vistagraphic

DR11W, DR11B, DR11C, and DRV11B parallel interface users manual

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CalComp
A Lockheed Company

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DISCLAIMER

CalComp has carefully prepared and reviewed this manual for accuracy. However, CalComp assumes no responsibility or liability for incidental or consequential damages arising from the use of this manual.

PROPRIETARY NOTICE

WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

RECORD OF CHANGES

CHANGE NO.	DATE	TITLE OR BRIEF DESCRIPTION	ENTERED BY
Original	MARCH 84		
A	NOV 85	Added DR11C and V4500 I/Fs.	
1	AUGUST 85	Clarify switch settings. Update.	
B	MARCH 87	Integrate TMC 1	

PREFACE

The DR11-W, DR11-B, DR11-C, and DRV11-B are direct memory access (DMA) parallel interfaces. The DR11-W, DR11-B, and DR11-C interfaces connect CalComp's Vistagraphic systems to Digital Equipment Corporation's UNIBUS.*

The DRV11-B interface connects CalComp's Vistagraphic systems to Digital Equipment Corporation's LSI system bus.

This document contains hardware and software interface information including instructions for installing the necessary circuit board and cables, and a summary of the handshaking signals, register descriptions, and software characteristics.

*UNIBUS and LSI are trademarks of Digital Equipment Corporation.

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SECTION 1

INTRODUCTION

1.1 GENERAL INFORMATION

The CalComp 24-bit Selectable Parallel Interface (24 bit SPI) is a multilayered parallel interface board that allows the host to access 24 address bits in Vistagraphic 4000 systems and 18 address bits in Vistagraphic 1000 and 3000 systems. The SPI has four modes of operation, which are factory set by switches and jumper plugs:

- DR11-B
- DR11-W
- DRV11-B
- DR11-C

Before you install the parallel interface, first determine which assembly pertains to your configuration according to the listings below.

DR11-B (Vistagraphic 1000 and 3000)

Model No. 5714	Assembly No. 5811614
• circuit card	5810058G1
• cable	5811454G2 (interconnect panel to card)
• cable	5811454G3
• cable	5811764G1 (panel to host - 25')
or	5811764G2 (panel to host - 50')

DR11-B (Vistagraphic 4000)

Model No. 4023	Assembly No. 5811726
• circuit card	5810058G1
• cables (2)	5811454G1 (CCA to rear panel)
• cable	5811764G1 (rear panel to host - 25')
or	5811764G2 (rear panel to host - 50')

DR11-W (Vistagraphic 1000 and 3000)

Model No. 5728 Assembly No. 5811615

• circuit card	5810015G1
• cable	5811454G2 (panel to card)
• cable	5811454G3 (panel to card)
• cables (2)	5810020G2 (25' card to host)
or	5810020G5 (50' card to host)
• cables (2)	5811455G1 (25' panel to host)
or	5811455G2 (50' panel to host)

DR11-W (Vistagraphic 4000)

Model No. 4024 Assembly No. 5811725

• circuit card	5810015G1
• cables (2)	5811454G1 (card to rear panel)
• cables (2)	5811455G1 (rear panel to host - 25')
or	5811455G2 (rear panel to host - 50')

DR11-W (Vistagraphic 4500)

Model No. 4534 Assembly No. 6003132

• circuit card	5810015G1
• cable	6003249G2 (card to rear panel)
• cable	6003249G3 (card to rear panel)
• cables (2)	6003250G1 (rear panel to host - 25')
or	
• cables (2)	6003250G2 (rear panel to host - 50')

DRV11-B (Vistagraphic 1000 and 3000)

Model No. 5729 Assembly No. 5811613

• circuit card	5810056G1	
• cable	5811454G2	(card to interconnect panel)
• cable	5811454G3	
• cables (2)	5811455G1	(25' from panel to host)
or	5811455G2	(50' panel to host)
• cables (2)	5810020G2	(25' card to host)
or	5810020G5	(50' card to host)

DRV11-B (Vistagraphic 4000)

Model No. 4025 Assembly No. 5811724

• circuit card	5810056G1	
• cables (2)	5811454G1	(card to rear panel)
• cables (2)	5811455G1	(rear panel to host - 25')
or	5811455G2	(rear panel to host - 50')

DRV11-B (Vistagraphic 4500)

Model No. 4535 Assembly No. 6003133

• circuit card	58I0056G1	
• cable	6003249G2	(card to rear panel)
• cable	6003249G3	(card to rear panel)
• cables (2)	6003250G1	(rear panel to host - 25')

DR11-C (Vistagraphic 1000 and 3000)

Model No. 5712 Assembly No. 5811334

• circuit card	5802528G2	
• cable	1089756G5	(with interconnect panel)
• cable	5977207G5	(without interconnect panel)
• cable	1089623	(to system interconnect panel)

1.2 SPI INTERFACE REGISTERS

The SPI contains five registers. Tables 1-1 through 1-6 list the register addresses and bit descriptions.

Table 1-1. Register Addresses

REGISTER	$ADDRESS_{(8)}$	$ADDRESS_{(16)}$
Word count register (WCR)	172410	F508
Memory address register (MAR)	172412	F50A
Status register (STR)	172414	F50C
Data Registers (IDR and ODR)	172416	F50E
Upper memory address register (UMAR)*	172422	F512

*The upper memory address register allows for 24 bits of addressing in Vistagraphic 4000 systems.

Table 1-2. Word Count Register Bit Descriptions

BIT	NAME	DESCRIPTION
00-15	Word count	Program read/write cleared by bus reset. To initiate DMA mode, the program writes the twos complement of the number of 16-bit words to be transferred between memory and the host. Each time the parallel interface completes a DMA word transfer, the word count increments by +1. The interface continues in DMA mode until word count = 0, then sets DMA complete (status register bit 4) and generates an interrupt to GCP.

Table 1-3. Memory Address Register Bit Descriptions

BIT	NAME	DESCRIPTION
00-15	Least significant memory address word	Program read/write, cleared by bus reset. Before entering DMA mode, the program writes the 16 least significant bits of the starting memory address for the transfer. After each 16-bit word is transferred, the parallel interface increments the address by +2 bytes (during the DMA mode).

REGISTER BIT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CONTENTS	A15	A14	A13	A12	A11	A10	A09	A08	A07	A06	A05	A04	A03	A02	A01	A00

Table 1-4. Upper Memory Address Register Bit Descriptions

BIT	NAME	DESCRIPTION
00-07	Most significant memory address byte	Program read/write, cleared by bus reset. Before entering DMA mode, the program writes the 8 most significant bits of the starting memory address for the transfer. After each 16-bit word is transferred, during the DMA mode, the parallel interface increments the address by +2 bytes.
08-15	Not used	These bits are don't cares when the program writes to UMAR. These bits are zeros when the program reads the UMAR.

REGISTER BIT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CONTENTS	X	X	X	X	X	X	X	X	A23	A22	A21	A20	A19	A18	A17	A16

Table 1-5. Status Register Bit Descriptions

BIT	NAME	DESCRIPTION
00	Spare input No. 1	Program read/write, cleared by bus reset. This bit is directly presented to the host and can be programmed as required.
01 02	Address bits 16, 17 (used only with 18-bit addressing)	Program read/write, cleared by bus reset. These bits are used in conjunction with the memory address register to expand the DMA addressing capability by 256 Kbytes.
03	DMA I/O	Program read/write cleared by bus reset. The program writes this bit before a DMA mode as follows: 1 = DMA input, 0 = DMA output. This bit must not be changed until the DMA operation is complete.
04	DMA complete	Program read only cleared by bus reset or by starting a DMA transfer. The parallel interface sets this bit at the completion of the DMA transfer.
05	Output word received	Program read/write (set only), cleared by bus reset. This bit, which is sent to the host to indicate that the parallel interface has taken data, is set when a data ready interrupt occurs or when output control (bit 07) is sensed. During an output DMA, the parallel interface sets this bit. It is cleared whenever output control is not present.
06	Output interrupt enable	Program read/write, cleared by bus reset. This bit when set, lets the parallel interface generate an interrupt to indicate either data ready or output DMA complete.
07	Output control	Program read only. This bit reflects the state of the output control signal from the host, and is raised to indicate that output data is available.
08	Word Count $\neq$ 0	Program read only, cleared by bus reset. This bit when set indicates that the word count register contains a non-zero value.

Table 1-5. Status Register Bit Descriptions (Cont)

BIT	NAME	DESCRIPTION
09 10	Attention No. 1, No. 2	Program read only. These bits reflect the state of the attention signals from the host. If bit 11 is high, a low-to-high transition of either attention bit causes an optional interrupt to be generated to the host.
11	Attention interrupt enable	Program read/write, cleared by bus reset. This bit when set lets the parallel interface generate an optional attention interrupt if either attention bit goes high.
12	Spare input No. 2	Program read/write, cleared by bus reset. This bit is directly presented to the host, and can be programmed as required.
13	Input word request	Program read/write (set only), cleared by bus reset. For a single word input transfer, the program loads the input data register, then sets this bit to indicate to the host that data is available. Either a data taken interrupt or sensing input ready (bit 15) indicates that the single word transfer is complete. For an input DMA transfer, the parallel interface reads data from memory, loads the input data register, then sets this bit. This bit is cleared whenever a new data ready pulse (NDRY) occurs. The parallel interface generates a NDRY pulse for the host whenever input control from the host goes high.
14	Input interrupt enable	Program read/write, cleared by bus reset. This bit when set lets the parallel interface generate an interrupt to indicate either data taken or input DMA complete.
15	Input not ready	Program read only. This bit is reset if both the input word request (bit 13) and the input control signal from the host are clear. This bit when set indicates that an input data transfer is in process.

Table 1-6. Data Register Bit Descriptions

	OUTPUT DATA REGISTER	
00-15	Output data	Program read only. These bits reflect the state of the data lines from the host. The program reads these bits when a data ready interrupt occurs, or after sensing output control (status bit 07). During an output DMA, the parallel interface loads this data into memory. Data from the host is active low.
	INPUT DATA REGISTER	
00-15	Input data	Program write only, cleared by bus reset. These bits are presented directly to the host. During an input DMA, the parallel interface loads this register with memory data. During single word transfers, the program loads this data before raising input word request (status bit 13).

1.3 PARALLEL INTERFACE INTERRUPT TRAP ADDRESSES

INTERRUPT	$ADDRESS_{(8)}$	$ADDRESS_{(16)}$
Input	120	50
Output	124	54
Attention	130	58

1.4 DELETED

SECTION 2

INSTALLATION INSTRUCTIONS

2.1 CONNECTION DIAGRAMS AND CIRCUIT CARD LOCATIONS

The following pages contain connection diagrams for installing the circuit board and cables for your particular configuration.

If your system is a Vistagraphic 4000 (pedestal version), install the circuit board in slot 4, 5, or 6 (right side from backpanel).

If your system is a rack-mount V4000, install the circuit board in the furthest slot to the left.

Vistagraphic 1000 and 3000 circuit board locations vary depending on the system configuration; refer to the installation manual.

In V1000 and V3000 systems, note that cable connections vary depending on whether your configuration includes an interconnect panel. Refer to the connection diagram that pertains to your system on the following pages.

For Vistagraphic 4500 systems, install the circuit board in slot A9 for rack-mount systems, slot A6 for tower units.

2.2 SWITCH SETTINGS (PARALLEL INTERFACE BOARD)

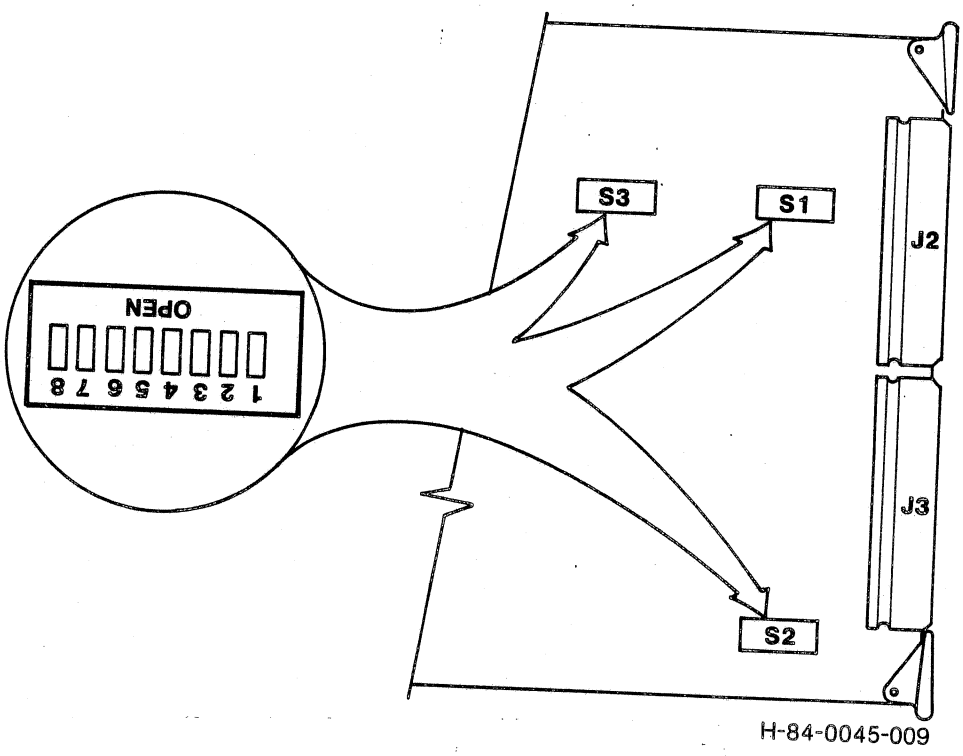
Each parallel interface card has three 8-section switches (see figure). Installing the card, check that the switches are properly set. Refer to the tables below.

Settings for Switches S1 and S2

PARALLEL INTERFACE TYPE	S1 SETTINGS	S2 SETTINGS
DR11-B	All sections open	All sections open
DR11-W	All sections closed	All sections closed
DRV11-B	All sections closed	All sections closed

Settings for Switch S3

SWITCH SECTION	V1000, 3000	V4000, V4500
1	Open	Closed
2	Open	Closed
3	Closed	Closed
4	Open	Open
5	Closed	Closed
6	Open	Open
7	Closed	Open
8	Closed	Open



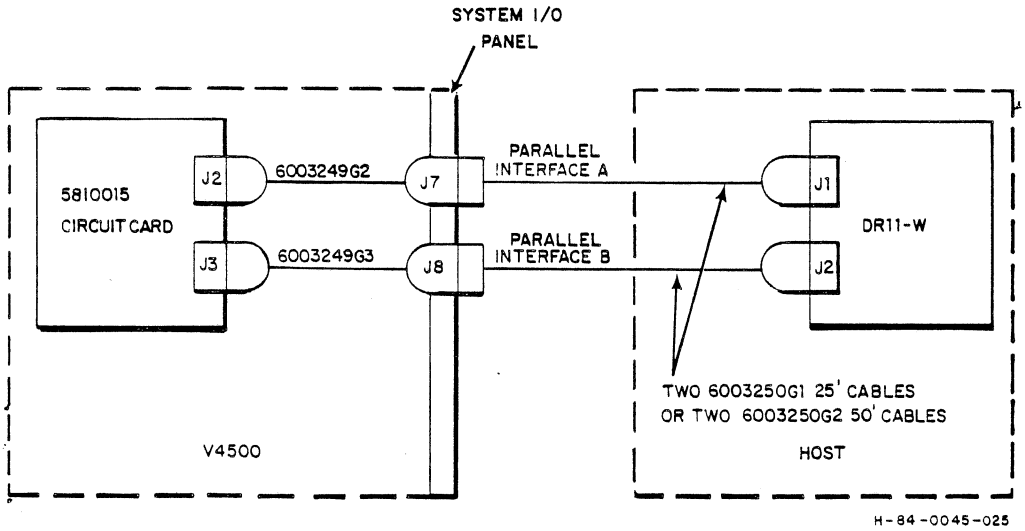
Switch Locations

2.3 SWITCH SETTING (SYSTEM PROCESSOR)

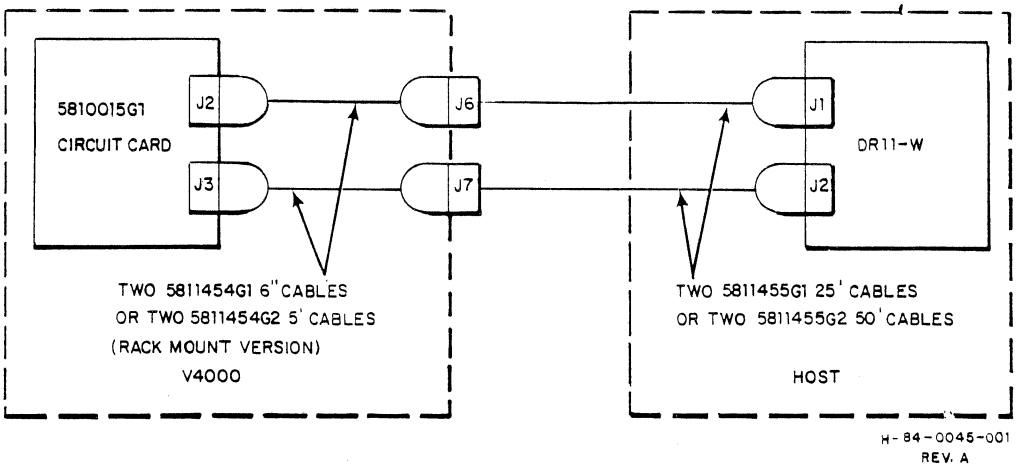
The system processor board contains switches that are set to correspond with the parallel interface board. Vistagraphic 1000 and 3000 systems use only 18-bit addressing; the switches are factory set and do not need to be altered.

Vistagraphic 4000 and 4500 system processor boards use a switch(es) that corresponds with various character framing and 18- and 24-bit addressing. For information regarding these settings, refer to the maintenance manual for your particular system:

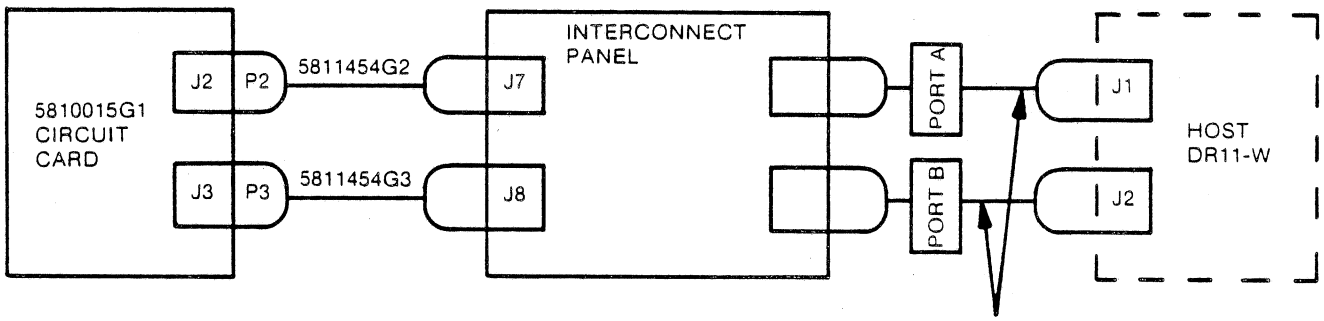
V4000 - H-81-0352B (Section 2)
V4500 - H-83-0612 (Section 2)



Connection Diagram DR11-W (V4500)

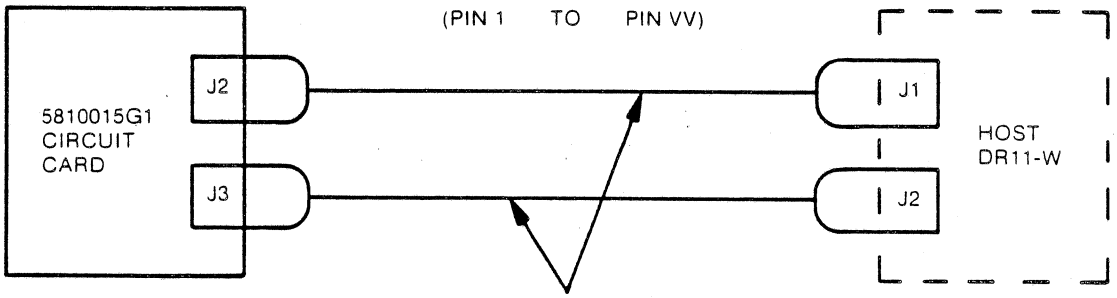


Connection Diagram DR11-W (V4000)



WITH INTERCONNECT PANEL

TWO 5811455G1 (25' FLAT RIBBON CABLE)
OR TWO 5811455G2 (50' FLAT RIBBON CABLE)



TWO 5810020G2 25' FLAT RIBBON CABLES
OR TWO 5810020G5 50' FLAT RIBBON CABLES

WITHOUT INTERCONNECT PANEL

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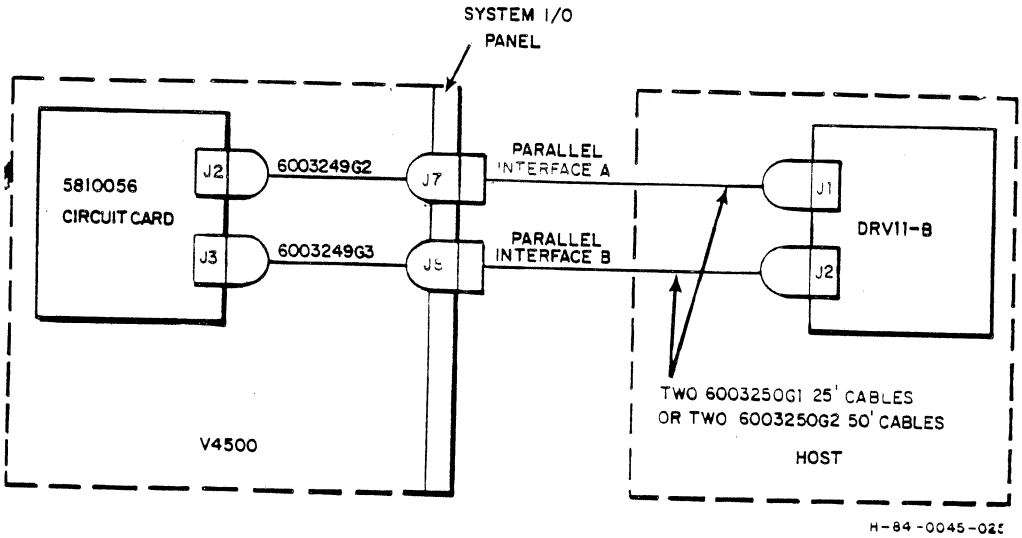
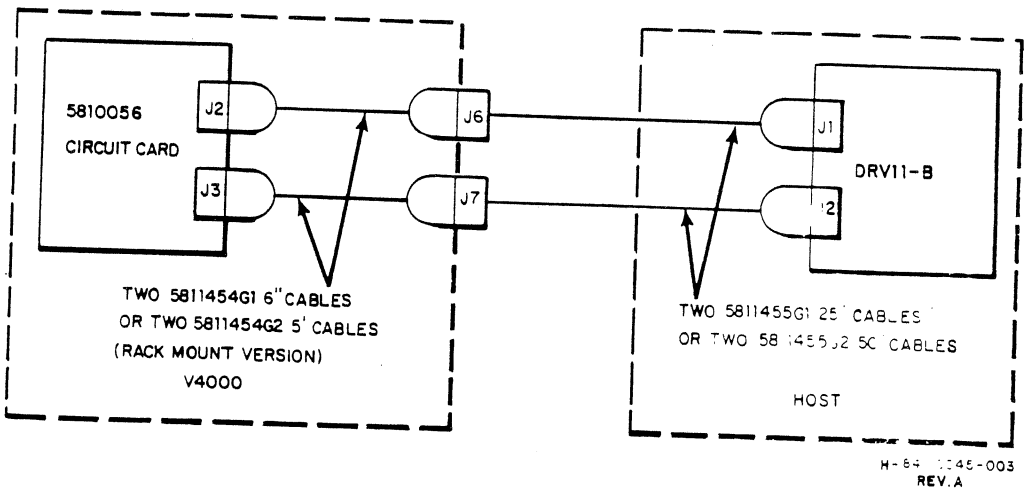
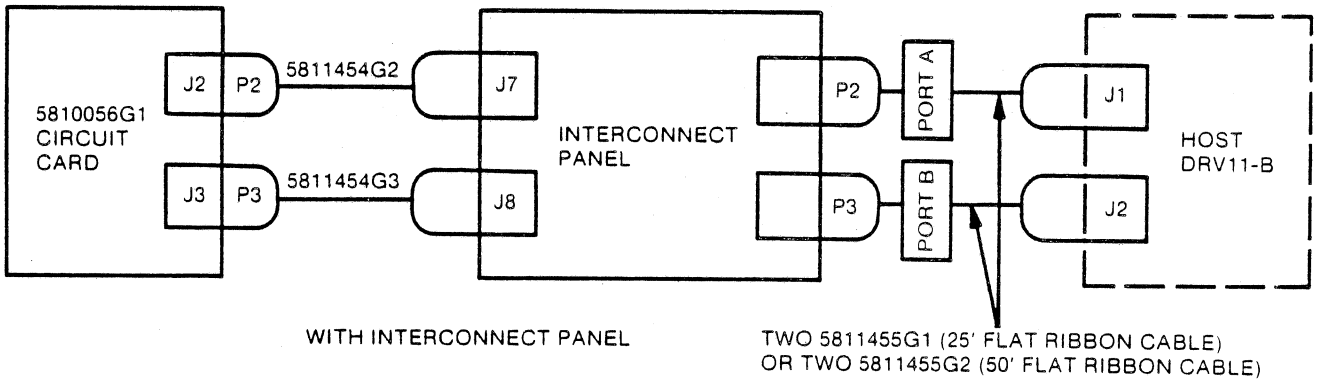
Connection Diagram DR11-W (V1000, V3000)

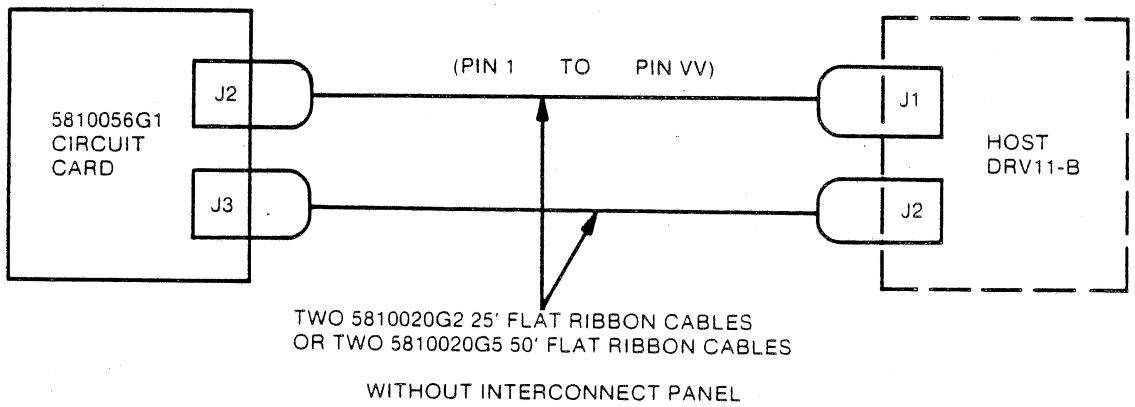


Connection Diagram DRV11-B (V4500)



Connection Diagram DRV11-B (V4000)





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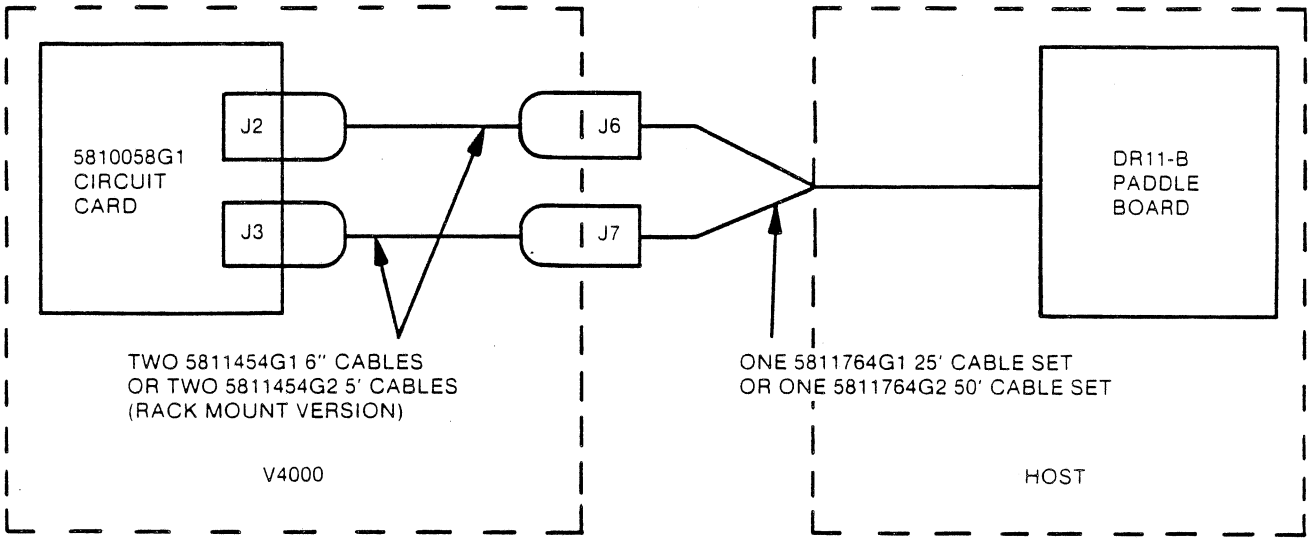
Connection Diagram DRV11-B (V1000, V3000)



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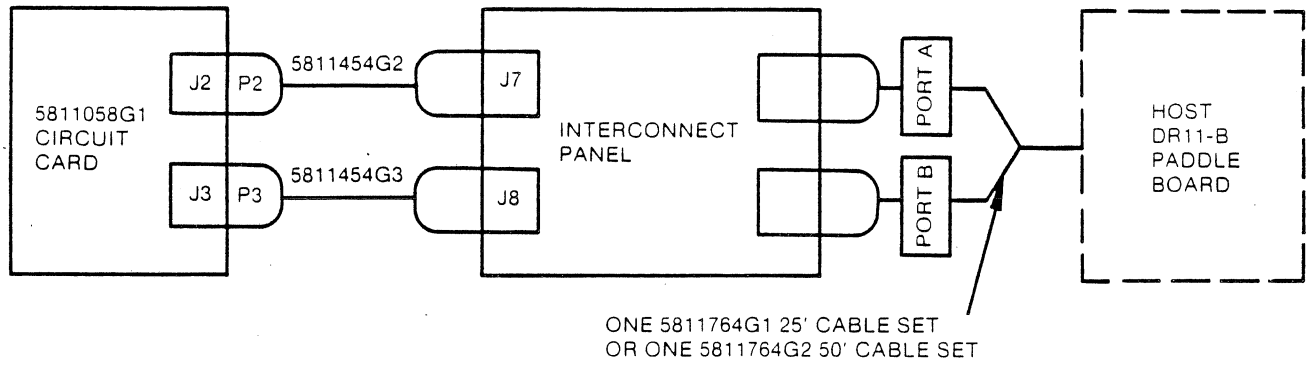
Connection Diagram DR11-B (V4000)



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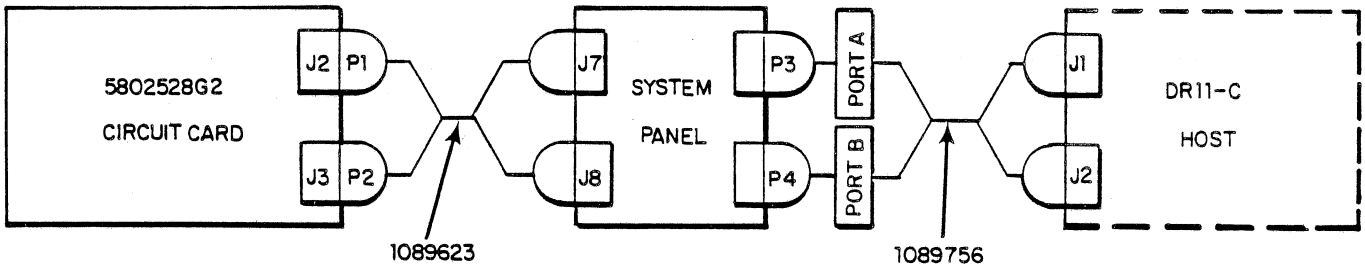
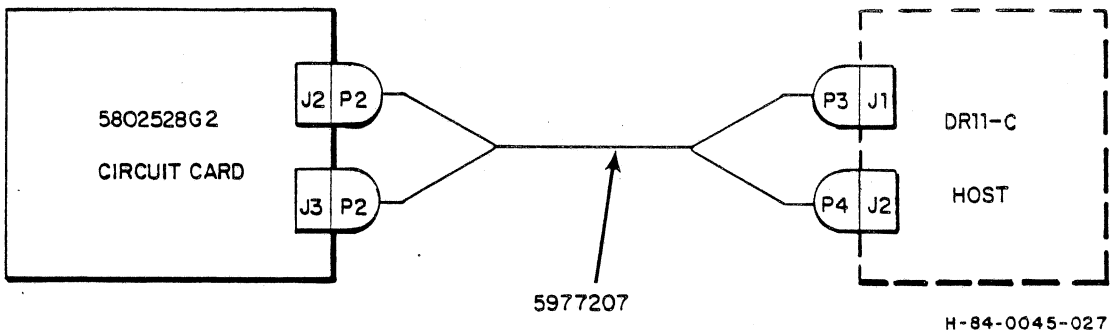
Connection Diagram DR11-B (V1000, V3000)



Connection Diagram DR11-C (V1000, V3000)
with Interconnect Panel



Connection Diagram DR11-C (V1000, V3000)
without Interconnect Panel

SECTION 3

INTERFACE SIGNALS

NOTE

All references to input and output in this document are with respect to Selectable Parallel Interface (SPI). Input means input from the Vistagraphic system to the host computer; output means output from the host computer to the Vistagraphic system.

3.1 INPUT TRANSFER SIGNALS (SPI to HOST)

MNEMONIC	NAME	FUNCTION
ID00 IN- ID15 IN	Input Data	Levels presented on these lines are read directly to memory when the host interface performs a DATO bus cycle. Data must remain stable for the entire DATO bus cycle.
C1 CTRL	C1 Control	This control signal specifies the type of bus cycle the host interface will perform. (Logic 0 = output, logic 1 = input.)
REQA	Cycle Request A	Generated by the 24 bit SPI, REQA signals the host interface to initiate a transfer, and sets the cycle flip-flop in the host. CYCLE initiates the sequence of requesting bus use (DEC HOST) and triggers the bus cycle after the host interface obtains control. CYCLE sets on the trailing edge of REQA.
REQB	Cycle Request B	This input to the host interface is "or"ed at the host interface with REQA. REQB is not used by the 24 bit SPI and is tied to ground (disabled).

MNEMONIC	NAME	FUNCTION
WC INC ENB	Word Count Increment Enable	This signal allows the Word Count Register (WCR) on the host interface to be incremented during each transfer. This input is tied +3V (enabled) on the 24 bit SPI.
BA INC ENB	Bus Address Increment Enable	This signal causes the Bus Address Register (BAR) on the host interface to be incremented during each transfer. This input to the host interface is tied to +3V (Enabled) on the 24 bit SPI.
A00	Bus Address Bit 00	Used for byte transfers, this host input signal allows the Vistagraphic to specify even or odd byte addresses.
DSTAT	Device Status Bits A, B, and C	The signal levels applied to these lines appear as bits 11, 10, and 09 of the CSR (Control Status Register on the host interface). These signals are defined as follows.
	DSTATA	Device Status Bit A. This signal is not used and is tied to ground on the 24 bit SPI.
	DSTATB	Device Status Bit B. This is the Input Word Request Signal (IWR); bit 13 of the status register. This signal, when logical 1 (+3V) indicates to the host that data is available for DMA transfer.

MNEMONIC	NAME	FUNCTION
	DSTATC	Device Status Bit C. This bit is set to a logical 1 (+3V) on the 24 bit SPI whenever the host interface has completed an output cycle and a data word is available at the output register (ODR) of the host interface. It is reset when the 24 bit SPI accepts the word.
BURST	Burst or Single Cycle	When set (+3V), this signal will hold control of the host for two bus cycles in order to speed up DMA transfers (Burst mode). Burst mode can only be generated when it is enabled by a jumper on the SPI and the SPI is configured as a DR11-W; otherwise, only single-cycle transfer will occur. If enabled, this signal will be set whenever bit 03 of the SPI status register is set, indicating a DMA input transfer and word count not equal zero. Burst mode is normally tied to ground (disabled) on the SPI.
ATTN	Attention	The ATTN signal appears at bit 13 of the CSR of the DR11. When ATTN is set, an ERROR flag is generated in the host interface. If IE (Interrupt Enable) has been set, it causes an interrupt. If a DMA transfer is in progress, the transfer is stopped at the completion of the current cycle. ATTN is generated by the 24 bit SPI when the following conditions are met. ATTN = READY*$\overline{\text{FNCT2}}$*IWR

3.2 OUTPUT TRANSFER SIGNALS (HOST TO SPI)

MNEMONIC	NAME	FUNCTION
OD00 - OUT OD15 - OUT	Output Data	Data is transmitted from the host interface Output Data Register (ODR) as OD00-0015. When the host does a DATI (output), the ODR is loaded with data read from memory. The data is sent to the 24 bit SPI.
INIT	Initialize	The initialization signal is sent by the host during power on/off, at the execution of a reset instruction when the CPU is initialized from its front panel, or when the MAINT bit in the CSR (Status register) is cleared. Init is not used on the 24 bit SPI.
FNCT 3, 2, and 1	Function Signals	These 3 signals are bits 3, 2, and 1 of the host DR11 CSR, and are used to specify SPI operations as follows: FNCT 3 - Program Initialize. When set to a "1" (+3V), initializes the Vistagraphic to the system mode of operation. FNCT 2 - ATTN ENABLE. When set to a "0", enables the 24 bit SPI to generate an ATTN to the host. FNCT2 when set to a "1" (+3V) inhibits the ATTN output. FNCT 1 - I/O Mode of Operation 0 (0V) = Output Mode 1 (+3V) = Input Mode

MNEMONIC	NAME	FUNCTION
READY		This signal corresponds to CSR bit 07. When set, it indicates that the host has completed the previous operation and is ready to accept a new command. When the GO bit is loaded into the CSR (host interface) indication that a command has been given, READY is cleared. READY is set when Word Count overflows, or an error (ATTN) condition develops.
BUSY		Busy indicates that a bus sequence is in progress. When set (+3V), a bus cycle is in progress, and no further request can be made. Busy becomes false (ground) when the bus cycle is completed.
END CYCLE		End of cycle is a 100ns pulse that indicates the completion of a host interface bus cycle. This signal is not used when the 24 bit SPI is configured in the DRV11-B mode.
GO		GO is a 200ns positive pulse that results from the setting of the GO bit in the CSR (bit 00. The GO pulse indicates that a new operation is to be performed. Not used when the 24 bit SPI is configured in the DRV11-B mode.

3.3 INTERFACE OPERATION

This section describes the sequence of events that occur between the SPI and the DEC interfaces. Variations between interfaces are noted in specific instances (see figure on following page).

3.3.1 OUTPUT TRANSFERS (Host to Vistagraphic)

1. Initialize System.

2. Host sets FNCT 2=1.

NOTE

FNCT 2=1 inhibits the ATTN input. This prevents an interrupt from the output enabling sequence of the host interface by an interrupt request from the 24 bit SPI.

3. The host sets up the word count and starting address.

4. The host writes to the Status Register.

- Sets GO
- Resets READY
- Sets FNCT1 = 0
- Sets FNCT2 = 0

NOTE

The DRV11-B does not have the GO signal. Extra hardware generates a 200ns pulse which emulates the GO signal when READY goes low.

5. The 24 bit SPI generates CYCLE REQUEST A in response to the GO READY signal. Cycle Request A initiates a memory read cycle by the host.

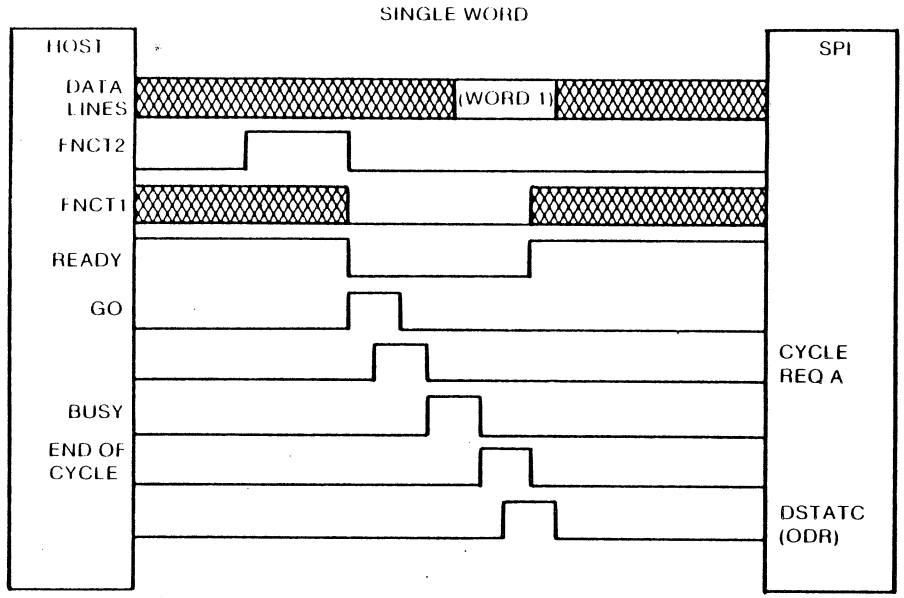
6. The host interface generates END OF CYCLE (output data available) which sets OCTL on the 24 bit SPI.

NOTE

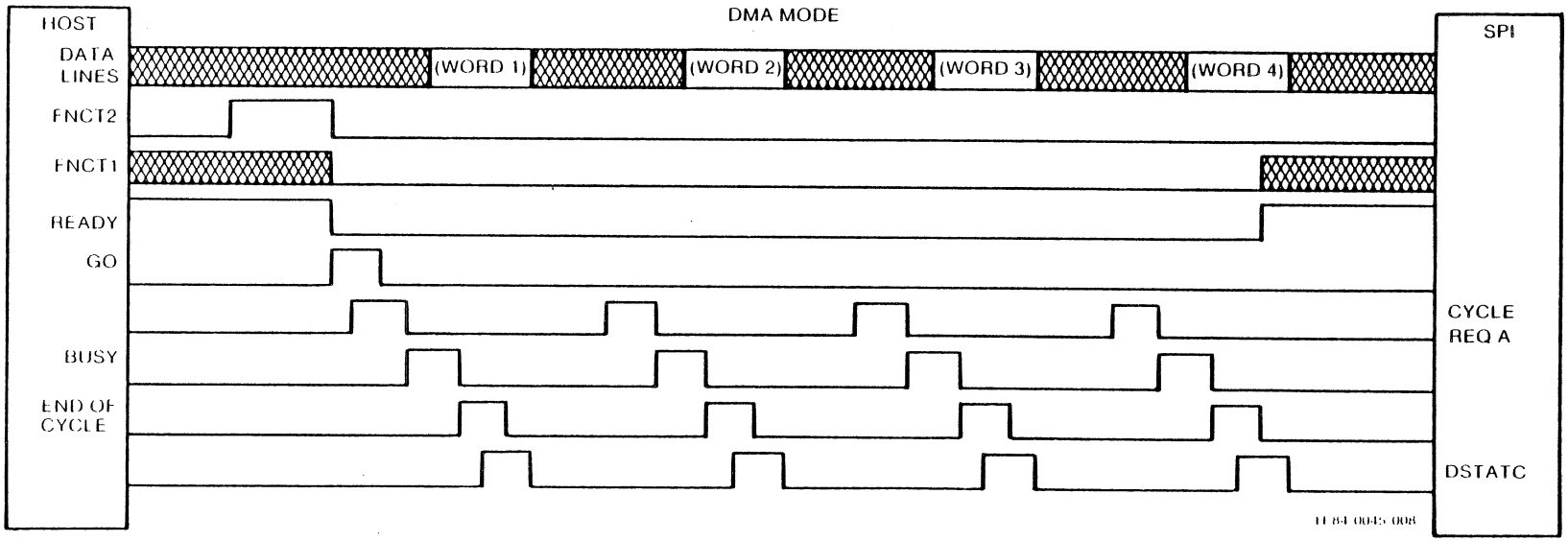
The DRV11-B does not have an END OF CYCLE signal. Extra hardware generates a 100ns pulse which emulates the END OF CYCLE signal when BUSY goes false.

7. The 24 bit SPI generates ODR (Data Received) and resets OCTL.

8. IF READY is still reset, (indicating a DMA transfer), the parallel interface will generate another CYCLE REQUEST A on the trailing edge of OCTL; otherwise, the output transfer is completed.



1 HOST SETS FNCT2 HI TO DISABLE INTERRUPTS DURING SETUP
2 HOST SETS FNCT1 LO (OUTPUT MODE) AND SETS READY LO AND SENDS GO PULSE (IF CONFIGURED AS A DRV11-B, THE SPI FAKES THE GO PULSE)
3 SPI STARTS ITS OUTPUT CYCLE AND SENDS CYCLE REQ A PULSE TO HOST
4 HOST SETS BUSY AND STEPS THROUGH ITS OUTPUT CYCLE
5 HOST SENDS END OF CYCLE INDICATING VALID DATA IS ON THE LINES (CAUSES OCTL1 ON SPI) (IF CONFIGURED AS A DRV11-B, THE SPI FAKES END OF CYCLE)
6. SPI COMPLETES ITS CYCLE AND SENDS DSTATC (ODR) PULSE WHEN DONE (CAUSES OCTL1 AND ODR11 ON SPI)
7. IF READY IS STILL LO, SPI STARTS ANOTHER OUTPUT CYCLE AND STEPS 3 THRU 6 ARE REPEATED. (DMA OUTPUT)



3.3.2 INPUT TRANSFERS (see figure on next page)

1. Initialize System.

2. The Vistagraphic System loads the input data register with the data to be input to the host.

3. Vistagraphic sets the IWR (Input Word Request).

4. Depending on the current mode of the SPI:

   a. If the SPI is not performing any operations (READY = 1 and FNCT2 = 0), the SPI will go directly to step 5.

   b. If the SPI is performing an output transfer (READY = 0 and FNCT1 = 0), the SPI will set the ATTN flip flop; the ATTN signal to the host DR11 will be inhibited until the output operation is completed (READY = 1). The SPI will go to step 6.

   c. If the SPI is performing an input transfer (READY = 0 and FNCT1 = 1), the SPI will go directly to step 10.

5. The leading edge of IWR sets the ATTN line on the parallel interface.

6. If the Interrupt Enable (IE) has been set on the DR11, the DR11 generates an interrupt in the host.

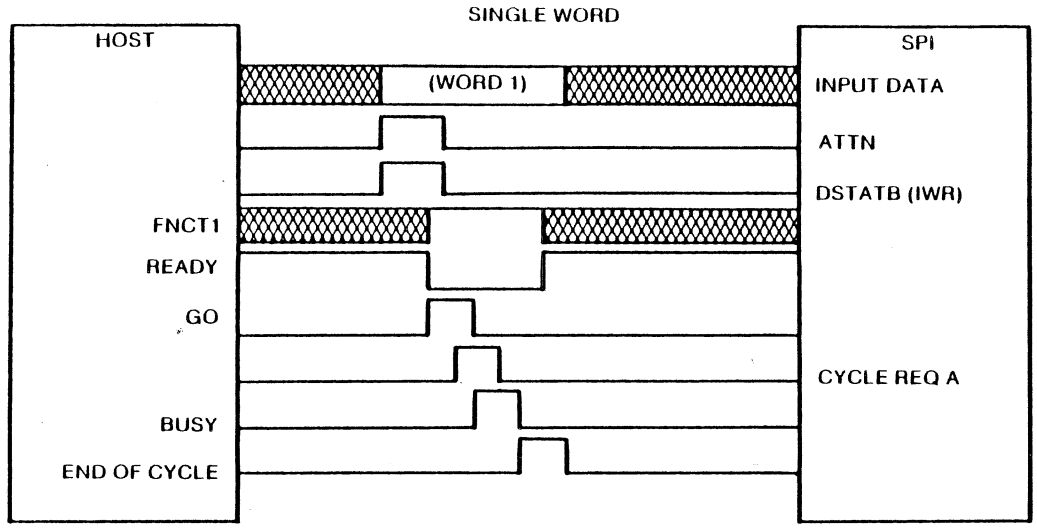
7. The host sets up the word count and starting address on the DR11 for the data transfer (NOTE: Word count is a function of the application software).

8. The host then writes to the DR11 status register to initiate the transfer.

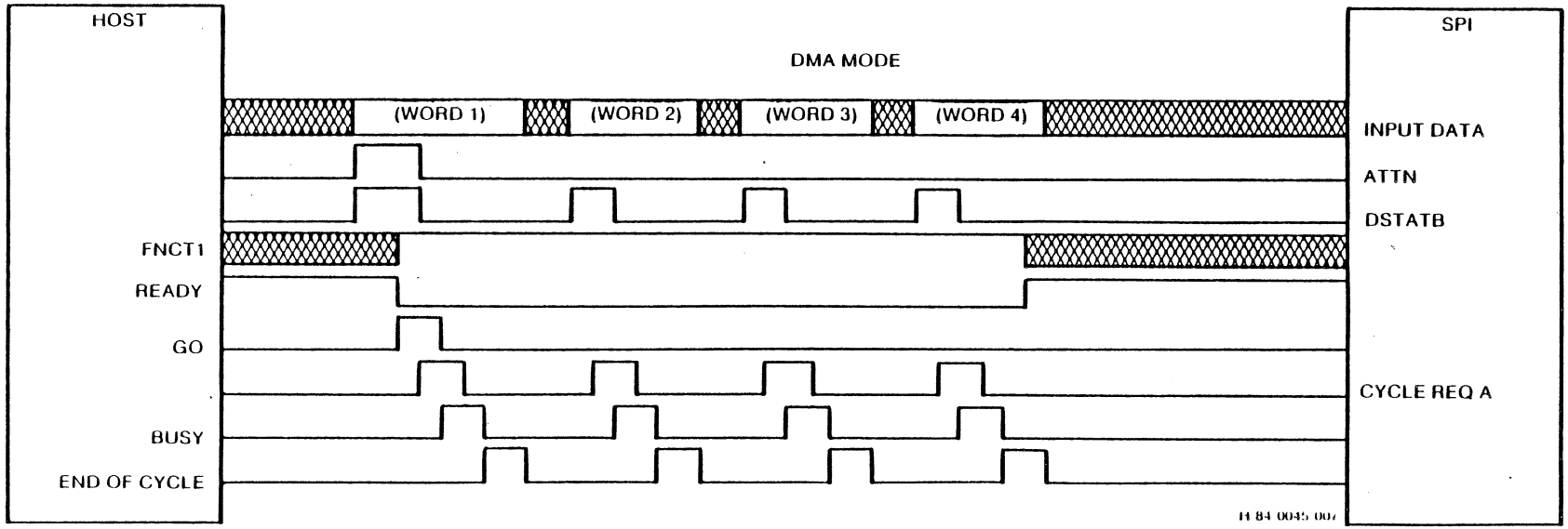
   GO = 1
   READY = 0
   FNCT1 = 1

NOTE

Since the DRV11-B does not have a GO signal, GO is generated on the 24 bit SPI when READY goes low.



1. SPI RAISES ATTN INTERRUPT AND DSTATB (IWR) AND WAITS FOR HOST TO ACKNOWLEDGE
2. HOST SETS FNCT1 HI (INPUT MODE), AND SETS READY LO AND SENDS GO PULSE. (IF CONFIGURED AS A DRV11-B, THE SPI FAKES THE GO PULSE)
3. SPI STARTS ITS INPUT CYCLE AND SENDS CYCLE REQ A PULSE
4. HOST SETS BUSY AND STEPS THRU ITS INPUT CYCLE. (BUSY SETS ICTL ON SPI)
5. HOST SENDS END OF CYCLE TO SAY IT HAS READ THE DATA (END OF CYCLE CAUSES ICTL TO RESET ON SPI). (IF CONFIGURED AS A DRV11-B, THE SPI FAKES END OF CYCLE)
6. IF READY IS STILL LO, SPI STARTS ANOTHER INPUT CYCLE AND STEPS 3 THRU 5 ARE REPEATED. (DMA INPUT)



9. The parallel interface resets the ATTN line.

10. Generates a CYCLE REQUEST A. CYCLE REQUEST A initiates a write cycle on the DR11.

11. The DR11 generates a BUSY (Bus Cycle in Operation) which sets ICTL on the parallel interface of the Vistagraphic.

12. At the end of the bus cycle, the DR11 generates END OF CYCLE (Data Taken) and resets ICTL on the 24 bit SPI completing the transfer.

NOTE

With END OF CYCLE on, the DRV11-B does not exist; therefore, END OF CYCLE is generated when BUSY goes false on the 24 bit SPI.

SECTION 4

SOFTWARE CHARACTERISTICS

4.1 HOST-VISTAGRAPHIC COMMUNICATIONS

All communications between the host computer and the Vistagraphic can be handled by GCP (Graphics Control Program), or can be downloaded user-generated software. Transmissions in either direction are referred to as messages. Each message begins with a command header that contains two ASCII characters to define the message type. The header is then followed by as many 16 bit words as are required to transmit the associated data. No translation of the data words is necessary and no end-of-message indicator is required.

GCP supports 19 different types of messages across the interface. They are divided into fundamental and additional messages. Table 4-1 summarizes the interface messages of the Vistagraphic, both fundamental and additional types.

However, as noted above, additional messages forming the user's own communications software can be written and used as per the interface protocol described herein.

4.2 GCP FUNDAMENTAL MESSAGES

These messages, which represent a nucleus of standard Vistagraphic functions allow the user to achieve an interactive graphic capability. These messages provide a means to display a graphic image, and allow the image to be rapidly transformed.

The format for these messages is shown below:

Each message consists of a command word followed by a number of argument words. The 16 bit command word is always formed as two 7 bit ASCII letters.

Example: Command Word: MU

	15	14 ... 8	7	6 ... 0	
MSB	0	ASCII M	0	ASCII U	LSB

4.3 GCP ADDITIONAL MESSAGES

Additional GCP messages give the user detailed control and access to all of the display terminal registers and parameters. These messages are available in the basic Vistagraphic terminal controller. See Table 4-1.

The additional message format is as per Section 4.2 and additional detail concerning all standard Host/Vistagraphic messages are found in the respective Programmer's Reference Manual.

Table 4-1. Host/Graphic System Message Summary

FUNDAMENTAL MESSAGES

Host-Vistagraphic		Vistagraphic-Host	
Initialize	IZ	Keyboard	KY
Memory Update	MU	Light Pen	PN
Start Picture	SP	Function Key	RK
Halt Picture	HP		

ADDITIONAL MESSAGES

Host-Vistagraphic		Vistagraphic-Host	
Continue Picture	KP	Keyboard No. 2	KT*+
Selective Update	SU	Light Pen No. 2	PT*
Give Image	GI	Return Image	RI
Give Register	GR	Return Register	RR
Enable Selected Interrupts	(IS)	Scratchpad Ready	XR XT+
Disable Selected Interrupts	(ZI)	Return PED	RP RW*
Interrupt Control	(IK)	Light Pen Switch	SW ST*
Light Function Keys	LK LT*+	Display Halt Interrupt	HI
Initialize PED(1)	IP IT*	Display X-Y Overflow	XI
Give PED	GP GT*	Error Condition	XX
Initialize Scratchpad	ZR ZT*	Variable Length Block	VL
Transfer Control	TK	Function Key No. 2	RL*+
No Operation	NO		

*These messages pertain to the second device of each type.

+Must enter extended device control (EDC) mode before second device can be accessed on Vistagraphic Systems 3000 and 4000 (refer to V3000 and Vistagraphic Programmer's Reference Manual).

4.4 SOFTWARE INTERFACE PROTOCOL

4.4.1 Vistagraphic-DR11 - Single Word Transfer

1. Move word to be sent to DR11 into Parallel Data Register.

2. Set bit 13 - Input Word Request - to notify DR11 that the Vistagraphic is ready to send data.

3. Test bit 15 - INPUT NOT READY - and loop until cleared acknowledging receipt of word by DR11.

4.4.2 Vistagraphic-DR11 - DMA Transfer

1. Enable DMA Input Mode to DR11 by setting bit 3-DMA MODE - in Parallel Interface Status Register

2. Set up memory addresses for data block to be sent.

3. Load the Word Count Register (WCR).

4. Test bit 4 - DMA COMPLETE - until it is set signifying the end of the DMA transfer.

4.4.3 DR11-Vistagraphic - Single Word Transfer

1. Test bit 7 - OUTPUT CONTROL - of Parallel Interface Status Register until set by DR11.

2. Move data word to memory after it is received in Parallel Data Register.

3. Set bit 5 - OUTPUT WORD RECEIVED - to notify DR11 that Vistagraphic had received the word.

4. Test bit 5 until cleared by DR11 acknowledge receipt of word by Vistagraphic.

4.4.4 DR11-Vistagraphic - DMA Transfer

1. Test OUTPUT CONTROL bit (bit 7) when set by DR11 - Host computer is ready to send data.

2. Clear bit 3 - DMA MODE - for DMA input from DR11.

3. Set up Vistagraphic memory addresses for data to be received.

4. Set up word count by loading Word Count Register (WRC) - this action initiates a DMA transfer.

5. Test bit 4 - DMA COMPLETE - until set signifying the end of the DMA transfer.

SECTION 5

ENGINEERING DRAWINGS

This section contains the following drawings, arranged in numerical order (parts lists and wire lists, where applicable, precede the assembly drawing):

	Number	Parts List and Wire List Page	Diagram Page
DR11-W	5810015	45	51
	5810017		53
	5810055		61
DRV11-B	5810056		63
	5810057		65
DR11-B	5810058		71
	5810059		73
DR11-C	5802528	43	44A
	5811606		83
	1086802	34A	34J
Cables	1089623	35	39
	1089756	41	42Q
	5810020		59
	5814454		79
	5811455		81
	5811764	85	97
	5977207	99	100Q
	6003249	101	105
	6003250	107	109

REVISION STATUS

PARTS LIST			DRAWING	
SHEET	1	2 & UP	REV	J
REV	P	P		

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
M	REV PER ECO 109592	9 JAN 82	RD/JAB
	2. P.S. PKG # 1, 2 & 4	5 JUNE 85	SEH/
	3. P.S. PKG # 7, 9		
N	REV PER ECO 111256		WJK
P	REV PER ECO 111271		

4. ITEM NUMBERS WITH SUBSCRIPTS ARE ALTERNATE ITEMS, SELECT ONE ONLY.
3. SYMBOL ‡ INDICATES VENDOR ITEM—SEE SPEC/SOURCE CONTROL DRAWING.
2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST AND DRAWING.
1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION
CHANGE BY ECO ONLY

MFG

NEXT ASSY	USED ON
	GRAPHIC 7

APPLICATION

CONT NO.

DRFTG		DATE
DR	R. Cordeleau	14 JAN 77
APPD		
CHK		

ENGRG		DATE
DEV	R. Ra...	1-20-77
E/M	J. Hale	21 JAN 77
PROJ		12 MAY 77

SA SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

CIRCUIT CARD ASSY, PARALLEL INTERFACE

SIZE	CODE IDENT NO.	
A	94117	PL 1086802

SHEET 1 OF 7

OP—1039 REV A

DWG SIZE E

PARTS LIST

ITEM NO.	QTY PER ASSY G1	G2	G3	DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	1	1	1	E		1086803G001	CIRCUIT CARD SUBASSY PARALLEL INTERFACE	
4	2	2	2	A		0310092P001	MICROCIRCUIT, DIGITAL NAND GATE (7400N) U14,61,	=
5	1	1	1	A		7013070P035	LOGIC, QUAD 2-INPUT POS-NOR GATE U52,	=
6	1	1	1	A		0310202P001	MICROCIRCUIT, DIGITAL, HEX INVERTERS U54,	=
7	1	1	1	A		0310319P001	MED, DIG, HEX INV (74S04N) U69,	=
8	1	1	1	A		0310203P001	MICROCIRCUIT, DIGITAL HEX INV (BUFFERS/DRIVERS) U39,	=
9	1	1	1	A		0310234P001	MICROCIRCUIT, DIGITAL AND GATE U7,	=
10	2	2	2	A		0310248P002	MICROCIRCUIT, DIGITAL OR GATE U44,47,	=
11	1	1	1	A		0930037P003	MED, DIGITAL, BUFFER, POSITIVE-NAND, 2-INPUT (74S37) U53,	
12	3	3	3	A		0310094P001	MICROCIRCUIT, DIGITAL FLIP-FLOP (DUAL) U23,62,64,	=
13	1	1	1	A		7013070P026	LOGIC, J-K FLIP-FLOP W/DATA LOCKOUT U70,	=
14	2	2	2	A		0310378P003	MICROCIRCUIT, DIGITAL J-K FLIP FLOP U36,60,	=
15	1	1	1	A		7013070P020	LOGIC, DUAL J-K POSITIVE EDGE- TRIGGERED, FLIP-FLOP U15,	=
16	2	2	2	A		7013070P077	LOGIC, DECODER/DEMULTIPLEXER U21,38,	=
17	1	1	1	A		0313109P003	MICROCIRCUIT, DIGITAL, DECODER U13,	
18	1	1	1	A		0313026P001	MICROCIRCUIT, DIGITAL PRIORITY ENCODERS U5,	=
19	1	1	1	A		7013070P054	LOGIC, 4-BIT D-TYPE REGISTER W/3-STATE OUTPUT U6,	=
20	3	3	3	A		0310279P001	MICROCIRCUIT, DIGITAL FLIP-FLOP U25,41,57,	=
21	1	1	1	A		0930174P003	MED, DIGITAL, D-TYPE, FLIP-FLOP (74S174) U37,	
22	1	1	1	A		0310279P002	MICROCIRCUIT, DIGITAL FLIP FLOP U45,	=
23	1	1	1	A		0930175P003	MED, DIGITAL, FLIP-FLOP, D-TYPE (74S175) U28,	
24	6	6		A		0310367P002	MICROCIRCUIT, DIGITAL HEX BUFFER U12,20,33,49,65,66,	=
			2	A		0310367P002	MICROCIRCUIT, DIGITAL HEX BUFFER U12,20,	=
25	5	5		A		0310368P002	MICROCIRCUIT, DIGITAL HEX INV U27,43,55,59,72,	=
			9	A		0310368P002	MICROCIRCUIT, DIGITAL HEX INV U27,33,43,49,55,59,65,66,72,	=
26	1	1	1	A		0944005P005	MED U40,	
27	4	4		A		0944005P003	MED U8,16,24,32,	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM—SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A		PL 1086802
	REV P	SHEET 2

SA-01-266A (12-84)

PARTS LIST

ITEM NO.	QTY PER ASSY G1	G2	G3	DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
			9	A		0944005P003	MED U1,2,8,10,16,17,18,24,32,	
28	5	5		A		0944005P001	MICROCIRCUIT, DIGITAL, TRANSCEIVER/RECEIVER (DS 8833N) U1,2,10,17,18,	
29	10	10	10	A		0931002P001	MED, DIGITAL, COUNTER, BINARY (8556) U3,11,19, 34,35,42,50,51,58,67,	
30	1	1	1	A		1086870P009	PROGRAMMED PROM U4,	
31	1	1	1	A		1086960P019	PROGRAMMED PROM U48,	
32	1	1	1	A		1086871P018	PROGRAMMED PROMS U29,	
33	2	2	2	A		0930109P003	MED, DIGITAL, FLIP-FLOP J-K EDGE TRIGGERED DUAL (74S109) U22,30,	
34	3	3	3	A		0931008P001	MED, DIGITAL, GATE, QUAD (9S41) U31,46,71,	
35	1	1	1	A		0310328P001	MICROCIRCUIT, DIGITAL MONOSTABLE MV U68,	‡
36	2	2	2	A		0925000P001	RES, FIX, NETWORK 220/330 OHMS + 5- 5% 1.5 WATT U9,26,	
39	2	2	2			RCR07G153JS	RES MIL-R-39008/1 15 K OHMS + 5- 5% .25 WATT R10,11,	
40	7	7	7			RCR07G103JS	RES MIL-R-39008/1 10 K OHMS + 5- 5% .25 WATT R4-8,12,13,	
41	2	2	2			RCR07G511JS	RES MIL-R-39008/1 510 OHMS + 5- 5% .25 WATT R3, 9,	
42	1	1	1			RCR07G221JS	RES MIL-R-39008/1 220 OHMS + 5- 5% .25 WATT R2,	
43	1	1	1			RCR07G331JS	RES MIL-R-39008/1 330 OHMS + 5- 5% .25 WATT R1,	
46	2	2	2	A		7011451P049	CAP. 15 UF +10% -10% 20V C39,40,	‡
47	36	36	36	A		7502023P055	CAP. FIXED, CERAMIC DIELECTRIC .01 UF +10% -10% C3-38,	‡
48	1	1	1	A		7011451P019	CAP. 39 UF +10% -10% 10V C1,	‡
49	1	1	1	A		7502023P073	CAP. FIXED, CERAMIC DIELECTRIC 100K PF +10 -10 % 50 V C2,	‡
50	2	2	2	A		7506001P020	CAP. 51 P FARAD+ 5- 5% 500 WVDC C41,42,	‡
53	5	5	5	A		0958000P003	LED, RED, DIFFUSED LENS, IF = 4MA DS1,2,3,4,5,	
55	1	1	1	A		7013626P001	INDUCTOR ASSY L1,	
56	1	1	1	C		4171126P001	CONN, ELEC, PC BOARD (98 PIN) J1,	‡
57	2		2		22526	65496-031	CONN, 50 PIN SOLDER J2,3,	
58		2		A		0907055P004	CONN, ELEC, RCPT, WIRE-WRAP, 50-PIN J2,3	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM—SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A		PL 1086802
	REV P	SHEET 3

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PARTS LIST

ITEM NO.	QTY PER ASSY G1	QTY PER ASSY G2	QTY PER ASSY G3	DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
59	2	2	2	A		0985007P001	EYELET, METALLIC	
59A	REF	REF	REF			MS20470AD2-6	RIVET, SOLID .062 X .38 LG	
60	2	2	2	A		1089678P001	CARD EJECTOR (MOD)	
61	2	2	2	A		0630003P014	EYELET, METALLIC	‡
62	AR	AR	AR	A		0093002P001	SOLDER	
67	REF	REF	REF	E		1086804	LOGIC DIAGRAM PARALLEL INTERFACE	
68	REF	REF	REF	A		0815003	PWB AND CKT BD, REQT FOR	
69	REF	REF	REF	A		0778000	APPL, EPOXY MARKING CMPD	
70	1	1	1	A		1086960P020	PROGRAMMED PROM U56,	
71	1	1	1	A		1086960P021	PROGRAMMED PROM U63,	
72	1 IN	1 IN	1 IN	A		0278000P013	WIRE, ELEC AWG 22	‡

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM—SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A		PL 1086802
	REV P	SHEET 4

SA-01-266A (12-84)

PARTS LIST

ITEM NO.	QTY PER ASSY G4			DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	1			E		1086803G001	CIRCUIT CARD SUBASSY PARALLEL INTERFACE	
4	2			A		0310092P001	MICROCIRCUIT, DIGITAL NAND GATE (7400N) U14,61,	=
5	1			A		7013070P035	LOGIC, QUAD 2-INPUT POS-NOR GATE U52,	=
6	1			A		0310202P001	MICROCIRCUIT, DIGITAL, HEX INVERTERS U54,	=
7	1			A		0310319P001	MED, DIG, HEX INV (74S04N) U69,	=
8	1			A		0310203P001	MICROCIRCUIT, DIGITAL HEX INV (BUFFERS/DRIVERS) U39,	=
9	1			A		0310234P001	MICROCIRCUIT, DIGITAL AND GATE U7,	=
10	2			A		0310248P002	MICROCIRCUIT, DIGITAL OR GATE U44,47,	=
11	1			A		0930037P003	MED, DIGITAL, BUFFER, POSITIVE-NAND, 2-INPUT (74S37) U53,	
12	3			A		0310094P001	MICROCIRCUIT, DIGITAL FLIP-FLOP (DUAL) U23,62, 64,	=
13	1			A		7013070P026	LOGIC, J-K FLIP-FLOP W/DATA LOCKOUT U70,	=
14	2			A		0310378P003	MICROCIRCUIT, DIGITAL J-K FLIP FLOP U36,60,	=
15	1			A		7013070P020	LOGIC, DUAL J-K POSITIVE EDGE- TRIGGERED, FLIP-FLOP U15,	=
16	2			A		7013070P077	LOGIC, DECODER/DEMULTIPLEXER U21,38,	=
17	1			A		0313109P003	MICROCIRCUIT, DIGITAL, DECODER U13,	
18	1			A		0313026P001	MICROCIRCUIT, DIGITAL PRIORITY ENCODERS U5,	=
19	1			A		7013070P054	LOGIC, 4-BIT D-TYPE REGISTER W/3-STATE OUTPUT U6,	=
20	3			A		0310279P001	MICROCIRCUIT, DIGITAL FLIP-FLOP U25,41,57,	=
21	1			A		0930174P003	MED, DIGITAL, D-TYPE, FLIP-FLOP (74S174) U37,	
22	1			A		0310279P002	MICROCIRCUIT, DIGITAL FLIP FLOP U45,	=
23	1			A		0930175P003	MED, DIGITAL, FLIP-FLOP, D-TYPE (74S175) U28,	
24	2			A		0310367P002	MICROCIRCUIT, DIGITAL HEX BUFFER U12,20,	=
25	9			A		0310368P002	MICROCIRCUIT, DIGITAL HEX INV U27,33,43,49,55, 59,65,66,72,	=
26	1			A		0944005P005	MED U40,	
27	9			A		0944005P003	MED U1,2,8,10,16,17,18,24,32,	
29	10			A		0931002P001	MED, DIGITAL, COUNTER, BINARY (8556) U3,11,19, 34,35,42,50,51,58,67,	
30	1			A		1086870P009	PROGRAMMED PROM U4,	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM—SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A		PL 1086802
		REV P SHEET 5

SA-01-266A (12-84)

PARTS LIST

ITEM NO.	QTY PER ASSY			DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
	C4							
31	1			A		1086960P019	PROGRAMMED PROM U48,	
32	1			A		1086871P018	PROGRAMMED PROMS U29,	
33	2			A		0930109P003	MED, DIGITAL, FLIP-FLOP J-K EDGE TRIGGERED DUAL (74S109) U22,30,	
34	3			A		0931008P001	MED, DIGITAL, GATE, QUAD (9S41) U31,46,71,	
35	1			A		0310328P001	MICROCIRCUIT, DIGITAL MONOSTABLE MV U68,	‡
36	2			A		0925000P001	RES, FIX, NETWORK 220/330 OHMS + 5- 5% 1.5 WATT U9,26,	
39	2					RCR07G153JS	RES MIL-R-39008/1 15 K OHMS + 5- 5% .25 WATT R10,11,	
40	7					RCR07G103JS	RES MIL-R-39008/1 10 K OHMS + 5- 5% .25 WATT R4-8,12,13,	
41	2					RCR07G511JS	RES MIL-R-39008/1 510 OHMS + 5- 5% .25 WATT R3, 9,	
42	1					RCR07G221JS	RES MIL-R-39008/1 220 OHMS + 5- 5% .25 WATT R2,	
43	1					RCR07G331JS	RES MIL-R-39008/1 330 OHMS + 5- 5% .25 WATT R1,	
46	2			A		7011451P049	CAP. 15 UF +10% -10% 20V C39,40,	‡
47	36			A		7502023P055	CAP. FIXED, CERAMIC DIELECTRIC .01 UF +10% -10% C3-38,	‡
48	1			A		7011451P019	CAP. 39 UF +10% -10% 10V C1,	‡
49	1			A		7502023P073	CAP. FIXED, CERAMIC DIELECTRIC 100K PF +10 -10 % 50 V C2,	‡
50	2			A		7506001P020	CAP. 51 P FARAD+ 5- 5% 500 WVDC C41,42,	‡
53	5			A		0958000P003	LED, RED, DIFFUSED LENS, IF = 4MA DS1,2,3,4,5,	
55	1			A		7013626P001	INDUCTOR ASSY L1,	
56	1			C		4171126P001	CONN, ELEC, PC BOARD (98 PIN) J1,	‡
58	2			A		0907055P004	CONN, ELEC, RCPT, WIRE-WRAP, 50-PIN J2,3,	
59	2			A		0985007P001	EYELET, METALLIC	
59A	REF					MS20470AD2-6	RIVET, SOLID .062 X .38 LG	
60	2			A		1089678P001	CARD EJECTOR (MOD)	
61	2			A		0630003P014	EYELET, METALLIC	‡
62	AR			A		0093002P001	SOLDER	
67	REF			E		1086804	LOGIC DIAGRAM PARALLEL INTERFACE	
68	REF			A		0815003	PWB AND CKT BD, REQT FOR	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM—SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A		PL 1086802
	REV P	SHEET 6

SA-01-266A (12-84)

PARTS LIST

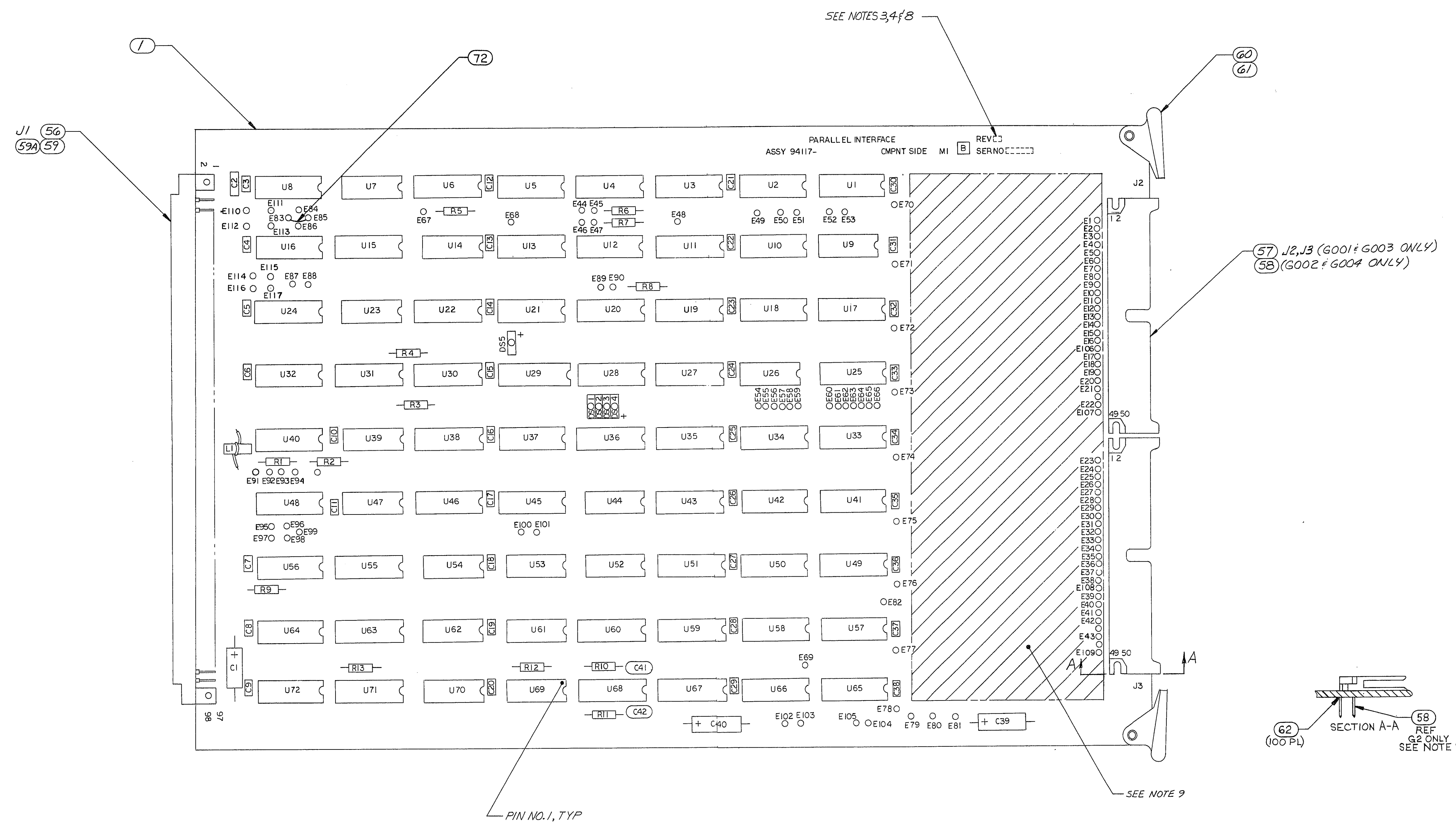
ITEM NO.	QTY PER ASSY G4	QTY PER ASSY	QTY PER ASSY	DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
69	REF			A		0778000	APPL, EPOXY MARKING CMPD	
70	1			A		1086960P020	PROGRAMMED PROM U56,	
71	1			A		1086960P021	PROGRAMMED PROM U63,	
72	1 IN			A		0278000P013	WIRE, ELEC AWG 22	=

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM—SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A		PL 1086802
		REV P SHEET 7

SA-01-266A (12-84)

ZONE	LTR	DESCRIPTION	DATE	APPROVED
REVISIONS				
	—	REL FOR DEVELOPMENT	14 JAN 77	RB/ODT
		REL FOR PROD NO. 7-022	25 MAY 77	/ODT
	A	REVISED PER ECO 76080	19 SEP 77	HG/
	B	REVISED PER ECO 76105	15 NOV 77	/RLB
	C	REV PER ECO 76163	10 MAY 78	/RLB
	D	REV PER ECO 76356	16 APR 79	WG/WL
	E	REV. PER ECO 96220	30 NOV 79	WG/WL
	F	REV. PER ECO 96409A	20 JUN 80	JL/WL
	G	REV PER ECO 97620	3 DEC 81	
	H	REV. PER ECO 109592	2 JUN 82	/JAB
	J	REV PER ECO 111271	23 MAY 85	SEH/



G 004 - G 001 **FOR PARTS LIST** SEE PL 1086802

10. ITEM 58 TO BE INSTALLED AFTER WAVE SOLDER. WIRE WRAP POSTS TO BE LEFT FULL LENGTH.
9. HOLES IN CROSS HATCHED AREA TO BE FREE OF SOLDER, 832 PLACES.
8. MARK APPROPRIATE SERNO, "G" CONDITION AND REVISION
7. SOLDER TIPS OR WIRE TO BE .09 MAX FROM BOARD.
6. MAX COMPONENT HEIGHT TO BE .44.
5. REFERENCE DESIGNATORS OTHER THAN THOSE ETCHED, OR SILK SCREENED ARE NOT TO BE MARKED ON FINISHED ASSY.
4. MARK CHARACTERS .04-.16 HIGH, COLOR BLACK, GOTHIC TYPE, AND LOCATE APPROX AS SHOWN. APPLY PER ITEM 69
3. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST AND DRAWING.
2. THIS ASSY SHALL MEET THE REQUIREMENTS OF ITEM 68.
1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

NOTES UNLESS OTHERWISE SPECIFIED.

NEXT ASSY	USED ON
	V1000
APPLICATION	

G6	G5	G4	G3	G2	G1	ITEM	SIZE	PART OR IDENTIFYING NO.	DESCRIPTION
QTY PER ASSY						PARTS LIST			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES .XX DECIMAL ± — .XXX DECIMAL ± — ANGLES ± —

[redacted]

MFG 1/20/77

CONT NO.
DRFTG DR R. Bordeau 14 JAN 77 DATE; APPD; CHK
ENGRG DSN R. Radford 1-20-77; EAM D. Hale 21 JAN 77; PROJ T. O'Toole 13 MAY 77

SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

CIRCUIT CARD ASSY, PARALLEL INTERFACE

SIZE E | CODE IDENT NO. 94117 | DWG NO. 1086802

SCALE 2/1 | SHEET 1 OF 1

DO NOT SCALE PRINT

1086802

REVISION STATUS

	SH	1	2	3	4	5	6	7	8	9	10	11	12
PARTS	REV	L	L	L									
	SH	13	14	15	16	17	18	19	20	21	22	23	24
	REV												
LIST													

DWG REV	L
WL REV	~

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
H	ECO NO. 96984B ADDED PL WITH CHANGE	23 march 81	JOB/WL
J	REV PER ECO 97684	21 AUG 81	BMK/WL
K	REV PER ECO 109569	26 MAY 82	BMK/AB
L	REV PER ECO 109756	15 NOV 82	TD/

3. ITEMS WITH A SUBSCRIPT ARE ALTERNATE ITEMS, SELECT ONE ONLY.

2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST, DRAWING AND WIRE LIST.

1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION
CHANGE BY ECO ONLY

MFG W. KOCH 11-10-77

1089619 NEXT ASSY | GRAPHIC 7 USED ON

APPLICATION

CONT NO.

DRFTG: DR L. O'BRIEN 23 march 81 DATE; APPD; CHK

ENGRG: DEV A.O'TOOLE 10 nov 77; E/M R. BATCHELDER 10 nov 77; PROJ F.E KELLEY 10 nov 77

SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

CABLE ASSY COMPUTER INTERFACE -PARALLEL-

SIZE	CODE IDENT NO.	
A	94117	PL 1089623

SHEET 1 OF 3

OP—1039 REV B

DWG SIZE D

PARTS LIST

ITEM NO.	QTY PER ASSY G1	G2	G3	DWG SIZE	CODE IDENT	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	1	1	1			DDC-50P-F0	CONN. ELEC, 50 PIN (ITT CANNON	
1A	REF	REF	REF			DDC-50P	CONN. ELEC	
2	1	1	1			65846-005	CONN. ELEC, 54 PIN, KEYED (BERG)	
3	660"	660"	650"	A		9174285P70	WIRE, ELEC., 22 AWG, BLACK & WHT TWISTED PR.	
4								
5								
6								
7								
8								
9								
10	50	50	50			47565	CONTACT, 22-26 AWG (SEE NOTE 3) (BERG)	
10A	REF	REF	REF			47745	CONTACT, 22-26 AWG (SEE NOTE 3) (BERG)	
11								
12								
13	5	5	14		06383	SSTIM-MP	CABLE TIE, 3.5"	
14								
15	50	50	50			D110238-34	CONTACT, 20-28 AWG (ITT CANNON)	
16	3	3	3			PLFIM	MARKER, TIE (PANDUIT)	
17								
18	—	—	—		71468	D20418-2	FEMALE LOCKSCREW ASSY	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG
SEE SHEET ONE FOR REVISION DESCRIPTIONS
SYMBOLS : INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	CODE IDENT NO.	
A	94117	PL 1089623
	REV L	SHEET 2

OP—277 REV C

PARTS LIST

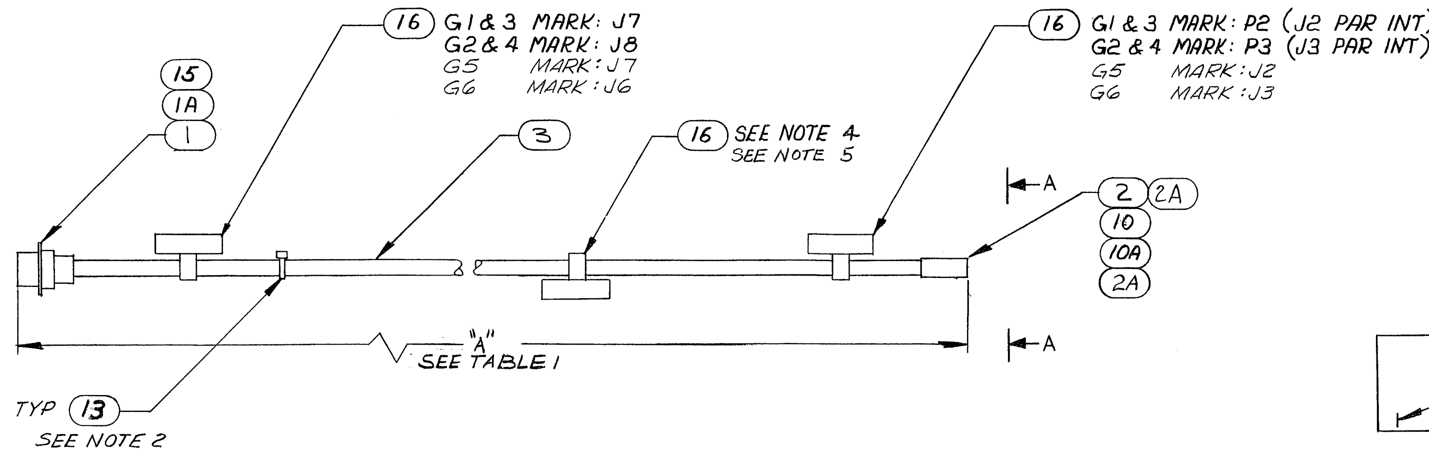
ITEM NO.	QTY PER ASSY G4	QTY PER ASSY G5	QTY PER ASSY G6	DWG SIZE	CODE IDENT	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	1	1	1			DDC-50P-FO	CONN., ELEC, 50 PIN ITT CANNON	
1A	REF	REF	REF			DDC-50P	CONN., ELEC	
2	1	1	1			65846-005	CONN., ELEC 54 PIN, KEYED (BERG)	
3	1650"	200"	200"	A		4174285P70	WIRE, ELEC., 22 AWG, BLACK & WHT TWISTED PR.	
4								
5								
6								
7								
8								
9								
10	50	50	50			47565	CONTACT, 22-26AWG, (SEE NOTE 3) (BERG)	
10A	REF	REF	REF			47745	CONTACT, 22-26AWG, (SEE NOTE 3) (BERG)	
11								
12								
13	14	—	—		06383	SSTIM-MP	CABLE TIE, 3.5"	
14								
15	50	50	50			D110238-34	CONTACT, 20-28 AWG (ITT CANNON)	
16	3	3	3			PLFIM	MARKER TIE (PANDUIT)	
17								
18	—	2	2		71468	D20418-2	FEMALE LOCKSCREW ASSY	

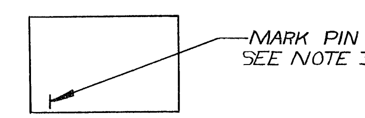
SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG
SEE SHEET ONE FOR REVISION DESCRIPTIONS
SYMBOLS : INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

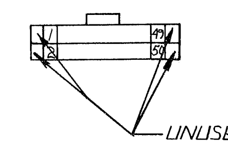
SIZE	CODE IDENT NO.	
A	94117	PL 1089623
	REV L	SHEET 3

OP—277 REV C

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	REL FOR PRODUCTION	13 OCT 77	RC RLB
	A	REV PER ECO 76112	15 DEC 77	WG/RLB
	B	REV PER ECO 76164	14 Apr 78	RP/RLB
	C	REV PER ECO 76200	10 JUL 78	WG/RLB
	D	REV PER ECO 76431	4 SEP 79	WG/WL
	E	REV PER ECO 96249	19 DEC 79	RDM/WL
	F	REV PER ECO 96299	23 JAN 80	WG/REP
	G	REV. PER ECO 96308	6 FEB 80	WG/WL
	H	REV PER ECO 96984B	23 march 81	LOB/WL
	J	REV PER ECO 97684	21 AUG 81	MB/WL
	K	REV PER ECO 109569	25 MAY 82	BM/JHB
	L	REV PER ECO 109756	15 NOV 82	TD/BD







VIEW A-A
SCALE 2/1

Signal	(DDC-50P)	Wire	(65846-012)
OD00/ID00	1	WHT	1
GND	2	BLK	2
OD01/ID01	3	WHT	3
GND	4	BLK	4
OD02/ID02	5	WHT	5
GND	6	BLK	6
OD03/ID03	7	WHT	7
GND	8	BLK	8
OD04/ID04	9	WHT	9
GND	10	BLK	10
OD05/ID05	11	WHT	11
GND	12	BLK	12
OD06/ID06	13	WHT	13
GND	14	BLK	14
OD07/ID07	15	WHT	15
GND	16	BLK	16
OD08/ID08	17	WHT	17
GND	18	BLK	18
OD09/ID09	19	WHT	19
GND	20	BLK	20
OD10/ID10	21	WHT	21
GND	22	BLK	22
OD11/ID11	23	WHT	23
GND	24	BLK	24
OD12/ID12	25	WHT	25
GND	26	BLK	26
OD13/ID13	27	WHT	27
GND	28	BLK	28
OD14/ID14	29	WHT	29
GND	30	BLK	30
OD15/ID15	31	WHT	31
GND	32	BLK	32
RESERVED	33	WHT	33
GND	34	BLK	34
ATN1/IIMR	35	WHT	35
GND	36	BLK	36
OWR/ICTL	37	WHT	37
GND	38	BLK	38
OMR/IATN2	39	WHT	39
GND	40	BLK	40
OCTL/IWR	41	WHT	41
GND	42	BLK	42
ODR/	43	WHT	43
GND	44	BLK	44
/NDRY	45	WHT	45
GND	46	BLK	46
INIT/	47	WHT	47
GND	48	BLK	48
RESERVED	49	WHT	49
GND	50	BLK	50

TABLE I	
"G" COND	DIM "A"
G1	24" ± 1
G2	24" ± 1
G3	60" ± 2
G4	60" ± 2
G5	7" +1/-0
G6	7" +1/-0

G1 THRU G6 **FOR PARTS LIST**
SEE PL 1089623

6. ITEM 18 TO BE SUPPLIED WITH G5 & G6.
5. ATTACH ITEM 16, (PART NO. MARKER) TO ONLY (3) TWISTED PAIRS OF WIRE FOR G5 & G6 CONDITIONS. CHOOSE ANY THREE.
4. MARK PART NO. & APPLICABLE 'G' CONDITION.
3. MARK CHARACTERS IN CONTRASTING COLOR AND LOCATE APPROX AS SHOWN.
2. ATTACH ITEM 13 EVENLY SPACED (APPROX) ON CABLE.
1. MNEUMONICS APPLICATION:
   G1 & 3 & 5 G2 & 4 & 6
   XXXX / XXXX

NOTES

334 REV H

NEXT ASSY	USED ON
5976105	GRAPHIC 7
1089619	GRAPHIC 7

APPLICATION

G6	G5	G4	G3	G2	G1	ITEM	SIZE	PART OR IDENTIFYING NO.	DESCRIPTION

QTY PER ASSY — PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
.XX DECIMAL ± — .XXX DECIMAL ± —
ANGLES ± — SURFACE QUALITY √ MAX
INTERPRET DRAWING PER 815002

PRODUCTION
CHANGE BY ECO ONLY

MFG W. Kah 11-10-77

CONT NO.
DRFTG: DR R. Couture DATE 6 SEP 77; APPD; CHK
ENGRG: DEV G. D. Poole 10 Nov. 77; EA R. Batchelder 11/10/77; PROJ J. Kelley 11/10/77

SANDERS ASSOCIATES, INC — NASHUA, NEW HAMPSHIRE

CABLE ASSY
COMPUTER INTERFACE
- PARALLEL -

SIZE D | CODE IDENT NO. 94117 | DWG NO. 1089623

SCALE 1/1 | SHEET 1 OF 1

DO NOT SCALE PRINT

1089623

REVISION STATUS

	SH	1	2	3	4	5	6	7	8	9	10	11	12
PARTS	REV	A	A	A	A	A							
	SH	13	14	15	16	17	18	19	20	21	22	23	24
	REV												
LIST	—												

DWG REV	A
WL REV	—

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
—	REL FOR PROD	8JUN78	WG/RLB
A	REV PER ECO 97701	3DEC81	BM/[illegible]

3 ITEM NO.'S WITH SUBSCRIPTS ARE ALTERNATE ITEMS. SELECT ONE ONLY.

2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST, DRAWING AND WIRE LIST.

1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION
CHANGE BY ECO ONLY

MFG W. Koch 6-27-78

MODEL 5712
GRA-7

NEXT ASSY | USED ON

APPLICATION

CONT NO.

DRFTG: DR W. Gwozdski 8JUN78 DATE
APPD
CHK

ENGRG: DEV
R/M [illegible] 6/28/78
PROJ [illegible] 6/27/78

SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

CABLE ASSY, DRII-C TO GRA-7 INTERFACE

SIZE	CODE IDENT NO.	
A	94117	PL 1089756

SHEET 1 OF 5

OP—1039 REV B

DWG SIZE C

PARTS LIST

ITEM NO.	QTY PER ASSY G1	G2	G3	DWG SIZE	CODE IDENT	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	2	2	2			H856	CONN, CABLE, 40 PIN, P1, P2 (DEC)	
2	2	2	2			DDC-50S	CONN, CABLE, 50 PIN, P3, P4 (ITT)	
3	2	2	2			DD24661	JUNCTION SHELL, DEEP STRAIGHT CLAMP (ITT)	
4	2	2	2			DD-20420-12	SCREW LOCK ASSY, MALE (ITT)	
5	10'	20'	30'			9525	CABLE, 25 TW PAIRS (BELDEN)	
6	5	10	15			SST2S-MP	CABLE TIE (PANDUIT)	
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18	AR	AR	AR			FIT221 1/4	TUBING, SHRINK (ALPHA)	
19	5	5	5			PLFIM	CABLE, MARKER (PANDUIT)	
1A	REF	REF	REF			65043-015	CONN CABLE 44 PIN P1,2 (BERG)	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG
SEE SHEET ONE FOR REVISION DESCRIPTIONS
SYMBOLS : INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	CODE IDENT NO.	
A	94117	PL 1089756

REV A | SHEET 2

OP—277 REV C

PARTS LIST

ITEM NO.	QTY PER ASSY G4	QTY PER ASSY G5	QTY PER ASSY G6	DWG SIZE	CODE IDENT	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	2	2	2			H856	CONN, CABLE, 40 PIN, P1,P2 (DEC)	
2	2	2	2			DDC-50S	CONN, CABLE, 50 PIN, P3,P4 (ITT)	
3	2	2	2			DD24661	JUNCTION SHELL, DEEP STRAIGHT CLAMP (ITT)	
4	2	2	2			DD-20420-12	SCREW LOCK ASSY, MALE (ITT)	
5	40'	50'	60'			9525	CABLE, 25 TW PAIRS (BELDEN)	
6	20	25	30			SST2S-MP	CABLE TIE (PANDUIT)	
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18	AR	AR	AR			FIT221 1/4	TUBING, SHRINK (ALPHA)	
19	5	5	5			PLFIM	CABLE MARKER (PANDUIT)	
1A	REF	REF	REF			65043-015	CONN, CABLE 44 PIN P1,2 (BERG)	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG
SEE SHEET ONE FOR REVISION DESCRIPTIONS
SYMBOLS ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	CODE IDENT NO.	
A	94117	PL 1089756

REV A | SHEET 3

OP—277 REV C

PARTS LIST

ITEM NO.	QTY PER ASSY G7	QTY PER ASSY G8	QTY PER ASSY G9	DWG SIZE	CODE IDENT	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	2	2	2			H856	CONN, CABLE, 40 PIN, P1, P2 (DEC)	
2	2	2	2			DDC-50S	CONN, CABLE, 50 PIN, P3, P4 (ITT)	
3	2	2	2			DD24661	JUNCTION SHELL, DEEP STRAIGHT CLAMP (ITT)	
4	2	2	2			DD-20420-12	SCREW LOCK ASSY, MALE (ITT)	
5	70'	80'	90'			9525	CABLE, 25 TW PAIRS (BELDEN)	
6	35	40	45			SST2S-MP	CABLE TIE (PANDUIT)	
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18	AR	AR	AR			FIT221 1/4	TUBING, SHRINK (ALPHA)	
19	5	5	5			PLFIM	CABLE, MARKER (PANDUIT)	
1A	REF	REF	REF			65043-015	CONN, CABLE 44 PIN P1,2 (BERG)	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG
SEE SHEET ONE FOR REVISION DESCRIPTIONS
SYMBOLS : INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	CODE IDENT NO.	
A	94117	PL 1089756

REV A | SHEET 4

OP—277 REV C

42 B Change 1

PARTS LIST

ITEM NO.	QTY PER ASSY G/10	QTY PER ASSY G	QTY PER ASSY G	DWG SIZE	CODE IDENT	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	2					H856	CONN, CABLE, 40 PIN, P1, P2 (DEC)	
2	2					DDC-50S	CONN, CABLE, 50 PIN, P3, P4 (ITT)	
3	2					DD24661	JUNCTION SHELL, DEEP STRAIGHT CLAMP (ITT)	
4	2					DD-20420-12	SCREW LOCK ASSY, MALE (ITT)	
5	100'					9525	CABLE, 25 TW PAIRS (BELDEN)	
6	50					SST2S-MP	CABLE TIE (PANDUIT)	
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18	A					FIT221 1/4	TUBING, SHRINK (ALPHA)	
19	5					PLFIM	CABLE, MARKER (PANDUIT)	
1A	REF					65043-015	CONN, CABLE 44 PIN P1,2 (BERG)	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG
SEE SHEET ONE FOR REVISION DESCRIPTIONS
SYMBOLS : INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	CODE IDENT NO.	
A	94117	PL 1089756

REV A SHEET 5

OP—277 REV C

REVISION STATUS OF EACH SHEET															
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13		
REVISION	—	—	—	—	—	—	—	—	—						
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
—	REL FOR PROD	8 JUN 78	WG/RLB

2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST, DRAWING AND WIRE LIST.

1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION
CHANGE BY ECO ONLY

MFG W. Koch 6-27-78

MODEL 5712
GRA-7

NEXT ASSY | USED ON

APPLICATION

CONT NO.

DRFTG: DR W. Luzowski 8 JUN 78 DATE
APPD
CHK

ENGRG: DEV
PROJ

SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

WIRE LIST
DRII-C TO GRA-7 INTERFACE

SIZE	CODE IDENT NO.	
A	94117	WL 1089756

SCALE —— SHEET 1 OF 9

OP—276 REV E

42 E Change 1

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM TERM. / STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO TERM. / STRIP (INCHES)	NOTE
001	OUT00/OD00	BLK	P3	1	P1	C	
002	GND	RED		2	P1	J	
003	OUT01/OD01	BLK		3	P1	K	
004	GND	WHT		4	P1	M	
005	OUT02/OD02	BLK		5	P1	NN	
006	GND	GRN		6			
007	OUT03/OD03	BLK		7	P1	U	
008	GND	BLU		8	P1	V	
009	OUT04/OD04	BLK		9	P1	L	
010	GND	YEL		10			
011	OUT05/OD05	BLK		11	P1	N	
012	GND	BRN		12			
013	OUT06/OD06	BLK		13	P1	R	
014	GND	ORG	P3	14	P1	S	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 1089756
	REV. —	SHEET 2

OP-233 REV D

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM: TERM. / STRIP (INCHES)	TO: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO: TERM. / STRIP (INCHES)	NOTE
015	OUT07/OD07	RED	P3	15	P1	T	
016	GND	WHT		16			
017	OUT08/OD08	RED		17	P1	W	
018	GND	GRN		18			
019	OUT09/OD09	RED		19	P1	X	
020	GND	BLU		20	P1	Y	
021	OUT10/OD10	RED		21	P1	Z	
022	GND	YEL		22			
023	OUT11/OD11	RED		23	P1	AA	
024	GND	BRN		24			
025	OUT12/OD12	RED		25	P1	BB	
026	GND	ORG		26	P1	CC	
027	OUT13/OD13	GRN		27	P1	FF	
028	GND	WHT	P3	28	P1	EE	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 1089756
	REV. —	SHEET 3

OP-233 REV D

42 G Change 1

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM: TERM. / STRIP (INCHES)	TO: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO: TERM. / STRIP (INCHES)	NOTE
029	OUT14/ODI4	GRN	P3	29	P1	HH	
030	GND	BLU		30			
031	OUT15/ODI5	GRN		31	P1	JJ	
032	GND	YEL		32	P1	KK	
033	RESERVED	GRN		33			
034	GND	BRN		34			
035	ATN 1	GRN		35			
036	GND	ORG		36			
037	REQA/OWR	WHT		37	P1	LL	
038	GND	BLU		38	P1	UU	
039	OMR	WHT		39			
040	GND	YEL		40			
041	CSR1/OCTL	WHT		41	P1	DD	
042	GND	BRN	P3	42	P1	MM	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 1089756
	REV. —	SHEET 4

OP-233 REV D

42 H Change 1

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM: TERM. / STRIP (INCHES)	TO: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO: TERM. / STRIP (INCHES)	NOTE
043	ODR	WHT	P3	43			
044	GND	ORG		44	P1	SS	
045	SPARE	BLU		45			
046	GND	YEL		46			
047	INIT	BLU		47	P1	P	
048	GND	BRN		48	P1	PP	
049	RESERVED	BLU		49			
050	GND	ORG	P3	50			
051	IN00/ID00	BLK	P4	1	P2	TT	
052	GND	RED		2		UU	
053	IN01/ID01	BLK		3		LL	
054	GND	WHT		4		MM	
055	IN02/ID02	BLK		5		H	
056	GND	GRN	P4	6	P2	J	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 1089756
	REV. ——	SHEET 5

OP-233 REV D

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM: TERM. / STRIP (INCHES)	TO: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO: TERM. / STRIP (INCHES)	NOTE
057	IN03/ID03	BLK	P4	7	P2	BB	
058	GND	BLU		8		AA	
059	IN04/ID04	BLK		9		KK	
060	GND	YEL		10		JJ	
061	IN05/ID05	BLK		11		HH	
062	GND	BRN		12		PP	
063	IN06/ID06	BLK		13		EE	
064	GND	ORG		14		SS	
065	IN07/ID07	RED		15		CC	
066	GND	WHT		16		DD	
067	IN08/ID08	RED		17		Z	
068	GND	GRN		18		X	
069	IN09/ID09	RED		19	P2	Y	
070	GND	BLU	P4	20			

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 1089756
	REV. —	SHEET 6

OP-233 REV D

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM: TERM. / STRIP (INCHES)	TO: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO: TERM. / STRIP (INCHES)	NOTE
071	IN10/ID10	RED	P4	21	P2	W	
072	GND	YEL		22	P2	R	
073	IN11/ID11	RED		23	P2	V	
074	GND	BRN		24			
075	IN12/ID12	RED		25	P2	U	
076	GND	ORG		26			
077	IN13/ID13	GRN		27	P2	P	
078	GND	WHT		28			
079	IN14/ID14	GRN		29	P2	N	
080	GND	BLU		30			
081	IN15/ID15	GRN		31	P2	M	
082	GND	YEL		32			
083	RESERVED	GRN		33			
084	GND	BRN	P4	34			

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 1089756
	REV. —	SHEET 7

OP-233 REV D

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM TERM. / STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO TERM. / STRIP (INCHES)	NOTE
085	IMR	GRN	P4	35			
086	GND	ORG		36			
087	CSRO/ICTL	WHT		37	P2	K	
088	GND	BLU		38	P2	L	
089	ATN 2	WHT		39			
090	GND	YEL		40			
091	REQB/IWR	WHT		41	P2	S	
092	GND	BRN		42	P2	T	
093	SPARE	WHT		43			
094	GND	ORG		44			
095	NDRY	BLU		45			
096	GND	YEL		46			
097	SPARE	BLU		47			
098	GND	BRN	P4	48			

OP-233 REV D

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 1089756
	REV. —	SHEET 8

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM: TERM. / STRIP (INCHES)	TO: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO: TERM. / STRIP (INCHES)	NOTE
099	RESERVED	BLU	P4	49			
100	GND	ORG	P4	50			

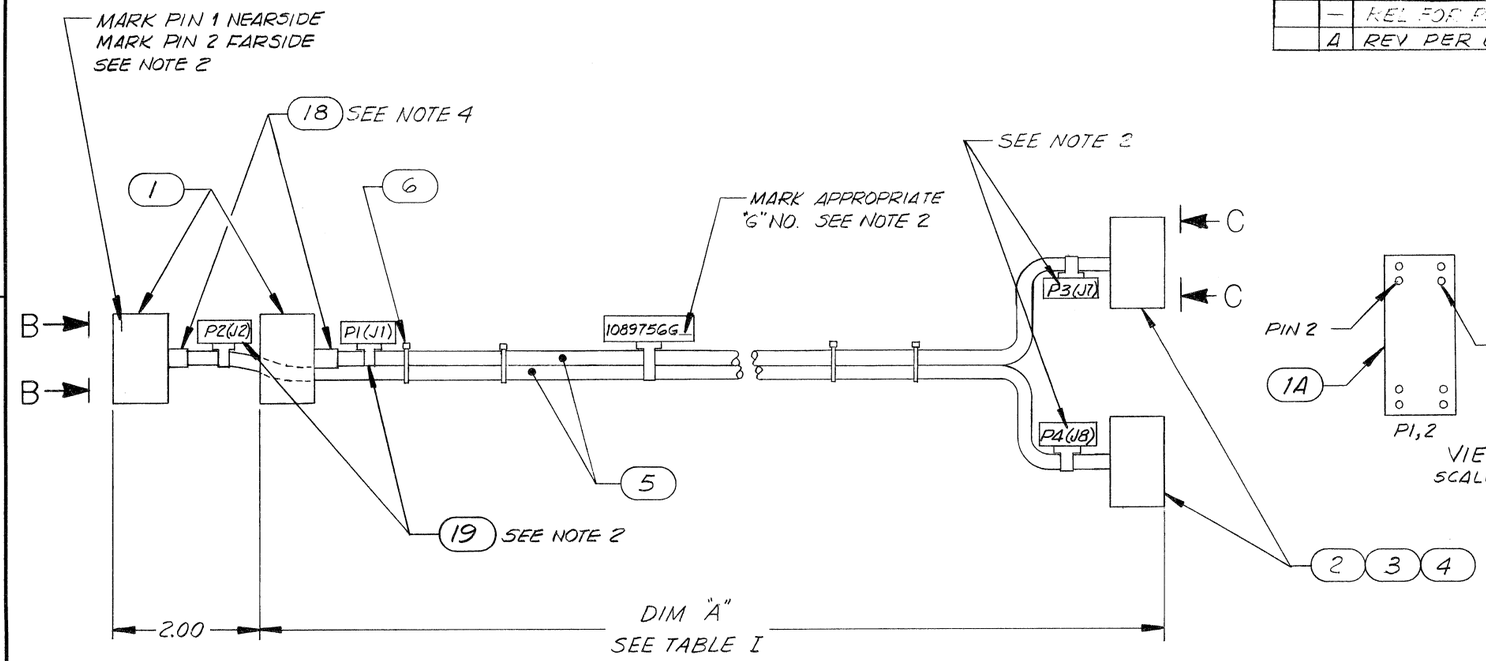
SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

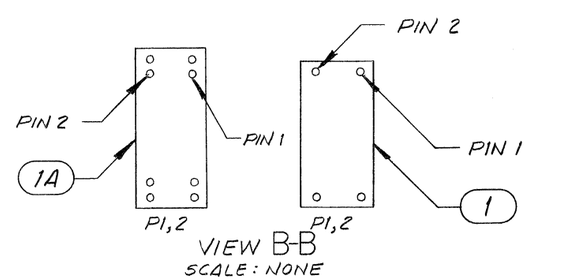
SIZE	CODE IDENT. NO.	
A	94117	WL 1089756
	REV. —	SHEET 9

OP-233 REV D

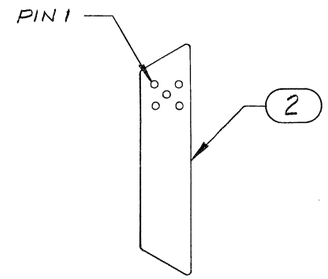
42 N/ 42 P Change 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	REL FOR PROD	8 JUN 78	WG/RLB
	A	REV PER ECO 97701	4 DEC 81	BM/





VIEW B-B
SCALE: NONE



VIEW C-C
PIN SIDE OF P3,4
SCALE: NONE

TABLE I

"G" COND	DIM "A" IN FT ±6"
G1	5
G2	10
G3	15
G4	20
G5	25
G6	30
G7	35
G8	40
G9	45
G10	50

(G1) THRU (G10) **FOR PARTS LIST**
SEE PL 1089756

FOR WIRE LIST
SEE WL 1089756

4. BOOT ALL UNUSED WIRES USING ITEM 18.

2. MARK PERMANENT AND LEGIBLE CHARACTERS .04 - .16 HIGH WITH CONTRASTING COLOR, GOTHIC TYPE AND LOCATE APPROX AS SHOWN. MARKING METHOD OPTIONAL.

1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING

NOTES

G6	G5	G4	G3	G2	G1
QTY PER ASSY					
					MODEL 5712
					GRA-7
NEXT ASSY					USED ON
APPLICATION					

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES
.XX DECIMAL ± —
.XXX DECIMAL ± —
ANGLES ± —

PRODUCTION
CHANGE BY ECO ONLY

MFG Wilfred 6-23-78

ITEM	SIZE	PART OR IDENTIFYING NO.	DESCRIPTION
			PARTS LIST

CONT NO.

DRFTG: DR W. Guzowski 8 JUN 78 DATE; APPD; CHK; DEV
ENGRG: E/M R. Batchelder 6/28/78; PROJ S. Kelley 6/27/78

SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

CABLE ASSY,
DRII-C TO GRA-7 INTERFACE

SIZE	CODE IDENT NO.	DWG NO.
C	94117	1089756

SCALE NONE SHEET 1 OF 1

DO NOT SCALE PRINT

OP-332 REV.-J

1089756

4.3 Change 1

REVISION STATUS

	SH	1	2	3	4	5	6	7	8	9	10	11	12
PARTS	REV	C	C										
	SH	13	14	15	16	17	18	19	20	21	22	23	24
	REV												
LIST	–												

DWG REV	B
WL REV	X

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
B	REV PER ECO 111297 REPLACE ON DWG P/L W/MARCH WHITIE	21 MARCH 1985	RS/
C	REV PER ECO 111246	5/7/85	

2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST, DRAWING AND WIRE LIST.

1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION
CHANGE BY ECO ONLY

MFG: A. SULLIVAN 1-22-81

	V1000
5802956	V3000
NEXT ASSY	USED ON
APPLICATION	

CONT NO.

DRFTG	DR R.P. MARSHALL	DATE 15JAN81
	APPD R.E. POIRIER	15JAN81
	CHK	
ENGRG	DEV R. GERTTULA	1/15/81
	E/M R. BATCHELDER	1/15/81
	PROJ DAVID BEAN	1/22/81

CALCOMP
A Sanders Graphics Company
SANDERS

CIRCUIT CARD ASSY, 32 BIT SEL INTERFACE

SIZE A

PL 5802528

SHEET 1 OF 2

DPD-102 REV-

DWG SIZE F

The Draftboard

PARTS LIST

ITEM NO.	QTY PER ASSY G1	QTY PER ASSY G2		DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	1	1		E		1086802G002	CIRCUIT CARD ASSY PARALLEL INTERFACE	
2	1	1		A		0310449P001	MICROCIRCUIT, DIGITAL, FLIP-FLOP, D-TYPE, DUAL (74LS74N) U73,	=
3	1	1		A		0970002P002	SOCKET, DIP, STR, MED, WIRE WRAP;14-SKT, 3 LEVEL, GOLD	
4	24 IN	24 IN		A		7011460P036	WIRE, 26AWG-BLU INS, WIREWRAP	=
5	AR	AR		A		0093002P001	SOLDER	
6	REF	REF		A		0815003	PWB AND CKT BD, REQT FOR PWB AND CKT BD, REQT FOR	
7	AR	AR		A		0740061P002	ADHESIVE, EPOXY CATALYST	=
8	AR	AR		A		0740061P001	ADHESIVE, EPOXY RESIN	=
10	1	1		A		4171182P001	MARKER, IDENTIFICATION	
11	REF	REF		E		5811606	LOGIC DIAGRAM	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM—SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A		PL 5802528
	REV C	SHEET 2

SA-01-266A (12-84)

REVISION STATUS

PARTS	SH	1	2	3	4	5	6	7	8	9	10	11	12
	REV	C	B	B	C	B							
	SH	13	14	15	16	17	18	19	20	21	22	23	24
LIST	REV												

DWG REV	B
WL REV	X

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
–	REL TO PROD	3/18/83	
A	REV PER ECO 110250	2 JAN 84	BM/RG
B	REV PER ECO 110286	24 JAN 84	SEH
C	REV PER ECO 110287	17 FEB 84	TD

3. ITEM NUMBERS WITH SUBSCRIPTS ARE ALTERNATE ITEMS. ITEM 51A IS AN ALTERNATE FOR U24 ONLY.

2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST, DRAWING AND WIRE LIST.

1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION

CHANGE BY ECO ONL

MFG 111 Jaiza 4/1/83

	V/G1000
	V/G3000
FINAL	V/G4000
NEXT ASSY	USED ON
APPLICATION	

CONT NO.

		DATE
DRFTG DR	J Moore	Jan 82
APPD		22MAR'83
CHK	JA Bates	3-22-83
ENGRG DEV		3/18/83
EXM	Batchelder	4/1/83
PROJ	D. Brian	4/1/83

SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

CIRCUIT CARD ASSY 24 BIT PAR INTFC V/G DR11-W

SIZE	CODE IDENT NO.	
A	94117	PL 5810015

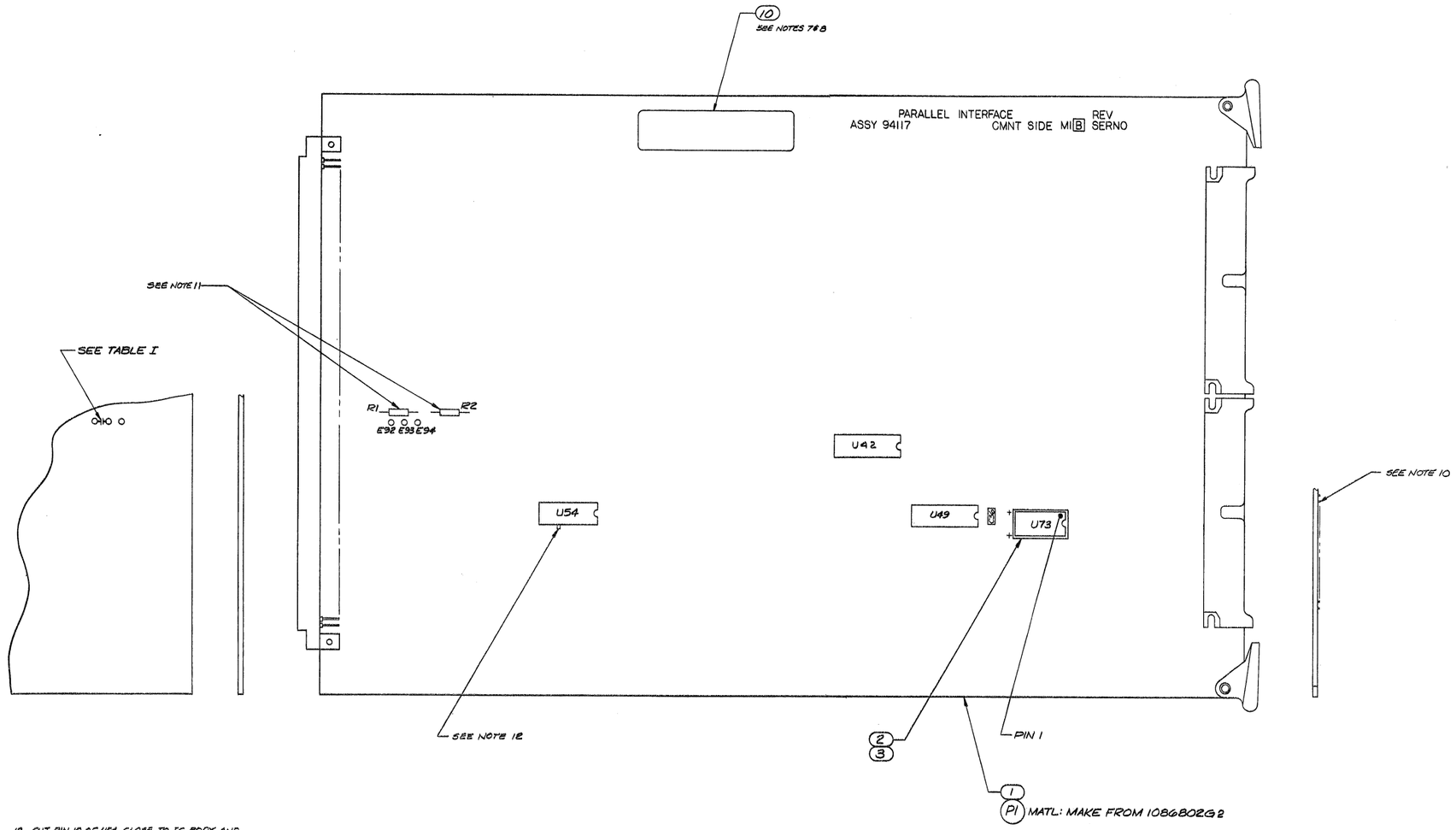
SHEET 1 OF 5

OP—1039 REV B

DWG SIZE E

45

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	B	REV PER ECO 111297	21 MAR 85	RS/WJC
		2. REPLACED WITHOUT CHANGE	29 JUL 85	SDS/



12. CUT PIN 10 OF U54 CLOSE TO IC BODY AND REMOVE CUT PIN FROM HOLE.
11. REMOVE R1&R2 FROM BOARD. G1 ONLY.
10. CUT WIRE WRAP PINS CLOSE TO BOARD. G1 ONLY.
9. JUMPER WIRES (ITEM 4) TO BE ATTACHED TO NON CMPT SIDE OF BOARD USING ITEM 7&8 CONNECTIONS OF JUMPER WIRES TO BE ROUTED THE SHORTEST POSSIBLE USING ITEM 5. (SOLDER)
8. MARK PART NO, SERNO AND REV PERMANENT AND LEGIBLE, MARKING METHOD OPTIONAL.
7. MARK APPROPRIATE "G" CONDITION SERNO AND REV AT FINAL ASSY.
6. SOLDER TIPS OR WIRE TO BE .09 MAX FROM BOARD.
5. MAX COMPONENT HEIGHT TO BE .44.
4. OTHER THAN SPECIFICALLY NOTED, CHARACTERS ARE REFERENCE AND NOT TO BE MARKED.
2. THIS ASSY SHALL MEET THE REQUIREMENTS OF ITEM 6.
1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

NOTES

TABLE I		
CUT CIRCUIT		"G" COND.
FROM	TO	
E93	E94	G1

TABLE II		
JUMPER		"G" COND.
FROM	TO	
U73 PIN 1	U46 PIN 6	G1,2
U73 PIN 2	U46 PIN 5	G1,2
U73 PIN 3	U46 PIN 7	G1,2
U73 PIN 4	E69	G1,2
U73 PIN 6	U61 PIN 10	G1,2
U73 PIN 7	GND	G1,2
U73 PIN 14	E75	G1,2
J3 PIN 43	U57 PIN 9	G1
J3 PIN 47	U58 PIN 2	G1
E92	E94	G1

6001 6002 **FOR PARTS LIST**
SEE PL 5802528

5802956	V1000
NEXT ASSY	USED ON
APPLICATION	

QTY PER ASSY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
XX DECIMAL ± —
XXX DECIMAL ± —
ANGLES ± —

PRODUCTION
CHANGE BY ECO ONLY

MFG A. SULLIVAN 1-22-81

CONT NO.

DRAWING RELEASED
DR A.P. MARSHALL 14JAN81
ENG D.E. REIER 15JAN81
CHK
DES R. GIATTULA 11/5/81
CHK R. BATCHELDER 11/5/81
PROJ DAVID BEAN 1/22/81

PARTS LIST
CALCOMP
A GERBER SCIENTIFIC COMPANY
SANDERS

CIRCUIT CARD ASSY, 32 BIT SEL INTERFACE

SIZE E | DWG NO 5802528
SCALE 2/1 | SHEET 1 OF 1
DO NOT SCALE PRINT

5802528 B

PARTS LIST

ITEM NO.	QTY PER ASSY G1			DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	1			E		5810016G1	CIRCUIT CARD SUBASSY, 24 BIT PARALLEL INTFC V/G DR11-W	
2	1			A		930002P3	MICROCIRCUIT, DIGITAL, NOR GATE, QUAD U76,	
3	1			A		310202P1	MICROCIRCUIT, DIGITAL, HEX INVERTERS U78,	‡
4	1			A		310319P1	MICROCIRCUIT, DIGITAL HEX INVERTER U97,	‡
5	1			A		310203P1	MICROCIRCUIT, DIGITAL HEX INV (BUFFERS/DRIVERS) U59,	‡
6	1			A		310234P1	MICROCIRCUIT, DIGITAL AND GATE U9,	‡
7	2			A		310248P2	MICROCIRCUIT, DIGITAL OR GATE U66,69,	‡
8	2				01295	SN74ALS37N	MED U77,110,	
9	3			A		310094P1	MICROCIRCUIT, DIGITAL FLIP-FLOP (DUAL) U39,98, 90,	‡
10	1			A		930074P3	MICROCIRCUIT, DIGITAL, FLIP-FLOP, D-TYPE U98,	
11	2			A		310278P3	MICROCIRCUIT, DIGITAL J-K FLIP FLOP U56,86,	‡
12	1			A		310405P1	MICROCIRCUIT, DIGITAL DUAL J-K POS EDGE TRIGGER ED F-F U19,	‡
13	3			A		930138P3	MICROCIRCUIT, DIGITAL, DECODER/DEMULTIPLEXER U28,37,58,	
14	1			A		313109P3	MICROCIRCUIT, DIGITAL, DECODER U17,	
15	1			A		313026P1	MICROCIRCUIT, DIGITAL PRIORITY ENCODERS U7,	‡
16	1			A		930173P1	MICROCIRCUIT, DIGITAL, REGISTER, D-TYPE U8,	
17	3			A		310279P1	MICROCIRCUIT, DIGITAL FLIP-FLOP U43,63,83,	‡
18	1			A		930174P3	MICROCIRCUIT, DIGITAL, D-TYPE, FLIP-FLOP U57,	
19	1			A		310279P2	MICROCIRCUIT, DIGITAL FLIP FLOP U67,	‡
20	1			A		930175P3	MICROCIRCUIT, DIGITAL, FLIP-FLOP D-TYPE U46,	
21	6			A		310367P2	MICROCIRCUIT, DIGITAL HEX BUFFER U16,36,53,73, 93,94,	‡
22	5			A		310368P2	MICROCIRCUIT, DIGITAL HEX INV U45,65,79,85,100,	‡
23	1			A		944005P5	MED U60,	
24	4			A		944005P3	MED U10,20,40,50,	
25	5			A		944005P1	MICROCIRCUIT, DIGITAL, TRANSCEIVER/RECEIVER U3, 4,14,33,34,	
26	12			A		931002P1	MICROCIRCUIT, DIGITAL, COUNTER, BINARY U5,15,25, 26,35,54,55,64,74,75,84,95,	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A	94117	PL 5 8 1 0 0 1 5
		REV B / SHEET 2

SA-01-266 (3 79)

PARTS LIST

ITEM NO.	QTY PER ASSY G1			DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
27	2			A		930109P7	MICROCIRCUIT, DIGITAL, FLIP-FLOP J-K EDGE TRIGGERED DUAL U38,48,	
28	3			A		931008P1	MED U49,68,99,	
30	1			A		1086870P9	PROGRAMMED PROM U6,	
31	1			A		1908509P2	PROGRAMMED PROM U70,	
32	1			A		1086871P18	PROGRAMMED PROMS U47,	
33	2					RCR07G153JS	RES MIL-R-39008/1 15 K OHMS + 5- 5% .25 WATT R10,11,	
34	10					RCR07G103JS	RES MIL-R-39008/1 10 K OHMS + 5- 5% .25 WATT R1,4-8,12-14,19,	
35	3					RCR07G511JS	RES MIL-R-39008/1 510 OHMS + 5- 5% .25 WATT R2,3,9,	
36	3			A		310092P1	MICROCIRCUIT, DIGITAL NAND GATE U18,29,87,	‡
38	2					M39003/01-2529	CAP. MIL-C-39003/1 15 U FARAD+ 10- 10% 20 WVDC C39,40,	
39	47					CK05BX103K	CAP. MIL-C-11015/18 .01 U FARAD+ 10- 10% 100 WV DC C3-38,43-53,	
40	1					M39003/01-2499	CAP. MIL-C-39003/1 39 U FARAD+ 10- 10% 10 WVDC C1,	
41	1					CK05BX104K	CAP. MIL-C-11015/18 .1 U FARAD+ 10- 10% 50 WVDC C2,	
42	4					CM05ED510JP3	CAP. MIL-C-5/18 51 P FARAD+ 5- 5% 500 WVDC C41,42,	
43	6			A		958000P3	LIGHT, INDICATOR, (LIGHT EMITTING DIODE) DS1-6,	
44	1			A		963001P1	CHOKE, WIDE BAND L1,	
45	1			D		1086608P18	CONNECTOR, ELECTRICAL PC BOARD (98 PIN) P1,	‡
47	4					310445P1	MICROCIRCUIT, DIGITAL, GATE, POSITVE-NAND U32,52,81,92,	‡
48	1			A		310453P1	MICROCIRCUIT, DIGITAL, HEX INVERTER U12,	
49	1					310445P3	MICROCIRCUIT, DIGITAL, GATE, POSITIVE-NAND U62,	‡
50	4			A		310449P1	MICROCIRCUIT, DIGITAL, FLIP-FLOP, D-TYPE, DUAL U11,22,51,72,	‡
51	5			A		310328P2	MICROCIRCUIT, DIGITAL MONOSTABLE MV U2,42,61,94,24,	‡

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A	94117	PL 5 8 1 0 0 1 5
	REV B	SHEET 3

SA-01-266 (3-79)

PARTS LIST

ITEM NO.	QTY PER ASSY G1			DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
51 A	REF				07263	96LS02	MED, DUAL RETRIGGERABLE U24,	
52	2			A		944005P7	MICROCIRCUIT, DIGITAL, TRANSCEIVER/RECEIVER U1, 41,	
53	1			A		310205P1	MICROCIRCUIT, DIGITAL NAND BUFFER U71,	‡
54	2			A		930240P3	MICROCIRCUIT, DIGITAL, BUFFER AND LINE DRIVER (OCTAL) U27,30,	
55	1			A		310451P1	MICROCIRCUIT, DIGITAL, GATE, BUS BUFFER (QUAD) U109,	
56	1					310445P5	MICROCIRCUIT, DIGITAL, GATE, POSITIVE-NAND U82,	‡
57	5					RCR07G512JS	RES MIL-R-39008/1 5.1 K OHMS + 5- 5% .25 WATT R15-18,20,	
58	4					CM05FD151JP3	CAP. MIL-C-5/18 150 P FARAD+ 5- 5% 500 WVDC C54-57,	
59	1					RCR07G332JS	RES MIL-R-39008/1 3.3 K OHMS + 5- 5% .25 WATT R21,	
61	1					CM05ED200JP3	CAP. MIL-C-5/18 20 P FARAD+ 5- 5% 500 WVDC C58,	
62	1					CM05ED240JP3	CAP. MIL-C-5/18 24 P FARAD+ 5- 5% 500 WVDC C59,	
63	2				22526	65496-031	CONN, 50 PIN SOLDER J2,3,	
64	1			A		1908509P1	PROGRAMMED PROM U60,	
65	1			A		1908510P1	PROGRAMMED PROM U89,	
66	3			A		925000P1	RES U13,31,44,	
67	3			A		920100P1	SWITCH, ROCKER, SPST S1-3,	
68	12				22526	65611-220	POST PKG, DOUBLE ROW, 10 POSITION, CREME	
69	5				22526	76266-110	10 POS JUMPER ASSY, BLUE	
70	1			A		4171182P1	MARKER, IDENTIFICATION	
71	REF			A		5810019	INTFC CONTROL DOCUMENT	
72	REF			E		5810017	LOGIC DIAGRAM, 24 BIT PARALLEL INTFC V/G DR11-W	
73	REF			A		815003	PW AND CKT BD, REQT FOR	
74	REF			A		5810055	REWORK INSTRUCTION, 5810015	
78	2			A		1089678P1	CARD EJECTOR (MOD)	
79	2			A		630003P14	EYELET, METALLIC	‡
80	2			A		985007P1	EYELET, METALLIC	
81	1					M39003/01-2499	CAP. MIL-C-39003/1 68 U FARAD+ 20- 20% 20 WVDC C60,	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A	94117	PL 5810015
	REV C	SHEET 4

SA-01-266 (3 79)

PARTS LIST

ITEM NO.	QTY PER ASSY G1			DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
82	3(IN			A		7011460P36	WIRE, 26AWG-BLU INS, WIREWRAP	‡
83	1(IN			A		278002P13	WIRE, ELEC (UNINSULATED) AWG 22	‡
84	1(IN			A		270006P5	INSULATION TUBING	‡

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

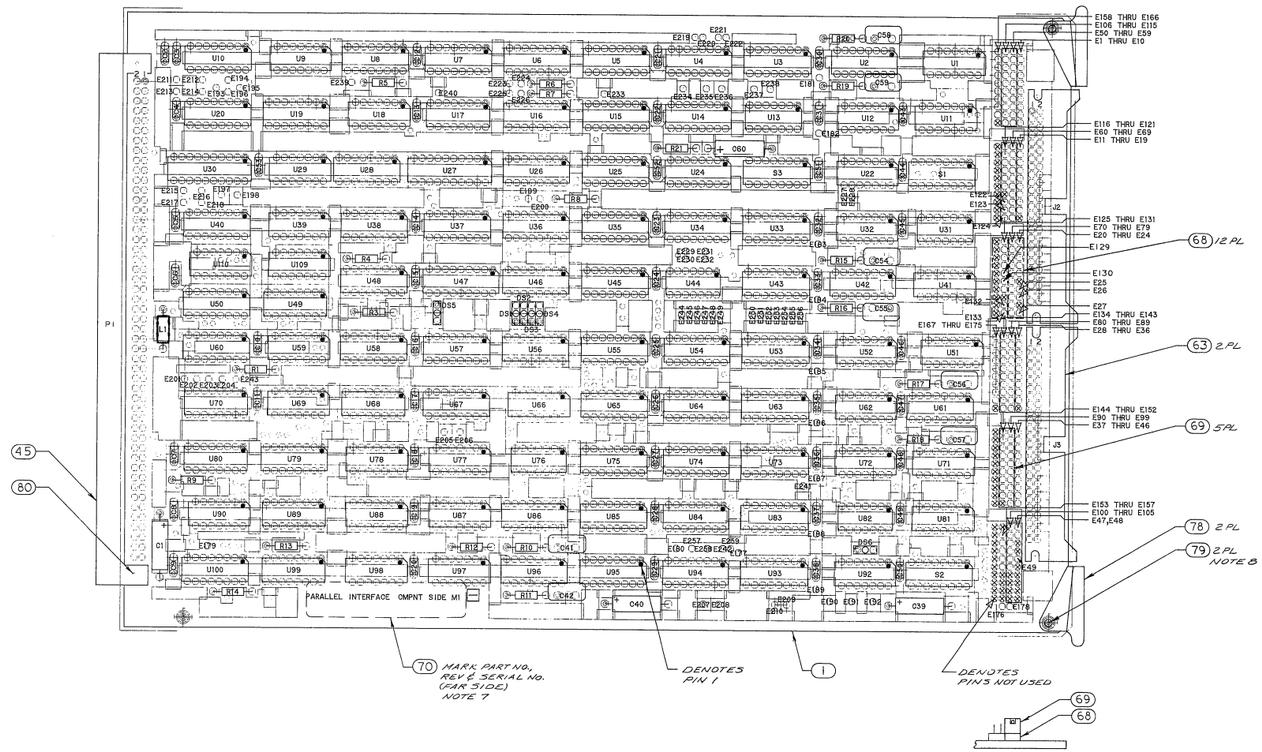
SIZE	FSCM NO.	
A	94117	PL 5 8 1 0 0 1 5
	REV B	SHEET 5

SA-01-266 (3 79)

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	-	REL TO PROD	3/15/83	
	A	REV PER ECO 1102SD	5 JAN 84	
	B	REV PER ECO 1102B6	24 JAN 84	

SWITCH SETTING CLOSED I&Z	
PARALLEL I/F No.1	
24 BIT ADDRESSING	CLOSE S3-1, S3-2, S3-3, S3-5 OPEN S3-4, S3-6, S3-7, S3-8
18 BIT ADDRESSING	CLOSE S3-7, S3-8, S3-3, S3-5 OPEN S3-1, S3-2, S3-4, S3-6

JUMPER TABLE			
FROM	TO	USING ITEM NO.	
E202	E204	83 & 84	COMP SIDE
E193	E195	83 & 84	COMP SIDE
E176	E177	82	COMP SIDE
E178	E179	82	COMP SIDE
INSTALL ITEM No. 69 AS SHOWN			COMP SIDE



G1 **FOR PARTS LIST**
SEE PL 5810015

8. DISCARD ROLLPIN INCLUDED WITH ITEM 78 REPLACE WITH ITEM 79.
7. MARK PERMANENT & LEGIBLE CHARACTERS .09-.16 HIGH WITH CONTRASTING COLOR, GOTHIC TYPE & LOCATE APPROX AS SHOWN. MARKING METHOD OPTIONAL.
6. SOLDER TIPS OR WIRE TO BE .06 MAX FROM BOARD
5. MAX COMPONENT HEIGHT TO BE .44 .
4. OTHER THAN SPECIFICALLY NOTED, CHARACTERS ARE REFERENCE AND NOT TO BE MARKED.
3. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST AND DRAWING.
2. THIS ASSY SHALL MEET THE REQUIREMENTS OF ITEM 73.
1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

NOTES

	1/G1000
	1/G3000
FINAL	1/G4000
NEXT ASSY	USED ON
APPLICATION	

G4	G3	G2	G1	ITEM	SIZE	PART OR IDENTIFYING NO.	DESCRIPTION
QTY PER ASSY							PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES
.XX DECIMAL ± —
.XXX DECIMAL ± —
ANGLES ± —

PRODUCTION
CHANGE BY ECO ONLY
MFG

	CONT NO.	DATE
DRAWN		12 MAR 83
ENGR		5-22-85
QUAL		7/11/83
PROJ		7/11/83

CALCOMP
SANDERS

CIRCUIT CARD ASSY
24 BIT PARALLEL INTFC
V/G DR11-W

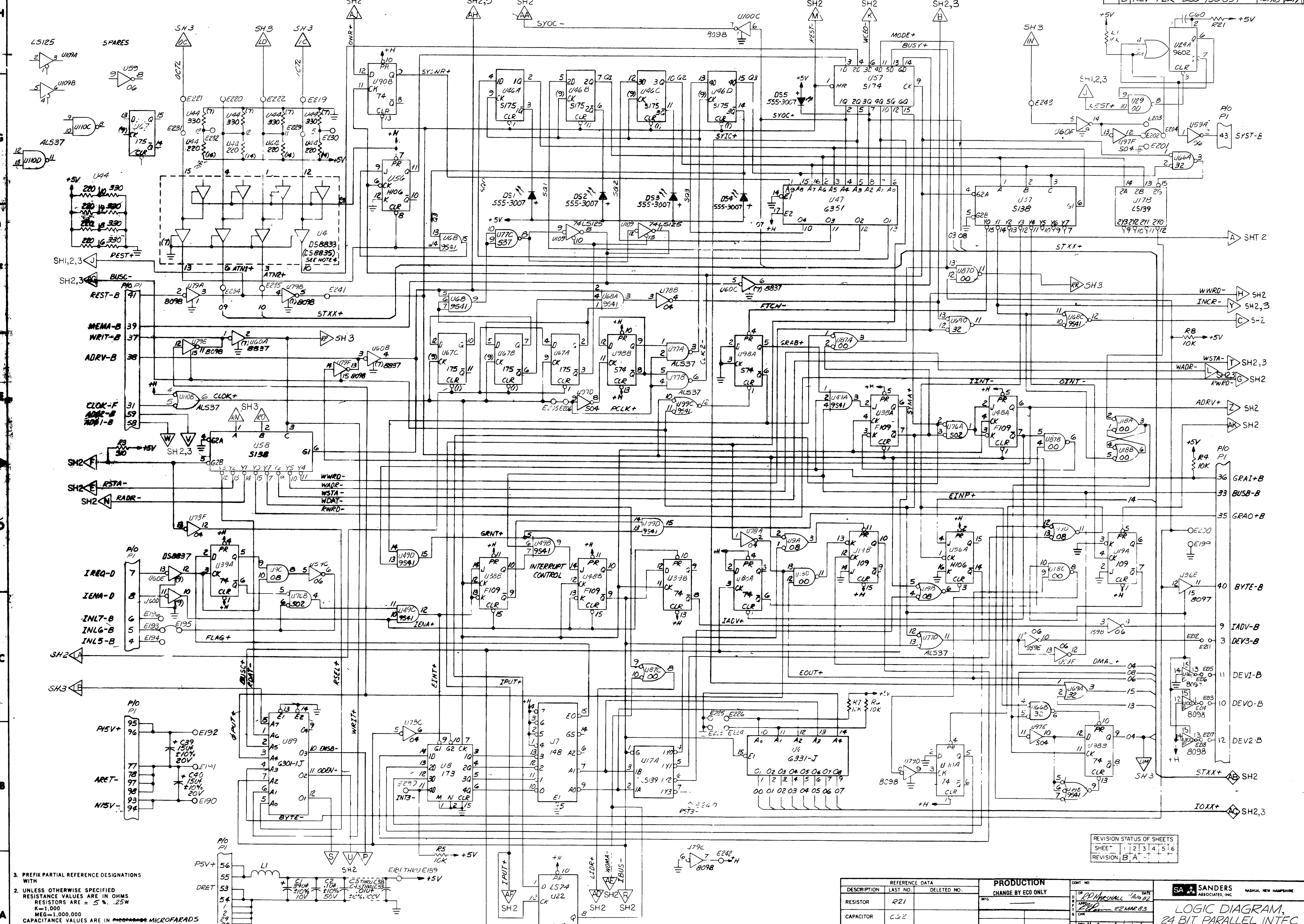
SIZE	DWG NO.	
E	5810015	A
SCALE NONE	SHEET 1 OF 1	

DO NOT SCALE PRINT

5810015

The Drafboard

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	-	REL FOR PROD	3/18/83	
	A	REV PER ECO 110286	24 JAN 84	SEH
	B	REV PER ECO 130834	6/24/85	MNT



3. PREFIX PARTIAL REFERENCE DESIGNATIONS WITH
2. UNLESS OTHERWISE SPECIFIED
   RESISTANCE VALUES ARE IN OHMS
   RESISTORS ARE ± 5%, .25W
   K=1,000
   MEG=1,000,000
   CAPACITANCE VALUES ARE IN ~~PICOFARADS~~ MICROFARADS
   CAPACITORS ARE ± 5%, .50V
   UF=MICROFARADS
   INDUCTANCE VALUES ARE IN MICROHENRIES
1. INTERPRET DRAWING PER 815002

NOTES

REVISION STATUS OF SHEETS						
SHEET	1	2	3	4	5	6
REVISION	B	A	-			

REFERENCE DATA		
DESCRIPTION	LAST NO.	DELETED NO.
RESISTOR	R21	
CAPACITOR	C62	
DIODE	DS6	
TRANSISTOR	-	
INDUCTOR	L1	
MICROELEMENT	U110	
WIRING DIAGRAM		

PRODUCTION
CHANGE BY ECO ONLY

NEXT ASSY	USED ON
	GRA-8
	GRA-7
5810069	GRA-X

APPLICATION

CONT NO

DR RP MARSHALL 1 AUG 82
APPD 22 MAR 83
CHK
DEV 3/1/83
ENGR R Batchelder 4/1/83
PROJ W. Bean 4/1/83

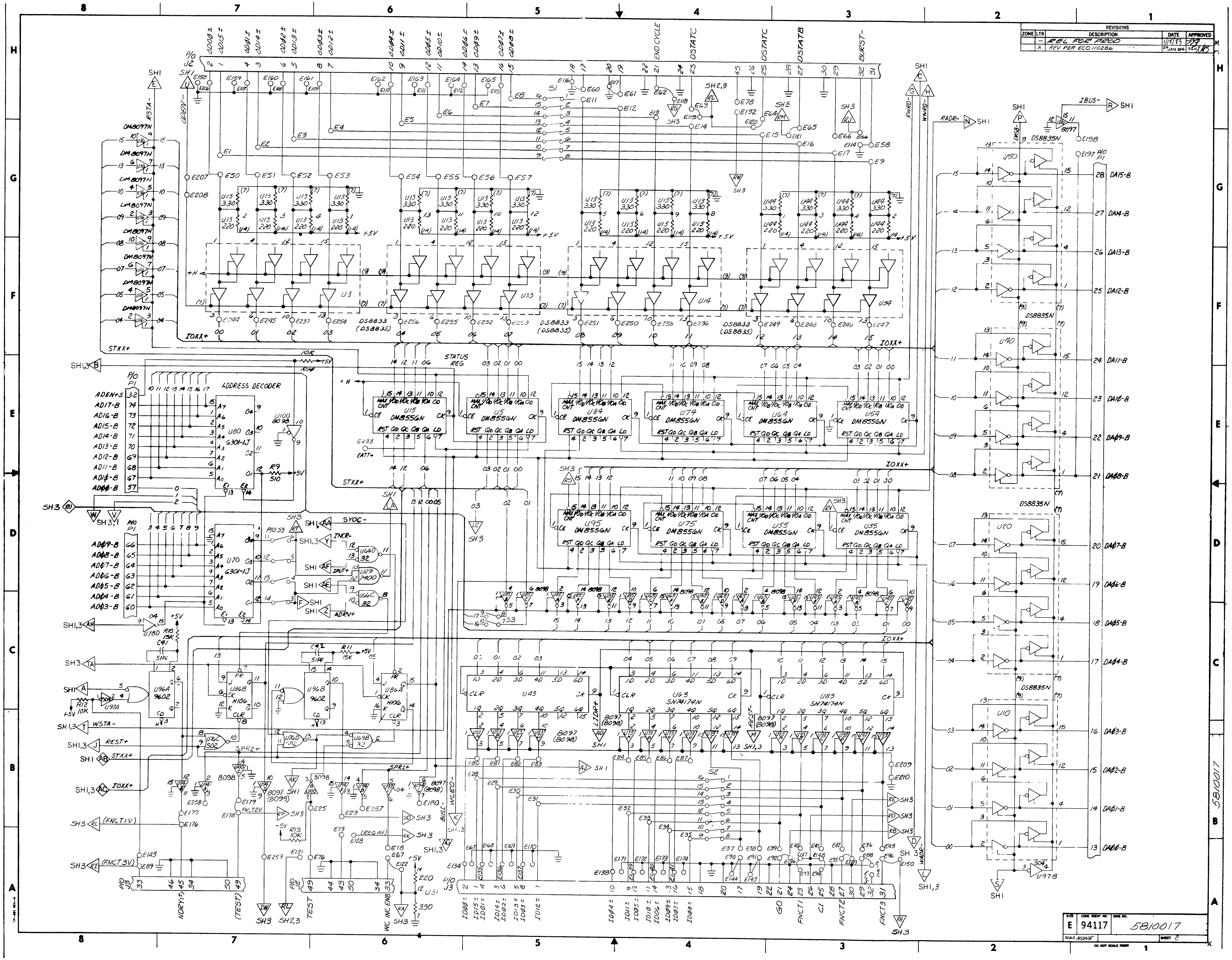
SANDERS ASSOCIATES, INC. NASHUA, NEW HAMPSHIRE

LOGIC DIAGRAM, 24 BIT PARALLEL INTFC V/G DR11-W

SIZE E | CODE IDENT NO. 94117 | DWG NO. 5810017

SCALE NONE | SHEET 1 OF 3

DO NOT SCALE PRINT


REVISIONS
ZONE LTR DESCRIPTION DATE APPROVED
REL FOR PROD
A REV PER ECO 110286
ADDRESS DECODER
STATUS REG
E 94117 5810017
SCALE NONE SHEET 2
DO NOT SCALE PRINT

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	–	REL FOR PROD	1/12/83	[illegible]

3. PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

2. UNLESS OTHERWISE SPECIFIED
RESISTANCE VALUES ARE IN OHMS
RESISTORS ARE ± %, W
K=1,000
MEG=1,000,000
CAPACITANCE VALUES ARE IN PICOFARADS
CAPACITORS ARE ± %, V
UF=MICROFARADS
INDUCTANCE VALUES ARE IN MICROHENRIES

1. INTERPRET DRAWING PER 815002

NOTES

REFERENCE DATA		
DESCRIPTION	LAST NO.	DELETED NO.
RESISTOR		
CAPACITOR		
DIODE		
TRANSISTOR		
INDUCTOR		
MICROASSEMBLY		
WIRING DIAGRAM		

MFG

NEXT ASSY | USED ON

APPLICATION

CONT NO.

		DATE
DR		
APPD		
CHK		
DEV		
ENG		
PROJ		

SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

SIZE	CODE IDENT NO.	DWG NO.
E	94117	5810017

SCALE — SHEET 9

DO NOT SCALE PRINT

5810017

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	–	REL FOR PROD	5-28-82	[illegible]
	A	REV PER ECO 109699	7 SEP 82	TD/JAB
	B	REV PER ECO 109771	17 NOV 82	TD/ [illegible]
	C	REV PER ECO 109821	20 JAN 83	RDM/JAB
	D	REV PER ECO 111234	2 JAN 85	BM

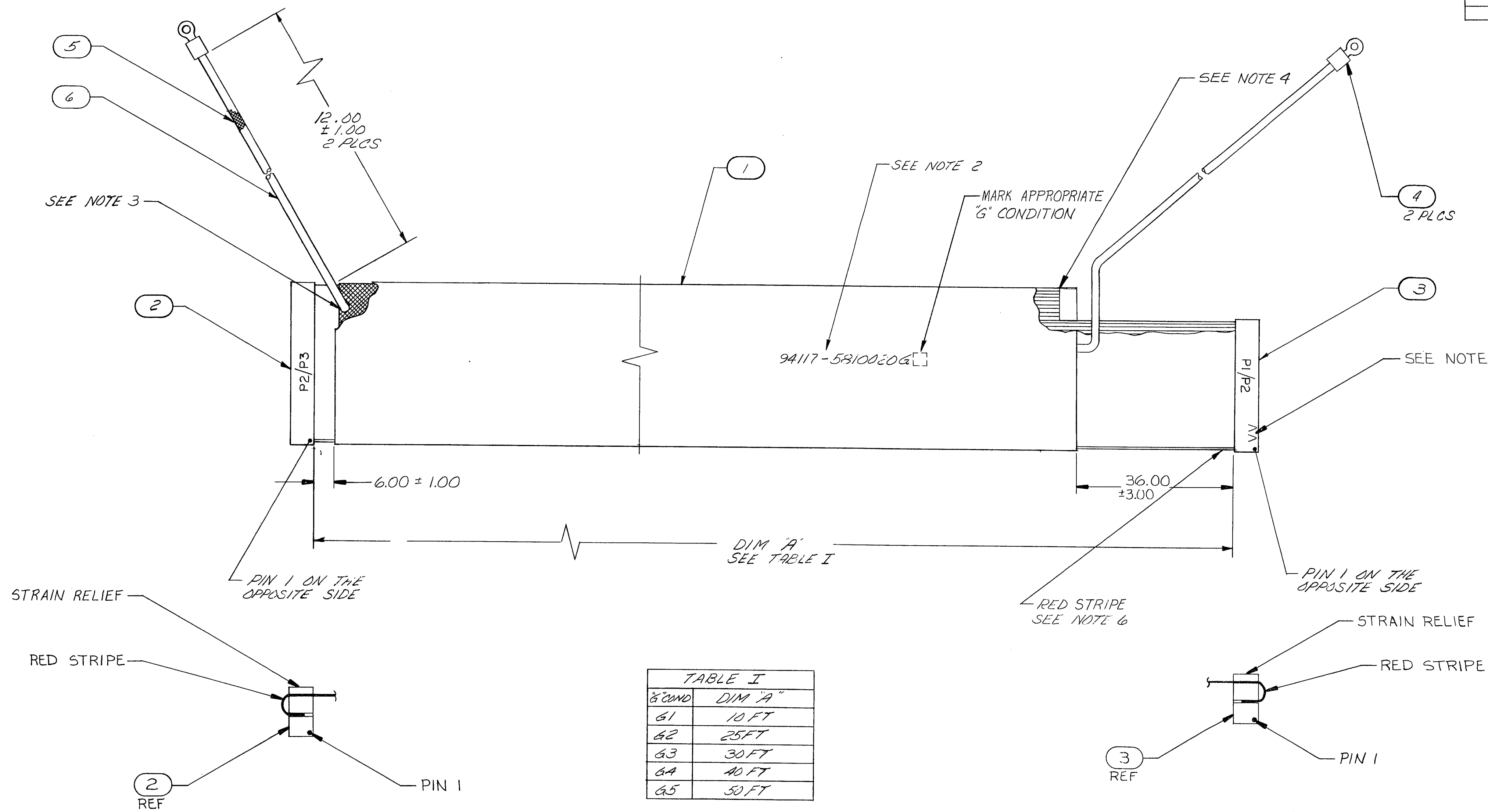


TABLE I	
"G" COND	DIM "A"
G1	10 FT
G2	25 FT
G3	30 FT
G4	40 FT
G5	50 FT

6. RED STRIPE IS CONNECTED TO PIN ONE OF ALL CONNECTORS.
5. PIN 1 OF 40 PIN SOCKET MATCHES "VV" ON DEC BERG CONN.
4. CUT UNUSED WIRE OF ITEM 1 OFF JUST INSIDE JACKET TO ALLOW MOUNTING OF ITEM 3.
3. SOLDER ITEM 5 TO BRAIDED SHIELD OF ITEM 1. ALLOW THE INSULATING JACKET TO COVER THE SOLDER JOINTS, AT BOTH ENDS OF THE CABLE. SECURE JACKET EDGE TO CABLE BY APPLYING ITEM 9 BETWEEN LAYERS AT BOTH ENDS.
2. MARK PERMANENT AND LEGIBLE, CHARACTERS .04-.16 HIGH WITH CONTRASTING COLOR, GOTHIC TYPE AND LOCATE APPROX AS SHOWN. MARKING METHOD OPTIONAL.
1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

NOTES

PARTS LIST

G6	G5	G4	G3	G2	G1	ITEM	SIZE	PART OR IDENTIFYING NO.	DESCRIPTION	FSCM
AR	AR	AR	AR	AR		9		649749	TAK PAK	05792
						8				
AR	AR	AR	AR	AR		7	A	93002P1	SOLDER	
25IN	25IN	25IN	25IN	25IN		6	A	0270061P005	HEAT SHRINKABLE SLEEVING 3/16	
26IN	26IN	26IN	26IN	26IN		5	A	0270017P3	BRAID WIRE	
2	2	2	2	2		4		MS25036-108	CRIMP LUG NO. 10	
1	1	1	1	1		3	A	0907069P001	CONN, PWB, PLUG, MASS TERM, 40 SKT	
1	1	1	1	1		2	A	0907069P002	CONN, PWB, PLUG, MASS TERM, 50 SKT	
50FT	40FT	30FT	25FT	10FT		1	A	0901003P009	CABLE FLAT 50-COND, SHLD, JACKET	

QTY PER ASSY

NEXT ASSY	USED ON
	GRA-X
	GRA-8
FINAL	GRA 7

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES
.XX DECIMAL ± 6.00 .XXX DECIMAL ± —
ANGLES ± —

PRODUCTION
CHANGE BY ECO ONLY

CONT NO.
DRFTG DR [signature] DATE 26 apr 82
APPD [signature] 18 MAY 82
CHK
ENGRG DEV [signature] 5-20-82
[signature] 5/27/82
PROJ [signature] 5/27/82
MFG [signature] 5-27-82

SA SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

PARALLEL INTERFACE CABLE ASSY

SIZE D | CODE IDENT NO. 94117 | DWG NO. 5810020
SCALE NONE | SHEET 1 OF 1
DO NOT SCALE PRINT

5810020

OP 334 REV-J
The Draftboard

APPLICATION	
NEXT ASSY	USED ON
FINAL	V/G 1000
	V/G 3000
	V/G 4000

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
-	REL FOR PROD	3/22/83	

REVISION STATUS OF SHEETS						
SHEET	1	2	3	4	5	6
REVISION	-	-				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
XX DECIMAL ± —
.XXX DECIMAL ± —
ANGLES ±
SURFACE QUALITY — V MAX
INTERPRET DWG PER B15002

PRODUCTION
CHANGE BY ECO ONLY

MFG

CONT NO.

DRFTG	DR	DATE 22MAR83
	APPD	22MAR83
	CHK	3/22/83
ENGR	DES	3/22/83
	E/R	4/1/83
	PROJ.	4/1/83

CALCOMP
SANDERS

REWORK INSTRUCTIONS
FOR 5810015

SIZE	DWG NO.	
A	5810055	
SCALE NONE		SHEET 1 OF 2

DPD-100 REV-

DO NOT SCALE PRINT

The Draftboard

1. INSTALL JUMPERS (SOLDER) ON COMPONENT SIDE USING ITEM NO. 82

   a. U82-12 TO U110-1 TO U110-2

   b. U110-3 TO U44-11

2. INSTALL A 510 Ω RESISTOR ITEM #35 BETWEEN U28-5 AND U28-16 USING ITEM #84 AS SHOWN IN FIG. 1.

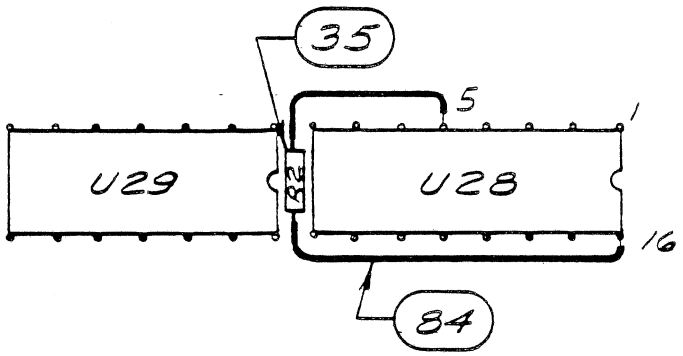
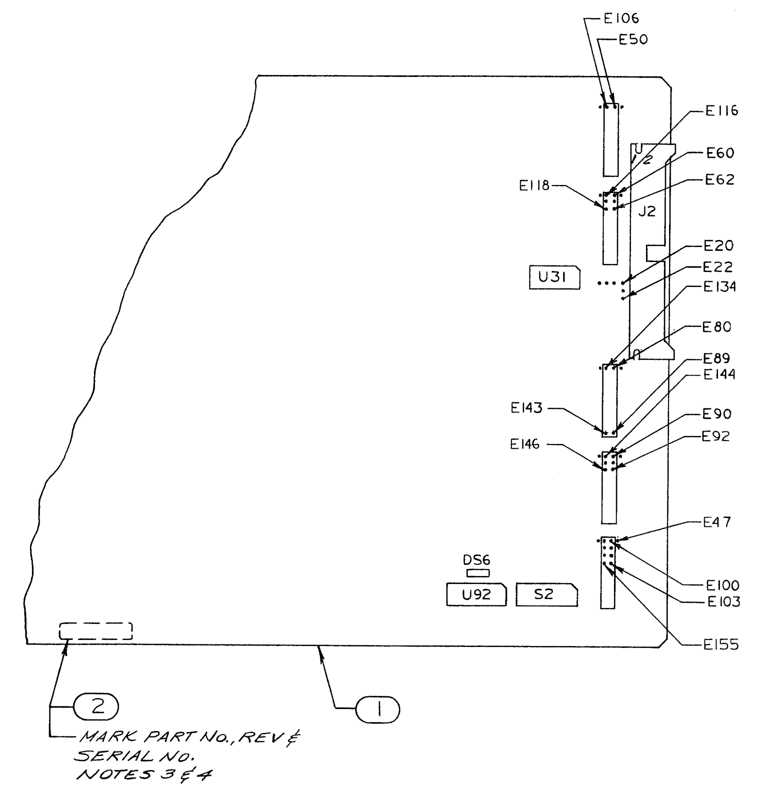


FIG. 1

SIZE		5810055
A		
	REV –	SHEET 2

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	REL TO PROD	3/31/83	



△2 ALTERATION INSTRUCTIONS

a. REMOVE JUMPER PLUG THAT CONNECTS THE BLOCKS STARTING AT E100-E47.
b. REINSTALL JUMPER PLUGS AS SHOWN.
c. REMOVE THE FOLLOWING JUMPER PINS FROM THE JUMPER PLUGS. E118-62, E143-89, E146-92, E155-103.
d. LIFT PIN U92-3.
e. REMOVE COMPONENT DS6.
f. ON COMPONENT SIDE OF BOARD, WIRE WRAP THE FOLLOWING "E" POINTS, USING ITEM No. 5 E20-E22.
g. ON NONCOMPONENT SIDE OF BOARD SOLDER THE FOLLOWING JUMPERS USING ITEM No 5 E62 & E92 TO GND PLANE, J2-32 TO U31-1.

ALTERED ITEM DWG

QTY PER ASSY G1	ITEM	SIZE	PART OR IDENTIFYING NO.	DESCRIPTION
AR	6	A	93002P1	SOLDER
3FT	5	A	7011460P36	WIRE, INSULATED 26AWG
REF	4	A	5810019	INTFC CONTROL DOCUMENT
REF	3	E	5810057	LOGIC DIAGRAM
1	2	A	4171182P1	MARKER, IDENTIFICATION
1	1	E	5810015G1	CCA 24 BIT PARALLEL INTFC

PARTS LIST

4. MARK PERMANENT & LEGIBLE CHARACTERS .04-.16 HIGH, WITH CONTRASTING COLOR, GOTHIC TYPE & LOCATE APPROX AS SHOWN. MARKING METHOD OPTIONAL.
3. PLACE ITEM 2 OVER EXISTING LABEL.
△2 ALTER AS SHOWN.
1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

NOTES

NEXT ASSY	USED ON
	V/G1000
	V/G3000
FINAL	V/G4000

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES
.XX DECIMAL ± — .XXX DECIMAL ± —
ANGLES ± —

PRODUCTION
CHANGE BY ECO ONLY

MFG M. Lanza 4/1/83

CONT NO.

DRFTG: DR Champagne 21 MAR 83; APPD 23 MAR 83; CHK A. Botton 3-22-83
ENGRG: DEV 3/22/83; ENG Batchelder 4/1/83; PROJ D. Bean 4/1/83

CALCOMP
A Sanders Graphics Company
SANDERS

CCA 24 BIT PARALLEL INTERFACE
V/G DRV11-B

SIZE C | DWG NO. 5810056

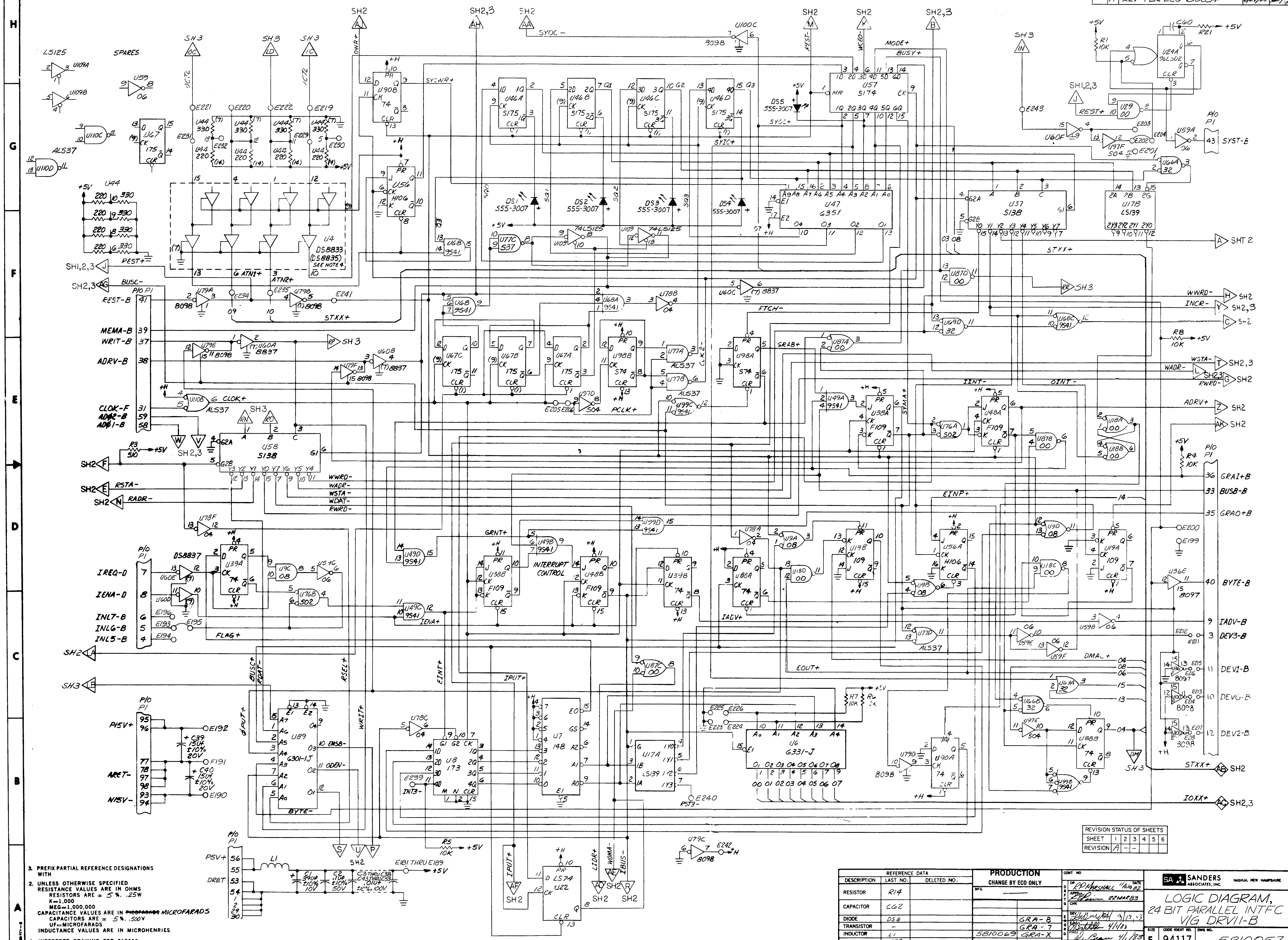
SCALE NONE | SHEET 1 OF 1

DO NOT SCALE PRINT

5810056

DPD-107 REV-

ZONE	LTR	REVISIONS DESCRIPTION	DATE	APPROVED
	–	REL FOR PROD	3/15/83	
	A	REV PER ECO 130834	6/24/85	



3. PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

2. UNLESS OTHERWISE SPECIFIED
RESISTANCE VALUES ARE IN OHMS
RESISTORS ARE ± 5 %, .25W
K=1,000
MEG=1,000,000
CAPACITANCE VALUES ARE IN ~~PICOFARADS~~ MICROFARADS
CAPACITORS ARE ± 5 %, .500V
UF=MICROFARADS
INDUCTANCE VALUES ARE IN MICROHENRIES

1. INTERPRET DRAWING PER 815002

NOTES

REVISION STATUS OF SHEETS						
SHEET	1	2	3	4	5	6
REVISION	A	–	–			

REFERENCE DATA		
DESCRIPTION	LAST NO.	DELETED NO.
RESISTOR	R14	
CAPACITOR	C62	
DIODE	DS6	
TRANSISTOR	–	
INDUCTOR	L1	
MICROELEMENT	U72	
WIRING DIAGRAM		

PRODUCTION
CHANGE BY ECO ONLY

NEXT ASSY	USED ON
	GRA-8
	GRA-7
5810069	GRA-X

APPLICATION

DR R P MARSHALL 11 AUG 82
APPD 22 MAR 83
DEV 3/18/83
ENG 4/1/83
PROJ D. Bean 4/1/83

SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

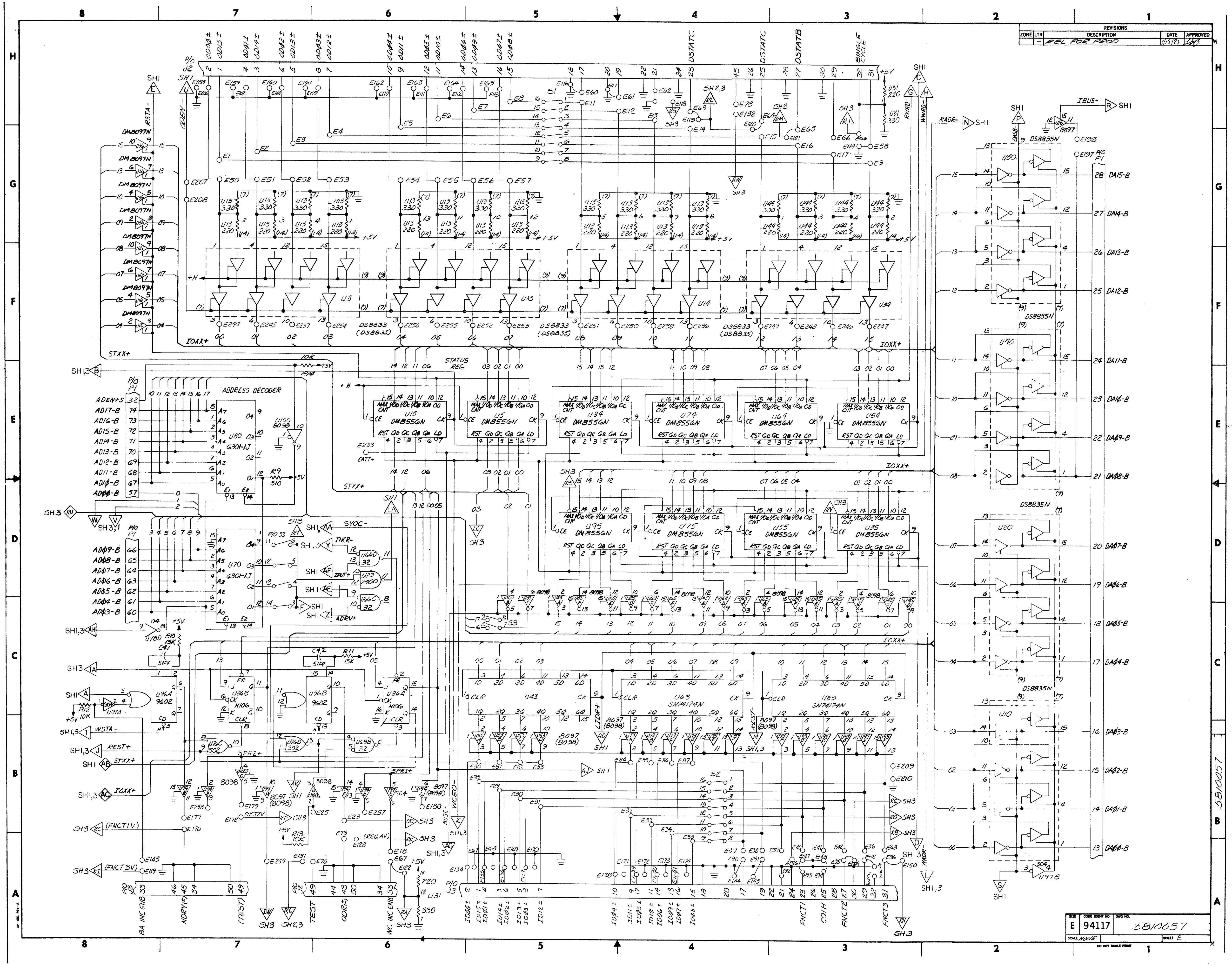
LOGIC DIAGRAM, 24 BIT PARALLEL INTFC V/G DRV11-B

SIZE E | CODE IDENT NO. 94117 | DWG NO. 5810057

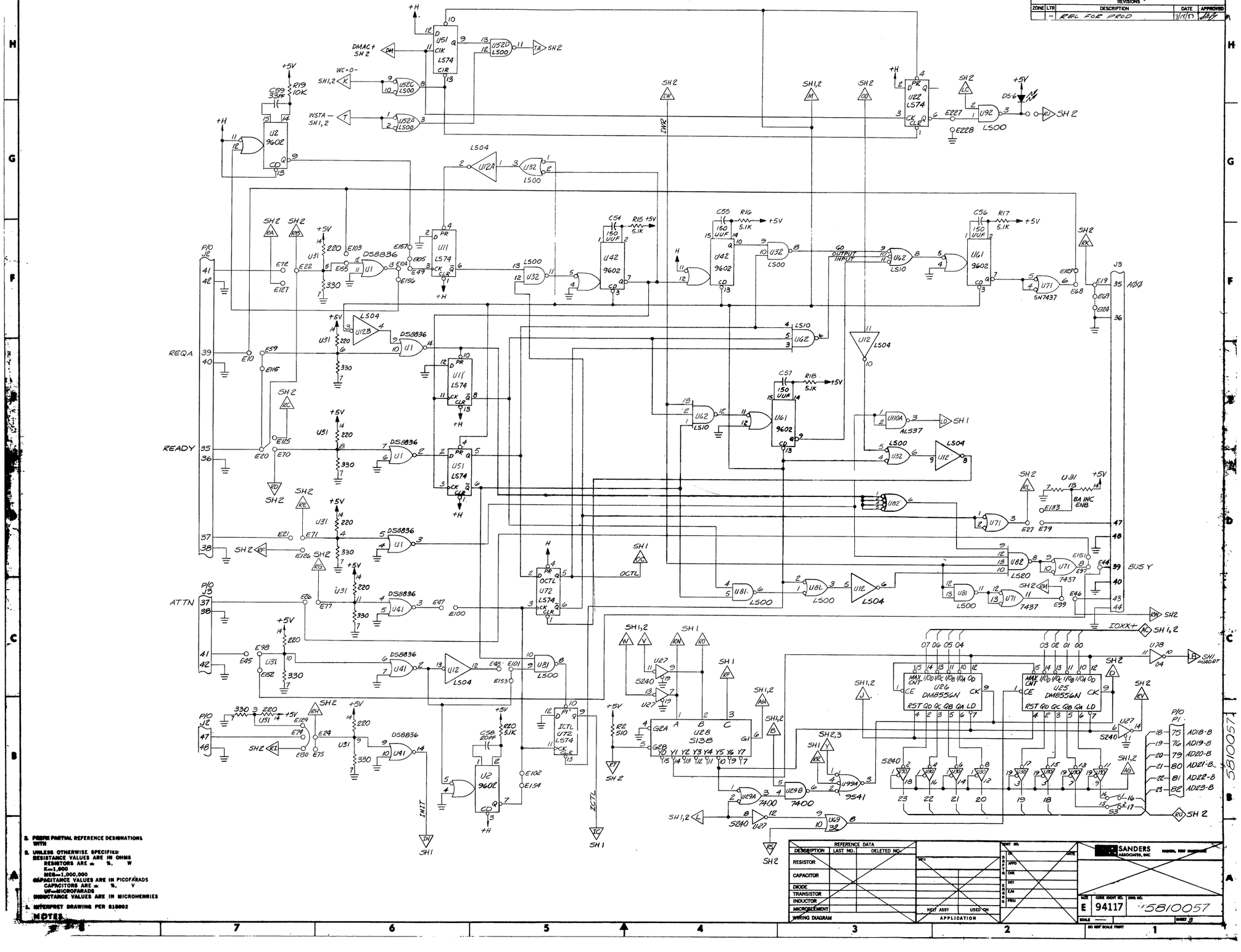
SCALE NONE | SHEET 1 OF 3

DO NOT SCALE PRINT

5810057


REVISIONS
ZONE LTR DESCRIPTION DATE APPROVED
- REL FOR PROD
ADDRESS DECODER
STATUS REG
U80 6301-1J
U70 6301-1J
DM855GN
DS8833 (DS8835)
DS8835N
SN74174N
U96A 9602
U96B 9602
U86B H106
U86A H106
8097 (8098)
IOXX+
STXX+
SH3
SH1,3
E 94117 5810057
5810057
SCALE NONE
DO NOT SCALE PRINT

ZONE	LTR	REVISIONS DESCRIPTION	DATE	APPROVED
	-	REL FOR PROD	7/19/80	



1. PREFIX PARTIAL REFERENCE DESIGNATIONS WITH
2. UNLESS OTHERWISE SPECIFIED
   RESISTANCE VALUES ARE IN OHMS
   RESISTORS ARE ± %, W
   K=1,000
   MEG=1,000,000
   CAPACITANCE VALUES ARE IN PICOFARADS
   CAPACITORS ARE ± %, V
   UF=MICROFARADS
   INDUCTANCE VALUES ARE IN MICROHENRIES
3. INTERPRET DRAWING PER S18002

NOTES:

REFERENCE DATA		
DESCRIPTION	LAST NO.	DELETED NO.
RESISTOR		
CAPACITOR		
DIODE		
TRANSISTOR		
INDUCTOR		
MICROELEMENT		
WIRING DIAGRAM		

NEXT ASSY | USED ON
APPLICATION

SANDERS ASSOCIATES, INC. NASHUA, NEW HAMPSHIRE

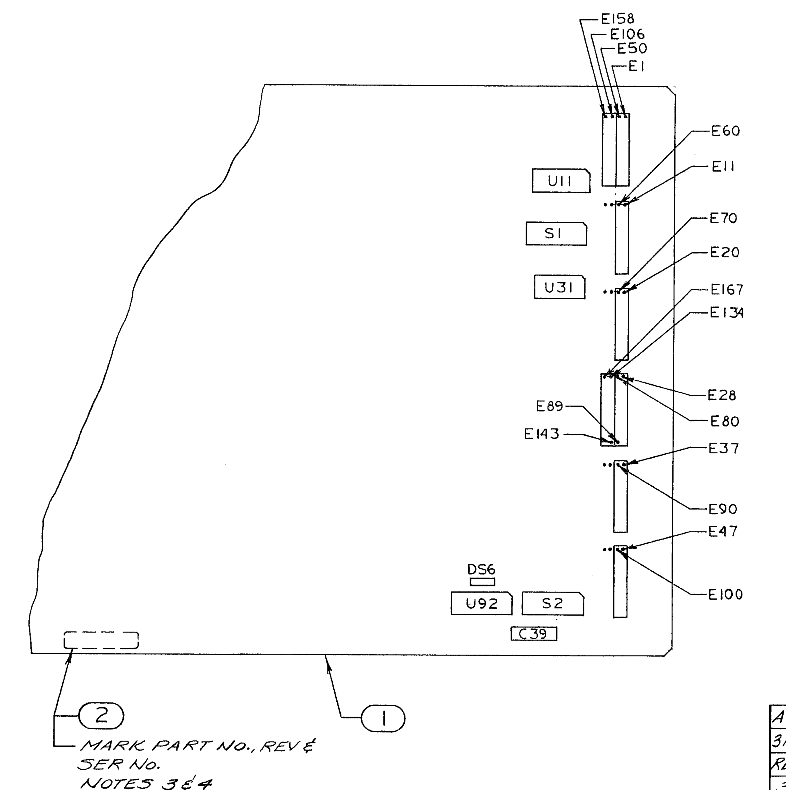
SIZE	CODE IDENT NO.	DWG NO.
E	94117	5810057

SCALE — SHEET 8

DO NOT SCALE PRINT

5810057

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	REL TO PROD	3/31/83	



△2 ALTERATION INSTRUCTIONS

a. OPEN ALL POSITIONS S1 & S2
b. REMOVE ALL JUMPER PLUGS & REINSTALL AS SHOWN. USE ADDITIONAL PLUGS, ITEM No. 4
C. LIFT PIN U92-3.
D. REMOVE COMPONENT DS6.
e. ON NONCOMPONENT SIDE, SOLDER THE FOLLOWING JUMPER USING ITEM No. 6. E89-E143.

ALTERED ITEM DWG

G1 (QTY PER ASSY)	ITEM	SIZE	PART OR IDENTIFYING NO.	DESCRIPTION
AR	7	A	93002P1	SOLDER
3FT	6	A	7011460P36	WIRE, INSULATED, 26 AWG
REF	5		5810019	INTFC CONTROL DOCUMENT
3	4		76266-110	JUMPER ASSY, 10 POS, BLUE, (BERG)
REF	3		5810059	LOGIC DIAGRAM
1	2	A	4171182P1	MARKER, IDENTIFICATION
1	1	E	5810015G1	CCA 24 BIT PARALLEL INTFC

PARTS LIST

NOTES

4. MARK PERMANENT & LEGIBLE CHARACTERS .04-.16 HIGH, WITH CONTRASTING COLOR, GOTHIC TYPE & LOCATE APPROX AS SHOWN. MARKING METHOD OPTIONAL.

3. PLACE ITEM 2 OVER EXISTING LABEL.

△2 ALTER AS SHOWN.

1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

NEXT ASSY	USED ON
	V/G1000
	V/G3000
FINAL	V/G4000

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
.XX DECIMAL ± — .XXX DECIMAL ± —
ANGLES ± —

PRODUCTION
CHANGE BY ECO ONLY

MFG M. Lanza 4/1/83

CONT NO.
DR Champagne 21MAR83
APPD 23MAR83
CHK 3-22-83
ENGR 4/1/83
PROJ D. Bean 4/1/83

CALCOMP
A Sanders Graphics Company
SANDERS

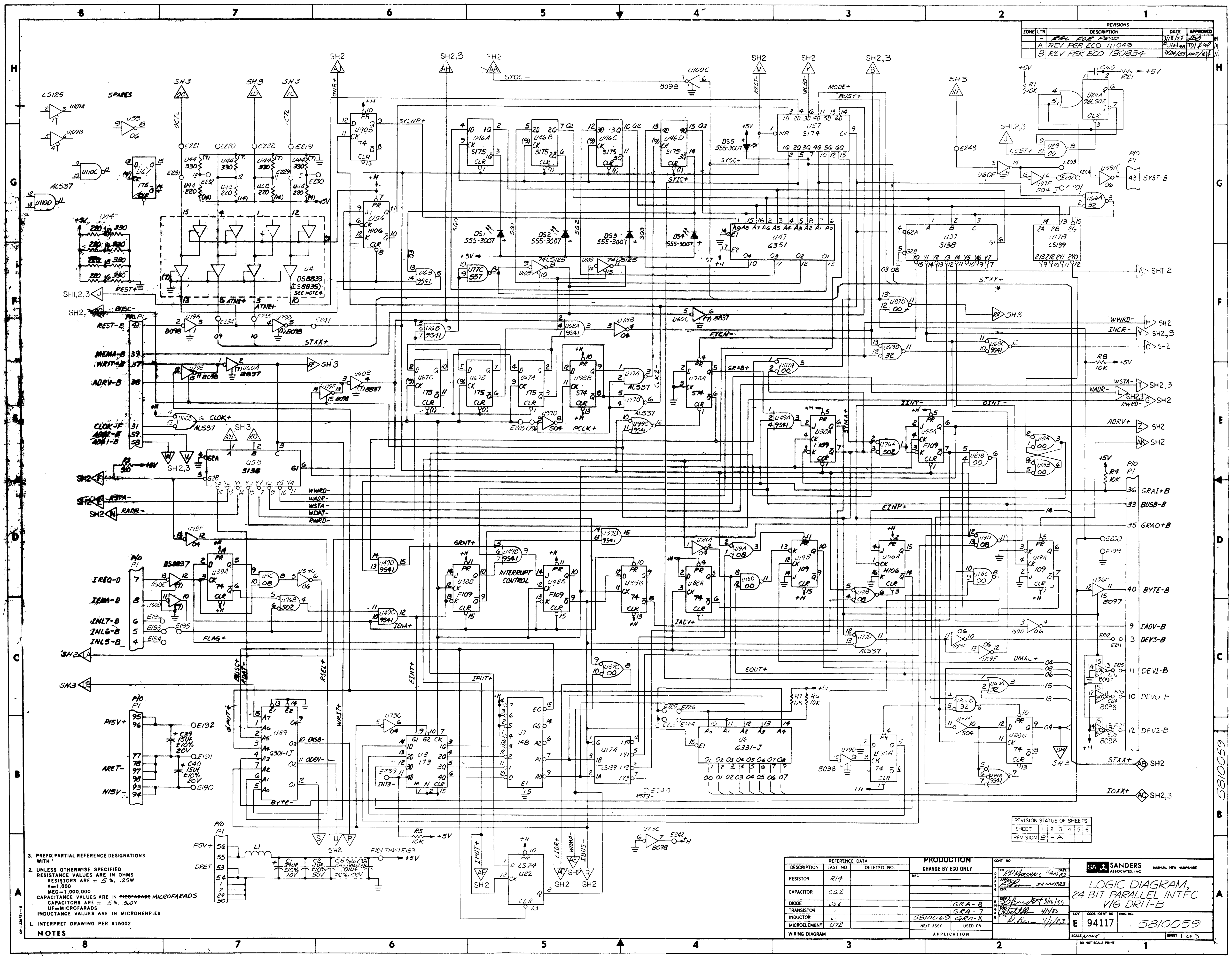
CCA 24 BIT PARALLEL INTERFACE
V/G DR11-B

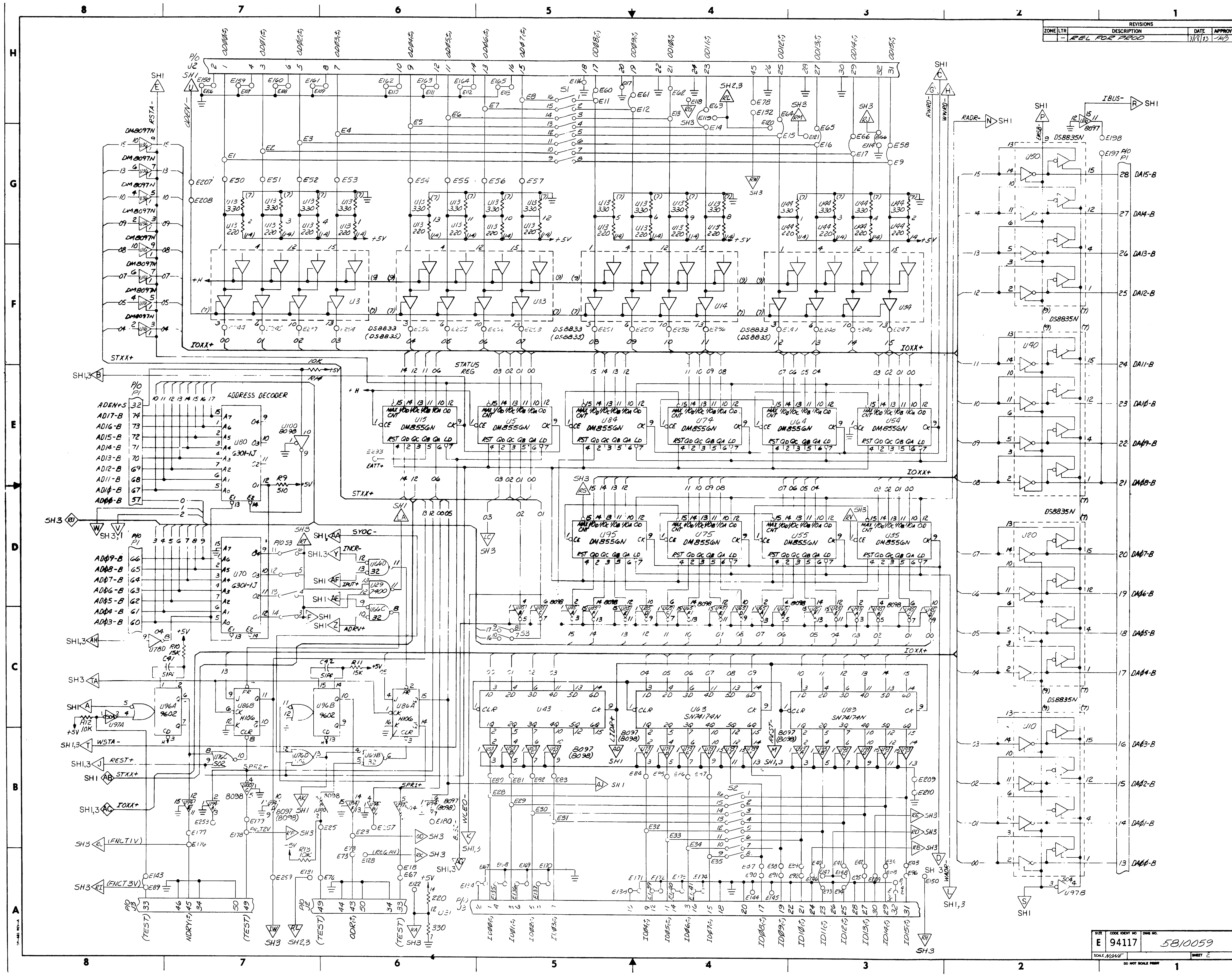
SIZE C DWG NO. 5810058

SCALE NONE SHEET 1 OF 1

DO NOT SCALE PRINT

5810058


LOGIC DIAGRAM, 24 BIT PARALLEL INTFC V/G DR11-B
SANDERS ASSOCIATES, INC. NASHUA, NEW HAMPSHIRE
94117
5810059
REVISIONS
A REV PER ECO 111049
B REV PER ECO 130834
3. PREFIX PARTIAL REFERENCE DESIGNATIONS WITH '
2. UNLESS OTHERWISE SPECIFIED RESISTANCE VALUES ARE IN OHMS RESISTORS ARE ± 5%, .25W K=1,000 MEG=1,000,000 CAPACITANCE VALUES ARE IN MICROFARADS CAPACITORS ARE ± 5%, 50V UF=MICROFARADS INDUCTANCE VALUES ARE IN MICROHENRIES
1. INTERPRET DRAWING PER 815002
NOTES
INTERRUPT CONTROL
PRODUCTION
CHANGE BY ECO ONLY
DO NOT SCALE PRINT
REVISION STATUS OF SHEETS


REVISIONS
ZONE
LTR
DESCRIPTION
DATE
APPROVED
REL FOR PROD
ADDRESS DECODER
STATUS REG
E
94117
5810059
SCALE NONE
SHEET 2
DO NOT SCALE PRINT
5810059

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	-	REL FOR PROD	3/15/83	JD
	A	REV PER ECO 111049	16 JAN 84	TD RAP

NOTES

1. INTERPRET DRAWING PER 815002
2. UNLESS OTHERWISE SPECIFIED
   RESISTANCE VALUES ARE IN OHMS
   RESISTORS ARE ± %, W
   K=1,000
   MEG=1,000,000
   CAPACITANCE VALUES ARE IN PICOFARADS
   CAPACITORS ARE ± %, V
   UF=MICROFARADS
   INDUCTANCE VALUES ARE IN MICROHENRIES
3. PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

REFERENCE DATA		
DESCRIPTION	LAST NO.	DELETED NO.
RESISTOR		
CAPACITOR		
DIODE		
TRANSISTOR		
INDUCTOR		
MICROELEMENT		
WIRING DIAGRAM		

NEXT ASSY | USED ON | APPLICATION

SANDERS ASSOCIATES, INC — MANUAL DATA PROCESSING

SIZE	CODE IDENT NO.	DWG NO.
E	94117	5810059

SCALE — | SHEET 3 | DO NOT SCALE PRINT

5810059

REVISIONS RN-GX-170				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	–	REL FOR PROD	2-18-83	EWB
	A	REV PER ECO 110285	16 JAN 84	TD/JAB
	B	REV PER ECO 130747	29 JUN 84	BM/B

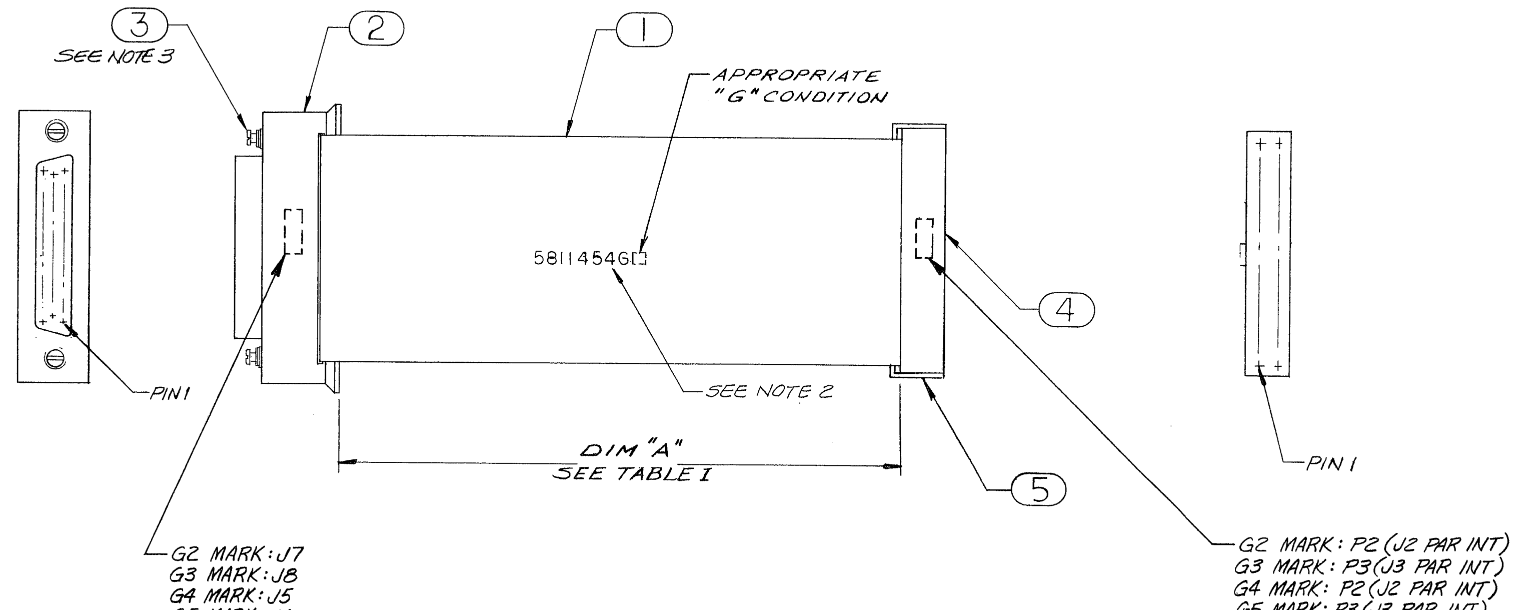


TABLE I

"G" COND	DIM "A"
G1	6.25
G2	60.00±2
G3	60.00±2
G4	50.00±2
G5	45.00±2
G6	60.00±2
G7	55.00±2

5811454

G7	G6	G5	G4	G3	G2	G1	ITEM	SIZE	PART OR IDENTIFYING NO.	DESCRIPTION	FSCM
1	1	1	1	1	1	1	5	–	609-5031	STRAIN RELIEF	26394
1	1	1	1	1	1	1	4	–	609-5030	CONN, POLARIZED SOCKET	26394
2	2	2	2	2	2	2	3	A	985002P4	POST, SLIDE-LOCK	
1	1	1	1	1	1	1	2	A	907040P2	CONN, 50 POS "D" PIN FEMALE	
56.00	61.00	46.00	51.00	61.00	61.00	7.25	1	A	901000P2	CABLE, 28 AWG STRANDED ROUND COND.	
QTY PER ASSY							PARTS LIST				

3. FOR .09 PANEL THICKNESS DISCARD FLAT WASHER AND LOCK WASHER. FOR .06 PANEL THICKNESS DISCARD LOCK WASHER

2. MARK PERMANENT & LEGIBLE CHARACTERS .04-.16 HIGH WITH CONTRASTING COLOR, GOTHIC TYPE AND LOCATE APPROX AS SHOWN. MARKING METHOD OPTIONAL

1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING

NOTES

NEXT ASSY	USED ON
5811864	
5811858	
5811462	
5811461	V/G 4000
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES
.XX DECIMAL ±.25 .XXX DECIMAL ± —
ANGLES ± —

PRODUCTION
CHANGE BY ECO ONLY

MFG R. King 2/18/83

CONT NO.

DRFTG: DR B. Maus 6 DEC 82; APPD 20 DEC 82; CHK JAB 20 DEC 82
ENGRG: DEV 12-20-82; 2/10/83; PROJ 2/18/83

SA SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

CABLE ASSY
TO PARALLEL INTERFACE

SIZE	CODE IDENT NO.	DWG NO.
C	94117	5811454

SCALE NONE | SHEET 1 OF 1

DO NOT SCALE PRINT

OP-332 REV-J

REVISIONS P/N GX-170

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	–	REL FOR PROD	2-18-83	
	A	REV PER ECO # 110272	23 DEC 85	MERLE

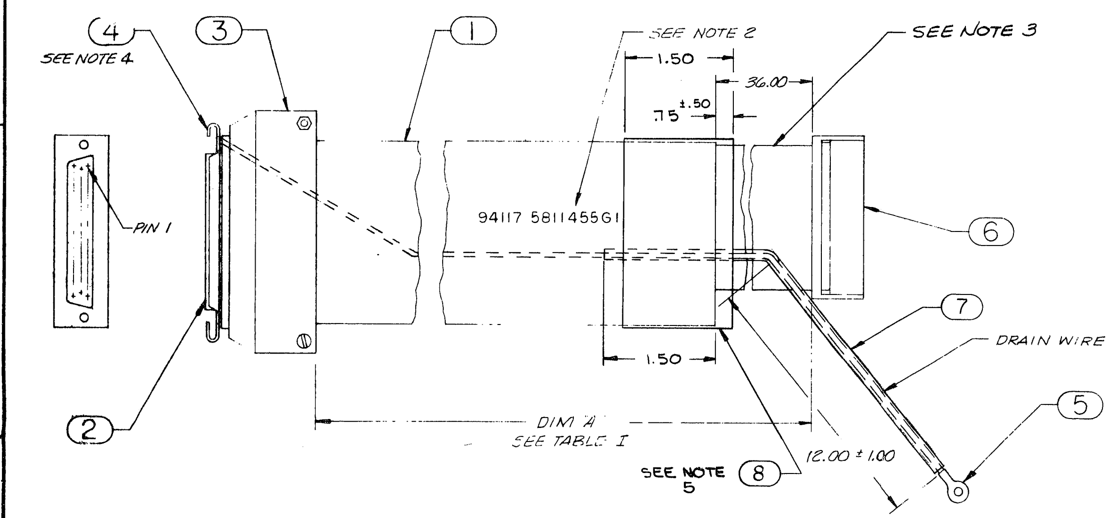


TABLE I

'G' COND	DIM 'A'
G1	25 FT ± 3.00
G2	50 FT ± 3.00

G6	G5	G4	G3	G2	G1	ITEM	SIZE	PART OR IDENTIFYING NO.	DESCRIPTION	FSCM
				24 IN	24 IN	8		TG-43-6180	3M TAPE	
				18 IN	18 IN	7		270028P4	SHRINK TUBING	
				1	1	6	A	907000P7	CONN, FEMALE SOCKET	
				1	1	5	–	MS25036-147	TERMINAL, LUG, CRIMP	
				1	1	4	A	985002P3	SLIDE-LOCK RETAINER	
				1	1	3	A	985002P5	STRAIN RELIEF, BACKSHELL	
				1	1	2	A	907040P1	CONN, 50 POS MALE 'D' PIN	
				50 FT	25 FT	1	A	901003P9	CABLE, 28 AWG	

QTY PER ASSY — PARTS LIST

5. DRESS TAPE AS NECESSARY.
4. TERMINATE DRAIN WIRE UNDER SLIDE-LOCK RETAINER AND DO NOT INSTALL WASHER.
3. CUT OUT WIRE NO.S 41-50.
2. MARK PERMANENT & LEGIBLE CHARACTERS .04-.16 HIGH, WITH CONTRASTING COLOR, GOTHIC TYPE AND LOCATE APPROX AS SHOWN. MARKING METHOD OPTIONAL.
1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING

NOTES

NEXT ASSY	USED ON
5811462	
5811461	V/G 4000

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES
.XX DECIMAL ± — .XXX DECIMAL ± —
ANGLES ± —

PRODUCTION
CHANGE BY ECO ONLY

MFG F. King 2/18/83

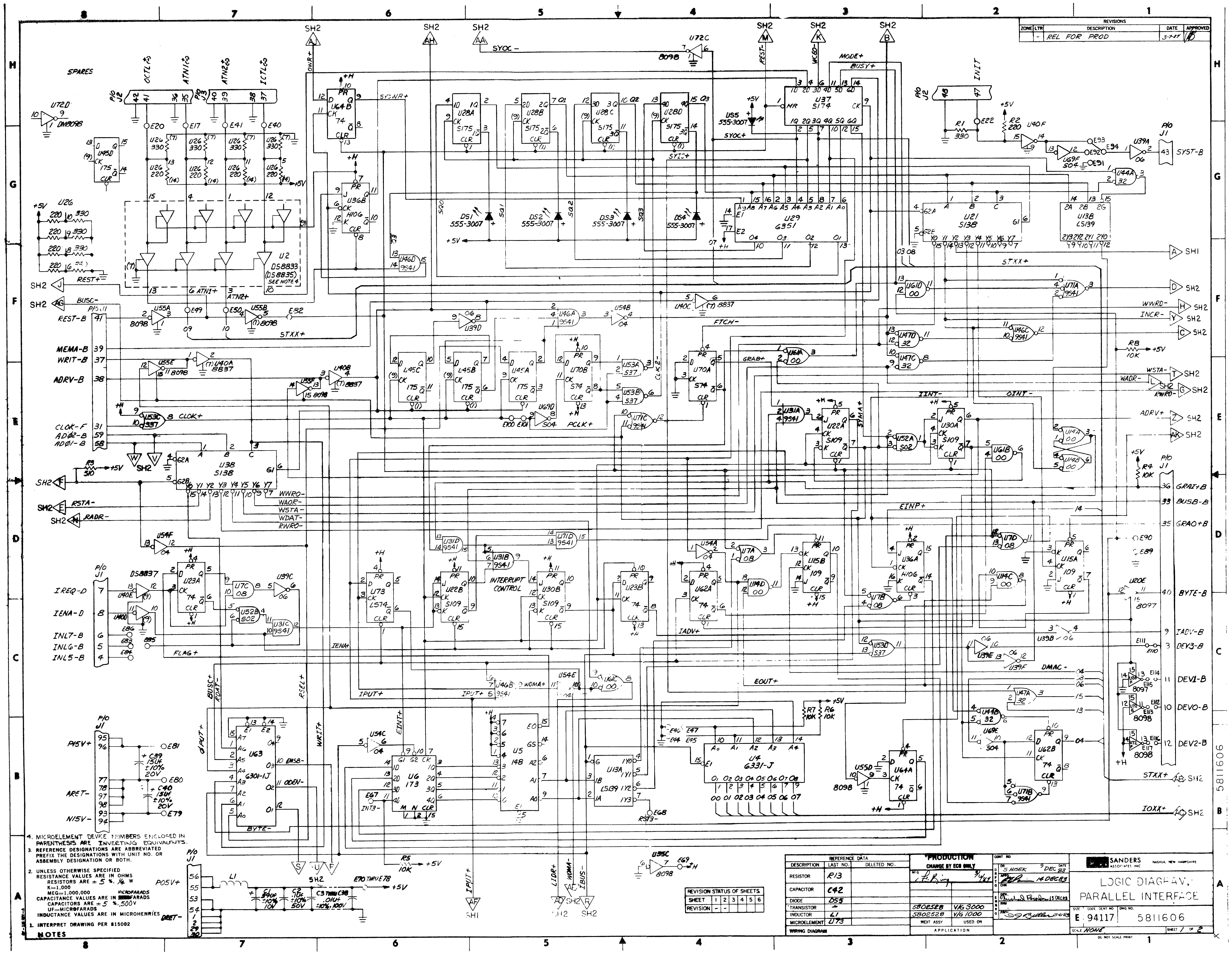
CONT NO.
DR B. Maas DEC 82
APPD 20 DEC 82
CHK JAB 20 DEC 82
DEV M. Houle 12-20-82
2/10/83
PROJ 1/10/83

SANDERS ASSOCIATES, INC — NASHUA, NEW HAMPSHIRE

CABLE ASSY
REAR PANEL TO DEC HOST

SIZE C | CODE IDENT NO. 94117 | DWG NO. 5811455
SCALE NONE | SHEET 1 OF 1
DO NOT SCALE PRINT

5811455


LOGIC DIAGRAM, PARALLEL INTERFACE
SANDERS ASSOCIATES, INC
E 94117 5811606
REL FOR PROD
SPARES
INTERRUPT CONTROL
4. MICROELEMENT DEVICE NUMBERS ENCLOSED IN PARENTHESIS ARE INVERTING EQUIVALENTS.
3. REFERENCE DESIGNATIONS ARE ABBREVIATED PREFIX THE DESIGNATIONS WITH UNIT NO. OR ASSEMBLY DESIGNATION OR BOTH.
2. UNLESS OTHERWISE SPECIFIED RESISTANCE VALUES ARE IN OHMS
INDUCTANCE VALUES ARE IN MICROHENRIES
1. INTERPRET DRAWING PER 815002
NOTES
5811606

REVISIONS			
ZONE LTR	DESCRIPTION	DATE	APPROVED
–	REL FOR PROD	3-7-77	

SIZE	CODE IDENT NO	DWG NO
E	94117	5811606
SCALE NONE		SHEET 2
DO NOT SCALE PRINT		

5811606 B

REVISION STATUS

PARTS	SH	1	2	3	4	5	6	7	8	9	10	11	12
	REV	A	A										
	SH	13	14	15	16	17	18	19	20	21	22	23	24
	REV												
LIST													

DWG REV	—
WL REV	—

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
—	REL FOR PROD	12 MAR 84	[illegible]
	2. REPL PL W/MACH WHITIE	5 APR 84	[illegible]
A	REV PER ECO 130820	5/23/85	MMT/NJK

2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST, DRAWING AND WIRE LIST.

1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION

CHANGE BY ECO ONLY

MFG [illegible] 4284

	V/G1000
	V/G3000
FINAL	V/G4000
NEXT ASSY	USED ON
APPLICATION	

CONT NO.

DRFTG	DR T. D. Daniels	DATE 1 MAR 84
	APPD [illegible]	12 MAR 84
	CHK	
ENGRG	DEV [illegible]	12 MAR 84
	E/M [illegible]	12 MAR 84
	PROJ [illegible]	3/30/84

CALCOMP
A Subsidiary of Gerber Scientific Company
SANDERS

CABLE ASSY, DRII-B INTERFACE

SIZE A

PL 5811764

SHEET 1 OF 2

DWG SIZE E

DPD-102 REV-

The Draftboard

PARTS LIST

ITEM NO.	QTY PER ASSY G1	QTY PER ASSY G2		DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	1	1		A		0970054P001	CONN, BOARD NOTE 7	
2	2	2		A		0907040P001	CONN, RCPT, FLAT CABLE, 50-PIN P2,3,	
3	50 FT	100 FT		A		0901003P009	CABLE, FLAT 50-COND, SHIELDED JACKET	
4	1	1		B		1089603P001	PLATE, CLAMP	
5	17	17				RCR07G331JS	RES MIL-R-39008/1 330 OHMS + 5- 5% .25 WATT	
6	17	17				RCR07G221JS	RES MIL-R-39008/1 220 OHMS + 5- 5% .25 WATT	
7	2	2		A		0985002P003	CONN RETAINER, SIDE LOCK, FLAT CABLE	
8	28 IN	28 IN		A		0278002P013	WIRE, ELEC (UNINSULATED) AWG 22	=
9	28 IN	28 IN		A		0270006P005	INSULATION TUBING	=
10	14	14		A		0902002P001	TIE, WRAP, CABLE 4.0 IN. LG	
11	AR	AR		A		0093002P001	SOLDER	
12	3 IN	3 IN				M23053/5-106-0	INSULATION SLVG, ELEC MIL-I-23053/5	
13	2	2		A		0985002P005	CONN BACKSHELL STRAIN RELIEF, FLAT CABLE RECT CONN	
14	4	4				MS51957-14	SCREW, MACHINE .112-40 X .31 LG	
15	8	8				MS15795-803	WASHER, FLAT-METAL .125 ID X .250 OD	
16	4	4				MS35649-244	NUT, PLAIN, HEX .112-40	
17	4	4				MS35338-135	WASHER, LOCK, SPRING .115 ID X .209 OD	
18	2	2				MS25036-147	TERMINAL, LUG	
19	36 IN	36 IN				M23053/5-104-0	INSULATION SLVG, ELEC MIL-I-23053/5	
20	48 IN	48 IN		A		0985085P001	INSULATION, TAPE ELEC	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM—SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A		PL 5811764
	REV A	SHEET 2

SA-01-266A (12-84)

BRUNING 40-107 39825

REVISION STATUS OF EACH SHEET															
SHEET			1	2	3	4	5	6	7	8	9	10	11	12	13
REVISION			—	—	—	—	—	—	—	—	—				
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
—	REL FOR PROD	12 MAR 84	[illegible] M

87

3. BOOT ALL UNUSED WIRES USING ITEM 12 HEAT SHRINK TUBING IN P/L 5811764
2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST, DRAWING AND WIRE LIST.
1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION
CHANGE BY ECO ONLY

MFG [illegible]

	V/G1000
	V/G3000
5811764	V/G4000
NEXT ASSY	USED ON
APPLICATION	

CONT NO.

DRFTG	DR J. D. Daniels	DATE 12 MAR 84
	APPD [illegible]	12 MAR 84
	CHK	
ENGRG	DEV [illegible]	12 MAR 84
	E/M Mark Emerson	12 MAR 84
	PROJ [illegible]	3/30/84

SANDERS ASSOCIATES, INC — NASHUA, NEW HAMPSHIRE

WIRE LIST, CABLE ASSY
DRII-B INTERFACE

SIZE	CODE IDENT NO.	
A	94117	WL 5811764

SCALE — SHEET 1 OF 9

OP—276 REV E

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM TERM. / STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO TERM. / STRIP (INCHES)	NOTE
001	DAT00IN	L	P3	1 L	A	C1	
002	GND			2		G	
003	DAT01IN	L		3		D1	
004	GND	L		4		G	
005	DAT02IN	L		5		D2	
006	GND			6		G	
007	DAT03IN	L		7		E1	
008	GND			8		G	
009	DAT04IN	L		9		E2	L
010	GND			10		G	
011	DAT05IN	L		11		F1	
012	GND			12		G	
013	DAT06IN	L		13		F2	
014	GND		P3	14	A	G	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5811764
	REV. —	SHEET 2

88

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM TERM. / STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO TERM. / STRIP (INCHES)	NOTE
015	DAT07 IN		P3	15	A	H1	
016	GND			16		G	
017	DAT08 IN			17		H2	
018	GND			18		G	
019	DAT09 IN			19		J1	
020	GND			20		G	
021	DAT10 IN			21		J2	
022	GND			22		G	
023	DAT11 IN			23		K1	
024	GND			24		G	
025	DAT12 IN			25		K2	
026	GND			26		G	
027	DAT13 IN			27		L2	
028	GND		P3	28	A	G	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION.
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5811764
	REV. —	SHEET 3

OP-233 REV D

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM TERM. / STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO TERM. / STRIP (INCHES)	NOTE
029	DATA IN		P3	29	A	M2	
030	GND			30	A	G	
031	DATI5 IN			31	A	N2	
032	GND			32	A	G	
033	NOT USED			33			3
034	NOT USED			34			3
035	CYCLE REQUEST A			35	A	A1	
036	GND			36		G	
037	END OF CYCLE			37		B1	
038	GND			38		G	
039	ATTN			39		M1	
040	GND			40		G	
041	BUSY			41		52	
042	GND		P3	42		G	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5811764

REV. — SHEET 4

OP-233 REV D

90

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM: TERM. / STRIP (INCHES)	TO: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO: TERM. / STRIP (INCHES)	NOTE
043	DSTAT B		P3	43	A	L1	3
044	GRD			44	A	G	3
045	NOT USED			45			3
046	NOT USED			46			3
047	DSTAT C			47	A	R2	3
048	GRD			48	A	G	3
049	NOT USED			49			3
050	NOT USED		P3	50			
051	DATØØ OUT		P2	1	B	51	
052	GND			2		G	
053	DATØ1 OUT			3		R1	
054	GND			4		G	
055	DATØ2 OUT			5		U2	
056	GND		P2	6	B	G	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

OP-233 REV D

SIZE	CODE IDENT. NO.	
A	94117	WL 5811764
	REV. —	SHEET 5

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM TERM. / STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO TERM. / STRIP (INCHES)	NOTE
057	DAT03 OUT		P2	7	B	P1 L	
058	GND	L		8		G L	
059	DAT04 OUT	L		9		T2 L	
060	GND	L		10		G L	
061	DAT05 OUT	L		11		N1 L	
062	GND	L		12		G L	
063	DAT06 OUT			13		S2 L	
064	GND			14		G L	
065	DAT07 OUT			15		M1 L	
066	GND	L		16		G L	
067	DAT08 OUT			17		R2 L	
068	GND			18		G L	
069	DAT09 OUT			19		L1 L	
070	GND		P2	20	B	G L	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5811764
	REV. —	SHEET 6

OR-233 REV D

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM TERM. / STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO TERM. / STRIP (INCHES)	NOTE
071	DATIØ OUT		P2	21	B	P2	
072	GND			22		G	
073	DATI1 OUT			23		K1	
074	GND			24		G	
075	DATI2 OUT			25		N2	
076	GND			26		G	
077	DATI3 OUT			27		M2	
078	GND			28		G	
079	DATI4 OUT			29		L2	
080	GND			30		G	
081	DATI5 OUT			31		K2	
082	GND			32	B	G	
083	NOT USED			33		L	3
084	NOT USED		P2	34		L	3

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5811764
	REV. —	SHEET 7

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM TERM. / STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO TERM. / STRIP (INCHES)	NOTE
085	FNCT 1		P2	35	B	E2	
086	GND			36		G	
087	FNCT 2			37		H1	
088	GND			38		G	
089	READY			39		J1	
090	GND			40		G	
091	GO			41		V1	
092	GND			42	B	G	
093	NOT USED			43			3
094	NOT USED			44			3
095	NOT USED			45			3
096	NOT USED			46			3
097	FNCT 3			47	B	J2	
098	GND		P2	48	B	G	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION.
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5811764
	REV.	SHEET 8

OP-233 REV D

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM: TERM. / STRIP (INCHES)	TO: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO: TERM. / STRIP (INCHES)	NOTE
099	NOT USED	L	P2	49			3
100	NOT USED	L	P2	50			3
101	AØØH TO GND	L	A	T2	A	G	
102	~~OSTATSH TO GND~~	L	~~A~~	~~P2~~	~~A~~	~~G~~	
103	OSTATAH TO GND	L	A	P2	A	G	
104	~~OSTATBH TO GND~~	L	~~A~~	~~L1~~	~~A~~	~~G~~	
105	WC INC ENB TO +3V	L	A	U1	A	V1	
106	BA INC ENB TO +3V	L	A	U1	B	A1	
107	SINGLE CYCLE TO +3V	L	B	A1	B	H2	
108	CØ CONTROL TO GND	L	B	F1	B	G	
109	CYCLE REQUEST B TO GND	L	B	U1	B	G	
110	C1 CONTROL TO FNCT I	L	B	F2	B	E2	
		L				L	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL PEFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5811764

REV. | SHEET 9

UP-233 REV J

95/96

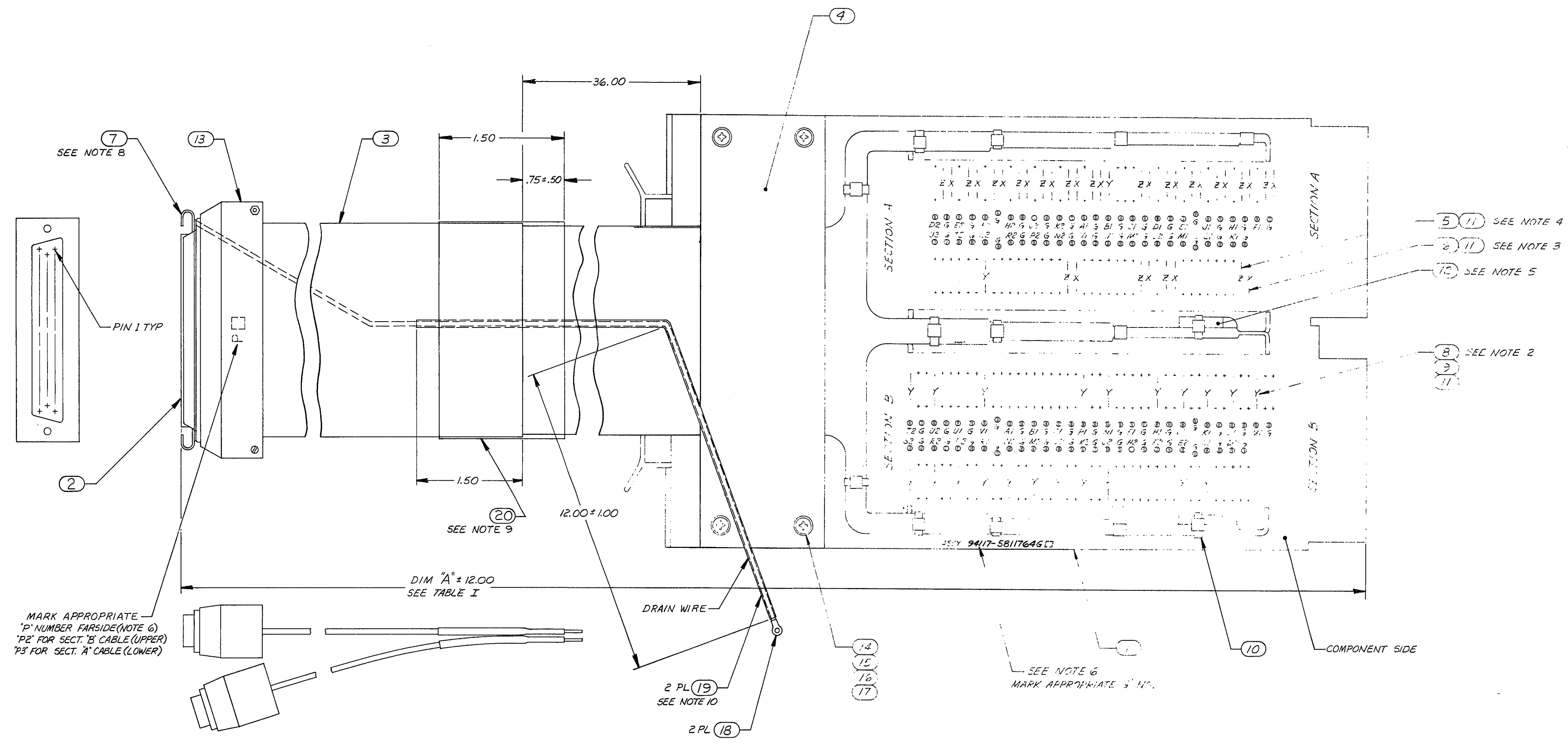
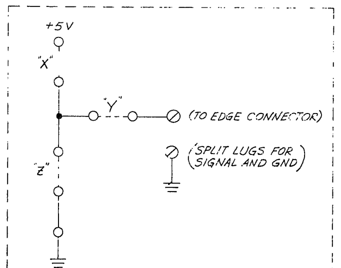


TABLE I	
"G" COND	DIM "A"
G1	25 FT.
G2	50 FT.



REFERENCE CIRCUIT
TYPICAL 56 PLACES

G1 G2 FOR PARTS LIST
SEE PL 5811764

FOR WIRE LIST
SEE WL 5811764

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	REL FOR PROD	12 MAR 84	

10. CUT TO 18" LENGTH.
9. DRESS TAPE AS NECESSARY.
8. TERMINATE DRAIN WIRE UNDER SLIDE-LOCK RETAINER AND DO NOT INSTALL WASHER.
7. PART OF GFE DR-11B INTERFACE.
6. MARK CHARACTERS IN CONTRASTING COLOR AND LOCATE APPROX AS SHOWN.
5. BOOT ALL UNUSED WIRES USING ITEM 12.
4. SYMBOL "Z" DENOTES ITEM 5, 17 PLACES.
3. SYMBOL "X" DENOTES ITEM 6, 17 PLACES.
2. REMOVE EXISTING RESISTOR AND INSTALL ITEMS 8 AND 9 23 PLACES MARKED "Y."
1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

NOTES

NEXT ASSY	USED ON
	V/G 1000
	V/G 3000
FINAL	V/G 4000

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES .XX DECIMAL ± — .XXX DECIMAL ± —
ANGLES ± —

PRODUCTION CHANGE BY ECO ONLY

DR T. D. Daniels MAR 84
APPD 12 MAR 84
REV 12 MAR 84
EAM Mark Emery 12 MAR 84
PROJ 3/22/84
MFG 4-2-84

SANDERS ASSOCIATES, INC. NASHUA, NEW HAMPSHIRE

CABLE ASSY, DR11-B INTERFACE

SIZE E | CODE IDENT NO. 94117 | DWG NO. 5811764

SCALE 2/1 | SHEET 1 OF 1

DO NOT SCALE PRINT

5811764

REVISION STATUS													
PARTS	SH	1	2	3	4	5	6	7	8	9	10	11	12
	REV	B2	B2	B2	B2	B2							
	SH	13	14	15	16	17	18	19	20	21	22	23	24
	REV												
LIST	-												

DWG REV	B
WL REV	A

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
—	REL FOR PROD	12 MAR 80	D/EwB
A	REV PER ECO 97110	13 MAR 81	gA/WL
B	REV PER ECO 97670	24 AUG 81	WL/WL
	2. P.S. PKG#2	10 APRIL 85	SEH/CMG

3. ITEM NUMBERS WITH SUBSCRIPTS ARE ALTERNATE ITEMS. SELECT ONE ONLY.
2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST, DRAWING AND WIRE LIST.
1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION
CHANGE BY ECO ONLY

MFG: [illegible] 4-16-80

5977206	GRA-7
NEXT ASSY	USED ON
APPLICATION	

CONT NO.

DRFTG: DR [illegible] DATE 10 Mar 80; APPD [illegible] 12 MAR 80; CHK

ENGRG: DEV D. Brown 12 Mar 80; E/M [illegible] 5/1/80; PROJ [illegible] 5/8/80

SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

CABLE ASSY
DRII-C TO GRA-7 INTERFACE

SIZE	CODE IDENT NO.	
A	94117	PL 5977207

SHEET 1 OF 5

OP—1039 REV B DWG SIZE C

99 Change 1

PARTS LIST

ITEM NO.	QTY PER ASSY G1	QTY PER ASSY G2	QTY PER ASSY G3	DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	2	2	2		22526	65043-015	CONN, 44 PIN P1,2,	
2	2	2	2		22526	65846-005	CONN, ELEC 54 PIN KEYED P3,4,	
2A	REF	REF	REF		22526	65043-010	CONN, ELEC 54 PIN P3,4,	
3	10	20	30		70903	9525	CABLE, 25 TWISTED PRS	
	FT	FT	FT					
4	5	10	15		06383	SST2S-MP	CABLE TIES	
5	161	161	161		22526	47565	CONTACT 22-26 AWG	
5A	REF	REF	REF	A		0165099P005	CONTACT, ELEC	=
14	1	1	1		06383	PLM2S	STANDARD MARKER TIE	
15	REF	REF	REF	A		0778000	APPL, EPOXY MARKING CMPD	
16	6	6	6		92194	FIT221-5/8	TUBING, SHRINK	
	IN	IN	IN					
18	REF	REF	REF	A		WL5977207	WIRE LIST DR11-C TO GRA-7 INTFC	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A	94117	PL 5 9 7 7 2 0 7

REV B2 SHEET 2

SA-01-266 (3-79)

PARTS LIST

ITEM NO.	QTY PER ASSY G4	QTY PER ASSY G5	QTY PER ASSY G6	DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	2	2	2		22526	65043-015	CONN, 44 PIN P1,2,	
2	2	2	2		22526	65846-005	CONN, ELEC 54 PIN KEYED P3,4,	
2A	REF	REF	REF		22526	65043-010	CONN, ELEC 54 PIN P3,4,	
3	40 FT	50 FT	60 FT		70903	9525	CABLE, 25 TWISTED PRS	
4	20	25	30		06383	SST2S-MP	CABLE TIES	
5	161	161	161		22526	47565	CONTACT 22-26 AWG	
5A	REF	REF	REF	A		0165099P005	CONTACT, ELEC	=
14	1	1	1		06383	PLM2S	STANDARD MARKER TIE	
15	REF	REF	REF	A		0778000	APPL, EPOXY MARKING CMPD	
16	6 IN	6 IN	6 IN		92194	FIT221-5/8	TUBING, SHRINK	
18	REF	REF	REF	A		WL5977207	WIRE LIST DR11-C TO GRA-7 INTFC	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A	94117	PL 5977207
	REV B2	SHEET 3

SA-01-266 (3-79)

PARTS LIST

ITEM NO.	QTY PER ASSY G7	QTY PER ASSY G8	QTY PER ASSY G9	DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	2	2	2		22526	65043-015	CONN, 44 PIN P1,2,	
2	2	2	2		22526	65846-005	CONN, ELEC 54 PIN KEYED P3,4,	
2A	REF	REF	REF		22526	65043-010	CONN, ELEC 54 PIN P3,4,	
3	70 FT	80 FT	90 FT		70903	9525	CABLE, 25 TWISTED PRS	
4	35	40	45		06383	SST2S-MP	CABLE TIES	
5	161	161	161		22526	47565	CONTACT 22-26 AWG	
5A	REF	REF	REF	A		0165099P005	CONTACT, ELEC	=
14	1	1	1		06383	PLM2S	STANDARD MARKER TIE	
15	REF	REF	REF	A		0778000	APPL, EPOXY MARKING CMPD	
16	6 IN	6 IN	6 IN		92194	FIT221-5/8	TUBING, SHRINK	
18	REF	REF	REF	A		WL5977207	WIRE LIST DR11-C TO GRA-7 INTFC	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A	94117	PL 5977207

REV B2 SHEET 4

SA-01-266 (3-70)

100 B Change 1

PARTS LIST

ITEM NO.	QTY PER ASSY G10			DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	2				22526	65043-015	CONN, 44 PIN P1,2,	
2	2				22526	65846-005	CONN, ELEC 54 PIN KEYED P3,4,	
2A	REF				22526	65043-010	CONN, ELEC 54 PIN P3,4,	
3	100 FT				70903	9525	CABLE, 25 TWISTED PRS	
4	50				06383	SST2S-MP	CABLE TIES	
5	161				22526	47565	CONTACT 22-26 AWG	
5A	REF			A		0165099P005	CONTACT, ELEC	=
14	1				06383	PLM2S	STANDARD MARKER TIE	
15	REF			A		0778000	APPL, EPOXY MARKING CMPD	
16	6 IN				92194	FIT221-5/8	TUBING, SHRINK	
18	REF			A		WL5977207	WIRE LIST DR11-C TO GRA-7 INTFC	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A	94117	PL 5977207

REV B2 SHEET 5

SA-01-266 (3-79)

100 C/ 100 D Change 1

BRUNING 40-107 39825

REVISION STATUS OF EACH SHEET															
SHEET			1	2	3	4	5	6	7	8	9	10	11	12	13
REVISION			A	A	A	A	A	A	A	A	–				
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
–	REL FOR PROD	5-7-80	
A	REV PER ECO 97670	24 AUG 81	LLG/WL

2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST, DRAWING AND WIRE LIST.

1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION

CHANGE BY ECO ONLY

MFG 4-1-80

5977207	GRA-7
NEXT ASSY	USED ON
APPLICATION	

CONT NO.

DRFTG	DR	DATE 15APR80
	APPD	15APR80
	CHK	
ENGRG	DEV	5-7-80
	E/M	5/11/80
	PROJ	5/11/80

SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

WIRE LIST

DRII-C TO GRA-7 INTFC

SIZE	CODE IDENT NO.	
A	94117	WL 5977207
SCALE		SHEET 1 OF 9

OP—276 REV E

100 E Change 1

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM: TERM. / STRIP (INCHES)	TO: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO: TERM. / STRIP (INCHES)	NOTE
001	OUT00/OD00	BLK	P3	1	P1	3	
002	GND	RED		2	P1	8	
003	OUT01/OD01	BLK		3	P1	9	
004	GND	WHT		4	P1	11	
005	OUT02/OD02	BLK		5	P1	34	
006	GND	GRN		6			
007	OUT03/OD03	BLK		7	P1	17	
008	GND	BLU		8	P1	18	
009	OUT04/OD04	BLK		9	P1	10	
010	GND	YEL		10			
011	OUT05/OD05	BLK		11	P1	12	
012	GND	BRN		12		1	
013	OUT06/OD06	BLK		13	P1	14	
014	GND	ORG	P3	14	P1	15	

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5977207
	REV. A1	SHEET 2

100 F Change 1

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION)	FROM TERM. / CONTACT PART NUMBER	FROM STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION)	TO TERM. / CONTACT PART NUMBER	TO STRIP (INCHES)	NOTE
015	OUT07/OD07	RED	P3	15		P1	16		
016	GND	WHT		16			1		
017	OUT08/OD08	RED		17		P1	19		
018	GND	GRN		18					
019	OUT09/OD09	RED		19		P1	20		
020	GND	BLU		20		P1	21		
021	OUT10/OD10	RED		21		P1	22		
022	GND	YEL		22					
023	OUT11/OD11	RED		23		P1	23		
024	GND	BRN		24					
025	OUT12/OD12	RED		25		P1	24		
026	GND	ORG		26		P1	25		
027	OUT13/OD13	GRN		27		P1	28		
028	GND	WHT	P3	28		P1	27		

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5977207
	REV. 4	SHEET 3

100 G Change 1

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION)	FROM TERM. / CONTACT PART NUMBER	FROM STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION)	TO TERM. / CONTACT PART NUMBER	TO STRIP (INCHES)	NOTE
029	OUT14/ODI4	GRN	P3	29		P1	29		
030	GND	BLU		30					
031	OUT15/ODI5	GRN		31		P1	30		
032	GND	YEL		32		P1	31		
033	RESERVED	GRN		33					
034	GND	BRN		34					
035	ATN 1	GRN		35					
036	GND	ORG		36					
037	REQA/OWR	WHT		37		P1	32		
038	GND	BLU		38		P1	39		
039	OMR	WHT		39					
040	GND	YEL		40					
041	CSR1/OCTL	WHT		41		P1	26		
042	GND	BRN	P3	42		P1	33		

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5977207
	REV. A	SHEET 4

100 H Change 1

WIRE LIST

WIRE NUMBER	FUNCTION CODE	COLOR	WIRE PART NUMBER	LENGTH	FROM LOCATION (REFERENCE DESIGNATION)	FROM TERM.	FROM CONTACT PART NUMBER	FROM STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION)	TO TERM.	TO CONTACT PART NUMBER	TO STRIP (INCHES)	NOTE
043	ODR	WHT			P3	43							
044	GND	ORG				44			P1	37			
045	SPARE	BLU				45							
046	GND	YEL				46							
047	INIT	BLU				47			P1	13			
048	GND	BRN				48			P1	35			
049	RESERVED	BLU				49							
050	GND	ORG			P3	50							
051	IN00/ID00	BLK			P4	1			P2	38			
052	GND	RED				2				39			
053	IN01/ID01	BLK				3				32			
054	GND	WHT				4				33			
055	IN02/ID02	BLK				5				1			
056	GND	GRN			P4	6			P2	8			

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5977207
	REV. A	SHEET 5

OP-233 REV D

100 J Change 1

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM TERM. / STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO TERM. / STRIP (INCHES)	NOTE
057	IN03/ID03	BLK	P4	7	P2	24	
058	GND	BLU		8		23	
059	IN04/ID04	BLK		9		31	
060	GND	YEL		10		30	
061	IN05/ID05	BLK		11		29	
062	GND	BRN		12		35	
063	IN06/ID06	BLK		13		27	
064	GND	ORG		14		37	
065	IN07/ID07	RED		15		25	
066	GND	WHT		16		26	
067	IN08/ID08	RED		17		22	
068	GND	GRN		18		20	
069	IN09/ID09	RED		19	P2	21	
070	GND	BLU	P4	20			

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5977207
	REV. A	SHEET 6

100 K Change 1

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM TERM. / STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO TERM. / STRIP (INCHES)	NOTE
071	IN10/ID10	RED	P4	21	P2	19	
072	GND	YEL		22	P2	14	
073	IN11/ID11	RED		23	P2	18	
074	GND	BRN		24			
075	IN12/ID12	RED		25	P2	17	
076	GND	ORG		26			
077	IN13/ID13	GRN		27	P2	13	
078	GND	WHT		28			
079	IN14/ID14	GRN		29	P2	12	
080	GND	BLU		30			
081	IN15/ID15	GRN		31	P2	11	
082	GND	YEL		32			
083	RESERVED	GRN		33			
084	GND	BRN	P4	34			

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5977207
	REV. A	SHEET 7

100 L Change 1

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM: TERM. / STRIP (INCHES)	TO: LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO: TERM. / STRIP (INCHES)	NOTE
085	IMR	GRN	P4	35			
086	GND	ORG		36			
087	CSRO/ICTL	WHT		37	P2	9	
088	GND	BLU		38	P2	10	
089	ATN 2	WHT		39			
090	GND	YEL		40			
091	REQB/IWR	WHT		41	P2	15	
092	GND	BRN		42	P2	16	
093	SPARE	WHT		43			
094	GND	ORG		44			
095	NDRY	BLU		45			
096	GND	YEL		46			
097	SPARE	BLU		47			
098	GND	BRN	P4	48			

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5977207
	REV. A	SHEET 8

100 M Change 1

WIRE LIST

WIRE NUMBER	FUNCTION CODE / WIRE PART NUMBER	COLOR / LENGTH	FROM LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	FROM TERM. / STRIP (INCHES)	TO LOCATION (REFERENCE DESIGNATION) / CONTACT PART NUMBER	TO TERM. / STRIP (INCHES)	NOTE
099	RESERVED	BLU	P4	49			
100	GND	ORG	P4	50			

SHEET ONE REVISION LETTER IS THE IDENTIFYING REVISION FOR THIS MULTISHEET DWG.
SEE SHEET ONE FOR REVISION DESCRIPTION
LOWER CASE LETTERS IN TERMINATION COLUMN DESIGNATED BY ( )
PREFIX PARTIAL REFERENCE DESIGNATIONS WITH

SIZE	CODE IDENT. NO.	
A	94117	WL 5977207
	REV. —	SHEET 9

OP-233 REV D

100 N/ 100 P Change 1

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	REL FOR PROD	12 MAR 80	
	A	REV PER ECO 97110	13 MAR 81	WL
	B	REV PER ECO 97670	24 AUG 81	WL

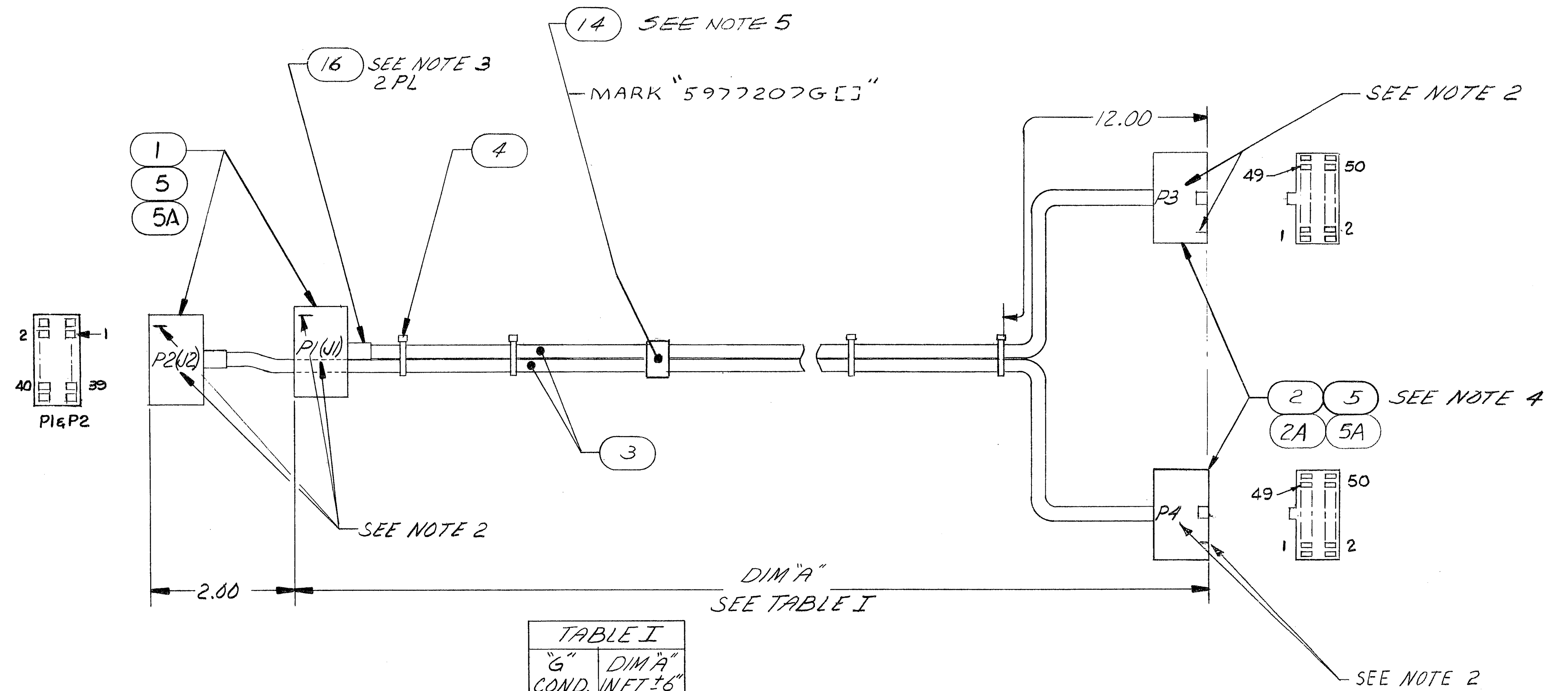


TABLE I	
"G" COND.	DIM "A" IN FT ±6"
G1	5
G2	10
G3	15
G4	20
G5	25
G6	30
G7	35
G8	40
G9	45
G10	50

G1 THRU G10 **FOR PARTS LIST** SEE PL 5977207

5. MARK PART NO. & APPROPRIATE "G" COND. PERMANENT AND LEGIBLE.
4. ITEM NUMBERS WITH SUBSCRIPTS ARE ALTERNATE ITEMS. SELECT ONE ONLY.
3. BOOT ALL UNUSED WIRES USING ITEM 16.
2. MARK CHARACTERS .04-.16 HIGH, CONTRASTING COLOR, GOTHIC TYPE AND LOCATE APPROX AS SHOWN APPLY PER ITEM 15.
1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING

NOTES

NEXT ASSY	USED ON
5977206	GRA-7
APPLICATION	

G6 G5 G4 G3 G2 G1 — QTY PER ASSY

ITEM | SIZE | PART OR IDENTIFYING NO. | DESCRIPTION — PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES .XX DECIMAL ±.50 .XXX DECIMAL ± — ANGLES ± —

PRODUCTION CHANGE BY ECO ONLY

CONT NO. DR R McDubois 10 Mar 80; APPD 12 MAR 80; CHK; DEV D. Bean 10 Mar 80; ENGRG May 1, 80; PROJ 5/8/80; MFG 5/7/80

SANDERS ASSOCIATES, INC NASHUA, NEW HAMPSHIRE

CABLE ASSY DR11-C TO GRA-7 INTERFACE

SIZE C | CODE IDENT NO. 94117 | DWG NO. 5977207

SCALE NONE | SHEET 1 OF 1

DO NOT SCALE PRINT

OP-332 REV—J

5977207

REVISION STATUS

PARTS	SH	1	2	3	4	5	6	7	8	9	10	11	12
	REV	—	—	—	—								
	SH	13	14	15	16	17	18	19	20	21	22	23	24
	REV												
LIST													

DWG REV	—
WL REV	X

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
—	REL FOR DEV	10-23-84	Kath
	2. REL FOR PROD	10 DEC 84	BAM

2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST, DRAWING AND WIRE LIST.

1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION

CHANGE BY ECO ONLY

MFG

6003253	
6003138	
6003133	
6003132	V4500
NEXT ASSY	USED ON
APPLICATION	

CONT NO.

DRFTG	DR S. HOLZAPFEL 14 AUG 84	DATE
	APPD C. Sessions	10/23/84
	CHK	
ENGRG	DES [illegible]	10-23-84
	E/M [illegible]	10-24-84
	PROJ [illegible]	10-23-84

CALCOMP
A Sanders Graphics Company
SANDERS

CABLE ASSY TO PARALLEL INTERFACE

SIZE A

PL 6003249

SHEET 1 OF 4

DWG SIZE C

DFD-102 REV-

The Draftboard

PARTS LIST

ITEM NO.	QTY PER ASSY G1	QTY PER ASSY G2	QTY PER ASSY G3	DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	1 FT	6 FT	6 FT	A		0901000P002	CABLE,FLAT,50-COND	
2	1	1	1	A		0907040P002	CONN, RCPT, FLAT CABLE, 50-SKT	
3	1	1	1	A		0907063P002	CONN, FLAT CABLE, PLUG, STR, MASS TERM 50-SKT	
4	1	1	1	A		0907063P001	CONN STRAIN RELIEF, FLAT CABLE	
5	1	1	1	A		0907040P004	CONN RETAINER	
6	2	2	2			MS51957-13	SCREW, MACHINE .112-40 X .25 LG	
7	2	2	2			MS35338-135	WASHER, LOCK, SPRING .115 ID X .209 OD	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A	94117	PL 6003249

REV — SHEET 2

SA 01 266 (3 79)

PARTS LIST

ITEM NO.	QTY PER ASSY G4	QTY PER ASSY G5	QTY PER ASSY G6	DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	5 FT	4 FT	6 FT	A		0901000P002	CABLE,FLAT,50-COND	
2	1	1	1	A		0907040P002	CONN, RCPT, FLAT CABLE, 50-SKT	
3	1	1	1	A		0907063P002	CONN, FLAT CABLE, PLUG, STR, MASS TERM 50-SKT	
4	1	1	1	A		0907063P001	CONN STRAIN RELIEF, FLAT CABLE	
5	1	1	1	A		0907040P004	CONN RETAINER	
6	2	2	2			MS51957-13	SCREW, MACHINE .112-40 X .25 LG	
7	2	2	2			MS35338-135	WASHER, LOCK, SPRING .115 ID X .209 OD	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A	94117	PL 6003249

REV - SHEET 3

SA 01 266 (3 79)

PARTS LIST

ITEM NO.	QTY PER ASSY G7			DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	5 FT			A		0901000P002	CABLE,FLAT,50-COND	
2	1			A		0907040P002	CONN, RCPT, FLAT CABLE, 50-SKT	
3	1			A		0907063P002	CONN, FLAT CABLE, PLUG, STR, MASS TERM 50-SKT	
4	1			A		0907063P001	CONN STRAIN RELIEF, FLAT CABLE	
5	1			A		0907040P004	CONN RETAINER	
6	2					MS51957-13	SCREW, MACHINE .112-40 X .25 LG	
7	2					MS35338-135	WASHER, LOCK, SPRING .115 ID X .209 OD	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A	94117	PL 6003249
	REV -	SHEET 4

SA-01 268 (3 79)

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	–	REL FOR DEV	10/23/84	GAM
		2. REL FOR PROD	12/10/84	BM/

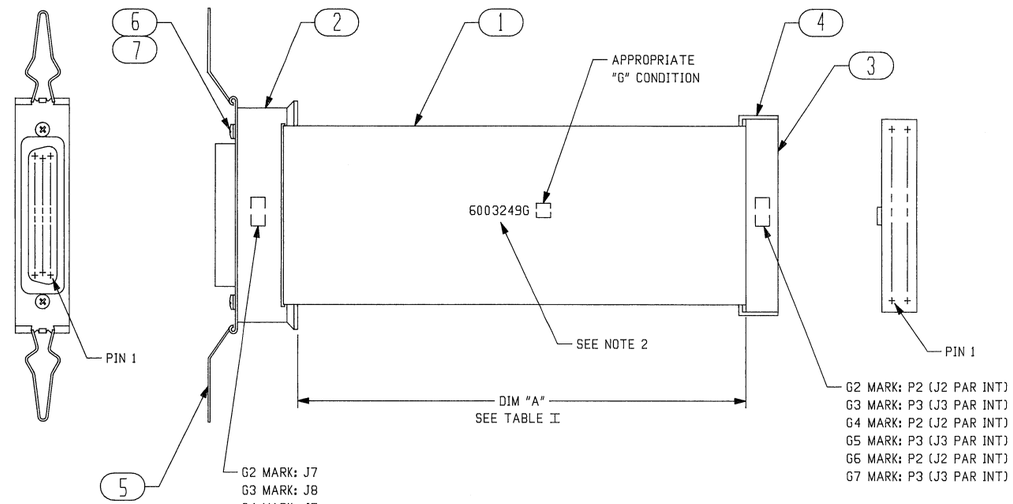


TABLE I

"G" COND	DIM "A"
G001	6.25
G002	60.00 ±2.00
G003	60.00 ±2.00
G004	50.00 ±2.00
G005	45.00 ±2.00
G006	60.00 ±2.00
G007	55.00 ±2.00

(G 001) - (G 007) FOR PARTS LIST
SEE PL. 6003249

6003249

3. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST AND DRAWING.

2. MARK PERMANENT AND LEGIBLE CHARACTERS .04–.16 HIGH WITH CONTRASTING COLOR GOTHIC TYPE AND LOCATE APPROX AS SHOWN. MARKING METHOD OPTIONAL

1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

NOTES

DP01-107 REV-

NEXT ASSY	USED ON
6003253	
6003138	
6003133	
6003132	V4500

APPLICATION

G6	G5	G4	G3	G2	G1	ITEM	SIZE	PART OR IDENTIFYING NO.	DESCRIPTION
QTY PER ASSY						PARTS LIST			

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES
.XX DECIMAL ± .25
.XXX DECIMAL ± –
ANGLES ± –

PRODUCTION
CHANGE BY ECO ONLY

MFG Robert G. Neale 12-10-84

CONT NO.

DRFTG	DR	S.HOLZAPFEL 14AUG84
	APPD	C STEADMAN 10/23/84
	CHK	
ENGRG	DEV	G. NEALE 10/23/84
	E/M	ED NYDAM 10/23/84
	PROJ	GE MOORE 10/23/84

CALCOMP
A Sanders Graphics Company
SANDERS

CABLE ASSY
TO PARALLEL INTERFACE

SIZE	DWG NO.
C	6003249

SCALE NONE SHEET 1 OF 1

DO NOT SCALE PRINT

REVISION STATUS

PARTS LIST	SH	1	2	3	4	5	6	7	8	9	10	11	12
	REV	—	—										
	SH	13	14	15	16	17	18	19	20	21	22	23	24
	REV												

DWG REV	—
WL REV	X

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
—	REL FOR DEV	10-23-84	[illegible]
	2. REL FOR PROD	10 DEC 84	BMJ

2. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST, DRAWING AND WIRE LIST.

1. SHOP PRACTICE TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

PRODUCTION

CHANGE BY ECO ONLY

MFG [illegible] 12-10-84

6003133	
6003132	V4500
NEXT ASSY	USED ON
APPLICATION	

CONT NO.

DRFTG	DR S. HOLZAPFEL	DATE 24 AUG 84
	APPD [illegible]	10/23/84
	CHK	
ENGRG	DW [illegible]	10-25-84
	E/W [illegible]	10-24-84
	PRJ [illegible]	10-28-84

CALCOMP
A Sanders Graphics Company
SANDERS

CABLE ASSY
REAR PANEL TO DEC HOST

SIZE A

PL 6003250

SHEET 1 OF 2

DWG SIZE C

DPD-102 REV-

The Draftboard

107

PARTS LIST

ITEM NO.	QTY PER ASSY G1	QTY PER ASSY G2		DWG SIZE	FSCM	PART OR IDENTIFYING NO.	DESCRIPTION	SYM
1	25 FT	50 FT		A		0901003P009	CABLE,FLAT 50-COND,SHIELDED JACKET	
2	1	1		A		0907040P001	CONN, RCPT, FLAT CABLE, 50-PIN	
3	1	1		A		0907040P003	CONN BACKSHELL	
4	1	1				MS25036-147	TERMINAL, LUG	
5	1	1		A		0907000P007	CONN,FLAT CABLE,RCPT,40-SKT,OPEN END WITH STRAIN RELIEF	
6	18 IN	18 IN		A		0270028P004	INSULATION SLV,HT SHRINK	=
7	24 IN	24 IN		A		0985085P004	TAPE	

3. SHEET ONE REVISION LETTER IS THE CONTROLLING REVISION FOR THIS MULTISHEET DWG
2. SEE SHEET ONE FOR REVISION DESCRIPTIONS
1. SYMBOL ‡ INDICATES VENDOR ITEM - SEE SPEC/SOURCE CONTROL DWG.

SIZE	FSCM NO.	
A	94117	PL 6003250
	REV –	SHEET 2

SA 01-266 (3-79)

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	–	REL FOR DEV	10/23/84	GAM
		2. REL FOR PROD	12/10/84	BM/

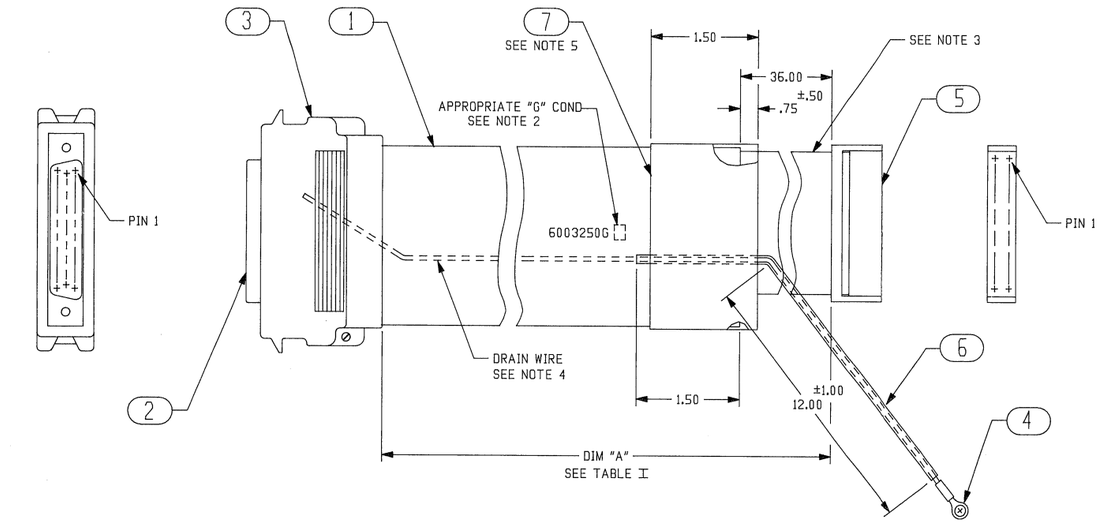


TABLE I

"G" COND	DIM "A"
G001	25FT ± 3.00 IN
G002	50FT ± 3.00 IN

(G 001) - (G 002) FOR PARTS LIST
SEE PL . 6003250

6. PARTS LIST SHEET ONE IS THE CONTROLLING REVISION FOR THE COMBINED PARTS LIST AND DRAWING.
5. DRESS TAPE AS NECESSARY.
4. TERMINATE DRAIN WIRE UNDER GROUNDING SPRING.
3. CUT OUT WIRE NO.S 41–50.
2. MARK PERMANENT AND LEGIBLE CHARACTERS .04–.16 HIGH WITH CONTRASTING COLOR GOTHIC TYPE AND LOCATE APPROX AS SHOWN. MARKING METHOD OPTIONAL
1. SHOP TOLERANCES AND DRAWING INTERPRETATION WITHIN 815002 SUPPLEMENT THIS DRAWING.

NOTES

6003133	
6003132	V4500
NEXT ASSY	USED ON
APPLICATION	

G6	G5	G4	G3	G2	G1
QTY PER ASSY					

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES
.XX DECIMAL ± .25
.XXX DECIMAL ± –
ANGLES ± –

PRODUCTION
CHANGE BY ECO ONLY
MFG

ITEM	SIZE	PART OR IDENTIFYING NO.	DESCRIPTION
PARTS LIST			

CONT NO.

DRFTG	DR	S HOLZAPFEL 24AUG84
	APPD	C STEADMAN 10/23/84
	CHK	
ENGRG	DEV	G. NEALE 10/23/84
	E/M	ED NYDAM 10/24/84
	PROJ	GE MOORE 10/23/84

CALCOMP
A Sanders Graphics Company
SANDERS

CABLE ASSY
REAR PANEL TO DEC HOST

SIZE	DWG NO.
C	6003250
SCALE NONE	SHEET 1 OF 1

DO NOT SCALE PRINT

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Company: _____

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Telephone: [ ] _____

Date: _____

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Version _____

Host computer _____

Host operating system _____ Version _____

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firmware ☐ manual ☐

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