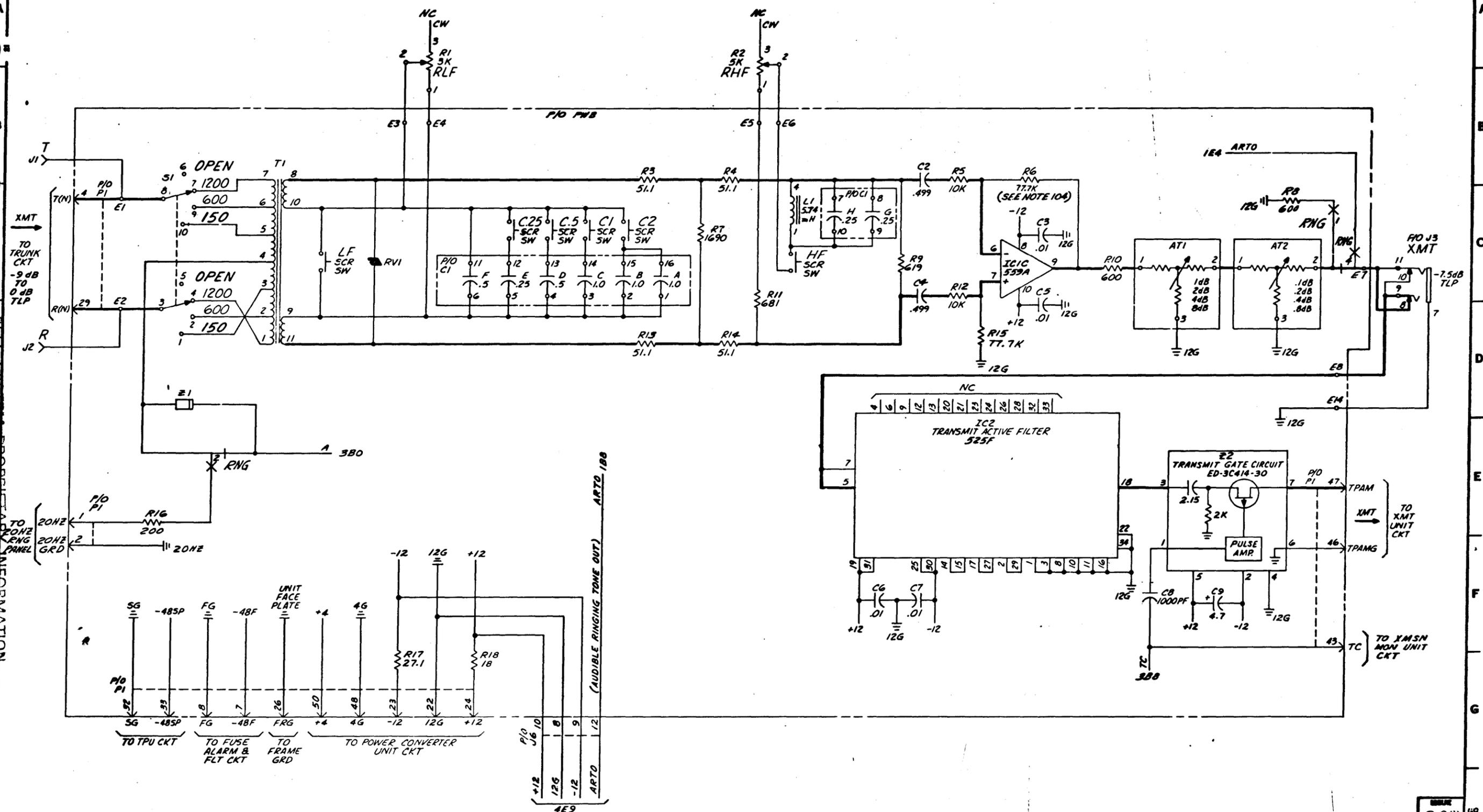




**FS 1**  
TRANSMITTER AMPLIFIER



BELL TELEPHONE LABORATORIES INFORMATION FOR PUBLICATION OF OUTSIDE DISTRIBUTION

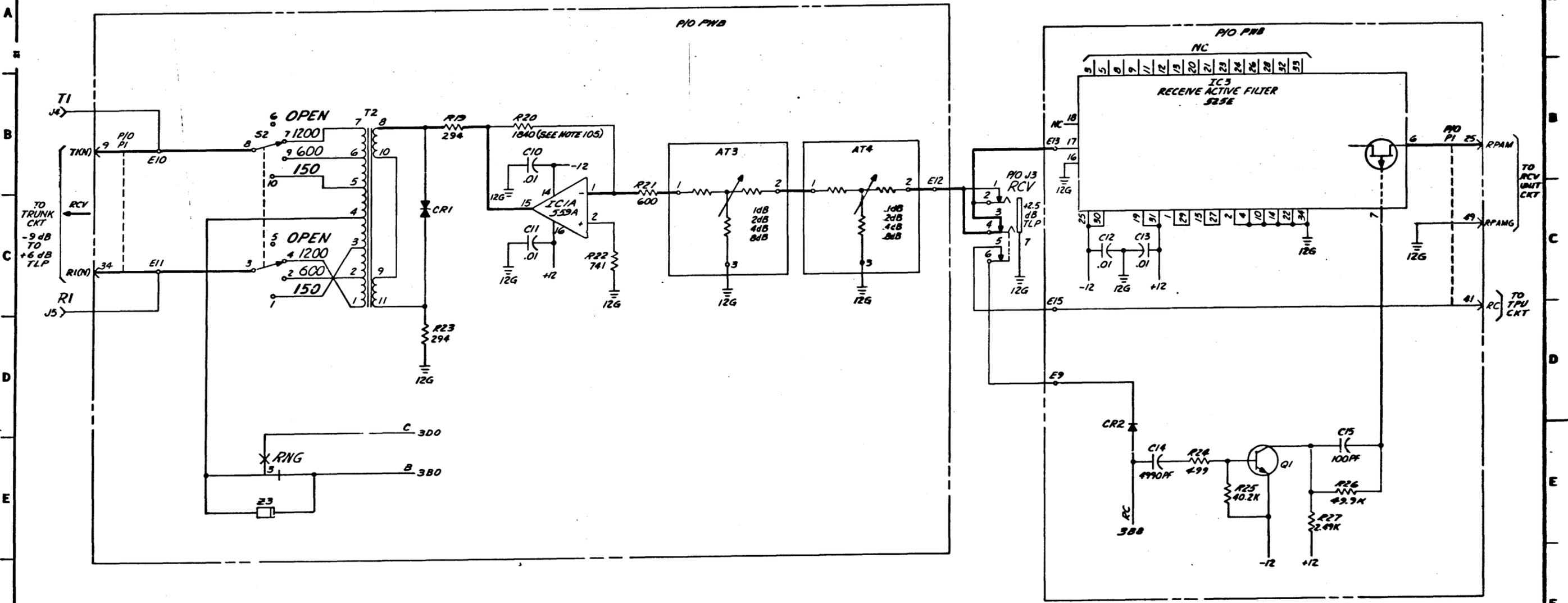
4-WIRE 600-OHM  
PRIVATE LINE AUTOMATIC RINGDOWN  
CHANNEL UNIT

BELL TELEPHONE LABORATORIES  
INCORPORATED

SD-3C229-01-B1

65

FS 2  
RECEIVER AMPLIFIER

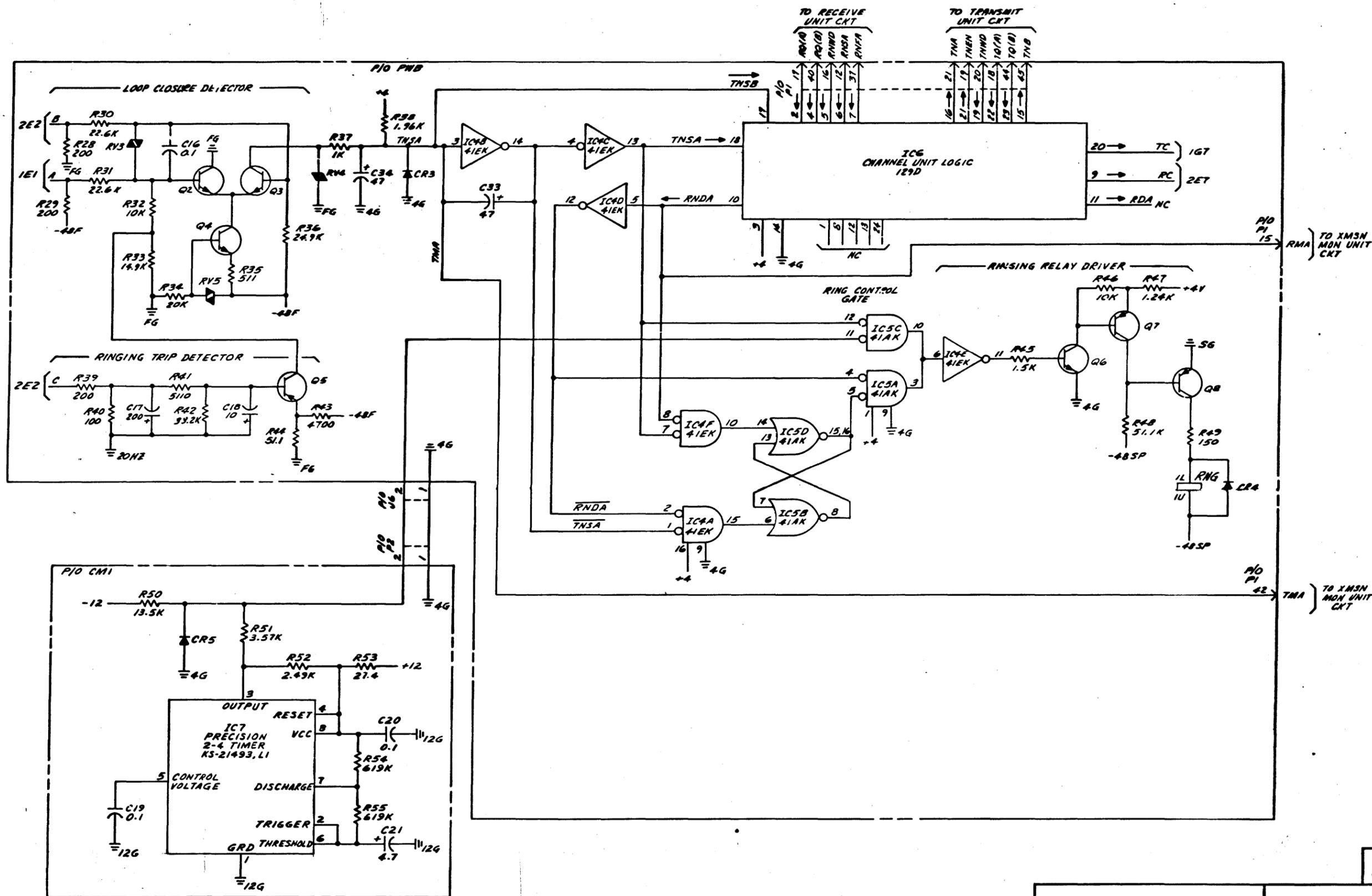


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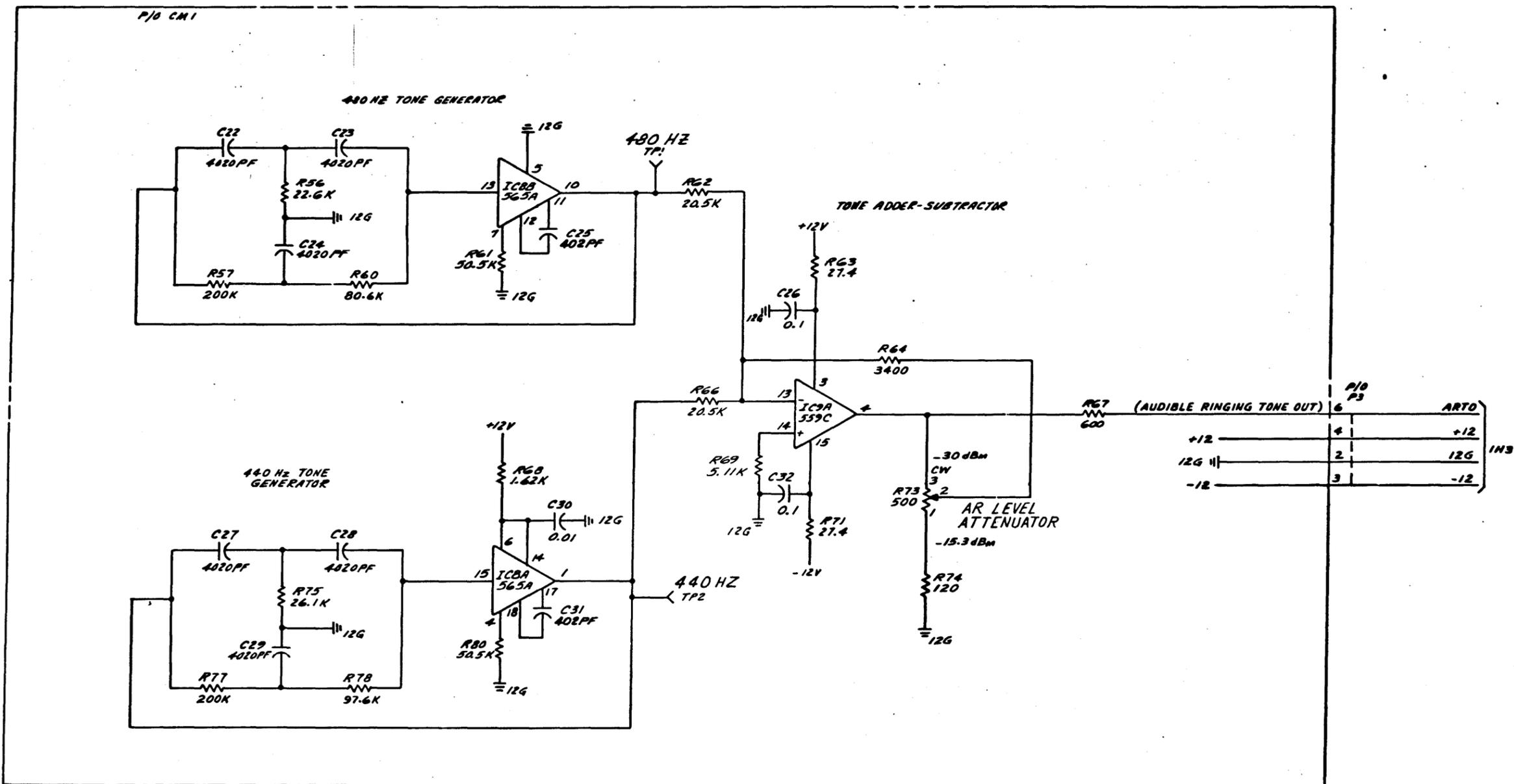
4-WIRE, 600-OHM PRIVATE LINE AUTOMATIC RINGDOWN CHANNEL UNIT		SD-3C229-01-B2
BELL TELEPHONE LABORATORIES INCORPORATED	65	PRINTED IN U.S.A.

FS 3  
RINGING CONTROL CKT



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**FS 4**  
AUDIBLE RINGING TONE GENERATOR



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ISSUE  
2A

4-WIRE, 600-OHM PRIVATE LINE AUTOMATIC RINGDOWN CHANNEL UNIT		SD-3C229-01-B4
BELL TELEPHONE LABORATORIES INCORPORATED	6S	

APP FIG. 1

**CONNECTOR**

DESIG	LOC	CODE
T(J1)	180	KS-20667,L9
R(J2)	100	KS-20667,L13
(1) RCV(J3)	2C6	601A (JACK)
(1) XMT(J3)	1C9	
T1(J4)	280	KS-20667,L9
R1(J5)	2C0	KS-20667,L13

**JACK**  
SEE CONNECTOR

**POTENTIOMETER**

DESIG	LOC	CODE
R1	1A2	KS-21423,L3
R2	1A5	KS-21423,L4

**PRINTED WIRING BOARD**

DESIG	LOC	CODE
PWB	1B3,2A4, 2A8,3A3	ED-7C082-( )

**E/W RELAY**

DESIG	RNG
CODE	MA35A
OPTION	
<input checked="" type="checkbox"/> CONT	
<input checked="" type="checkbox"/> ARR	
<input checked="" type="checkbox"/> LOC	
4 EBM	1C9
3 EBM	2E7
2 EBM	1E7
1 EBM	1C9
COIL	3E8

**ATTENUATOR**

DESIG	LOC	CODE
AT1	1C8	50E
AT2	1C8	50A
AT3	2B4	50E
AT4	2B5	50A

**CAPACITOR**

DESIG	LOC	CODE
(1) C1,A-H	1C3,1C5	734F,CAP PAK
C2	1B6	535J5
C3	1C7	KS-19774,L2,.01
C4	1C6	535J5
C5	1D7	KS-19774,L2,.01
C6	1F5	KS-19774,L1,.01
C7	1F6	KS-19774,L1,.01
C8	1F7	KS-16742,L27,1000PF
C9	1F8	651C,4.7
C10	2B3	KS-19774,L2,.01
C11	2C3	KS-19774,L2,.01
C12	2C7	KS-19774,L1,.01
C13	2C7	KS-19774,L1,.01
C14	2E7	KS-16742,L27,4990PF
C15	2E8	KS-16958,L31,100PF
C16	3B1	KS-19774,L5,.01
C17	3D1	KS-19524,L15,200
C18	3D2	601M
C33	3B3	652A,47
C34	3B2	652A,47

**CONNECTOR**

DESIG	LOC	CODE
J6	1G3,3E3	KS-21290,L2

**DIODE**

DESIG	LOC	CODE
CR1	2C2	521B
CR2	2E7	458C
CR3	3B3	456F
CR4	3E8	458A

**PRINTED WIRING BOARD (CONT)**

**INDUCTOR**

DESIG	LOC	CODE
L1	1C5	1622B5,5.74 MH

**INTEGRATED CIRCUIT**

DESIG	LOC	CODE
(1) IC1A	2C3	559A
IC1B	SPARE	
IC1C	1C6	
IC2	1E6	52ZF
IC3	2B7	525E
(1) IC4A	3E5	41EK
IC4B	3B3	
IC4C	3B4	
(1) IC4D	3B4	41AK
IC4E	3D6	
IC4F	3D5	
(1) IC5A	3D6	41AK
IC5B	3E5	
IC5C	3C6	
IC5D	3D5	1290
IC6	3B6	

**NETWORK**

DESIG	LOC	CODE
Z1	1D1	185A
Z2	1E8	ED-5C414-30
Z3	2E1	185A

**RESISTOR**

DESIG	LOC	CODE
R3	1B4	KS-20810,L1A,51.1
R4	1B4	KS-20810,L1A,51.1
R5	1B6	KS-20810,L1A,10K
R6	1B7	KS-20810,L1A,77.7K
R7	1C4	KS-20810,L1A,1690
R8	1C8	KS-20810,L1A,600
R9	1C6	KS-20810,L1A,619
R10	1C7	KS-20810,L1A,600
R11	1C5	KS-20810,L1A,681
R12	1C6	KS-20810,L1A,10K
R13	1D4	KS-20810,L1A,51.1
R14	1D4	KS-20810,L1A,51.1
R15	1D6	KS-20810,L1A,77.7K
R16	1E0	KS-14603,L38,200
R17	1G2	KS-20810,L1A,27.1
R18	1G2	KS-20810,L1A,18
R19	2B2	KS-20810,L1A,294
R20	2B3	KS-20810,L1A,1840
R21	2C4	KS-20810,L1A,600
R22	2C3	KS-20810,L1A,741
R23	2D2	KS-20810L1A,294
R24	2E7	257A,499
R25	2E8	257A,40.2K
R26	2E8	257A,49.9K
R27	2E8	257A,2.49K
R28	3B0	KS-14603,L1C,200
R29	3B0	KS-14603,L1C,200
R30	3B1	KS-20810,L1A,22.6K
R31	3B1	KS-20810,L1A,10K
R32	3B1	KS-20810,L1A,14.9K
R33	3C1	KS-20810,L1A,20K
R34	3C1	KS-20810,L1A,20K
R35	3C2	KS-20810,L1A,511
R36	3C2	KS-20810,L1A,24.9K
R37	3B2	KS-20810,L1A,1K
R38	3B3	KS-20810,L1A,1.96K
R39	3D1	KS-14603,L38,200
R40	3D1	KS-20810,L1A,100
R41	3D1	KS-20810,L1A,5110
R42	3D1	KS-20810,L1A,33.2K

**PRINTED WIRING BOARD (CONT)**

**RESISTOR (CONT)**

DESIG	LOC	CODE
R43	3D2	KS-20810,L1A,4700
R44	3D2	KS-20810,L1A,51.1
R45	3D7	KS-20810,L1A,1.5K
R46	3C7	KS-20810,L1A,10K
R47	3C8	KS-20810,L1A,1.24K
R48	3D8	KS-20810,L1A,51.1F
R49	3D8	KS-20810,L1A,150

**SELECTOR BLOCK**

DESIG	LOC	CODE
(1) LF	1C2	841587785
C.25	1C3	
C.5	1C3	
E1	1C4	
C2	1C4	
HF	1C5	

**SWITCH**

DESIG	LOC	CODE
S1	1B1	KS-19104,L1B
S2	2B1	KS-19104,L1B

**TRANSFORMER**

DESIG	LOC	CODE
T1	1B1	2578BA
T2	2B2	2578BA

**TRANSISTOR**

DESIG	LOC	CODE
Q1	2E8	66J
Q2	3B1	66L
Q3	3B2	66L
Q4	3C2	66L
Q5	3D2	51C
Q6	3D7	66G
Q7	3C8	51A
Q8	3D8	51B

**VARIATOR**

DESIG	LOC	CODE
RV1	1C2	106A
RV3	3B1	106A
RV4	3B2	106A
RV5	3C1	106A

**CIRCUIT MODULE**

DESIG	LOC	CODE
CM1	3E1,4B4	ED-7C083-( )

**E/W CAPACITOR**

DESIG	LOC	CODE
C19		KS-20736,LB,0.1
C20		KS-20736,LB,0.1
C21		606E
C22	4B1	570FK
C23	4B2	570FK
C24	4C2	570FK
C25	4C3	KS-16958,L29,402PF
C26	4D5	KS-20736,LB,0.1
C27	4E1	570FK
C28	4E2	570FK
C29	4F2	570FK
C30	4E3	KS-16048,L4,0.01
C31	4F3	KS-16958,L29,402PF
C32	4E4	KS-20736,LB,0.1

**CONNECTOR**

DESIG	LOC	CODE
P2	3E3	65433-006,BERG ELEC
P3	4D8	65433-006,BERG ELEC

**PRINTED WIRING BOARD (CONT)**

**CIRCUIT MODULE (CONT)**

**DIODE**

DESIG	LOC	CODE
CR5	3F1	456F

**INTEGRATED CIRCUIT**

DESIG	LOC	CODE
(1) IC7	3G2	KS-21493,L1
IC8A	4F3	
IC8B	4C3	
(1) IC9A1	4D5	9C
IC9A2	SPARE	
IC9B1	SPARE	
IC9B2	SPARE	

**POTENTIOMETER**

DESIG	LOC	CODE
R73	4E5	KS-21423,L2

**RESISTOR**

DESIG	LOC	CODE
R50	3E1	KS-20810,L1A,13.5K
R51	3E2	KS-20810,L1A,3.57K
R52	3E2	KS-20810,L1A,2.49K
R53	3E2	KS-20810,L1A,27.4
R54	3F2	KS-20810,L1A,619K
R55	3G2	KS-20810,L1A,619K
R56	4C2	KS-20810,L1A,22.6K
R57	4C1	KS-20810,L1A,200K
R60	4E2	KS-20810,L1A,80.6K
R61	4C3	KS-20810,L1A,50.5K
R62	4C4	KS-20810,L1A,20.5K
R63	4C5	KS-20810,L1A,27.4
R64	4D5	KS-20810,L1A,3400
R66	4D4	KS-20810,L1A,20.5K
R67	4D6	KS-20810,L1A,600
R68	4E3	KS-20810,L1A,1.62K
R69	4E4	KS-20810,L1A,5.11K
R71	4E5	KS-20810,L1A,27.4
R74	4F5	KS-20810,L1A,120
R75	4F2	KS-20810,L1A,26.1K
R77	4F1	KS-20810,L1A,200K
R78	4F2	KS-20810,L1A,97.6K
R80	4F3	KS-20810,L1A,50.5K

ISSUE  
2A

4-WIRE, 600-OMW PRIVATE LINE AUTOMATIC RINGDOWN CHANNEL UNIT		SD-3C229-01-C1
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CIRCUIT NOTES:

101.

DESIG	FUSE AMP	POTENTIAL	ONE PER
BATTERY SYMBOL		VOLTAGE RANGE	

104. THIS RESISTOR IS TO BE SELECTED AT MANUFACTURE TO MEET GAIN REQUIREMENTS. IF THE RESISTOR VALUE SHOWN ON SHEET B1 IS INADEQUATE, A VALUE MAY BE SELECTED FROM AMONG THE FOLLOWING KS20810-L1A RESISTORS: 75.0K, 75.9K, 77.7K, 78.7K, 79.6K, 80.6K.
105. THIS RESISTOR IS TO BE SELECTED AT MANUFACTURE TO MEET GAIN REQUIREMENTS. IF THE RESISTOR VALUE SHOWN SHEET B2 IS INADEQUATE, A VALUE MAY BE SELECTED FROM AMONG THE FOLLOWING KS20810-L1A RESISTORS: 1.78K, 1.82K, 1.89K, 1.91K, 1.93K, 1.96K.

EQUIPMENT NOTES:

201. "P1" INDICATES PRINTED CONNECTOR FINGERS OF PWB PLUG END AND MATES WITH A 940A CONNECTOR.
202. DESIGNATIONS SHOWN IN BOLD CHARACTERS IN B SECTION ARE MARKED ON UNIT.
203. TO CLOSE A SCREW SWITCH, THE SCREW SHALL BE TIGHTENED SUFFICIENTLY TO INSURE CONTACT BETWEEN TERMINALS AND UNDERSIDE OF SCREW HEAD. CAUTION IN TIGHTENING SCREW IS RECOMMENDED TO AVOID SHEARING OF SCREW. TO OPEN A SCREW SWITCH, THE SCREW SHALL BE LOOSENEED APPROXIMATELY TWO COMPLETE TURNS. UNIT IS NORMALLY FURNISHED WITH SCREWS OPEN AND ATTENUATORS SET TO MAXIMUM.

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.

102.

FEATURE OR OPTION	PROVIDE		QUANTITY
	APP FIG	APP OR WRG	

103. RECORD OF FIGURES, WIRING AND APPARATUS CHANGES

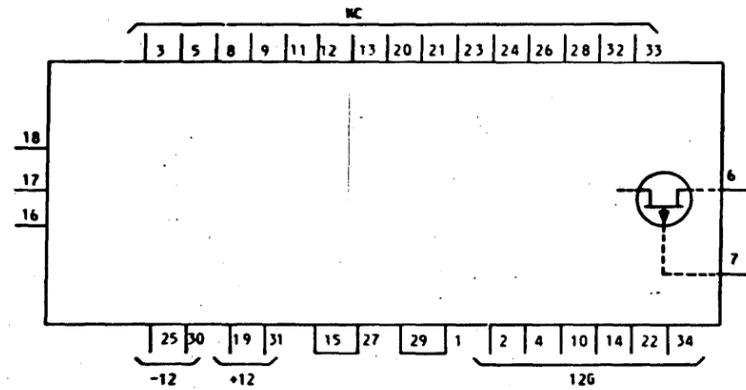
CHANGED ON ISSUE	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION WAS FURN	SEE NOTE	USE IN CIRCUIT		
				STD	A&M	MD

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED  
 DATE 11/19/01 BY 60322 JAW/STP

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INFORMATION NOTES: (CONT)

3.02 IC DEVICE CIRCUIT ELEMENTS  
(A) 525E RECEIVE ACTIVE FILTER



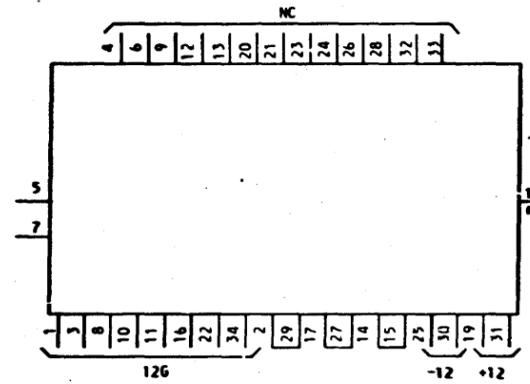
INPUT/OUTPUT INFORMATION

PIN 6 IS THE PRIMARY CHANNEL INPUT FOR THE RECEIVE PULSE AMPLITUDE MODULATED SIGNAL.  
PIN 7 IS THE TIMING INPUT REQUIRED TO SAMPLE THE INDIVIDUAL CHANNEL.  
PIN 17 IS THE PRIMARY CHANNEL OUTPUT FOR THE RECONSTRUCTED VOICE FREQUENCY SIGNAL.

CIRCUIT DESCRIPTION

THE RECEIVING ACTIVE FILTER RECONSTRUCTS THE TRANSMITTED WAVEFORM FROM THE RECEIVED SAMPLES. IT EFFECTIVELY HAS A LOW-PASS CHARACTERISTIC WHICH SUPPRESSES FREQUENCY COMPONENTS IN THE INPUT ABOVE 4 KHZ.

(B) 525F TRANSMIT ACTIVE FILTER



INPUT/OUTPUT INFORMATION

PIN 5 IS THE PRIMARY VOICE FREQUENCY SIGNAL INPUT.  
PIN 18 IS THE FILTERED VOICE FREQUENCY OUTPUT.

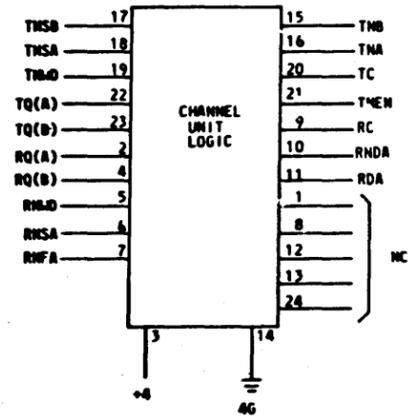
CIRCUIT DESCRIPTION

THE TRANSMIT ACTIVE FILTER IS A LOW-PASS FILTER WHICH EFFECTIVELY SUPPRESSES FREQUENCIES ABOVE 4 KHZ. THESE FREQUENCIES WOULD PRODUCE MODULATION PRODUCTS BELOW 4 KHZ IF THEY WERE NOT SUPPRESSED.

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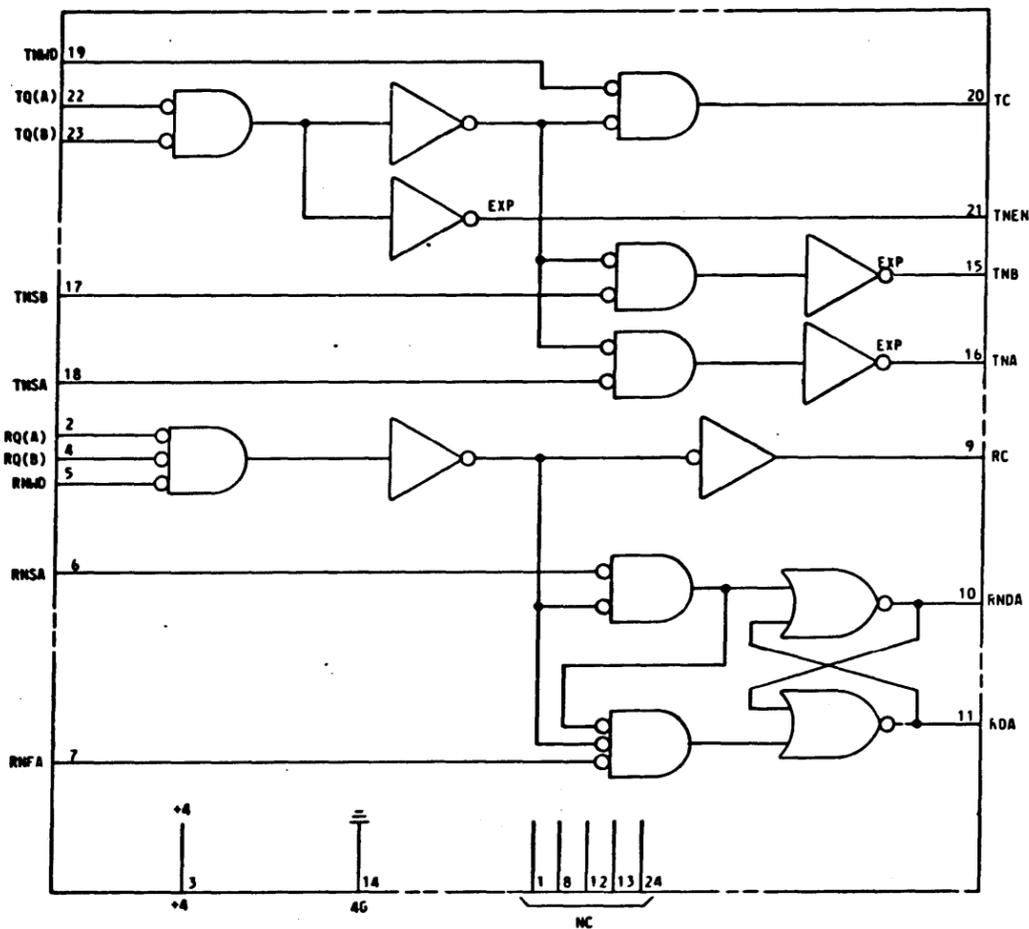
4-WIRE, 600-OHM PRIVATE LINE AUTOMATIC RINGDOWN CHANNEL UNIT		SD-3C229-01-D2
BELL TELEPHONE LABORATORIES INCORPORATED	6S	U.S.A.

INFORMATION NOTES (CONT)  
302. I.C. DEVICE CIRCUIT ELEMENTS (CONT)  
(C) 129D CHANNEL UNIT LOGIC

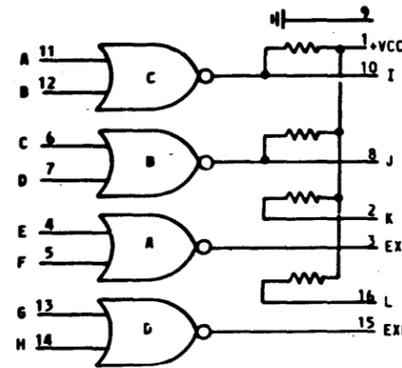


INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

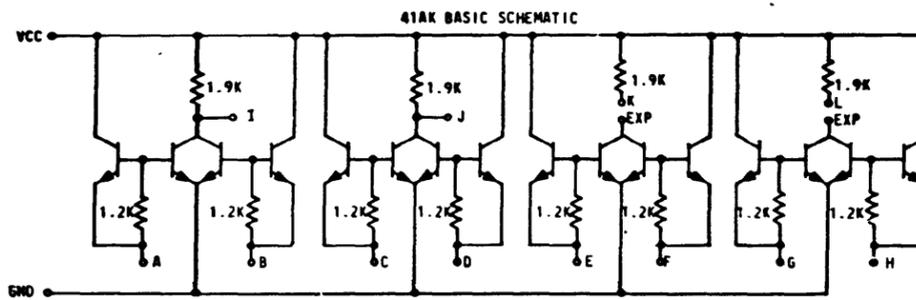


(D) 41AK QUAD 2-INPUT NOR GATE

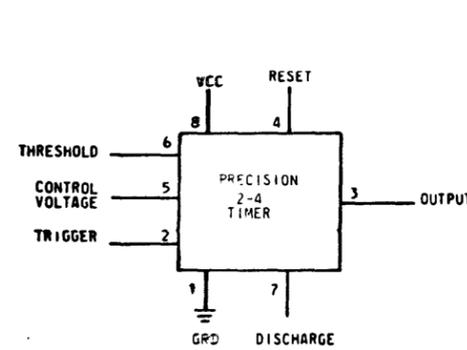


INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

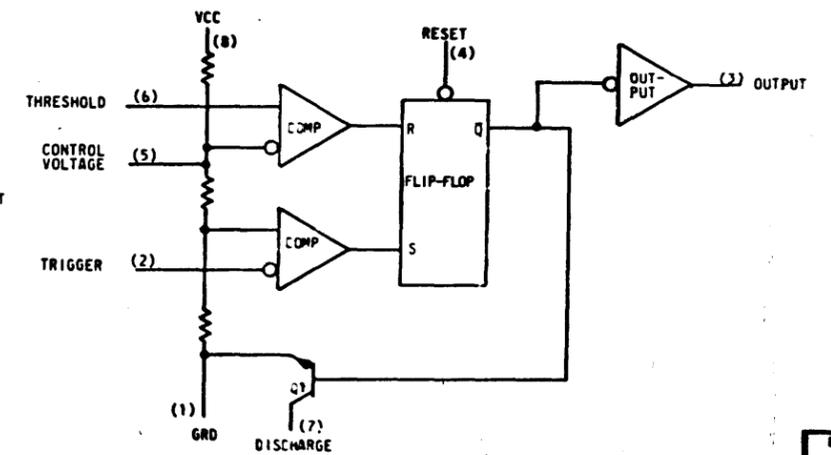


(E) KS-21493, L1 PRECISION TIMER



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION



BELL SYSTEM PROPRIETARY INFORMATION  
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4-WIRE, 600-OHM  
PRIVATE LINE AUTOMATIC RINGDOWN  
CHANNEL UNIT

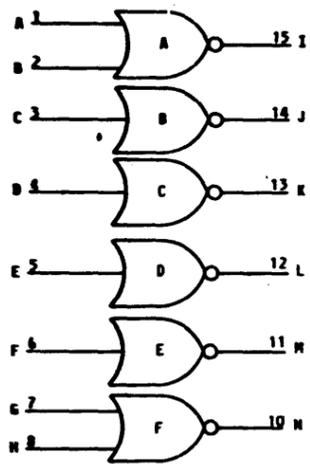
SD-3C229-01-D3

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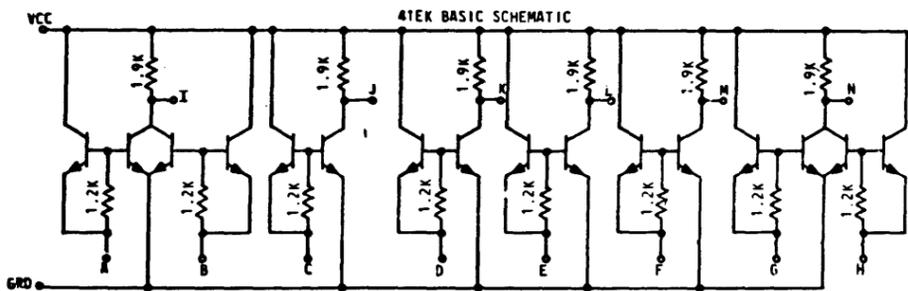
INFORMATION NOTES (CONT)  
302. IC DEVICE CIRCUIT ELEMENT

(F) 41EK 1-1-1-1-2-2 INPUT NOR GATE

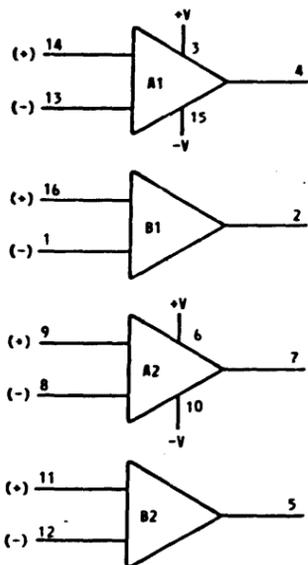


INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION



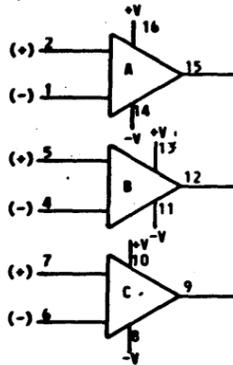
(G) 559C QUAD VOICE FREQUENCY AMPLIFIER



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

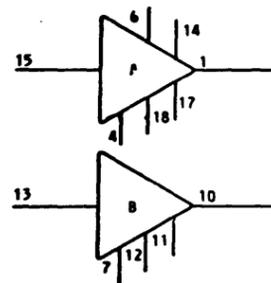
(H) 559A TRIPLE VOICE FREQUENCY AMPLIFIER



INPUT/OUTPUT INFORMATION

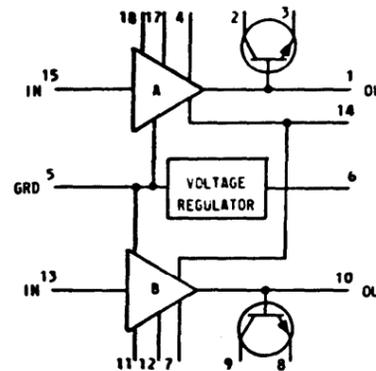
CIRCUIT DESCRIPTION

(I) 565A DUAL AMPLIFIER/OSCILLATOR WITH GAIN COMPRESSION



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION



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