PM-SV32A

Semiconductor Memory

Manual

Plessey
Peripheral
Systems

PM-SV32A

Semiconductor Memory

Manual

November 1978 - Revision A

SIZE	CODE IDENT NO.	DWG NO.
A	52648	MA 701660
SCALE	REV A	SHEET 0-0

Contents

Tables

Figures

Section 1
General Information

1.0 INTRODUCTION

This manual provides the information needed to install and operate the PM-SV32A semiconductor memory module manufactured by Plessey Peripheral Systems, Irvine, CA 92714.

The material is arranged into the following sections:

- Section 1 - General Information

  This section contains a brief, general description of the PM-SV32A and the specifications of the memory module.

- Section 2 - Installation

  This section explains the procedures for equipment installation, including jumper and switch settings.

- Section 3 - Functional Description

  This section contains a detailed, functional description of the PM-SV32A address selection, refresh electronics, modes of operation, and interfacing.

- Drawing Package - MD 701660

  A separate drawing package is available. This document contains logic diagram, schematics, and assemblies required for a complete understanding of the chassis and power supply.

1.1 GENERAL DESCRIPTION

The PM-SV32A is a 32K word MOS dynamic semiconductor memory designed to operate in the DEC LSI-11 Q-bus.* The memory module is contained on a standard dual board.

*DEC and LSI-11 are registered trademarks of Digital Equipment Corporation.

The PM-SV32A is available in four configurations. They are:

Plessey Part Number	Configuration
701660-100	32K x 16 bits
701660-101	24K x 16 bits
701660-102	16K x 16 bits
701660-103	8K x 16 bits

1.2 SPECIFICATIONS

1.2.1 Electrical

Access Time	250ns	
Cycle Time	500ns	
Power Requirements	+ 5VDC	1.2A
	+12VDC	0.3A

1.2.2 Physical

The PM-SV32A is a standard dual height board.

1.2.3 Environmental

Temperature:

Storage	-40°C to 85°C
Operating	0°C to 50°C

Relative Humidity: 95% without condensation

Section 2
Installation

2.0 INTRODUCTION

This section provides information for the installation and operation of the PM-SV32A bootstrap ROM module.

2.1 UNPACKING AND INSPECTION

The PM-SV32A is shipped in a special packing carton designed to keep the board from vibrating and to give it maximum protection during shipment. The packing carton should be retained in case the memory requires reshipment.

To unpack the memory, remove any packing materials and visually inspect for physical damage.

2.2 INSTALLATION

See Figure 2-1 for switch locations.

2.3 REFRESH SWITCH SETTINGS

The PM-SV32A offers two switch selectable refresh modes. External refresh mode is under the control of the processor microcode or user selected DMA device. When external refresh is used on the PM-SV32A, it is usually switch selected to do refresh reply. Only one memory should respond with refresh reply and any memories that are faster during refresh than the PM-SV32A should not be selected for this function.

Internal refresh is accomplished by on-board refresh circuitry. The PM-SV32A refresh is transparent to the processor. Switch SW2 functions are defined in Table 2-1.

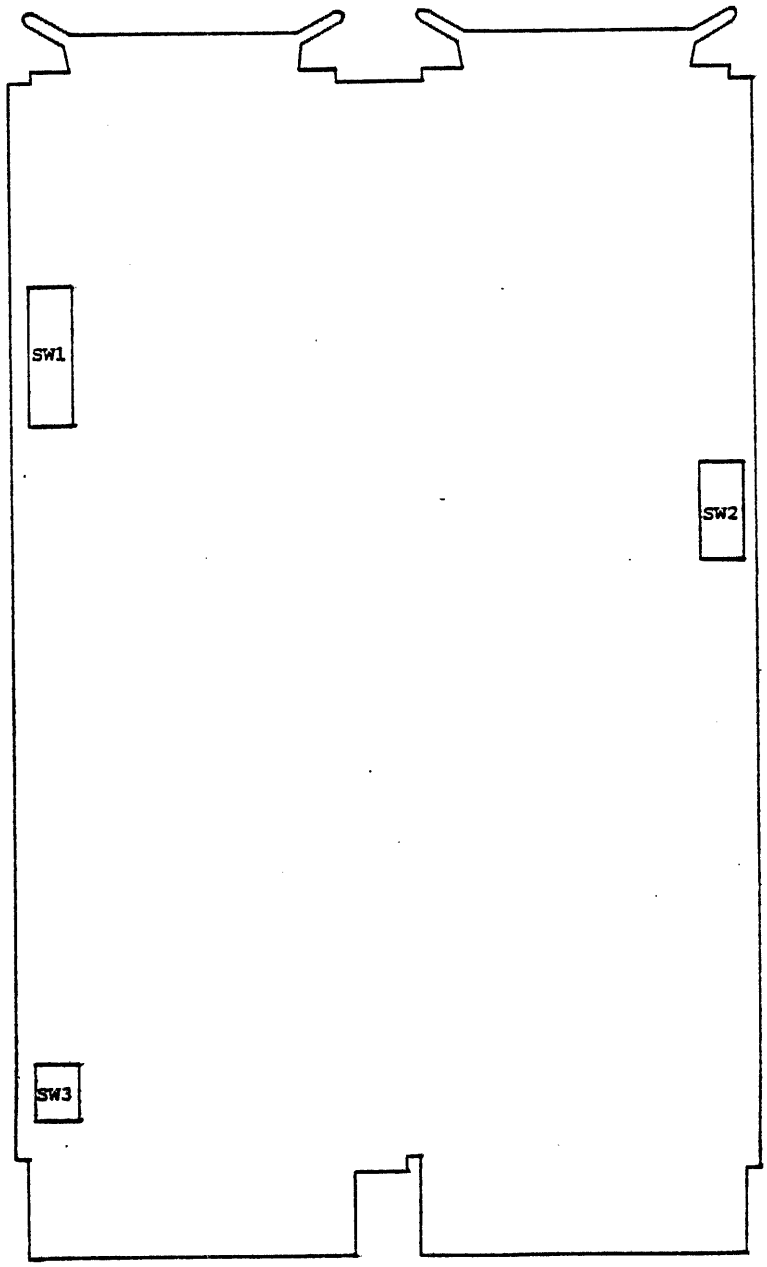


Figure 2-1: Switch Locations (Component Side)

SIZE	CODE IDENT NO.	DWG NO.
A	52648	MA 701660
SCALE	REV A	SHEET 2-2

SW2 POSITIONS	FUNCTION
1	ON - Disable Internal Refresh
2	ON - Disable External Refresh
3	ON - Enables Refresh Reply
4	See Table 2-2.
5	See Table 2-2.

Table 2-1: SW2 Functions

2.4 ADDRESS SWITCH SETTINGS

The PM-SV32A is address switch selectable on 4K boundaries. Table 2-2 defines the DIP switch settings for address selection. Table 2-3 defines extended memory switch settings.

ADDRESS SELECTION			SWITCH SETTINGS											
			S1										S2	
VERSION	SIZE	MEMORY ADDRESS	1	2	3	4	5	6	7	8	9	10	4	5
-100	32K	0 - 28K	ON	ON	ON	ON	ON	ON	ON	X	X	X	ON	X
-101	24K	0 - 24K	ON	ON	ON	ON	ON	ON	X	X	X	X	ON	ON
		4 - 28K	X	ON	ON	ON	ON	ON	X	X	X	ON	ON	ON
-102	16K	0 - 16K	ON	ON	ON	ON	X	X	X	X	X	X	ON	X
		4 - 20K	X	ON	ON	ON	X	X	X	ON	X	X	ON	X
		8 - 24K	X	X	ON	ON	X	X	X	ON	ON	X	ON	X
		12 - 28K	X	X	X	ON	X	X	X	ON	ON	ON	ON	X
-103	8K	0 - 8K	ON	ON	X	X	X	X	X	X	X	X	X	*
		4 - 12K	X	ON	ON	X	X	X	X	X	X	X	X	*
		8 - 16K	X	X	ON	ON	X	X	X	X	X	X	X	*
		12 - 20K	X	X	X	ON	X	X	X	ON	X	X	X	*
		16 - 24K	X	X	X	X	X	X	X	ON	ON	X	X	*
		20 - 28K	X	X	X	X	X	X	X	X	ON	ON	X	*

X = Off
* = Does not care

Table 2-2: Address Selection Switch Settings

MEMORY ADDRESS	SW3 SWITCH SETTINGS			
	1	2	3	4
0 - 28K	ON	OFF	OFF	OFF
0 - 29K	OFF	ON	ON	OFF
0 - 30K	OFF	OFF	ON	OFF
0 - 31K	OFF	OFF	OFF	ON

Table 2-3: Extended Memory Switch Settings

2.5 POWER REQUIREMENTS

The PM-SV32A is designed to operate on +12V and +5V power supplies and can be operated in a battery back-up mode. The typical and worst case power requirements are shown in Table 2-4. Refer to Figure 2-2 and 2-3 for battery back-up configuration.

VOLTAGE	TYPICAL OPERATING CURRENT	WORST CASE OPERATING CURRENT	BATTERY BACK-UP STANDBY (REFRESH ONLY)
+5V	1.2A	1.6A	1.2A
+12V	0.3A	0.5A	0.25A

Table 2-4: Power Requirements

For battery back-up, do the following:

Cut etch:

CONNECTOR PIN		E#	ADD JUMPERS:
AD2	to	E2	E2 to E3
BD2	to	E8	E8 to E4
AA2	to	E1	E1 to E5
BA2	to	E7	E7 to E6

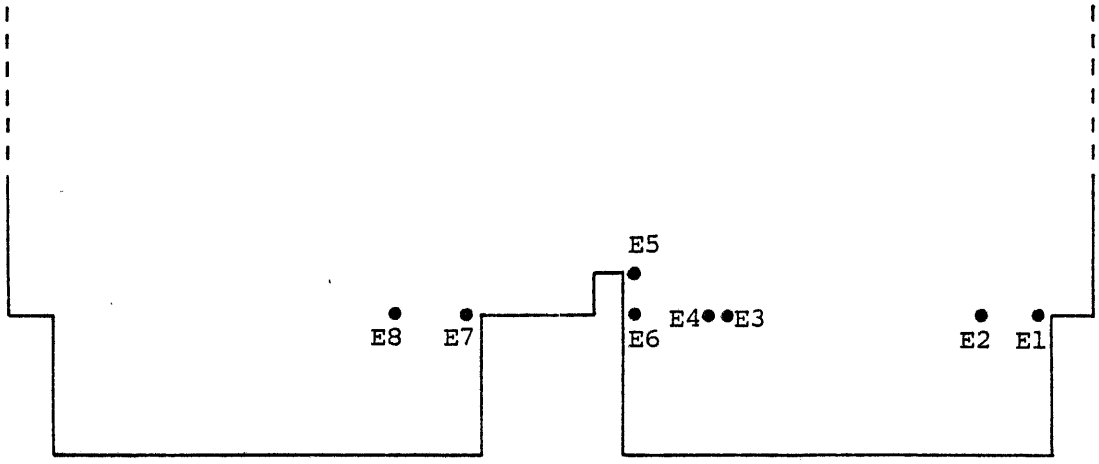


Figure 2-2: Component Side 1

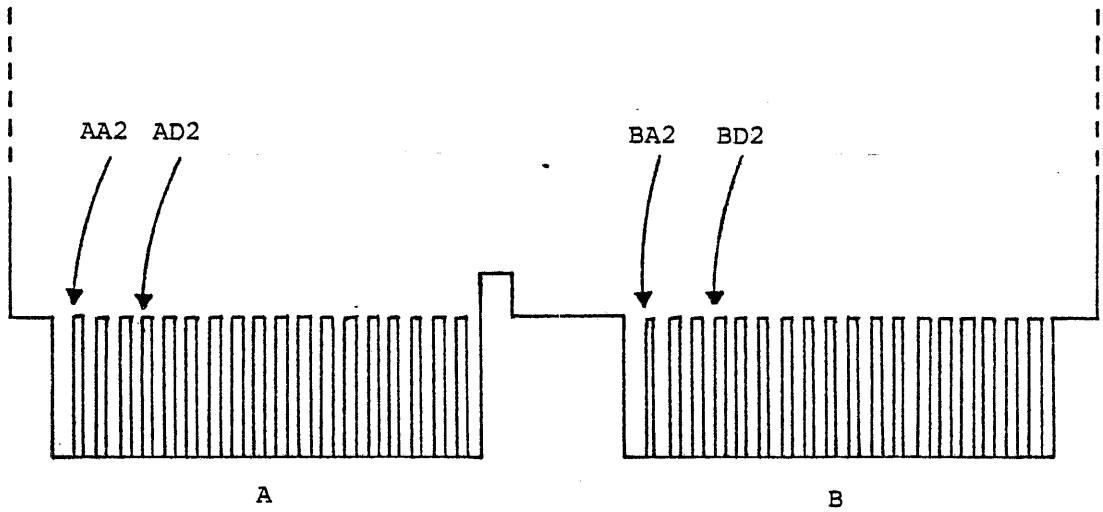


Figure 2-3: Solder Side 2

SIZE	CODE IDENT NO.	DWG NO.
A	52648	MA 701660
SCALE	REV A	SHEET 2-5

Section 3
Functional Description

3.0 ACCESS TIME

The read access time of the PM-SV32A is 250ns typical. Access time is defined as the time from when BDIN or BDOUT is asserted to the time BRPLY is asserted.

3.1 CYCLE TIME

The cycle time of the memory is 500ns typical. Cycle time is defined as the time from when a BDIN or BDOUT is asserted to the time when the memory is ready to accept another BDIN or BDOUT.

3.2 REFRESH ELECTRONICS

The PM-SV32A memory module uses 16K and 8K MOS dynamic random access memory devices. These devices, being dynamic, require refreshing. The refresh sequence is a series of forced memory read (DATI) operations where only the row addresses are significant.

The PM-SV32A offers the user two switch selectable modes of refresh. The first mode of refresh is entirely under the control of either processor microcode, or an external user selected DMA device, such as the PM-REV11. In this mode, all 128 rows of all dynamic MOS memory chips in an LSI-11 system are sequentially refreshed. The timing specification of 8K and 16K RAMs require refresh cycles twice as often as 4K RAMs. Therefore, a double refresh cycle is performed on the PM-SV32A when a bus refresh is initiated. Consequently, the PM-SV32A takes longer to do a bus refresh (850ns) and must be the memory used for refresh reply.

The second refresh mode is accomplished on the PM-SV32A memory board by on-board refresh circuitry. In this mode, the PM-SV32A generates a double refresh cycle at a periodic rate of approximately 30µs. That is, every 30µs the memory is disabled and refreshed at the refresh counter address contained on the PM-SV32A. If a processor request is generated while a refresh cycle is in progress, the request is stored and accomplished immediately following the refresh cycle.

On the other hand, if a 30μs refresh request occurs while the memory is in a processor request cycle, the refresh request is stored and accomplished following the processor cycle. The PM-SV32A refresh is transparent to the processor.

3.3 ADDRESS SELECTION

The memory module is address selectable on 4K boundaries. The address of the memory module may begin on any 4K boundary and end on any 4K boundary depending upon the memory size. Addresses are selected using DIP switch settings. Tables 2-2 and 2-3 list the DIP switch settings. The PM-SV32A can also respond to addresses in the I/O page via switch 3. The I/O page addressing available is 29K, 30K, and 31K.

3.4 MODES OF OPERATION

The PM-SV32A is capable of operating in five different modes. The modes are:

DATI (Read Cycle): In this mode, the memory reads data from a specified location and presents this data to the data bus.

DATO (Write Cycle): In this mode, the memory writes new data from the data bus into a specified location in memory.

DATOB (Write Byte Cycle): In this mode, the memory performs a write on a specified byte of data. The other byte of data is not affected.

DATIO/DATIOB (Read Modify Write): In this mode, the memory performs two memory cycles. A read (DATI) followed by either a DATO or DATOB operation specified by the processor.

Refresh Cycle: In this mode, the memory performs a memory refresh cycle as described in Section 3.2.

3.5 INTERFACE

The memory interfaces with the processor and peripherals via card edge connectors on the bottom of the memory card. Pin connections for these connectors are listed in Table 3-1. All receivers present one bus load to the data bus and comply with DEC LSI-11 bus receiver specifications. Input/output signals required for memory operations are shown below.

MEMORY CONNECTOR SECTION A				MEMORY CONNECTOR SECTION B			
PIN NO.	SIGNAL NAME	PIN NO.	SIGNAL NAME	PIN NO.	SIGNAL NAME	PIN NO.	SIGNAL NAME
		A2	+5V			A2	+5V
		C2	GND	B1	BPOK H	C2	GND
		D2	+12V			D2	+12V
		E2	BDOUT L			E2	BDAL 2 L
		F2	BRPLY L			F2	BDAL 3 L
		H2	BDIN L			H2	BDAL 4 L
J1	GND	J2	BSYNC L	J1	GND	J2	BDAL 5 L
		K2	BWTBT L			K2	BDAL 6 L
						L2	BDAL 7 L
M1	GND	M2	BIAKO L	M1	GND	M2	BDAL 8 L
		N2	BIAKI L			N2	BDAL 9 L
		P2	BBST L			P2	BDAL1Ø L
R1	BREF L	R2	BDMGI L			R2	BDAL11 L
S1	+12B	S2	BDMGO L			S2	BDAL12 L
T1	GND	T2	BINIT L	T1	GND	T2	BDAL13 L
		U2	BDAL Ø L			U2	BDAL14 L
V1	+5VB	V2	BDAL 1 L	V1	+5V	V2	BDAL15 L

NOTE: Q bus signals not connected on the memory are not listed.

Table 3-1: PM-SV32A Backplane Interface Connection

- BDALØØ-BDAL15 - 16 address and bidirectional data bus lines on which address and data are time multiplexed.
- BPOKL - Used by memory to enable refresh oscillator during power up.
- BRPLY - Response line from memory indicating to processor that the memory is through with data for either a read or write cycle.
- BREFL - Control line enabling all memories to do a refresh cycle.
- BDIN - Control line from the processor to the memory which enables a read cycle.

- BDOUT - Control line from the processor to the memory which enables a write cycle.

- BWTBT - Control line from the processor to the memory which enables a write byte cycle.

- BREF - Control line from the processor to the memory which initiates a refresh cycle.

- BBS7L - Control line from the processor to the memory which normally causes deselection of the memory in the 28 - 32K range.

3.6 QUALITY ASSURANCE

This section provides an overview of the quality standard designed into Plessey Peripheral Systems products.

3.6.1 Design Standards

The materials, fabrication, and workmanship conform to the best commercial practices. Specifically, the following standards are met:

1. Printed circuit boards are gold plated on the connector fingers.
2. Silicon integrated circuits in dual in-line packages unless their application is prohibited by voltage swing, power dissipation or function availability.
3. All assemblies having the same part number are interchangeable.
4. The circuits are designed to minimize the risk of catastrophic failure propagation.
5. All hardware items of the products are resistant to corrosion.
6. All components are suitably derated for maximum MTBF (mean time between failures).

3.6.2 Quality and Workmanship

Workmanship is consistent with the best commercial computer practices.

3.6.3 Reliability and Maintainability

Plessey Peripheral Systems products are designed for high reliability and maintainability, as well as low cost and state-of-the-art electrical performance.

- Mean Time Between Failures (MTBF)

  Each product is designed and components chosen to yield the maximum MTBF. MTBF calculations based on MIL-STD-217-A are available for specific products.

- Mean Time To Repair (MTTR)

  The products are designed with the objective of rapid fault isolation and repair. The degree of internal system modularity is maximized such that all systems within their design limits can be constructed from a minimum variety of printed circuit boards. Complete systems are mounted when possible on one circuit board assembly.

- Routine Maintenance

  Most products are designed to require no routine maintenance or adjustment to achieve satisfactory operation.

3.6.4 Service Life

The memory products are designed for a service life of ten years at 24 hours per day exclusive of time required for periodic routine maintenance.

3.6.5 Warranty

All Plessey solid state products are warrantied for a period of six months, including parts and labor.

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REL. TO PRODUCTION PER E.O. 5544	11-29-78	

PRODUCTION RELEASE

TABLE OF CONTENTS

Maintenance Drawing Package

Products Covered by this Drawing Package
PM-SV32A/100
PM-SV32A/101
PM-SV32A/102
PM-SV32A/103

Plessey Peripheral Systems

DO NOT SCALE DRAWING	CONTRACT NO.		
SCREW THREADS PER HANDBOOK H-28	DRAWN N. Glass	11-29-78	
COUNTERBORE AND SPOTFACE FILLET RADII TO BE .010 MAXIMUM	CHECK N. Glass	11-29-78	
REMOVE ALL BURRS AND BREAK SHARP EDGES EQUIVALENT TO .010R	DESIGN		
ROUGHNESS OF MACHINED SURFACES 125√ PER USAS B46.1.	PROJ. ENGR. W. Perry		
STANDARD HOLE TOLERANCE PER ANSI 10387		12-9-78	
TOLERANCES ON: .XX = ± .03 .XXX = ± .010 ANGLES = ± 0° 30'			
INTERPRET DIMENSIONS AND TOLERANCES PER USAS Y14.5			
DIMENSIONS ARE IN INCHES AND APPLY AFTER HEAT TREAT AND FINISH	OTHER APPROVALS		
UNLESS OTHERWISE SPECIFIED			

Plessey Peripheral Systems

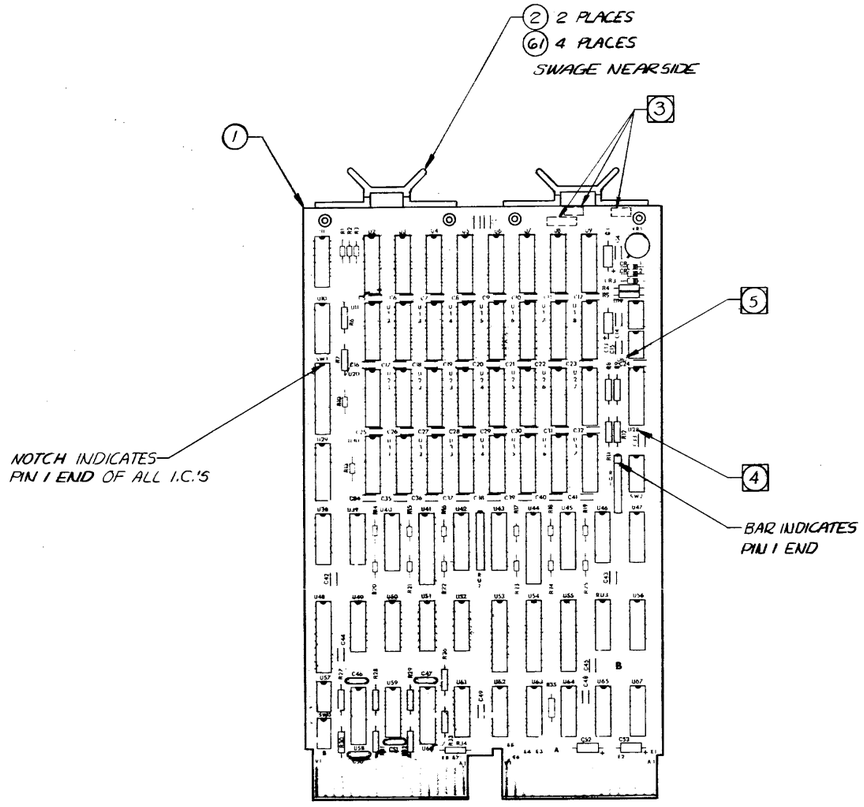
DRAWING TITLE: MAINTENANCE DRAWING PACKAGE

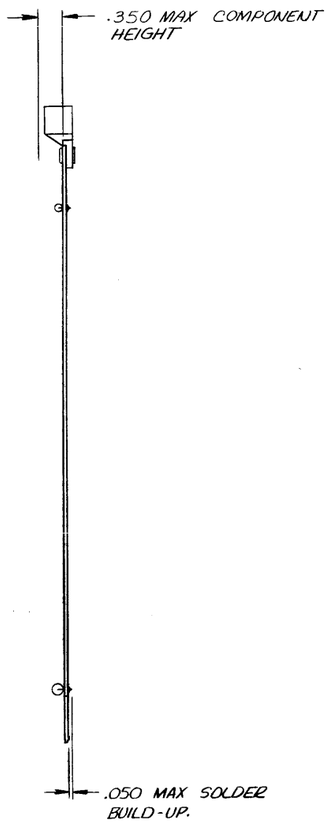
PM-SV32A Semiconductor Memory

SIZE	CODE IDENT NO.	DWG NO.
B	52648	MD 701660

SCALE: | REV. A | SHEET 1 OF 13

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	REL TO PROD PER EO 2413	4-21-78	





FOR BATTERY BACKUP OPTION MODIFY ASSEMBLY AS FOLLOWS:			
1	ISOLATE THE FOLLOWING BY CUTTING THE CIRCUIT ETCH BETWEEN:		
	CONN. PIN		E#
	AD2		E2
	BD2		E8
	AA2		E1
	BA2		E7
2	ADD THE FOLLOWING JUMPERS USING 20 AWG WIRE		
	E2	TO	E3
	E8	TO	E4
	E1	TO	E5
	E7	TO	E6

PRODUCTION RELEASE

(5) UG7 SHOULD BE UG8

(4) COMPONENT DESIGNATIONS ARE FOR REFERENCE ONLY AND DO NOT APPEAR ON PART.

(3) MARK ASSEMBLY VERSION NUMBER, LATEST ASSEMBLY REVISION LETTER AND SERIAL NUMBER USING BLACK INK, PER MIL-M-13231, GROUP III. LOCATION APPROXIMATELY AS SHOWN.

2. FOR SCHEMATIC DIAGRAM SEE SD701660.

1. ASSEMBLE AND INSPECT PER WORKMANSHIP STANDARDS MANUAL.

NOTES: UNLESS OTHERWISE SPECIFIED

														5
		X						FOR PARTS LIST SEE	PL701660-103				4
			X					FOR PARTS LIST SEE	PL701660-102				3
				X				FOR PARTS LIST SEE	PL701660-101				2
					X			FOR PARTS LIST SEE	PL701660-100				1
		-103	-102	-101	-100	NOTE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION / MATERIAL		SPEC SOURCE	CODE IDENT NO.	FIND NO.		
PART ASSY NO. & QTY PER ASSY								PARTS LIST						
		A	A	A	A									
PART ASSY REV LTR														
-103				PM-SV32A										
-102				PM-SV32A										
-101				PM-SV32A										
-100				PM-SV32A										
PART NO.	NEXT ASSY			USED ON										
APPLICATION														

DO NOT SCALE DRAWING

SCREW THREADS PER HANDBOOK H-28

COUNTERBORE AND SPOTFACE FILLET RADII TO BE .010 MAXIMUM

REMOVE ALL BURRS AND BREAK SHARP EDGES EQUIVALENT TO .030R

ROUGHNESS OF MACHINED SURFACES 125√ PER USAS B46.1

STANDARD HOLE TOLERANCE PER ANSI B32.1

TOLERANCES ON: XX ± .05 XXX ± .010 ANGLES ± 0° 30'

INTERPRET DIMENSIONS AND TOLERANCES PER USAS Y14.5

DIMENSIONS ARE IN INCHES AND APPLY AFTER HEAT TREAT AND FINISH

UNLESS OTHERWISE SPECIFIED

CONTRACT NO.

DRAWN	L. LAMBERT	4-24-78
CHECK	L. Tunkis	4-28-78
ENGR		
PROJ. ENGR		4-28-78
PROD. DESIGN		4-24-78
OTHER APPROVALS		

Plessey Memories Incorporated
Santa Ana, California

DWG TITLE
BOARD ASSEMBLY
MEMORY 28K X 16 MAX
PM-SV32A

SIZE	CODE IDENT NO.	DWG NO.
D	52648	701660

SCALE: FULL SHEET 1 OF 1

DISTR NO. 1234 20 16

701660 A

PARTS LIST | Plessey Microsystems

APP TITLE: BOARD ASSY, MEMORY, 28K x16 PM-SV32A

PREPARED BY: J. Wilson 12-7-78 | CHECKED BY: K. Junkins 1-10-78 | REVIEWED BY: | NEW ENGR: R.K. Johnston 1-12-78 | APPROVED: [illegible] 8-23-78

PARTS LIST NO. PL701660-100 | REV LTR A | CODE IDENT NO. 52648 | DWG NO. 1234570 | REV B | CONTRACT NO. | SH 1 OF 7

LTR	DESCRIPTION	DATE	APPROVED
A	RELTO PRODEO 2413	8-21-78	[illegible]

LTR	DESCRIPTION	DATE	APPROVED
	PRODUCTION RELEASE		

REV STATUS OF SHEETS										
REV LTR	A	A	A	A	A	A	A			
SHEET	1	2	3	4	5	6	7	8	9	10

INTERPRET SYMBOLS USED AS FOLLOWS:
A = PURCHASED ITEM; B = FABRICATED ITEM; C = SPECIFICATION OR SOURCE CONTROL ITEM; D = ALTERED ITEM; E = SELECTED ITEM; F = CUSTOMER FURNISHED ITEM; G = BULK ITEM

PARTS LIST | Plessey Microsystems | CODE IDENT NO. 52648 | PARTS LIST NO. PL701660-100 | SH 2 | REV LTR A

CROSS INDEX OF REFERENCE DESIGNATIONS TO FIND NO.

REFERENCE DESIGNATION	FIND NO.	REFERENCE DESIGNATION	FIND NO.	REFERENCE DESIGNATION	FIND NO.	REFERENCE DESIGNATION	FIND NO.
CR1-3	7	U41,44,48,53-55	29	C46	52		
VR1	8	U52	30	C50	53		
SW1	9	U57	31	C4,15	54		
SW2	10	U19, 68	32	C14,24	55		
SW3	11		33	C1,2,5-12,16-23,25-41	56		
	12	R1-3,10,13-25	34				
	13	R12	35	C13	57		
U12-9,11-18,20-27,30-37	14	R5	36	C53	58		
		R6,7,34	37	C3,52	59		
U64,65	15	R9	38	C42,43,44,45,48,49	60		
U40,42,43,45	16	R4,11	39				
U50	17	R26-28	40	LAB SET: R8,29-31,33 C47			
U10,47,51,56	18	R32	41				
U63	19	R35	42				
U49	20		43				
U1	21		44				
U67	22		45				
U38,39	23		46				
U62	24	RU2	47				
U59,61	25	RU3	48				
U46	26	RU1	49				
U58,60	27		50				
U29	28	C51	51				

PARTS LIST | Plessey Microsystems | CODE IDENT NO. 52648 | PARTS LIST NO. PL701660-100 | SH 3 | REV LTR A

ITEM SEQ NO.	NOTE	QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SPECIFICATION	CODE IDENT NO.	ZONE	FIND NO.	SYM	C/I USAGE C/I CODE	C/I USAGE INV ON HAND	C/I USAGE PAR	C/I USAGE UNIT COST
		1	701659-01	PRINTED WIRING BOARD				1					
		2	701339-100	HANDLE				2					
								3					
								4					
								5					
								6					
		3	138000-001	DIODE				7					
		1	LM320-H05	VOLTAGE REGULATOR				8					
		1	3-435668-0	SWITCH, 10 POS. DIP W/TAPE	AMP			9					
		1	3-435668-5	SWITCH, 5 POS. DIP W/TAPE	AMP			10					
		1	3-435668-4	SWITCH, 4 POS. DIP	AMP			11					
								12					
								13					

PARTS LIST | Plessey Microsystems | CODE IDENT NO. 52648 | PARTS LIST NO. PL701660-100 | SH 4 | REV LTR A

ITEM SEQ NO.	NOTE	QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SPECIFICATION	CODE IDENT NO.	ZONE	FIND NO.	SYM	C/I USAGE C/I CODE	C/I USAGE INV ON HAND	C/I USAGE PAR	C/I USAGE UNIT COST
		32	136003	I.C./DYNAMIC RAM, 16K	MOSTEK			14					
		2	DS8640	I.C./QUAD NOR UNIFIED BUS RECEIVER	NATIONAL			15					
		4	DS8641	I.C./QUAD UNIFIED BUS TRANSCEIVER	NATIONAL			16					
		1	SN7400	I.C./QUAD 2-INPUT POS-NAND GATE	T.I.			17					
		4	SN74S00	I.C./QUAD 2-INPUT POS-NAND GATE	T.I.			18					
		1	SN74S04	I.C./HEX INVERTER	T.I.			19					
		1	SN7408	I.C./QUAD 2-INPUT POS AND GATE	T.I.			20					
		1	SN74S08	I.C./QUAD 2-INPUT POS AND GATE	T.I.			21					
		1	SN74S10	I.C./TRIPLE 3-INPUT POS-NAND GATE	T.I.			22					
		2	SN7432	I.C./QUAD 2-INPUT POS-OR GATE	T.I.			23					
		1	SN7438	I.C./QUAD 2-INPUT POS-NAND BUFFER W/OC	T.I.			24					
		2	SN74S74	I.C./DUAL D-TYPE POS-EDG-TRIG F/F W/PRESET/CLEAR	T.I.			25					
		1	SN7486	I.C./QUAD 2-INPUT EXCLSVE-OR GATE	T.I.			26					

SIZE B | CODE IDENT NO. 52648 | DWG NO. PL 701660-100 | REV A | SCALE | SHEET 1 of 2

Form 000087

PARTS LIST — Plessey Microsystems — CODE IDENT NO. 52648 — PARTS LIST NO. PL701660-100 — SH 5 — REV LTR A

CIRCUIT REF	NOTE	QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SPECIFICATION	CODE IDENT NO.	ZONE	FIND NO.	SYM	C/I USAGE C/I CODE	INV ON HAND	PAR	UNIT COST
		2	SN74123	I.C./ DUAL RETRIG MONO MULTI W/CLEAR	T.I.			27					
		1	SN74156	I.C./ DUAL 2 LINE TO 4 LINE DEC / DEMULTI	T.I.			28					
		6	SN74S373	I.C./ OCTAL D-TYPE FLIP - FLOP	T.I.			29					
		1	SN74393	I.C./ DUAL 4-BIT DECADE AND BINARY COUNTER	T.I.			30					
		1	SN75452	I.C./ DUAL PERIPHERAL POS-NAND DRIVER	T.I.			31					
		2	NE555	TIMER	NATIONAL			32					
								33					
		17	RC05GF330J	RESISTOR, 33Ω, ±5%, 1/8 W	MIL-R-11			34					
		1	RC07GF101J	RESISTOR, 100Ω, ±5%, 1/4 W	MIL-R-11			35					
		1	RC07GF272J	RESISTOR, 2.7K, ±5%, 1/4 W	MIL-R-11			36					
		3	RC07GF472J	RESISTOR, 4.7K, ±5%, 1/4 W	MIL-R-11			37					
		1	RC07GF153J	RESISTOR, 15K, ±5%, 1/4 W	MIL-R-11			38					
		2	RC07GF223J	RESISTOR, 22K, ±5%, 1/4 W	MIL-R-11			39					

PARTS LIST — Plessey Microsystems — CODE IDENT NO. 52648 — PARTS LIST NO. PL701660-100 — SH 6 — REV LTR A

CIRCUIT REF	NOTE	QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SPECIFICATION	CODE IDENT NO.	ZONE	FIND NO.	SYM	C/I USAGE C/I CODE	INV ON HAND	PAR	UNIT COST
		3	RC07GF273J	RESISTOR, 27K, ±5%, 1/4 W	MIL-R-11			40					
		1	RC07GF333J	RESISTOR, 33K, ±5%, 1/4 W	MIL-R-11			41					
		1	RC07GF102J	RESISTOR, 1KΩ, ±5%, 1/4 W	MIL-R-11			42					
								43					
								44					
								45					
								46					
		1	750-83-R33Ω	RESISTOR MODULE, 33Ω	CTS			47					
		1	760-3-R39Ω	RESISTOR MODULE, 39Ω	CTS			48					
		1	750-81-R4.7K	RESISTOR MODULE, 4.7K	CTS			49					
								50					
		1	CD15FD220J03	CAPACITOR, 22 pF, ±5%, 500V	CORNELL-DUBILIER			51					
		1	CD15FD470J03	CAPACITOR, 47 pF, ±5%, 500V	CORNELL-DUBILIER			52					

PARTS LIST — Plessey Microsystems — CODE IDENT NO. 52648 — PARTS LIST NO. PL701660-100 — SH 1 — REV LTR A

CIRCUIT REF	NOTE	QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SPECIFICATION	CODE IDENT NO.	ZONE	FIND NO.	SYM	C/I USAGE C/I CODE	INV ON HAND	PAR	UNIT COST
		1	CD15FD101J03	CAPACITOR, 100 pF, ±5%, 500V	CORNELL-DUBILIER			53					
		2	CK05BX102K	CAPACITOR, .001 μf, ±10%, 100V	MIL-C-11015			54					
		2	CK05BX103K	CAPACITOR, .01 μf, ±10%, 100V	MIL-C-11015			55					
		35	CK05BX104K	CAPACITOR, .1 μf,	MIL-C-11015			56					
		1	150D474X0035A2	CAPACITOR, .47 μF, 35V	SPRAGUE			57					
			150D475X0010A2	CAPACITOR, 4.7 μF, 10V, ±20%	SPRAGUE			58					
		2	150D225 X0020A2	CAPACITOR, 2.2 μF, 20V, ±20%	SPRAGUE			59					
		6	CGA103Z1DZ	CAPACITOR, .01 μF, 50V	UNITRODE			60					
		4	MS16535 -154	RIVET / TUBULAR, OVAL HD .123 DIA × .188 LG				61					

SIZE B | CODE IDENT NO. 52648 | DWG NO. PL 701660-100 | REV A | SHEET 2 of 2 | SCALE

Form 000087

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
/	A	REL TO PROD PER EO 2413	8-21-78	
/	B	INCORP EO 2634	11-30-78	

LAST REFERENCE DESIGNATION USED	
RESISTOR	R35
CAPACITOR	C53
INTEGRATED CKT	U68
DIODE	CR3
RESISTOR MODULE	RU3
SWITCH	SW3
VOLTAGE REGULATOR	VR1

REFERENCE DESIGNATION NOT USED	
INT CKT	U28, ,66

REF DESIG.	GATES USED PER TOTAL	PART NUMBER
U10	3/4	74S00
U46	2/4	74S86
U49	3/4	7408
U50	3/4	7400
U51	3/4	74S04
U62	2/4	7438
U65	3/4	8640

SOLDER SIDE		SIDE 2		SIDE 1	
CONNECTOR A	COMPONENT SIDE	+5V	A		CONNECTOR A
			B		
		GND	C		
		+12V	D		
		BDOUTL	E		
		BRPLY	F		
		BDINL	H		
		BSYNCL	J	GND	
		BWTBTL	K		
			L		
		BIAKOL	M	GND	
		BIAKIL	N		
		BBS7L	P		
		BDMGIL	R	BREFL	
		BDMGOL	S	+12VB	
			T	GND	
		BDALØL	U		
		BDAL1L	V	+5VB	
CONNECTOR B		+5V	A		CONNECTOR B
			B	BPOKH	
		GND	C		
		+12V	D		
		BDAL2L	E		
		BDAL3L	F		
		BDAL4L	H		
		BDAL5L	J	GND	
		BDAL6L	K		
		BDAL7L	L		
		BDAL8L	M	GND	
		BDAL9L	N		
		BDAL10L	P		
		BDAL11L	R		
		BDAL12L	S		
		BDAL13L	T	GND	
		BDAL14L	U		
		BDAL15L	V		

4K BLOCK	SWITCH ON	MEMORY ADDRESS (OCTAL)
0-4K	1	000000 - 017776
4-8K	2	020000 - 037776
8-12K	3	040000 - 057776
12-16K	4	060000 - 077776
16-20K	5	100000 - 117776
20-24K	6	120000 - 137776
24-28K	7	140000 - 157776

VERSIONS	
SV32A/100	(32K-28K)
SV32A/101	24K
SV32A/102	16K
SV32A/103	8K

ADDRESS SELECTIONS			SWITCH SETTINGS											
			S1										S2	
VERSION	SIZE	MEMORY ADDRESS	1	2	3	4	5	6	7	8	9	10	4	5
-100	28/32K	0-28K	ON	ON	ON	ON	ON	ON	ON	X	X	X	ON	X
-101	24K	0-24K	ON	ON	ON	ON	ON	ON	X	X	X	X	ON	ON
		4-28K	X	ON	ON	ON	ON	ON	X	X	X	ON	ON	ON
-102	16K	0-16K	ON	ON	ON	ON	X	X	X	X	X	X	ON	X
		4-20K	X	ON	ON	ON	X	X	X	ON	X	X	ON	X
		8-24K	X	X	ON	ON	X	X	X	ON	ON	X	ON	X
		12-28K	X	X	X	ON	X	X	X	ON	ON	ON	ON	X
-103	8K	0-8K	ON	ON	X	X	X	X	X	X	X	X	X	*
		4-12K	X	ON	ON	X	X	X	X	X	X	X	X	*
		8-16K	X	X	ON	ON	X	X	X	X	X	X	X	*
		12-20K	X	X	X	ON	X	X	X	ON	X	X	X	*
		16-24K	X	X	X	X	X	X	X	ON	ON	X	X	*
		20-28K	X	X	X	X	X	X	X	X	ON	ON	X	*

X = OFF
* = DON'T CARE

SWITCH	FUNCTION
SW2-1	ON-DISABLE INTERNAL REFRESH OSCILLATOR
SW2-2	ON-ENABLES BREFL (EXTERNAL REFRESH)
SW2-3	ON-ENABLES BRPLY (BUSS REPLY)

SWITCH 2 FUNCTIONS

EXTENDED MEMORY ENABLE				
RANGE	SW3-1	SW3-2	SW3-3	SW3-4
0-28K	ON	OFF	OFF	OFF
0-29K	OFF	ON	ON	OFF
0-30K	OFF	OFF	ON	OFF
0-31K	OFF	OFF	OFF	ON

(6) COMPONENT VALUES ARE LAB SET.

5. CAPACITOR VALUES ARE MICROFARADS.
4. RESISTOR VALUES ARE IN OHMS, ±5%, 1/4 W.
3. DESIGNATIONS SHOWN IN PARENTHESIS INDICATES WHERE SIGNAL ORIGINATES OR TERMINATES.
   (2/B3)
   - 2 = ZONE DESIGNATION
   - B3 = SHEET NUMBER
2. SIGNALS SHOWN IN RECTANGLES ARE I/O CONNECTIONS.
   [A A1]
   - A = BOARD SIDE
   - A1 = PIN DESIGNATION
   - A = CONNECTOR DESIGNATION
1. FOR ASSEMBLY DRAWING SEE 701660

NOTES: UNLESS OTHERWISE SPECIFIED:

7. ALL DIODES ARE 138000-001.

(8)

FOR BATTERY BACKUP OPTION MODIFY ASSEMBLY AS FOLLOWS:	
1	ISOLATE THE FOLLOWING BY CUTTING THE CIRCUIT ETCH BETWEEN:
	CONN. PIN — E#
	AD2 — E2
	BD2 — E8
	AA2 — E1
	BA2 — E7
2	ADD THE FOLLOWING JUMPERS USING 20 AWG WIRE
	E2 TO E3
	E8 TO E4
	E1 TO E5
	E7 TO E6

PRODUCTION RELEASE

NOTE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION / MATERIAL	SPEC/SOURCE	CODE IDENT NO.	FIND NO.
					5
					4
					3
					2
					1

PARTS LIST

PART/ASSY NO. & QTY PER ASSY

PART/ASSY REV LTR

PART NO.	NEXT ASSY	USED ON
/	701660	PM-SV32A

APPLICATION

DO NOT SCALE DRAWING

SCREW THREADS PER HANDBOOK H-28
COUNTERBORE AND SPOTFACE FILLET RADII TO BE .030 MAXIMUM
REMOVE ALL BURRS AND BREAK SHARP EDGES EQUIVALENT TO .010R
ROUGHNESS OF MACHINED SURFACES 125 PER USAS B46.1
STANDARD HOLE TOLERANCE PER ANSI B32.1
TOLERANCES ON: XX = ± .02 XXX = ± .010 ANGLES = ± 0° 30'
INTERPRET DIMENSIONS AND TOLERANCES PER USAS Y14.5
DIMENSIONS ARE IN INCHES AND APPLY AFTER HEAT TREAT AND FINISH
UNLESS OTHERWISE SPECIFIED

CONTRACT NO.

DRAWN		11-17-77
CHECK	K Trumbo	1-10-78
ENGR	R J Johnston	1-12-78
PROJ. ENGR		
PROD. DESIGN	Dsoul	1-17-78
OTHER APPROVALS		

Plessey Microsystems

DWG TITLE: SCHEMATIC DIAGRAM, MEMORY, 24K x 16 BITS PMSV-32A

SIZE	CODE IDENT NO.	DWG NO.
D	52648	SD701660

SCALE: ~ | SHEET 1 OF 9

DISTR NO. 19990

REV B
PMM NO. SD701660

C-2

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

8641

BDAL0L AU2 (6/B3) D00 → U40 pin 2 → pin 3 → R14 33.1/8W → DAI0 (8/C8) (9/C8); DA 0 (6/D6)

BDAL1L AV2 (6/B3) D01 → U40 pin 12 → pin 11 → R21 33.1/8W → DAI1 (8/C8) (9/C8); DA1 (7/D7)

BDAL2L BE2 (6/B3) D02 → U42 pin 1 → pin 2 → R16 33.1/8W → DAI2 (8/C8) (9/C8); DA2 (7/D7)

BDAL3L BF2 (6/B3) D03 → U42 pin 15 → pin 14 → pin 13 → RU2 pin 3 → pin 4 33 → DAI3 (8/C8) (9/C8); DA3 (7/D7)

(4/D3) DDENL → U40 pin 9 → pin 7

8641

BDAL4L BH2 (6/B3) D04 → U42 pin 12 → pin 11 → pin 10 → RU2 pin 7 → pin 8 33 → DAI4 (8/C8) (9/C8); DA4 (7/C7)

BDAL5L BJ2 (6/B3) D05 → U43 pin 15 → pin 14 → pin 13 → R17 33.1/8W → DAI5 (8/C8) (9/C8); DA5 (7/C7)

BDAL6L BK2 (6/B3) D06 → U45 pin 1 → pin 2 → pin 3 → R18 33.1/8W → DAI6 (8/C8) (9/C8); DA6 (7/C7)

BDAL7L BL2 (6/B3) D07 → U45 pin 12 → pin 11 → pin 10 → R25 33.1/8W → DAI7 (8/C8) (9/C8); DA7 (7/C7)

U42 pin 9 → pin 7

8641

BDAL8L BM2 (6/A3) D08 → U40 pin 4 → pin 5 → pin 6 → R20 33.1/8W → DAI8 (8/A8) (9/A8); DA8 (7/B7)

BDAL9L BN2 (6/A3) D09 → U40 pin 15 → pin 14 → pin 13 → R15 33.1/8W → DAI9 (8/A8) (9/A8); DA9 (7/B7)

BDAL10L BP2 (6/A3) D010 → U42 pin 4 → pin 5 → pin 6 → R22 33.1/8W → DAI10 (8/A8) (9/A8); DA10 (7/B7)

BDAL11L BR2 (6/A3) D011 → U43 pin 4 → pin 5 → pin 6 → RU2 pin 6 → pin 5 33 → DAI11 (8/A8) (9/A8); DA11 (7/B7) (2/A3)

U43 pin 9 → pin 7

8641

BDAL12L BS2 (6/A3) D012 → U43 pin 1 → pin 2 → pin 3 → RU2 pin 2 → pin 1 33 → DAI12 (8/A8) (9/A8); DA12 (7/B7) (2/A3)

BDAL13L BT2 (6/A3) D013 → U43 pin 12 → pin 11 → pin 10 → R23 33.1/8W → DAI13 (8/A8) (9/A8); DA13 (7/B7) (6/D6)

BDAL14L BU2 (6/A3) D014 → U45 pin 4 → pin 5 → pin 6 → R24 33.1/8W → DAI14 (8/A8) (9/A8); DA14 (7/B7) (6/D6)

BDAL15L BV2 (6/A3) D015 → U45 pin 15 → pin 14 → pin 13 → R19 33.1/8W → DAI15 (8/A8) (9/A8); DA15 (7/B7) (6/D6)

U45 pin 9 → pin 7

8640

BSYNC L AJ2 → U64 pin 12 → pin 11 → pin 13 → SYNC (5/C7) (6/C6)

BWTBTL AK2 → U64 pin 9 → pin 10 → pin 14 → WTBT (5/A7)

BDINL AH2 → U65 pin 4 → pin 5 → pin 3 → DIN (4/D6)

BPOKH BB1 → U65 pin 7 → pin 6 → pin 2 → BPOKL (3/C6)

BDOUTL AE2 → U65 pin 9 → pin 10 → pin 14 → DOUT (4/C6)

8640

BREFL AR1 → U64 pin 4 → pin 5 → pin 3 → BREF (6/D6)

+5V → RU1 4.7K pin 1 → pin 3

SW2 pin 2 → pin 9

BIAKIL AN2

BIAKOL AM2

BDMGIL AR2

BDMGOL AS2

(2/B5) DAI1 → U57 pin 1 → pin 2 → pin 3

(2/A5) DAI2 → U57 pin 6 → pin 7 → pin 5

75452

U62 7438 pin 1 → pin 2 → pin 3

SW3 pin 1 → pin 8; pin 2 → pin 7; pin 3 → pin 6; pin 4 → pin 5

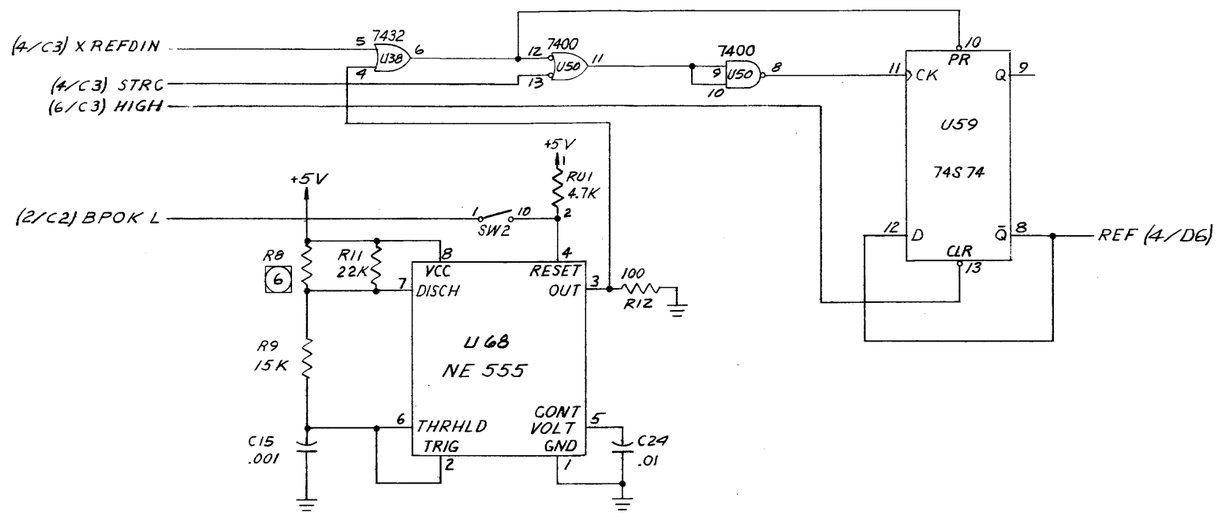
+5V → R35 1K → XMEMSEL

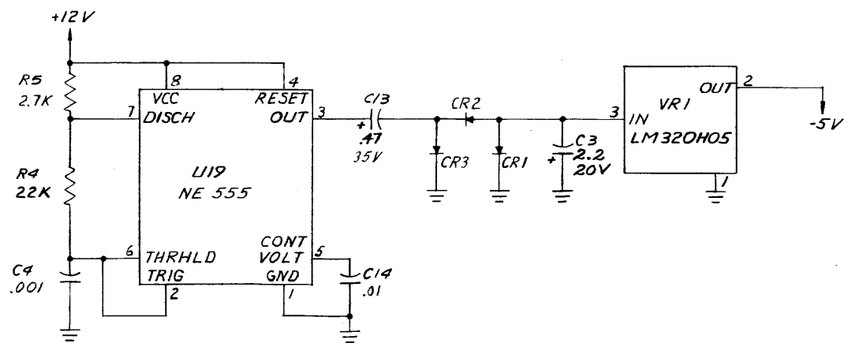
U64 pin 7 → pin 6 → pin 2 → BBS7(6/D6)

BBS7L AP2

SIZE	CODE IDENT NO.	DWG NO.
D	52643	SD701660
SCALE: ~	REV B	SHEET 2 OF 9
		DISTR NO.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		





SIZE	CODE IDENT NO.	DWG NO.
D	52648	SD701660
SCALE: —	REV B	SHEET 3 OF 9
		DISTR NO.

SD701660

C4

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

(2/D4) DIN
(6/D3) XREF
(3/C3) REF
(4/B3) CAS
(4/B3) RFCASL
(5/C7) RAS
(2/C2) DOUT
(5/D2) SELH
(6/C3) HIGH
(4/B3) SRASL

+5V
RU1 4.7K
SW2
R34 4.7K
R31 R28 27K 47PF C46
R30 R27 27K 100PF C30
R33 R26 27K C47
R29 R32 33K 22PF C57

U67 74S10
U46 7486
U63 74S04
U61 74S74
U49 7408
U47 74S00
U61 74S10
U58 74123
U1 74S08
U59 74S74
U60 74123
U50 7400
U51 74S00
U62 7438
U56 74S00

DOENL (2/D6)
AF2 BRPLY
STRC (3/D6)
STMC (5/C7)
XREFDIN (3/D6)
WRITEL (5/A7)
SRFCL (6/B6) (7/C7) (5/B7)
SRFC (5/C7)
READ L (5/B7)
SRASL (4/A6)
RASL (5/C7)
RAS (5/C7)
RFCASL (4/C6)
RFCAS (6/C6)
CAS (4/C6) (5/C7)
MXSL (7/C7)
MXS (7, C7)

SD701660 REV B

SIZE	CODE IDENT NO.	DWG NO.
D	52643	SD701660
SCALE: —	REV B	SHEET 4 OF 9
		DISTR NO.

C-5

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

+5V

R6 4.7K

R7 4.7K

74156 U29

SW1

(6/D3) A13
(6/D3) A14
(6/D3) A15
(6/D3) BS7
(6/D3) XREF
(4/B3) RASL
(4/B3) CAS
(2/D2) SYNC
(4/B3) (4/C6) (6/B6) RAS
(4/C3) SRFC
(4/C3) STMC

7432 U38

74S00 U10

74S08 U1

R1 33, 1/8 W
R2 33, 1/8 W
R3 33, 1/8 W

SELH (4/C6)
RASIL (8/D8)
RASOL (9/D8)
CASOL (8/C8) (9/C8)

(4/C3) SRFC L
(4/C3) READ L

7400 U50

UG3 74S04

7408 U49

7432 U39

R10 33, 1/8W
R13 33, 1/8W

(6/D3) A0
(2/C2) WTBT
(4/C3) WRITE L

WELBOL (8/C8) (9/C8)
WEUBOL (8/B8) (9/B8)

SIZE	CODE IDENT NO.	DWG NO.
D	52648	SD701660

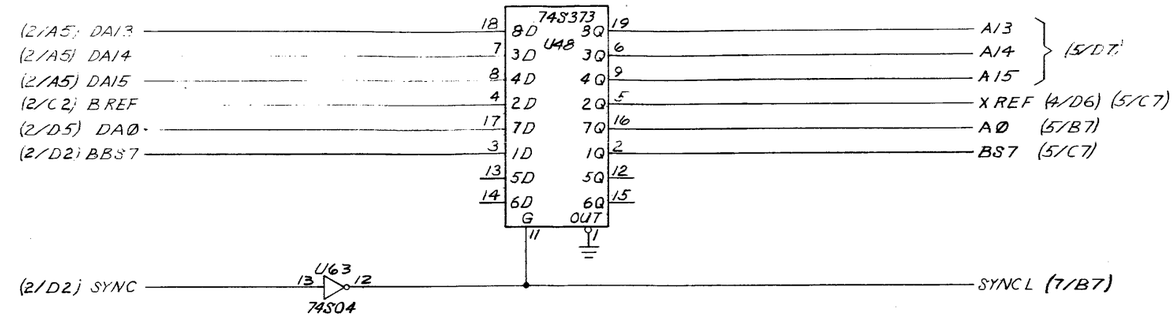
SCALE: — REV B SHEET 5 OF 9

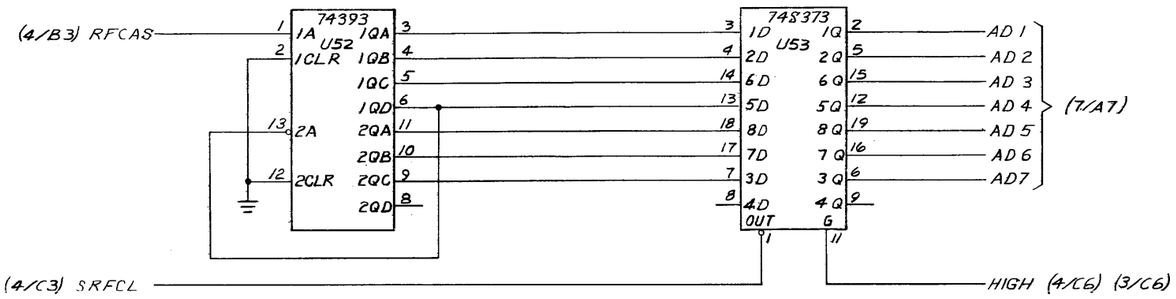
DISTR NO.

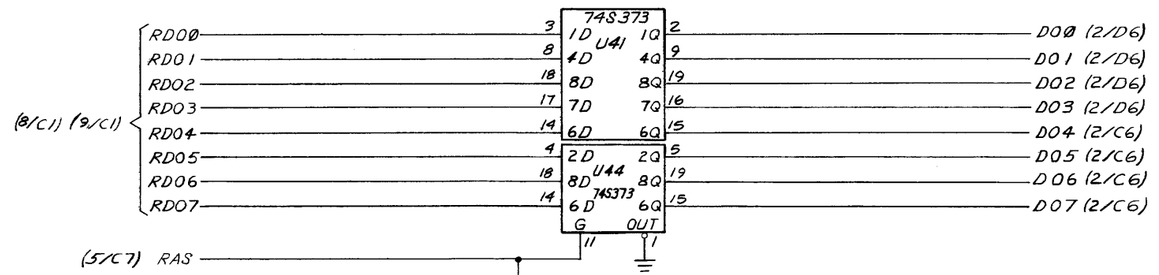
SD701660 REV B

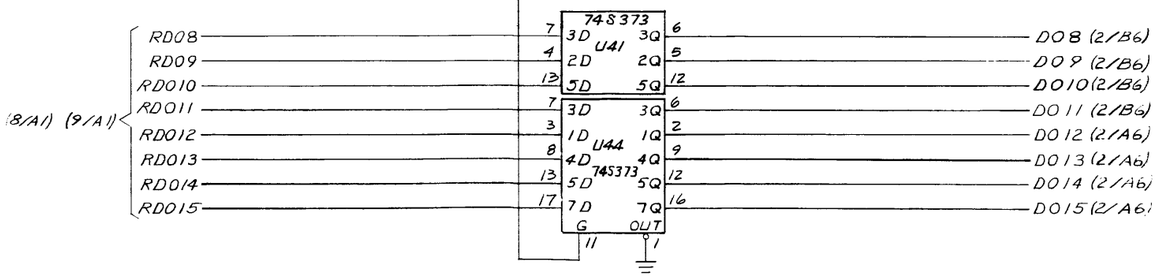
C6

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		









SIZE	CODE IDENT NO.	DWG NO.
D	52648	[illegible]
SCALE: —	REV B	SHEET 6 OF 9
		DISTR NO.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

74S373 U54

(2/D5) DA1
(2/D5) DA2
(2/D5) DA3
(2/C5) DA4
(2/C5) DA5
(2/C5) DA6
(2/A1) DA7

RU3 39Ω

A00L A01L A02L A03L A04L A05L (8/D8) (9/D8)
A06L (8/C8) (9/C8)

(4/A3) MXSL
(4/C3) SRFCL
74S00 U56

(4/A3) MXS
74S00 U56

74S373 U55

(2/B5) DA8
(2/B5) DA9
(2/B5) DA10
(2/B5) DA11
(2/A5) DA12
(2/A5) DA13
(2/A5) DA14
(2/A5) DA15

7486 U46
SW2 SW2
RU1 4.7K
RU1 4.7K +5V

(6/C3) SYNCL

(6/C3) AD1 AD2 AD3 AD4 AD5 AD6 AD7

+5V AA2 E1
+5V BA2 E7
C16 C18 C20 C22 C33 C34 C35 C37 C39 C41-C45 C48 C49 C53 4.7,10V

+5VB AV1 E5 E6

(8)

+12V AD2 E2
+12V BD2 E8
C1 C5-C12 C25-C32 C52 2.2,20V

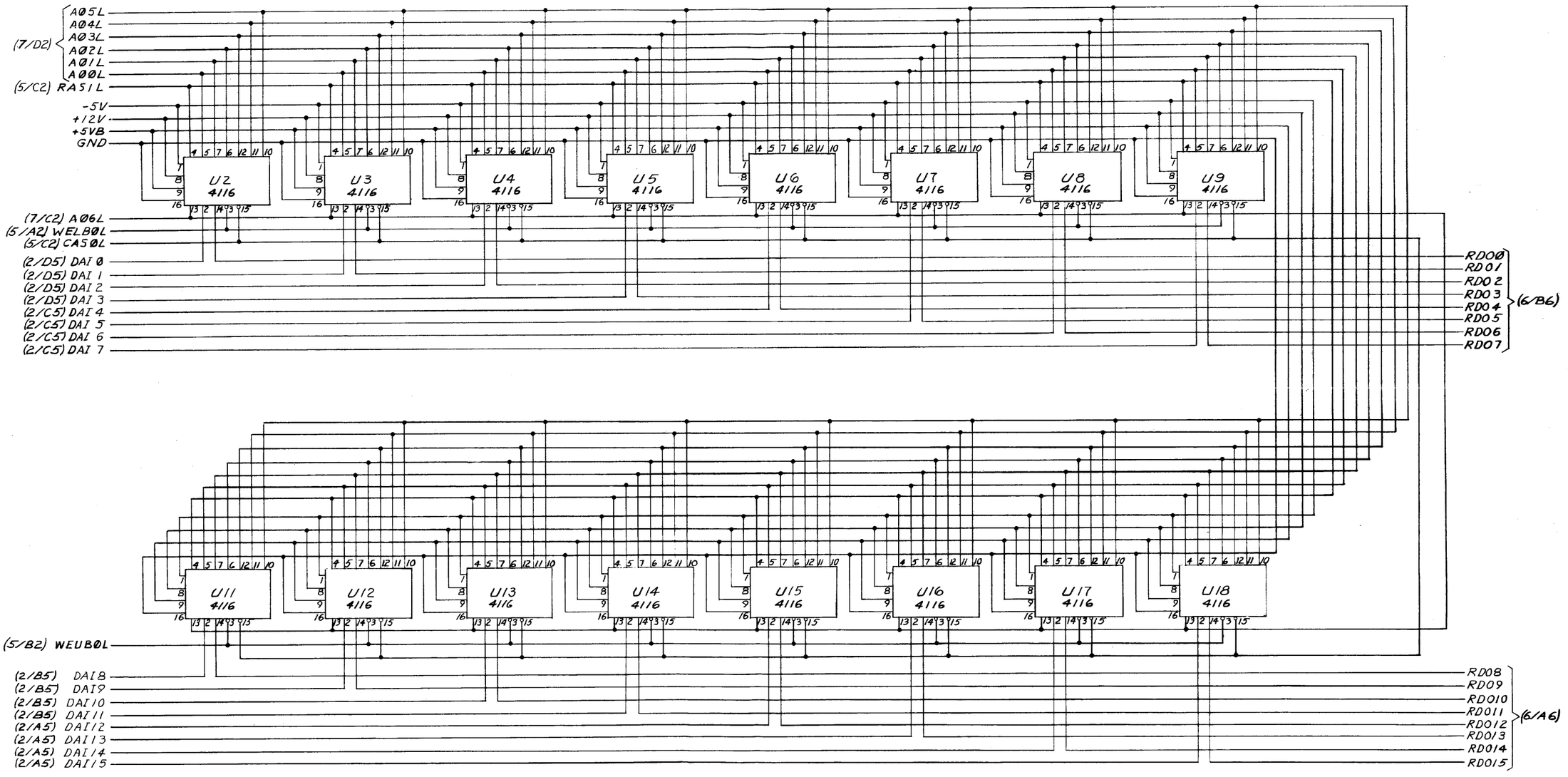
+12VB AS1 E3 E4

-5V C2 C17 C19 C21 C23 C36 C38 C40 -5V

GND AC2 AJ1 AM1 AT1 BC2 BJ1 BM1 BT1

SIZE	CODE IDENT NO.	DWG NO.
D	52648	SD 701660
SCALE: —	REV B	SHEET 7 OF 9
		DISTR NO.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



SIZE	CODE IDENT NO.	DWG NO.
D	52648	SD701660
SCALE: —	REV B	SHEET 8 OF 9
		DISTR NO.

SD701660 B

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

(T/D2) A05L
A04L
A03L
A02L
A01L
A00L
(5/C2) RAS0L
-5V
+12V
+5VB
GND

U20 4116
U21 4116
U22 4116
U23 4116
U24 4116
U25 4116
U26 4116
U27 4116

(T/C2) A06L
(5/A2) WELB0L
(5/C2) CAS0L
(2/D5) DAI 0
(2/D5) DAI 1
(2/D5) DAI 2
(2/D5) DAI 3
(2/C5) DAI 4
(2/C5) DAI 5
(2/C5) DAI 6
(2/C5) DAI 7

RD00
RD01
RD02
RD03
RD04
RD05
RD06
RD07
(6/B6)

U30 4116
U31 4116
U32 4116
U33 4116
U34 4116
U35 4116
U36 4116
U37 4116

(5/B2) WEUB0L

(2/B5) DAI 8
(2/B5) DAI 9
(2/B5) DAI 10
(2/B5) DAI 11
(2/A5) DAI 12
(2/A5) DAI 13
(2/A5) DAI 14
(2/A5) DAI 15

RD08
RD09
RD010
RD011
RD012
RD013
RD014
RD015
(6/A6)

SIZE	CODE IDENT NO.	DWG NO.
D	52648	SD701660
SCALE: —	REV B	SHEET 9 OF 9
		DISTR NO.

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