

SHEET INDEX

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SYMBOL  
BUFFER D  
ELEMENT IDENT

TERM. MOD	FUNCT	TERM.	LOC
CLC01	I	012	2A0
CLC11	I	115	2A7
FACTO	I	116	2A3
LDDO	I	014	2A4
BFCLK1	I	210	2A2
BNLCKO	I	309	2A2
SDINO	I	015	2A3
-17.20V	I	018,117	2A6
BACRO	B	107	2H5
BA16CRO	B	006	2H2
IBCC1	B	013	2H5
I16BC1	B	016	2H3
SDITRO	B	114	2H6
SDOTO	B	208	2H7
-12V	B	218	2A6
+5	P	000,119	2H0
GRD	G	200,319	2H2

RECORD OF CHANGES

DWG ISS	PREV FURN	STD	MFR DISC	SEE NOTE
2A1	Z	Y	Z	

SYSTEM USED ON	DESIGN CONTROL
COMMON SYSTEMS	Ih

CURRENT DRAIN: +5V SUPPLY = 550mA  
-17.2V SUPPLY = 50mA

NOTES:

- GROUND RETURN
- UNLESS OTHERWISE SPECIFIED:  
RESISTANCE VALUES ARE IN OHMS  
CAPACITANCE VALUES ARE IN MICROFARADS  
VALUES PRECEDED BY THE SYMBOL + (PLUS)  
OR - (MINUS) ARE IN VOLTS
- BATTERY AND GROUND TERMINALS FOR INTEGRATED CIRCUITS

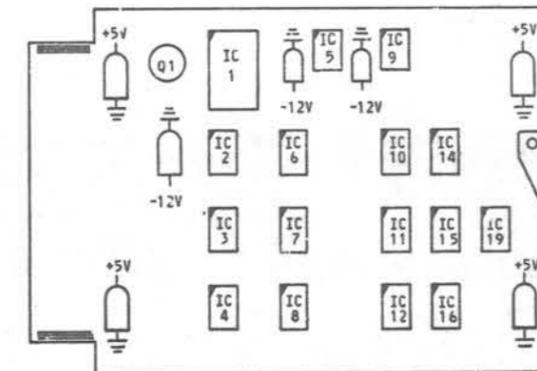
IC CODE	BAT. TERM.	GRD TERM.
41AC	16	7,8
41BP	16	8
41CA	16	8
41CJ	16	8
41W	16	8
535K	1,2	5
3355DC	8	4
KS-2878, LI	16	8
2833B	8	4

- BATTERY AND GROUND TERMINALS FOR THIS CIRCUIT PACK ARE AS FOLLOWS:

FUNCTION	TERMINAL
+5	000,119
GRD	200,319

- HORIZONTAL MOUNTING CENTERS AT 1.0 INCH.

- INTEGRATED CIRCUIT AND TRANSISTOR LOCATION GUIDE:  
(COMPONENT SIDE SHOWN)



UNMARKED COMPONENTS ARE FILTER CAPACITORS

SUPPORTING INFORMATION

CATEGORY	NO.
CIRCUIT PACK CODE	JK13
CONNECTOR ON FRAME	947C OR 947A
SERIES FOR LATEST CLASS A CHANGE. (ANY HIGHER SERIES IS ACCEPTABLE.)	
ACCEPTABLE SERIES	1,2

SHEET INDEX NOTES

- WHEN CHANGES ARE MADE IN THIS DRAWING ONLY THOSE SHEETS AFFECTED WILL BE REISSUED.
- 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.
- THE ISSUE NUMBER ASSIGNED TO A CHANGED OR NEW SHEET WILL BE THE SAME ISSUE NUMBER AS THAT OF THE FIRST SHEET.
- SHEETS THAT ARE NOT CHANGED WILL RETAIN THEIR EXISTING ISSUE NUMBER.
- THE LAST ISSUE NUMBER OF THE FIRST SHEET INDEX IS RECOGNIZED AS THE LATEST ISSUE NUMBER OF THE DRAWING AS A WHOLE.

NOTICE- NOT FOR USE OR DISCLOSURE OUTSIDE THE BELL SYSTEM EXCEPT UNDER WRITTEN AGREEMENT.

ISSUE  
301

JK13 CIRCUIT PACK

BUFFER D  
CIRCUIT

2

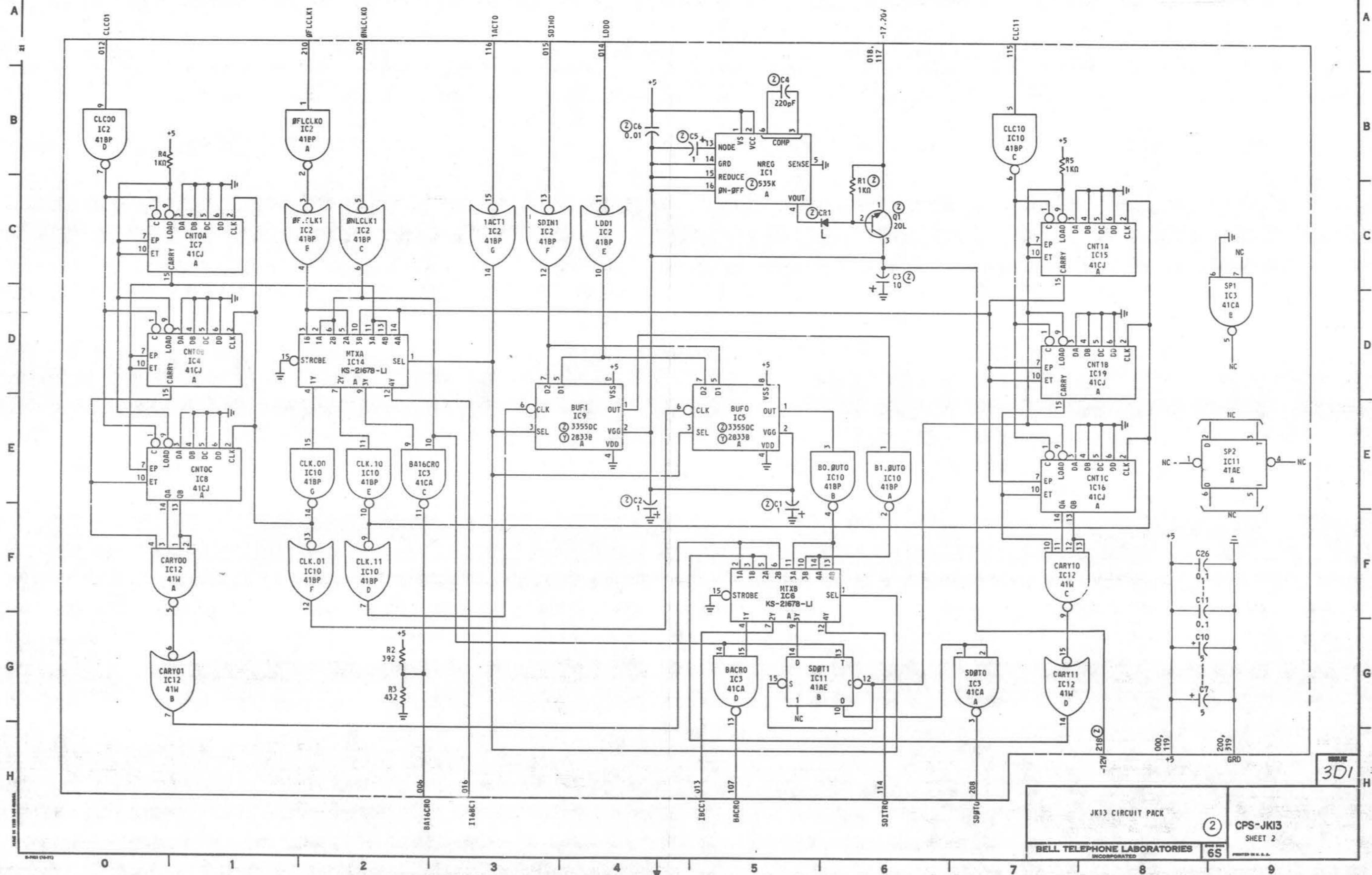
CPS-JK13  
3 SHEETS

BELL TELEPHONE LABORATORIES  
INCORPORATED

6S

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PART OF CPS JK13  
BUFFER D



CPS-JK13

JK13 CIRCUIT PACK

BELL TELEPHONE LABORATORIES  
INCORPORATED

CPS-JK13  
SHEET 2

65

3DI

PART OF CPS JK13  
BUFFER D

COMPONENT LIST  
INTEGRATED CIRCUIT

LOC	IC1		IC2		IC3		IC4		IC5		IC6		IC7		IC8		IC9	
CODE	535K (2)		41BP		41CA		41CJ		3359DC (FAIRCHILD) (2)		KS-21678, LI 54157 T.I.		41CJ		41CJ		3359DC (FAIRCHILD) (2)	
ELEM									2833B (SYNERTEK) (Y)								2833B (SYNERTEK) (Y)	
ID	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC
A	NREG	2B5	BFCLK0	2B2	SD0T0	2G7	CNT0B	201	BUFO	2D5	MTXB	2F5	CNT0A	2C1	CNT0C	2E1	BUF1	2D4
B			BFCLK1	2C2	SP1	2D9												
C			BNLCLK1	2C2	BA16CRO	2E2												
D			CLC00	2B0	BACRO	2G5												
E			LDD1	2C4														
F			SDIN1	2C3														
G			1ACT1	2C3														

LOC	IC10		IC11		IC12		IC14		IC15		IC16		IC19	
CODE	41BP		41AE		41W		KS-21678, LI 54157 T.I.		41CJ		41CJ		41CJ	
ELEM														
ID	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC	DESIG	SH LOC
A	B1.BUTO	2E6	SP2	2E9	CARY00	2F1	MTXA	2D2	CNT1A	2C8	CNT1C	2E8	CNT1B	2D8
B	B0.BUTO	2E6	SD0T1	2E5	CARY01	2G1								
C	CLK10	2B7			CARY10	2F7								
D	CLK.11	2F2			CARY11	2G7								
E	CLK.10	2E2												
F	CLK.01	2F2												
G	CLK.00	2E2												

CAPACITOR

DESIG	CODE
[2] C1, C2	(2) 600A, 1
C3	(2) 604A, 10
C4	(2) KS-19774 L1, 220pF
C5	(2) 600A, 1
C6	(2) KS-19774 L1, 0.01
[4] C7-C10	601A, 5
[16] C11-C26	KS-19774 L5, 0.1

DIODE

DESIG	CODE
CRT	(2) 446M

RESISTOR

DESIG	CODE
R1	(2) KS-20616 L1A, 1KΩ
R2	392
R3	432
R4	1KΩ
R5	KS-20616 L1A, 1KΩ

TRANSISTOR

DESIG	CODE
Q1	(2) 20L

CIRCUIT DESCRIPTION:

THIS CIRCUIT PACK IS PART OF THE BUFFER UNIT. THE 1024-BIT SHIFT REGISTERS, BUFO AND BUF1 PROVIDE SERIAL DATA STORAGE. EACH SHIFT REGISTER HAS ASSOCIATED WITH IT A 10-BIT COUNTER. THE COUNTERS INCREMENT EACH TIME THAT THE ASSOCIATED BUFFER IS CLOCKED. THE TWO BUFFERS CAN BE INDEPENDENTLY CLOCKED DUE TO THE MULTIPLEXING OF CLOCK AND DATA INPUT SIGNALS.

WHEN LEAD 1ACT0 IS LOW, BUF1 IS CONSIDERED TO BE ON-LINE AND BUFO IS CONSIDERED TO BE OFF-LINE. ON-LINE CLOCK PULSES AT INPUT BNCLK0 ARE ROUTED THROUGH MTXA AND SHIFT THE DATA ON LEAD SDINO INTO BUF1'S DATA PORT D2. THE SELECT LEAD SEL ON BUF1 IS HIGH AND THE DATA AT BUF1'S DATA INPUT PORT D1 IS IGNORED. THE OUTPUT DATA OF BUF1 IS ROUTED THROUGH MTXB AND F/F SD0T1 AND APPEARS ON LEAD SD0T0.

BUF1 IS CLOCKED ON THE TRAILING EDGE OF THE PULSE ON LEAD BNCLK0 AND F/F SD0T1 IS CLOCKED ON THE LEADING EDGE. THE 1024-BIT CARRY OF COUNTER 1 IS ROUTED THROUGH MTXB AND APPEARS ON BACRO. THE 16-BIT CARRY OF COUNTER 1 APPEARS ON LEAD BA16CRO. BA16CRO AND BACRO ARE GATED WITH THE ON-LINE CLOCK PULSE AND THEREFORE ARE AS WIDE AS THE GROUND LEVEL PULSE ON LEAD BNCLK0.

AS LONG AS LEAD 1ACT0 IS AT GROUND LEVEL, BUFO IS CONSIDERED TO BE OFF-LINE. OFF-LINE CLOCK PULSES ON LEAD BFCLK1 ARE ROUTED THROUGH MTXA AND SHIFT THE DATA ON LEAD LDD0 INTO BUFO'S DATA INPUT PORT D2. THE SELECT LEAD SEL ON BUFO IS HIGH AND THE DATA AT BUFO'S DATA INPUT PORT D1 IS IGNORED. THE OUTPUT DATA OF BUFO IS ROUTED THROUGH MTXB AND APPEARS ON LEAD SDIT0. THE 1024-BIT CARRY OF COUNTER 0 IS ROUTED THROUGH MTXB AND APPEARS ON LEAD IBCC1. THE 16-BIT CARRY OF COUNTER 0 IS ROUTED THROUGH MTXA AND APPEARS ON LEAD I16BC1.

WHEN LEAD 1ACT0 IS HIGH, BUFO IS ON-LINE AND BUF1 IS OFF-LINE. IN THIS STATE ON-LINE CLOCK PULSES SHIFT THE DATA ON LEAD SDINO INTO BUFO AND OFF-LINE CLOCK PULSES SHIFT THE DATA ON LEAD LDD0 INTO BUF1.

A HIGH LEVEL ON LEADS CLC01 AND CLC11 CLEARS COUNTERS CNT0 AND CNT1 RESPECTIVELY. THE CLEAR FUNCTION OVERRIDES THE COUNTERS CLOCK INPUTS. AS LONG AS CLEAR IS ACTIVE, ANY CLOCK PULSES TO THE COUNTER ARE IGNORED.

NREG AND TRANSISTOR Q1 PROVIDE A -12V REGULATED SUPPLY VOLTAGE FOR THE M05 SHIFT REGISTERS BUFO AND BUF1 ON SERIES 1 CIRCUIT PACKS.

3D1

JK13 CIRCUIT PACK	(2)	CPS-JK13 SHEET 3
BELL TELEPHONE LABORATORIES INCORPORATED	65	PRINTED IN U.S.A.

CPS-JK13

0-100 (10-7)

0 1 2 3 4 5 6 7 8 9