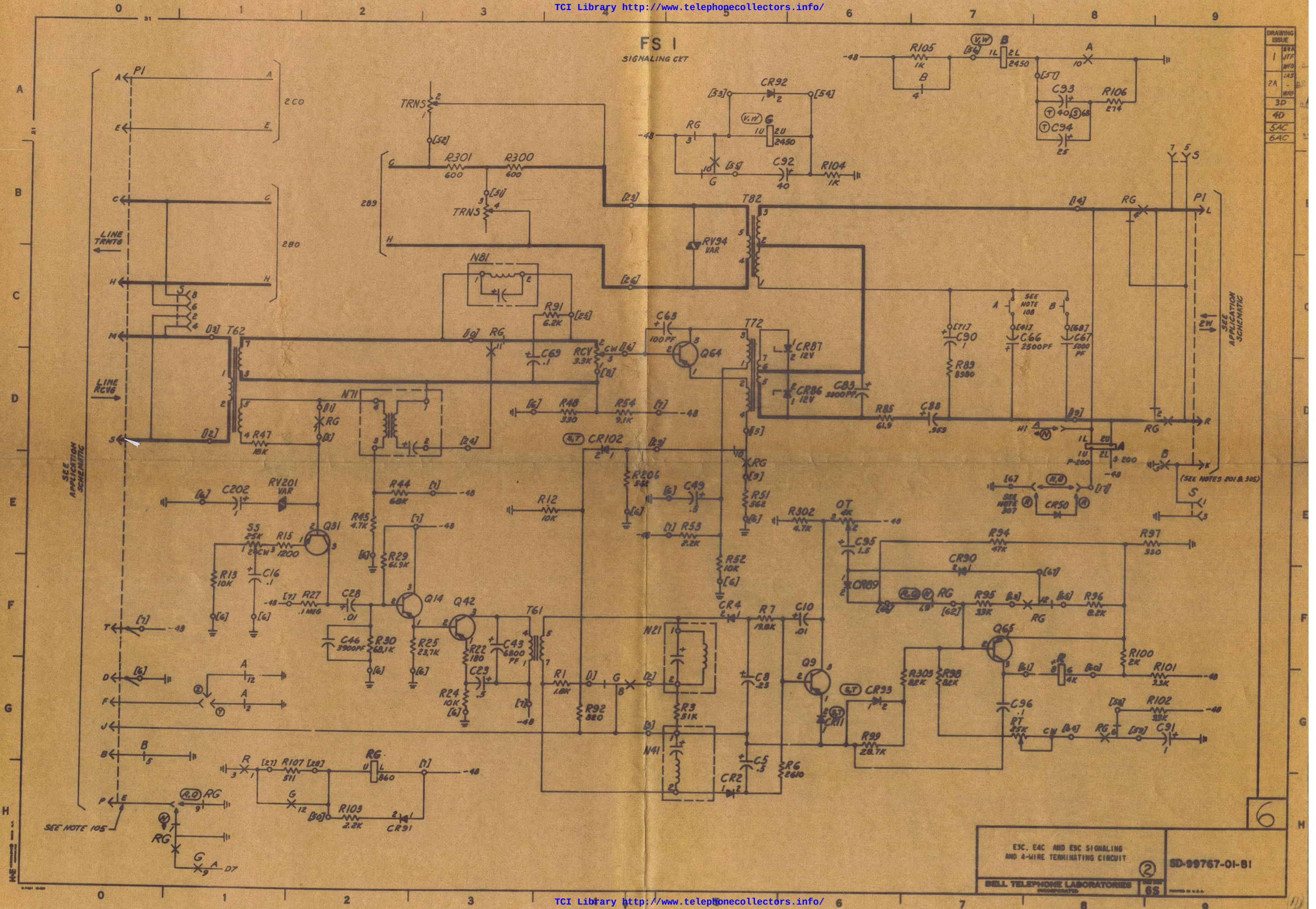


21

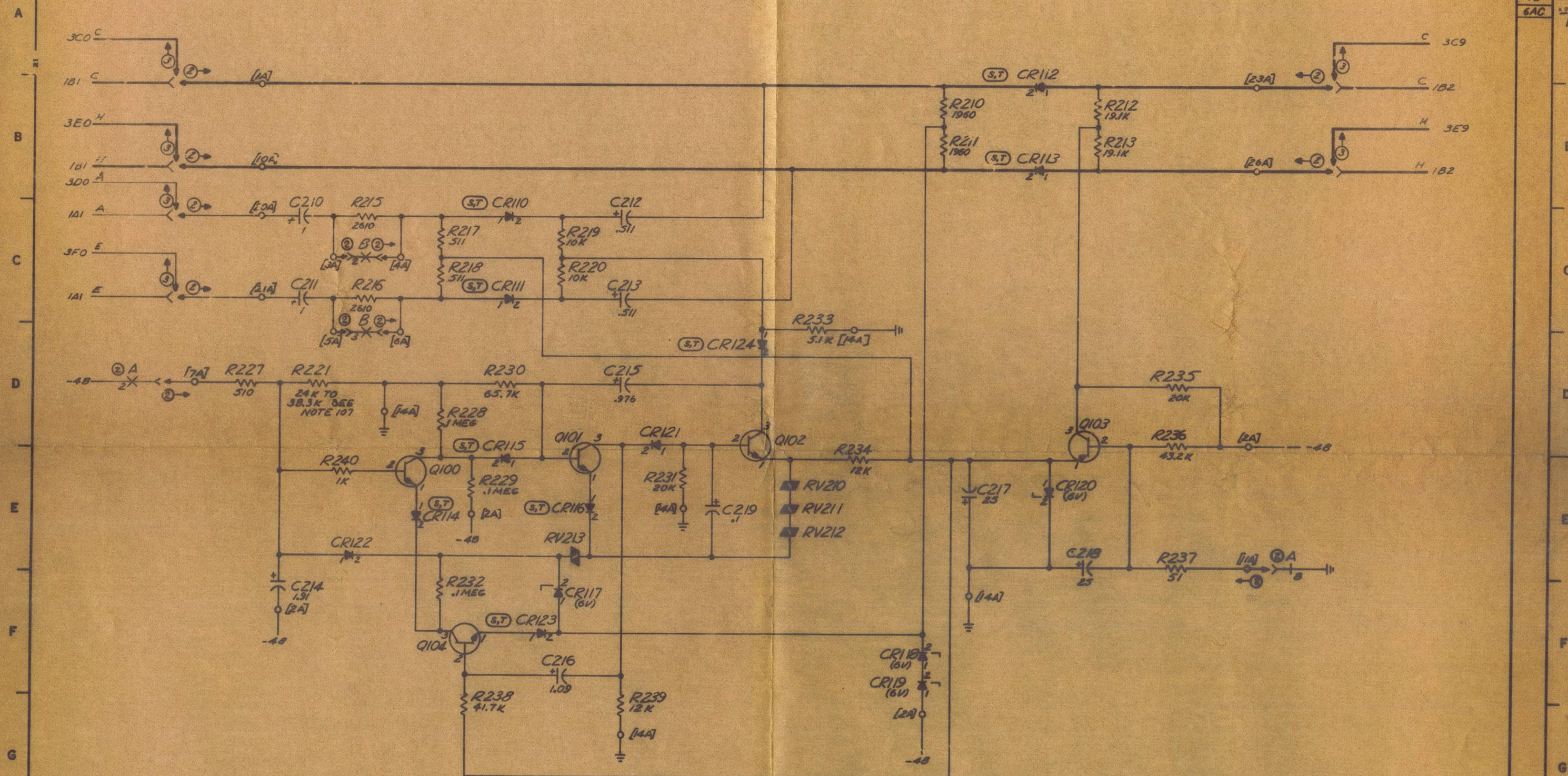
[illegible]

1997年12月

②



FS 2
PULSE CORRECTOR



ESC, E4C AND E5C SIGNALING AND 4-WIRE TERMINATING CIRCUIT

SD-99767-01-B2

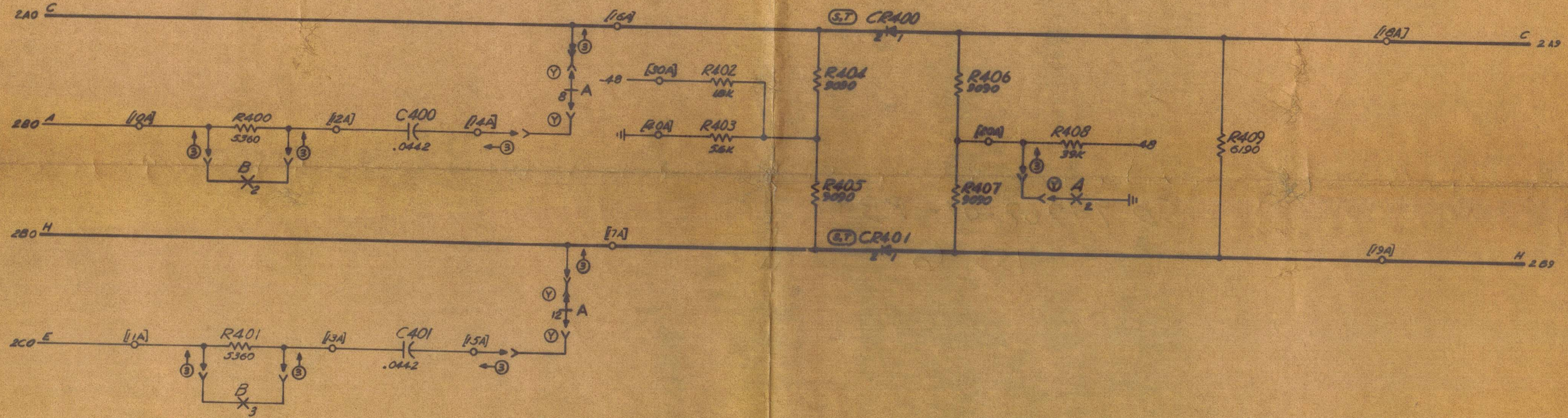
BELL TELEPHONE LABORATORIES

69

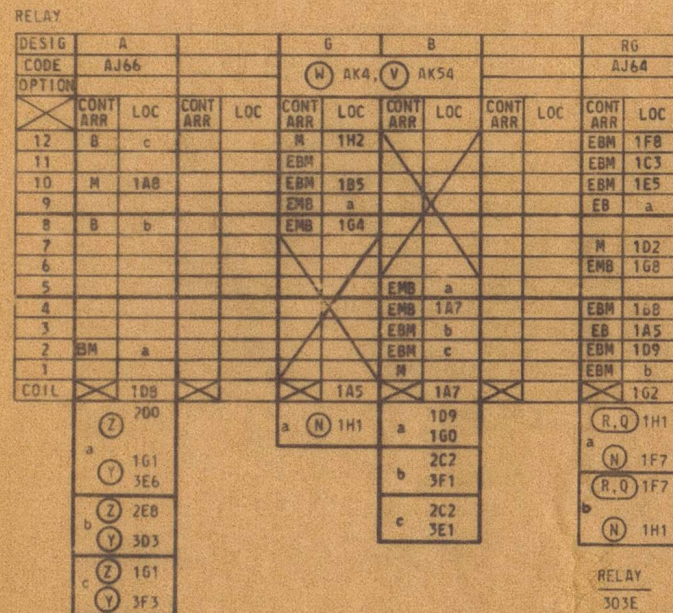
1992

FS 3 GATE CIRCUIT

DRAWING
ISSUE
1 SEA
JIT
MFO
GAS
2A
4D
6AC



APP FIG 1



CONNECTOR

DESIG	P1
CODE	KS-16370, L33
OPTION	CONNECTOR
TERMINAL	LOC
A	1A0
B	1G0
C	1B0
D	1G0
E	1A0
F	
H	1C0
J	1G0
K	1D9
L	1B9
M	1C0
N	
P	1H0
R	1D9
S	1D0
T	1F0
U	
V	

CONNECTOR

DESIG	S
CODE	KS-8586, L10
OPTION	SOCKET
TERMINAL	LOC
1	1E9
2	1C1
3	1E9
4	1C1
5	1B9
6	1C1
7	1B9
8	1C1

CAPACITOR

DESIG	LOC	CODE
C5	1G5	542A
C8	1G5	542C
C10	1F6	RADIO MATERIALS CO TYPE BT, .01±20%,100V
C15	1F1	RADIO MATERIALS CO TYPE BT, 0.1 ±20%,100V
C23	1G3	542A
C28	1F2	RADIO MATERIALS CO TYPE BT, .01 ±20%,100V
C43	1F3	RADIO MATERIALS CO TYPE JF, 6800 PF±10%
C46	1F2	RADIO MATERIALS CO TYPE JF, 3900 PF±10%
C49	1E5	542A
C63	1C5	RADIO MATERIALS CO TYPE C,N-1500, 100 PF±20%
C66	1C7	RADIO MATERIALS CO TYPE JF, 2500 PF±10%
C67	1D8	RADIO MATERIALS CO TYPE JF, 5000 PF±10%
C69	1D4	RADIO MATERIALS CO TYPE BT, .1 ±20%,100V
C83	1D6	RADIO MATERIALS CO TYPE JF, 3300 PF ±10%
C88	1D7	701C, .953UF
C90	1C7	542D
C91	1G9	701G, 1 10%
C92	1B5	KS-19524,L2
C93	1A8	KS-19524,L2
C94	1A8	KS-19524,L11
C95	1E6	542E
C96	1G7	RMC TYPE TA SPECIAL, 0.1±20%,150V
C202	1E1	596G, 1

DIODE

DESIG	LOC	CODE
CR2	1H5	400A
CR4	1F5	400A
CR11	1G6	420D, 458C
CR50	1E8	KS-15724,L1
CR86	1D6	420P (12V) OR 446D (12V)
CR87	1C6	420P (12V) OR 446D (12V)
CR89	1F6	400A
CR90	1E7	400A
CR91	1H2	400J
CR92	1A5	441J
CR93	1G6	420G, 458A
CR102	1D4	420G, 458A

RESISTOR

DESIG	LOC	CODE
R1	1G4	KS-19150,L1, 1.8K
R3	1G5	KS-19150,L1, 51K
R6	1G6	254A, 254A, 2610
R7	1F5	254A, 254A, 19.8K
R12	1E4	KS-19150,L1, 10K
R13	1F1	KS-19150,L1, 10K
R15	1E1	KS-19150,L1, 1.2K
R22	1F3	KS-19150,L1, 180
R24	1G3	KS-19150,L1, 10K
R25	1F3	254A, 254J, 23.7K
R27	1F2	KS-19150,L1, 0.1 MEG
R29	1E2	254A, 254J, 61.9K
R30	1F2	254A, 254J, 68.1K
R44	1E2	KS-19150,L1, 68K
R45	1E2	KS-19150,L1, 4.7K
R47	1D1	KS-19150,L1, 18K
R48	1D4	KS-19150,L1, 330
R51	1E5	221A, 562
R52	1E5	KS-19150,L1, 10K
R53	1E5	KS-19150,L1, 2.2K
R54	1D4	KS-19150,L1, 9.1K
R85	1D6	221A, 61.9
R89	1D7	254A, 254J, 8980
R91	1C4	KS-19150,L1, 6.2K
R92	1G4	KS-19150,L1, 820
R94	1E7	KS-19150,L1, 47K
R95	1F7	KS-19150,L1, 3.3K
R96	1F8	KS-19150,L1, 8.2K
R97	1E9	KS-19150,L1, 330
R98	1G7	KS-19150,L1, 8.2K
R99	1G6	254A, 254J, 28.7K
R100	1F8	KS-19150,L1, 2K
R101	1F9	KS-19150,L1, 3.3K
R102	1G9	KS-19150,L1, 3.3K
R103	1H2	KS-19150,L1, 2.2K
R104	1B6	KS-16266,L3A, 1K OR KS-20289,L3A,1K
R105	1A7	KS-16266,L3A, 1K OR KS-20289,L3A,1K
R106	1A8	KS-14603,L3A, 274 OR KS-20289,L3A,274
R107	1H2	KS-14603,L3C, 511 OR KS-20289,L3C,511

RESISTOR (CONT)

DESIG	LOC	CODE
R206	1E4	221A, 562
R300	1B3	221A, 600
R301	1B3	221A, 600
R302	1E6	KS-16645,L1, 4.7K
R303	1G7	KS-19150,L1, 8.2K

TRANSFORMER

DESIG	LOC	CODE
T61	1F3	2532R
T62	1C1	2532S
T72	1C5	2543A
T82	1B5	2532AL

TRANSISTOR

DESIG	LOC	CODE
Q9	1G6	12H
Q14	1F3	12H
Q31	1E2	12H
Q42	1F3	12H
Q64	1C5	12N
Q65	1F7	12H

VARISTOR

DESIG	LOC	CODE
RV92	1B5	100D
RV201	1E1	100A

NETWORK

DESIG	LOC	CODE
N21	1F5	187D
N41	1G5	AP
N71	1D2	487J
N81	1C7	487A

POTENTIOMETER

DESIG	LOC	CODE
OT	1E6	AB CO., SPEC NO. F6451, 4K
RCV	1C4	KS-13790,L52, 3300
RT	1G7	AB CO., SPEC NO. F6452, 25K
SS	1E1	ALLEN BRADLEY CO SPEC NO. F6452, 25K
TRNS	1A3,1B3	AB CO., KS-13920,L14

DRAWING
ISSUE
1
3D
4D
5AC
6AC

ISSUE
7D

ESC, EAC AND ESC SIGNALING
AND 4-WIRE TERMINATING CIRCUIT

BELL TELEPHONE LABORATORIES
INCORPORATED

SD-99767-01-C1

6S

PRINTED IN U.S.A.

② APP FIG 2

A

CAPACITOR

DESIG	LOC	CODE
C210	2C1	600A
C211	2C1	600A
C212	2C3	596G, 0.511
C213	2C3	596G, 0.511
C214	2F1	535GD, 1.91
C215	2D3	535GK, 0.976
C216	2F3	535GB, 1.09
C217	2E6	601C
C218	2E6	601C
C219	2E4	542AD

RESISTOR

DESIG	LOC	CODE
R210	2B6	221A, 1960
R211	2B6	221A, 1960
R212	2B7	221A, 19.1K
R213	2B7	221A, 19.1K
R215	2C2	221A, 2610
R216	2C2	221A, 2610
R217	2C2	221A, 511
R218	2C2	221A, 511
R219	2C3	221A, 10K
R220	2C3	221A, 10K
R221	2D1	238A, SEE NOTE 107
R227	2D1	KS-19150, L1, 510
R228	2D2	KS-16645, L1, 0.1 MEG
R229	2E2	KS-16645, L1, 0.1 MEG
R230	2D3	238A, 254A, 66.7K
R231	2E4	KS-16645, L1, 20K
R232	2F2	KS-16645, L1, 0.1 MEG
R233	2C5	KS-19150, L1, 5.1K
R234	2E5	KS-16645, L1, 12K
R235	2D7	KS-16645, L1, 20K
R236	2D7	238A, 43.2K
R237	2E7	KS-19150, L1, 51
R238	2E2	238A, 41.7K
R239	2E3	KS-16645, L1, 12K
R240	2E1	KS-16645, L1, 1K

TRANSISTOR

DESIG	LOC	CODE
Q100	2E2	16G OR 66G
Q101	2D3	16G OR 66G
Q102	2D4	16L OR 66L
Q103	2D6	12N
Q104	2F2	16G OR 66G

B

C

DIODE

DESIG	LOC	CODE
CR110	2C3	① 420G ⑤ 458A
CR111	2C3	
CR112	2B6	
CR113	2B6	
CR114	2E2	420A OR 446B (6.2V)
CR115	2E3	
CR116	2E3	
CR117	2F3	
CR118	2F5	420A OR 446B (6.2V)
CR119	2F5	420A OR 446B (6.2V)
CR120	2E6	420A OR 446B (6.2V)
CR121	2D4	441J
CR122	2E1	400J
CR123	2F3	① 420G ⑤ 458A
CR124	2D4	① 420G ⑤ 458A

VARISTOR

DESIG	LOC	CODE
RV210	2E5	1000
RV211	2E5	1000
RV212	2E5	1000
RV213	2E5	1000

D

E

③ APP FIG 3

F

CAPACITOR

DESIG	LOC	CODE
C400	3D2	570 GR, 0.0442
C401	3F2	570 GR, 0.0442

DIODE

DESIG	LOC	CODE
CR400	3C5	① 420G ⑤ 458A
CR401	3E5	① 420G ⑤ 458A

RESISTOR

DESIG	LOC	CODE
R400	3D1	221A, 5360
R401	3F1	221A, 5360
R402	3D4	KS-19150, L1, 1.8K
R403	3D4	KS-19150, L1, 9.6K
R404	3D5	221A, 9090
R405	3E5	221A, 9090
R406	3D6	221A, 9090
R407	3E4	221A, 9090
R408	3D6	KS-19150, L1, 39K
R409	3D7	221A, 6190

G

H

DRAWING
ISSUE
1
SEA
JTP
INFO
4D
SAC

6

ESC, E4C AND ESC SIGNALING
AND 4-WIRE TERMINATING CIRCUIT

SD-99767-01-C2

BELL TELEPHONE LABORATORIES

6S

PRINTED IN U.S.A.

CIRCUIT NOTES:

DESIG	FUSE AMP	POTENTIAL	ONE PER
1-1/3		-48 TALK	MAXIMUM OF 6 CIRCUITS
LIST 1 CURRENT DRAINS FOR POWER PLANT AMPERE BUSY HOUR DRAIN PER CKT			
-48 BAT.		-48 BAT	-48 GRD
① .095		.155	.155
② .112		.175	.175
BATTERY SYMBOL -48		VOLTAGE RANGE 45-52	

FEATURE OR OPTION	PROVIDE		
	APP FIG.	APP OR WRG	QUANTITY
ESC FOR MF TRUNKS	1,3	Y,R	1
ESC FOR DIAL PULSE AND MF APPLICATIONS	1,2	Z,N	1

NETWORK VALUES		
NETWORK NO.	RESISTANCE IN OHMS	CAPACITANCE IN UF

RECORD OF APP FIGURES, WIRING, AND APPARATUS CHANGES						
CHANGED ON ISS	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION HAS FURN	SEE NOTE	USE IN CIRCUIT		
				STD	ADM	MD
3D	Y OR Z	NONE	102	Y,Z		
4D	Y OR W	H		V		W
	S OR T	T		S		T
5AC	Q OR R	R	307	Q,R		
6AC	N	Q OR R	306, 307	N,R		Q

CIRCUIT NOTES: (CONT)

105. THE E LEAD IS CONNECTED TO ALARM CIRCUIT ONLY WHEN THIS CIRCUIT IS TO BE USED IN THE TEST CHANNEL.
106. THIS CIRCUIT WILL PROVIDE BATTERY ON THE TIP AS AN OFF-HOOK SIGNAL.
107. RESISTOR (R221) IS SELECTED FROM PREFERRED VALUES IN A RANGE FROM 24,000 TO 38,300 OHMS DURING MANUFACTURE, TO MINIMIZE PULSE DISTORTION. THE VALUE SHOULD BE OBTAINED AS PER MANUFACTURING SPECIFICATION X-77706.
108. TO TAKE CARE OF VARIATIONS IN OFFICE CABLING, OPERATE SCREWS "A" AND/OR "B". (SEE NOTE 304)

EQUIPMENT NOTES:

201. FOR INTER-CONNECTING INFORMATION SEE APPLICATION SCHEMATIC SD-98151-01.
202. THE (A) RELAY SHALL BE EQUIPPED WITH A P19A146 (OR EQUIVALENT) SHIELD ASSEMBLY.

INFORMATION NOTES: (CONT)

307. OPTION R IS REQUIRED FOR ALL E3C UNITS. IN HIGH LONGITUDINAL NOISE APPLICATIONS OF E4C UNITS, Q OPTION IS REQUIRED AND MAY BE USED IN ANY E4C APPLICATION. AN ESC UNIT MUST BE USED IN SXS OFFICES WHERE A PUMPING CONDITION EXISTS AND CAN BE USED IN ANY E4C APPLICATION.

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. ARROWS BETWEEN A TRANSMISSION PAIR OF LEADS SHOW THE DIRECTION OF TRANSMISSION.
303. TERMINALS DESIGNATED AS FOLLOWS [] ARE LOCATED ON THE PRINTED WIRING BOARD.
304. ADJUSTINGS OF SCREWS "A" AND/OR "B" WILL PROVIDE BALANCE FOR APPROXIMATELY THE FOLLOWING OFFICE CAPACITANCE:
A - .025UF
B - .05UF
A AND B - .075UF
305. WHEN THIS CIRCUIT IS USED IN A 3SE97 SXS OFFICE, ADD A CONNECTION FROM -48 BATTERY THRU A 500Ω RESISTOR TO THE SLEEVE(S) LEAD. (SEE APPLICATION SCHEMATIC)

IDENTIFICATION	CKT DWG		EQUIP. DWG.
	ISSUE	OPTION	
E3C-20	1	Y,R	J986130A(),L1,A
E3C-21	4D	Y,S,R	J986130A(),L1,A,B

IDENTIFICATION	CKT DWG		EQUIP. DWG.
	ISSUE	OPTION	
E4C-20	1	Z,R	J986130B(),L1,A
E4C-21	4D	Z,S,R	J986130B(),L1,A,B
E4C-22	5AC	Z,Q	J986130B-1,L1,A,C
E4C-23	5AC	Z,S,Q	J986130B-1,L1,A,B,C

IDENTIFICATION	CKT DWG		EQUIP DWG
	ISSUE	OPTION	
ESC-0	6AC	Z,N OR Z,S,N	J986130B-1,L1,A,C,WA OR J986130B-1,L1,A,B,C,WA

E3C, E4C AND ESC SIGNALING
AND 4-WIRE TERMINATING CIRCUITBELL TELEPHONE LABORATORIES
INCORPORATED

②

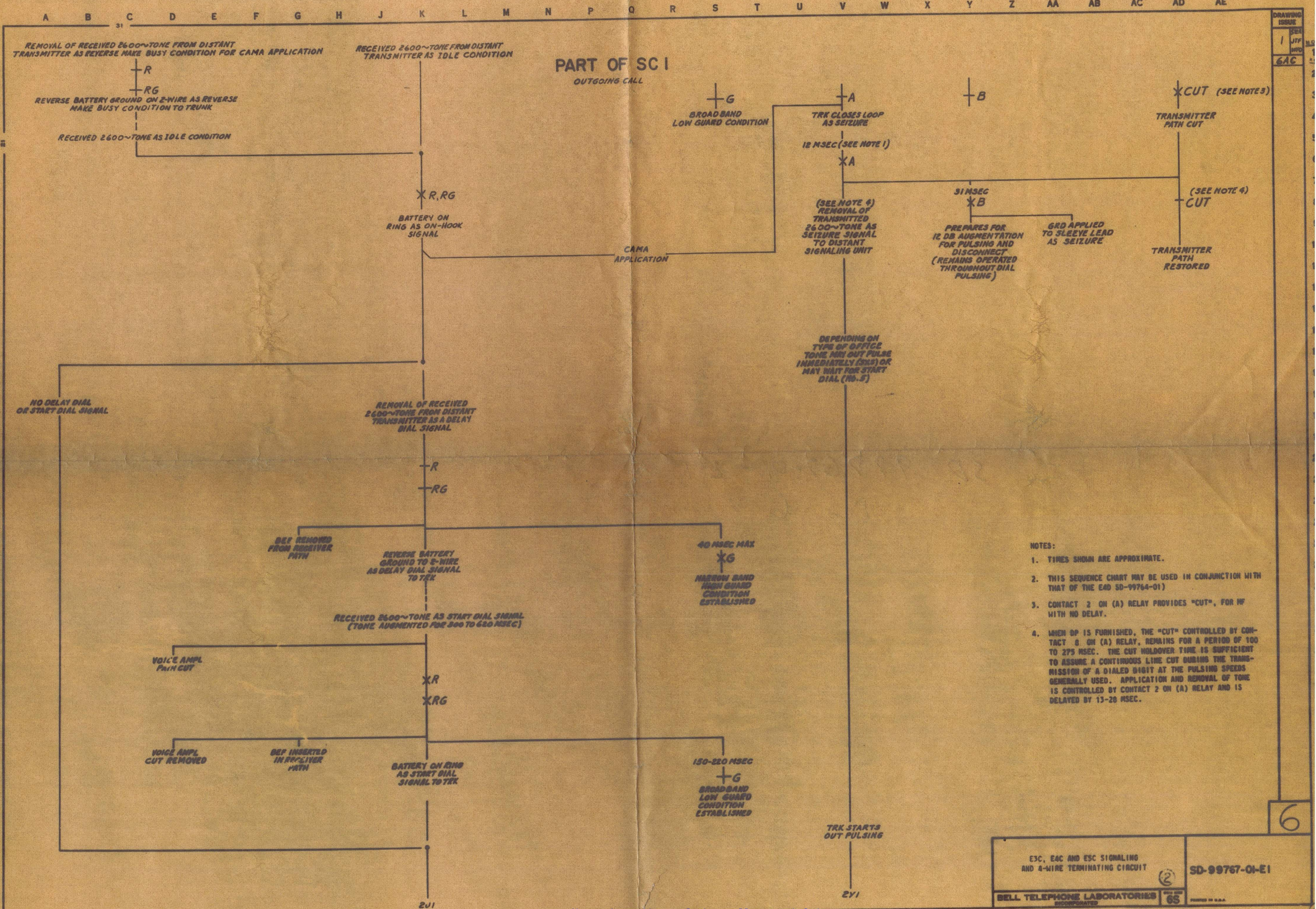
6S

SD-99767-01-D1

PRINTED IN U.S.A.

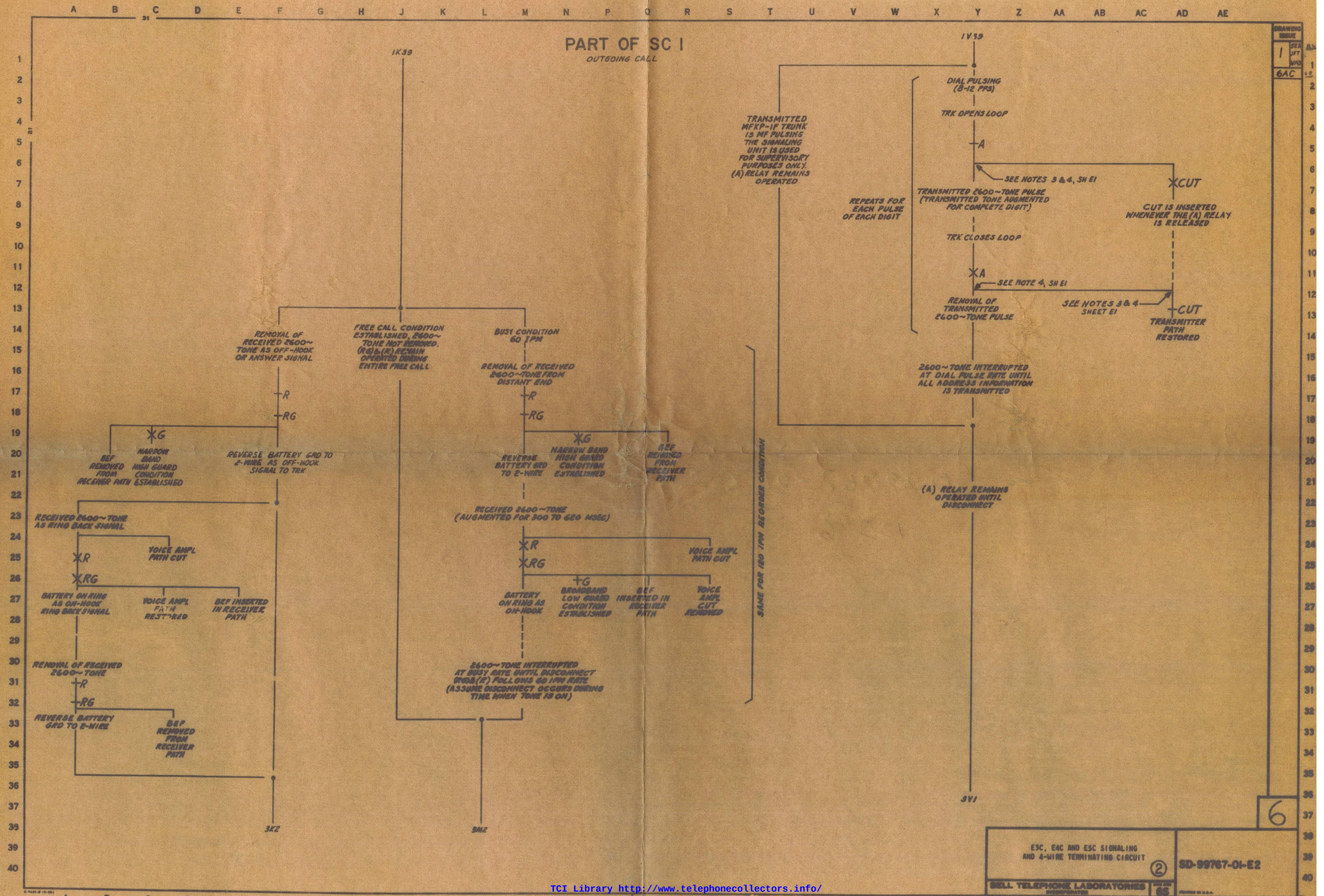
DRAWING
INDEX
1
2A
3D
4D
5AC
6AC

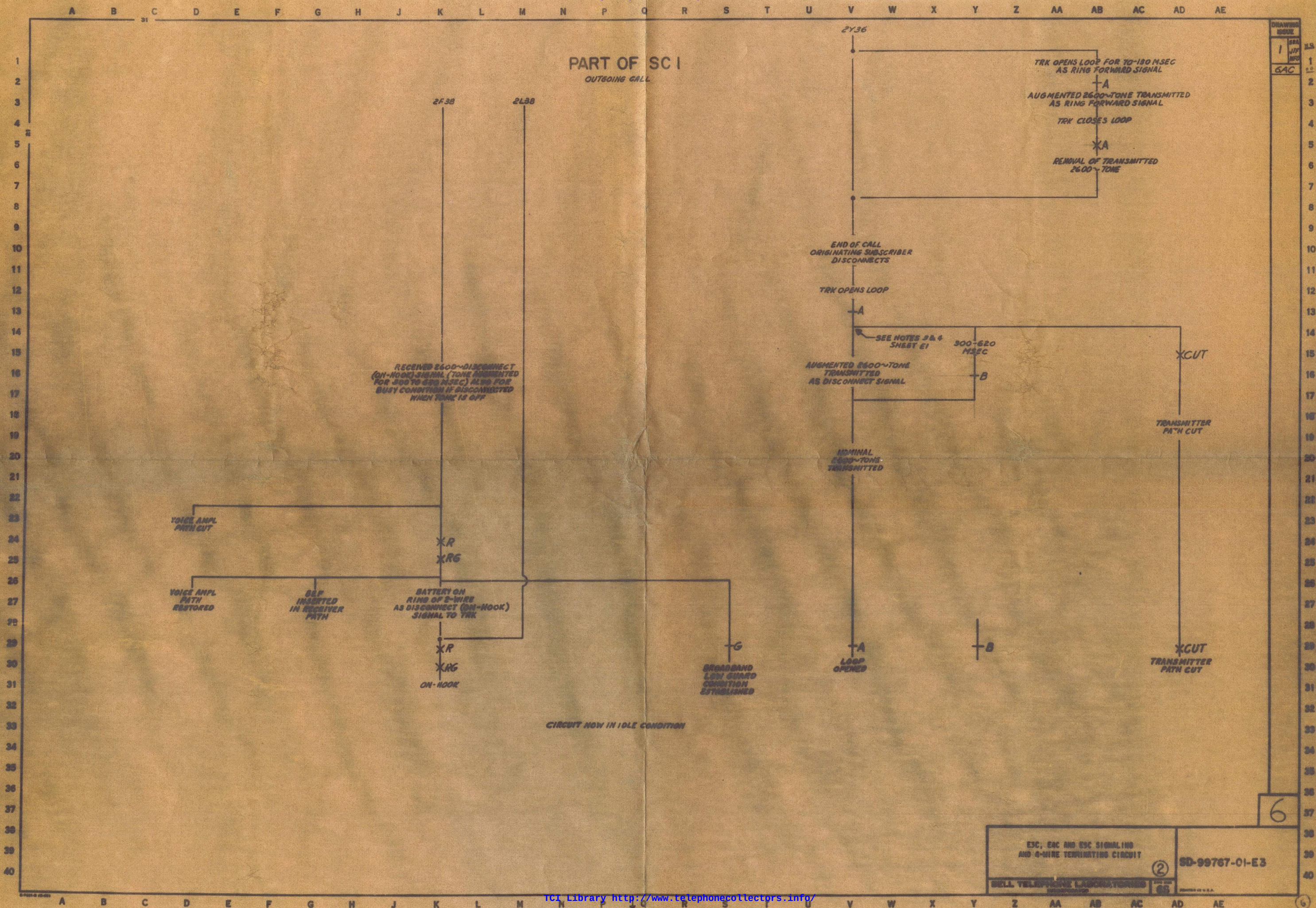
6



- NOTES:
1. TIMES SHOWN ARE APPROXIMATE.
 2. THIS SEQUENCE CHART MAY BE USED IN CONJUNCTION WITH THAT OF THE E4D SD-99764-01)
 3. CONTACT 2 ON (A) RELAY PROVIDES "CUT", FOR WF WITH NO DELAY.
 4. WHEN OP IS FURNISHED, THE "CUT" CONTROLLED BY CONTACT 6 ON (A) RELAY, REMAINS FOR A PERIOD OF 100 TO 275 MSEC. THE CUT HOLDOVER TIME IS SUFFICIENT TO ASSURE A CONTINUOUS LINE CUT DURING THE TRANSMISSION OF A DIALED DIGIT AT THE PULSING SPEEDS GENERALLY USED. APPLICATION AND REMOVAL OF TONE IS CONTROLLED BY CONTACT 2 ON (A) RELAY AND IS DELAYED BY 13-28 MSEC.

SD-99767-01-E1





SD-99767-01-E3

[illegible][illegible]