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																					
FS1 - DATA SET 108G	B1	1	2	2	2																					
FS2 - 52A1 DATA UNIT	B2	1	2	2	2																					
APP FIG. 1,2	C1	1	2	2	2																					
CIRCUIT NOTES EQUIPMENT NOTES	D1	1	2	3	4																					
INFORMATION NOTES	D2	1	2	2	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
CPS 1	J1A	1	2	2	4																					
	J1B	1	2	2	2																					
	J1C	1	2	3	4																					
CPS 2	J2	1	2	2	2																					

BRNG ISSUE	CD ISSUE	DATE ISSUED		
1	1	12-14-77	ADC AEZ	EFW ACM RTR
281	1 APP 1B1	5-4-78	KSS AEZ	EFW ACM RTR
301	1 APP 2D1	4-13-79	JVE AEZ	EFW JES RTR
481	1 APP 3B1	3-7-80	SFL —	CFW JES RTR

OPTION INDEX

APP OR WRG	LOCATION

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.
MANUFACTURING TESTING REQUIREMENTS	
DATA SET 108F AND DATA SET 108G TYPE 52A1 DATA UNIT	X-18333 X-18430
BSP	
DATA SET 108F AND DATA SET 108G	591-042-100 591-818-100 591-818-200
52A1 DATA UNIT	590-100-139 591-818-100 591-818-200

4B1

SD-1D286-01 1L02

DATA SYSTEMS STATION

DATA SET 108G AND 52A1 DATA UNIT

(2)

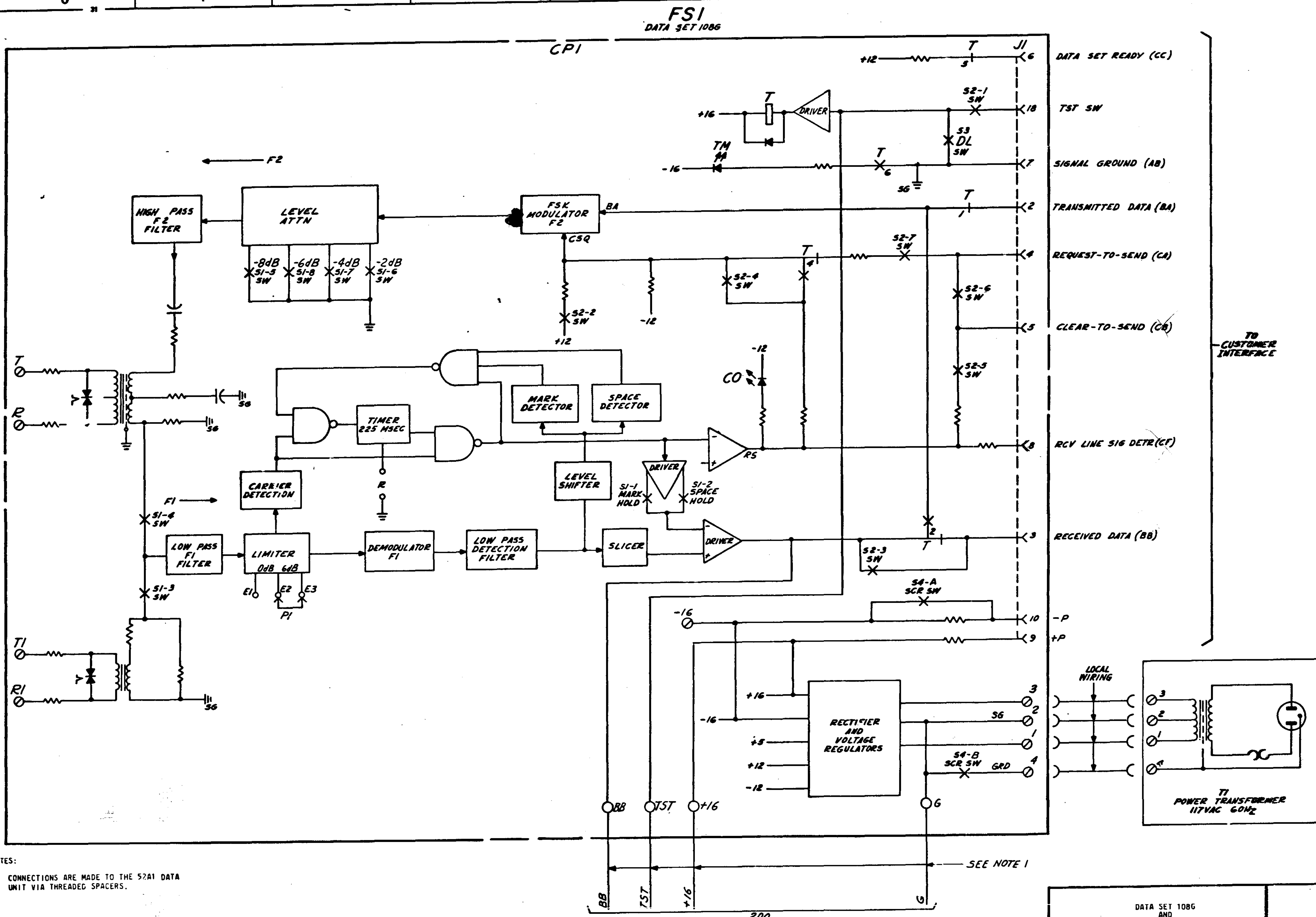
BELL TELEPHONE LABORATORIES INCORPORATED

SIZE 6S

STATCO STANDARD

SD-1D286-01-A1

10 SHEETS


FS1
DATA SET 108G
CP1
DATA SET READY (CC)
TST SW
SIGNAL GROUND (AB)
TRANSMITTED DATA (BA)
REQUEST-TO-SEND (CA)
CLEAR-TO-SEND (CB)
RCV LINE SIG DETR (CF)
RECEIVED DATA (BB)
-P
+P
TO CUSTOMER INTERFACE
DRIVER
HIGH PASS F2 FILTER
LEVEL ATTN
FSK MODULATOR F2
CSQ
-8dB
-6dB
-4dB
-2dB
MARK DETECTOR
SPACE DETECTOR
TIMER 225 MSEC
CARRIER DETECTION
LEVEL SHIFTER
S1-1 MARK HOLD
S1-2 SPACE HOLD
LOW PASS F1 FILTER
LIMITER 0dB 6dB
DEMODULATOR F1
LOW PASS DETECTION FILTER
SLICER
S4-A SCR SW
RECTIFIER AND VOLTAGE REGULATORS
S4-B SCR SW
GRD
LOCAL WIRING
T1 POWER TRANSFORMER 117VAC 60Hz
SEE NOTE 1
2D0

NOTES:

1. CONNECTIONS ARE MADE TO THE 52A1 DATA UNIT VIA THREADED SPACERS.

ISSUE 2B1

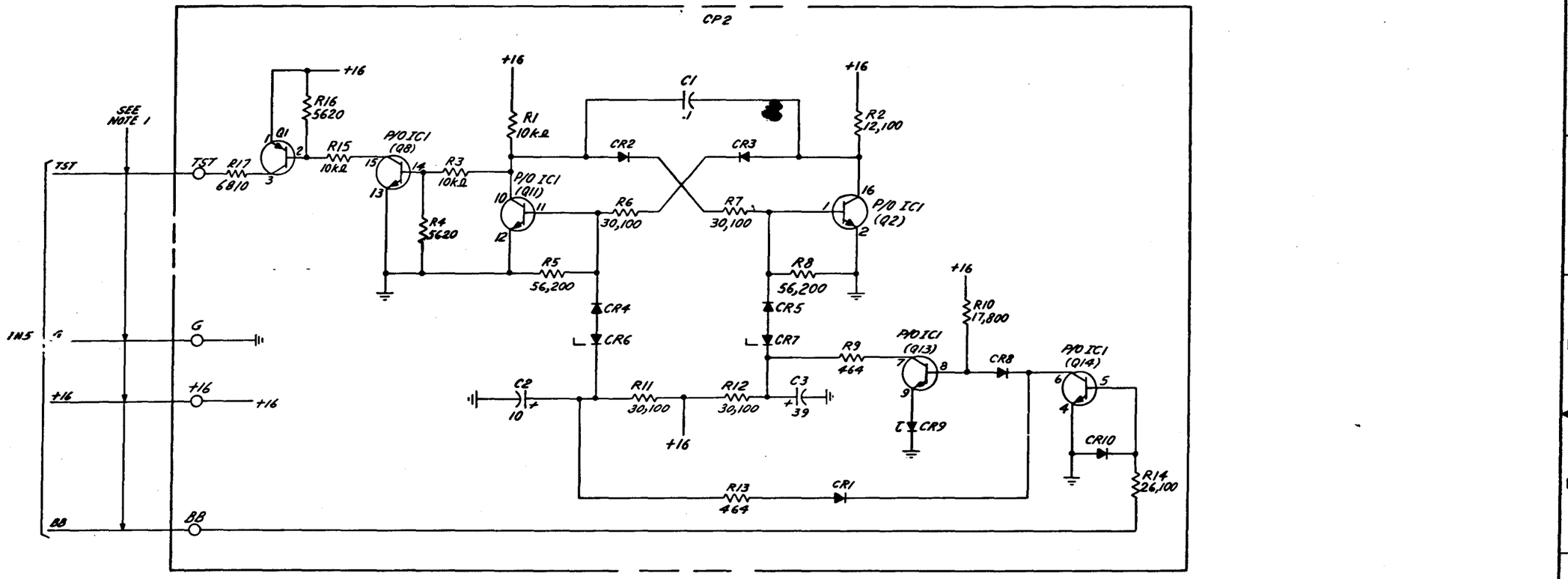
DATA SET 108G AND 52A1 DATA UNIT

SD-1D286-01-B1

BELL TELEPHONE LABORATORIES INCORPORATED

6S

FS 2
52A1 DATA UNIT



NOTES:
CONNECTIONS ARE MADE TO DATA SETS 108F
OR 108G VIA THREADED SPACERS.

DATA SET 108G AND 52A1 DATA UNIT	DWG SIZE 6S	ISSUE 2B1
BELL LABORATORIES	SD-1D286-01	-B2

APP FIG. 1

CIRCUIT PACK

EQPT LOC	
DESIG	CP1
CODE	
OPTION	
ELEM IDENT	TERM.
TERM. FS LOC	18-1A7

TRANSFORMER

DESIG	LOC	CODE
T1	1G8	KS-21239,L4 OR KS-21239,L5

APP FIG. 2

CIRCUIT PACK

DESIG	LOC	CODE
CP2	2B4	-

DATA SET 108G AND 52A1 DATA UNIT	SD-1D286-01-C1
BELL TELEPHONE LABORATORIES INCORPORATED	DWG SIZE 6S

2B1

CIRCUIT NOTES:

101.

DESIG	FUSE AMP	POTENTIAL	ONE PER

BATTERY SYMBOL — VOLTAGE RANGE

102.

FEATURE OR OPTION	PROVIDE		
	APP FIG.	APP OR WRG	QUANTITY
DATA SET 108G	1		1 PER SET
52A1 DATA UNIT	2		1 PER SET

103.

RECORD OF 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
2B1				Y		Z
4B1	-			X		-
				-		W

CIRCUIT NOTES: (CONT)

104.

TRANSMIT LEVEL	FACTORY FURNISHED	SWITCH SETTING S1 SWITCH ON CP1	
		OPEN	CLOSED
-1dBm		5,6,7,8	-
-3dBm		5,7,8	6
-5dBm		5,6,8	7
-7dBm		5,6,7	8
-9dBm	✓	6,7,8	5
-11dBm		7,8	5,6
-13dBm		6,8	5,7
-15dBm		6,7	5,8
-16dBm		7	5,6,8
-17.5dBm		6	5,7,8
-18.5dBm		-	5,6,7,8

105.

FEATURE		OPTION	SWITCH SETTING S1 SWITCH ON CP1		FACTORY FURNISHED
			OPEN	CLOSED	
FACILITY	4-WIRE	Z	4	3	
	2-WIRE	Y	3	4	✓
MARK OR SPACE HOLD	MARK	U	2	1	✓
	SPACE	V	1	2	
			SWITCH SETTING S2 SWITCH ON CP1		
			OPEN	CLOSED	
CB CONNECTED TO	NONE	E	5,6	-	
	RS	W	6	5	
CARRIER CONTROL VIA	CA	X	7	6	✓
		D NOTE 108	2,4,6	7	
	RS	T NOTE 106	2,7	4	
	ALWAYS ON IN DATA MODE	S	4,7	2	✓
	ALWAYS OFF IN DATA MODE	H NOTE 107	2,4,7	-	
REMOTE TEST CONNECTION VIA J1	YES	P	-	1	
	NO	N	1	-	✓
LOCAL COPY IN DIGITAL LOOPBACK TEST MODE	YES	G	-	3	
	NO	F	3	-	✓
			OPTION STRAP		
RECEIVER DB GAIN REDUCTION	6	K	E2-E3		✓
	0	J	E1-E2		
			SWITCH SETTING S4 SCR SWITCH ON CP1		
			OPEN	CLOSED	
GROUND WIRE (GRD) CONNECTED TO SIGNAL GROUND (SG)	YES	M	-	B	✓
	NO	L	B	-	
RESISTOR BYPASS FOR -16 VOLT(-P) ON J1	YES	R	-	A	
	NO	Q	A	-	✓

106. OPTION T PROVIDES CARRIER SQUELCH ON CARRIER FAIL.

107. OPTION H IS USED FOR BROADCAST SERVICE. THE TRANSMITTER WILL BE SQUELCHED IN THE DATA MODE AND WILL ENABLE IN THE DIGITAL LOOPBACK TEST MODE.

108. OPTION D PROVIDES CUSTOMER CONTROL OF THE DATA SET TRANSMITTER SQUELCH CIRCUIT. OPTIONS D AND X ARE MUTUALLY EXCLUSIVE.

109. 52A1 DATA UNIT RESTRICTIONS:
DATA SET 108G EQUIPPED WITH THE 52A1 DATA UNIT MAY NOT USE THE SPACE HOLD OPTION (V), IF THE DISTANT DATA SET PROVIDES THE CARRIER SQUELCH ON CARRIER FAIL OPTION.
DATA SET 108F EQUIPPED WITH A 52A1 DATA UNIT MAY NOT USE THE SPACE HOLD OPTION (V), IF THE DISTANT DATA SET PROVIDES BOTH THE CARRIER SQUELCH ON CARRIER FAIL OPTION AND THE SPACE HOLD OPTION.

110. THE CARRIER DETECTION TIME CAN BE REDUCED FROM 300msec. TO 100msec. BY INSERTING A KS-20616, L1A, 750Ω RESISTOR IN POSITION 'R' ON THE CIRCUIT BOARD. THIS MODIFICATION IS SOMETIMES DESIRED FOR THE MASTER STATION OF A POLLING SYSTEM.

EQUIPMENT NOTES:

ISSUE 4B1

DATA SET 108G AND 52A1 DATA UNIT

SD-1D286-01-DI

BELL TELEPHONE LABORATORIES INCORPORATED

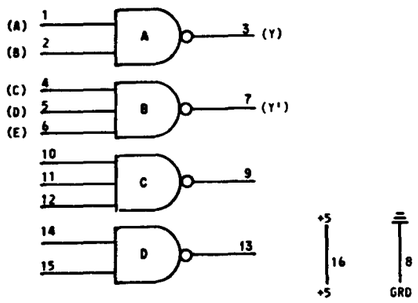
6S

INFORMATION NOTES:

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

302. INTEGRATED CIRCUIT DEVICE ELEMENTS:

(A) 41N, 41HN, 41U, 2-2-3-3 INPUT NAND GATES,
4 PER DEVICE, SEE NOTE 2.



CIRCUIT DESCRIPTION

THIS DEVICE CONTAINS FOUR POSITIVE NAND GATES. GATES A AND D PERFORM THE LOGICAL FUNCTION:

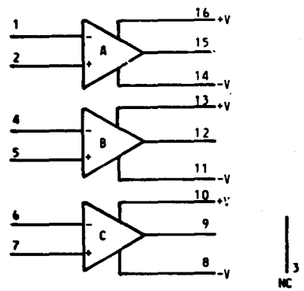
$$Y = \overline{AB}$$

GATES B AND C PERFORM THE LOGICAL FUNCTION:

$$Y' = \overline{CDE}$$

FOR EACH GATE A LOGICAL 0 OUTPUT IS OBTAINED IF ALL ITS INPUTS ARE LOGICAL 1. ALL OTHER INPUT COMBINATIONS CAUSE THE OUTPUT TO BE A LOGICAL 1.

(B) 559A OPERATIONAL AMPLIFIER, 3 PER DEVICE, SEE NOTE 2.



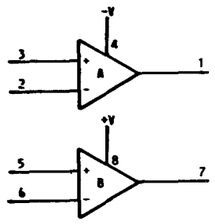
CIRCUIT DESCRIPTION

THIS DEVICE CONTAINS 3 IDENTICAL VOICE FREQUENCY OPERATIONAL AMPLIFIERS WITH INTERNAL "T" COMPENSATION, EACH WITH A DIFFERENTIAL INPUT AND A SINGLE ENDED OUTPUT.

INFORMATION NOTES: (CONT)

302. (CONT)

(C) 613E, OPERATIONAL AMPLIFIER, 2 PER DEVICE,
SEE NOTE 1.

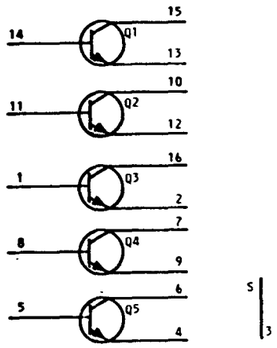


CIRCUIT DESCRIPTION

THIS DEVICE CONTAINS TWO OPERATIONAL AMPLIFIERS.

(D) 618-TYPE HYBRID INTEGRATED ACTIVE FILTERS,
SEE NOTE 2.

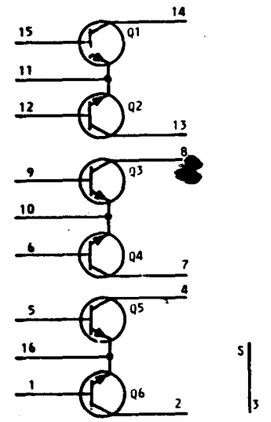
(E) 502E TRANSISTOR INTEGRATED CIRCUIT, SEE NOTE 2.



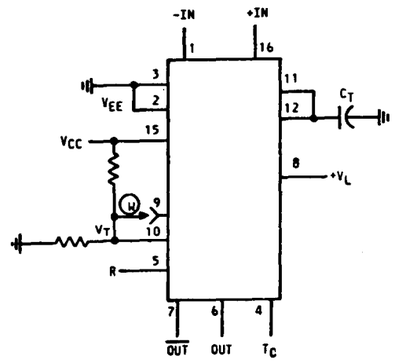
INFORMATION NOTES: (CONT)

302. (CONT)

(F) 502R TRANSISTOR INTEGRATED CIRCUIT,
SEE NOTE 2.

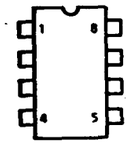


(G) 502CL, TIME DELAY COMPARATOR, SEE NOTE 2.

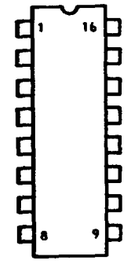


NOTES:

1. PIN NUMBERING, TOP VIEW.



2. PIN NUMBERING, TOP VIEW.



ISSUE 4B1

DATA SET 108G
AND
52A1 DATA UNIT

SD-ID286-01-D2

BELL TELEPHONE LABORATORIES
INCORPORATED

6S

PART OF CPS I

PART OF CPS I

ISSUE 481

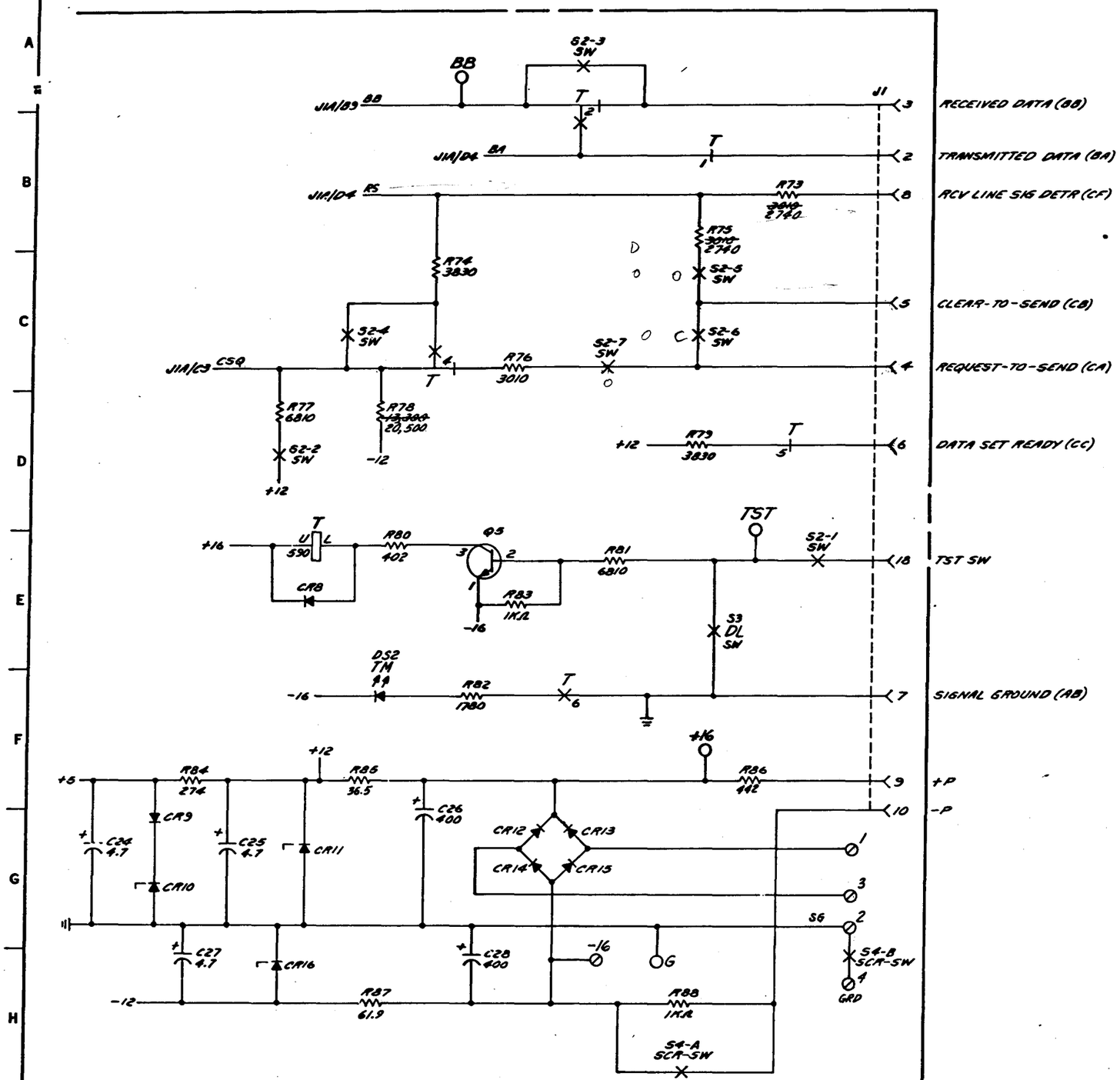
DATA SET 108G AND 52A1 DATA UNIT

SD-1D286-01-JIA

BELL TELEPHONE LABORATORIES INCORPORATED

6S

PART OF CPS I



PART OF CPS I

ISSUE 2B1

DATA SET 108G AND 52A1 DATA UNIT

SD-ID286-01-JIB

BELL TELEPHONE LABORATORIES INCORPORATED

6S

PART OF CPS I

COMPONENT LIST

RELAY

DESIG	T	
CODE	MB1A	
OPTION		
	CONT ARR	LOC
6	EBM	J1B/F3
5	EBM	J1B/D4
4	EBM	J1B/C2
3	EBM	
2	EBM	J1B/A3
1	EBM	J1B/B3
COIL		J1B/E1

RELAY NOT ADJUSTABLE REPLACE WHEN THERE IS MALFUNCTION.

CONNECTOR

DESIG	CODE
J1	841937824

CAPACITOR

DESIG	CODE
C1	KS-21743,L1,.01
C2	KS-21743,L1,.01
C3	701G,1.96
C4	570BN,.1
C5	KS-19774,L13,.15
C6	KS-21743,L1,.01
C7	KS-21743,L1,.01
C8	KS-19774,L8,.0022
C9	KS-21743,L1,.01
C10	KS-21743,L1,.01
C11	KS-19774,L6,.47
C12	KS-21743,L1,.01
C13	KS-21743,L1..01
C14	KS-21743,L1..01
C15	651C
C16	KS-21743,L1..01
C17	KS-21743,L1..01
C18	701G,1.96
C19	KS-21743,L1,.01
C20	KS-21743,L1,.01
C21	570BN,.1
C22	KS-21743,L1,.01
C23	570BN,.1
C24	650A
C25	651C
C26	KS-19524,L18,400
C27	651C
C28	KS-19524,L18,400

COMPONENT LIST (CONT)

DIODE

DESIG	CODE
CR1	521C
CR2	458C
CR3	458C
CR4	458C
CR5	521C
CR6	458C
CR7	459B
CR8	458C
CR9	458A
CR10	806CE
CR11	813AB
CR12	533F
CR13	533F
CR14	533F
CR15	533F
CR16	808J
(Z) CR17	458C
CR18	458C
CR19	458C
CR20	458C
CR21	458C
CR22	458C

DIODE,LIGHT-EMITTING

DESIG	CODE
DS1(CO)	530A
DS2(TN)	530A

INTEGRATED CIRCUIT

DESIG	CODE
IC1	618EK
IC2	618EJ
IC3A-C	559A
IC4A,B	613E
IC5	618EN
IC6A-D	~~41H~~, 41HN, 41U
IC7	502CL
IC8	618EG
IC9	618EH
IC10	618EL
IC11A-D	~~41H~~, 41HN, 41U
IC12	618ER
IC13A-F	502R
IC14A-E	502E
IC15A,B	613E
IC16	618LB

PLUG

DESIG	CODE
P1	841331051

POTENTIOMETER

DESIG	CODE
R9	KS-19069,L38,100
R58	KS-19069,L38,500

RESISTOR

DESIG	CODE
R1	KS-20616,L1A,1690
R2	KS-20616,L1A,1KΩ
R3	KS-20616,L1A,6810
R4	KS-20616,L1A,(Z)365,(Y)1470
R5	KS-20616,L1A,(Z)348,(Y)1150
R6	KS-20616,L1A,(Z)590,(Y)1960
R7	KS-20616,L1A,(Z)1330,(Y)4420
R8	KS-20616,L1A,3010
R10	KS-20616,L1A,1780
R11	KS-19151,L1,15
R12	KS-19151,L1,15
R13	KS-20616,L1A,1690
R14	KS-20616,L1A,1690
R15	KS-20616,L1A,1KΩ
R16	KS-20616,L1A,1KΩ
R17	KS-20616,L1A,51,100

COMPONENT LIST (CONT)

RESISTOR (CONT)

DESIG	CODE
R18	KS-20616,L1A,1KΩ
R19	KS-20616,L1A,51,100
R20	KS-20616,L1A,1470
R21	KS-20616,L1A,13,300
R22	KS-20616,L1A,3160
R23	KS-20616,L1A,(Z)1KΩ,(Y)1100
R24	KS-20616,L1A, SEE NOTE 3
R25	KS-20616,L1A,6810
R26	KS-20616,L1A,6810
R27	KS-20616,L1A,13,300
R28	KS-20616,L1A,6810
R29	KS-20616,L1A,1KΩ
R30	KS-20616,L1A,6810
R31	KS-20616,L1A,2370
R32	KS-20616,L1A,6810
R33	KS-20616,L1A,2370
R34	KS-20616,L1A,6810
R35	KS-20616,L1A,619
R36	KS-20616,L1A,8660
R37	KS-19151,L1,15
R38	KS-19151,L1,15
R39	KS-20616,L1A,1690
R40	KS-20616,L1A,1690
R41	KS-20616,L1A,1KΩ
R42	KS-20616,L1A,20,500
R43	KS-20616,L1A,715
R44	KS-20616,L1A,~~3010~~,2740
R45	KS-20616,L1A,2370
R46	KS-20616,L1A,1KΩ
R47	KS-20616,L1A,3650
R48	KS-20616,L1A,3010
R49	KS-20616,L1A,13,300
R50	KS-20616,L1A,20,500
R51	KS-20616,L1A,115
R52	KS-20616,L1A,13,300
R53	KS-20616,L1A,6810
R54	KS-20616,L1A,619
R55	KS-20616,L1A,51,100 OR 44,200 (SEE NOTE 3)
R56	KS-20616,L1A,3480
R57	KS-20616,L1A,866
R59	KS-20616,L1A,2150
R60	KS-20616,L1A,13,300
R61	KS-20616,L1A,6810
R62	KS-20616,L1A,1KΩ
R63	KS-20616,L1A,715
R64	KS-20616,L1A,51,100
R65	KS-20616,L1A,1690
R66	KS-20616,L1A,2370
R67	KS-20616,L1A,6810
R68	KS-20616,L1A,13,300
R69	KS-20616,L1A,215
R70	KS-20616,L1A,6810
R71	KS-20616,L1A,13,300
R72	KS-20616,L1A,1690
R73	KS-20616,L1A,~~3010~~2740
R74	KS-20616,L1A,3830
R75	KS-20616,L1A,~~3010~~2740
R76	KS-20616,L1A,3010
R77	KS-20616,L1A,6810
R78	KS-20616,L1A,~~13,300~~ 20,500
R79	KS-20616,L1A,3830
R80	KS-20810,L1A,402
R81	KS-20616,L1A,6810
R82	KS-20616,L1A,1780
R83	KS-20616,L1A,1KΩ
R84	KS-20810,L1A,274
R85	KS-20289,L6C,36.5
R86	KS-20289,L6C,442
R87	KS-20289,L6C,61.9
R88	KS-20289,L6C,1KΩ
R89	KS-20616,L1A,1050
R90	KS-20616,L1A,1470

COMPONENT LIST (CONT)

SWITCH

DESIG	CODE
S1	KS-21193,L5
S2	KS-21193,L4
S3	KS-21216,L14
S4A	P-30H563

TERMINAL

DESIG	CODE
E1	840347868
E2	
E3	

TRANSFORMER

DESIG	CODE
T1	2564BH
T2	2564BJ

TRANSISTOR

DESIG	CODE
Q1	98C
Q2	51A
Q3	51A
Q4	51A
Q5	66G
Q6	66G

VARISTOR

DESIG	CODE
(Y) RV1	108A
(Y) RV2	108A
(T) RV3	100J

MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE	
CONNECTOR ON FRAME	

SYMBOL

SHOWN IN FS

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. SELECT IN MANUFACTURE.
4. POWER AND GROUND TERMINATIONS FOR IC'S.

IC CODE	BAT. TERM.		GRD TERM.
	-12	+5	
41N		16	8
502R	3		
502E	3		

5.

RECORD OF CHANGES				
DWG ISS	SERIES	STD	MFR DISC.	SEE NOTE
2B1		Y	Z	
4B1	4	-	W	
	3	X	-	

PART OF CPS I

ISSUE 4B1

DATA SET 108G AND 52A1 DATA UNIT

SD-ID286-01-JIC

BELL TELEPHONE LABORATORIES INCORPORATED

6S

CPS 2

COMPONENT LIST

CAPACITOR

DESIG	CODE
C1	KS-20736,L4,.1
C2	601B
C3	614C

DIODE

DESIG	CODE
CR1	458C
CR2	458C
CR3	458C
CR4	458C
CR5	458C
CR6	459D
CR7	459D
CR8	458C
CR9	449A
CR10	458C

INTEGRATED CIRCUIT

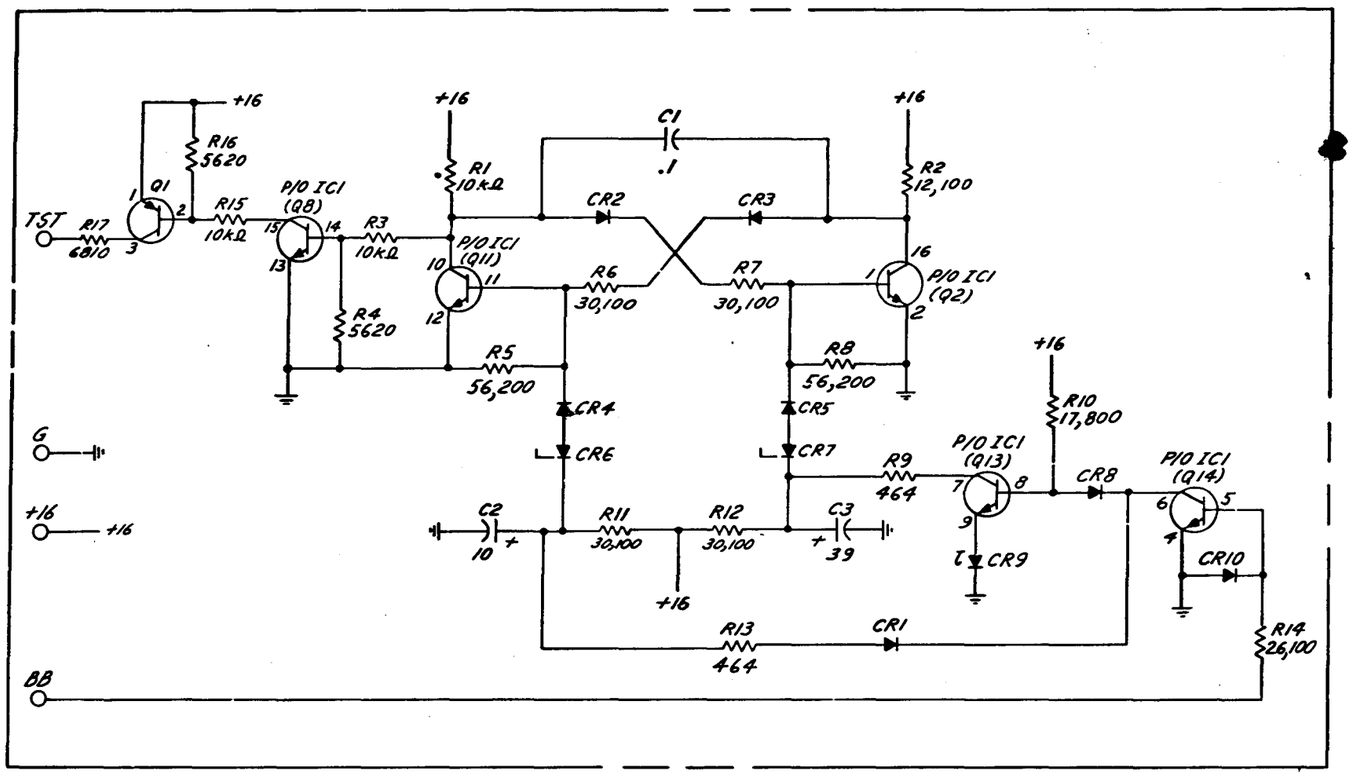
DESIG	CODE
IC1	502G

RESISTOR

DESIG	CODE
R1	KS-20616,L1A,10KΩ
R2	KS-20616,L1A,12,100
R3	KS-20616,L1A,10KΩ
R4	KS-20616,L1A,5620
R5	KS-20616,L1A,56,200
R6	KS-20616,L1A,30,100
R7	KS-20616,L1A,30,100
R8	KS-20616,L1A,56,200
R9	KS-20616,L1A,464
R10	KS-20616,L1A,17,800
R11	KS-20616,L1A,30,100
R12	KS-20616,L1A,30,100
R13	KS-20616,L1A,464
R14	KS-20616,L1A,26,100
R15	KS-20616,L1A,10KΩ
R16	KS-20616,L1A,5620
R17	KS-20616,L1A,6810

TRANSISTOR

DESIG	CODE
Q1	51A



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. CONNECT TERMINAL 3 ON 502G INTEGRATED CIRCUIT TO GROUND.

MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE	
CONNECTOR ON FRAME	

SYMBOL
SHOWN IN FS

CPS 2

DATA SET 108G AND 52A1 DATA UNIT	DWG SIZE 6S	ISSUE 2B1
BELL LABORATORIES	SD-1D286-01	-J2