. OFF., TO C.D.O., WITH BUSY LAMPS										
WITH AUX. TRK.										
E, M, & F LEADS SUPV.	SD-15333-01	2,3,4	K.216	K.143			L.230	L.150		
LOOP SUPV.	SD-15333-01	2,4	K.176	K.128			L.186	L.136		
WITHOUT AUX. TRK.										
E, M, & F LEADS SUPV.	SD-15333-01	2,3,4	G.174	G.142			L.231	L.189		
LOOP SUPV.	SD-15333-01	2,4	G.099	G.099			L.131	L.131		
OPR. OFF., TO C.D.O., WITHOUT BUSY LAMPS										
WITH AUX. TRK.										
E, M, & F LEADS SUPV.	SD-15333-01	3,4	.177	.123			.187	.130		
LOOP SUPV.	SD-15333-01	4	.157	.102			.165	.106		
WITHOUT AUX. TRK.										
E, M, & F LEADS SUPV.	SD-15333-01	3,4	.143	.127			.191	.169		
LOOP SUPV.	SD-15333-01	4	.083	.083			.110	.110		
TO TOLL OFF., WITH BUSY LAMPS										
WITH FIG. 1	SD-15376-01	2,4	E.139	E.139			L.186	L.186		
WITH FIGS. 1 & C	SD-15376-01	2,4	E.169	E.160			L.226	L.214		
WITH FIGS. 1 & 5	SD-15376-01	2,4	E.210	E.208			L.282	L.280		
WITH FIGS. 1 & 6	SD-15376-01	2,4	E.252	E.240			L.338	L.322		
TO TOLL OFF., WITHOUT BUSY LAMPS										
WITH FIG. 1	SD-15376-01	4	.102	.102			.137	.137		
WITH FIGS. 1 & C	SD-15376-01	4	.131	.123			.176	.165		
WITH FIGS. 1 & 5	SD-15376-01	4	.170	.168			.228	.226		
WITH FIGS. 1 & 6	SD-15376-01	4	.210	.200			.282	.268		
INTERTOLL										
WITH BUSY LAMPS	SD-15396-01	2,4	Y.410	Y.355			L.282	L.194		
WITHOUT BUSY LAMPS	SD-15396-01	4	.382	.327			.263	.175		
AUTOMATIC										
	SD-15447-01	4	.064	.064			.086	.086		
OPR. OFF., TO C.D.O. WITH BRIDGED TOLL STA.										
WITH BUSY LAMPS	SD-15491-01	2,4	N.270	N.238			L.210	L.186		
WITHOUT BUSY LAMPS	SD-15491-01	4	.242	.210			.191	.163		
LONG RD. INTERTOLL, WITH BUSY LAMPS										
WITH SEL. MULT.	SD-15507-01	2,4	R.067	R.067			L.047	L.047		
WITHOUT SEL. MULT.	SD-15507-01	2,4	R.048	R.048			L.034	L.034		
LONG RD. INTERTOLL, WITHOUT BUSY LAMPS										
WITH SEL. MULT.	SD-15507-01	4	.041	.041			.029	.029		
WITHOUT SEL. MULT.	SD-15507-01	4	.020	.020			.014	.014		
INTERTOLL										
WITH BUSY LAMPS	SD-14215-01	2,4	K.170	K.170			L.189	L.192		
WITHOUT BUSY LAMPS	SD-14215-01	4	.152	.156			.169	.173		
TRUNK, MISCELLANEOUS										
AUXILIARY	SD-90599-01		.003	.003	.012	.012	.004	.004	.017	.017

NOTES:

- GROUND DRAINS IN LIST 1 ARE FOR USE WHERE ADDITIONS ARE MADE TO CENTRALIZED FUSE PANELS.
- "E" ADD .014 PER BUSY LAMP.
"G" ADD .015 PER BUSY LAMP.
"K" ADD .018 PER BUSY LAMP.
"L" ADD .019 PER BUSY LAMP.
"N" ADD .024 PER BUSY LAMP.
"R" ADD .027 PER BUSY LAMP.
"Y" ADD .028 PER BUSY LAMP.
- FOR E&M LEADS SUPV. ADD THE FOLLOWING TO 48V. BATTERY: LIST 1, .027, LIST 2, .038.
- ADD THE FOLLOWING BAT. & GRD. DRAINS PER ANS. LAMP TO THE DRAINS OF THE CIRCUIT ON WHICH THE LAMPS ARE FUSED OR GROUNDED: FOR LAMPS C2, K1, 2Y OR 2U, LIST 1, .002, LIST 2, .004; FOR LAMP 2K, LIST 1, .0005, LIST 2, .001; FOR LAMP 2E, LIST 1, .005, LIST 2, .010.

ALARM

Busy Back	SD-15046-01 C18	on Back Cord, 4 Pty. Sel.	
Night Alm. & Observed Off. End of Aux.	SD-15048-01 H18	Non-coin Universal, & Ringing Ckt. Arr. to Ring on Back Cord, 2 Pty.	SD-15284-01 C27
Night Alm.		Sel., 4 Pty. Semi- Sel. or 4 Pty., Sel., Coin	
Night Alm. and Fuse Alm.	SD-15233-01 K16		
Fuse, For 24V., 48V. And Coin Bat., Ring, Current & 60 Cycle 6 Volt	SD-15326-01 D19		
60 Cycle Supply, For 6 Volt Lamps	SD-95005-01 A19	DISTRIBUTING	
Extension, From Dial Off.	SD-95484-01 A18	Milliwatt, With 2A Sending Panel	SD-95000-01 I7
		DOOR OPENING	SD-90085-01 H20
ALARM RECEIVING	SD-95418-01 I19	FLASHING	SD-14148-01 H16
BUSY BACK	SD-15228-01 B17	GROUNDING	
For Use With Cord Ckts. Arr. for Thru Supv.	SD-14163-01 A20	Method of Grounding Framework	SD-12726-01 K20
		GROUPING	
CALCULAGRAPH		Type F Trunk	SD-12629-01 D14
Motor-Driven	SD-95012-01 D18	Type G Trunk	SD-15109-01 E23
CONTROL		INTERRUPTER	
Type F Opr., for Use with Stfd. Trks. Only	SD-10772-01 E14	60 or 120 IPM Rel. Int.	SD-14163-01 A20
Type F Opr., for Use with Call Announcer or Stfd. & C.A. Trks.	SD-10772-02 F14	Relay	SD-15228-01 B17
Coin, Grd. Potential 8 Volts or Less	SD-12960-01 H13	Relay, For Providing Aud. Ring. Tone for Inc. Trks. From SXS Off.	SD-15430-01 B20
Coin, Grd. Potential More than 8 Volts Position	SD-15086-01 H13		
Aux., Arr. to Permit Operation of F-SF & F-CA Trks. With Type G Pos. Cont. Ckt.	SD-15105-01 D24 SD-15130-01 E24	JACK	
Line Load, & Bat. Supply Switching	SD-15451-01 C4	Battery & Grd. Supply for P.C.I. Trk. & Recorder Test Set Hold & Test, for Pro- viding Intertoll Trk. Termination Jack, Lamp & Key	SD-15014-01 G18 SD-63377-01 D17 SD-15441-01 C26
		KEY SET	
CORD		MF	SD-14203-01 C28
Dial	SD-15024-01 E29	LEADS	
Universal, & Ring- ing Ckt. Not Arr. to Ring on Back Cord, 2 Pty. Sel. or 4 Pty. Semi-Sel. Non-Coin	SD-15281-01 C27	A-C Ringing Sup. Ringing Ringing, for Supply- ing Ringing Current to PBX's and Sta. Eqpts.	SD-10701-01 C13 SD-10702-01 C13 SD-95667-01 E18
Universal, & Ring- ing Ckt. Arr. to Ring on Back Cord, 2 Pty. Sel. or 4 Pty. Semi- Sel. Non-Coin	SD-15282-01 C27	LINE	
Universal, & Ring- ing Ckt. Not Arr. to Ring	SD-15283-01 C27	Long Sub., Without Line Relay Sub., With Line Relay	SD-12287-01 B1 SD-15021-01 B3 SD-15021-02 B2

Rural, With Line Drop Toll, With Line Drop & With Busy Lamps	SD-15022-01 C3 SD-15173-01 A3	TELEPHONE	
Rural, With Line Lamps Free	SD-15180-01 D3 SD-15267-01 J18	Sub. Operator's Service Assistant's Trunk Operator's Service Ass't., for Use at Trk. Positions or In Lineup Which Includes Trk. Pos.	SD-15024-01 D29 SD-15170-01 A2 SD-15221-01 C14 SD-15429-01 F17
Test, For One Way Transmission Testing With Auto. Disconnect Sig.	SD-15465-01 I6		
Aux., for Extending the Coin or Coin & Sr. Range of Coin Lines	SD-15466-01 C1	TEST	
Aux., for Public Emg. Reporting	SD-95661-01 H32	Voltmeter Swbd. Eqpt.	SD-15118-01 G32 SD-15174-01 D32
Test, for One Way Trans. Testing	SD-96000-01 I8	TEST SET	
Aux., With Auto. Cut Off, Main & Extension Stations on Separate Loops	SD-96468-01 C2	P.C.I. Trk. and Recorder Jack, For Testing 49, 92, 141 & 218 Type Jacks Local Test Cabinet No. 2 for Testing Sub. Lines & Trks.	SD-15132-01 G19 SD-95056-01 F20 SD-96002-01 G32
RECALL		TONE	
Audible, for Modifying Cord & Tel. Ckts.	SD-96020-01 D28	High Low	SD-15227-01 E19 SD-15229-01 C19
RECORDER		TRUNK APPLIQUE	SD-15099-01 D23
Ans. Time, Concentrat- ing, Time Control, Test & Interrupter Type G Trunk	SD-96275-01 B19 SD-12903-01 C24	TRUNK	
REGISTER		<u>Incoming</u>	
Group Busy	SD-15297-01 G17	Type F, Tdm. Compl., 4 Pty. Semi-Sel.	SD-12222-01 D12
REORDER		Type F, Call Announcer, 4 Pty. Semi-Sel.	SD-12222-02 F12
For Use With Cord Ckts. Arr. for Thru Supv. For Type F & G Trk. Eqpt.	SD-14163-01 A20 SD-15228-01 B17	Type F, Tdm. Compl., 4 Pty. Sel.	SD-12460-01 C12
REPEATING COIL GROUP	SD-95022-01 E2	Type F, Call Announcer, 4 Pty. Sel.	SD-12460-02 E12
RINGING		Type F, Loc. Inc., 4 Pty. Semi-Sel.	SD-12461-01 B12
Position	SD-10886-01 B13	Type F, Loc. Inc., 4 Pty. Sel.	SD-12462-01 A12
SIGNALING		Type F, Toll Sw., 4 Pty. Semi-Sel.	SD-12668-01 H12
CX	SD-12134-01 C11	Type F, Toll Sw., 4 Pty. Sel.	SD-12669-01 G12
CX Phantom Group	SD-90598-01 I12	Call Announcer, Rev. Bat. or E & M Leads Supv.	SD-14209-01 H3
SUPPLY		Rec. Compl., From CBR No. 5 Off., Non-Coin	SD-14224-01 D37
Emergency Battery Bat. & Grd. Supply for Lineman's Hand Set & Ringing Supply for Test- ing Defective Cables	SD-15024-01 F32 SD-90048-01 E17	Rec. Compl., From CBR. No. 5 Off., Coin	SD-14225-01 E37
PBX Battery	SD-90232-01 F18	Type G, Local Inc., 4 Pty. Sel.	SD-15096-01 A22
MF Current, & Distribution	SD-95391-01 B28	Type G, Tdm. Compl., 4 Pty. Sel.	SD-15096-01 C22
		Type G, Call Announcer, 4 Pty. Sel.	SD-15096-01 E22
		Type G, Call Indicator, 4 Pty. Sel.	SD-15096-01 G22

TRUNK

MFKP or Stfd., with or without Group Busy Tone or Busy Lamps

SD-95507-01 C37

Incoming (Cont'd.)

Type G, Local Inc., 4 Pty. Semi-Sel. SD-15098-01 B22
 Type G, Tdm. Compl., 4 Pty. Semi-Sel. SD-15098-01 D22
 Type G, Call Announcer, 4 Pty. Semi-Sel. SD-15098-01 F22
 Type G, Call Indicator, 4 Pty. Semi-Sel. SD-15098-01 H22
 Incpt. From Trk. Position From Local Off., Jack Ended SD-15222-01 H4
 SD-15234-01 I4
 From 355A Dial Off. Sel. Levels SD-15314-01 I9
 From Man. Local or Tdm. Off., Rev. Bat., High Low or E, M & F Leads Supv. SD-15327-01 F3
 Operator Off., Tip & Ring Dial Cord Dialing, High Low Rev. Bat., E, M & F or E & M Leads Supv. SD-15333-01 I2
 From SXS Off., with Charge Key & Lamp SD-15366-01 J7
 Rec. Compl., from SXS Off., Coin or Non-Coin SD-15370-01 F7
 From Intertoll Sel. or Intertoll Trk. Ckt. SD-55259-01 E9
 Incpt., from SXS Off. in Same or Dst. Bldg. SD-95708-01 G37

2 Way

Intertoll, MFKP, E & M Leads Supv. SD-14215-01 A37
 Ringdown or Intertoll, With Line Drop SD-15022-01 C3
 Ringdown or Intertoll, With Line Lamps SD-15180-01 D3
 Toll, to Local Man. SD-15298-01 K5
 Tributary Off., Dialing, to SXS Off., E & M or E, M & F Leads or Rev. Bat. Supv. SD-15333-01 I2
 Operator Off., Tip & Ring Dial Cord Dialing, High Low Rev. Bat., E, M & F or E & M Leads Supv. SD-15376-01 C7
 To Toll, Arr, for Thru Supv., Selective Signaling & Charge Key, Also Plug Supv., High Low Rev. Bat. or E, M & F Leads Supv. SD-15396-01 A7
 Intertoll Dial, E & M Leads Supv. SD-15447-01 J9
 Auto., 2 Wire to Man. Swbd. SD-15491-01 D7
 Cpr. Off., SX Supv. With Bridged Toll Stations, Dial Cord Dialing SD-15507-01 E3
 Long Ringdown Intertoll, With or Without A-C or D-C Busy Lamps SD-15511-01 F37
 Auto. From L.T.D. No. 14 or Rep. Serv. Desk No. 2 in Same Bldg.

Outgoing

Dialing, Rev. Bat. Supv., SX Ringing Start Sig., with or without Coin Control SD-14217-01 B37
 Stfd. or MFKP, Rev. Bat. Supv., with Rep. Coil or Bridged Impedance Trans. SD-15193-01 E4
 Long, High Low Supv., With or Without Busy Lamps SD-15235-01 J4
 Dialing, to SXS Off., E&M or E, M & F Leads or Rev. Bat. Supv. SD-15334-01 H2
 To Toll Inc. Sel., 4 Wire, Controlled Ringing SD-15342-01 F4
 Dialing, to Loop Dialing Toll Train in SXS Off., 20 Cycle or no Ringing Start Sig., With or Without Coin Control SD-15367-01 G7
 Dialing, to Coin Cont. Sel. in SXS Off. SD-15369-01 H7
 To Toll Office for Use with Intertoll Dialing, Dial Cord Dialing, E & M Leads Supv. SD-15373-01 E7
 Long, to Swbd. No. 3 or 3B, Arr. for Re-ring SD-15433-01 K7

Miscellaneous

Interposition Test, From Local Test Cabinet No. 3 Not In Same Building SD-15165-01 G4
 SD-15343-01 A32
 Test, From Local Test Cabinet No. 3 in Same Building SD-15438-01 C32
 Interposition, for Use As Rural or Incpt. Trk. From Inter-Office, Tdm. Compl. or Toll Sw. Trk. Pos. SD-15444-01 H9
 Transferred, from L.T.D. No. 14 or Rep. Serv. Desk No. 2 in Same Bldg. SD-15511-01 F37
 Trk. Aux. for Use With Toll Sw. Trks. SD-90599-01 I13
 Aux., Connects to Out. or Opr. Off. Trk. & Trk. from Intertoll or SXS Tdm. SD-96384-01 H1

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