

TALLY

SERIES 2000

INTERFACE MANUAL

**Data
Products**

ADDENDUM SERIES 2000 DATAPRODUCTS INTERFACE MANUAL

This addendum applies to the Series 2000 Data-products Interface Manual, Revision D, dated November 1976.

Please make the following changes to the manual:

PAGE 8, CABLE ASSEMBLY

Change the part number on the Polarizing Key from 400962-04 to 400517-51.

PAGE 8, DATAPRODUCTS INTERFACE CIRCUIT BOARD

Add the following circuit board option:

603825-17 Upper Case with Long Lines, Inverted Status, and Paper Instruction Options

PAGE 9, PARTS LIST

Correct the description on the following parts to read:

400001-21 Capacitor, 100 PFD, 1000V
400016-05 Screw, No. 6-32 x 3/8, Pan Head Slotted (2) (for VR1)
400783-05 Nut, No. 6-32, Hex Keps (2) (for VR1)

PAGE 11, FIGURE 7


Revise note  to read:

Paper Instruction Options only.
(-3,-4,-6,-9,-10,-12,-15, and -17)


Revise note  to read:


Long Line Options only.
(-13 thru -17)

Add a new flag note, reading:

 *Paper Instruction without Long Line Options only. (-3,-4,-6,-9,-10, and -12)*

On resistor R9, change  to .

On resistor R15, delete .

Add a  to capacitors C17, C18, C21, C24, C25, C28, C29, C32, C33, and C36.

PAGE 12, JUMPER INFORMATION TABLE

Add to the table a-17 configuration identical to the -15 configuration except that jumper E3 is A-B and E14, E16, E18 are A-C.

PAGE 13, FIGURE 9

In zone 8B, add the signal return lines to connector J7 as shown in Figure 1 of this addendum.

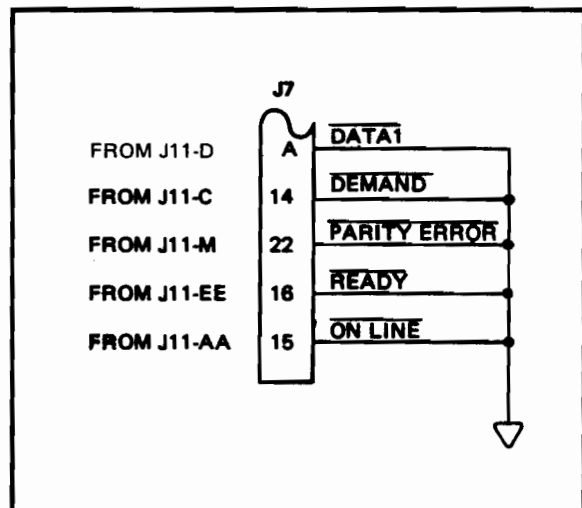
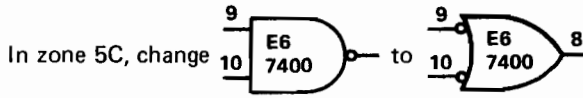


Figure 1

HP Computer Museum
www.hpmuseum.net

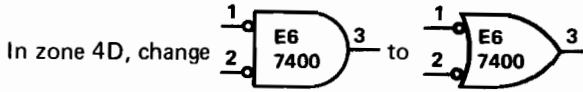
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ADDENDUM SERIES 2000 DATAPRODUCTS INTERFACE MANUAL



PAGE 15, FIGURE 10

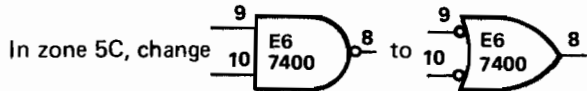
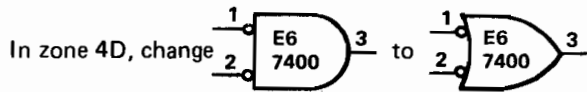
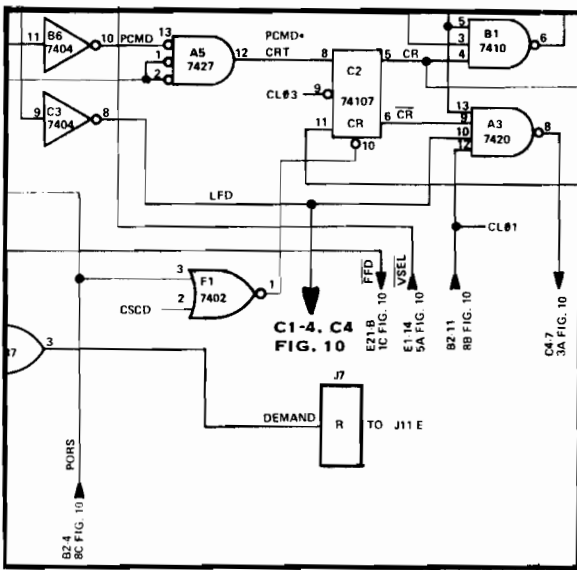
Replace this entire page in the manual with page 3 of this addendum.



PAGE 17, FIGURE 11

Change the Figure title to read: (-13 thru -17 only).

In zone 3B, add signal line LFD as shown in Figure 2 of this addendum.



PAGE 19, FIGURE 12

Replace this entire page in the manual with page 4 of this addendum.

Figure 2

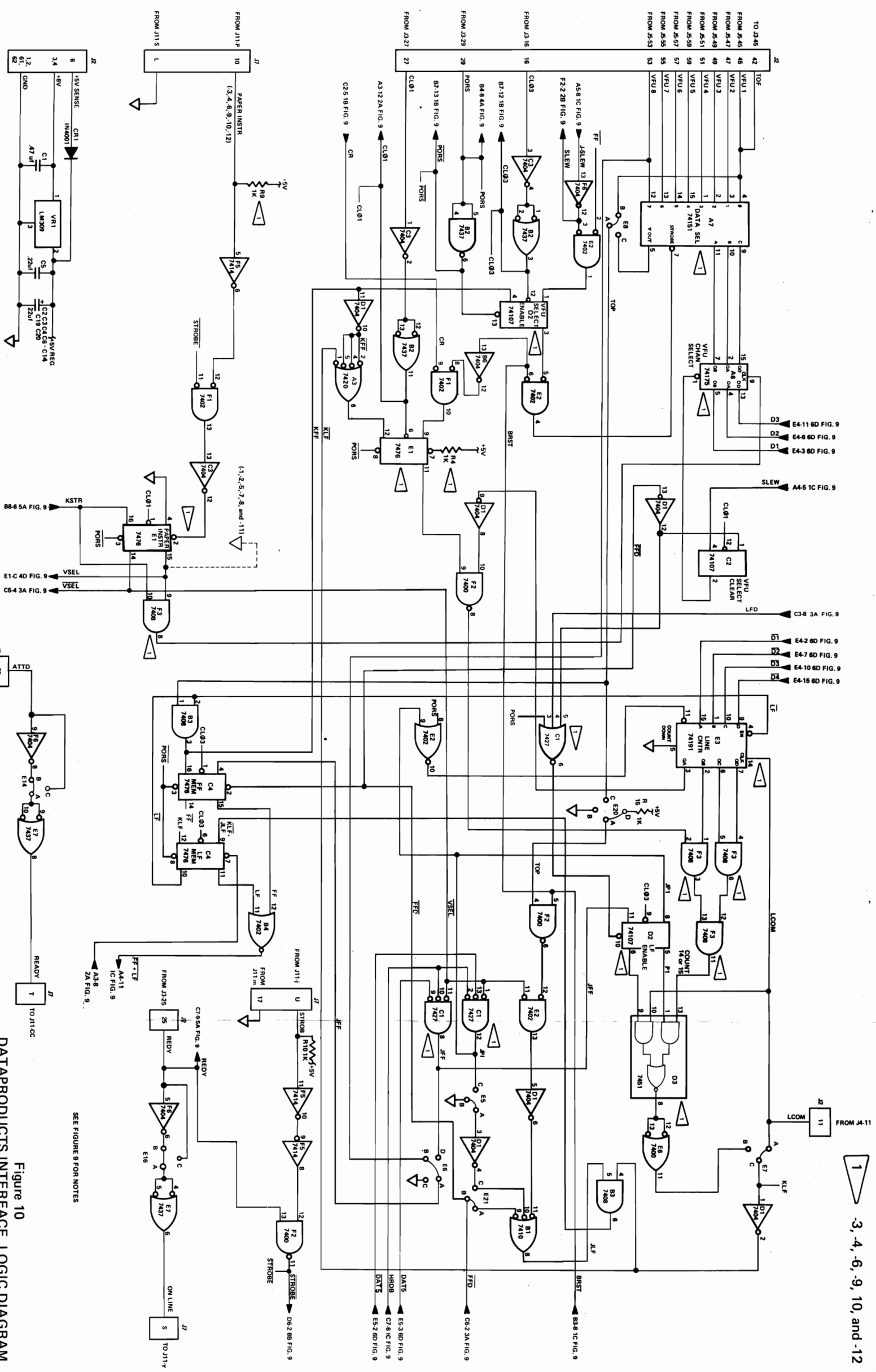


Figure 10
DATAPRODUCTS INTERFACE LOGIC DIAGRAM
(Reference No. 603825)
(-1 thru -12 only)

SEE FIGURE 9 FOR NOTES

MARCH 1977

A B C D



ADDENDUM SERIES 2000 DATAPRODUCTS INTERFACE MANUAL

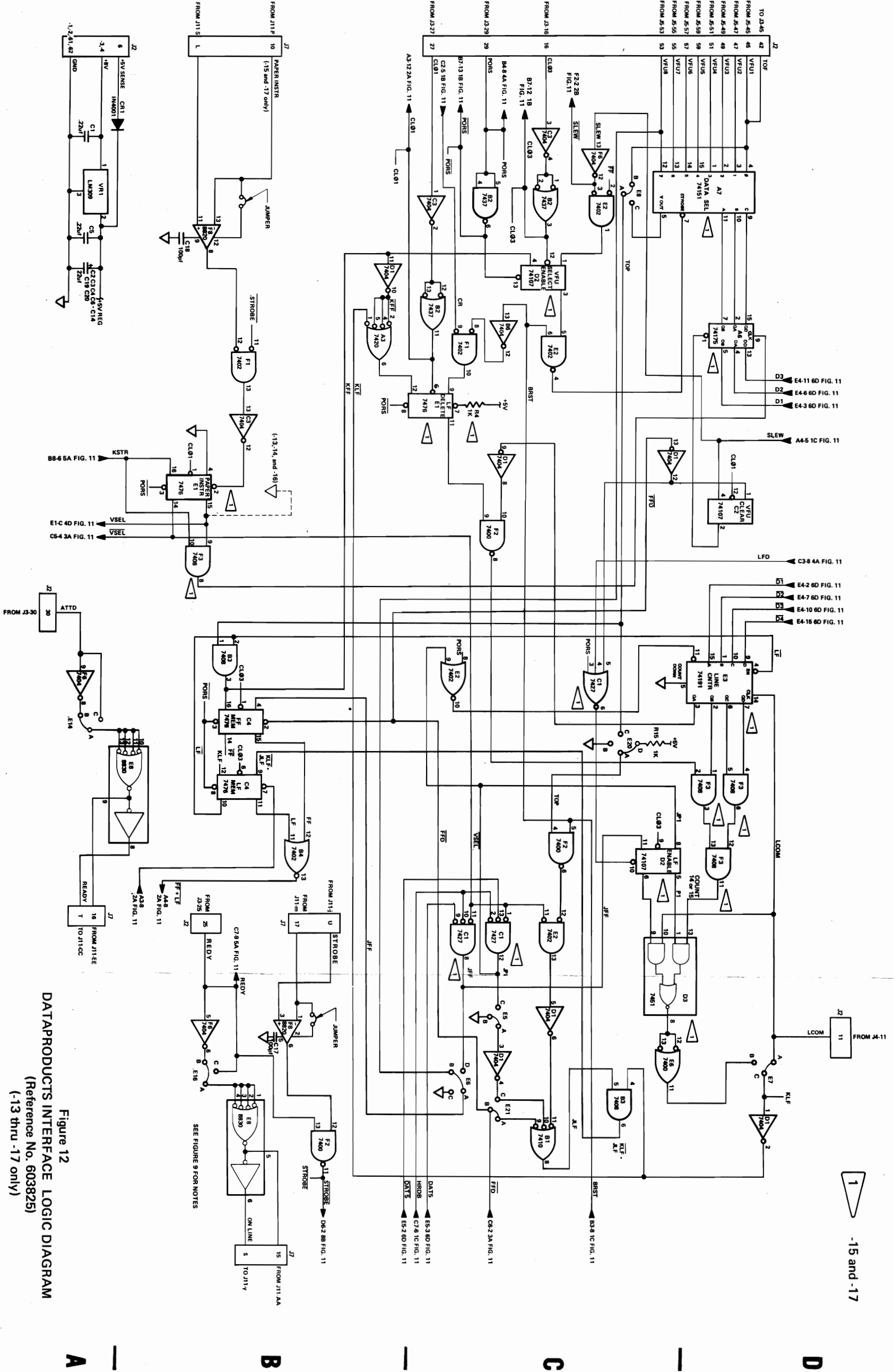


Figure 12
 DATAPRODUCTS INTERFACE LOGIC DIAGRAM
 (Reference No. 603825)
 (-13 thru -17 only)

MARCH 1977

INTRODUCTION

The Data Products Interface option (Reference Number 603614) is designed to interface the Tally Series 2000 Printer with equipment using a Data Products controller. The interface can be obtained with parity,

paper instruction, inverted status, or long lines options as well as certain combinations of these options.

NOTE: This manual is to be used with the Tally Series 2000 Printer Maintenance Manual.

INTERFACE SPECIFICATIONS

SIGNALS TO THE INTERFACE

Data 1 Through Data 7

Inputs DATA 1 through DATA 7 are used in combination to form a code. If DATA 6 or 7 is high, the code represents a printable character. If both DATA 6 and 7 are low, the code represents a control function or invalid character. Invalid characters are ignored by the interface. Character codes and control function codes are shown in figure 1.

All data lines (including DATA 8 and PAPER INSTR) must be stable from at least .5 microseconds before STROBE goes active to at least .5 microseconds after STROBE goes inactive (see figure 2).

Strobe

The controlling device causes the interface to accept information on the data lines by causing STROBE to go active (high) for a period of $1 \pm .5$ microseconds. A STROBE must occur in conjunction with each character or paper instruction.

Data 8 (Parity Option)

The parity bit appears as DATA 8 when the parity option is employed.

Paper Instruction (Option)

When a code on the data lines is to be interpreted as a paper instruction, the controller must cause PAPER INSTR to go active (high).

SIGNALS FROM THE INTERFACE

Ready

READY is a status signal. Normally, when it is high, it indicates the printer ON switch is depressed. When the inverted status signal option is employed, READY goes low to indicate the printer is ON.

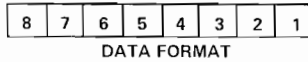
On-Line

ON-LINE is a status signal. Normally, when it is high, it indicates the following:

1. Printer power is ON.
2. Paper is loaded.
3. Platen is closed.
4. Print switch is depressed.

When the inverted status signal option is employed, ON-LINE goes low to indicate these conditions.





				CONTROL FUNCTIONS				PRINT CHARACTERS			
			7	0	0	0	0	1	1	1	1
			6	0	0	1	1	0	0	1	1
			5	0	1	0	1	0	1	0	1
4	3	2	1								
0	0	0	0	NUL	VT1	SPACE	0	@	P	␣	p
0	0	0	1	SOH	VT2	!	1	A	Q	a	q
0	0	1	0	STX	VT3	"	2	B	R	b	r
0	0	1	1	ETX	VT4	#	3	C	S	c	s
0	1	0	0	EOT	VT5	\$	4	D	T	d	t
0	1	0	1	ENQ	VT6	%	5	E	U	e	u
0	1	1	0	ACK	VT7	&	6	F	V	f	v
0	1	1	1	BEL	VT8	'	7	G	W	g	w
1	0	0	0	BS	CAN	(	8	H	X	h	x
1	0	0	1	HT	EM	)	9	I	Y	i	y
1	0	1	0	LF	SUB	*	:	J	Z	j	z
1	0	1	1	VT	ESC	+	;	K	[	k	{
1	1	0	0	FF	FS	,	<	L	\	l	|
1	1	0	1	CR	GS	-	=	M	]	m	~
1	1	1	0	SO	RS	.	>	N	^	n	~
1	1	1	1	SI	US	/	?	O	_	o	DEL

NOTE: Shaded areas indicate unused control codes.

Figure 1
USASCII CODE CHART

When the printer runs out of paper, ON-LINE goes inactive (false) upon detection of the next hole in channel one of the vertical format unit.

Demand

DEMAND is a status signal. When it is high, it indicates the following:

1. Printer power is ON.
2. The PRINT switch is depressed.
3. The interface is ready to accept data.

Connection Verification

Two pins (J11-v and J11-x) are jumpered together, so the controller can remotely verify its connection to the printer.

Parity Error (Option)

PARITY ERROR goes high during the character transfer time of an error character and it remains high until an autoprnt, CR, LF, FF or paper instruction occurs.

OPERATION

PRINTABLE CHARACTERS

The interface handles the ASCII code for printable characters as shown in figure 1. See figure 13 for a flow diagram of interface operations. When the printer is configured for upper case characters only, any lower case character received is printed as its upper

case equivalent. A printer configured for both upper and lower case characters prints valid characters as received. Invalid characters are ignored by the interface.

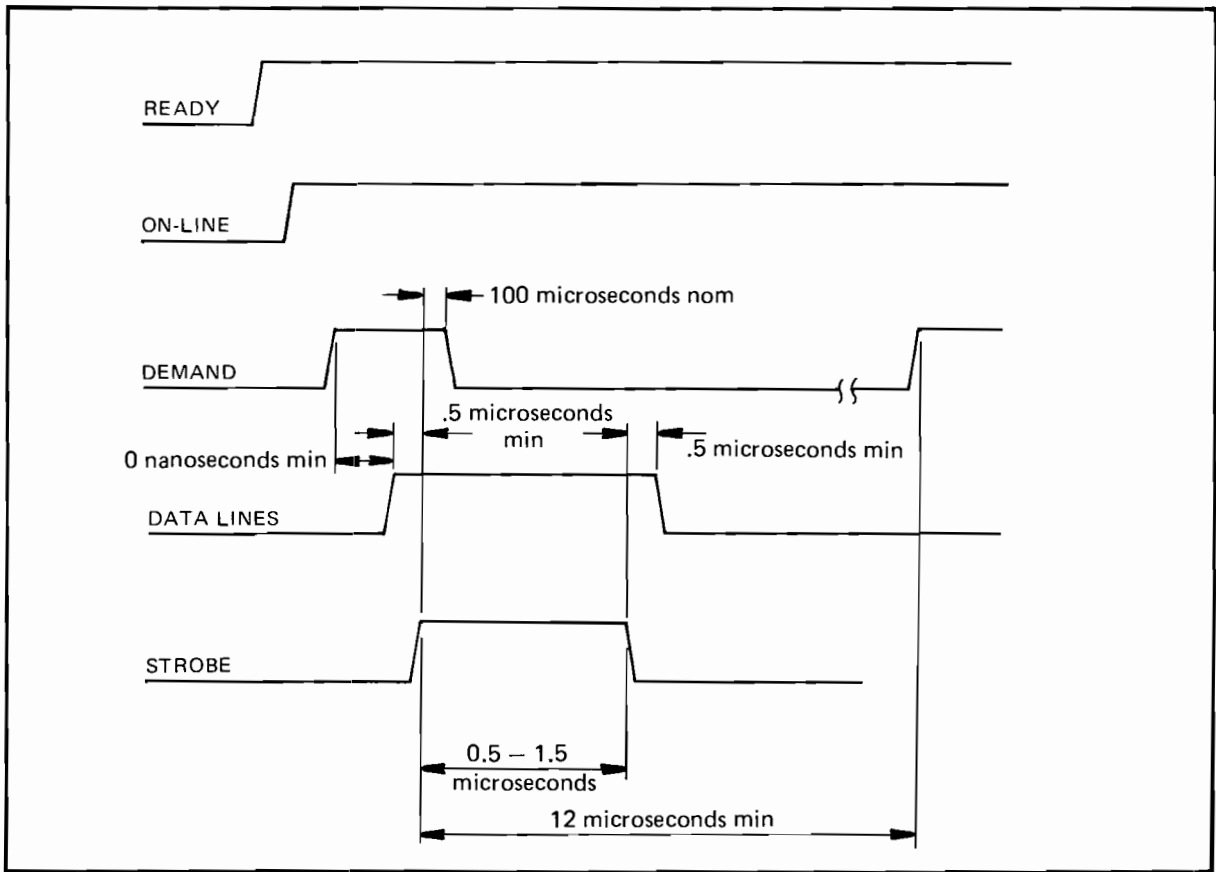


Figure 2
TIMING INFORMATION

CONTROL CHARACTERS

Autoprint

The 133rd character presented to the interface generates a print cycle. If this character is printable, it is stored and printed as the first character in the next line.

Carriage Return (CR)

When one or more printable characters is followed by a CR ('015), a print cycle is generated. If no printable character precedes it, the CR is ignored.

Line Feed (LF)

When one or more printable characters is followed by a LF ('012), a print cycle is generated. When no printable characters precede a LF, a line feed only occurs.

Carriage Return and Line Feed (CR•LF)

When one or more printable characters is followed by a CR•LF, a print cycle is generated and the LF is ignored. When no printable characters precede a CR•LF combination, a line feed only occurs.

Form Feed (FF)

When one or more printable characters is followed by a FF ('014), a print cycle occurs and paper then advances until the next hole in VFU channel one is encountered. When no printable characters precede a FF, a form feed only occurs (i.e. paper advances until the next hole in VFU channel one is encountered).

Print Cycle

When a print cycle is generated, the contents of the printer line buffer are transferred to the print buffer

in order to be processed onto paper. The DEMAND line goes false during this transfer. Once the print buffer receives the contents of the line buffer, the line buffer is free to accept data for the next line of print; so DEMAND goes true. In this manner the line buffer receives data for a line of print while the print buffer processes the previous line onto paper. When the interface again receives a command to print, DEMAND goes false to inhibit further inputs and (as soon as the print buffer is ready for a new line) data is again transferred from the line buffer to the print buffer.

Since paper is automatically advanced one line during a print cycle, it is not possible to overprint a previous line. A print cycle is generated in the same manner with a CR as with a LF.

NOTE: When the printer PRINT switch is depressed, both the LINE FEED and FORM FEED switches are disabled.

Perforation Skip

A perforation skip can be performed under control of the printer vertical format unit (VFU). A skip is initiated when a hole in VFU channel eight is encountered and terminated when a hole in channel one is encountered. (A hole in channel one indicates top of form).

Paper Instruction (Option)

When one or more printable characters is followed by a paper instruction (PAPER INSTR), a print cycle is generated and slew then commences. When no printable characters precede a PAPER INSTR, slew commences but a print cycle does not occur.

When a paper instruction is issued, paper advances under control of a selected VFU channel or until a selected number of lines advance. So slew duration is determined according to the paper instruction code issued. These codes are shown in figures 3 and 4.

PAPER INSTR must be high at STROBE time in order to commence a paper instruction. The perforation skip feature is inoperable with the paper instruction option.

Parity (Option)

The parity option checks each character for parity. When a parity error is detected, the ERROR line goes true and remains true until a CR, LF, FF, PAPER INSTR or autoprnt situation occurs. When a CR occurs after ERROR goes true, the line buffer is emptied and no print cycle occurs. When a LF, FF, PAPER INSTR or autoprnt situation occurs after ERROR goes true, a print cycle occurs and any characters in error are printed as received. Parity is ignored for control characters.

The interface circuit board is available with either odd or even parity checking.

Long Line (Option)

The long line option allows the printer to be operated with cable lengths from 15 to 500 feet. The recommended cable consists of twisted pairs with a characteristic impedance of 50 to 500 ohms. Cable configuration for both long lines and short lines is as shown in figure 6.

Inputs to the interface circuit board are differential inputs with an impedance of 170 ohms nominal. The differential receivers are SN74182, DM8830 or equivalent. Inverting input current is 4.2 milliamperes maximum at 15 Vcm (common-mode input voltage) and - 4.2 milliamperes maximum at - 15 Vcm. Non-inverting input current is 7.0 milliamperes maximum at 15 Vcm and - 9.8 milliamperes maximum at - 15 Vcm.

Outputs from the interface circuit board are differential line drivers (SN75183, DM8820 or equivalent). Outputs are 1.8V minimum at 40 milliamperes for logic 1 (high) and .5V maximum at 40 milliamperes for logic 0 (low).

With cable lengths of 100 feet or less, the specified pulse widths are operable: When line lengths exceed 100 feet, pulse widths must increase by 200 nanoseconds for each additional 50 feet of cable. A minimum pulse width of 2 microseconds is required for the maximum cable length of 500 feet.

PAPER INSTRUCTION (J7-10)	DATA LINES							VFU CHANNEL
	J7-7	J7-6	J7-5	J7-4	J7-3	J7-2	J7-1	
1	X	X	0	0	0	0	0	1
1	X	X	0	0	0	0	1	2
1	X	X	0	0	0	1	0	3
1	X	X	0	0	0	1	1	4
1	X	X	0	0	1	0	0	5
1	X	X	0	0	1	0	1	6
1	X	X	0	0	1	1	0	7
1	X	X	0	0	1	1	1	8

X=IRRELEVANT
1=HIGH
0=LOW

Figure 3
CODES FOR
PAPER ADVANCE UNDER CONTROL
OF SELECTED VFU CHANNEL

PAPER INSTRUCTION (J7-10)	DATA LINES							NUMBER OF LINES ADVANCED
	J7-7	J7-6	J7-5	J7-4	J7-3	J7-2	J7-1	
1	X	X	1	0	0	0	1	1
1	X	X	1	0	0	1	0	2
1	X	X	1	0	0	1	1	3
1	X	X	1	0	1	0	0	4
1	X	X	1	0	1	0	1	5
1	X	X	1	0	1	1	0	6
1	X	X	1	0	1	1	1	7
1	X	X	1	1	0	0	0	8
1	X	X	1	1	0	0	1	9
1	X	X	1	1	0	1	0	10
1	X	X	1	1	0	1	1	11
1	X	X	1	1	1	0	0	12
1	X	X	1	1	1	0	1	13
1	X	X	1	1	1	1	0	14
1	X	X	1	1	1	1	1	15

X=IRRELEVANT
1=HIGH
0=LOW



Figure 4
CODES FOR PAPER ADVANCE
OF A SPECIFIC NUMBER OF LINES

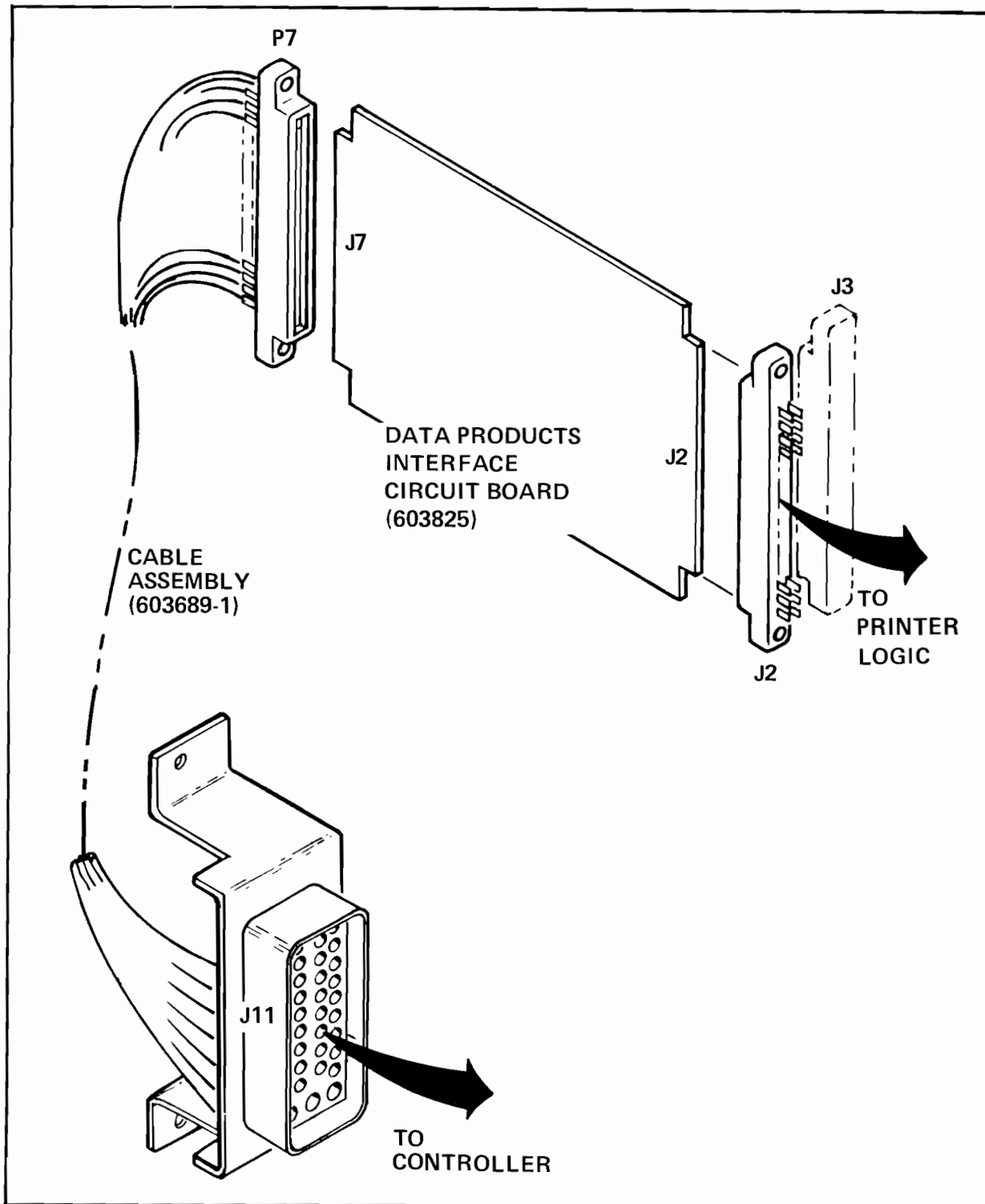


Figure 5
 INTER CONNECTIONS FOR
 DATA PRODUCTS INTERFACE

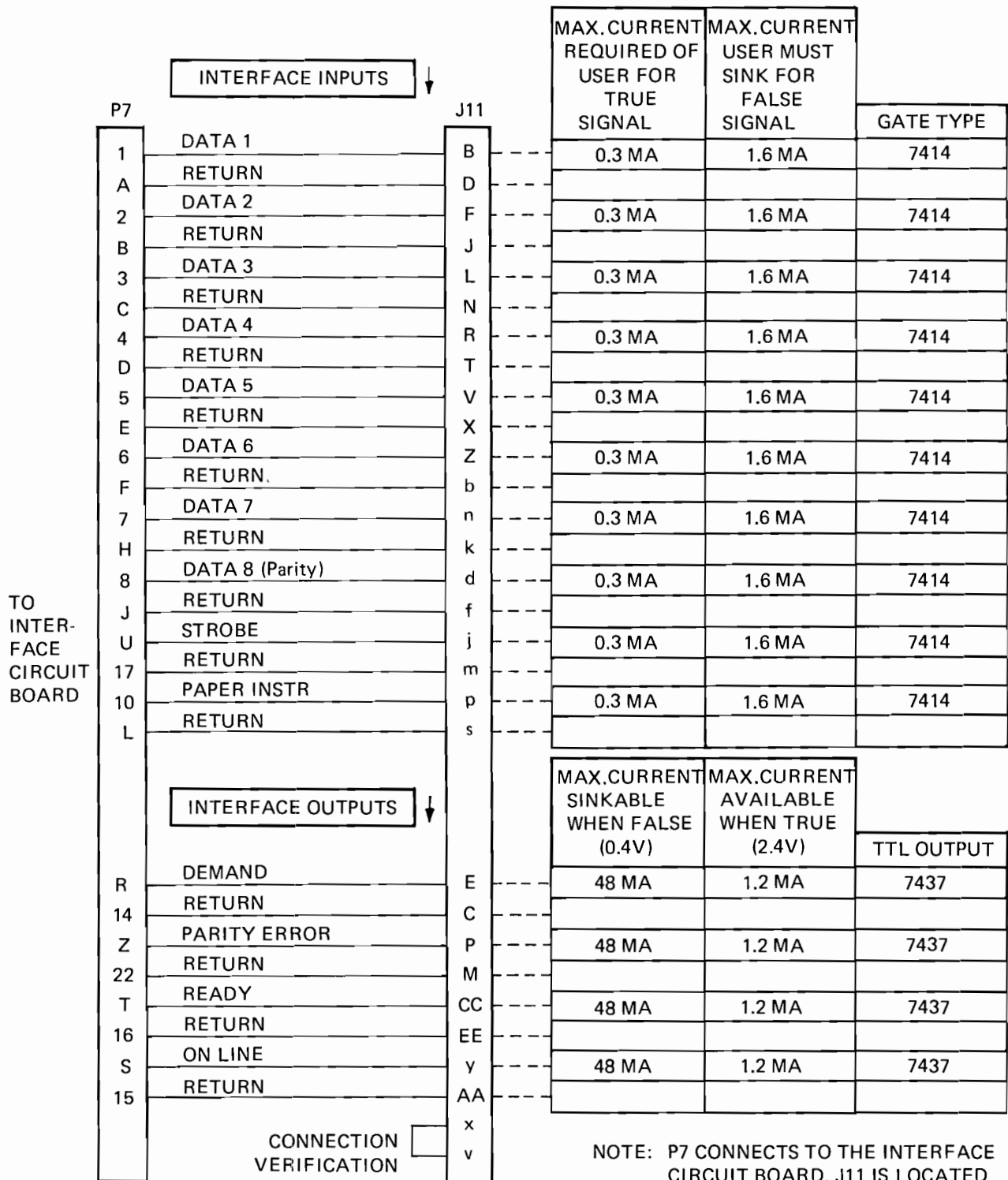


Figure 6
INTERFACE CABLE INFORMATION



SERVICE INSTRUCTIONS

The Data Products Interface option (reference number 603614) is available in the configurations listed in the PARTS LIST on this page.

To incorporate the Data Products Interface option, add one of the circuit boards from the PARTS LIST and the following parts to the Printer General Assembly.

CABLE ASSEMBLY

The following parts are used in the cable assembly (part number 603689-1) for the Data Products Interface option.

PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
603689-1	Cable Assembly	603571-2	Bracket, Connector (For J11)
400216-10	Washer, No. 8, Flat (2)	401172-03	Contacts, Socket (30)
400215-10	Washer, No. 8, Lock (2)	401028-23	Connector, 50 Pin (J11)
400017-05	Screw, 8-32 x 3/8, Pan Head (2)	400962-02	Connector, 44 Pin (P7)
		400962-04	Key, Polarizing (Between P7-2 and P7-3)

PARTS LIST

DATA PRODUCTS INTERFACE CIRCUIT BOARD

Reference No.	Description
603825-1	Upper Case Only
603825-2	Upper Case with Parity Option
603825-3	Upper Case with Paper Instruction Option
603825-4	Upper Case with Parity and Paper Instruction Options
603825-5	Upper Case with Inverted Status Option
603825-6	Upper Case with Inverted Status and Paper Instruction Options
603825-7	Upper-Lower Case
603825-8	Upper-Lower Case with Parity Option
603825-9	Upper-Lower Case with Paper Instruction Option
603825-10	Upper-Lower Case with Parity and Paper Instruction Options
603825-11	Upper-Lower Case with Inverted Status Option
603825-12	Upper-Lower Case with Inverted Status and Paper Instruction Options
603825-13	Upper Case with Long Lines Option
603825-14	Upper-Lower Case with Long Lines Option
603825-15	Upper-Lower Case with Long Lines and Paper Instruction Options
603825-16	Upper-Lower Case with Long Lines and Parity Options

COMPONENT	PART NUMBER	DESCRIPTION
A3,C6	400488-01	Integrated Circuit, 7420
A4,B7,C2,C8,D2	400195-01	Integrated Circuit, 74107
A5,C1	400929-01	Integrated Circuit, 7427
A6,E4,E5	400923-01	Integrated Circuit, 74175
A7	401001-01	Integrated Circuit, 74151
A8	400930-01	Integrated Circuit, 7425
B1,C7	400173-01	Integrated Circuit, 7410
B2,E7	400466-01	Integrated Circuit, 7437
B3,B5,B8,D8,F3	400190-01	Integrated Circuit, 7408
B4,E2,F1	400192-01	Integrated Circuit, 7402
B6,D1,F6,C3	400194-01	Integrated Circuit, 7404
C4,D6,E1	400812-01	Integrated Circuit, 7476
C5	400189-01	Integrated Circuit, 7430
D3	400723-01	Integrated Circuit, 7451
D4	400388-01	Integrated Circuit, 7442
D5	400191-01	Integrated Circuit, 74180
E3	400919-01	Integrated Circuit, 74191
E6,F2	400106-01	Integrated Circuit, 7400
E8,F7	401166-01	Integrated Circuit, 8880
F4,F5	401128-01	Integrated Circuit, 7414
F8,G2,G4,G6,G8	401165-01	Integrated Circuit, 8820
C1	400955-08	Capacitor, .47 MFD, 50V
C2,C3,C4,C6 thru C14,C19,C20	401389-29	Capacitor, 22 MFD, 35V
C5	400955-01	Capacitor, .22 MFD, 50V
C17,C18,C21,C24, C25,C28,C29,C32, C33,C36	400001-21	Capacitor, 100 PFD
CR1	400698-01	Diode, IN4001
R1 thru R15	400071-01	Resistor, 1K, 1/4W
VR1	400522-01	Regulator, LM309
—	401039-01	Heatsink (for VR1)
—	400016-05	Screw, No. 6 - 32 x 3/8 Pan Head Slotted (for VR1)
—	400783-05	Nut, No. 6 - 32, Hex Keps (for VR1)



- 1 Paper Instruction Options only.
(-3,-4,-6,-9,-10,-12 and -15)
- 2 Parity Options only.
(-2,-4,-8,-10 and -16)
- 3 Long Line Options only.
(-13 thru -16)
- 4 Non-Long Line Options only.
(-1 thru -12)

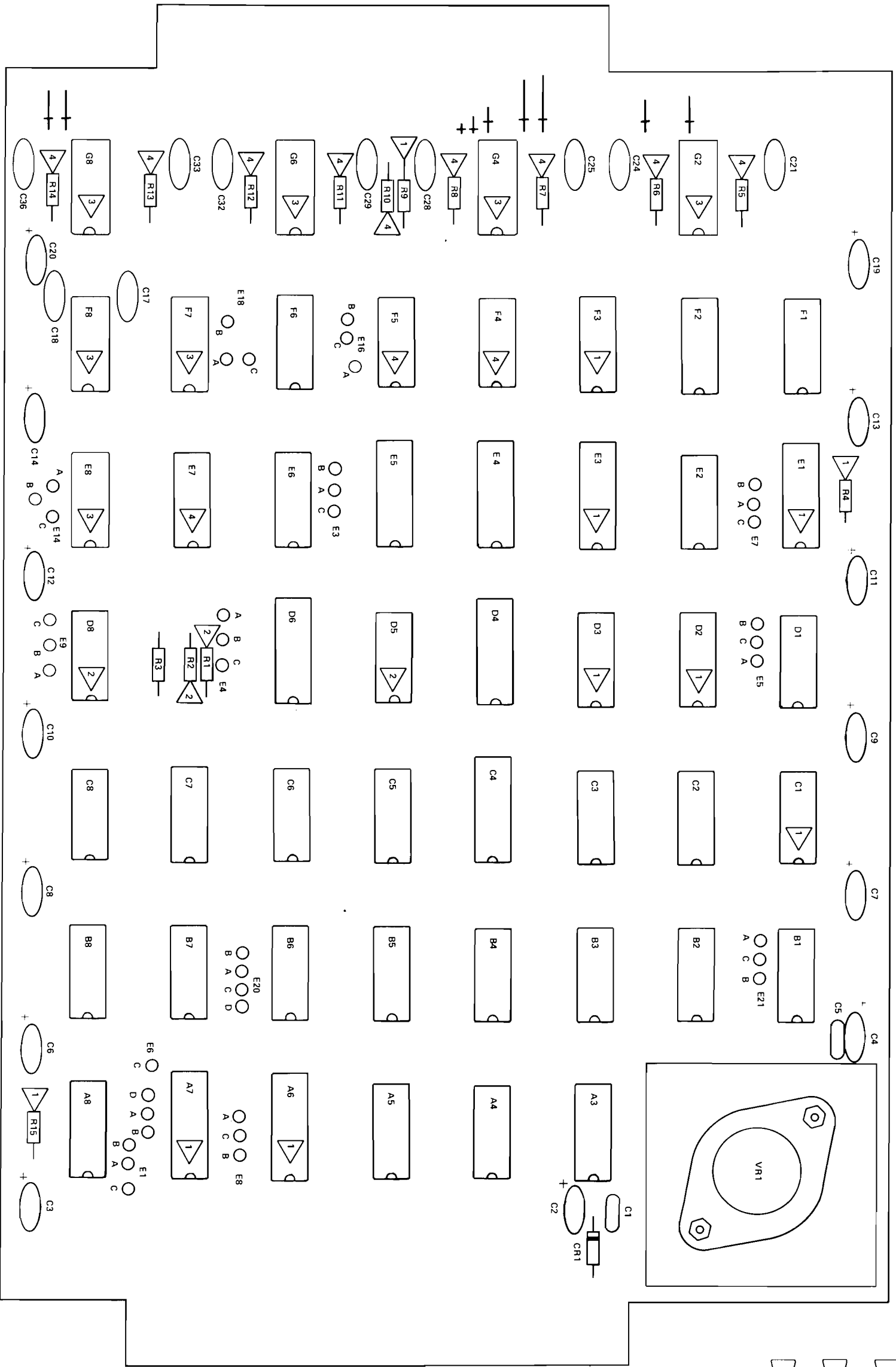


Figure 7
DATA PRODUCTS INTERFACE
CIRCUIT BOARD
(Reference No. 603825)

CONFIGURATION

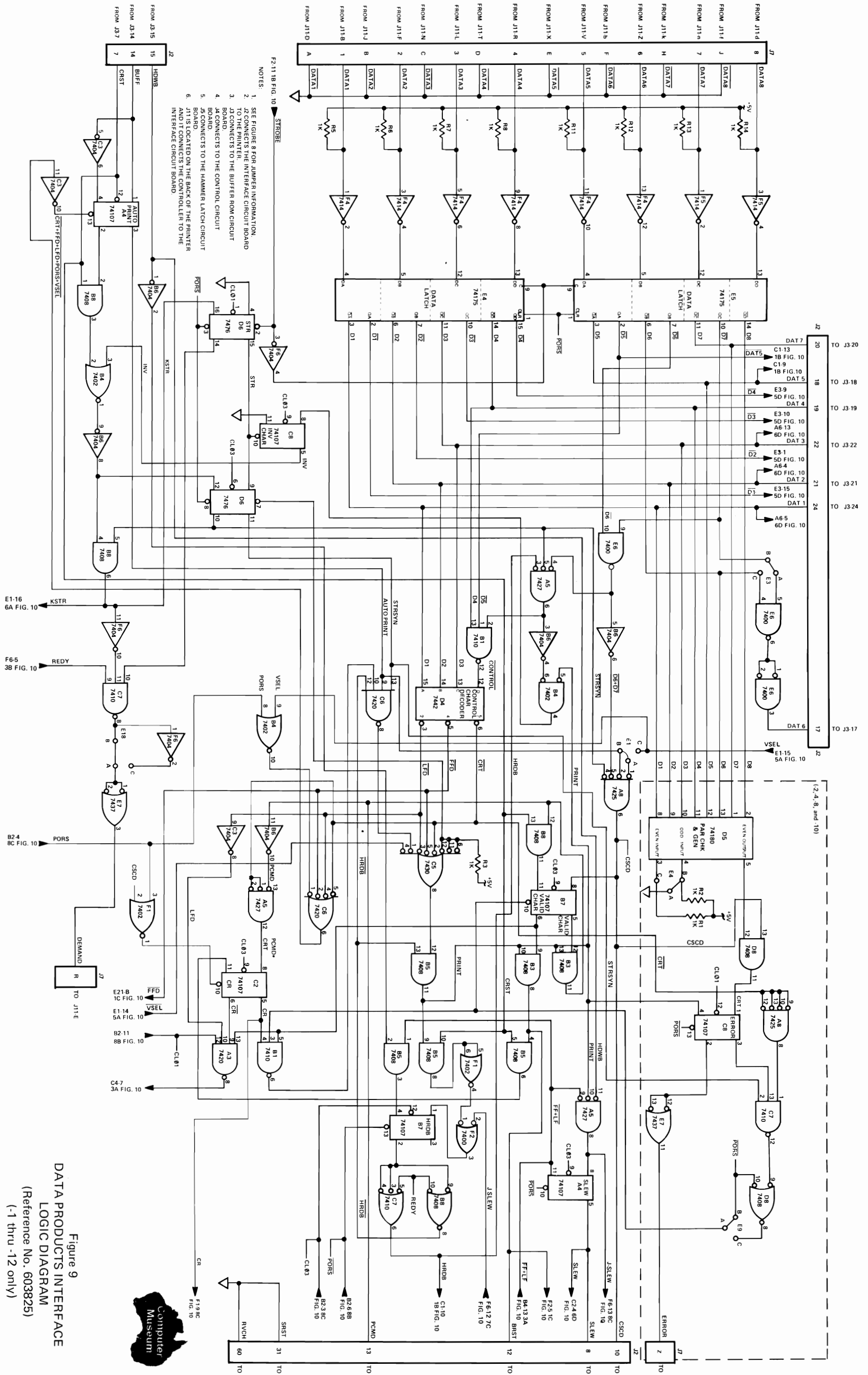
JUMPER NUMBER	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16
E1	A-B	A-B	A-C	A-C	A-B	A-C	A-B	A-B	A-C	A-C	A-B	A-C	A-B	A-B	A-C	A-B
E3	A-B	A-B	A-B	A-B	A-B	A-B	A-C	A-C	A-C	A-C	A-C	A-C	A-B	A-C	A-C	A-C
E4	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B
E5	A-B	A-B	A-C	A-C	A-B	A-C	A-B	A-B	A-C	A-C	A-B	A-C	A-B	A-B	A-C	A-B
E6	A-B	A-B	A-D	A-D	A-B	A-D	A-B	A-B	A-D	A-D	A-B	A-D	A-B	A-B	A-D	A-B
E7	A-C	A-C	B-C	B-C	A-C	B-C	A-C	A-C	B-C	B-C	A-C	B-C	A-C	A-C	A-B	A-C
E8	A-B	A-B	A-C	A-C	A-B	A-C	A-B	A-B	A-C	A-C	A-B	A-C	A-B	A-B	A-C	A-B
E9	A-B	A-C	A-B	A-C	A-B	A-B	A-B	A-C	A-B	A-C	A-B	A-B	A-B	A-B	A-B	A-C
E14	A-B	A-B	A-B	A-B	A-C	A-C	A-B	A-B	A-B	A-B	A-C	A-C	A-B	A-B	A-B	A-B
E16	A-B	A-B	A-B	A-B	A-C	A-C	A-B	A-B	A-B	A-B	A-C	A-C	A-B	A-B	A-B	A-B
E18	A-B	A-B	A-B	A-B	A-C	A-C	A-B	A-B	A-B	A-B	A-C	A-C	A-B	A-B	A-B	A-B
E20	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D
E21	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B	A-B

NOTE:

E3 A TO B IS FOR UPPER CASE ONLY

E3 A TO C IS FOR UPPER AND LOWER CASE

Figure 8
JUMPER INFORMATION



- NOTES
1. SEE FIGURE 8 FOR JUMPER INFORMATION.
 2. J2 CONNECTS THE INTERFACE CIRCUIT BOARD TO THE PRINTER.
 3. J3 CONNECTS TO THE BUFFER FROM CIRCUIT BOARD.
 4. J4 CONNECTS TO THE CONTROL CIRCUIT BOARD.
 5. J5 CONNECTS TO THE HAMMER LATCH CIRCUIT BOARD.
 6. J11 IS LOCATED ON THE BACK OF THE PRINTER AND J11 CONNECTS THE CONTROLLER TO THE INTERFACE CIRCUIT BOARD.

Figure 9
DATA PRODUCTS INTERFACE
LOGIC DIAGRAM
(Reference No. 603825)
(-1 thru -12 only)



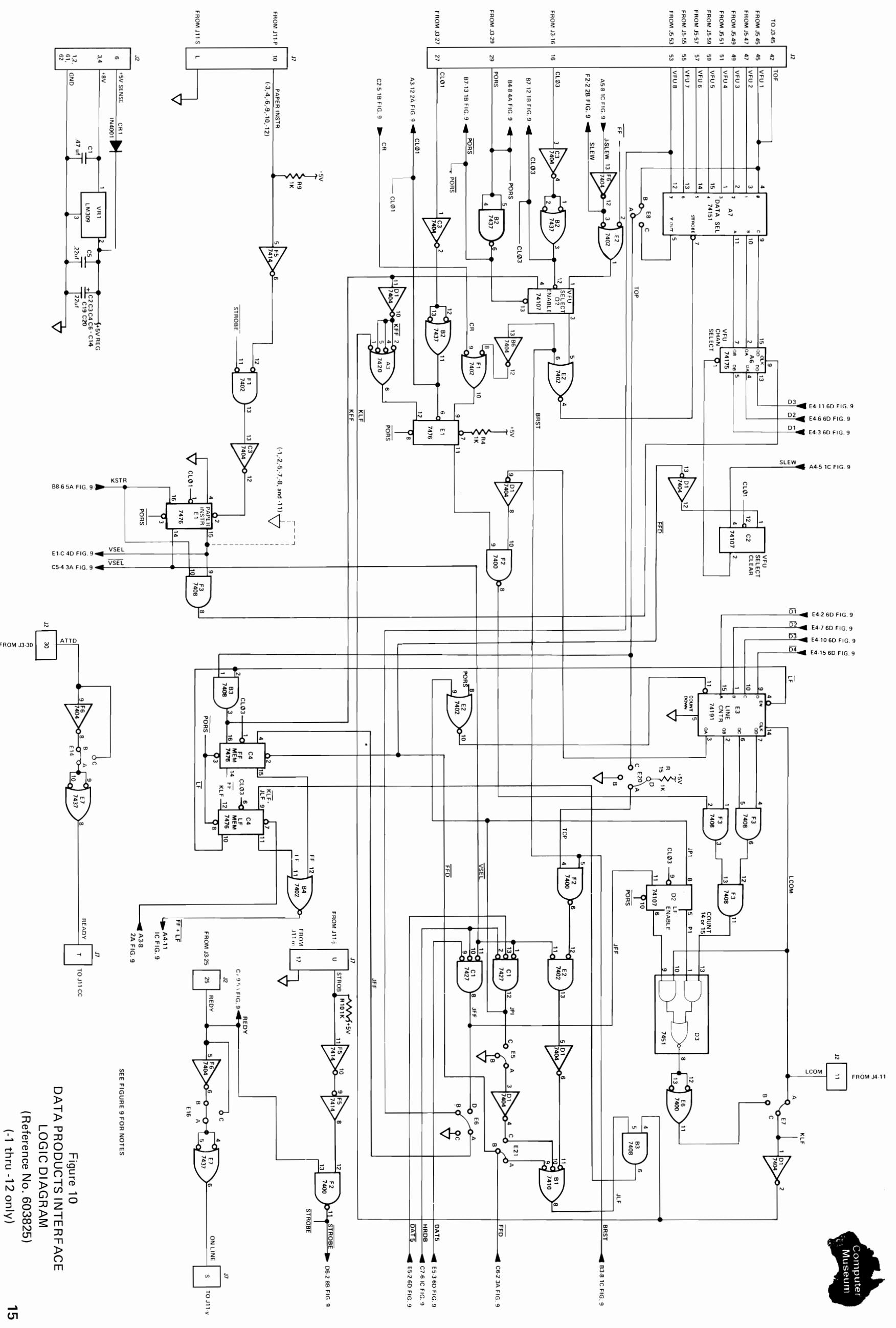


Figure 10
DATA PRODUCTS INTERFACE
LOGIC DIAGRAM
(Reference No. 603825)
(-1 thru -12 only)

SEE FIGURE 9 FOR NOTES



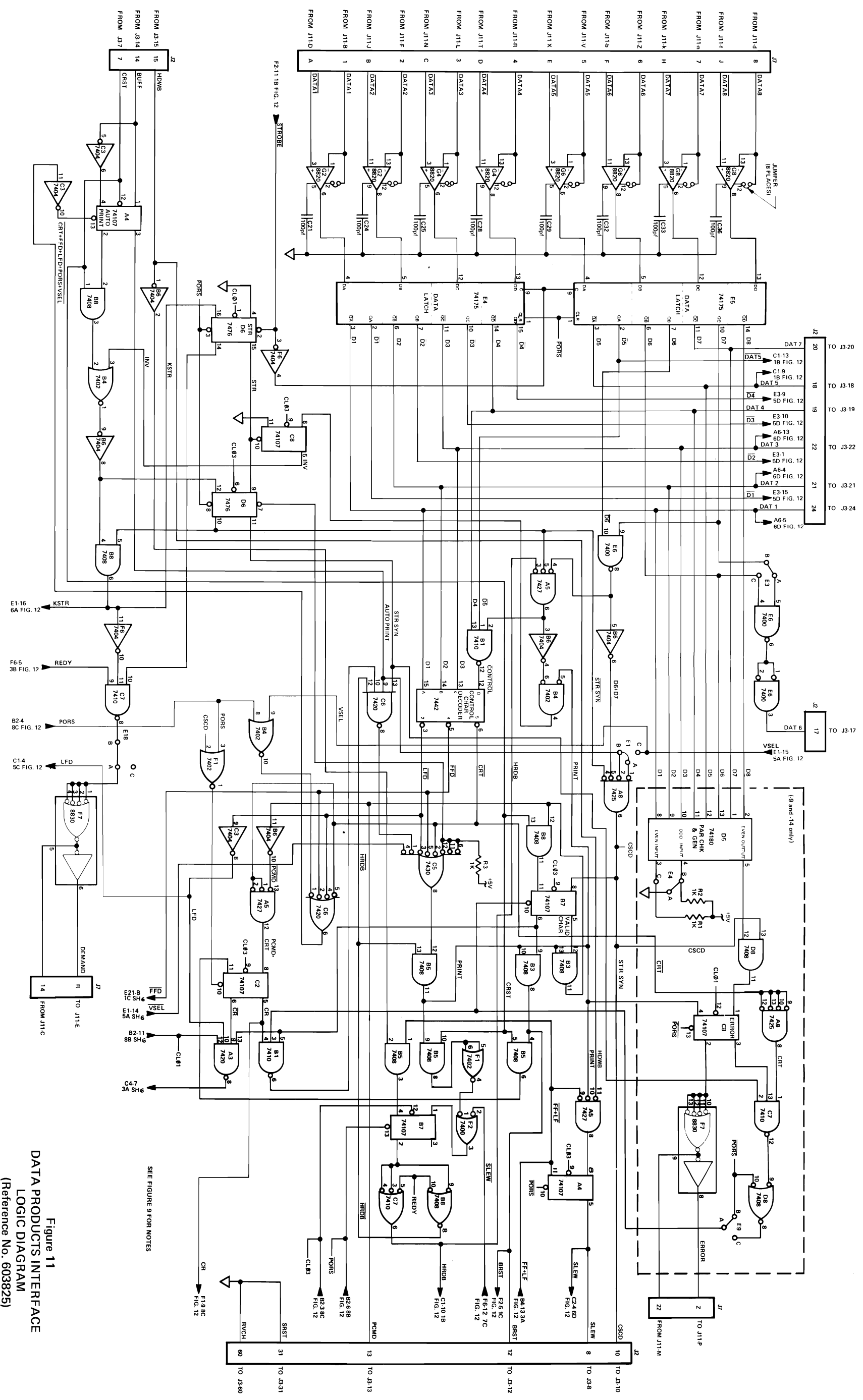


Figure 11
 DATA PRODUCTS INTERFACE
 LOGIC DIAGRAM
 (Reference No. 603825)
 (-13 thru -16 only)

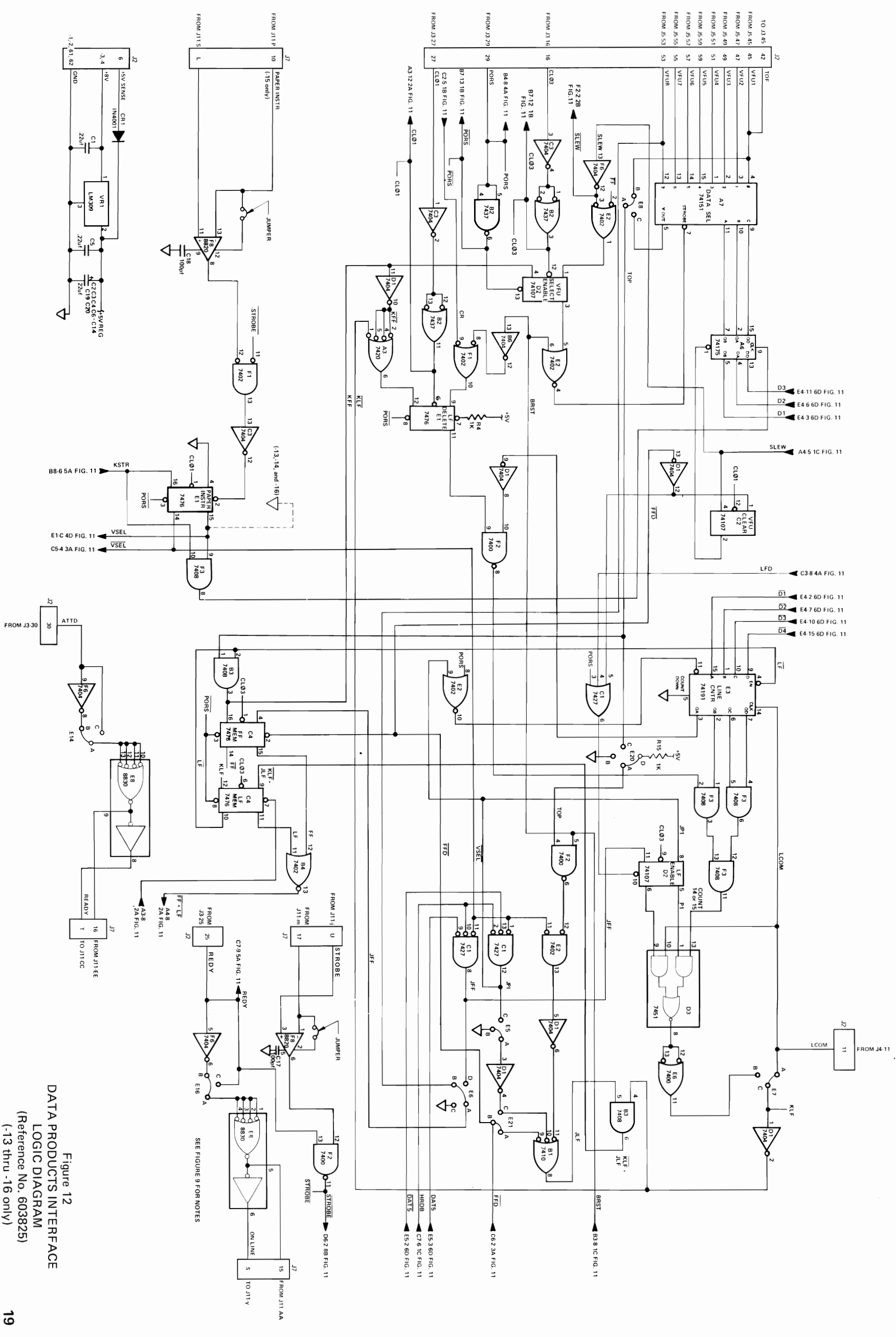


Figure 12
DATA PRODUCTS INTERFACE
LOGIC DIAGRAM
(Reference No. 603825)
(-13 thru -16 only)

