SD-1C245-01

SHEET INDEX

CONTENTS	SHEET NO.	ISSUE NO. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
SHEET INDEX SUPPORTING INFORMATION	A1	1	2	3	4	5	6	7	8	9	10	11														
FS 1 4-WIRE BRIDGE AND AMPLIFIER ARRANGED FOR TALKBACK	B1	1	2	3	4	5	5	5	5	5	5	11														
FS 2 TALK BATTERY FEED WITH OR WITHOUT PICKUP FS 3 TALK BATTERY FEED WITHOUT PICKUP	B2	1	2	3	4	5	5	7	7	7	10	11														
FS 4 SUPPLEMENTARY TALK BATTERY FEED WITH OR WITHOUT PICKUP FS 5 SUPPLEMENTARY TALK BATTERY FEED WITHOUT PICKUP	B3	1	2	3	4	5	5	7	7	7	10	11														
FS 6 SIGNAL RECEIVER FS 7 SUPPLEMENTARY SIGNAL DETECTOR	B4	1	2	3	3	5	5	7	7	7	7	11														
FS 9 TOUCH-TONE RECEIVER AND DECODER	B5	1	2	2	4	5	5	5	5	5	5	11														
FS 9 CALL-RECALL-ALERT CKT FS 10 PRE-EMPT CKT	B6	1	2	3	4	5	5	7	7	9	9	11														
FS 11 4-WIRE BRIDGE AND AMPLIFIER	B7	1	1	3	3	5	5	5	5	5	5	5														
FS 12 4-WIRE LINE CONNECT CKT	B8	1	1	3	3	5	5	7	7	7	10	10														
FS 13 JACK CKT FS 14 DIAL & NETWORK CKT FS 15 HANDSET CKT FS 16 HANDSET CKT FS 17 BUZZER CKT FS 18 LAMP CKT FS 19 TEL SET CKT	B9	1	2	3	4	5	5	7	7	7	10	11														
FS 20 OUTDOOR HANDSET CKT FS 21 LOUDSPEAKER CKT FS 22 HORN CKT FS 23 BUZZER OR BELL FS 24 VISUAL INDICATOR FS 25 KEY FS 26 JACK CKT	B10	1	2	2	4	5	5	7	7	7	10	11														
FS 27 LINE PICKUP KEYS	B11	-	-	-	4	4	4	7	7	7	7	11														
FS 28 4 WIRE BRIDGE AND AMPLIFIER ARRANGED FOR LOOP-BACK	B12	-	-	-	-	5	5	7	7	7	7	7														
FS 29 4 WIRE LINE CONNECT CKT ARRANGED FOR DIALED CUT-THRU	B13	-	-	-	-	5	5	7	7	7	10	10														
FS 30 SIGNALING AMPLIFIER CKT FS 31 SUPPLEMENTARY SIGNAL DETECTOR WITH INHIBIT CKT	B14	-	-	-	-	5	5	5	5	5	10	11														
FS 32 TOUCH-TONE RECEIVER INHIBIT CKT FS 33 OUTDOOR HANDSET CKT	B15											11														
APP FIG. 1-17	C1	1	1	1	1	5	5	7	7	7	7	7														
APP FIG. 18-21	C2	1	1	3	4	5	5	5	5	5	10	10														
APP FIG. 22-32	C3	-	-	-	4	5	5	7	7	7	7	11														
APP FIG. 33,34	C4	-	-	-	4	4	4	7	7	7	10	11														
APP FIG. 36-45	C5	-	-	-	-	5	5	7	7	7	7	11														
CIRCUIT NOTES	D1	1	2	3	4	5	5	7	7	7	10	11														
	D2	1	2	3	3	5	5	7	7	7	10	11														
EQUIPMENT NOTES	D3	1	2	2	4	5	5	7	8	8	8	11														
INFORMATION NOTES	D4	-	-	-	4	4	4	4	4	4	4	4														

CONTENTS	SHEET NO.	ISSUE NO. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
CAD 1-3	G1	1	2	3	4	5	5	7	7	7	10	11														
CAD 4	G2	1	2	3	4	5	5	7	7	7	10	11														
CAD 5	G3	1	2	3	4	5	5	7	7	7	7	11														
	G4	1	2	3	4	5	5	7	7	7	10	11														
CAD 6-14	G5	-	-	-	4	5	5	7	7	7	10	11														
CAD 15-19	G6	-	-	-	4	5	5	7	7	7	7	11														
CAD 20	G7	-	-	-	-	5	5	7	7	7	10	11														
	G8	-	-	-	-	5	5	7	7	7	7	11														
CAD 21, 22	G9	-	-	-	-	5	5	7	7	7	10	11														
	G10	-	-	-	-	5	5	7	7	7	10	11														
CAD 23	G11	-	-	-	-	-	-	7	7	7	10	11														
CAD 24,25	G12	-	-	-	-	-	-	7	7	7	7	11														
	G13	-	-	-	-	-	-	7	7	7	10	11														
BD1 SINGLE SIGNAL CODE ONE DIGIT OR TWO DIGIT	H1	1	2	2	4	5	5	7	7	7	7	11														
BD2 SINGLE CODE ONE DIGIT OR TWO DIGIT	H2	1	2	2	4	5	5	7	7	7	7	11														
BD3 (M) 2 DIGIT, OR; (X) 3 DIGIT, SIGNAL CODE UP TO 5 CODES PER LOCATION	H3	1	2	2	4	5	5	7	7	7	7	11														
BD4 (M) 2 DIGIT, OR; (X) 3 DIGIT, SIGNAL CODE COMMON TTR FOR TWO ORDER CKTS J993400	H4	-	-	-	-	5	6	7	7	7	7	11														
BD5 (M) 2 DIGIT, OR; (X) 3 DIGIT, SIGNAL CODE COMMON TTR FOR TWO ORDER CKTS DIALED CUT-THRU J993406E.	H5	-	-	-	-	5	6	7	7	7	7	11														
CPS 1 4 WAY - 4 WIRE BRIDGE CKT	J1	1	1	1	4	4	4	4	4	4	10	10														
CPS 2 DUAL AMPLIFIER CKT	J2	1	1	1	4	4	4	4	4	4	10	10														
CPS 3 SIGNAL RECEIVER	J3A	1	2	2	2	2	2	7	7	7	10	10														
	J3B	1	1	1	4	4	4	7	7	7	10	10														
CPS 4 SUPPLEMENTARY SIGNAL DETECTOR	J4	1	2	2	4	4	4	7	7	7	10	10														
CPS 5 PART OF DECODER	J5	1	2	2	4	4	4	4	4	4	10	10														
CPS 6 PART OF DECODER	J6A	1	2	2	2	2	2	2	2	2	10	10														
	J6B	1	2	2	4	4	4	4	4	4	10	10														
CPS 7 PART OF DECODER	J7A	1	2	2	2	2	2	2	2	2	10	10														
	J7B	1	2	2	4	4	4	4	4	4	4	4														
CPS 8 TO 11 TALK BATTERY FEED CIRCUIT	J8	1	1	3	4	5	5	7	7	7	10	10														
CPS 12 PRE-EMPT CIRCUIT	J9	1	1	1	4	4	4	7	7	7	10	11														
CPS 13 CALL-RECALL-ALERT CIRCUIT	J10	1	2	2	4	4	4	7	7	7	7	7														
CPS 14 LINE CUT CIRCUIT	J11	1	2	2	2	2	2	7	7	7	10	10														
CPS 15 CALL-RECALL-ALERT CKT WITH TIMED LOCKUP	J12	-	-	-	-	-	-	7	7	9	9	9														
CPS 16 SUPPLEMENTARY SIGNAL DETECTOR AND INHIBIT	J13A											11														
	J13B											11														

DWG ISSUE	CD ISSUE	DATE ISSUED	DESIGN	APPD
1	1	3-15-68	DS RFB	HBA WPK LJH
2A	1 APP 1A	9-9-68	DS JCB	HBA WPK GF
3A	2A	2-4-69	LW JCB	DWB DYM DLV
4B	2A APP 1B	2-4-69	LW JCB	DWB DYM DLV
5B	3B	8-5-70	REW JCB	DWB DYM DLV
6A	3B APP 1A	12-2-71	JBL JCB	LJH DYM DLV
7B	3B APP 2B	12-21-71	CDT JCB	LJH DYM DLV
8D	3B APP 3D	9-27-72	LWB	LJH DYM DLV
9A	3B APP 4A	8-17-73	AD GJS	LJH DYM DLV
10B	3B APP 5B	8-17-73	AD GJS	LJH DYM DLV
11B	3B APPX 6B	11-6-75	LEN —	LJH DYM DLV

SHEET INDEX NOTES

1. WHEN CHANGES ARE MADE IN THIS DRAWING, ONLY THOSE SHEETS AFFECTED WILL BE REISSUED.
2. THIS SHEET INDEX WILL BE REISSUED AND BROUGHT UP TO DATE EACH TIME ANY SHEET OF THE DRAWING IS REISSUED, OR A NEW SHEET IS ADDED.
3. THE ISSUE NUMBER ASSIGNED TO A CHANGED OR NEW SHEET WILL BE THE SAME ISSUE NUMBER AS THAT OF THE SHEET INDEX.
4. SHEETS THAT ARE NOT CHANGED WILL RETAIN THEIR EXISTING ISSUE NUMBER.
5. THE LAST ISSUE NUMBER OF THE SHEET INDEX IS RECOGNIZED AS THE LATEST ISSUE NUMBER OF THE DRAWING AS A WHOLE.

SUPPORTING INFORMATION

CATEGORY	NO.
EQUIPMENT DRAWING	J99340A J99340B J99340C J99340D J99340E E0-1C385-( )
EQUIPMENT DESIGN REQT	J99340 (801-026-155)
MAINTENANCE REQUIREMENTS	

ISSUE 11B

SD-1C245-01 1999

AT&TCO STANDARD

COMMON SYSTEMS
GENERAL PURPOSE 4-WIRE ORDER CIRCUIT
(GEN PURP OW)

SD-1C245-01-A1
60 SHEETS

BELL TELEPHONE LABORATORIES INCORPORATED

65

SD-1C245-01-A1

FS 1

4-WIRE BRIDGE AND AMPLIFIER ARRANGED FOR TALK BACK

BG1
BG2

CA-2
0-W CKT-2
BR-W CKT-1

CA-3
B-W 2
G-W 1

1F3

(13,15) J1 (-17)
LINE 1 BG( )2
OUT IN

27 600

3dB PAD

4 WAY 4 WIRE BRIDGE CKT
① BG( )
CP1

600

5dB PAD

SEE NOTES 105 & 206

(13,15) J4 (-11)
BG( )1 LINE 2
OUT IN

4-WAY-4-WIRE BRIDGE

(13,15) J3 (-14)
BG( )1 LINE 2
IN OUT

(12,-38)

(18,38)

TO
⑪ 7H2
OR
⑪ 88A OF CONN ORDER CKT
OR
⑪ 4-WIRE
LINE
FACILITY
OR
TERMINATE
IN 600 OHMS
SEE NOTES
104, 105, & 206

TO 4-WIRE LINE FACILITY SEE NOTE 104

(13,15) J2 (-16)
LINE 1 BG( )2
IN OUT

5dB PAD

3dB PAD

600

33 SEE NOTES 105 & 206

SEE NOTES 105 & 106

TO
19C1 OF 1ST FS 1 &
19D0 OF 2ND FS 1
OR
TERMINATE IN
600 OHMS
SEE NOTES 105
& 206

1A2

DUAL AMPLIFIER CKT
① BUS AMPL( )
CP 2

TP6
TP2
TP1
TP9
TP12
TP14
TP10
TP8

CABLE 3 SLW + STRAP TO 2

(13,15) J5 (-16)
BUS( )T AMPL( )
OUT IN

2C0, 2C5, OR GC9

(13,15) J6 (-17)
R AMPL( ) BUS( )
OUT IN

400 OR 500 OR 15C4

200 OR 205

CA-2
0-W CKT-2
BR-W CKT-1

CA-3
B-W 2
G-W 1

TO OOCAT

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-81

BELL TELEPHONE LABORATORIES INCORPORATED

SD-1C245-01-81

② FS2

TALK BATTERY FEED WITH OR WITHOUT PICKUP

③ FS3 (MFR DISC)

TALK BATTERY FEED WITHOUT PICKUP

TALK BATTERY FEED CKT
BAT. FEED
CP9

TALK BATTERY FEED CKT
BAT. FEED
CP8

TO MAX 4 FS4 AND/OR FS5

380 OR 385

-1,10,37 4 WIRE LINE FACILITY SEE NOTE 104

(1) 1H0 OR (10) 6C9 OR (37) 12H0

-1,37 4CO

(1) 1H5 OR (37) 12H5

300 OR 305

9C5 OR 9E7

SEE NOTE 118

SEE NOTE 116

980, 900, 1080, 1586 AS REQD

SEE NOTES 116 & 118

940, 987, 9E0, 9E7, 1080, 10F0, 1586 AS REQD

SEE NOTE 119

1083 SEE NOTES 106 & 202 (SPKR CUTOFF)

11A4

9C0, 900

9A0, 9C7, 907, 9F0, 10F0 SEE NOTE 130

SEE NOTE 116

6C1 SEE NOTE 113

CA-3

CA-2

CA-2

K1 K2 K3 K4 K5

TP1 TP8 TP9 TP12 TP13 TP14

3.01

600

82.5

-24

9,41

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-B2

BELL TELEPHONE LABORATORIES INCORPORATED

6S

④ FS 4

SUPPLEMENTARY TALK BATTERY FEED WITH OR WITHOUT PICKUP

TALK BATTERY FEED CKT
SUPL BAT. FEED
CP11

280 OR 285 — TR 22 — TT 3 — P

600 Ω — K1

600 Ω — NC — K2

K4 — 6 — 85 — 82.5 Ω — -24

K5 — 6 — 85 — 82.5 Ω — -24

TP1 — TP9

SEE NOTE 118 — 7 R — 32 T — P — 9C5 OR 9E7

SEE NOTE 116 — 21 TR — 23 TT — P — 9B0, 9D0 AS REQ'D

SEE NOTES 116 & 118 — 19 RT — 33 RR — P — 9A0, 9B7, 9E0, 9E7, 10F0 AS REQ'D

SEE NOTE 119 — 18 T — 15 R — P — 10B3 SEE NOTES 106 & 202 (SPKR, NO CUTOFF)

SEE NOTE 118 — 10 P R — 13 T — 11A4

29 P TRI — 30 TTI — 9C0, 9D0

9 RTI — 8 P RRI — 9A0, 9C7, 9D7, 9F0, 10F0 SEE NOTE 130

SEE NOTE 116

SEE NOTE 119 — 39 P T — 40 R — 10B3 SEE NOTES 106 & 202 (SPKR, CUTOFF)

24 — K2 — 25 — SEE NOTES 106 & 202 — SEE NOTE 119

K2 — 6 — 26 — P — 10B3 (SPKR CUTOFF) SEE NOTES 106 & 202

4 CR — K2 — 5 CRG — 9C1 SEE NOTE 113

K1 — 37 — 36 — (9,41)

RT 17 — RR 34 — P — 260 OR 265

K1 L U K4 — -24

K2 L U 590 K5 — -24

1184 A — 27 — K3 U L — -24

B — 20 — TP14

-24 — B 14 — TP8 — -24

K3

K1

③ FS 5 (MFR DISC)

SUPPLEMENTARY TALK BATTERY FEED WITHOUT PICKUP

TALK BATTERY FEED CKT
SUPL BAT. FEED
CP10

280 OR 285 — TR 22 — TT 3 — P

600 Ω — K1

600 Ω — NC — K2

K4 — 6 — 85 — 82.5 Ω — -24

K5 — 6 — 85 — 82.5 Ω — -24

TP1 — TP9 — TP12 — TP13

SEE NOTE 118 — 7 R — 32 T — P — 9C5 OR 9E7

SEE NOTE 116 — 21 TR — 23 TT — P — 9B0, 9D0 AS REQ'D.

SEE NOTES 116 & 118 — 19 RT — 33 RR — P — 9A0, 9B7, 9E0, 9E7, 10F0 AS REQ'D

SEE NOTE 119 — 18 T — 15 R — P — 10B3 SEE NOTES 106 & 202 (SPKR, NO CUTOFF)

10B3 SEE NOTES 106 & 202 (SPKR CUTOFF) — 39 P T — 40 R

24 — SEE NOTES 106 & 202 — K2 — 25 — SEE NOTE 119

K2 — 6 — 26 — P — 10B3 SEE NOTES 106 & 202 (SPKR CUTOFF)

4 CR — K2 — 5 CR5 — 9C1 SEE NOTE 113

K1 — 37 — 36 — (9)

RT 17 — RR 34 — P — 260 OR 265

K1 L U K4 — -24

K2 L U K5 — -24

TP14 — TP8 — -24

E0 — B — 14 — -24

K1

K2

DRAWING ISSUE
1
2A
3A
4B
5B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-B3

BELL TELEPHONE LABORATORIES INCORPORATED

65

SD-1C245-01-B3

FS 6
SIGNAL RECEIVER

SIGNAL RECEIVER
SIG RCVR
CP3

SEE NOTES 107 & 203

1 1HS OR 37 12HS
T, R, P, 22, 23
200 & 4 WIRE FACILITY OR 205 & 4 WIRE FACILITY SEE NOTE 109
-1-37, R1, T1

INPUT AMPL
TP9
BEF FILTERS
LOW GROUP LIMITER
HIGH GROUP LIMITER
LC( ) TUNED CKT
HC( ) TUNED CKT
TP6, TP1, -24, 20, 14, C, -24
21, 33, HC, LC, 4E3 OR 148A
36, 39, 40, 13, 10, 29, 11, 8, 42, 9
24, 26, 27, 1, 4, 5, 3, 2, 6
32, 30

TP12, TP11, TP7, TP10
L DET
BIAS
H DET
TP13
K1

K1 34, 15, 17, 19, 16, 18, 35, 37, 7
D 4H7 OR 148B
AS
E 4FT SEE NOTE 106
F 148
LB 9E4, 954, 11C4 AS REQD
C TO OFFICE ALM CKTS AS REQD SEE NOTE 109
D
A -78-43A 30R-41 6A0 OR
B -78-43B-98R-41 TO OFFICE ALM CKTS SEE NOTE 109
-78-43B-98R-41
SEE NOTE 117
7, 43
C B A 4H7 OR 148B

SEE NOTES 107 & 203

FS 7
SUPPLEMENTARY SIGNAL DETECTOR

4D3
HC, LC
SEE NOTES 108 & 204
2, 17, 38, 34, 36, 35, 16, 37, 33, 32, 12, 13, 15, 18

SUPPLEMENTARY SIGNAL DETECTOR
SUPL S DET
CP4

LC( ) TUNED CKT
L4 TUNED CKT
H3 TUNED CKT
HC( ) TUNED CKT
TP10
TP8
TP4
TP1
TP7
BIAS
BIAS
TP3
L DET
L4 DET
H3 DET
H DET
TIMER
TP12
TP11
K1
40 F 488 SEE NOTE 126
39 AS
31 E
29 A (9,41) 6B0 OR (9,41) TO OFFICE ALM CKTS
28 B SEE NOTE 109
10 C TO OFFICE ALM CKTS AS REQ'D
27 D SEE NOTE 109
11 LB 9E4, 964, 11D4 AS REQ'D
26
21 C
22 B
1 A 4D7
30 D 488
(9,41)
SEE NOTE 117

-24, TP3, TP6, 20, C, 14, -24
7, 8, 9, 5, 4, 3, 23, 6, 24, 25
SEE NOTES 108 & 204

DRAWING ISSUE 1, 2A, 3H, 5B

ISSUE 11B

GENERAL PURPOSE --WIRE ORDER CIRCUIT (2)
SD-IC245-01-B4
BELL TELEPHONE LABORATORIES INCORPORATED
6S

SD-IC245-01-B4

(8)

FS 8

TOUCH TONE (R) RECEIVER AND DECODER

PART OF DECODER DECODER CP6

PART OF DECODER DECODER CP7

PART OF DECODER DECODER CP5

1ST DIGIT CONN AS REQD SEE NOTES 110 & 205

MIDDLE DIGIT (OF 3 DIGIT CODE) CONN AS REQD SEE NOTES 110 & 208

TOUCH-TONE (R) RECEIVER TTR SEE NOTES 121 & 208

INTER FACE GATE

TIMER

6BS OR 1580

6BI SEE NOTES 110 & 205

6BI OR 1386 SEE NOTES 110, 123 & 205

1H5 OR 1402 OR 1504

DRAWING ISSUE: 1, 2A, 4B, 5B

11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-IC245-01-B5

BELL TELEPHONE LABORATORIES (INCORPORATED) 6S

SD-IC245-01-B5

FS 9
CALL-RECALL-ALERT CKT

CALL-RECALL-ALERT CKT
CALL-RECALL
(9) CP13 (MFR DISC)

CALL-RECALL-ALERT CKT
WITH TIMED LOCK-UP
CALL-RECALL
(H) CP15

FS 31 — K1 CP16 HD8

FS 6 — K1 CP3 4C8

FS 7 — K1 CP4 4F7

FS 8 — RG 5C9, RG 5D6

5C( )

+24 AA (2) (Y) 6FA OF 1ST FS9

-24 (2) (Y)

2H4, 2F9, 3H4, 3F9 AS REQD SEE NOTE 119

6E9

TP12 K1 U L
TP13
TP2 K2 U L
TP3
TP5 K3 U L
TP14 K4 U L
K7 K2 K1
K4 (9) K5 (41) K9
K9 U L
TP9 K1 K3 K5 U L
K2 (9), K5 (41) K9 K8
TP6 K1 K3 K6 U L
K2 K6 K3 K8
TP1 (9) K5 (41) K9 K1 K7 U L
K7 K8

-24

TO OTHER FS9 IN SAME CKT

TO OFFICE ALM CKT SEE NOTE 112

6 ATN — 40, 22

K8 U L

K4 K9 K6 — TIMER

35 (41)

475 C1 25

TP8 TP10 -24

20 D, 14 D -24

K4 19 H — 1086 SEE NOTE 111
K4 18 D
K4 13 C1 — TO OFFICE ALM CKTS AS REQD SEE NOTE 111
K4 16 D1
K4 12 A1 — TO OFFICE ALM CKTS AS REQD SEE NOTE 111
K4 15 B1
K5 29 — SEE NOTE 117
K5 8 LB — 9E4, 9G4, 11E4 AS REQD
K5 11 A
K5 30
K5 7 C — TO OFFICE ALM CKT AS REQD SEE NOTE 109
K5 10 D
K5 31 P A
K5 32 B
K6 1
K6 6
K6 28 A
K6 3
K6 5
K6 2
K6 4
K2 21 E — 6B1 OF 2ND-5TH FS9 (SEE NOTE 128)
K8 33 L3 — SEE NOTE 112
K8 34 L63
K8 23 D -24

32 A B1Y
9 B B2Y
1 C B3Y
10 D B4BK

CA-2 5-2W

FS 10 (A & M ONLY)
PRE-EMPT CKT

PRE-EMPT CKT
PRE-EMPT
CP12

TP4 24
TP13
5D6 P̄ 33 — S FF 1, C 0
5C6 STR 40
TP14
L — RG — K1 — +24
HBB — TIMER — TP12 L

26 — K1 5 T1
600
1 P T1 R1 — 2C0 OR 2C5 — 1H0
4
30 — K1 7 R1
9
K1 12
16
10
K1 13
18
11 — SEE NOTE 117 — L 108J
K1 15 A
19
9 P — TO ALL FS9
8 PR — 6D1
K1 3

TP11 +24 — TP9 -24 — TP10
20 AA (2) E
17 +24
14 -24

9-12 B1Y
9-15 B2Y
7-13 B3BK
18-16 B4BK

DRAWING ISSUE
1
2A
3A
4B
5B

ISSUE 118

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT
SD-1C245-01-86
BELL TELEPHONE LABORATORIES INCORPORATED
UNIT 6S

SD-1C245-01-86

FS II
4-WIRE BRIDGE AND AMPLIFIER

TO 8BO (12) SEE NOTE 120 OR TERMINATE IN 600 OHMS SEE NOTES 105 & 206

(14,14) J11 (+9) LINE 5 BG23 OUT IN

(14,18) J12 (-11) LINE 5 BG23 IN OUT

SEE NOTE 105

(14,14) J7 (+7) LINE 3 BG22 OUT IN

4 WAY 4 WIRE BRIDGE CKT BG( ) CP1

3 dB PAD

5 dB PAD

(14,16) J10 (-11) BG21 LINE 4 OUT IN

(14,16) J9 (+4) BG21 LINE 4 IN OUT

4 WAY 4-WIRE BRIDGE

TO 4-WIRE LINE FACILITY SEE NOTES 104, 105 & 206

8BO WHEN REQD SEE NOTE 120

TO 8BG OF CONNECTING ORDER CKT OR 4-WIRE LINE FACILITY OR TERMINATE IN 600 OHMS SEE NOTES 104, 105 & 206

(14,16) J8 (-16) LINE 3 BG22 IN OUT

DUAL AMPLIFIER CKT LINE 2 AMPL TP6 CP2

TP6 TP2 TP1 TP9 TP14 TP12 TP10 TP8

-24

IDG OR 12A1

DRAWING ISSUE 1

3A

5B

5

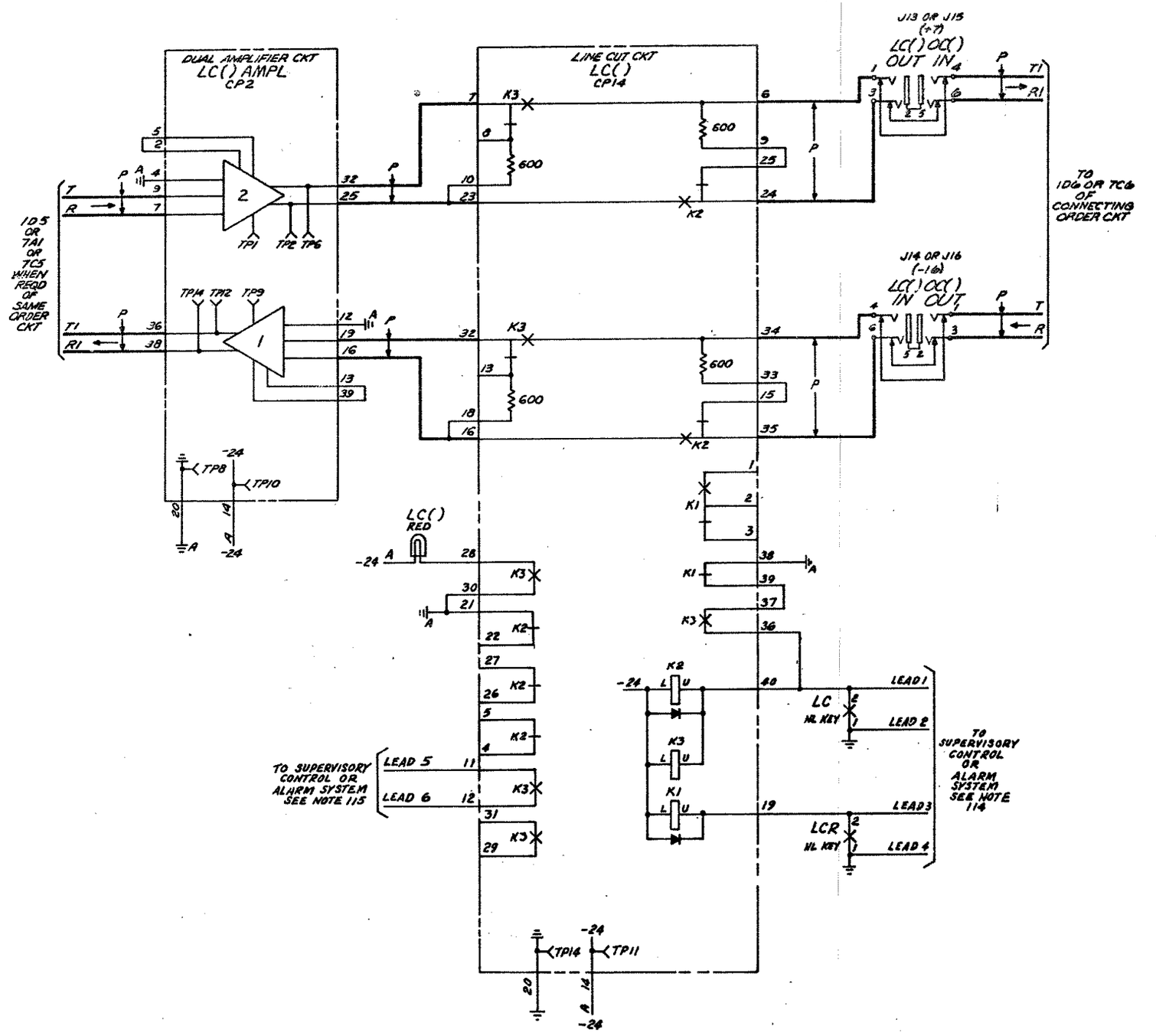
GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-IC245-01-87

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-IC245-01-87

FS 12
4-WIRE LINE CONNECT CKT



DRAWING ISSUE
1
3A
5B

ISSUE 108

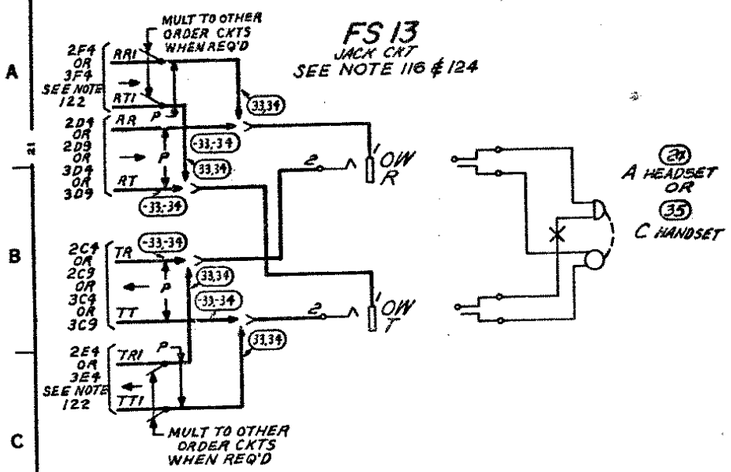
GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-IC245-01-B8

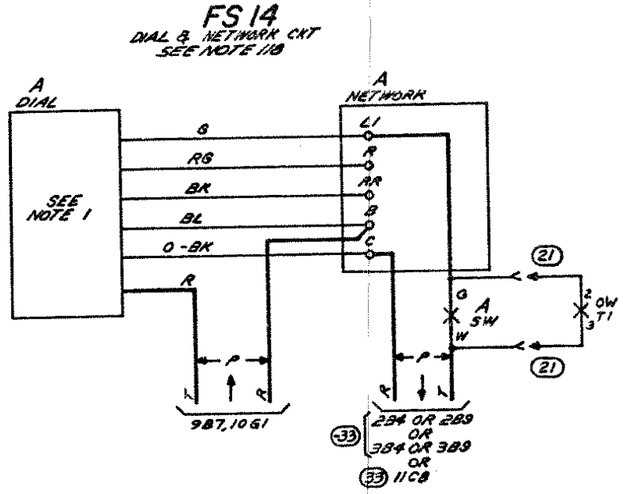
BELL TELEPHONE LABORATORIES INCORPORATED

65

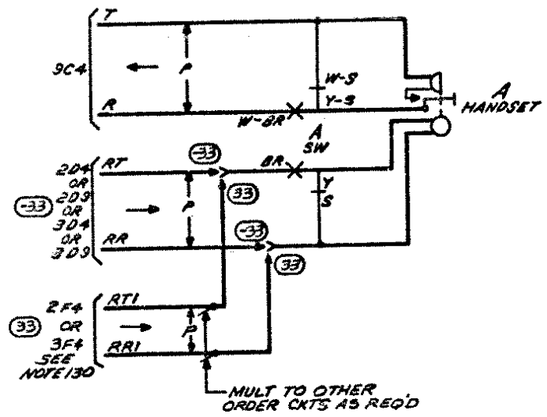
SD-IC245-01-B8



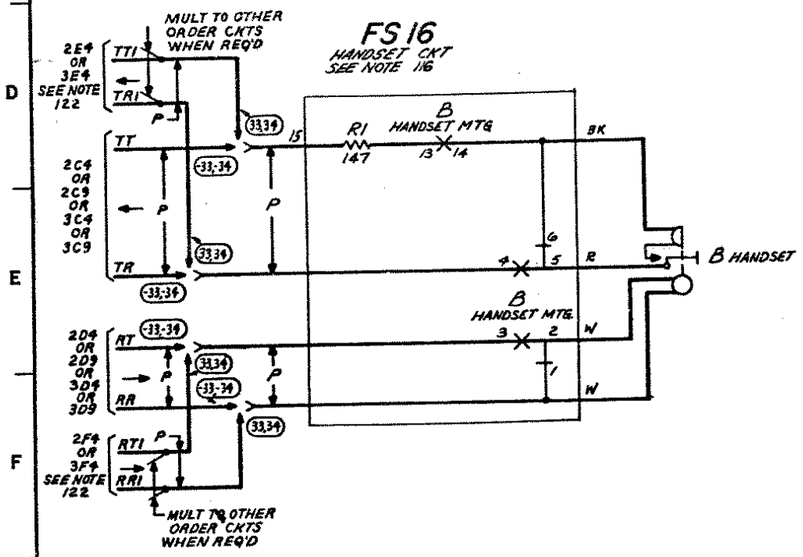
FS 13
JACK CKT
SEE NOTE 116 & 124



FS 14
DIAL & NETWORK CKT
SEE NOTE 118

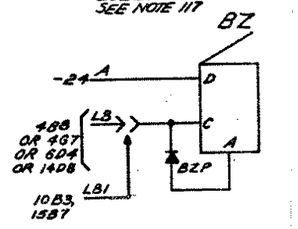


FS 15
HANDSET CKT
SEE NOTE 118

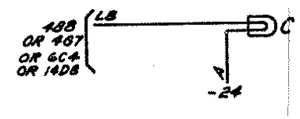


FS 16
HANDSET CKT
SEE NOTE 116

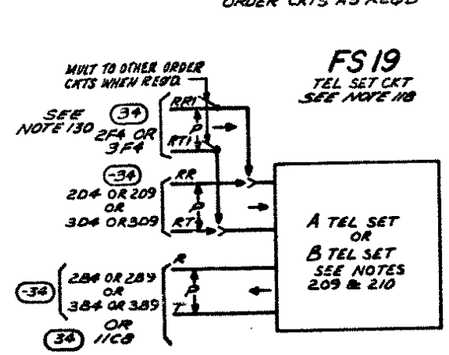
NOTES:
1. INSULATE AND STORE UNUSED LEADS.



FS 17
BUZZER CKT
SEE NOTE 117



FS 18
LAMP CKT
SEE NOTE 117



FS 19
TEL SET CKT
SEE NOTE 118

DRAWING ISSUE: 1, 2A, 3A, 4B, 5B

ISSUE 11B

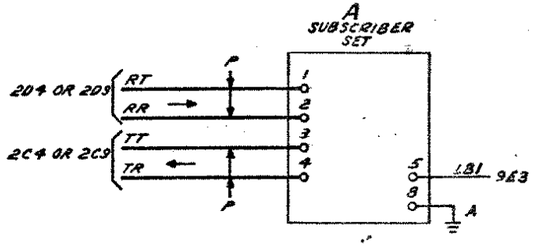
GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-1C245-01-89

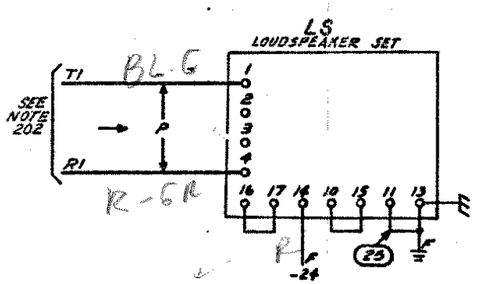
BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-1C245-01-89

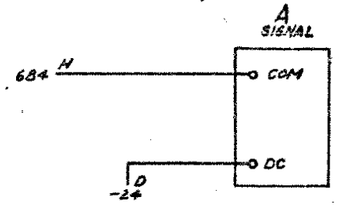
FS 20 (MFR DISC.)
OUTDOOR HANDSET CKT
SEE NOTE 1 & 116



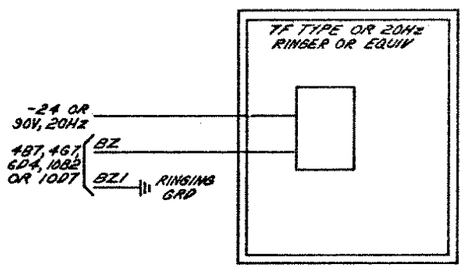
FS 21
LOUDSPEAKER CKT
SEE NOTE 2, 106, 119 & 129



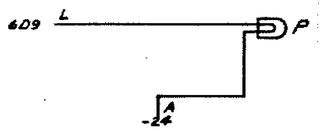
FS 22
HORN CKT
SEE NOTE 3



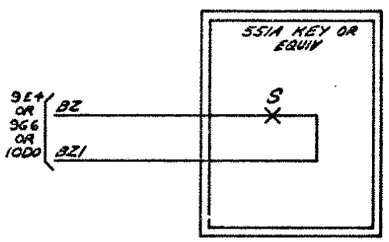
FS 23 (MFR DISC.)
BUZZER OR BELL
SEE NOTE 118



FS 24
PREEMPT LAMP CKT

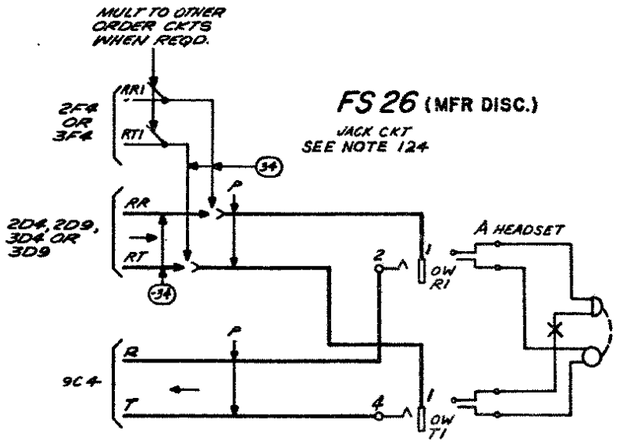


FS 25 (MFR DISC.)
KEY



MULT TO OTHER ORDER CKTS WHEN REQD.

FS 26 (MFR DISC.)
JACK CKT
SEE NOTE 124



NOTES:
1. SEE BSP SECTION 502-201-102.
2. SEE BSP SECTION 463-220-100
3. SEE BSP SECTION 463-110-400.

DRAWING ISSUE
1
2A
4B
5B

ISSUE 11B

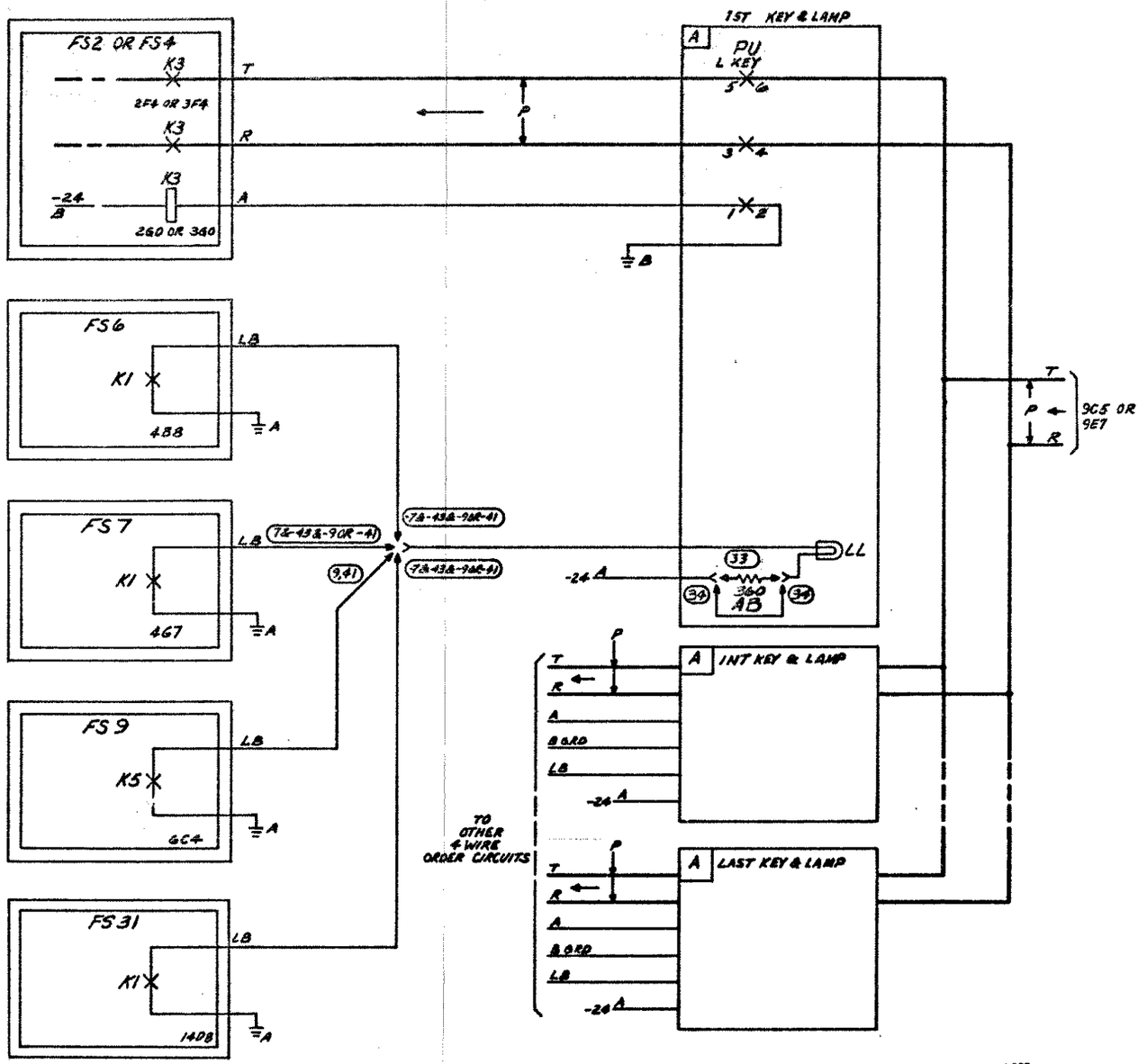
GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-IC245-01-B10

SD-IC245-01-B10

FS 27
LINE PICKUP KEYS
SEE NOTE 1



NOTE:
1. FOR ADDITIONAL PICKUP KEY POSITIONS SEE CIRCUIT NOTE 125.

DRAWING ISSUE 48

ISSUE 118

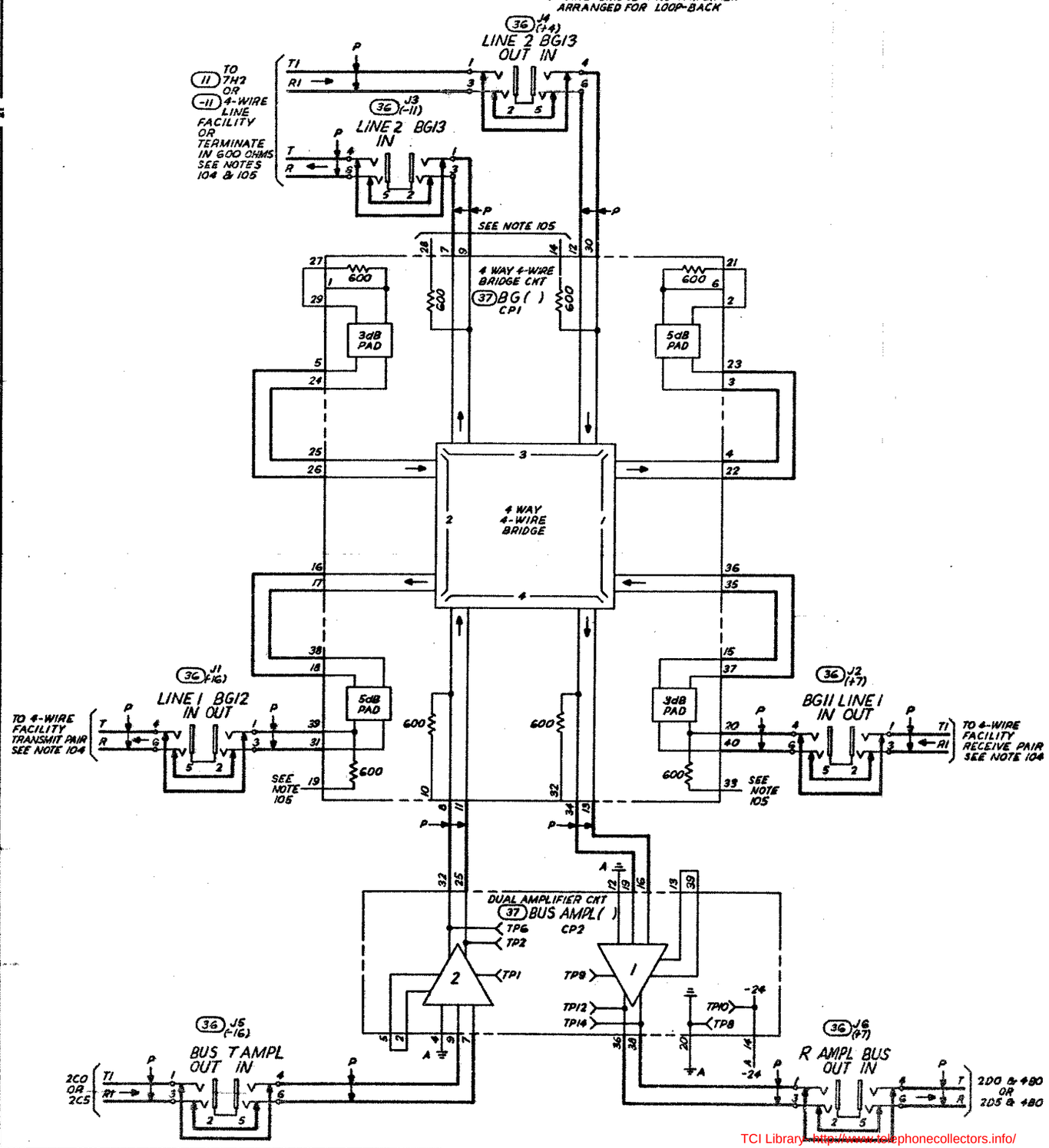
GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2) SD-1C245-01-B11

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-1C245-01-B11

FS 28

4-WIRE BRIDGE AND AMPLIFIER ARRANGED FOR LOOP-BACK



DRAWING ISSUE 5B

ISSUE 7B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)	SD-1C245-01-812
BELL TELEPHONE LABORATORIES INCORPORATED	6S

SD-1C245-01-812

FS 29

4-WIRE LINE CONNECT CKT
ARRANGED FOR DIALED CUT-THROUGH

DRAWING ISSUE 38

DUAL AMPLIFIER CKT
LC AMPL
CP2

LINE CUT CIRCUIT
LC
CP14

IDG OF 1ST FS1

IDG OF 2ND FS1

CALL-RECALL-ALERT CKT
CALL-RECALL
(V) CP13 (MFR DISC)
CALL-RECALL-ALERT CKT
WITH TIMED LOCK-UP
CALL-RECALL
(U) CP13

LC( )
RED

TIMER

C1
25
-24

LC
NL KEY

LCR
NL KEY

TO SUPERVISORY CONTROL OR ALARM SYSTEM SEE NOTE 114

TO SUPERVISORY CONTROL OR ALARM SYSTEM SEE NOTE 115

LEAD 1
LEAD 2
LEAD 3
LEAD 4
LEAD 5
LEAD 6

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

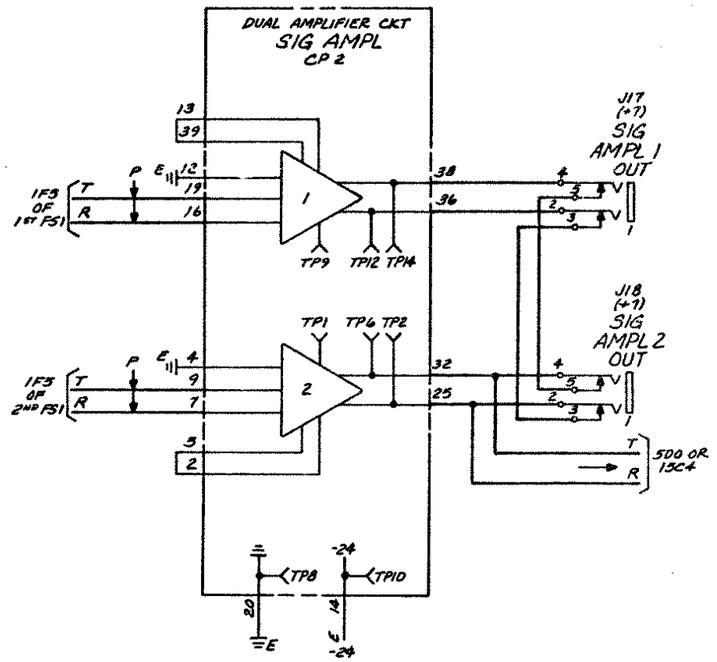
SD-1C245-01-813

BELL TELEPHONE LABORATORIES INCORPORATED

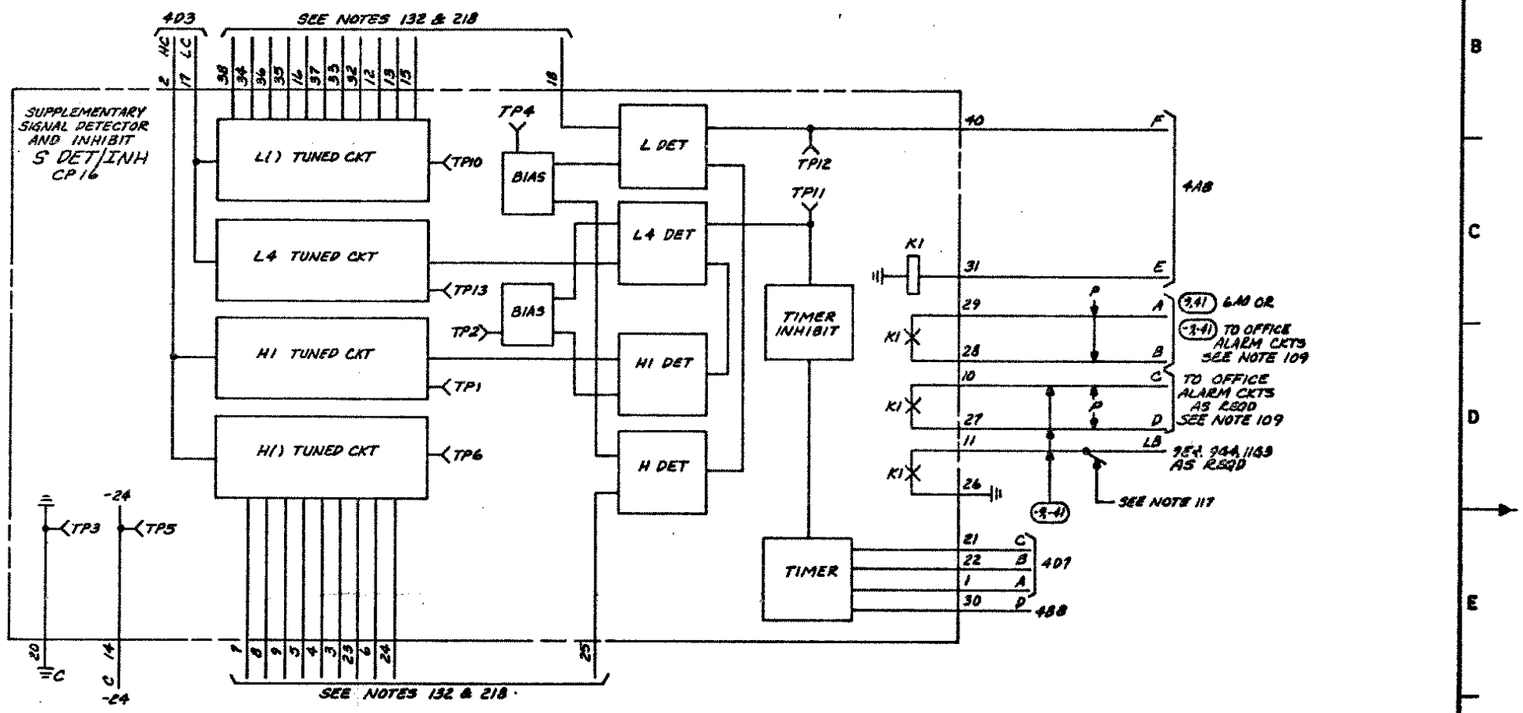
ISSUE 10B

SD-1C245-01-813

FS 30
SIGNALING AMPLIFIER CKT



FS 31
SUPPLEMENTARY SIGNAL DETECTOR WITH INHIBIT CKT



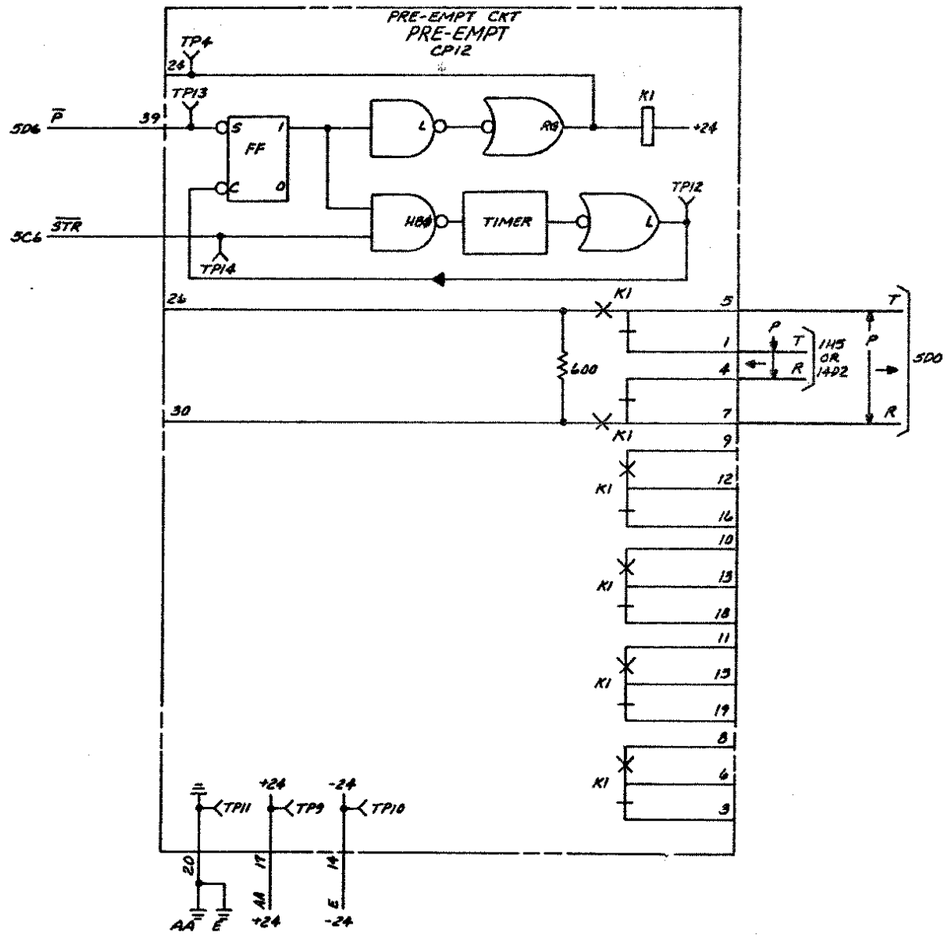
ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT	SD-1C245-01-B14
BELL TELEPHONE LABORATORIES INCORPORATED	6S

SD-1C245-01-B14

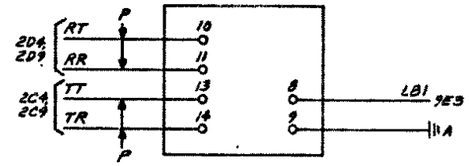
FS 32

TOUCH-TONE RECEIVER INHIBIT CKT



FS 33

OUTDOOR HANDSET CKT
SEE NOTE 1 & 116



NOTES:

1. SEE BSP SECTION 502-501-117.

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT	SD-1C245-01-815
BELL TELEPHONE LABORATORIES INCORPORATED	6S

SD-1C245-01-815

APP FIG. 1

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
BG( )(CP1)	1B2	SEE NOTE 201	ED-1C304
BUS AMPL(CP2)	1G3		ED-1C305

APP FIG. 2

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
BAT FEED(CP9)	2A2	SEE NOTE 201	ED-1C311-G2 (MD) ED-1C311-G5

APP FIG. 3 (MFR DISC.)

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
BAT FEED(CP8)	2A7	SEE NOTE 201	ED-1C311-G1

APP FIG. 4

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
SUPL BAT FEED(CP11)	3A2	SEE NOTE 201	ED-1C311-G4(MD) ED-1C311-G6

APP FIG. 5 (MFR DISC.)

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
SUPL BAT FEED(CP10)	3A7	SEE NOTE 201	ED-1C311-G3

APP FIG. 6

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
SIG RCVR(CP3)	4A1	SEE NOTE 201	ED-1C306-G1(MD) ED-1C306-G2

APP FIG. 7

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
SUPL S DET(CP4)	4E2	SEE NOTE 201	ED-1C307-G1(MD) ED-1C307-G2

APP FIG. 8

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
DECODER(CP5)	5E1	SEE NOTE 201	ED-1C308 ED-1C309 ED-1C310
DECODER(CP6)	5A4		
DECODER(CP7)	5A8		

RECEIVER, TOUCH-TONE (R)

DESIG	LOC	CODE
TTR	5E0	H310-116

APP FIG. 9 (MFR DISC.)

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
CALL-RECALL(CP13)	6A2	SEE NOTE 201	ED-1C313

APP FIG. 10 (A & M ONLY)

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
PRE-EMPT(CP12)	6A7	SEE NOTE 201	ED-1C312-G1(MD) ED-1C312-G2

APP FIG. 11

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
BG( )(CP1)	7B2	SEE NOTE 201	ED-1C304 ED-1C305
LINE 2 AMPL(CP2)	7G2		

APP FIG. 12

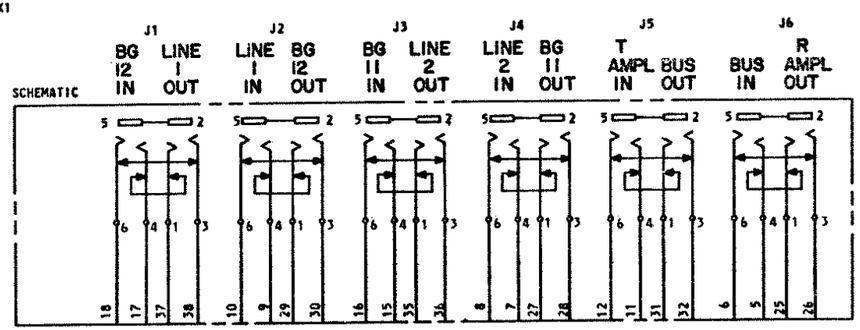
CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
LC( )AMPL(CP2)	8A1	SEE NOTE 201	ED-1C305-G1(MD) ED-1C314-G2 ED-1C314-G2
LC( )(CP14)	8A3		

APP FIG. 13

JACK UNIT (PLUG-IN)

JK1



JACK UNIT

ED-1C315-( )-G1 E/W

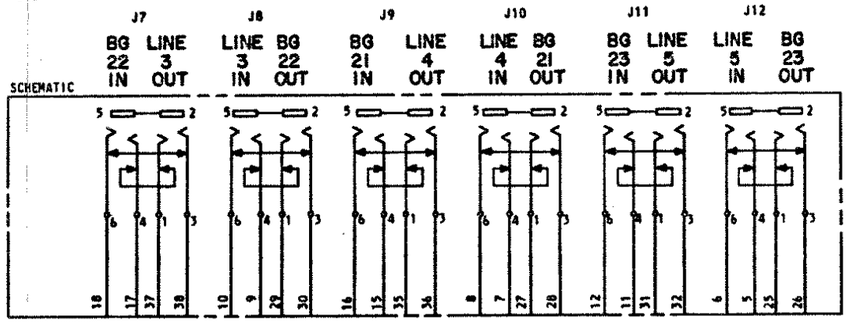
JACK

DESIG	LOC	CODE
J1	1A1	482BM
J2	1E1	482BM
J3	1D4	482BM
J4	1C4	482BM
J5	1H1	482BM
J6	1H4	482BM

APP FIG. 14

JACK UNIT (PLUG-IN)

JK2



JACK UNIT

ED-1C315-( )-G2 E/W

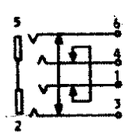
JACK

DESIG	LOC	CODE
J7	7B1	482BM
J8	7E1	482BM
J9	7D4	482BM
J10	7C4	482BM
J11	7A2	482BM
J12	7A2	482BM

APP FIG. 15

JACK

482BM

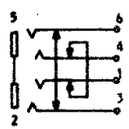


J1	J2	J3	J4	J5	J6
BG ( )2 IN	LINE 1 IN	BG ( )1 IN	LINE 2 IN	T AMPL( ) IN	BUS( ) IN
1A1	1E1	1D4	1C4	1H1	1H4
1A1	1E1	1D4	1C4	1H1	1H4
LINE 1 OUT	BG ( )2 OUT	LINE 2 OUT	BG ( )1 OUT	BUS( ) OUT	R AMPL( ) OUT

APP FIG. 16

JACK

482BM

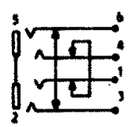


J7	J8	J9	J10	J11	J12
BG 22 IN	LINE 3 IN	BG 21 IN	LINE 4 IN	BG 23 IN	LINE 5 IN
7B1	7E1	7D4	7C4	7A2	7A2
7B1	7E1	7D4	7C4	7A2	7A2
LINE 3 OUT	BG 22 OUT	LINE 4 OUT	BG 21 OUT	LINE 5 OUT	BG 23 OUT

APP FIG. 17

JACK

482BM



J13 OR J15	J14 OR J16
OC( ) IN	LC( ) IN
8C5	8A5
8C5	8A5
LC( ) OUT	OC( ) OUT

DRAWING ISSUE 1 58 88

ISSUE 7B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-CI

BELL TELEPHONE LABORATORIES INCORPORATED

PAGE NO. 65

SD-1C245-01-CI

APP FIG. 18

KEY
547A

LAMP
DESIG
LC( )

LC( ) LCR( )

8E2 8D2
13D4 13E4

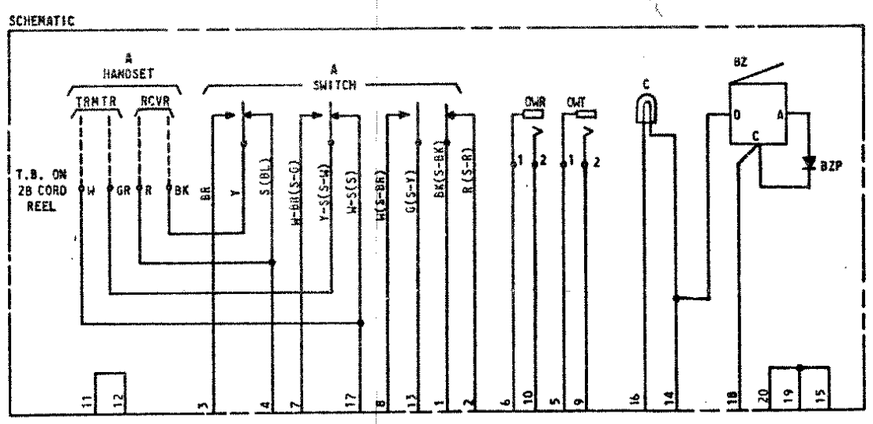
LOC
8E5
13E2

CODE
A1 (RD)
A1 (RD)

APP FIG. 19

HANDSET UNIT (PLUG-IN)
HANDSET

SCHEMATIC



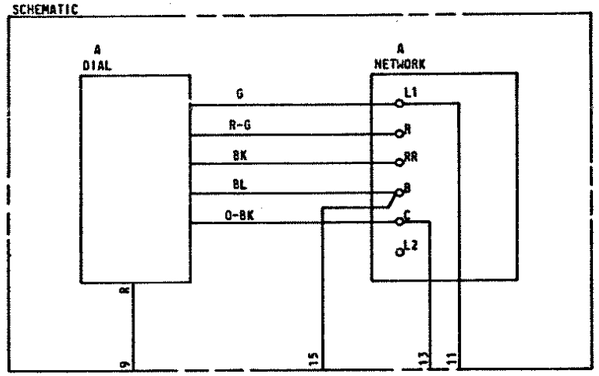
HANDSET UNIT
ED-6G190-( )-G2 E/W

APP	DESIG	CONT	LOC	CODE
SET, HAND	A		9B8	G5GR-61
SWITCH (HANDSET)	A	BR	9B8	235F
		Y		
		S		
		W-BR	9B8	
		Y-S		
		W-S		
		W	9B5	
		G		
		BK		
		R		
JACK	OWR	1	9A1	223A
		2		
	OWT	1	9B1	223A
		2		
BUZZER	BZ		9D4	7F-49
DIODE	BZP		9E4	446F
LAMP	C		9F4	A1

APP FIG. 20

DIAL UNIT (PLUG-IN)
TT DIAL

SCHEMATIC



DIAL UNIT
ED-6G191-( )-G2 E/W

DIAL

DESIG	LOC	CODE
A	9A3	35C3A

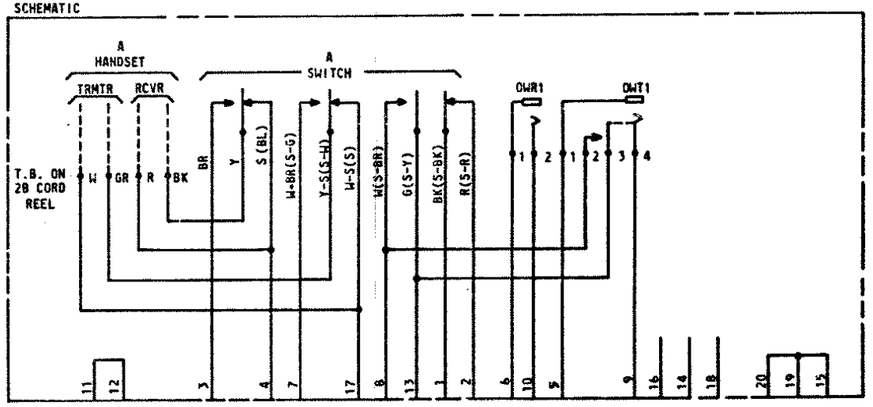
NETWORK

DESIG	LOC	CODE
A	9A5	425E

APP FIG. 21 (MFR DISC.)

HANDSET UNIT (PLUG-IN)
HANDSET

SCHEMATIC



HANDSET UNIT
ED-6G190-( )-G3E/W

APP	DESIG	CONT	LOC	CODE
SET, HAND	A		9B8	6SGR-61
SWITCH (HANDSET)	A	BR	9B8	235F
		Y		
		S		
		W-BR	9B8	
		Y-S		
		W-S		
		W	9B5	
		G		
		BR		
		R		
JACK	OWR1	1	10F2	223A
		2		
	OWT1	1,4	10G2	215A
		2,3	9C6	

DRAWING ISSUE
1
3A
4B
5B

ISSUE 10B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-C2

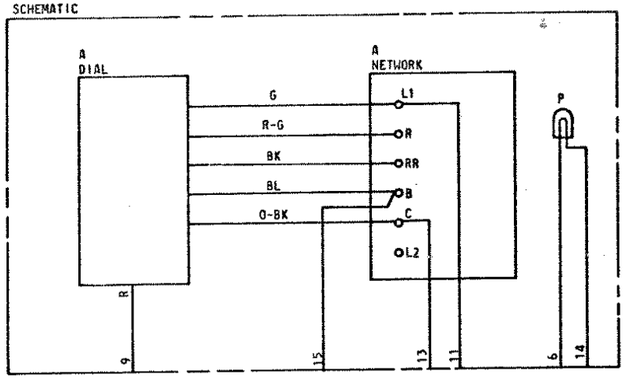
BELL TELEPHONE LABORATORIES INCORPORATED

6S

SD-1C245-01-C2

APP FIG. 22

DIAL UNIT (PLUG-IN)
TT DIAL
SCHEMATIC



DIAL UNIT
ED-6G191-( )-G3E/H

DIAL

DESIG	LOC	CODE
A	9A3	35C3A

NETWORK

DESIG	LOC	CODE
A	9A5	425E

LAMP

DESIG	LOC	CODE
P	10D4	A1

APP FIG. 23

JACK
223A

	OWT	OWR
	9B1	9A1
	9B1	9A1

APP FIG. 24

SET, HEAD TELEPHONE

DESIG	LOC	CODE
A	9B2 OR 10G3	52PR

APP FIG. 25 (MFR DISC.)

SET, LOUDSPEAKER

DESIG	LOC	CODE
LS	10B4	106A *

* LOUDSPEAKER SET IS PROVIDED WITH 2Y LAMP WHICH SHALL BE DISCARDED AND REPLACED WITH A1 LAMP.

APP FIG. 26

SIGNAL, HORN

DESIG	LOC	CODE
A	10B7	KS-16301,L8 BACKBOX KS-16301,L15 RELAY AND L2(115V DC) HORN(MFR DISC) OR L5(115V AC) HORN OR L6(48V AC) HORN(MFR DISC) (SEE NOTE 217)

APP FIG. 27 (MFR DISC.)

SET, SUBSCRIBER

DESIG	LOC	CODE
A	10B2	695A

APP FIG. 28

SET, TELEPHONE

DESIG	LOC	CODE
A	9D8	2504B-( ) SEE NOTE 209

CONNECTOR, JACK

DESIG	LOC	CODE
A	9D8	KS-16690,L1

APP FIG. 29

SET, TELEPHONE

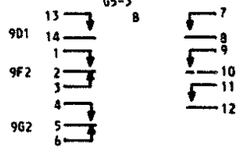
DESIG	LOC	CODE
B	9D8	2554B-( ) SEE NOTE 210

APP FIG. 30

SET, HAND

DESIG	LOC	CODE
B	9E2	G5GR-( )

HANDSET MTG
G5-3



RESISTOR

DESIG	LOC	CODE
R1	9E1	KS-14603, L3A 147Ω

APP FIG. 31

BUZZER

DESIG	LOC	CODE
BZ	9D4	7F-49

DIODE

DESIG	LOC	CODE
BZP	9D4	446F

APP FIG. 32

LAMP

DESIG	LOC	CODE
C	9G4	A1

DRAWING ISSUE
40
58

ISSUE
11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-1C245-01-C3

BELL TELEPHONE LABORATORIES INCORPORATED

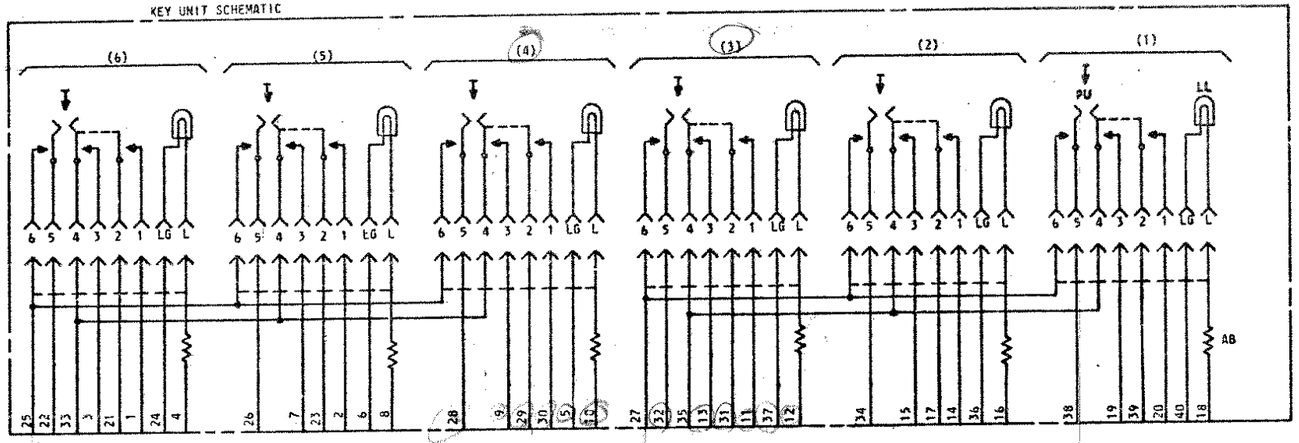
DRAWING 6S

SD-1C245-01-C3

APP FIG. 33

KEY UNIT (PLUG-IN)

KEY UNIT SCHEMATIC



KEY UNIT (PLUG IN) ED-6G193-( )G5E/W

5356Z KEY*					PLUG	RESISTOR		
DESIG	CONT	LOC	LAMP DESIG	LAMP LOC	CODE	DESIG	LOC	CODE
(1)**	PU	1-2 3-4 5-6	LL	1106	508A	[6]AB		KS-20289,L6C 348
(2)					508B			
(3)					508C			
(4)					508D			
(5)					508E			
(6)					508F			

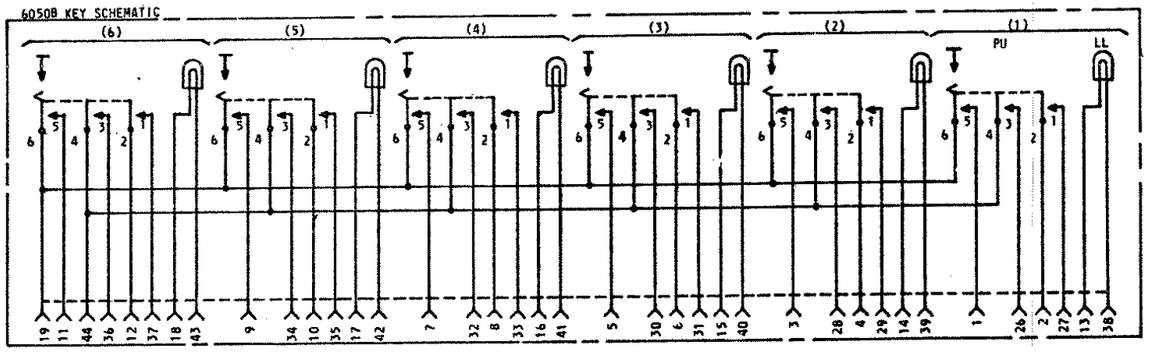
* PROVIDED WITH [6] 53A LAMPS

** NUMBERS IN PARENTHESIS ARE FOR REFERENCE ONLY AND ASSOCIATE KEY SEGMENT WITH PLUGS AND RESISTORS.

APP FIG. 34

(SEE NOTE 214 FOR CABLES REQ'D)

6050B KEY SCHEMATIC



KEY E/W LAMP*

6050B-( )KEY				52A LAMP	
DESIG	CONT	LOC		DESIG	LOC
(1)**	PU	1-2 3-4 5-6	11B6	LL	11D6
(2)					
(3)					
(4)					
(5)					
(6)					

* KEY IS PROVIDED WITH 51A LAMPS WHICH ARE TO BE DISCARDED AND REPLACED BY 52A LAMPS.

** NUMBERS IN PARENTHESIS ARE FOR REFERENCE ONLY.

APP FIG. 35

SEE NOTE 215

SET, HAND

DESIG	LOC	CODE
C	9B2	G3CR-( )

DRAWING ISSUE 48

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

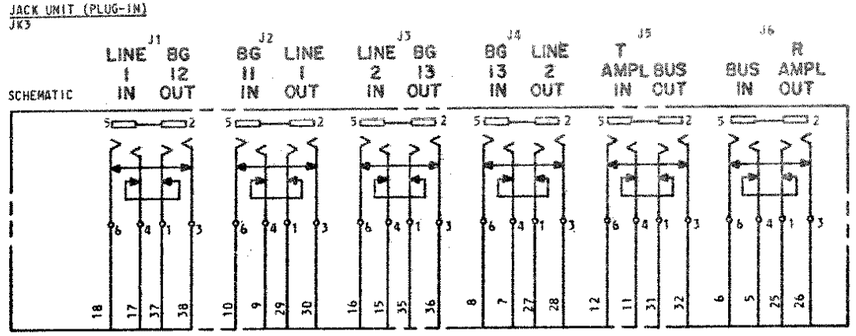
SD-1G245-01-C4

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-1G245-01-C4

APP FIG. 36

JACK UNIT (PLUG-IN)
JK3



JACK UNIT
ED-1C315-( )-G3E/W

JACK

DESIG	LOC	CODE
J1	12F1	4828M
J2	12F4	4828M
J3	12B2	4828M
J4	12A3	4828M
J5	12H1	4828M
J6	12H4	4828M

APP FIG. 37

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
BG( ) (CP1)	12C2	SEE NOTE 201	ED-1C304
BUS AMPL( ) (CP2)	12G3		ED-1C305

APP FIG. 38

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
LC AMPL (CP2)	13A1	SEE NOTE 201	ED-1C305
LC (CP14)	13A3		ED-1C314
CALL RECALL (V),CP13 (MD)	13A7		ED-1C313
(U) CP15	13A7		ED-1C767

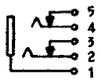
APP FIG. 39

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
SIG AMPL (CP2)	14B1	SEE NOTE 201	ED-1C305

APP FIG. 40

JACK
239A



J17 SIG AMPL 1 OUT	J18 SIG AMPL 2 OUT
14C2	14D2

APP FIG. 41

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
CALL-RECALL (CP15)	6A2	NOTE 201	ED-1C767

APP FIG. 42

SET, LOUDSPEAKER

DESIG	FS LOC	EQPT LOC	CODE
LS	1084	SEE NOTE 129	1060

APP FIG. 43

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
S DET/INH (CP16)	14C3	SEE NOTE 201	ED-2C439-( ) GR1

APP FIG. 44

CIRCUIT PACK

DESIG	FS LOC	EQPT LOC	CODE
PRE-EMPT (CP12)	15A2	SEE NOTE 201	ED-1C312-( ) GR2

APP FIG. 45

SET, SUBSCRIBER

DESIG	LOC	CODE
A	15B7	526A

DRAWING ISSUE 5B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-1C245-01-C5

BELL TELEPHONE LABORATORIES INCORPORATED

FORM 6S

SD-1C245-01-C5

CIRCUIT NOTES:

101.

DESIG	FUSE AMP	POTENTIAL	ONE PER
A	1-1/3	-24 SIG	APP FIG. 11,37,38,39, AND [2] APP FIG. 1,12,18, AND [5] APP FIG. 19,22,31,32
B	1-1/3	-24 SIG	APP FIG. 2 OR 3 AND [4]APP FIG. 4 OR 5
C	1-1/3	-24 SIG	APP FIG. 6,7
D	1-1/3	-24 SIG	[5] APP FIG. 26 [5] APP FIG. 9 OR 41
E	1-1/3	-24 SIG	APP FIG. 8,10
F	1-1/3	-24 SIG	[5] APP FIG. 25
AA	1-1/3	+24 SIG	APP FIG 8, 10

BATTERY SYMBOL	VOLTAGE RANGE
-24	21-27
+24	21-27

CURRENT DRAINS AMPERES	LIST 1 AVERAGE DRAIN PER BUSY HOUR		LIST 2 CURRENT DRAIN FOR DISTRIBUTION EQPT	
UNIT	-24	+24	-24	+24
SINGLE CODE AUX STATION J99340A	0.7	-	1.0	-
SINGLE CODE MAIN STATION J99340B	1.0	-	1.5	-
MULTIPLE CODE MAIN OFFICE J99340C	1.3	0.6	2.8	0.6
MULTIPLE CODE MAIN OFFICE J99340B	1.9	0.5	4.3	0.5
MULTIPLE CODE MAIN OFFICE J 99340E	1.6	0.5	3.3	0.5
APP FIG 19,20	0.1		0.1	
APP FIG 19,22	0.15		0.15	
APP FIG 42	0.2		0.2	
APP FIG 31	0.05		0.05	
APP FIG 32	0.05		0.05	
SINGLE CODE MAIN STATION J99340F	1.0	-	1.5	-
MULTIPLE CODE MAIN OFFICE J99340G	1.3	0.6	2.6	0.6

102.

FEATURE OR OPTION			PROVIDE APP FIG.	PROVIDE APP OR WRG	PROVIDE QUANTITY
AUXILIARY STATION SINGLE CODE (SEE 801)					
BRIDGE AND AMPLIFIER	WITH TALKBACK		1		1 PER CKT
	WITH LOOPBACK		37		
TALK BATTERY FEED			2		
SUPPLEMENTARY TALK BATTERY FEED			4		
SIGNAL RECEIVER AND DETECTOR	SINGLE DIGIT CODE		6		1 PER APP FIG. 6
	TWO DIGIT CODE		7		
	TWO DIGIT CODE WITH INHIBIT CKT		43		
LINE TEST AND MTCE JKS	WITH TALKBACK		13		1 PER CKT
	WITH LOOPBACK		36		
HANDSET, JACKS, LAMP AND BUZZER			19		
TOUCH-TONE® DIAL			20		

CIRCUIT NOTES: (CONT)

102. (CONT)

FEATURE OR OPTION			PROVIDE APP FIG.	PROVIDE APP OR WRG	PROVIDE QUANTITY
MAIN STATION SINGLE CODE (SEE 802)					
BRIDGE AND AMPLIFIER	WITH TALKBACK		1		1 PER CKT
	WITH LOOPBACK		37		
TALK BATTERY FEED			2		
SUPPLEMENTARY TALK BATTERY FEED			4		AS REQD MAX 3 PER CKT
SIGNAL RECEIVER AND DETECTOR	SINGLE DIGIT CODE		6		1 PER CKT
	TWO DIGIT CODE		7		1 PER APP FIG. 6
	TWO CODE DIGIT WITH INHIBIT CKT		43		
LINE TEST AND MTCE JKS	WITH TALKBACK		13		1 PER CKT
	WITH LOOPBACK		36		
CALL-RECALL-ALERT			41		
BRIDGE AND AMPLIFIER FOR ADDITIONAL LINES AND/OR LINE CONNECT			11		
TEST AND MAINTENANCE JACKS FOR ADDITIONAL LINES			14		
MULTIPLE CODE SIGNALING UP TO 5 CODES PER LOCATION (SEE 803)					
BRIDGE AND AMPLIFIER WITH TALKBACK			1		1 PER CKT
TALK BATTERY FEED			2		
SUPPLEMENTARY TALK BATTERY FEED			4		AS REQD SEE 803
TOUCH-TONE® RECEIVER AND DECODER	2 DIGIT		8	W	1 PER CKT
	3 DIGIT			X	
TOUCH-TONE® RECEIVER INHIBIT CKT			44		
CALL-RECALL-ALERT	FIRST APP FIG. 41		41	Z	1 PER STATION CODE, SEE 803
	ADDITIONAL APP FIG. 41			Y	
	TIMER			T	
LINE TEST AND MAINTENANCE JACKS			15		1 PER CKT
BRIDGE AND AMPLIFIER FOR ADDITIONAL LINES AND/OR LINE CONNECT			11		
TEST AND MAINTENANCE JACKS FOR ADDITIONAL LINES			16		
LINE CONNECT	RELAY AND AMPLIFIER		12		AS REQ MAX 2 PER CKT
	KEYS AND LAMPS		18		1 PER APP FIG.12
TEST AND MAINTENANCE JACKS FOR LINE CONNECT			17		AS REQ MAX 2 PER CKT
OPERATORS POSITION FOR BAY MOUNTING ASSEMBLY SEE NOTE 213	WITHOUT PICKUP	PLUG-IN HAND SET UNIT	19		MAX 1 PER POSITION MAX 1 POSITION PER APP FIG 2 OR 4
		PLUG-IN DIAL UNIT WITHOUT PREEMPT	20		
		PLUG-IN DIAL UNIT WITH PREEMPT	22		
		LOUDSPEAKER	25		
	WITH PICKUP	PLUG-IN HAND SET UNIT	19		
		PLUG-IN DIAL UNIT	20		
		PLUG-IN KEY UNIT	33		
MISC MOUNTED OPERATOR'S POSITION	DESK TELEPHONE SET	WITHOUT PICK-UP	28		MAX 2 PER APP FIG. 2 OR 4
		WITH PICK-UP	28, 34		MAX 1 PER APP FIG.2 OR 4 & 34
	WALL TELEPHONE SET	WITHOUT PICK-UP	29		MAX 2 PER APP FIG. 2 OR 4
		WITH PICK UP	29, 34		MAX 1 PER APP FIG.2, OR 4 & 34

CIRCUIT NOTES: (CONT)

102. (CONT)

FEATURE OR OPTION			PROVIDE APP FIG	PROVIDE APP OR WRG	PROVIDE QUANTITY
MISC MOUNTED TEL JACK AND HAND SET APPEARANCES	TEL JACKS		23		AS REQ SEE NOTE 211
	HEAD SET		24		AS REQ
	OUTDOOR HAND SET		45		
	HAND SET WITH HAND SET MTG		30		
	HAND SET		35		
MISC MOUNTED SIGNALS	HORN SIGNAL		26		MAX 1 PER APP FIG. 9
	BUZZER		31		AS REQ.
	LAMP		32		AS REQ SEE NOTE 212
MISC MOUNTED LOUDSPEAKER			42		AS REQ, MAX 2 PER APP FIG 2,3 4 OR 5
MULTIPLE CODE SIGNALING FOR TWO ORDER CKTS UP TO 5 CODES PER LOCATION (SEE 804)					
BRIDGE AND AMPLIFIER WITH TALKBACK			1		2 PER CKT
TALK BATTERY FEED			2		1 PER APP FIG. 1
SUPPLEMENTARY TALK BATTERY FEED			4		AS REQD MAX 4 PER APP FIG. 1 SEE NOTE 219
SIGNALING AMPLIFIER			39		1 PER CKT
TOUCH-TONE® RECEIVER AND DECODER	2 DIGIT		8	W	
	3 DIGIT			X	
TOUCH-TONE® RECEIVER INHIBIT CKT			44		
CALL-RECALL-ALERT	FIRST APP FIG. 41		41	Z	1 PER STATION CODE, MAX 5 PER CKT
	ADDITIONAL APP FIG. 41			Y	
	TIMER			T	
LINE TEST AND MAINTENANCE JACKS			15		1 PER APP FIG. 1
TEST AND MAINTENANCE JACKS FOR SIGNALING AMPLIFIER			40		1 PER CKT.
MULTIPLE CODE SIGNALING FOR TWO ORDER CKTS AND DIALED CUT THROUGH FOR UP TO 5 CODES PER LOCATION (SEE 805)					
BRIDGE AND AMPLIFIER WITH TALKBACK			1		2 PER CKT
TALK BATTERY FEED			2		1 PER APP FIG. 1
SUPPLEMENTARY TALK BATTERY FEED			4		AS REQD MAX 2 PER APP FIG. 1
SIGNALING AMPLIFIER			39		1 PER CKT
TOUCH-TONE® RECEIVER AND DECODER	2 DIGIT		8	W	
	3 DIGIT			X	
TOUCH-TONE RECEIVER INHIBIT CKT			44		
CALL-RECALL-ALERT	FIRST APP FIG. 41		41	Z	1 PER STATION CODE, MAX 4 PER CKT
	ADDITIONAL APP FIG. 41			Y	
LINE CONNECT CKT			38		1 PER CKT
LINE CUT KEY AND LAMP CKT			18		
TEST AND MAINTENANCE JACKS FOR SIGNALING AMPL			40		
LINE TEST AND MAINTENANCE JACKS			15		1 PER APP FIG.1

CIRCUIT NOTES: (CONT)

103.

RECORD OF APP FIGURES, WIRING AND APPARATUS CHANGES								
CHANGED ON ISS	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION WAS FURN	SEE NOTE	USE IN CIRCUIT				
				STD	A&M	MD		
78			127	2		3		
				4		5		
				41		9		
					10			
				T				
				42		25		
	U,V	V		U		V		
108			131			21		
118				45		27		

104. TRANSMISSION LEVELS ARE -16 dB TRANSMITTING AND +7 dB RECEIVING. IF THE CONNECTING CIRCUIT REQUIRES GAIN, LOSS AND/OR EQUALIZATION THE INTERCONNECTION SHOULD BE MADE VIA A 44V4 TYPE TELEPHONE REPEATER OR EQUIVALENT. (SEE BSP SECTIONS 332-104-100 AND AB24.100.01).

105. WHEN ALL PORTS OF THE 4-WAY 4-WIRE BRIDGE ARE NOT USED THE UNUSED PORTS MUST BE TERMINATED IN 600 OHMS. THIS MAY BE ACCOMPLISHED IN ACCORDANCE WITH NOTE 206, OR PORTS MAY BE TERMINATED BY CONNECTING T, R AND T1,R1 LEADS TO MULTI-STATION LINE CIRCUIT FIGURE 21, OR EQUIVALENT.

106. LOUDSPEAKER CONNECTIONS MAY BE MADE TO ANY TALK BATTERY FEED CIRCUIT AND MAY BE WIRED TO PROVIDE (a) NO SPEAKER CUT-OFF, (b) SPEAKER CUT-OFF BY ASSOCIATED OFF-HOOK TELEPHONE SET AT THE SIGNALING POSITION, OR (c) SPEAKER CUT-OFF BY ASSOCIATED OFF-HOOK TELEPHONE SET OR ASSOCIATED ACTIVE JACK AT ANY POSITION. FOR REQUIRED WIRING CONNECTIONS SEE NOTE 202. IT IS RECOMMENDED THAT A LOUDSPEAKER LOCATED IN THE VICINITY OF ANY TELEPHONE INSTRUMENT BE PROVIDED WITH SPEAKER CUT-OFF BY THAT INSTRUMENT TO PREVENT ACOUSTIC FEEDBACK. CONNECTIONS MAY BE MADE TO REMOTELY LOCATED JACKS TO FACILITATE PORTABLE SPEAKERS.

107. THE SIGNAL RECEIVER CIRCUIT MUST BE STRAPPED IN ACCORDANCE WITH NOTE 203 FOR THE SINGLE DIGIT STATION CODE OR THE FIRST DIGIT OF A TWO-DIGIT STATION CODE.

108. THE SUPPLEMENTARY SIGNAL DETECTOR MUST BE STRAPPED IN ACCORDANCE WITH NOTE 204 FOR THE SECOND DIGIT OF A TWO-DIGIT STATION CODE. FOR A TWO DIGIT CODE, THE FIRST AND SECOND DIGITS MUST BE DIFFERENT NUMBERS, ie, CODES 00, 11, 22, ...99 ARE NOT ALLOWED

109. CONNECT AS REQUIRED TO GIVE PROPER AUDIBLE AND VISUAL SIGNALS PROVIDED FOR SERVICE ALARMS:
ALARM LEADS ARE DESIGNATED AS FOLLOWS:

ALARM CIRCUITS	LEADS A	B	C	D
	SERVICE ALARM DESIGNATIONS SA	SAR	SAV	SAVR
TD-3 AND TH-3 RADIO OFFICE AUDIBLE AND VISUAL ALARM CKT	A	ARTH	-	-
TD-3 AND TH-3 RADIO DISTRIBUTION FUSE AND INDIVIDUAL ALARMS FOR COMMON OFFICE AND BLDG EQPT	"	-	F	FRTH
ANNUNCIATOR CKT	A	*	AC	*
AUDIBLE ALARM AND PILOT LAMP CKT	A	*	AV	*
AUDIBLE AND VISUAL ALARM CKT	A	*	AV	*

* CONNECT TO LOCAL CKT GRD. IN THESE CASES PAIRING OF LEADS IS NOT REQUIRED.

DRAWING ISSUE
1
2A
3A
4B
5B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CKT

SD-1C245-01-01

BELL TELEPHONE LABORATORIES INCORPORATED

SHEET 65

SD-1C245-01-01

CIRCUIT NOTES: (CONT)

110. THE DECODER MUST BE STRAPPED IN ACCORDANCE WITH NOTE 205. FOR 3 DIGIT OFFICE CODE, (X) OPTION IS REQUIRED. FOR 2 DIGIT OFFICE CODE, (Y) OPTION IS REQUIRED AND STRAPPING FOR THE MIDDLE DIGIT IS NOT REQUIRED. FROM ONE TO FIVE SEPARATE LAST DIGITS MAY BE USED BY PROVIDING A CONNECTION BETWEEN CP13 (CALL-RECALL-ALERT CKT) AND THE ASSOCIATED STATION CODE (SC) OUTPUT OF CP7.

111. RELAY (K4) OF FS 9 OPERATES UPON RECEPTION OF THE INCOMING ALERT SIGNAL. THE OUTPUT LEAD H MAY BE CONNECTED TO MISC. HORN SIGNAL. LEADS A1,B1,C1,D1 MAY BE CONNECTED AS REQUIRED TO GIVE AUDIBLE AND VISUAL SIGNALS PROVIDED FOR SERVICE ALARMS. ALARM LEADS ARE DESIGNATED AS FOLLOWS:

ALARM CIRCUITS	LEADS			
	A1	B1	C1	D1
	SERVICE ALARM DESIGNATIONS			
	SA1	SAR1	SAV1	SAVR1
TD-3 AND TH-3 RADIO OFFICE AUDIBLE AND VISUAL ALARM CKT	A	ARTN	-	-
TD-3 RADIO DISTRIBUTION FUSE AND INDIVIDUAL ALARMS FOR COMMON OFFICE AND BLDG EQPT	-	-	F	FRTN
ANNOUNCIATOR CKT	A	*	AC	*
AUDIBLE ALARM AND PILOT LAMP CKT	A	*	SV	*
AUDIBLE AND VISUAL ALARM CKT	A	*	SV	*

* CONNECT TO LOCAL CKT GRD. IN THESE CASES PAIRING OF LEADS IS NOT REQUIRED.

112. RELAY (K8) OPERATED PREVENTS LOCK-UP OF SERVICE ALARM OUTPUTS ON INCOMING SIGNALING. THIS IS PROVIDED BY A LOCKING CONTACT CLOSURE IN CONNECTING CIRCUIT AND SHOULD BE USED ONLY IN UNATTENDED OR PARTIALLY ATTENDED OFFICES. THE CONTROL SHOULD APPEAR AT ONLY ONE LOCATION WITHIN THE OFFICE. LEADS L3 AND LG3 FROM RELAY (K8) CONTACT 6 MAY BE CONNECTED TO PROVIDE A VISUAL INDICATION AS REQUIRED. ALARM CIRCUIT CONNECTING LEADS ARE DESIGNATED AS FOLLOWS:

ALARM CIRCUITS	LEADS	
	G	GRTN
TD-2,TD-3 AND TH-3 RADIO DISTRIBUTION FUSE AND INDIVIDUAL ALARMS FOR COMMON OFFICE AND BLDG EQPT	G	GRTN

113. IN OFFICES PROVIDED WITH MORE THAN ONE STATION CODE ONE FS9 IS PROVIDED WITH EACH SEPARATE CODE. THE CR AND CRG LEADS SHOULD BE CONNECTED TO THE TALK BATTERY FEED CIRCUIT(s) USED WITH THE TELEPHONE INSTRUMENT(s) ASSOCIATED WITH THE SAME CODE.

114. CONNECT AS REQUIRED TO PROVIDE A 300 ms GROUND FOR REMOTE OPERATION OF LINE CONNECT (LEADS 1 AND 2) OR LINE CONNECT RELEASE (LEADS 3 AND 4).

CONTROL CIRCUITS	LEADS			
	1	2	3	4
E TYPE STATUS REPORTING AND CONTROL SYSTEM REMOTE SWITCH CKT	RS	RSR	RS	RSR

CIRCUIT NOTES: (CONT)

115. CONNECT AS REQUIRED TO PROVIDE A STATUS INDICATION OF STATE OF LINE CONNECT CIRCUIT.

CONTROL CIRCUITS	LEADS	
	5	6
E TYPE STATUS REPORTING AND CONTROL SYSTEM STATUS INPUT CKT	SI	SIR

116. MULTIPLE CONNECTION OF JACKS FOR USE OF HEADSETS AND/OR HANDSETS MAY BE MADE TO TERMINALS 21, 23 OR 29, 30 (OF CP9 OR CP11) TO PROVIDE CONVENIENT ACCESS APPEARANCES. THEY SHOULD BE WIRED TO INCLUDE NO MORE THAN 50-OHM LOOP RESISTANCE BETWEEN THE TALK BATTERY FEED AND THE JACK APPEARANCE. DIRECT CONNECTIONS OF HEADSETS AND/OR HANDSETS MAY ALSO BE MADE TO THESE TERMINALS. NOTE, HOWEVER, THAT SIMULTANEOUS USE OF MORE THAN THREE HEADSETS AND/OR HANDSETS PER CP9 OR CP11 TALK BATTERY FEED (i.e. THREE MULTIPLES AT TERMINALS 21, 23 OR 29, 30 OR COMBINATION THEREOF) WILL RESULT IN SEVERE DEGRADATION OF THE TRANSMIT POWER.

117. MULTIPLE CONNECTION OR LAMPS AND BUZZERS TO FS 6, FS 7, FS9 OR FS 31 SHOULD BE LIMITED TO A MAXIMUM TOTAL CURRENT DRAIN OF 500 MA.

118. ONE BATTERY FEED (CP9 OR CP11) CAN SUPPLY TWO APPEARANCES OF A TEL SET OR HANDSET WITH TT DIAL AND NETWORK. THREE APPEARANCES PER BATTERY FEED ARE TOLERABLE WHEN SPECIFICALLY REQUIRED. NOTE THE APPEARANCES MAY BE CONNECTED AT TERMINALS 7, 32 (WITHOUT PICKUP), OR 10, 13 (WITH PICKUP) OR A COMBINATION THEREOF.

119. LOUDSPEAKERS SHALL BE LIMITED TO A MAXIMUM OF 2 PER TALK BATTERY FEED.

120. UNDER APP FIG. OPTION 11 AND 12 THE FIRST LINE CONNECT CIRCUIT (FS12) SHOULD BE CONNECTED TO PORT 3 OF THE 4-WAY 4-WIRE BRIDGE (FS11). IF REQUIRED, A SECOND LINE CONNECT CIRCUIT (FS12) MAY BE CONNECTED TO PORT 1 OF THE 4-WAY 4-WIRE BRIDGE (FS11). IF THE SECOND LINE CONNECT CIRCUIT IS NOT REQUIRED, PORT 1 OF THE 4-WAY 4-WIRE BRIDGE (FS11) SHOULD BE WIRED IN ACCORDANCE WITH APP FIG. OPTION -12.

121. THE TOUCH-TONE (R) CALLING RECEIVER IS A J99289B,L2 UNIT MODIFIED TO OPERATE WITH -24 AND +24 VOLTS INSTEAD OF -48 VOLTS. REFER TO NOTE 208 FOR MODIFICATION.

122. WHEN A SINGLE JACK CIRCUIT APPEARANCE IS REQUIRED FOR MORE THAN ONE ORDER CIRCUIT IN CONJUNCTION WITH PICKUP KEYS, THE TRANSMIT AND RECEIVE PAIRS FROM MAKE CONTACTS OF THE K3 RELAY IN ASSOCIATED BATTERY FEEDS SHALL BE MULTIPLED TOGETHER. THIS ALSO APPLIES WHEN A SINGLE HANDSET APPEARANCE PER FS16 IS REQUIRED.

123. UNDER APP FIG OPTION 38 THE SC5 LEAD IS CONNECTED TO CP13 (CKT5) TO PROVIDE CUT-THRU WHEN A 5 IS DIALED AS THE LAST DIGIT OF AN OFFICE CODE. THE NUMBER OF STATION CODES AVAILABLE IS THEREFORE LIMITED TO A MAXIMUM OF FOUR BY PROVIDING A CONNECTION BETWEEN CP13 (CKT1-4) AND THE ASSOCIATED STATION CODE (SC1-4) OUTPUT OF CP7.

124. WHEN HEAD SET IS NOT IN USE IT MUST BE UNPLUGGED TO ALLOW CALL RELAY TO RELEASE.

125. IF REQUIRED, A 6051B KEY UNIT WITH 12 PICKUP KEYS, MISC. MOUNTED, MAY OPTIONALLY BE USED TO ACCOMMODATE UP TO A MAX. OF 12 ORDER WIRES. IF EVEN A GREATER NUMBER OF ORDER WIRES ARE TO BE ACCOMMODATED, REFERENCE SHOULD BE MADE TO BSP 512-240-101 AND BSP 512-240-100. THE FORMER DESCRIBES 400 SERIES TYPE KEY MOUNTINGS IN MODULES OF 6, 12 AND 18 LINE SIZES, WHILE THE LATTER DESCRIBES 400 SERIES TYPE KEY MOUNTINGS IN MODULES OF 30, 60, 90 AND 120 LINE SIZES.

126. IF ALL-STATIONS ALARM IS NOT REQ'D REMOVE LEAD "AS" BETWEEN CP3 & CP4.

127. STARTING WITH ISSUE 7B TALK BATTERY FEED WITHOUT PICKUP APP. FIG. 3 & 5 HAVE BEEN RATED MD. THIS FEATURE IS IN TALK BATTERY FEED APP FIGS. 2 & 4.

128. LEAD E MAY BE LEFT UNCONNECTED IF ALL STATIONS ALERT IS NOT REQUIRED FOR 2ND-5TH FS9.

CIRCUIT NOTES: (CONT)

129. TWO WIRING MODIFICATIONS ARE REQUIRED FOR 106D REPLACEMENT LOUDSPEAKER:

1. FOR 24 VOLT DC SUPPLY CONNECT SPADE TIPPED LEAD FROM PILOT LAMP SOCKET TO SCREW TERMINAL 10.
2. GROUNDING SCREW PREVIOUSLY LOCATED ON THE AMPLIFIER RETAINING BRACKET IN THE 106A IS NOW LOCATED ON THE CHASSIS NEXT TO THE LAMP SOCKET IN THE 106D.

130. WHEN A PARTICULAR TEL SET OR NETWORK & HANDSET IS ASSOCIATED WITH MORE THAN ONE ORDER CIRCUIT IN CONJUNCTION WITH PICK UP KEYS, A SEPERATE BATTERY FEED MUST BE PROVIDED IN EACH ORDER CIRCUIT. RECEIVE PAIRS FROM MAKE CONTACTS OF THE K3 RELAYS IN ASSOCIATED BATTERY FEEDS SHALL BE MULTIPLIED TOGETHER. TRANSMIT PAIRS ARE CONNECTED AS SHOWN ON FS27.

131. AS OF ISSUE 10B APP FIG 21 IS RATED MFR DISC. AND IS REPLACED BY APP FIG 19.

132. THE SUPPLEMENTARY SIGNAL DETECTOR WITH INHIBIT CIRCUIT MUST BE STRAPPED IN ACCORDANCE WITH NOTE 218 FOR THE SECOND DIGIT OF A TWO-DIGIT STATION CODE. FOR A TWO DIGIT CODE, THE FIRST AND SECOND DIGITS MUST BE DIFFERENT NUMBERS, IE, CODES 00, 11, 22, ...99 ARE NOT ALLOWED.

DRAWING ISSUE: 1, 2A, 3A, 5B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-D2

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-1C245-01-D2

EQUIPMENT NOTES:

201. THE CIRCUIT PACK EQUIPMENT LOCATIONS ARE VARIED BY THE EQUIPMENT CODE AND ARE CONTROLLED BY THE EQUIPMENT DRAWINGS.

202. THE FOLLOWING TABLE PROVIDES INFORMATION FOR CONNECTIONS TO LOUDSPEAKER FOR CONDITIONS SPECIFIED.

	CONDITION	CONNECTIONS AT TALK BATTERY FEED CONNECTOR CP8, CP9, CP10 OR CP11		
		"T" LEAD	"R" LEAD	STRAP
1	NO SPEAKER CUTOFF	18	15	-
2	CUTOFF BY TEL. SET	39	40	-
3	CUTOFF BY JACKS OR HANDSET	25	26	18-24, 6-15
4	CUTOFF BY EITHER 2 OR 3	25	26	24-39 6-40

203. THE SIGNAL RECEIVER MUST BE STRAPPED FOR THE OFFICE CODE. THE STRAPS ARE MADE BETWEEN TERMINALS ON THE CP3 CONNECTOR AS SHOWN IN TABLE BELOW.

DIGIT	STRAP ON THE CP3 CONNECTOR	
1	5-24-30, 2-4	28-32-36, 8-11
2	6-27-30, 1-2	
3	5-26-30, 3-4	
4	5-24-30, 2-4	10-32-38, 13-28, 8-11
5	6-27-30, 1-2	
6	5-26-30, 3-4	
7	5-24-30, 2-4	28-32-39, 9-11
8	6-27-30, 1-2	
9	5-26-30, 3-4	
0	13-32-40, 11-12, 1-2, 6-27-30, 10-28	

204. THE SUPPLEMENTARY SIGNAL DETECTOR MUST BE STRAPPED FOR THE SECOND DIGIT OF AN OFFICE CODE. THE STRAPS ARE MADE BETWEEN TERMINALS ON THE CP4 CONNECTOR AS SHOWN IN TABLE BELOW. THE SECOND DIGIT OF THE TWO DIGIT STATION CODE MUST NOT BE THE SAME NUMBER AS THE FIRST DIGIT.

DIGIT	STRAP ON THE CP4 CONNECTOR	
1	3-7-25,24-6	12-18-36, 32-35
2	4-8-25, 5-6	
3	3-9-25,24-23	
4	3-7-25,24-6	13-18-34, 36-38, 32-35
5	4-8-25, 5-6	
6	3-9-25,24-23	
7	3-7-25,24-6	15-18-36, 33-35
8	4-8-25, 5-6	
9	3-9-25,24-23	
0	16-18-38, 34-36, 35-37, 4-8-25, 5-6	

EQUIPMENT NOTES: (CONT)

205. FOR THREE DIGIT OFFICE CODE, (X) OPTION: THE DECODER MUST BE STRAPPED FOR THE FIRST AND MIDDLE DIGIT OF AN OFFICE CODE AND THE LAST DIGIT FOR A POSITION OR STATION WITHIN AN OFFICE. THE STRAPS FOR THE FIRST DIGIT ARE MADE BETWEEN TERMINALS ON THE CP5 AND CP6 CONNECTORS AND FOR THE MIDDLE DIGIT BETWEEN TERMINALS ON THE CP7 CONNECTOR. THE LAST DIGIT REQUIRES A SINGLE CONNECTION BETWEEN THE CP13 OR CP15 CONNECTOR ASSOCIATED WITH THE STATION CALL-RECALL-ALERT UNIT AND A TERMINAL ON THE CP7 CONNECTOR AS SHOWN IN TABLE BELOW. FOR TWO DIGIT OFFICE CODE, (W) OPTION: STRAPPING FOR THE MIDDLE DIGIT IS NOT REQUIRED. STRAPPING FOR THE FIRST AND LAST DIGITS IS THE SAME AS ABOVE.

DIGIT	1ST DIGIT STRAP FROM CP5 CONN.	1ST DIGIT STRAP TO CP6 CONN.	MIDDLE DIGIT STRAP ON CP7 CONN.		LAST DIGIT CONNECT FROM CP7 CONN.	LAST DIGIT CONNECT TO CP13 OR CP15 CONN.	LAST DIGIT STATION
1	27	39	5-37	13-36	31	39	1
	23	38					
2	27	39	28-37		30		2
	22	38					
3	27	39	29-37		27		3
	21	38					
4	26	39	5-37	12-36	9		4
	23	38					
5	26	39	28-37		8		5
	22	38					
6	26	39	29-37				
	21	38					
7	25	39	5-37	24-36			
	23	38					
8	25	39	28-37				
	22	38					
9	25	39	29-37				
	21	38					
0	24	39	28-37	34-36			
	22	38					

206. THE FOLLOWING TABLE PROVIDES STRAPPING INFORMATION FOR 600 OHM TERMINATIONS AT THE PORTS OF THE 4-WAY 4-WIRE BRIDGE.

PORT IN	PORT OUT	STRAP ON THE CP1 CONNECTOR
1		33-40
	1	2-21
2		27-29
	2	19-31
3		12-14
	3	7-28
4		10-11
	4	13-32

207. PAIRING INFORMATION APPLIES TO LEADS 23 INCHES AND LONGER.

208. THE RECEIVER IS TO BE SPECIFIED AND ORDERED AS A H310-116 TOUCH TONE CALLING RECEIVER. THE H310-116 TOUCH TONE RECEIVER IS A MODIFIED VERSION OF THE J99289B,L2 TOUCH TONE RECEIVER SHOWN IN DETAIL ON SD-98148-01. THE BASIC MODIFICATION IS TO CHANGE THE RECEIVER SUPPLY VOLTAGE FROM -48V AND GROUND TO -24V AND +24V, RESPECTIVELY. CHANGES INCLUDE THE FOLLOWING: ALL GROUND POINTS ARE RETURNED TO +24V; ALL -48V POINTS ARE RETURNED TO -24V; ALL -22V POINTS ARE RETURNED TO CHASSIS GROUND. ALL VOLTAGE MEASUREMENTS REMAIN THE SAME AS SPECIFIED FOR THE J992898,L2 RECEIVER WHEN REFERENCED TO THE GRD TEST POINT ON CP3 5 (B19) INSTEAD OF FRAME GROUND. TO PROVIDE THE ABOVE MENTIONED CHANGES, THE FOLLOWING WIRING MODIFICATIONS ARE INCLUDED.

EQUIPMENT NOTES: (CONT)

1. THE UNIT CONNECTOR (F) TERMINALS 9, 15, AND 21 ARE ASSIGNED TO +24, -24 AND GROUND RESPECTIVELY.
2. THE LEAD TO DIODE CR1 OF FS1 ON SD-98148-01 IS REMOVED. (DIODE CR1 IS NO LONGER NEEDED.)
3. TERMINAL 2 OF B1, B2, B9, B19 AND TERMINAL 9 OF (F) CONNECTOR ARE REMOVED FROM CHASSIS GROUND.
4. TERMINAL 5 OF B9, B19 AND TERMINAL 21 OF (F) CONNECTOR ARE CONNECTED TO CHASSIS GROUND.

209. THE 2504B TELEPHONE SET IS FACTORY WIRED FOR 2-WIRE SERVICE. THE FOLLOWING TABLE SHOWS THE CHANGE NECESSARY TO CONVERT THE SET TO 4-WIRE SERVICE. REFER TO BSP 529-225-102 FOR CONNECTIONS. SEE CAD 12 FOR EXTERNAL CONNECTIONS.

LEADS	REMOVE FROM NETWORK	CONNECT TO TB1
DIAL (W)	GN	17
LINE SWITCH (BK)	R	18
MOUNTING CORD (BR-Y)		17
MOUNTING CORD (Y-BR)		18

210. THE 2554B TELEPHONE SET IS FACTORY WIRED FOR 2-WIRE SERVICE. THE FOLLOWING TABLE SHOWS THE CHANGE NECESSARY TO CONVERT THE SET TO 4-WIRE SERVICE. REFER TO BSP 502-503-101 FOR CONNECTIONS. SEE CAD 13 FOR EXTERNAL CONNECTIONS. FOR SETS WITH J-K CONTACTS OMITTED REFER TO NOTE 216.

LEADS	REMOVE FROM NETWORK	CONNECT TO NETWORK
DIAL (W)	GN	G
RECEIVER (W)	R	L2
LINE SWITCH (BK)	R	L2
LINE SWITCH (BL)	L2	L1

211. WHEN MULTIPLE APPEARANCES OF TELEPHONE JACKS ARE REQUIRED THEY SHALL BE MOUNTED ON A MISCELLANEOUS BASIS. IF AN EXISTING JACK MOUNTING WITH CONVENIENT SPARE POSITIONS IS NOT AVAILABLE IT IS RECOMMENDED THAT A 255A, OR 215 TYPE JACK MOUNTING OR JACK MOUNTINGS PER ED-60613-( ) BE USED.

212. WHEN LAMP APPEARANCES ARE REQUIRED THEY SHALL BE MOUNTED ON A MISCELLANEOUS BASIS. IF AN EXISTING JACK MOUNTING WITH A CONVENIENT SPARE POSITION IS NOT AVAILABLE IT IS RECOMMENDED THAT A 1S TYPE INDICATOR OR JACK MOUNTINGS REFERRED TO IN NOTE 211 BE USED.

213. TYPICAL EQUIPMENT ARRANGEMENTS FOR AN OPERATOR'S ORDER CIRCUIT POSITION IN A BAY FRAMEWORK MOUNTING ARE SHOWN ON ED-1C385-( ).

214. REFER TO BSP 512-210-103 FOR CABLE REQUIRED, INSTALLATION AND CONNECTIONS FOR 6050 B KEY.

215. WHEN HANDSET HANGER IS REQUIRED EITHER A 9B OR 10-61 HANDSET HANGER IS RECOMMENDED.

216. THE FOLLOWING TABLE SHOWS THE WIRING CHANGES NECESSARY TO CONVERT A 2554B TELEPHONE SET WITH J-K CONTACTS OMITTED FROM 2-WIRE TO 4-WIRE SERVICE. OTHERWISE SEE NOTE 210.

LEADS	REMOVE FROM NETWORK	REMOVE FROM TERM STRIP	CONNECT TO NETWORK	CONNECT TO TERM STRIP
DIAL (W)	GN		G	
RECEIVER (W)	R		L2	
LINE SWITCH (BK)	R		L2	
LINE SWITCH (Y)		2	L2	
LINE SWITCH (BR)	C		L1	
ADD NEW LEAD			C	2

EQUIPMENT NOTES: (CONT)

217. THE KS-16301,L5 115V AC HORN HAS A SOUND LEVEL PRESSURE OF 105dB SPL AT 4 FEET. THIS HIGH LEVEL OUTPUT WAS SELECTED FOR NOISY ENVIRONMENTS IN VERY LARGE OFFICES AND WILL DEFINITELY BE TOO LOUD FOR MANY APPLICATIONS. FOR THOSE SITUATIONS, AN ALARM WITH APPROPRIATE LOUDNESS WILL HAVE TO BE PROVIDED ON A LOCAL BASIS.

218. THE SUPPLEMENTARY SIGNAL DETECTOR WITH INHIBIT CIRCUIT MUST BE STRAPPED FOR THE SECOND DIGIT OF AN OFFICE CODE. THE STRAPS ARE MADE BETWEEN TERMINALS ON THE CP16 CONNECTOR AS SHOWN IN TABLE BELOW. THE SECOND DIGIT OF THE TWO DIGIT STATION CODE MUST NOT BE THE SAME NUMBER AS THE FIRST DIGIT.

DIGIT	STRAP ON THE CP16 CONNECTOR	
1	3-7-25,24-6	12-18-36, 32-35
2	4-8-25,5-6	
3	3-9-25,24-23	
4	3-7-25,24-6	13-18-34, 36-38 32-35
5	4-8-25,5-6	
6	3-9-25,24-23	
7	3-7-25,24-6	15-18-34, 33-35
8	4-8-25,5-6	
9	3-9-25,24-23	
0	16-18-38,34-36,35-37,4-8-25,5-6	

219. WHEN FS 32 IS USED, A MAXIMUM OF THREE FS 4'S (SUPPLEMENTARY TALK BATTERY FEED) MAY BE EQUIPPED IN CKT 2.

220. WHEN FS32 IS USED, A MAXIMUM OF TWO FS4'S (SUPPLEMENTARY TALK BATTERY FEED) MAY BE EQUIPPED.

DRAWING ISSUE: 1, 2A, 3B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-D3

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-1C245-01-D3

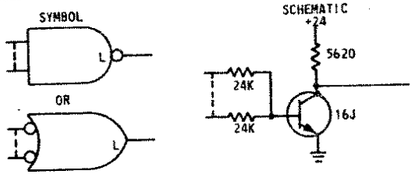
INFORMATION NOTES:

301. UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS;
CAPACITANCE VALUES ARE IN MICROFARADS;
VALUES PRECEDED BY THE SYMBOL +(PLUS) OR -(MINUS) ARE IN VOLTS.

302. FOR ALL GATES; ANY "0" INPUT PRODUCES A "1" OUTPUT. ALL "1" INPUTS PRODUCE A "0" OUTPUT. A "0" IS DEFINED AS A VOLTAGE LEVEL GREATER THAN +3 VOLTS. A "1" IS DEFINED AS A VOLTAGE LEVEL LESS THAN +0.3 VOLTS (NOMINALLY GROUND).

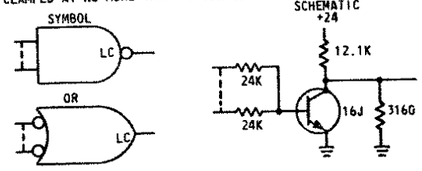
LOW FANOUT GATE

USED WHERE FANOUT REQUIREMENTS ARE LOW.



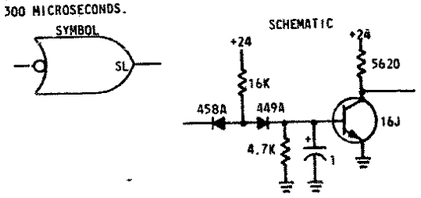
LOW FANOUT CLAMPED GATE

USED WHERE THE "0" OUTPUT MUST BE CLAMPED AT NO MORE THAN +6 VOLTS.



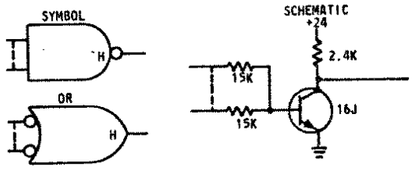
LOW FANOUT SLOW GATE

A "1" TO "0" TRANSITION AT THE INPUT PRODUCES A "1" TO "0" TRANSITION AT THE OUTPUT DELAYED BY APPROXIMATELY 300 MICROSECONDS.



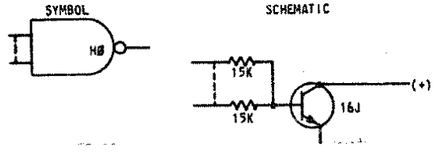
HIGH FANOUT GATE

USED WHERE FANOUT REQUIREMENTS ARE HIGH.



HIGH FANOUT OPEN GATE

USED WHERE LOAD IS FURNISHED BY A TIMER

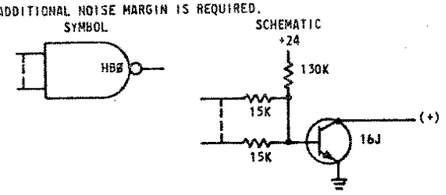


INFORMATION NOTES: (CONT)

302. (CONT)

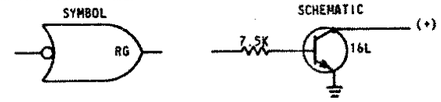
HIGH FANOUT OPEN BIASED GATE

USED WHERE LOAD IS FURNISHED BY A TIMER AND ADDITIONAL NOISE MARGIN IS REQUIRED.



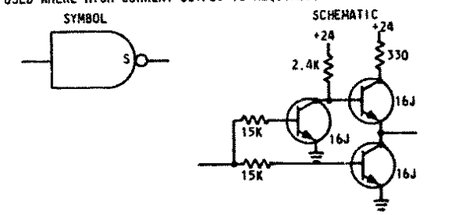
RELAY GROUND GATE

FURNISHES GROUND FOR DRIVING A RELAY MAXIMUM CURRENT CAPABILITY = 75 ma.



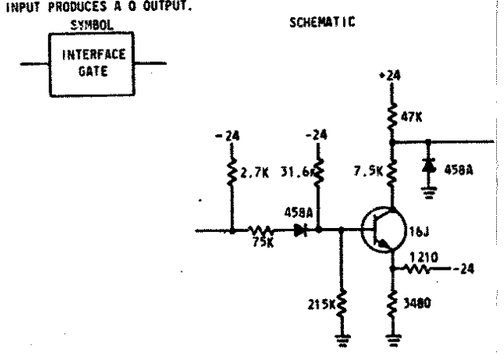
SUPER GATE

USED WHERE HIGH CURRENT OUTPUT IS REQUIRED.



INTERFACE GATE

USED AS INTERFACE BETWEEN TOUCH TONE RECEIVER AND TRL GATES. GROUND AT INPUT PRODUCES A "1" OUTPUT. OPEN AT INPUT PRODUCES A 0 OUTPUT.

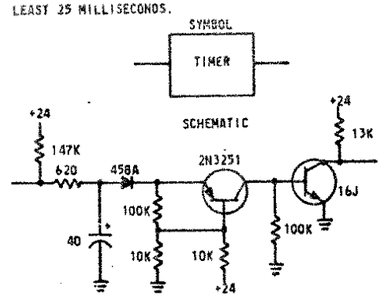


INFORMATION NOTES: (CONT)

302. (CONT)

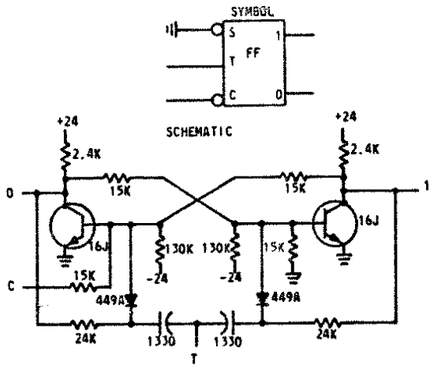
TIMER

A "1" INPUT PRODUCES A "0" OUTPUT. AN OPEN INPUT STARTS THE TIMER AND PRODUCES A "1" OUTPUT IN APPROXIMATELY 5 SECONDS. TIMING MAY BE RESTARTED DURING THE 5 SECOND PERIOD BY A "1" ON THE INPUT FOR AT LEAST 25 MILLISECONDS.



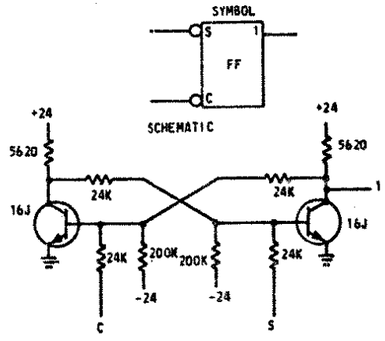
TOGGLE FLIP FLOP

A "0" ON THE "C" INPUT PRODUCES A "1" ON THE "0" OUTPUT AND A "0" ON THE "1" OUTPUT. A "0" TO "1" TRANSITION ON THE "T" INPUT WITH A "1" ON THE "C" INPUT CAUSES BOTH OUTPUTS TO CHANGE STATE.



FLIP FLOP

A "0" ON THE "C" INPUT WITH A "1" ON THE "S" INPUT PRODUCES A "0" ON THE "1" OUTPUT. A "0" ON THE "S" INPUT WITH A "1" ON THE "C" INPUT PRODUCES A "1" ON THE "1" OUTPUT. A "1" ON BOTH INPUTS CAUSES NO CHANGE. A "0" ON BOTH INPUTS IS NOT ALLOWED.



DRAWING ISSUE 4B

SD-IC245-01-D4

4

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

BELL TELEPHONE LABORATORIES INCORPORATED

6S

SD-IC245-01-D4

BD 1

AUX STATION - SINGLE SIGNAL CODE
ONE DIGIT (6,37) OR TWO DIGIT (6,37)
J99340 A

(1) FS1
4-WIRE BRIDGE AND AMPLIFIER ARRANGED FOR TALK BACK
OR
(37) FS28
4-WIRE BRIDGE AND AMPLIFIER ARRANGED FOR LOOP BACK

TO 4-WIRE LINE FACILITY SEE NOTE 104

T1, R1 (1,37) (-1,-37) T1, R1
T, R (1,37) (-1,-37) T, R

TO 4-WIRE LINE FACILITY SEE NOTE 104
OR
TERMINATE IN 600 OHMS SEE NOTES 105 & 206

T, R (1,37) (-1,-37)
T1, R1 (1,37) (-1,-37)

TO FS 21 LOUDSPEAKER SEE NOTES 106 & 119

TO MAX 2 FS 21 T, R

(4) FS 4
SUPPLEMENTARY TALK BATTERY FEED WITH OR WITHOUT PICK UP
OR
(5) (MFR DISC.) FS 5
SUPPLEMENTARY TALK BATTERY FEED WITHOUT PICK UP

TT, TR
RT, RR

(3) (MFR DISC.) F33
TALK BATTERY FEED WITHOUT PICK-UP
(2) F32
TALK BAT FEED WITH OR WITHOUT PICK-UP

TO MAX 2 FS 21 T, R

T, R TO FS 21 LOUDSPEAKER SEE NOTES 106 & 119

SEE NOTE 118

MULT TO OTHER ORDER CIRCUITS AS REQ'D SEE NOTE 122

TT, TR — TO FS27
RT, RR — TO FS13 OR FS16
RT, RR — TO FS15, FS19, FS28
T, R — TO FS27
TT, TR — TO FS13, OR FS16
RT, RR — TO FS15 OR FS19
RT, RR — TO FS14
T, R — TO FS19 OR FS18

TO ADDITIONAL FS13, FS16 AS REQ'D SEE NOTE 116

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQ'D SEE NOTE 118

MULT TO FS13, FS16, FS20 AS REQ'D SEE NOTE 116

TT, TR
RT, RR
RT, RR
T, R

FS13 JACK CKT
FS15 HANDSET CKT
FS14 DIAL & NETWORK CKT
T, R

FS6
APP FIG. 6
SIGNAL RECEIVER
SEE NOTES 107 & 203

A9, C
A9, C
LC, HC
D
(7,43) F
(-7,-43)

FS7
APP FIG. 7
SUPPLEMENTARY SIGNAL DETECTOR
SEE NOTES 108 & 204
OR
FS 31
APP FIG. 43
SUPPLEMENTARY SIGNAL DETECTOR WITH INHIBIT CIRCUIT
SEE NOTES 132 & 218

A, B

C, D
A, B
L8
E
(7,43)
(-7,-43)
A, B
C, D
TO OFFICE ALM CKTS SEE NOTE 109
L8
MULT TO FS17, FS18 AS REQ'D SEE NOTE 117

FS18 LAMP
FS17 BUZZER

NOTES:
1. THE FOLLOWING SYMBOL INDICATES DIRECTION OF TRANSMISSION:
2. THE FOLLOWING SYMBOL INDICATES DIRECTION OF CONTROL FUNCTION.

DRAWING ISSUE
1
2A
4B
5B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)
SD-IC245-01-HI
BELL TELEPHONE LABORATORIES INCORPORATED
6S

SD-IC245-01-HI

BD2

MAIN STATION - SINGLE CODE
ONE DIGIT (6,2-) OR TWO DIGIT (6,37)
J99340B OR J99340F

TO 4-WIRE LINE FACILITY-SEE NOTE 104 OR BD3-(FS12) OR TERMINATE IN 600 OHMS-SEE NOTE 105 & 206

TO 4-WIRE LINE FACILITY-SEE NOTE 104 OR TERMINATE IN 600Ω-SEE NOTE 105 & 206

TO 4-WIRE LINE FACILITY SEE NOTE 104

(1) FS1 4-WIRE BRIDGE AND AMPLIFIER ARRANGED FOR TALK-BACK OR (37) FS28 4-WIRE BRIDGE AND AMPLIFIER ARRANGED FOR LOOP BACK

FS11 APP FIG.11 4-WIRE BRIDGE AND AMPLIFIER

TO BD3-(FS12) OR TERMINATE IN 600 OHMS SEE NOTES 105 & 206 OR TO 4-WIRE LINE FACILITY SEE NOTE 104

TO FS21 LOUDSPEAKER SEE NOTES 106, 119

TO FS9

TO MAX 2 FS21

TO MAX 2 ADDITIONAL (4) FS4 OR (5) FS5

(4) FS4 SUPPLEMENTARY TALK BATTERY FEED WITH OR WITHOUT PICK-UP OR (5) (MFR DISC) FS5 SUPPLEMENTARY TALK BATTERY FEED WITHOUT PICK-UP

(2) FS2 TALK BATTERY FEED WITH OR WITHOUT PICK-UP OR (3) (MFR DISC) FS3 TALK BATTERY FEED WITHOUT PICK-UP

TO MAX 2 FS21

TO FS21 LOUDSPEAKER SEE NOTES 106, 119

TO FS9

MULT TO OTHER ORDER CIRCUITS AS REQ'D SEE NOTE 122

TO FS13 OR FS16

TO FS15, FS19, FS26

TO FS27

TO ADDITIONAL FS13, FS16 AS REQ'D SEE NOTE 116

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQ'D SEE NOTE 118

TO FS15 OR FS19

TO FS14 OR FS19

TO ADDITIONAL FS13, FS16, FS20 SEE NOTE 116

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQ'D SEE NOTE 118

FS6 APP FIG.6 SIGNAL RECEIVER SEE NOTES 107 & 203

FS7 APP FIG.7 SUPPLEMENTARY SIGNAL DETECTOR SEE NOTES 108 & 204 OR FS31 APP FIG.43 SUPPLEMENTARY SIGNAL DETECTOR WITH INHIBIT CIRCUIT SEE NOTES 136, 218

TO OFFICE ALARM CIRCUITS SEE NOTE 109

FS9 APP FIG.9 (MFR DISC) CALL-RECALL-ALERT CKT OR APP FIG.41 CALL-RECALL-ALERT CKT WITH TIMED LOCK UP

TO OFFICE ALARM CKTS SEE NOTE 112

TO OFFICE ALARM CKTS SEE NOTE 110

TO FS22 SEE NOTE 110

TO FS11, FS18 AS REQ'D SEE NOTE 117

TO OFFICE ALARM CRTS SEE NOTE 109

TO (2) FS2, (3) FS3, (4) FS4, (5) FS5

NOTES:

1. THE FOLLOWING SYMBOL INDICATES DIRECTION OF TRANSMISSION: →
2. THE FOLLOWING SYMBOL INDICATES DIRECTION OF CONTROL FUNCTION: →

DRAWING ISSUE: 1, 2A, 4B, 3B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-H2

BELL TELEPHONE LABORATORIES

SD-1C245-01-H2

BD 3

(W), 2 DIGIT, OR (X), 3 DIGIT SIGNAL CODE UP TO 5 CODES PER LOCATION FOR J99340C AND UP TO 4 CODES PER LOCATION FOR J99340G SEE NOTE 220

TO 4-WIRE LINE FACILITY-SEE NOTE 104 OR TERMINATE IN 600 OHMS-SEE NOTES 105,206

TO 4-WIRE LINE FACILITY SEE NOTE 104

T1, R1

T, R

FS 1
4-WIRE BRIDGE & AMPLIFIER ARRANGED FOR TALK BACK

FS 11
APP FIG. 11
4-WIRE BRIDGE & AMPLIFIER
SEE NOTE 120

TO ANOTHER FS 12 ON J99340C ONLY IF REQD OR TO 4-WIRE LINE FACILITY-SEE NOTE 104 OR TERMINATE IN 600 OHMS-SEE NOTES 105 & 206

FS 12
APP FIG. 12
4-WIRE LINE CONNECT CKT
SEE NOTE 120

TO BD 2 (FS11 OR FS31) OR CONNECTING ORDER CKT

TO FS 24 SEE NOTE 117

FS 10 (A&M ONLY)
APP FIG. 10
PRE-EMPT CKT
OR
FS 32
APP FIG. 44
TOUCH-TONE (R) RCVR INHIBIT CKT
SEE NOTE 220

P, PR TO FS 9

TO ALL OTHER FS 9

P, STR

FS 8
TOUCH-TONE (R) RECEIVER & DECODER
SEE NOTES 110, 205, 208
(W), 2 DIGIT DECODER
(X), 3 DIGIT DECODER

TO SUPVR CONTROL SYSTEM OR ALARM SYSTEM SEE NOTES 114,115

LEADS 1-4

LEADS 5,6

TO FS 21 LOUDSPEAKER SEE NOTES 106,119

TO FS 9 SEE NOTE 113

TO MAX 3 ADDITIONAL (4) FS4 OR (5) FS5 FOR J99340C OR TO MAX 2 (44) OR TO MAX 1 (44) ADDITIONAL FS4 FOR J99340G

TO MAX 2 FS 21

(4) FS4
SUPPLEMENTARY TALK BATTERY FEED WITH OR WITHOUT PICK UP
OR
(5) (MFR DISC.) FS 5
SUPPLEMENTARY TALK BATTERY FEED WITHOUT PICKUP

(2) FS2
TALK BATTERY FEED WITH OR WITHOUT PICK UP
OR
(3) (MFR DISC.) FS 3
TALK BATTERY FEED WITHOUT PICKUP

TO FS 21 LOUDSPEAKER SEE NOTES 106,119

TO (2) FS2 OR (3) FS3 OR (4) FS4 OR (5) FS5 SEE NOTE 113

FOR C UNIT

FOR G UNIT

TO FS9 FOR ADDITIONAL STATION CODES SEE NOTES 110,205

CR, CRG TO FS 9 SEE NOTE 113

MULT TO OTHER ORDER CIRCUITS AS REQ'D SEE NOTE 122

TO ADDITIONAL FS13, FS16 AS REQ'D SEE NOTE 116

TO FS13 OR FS16

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQ'D SEE NOTE 118

TO FS19 OR FS14

TO FS15 OR FS19

TO FS14 OR FS19

TO FS27

TO FS21

TO FS13, FS16, OR FS20

TO ADDITIONAL FS13, FS16, FS20 SEE NOTE 116

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQ'D SEE NOTE 118

FS 9
APP FIG. 9 (MFR DISC.)
CALL-RECALL-ALERT CKT
OR
APP FIG. 41
CALL-RECALL-ALERT CKT WITH TIMED LOCKUP

TO P.PR FS10

TO OFFICE ALARM CKTS SEE NOTE 112

G, GRTN

TO ALL ADDITIONAL FS 9 INCLUDED IN ALL STATION ALERT CODE

LB

TO FS17, FS18 AS REQ'D SEE NOTE 117

TO OFFICE ALARM CKTS SEE NOTE 109

TO FS22 SEE NOTE 111

TO A,B OFFICE ALARM CKTS A1, B1 SEE NOTES 103, 111 C1, D1

NOTES:

1. THE FOLLOWING SYMBOL INDICATES DIRECTION OF TRANSMISSION: →

2. THE FOLLOWING SYMBOL INDICATES DIRECTION OF CONTROL FUNCTION: →

DRAWING ISSUE: 1, 2A, 4B, 5B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-IC245-01-H3

BELL TELEPHONE LABORATORIES INCORPORATED

SD-IC245-01-H3

BD 4

(M), 2 DIGIT OR (X), 3 DIGIT SIGNAL CODE COMMON TTR FOR TWO ORDER CIRCUITS J93400D SEE NOTE 219

TO 4-WIRE LINE FACILITY FOR 1ST ORDER CIRCUIT SEE NOTE 104 — T1, R1 / T, R

FS 1 4-WIRE BRIDGE & AMPLIFIER ARRANGED FOR TALK BACK

T, R / T1, R1 — TO 4-WIRE LINE FACILITY FOR 1ST ORDER CIRCUIT SEE NOTE 104 OR TERMINATE IN 600 OHMS SEE NOTES 103 & 206

TO 4-WIRE LINE FACILITY FOR 2ND ORDER CIRCUIT SEE NOTE 104 — T1, R1 / T, R

FS 1 4-WIRE BRIDGE & AMPLIFIER ARRANGED FOR TALK BACK

T, R / T1, R1 — TO 4-WIRE LINE FACILITY FOR 2ND ORDER CIRCUIT SEE NOTE 104 OR TERMINATE IN 600 OHMS SEE NOTES 103 & 206

FS 30 SIGNALING AMPLIFIER CKT

TO FS21 LOUDSPEAKER SEE NOTES 106 & 119 — TO MAX 2 FS 21 — T, R

TO FS9 SEE NOTE 113 — CR, CRG

TO MAX 3 ADDITIONAL (4) FS4 OR (5) FS5

(4) FS4 SUPPLEMENTARY TALK BATTERY FEED WITH OR WITHOUT PICK UP OR (5) (MFR DISC) FS5 SUPPLEMENTARY TALK BATTERY FEED WITHOUT PICK UP

TT, TR / RT, RR

(2) FS2 TALK BATTERY FEED WITH OR WITHOUT PICK UP OR (3) (MFR DISC) FS3 TALK BATTERY FEED WITHOUT PICK UP

TO MAX 2 FS 21 — T, R

TO FS21 LOUDSPEAKER SEE NOTES 106 & 119 — T, R

CR, CRG TO FS9 SEE NOTE 113

(44) T, R

FS 32 APP FIG. 44 TOUCH-TONE (X) RECEIVER INHIBIT CKT SEE NOTE 219

(44) T, R

TO MAX 2 FS 21 — T, R

TO FS21 LOUDSPEAKER SEE NOTES 106, 119 — T, R

TO FS21 CR, CRG SEE NOTE 113

(2) FS2 TALK BATTERY FEED WITH OR WITHOUT PICK UP OR (3) (MFR DISC) FS3 TALK BATTERY FEED WITHOUT PICK UP

TT, TR / RT, RR

TO FS9 SEE NOTE 113 — CR, CRG

TO FS21 LOUDSPEAKER SEE NOTES 106 & 119 — TO MAX 2 FS 21 — T, R

(44) TO MAX 2

(-44) TO MAX 3 ADDITIONAL (4) FS4 OR (5) FS5

(4) FS4 SUPPLEMENTARY TALK BATTERY FEED WITH OR WITHOUT PICK UP OR (5) (MFR DISC) FS5 SUPPLEMENTARY TALK BATTERY FEED WITHOUT PICK UP

TT, TR / RT, RR

FS8 TOUCH-TONE (R) RECEIVER & DECODER SEE NOTES 110, 205, 208

(M) 2 DIGIT DECODER

(X) 3 DIGIT DECODER

SC5 SC4 SC3 SC2 — TO FS9 FDR ADDITIONAL STATION CODES SEE NOTES 110, 205

SC1 — AL

MULT TO OTHER ORDED CIRCUITS AS REQD SEE NOTE 122 — TO FS27 A / TT, TR / RT, RR / T, R — TO FS13 OR FS16 — TO FS15, FS26 — TO FS27

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQD SEE NOTE 118 — TO ADDITIONAL FS13, FS16 AS REQD SEE NOTE 116 — TO FS13 OR FS16 — TO FS15 OR FS19 — TO FS14 OR FS19

MULT TO OTHER CIRCUITS AS REQD SEE NOTE 122 — TO FS27 A / TT, TR / RT, RR — TO FS13 OR FS16 — TO FS15, FS26 — TO FS27

TO ADDITIONAL FS13, FS16, FS19 SEE NOTE 116 — TO FS13, FS16 OR FS19 — TO FS15 OR FS19 — TO FS14 OR FS19

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQD SEE NOTE 118

MULT TO OTHER ORDER CIRCUITS AS REQD SEE NOTE 122 — TO FS27 A / TT, TR / RT, RR — TO FS13 OR FS16 — TO FS15, FS26 — TO FS27

TO ADDITIONAL FS13, FS16, FS19 AS REQD SEE NOTE 116 — TO FS13, FS16 OR FS20 — TO FS15 OR FS19 — TO FS14 OR FS19

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQD SEE NOTE 118

MULT TO OTHER ORDER CIRCUITS AS REQD SEE NOTE 122 — TO FS27 A / TT, TR / RT, RR — TO FS13 OR FS16 — TO FS15, FS26 — TO FS27

TO ADDITIONAL FS13, FS16 AS REQD SEE NOTE 116 — TO FS13 OR FS16 — TO FS15 OR FS19 — TO FS14 OR FS19

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQD SEE NOTE 118

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQD SEE NOTE 118

TO (2) FS2 OR (3) FS3 OR (4) FS4 OR (5) FS5 SEE NOTE 113 — CR, CRG

TO OFFICE ALARM CKTS SEE NOTE 112 — G, GRTN

FS39 APP FIG. 9 (MFR DISC) CALL-RECALL-ALERT CKT OR APP FIG. 91 CALL-RECALL-ALERT CKT WITH TIMED LOCK UP

TO FS17 FS18 AS REQD SEE NOTE 117 — LB — (6)

C, D — TO OFFICE ALARM CIRCUITS SEE NOTE 109

H — TO FS22 SEE NOTE 111

AB — A1, B1, C1, D1 — TO OFFICE ALARM CKTS SEE NOTES 109 & 111

TO (2) FS2 OR (3) FS3 OR (4) FS4 OR (5) FS5 SEE NOTE 113 — CR, CRG

SC1 — AL

TO OFFICE ALARM CKTS SEE NOTE 112 — G, GRTN

FS39 APP FIG. 9 (MFR DISC) CALL-RECALL-ALERT CKT OR APP FIG. 91 CALL-RECALL-ALERT CKT WITH TIMED LOCK UP

E — TO ALL ADDITIONAL FS39 INCLUDED IN ALL STATION ALERT CODE

TO FS17 FS18 AS REQD SEE NOTE 117 — LB — (6)

C, D — TO OFFICE ALARM CIRCUITS SEE NOTE 109

H — TO FS22 SEE NOTE 111

AB — A1, B1, C1, D1 — TO OFFICE ALARM CKTS SEE NOTES 109 & 111

NOTES:

1. THE FOLLOWING SYMBOL INDICATES DIRECTION OF TRANSMISSION. →
2. THE FOLLOWING SYMBOL INDICATES DIRECTION OF CONTROL FUNCTION. →

DRAWING ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-IC245-01-H4

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-IC245-01-H4

BD 5

(W), 2 DIGIT, OR (X), 3 DIGIT SIGNAL CODE
COMMON TT,R FOR TWO ORDER CIRCUITS
DIALED CUT-THRU
J93408

TO 4-WIRE LINE FACILITY SEE NOTE 104

FS1 4-WIRE BRIDGE & AMPLIFIER ARRANGED FOR TALK BACK

FS 29 4-WIRE LINE CONNECT CKT

FS1 4 WIRE BRIDGE & AMPLIFIER ARRANGED FOR TALK BACK

TO 4-WIRE LINE FACILITY SEE NOTE 104

LEADS 1-4

LEADS 5-8

SCS

TO SUPVR CONT SYSTEM OR ALARM SYSTEM SEE NOTES 114, 115

FS3 30 SIGNALING AMPLIFIER CKT

TO FS21 LOUDSPEAKER SEE NOTES 106 & 119

TO FS9 SEE NOTE 113

TO MAX 2 FS 21

CR, CRG

TO MAX 1 ADDITIONAL (4) FS4 OR (5) FS5

(4) FS4 SUPPLEMENTARY TALK BATTERY FEED WITH OR WITHOUT PICK UP OR (5) (MFR DISC) FS5 SUPPLEMENTARY TALK BATTERY FEED WITHOUT PICK UP

(2) FS2 TALK BATTERY FEED WITH OR WITHOUT PICK UP OR (3) (MFR DISC) FS3 TALK BATTERY FEED WITHOUT PICK UP

TT, TR

RT, RR

T, R

TO MAX 2 FS 21

T, R TO FS21 LOUDSPEAKER SEE NOTES 106 & 119

CR, CRG TO FS9 SEE NOTE 113

(14) T, R

(44)

FS 32 APP FIG 44 TOUCH-TONE (R) RECEIVER INHIBIT CKT

FS3 8 TOUCH-TONE (R) RECEIVER & DECODER SEE NOTES 110, 205, 208

(W) 2 DIGIT DECODER

(X) 3 DIGIT DECODER

SC4 SC3 SC2

TO FS9 FOR ADDITIONAL STATION CODES SEE NOTES 110, 205

SC1 AL SC5

TO (2) FS2 OR (3) FS3 OR (4) FS4 OR (5) FS5 SEE NOTE 113

TO FS21 LOUDSPEAKER SEE NOTES 106, 119

TO FS21 CR, CRG SEE NOTE 113

(2) FS2 TALK BATTERY FEED WITH OR WITHOUT PICK UP OR (3) (MFR DISC) FS3 TALK BATTERY FEED WITHOUT PICK UP

(4) FS4 SUPPLEMENTARY TALK BATTERY FEED WITH OR WITHOUT PICK UP OR (5) (MFR DISC) FS5 SUPPLEMENTARY TALK BATTERY FEED WITHOUT PICK UP

MULT TO OTHER ORDER CIRCUITS AS REQD SEE NOTE 122

TO FS27 A

TO FS13 OR FS16

TO FS15, FS26, FS36

TO FS27

TO FS15, FS26, FS36

TO FS27

TO FS13, FS16, FS19 SEE NOTE 116

TO FS13, FS16, FS19

TO FS15 OR FS19

TO FS14 OR FS19

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQD SEE NOTE 118

TO ADDITIONAL FS13, FS16, FS19 AS REQD SEE NOTE 116

TO FS13 OR FS16

TO FS15 OR FS19

TO FS14 OR FS19

TO ADDITIONAL FS19 OR FS14 & FS15 AS REQD SEE NOTE 118

TO OFFICE ALARM CKTS SEE NOTE 112

G, GRTN

FS39 APP FIG. 9 (MFR DISC) CALL-RECALL-ALERT CKT OR APP FIG. 41 CALL-RECALL-ALERT CKT WITH TIMED LOCK UP

TO ALL ADDITIONAL FS39 INCLUDED IN ALL STATION ALERT CODE

(6)

TO FS17, FS18 AS REQD SEE NOTE 117

LB

C, D

TO OFFICE ALARM CIRCUITS SEE NOTE 109

H

TO FS22 SEE NOTE 111

A, B A1, B1 C1, D1

TO OFFICE ALARM CKTS SEE NOTES 109 & 111

NOTES:

1. THE FOLLOWING SYMBOL INDICATES DIRECTION OF TRANSMISSION.

2. THE FOLLOWING SYMBOL INDICATES DIRECTION OF CONTROL FUNCTION.

DRAWING ISSUE

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-IC245-01-H5

BELL TELEPHONE LABORATORIES INCORPORATED

65

SD-IC245-01-H5

CPS 1
4 WAY 4-WIRE BRIDGE CIRCUIT

COMPONENT LIST

RESISTOR

DESIG	CODE	
R1-R24	258A	KS-20616,L1A,796
R25-R32		600
R33		106
R34,R35		3520
R36		106
R37		182
R38,R39		2150
R40		182
R41		106
R42,R43		3520
R44		106
R45		182
R46,R47		2150
R48	258A	KS-20616,L1A,182

INPUT/OUTPUT INFORMATION

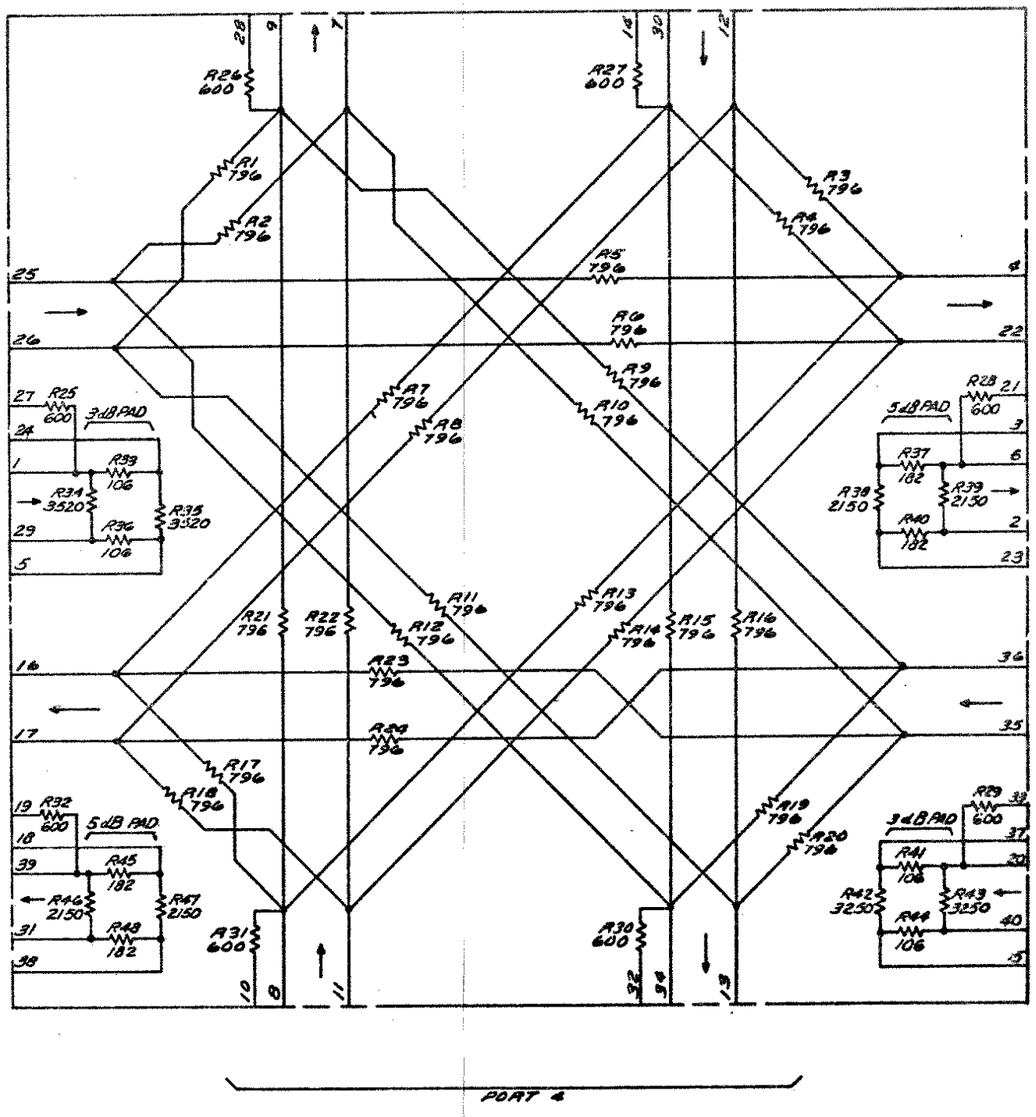
FUNCTION: PROVIDES THE LINE DROP AND THROUGH CONNECTION FOR MULTIPLE OFFICE 4 WIRE 600 OHM VOICE ORDER CIRCUITS.

IMPEDANCE: APPROXIMATELY 650 OHMS AT ANY PORT WHEN ALL OTHER PORTS ARE TERMINATED IN 600 OHMS.

LOSS: ANY INPUT TO ANY OTHER NUMBERED OUTPUT - 15 dB.
ANY INPUT TO THE SIMILARLY NUMBERED OUTPUT AND ALL OTHER IMPUTS >70dB.
ANY OUTPUTS TO THE SIMILARLY NUMBERED INPUT AND ALL OTHER OUTPUTS >70 dB.

CIRCUIT DESCRIPTION:

RESISTORS (R1) - (R24) FORM A FOUR PORT BALANCED NETWORK EACH HAVING A 600 OHM BALANCED INPUT AND OUTPUT. (R26). (R27), (R30), AND (R31) ARE 600 OHM TERMINATING RESISTORS WHICH MAY BE USED WHEN THE INPUTS AND OUTPUTS OF PORTS 3 AND 4 ARE NOT USED. ASSOCIATED WITH PORTS 1 AND 2 ARE BALANCED RESISTIVE PADS, 3 dB FOR INPUTS AND 5 dB FOR OUTPUTS. (R41) - (R44) FORM A 3 dB PAD AND (R37) - (R40) FORM A 5 dB PAD FOR PORT 1. (R33) - (R36) FORM A 3 dB PAD AND (R45)-(R48) FORM A 5db PAD FOR PORT 2. THESE PADS PERMIT CONNECTING TO 4 WIRE FACILITIES HAVING STANDARD LEVELS OF +7 dB RECEIVING AND -16 dB TRANSMITTING. (R25), (R28), (R29), AND (R32) ARE 600 OHM RESISTORS ASSOCIATED WITH THE PADS TO PROVIDE TERMINATIONS WHEN PORTS 1 AND 2 ARE NOT USED.



MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-1C304
CONNECTOR ON FRAME	908C

SYMBOL

SHOWN IN FS 1, FS 11

NOTES:
1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS.

DRAWING ISSUE 1
48

4 WAY 4-WIRE BRIDGE CKT
CPS 1
ISSUE 10B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT
SD-1C245-01-J1
BELL TELEPHONE LABORATORIES INCORPORATED
ISSUE 6S

SD-1C245-01-J1

CPS 2
DUAL AMPLIFIER CIRCUIT

DRAWING ISSUE 1 — 48

COMPONENT LIST

CAPACITOR

DESIG	CODE
[2] C1.0,C1.1	602A
[2] C2.0,C2.1	535H
[2] C3.0,C3.1	542C
[2] C4.0,C4.1	~~KS-16390,L9~~ 602B
[2] C5.0,C5.1	KS-19953,L3, .022
[2] C6.0,C6.1	KS-16390,L12
[2] C7.0,C7.1	KS-16390,L12
[2] C8.0,C8.1	KS-16390,L12
[2] C9.0,C9.1	600A

DIODE

DESIG	CODE
[2] CR1.0,CR1.1	459AF
[2] CR2.0,CR2.1	459AF
[2] CR3.0,CR3.1	446Y
[2] CR4.0,CR4.1	446Y

POTENTIOMETER

DESIG	CODE
[2] R2.0,R2.1	~~KS-14706,L2A,1K~~ KS-20231,L1A,1K

RESISTOR

DESIG	CODE
[2] R1.0,R1.1	~~238A~~ KS-20610,L1A,1780
[2] R3.0,R3.1	~~238A~~ KS-20610,L1A,750
[2] R4.0,R4.1	~~238A~~ KS-20610,L1A,1620
[2] R5.0,R5.1	KS-13490,L1, 180
[2] R6.0,R6.1	KS-13490,L1, 51
[2] R7.0,R7.1	KS-13490,L1, 51
[2] R8.0,R8.1	~~238A~~ KS-20610,L1A,12.1
[2] R9.0,R9.1	KS-13490,L1, 8.2K
[2] R10.0,R10.1	KS-13490,L1, 47
[2] R11.0,R11.1	KS-13490,L1, 120
[2] R12.0,R12.1	221A, 68.1
[2] R13.0,R13.1	KS-13490,L1, 33
[2] R14.0,R14.1	~~KS-13491,L1, 160~~ KS-20289,L6C,165

TRANSFORMER

DESIG	CODE
[2] T1.0,T1.1	2532AD
[2] T2.0,T2.1	2568B

TRANSISTOR

DESIG	CODE
[2] Q1.0,Q1.1	12P
[2] Q2.0,Q2.1	43A

VARISTOR

DESIG	CODE
[2] RV1.0,RV1.1	100D
[2] RV2.0,RV2.1	100D

INPUT/OUTPUT INFORMATION

FUNCTION: PROVIDES TWO IDENTICAL VOICE FREQUENCY AMPLIFIERS OPERATING FROM A COMMON -24 VOLT SUPPLY. PIN CONNECTIONS FOR VARIOUS INPUT AND OUTPUT IMPEDANCES ARE SHOWN IN TABLE A.

SIGNAL LEVELS: MAX OUTPUT LEVEL +18 dBm
GAIN RANGE - 12 TO 27 dB
GAIN RANGE WITH 10 dB PAD (STRAP TERMS 11-13 INPUT OR 11-15 FOR 1200Ω INPUT) - 2 TO 17 dB

FREQUENCY RESPONSE: 200 Hz - 20 KHz; 60 Hz - 20 KHz WITH TERMINALS 35 AND 39 STRAPPED (AMP 1), 2 AND 22 (AMP 2)

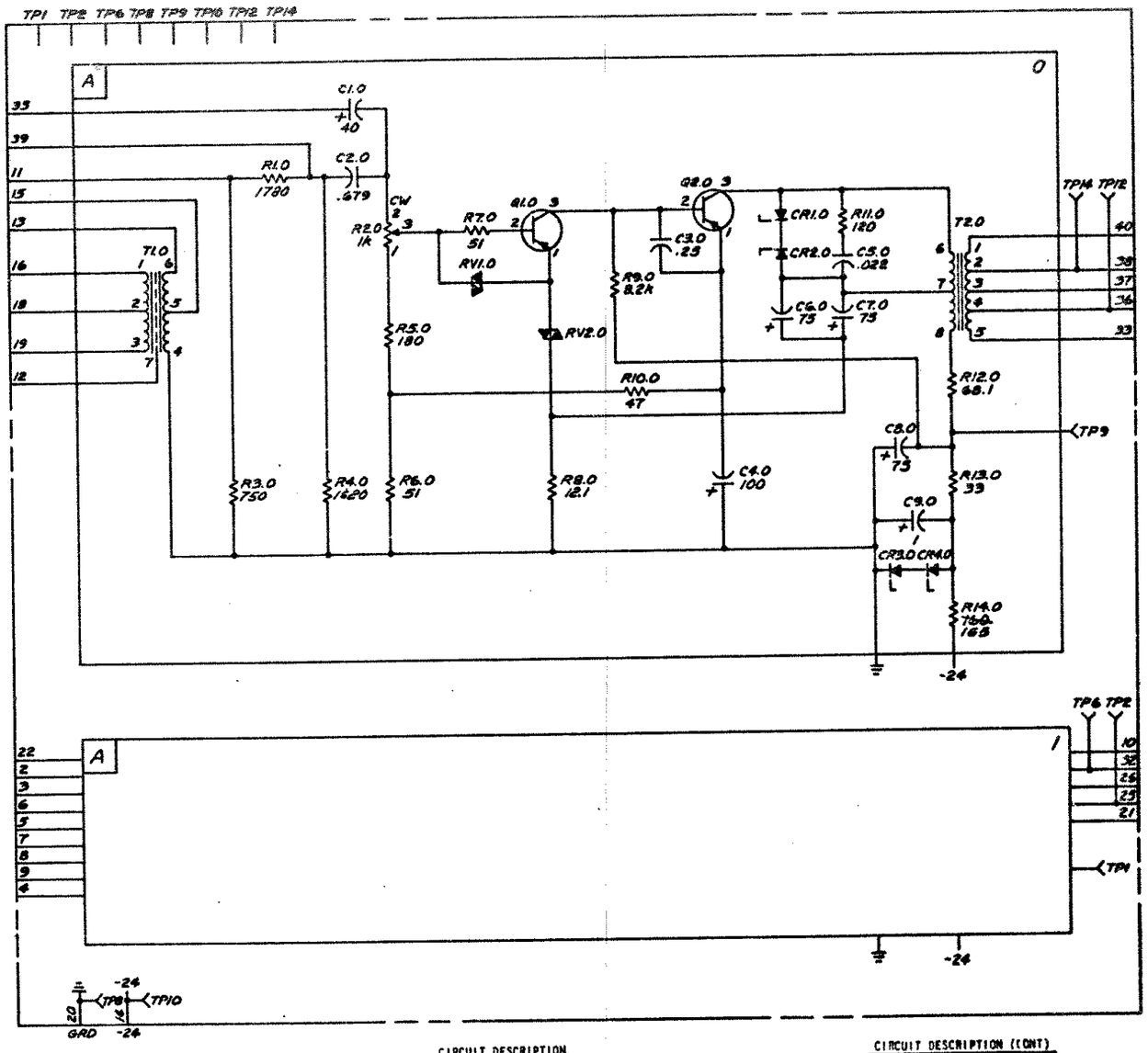


TABLE A

Z	AMPLIFIER 1 INPUT TERMS	AMPLIFIER 1 STRAP	AMPLIFIER 1 OUTPUT TERMS	AMPLIFIER 2 INPUT TERMS	AMPLIFIER 2 STRAP	AMPLIFIER 2 OUTPUT TERMS
1200	16-19 (CT-18)	(15,39)	33-40 (CT-37)	7-9 (CT-8)	(2,6)	10-21 (CT-26)
600	16-19 (CT-18)	(13,39)	36-38 (CT-37)	7-9 (CT-8)	(2,5)	25-32 (CT-26)
300	18-19	(15,39)	33-37	8-9	(2,6)	21-26
150	18-19	(13,39)	36-37	8-9	(2,5)	25-26

CIRCUIT DESCRIPTION

EACH AMPLIFIER IS COMPOSED OF AN INPUT CIRCUIT, OUTPUT CIRCUIT, AND A FEEDBACK SYSTEM. THE INPUT CIRCUIT CONSISTS OF A TERMINATED TRANSFORMER (T1), A CONTINUOUS GAIN CONTROL POTENTIOMETER (R2) OF APPROXIMATELY 15 dB RANGE AS PART OF A VOLTAGE DIVIDER CIRCUIT (C1), (R2), (R5), AND (R6), AND A 10 dB PAD (R1) AND (R3) TO REDUCE OVERALL GAIN WHEN REQUIRED. (R4) PROVIDES A TERMINATION FOR THE PAD ON (T1). CAPACITOR (C1) MAY BE STRAPPED IN PARALLEL WITH (C2) TO REDUCE THE LOW END CUT-OFF FREQUENCY. THE OUTPUT CIRCUIT CONSISTS OF A MULTIPLE WINDING TRANSFORMER (T2) IN WHICH THE PRIMARY WINDING IS TAPPED FOR A 10:1 IMPEDANCE DIVISION TO FURNISH FEEDBACK. THE FEEDBACK SYSTEM CONSISTS OF BOTH AC AND DC LOOPS. A PORTION OF THE OUTPUT SIGNAL FROM (T2) IS FED BACK THROUGH CAPACITORS (C6) AND (C7) AND ACROSS (R8) TO THE EMITTER OF TRANSISTOR (Q1). VARISTOR (RV2) PROVIDES TEMPERATURE

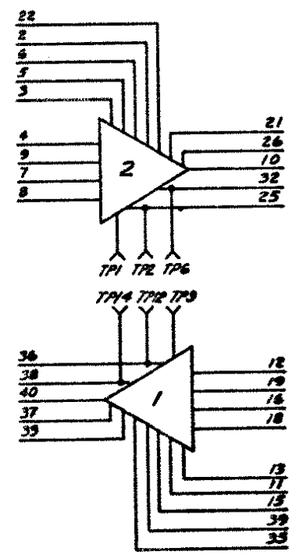
CIRCUIT DESCRIPTION (CONT)

COMPENSATION FOR (Q1). THE COLLECTOR CURRENT OF (Q2) IS STABILIZED BY EMITTER RESISTORS (R6) AND (R10). A PORTION OF dc VOLTAGE DEVELOPED ACROSS (R6) AND (R10) IS FED BACK THROUGH (R5) TO THE BASE OF (Q1) TO STABILIZE ITS COLLECTOR CURRENT. CAPACITOR (C4) IS A EMITTER BYPASS FOR (Q2). (R11), (C3), AND (C5) SERVE TO CONTROL THE FEEDBACK LOOP CUT-OFF CHARACTERISTICS. (R14), (CR3), AND (CR4) PROVIDE REGULATION TO PERMIT OPERATION OVER A RANGE OF BATTERY SUPPLY VOLTAGE FROM -19 TO -29 VOLTS. (R13), (C8), AND (C9) SERVE AS BATTERY DECOUPLING. (RV1), (CR1), AND (CR2) PROVIDE LIGHTNING AND SURGE PROTECTION.

MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-1C309
CONNECTOR ON FRAME	908C

SYMBOL



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE VALUES ARE IN OHMS;
   CAPACITANCE VALUES ARE IN MICROFARADS;
   VALUES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS.
2. ⏚ GROUND RETURN

DUAL AMPLIFIER CKT CPS 2

ISSUE 10B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-J2

BELL TELEPHONE LABORATORIES INCORPORATED

SD-IC245-01-J2

PART OF CPS 3
SIGNAL RECEIVER

TP1 TP6 TP7 TP9 TP10 TA11 TP12 TP13

L CHAN
32
33
36
38
39
40
C16 .0422
C17 .0383
C18 .0348
C19 .0305
R21 316
R31 2 CW 1 1K 3
13 T2
10 9
28
11 10
12
NC
9
8 7
22 R1 5110
C1 .0511
T1 10,000:600
NC
NC
RV1
C2 .5
R3 2210
R4 1020
R5 750
C3 .022
Q1
Q2
R6 562
R7 681
C4 10
R8 760 562
R9 200
-24
TP9
23 R2 5110
1 T3
6 9
4
5 10
2
3
NC
NC
24
27
26
C20 .0232
C21 .0196
C22 .0193
R32 2 CW 1 2K 3
R22 422
21
H CHAN
30
TP6
TP1
20
14
GRD -24
L1 INDA .0392H
C5 .411
L2 INDA .0248H
C6 .642
C7 5
R10 562
R11 562
R12 750
Q3
RV2
C13 3920pf
C14 5
RV4
R13 715
C11 20
R19 1620
-24
TA11
TP12
R29 442
R27 3920
CR2
R30 442
R28 5230
TP7
R17 750
C15 5
R14 383
R15 133
R16 511
Q4
RV3
R18 715
C12 10
R20 1620
C8 .835
C10 .835
L3 INDA .0292H
C9 1.45
RV5
TP10
Q5
Q7
R23 5110
C23 5
R25 5110
R24 5110
C24 5
R26 5110
Q6
Q8
TP13
2 R.S K1 U 590 CR1 34
R.S K1 15 5 17 19
R.S K1 16 3 18
R.S K1 35 37 1 7

SIGNAL RECEIVER
PART OF CPS 3
ISSUE 108

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)
SD-1C245-01-J3A
BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-1C245-01-J3A

PART OF CPS 3
SIGNAL RECEIVER

CIRCUIT REQUIREMENTS

APPARATUS DESIG	CODE	OPT	FIG		MECH REQT BSP FIG.	MECH REQT CONT PRES	MECH REQT ARM. TRVL	CIRCUIT PREPARATION BLOCK OR INSULATE	CIRCUIT PREPARATION TEST CLIP DATA CONN BAT.	CIRCUIT PREPARATION TEST CLIP DATA CONN GRD	TEST SET PREP	SEE TEST NOTE	DIRECT CURRENT FLOW REQT TEST WDG	DIRECT CURRENT FLOW REQT TEST FOR	DIRECT CURRENT FLOW REQT AFTER TEST MA	DIRECT CURRENT FLOW REQT READJ TEST MA	DIRECT CURRENT FLOW REQT READJ MB	REMARKS
RELAY																		
K1	BF6	R			3				L(K1)	U(K1)		1		0		25.3	24.0	
K1	MB1	S			200				L(K1)	U(K1)		1		0		25.5	24.0	

TEST NOTES:

1. REMOVE CIRCUIT PACK FROM EQUIPMENT UNIT TO TEST

COMPONENT LIST

RELAY

DESIG	K1		K1	
CODE	BF6		MB1	
OPTION	R		S	
	CONT ARR	LOC	CONT ARR	LOC
6	BM	D9	EBM	D9
5	BM	E9	EBM	E9
4	BM		EBM	
3	BM		EBM	
2	BM	C8	EBM	C8
1	BM	E9	EBM	E9
COIL	X	C9		C9

CAPACITOR

DESIG	CODE
C1	542W
C2	542A
C3	~~K3-19866 L1~~ KS-20977,L4 .022
C4	601B
C5	535GT
C6	535GR
C7	601A
C8	535GS
C9	535CJ
C10	535GS
C11	602C
C12	601B
C13	KS-16591 L1, 3320pF
C14	601A
C15	601A
C16	577D, .0422
C17	577D, .0383
C18	577D, .0348
C19	577D, .0305
C20	577D, .0232
C21	577D, .0196
C22	577D, .0193
C23,C24	601A

DIODE

DESIG	CODE
CR1	400J
CR2	446B

INDUCTOR

DESIG	CODE
L1	1592C, .0392H
L2	1592C, .0248H
L3	1592C, .0242H

POTENTIOMETER

DESIG	CODE
R31	~~KS-20231, L2~~ KS-20231,L2A,1K
R32	~~KS-20231, L2~~ KS-20231,L2A,2K

COMPONENT LIST (CONT)

RESISTOR

DESIG	CODE
R1,R2	~~257A~~ KS-20616,L1A,5510
R3	~~257A~~ KS-20616,L1A,2210
R4	~~257A~~ KS-20616,L1A,1020
R5	~~257A~~ KS-20616,L1A,750
R6	~~257A~~ KS-20616,L1A,56.2
R7	~~257A~~ KS-20616,L1A,681
R8	~~K3-15491 L1 560~~ KS-20289,L6C,562
R9	237A, 200
R10,R11	221A, 562
R12	~~257A~~, KS-20616,L1A,750
R13	221A, 715
R14	221A, 383
R15	~~257A~~, KS-20616,L1A,135
R16	~~221A~~, KS-20616,L1A,511
R17	~~257A~~, KS-20616,L1A,750
R18	221A, 715
R19,R20	~~257A~~, KS-20616,L1A,1620
R21	~~257A~~, KS-20616,L1A,316
R22	~~257A~~, KS-20616,L1A,422
R23,R24	~~257A~~, KS-20616,L1A,5110
R25,R26	~~257A~~, KS-20616,L1A,5110
R27	221A, 3920
R28	221A 5230
R29,R30	~~257A~~, KS-20616,L1A,442

TRANSFORMER

DESIG	CODE
T1	2564W
T2,T3	2597A

TRANSISTOR

DESIG	CODE
Q1-Q4	~~46F~~ 66F
Q5	12D
Q6	~~46F~~ 66F
Q7	12D
Q8	~~46F~~ 66F

VARISTOR

DESIG	CODE
RV1-RV5	1000

NOTES:

1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, VALUES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS.
2. ⏚ GROUND RETURN.
3. RECORD OF CHANGES

DWG ISS	PREV FURN	STD	MFR DISC	SEE NOTE
7B	R	S	R	

MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	(R) ED-1C306()G1 (S) ED-1C306()G2
CONNECTOR ON FRAME	90BC

SYMBOL

SHOWN IN DETAIL IN FS6

INPUT/OUTPUT INFORMATION

FUNCTION: RESPONDS TO A PAIR OF TONES WHICH CONSTITUTE A VALID TOUCH-TONE (TT) DIGIT AND GIVES A RELAY CONTACT CLOSURE OUTPUT UPON RECEPTION OF THE PARTICULAR DIGIT FOR WHICH THE RECEIVER IS STRAPPED.

INPUT: TOUCH-TONE DIGIT SIGNAL OF -1 dBm NOMINAL ON PINS 22 AND 23. INPUT IMPEDANCE APPROXIMATELY 10K OHMS FOR BRIDGING ONTO A 600 OHM BALANCED LINE.

CIRCUIT DESCRIPTION

THE BALANCED INPUT CIRCUIT CONSISTS OF RESISTORS (R1) AND (R2), CAPACITOR (C1), AND TRANSFORMER (T1). IT PROVIDES A HIGH INPUT IMPEDANCE FOR BRIDGING ONTO A LOW IMPEDANCE BALANCED CIRCUIT. (C1) BLOCKS dc FROM THE PRIMARY WINDING OF (T1). TRANSISTORS (Q1) AND (Q2), AND ASSOCIATED BIASING COMPONENTS FORM AND INPUT AMPLIFIER TO PROVIDE THE NECESSARY GAIN AS WELL AS IMPEDANCE TRANSFORMATION TO DRIVE THE CUT-APART FILTER AND LIMITERS. THE CUT APART FILTER SEPARATES THE INCOMING SIGNAL INTO TWO CHANNELS. (L1), (L2), (C5), AND (C6) FORM A LOW CHANNEL FILTER WHICH REJECTS FREQUENCIES ABOVE 1175 Hz. (C8), (C9), (C19) AND (L3) FORM A HIGH CHANNEL FILTER WHICH REJECTS FREQUENCIES BELOW 965 Hz. (Q3) AND (Q4) ARE LIMITERS FOR LOW AND HIGH CHANNELS RESPECTIVELY. EACH LIMITER PRODUCES A SQUARE WAVE OF FIXED AMPLITUDE. THE LIMITERS PROVIDE PROTECTION AGAINST FALSE OPERATION OF THE RECEIVER CAUSED BY SPEECH OR NOISE SIMULATION OF TOUCH-TONE FREQUENCIES. ONLY A SINGLE FREQUENCY INPUT WILL ALLOW THE LIMITER OUTPUT FUNDAMENTAL TO HAVE THE REQUIRED ENERGY TO BE ABOVE THRESHOLD. EACH LIMITER CONNECTS TO A SERIES RESONANT CIRCUIT WHICH IN TURN CONNECTS TO A THRESHOLD DETECTOR. THE FREQUENCY OF THE SERIES RESONANT CIRCUIT IS DETERMINED BY STRAPS AS INDICATED IN NOTE 203. THE DETECTOR OPERATES WHEN THE TUNED CIRCUIT IS PRESENTED WITH A SIGNAL AT OR NEAR ITS RESONANT FREQUENCY. THE OPERATING THRESHOLD IS SET AT APPROXIMATELY 2 dB BELOW THE PEAK-TUNED CIRCUIT RESPONSE AS DETERMINED BY THE BIAS CIRCUIT (CR2,R27-R30) AND THE BANDWIDTH ADJUSTING POTENTIOMETER (R31) OR (R32). (Q5), LOW TONE DETECTOR, OR (Q7), HIGH TONE DETECTOR, IS TURNED ON BY THE NEGATIVE PEAKS OF AN ac SIGNAL APPEARING ON THE BASE. A CHARGE IS BUILT UP ON (C23) OR (C24) AND FORWARD BIASES THE OUTPUT TRANSISTORS (Q6) OR (Q8). IF BOTH (Q6) AND (Q8) ARE ON SIMULTANEOUSLY, INDICATING A VALID TOUCH-TONE DIGIT FOR WHICH THE RECEIVER IS STRAPPED, A PATH TO -24 VOLTS IS PROVIDED WHICH OPERATES RELAY (K1) (K1) REMAINS OPERATED AS LONG AS BOTH (Q6) AND (Q8) ARE ON OR UNTIL RELEASED BY AN EXTERNAL CIRCUIT IF THE SELF LOCKING PATH THROUGH PIN 34 IS USED.

DRAWING ISSUE 1 4B

SIGNAL RECEIVER
PART OF CPS 3

ISSUE 10B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-1C245-01-J3B

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-1C245-01-J3B

CPS 4
SUPPLEMENTARY SIGNAL DETECTOR

CIRCUIT REQUIREMENTS

APPARATUS DESIG	CODE	OPT	FIG	MECH REQT BSP FIG	CONT PRES	ARM TRVL	CIRCUIT PREPARATION BLOCK OR INSULATE	TEST CLIP DATA CONN BAT.	CONN GRD	TEST SET PREP	SEE TEST NOTE	DIRECT CURRENT FLOW REQT TEST WDG	TEST FOR	MASTER TIMER MA	TEST MA	READ MA	REMARKS
RELAY																	
K1	BF6	R		3				U(K1)	L(K1)	B/G	1				25.5	24.0	
K1	MB1	S		200				U(K1)	L(K1)	B/G	1				25.9	24.00	

TEST NOTES:

1. REMOVE CIRCUIT PACK FROM EQUIPMENT UNIT TO TEST

COMPONENT LIST

RELAY

DESIG	K1		K1	
CODE	BF6		MB1	
OPTION	R		S	
	CONT ARR	LOC	CONT ARR	LOC
6	BM		EBM	
5	BM	H5	EBM	H5
4	BM	H5	EBM	H5
3	BM			
2	BM	A5		A5
1	BM	G5		G5
COIL		H3		H3

CAPACITOR

DESIG	CODE
C1	577D, .0422
C2	577D, .0383
C3	577D, .0348
C4	577D, .0305
C5	577D, .0305
C6	577D, .0193
C7	577D, .0232
C8	577D, .0196
C9	577D, .0193
[4] C10.0-C10.3	601A
C11	602A
C12	600A 1.0

DIODE

DESIG	CODE
CR1	400J
CR2	446D
CR3,CR4	446B

POTENTIOMETER

DESIG	CODE
R12 R13	~~KS-20231,L2,~~ KS-20231,L2A,1K
R14 R15	~~KS-20231,L2,~~ KS-20231,L2A,2K

RESISTOR

DESIG	CODE
R1	~~237A,~~KS-20616,L1A,316
R2	~~237A,~~KS-20616,L1A,316
R3	~~237A,~~KS-20616,L1A,442
R4	~~237A,~~KS-20616,L1A,442
[4] R5.0-R5.3	~~237A,~~KS-20616,L1A,5110
[4] R6.0-R6.3	~~237A,~~KS-20616,L1A,5110
R7	KS-13490,L7, 12K,
R8	~~KS-16645,L1, 63K~~ KS-20616,L1A,61.9k
R10	~~KS-16645,L1,~~ KS-20616,L1A,5.1K
R11	~~KS-16645,L1, 82K~~ KS-20616,L1A,82.5K

RESISTOR (CONT)

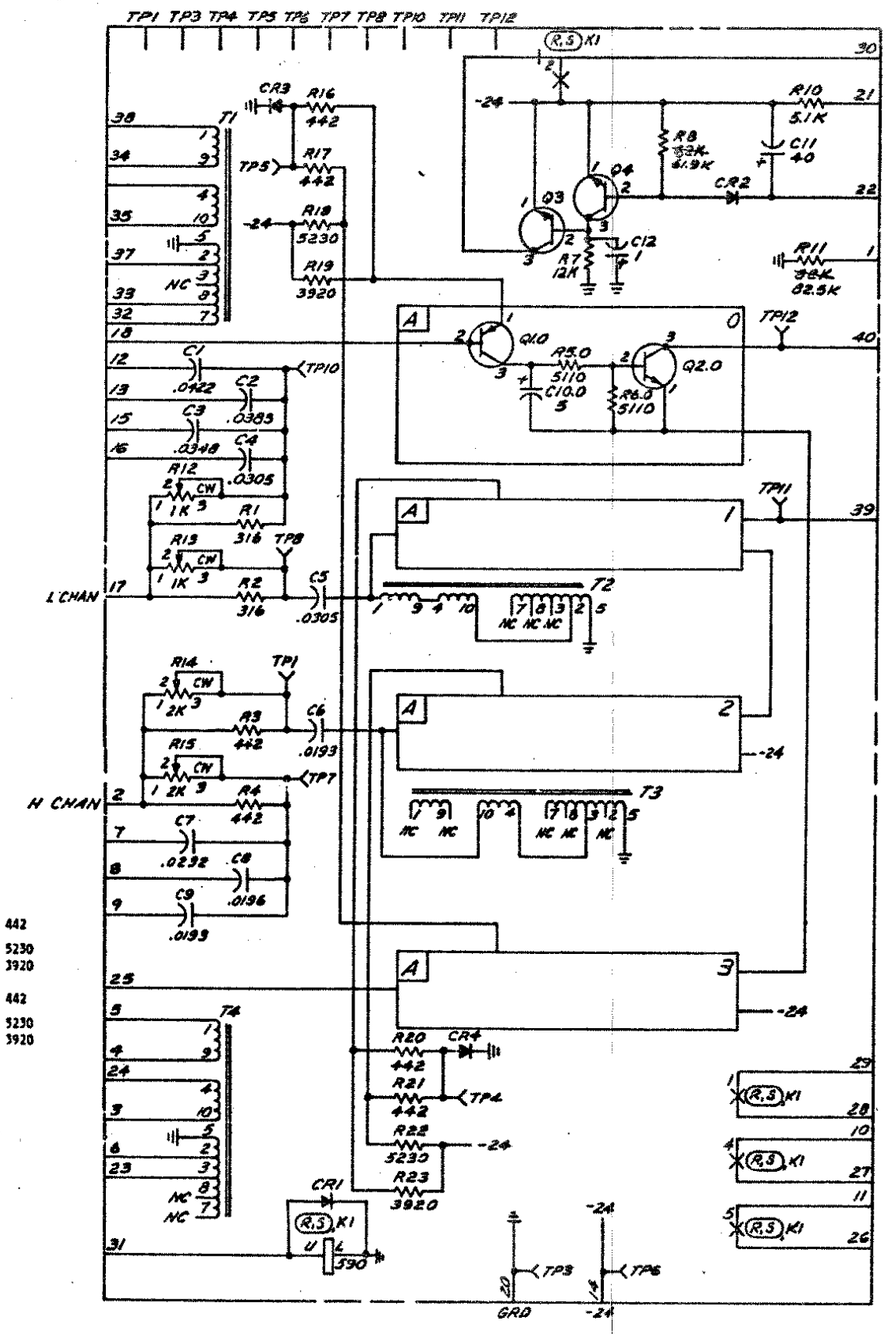
DESIG	CODE
R16 R17	237A, 442
R18	221A, 5230
R19	221A, 3920
R20 R21	237A, 442
R22	221A, 5230
R23	221A, 3920

TRANSFORMER

DESIG	CODE
T1-T4	2597A

TRANSISTOR

DESIG	CODE
[4]Q1.0-Q1.3	12D
[4]Q2.0-Q2.3	~~16F~~ 66F
Q3	~~16L~~ 66L
Q4	~~16J~~ 66J



MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	④ED-1C307()G1 ⑤ED-1C307()G2
CONNECTOR ON FRAME	908C

SYMBOL

SHOWN IN FS 7

INPUT/OUTPUT INFORMATION

FUNCTION: PROVIDES TWO DIGIT DETECTORS WHICH RESPOND TO VALID TOUCH-TONE DIGITS WHEN USED IN CONJUNCTION WITH CP3. A TIMER CIRCUIT PROVIDES AN INTERDIGITAL TIME-OUT PERIOD OF APPROXIMATELY 2.5 SECONDS.

INPUT: SQUARE WAVE SIGNAL OF APPROXIMATELY 1.25 VOLTS PEAK TO PEAK.

CIRCUIT DESCRIPTION

TWO HIGH CHANNEL AND TWO LOW CHANNEL TUNED CIRCUITS ARE PROVIDED WHICH ARE DRIVEN FROM THE HIGH AND LOW LIMITERS, RESPECTIVELY, OF CP3. ONE HIGH CHANNEL (T3) AND (C6) AND ONE LOW CHANNEL (T2) AND (C5) ARE CONNECTED TO RESPOND TO TONES L4 (941 Hz) AND H3 (1477 Hz). THE OTHER TWO TUNED CIRCUITS MUST BE STRAPPED IN ACCORDANCE WITH NOTE 204. OPERATION OF THE DETECTORS IS IDENTICAL WITH THAT OF CP3. THE TIMER CIRCUIT CONSISTS OF TRANSISTORS (Q3) AND (Q4), REFERENCE DIODE (CR2), AND ASSOCIATED RESISTORS AND CAPACITORS. IT PROVIDES AN INTERDIGITAL TIME-OUT PERIOD OF APPROXIMATELY 2.5 SECONDS WHEN USED WITH CP3. WITH RELAY (K1) RELEASED AND PINS 21 AND 22 CONNECTED EXTERNALLY, CAPACITOR (C11) IS DISCHARGED, TRANSISTOR (Q4) IS OFF AND (Q3) IS ON. THIS APPLIES -24 VOLTS TO PIN 30. WITH THE CONNECTION BETWEEN PINS 21 AND 22 REMOVED AND PINS 22 AND 1 CONNECTED EXTERNALLY, CAPACITOR (C11) CHARGES THROUGH RESISTOR (R11). IN APPROXIMATELY 2.5 SECONDS THE REFERENCE VOLTAGE OF DIODE (CR2) IS OVERCOME. THIS FORWARD BIASES (Q4) WHICH TURNS OFF (Q3) REMOVING VOLTAGE FROM PIN 30. RECONNECTING PINS 21 AND 22 DISCHARGES (C11) THROUGH (R10) PROVIDING A TIMER RECOVERY TIME OF APPROXIMATELY 0.2 SECONDS. WITH RELAY (K1) OPERATED CONTACT 2 CONNECTS -24 VOLTS TO PIN 30 DIRECTLY.

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE VALUES ARE IN OHMS;
   VALUES PRECEDED BY THE SYMBOL + (PLUS)
   ARE -(MINUS) ARE IN VOLTS.
2. ⏚ GROUND RETURN.
3. RECORD OF CHANGES

CHG ISS	PREV FURN	STD	REF DISC	SEE NOTE
7B	R	S	R	

SUPPLEMENTARY SIGNAL DETECTOR

CPS 4

ISSUE 10B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-J4

BELL TELEPHONE LABORATORIES INCORPORATED

SHEET NO. 6S

DRAWING ISSUE 1 2A 4B

SD-1C245-01-J4

CPS 5
PART OF DECODER

COMPONENT LIST

QIODE

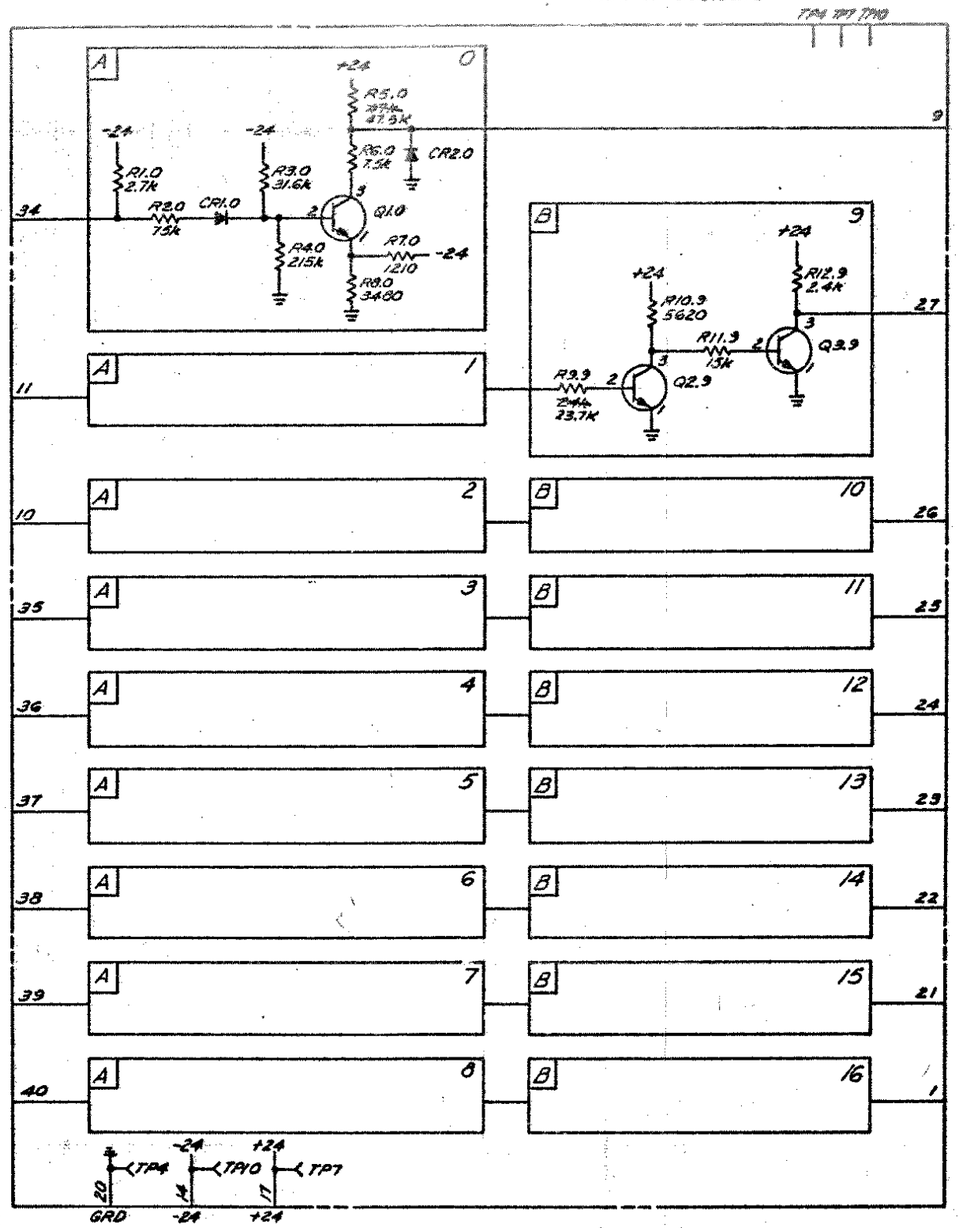
DESIG	CODE
[9] CR1.0-CR1.8	458A
[9] CR2.0-CR2.8	458A

RESISTOR

DESIG	CODE
[9] R1.0-R1.8	KS-13490,L1, 2.7k
[9] R2.0-R2.8	~~KS-16645,L1,~~ KS-20616,L1A,75k
[9] R3.0-R3.8	~~237A,~~ KS-20616,L1A,31.6k
[9] R4.0-R4.8	~~237A,~~ KS-20616,L1A,215k
[9] R5.0-R5.8	~~KS-16645,L1, 47k~~ KS-20616,L1A,47.5k
[9] R6.0-R6.8	~~KS-16645,L1,~~ KS-20616,L1A,7.5k
[9] R7.0-R7.8	~~237A,~~ KS-20616,L1A,1210
[9] R8.0-R8.8	~~238A,~~ KS-20616,L1A,3480
[8] R9.9-R9.16	~~KS-16645,L1, 24k~~ KS-20616,L1A,23.7k
[8] R10.9-R10.16	~~238A,~~ KS-20616,L1A,5620
[8] R11.9-R11.16	~~KS-16645,L1,~~ KS-20616,L1A,15k
[8] R12.9-R12.16	KS-13490,L1,2.4k

TRANSISTOR

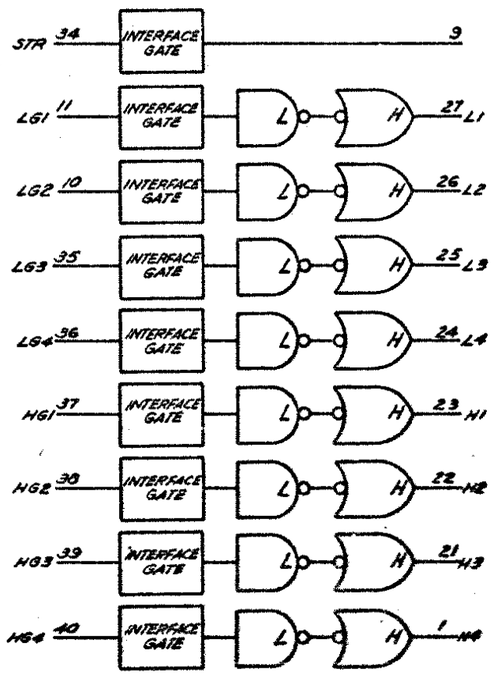
DESIG	CODE
[9] Q1.0-Q1.8	~~151~~ 66J
[8] Q2.9-Q2.16	~~151~~ 66J
[8] Q3.9-Q3.16	~~151~~ 66J



MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-1C303
CONNECTOR ON FRAME	908C

SYMBOL



INPUT/OUTPUT INFORMATION

FUNCTION: PROVIDES NINE SEPARATE INPUTS WHICH SUPPLY -24 VOLTS THROUGH 2700 OHM RESISTORS TO THE INPUT CONNECTING CIRCUIT. PROVIDES NINE SEPARATE OUTPUTS CAPABLE OF DRIVING CONNECTING TRL CIRCUITS.

LEVELS : OUTPUTS ARE AT APPROXIMATELY GROUND POTENTIAL IF THE ASSOCIATED INPUT IS GROUNDED, AND GREATER THAN +6 VOLTS IF THE ASSOCIATED INPUT IS OPEN.

CIRCUIT DESCRIPTION:

TRANSISTORS (Q1.0) TO (Q1.8) AND ASSOCIATED COMPONENTS FORM NINE IDENTICAL INTERFACE GATES WHOSE FUNCTION IS TO PROVIDE THE PROPER LOGIC LEVEL CONVERSION BETWEEN THE INPUT CONNECTING CIRCUITS AND THE TRL GATES WHICH FOLLOW. (Q2.9) TO (Q2.16) AND ASSOCIATED RESISTORS FORM EIGHT IDENTICAL L GATES WHICH IN TURN DRIVE EIGHT IDENTICAL H GATES COMPOSED OF (Q3.9) TO (Q3.16) AND ASSOCIATED RESISTORS. THE H GATES ARE NEEDED TO SATISFY THE CURRENT REQUIREMENTS OF THE CONNECTING OUTPUT CIRCUITS. OPERATION OF THE INDIVIDUAL GATE CIRCUITS IS EXPLAINED IN NOTE 302.

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE VALUES ARE IN OHMS;
   VALUES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS.
2. ⏚ GROUND RETURN

DRAWING ISSUE 1 24 +B

PART OF DECODER CPS 5

ISSUE 10B

SD-IC245-01-J5

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-IC245-01-J5

PART OF CPS 6
PART OF DECODER

TP1 TP2 TP3 TP5 TP7 TP8 TP9 TP11

+24 R2 2.4k CR1 CR2 R3 16k R4 5620 Q1 Q2 R1 15k R5 4.75k C1 1uF R7 12.1k Q3 R6 24k 23.7k R8 3160

A +24 R9.0 2.4k R10.0 15k R11.0 15k R12.0 2.4k Q4.0 Q5.0 CR3.0 CR4.0 R16.0 7.94k 133K R15.0 7.94k 133K R13.0 15k R14.0 15k R17.0 24k 23.7k C2.0 1330 -24 C3.0 1330 R18.0 24k 23.7k

TP7 +24 R20 12.1k Q6 R19 24k 23.7k R21 3160

A 1 TP9

+24 R22 23.7k 24k R23 23.7k 24k R24 23.7k 24k R25 24k 23.7k R26 12.1k Q7 R27 3160

B 2 +24 R40.2 2.4K R38.2 15k R39.2 15k Q11.2 R41 7.5k Q12

B 3

C 4 +24 R44.4 5620 R42.4 24k 23.7k R43.4 24k 23.7k Q13.4

C 5

C 6

C 7

TP5

+24 R28 16K CR5 CR6 R30 5620 Q8 R29 4.75k C4 1 uF

R31 24k 23.7k R32 24k 23.7k R33 24k 23.7k +24 R34 5620 Q9

CR9 CR8 R72 16K +24 R70 5620 +24 Q22 R71 4.75k C7 1 uF

R35 24k 23.7k R36 24k 23.7k +24 R37 5620 Q10

R45 24k 23.7k R46 24k 23.7k R47 24k 23.7k R48 24k 23.7k R49 24k 23.7k R50 24k 23.7k R51 24k 23.7k R52 24k 23.7k

+24 R55 24k R54 15k Q15 +24 R57 330 Q16 R56 24k 23.7k Q17 +24 R53 5620 Q14 TP1

TP2

R58 15k R59 15k R60 15k +24 R61 147k Q18 R62 620 C5 20 uF C6 20 uF CR7 Q19 R63 100A R64 10A R65 10A R66 100A

+24 R67 13.3K R68 24k 23.7k Q20 +24 R69 5620 Q21

21 15 3 2 1 21

TP3 TP11 TP8
GRD +24 -24

PART OF DECODER
PART OF CPS 6

ISSUE 10B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT
SD-IC245-01-J6A
BELL TELEPHONE LABORATORIES INCORPORATED
SIZE CODE 65

SD-IC245-01-J6A

PART OF CPS6
PART OF DECODER

COMPONENT LIST

CAPACITOR

DESIG	CODE
C1	600A
[2] C2.0-C2.1	~~394C~~, KS-20977,L4,1330
C3.0-C3.1	~~394C~~, KS-20977,L4,1330
C4	600A
C5,C6	602C
C7	600A

DIODE

DESIG	CODE
CR1	458A
CR2	449A
[2] CR3.0-CR3.1	449A
[2] CR4.0-CR4.1	449A
CR5	458A
CR6	449A
CR7	458A
CR8	449A
CR9	458A

RESISTOR

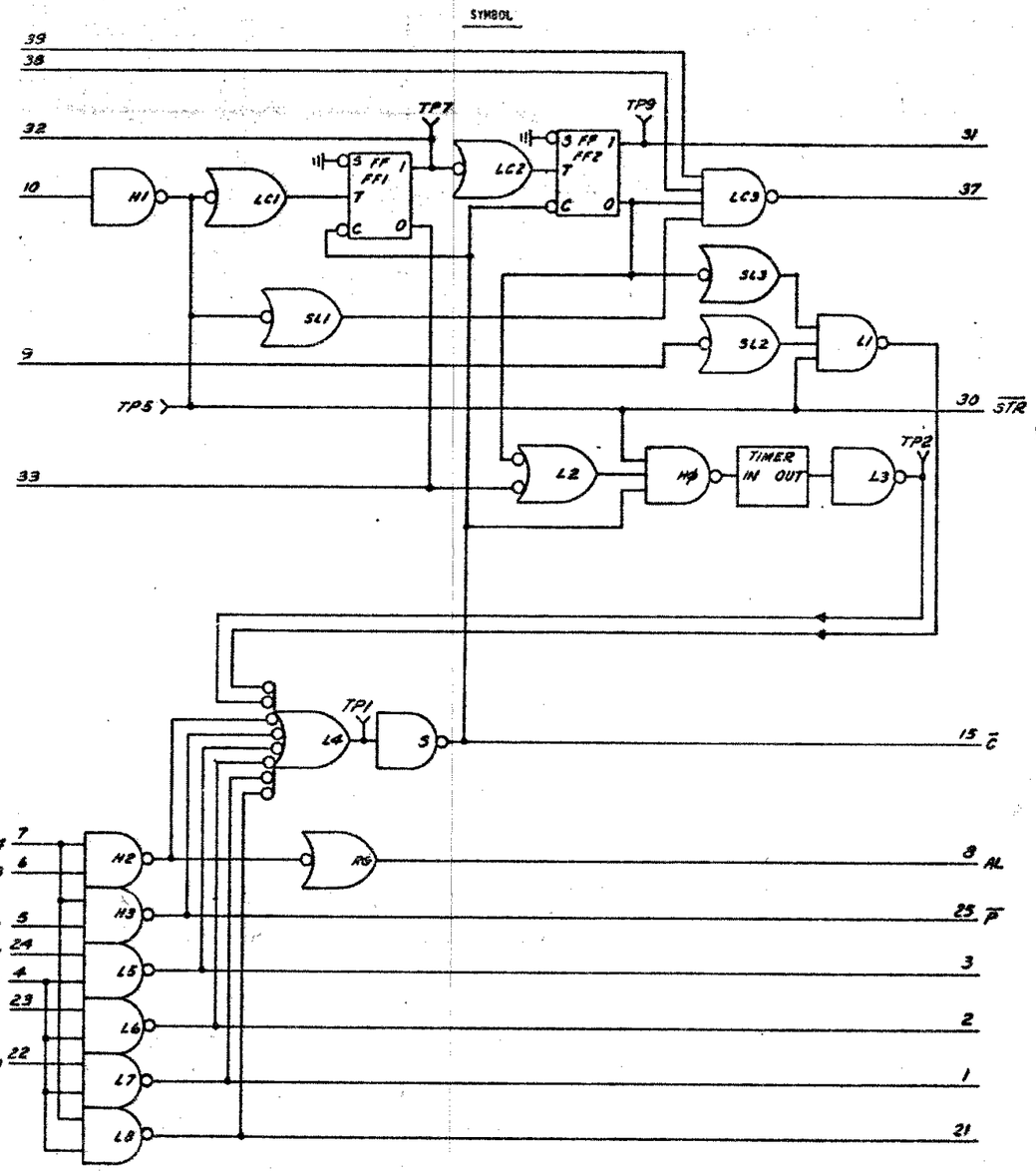
DESIG	CODE
R1	~~KS-16645, L1~~, KS-20616,L1A,15K
R2	KS-13490, L1, 2.4K
R3	~~KS-16645, L1~~, KS-20616,L1A,16K
R4	~~2368~~, KS-20616,L1A,5620
R5	~~KS-16645, L1, 4.7K~~, KS-20616,L1A,4.75K
R6	~~KS-16645, L1, 24K~~ KS-20616,L1A,23.7K
R7	~~2374~~, KS-20616,L1A,12.1K
R8	~~2374~~, KS-20616,L1A,3160
[2] R9.0,R9.1	KS-13490, L1, 2.4K
[2] R10.0,R10.1	~~KS-16645, L1~~, KS-20616,L1A,15K
[2] R11.0,R11.1	~~KS-16645, L1~~, KS-20616,L1A,15K
[2] R12.0,R12.1	KS-13490, L1, 2.4K
[2] R13.0,R13.1	~~KS-16645, L1~~, KS-20616,L1A,15K
[2] R14.0,R14.1	~~KS-16645, L1, 130K~~ KS-20616,L1A,133K
[2] R15.0,R15.1	~~KS-16645, L1, 130K~~ KS-20616,L1A,133K
[2] R16.0,R16.1	~~KS-16645, L1~~, KS-20616,L1A,15K
[2] R17.0,R17.1	~~KS-16645, L1, 24K~~ KS-20616,L1A,23.7K
[2] R18.0,R18.1	~~KS-16645, L1, 24K~~ KS-20616,L1A,23.7K
R19	~~KS-16645, L1, 24K~~ KS-20616,L1A,23.7K
R20	~~2374~~, KS-20616,L1A,12.1K
R21	~~2374~~, KS-20616,L1A,3160
R22-R25	~~KS-16645, L1, 24K~~ KS-20616,L1A,23.7K
R26	~~2374~~, KS-20616,L1A,12.1K
R27	~~2374~~, KS-20616,L1A,3160
R28	~~KS-16645, L1~~, KS-20616,L1A,16K
R29	~~KS-16645, L1, 4.7K~~ KS-20616,L1A,4.75K
R30	~~2384~~, KS-20616,L1A,5620
R31-R33	~~KS-16645, L1, 24K~~ KS-20616,L1A,23.7K
R34	~~2384~~,KS-20616,L1A,5620
R35,R36	~~KS-16645, 24K~~,KS-20616,L1A,23.7K
R37	~~2384~~, KS-20616,L1A,5620
[2] R38.2-R38.3	~~KS-16645, L1~~,KS-20616,L1A,15K
[2] R39.2,R39.3	~~KS-16645, L1~~, KS-20616,L1A,15K
[2] R40.2-R40.3	KS-13490, L1, 2.4K
R41	~~KS-16645, L1~~, KS-20616,L1A,7.5K
[4] R42.4-R42.7	~~KS-16645, L1, 24K~~ KS-20616,L1A,23.2K
[4] R43.4-R43.7	~~KS-16645, L1, 24K~~ KS-20616,L1A,23.7K
[4] R44.4-R44.7	~~2384~~, KS-20616,L1A,5620
R45-R52	~~KS-16645, L1, 24K~~ KS-20616,L1A,23.7K
R53	~~2384~~, KS-20616,L1A,5620
R54	~~KS-16645, L1~~, KS-20616,L1A,15K
R55	KS-13490, L1, 2.4K
R56	~~KS-16645, L1, 24K~~ KS-20616,L1A,23.7K
R57	KS-13490, L1, 330
R58-R60	~~KS-16645, L1~~, KS-20616,L1A,15K
R61	~~2374~~, KS-20616,L1A, 147K
R62	~~KS-16645, L1~~,KS-20616,L1A,620
R63	~~KS-16645, L1~~,KS-20616,L1A,100K
R64,R65	~~2384~~,KS-20616,L1A,10K
R66	~~KS-16645, L1~~,KS-20616,L1A,100K
R67	~~KS-16645, L1, 13K~~KS-20616,L1A,13.3K
R68	~~KS-16645, L1~~, KS-20616,L1A,24K
R69	~~2384~~KS-20616,L1A,5620
R70	~~2384~~, KS-20616,L1A,5620
R71	~~KS-16645 L1, 4.7K~~ KS-20616,L1A,4.75K
R72	~~KS-16645 L1~~, KS-20616,L1A,16K

COMPONENT LIST (CONT)

TRANSISTOR

DESIG	CODE
Q1-Q3	~~154~~ 66J
[2] Q4.0-Q4.1	~~154~~ 66J
[2] Q5.0-Q5.1	~~154~~ 66J
Q6-Q10	~~154~~ 66J
[2] Q11.2-Q11.3	~~154~~ 66J
Q12	~~166~~ 66L
[4] Q13.4-Q13.7	~~154~~ 66J
Q14-Q18	~~154~~ 66J
Q19	2N3251
Q20,Q21	~~154~~ 66J
Q22	~~154~~ 66J

SYMBOL



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE VALUES ARE IN OHMS;
   CAPACITANCE VALUES ARE IN PICOFARADS;
   VALUES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS
2. ⏚ GROUND RETURN

MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-1C309
CONNECTOR ON FRAME	908C

INPUT/OUTPUT INFORMATION

FUNCTION: WHEN USED AS PART OF THE DECODER IT PROVIDES THE COUNTING REQUIRED TO RECOGNIZE A PARTICULAR SET OF FIVE TOUCH-TONE 2-DIGIT OR 3-DIGIT CODES AS WELL AS SPECIAL SINGLE DIGIT CODES. INTER-DIGITAL TIMING IS PROVIDED WHICH REQUIRES THE SEPARATE DIGITS IN A VALID CODE BE SPACED NO MORE THAN 5 SECONDS APART.

LEVELS: LOGIC LEVELS REQUIRED FOR OPERATION OF THE VARIOUS TRL CIRCUITS ARE GIVEN IN NOTE 302.

CIRCUIT DESCRIPTION

A STEERING PULSE OF APPROXIMATELY 50 MSEC DURATION APPEARING ON PIN 10 IS FED THROUGH GATES (H1) AND (LC1) TO TOGGLE FLIP-FLOP (FF1). THE "1" OUTPUT OF FF1 IS FED THROUGH (LC2) AND APPEARS AT THE TOGGLE INPUT OF (FF2). SINCE ONLY A NEGATIVE GOING TRANSITION WILL TOGGLE A FLIP-FLOP, (FF2) WILL CHANGE STATE AT ONE HALF THE (FF1) RATE. BOTH FLIP-FLOPS ARE CLEARED SIMULTANEOUSLY EITHER BY A TIMER, WHICH ALLOWS A PERIOD OF NO MORE THAN FIVE SECONDS BETWEEN STEERING PULSES, OR BY RECOGNIZING THE COUNT FOR WHICH THE UNIT IS STRAPPED. A STRAP BETWEEN PINS 9 AND 32 PERMITS A 2 DIGIT COUNT WHILE A STRAP BETWEEN PINS 9 AND 35 PERMITS A 3 DIGIT COUNT. TIMING IS INITIATED WHEN ALL THREE INPUTS TO THE H8 GATE ARE IN THE "1" STATE WHICH TURNS OFF THE H8 GATE. THIS CONDITION IS PRESENT WHEN THE ZERO OUTPUT OF EITHER FLIP-FLOP HAS REACHED THE "0" STATE CAUSING THE (L2) GATE OUT TO BECOME "1" AND THE (H1) GATE OUTPUT HAS RETURNED TO THE "1" STATE. AFTER APPROXIMATELY FIVE SECONDS THE TIMER OUTPUT TURNS OFF GATE (L3); TURNS ON GATE (L4); TURNS OFF THE S GATE, CLEARING (FF1) AND (FF2). IN ORDER TO CLEAR THE FLIP-FLOPS AFTER THE PROPER COUNT, ALL THREE INPUTS TO GATE (L1) MUST BE IN THE "1" STATE TO TURN IT OFF. TWO OF THE INPUTS ARE FROM SLOW GATES (SL2) AND (SL3) WHICH HAVE, WHEN COUNTING THREE DIGITS, THE ZERO OUTPUTS OF (FF1) AND (FF2) RESPECTIVELY AS THEIR INPUTS. THE THIRD INPUT TO GATE (L1) IS THE OUTPUT OF GATE (H1). WHEN COUNTING TWO DIGITS THE "1" OUTPUT OF (FF1) IS CONNECTED TO (SL2). THE TURNING OFF OF L1 CLEARS BOTH FLIP-FLOPS IN THE SAME MANNER AS GATE (L3). THE OUTPUT OF THE (S) GATE IS ALSO FED TO THE (H8) GATE INPUT WHICH CLEARS THE TIMER. THE FIRST DIGIT OF AN OFFICE CODE PRODUCES A POSITIVE PULSE AT PIN 37. THIS REQUIRES THAT ALL FOUR INPUT LEADS TO GATE (LC3) BE IN THE "1" STATE DURING THE DIGIT PERIOD. PINS 38 AND 39 ARE DIGIT INPUTS WHICH OCCUR COINCIDENT WITH THE STEERING PULSE ON PIN 10. THE OUTPUT OF GATE (H9) TURNS ON SLOW GATE (SL3) WHOSE OUTPUT IS IN THE "1" STATE DURING THIS PERIOD. THE ZERO OUTPUT OF (FF2) IS THE FOURTH INPUT TO (LC3) AND, SINCE FF2 IS IN THE CLEAR CONDITION, IS ALREADY IN THE "1" STATE. THE INPUTS TO GATES (H2), (H3), AND (L5) TO (L8) ARE WIRED TO PRODUCE A "0" STATE OUTPUT FOR ANY OF SIX SPECIAL SINGLE DIGIT CODES. ALL OUTPUTS ARE FED TO GATE (L4) SO THAT THE TURNING OFF OF ANY OF THESE GATES WILL CLEAR FLIP-FLOPS (FF1) AND (FF2). AN R6 GATE IS SWITCHED BY THE OUTPUT OF GATE (H2) WHICH CAN OPERATE AN EXTERNAL RELAY. OPERATION OF THE INDIVIDUAL TRL CIRCUITS IS DESCRIBED IN NOTE 302.

DRAWING ISSUE 1 2A 4B

PART OF DECODER
PART OF CPS 6
ISSUE 108

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)
SD-IC245-01-J6B
BELL TELEPHONE LABORATORIES INCORPORATED
SHEET 6S

SD-IC245-01-J6B

PART OF CPS7
PART OF DECODER

COMPONENT LIST

CAPACITOR

DESIG	CODE
[2] C1.0,C1.1	~~5946~~, KS-20977,L4,1330
[2] C2.0,C2.1	~~5946~~, KS-20977,L4,1330

DIODE

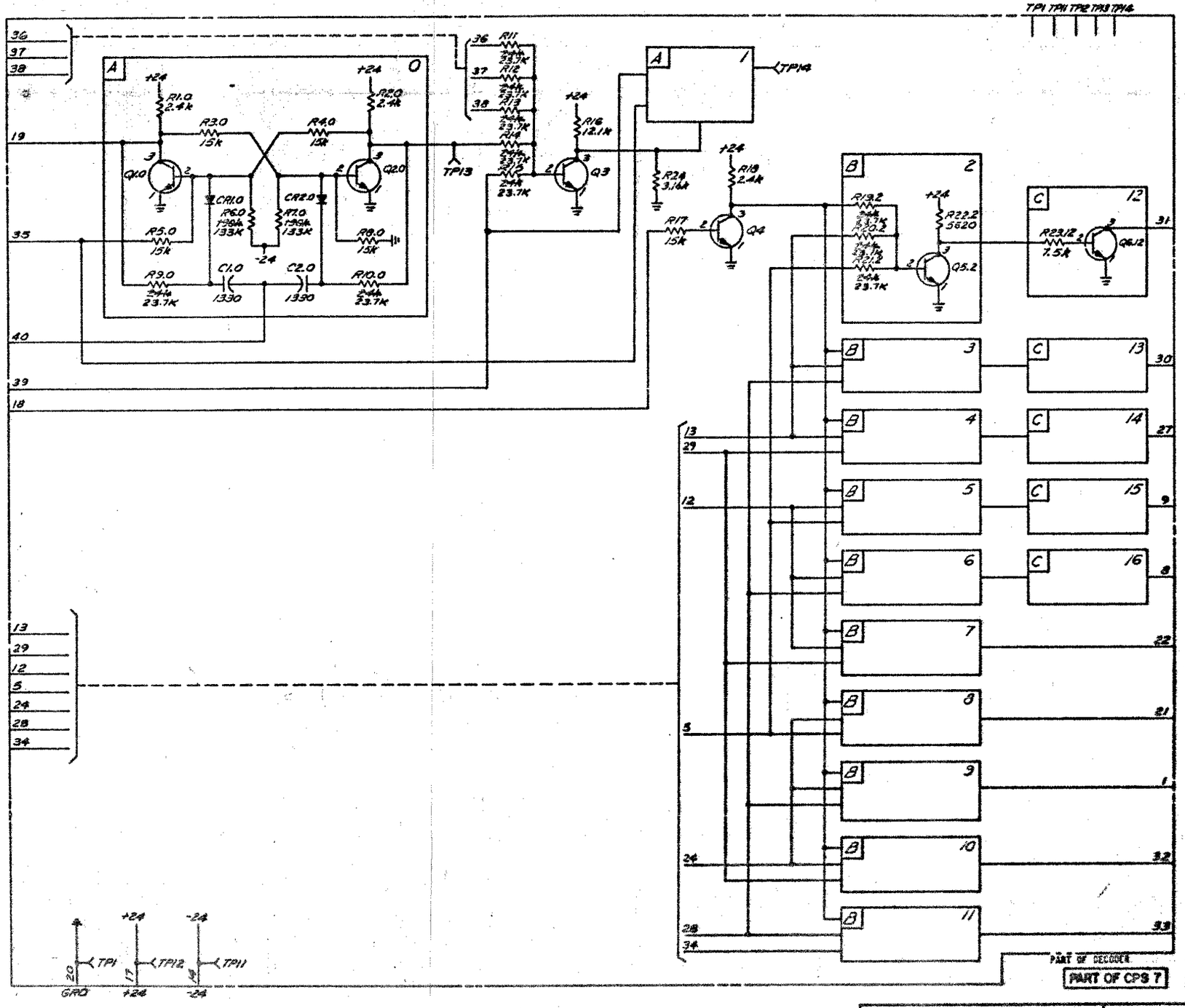
DESIG	CODE
[2] CR1.0,CR1.1	449A
[2] CR2.0,CR2.1	449A

RESISTOR

DESIG	CODE
[2] R1.0,R1.1	KS-13490,L1, 2.4k
[2] R2.0,R2.1	KS-13490,L1, 2.4k
[2] R3.0,R3.1	~~KS-16645,L1,~~ KS-20616,L1A,15k
[2] R4.0,R4.1	~~KS-16645,L1,~~ KS-20616,L1A,15k
[2] R5.0,R5.1	~~KS-16645,L1,~~ KS-20616,L1A,15k
[2] R6.0,R6.1	~~KS-16645,L1, 130k~~ KS-20616,L1A,133k
[2] R7.0,R7.1	~~KS-16645,L1, 130k~~ KS-20616,L1A,133k
[2] R8.0,R8.1	~~KS-16645,L1,~~ KS-20616,L1A,15k
[2] R9.0,R9.1	~~KS-16645,L1, 24k~~ KS-20616,L1A,23.7k
[2] R10.0,R10.1	~~KS-16645,L1, 24k~~ KS-20616,L1A,23.7k
R11-R15	~~KS-16645,L1, 24k~~ KS-20616,L1A,23.7k
R16	~~237A~~, KS-20616,L1A,12.1k
R17	~~KS-16645,L1,~~ KS-20616,L1A,15k
R18	KS-13490,L1, 2.4k
[10] R19.2-R19.11	~~KS-16645,L1, 24k~~ KS-20616,L1A,23.7k
[10] R20.2-R20.11	~~KS-16645,L1, 24k~~ KS-20616,L1A,23.7k
[10] R21.2-R21.11	~~KS-16645,L1, 24k~~ KS-20616,L1A,23.7k
[10] R22.2-R22.11	~~228A~~, KS-20616,L1A,5620
[5] R23.12-R23.16	~~KS-16645,L1,~~ KS-20616,L1A,7.5k
R24	~~237A~~, KS-20616,L1A,3.16k

TRANSISTOR

DESIG	CODE
[2] Q1.0,Q1.1	~~166~~ 66J
[2] Q2.0,Q2.1	~~166~~ 66J
Q3,Q4	~~166~~ 66J
[10] Q5.2-Q5-11	~~166~~ 66J
[5] Q6.12-Q6.16	~~166~~ 66L



DRAWING ISSUE 1 2A

ISSUE 10B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

BELL TELEPHONE LABORATORIES INCORPORATED

SD-1C245-01-J7A

SD-1C245-01-J7A

PART OF CPS7
PART OF DECODER

INPUT/OUTPUT INFORMATION

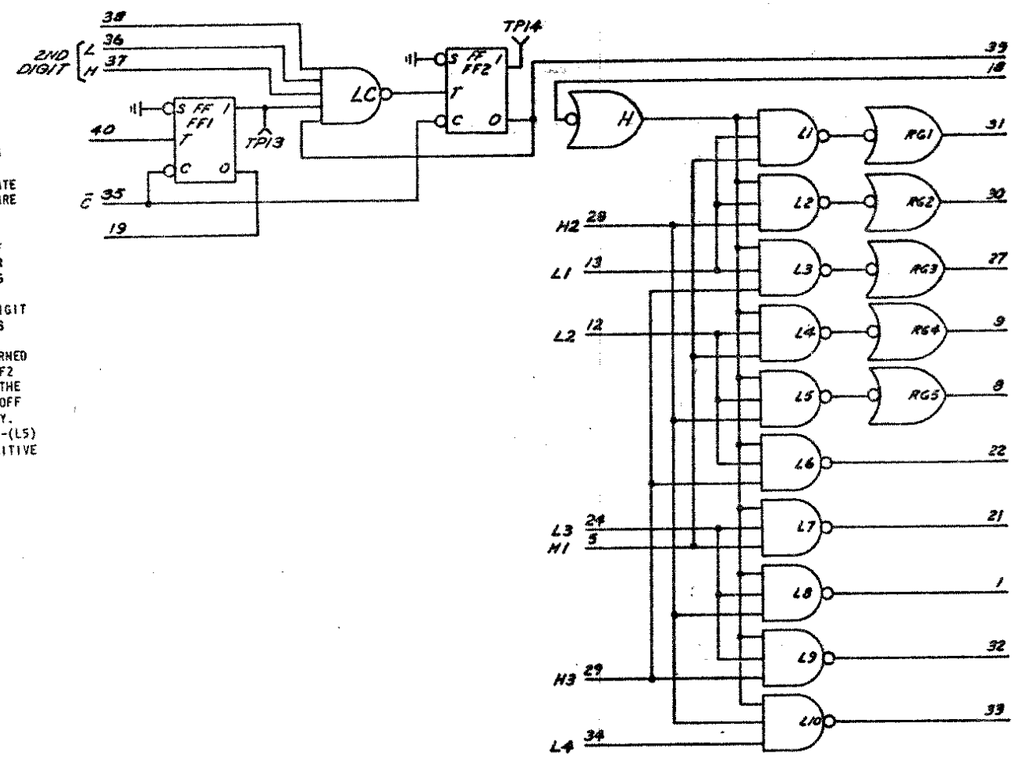
FUNCTION: WHEN USED AS PART OF THE DECODER IT PROVIDES THE TRANSLATION REQUIRED FOR THE MIDDLE AND LAST DIGITS OF A STATION CODE.

LEVELS: LOGIC LEVELS REQUIRED FOR OPERATION OF THE VARIOUS TRL CIRCUITS ARE GIVEN IN NOTE 302.

CIRCUIT DESCRIPTION

THE FIRST DIGIT OF AN OFFICE CODE CAUSES THE INPUT CONNECTING CIRCUIT TO FURNISH A POSITIVE PULSE ON PIN 40 WHICH TOGGLES FLIP-FLOP (FF1). THE "1" OUTPUT OF (FF1) ASSUMES THE "1" STATE AND IS FED TO THE LC GATE. TWO OTHER INPUTS TO THE LC GATE ARE THE MIDDLE DIGIT OF A THREE DIGIT OFFICE CODE WHICH APPEARS ON PINS 36 AND 37 AND ARE IN THE "1" STATE DURING THE DIGIT PERIOD. THE FOURTH INPUT TO THE LC GATE IS THE "0" OUTPUT OF FLIP-FLOP (FF2) WHICH IS CLEARED AND IN THE "1" STATE. UNDER THESE CONDITIONS THE LC GATE PRODUCES A POSITIVE PULSE DURING THE DIGIT PERIOD AND TOGGLES (FF2). THE "0" OUTPUT OF FF2 ASSUMES THE "0" STATE AND, WITH PINS 18 AND 39 STRAPPED (3 DIGIT OPERATION), TURNS ON THE H GATE. THE OUTPUT OF THE H GATE IS ONE OF THREE INPUTS TO EACH L GATE (L1)-(L10). FOR 2 DIGIT OPERATION, PIN 18 AND 19 ARE STRAPPED, AND THE H GATE IS TURNED ON BY THE "0" OUTPUT OF FF1. THUS, FOR 2 DIGIT OPERATION, FF2 IS IGNORED AND THE L GATES ARE ENABLED BY THE FIRST DIGIT. THE OTHER TWO INPUTS TO GATES (L1)-(L10) ARE WIRED TO BE TURNED OFF BY THE LAST DIGIT OF AN OFFICE CODE, 1 THROUGH 0 RESPECTIVELY. GATES (RG1)-(RG5) ARE TURNED ON BY THE OUTPUTS OF GATES (L1)-(L5) RESPECTIVELY. FLIP-FLOP (FF1) AND (FF2) ARE CLEARED BY A POSITIVE PULSE APPEARING ON PIN 35. OPERATION OF THE INDIVIDUAL TRL CIRCUITS IS DESCRIBED IN NOTE 302.

SYMBOL



MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-1C310
CONNECTOR ON FRAME	908C

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE VALUES ARE IN OHMS;
   CAPACITANCE VALUES ARE IN MICROFARADS;
   VALUES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS.
2. ⏚ GROUND RETURN

DRAWING ISSUE: 1, 2A, 4B

PART OF DECODER
PART OF CPS7
4

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT
SD-1C245-01-J78
BELL TELEPHONE LABORATORIES INCORPORATED
6S

SD-1C245-01-J78

CPS 8, CPS 10 (MFR DISC.)
CPS 9, CPS 11
TALK BATTERY FEED CKT

CIRCUIT REQUIREMENTS

APPARATUS DESIG	CODE	OPT	FIG	MECH REQT BSP FIG.	CONT PRES	ARM TRVL	CIRCUIT PREPARATION BLOCK OR INSULATE	TEST CLIP DATA CONN BAT.	CONN GRD	TEST SET PREP	SEE TEST NOTE	DIRECT CURRENT FLOW REQT TEST WDG	TEST FOR	AFTER OPR MA	TEST MA	READJ MA	REMARKS
RELAY																	
K1	3F6	R		3				L(K1)	U(K1)	B/G	1		0		25.5	24.0	
K2	3F6	R		3				L(K2)	U(K2)	B/G	1		0		25.5	24.0	
K3	3J3	R		401				L(K3)	U(K3)	B/G	1		0		32.5	30.5	
K1-K3	MB1	S		200				L REL TST	U REL TST	B/G	1		0		25.5	24.0	

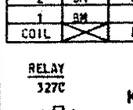
TEST NOTES:
1. REMOVE CIRCUIT PACK FROM EQUIPMENT UNIT TO TEST

COMPONENT LIST

RELAY — SEE NOTE 2

DESIG	K1		K2		K3		K1		K2	
CODE	3F6		3F6		3J3		MB1		MB1	
OPTION	R		R		R		S		S	
	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC
12					BM					
11					BM					
10					BM					
9					BM	C6				
8					BM	F6				
7					BM	F6				
6	BM	H6	BM	H6	BM	C6	EBM	H6	EBM	H6
5	BM	C3	BM	D4	BM	E6	EBM	C3	EBM	D4
4	BM		BM		BM	E6	EBM		EBM	
3	BM	F5	BM	H6	BM	E6	EBM	F5	EBM	H6
2	BM	F5	BM	H6	BM	E6	EBM	F5	EBM	H6
1	BM		BM		BM	G6	EBM		EBM	
COIL		F3		G3		H3		F3		G3

RELAY 327C



DESIG	K3	
CODE	MB1	
OPTION	S	
	CONT ARR	LOC
12		
11		
10		
9		
8		
7		
6	EBM	
5	EBM	E6
4	EBM	E6
3	EBM	E6
2	EBM	E6
1	EBM	C6
COIL		H3

CAPACITOR

DESIG	CODE
C1-C5	542G

DIODE

DESIG	CODE
CR1-CR3	400J SEE NOTE 2

RESISTOR

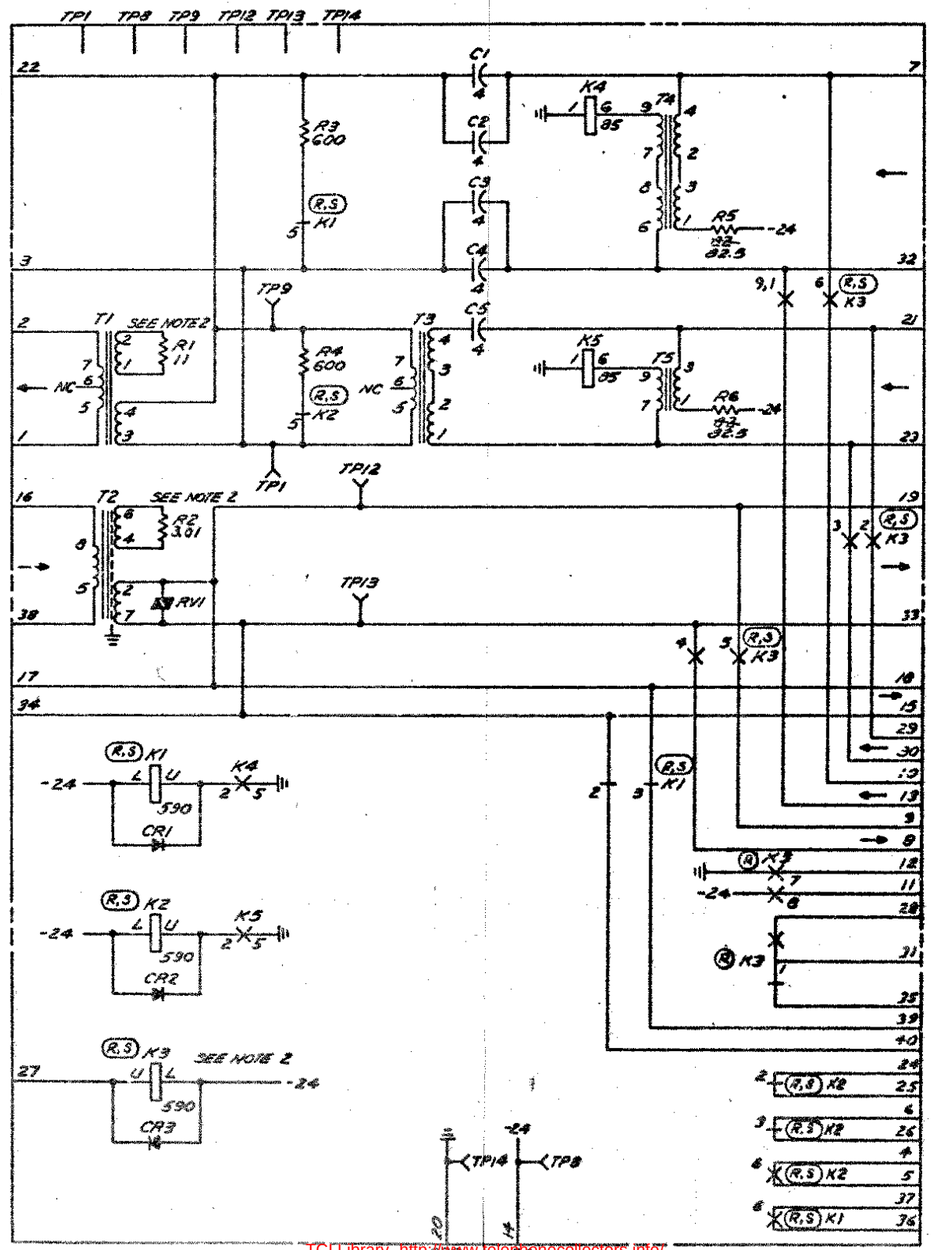
DESIG	CODE
R1	~~297A~~, KS-20616,L1A,11 } SEE NOTE 2
R2	~~297A~~, KS-20616,L1A,3.01 } SEE NOTE 2
R3,R4	~~297A~~, KS-20616,L1A,600 } SEE NOTE 2
R5,R6	~~KS-13492 L1, 82~~ KS-20289,L6C,82.5

TRANSFORMER

DESIG	CODE
T1	2532AC } SEE NOTE 2
T2	2586C } SEE NOTE 2
T3	2532AC
T4,T5	2578U

VARISTOR

DESIG	CODE
RV1	104A, SEE NOTE 2



MANUFACTURING REFERENCES

CATEGORY	NO
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	
(R) CP 8	ED-1C311( )G1
(R) CP 9	ED-1C311( )G2
(S) CP 9	ED-1C311( )G5
(R) CP 10	ED-1C311( )G3
(R) CP 11	ED-1C311( )G4
(S) CP 11	ED-1C311( )G6
CONNECTOR ON FRAME	909C

SYMBOL SHOWN IN DETAIL IN FS2,3,4&5

INPUT/OUTPUT INFORMATION

FUNCTION: PROVIDES CURRENT FEED FOR TELEPHONE TRANSMITTER. CP8 AND CP9 PROVIDE IMPEDANCE TRANSFORMATION FOR MATCHING MULTIPLE TALK BATTERY FEEDS (CP10 OR CP11) TO A 600 OHM AMPLIFIER CIRCUIT. CP9 AND CP11 PROVIDE PICK-UP CAPABILITY.

CIRCUIT DESCRIPTION:

CURRENT IS SUPPLIED THROUGH RELAY (K4) AND TRANSFORMER (T4) FOR A TOUCH-TONE TELEPHONE SET. CAPACITORS (C1), (C2), (C3), AND (C4) BLOCK THE dc WHILE PROVIDING ac COUPLING OF THE INPUT SIGNAL. CURRENT IS SUPPLIED THROUGH RELAY (K5) AND TRANSFORMER (T5) FOR A 50 OHM TELEPHONE TRANSMITTER. CAPACITOR (C5) BLOCKS THE dc WHILE TRANSFORMER (T3) STEPS UP THE ac IMPEDANCE FROM 50 TO 600 OHMS. IDLE CIRCUIT TERMINATING RESISTORS (R5) AND (R4) ARE REMOVED FROM THE CIRCUIT BY THE OPERATION OF RELAYS (K4) OR (K5) WHICH OPERATE RELAYS (K1) AND (K2) RESPECTIVELY. CP8 AND CP9 ARE EQUIPPED WITH TRANSFORMERS (T1) AND (T2). (T1) STEPS UP THE IMPEDANCE TO 600 OHMS AT TERMINALS 1 AND 2. (T2) STEPS UP THE IMPEDANCE TO 600 OHMS AT TERMINALS 16 AND 38. THIS ALLOWS UP TO FOUR CP10 OR 11 TO BE MULTIPLIED WITH A CP8 OR 9 WITH NO SIGNIFICANT CHANGE IN TRANSMIT OR RECEIVE LEVEL. CP9 AND 11 ARE EQUIPPED WITH A PICK UP RELAY (K3) WHICH OPERATES UNDER CONTROL OF AN ASSOCIATED STATION SET KEY. THE OPERATION OF (K3) CONNECTS THE TRANSMISSION LEADS OF THE ASSOCIATED STATION SET TO THE 4-WIRE LINE. CONTACTS ON RELAYS (K1) AND (K2) PROVIDE LOUDSPEAKER CUT-OFF AS REQUIRED.

NOTES:
1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, VALUES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS.
2.

OPTION A CPS	OMIT COMPONENT
(R) 8	K3,CR3
(R,S) 9	NONE
(R) 10	K3,T1,T2,R1,R2, RV1,CR3
(R,S) 11	T1,T2,R1,R2,RV1

3. ⏚ GROUND RETURN.
4.

RECORD OF CHANGES				
CHNG ISS	PREV FURN	STD	WR DISC	SEE NOTE
7B	R	S	R	

TALK BATTERY FEED CKT
CPS 8,9,10,11

ISSUE 10B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-1C245-01-J8

BELL TELEPHONE LABORATORIES INCORPORATED

65

DRAWING ISSUE: 1 3A 4B 5B

SD-1C245-01-J8

CPS 12
PRE-EMPT CIRCUIT

CIRCUIT REQUIREMENTS

APPARATUS DESIG	APPARATUS CODE	APPARATUS OPT	APPARATUS FIG.	MECH REQT BSP FIG.	MECH REQT CONT PRES	MECH REQT ARM. TRVL	CIRCUIT PREPARATION BLOCK OR INSULATE	CIRCUIT PREPARATION TEST CLIP DATA CONN BAT.	CIRCUIT PREPARATION TEST CLIP DATA CONN GRD	TEST SET PREP	SEE TEST NOTE	DIRECT CURRENT FLOW REQT TEST WDG	DIRECT CURRENT FLOW REQT TEST FOR	DIRECT CURRENT FLOW REQT SOAK MA	DIRECT CURRENT FLOW REQT TEST MA	DIRECT CURRENT FLOW REQT READJ MA	REMARKS
RELAY																	
K1	BF6	R		3				L(K1)	U(K1)	B/G	1,2		0		25.5	24.0	
K1	MB1	S		200				L(K1)	U(K1)	B/G	1,2		0		25.5	24.0	

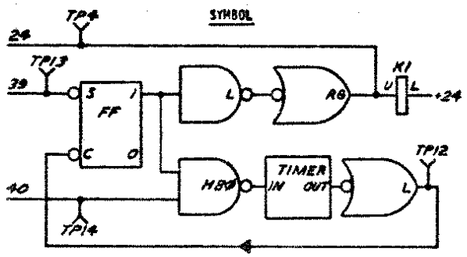
TEST NOTES:

1. REMOVE CIRCUIT PACK FROM EQUIPMENT UNIT TO TEST.
2. USE + BATTERY.

MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	(R) ED-1C312( )G1 (S) ED-1C312( )G2
CONNECTOR ON FRAME	90BC

SYMBOL



COMPONENT LIST

RELAY

DESIG	K1		K1	
CODE	BF6		MB1	
OPTION	R		S	
	CONT ARR	LOC	CONT ARR	LOC
6	BM	F7	EBM	F7
5	BM	E7	EBM	E7
4	BM	E7	EBM	E7
3	BM	D7	EBM	D7
2	BM	C7	EBM	C7
1	BM	C7	EBM	C7
COIL	X	C5		C5

CAPACITOR

DESIG	CODE
C1,C2	602C

DIODE

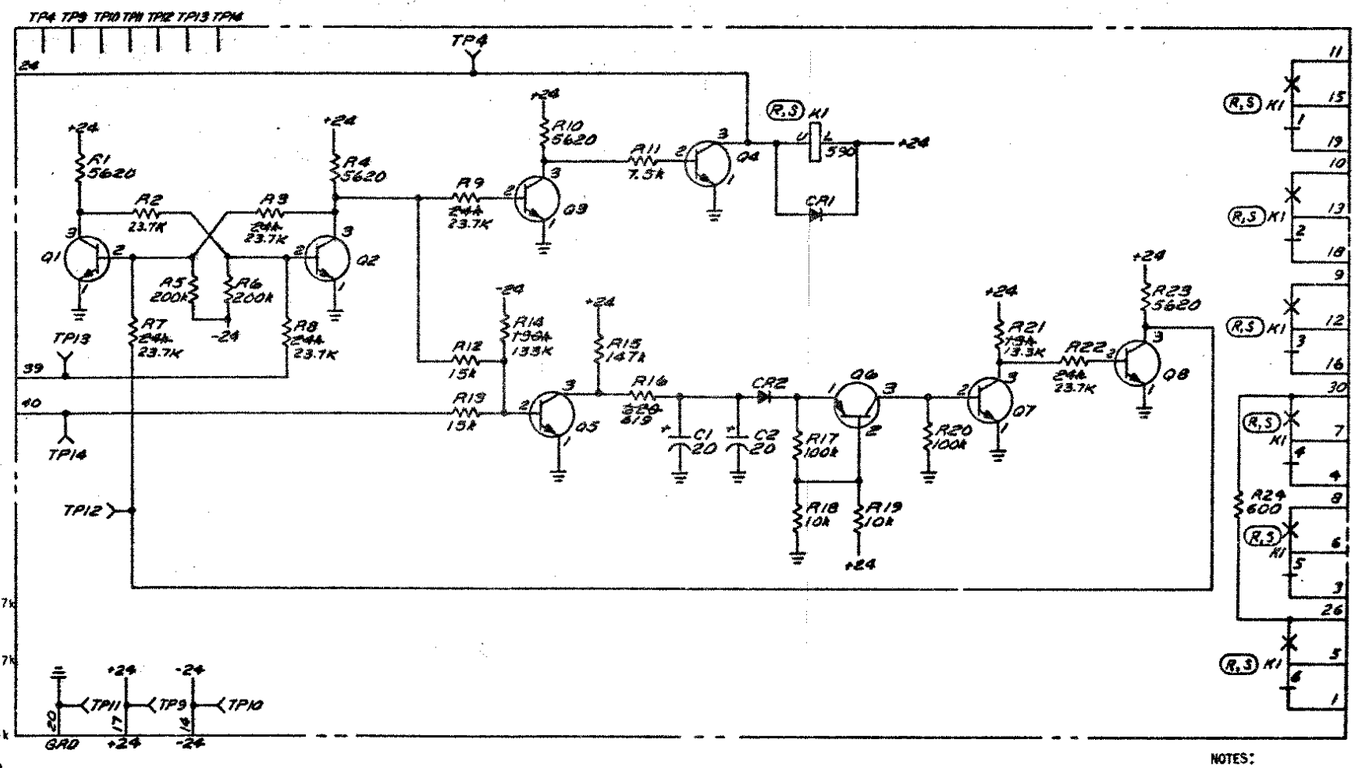
DESIG	CODE
CR1	400J
CR2	458A

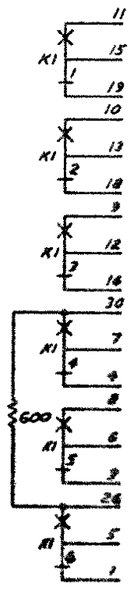
RESISTOR

DESIG	CODE
R1	~~237A~~, KS-20616,L1A,5620
R2,R3	~~KS-16645,L1,24K~~ KS-20616,L1A,23.7k
R4	~~237A~~, KS-20616,L1A,5620
R5,R6	~~KS-16645,L1~~, KS-20616,L1A,200k
R7-R9	~~KS-16645,L1,~~ ~~24K~~KS-20616,L1A,23.7k
R10	~~237A~~, KS-20616,L1A,5620
R11	~~KS-16645,L1~~KS-20616,L1A,7.5k
R12,R13	~~KS-16645,L1~~KS-20616,L1A,15k
R14	~~KS-16645,L1,133K~~KS-20616,L1A,133k
R15	~~237A~~, KS-20616,L1A,147k
R16	~~KS-16645,L1,~~ ~~620K~~KS-20616,L1A,619
R17	~~KS-16645,L1~~, KS-20616,L1A,100k
R18,R19	~~237A~~, KS-20616,L1A,10k
R20	~~KS-16645,L1~~, KS-20616,L1A,100k
R21	~~KS-16645,L1,~~ ~~13K~~KS-20616,L1A,13.3k
R22	~~KS-16645,L1~~, KS-20616,L1A,24k
R23	~~237A~~, KS-20616,L1A,5620
R24	~~237A~~, KS-20616,L1A,600

TRANSISTOR

DESIG	CODE
Q1-Q3	~~16J~~ 66J
Q4	~~16L~~ 66L
Q5	~~16J~~ 66J
Q6	~~2N3251~~ 51A
Q7,Q8	~~16J~~ 66J





INPUT/OUTPUT INFORMATION

FUNCTION: PROVIDES RELAY TRANSFER CONTACTS WHICH OPERATE WHEN THE INPUT IS PULSED BY A CONNECTING CIRCUIT. A TIMER CIRCUIT RELEASES THE RELAY AFTER A 5 SECOND INTERVAL.

INPUT: RELAY (K1) OPERATES WITH POSITIVE PULSE GREATER THAN +6 VOLTS APPLIED TO PIN 39. A PULSE GREATER THAN THE +6 VOLTS APPLIED TO PIN 40 DURING TIME-OUT PERIOD RESTARTS TIMER. GROUND APPLIED TO PIN 24 OPERATES RELAY (K1).

CIRCUIT DESCRIPTION

TRANSISTORS (Q1) AND (Q2) AND ASSOCIATED COMPONENTS FORM A FLIP-FLOP WHICH SETS WHEN A POSITIVE PULSE IS APPLIED TO TERMINAL 39. THIS, IN SEQUENCE, TURNS OFF L GATE (Q3); TURNS ON RG GATE (Q4) AND OPERATES RELAY (K1). THE 1 OUTPUT OF THE FLIP-FLOP ALSO TURNS OFF THE H80 GATE (Q5). THIS STARTS A TIMER COMPOSED OF (Q6), (Q7), AND ASSOCIATED COMPONENTS WHICH, AFTER APPROXIMATELY 5 SECONDS, TURNS OFF L GATE (Q8) AND RESETS THE FLIP-FLOP. A POSITIVE PULSE APPEARING ON PIN 40 DURING THE 5 SECOND TIME-OUT PERIOD WILL RESTART THE TIMER. RELAY (K1) CAN BE OPERATED EXTERNALLY BY APPLYING GROUND TO PIN 24. OPERATION OF THE INDIVIDUAL TRL CIRCUITS IS DESCRIBED IN NOTE 302.

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE VALUES ARE IN OHMS; K FOR KILOHMS;
   CAPACITANCE VALUES ARE IN MICROFARADS;
   VOLTAGES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS.
2. $\frac{1}{3}$ GROUND RETURN.
3. RECORD OF CHANGES

DWG ISS	PREV FURN	STD	A & M ONLY	AFR DISC	SEE NOTE
7B	R		S	R	
11B	S	S			4

4. RATING CHANGED TO STANDARD FOR USE IN FS 52.

PRE-EMPT CKT CPS 12

DRAWING ISSUE 1 4B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-J9

BELL TELEPHONE LABORATORIES (INCORPORATED) 69

SD-1C245-01-J9

CPS 13 (MFR DISC.)
CALL-RECALL ALERT CKT

CIRCUIT REQUIREMENTS

APPARATUS DESIG	CODE	OPT	FIG		MECH REQT BSP FIG.	CONT RES	ARM. TRVL	CIRCUIT PREPARATION BLOCK OR INSULATE	TEST CLIP DATA CONN BAT	CONN GRD	TEST SET PREP	SEE TEST NOTE	DIRECT CURRENT FLOW REQT TEST WDG	TEST FOR	AFTER SOAK MA	TEST MA	READJ MA	REMARKS
RELAY																		
K1	9F24				211				L(K1)	U(K1)	GRD	1		0		34.6	33.0	
K2	9F24				211				L(K2)	U(K2)	GRD	1		0		34.6	33.0	
K3	9F2				1				L(K3)	U(K3)	GRD	1		0		14.0	13.3	
K4	9F6				3				L(K4)	U(K4)	GRD	1		0		25.5	24.0	
K5	9F6				3				L(K5)	U(K5)	GRD	1		0		25.5	24.0	
K6	9F6				3				L(K6)	U(K6)	GRD	1		0		25.5	24.0	
K7	9F2				1				L(K7)	U(K7)	GRD	1		0		14.0	13.3	
K8	9F6				3				L(K8)	U(K8)	GRD	1		0		25.5	24.0	

TEST NOTES:

1. REMOVE CIRCUIT PACK FROM EQUIPMENT UNIT TO TEST

DESIG	K1		K2		K3		K4		K5		K6		K7		K8	
CODE	9F24		9F24		9F2		9F6		9F6		9F6		9F2		9F6	
OPTION																
	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC
6	EBM	H3	EBM		BM	G4	BM		BM	C5	BM		BM	E3	BM	H5
5	EBM		EBM	G3			BM	D5	BM	E5	BM	G5			BM	
4	EBM		EBM		B	F4	BM	D5	BM	D5	BM	F5	B		BM	E4
3	EBM	G3	EBM	F3			BM	E4	BM	E4	BM	F5			BM	F4
2	EBM	E3	EBM	G5			BM	C5	BM	H4	BM	G4			BM	G4
1	EBM	F3	EBM	E3	BM	G3	BM		BM	F4	BM		BM	H3	BM	H5
COIL	X	C4	X	D4	X	D4	X	E4	X	F4	X	G4	X	H4	X	H4

DIODE

DESIG	CODE
CR1-CR8	400J

INPUT/OUTPUT INFORMATION

FUNCTION: PROVIDES RELAY LOGIC AND MEMORY FUNCTIONS WHEN CONNECTED TO AN EXTERNAL SIGNALLING RECEIVER OR DECODER AND STATION ALARM CIRCUITS.

CIRCUIT DESCRIPTION

THIS CIRCUIT PROVIDES THREE MODES OF OPERATION AS FOLLOWS:

CALL - EXTERNAL OPERATION OF RELAY (K1), WHILE RELAY (K3) IS RELEASED, OPERATES RELAY (K5). THE SUBSEQUENT RELEASE OF (K1) OPERATES RELAY (K7) WHICH SERVES AS A REGISTER TO STORE THE INFORMATION THAT AN UNANSWERED CALL IS PRESENT. EXTERNAL OPERATION OF RELAY (K3) RELEASES (K5) WHICH RELEASES (K7) RESTORING THE CIRCUIT TO NORMAL.

RECALL - EXTERNAL OPERATION OF RELAY (K1), WHILE RELAY (K3) IS OPERATED, OPERATES RELAY (K6). EXTERNAL RELEASE THEN RE-OPERATION OF (K3) RESTORES THE CIRCUIT TO THE INITIAL STATE.

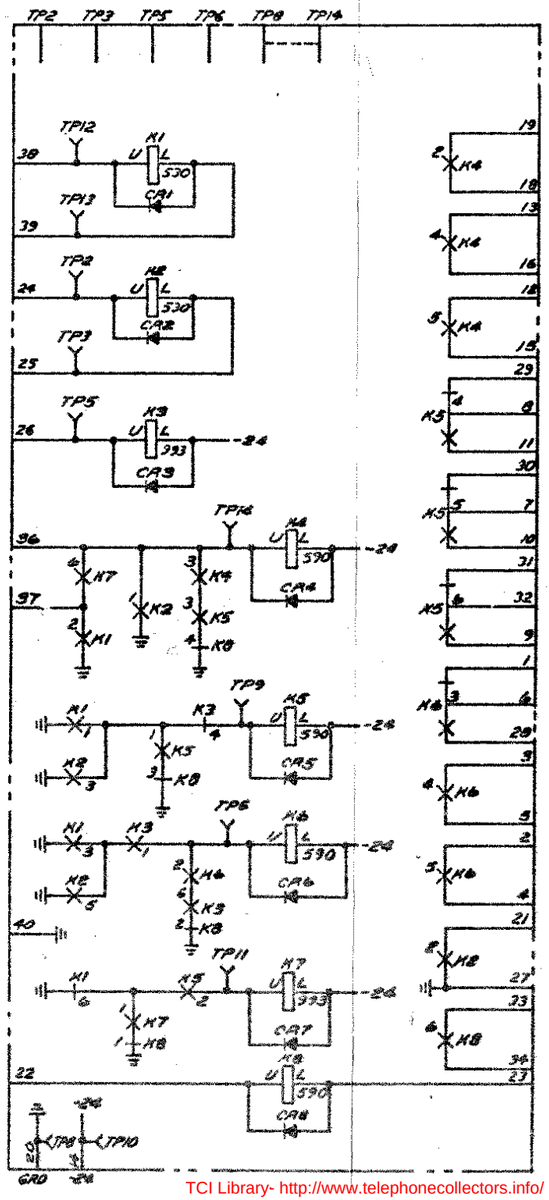
ALERT - THE ALERT OUTPUT, OPERATION OF RELAY (K4), IS A MOMENTARY ADDITION TO THE RECALL STATE OR A LOCKED UP ADDITION TO THE CALL STATE. THE ALERT OUTPUT, PLUE THE CALL OR RECALL, MAY BE ACHIEVED IN ONE OF THREE WAYS:

(1) EXTERNAL OPERATION OF RELAY (K2).

(2) TWO SEQUENTIAL OPERATIONS OF RELAY (K1) WITH NO INTERVENING OPERATION OF RELAY (K3).

(3) A SINGLE OPERATION OF RELAY (K1) DURING THE PERIOD IN WHICH THERE IS AN EXTERNAL CONTACT CLOSURE BETWEEN TERMINALS 36 AND 37. THE ALERT MODE IS RELEASED IN THE SAME MANNER AS THE CALL OR RECALL.

ALL THREE MODES OF OPERATION ARE RENDERED NON-LOCKING BY EXTERNAL OPERATION OF RELAY (K8).



MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-1C313
CONNECTOR ON FRAME	908C

SYMBOL

SHOWN IN DETAIL IN F59

NOTES:

1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS. VALUES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS.
2. ⏚ GROUND RETURN

CALL-RECALL-ALERT CKT

CPS 13

DRAWING ISSUE 1 2A 4B

ISSUE 7B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-J10

BELL TELEPHONE LABORATORIES INCORPORATED

SHEET 65

SD-1C245-01-J10

CPS 14

LINE CUT CKT

CIRCUIT REQUIREMENTS

APPARATUS DESIG	CODE	OPT	FIG.		MECH REQT BSP FIG.	CONT PRES	ARM TRVL	CIRCUIT PREPARATION BLOCK OR INSULATE	TEST CLIP DATA CONN BAT.	CONN GRD	TEST SET PREP	SEE TEST NOTE	DIRECT CURRENT FLOW REQT TEST WDG	TEST FOR	AFTER SOAK MA	TEST MA	READJ MA	REMARKS
RELAY																		
K1	8F2	R			1				L(K1)	U(K1)	B/G	1		0		14.0	13.3	
K2	BJ2	R			600				L(K2)	U(K2)	B/G	1		0		35.5	33.5	
K1-K3	MB1	S			200				L REL TST	U REL TST	B/G	1		0		25.5	24.0	

TEST NOTES:

1. REMOVE CIRCUIT PACK FROM EQUIPMENT UNIT TO TEST.

COMPONENT LIST

RELAY

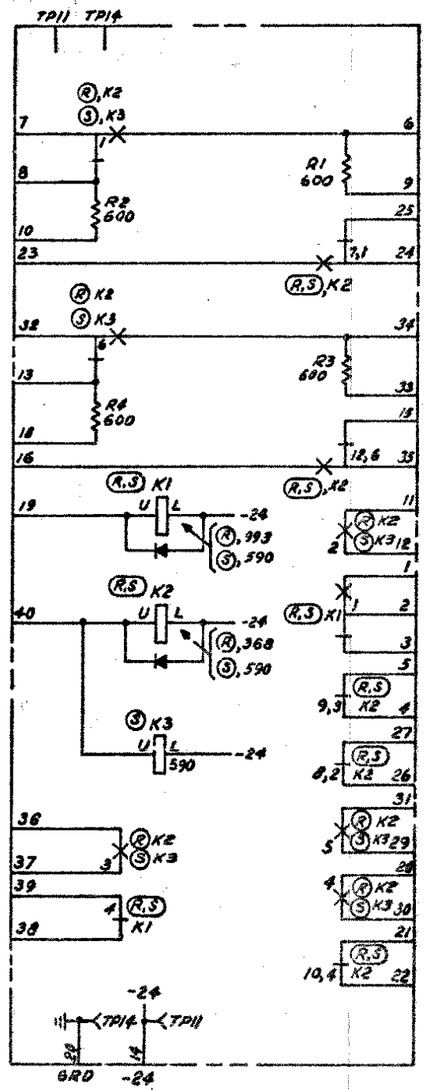
DESIG	K1		K2		K1		K2		K3	
CODE	8F2		BJ2		MB1		MB1		MB1	
OPTION	R		R		S		S		S	
	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC				
12			EMB	D5						
11			B							
10			B	G5						
9			B	E5						
8			B	F5						
7			EBM	C5						
6	BM		EBM	C3	EBM		EBM	D5	EBM	C3
5			M		EBM		EBM		EBM	F5
4	B	G4	M		EBM	G4	EBM	G5	EBM	G5
3			M		EBM		EBM	E5	EBM	F4
2			M		EBM		EBM	F5	EBM	E5
1	BM	E5	EBM	B3	EBM	E5	EBM	C5	EBM	B3
COIL		D4		E4		D4		E4		F4

DIODE

DESIG	CODE
CR1, CR2	400J

RESISTOR

DESIG	CODE
R1-R4	257A KS-20616, L1A, 600



MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	(R) ED-1C314( )G1 (S) ED-1C314( )G2
CONNECTOR ON FRAME	908C

SYMBOL

SHOWN IN DETAIL IN FS 12

NOTES:

1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS, VALUES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS.
2. ⏚ GROUND RETURN.
3.

RECORD OF CHANGES

DWG ISS	PREV FORM	STD	MFR DISC	SEE NOTE
7B	X	S	M	

LINE CUT CKT

CPS 14

ISSUE 10B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-1C245-01-J11

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-1C245-01-J11

CIRCUIT REQUIREMENTS

APPARATUS DESIG	CODE	OPT	FIG		MECH REQT BSP FIG.	CONT RES	ARM. TRVL	CIRCUIT PREPARATION BLOCK OR INSULATE	TEST CLIP DATA CONN BAT	CONN GRD	TEST SET PREP	SEE TEST NOTE	DIRECT CURRENT FLOW REQT TEST WDG	TEST FOR	AFTER SOAK MA	TEST MA	READJ MA	REMARKS
RELAY																		
K1-K9	MB1				200				L REL TST	U REL TST	8/5	1		0		25.5	24.0	

TEST NOTES:

1. REMOVE CIRCUIT PACK FROM EQUIPMENT UNIT TO TEST

DESIG	K1		K2		K3		K4		K5		K6		K7		K8		K9	
CODE	MB1		MB1		MB1		MB1		MB1		MB1		MB1		MB1		MB1	
OPTION	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC
6	EBM	F5	EBM		EBM	F6	EBM		EBM	D7	EBM		EBM	D5	EBM	F7	EBM	G5
5	EBM		EBM	F5	EBM		EBM	C7	EBM	D7	EBM	F7	EBM		EBM		EBM	
4	EBM		EBM		EBM	E6	EBM	B7	EBM	C7	EBM	E7	EBM		EBM	D6	EBM	
3	EBM	E5	EBM	E5	EBM		EBM	D6	EBM		EBM	E7	EBM		EBM	E6	EBM	D6
2	EBM	D5	EBM	F7	EBM		EBM	B7	EBM		EBM	F6	EBM		EBM	F6	EBM	F6
1	EBM	E5	EBM	D5	EBM	E5	EBM	G5	EBM		EBM	G5	EBM	F5	EBM	F5	EBM	E6
COIL		B5		B5		C5		D6		E6		E6		F6		G6		D6

CAPACITOR

DESIG	CODE
C1	KS16390,L1 25uf, 60V

DIODE

DESIG	CODE
CR1-CR8	400J

RESISTOR

DESIG	CODE
R1	KS-20810,L1A,475

TIMER

DESIG	CODE
TM	KS-20919

INPUT/OUTPUT INFORMATION

FUNCTION: PROVIDES RELAY LOGIC AND MEMORY FUNCTIONS WHEN CONNECTED TO AN EXTERNAL SIGNALLING RECEIVER OR DECODER AND STATION ALARM CIRCUITS.

CIRCUIT DESCRIPTION

THIS CIRCUIT PROVIDES THREE MODES OF OPERATION AS FOLLOWS:

CALL - EXTERNAL OPERATION OF RELAY (K1), WHILE RELAY (K3) IS RELEASED, OPERATES RELAYS (K5) AND (K9). THE SUBSEQUENT RELEASE OF (K1) OPERATES RELAY (K7) WHICH SERVES AS A REGISTER TO STORE THE INFORMATION THAT AN UNANSWERED CALL IS PRESENT. EXTERNAL OPERATION OF RELAY (K3) RELEASES (K9) WHICH RELEASES (K7) RESTORING THE CIRCUIT TO NORMAL.

RECALL - EXTERNAL OPERATION OF RELAY (K1), WHILE RELAY (K3) IS OPERATED, OPERATES RELAY (K6). EXTERNAL RELEASE THEN RE-OPERATION OF (K3) RESTORES THE CIRCUIT TO THE INITIAL STATE.

ALERT - THE ALERT OUTPUT, OPERATION OF RELAY (K4), IS A MOMENTARY ADDITION TO THE RECALL STATE OR A LOCKED UP ADDITION TO THE CALL STATE. THE ALERT OUTPUT, PLUG THE CALL OR RECALL, MAY BE ACHIEVED IN ONE OF THREE WAYS:

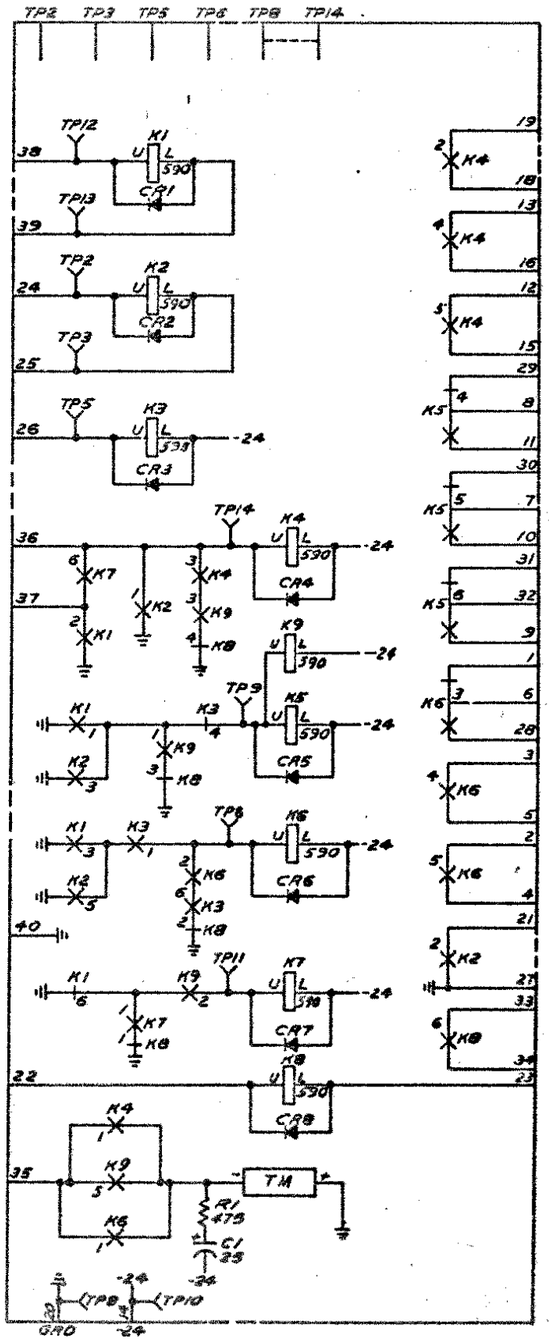
(1) EXTERNAL OPERATION OF RELAY (K2).

(2) TWO SEQUENTIAL OPERATIONS OF RELAY (K1) WITH NO INTERVENING OPERATION OF RELAY (K3).

(3) A SINGLE OPERATION OF RELAY (K1) DURING THE PERIOD IN WHICH THERE IS AN EXTERNAL CONTACT CLOSURE BETWEEN TERMINALS 36 AND 37. THE ALERT MODE IS RELEASED IN THE SAME MANNER AS THE CALL OR RECALL.

THE THREE MODES REMAIN LOCKED-UP UNTIL OPERATION OF A RELEASE RELAY. AN EXTERNAL STRAP PROVIDES A 3 MINUTE LOCK-UP LIMIT USING TIMER (TM) AND RELAY (K8). ALL THREE MODES OF OPERATION ARE RENDERED NON-LOCKING BY EXTERNAL OPERATION OF RELAY (K8).

CPS 15
CALL-RECALL ALERT CKT WITH TIMED LOCK-UP



MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-1C767( )
CONNECTOR ON FRAME	908C

SYMBOL
SHOWN IN DETAIL

NOTES:

1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS; VALUES PRECEDED BY THE SYMBOL +(PLUS OR -(MINUS) ARE IN VOLTS.
2. ⏚ GROUND RETURN.

CALL-RECALL-ALERT CKT WITH TIMED LOCK-UP
CPS 15

ISSUE 9A

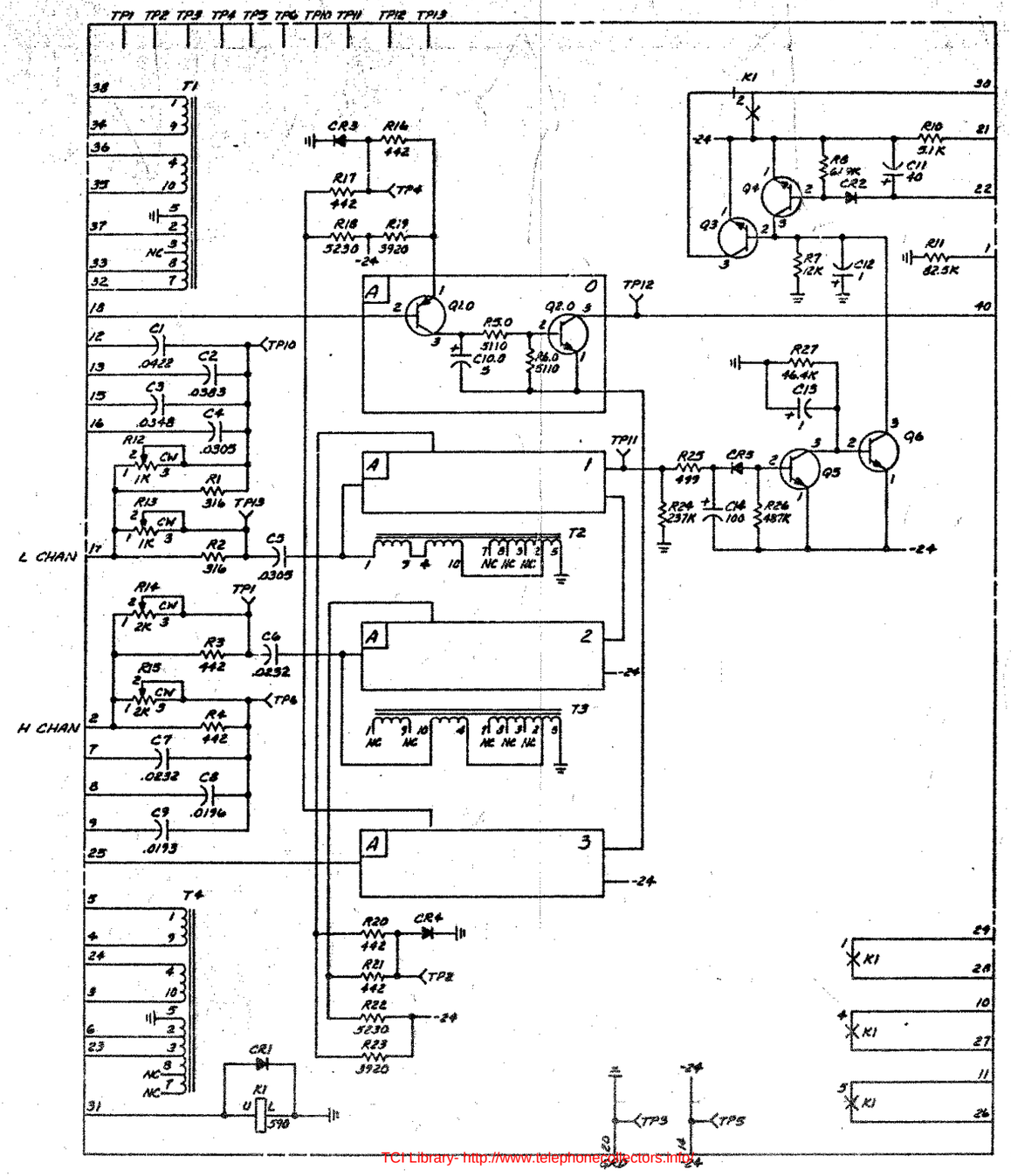
GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

BELL TELEPHONE LABORATORIES INCORPORATED — ISSUE 6S

SD-1C245-01-J12

PART OF CPS 16

SUPPLEMENTARY SIGNAL DETECTOR AND INHIBIT CIRCUIT



SUPPLEMENTARY SIGNAL DETECTOR AND INHIBIT

PART OF CPS 16

118

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT	SD-1C245-01-J13A
BELL TELEPHONE LABORATORIES	

SD-1C245-01-J13A

PART OF CPS 16

SUPPLEMENTARY SIGNAL DETECTOR AND INHIBIT CIRCUIT

CIRCUIT REQUIREMENTS

APPARATUS DESIG	CODE	OPT	FIG	MECH REQT BSP FIG.	CONT PRES	ARM TRVL	CIRCUIT PREPARATION BLOCK OR INSULATE	TEST CLIP DATA CONN BAT	CONN GRD	TEST SET PREP	SEE TEST NOTE	DIRECT CURRENT FLOW REQT TEST WDG	TEST FOR	AFTER SOAK MA	TEST MA	READJ MA	REMARKS
RELAY																	
K1	MB1			200				U(K1)	L(K1)	B/G	1				25.5	24.00	

TEST NOTES:

1. REMOVE CIRCUIT PACK FROM EQUIPMENT UNIT TO TEST.

COMPONENT LIST

RELAY

DESIG	K1			
CODE	MB1A			
OPTION				
X	CONT ARR	LOC	CONT ARR	LOC
6	EBM			
5	EBM	A/H6		
4	EBM	A/H6		
3	EBM			
2	EBM	A/B6		
1	EBM	A/G6		
COIL	X	A/H3		

CAPACITOR

DESIG	CODE
C1	577D, .0422
C2	577D, .0383
C3	577D, .0348
C4	577D, .0309
C5	577D, .0305
C6	577D, .0232
C7	577D, .0232
C8	577D, .0196
C9	577D, .0193
[4] C10.0-C10.3	601A
C11	602A
C12	600A
C13	600A
C14	602A

DIODE

DESIG	CODE
CR1	400J
CR2	446D
CR3	446B
CR4	446B
CR5	446B

POTENTIOMETER

DESIG	CODE
R12	
R13	KS-20231,L2A,1K
R14	
R15	KS-20231,L2A,2K

COMPONENT LIST (CONT)

RESISTOR

DESIG	CODE
R1	KS-20616,L1A,316
R2	KS-20616,L1A,316
R3	KS-20616,L1A,442
R4	KS-20616,L1A,442
[4] R5.0-R5.3	KS-20616,L1A,5110
[4] R6.0-R6.3	KS-20616,L1A,5110
R7	KS-13490,L1,12K
R8	KS-20616,L1A,61.9K
R10	KS-20616,L1A,9.1K
R11	KS-20616,L1A,82.5K
R16	KS-20616,L1A,442
R17	KS-20616,L1A,442
R18	KS-20810,L1A,5230
R19	KS-20810,L1A,3920
R20	KS-20616,L1A,442
R21	KS-20616,L1A,442
R22	KS-20810,L1A,5230
R23	KS-20810,L1A,3920
R24	KS-20616,L1A,237K
R25	KS-20616,L1A,499
R26	KS-20616,L1A,487K
R27	KS-20616,L1A,46.4K

TRANSFORMER

DESIG	CODE
T1-T4	2597A

TRANSISTOR

DESIG	CODE
[4] Q1.0-Q1.3	51C
[4] Q2.0-Q2.3	66F
Q3	66L
Q4	66J
Q5	66J
Q6	66J

INPUT/OUTPUT INFORMATION

FUNCTION: PROVIDES TWO DIGIT DETECTORS WHICH RESPOND TO VALID TOUCH-TONE DIGITS WHEN USED IN CONJUNCTION WITH CP3. A TIMER CIRCUIT PROVIDES AN INTER-DIGITAL TIME-OUT PERIOD OF APPROXIMATELY 2.5 SECONDS.

A TIMER INHIBIT CIRCUIT BLOCKS THE TIMER CIRCUIT FOR APPROXIMATELY FIVE SECONDS AFTER THE RECEIPT OF THE TOUCH-TONE® DIGIT (*).

INPUT: SQUARE WAVE SIGNAL OF APPROXIMATELY 1.25 VOLTS PEAK-TO-PEAK.

CIRCUIT DESCRIPTION

TWO HIGH CHANNEL AND TWO LOW CHANNEL TUNED CIRCUITS ARE PROVIDED WHICH ARE DRIVEN FROM THE HIGH AND LOW LIMITERS, RESPECTIVELY, OF CP3. ONE HIGH CHANNEL (T3) AND (C6) AND ONE LOW CHANNEL (T2) AND (C5) ARE CONNECTED TO RESPOND TO TONES L4 (941 HZ) AND H1(1209 HZ). THE OTHER TWO TUNED CIRCUITS MUST BE STRAPPED IN ACCORDANCE WITH NOTE 218. OPERATION OF THE DETECTORS IS IDENTICAL WITH THAT OF CP3. THE TIMER CIRCUIT CONSISTS OF TRANSISTORS (Q3) AND (Q4), REFERENCE DIODE (CR2), AND ASSOCIATED RESISTORS AND CAPACITORS. IT PROVIDES AN INTERDIGITAL TIME-OUT PERIOD OF APPROXIMATELY 2.5 SECONDS WHEN USED WITH CP3. WITH RELAY (K1) RELEASED AND PINS 21 AND 22 CONNECTED EXTERNALLY, CAPACITOR (C11) IS DISCHARGED, TRANSISTOR (Q4) IS OFF AND (Q3) IS ON. THIS APPLIES -24 VOLTS TO PIN 30. WITH THE CONNECTION BETWEEN PINS 21 AND 22 REMOVED AND PINS 22 AND 1 CONNECTED EXTERNALLY, CAPACITOR (C11) CHARGES THROUGH RESISTOR (R11). IN APPROXIMATELY 2.5 SECONDS THE REFERENCE VOLTAGE OF DIODE (CR2) IS OVERCOME. THIS FORWARD BIASES (Q4) WHICH TURNS OFF (Q3) REMOVING VOLTAGE FROM PIN 30. RECONNECTING PINS 21 AND 22 DISCHARGES (C11) THROUGH (R10) PROVIDING A TIMER RECOVERY TIME OF APPROXIMATELY 0.2 SECONDS. WITH RELAY (K1) OPERATED CONTACT 2 CONNECTS -24 VOLTS TO PIN 30 DIRECTLY.

THE TIMER INHIBIT CIRCUIT CONSISTS OF TRANSISTORS (Q5) AND (Q6), REFERENCE DIODE (CR5), AND ASSOCIATED RESISTORS AND CAPACITORS. NORMALLY, TRANSISTOR (Q5) IS ON AND TRANSISTOR (Q6) IS OFF. WHEN THE L4-H1 TONE COMBINATION IS DETECTED, TRANSISTOR (Q2.1) APPLIES -24 VOLTS TO THE INHIBIT CIRCUIT, CAPACITOR (C13) DISCHARGES THROUGH RESISTOR (R24) AND TRANSISTOR (Q2.1). WHEN THE VOLTAGE ACROSS CAPACITOR (C13) GOES BELOW THE REFERENCE LEVEL OF DIODE (CR5), TRANSISTOR (Q3) TURNS OFF AND TRANSISTOR (Q6) TURNS ON. TRANSISTOR (Q6) APPLIES -24 VOLTS TO THE BASE OF TRANSISTOR (Q3) HOLDING TRANSISTOR (Q5) OFF. WHEN THE L4-H1 TONE IS GONE, TRANSISTOR (Q2.1) TURNS OFF ALLOWING CAPACITOR (C13) TO RECHARGE THROUGH RESISTORS (R24) AND (R25). WHEN THE VOLTAGE ACROSS CAPACITOR (C13) REACHES THE REFERENCE LEVEL OF DIODE (CR5), TRANSISTOR (Q5) TURNS ON, TRANSISTOR (Q6) TURNS OFF, AND THE TIMER CIRCUIT IS RESTORED TO NORMAL.

MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-1C307-( )G2
CONNECTOR ON FRAME	908C

SYMBOL

SHOWN IN FS31

NOTES:

1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS; VALUES PRECEDED BY THE SYMBOL + (PLUS) ARE - (MINUS) ARE IN VOLTS.
2. ⏚ GROUND RETURN.

SUPPLEMENTARY SIGNAL DETECTOR AND INHIBIT

PART OF CPS 16

ISSUE 1 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-J138

BELL TELEPHONE LABORATORIES INCORPORATED

6S

SD-1C245-01-J138

CAD 1

FOR J39340A, L1 - L10
FOR APP FIG. 1, 3-7, 13, 19, & 20

TO CAD 19

T1 — P — 37
R1 — 38
T — P — 9
R — 10
T3 a — P — 20
R3 a — 40
T2 a — P — 6
R2 a — 2
REMOVE STRAPS WHEN LEADS MARKED "a" ARE RUN — 33, 21

(13) 63 JK (JK1)
(1) 61 CP1 (BGI)

-24A — 14
A GRD — 20
-24C — 14
C GRD — 20
TO FUSE PANEL

55 CP2 (BUS AMPL)
50 CP3 (SIG RCVR)

TO OFFICE ALARM CKT SEE NOTE 109
A — P — (7) — 35
B — 37

TO OFFICE ALARM CKT SEE NOTE 109
A — P — (7) — 29
B — 28

45 CP4 (SUPL S DET)

SEE NOTE 117

TO CAD 6, 11, 15, 17, 18, OR 22
LB — 16
-24A — 14
TO CAD 6, 11, 15, 17 OR 18
A GRD — 20
TO CAD 2 OR 23

1 H3 (HANDSET)

TO OFFICE ALARM CKT SEE NOTE 109
C — P — (7) — 16
D — 18
C — P — (7) — 10
D — 27

50 CP3 (SIG RCVR)
45 CP4 (SUPL S DET)

TO CAD 6, 9, 12, OR 13
T — P — SEE NOTE 116 — 32
R — 7
RT — P — 17
RR — SEE NOTES 116 & 118 — 33
TO CAD 2, 9, 14 OR 23
RT — P — 19
RR — 35
TT — P — SEE NOTE 116 — 23
TR — 21

(3) 40 CP8 (BAT. FEED)
(2) CP9 BAT. FEED W/O PICKUP)

T — 18
R — 15
T — 39
R — 40
T — 25
R — 26
24
6

TO CAD 3 OR 22
T1 — P — T
R1 — R

SEE NOTE 202 FOR CONN TO LOUDSPEAKER

TO FUSE PANEL
-24B — 14
B GRD — 20

35 (3) CP10 (SUPL BAT. FEED)
(4) CP11 (SUPL BAT. FEED W/O PICKUP)

TO CAD 6, 12 OR 13
T — P — SEE NOTE 116 — 32
R — 7
RT — P — 17
RR — SEE NOTES 116 & 118 — 33
TO CAD 9 OR 14
TT — P — SEE NOTE 116 — 23
TR — 21

(3) 35 CP10 (SUPL BAT. FEED)
(4) CP11 (SUPL BAT. FEED W OR W/O PICKUP)

T — 18
R — 15
T — 39
R — 40
T — 25
R — 26
24
6

TO CAD 3 OR 22
T1 — P — T
R1 — R

SEE NOTE 202 FOR CONN TO LOUDSPEAKER

TO CAD 11, 18 OR 22
T — P — 13
R — 10
TO CAD 10 OR 22
RT — P — 9
RR — 8
TO CAD 11 18 OR 22
A — 27
B GRD — 20

(4) 35 CP11 (SUPL BAT. FEED WITH PICKUP)

TO CAD 6, 9, 12, 13 OR 14
RT1 — P
RR1
TT1 — P — 30
TR1 — 29

CAD 2 (MFR DISC.)

FOR APP FIG. 27

TO CAD 1, 4, 5, 20, 21, 23 OR 24
TT — P — SEE NOTE 116 — 3
TR — 4
RT — P — 1
RR — 2

695A SUBSCRIBER SET (OUTDOOR TYPE)

TO CAD 15 — LB1 — 5
TO CAD 1, 4, 5, 20, 21, 23 OR 24 — A GRD — 8

CAD 3

FOR APP FIG. 25

MULT TO OTHER CAD 3 WHEN REQ'D

TO CAD 1, 4, 5, 20, 21, 23 OR 24
T1 — 1 — 1
R1 — 2 — 4
TO FUSE PNL
-24F — 3 — 14
F GRD — 4 — 13

T.B. & CONN STRIP WHEN LOUD-SPEAKER IS MTD IN BAY FRWK MTG.

10
15 — LOUDSPEAKER SET
16
17
11

TO CAD 1, 4, 5, 20, 21 23 OR 24
T1
R1
TO FUSE PNL
-24F
F GRD

MULT TO OTHER CAD 3 WHEN REQ'D

SCREW ON AMPL RETAIN. BRKT

DRAWING ISSUE
1
2A
3A
4B
5B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-1C245-01-GI

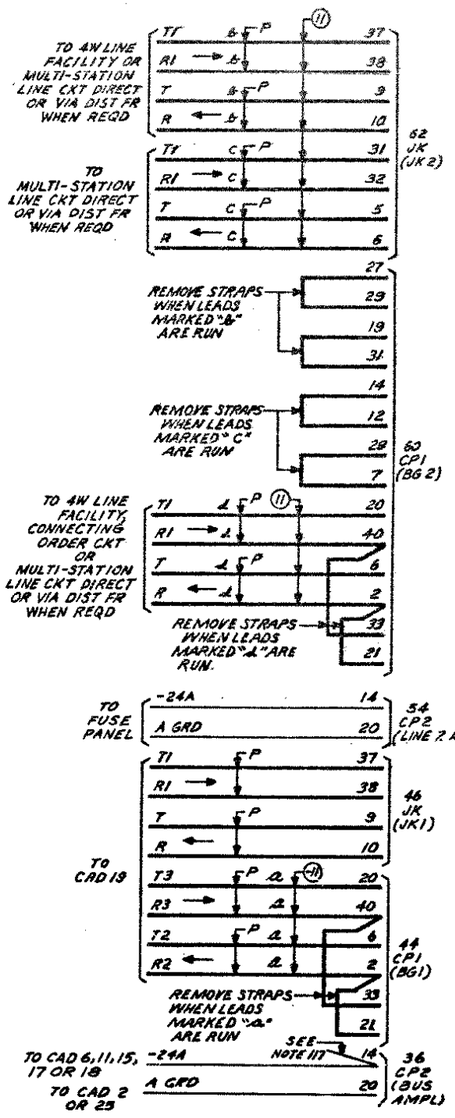
BELL TELEPHONE LABORATORIES INCORPORATED

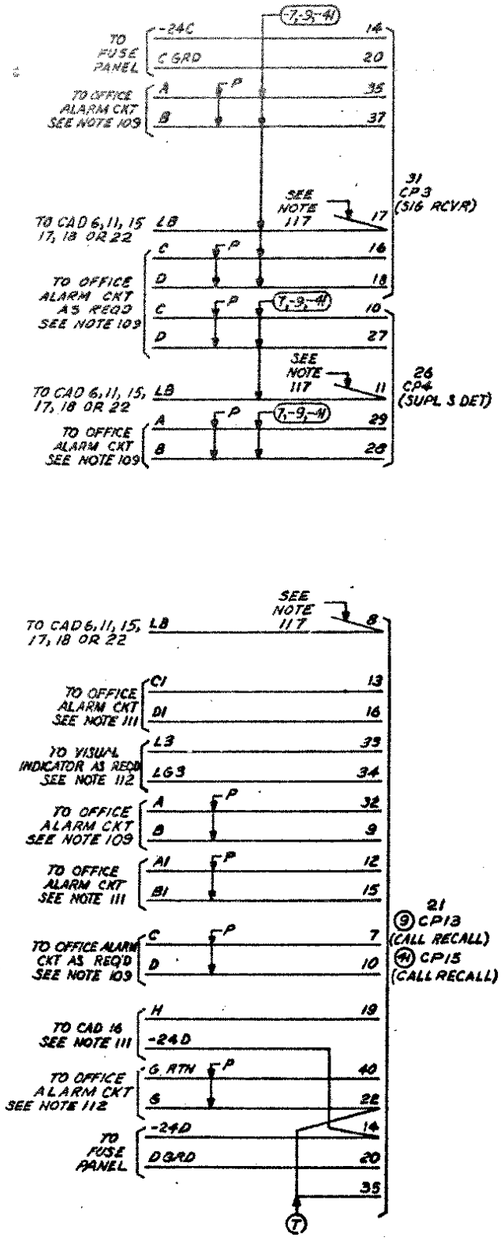
6S

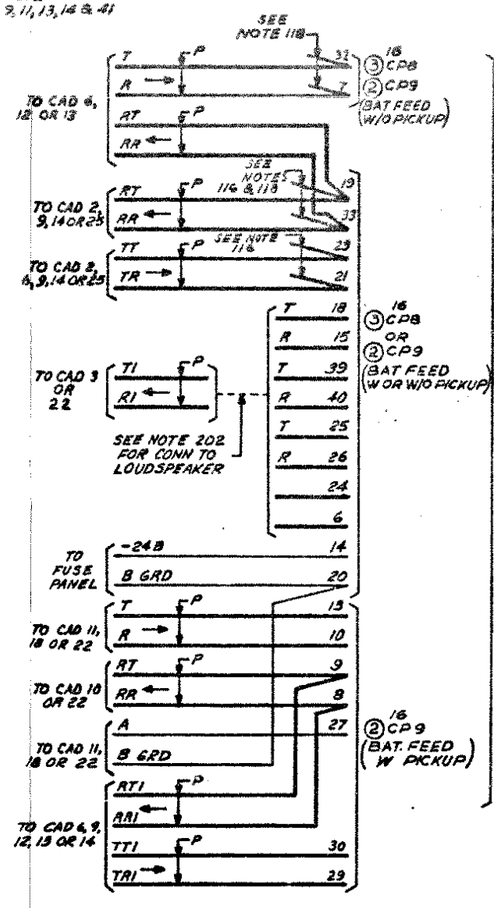
SD-IC245-01-GI

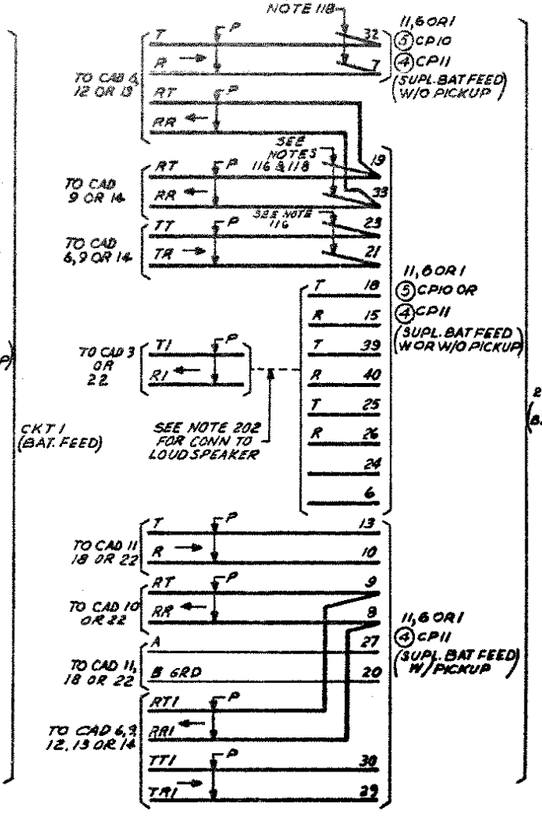
CAD 4

FOR J98310B, L1 - L12
FOR APP FIG. 1-7, 9, 11, 13, 14 & 41









CRAWING ISSUE: / 2A 3A 4B 5B

ISSUE 11B

SD-IC245-01-G2

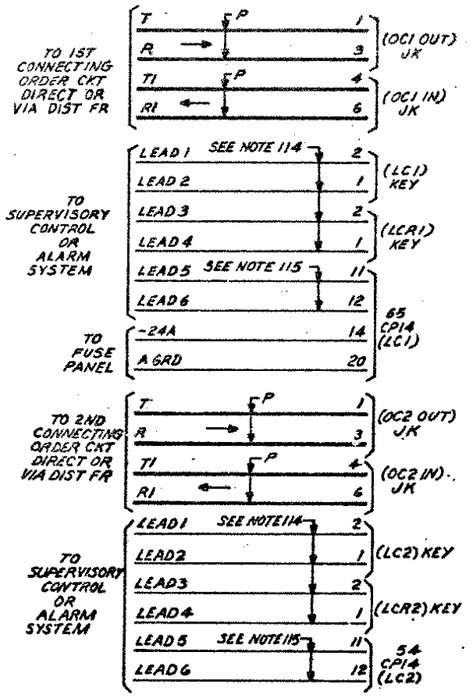
GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

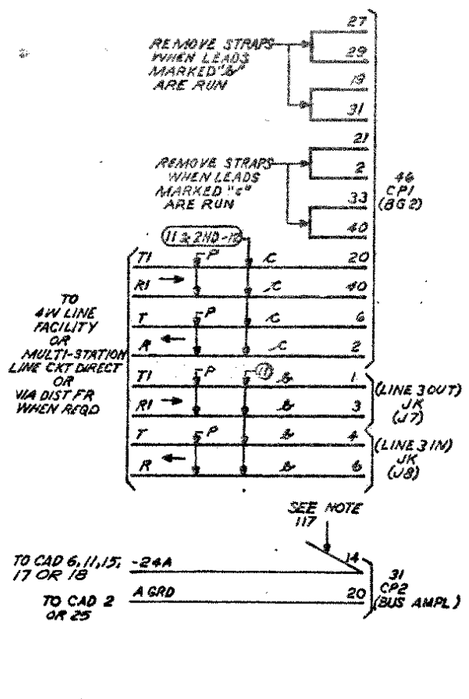
BELL TELEPHONE LABORATORIES INCORPORATED

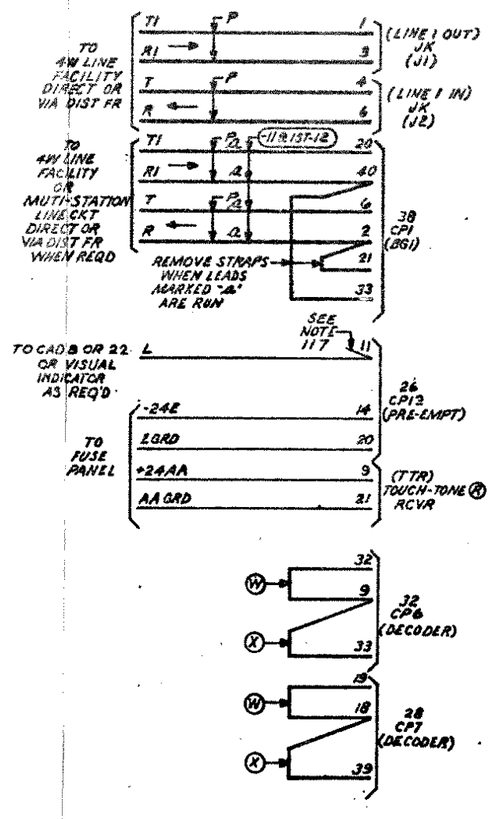
SHEET 6S

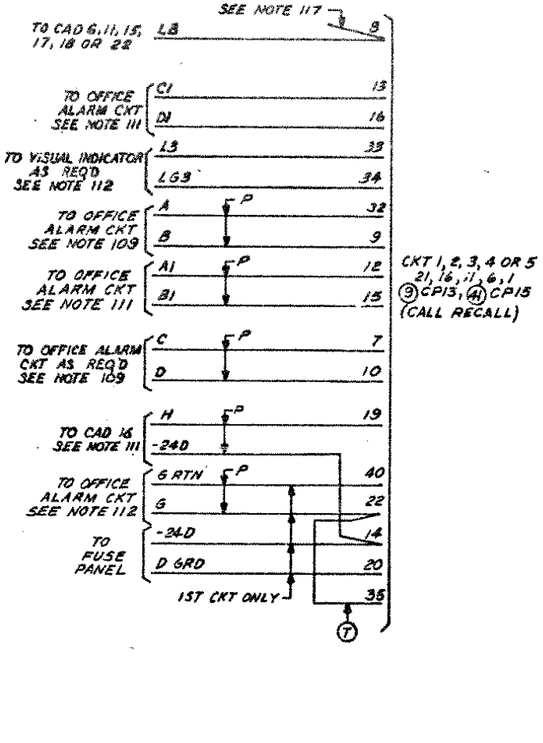
PART OF CAD 5

FOR J99340C
FOR APP FIG. 1-5, 8-12, 15-18 & 41









DRAWING ISSUE
1
2A
3A
4B
5B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

SD-IC245-01-G3

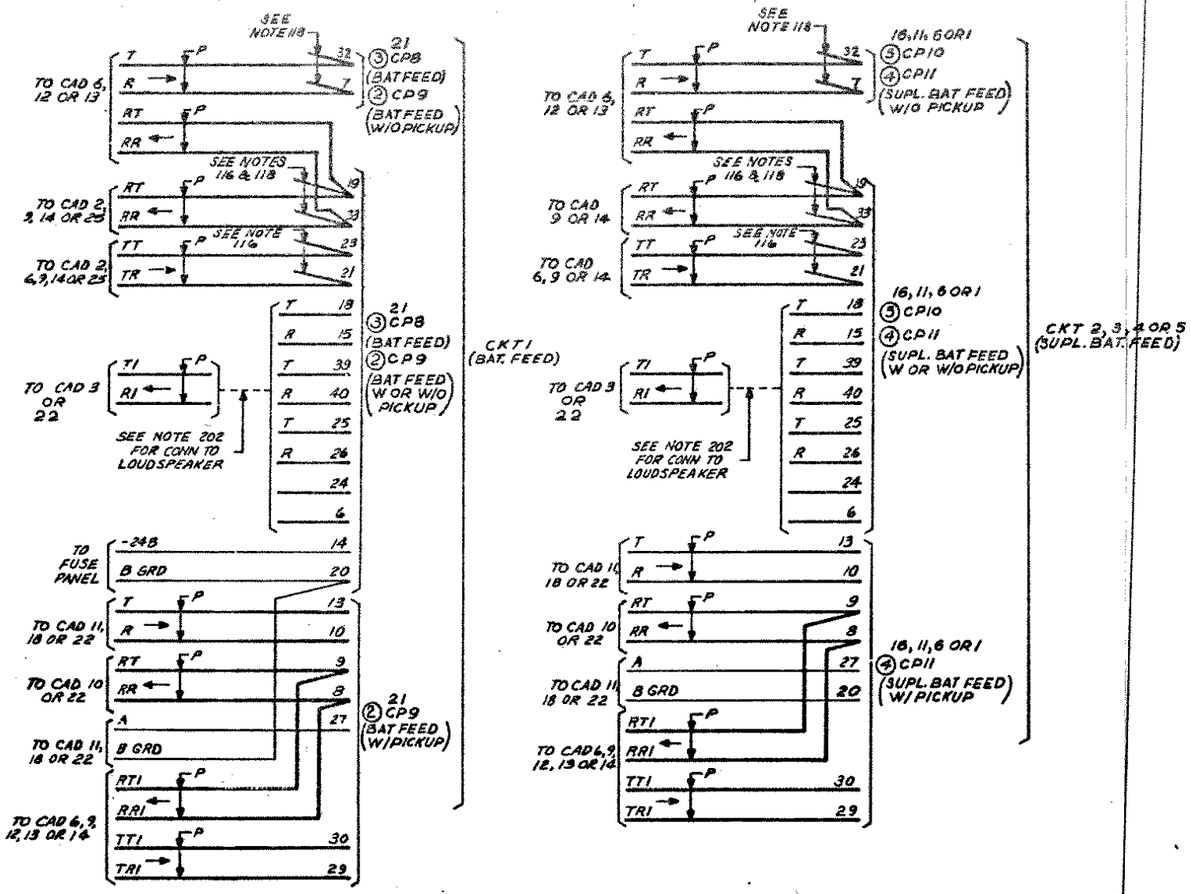
BELL TELEPHONE LABORATORIES INCORPORATED

6S

SD-IC245-01-G3

PART OF CAD 5

FOR J99340C
FOR APP FIG. 1-5, 8-12, 15-18 & 41



DRAWING ISSUE
1
2A
3A
4B
5B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT

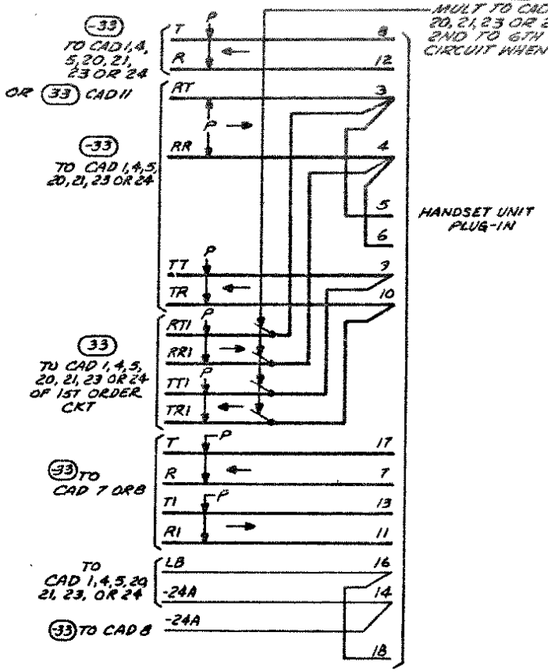
SD-1C245-01-G4

BELL TELEPHONE LABORATORIES INCORPORATED

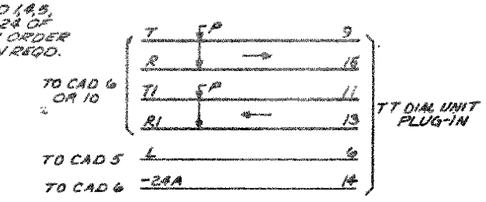
SHEET 65

SD-1C245-01-G4

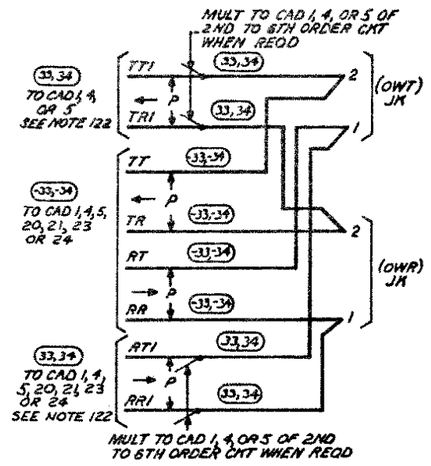
CAD 6
FOR APP FIG 19



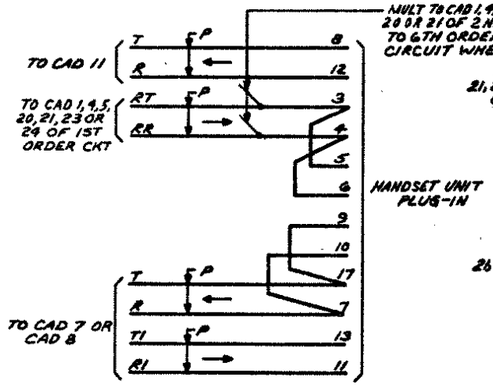
CAD 8
FOR APP FIG. 22



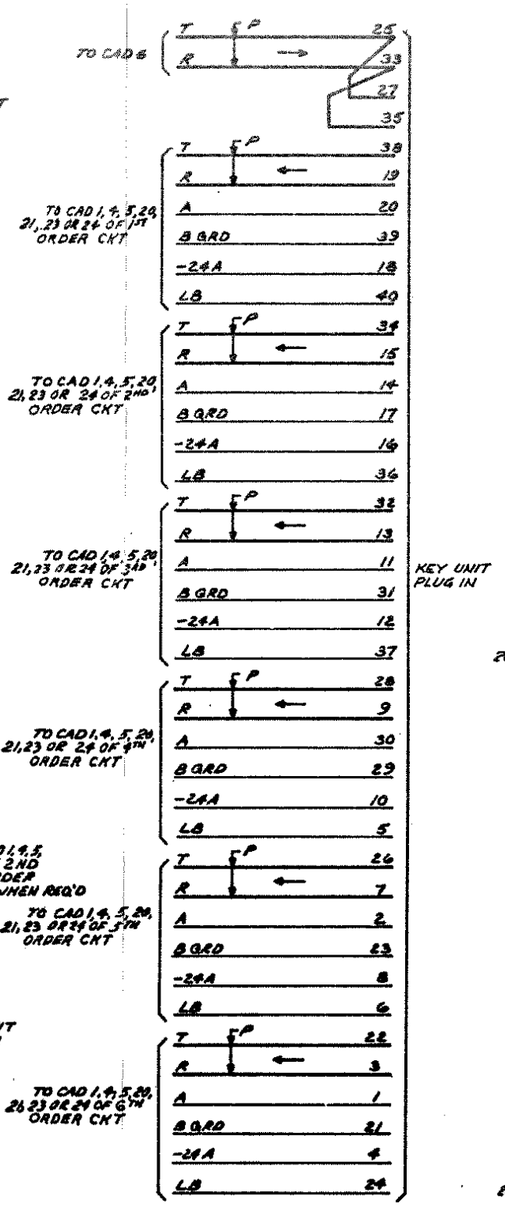
CAD 9
FOR APP FIG 23



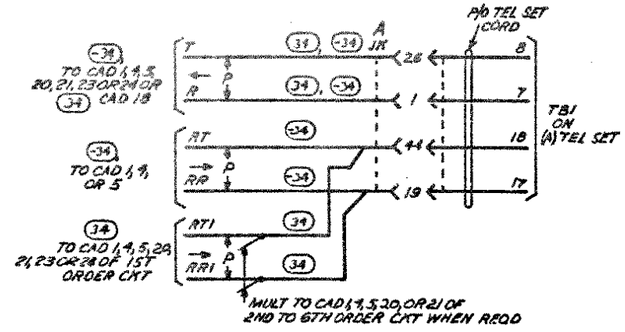
CAD 10 (MFR DISC.)
FOR APP FIG. 21



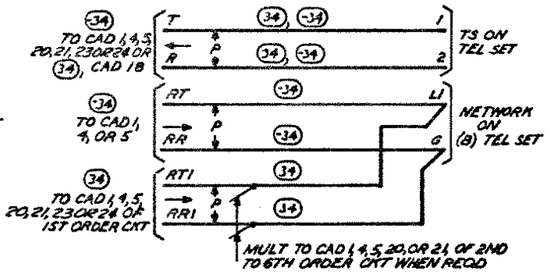
CAD 11
FOR APP FIG. 33



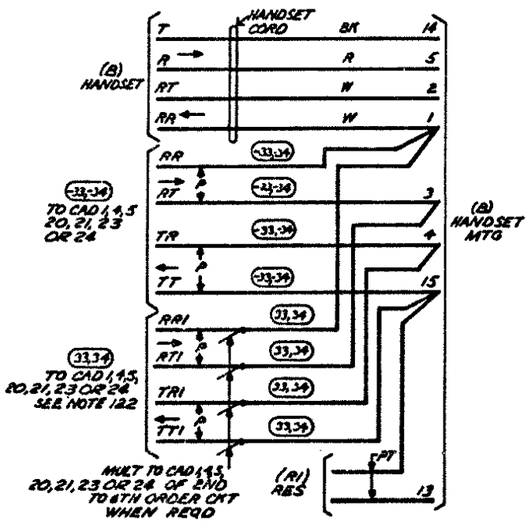
CAD 12
FOR APP FIG 28
SEE NOTE 209



CAD 13
FOR APP FIG. 29
SEE NOTE 210



CAD 14
FOR APP FIG.30



DRAWING ISSUE 4B 5B

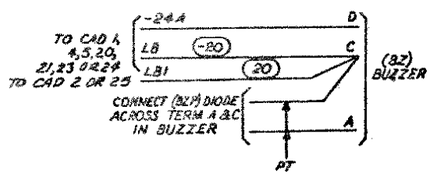
ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2) | SD-IC245-01-G5

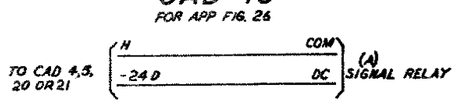
BELL TELEPHONE LABORATORIES INCORPORATED | 6S

SD-IC245-01-G5

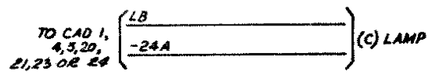
CAD 15
FOR APP FIG. 31



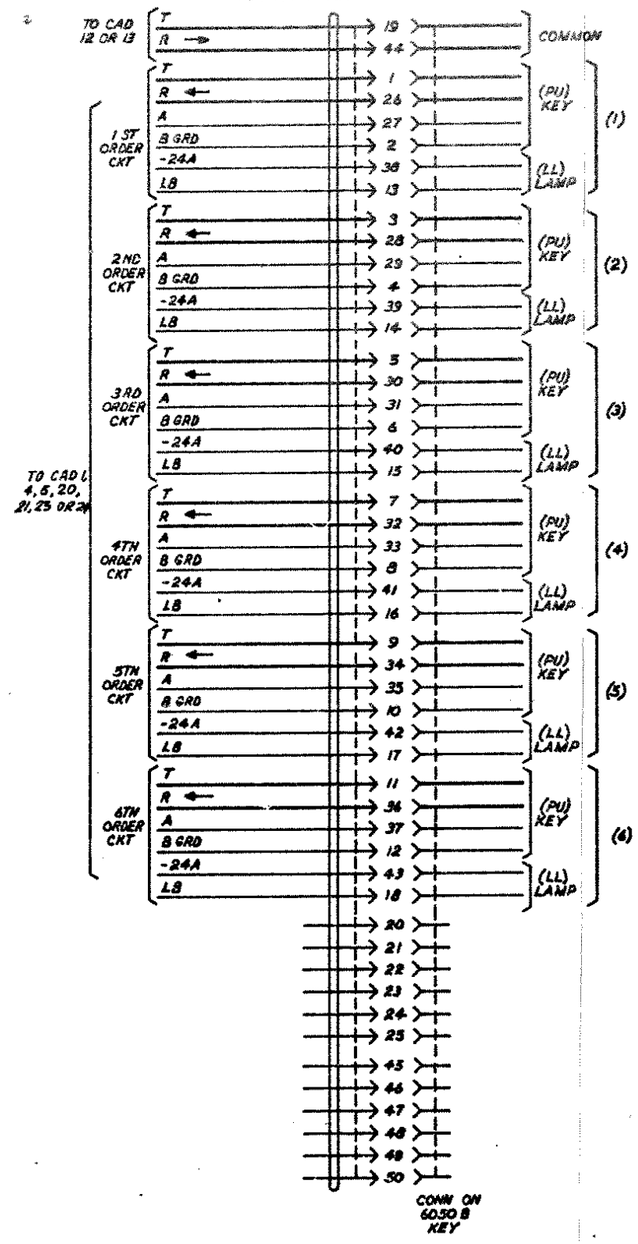
CAD 16
FOR APP FIG. 26



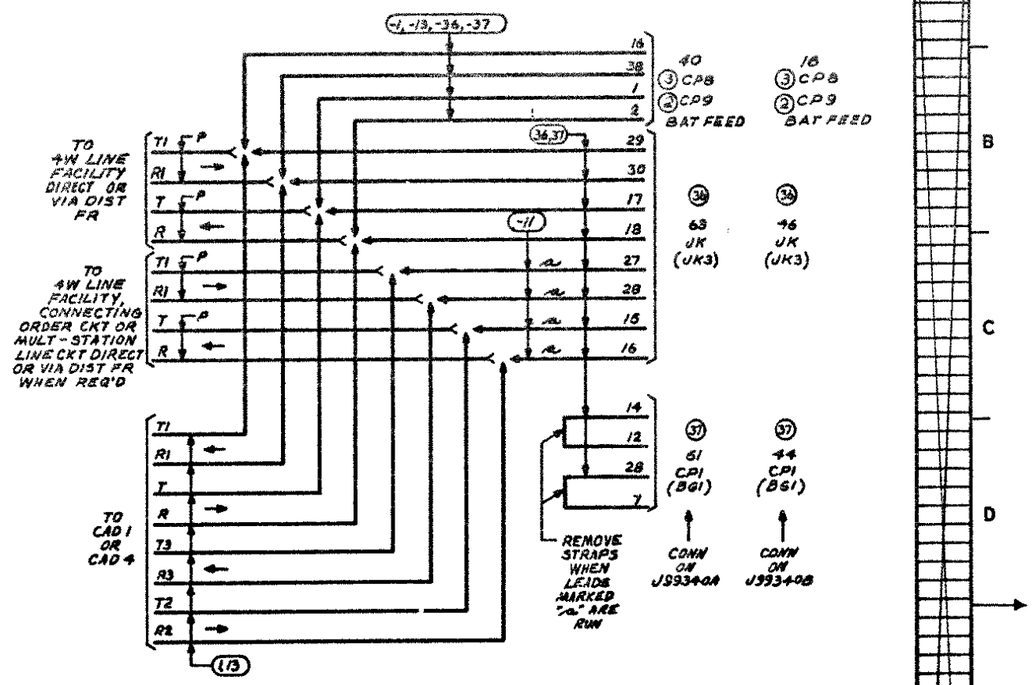
CAD 17
FOR APP FIG. 32



CAD 18
FOR APP FIG. 34



CAD 19
FOR J99340 A,L11-L15 OR
FOR J99340 B,L13-L17
FOR APP FIG. 36,37



DRAWING ISSUE 4S 5S

ISSUE 11B

GENERAL PURPOSE 4-WIRE CIRCUIT (2)

SD-1C245-01-G6

BELL TELEPHONE LABORATORIES INCORPORATED

SIZE 6S

SD-1C245-01-G6

PART OF CAD 20

FOR J99340D
FOR APP FIG. 1-5, 8, 9, 15, 39, 40 & 41

FOR 2 ND ORDER CIRCUIT

TO 4W LINE FACILITY DIRECT OR VIA DIST FR
T1 P 1 (LINE I OUT) JK (J1)
R1 3
T P 4 (LINE I IN) JK (J2)
R 6

TO 4W LINE FACILITY OR MULTI-STATION LINE CKT DIRECT OR VIA DIST FR WHEN REQ'D
T1 P a 20
R1 a 40
T P a 6
R a 2
63 CP1 (BG2)
REMOVE STRAPS WHEN LEADS MARKED "a" ARE RUN SEE NOTE 117
21
33

TO CAD 6,11,15, 17 OR 18 -24A 14
TO CAD 2 OR 25 A GRD 20
65 CP2 (BUS AMPL 2)

TO FUSE PANEL -24A
A GRD

SEE NOTE 118
T P 32
R 7
58 ③CP8 ②CP9 (BAT FEED W/O PICKUP)

TO CAD 6, 12 OR 13
RT P
RR
SEE NOTES 116 & 118
RT P 19
RR 33
TO CAD 2, 9, 14 OR 25
TT P SEE NOTE 116 23
TR 21

T 18
R 15
T 39
R 40
T 25
R 26
24
6
53 ③CP8 ②CP9 (BAT FEED W OR W/O PICKUP)

TO CAD 3 OR 22
T1 P
R1
SEE NOTE 202 FOR CONN TO LOUDSPEAKER

TO FUSE PANEL -24B2 14
B2 GRD 20

T P 13
R 10
TO CAD 11, 18 OR 22
RT P 9
RR 8
TO CAD 10 OR 22
A 27
B GRD 20
TO CAD 11, 18 OR 22
RT1 P
RR1
TO CAD 6, 9, 12, 13 OR 14
TT1 P 30
TR1 29
58 ②CP9 (BAT FEED W/PICKUP)

CKT 21 (BAT FEED)

FOR 2 ND ORDER CIRCUIT

SEE NOTE 118
T P 32
R 7
53, 48, 43 OR 38 ⑤CP10 ④CP11 (SUPL. BAT FEED W/O PICKUP)
TO CAD 6, 12 OR 13
RT P
RR
SEE NOTES 116 & 118
RT P 19
RR 33
TO CAD 9 OR 14
TT P SEE NOTE 116 23
TR 21
TO CAD 6 9 OR 14

T 18
R 15
T 39
R 40
T 25
R 26
24
6
53, 48, 43 OR 38 ③CP10 ④CP11 (SUPL. BAT FEET W OR W/O PICKUP)

TO CAD 3 OR 22
T1 P
R1
SEE NOTE 202 FOR CONN TO LOUDSPEAKER

T P 13
R 10
TO CAD 11, 18 OR 22
RT P 9
RR 8
TO CAD 10 OR 22
A 27
B GRD 20
TO CAD 11, 18 OR 22
RT1 P
RR1
TO CAD 6, 9, 12, 13 OR 14
TT1 P 30
TR1 29
53, 48 43, 38 ④CP11 (SUPL. BAT FEED W/PICKUP)

CKT 22, 23, 24 OR 25 (SUPL. BAT FEED) OR (44) CKT 22, 23 OR 24 (SUPL BAT. FEED)

FOR 1ST ORDER CIRCUIT

TO 4W LINE FACILITY DIRECT OR VIA DIST FR
T1 P 1 (LINE I OUT) JK (J1)
R1 3
T P 4 (LINE I IN) JK (J2)
R 6

TO CAD 6, 11, 15, 17, 18 OR 22 -24A SEE NOTE 117 14
TO CAD 2 OR 25 A GRD 20
26 CP2 (BUS AMPL 1)

SEE NOTE 118
T P 32
R 7
21 ③CP8 ②CP9 (BAT FEED W/O PICKUP)
TO CAD 6, 12 OR 13
RT P
RR
SEE NOTES 116 & 118
RT P 19
RR 33
TO CAD 9 OR 14
TT P SEE NOTE 116 23
TR 21
TO CAD 6, 9 OR 14

T 18
R 15
T 39
R 40
T 25
R 26
24
6
21 ③CP8 ②CP9 (BAT FEED W OR W/O PICKUP)

TO CAD 3 OR 22
T1 P
R1
SEE NOTE 202 FOR CONN TO LOUDSPEAKER

TO FUSE PANEL -24B1 14
B1 GRD 20

T P 13
R 10
TO CAD 11, 18 OR 22
RT P 9
RR 8
TO CAD 10 OR 22
A 27
B GRD 20
TO CAD 11, 18 OR 22
RT1 P
RR1
TO CAD 6, 9, 12, 13 OR 14
TT1 P 30
TR1 29
21 ②CP9 (BAT FEED W/PICKUP)

CKT 11 (BAT FEED)

DRAWING ISSUE 58

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-1C245-01-G7

BELL TELEPHONE LABORATORIES INCORPORATED

6S

SD-1C245-01-G7

PART OF CAD 20

FOR J93340B
FOR APP FIG. 1-5, 8, 9, 15, 39, 40 & 41

FOR 1ST ORDER CIRCUIT

SEE NOTE 116

TO CAD 6, 12 OR 13
T, R, RT, RR — P — 32, 7
16, 10, 6, 1
(5) CP10
(4) CP11
(SUPL. BAT FEED W/O PICKUP)

SEE NOTE 116

TO CAD 9 OR 14
RT, RR — P — 8, 33

TO CAD 6 9 OR 14
TT, TR — P — 23, 21

TO CAD 3 OR 22
TI, RI — P

SEE NOTE 202 FOR CONN TO LOUDSPEAKER

T 18
R 15
T 39
R 40
T 25
R 26
24
6
16, 10, 6, 1
(5) CP10
(4) CP11
(SUPL. BAT FEED W OR W/O PICKUT)

CKT 12, 13, 14, 15 (SUPL. BAT FEED)

TO CAD 11, 18 OR 22
T, R — P — 13, 10

TO CAD 10 OR 22
RT, RR — P — 9, 8
16, 10, 6, 1
(5) CP10
(4) CP11
(SUPL. BAT FEED W/PICKUP)

TO CAD 11, 18 OR 22
A — 27
B GRD — 20

TO CAD 6, 9, 12, 13 OR 14
RTI, RRI — P
TTI, TRI — P — 30, 29

FOR 1ST ORDER CKT

TO 4W LINE FACILITY OR MULTI-STATION LINE CKT DIRECT OR VIA DIST FR WHEN REQ'D
T1, R1 — P — b — 20, 40
T, R — P — b — 6, 2
26 CP1 (BG1)

REMOVE STRAPS WHEN LEADS MARKED "b" ARE RUN
21
33

SEE NOTE 117

TO CAD 6, 11, 15, 17, 18 OR 22 — LB — 8

TO OFFICE ALARM CKT SEE NOTE 111
C1 — 13
D1 — 16

TO VISUAL INDICATOR AS REQ'D SEE NOTE 112
L3 — 33
LG3 — 34

TO OFFICE ALARM CKT SEE NOTE 109
A, B — P — 32, 9

TO OFFICE ALARM CKT SEE NOTE 111
A1, B1 — P — 12, 15

TO OFFICE ALARM CKT AS REQ'D SEE NOTE 109
C, D — P — 7, 10

TO CAD 16 SEE NOTE 111
H — P — 19
-24D

TO OFFICE ALARM CKT SEE NOTE 112
G RTN — P — 40
G — 22

TO FUSE PANEL
-24D — H
D GRD — 20

1ST CKT ONLY
35
(7)

CKT 1, 2, 3, 4 OR 5
21, 16, 11, 6 OR 1
(3) CP13, (4) CP15
(CALL RECALL)

W — 32, 9 — X — 33
30 CP6 (DECODER)

W — 19, 18 — X — 39
28 CP7 (DECODER)

TO FUSE PANEL
-24E — 14
E GRD — 20
+24AA — 9
AA GRD — 21
TTR TOUCH-TONE (M) RCVR

DRAWING ISSUE 5B

ISSUE 118

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-1C245-01-G8

BELL TELEPHONE LABORATORIES INCORPORATED

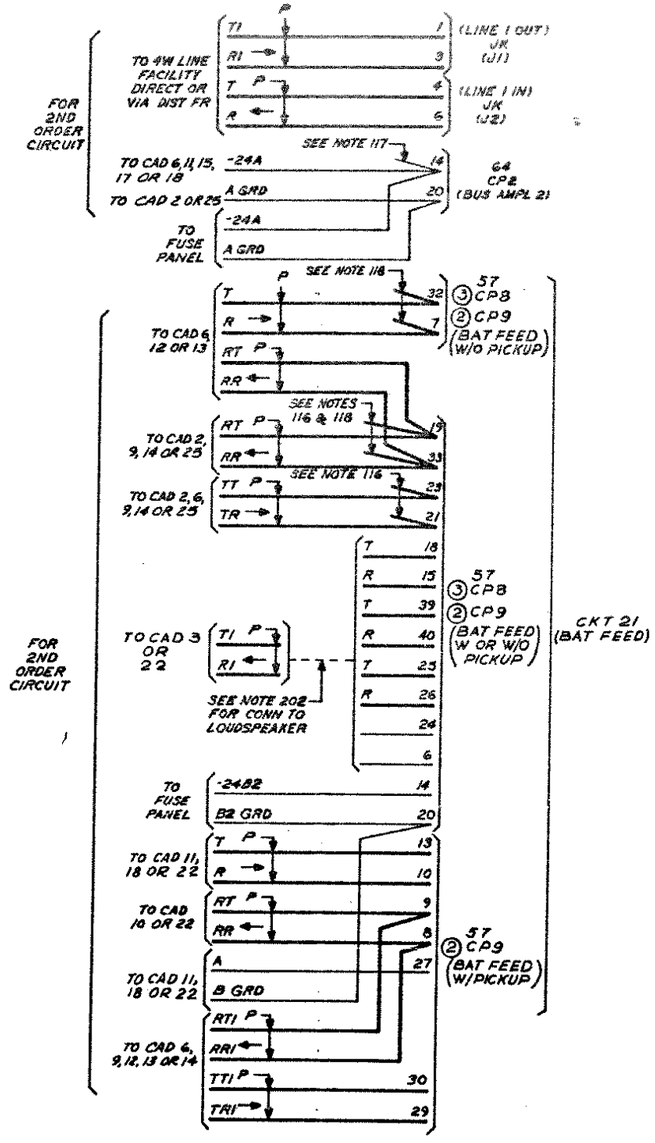
SHEET 6S

SD-1C245-01-G8

PART OF CAD 21

FOR J99340E

FOR APP FIGS. 1-5, 8, 9, 15, 18, 38 & 41



DRAWING ISSUE 3B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-IC245-01-G9

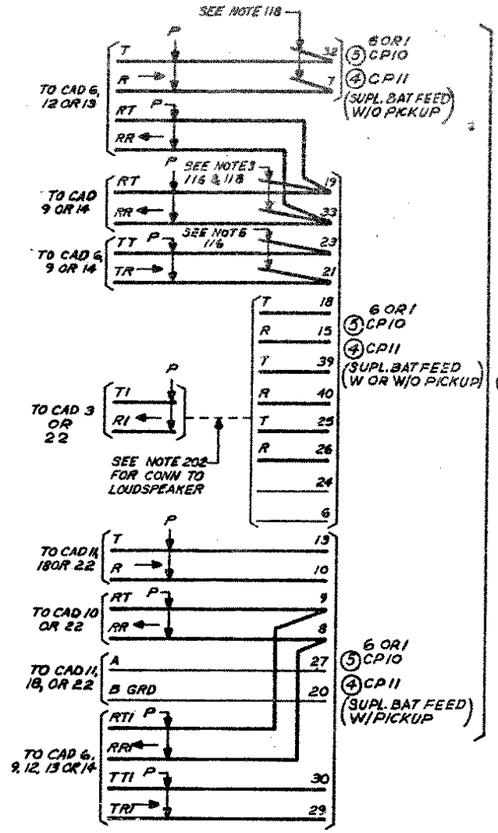
BELL TELEPHONE LABORATORIES INCORPORATED

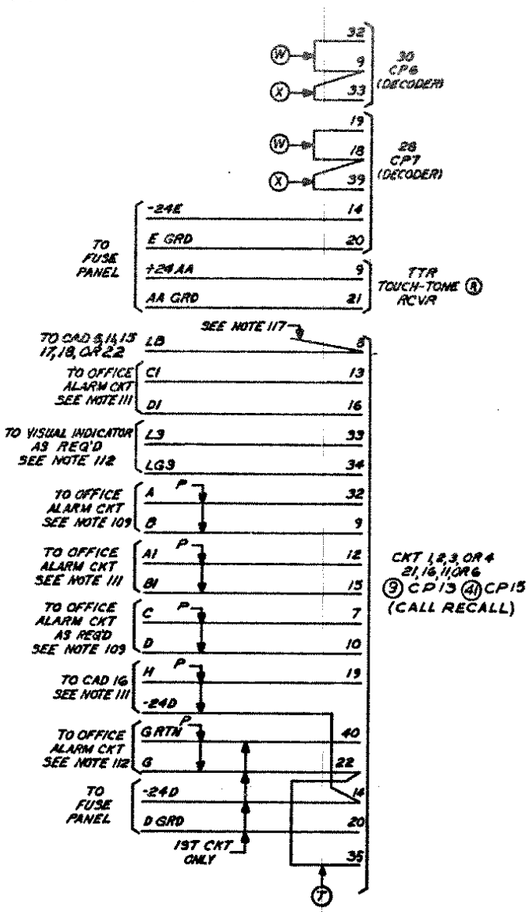
65

SD-IC245-01-G9

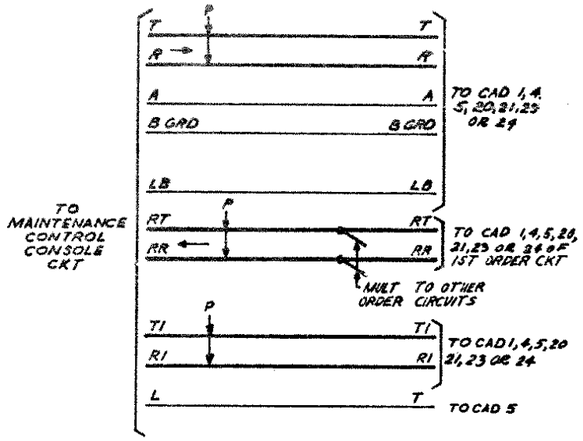
PART OF CAD 21

FOR J93540E
FOR APP FIG. 1-5,8,9,15,18,38 &41





CAD 22



DRAWING ISSUE 5B

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-1C245-01-G10

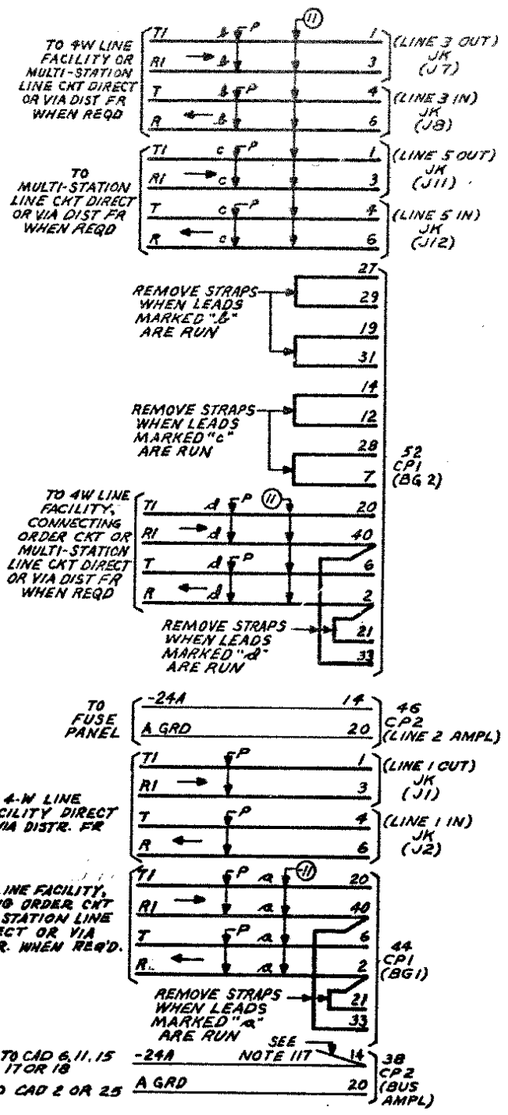
BELL TELEPHONE LABORATORIES INCORPORATED

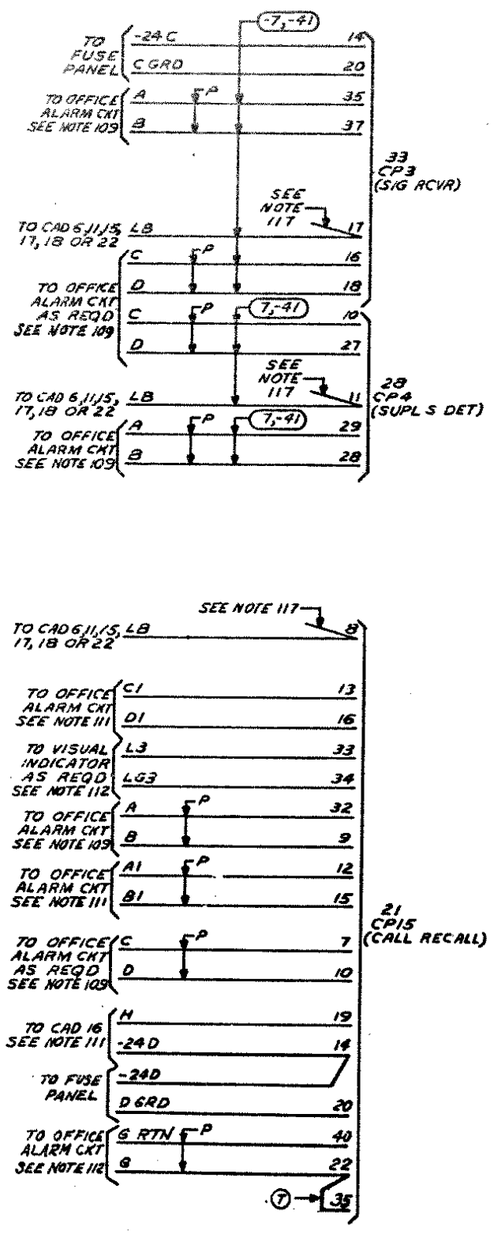
65

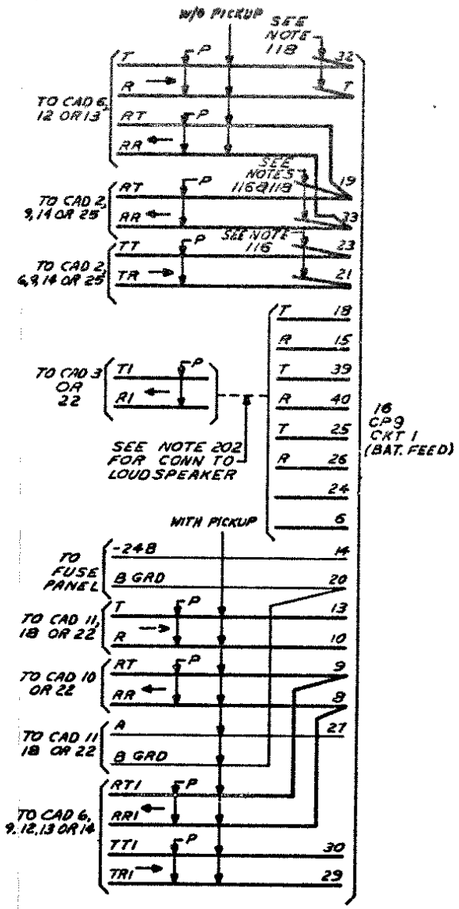
SD-1C245-01-G10

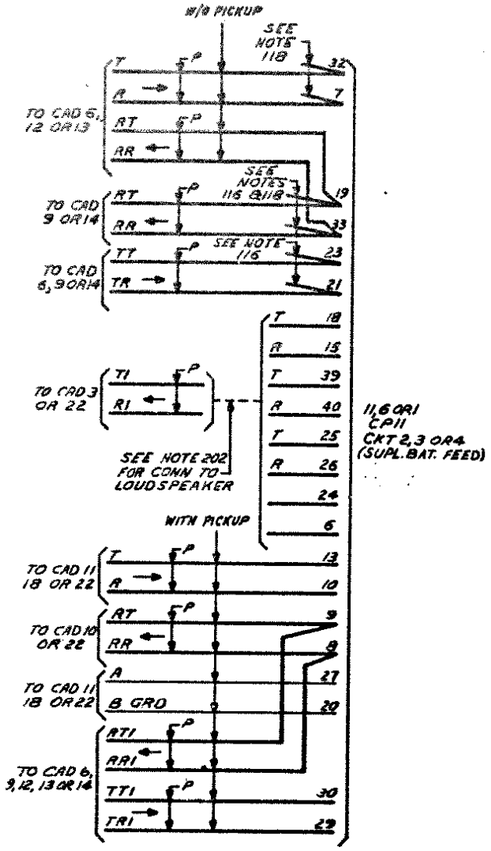
CAD 23

FOR J99340 F, L1 – L7
FOR APP FIGS. 1, 2, 4, 6, 7, 11, 15, 16, 41









DRAWING ISSUE

ISSUE 118

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)

SD-IC245-01-GII

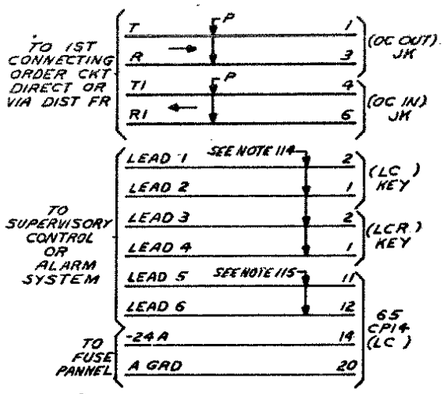
BELL TELEPHONE LABORATORIES INCORPORATED

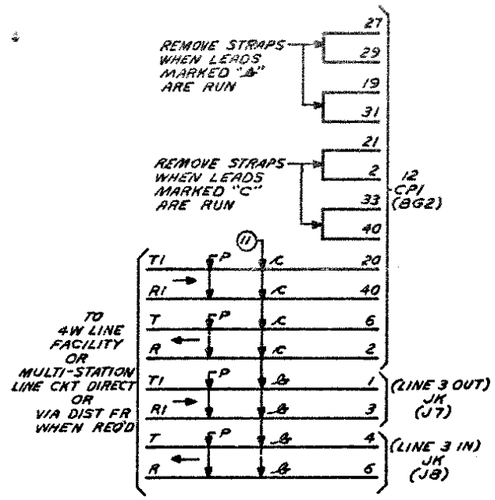
DATE ISSUED 6S

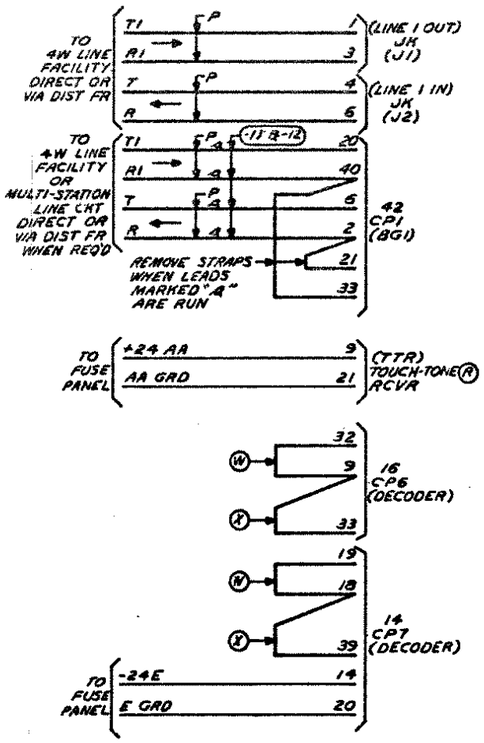
SD-IC245-01-GII

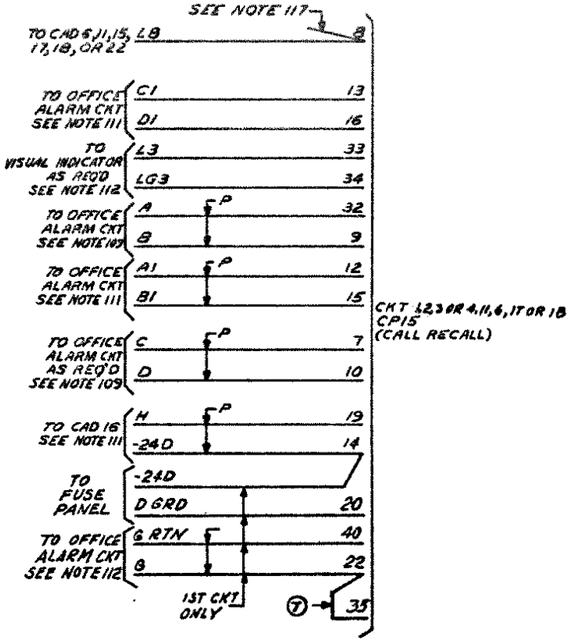
PART OF CAD 24

FOR J93340G
FOR APP FIG. 1,2,4,8,11,12,15-18,41









DRAWING ISSUE

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT ②

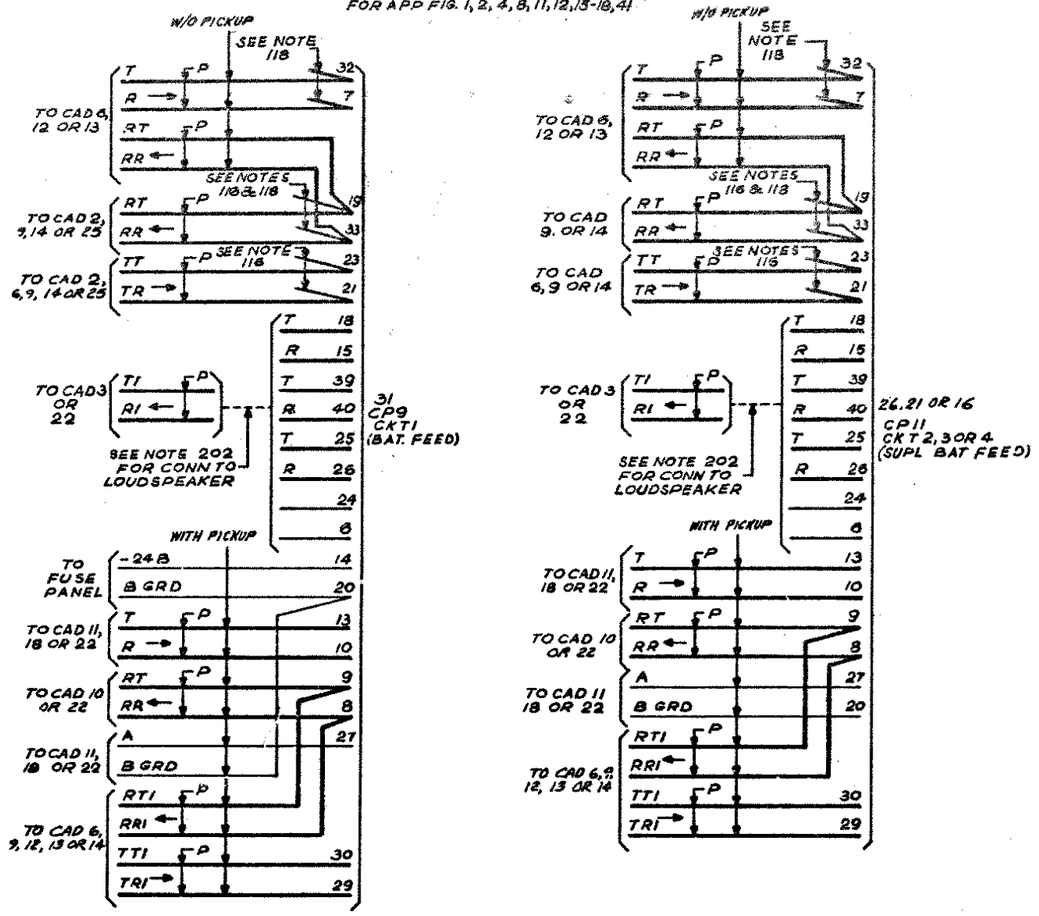
SD-IC245-01-G12

BELL TELEPHONE LABORATORIES

SD-IC245-01-G12

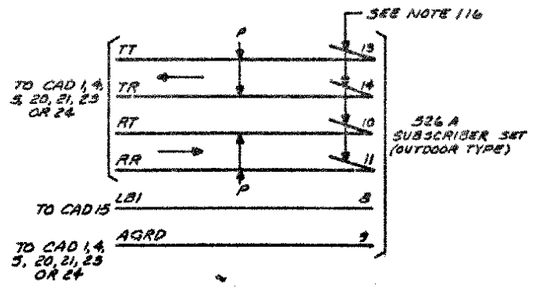
PART OF CAD 24

FOR J93340G
FOR APP FIG. 1, 2, 4, 8, 11, 12, 13-18, 41



CAD 25

FOR APP FIG 48



DRAWING ISSUE

ISSUE 11B

GENERAL PURPOSE 4-WIRE ORDER CIRCUIT (2)	SD-IC245-01-G13
BELL TELEPHONE LABORATORIES INCORPORATED	65

SD-IC245-01-G13