REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
C	REVISED FOR 3 VERSIONS	5-2-75	JW
D	REVISED FOR SWITCH CONFIG.	4-7-76	JW

MAINTENANCE MANUAL

MONOSTORE VII/PLANAR
PDP-11 Add-In
Semiconductor Memory System

MSC P/N 303-0097-000

Monolithic Systems Corporation
14 Inverness Drive East
Englewood, Colorado 80110
303/770-7400

REV																										
SHEET																										
REV STATUS OF SHEETS	REV	D	B	B	C	D	C	B	B	D	D	D	D	D	B	B	B	A	A	A						
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19						

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES FRACTIONS DECIMALS ANGLES		MONOLITHIC SYSTEMS CORP.		
	DATE			
MATERIAL	DRAWN	MONO VII/PL PDP-11 Add-In		
	CHECKED			
	APPROVED J. Waldinger	SIZE A	CODE IDENT NO. 51513	DWG NO. 100-0018-000
	APPROVED	SCALE	REV D	SHEET 1 of 19

MONOSTORE VII/PLANAR
PDP-11 Add-In

SEMICONDUCTOR MEMORY SYSTEM

C O N T E N T S

SECTION I

GENERAL DESCRIPTION

1.1 INTRODUCTION

This manual provides information for installing, operating, and maintaining the Monostore VII/Planar PDP-11 add-in memory systems. The material is arranged in five sections as follows:

Section I General Description

This section provides the scope, contents, and arrangement of the manual. A general description and a list of system specifications are also given.

Section II Installation and Operation

Instructions are provided for unpacking, inspecting and installing the memory system.

Section III Theory of Operation

An overall description of the memory system is provided along with a timing diagram to aid in understanding the system and to support troubleshooting.

Section IV Maintenance and Troubleshooting

This section gives recommended general maintenance procedures and troubleshooting information for diagnosing and locating a malfunction.

Section V Drawings

This section contains schematics, assembly, and parts list for the memory system.

1.2 General Description

The Monostore VII/Planar PDP-11 Add-In Memory System, P/N 303-0097-xxx, consists of a single planar 12Kx16 memory assembly. All electronics, DC conversion, and semiconductor dynamic N channel memory storage elements are contained on a single printed circuit board. The memory elements are mounted in IC sockets providing for ease of replacement.

All signal interface is made through the DEC™ PDP-11A System Unit, sections CDEF. Data interfacing is provided by 16 bidirectional data bits. Addressing any one of the 12,288 words is provided by 14 binary address bits, together with command and control information to define the memory mode required.

The memory system uses the +5 V and -15 V power available on the PDP-11A unit and generates additional voltages on the board.

The maximum capacity of the board is 12,288 words by 16 bits. The system can also be configured in 4,096 words by 16 bits or 8,192 words by 16 bits.

1.3 Modes of Operation (slave = memory system)

Name	Mnemonic	C Lines		Function	Octal Code
		C1	C0		
Data in	DATI	0	0	Data from slave to master	0
Data in, pause	DATIP	0	1	Data from slave to master	1
Data out	DATO	1	0	Data from master to slave	2
Data out Byte	DATOB	1	1	Transfers data from master to a single byte in slave. Data transmitted on D <15:08> for A00=1 D <07:00> for A00=0	3

NOTE: DEC IS A TRADEMARK OF DIGITAL EQUIPMENT CORPORATION.

1.4 System Specifications

Characteristics	Specification
Storage Capacity	4096 words x 16 bits 8192 words x 16 bits 12288 words x 16 bits
Cycle Time	700 nsec
Read Access Time	500 nsec
Input Power	+5V,2.7A -15V,0.4A
Operating Environment	
Temperature	0°C to +50°C
Relative Humidity	90% maximum without condensation
Physical Dimensions	
Height	8.5 inches
Depth	0.5 inch *
Width	14.7 inches

* 1.0 inch for "non-switch" version.

SECTION II

INSTALLATION & OPERATION

2.1 INTRODUCTION

This section contains information for installation and operation of the memory system.

2.2 UNPACKING AND INSPECTION

Carefully remove the memory system from the shipping container. Remove any packing material from the assembly. Inspect the system for any damage or loose connections.

2.3 INSTALLING MEMORY SYSTEM

Remove the external bottom cover from the PDP-11 computer. Insert the memory system into the DD-11A System Unit, designated for small peripherals, in the CDEF sections. The cutaway portion of the board will align itself over the UNIBUS cable connector Sections A & B. Reassembly the bottom cover. The memory system is now ready for use.

NOTE: UNIBUS IS A TRADEMARK OF DIGITAL EQUIPMENT CORPORATION.

2.4 I/O SIGNALS

PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
CA1		CA2	+5V	DA1		DA2	+5V
CB1		CB2	-15V	DB1		DB2	-15V
CC1		CC2	GND	DC1	SEL6H	DC2	GND
CD1		CD2	D15L	DD1	OUT LOW H	DD2	BR7
CE1		CE2	D14L	DE1	SEL4H	DE2	BR6
CF1		CF2	D13L	DF1	SEL OH	DF2	BR5
CH1	D11L	CH2	D12L	DH1	IN H	DH2	BR4
CJ1	INT B H	CJ2	D10L	DJ1	SEL 2H	DJ2	B REQUEST
CK1		CK2	D09L	DK1	OUT HIGH H	DK2	BG 7 IN H
CL1	INTR ENB BH	CL2	D08L	DL1	INIT L	DL2	BG 7 OUT H
CM1		CM2	D07L	DM1	INT ENB AH	DM2	BG 6 IN H
CN1		CN2	D04L	DN1	INT AH	DN2	BG 6 OUT H
CP1		CP2	DO5L	DP1		DP2	BG 5 IN H
CR1		CR2	D01L	DR1		DR2	BG 5 OUT H
CS1		CS2	D00L	DS1		DS2	BG 4 IN H
CT1	GND	CT2	D03L	DT1	GND	DT2	BG 4 OUT H
CU1		CU2	D02L	DU1		DU2	BG IN AH
CV1		CV2	D06L	DV1	EXT CAP.	DV2	BG OUT BH

2.4 I/O SIGNALS

PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
EA1	EXT GND	EA2	+5V	FA1	BG OUT BH	FA2	+5V
EB1	EXT CAP	EB2	-15V	FB1	BG IN AH	FB2	-15V
EC1	A12L	EC2	GND	FC1	SSYNL	FC2	GND
ED1	A17L	ED2	A15L	FD1	BBSYL	FD2	VECTOR BIT 2
EE1	MSYNL	EE2	A16L	FE1	BG IN BH	FE2	D02L
EF1	A02L	EF2	C1L	FF1	005L	FF2	DO6L
EH1	A01L	EH2	A00L	FH1	007L	FH2	INT ENB BH
EJ1	SSYNL	EJ2	COL	FJ1		FJ2	EXT GND
EK1	A14L	EK2	A13L	FK1	D08L	FK2	INT BH
EL1	A11L	EL2	TEST PT	FL1	D03L	FL2	INTR DONE AH
EM1	IN H	EM2	OUT HIGH H	FM1	INTRL	FM2	INTR DONE BH
EN 1	OUT LOW H	EN2	A08L	FN1	MSTR CLR AL	FN2	D04L
EP1	A10L	EP2	A07L	FP1	BR BL	FP2	STRT INTR BL
ER1	A09L	ER2	SEL 4H	FR1	MSTR CLR AH	FR2	STRT INTR AL
ES1	SEL 6H	ES2	SEL 0H	FS1	MSTR CLR BH	FS2	MSTR BL
ET1	GND	ET2	SEL 2H	FT1	GND	FT2	SACK L
EU1	A06L	EU2	A04L	FU1	INTA H	FU2	BR AL
EV1	A05L	EV2	A03L	FV1	ENBA H	FV2	BG OUT AH

SECTION III

THEORY OF OPERATION

3.1 INTRODUCTION

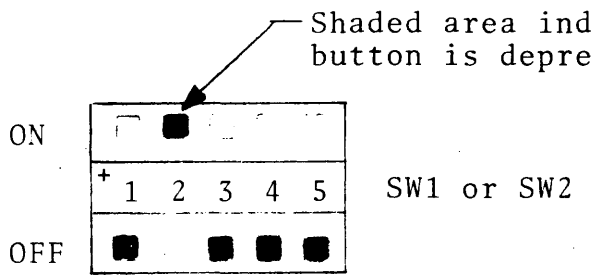
This section describes the overall organization and operation of this MO VII PL PDP-11 Add-in Semiconductor Memory System. The System has a maximum capacity of 12288 words of 16 bits.

This section is organized into the following major parts:

Description	Paragraph
Memory Location Programming	3.2
Address Channel	3.3
Data Channel	3.4
Timing Circuitry	3.5
DC Converter	3.6

3.2 MEMORY LOCATION PROGRAMMING

The memory location is programmed via wire jumpers or switches on the board. The user can program the memory to any location according to the following table:



Example shown is for address 56xxxx.

3.2 Memory Location Programming

MONOSTORE VII/PLANAR PDP-11 ADD-IN PROGRAMMING

Starting Address	L SW1 B Section- 1 2 3 4 5	H SW2 A Section 1 2 3 4 5	NOT PROGRAMMED K PROGRAM JUMPERS U V W X Y Z	MEMORY CAPACITY
0 0 0 0 0 0 OK	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 0 1 1 1 0 1	C E D E F C	4K 8K 12K
0 2 0 0 0 0 4K	1 1 1 1 0 1 1 1 1 0 1 1 1 1 0	1 1 1 1 0 1 1 1 0 1 1 1 1 0 0	D E C F F D	4K 8K 12K
0 4 0 0 0 0 8K	1 1 1 0 1 1 1 1 0 1 1 1 1 0 1	1 1 1 0 1 1 1 1 0 0 1 1 0 1 1	C F D F E C	4K 8K 12K
0 6 0 0 0 0 12K	1 1 1 0 0 1 1 1 0 0 1 1 1 0 0	1 1 1 0 0 1 1 0 1 1 1 1 0 1 0	D F C E E D	4K 8K 12K
1 0 0 0 0 0 16K	1 1 0 1 1 1 1 0 1 1 1 1 0 1 1	1 1 0 1 1 1 1 0 1 0 1 1 0 0 1	C E D E F C	4K 8K 12K
1 2 0 0 0 0 20K	1 1 0 1 0 1 1 0 1 0 1 1 0 1 0	1 1 0 1 0 1 1 0 0 1 1 1 0 0 0	D E C F F D	4K 8K 12K
1 4 0 0 0 0 24K	1 1 0 0 1 1 1 0 0 1 1 1 0 0 1	1 1 0 0 1 1 1 0 0 0 1 0 1 1 1	C F D F E C	4K 8K 12K
1 6 0 0 0 0 28K	1 1 0 0 0 1 1 0 0 0 1 1 0 0 0	1 1 0 0 0 1 0 1 1 1 1 0 1 1 0	D F C E E D	4K 8K 12K

1 = Add Jumper or ON
0 = No Jumper or OFF

SIZE A | CODE IDENT NO. 51513 | DWG NO. 100-0018-000 | REV D | SCALE | SHEET 10

MONOSTORE VII/PLANAR PDP-11 ADD-IN PROGRAMMING

Starting Address	L1 B Section- 1 2 3 4 5	L2 A Section 1 2 3 4 5	DT GRADED K PROGRAM JUMPERS U V W X Y Z	MEMORY CAPACITY
2 0 0 0 0 0 32K	1 0 1 1 1 1 0 1 1 1 1 0 1 1 1	1 0 1 1 1 1 0 1 1 0 1 0 1 0 1	C E D E F C	4K 8K 12K
2 2 0 0 0 0 36K	1 0 1 1 0 1 0 1 1 0 1 0 1 1 0	1 0 1 1 0 1 0 1 0 1 1 0 1 0 0	D E C F F D	4K 8K 12K
2 4 0 0 0 0 40K	1 0 1 0 1 1 0 1 0 1 1 0 1 0 1	1 0 1 0 1 1 0 1 0 0 1 0 0 1 1	C F D F E C	4K 8K 12K
2 6 0 0 0 0 44K	1 0 1 0 0 1 0 1 0 0 1 0 1 0 0	1 0 1 0 0 1 0 0 1 1 1 0 0 1 0	D F C E E D	4K 8K 12K
3 0 0 0 0 0 48K	1 0 0 1 1 1 0 0 1 1 1 0 0 1 1	1 0 0 1 1 1 0 0 1 0 1 0 0 0 1	C E D E F C	4K 8K 12K
3 2 0 0 0 0 52K	1 0 0 1 0 1 0 0 1 0 1 0 0 1 0	1 0 0 1 0 1 0 0 0 1 1 0 0 0 0	D E C F F D	4K 8K 12K
3 4 0 0 0 0 56K	1 0 0 0 1 1 0 0 0 1 1 0 0 0 1	1 0 0 0 1 1 0 0 0 0 0 1 1 1 1	C F D F E C	4K 8K 12K
3 6 0 0 0 0 60K	1 0 0 0 0 1 0 0 0 0 1 0 0 0 0	1 0 0 0 0 0 1 1 1 1 0 1 1 1 0	D F C E E D	4K 8K 12K

1 = Add Jumper or ON
0 = No Jumper or OFF

SIZE A | CODE IDENT NO. 51513 | DWG NO. 100-0018-000 | REV D | SCALE | SHEET 11

Starting Address	L SW1 B Section- 1 2 3 4 5	H SW2 A Section 1 2 3 4 5	NOT PROGRAMMED K PROGRAM JUMPERS U V W X Y Z	MEMORY CAPACITY
4 0 0 0 0 0 64K	o 1 1 1 1 o 1 1 1 1 o 1 1 1 1	o 1 1 1 1 o 1 1 1 0 o 1 1 0 1	C E D E F C	4K 8K 12K
4 2 0 0 0 0 68K	o 1 1 1 0 o 1 1 1 0 o 1 1 1 0	o 1 1 1 0 o 1 1 0 1 o 1 1 0 0	D E C F F D	4K 8K 12K
4 4 0 0 0 0 72K	o 1 1 0 1 o 1 1 0 1 o 1 1 0 1	o 1 1 0 1 o 1 1 0 0 o 1 0 1 1	C F D F E C	4K 8K 12K
4 6 0 0 0 0 76K	o 1 1 0 0 o 1 1 0 0 o 1 1 0 0	o 1 1 0 0 o 1 0 1 1 o 1 0 1 0	D F C E E D	4K 8K 12K
5 0 0 0 0 0 80K	o 1 0 1 1 o 1 0 1 1 o 1 0 1 1	o 1 0 1 1 o 1 0 1 0 o 1 0 0 1	C E D E F C	4K 8K 12K
5 2 0 0 0 0 84K	o 1 0 1 0 o 1 0 1 0 o 1 0 1 0	o 1 0 1 0 o 1 0 0 1 o 1 0 0 0	D E C F F D	4K 8K 12K
5 4 0 0 0 0 88K	o 1 0 0 1 o 1 0 0 1 o 1 0 0 1	o 1 0 0 1 o 1 0 0 0 o 0 1 1 1	C F D F E C	4K 8K 12K
5 6 0 0 0 0 92K	o 1 0 0 0 o 1 0 0 0 o 1 0 0 0	o 1 0 0 0 o 0 1 1 1 o 0 1 1 0	D F C E E D	4K 8K 12K

1 = Add Jumper or ON
0 = No Jumper or OFF

SIZE A | SCALE | CODE IDENT NO. 51513 | REV D | DWG NO. 100-0018-000 | SHEET 12

MONOSTORE VII/PLANAR PDP-11 ADD-IN PROGRAMMING

Starting Address	L SW1 B Section- 1 2 3 4 5	H SW2 A Section 1 2 3 4 5	NOT PROGRAMMED K PROGRAM JUMPERS U V W X Y Z	MEMORY CAPACITY
6 0 0 0 0 0 96K	0 0 1 1 1 0 0 1 1 1 0 0 1 1 1	0 0 1 1 1 0 0 1 1 0 0 0 1 0 1	C E D E F C	4K 8K 12K
6 2 0 0 0 0 100K	0 0 1 1 0 0 0 1 1 0 0 0 1 1 0	0 0 1 1 0 0 0 1 0 1 0 0 1 0 0	D E C F F D	4K 8K 12K
6 4 0 0 0 0 104K	0 0 1 0 1 0 0 1 0 1 0 0 1 0 1	0 0 1 0 1 0 0 1 0 0 0 0 0 1 1	C F D F E C	4K 8K 12K
6 6 0 0 0 0 108K	0 0 1 0 0 0 0 1 0 0 0 0 1 0 0	0 0 1 0 0 0 0 0 1 1 0 0 0 1 0	D F C E E D	4K 8K 12K
7 0 0 0 0 0 112K	0 0 0 1 1 0 0 0 1 1 0 0 0 1 1	0 0 0 1 1 0 0 0 1 0 0 0 0 0 1	C E D E F C	4K 8K 12K
7 2 0 0 0 0 116K	0 0 0 1 0 0 0 0 1 0 0 0 0 1 0	0 0 0 1 0 0 0 0 0 1 0 0 0 0 0	D E C F F D	4K 8K 12K
7 4 0 0 0 0 120K	0 0 0 0 1 0 0 0 0 1	0 0 0 0 1 0 0 0 0 0	C F D F E C	4K 8K
7 6 0 0 0 0 124K	0 0 0 0 0	1 1 0 0 0	D F C E E D	4K

1 = Add Jumper or ON
0 = No Jumper or OFF

SIZE A | CODE IDENT NO. 51513 | DWG NO. 100-0018-000 | REV D | SCALE | SHEET 13

The computer generated addresses A17L → A13L are compared against the programmed jumpers A and B sections. If the generated addresses are within the programmed range a memory cycle will be initiated by MSYNL signal. This circuitry is shown on sheets 2, 3, and 6 of the schematic in Section V.

3.3 ADDRESS CHANNEL

When a memory cycle is initiated the information on the address lines A00L → A13L is latched into an address register.

A01L → A06L - These address bits are multiplexed with another set of bits used for refreshing. They are then buffered in order to drive the complete memory array.

A07L → A12L - These address bits are buffered in order to drive the complete memory array.

A13L, A14L - These address bits are decoded to generate the 4K, 8K or 12K cenable pulse required by the memory elements. The cenable pulse then enables only one row of memory elements at any one time thereby preventing interraction of data bits.

The address channel and cenable circuits are shown on sheets 2 and 6 of the schematic in Section V.

3.4 DATA CHANNEL

When a memory cycle, DATO, is initiated the information contained on the D00L → D15L lines is latched into a write data register. The outputs of the register are then buffered in order to drive the data input lines of the memory storage elements. A write cycle is then performed and this data is stored in the memory elements at the address location specified on the AxxL lines.

When a memory cycle, DATI, is initiated the information previously stored in the memory elements is accessed and transmitted onto the D00L → D15L lines for use by the computer.

A DATOB is similar to a DATO cycle except on an 8 bit basis.
A DATIP is the same as a DATI cycle.
The data channel circuits are shown on sheets 4 and 5 of the schematic in Section V.

3.5 TIMING CIRCUITRY

The memory system contains delay line timing circuits which generate, directly or indirectly, all internal and I/O pulses or signals.

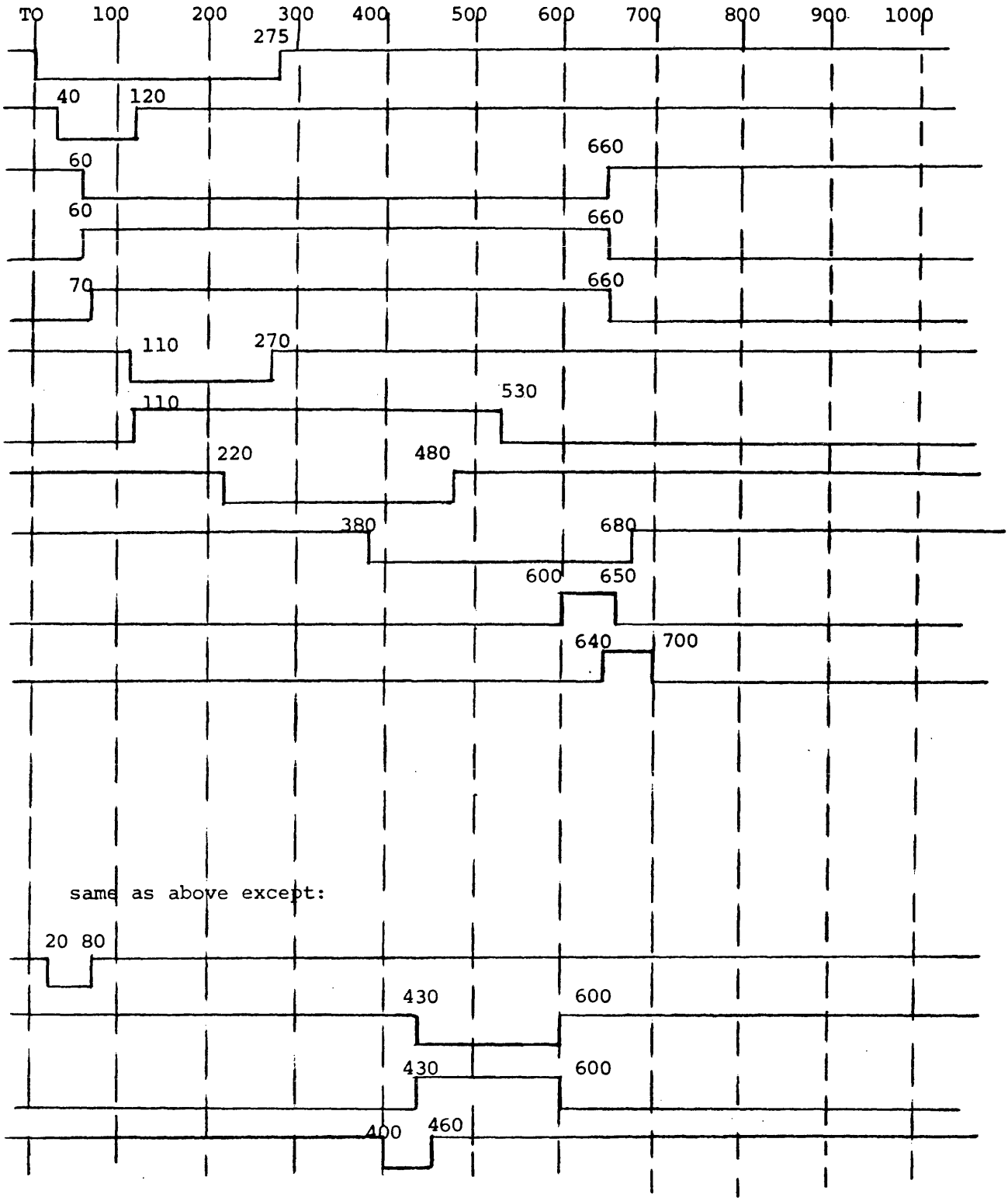
The MSYNL signal is received by the memory system and generates a read or write cycle depending upon whether C1L is a "0" or a "1" respectively. If it is a write cycle then SSYNL is sent back to the master unit signifying receipt of data and address info. If it is a read cycle SSYNL is delayed until data is on the DxxL lines and SSYNL is then generated telling the master that the data is available.

The timing circuitry generates pulses according to the following timing diagram:

TIMING DIAGRAM

MONOSTORE VII/PL PDP-11 ADD-IN MEMORY SYSTEM

500/700



SIZE	CODE IDENT NO.	DWG NO.
A	51513	
SCALE	REV E	SHEET 16

MSE-1005

There are 2 level transitions which travel down the two delay lines in series. The timing pulses are generated in such a way that the sequence of these transitions and the delay line taps used determine when a pulse will or will not be generated.

The memory elements are dynamic N-channel devices and require refreshing every 2 msec. The memory system uses "cycle steal" refreshing such that a normal cycle may be extended by 700 nsec approximately 2% of the time.

The timing circuitry is shown on sheet 6 of the schematic in Section V.

3.6 DC CONVERTER

The memory system contains a "DC to DC Converter" to convert -15V power to -5V and +12V power.

The -5V is series regulated down from the -15V level.

The +12V is generated by first converting the -15V to a nominal 20 Kilo-HZ signal, isolating it, and then rectifying and regulating it for +12V.

The DC converter circuit is shown on sheet 7 of the schematic in Section V.

SECTION IV

MAINTENANCE AND TROUBLESHOOTING

4.1 INTRODUCTION

This section presents troubleshooting instructions for ease of trouble location. Further localization of the trouble is to be found by means of the maintenance drawings in Section V. The theory of operation in Section III should be read and understood, along with a detailed review of the schematics in Section V in order to make effective use of this section.

4.2 PREVENTIVE MAINTENANCE

4.2.1 VISUAL INSPECTION

This inspection includes checking for loose programming wires, components, and discoloration of parts. The inspection should be performed with a minimum of prying or moving of parts.

4.2.2 CLEANING

Cleaning should be limited to removal of excess dust or particles. Never use any abrasive on any part of the gold fingers on the edge connectors. Low pressure compressed air can be used for removing dust or dirt and an aerosol cleaner can be used, with light brushing, to clean the gold contacts.

4.2.3 DC VOLTAGES

The DC voltages should be maintained as follows:

+5V ±5% +12V ±5%

-15V ±5% -5V ±5%

4.3 TROUBLESHOOTING

To facilitate troubleshooting the following information, cause and effect, can be used to isolate the problem to a particular area. From there on the schematics should be used to determine the exact component that is at fault.

Effect	Cause
Single bit failure all addresses.	Data receiver/driver/ write register/read register
Complete byte failure all addresses	WCEN pulse/strobe pulse/ COL circuitry.
Complete word failure, all addresses	DC voltages/refresh not working/ bus en pulse/ C1L circuitry/ WR pulse/strobe pulse.
Single bit failure, single address.	Memory element
Four bit failure, all addresses	Write register/read register
Complete word failure, a 4K section	CENABLE driver/ CEN programming jumpers/address register for A13L and A14L.
Complete byte failure, a 4K section.	CENABLE driver/ CEN programming jumpers/address register for A13L and A14L.

Effect	Cause
Complete or major part of word failure, 2 addresses	Address receiver/address register/ address buffer.
Timeout	A & B sets of jumpers/ SSYNL not generated/A13L → A17L comparison circuit.
Non-retention of data	Refresh circuit/DC voltages.

SECTION V

DRAWINGS

ASSEMBLY	303-0097-000
SCHEMATIC	305-0097-000

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
H	REVISED TO COMBINE MEMORY ELEMENTS	4/29/75	
J	REVISED PER ECO 0322	6/10/75	TSP
K	REVISED PER ECO 0377	10-22-75	TSP
L	ADDED NEW MSC I.C.PARTS NOS.	3-4-76	
M	REVISED PER ECO 0440		TSP

DASH NO.	EQUIPMENT REV.
018	K
017	K
016	K
015	K
014	K
013	K
012	K
011	K
010	K
009	K
008	K
007	K
006	K
005	K
004	K
003	K
002	K
001	K

REV	M	H	L	L	L	K	M	M
SHEET	25	26	27	28	29	30	31	32

REV STATUS OF SHEETS																											
REV	M	L	G	L	L	K	M	G	L	L	L	K	M	I	G	L	L	K	M	L	H	L	L	K		
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES FRACTIONS DECIMALS ANGLES

MATERIAL

DATE

DRAWN

CHECKED

APPROVED J. Waldinger

APPROVED

MONOLITHIC SYSTEMS CORP.

MONOSTORE VII PL/SPS
ASSEMBLY

SIZE	CODE IDENT NO.	DWG NO.
A	51513	303-0097-000

SCALE	REV M	SHEET 1

MSF-1015

SIZE A | CODE IDENT NO. 51513 | DWG NO. PL 303-0097-000 | L | SHEET 2

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
04	03	02	01	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
-	1	1	1	304-0097-001	PC BOARD			1
1	-	-	-	304-0097-002	PC BOARD			1
4	4	4	4	210-0105- 02	IC SN74H10	U1,U3,U44,U64		2
7	7	7	7	210-0200- 02	IC SN74H08	U2,U4,U31,U33,U34,U60,U65		3
9	9	9	9	210-0605- 01	IC SN7475	U5,U8,U16,U18,U36,U38, U47,U51,U58		4
2	2	2	2	210-0716- 01	IC SN74193	U10,U13		5
11	11	11	11	210-0100- 02	IC SN7400	U6,U7,U9,U12,U15,U19, U22,U23,U26,U27,U42		6
1	1	1	1	210-0604- 01	IC SN7474	U52		7
3	3	3	3	210-0805- 02	IC SN74H51	U11,U14,U17		8
6	6	6	6	210-0100- 02	IC SN74H00	U35,U39,U41,U43,U45,U55		9
4	4	4	4	210-0718- 05	IC SN74LS197	U21,U24,U25,U28		10
2	2	2	2	210-0107- 02	IC SN74H20	U29,U30		11
5	5	5	5	210-0103- 02	IC SN74H04	U32,U40U74,U75,U83		12
5	5	5	5	210-0301- 01	IC SN7438	U37,U66,U62,U76,U56		13

MSF-1015

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
04	03	02	01	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
10	10	10	10	210-1104- 01	IC SP380	U46,U48,U57,U61,U67-U72		14
2	2	2	2	210-0905- 01	IC SN7485	U49,U59		15
1	1	1	1	210-0816- 01	IC SN7486	U50		16
1	1	1	1	210-0504- 01	IC SN74123	U53		17
2	2	2	2	223-0001- 02	IC PE9829	U63,U73		18
								19
3	3	3	3	210-0039- 01	IC MH0026CH	U77-U79		20
								21
1	1	1	1	221-0002- 01	IC 7808C LM340K-8.0	U80		22
48	16	32	48	210-0038- 02 or 01 or 06	ARRAY 2107A-4 or TMS4060 or 2107B-4			23

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

G

SHEET 3

MSF-1015

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
04	03	02	01	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
1	1	1	1	210-0001- 18	IC LM304	U81		24
2	2	2	2	210-0307- 01	IC SN7437	U20,U54		25
2	2	2	2	217-0003-001	TRANSISTOR 2N4238	Q1,Q2		26
								27
2	2	2	2	206-0015- 01	DIODE 1N4934	CR1,CR2		28
6	6	6	6	201-0006-027	CAP. 47pf	C1-C6		29
7	7	7	7	201-0018- 04	CAP. 6.8uf,25V	C7-C13		30
								31
1	1	1	1	201-0001- 14	CAP. 33uf,10V	C21		32
								33
1	1	1	1	201-0002- 70	CAP. 01uf,50V	C14 (CORN.DUB.MM WW8)		34
								35
2	2	2	2	201-0012-004	CAP. 50 uf, 25V	C15,C16 (TE1209)		36
								37
2	2	2	2	201-0015- 31	CAP..05 uf, 20V	C17,C18		38
								39
1	1	1	1	201-0002- 25	CAP. .0047uf	C19		40
								41
1	1	1	1	201-0006- 06	CAP. 15pf,	C20		42
								43

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

L

SHEET 4

NSF-1015

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
04	03	02	01	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
19	19	19	19	201-0018- 01	CAP. 6.8uf,10V	C50,C58-C67,C105,C43,		44
11	11	11	11	201-0018- 02	CAP 2.2uf,25	C22,C23,C26-C34		45
53	53	53	53	701-0001- 03	CAP. .1uf,50V	C24.C25,C35-C42,C51-C57,C68,C70-C104		46
								48
1	1	1	1	301-0038-001	INDUCTOR 10K,1W	L1		49
								50
1	1	1	1	216-0006-001	TRANSFORMER	T1		51
								52
5	5	5	5	208-0057-001	CARD PULLS			53
								54
								55
-	-	32	-	208-0023-005	HEADER	4K,8K ROWS		56
48	-	-	48	208-0023-005	HEADER	ALL MEMORY ELEMENTS		56
-	16	-	-	208-0023-005	HEADER	4K ROW		56
5	5	5	5	214-0007-065	RESISTOR NETWORK	RN1-RN5 470 OHMS		57
1	1	1	1	214-0008-007	RESISTOR NETWORK	RN6 1K		58
1	1	1	1	210-0905- 01	IC SN7483	U82		59
2	2	2	2		SAE DIP SWITCH	SW1,SW2 5 POSITION		60
								61

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

L

SHEET 5

MSF-1016

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
04	03	02	01	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
6	6	6	6	214-0002-073	RES. 1K ¼W,5%	R1-R6		62
6	6	6	6	214-0002-087	RES. 3.9K,¼W,5%	R7-R12		63
6	6	6	6	214-0002-041	RES. 47 OHMS, ¼W,5%	R13-R18		64
4	4	4	4	214-0002-056	RES. 200 OHM, ¼W,5%	R19-R22		65
								66
1	1	1	1	214-0003-139	RES. 560 OHM,½W	R23		67
								68
2	2	2	2	214-0003-041	RES. 47 OHM,½W	R24,R25		69
								70
1	1	1	1	214-0002-	RES. ¼W,5%	R26 SELECT AT TEST		71
								72
4	4	4	4	214-0002-066	RES. 510 OHM,¼W,5%	R31-R34	R31-R34 BEND ON .3 CTR	73
1	1	1	1	214-0010-083	RES. 511 OHM,¼W,1%	R27		74
1	1	1	1	214-0010-116	RES. 2.49 K, ¼W,1%	R28		75
								75
								76
1	1	1	1	214-0002-033	RES. 22 OHM,¼W,5%	R29		77
								78

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

K

SHEET 6

MDF-1018

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
04	03	02	01	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
1	1	1	1	214-0002-082	RES. 2.4K, ¼W, 5%	R30		79
								80
4	4	4	4	214-0002-047	RES. 82 Ohm, ¼W, 5%	R35-R38 (BEND FOR .3 CTRS)		81
1	1	1	1	208-0066-003	TRANSIPAD	FOR U81		82
1	1	1	1	214-0002-103	RES. 18K ¼W, 5%	R39		83
3	3	3	3	208-0066-002	TRANSIPAD	FOR U77, 78, 79		84
1	1	1	1	214-0002-097	RES. 10K, ¼W, 5%	R40		85
2	2	2	2	208-0066-001	TRANSIPAD	FOR Q1 & Q2		86
3	3	3	3	208-0064-004	STANDOFF, NYLON	LENG. 5/16 X ¼ DIA		87
3	3	3	3	208-0065-003	SCREW, NYLON	#4-40 X ¼		88
2	2	2	2	219-0005-007	HEAT SHRINK TUBING	APPROX. .90 LONG	FOR C15, 16	89
2	2	2	2	208-0002-005	SCREW, PAN HD.	#4-40 X 5/16	FOR U80	90
2	2	2	2	208-0021-004	WASHER, INT. STAR	#4	FOR U80	91
2	2	2	2	208-0006-004	NUT, HEX	#4-40	FOR U80	92
A/R	A/R	A/R	A/R	208-0050-001	SILICONE GREASE			93
10	10	10	10	208-0011-002	RIVET			94
REF	REF	REF	REF	308-0014-000	PRODUCTION TEST REQUIREMENTS			95
REF	REF	REF	REF	305-0097-000	SCHEMATIC			96
REF	REF	REF	REF	100-0018-000	MAINTENANCE MANUAL			97

SIZE A | CODE IDENT NO. 51513 | DWG NO. PL 303-0097-000 | REV N | SHEET 7

MSF-1015

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
08	07	06	05	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
1	1	-	-	304-0097-001	PC BOARD			1
-	-	1	1	304-0097-002	PC BOARD			1
4	4	4	4	210-0105- 02	IC SN74H10	U1,U3,U44,U64		2
7	7	7	7	210-0200- 02	IC SN74H08	U2,U4,U31,U33,U34, U60,U65		3
9	9	9	9	210-0605- 01	IC SN7475	U5,U8,U16, U18,U36,U38,U47,U51,U58		4
2	2	2	2	210-0716- 01	IC SN74193	U10,U13		5
11	11	11	11	210-0100- 02	IC SN7400	U6,U7,U9,U12,U15,U19, U22,U23,U26,U27,U42		6
1	1	1	1	210-0604- 01	IC SN7474	U52		7
3	3	3	3	210-0805- 02	IC SN74H51	U11,U14,U17		8
6	6	6	6	210-0100- 02	IC SN74H00	U35,U39,U41, U43,U45,U55		9

SIZE A | CODE IDENT NO. 51513 | DWG NO. PL 303-0097-000 | G | SHEET 8

MBF-1016

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
08	07	06	05	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
4	4	4	4	210-0718- 05	IC SN74LS197	U21,U24,U25,U28		10
2	2	2	2	210-0107- 02	IC SN74H20	U29,U30		11
5	5	5	5	210-0103- 02	IC SN74H04	U32,U40,U74,U75,U83		12
5	5	5	5	210-0301- 01	IC SN7438	U37,U66,U62,U76,U56		13
10	10	10	10	210-1104- 01	IC SP380	U46,U48,U57,U61, U67-U72		14
2	2	2	2	210-0905- 01	IC SN7485	U49,U59		15
1	1	1	1	210-0816- 01	IC SN7486	U50		16
1	1	1	1	210-0504- 01	IC SN74123	U53		17
-	-	2	2	223-0001- 02	IC PE9829	U63,U73		18
2	2	-	-	223-0001- 01	IC PE9828	U63,U73		18
3	3	3	3	210-0039- 01	IC MH0026CH	U77-U79		20
1	1	1	1	221-0002- 01	IC 7808C	U80 LM340K-8.0		22
-	-	16	32	210-0038- 01 or 02 or 06	ARRAY 2107A-4 or TMS 4060 or 2107B-4			23
32	48	-	-	210-0038- 06 or 05	ARRAY 2107B-4 or TMS4060			23

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

L

SHEET 9

MSF-1015

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
08	07	06	05	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
1	1	1	1	210-0001- 18	IC LM304	U81		24
2	2	2	2	210-0307- 01	IC SN7437	U20,U54		25
2	2	2	2	217-0003-001	TRANSISTOR 2N4238	Q1,Q2		26
								27
2	2	2	2	206-0015- 01	DIODE 1N4934	CR1,CR2		28
6	6	6	6	201-0006-027	CAP. 47pf	C1-C6		29
7	7	7	7	201-0018- 04	CAP. 6.8uf,25V	C7-C13		30
								31
1	1	1	1	201-0001- 14	CAP. 33uf,10V	C21		32
								33
1	1	1	1	201-0002- 70	CAP..01uf,50V	C14 (CORN DUB. MM WW8)		34
								35
2	2	2	2	201-0012-004	CAP. 50uf,25V	C15,C16, (TE1209)		36
								37
2	2	2	2	201-0015- 31	CAP. .05uf,20V	C17,C18		38
								39
1	1	1	1	201-0002- 25	CAP. .0047	C19		40
								41
1	1	1	1	201-0002- 25	CAP. 15pf	C20		42
								43

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

L

SHEET 10

MBF-1015

SIZE A | CODE IDENT NO. 51513 | DWG NO. PL 303-0097-000 | L | SHEET 11

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
08	07	06	05	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
19	19	19	19	201-0018- 01	CAP. 6.8uf,10V	C50,C58-C67,C105,C43		44
11	11	11	11	201-0018- 02	CAP. 2.2uf,25	C22,C23,C26-C34		45
53	53	53	53	701-0001- 03	CAP. .1uf,50V	C24,C25,C35-C42,C51-C57,C68,C70-C104		46
								47
								48
1	1	1	1	301-0038-001	INDUCTOR 10K,1W	L1		49
								50
1	1	1	1	216-0006-001	TRANSFORMER	T1		51
								52
5	5	5	5	208-0057-001	CARD PULLS			53
								54
								55
32	-	-	32	208-0023-005	HEADER	4K,8K ROWS		56
-	-	16	-	208-0023-005	HEADER	4K,ROW		56
-	48	-	-	208-0023-005	HEADER	ALL MEMORY ELEMENTS		56
5	5	5	5	214-0007-065	RESISTOR NETWORK	RN1-RN5 470 OHMS		57
1	1	1	1	214-0008-007	RESISTOR NETWORK	RN6 1K		58
1	1	1	1	210-0905- 01	IC SN7483	U82		59
2	2	2	2		SAE DIP SWITCH	SW1,SW2 5 POSITION		60
								61

NSF-1018

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
08	07	06	05	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
6	6	6	6	214-0002-073	RES. 1K,¼W,5%	R1-R6		62
6	6	6	6	214-0002-087	RES. 3.9K,¼W,5%	R7-R12		63
6	6	6	6	214-0002-041	RES. 47 OHM,¼W,5%	R13-R18		64
4	4	4	4	214-0002-056	RES. 200 OHM,¼W,5%	R19-R22		65
								66
1	1	1	1	214-0003-139	RES. 560 OHM,½W	R23		67
								68
2	2	2	2	210-0003-041	RES. 47 OHM,½W	R24,R25		69
								70
1	1	1	1	214-0002-	RES. ¼W,5%	R26 SELECT AT TEST		71
								72
4	4	4	4	214-0002-066	RES. 510 OHM, ¼W,5%	R31-R34	R31-R34 BEND ON .3 CTRS	73
1	1	1	1	214-0010-083	RES. 511 OHM, ¼W,1%	R27		74
1	1	1	1	214-0010-116	RES. 2.49K,¼W,1%	R28		75
								75
1	1	1	1	214-0002-033	RES. 22 OHM, ¼W,5%	R29		77
								78

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

K

SHEET 12

MDF-1016

SIZE A | CODE IDENT NO. 51513 | DWG NO. PL 303-0097-000 | REV M | SHEET 13

QTY/DASH NO. 08	07	06	05	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	ITEM NO.
1	1	1	1	214-0002-082	RES. 2.4K, ¼W,5%	R30		79
								80
4	4	4	4	214-0002-047	RES. 82 Ohm, ¼W,5%	R35-R38(BEND FOR .3 CTRS)		81
1	1	1	1	208-0066-003	TRANSIPAD	FOR U81		82
1	1	1	1	214-0002-103	RES. 18K,¼W,5%	R39		83
3	3	3	3	208-0066-002	TRANSIPAD	FOR U77,78,79		84
1	1	1	1	214-0002-097	RES. 10K,¼W,5%	R40		85
2	2	2	2	208-0066-001	TRANSIPAD	FOR Q1 & Q2		86
3	3	3	3	208-0064-004	STANDOFF, NYLON	LENG. 5/16 X ¼ DIA		87
3	3	3	3	208-0065-003	SCREW,NYLON	#4-40 X ¼		88
2	2	2	2	219-0005-007	HEAT SHRINK TUBING	APPROX. .90 LONG	FOR C15,16	89
2	2	2	2	208-0002-005	SCREW, PAN HD.	#4-40 X 5/16	FOR U80	90
2	2	2	2	208-0021-004	WASHER,INT. STAR	#4	FOR U80	91
2	2	2	2	208-0006-004	NUT,HEX	#4-40	FOR U80	92
A/R	A/R	A/R	A/R	208-0050-001	SILICONE GREASE			93
10	10	10	10	208-0011-002	RIVET			94
REF	REF	REF	REF	308-0014-000	PRODUCTION TEST REQUIREMENT			95
REF	REF	REF	REF	305-0097-000	SCHEMATIC			96
REF	REF	REF	REF	100-0018-000	MAINTENANCE MANUAL			97

MBF-1015

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
012	011	010	09	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
-	-	-	1	304-0097-001	PC BOARD			1
1	1	1	-	304-0097-002	PC BOARD			1
4	4	4	4	210-0105- 02	IC SN74H10	U1,U3,U44,U64		2
7	7	7	7	210-0200- 02	IC SN74H08	U2,U4,U31,U33,U65, U34,U60		3
9	9	9	9	210-0605- 01	IC SN7475	U5,U8,U16,U18,U36, U38,U47,U51,U58		4
2	2	2	2	210-0716- 01	IC SN74193	U10,U13		5
11	11	11	11	210-0100- 02	IC SN7400	U6,U7,U9,U12,U15,U19, U22,U23,U26,U27,U42		6
1	1	1	1	210-0604- 01	IC SN7474	U52		7
3	3	3	3	210-0805- 02	IC SN74H51	U11,U14,U17		8
6	6	6	6	210-0100- 02	IC SN74H00	U35,U39,U41,U43,U45,U55		9

SIZE A | CODE IDENT NO. 51513 | DWG NO. PL 303-0097-000 | I | SHEET 14

MSF-1015

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
012	011	010	09	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
4	4	4	4	210-0718- 05	IC SNLS197	U21,U24,U25,U28		10
2	2	2	2	210-0107- 02	IC SN74H20	U29,U30		11
				210-0103- 02	IC SN74H04	U32,U40,U74,U75		12
5	5	5	5	210-0301- 01	IC SN7438	U37,U66,U62,U76,U56		13
10	10	10	10	210-1104- 01	IC SP380	U46,U48,U57,U61,U67-U72		14
2	2	2	2	210-0905- 01	IC SN7485	U49,U59		15
1	1	1	1	210-0816- 01	IC SN7486	U50		16
1	1	1	1	210-0504- 01	IC SN74123	U53		17
2	2	2	2	223-0001- 01	IC PE9828	U63,U73		18
								19
3	3	3	3	210-0039- 01	IC MH0026CH	U77,U79		20
1	1	1	1	221-0002-001	IC 7808C	U80 LM340K-8.0		22
16	32	48	16	210-0038- 06 or 05	IC 2107B-4 or TMS4060	ARRAY		23
								23

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

G

SHEET 15

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
012	011	010	09	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
1	1	1	1	210-0001- 18	IC LM304	U81		24
2	2	2	2	210-0307- 01	IC SN7437	U20,U54		25
2	2	2	2	217-0003-001	TRANSISTOR 2N4238	Q1,Q2		26
								27
2	2	2	2	206-0015- 01	DIODE 1N4934	CR1,CR2		28
6	6	6	6	201-0006-027	CAP. 47pf	C1-C6		29
7	7	7	7	201-0018- 04	CAP. 6.8uf,25V	C7-C13		30
								31
1	1	1	1	201-0001- 14	CAP. 33uf,10V	C21		32
								33
1	1	1	1	201-0002- 70	CAP. .01uf,50V	C14 (CORN. DUB. MM WW8)		34
								35
2	2	2	2	201-0012-004	CAP. 50uf,25V	C15,C16,(TE 1209)		36
								37
2	2	2	2	201-0015- 31	CAP. .05uf,20V	C17,C18		38
								39
1	1	1	1	201-0002- 25	CAP. .0047	C19		40
								41
1	1	1	1	201-0002- 25	CAP. 15pf	C20		42
								43

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

SHEET 16

L

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
012	011	010	09	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
19	19	19	19	201-0018- 01	CAP. 6.8uf,10V	C50,C58-C67,C105,C43		44
11	11	11	11	201-0018- 02	CAP. 2.2 uf,25	C22,C23,C26-C34		45
53	53	53	53	701-0001- 03	CAP. .1uf,50V	C24,C25,C35-C42,C51-C57,C68,C70-C104		46
								47
								48
1	1	1	1	301-0038-001	INDUCTOR 10K,1W	L1		49
								50
1	1	1	1	216-0006-001	TRANSFORMER	T1		51
								52
5	5	5	5	208-0057-001	CARD PULLS			53
								54
								55
-	32	-	-	208-0023-005	HEADER	4K,8K ROWS		56
16	-	-	16	208-0023-005	HEADER	4K,ROW		56
-	-	48	-	208-0023-005	HEADER	ALL MEMORY ELMENTS		56
5	5	5	5	214-0007-065	RESISTOR NETWORK	RN1-RN5, 470 Ohms		57
1	1	1	1	214-0008-007	RESISTOR NETWORK	RN6 1K		59
1	1	1	1	210-0905- 01	IC SN7483	U82		60
					SAE DIP SWITCH	SW1,2 5 POSITION		61

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

L

SHEET 17

SIZE	CODE IDENT NO.	DWG NO.	REV
A	51513	PL 303-0097-000	K

SHEET 18

QTY/DASH NO. 012	011	010	09	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	ITEM NO.
6	6	6	6	214-0002-073	RES. 1K,¼W,5%	R1-R6		62
6	6	6	6	214-0002-087	RES. 3.9K,¼W,5%	R7-R12		63
6	6	6	6	214-0002-041	RES. 47 OHM,¼W,5%	R13-R18		64
4	4	4	4	214-0002-056	RES. 200 OHM, ¼W,5%	R19-R22		65
								66
1	1	1	1	214-0003-139	RES. 560 OHM, ½W	R23		67
								68
2	2	2	2	214-0003-041	RES. 47 OHM,½W	R24,R25		69
								70
1	1	1	1	214-0002-	RES. ¼W,5%	R26 SELECT AT TEST		71
								72
4	4	4	4	214-0002-066	RES. 510 OHM, ¼W,5%	R31,R34		73
1	1	1	1	214-0010-083	RES. 511 OHM, ¼W,1%	R27		74
1	1	1	1	214-0010-116	RES. 2.49K,¼W,1%	R28		75
								75
								75
								76
1	1	1	1	214-0002-033	RES. 22 OHM, ¼W,5%	R29		77

SIZE	CODE IDENT NO.	DWG NO.	SHEET
A	51513	PL 303-0097-000	M 19

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
012	011	010	09	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
1	1	1	1	214-0002-082	RES. 2.4K, ¼W,5%	R30		79
								80
4	4	4	4	214-0002-047	RES. 82 ohm, ¼W,5%	R35-R38 (BEND FOR .3	CTRS)	81
1	1	1	1	208-0066-003	TRANSIPAD	FOR U81		82
1	1	1	1	214-0002-103	RES. 18K ¼W, 5%	R39		83
3	3	3	3	208-0066-002	TRANSIPAD	FOR U77,78,79		84
1	1	1	1	214-0002-097	RES. 10K, ¼W,5%	R40		85
2	2	2	2	208-0066-001	TRANSIPAD	FOR Q1 & Q2		86
3	3	3	3	208-0064-004	STANDOFF, NYLON	LENG. 5/16 ¼ DIA.		87
3	3	3	3	208-0065-003	SCREW, NYLON	#4-40 X ¼		88
2	2	2	2	219-0005-007	HEAT SHRINK TUBING	APPROX. .90 LONG	FOR C15,16	89
2	2	2	2	208-0002-005	SCREW,PAN HD.	#4-40 X 5/16	FOR U80	90
2	2	2	2	208-0021-004	WASHER, INT.STAR	#4	FOR U80	91
2	2	2	2	208-0006-004	NUT, HEX	#4-40	FOR U80	92
A/R	A/R	A/R	A/R	208-0050-001	SILICONE GREASE			93
10	10	10	10	208-0011-002	RIVET			94
REF	REF	REF	REF	308-0014-000	PRODUCTION TEST REQUIREMENT			95
REF	REF	REF	REF	305-0097-000	SCHEMATIC			96
REF	REF	REF	REF	100-0018-000	MAINTENCE MANUAL			97

SIZE	CODE IDENT NO.	DWG NO.	SHEET
A	51513	PL 303-0097-000	L 20

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
16	15	14	13	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
-	1	1	1	304-0097-001	PC BOARD			1
1	-	-	-	304-0097-002	PC BOARD			1
4	4	4	4	210-0105- 02	IC SN74H10	U1,U3,U44,U64		2
7	7	7	7	210-0200- 02	IC SN74H08	U2,U4,U31,U33, U34,U60,U65		3
9	9	9	9	210-0605- 01	IC SN7475	U5,U8,U16,U18,U36, U38,U47,U51,U58		4
2	2	2	2	210-0716- 01	IC SN74193	U10,U13		5
11	11	11	11	210-0100- 02	IC SN7400	U6,U7,U9,U12,U15,U19, U22,U23,U26,U27,U42		6
1	1	1	1	210-0604- 01	IC SN7474	U52		7
3	3	3	3	210-0805- 02	IC SN74H51	U11,U14,U17		8
6	6	6	6	210-0100- 02	IC SN74H00	U35,U39,U41, U43,U45,U55		9
4	4	4	4	210-0718- 05	IC SN74LS197	U21,U24,U25,U28		10
2	2	2	2	210-0107- 02	IC SN74H20	U29,U30		11
5	5	5	5	210-0103- 02	IC SN74H04	U32,U40,U74,U75,U83		12
5	5	5	5	210-0301- 01	IC SN7438	U37,U66,U62,U76,U56		13

SIZE A | CODE IDENT NO. 51513 | DWG NO. PL 303-0097-000 | H | SHEET 21

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
16	15	14	13	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
10	10	10	10	210-1104- 01	IC SP380	U46,U48,U57,U61,U67-U72		14
2	2	2	2	210-0905- 01	IC SN7485	U49,U59		15
1	1	1	1	210-0816- 01	IC SN7486	U50		16
1	1	1	1	210-0504- 01	IC SN74123	U53		17
2	2	2	2	223-0001- 03	IC PE9825	U63,U73		18
								19
3	3	3	3	210-0039- 01	IC MH0026CH	U77-U79		20
								21
1	1	1	1	221-0002- 01	IC 7808C LM340K-8.C	U80		22
48	16	32	48	210-0038- 03	ARRAY 2107B or TMS4060-2			23

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
16	15	14	13	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
1	1	1	1	210-0001- 18	IC LM304	U81		24
2	2	2	2	210-0307- 01	IC SN7437	U20,U54		25
2	2	2	2	217-0003-001	TRANSISTOR 2N4238	Q1,Q2		26
								27
2	2	2	2	206-0015- 01	DIODE 1N4934	CR1,CR2		28
6	6	6	6	201-0006-027	CAP. 47pf	C1-C6		29
7	7	7	7	201-0018- 04	CAP. 6.8uf,25V	C7-C13		30
								31
1	1	1	1	201-0001- 14	CAP.33uf,10V	C21		32
								33
1	1	1	1	201-0002- 70	CAP. .01uf,50V	C14 (CORN DUB.MM WW8)		34
								35
2	2	2	2	201-0012-004	CAP. 50uf,25V	C15,C16 (TE1209)		36
								37
2	2	2	2	201-0015- 31	CAP..05uf, 20V	C17,C18		38
								39
1	1	1	1	201-0002- 25	CAP. .0047uf	C19		40
								41
1	1	1	1	201-0006- 06	CAP. 15pf,	C20		42
								43

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

L

SHEET 22

SIZE	CODE IDENT NO.	DWG NO.	REV	SHEET
A	51513	PL 303-0097-000	L	23

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
16	15	14	13	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
19	19	19	19	201-0018- 01	CAP. 6.8uf,10V	C50,C58-C67,C105,C43		44
11	11	11	11	201-0018- 02	CAP. 2.2uf,25	C22,C23,C26-C34		45
53	53	53	53	701-0001- 03	CAP. .1uf,50V	C24,C25,C35-C42,C51-C57,C68,C70-C104		46
								48
1	1	1	1	301-0038-001	INDUCTOR 10K,1W	L1		49
								50
1	1	1	1	216-0006-001	TRANSFORMER	T1		51
								52
5	5	5	5	208-0057-001	CARD PULLS			53
								54
								55
-	-	32	-	208-0023-005	HEADER	4K,8K ROWS		56
48	-	-	48	208-0023-005	HEADER	ALL MEMORY ELEMENTS		56
-	16	-	-	208-0023-005	HEADER	4K ROW		56
5	5	5	5	214-0007-065	RESISTOR NETWORK	RN1-RN5 470 OHMS		57
5	5	5	5	214-0008-007	RESISTOR NETWORK	RN6 1K		58
1	1	1	1	210-0905- 01	IC SN7483	U82		59
2	2	2	2		SAE DIP SWITCH	SW1,SW2 5 POSITION		60
								61

SIZE	CODE IDENT NO.	DWG NO.	SHEET
A	51513	PL 303-0097-000	24

K

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
16	15	14	13	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
6	6	6	6	214-0002-073	RES. 1K,¼W,5%	R1-R6		62
6	6	6	6	214-0002-087	RES. 3.9K,¼W,5%	R7-R12		63
6	6	6	6	214-0002-041	RES. 47 OHMS,¼W,5%	R13-R18		64
4	4	4	4	214-0002-056	RES. 200 OHM, ¼W,5%	R19-R22		65
								66
1	1	1	1	214-0003-139	RES. 560 OHM,½W	R23		67
								68
2	2	2	2	214-0003-041	RES. 47 OHM,½W	R24,R25		69
								70
1	1	1	1	214-0002	RES. ¼W,5%	R26 SELECT AT TEST		71
								72
4	4	4	4	214-0002-066	RES. 510 OHM, ¼W,5%	R31-R34	R31-R34 BEND ON .3 CTR	73
1	1	1	1	214-0010-083	RES.511 OHM, ¼W,1%	R27		74
1	1	1	1	214-0010-116	RES.2.49K,¼W,1%	R28		75
								75
								76
1	1	1	1	214-0002-033	RES. 22 OHM, ¼W,5%	R29		77
								78

SIZE	CODE IDENT NO.	DWG NO.	REV	SHEET
A	51513	PL 303-0097-000	M	25

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
16	15	14	13	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
1	1	1	1	214-0002-082	RES. 2.4K, ¼W,5%	R30		79
								80
4	4	4	4	214-0002-047	RES. 82 Ohm, ¼W,5%	R35-R38 (BEND FOR .3	CTRS)	81
1	1	1	1	208-0066-003	TRANSIPAD	FOR U81		82
1	1	1	1	214-0002-103	RES.18K,¼W,5%	R39		83
3	3	3	3	208-0066-002	TRANSIPAD	FOR U77,78,79		84
1	1	1	1	214-0002-097	RES. 10K,¼W,5%	R40		85
2	2	2	2	208-0066-001	TRANSIPAD	FOR Q1 & Q2		86
3	3	3	3	208-0064-004	STANDOFF, NYLON	LENG 5/16 X ¼ DIA		87
3	3	3	3	208-0065-003	SCREW, NYLON	#4-40 X ¼		88
2	2	2	2	219-0005-007	HEAT SHRINK TUBING	APPROX. .90 LONG	FOR C15,16	89
2	2	2	2	208-0002-005	SCREW, PAN HD.	#4-40 X 5/16	FOR U80	90
2	2	2	2	208-0021-004	WASHER, INT. STAR	#4	FOR U80	91
2	2	2	2	208-0006-004	NUT,HEX	#4-40	FOR U80	92
A/R	A/R	A/R	A/R	208-0050-001	SILICONE GREASE			93
10	10	10	10	208-0011-002	RIVET			94
REF	REF	REF	REF	308-0014-000	PRODUCTION TEST REQUIREMENTS			95
REF	REF	REF	REF	305-0097-000	SCHEMATIC			96
REF	REF	REF	REF	100-0018-000	MAINTENANCE MANUAL			97

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
16	15	14	13	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
1	1	1	1	214-0002-082	RES. 2.4K, ¼W,5%	R30		79
								80
4	4	4	4	214-0002-047	RES. 82 Ohm, ¼W,5%	R35-R38 (BEND FOR .3	CTRS)	81
1	1	1	1	208-0066-003	TRANSIPAD	FOR U81		82
1	1	1	1	214-0002-103	RES.18K,¼W,5%	R39		83
3	3	3	3	208-0066-002	TRANSIPAD	FOR U77,78,79		84
1	1	1	1	214-0002-097	RES. 10K,¼W,5%	R40		85
2	2	2	2	208-0066-001	TRANSIPAD	FOR Q1 & Q2		86
3	3	3	3	208-0064-004	STANDOFF, NYLON	LENG 5/16 X ¼ DIA		87
3	3	3	3	208-0065-003	SCREW, NYLON	#4-40 X ¼		88
2	2	2	2	219-0005-007	HEAT SHRINK TUBING	APPROX. .90 LONG	FOR C15,16	89
2	2	2	2	208-0002-005	SCREW, PAN HD.	#4-40 X 5/16	FOR U80	90
2	2	2	2	208-0021-004	WASHER, INT. STAR	#4	FOR U80	91
2	2	2	2	208-0006-004	NUT,HEX	#4-40	FOR U80	92
A/R	A/R	A/R	A/R	208-0050-001	SILICONE GREASE			93
10	10	10	10	208-0011-002	RIVET			94
REF	REF	REF	REF	308-0014-000	PRODUCTION TEST REQUIREMENTS			95
REF	REF	REF	REF	305-0097-000	SCHEMATIC			96
REF	REF	REF	REF	100-0018-000	MAINTENANCE MANUAL			97

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

M

SHEET 25

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
		18	17	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
		1	1	304-0097-002	PC BOARD			1
		4	4	210-0105- 02	IC SN74H10	U1,U3,U44,U64		2
		7	7	210-0200- 02	IC SN74H08	U2,U4,U31,U33,U34,U60,U65		3
		9	9	210-0604- 02	IC SN7475	U5,U8,U16,U18,U36, U38,U47,U51,U58		4
		2	2	210-0716- 01	IC SN74193	U10,U13		5
		11	11	210-0100- 01	IC SN7400	U6,U7,U9,U12,U15,U19, U22,U23,U26,U27,U42		6
		1	1	210-0604- 01	IC SN7474	U52		7
		3	3	210-0805- 02	IC SN74H51	U11,U14,U17		8
		6	6	210-0100- 02	IC SN74H00	U35,U39,U41, U43,U45,U55		9

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

H

SHEET 26

SIZE A | CODE IDENT NO. 51513 | DWG NO. PL 303-0097-000 | L | SHEET 27

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
		18	17	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
		4	4	210-0718- 05	IC SN74LS197	U21,U24,U25,U28		10
		2	2	210-0107- 02	IC SN74H20	U29,U30		11
		5	5	210-0103- 02	IC SN74H04	U32,U40,U74,U75,U83		12
		5	5	210-0301- 01	IC SN7438	U37,U66,U62,U76,U56		13
		10	10	210-1104- 01	IC SP380	U46,U48,U57, U61,U67-U72,		14
		2	2	210-0905- 01	IC SN7485	U49,U59		15
		1	1	210-0816- 01	IC SN7486	U50		16
		1	1	210-0504- 01	IC SN74123	U53		17
		2	2	223-0001- 03	IC PE9825	U63,U73		18
								19
		3	3	210-0039- 01	IC MH0026CH	U77-U79		20
		1	1	221-0002- 01	IC 7808C	U80 LM340OK-8.0		22
		16	32	210-0038- 03	IC 2107B or TMS4060-2	ARRAY		23

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
		18	17	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
		1	1	210-0001- 18	IC LM304	U81		24
		2	2	210-0307- 01	IC SN7437	U20,U54		25
		2	2	217-0003-001	TRANSISTOR 2N4238	Q1,Q2		26
								27
		2	2	206-0015- 01	DIODE 1N4934	CR1,CR2		28
		6	6	201-0006-027	CAP. 47pf	C1-C6		29
		7	7	201-0018- 04	CAP. 6.8uf, 25V	C7-C13		30
								31
		1	1	201-0001- 14	CAP. 33uf, 10V	C21		32
								33
		1	1	210-0002- 70	CAP. .01uf,50V	C14(CORN.DUB. MM WW8)		34
								35
		2	2	201-0012-004	CAP. 50uf,25V	C15,C16,(TE1209)		36
								37
		2	2	201-0015- 31	CAP. .05uf, 20V	C17,C18		38
								39
		1	1	201-0002- 25	CAP. .0047	C19		40
								41
		1	1	201-0002- 25	CAP. 15pf	C20		42
								43

SIZE A | CODE IDENT NO. 51513 | DWG NO. PL 303-0097-000 | L | SHEET 28

SIZE	CODE IDENT NO.	DWG NO.	SHEET
A	51513	PL 303-0097-000	L 29

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
		18	17	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
		19	19	201-0018- 01	CAP. 6.8uf, 10V	C50,C58-C67,C105,C43		44
		11	11	210-0018- 02	CAP. 2.2uf, 25	C22,C23,C26-C34		45
		53	53	701-0001- 03	CAP. .1uf, 50V	C24,C25,C35-C42,C51-C57,C68,C70-C104		46
								47
								48
		1	1	301-0038-001	INDUCTOR 10K,1W	L1		49
								50
		1	1	216-0006-001	TRANSFORMER	T1		51
								52
		5	5	208-0057-001	CARD PULLS			53
								54
								55
		-	32	208-0023-005	HEADER	4K,8K ROWS		56
		16	-	208-0023-005	HEADER	4K, ROW		56
								56
		5	5	214-0007-065	RESISTOR NETWORK	RN1-RN5 470 OHMS		57
		1	1	214-0008-007	RESISTOR NETWORK	RN6 1K		58
		1	1	210-0905- 01	IC SN7483	U82		59
		2	2		SAE DIP SWITCH	SW1,SW2 5 POSITION		60
								61

QTY/DASH NO.				LIST OF MATERIAL				ITEM NO.
		18	17	PART NO.	DESCRIPTION	MATERIAL OR NOTE	SPECIFICATION	
		6	6	214-0002-073	RES. 1K, ¼W,5%	R1-R6		62
								63
		6	6	214-0002-041	RES. 47 OHM, ¼W,5%	R13-R18		64
		4	4	214-0002-056	RES. 200 OHM,¼W,5%	R19-R22		65
								66
		1	1	214-0003-139	RES. 560 OHM,½W	R23		67
								68
		2	2	214-0003-041	RES. 47 OHM, ½W	R24,R25		69
								70
		1	1	214-0002-	RES. ¼W,5%	R26 SELECT AT TEST		71
								72
		4	4	214-0002-066	RES. 510 OHM, ¼W,5%	R31-R34	R31-R34 BEND ON .3 CTRS	73
		1	1	214-0006-083	RES. 511 OHM, 1/8,1%	R27		74
								75
		1	1	214-0002-077	RES. 1.5K,¼W,5%	R28		75
		1	1	214-0002-033	RES. 22 OHM, ¼W,5%	R29		77
								78

SIZE A

CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

K

SHEET 30

		1	1	214-0002-082	RES. 2.4K,¼W,5%	R30		79
								80
		4	4	214-0002-047	RES. 82 Ohm, ¼W,5%	R35-R38 (BEND FOR .3	CTRS)	81
		1	1	208-0066-003	TRANSIPAD	FOR U81		82
		1	1	214-0002-103	RES. 18K, ¼W,5%	R39		83
		3	3	208-0066-002	TRANSIPAD	FOR U77,78,79		84
		1	1	214-0002-097	RES. 10K,¼W,5%	R40		85
		2	2	208-0066-001	TRANSIPAD	FOR Q1 & Q2		86
		3	3	208-0064-004	STANDOFF, NYLON	LENGTH 5/16 X ¼ DIA		87
		3	3	208-0065-003	SCREW, NYLON	#4-40 X ¼		88
		2	2	219-0005-007	HEAT SHRINK TUBING	APPROX. .90 LONG	FOR C15,16	89
		2	2	208-0002-005	SCREW, PAN HD.	#4-40 X 5/16	FOR U80	90
		2	2	208-0021-004	WASHER,INT. STAR	#4	FOR U80	91
		2	2	208-0006-004	NUT, HEX	#4-40	FOR U80	92
		A/R	A/R	208-0050-001	SILICONE GREASE			93
		10	10	208-0011-002	RIVET			94
		REF	REF	308-0014-000	PRODUCTION TEST REQUIREMENT			95
		REF	REF	305-0097-000	SCHEMATIC			96
		REF	REF	100-0018-000	MAINTENANCE MANUAL			97

SIZE A

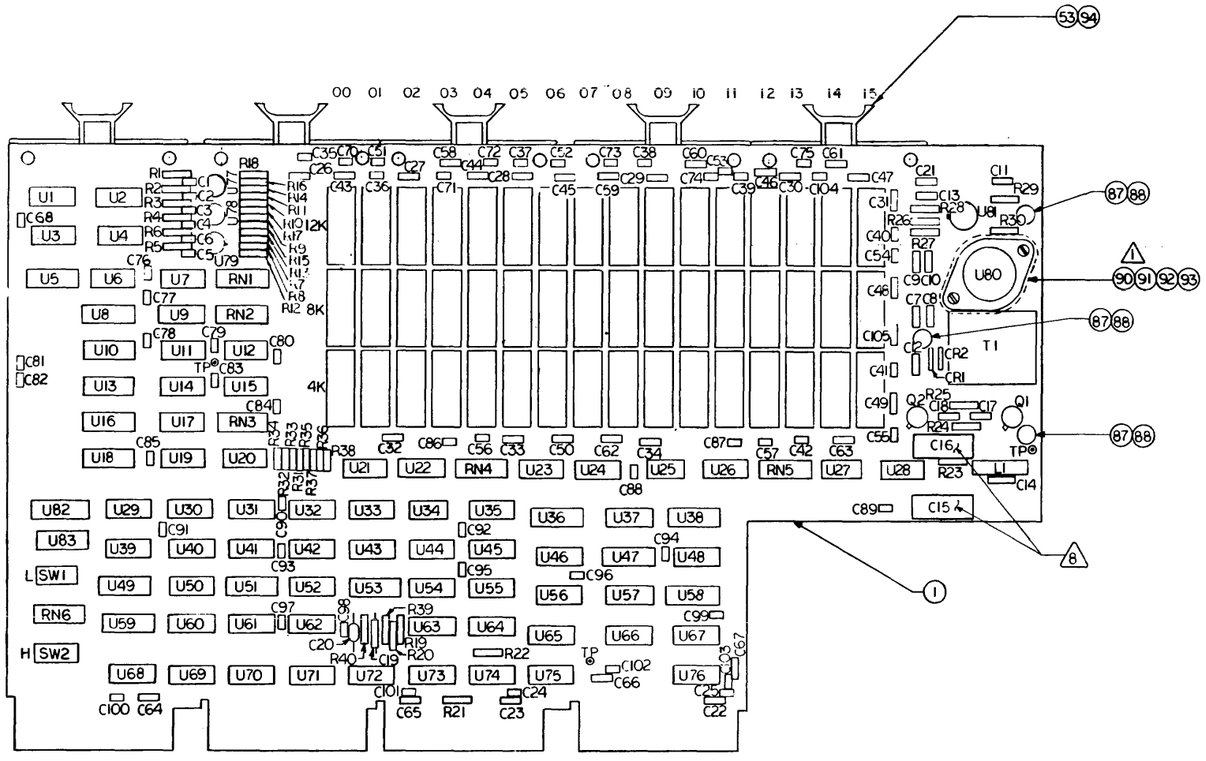
CODE IDENT NO. 51513

DWG NO. PL 303-0097-000

M

SHEET 31

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



8. REMOVE EXISTING COVERING FROM C15 & C16 AND ADD ITEM 89. VALUE MUST BE CHECKED BY QUALITY ASSURANCE BEFORE COVERING IS REMOVED.

7. ALL METAL CAN COMPONENTS MUST BE LOWER THAN ITEM 87.

6. WHEN HERMETICALLY SEALED COMPONENTS AND ASSEMBLIES ARE NOT REQUIRED THE DASH NUMBERS WILL BEGIN WITH 0XX. WHEN HERMETICALLY SEALED COMPONENTS AND ASSEMBLIES ARE REQUIRED, THE DASH NUMBERS WILL BEGIN WITH 5XX. ASSEMBLIES WILL BE MARKED ACCORDINGLY.

5. SOLDER PER 313-0005-000.

4. FACTORY SERIAL NOS. TO BE MARKED IN A CLEAR AREA WITH NO DUPLICATION.

3. MARK APPROPRIATE DASH NO. PER 313-0003-006

2. COMPONENT ALIGNMENT PER 313-0002-000.

1. APPLY EVEN COATS OF SILICONE GREASE (ITEM 93) TO MTG SURFACE OF U80 (ITEM 22).

NOTES (UNLESS OTHERWISE SPECIFIED)

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN CHB	
CHECKED	

MONOLITHIC SYSTEMS CORP.

MO VII PL/SPS ASSEMBLY

SIZE	CODE IDENT NO.	DRAWING NO.	REV
D	51513	303-0097-000	LM

SCALE

SHEET 32 OF 32

303-0097-000

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	D	ENG RELEASE ECO 0267	10-7-74	TSP
	E	ADD TO SHT 7 ECO 0284	11-6-74	TSP
	F	ADD TO SHT 6 ECO 0292	12-2-74	TSP
	G	CR1 & CR2 WAS IN4002 ECO 0302	1-9-75	TSP
	H	REVISED TIMING SHT 6 ECO 0310	3-26-75	TSP
	J	REVISED CAP VALUES SHT 7 ECO 0322	6-10-75	TSP
	K	REVISED PER ECO 0377	10-22-75	

EDI $\overline{AI7}$ ← SP380 U72 (4, 5) → 3 → AI7B → 3D7, 3B7

EE2 $\overline{AI6}$ ← SP380 U72 (12, 11) → 13 → AI6B → 3D7, 3B7

ED2 $\overline{AI5}$ ← SP380 U72 (9, 10) → 14 → AI5B → 3D7, 3B7

EK1 $\overline{AI4}$ ← SP380 U70 (7, 6) → 2 → ADI3 → 6D4, 3B7, 3D7

EK2 $\overline{AI3}$ ← SP380 U70 (12, 11) → 13 → ADI2 → 6D4, 3A8

EC1 $\overline{AI2}$ ← SP380 U72 (7, 6) → 2 → ADI1 → 2D4

EL1 $\overline{AI1}$ ← SP380 U70 (4, 5) → 3 → ADI0 → 2C4

EP1 $\overline{AI0}$ ← SP380 U69 (7, 6) → 2 → AD09 → 2C4

ER1 $\overline{A09}$ ← SP380 U69 (4, 5) → 3 → AD08 → 2C4

EN2 $\overline{A08}$ ← SP380 U69 (9, 10) → 14 → AD07 → 2C4

EP2 $\overline{A07}$ ← SP380 U69 (12, 11) → 13 → AD06 → 2C4

EU1 $\overline{A06}$ ← SP380 U68 (7, 6) → 2 → AD05 → 2C4

EV1 $\overline{A05}$ ← SP380 U68 (4, 5) → 3 → AD04 → 2C4

EU2 $\overline{A04}$ ← SP380 U68 (9, 10) → 14 → AD03 → 2B4

EV2 $\overline{A03}$ ← SP380 U68 (11, 12) → 13 → AD02 → 2B4

EF1 $\overline{A02}$ ← SP380 U71 (7, 6) → 2 → AD01 → 2B4

EH1 $\overline{A01}$ ← SP380 U71 (4, 5) → 3 → AD00 → 2B4

EH2 $\overline{A00}$ ← SP380 U71 (12, 11) → 13 → AD08 → 3D4

5B2 $\overline{DO-15}$ ← 7438 U76 (9, 10) → 8 → DI5 → CD2 → SP380 U67 (9, 10) → 14 → $\overline{DI-15}$ → 5B7

5B2 $\overline{DO-14}$ ← 7438 U76 (5, 4) → 6 → DI4 → CE2 → SP380 U67 (7, 6) → 2 → $\overline{DI-14}$ → 5B7

5B2 $\overline{DO-13}$ ← 7438 U76 (12, 13) → 11 → DI3 → CF2 → SP380 U67 (4, 5) → 3 → $\overline{DI-13}$ → 5B7

5B2 $\overline{DO-12}$ ← 7438 U76 (1, 2) → 3 → DI2 → CH2 → SP380 U67 (12, 11) → 13 → $\overline{DI-12}$ → 5B7

5C2 $\overline{DO-11}$ ← 7438 U37 (9, 10) → 8 → DI1 → CH1 → SP380 U48 (7, 6) → 2 → $\overline{DI-11}$ → 5C7

5C2 $\overline{DO-10}$ ← 7438 U37 (5, 4) → 6 → DI0 → CJ2 → SP380 U48 (4, 5) → 3 → $\overline{DI-10}$ → 5C7

5C2 $\overline{DO-09}$ ← 7438 U37 (12, 13) → 11 → DO9 → CK2 → SP380 U48 (10, 9) → 14 → $\overline{DI-09}$ → 5C7

5C2 $\overline{DO-08}$ ← 7438 U37 (2, 1) → 3 → DO8 → CL2 → SP380 U48 (12, 11) → 13 → $\overline{DI-08}$ → 5C7

4B7 $\overline{DO-07}$ ← 7438 U66 (10, 9) → 8 → DO7 → CM2 → SP380 U57 (9, 10) → 14 → $\overline{DI-07}$ → 4B7

4B7 $\overline{DO-06}$ ← 7438 U66 (2, 1) → 3 → DO6 → CV2 → SP380 U57 (12, 11) → 13 → $\overline{DI-06}$ → 4B7

4B7 $\overline{DO-05}$ ← 7438 U66 (12, 13) → 11 → DO5 → CP2 → SP380 U57 (4, 5) → 3 → $\overline{DI-05}$ → 4B7

4B7 $\overline{DO-04}$ ← 7438 U66 (4, 5) → 6 → DO4 → CN2 → SP380 U57 (7, 6) → 2 → $\overline{DI-04}$ → 4B7

4C7 $\overline{DO-03}$ ← 7438 U56 (12, 13) → 11 → DO3 → CT2 → SP380 U46 (4, 5) → 3 → $\overline{DI-03}$ → 4C7

4C7 $\overline{DO-02}$ ← 7438 U56 (2, 1) → 3 → DO2 → CU2 → SP380 U46 (12, 11) → 13 → $\overline{DI-02}$ → 4C7

4C7 $\overline{DO-01}$ ← 7438 U56 (10, 9) → 8 → DO1 → CR2 → SP380 U46 (9, 10) → 14 → $\overline{DI-01}$ → 4C7

4C7 $\overline{DO-00}$ ← 7438 U56 (4, 5) → 6 → DO0 → CS2 → SP380 U46 (7, 6) → 2 → $\overline{DI-00}$ → 4C7

3B1 BUS EN

2. CAPACITORS IN MICROFARADS.
1. RESISTORS IN OHMS 1/4W, ±5%
NOTES: UNLESS OTHERWISE SPECIFIED

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

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CONTRACT NO.

APPROVALS	DATE
DRAWN PA	4-23-74
CHECKED TSP	9-13-74
JW	10-7-74

MONOLITHIC SYSTEMS CORP.

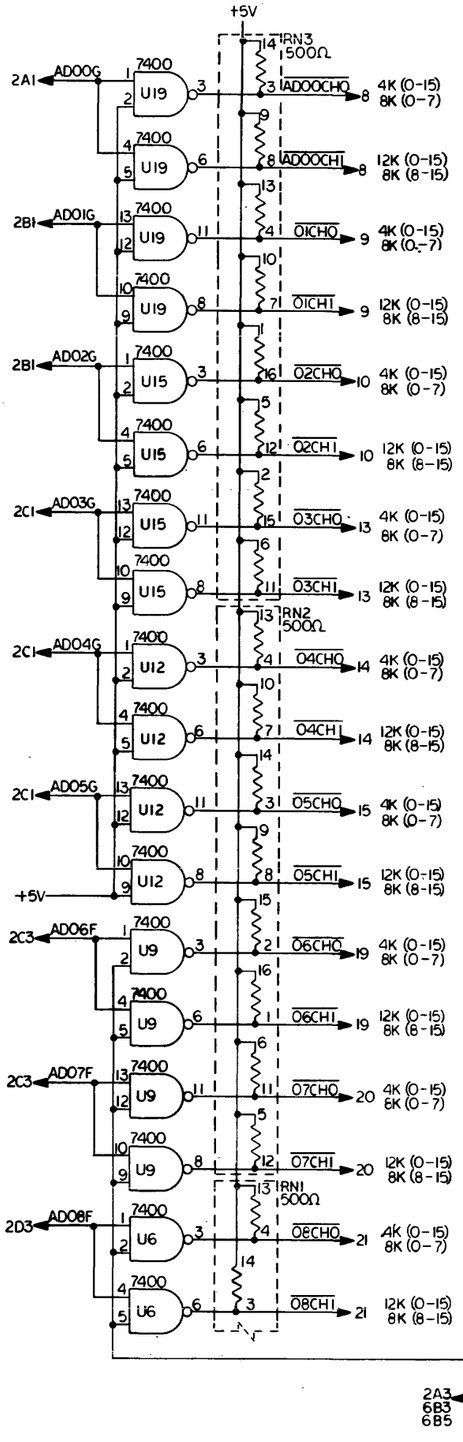
MO VII PL/SPS
SCHEMATIC

SIZE	CODE IDENT NO.	DRAWING NO.	
D	51513	305-0097-000	K

SCALE

SHEET 1 OF 7

305-0097-000



REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

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CONTRACT NO.

APPROVALS	DATE
DRAWN C BELMETT	8/23/91
CHECKED	

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MO VII PL/SPS SCHEMATIC

SIZE	CODE IDENT NO.	DRAWING NO.	
D	51513	305-0097-000	K

SCALE | SHEET 2 OF 7

NEXT ASSY | USED ON

APPLICATION

305-0097-000

REVISIONS				
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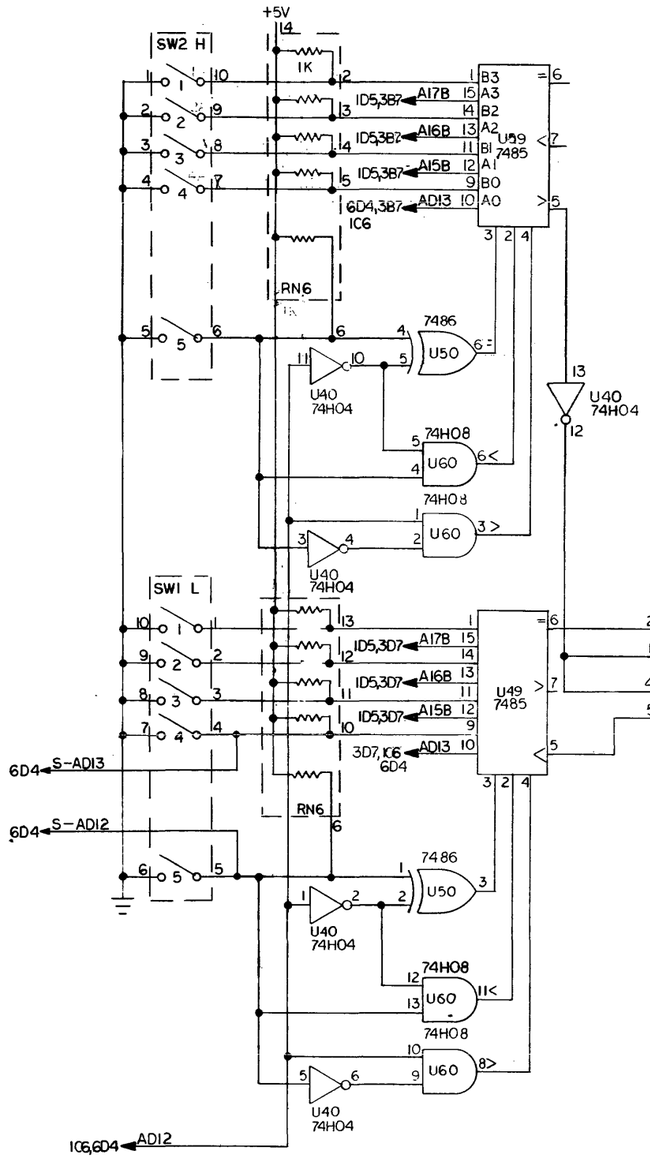

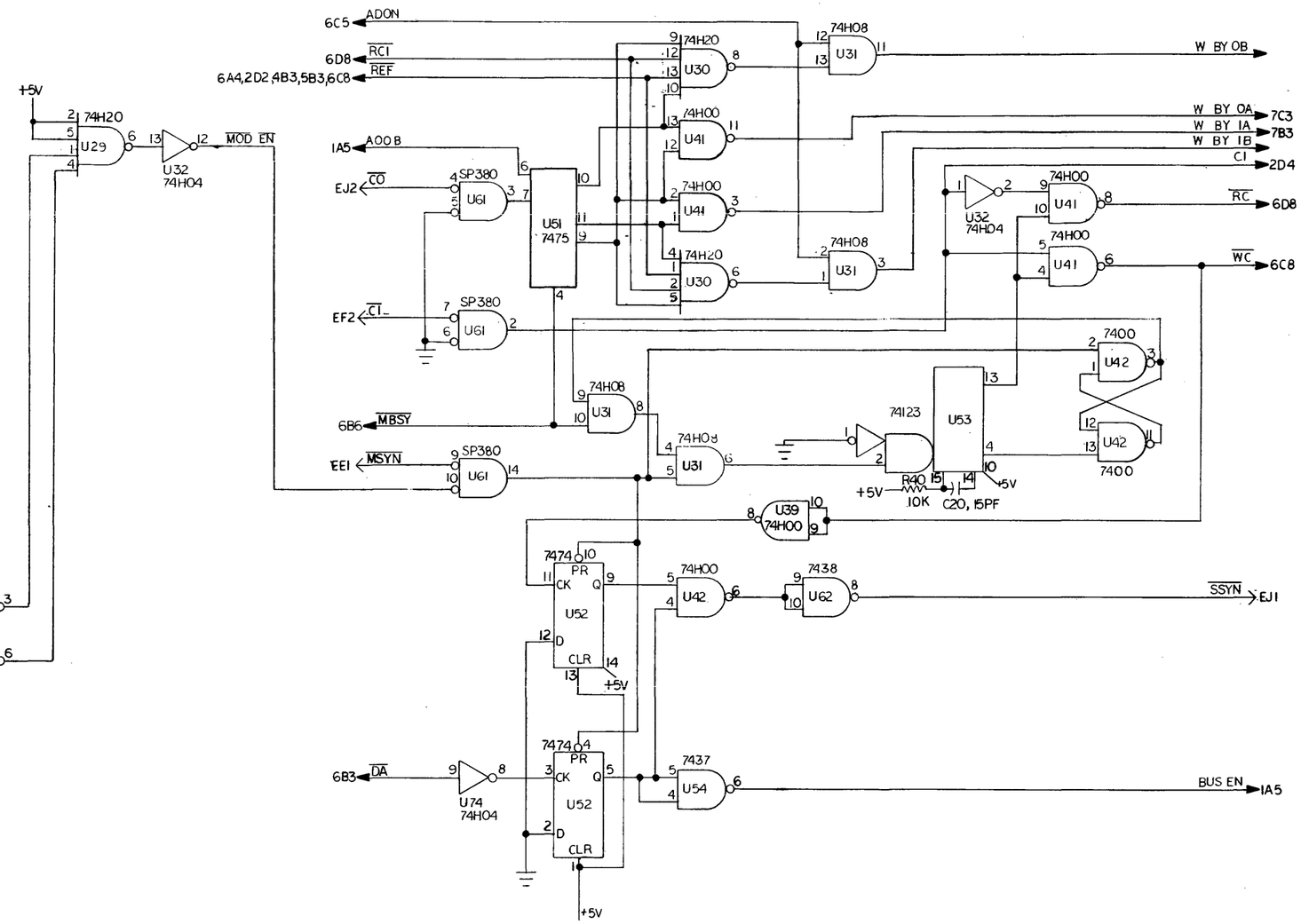

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

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MATERIAL

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CONTRACT NO.

APPROVALS	DATE
DRAWN P. ANDERSON	29APR7
CHECKED	

MONOLITHIC SYSTEMS CORP.

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SCHEMTIC

NEXT ASSY	USED ON
APPLICATION	

SIZE	CODE IDENT NO.	DRAWING NO.	
D	51513	305-0097-000	K

SCALE | SHEET _ OF 7

305-0097-000

REVISIONS				
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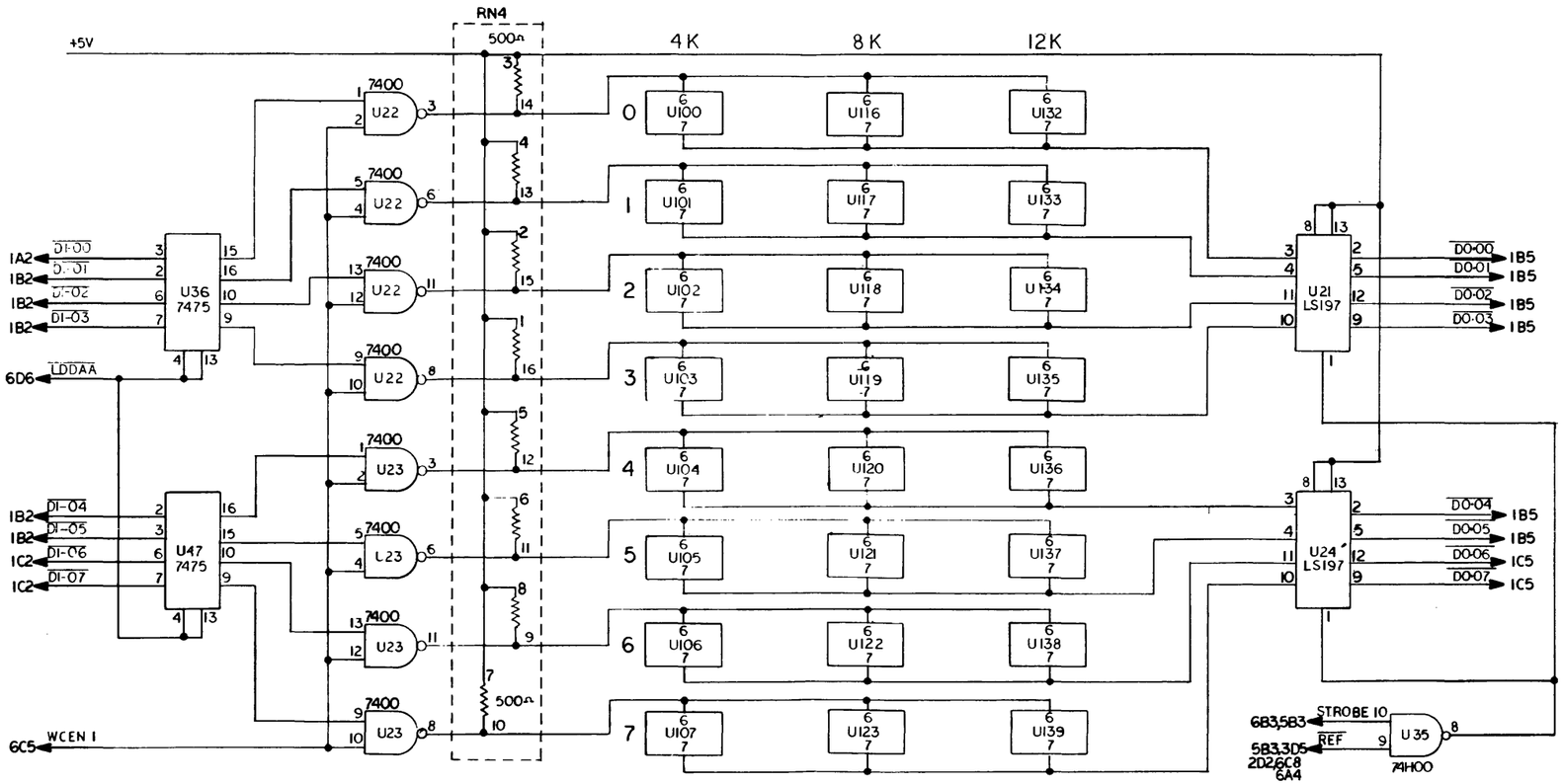

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
		PARTS LIST	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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MATERIAL

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CONTRACT NO.

APPROVALS	DATE
DRAWN P. ANDERSON	29APR74
CHECKED	

MONOLITHIC SYSTEMS CORP.

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SCHEMATIC

NEXT ASSY	USED ON
APPLICATION	

SIZE	CODE IDENT NO.	DRAWING NO.	
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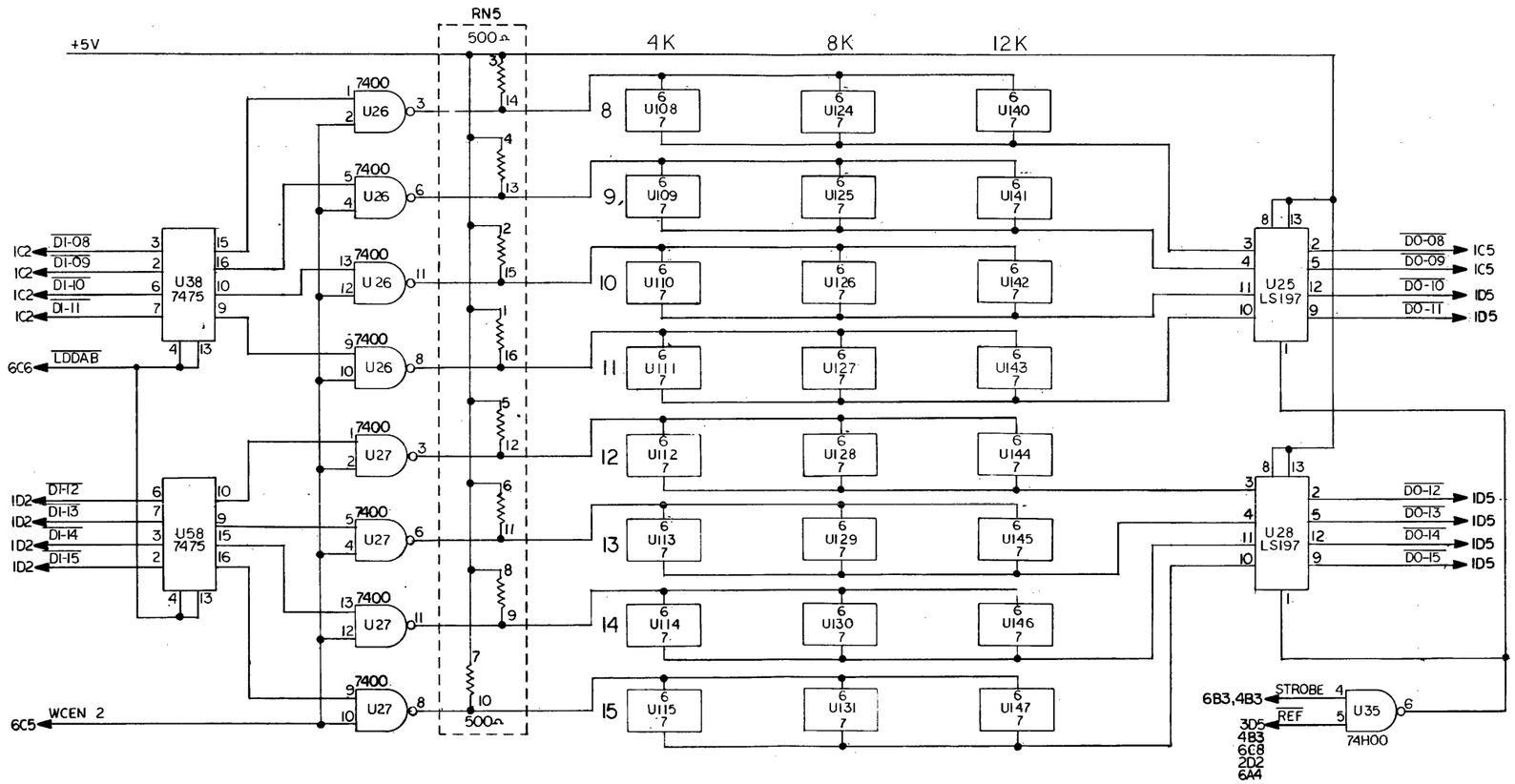
SCALE

SHEET 4 OF 7

305-0097-000

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
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APPROVALS	DATE
DRAWN P. ANDERSON	29 APR 74
CHECKED	

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SIZE	CODE IDENT NO.	DRAWING NO.	
D	51513	305-0097-000	G

SCALE | SHEET 5 OF 7

305-0097-000

REVISIONS				
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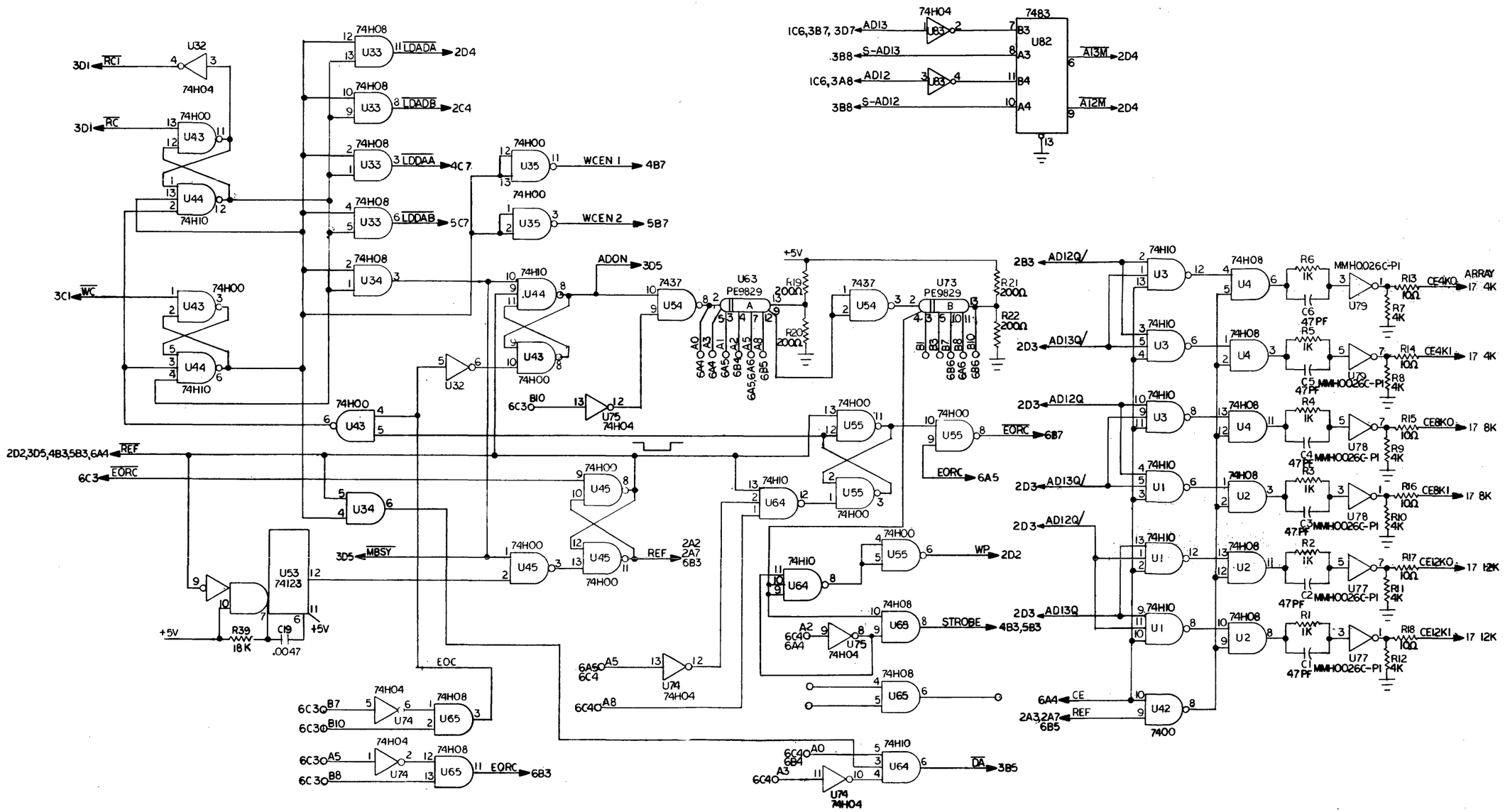

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
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CONTRACT NO.

APPROVALS	DATE
DRAWN P. ANDERSON	2MAY74
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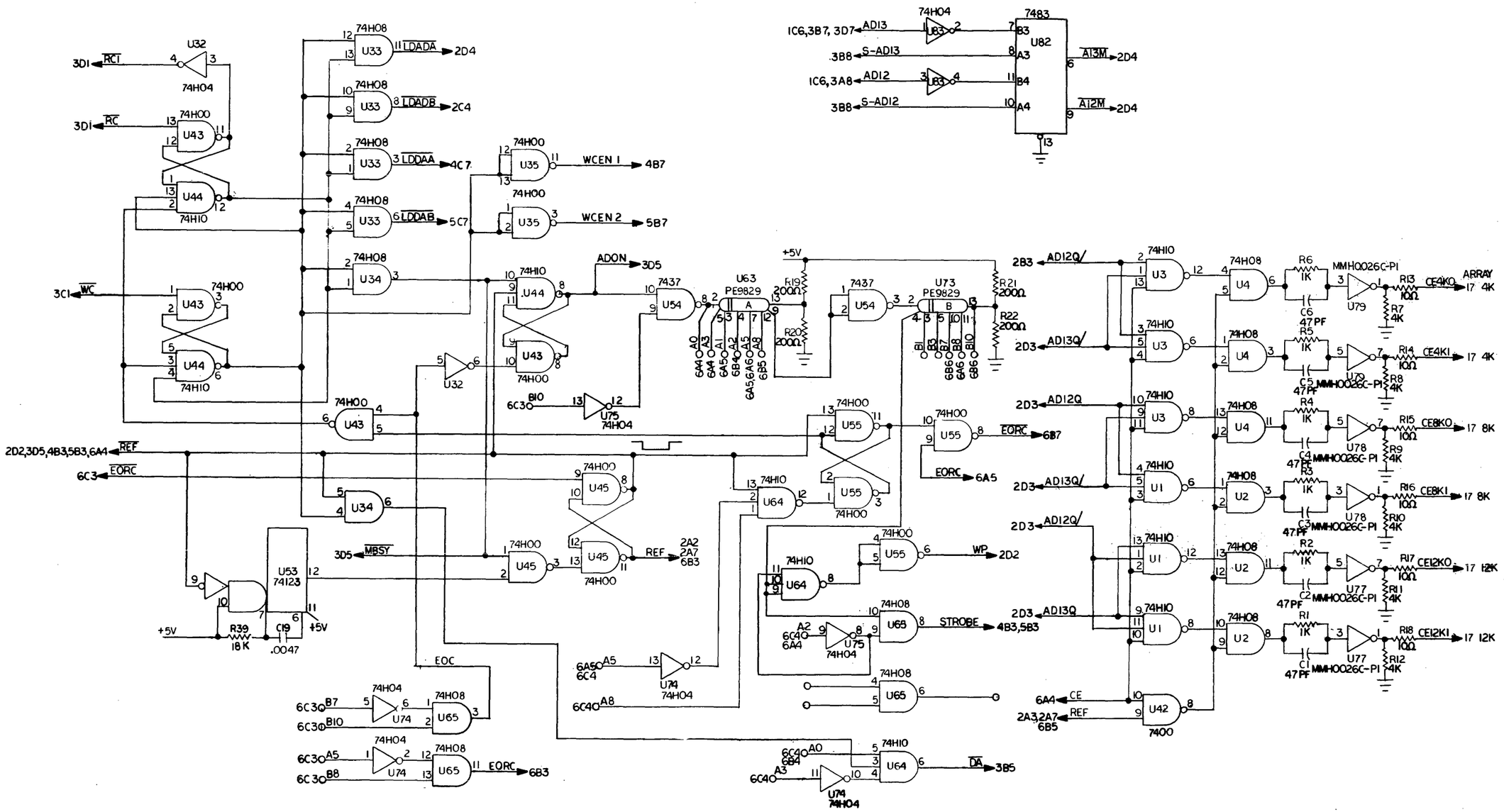
SIZE	CODE IDENT NO.	DRAWING NO.	
D	51513	305-0097-000	K

SCALE | SHEET 6 OF 7

305-0097-000

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



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SCHEMATIC

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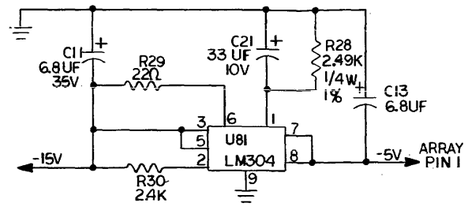
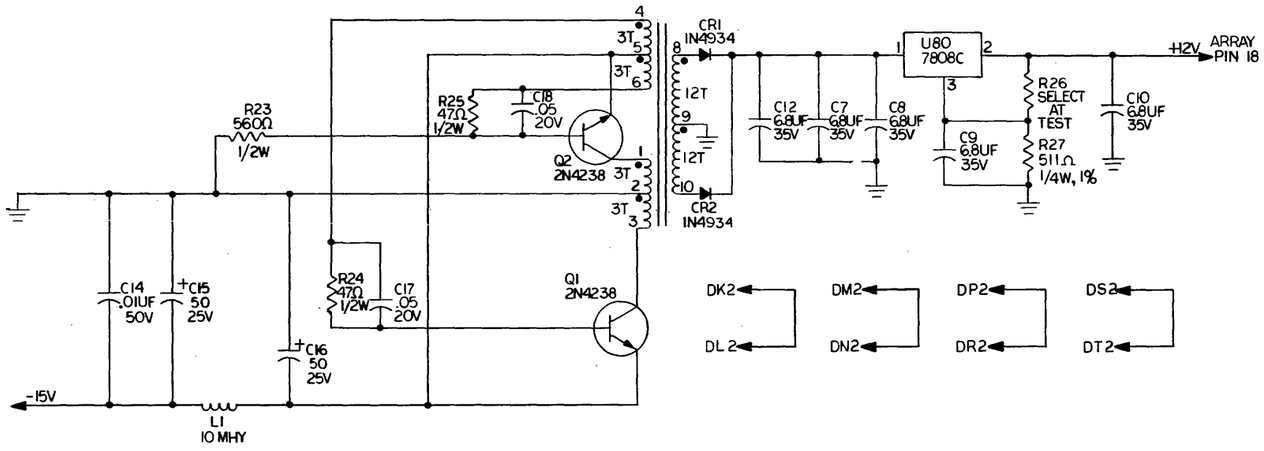
D	51513	305-0097-000	K

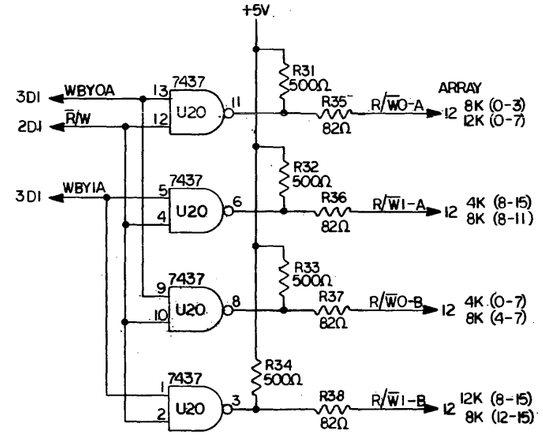
SCALE | SHEET 6 OF 7

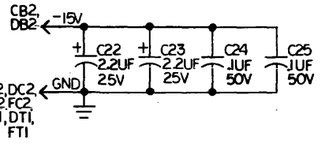
305-0097-000

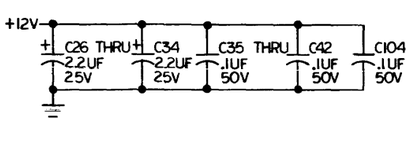
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

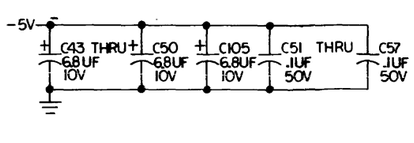


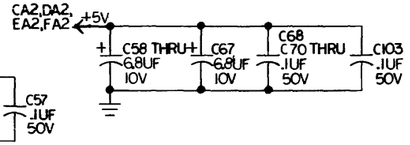












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MONOLITHIC SYSTEMS CORP.

APPROVALS	DATE
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SCALE | SHEET 7 OF 7

305-0097-000