MF-384K
MULTIFUNCTION
CARD
USER'S MANUAL

DOC:CB004

MF- 384K
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CHAPTER 1 INTRODUCTION

The MF-384(A) is a flexible and powerful multifunction enhancement product for the IBM PC, PC/XT and compatibles. The MF-384(A) provides memory expansion upgradeable to the maximum addressable user memory in the PC systems. It is also a powerful data I/O accessory; standard features include a real-time Clock-Calendar with rechargeable battery backup, one RS-232 asynchronous serial communication port, a parallel printer port. And a game adapter port is also provided.

NOTE: MF-384 has female RS232C connector
MF-384A has male RS232C connector

1.1 Standard Features

1. Up to 384K of user installable memory.
2. An RS-232C serial interface to be used with a Modem, serial printer, remote display terminal, or other serial device, or as asynchronous communications to another computer or peripheral operating under seperate asynchronous communications software control.
3. A parallel printer port.
4. A Real-time clock-calendar with rechargeable battery backup so that you don't have to reenter the time and data every time you start your system. The battery power is only used when your system is turned off.
5. The MFPLUS utility diskette containing clock software, that support the clock-calendar. RAMDISK and PSPOOL Software. This software is described in the SOFTWARE SECTION.

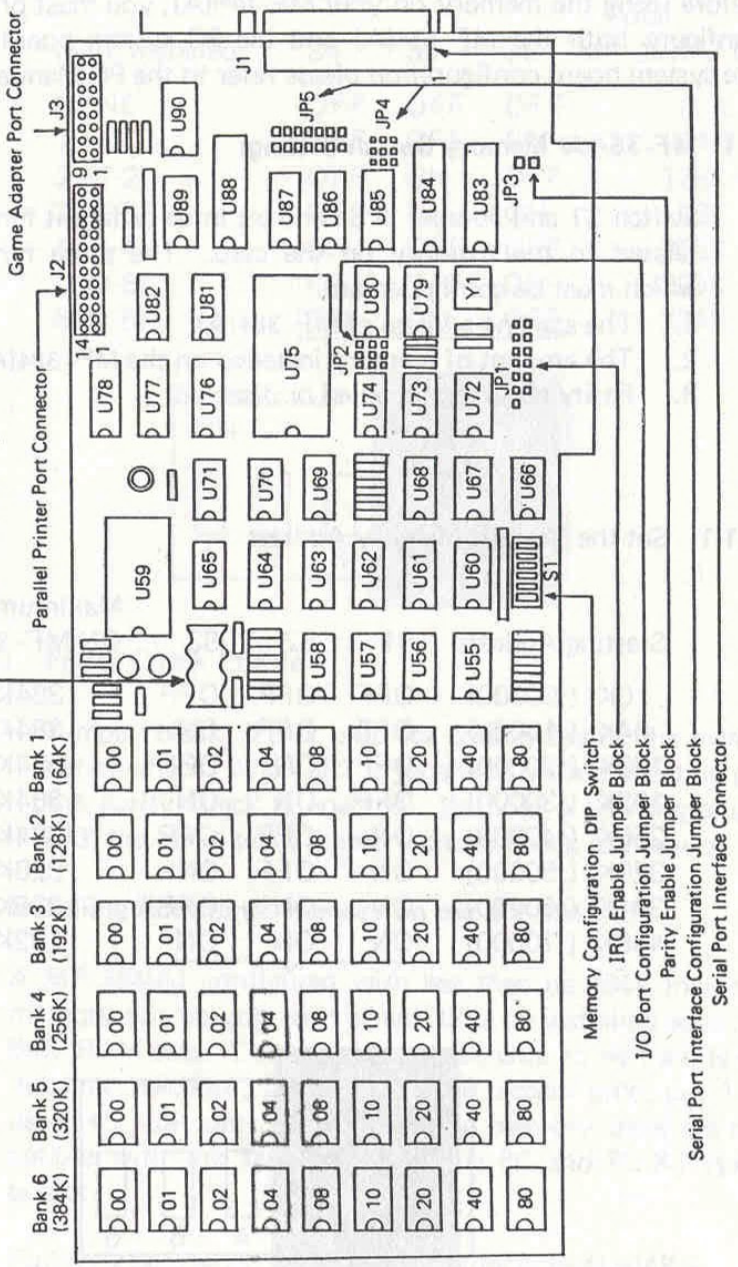
1.2 Options

1. Memory expansion available in 64K increments up to 384KB. The 384K on the MF-384(A) added to 256K on the PC-XT system board provides 640K, the maximum addressable user memory for these systems.

1.3 Software

Refer now to Chapter 7 in order to backup and transfer provided files to your system disk. This must be done before proceeding.

1.4 MF-384 BOARD LAYOUT AND A BRIEF DESCRIPTION



NOTE: 1. In MF-384A JP4 location exchange with JP5 on the board layout.
2. J1 is female connector in MF-384, but male connector in MF-384A.

CHAPTER 2 MEMORY CONFIGURATION

Before using the memory on your MF-384(A), you must properly configure both the MF-384(A) and the PC system board. For the system board configuration please refer to the PC Manual.

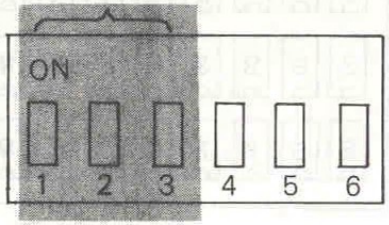
2.1 MF-384(A) Memory Switch Settings

Switch S1 and Jumper JP3 controls three different functions related to the memory on the card. The three functions which must be configured are:

1. The starting address of MF-384(A)
2. The amount of memory installed on the MF-384(A)
3. Parity checking (enabled or disabled)

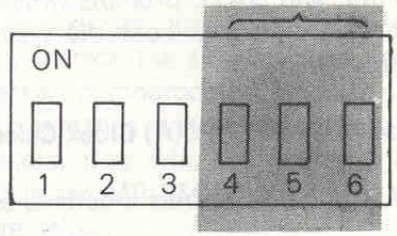
2.1-1 Set the Starting Memory Address

Starting Address	S1	S2	S3	Maximum RAM ON MF-384(A)
0K (:00000)	OFF	OFF	OFF	384K
64K (:10000)	OFF	OFF	ON	384K
128K (:20000)	OFF	ON	OFF	384K
192K (:30000)	OFF	ON	ON	384K
256K (:40000)	ON	OFF	OFF	384K
320K (:50000)	ON	OFF	ON	320K
384K (:60000)	ON	ON	OFF	256K
448K (:70000)	ON	ON	ON	192K



2.1-2 Amount of Memory Installed

Bank Installed	S4	S5	S6	Total MF-384(A) RAM
NONE	OFF	OFF	OFF	0K
1	OFF	OFF	ON	64K
2 (1-2)	OFF	ON	OFF	128K
3 (1-3)	OFF	ON	ON	192K
4 (1-4)	ON	OFF	OFF	256K
5 (1-5)	ON	OFF	ON	320K
6 (1-6)	ON	ON	OFF	384K



2.1-3 Parity Check Enable

Jumper block JP3 is used for enable/disable the memory parity check, when JP3 is jumpered with a shorting plug, the parity check is enabled. Without a shorting plug on JP3, the MF-384(A) memory parity check is disabled.

2.2 Installing Additional Memory on the MF-384(A)

A MF-384(A) configured with less than its 384K maximum memory can be upgraded at any time by installing additional 64K RAM sets. The correct type of chip to be used is 64K dynamic memory, 200 nanosecond access time, pin 1 not used, +5 Volt only. The following memory chips are compatible with the MF-384(A) or the PC and PC-XT system board:

Fujitsu MB8264-20
Micron Technology
MT4264-3 or MT4264-20
Mitsubishi M5K4164NS-20
Hitachi HM4864P-3
NEC UPD4164C-15/20
Toshiba TMM4264-15/20
T.I. TMS4164-20NLJ

CHAPTER 3 THE CLOCK-CALENDAR

The Clock Calendar has following features:

1. 24-hour clock, maintained in a Microprocessor Real Time Clock chip (MM58167A) on the MF-384(A) board.
2. Four-year calendar (no leap year).
3. Rechargeable battery backup power supply, automatically recharges each time the computer is turned on.
4. Full PC-DOS Compatiblity.

The clock utility program GETCLOCK.COM and SETCLOCK.COM are supplied on your MFPLUS diskette. Using GETCLOCK can answer the TIME and DATE prompts which the DOS operating system issues each time you boot the system. SETCLOCK updates the real-time clock.

3.1 Configuration of the MF-384(A) Clock-Calendar

Clock-Calendar I/O port address is defined as follows:

PORT CONFIGURATION	I/O PORTS
CLOCK 1	340-35F HEX
CLOCK 2	2C0-2DF HEX (default)
	or 240-25F HEX

Jumper setting as Fig. 2 to select clock 1 or clock 2, but only one can be selected at the same time. Disconnect both jumper to disable the clock, this may be necessary in cases of conflict between the ports used by the clock and other devices installed in your PC.

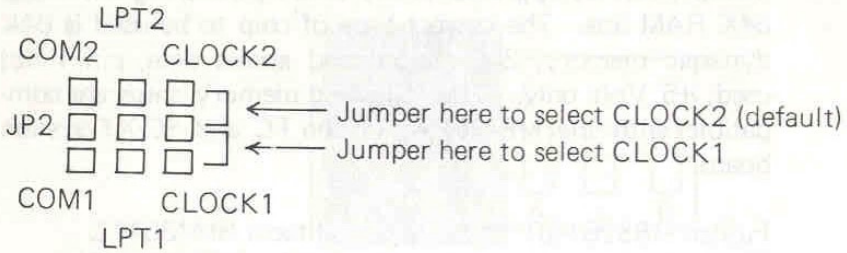


Fig. 2

3.2 The GETCLOCK Utility

Setting the PC TIME and DATE

GETCLOCK is a utility program which reads and displays the current time and date from the MF-384(A) at each power-up or reboot of the system. GETCLOCK eliminates the need for manually entering the correct time and date through the keyboard whenever the PC is turned on or rebooted.

3.3 The SETCLOCK Utility

Setting the TIME and DATE

You need to execute the SETCLOCK Utility whenever you want to correct the time or date of the MF-384(A) board's internal microprocessor clock. The DOS TIME and DATE commands only update the system's time and date parameters; they will not update the time and date values stored in the MF-384(A) clock chip until you execute the procedure below.

STEP 1

Boot the system with a diskette that leaves the screen at the A > prompt.

STEP 2

From the DOS prompt A >, enter the following instruction:

SETCLOCK <enter>

A message of current date and time will be displayed. If your clock calendar has not been used before, then the current date and time will be the system's time and date, and these data will be recorded into your clock calendar. Otherwise the date and time will be the clock calendar that you just load into the system by the SETCLOCK command. From now on, you can do step 3 and step 4 to update the date or time of clock calendar without any extra command executed.

STEP 3

Enter the DOS command DATE. The current date will be printed on the screen, and you will be given a chance to enter a new date. Press <enter> if no change is necessary or type a new date in the form mm/dd/yy <enter> or mm-dd-yy <enter>. DOS will figure out the day of the week from the information that you enter.

STEP 4

Enter the DOS command TIME. The current date will be printed on the screen, and you will be given a chance to enter a new time. Press <enter> if no change is necessary or type a new time in the form hh:mm:ss <enter>. For maximum accuracy, type in a time that is 10 to 15 seconds ahead of the actual time but do not press the <enter> key; observe a digital clock or watch, and press <enter> when the seconds reading on the clock cathes up to the value that you typed in.

STEP 5

Reboot the system (Ctrol-Alt-Del) to install the new TIME and DATE values.

3.4 Clock-Calendar Interrupt Generation

The Clock-Calendar feature does not normally need or support interrupts. By writing your own software, however, it is possible to generate timed interrupts on any of the IRQ2, IRQ4, IRQ5, IRQ7 interrupt lines. To implement this feature, you will need to do the following:

1. Enable clock interrupts by installing a shorting plug on the appropriate position of the interrupt select jumper block JP1 shown in figure 3:

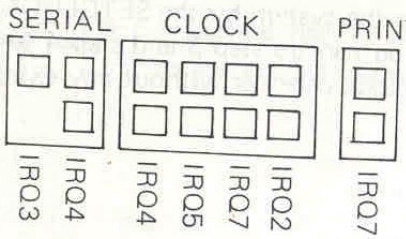


Fig. 3

2. Obtain data sheets for the National Semiconductor MM58167AN clock chip from your local National Semiconductor distributor.
3. Write your own software to handle the interrupts, based upon the information contained in the clock chip data sheets and in the IBM Technical Reference Manual.

3.5 Setting the Software for Clock Functions

After installing your MF-384(A), you must prepare your working DOS diskette to automatically initialize the time and date each time you boot the system. This subsection lists the process used to invoke your Clock-Calendar.

STEP 1

Copy the two clock programs, GETCLOCK.COM and SETCLOCK.COM to your working DOS diskette. These programs are on the MFPLUS diskette.

STEP 2

If your working DOS diskette already has an AUTOEXEC.BAT file, then you need to alter this file to include the GETCLOCK command. To see the current contents of your AUTOEXEC file, insert the working DOS diskette in drive A: and from the A > prompt, type the following command line:

TYPE AUTOEXEC.BAT <enter>

The contents of your AUTOEXEC file will be listed on your CRT screen. You now need to create a new AUTOEXEC file in which the command GETCLOCK proceds these other command(s). The following sequence will do this for you:

COPY CON: AUTOEXEC.BAT <enter>
GETCLOCK <enter>
.
.
.
.
Function Key F6 <enter>

If your working DOS diskette has no AUOTEXEC file, then you should use the above sequence to create one. The only command in the file will be GETCLOCK.

STEP 3
If necessary, use the SETCLOCK Utility to give the TIME and DATE variables their initial values.

3.6 Technical Information

I/O Address	Function
2C0	counter-1/10000 of seconds
2C1	counter-1/100 and 1/10 seconds
2C2	counter-seconds
2C3	counter-minutes
2C4	counter-hours
2C5	counter-day of the week
2C6	counter-day of the month
2C7	counter-month
2C8	RAM-upper nibble only
2C9	RAM-last month storage
2CA	RAM-year storage
2CB	RAM-reserved
2CC	RAM-not used
2CD	RAM-not used
2CE	RAM-not used
2CF	RAM-not used
2D0	interrupt status register
2D1	interrupt control register
2D2	counter reset
2D3	RAM reset
2D4	status bit
2D5	GO command
2D6	standby interrupt
2DF	test mode

Counter and RAM reset format

Data	Function
01	1/10000 of second
02	1/100 and 1/10 of second
04	seconds
08	minutes
10	hours
20	day of the week
40	day of the month
80	month

CHAPTER 4 PARALLEL PRINTER PORT

The MF-384(A) has a standard feature for interfacing the PC to any centronics compatible parallel printer such as the IBM/ Epson MX-80. This port is completely compatible with the IBM PC and uses the same female DB25 connector.

4.1 Configuration of the MF-384(A) Parallel Port

The IBM PC allows installation in the computer of up to three parallel ports, called LPT1, LPT2, and LPT3. The parallel port on the MF-384(A) has been configured at the factory to respond as LPT1. It can be configured to be LPT2 by moving the jumper to select LPT2.

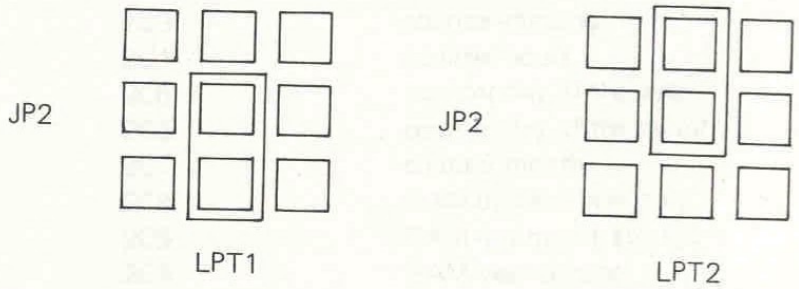


Fig. 4 Parallel Port Configuration

4.2 Parallel Port I/O Port Assignment and Pinouts

The parallel port on the MF-384(A) uses the following system I/O ports:

PORT CONFIGURATION	I/O PORTS
LPT 1	378-37A Hex
LPT 2	278-27A Hex

PARALLEL PORT SIGNAL LINE CONFIGURATION

Line Name	J2 Pin	MF-384 Adapter Cable Output DB25S	IBM MATRIX PRINTER
– STROBE	1	1	1
D0	2	2	2
D1	3	3	3
D2	4	4	4
D3	5	5	5
D4	6	6	6
D5	7	7	7
D6	8	8	8
D7	9	9	9
– ACK	10	10	10
BUSY	11	11	11
PE	12	12	12
SLCT	13	13	13
– AUTOFD	14	14	14
– ERROR	15	15	32
– INIT	16	16	31
– SLCT IN	17	17	36
GROUND	(18-25)	(18-25)	(16,19-30,33)

4.3 Installing the Parallel Interface Cable

The MF-384(A) is supplied with a ribbon cable for the parallel port to bring the parallel interface out the rear of the PC. This cable is approximately 30 cm long and has a rectangular connector at one end and a female DB25S connector at the other end. A bracket is supplied to mount the DB25S connector. The rectangular connector on the 30 cm cable plugs into J2 on the MF-384(A), while the cable from the printer plugs into the DB25S connector at the opposite end. Note that one edge of the 30 cm flat ribbon cable has a red or blue line on it; this line indicates which end of the rectangular connector is to be installed to pin 1 of J2. The rectangular connector plugs into J2 with the red or blue line at the left side of J2 (toward the front of PC), with the cable exiting toward the back of the MF-384(A).

CHAPTER 5 SERIAL PORT

The MF-384(A) has as a standard feature one serial port for asynchronous communications. This port can be used to connect your PC to a serial printer, modem, or other device which uses an RS-232C interface. The MF-384A interface is a HOST/DTE type (Data Terminal Equipment) with a male DB25 connector. (MF-100 use a female DB25S connector)

5.1 Configuration of the Serial Port

The IBM PC allows installation in the computer of up to two serial ports, called COM1 and COM2. This can be selected on JP2 Jumper Block. The interrupt request line IRQ4 and IRQ3 can also be selected as the COM1, COM2 interrupt by setting the jumper on JP1.

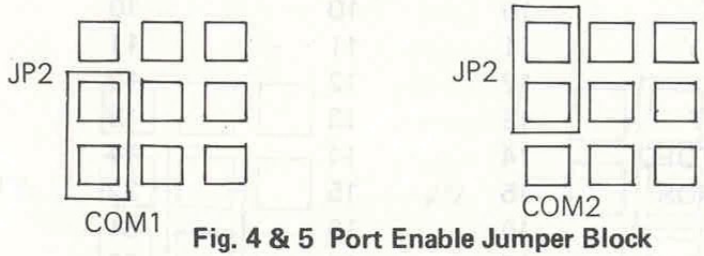


Fig. 4 & 5 Port Enable Jumper Block

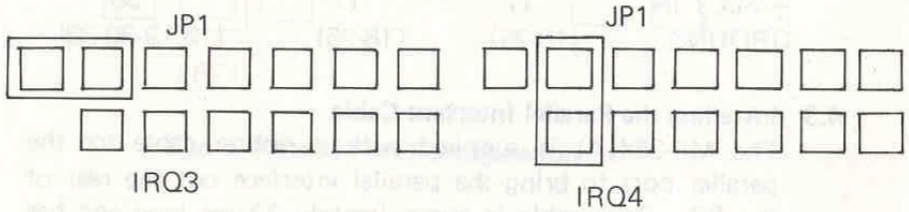
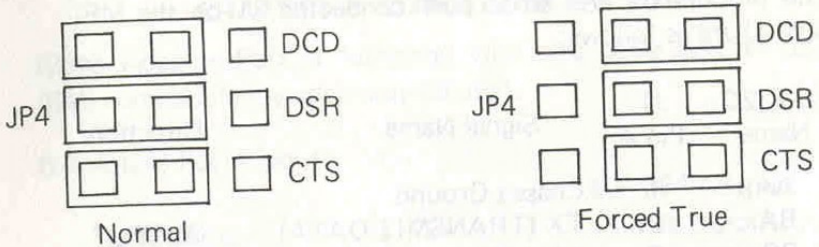
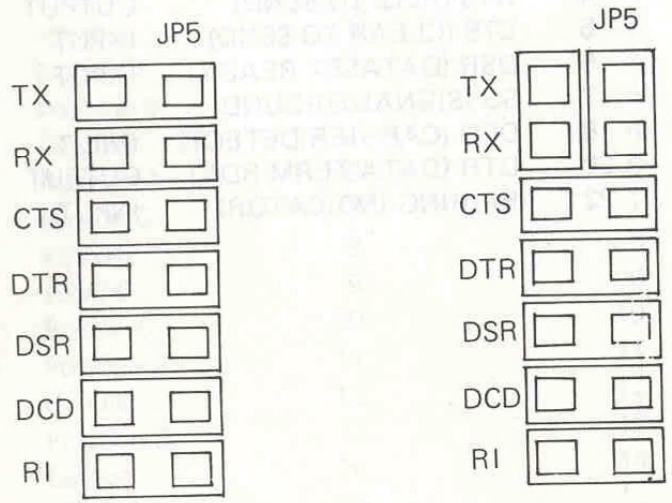


Fig. 6 IRQ Enable Jumper Block

5.2 Configuring the RS-232C Interface Line

MF-384(A) has adhered to RS-232C engineering standards, all inputs to the serial port with the exception of Ring Indicator, Pin 22, must be connected to a signal, even if the device the port is connected to is not using one or more of the interface lines at connector J1. The serial port interface configuration block JP4 are provided to make some signal lines input such as CTS, DSR, DCD to be "forced true" state. JP5 are provided to make this port to be HOST or Data Terminal Configuration. These configuration jumpers are shown as follows:





The JP5 configuration block has some jumper such as CTS, RTS, DTR, DSR, DCD, RI, that will be useful if you will use the serial port for two or more different serial devices at different times.

5.3 Serial I/O Port Assignments and Pinouts

The serial port on the MF-384(A) uses the following system I/O ports and IRQ interrupt request lines:

Port Configuration	I/O Ports	IRQ Line
COM1	3F8-3FF Hex	IRQ4
COM2	2F8-2FF Hex	IRQ3

The pinouts for the serial port connector J1 on the MF-384(A) are as follows:

RS-232C Name	J1 Pin #	Signal Name	Direction
AA	1	Chassis Ground	—
BA	2	TX (TRANSMIT DATA)	OUTPUT
BB	3	RX (RECEIVE DATA)	INPUT
CA	4	RTS (REQ. TO SEND)	OUTPUT
CB	5	CTS (CLEAR TO SEND)	INPUT
CC	6	DSR (DATASET READY)	INPUT
AB	7	SG (SIGNAL GROUND)	—
CF	8	DCD (CARRIER DETECT)	INPUT
CD	20	DTR (DATA TERM RDY)	OUTPUT
CE	22	RI (RING INDICATOR)	INPUT

CHAPTER 6 GAME ADAPTER PORT

Game Adapter Port is furnished with one game adapter cable, IBM-compatible joy stick may be used.

6.1 Game Port Pinout

Line Name	J3 Pin	MF-384 Adapter Cable Output DB-15 S
+5VDC	1	1
Button 4	2	2
Position 0	3	3
Ground	4	4
Position 1	6	6
Button 5	7	7
+5VDC	8	8
+5VDC	9	9
Button 6	10	10
Position 2	11	11
Ground	12	12
Position 3	13	13
Button 7	14	14
+5VDC	15	15

6.2 Installing the Game Port Cable

The game port cable is used to bring the game port interface out the rear of the PC. This cable is approximately 30 cm long and has a rectangular connector at one end and a female DB15S connector at the other end. DB15S connector can mount on the additional bracket supplied with MF-384, and mount the bracket on the rear panel. The rectangular connector plugs into J3 with red or blue color side of ribbon cable as Pin 1. The IBM-compatible joy-stick DB15P male connector connect to the DB15S connector. Then the user can enjoy games by executing game software with the joystick.

SECTION II

— SOFTWARE —

CHAPTER 7 INTRODUCTION

7.1 About this Section

This section describes the use and operation of the MFPLUS Utility programs. These programs will work satisfactorily on most expansion cards that are available for IBM PC and compatible Personal Computers and should be executed under current releases of MS DOS.

The MFPLUS Utility diskette supports six utility programs as following:

RAMDISK.COM — A program which emulates a floppy disk drive using your PC system RAM. It allows you to access data or execute programs much faster than with the floppy disk.

RAMHELP.COM — This utility lists the RAMDISK operation menu, giving you a brief listing of all options, types, and their meanings. When you are not sure how to enter a command, execute this utility to get help.

DISKCONF.COM — A program which displays the message of current RAMDISK status.

PSPOOL.COM — A program which enables printing a list of data files on the printer while you are doing other tasks on the PC system. Your print output data is queued in a predefined area of memory and will be printed using the PC system interrupt.

PSPLHELP.COM — This utility lists the PSPOOL operation menu, giving you a brief listing of all options, types and their meanings. When you are not sure how to enter a command, execute this utility to get help.

PSPLCONF.COM — A program which displays the current PSPOOL status.

7.2 Back Up Your MFPLUS Utility Programs

The MFPLUS Utility diskette is a single-side, 8 sector non-system diskette, can be used with all MS DOS versions. The following steps tell you how to back up the MFPLUS Utility programs.

Step 1: Write-Protect your original MFPLUS Utility diskette.

Step 2: Boot PC system.

Step 3: Copy the utility program to your system diskette.

(i) If you have only one floppy drive, type

COPY B:*.* A: <enter>

The system will prompt you to change source and destination diskette for coping programs.

(ii) If you have two or more floppy drives, place the MFPLUS diskette in drive B: and type

COPY B:*.* A: <enter>

The system will copy all the program in B: into A:.

NOTE: The MFPLUS Utility diskette should be kept in a safe place and should not be used during system operation.

CHAPTER 8 RAMDISK

8.1 Introduction

The RAMDISK Utility programs allow you assign RAM space for use as up to four RAMDISKS that will enhance the processing speed of the computer. The RAMDISK could be thought as a disk drive. You can run any DOS command on it and save data into it. However, because RAMDISK is a program that must be loaded by EXEC loader, so it must be loaded each time you turn on the PC.

The RAMDISK allows many features:

1. Emulation of up to four disk drives.
2. The ability to define user's memory space and RAMDISK size.
3. Support of single and double side drives with eight or nine sectors per track.
4. Maximum RAMDISK of 360K.

8.2 Preparing Your RAMDISK for use on the PC

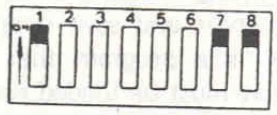
Before you install the RAMDISK on your Personal Computer, set the PC for RAMDISK operation. Normally, you will do this only once. After you have set the PC as described below, you don't need any hardware preparation.

(A) Set PC system Board DIP switch 1 to specify drives option. The switch 1 setting tells the computer how many floppy diskette drives are present.
NOTE: This drive number must include the RAMDISKS.

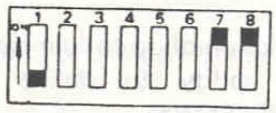
Refer to figure 7, this figure shows the way of setting dip switch 1 on the main board. You may set the dip switch for more disk drives than are actually installed. It's perfectly acceptable for you to leave the switches set for a total of three or four drives, so that you can assign any of four drive name (A, B, C, and D) to your RAMDISKS at any time.

SWITCH 1

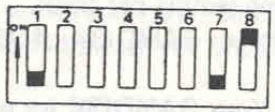
0-Drives



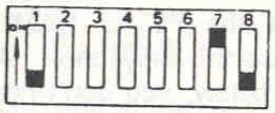
1-Drives



2-Drives



3-Drives



4-Drives

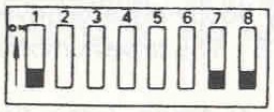


Figure 7

(B) Memory Setting

Refer to your PC Technical Reference Manual for memory setting, set the switchs to maximum memory size of the system. This allows you to fully use your memory space.

8.3 Getting Started

To start the RAMDISK, you must be sure copied these three utility programs onto your DOS diskette, as explained in Chap. 7.

RAMDISK.COM
RAMHELP.COM
DISKCONF.COM

8.3.1 RAMDISK Help Command

RAMDISK Help Command is one of the RAMDISK Utility programs. It provides an operation menu. After you type the command: RAMHELP, the screen will display.

RAMDISK HELP INFORMATION

Command Format:

RAMDISK X: [/1] [/2] [/M=xxx] [/U=xxx] [/8] [/9]

/1 – Side specification. Creates a single side RAMDISK.
/2 – Side specification. Creates a double side RAMDISK.
/M=xxx – RAMDISK size specification.
/U=xxx – Reserves memory space size for user application program.
/8 – Creates 8 sectors per track formatted RAMDISK.
/9 – Creates 9 sectors per track formatted RAMDISK.
X: – Drive specification.
[ ] – Indicates an optional term. The [ ] is not part of the input.

8.3.2 RAMDISK Parameters Specification

Because RAMDISK is a program, just like a DOS command, it must be initialized each time you turn on your PC. This section describes in detail the various commands and options you can use, and the format which they must be entered in.

To install the RAMDISK, type the command using the following format:

RAMDISK X: [/M=xxx] [/U=xxx] [/1] [/2] [/8] [/9]

The word RAMDISK invokes the RAMDISK program's command handler routines. The remainder of the command syntax specifies the various options. They are described below:

X: It creates a RAMDISK in memory. X may be A, B, C, and D.

/1 or /2 Side specification, creates a single-side drive with /1 option, the default drive size is 160K for DOS 1.1, 180K for DOS 2.0. Creates a double-side drive with /2 option, the default drive size is 320K for DOS 1.1, 360K for DOS 2.0 or newer. Default side specification is /2.

/8 or /9 Specifies eight sectors per track or nine sectors per track, under DOS 2.0 or newer.

/M=xxx This option reserves xxxK bytes of memory for RAMDISK use. If this option is omitted, as much memory as possible will be allocated to RAMDISK depend on /1 or /2 options.

/U=xxx This option reserves a minimum of xxxK bytes of memory for the user application programs, and its work space. If this option is omitted, the RAMDISK will reserve a minimum default program space of 64K memory space.

8.4 Some Examples About RAMDISK

The following examples are provided to help clarify the use of the RAMDISK command.

RAMDISK B: <enter>

Will allocate a minimum 64K bytes of application memory space. And create a double side drive as B:

RAMDISK C: /2/U=128/M=128 <enter>

Will allocate a minimum 128K bytes of application memory space, and create a double side drive with memory space of 128K.

Now, we will take you step by step through the process of creatting and using the RAMDISK.

Step 1: Create the RAMDISK by entering a command such as following:

RAMDISK D: <enter>

The screen will display the message.

```
RAMDISK Version 2.00
RAMDISK D: total space xxxxxx bytes
A>
```

Step 2: Copy all of the files from drive A: to drive D:
Type:

COPY A:*.* D: <enter>

Step 3: Set drive to D:
Type:

D: <enter>

Step 4: Execute the program at drive D:
Program – Name <enter>

8.5 Execute the DISKCONF Command

DISKCONF Command is one of the RAMDISK Utility programs. It allows you to check the current RAMDISK configuration. After you type in the command "DISKCONF", the screen will display the configuration of current RAMDISKS.

DISKCONF <enter>

RAMDISK CONFIGURATION INFORMATION
RAMDISK X: 1 side 8 sectors, total xxxxxx bytes.
RAMDISK X: 2 sides 9 sectors, total xxxxxx bytes.
. .
. .
. .

8.6 RAMDISK Error Messages

RAMDISK may give you an error message under certain conditions. These message are described below:

A. INVALID RAMDISK SPECIFIED! – This indicates that either the system board switches have not been set for the correct number of drives or you have used an invalid drive letter in your RAMDISK command.

B. NO AVAILABLE MEMORY SPACE! – This indicates that there is no available memory space to allocate a RAMDISK.

C. xxxxxx BYTES SHORT! – This is a message indicating the amount of insufficient memory space that you specified for memory allocation.

D. RAMDISK CAN NOT BE REPLACED! – Indicates an attempt to specify an installed RAMDISK name.

E. INVALID PARAMETERS SPECIFIED! – Indicates an invalid parameter specified.

CHAPTER 9 PSPOOL

9.1 Introduction

The PSPOOL Utility program is a print spooler which provides buffered print-out data to a parallel or serial printer during concurrent processing of other programs. Files to be printed will be output to the PSPOOL buffer the PSPOOL program will handle output to the printer at printer speed.

PSPOOL has the following features:
* Provides buffered output of printer data to either a parallel or serial printer.
* Allows you to define the size of the spooler buffer.
* Allows stop/restart, and line-per-page controls.

9.2 Preparing your PSPOOL for use on the PC

Refer to your PC technical reference manual for memory setting to set the switchs to maximum memory size. This allows you to fully use your memory space. Prior to entering the PSPOOL command, you must enter the DOS MODE command to disable the redirection of printer LPT#: This can be done by type in:

MODE LPT1: <enter>

If you assign the print data to a serial printer, you must do the following:
1. Refer to the DOS MODE command. Initialize the Asynchronous Communications Adapter by using option 3.
2. Use the PSPOOL command to redirect LPT1: to the serial printer.

9.3 Getting Started

To start the PSPOOL be sure you have copied these utility program onto your DOS diskette as explained in Chap. 7.

PSPOOL.COM
PSPLHELP.COM
PSPLCONF.COM

9.3.1 PSPOOL HELP Command

PSPOOL HELP Command is one of the PSPOOL Utility program. It provides you an operation menu. After you type the command:

PSPLHELP <enter>

The screen will display:

PSPOOL HELP INFORMATION

Command Format:

PSPOOL LPTn: [=COMn:] [/U=xxx] [/M=xxx] [/L=xx] [/S] [/C] [/R] [/I] [/ON=] [/OFF=]

LPTn:	—	Selects parallel printer.
=COMn:	—	Redirects parallel printer output to a serial port.
/U=xxx	—	Reserves memory space size for user application programs.
/M=xxx	—	PSPOOL queue size specification.
/L=xx	—	Sets the number of lines per page.
/S	—	Stops output of print data.
/C	—	Continues output of print data.
/R	—	Continues output of print data at the beginning of the current page.
/I	—	Initializes the PSPOOL queue, all print data will be purged.
/ON=	—	Turns on serial printer port handshake line protocol options.
/OFF=	—	Turns off serial printer port handshake line protocol otpions.
[ ]	—	Indicates an optional term. The [ ] is not part of the input.

9.3.2 PSPOOL Parameters Specification

Because PSPOOL is a program just like a DOS command, it must be initialized each time you turn on your PC. This section describes in detail the various commands and options you can use, and the format which they must be entered in. The PC normally sends all printer output to LPT1 unless the user takes steps to redirect the output to a different port. When either a serial or parallel port is assigned for printer output with PSPOOL, the port can not be used by any other program for any purpose until the port is redirected by PSPOOL command again.

To install the PSPOOL, type the command using the following format.

PSPOOL LPTn: [=COMn:] [/U=xxx] [/M=xxx] [/L] [/S] [/C] [/R] [/I] [/ON=OPTION] [/OFF=OPTION]

The word PSOPOL invokes the PSPOOL program's command handler routines. The remainder of the command syntax specifies the various options. They are described below:

LPTn: Selects one of the three possible parallel ports.

=COMn: Redirects parallel printer output to a serial port. LPTn now responds as LPTn+1. NOTE: You must initialize the Asynchronous Communication Adapter by using DOS command MODE before you select this option.

/U=xxx This option reserves a minimum of xxxK bytes of memory for the user application programs, and its work space. If this option is omitted, the PSPOOL will reserve a minimum default program space of 64K memory space.

/M=xxx This option reserves a minimum of xxxK bytes of memory for PSPOOL buffer. If the option is omitted. The default buffer size is 64K. If =xxx is omitted as much memory as possible will allocate to PSPOOL buffer.

/L Set the number of lines per page. Default is 66.

/S Stops output of printer data. No data will be lost, and data output can be restarted by using the /C option.

/C Continues output of printer data.

/R Continues output of printer data at the beginning of the current page.

/I Immediately purges all data from PSPOOL queue, the queue is empty.

/ON= Turns on the serial printer port's handshake line protocol options.

/OFF= Turns off the serial printer port's handshake line protocol options.

The handshake line protocol options are XON, DCD, DSR, CTS, default ON=CTS, DSR, OFF=XON, DCD.

9.4 Some Examples of PSPOOL

The following examples are provided to help clarify the use of PSPOOL command.

PSPOOL LPT1: <enter>

spooler printer output to LPT1.

PSPOOL LPT1:/U=192/M <enter>

spooler printer output to LPT1, reserves a minimum of 192K for the application program. Uses as much memory space as possible for spooler buffer.

PSPOOL LPT1:=COM1:/ON=CTS <enter>

Redirects to the serial printer 1, with CTS handshake line protocol control.

Now, we will take you step by step through the process of creating and using a PSPOOL.

STEP 1: Prepare the DOS for PSPOOL by using the MODE command.

A>MODE LPT1: <enter>

STEP 2: Create the PSPOOL by entering a command such as following.

A>PSPOOL LPT1: <enter>

PSPOOL Version 2.00
PSPOOL total queue space xxxxxx bytes

A>

STEP 3: To test the spooler, give a print out file to LPT1:, and at this point, you can proceed with running whatever program you want and let PSPOOL to print out data.

9.5 Execute PSPLCONF Command

Once PSPOOL has been activated, status can be checked at any time by enter PSPLCONF command. The current printer configuration and spooler buffer will be displayed. The PSPOOL directed printer port configuration can only be changed when the spool buffer is empty.

9.6 PSPOOL Error Message

PSPOOL may give you an error message under certain conditions. The messages are described below:

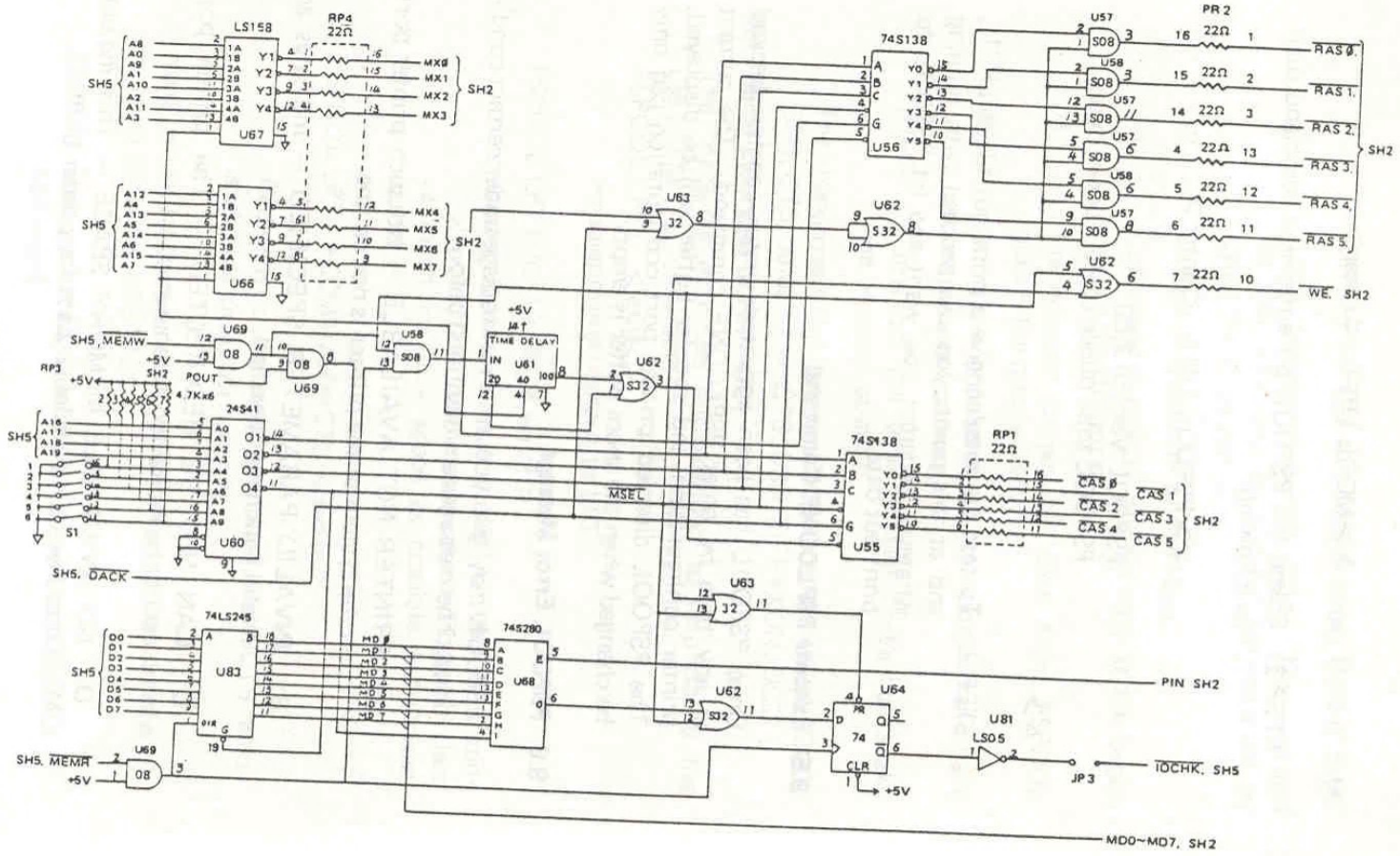
A: PRINTER NOT AVAILABLE – No such printer port in the system or the printer is not on line.

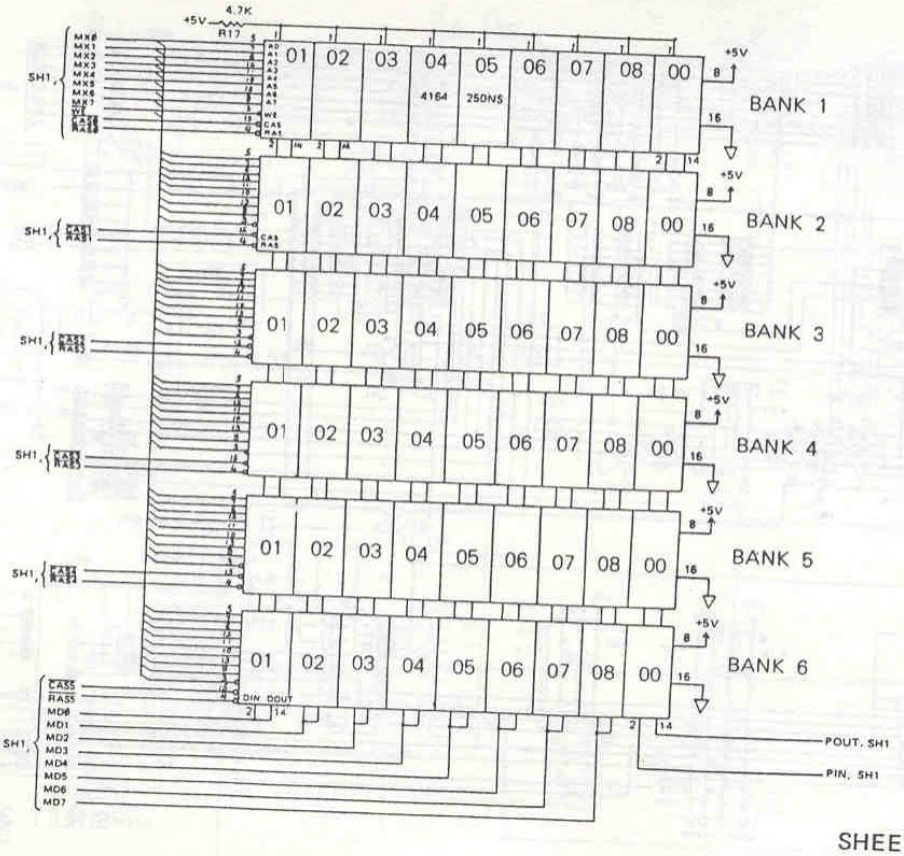
B: INVALID PARAMETER SPECIFIED – Indicates an invalid parameter specified.

C: CAN NOT BE REDIRECTED – The printer port cannot be redirected as requested.

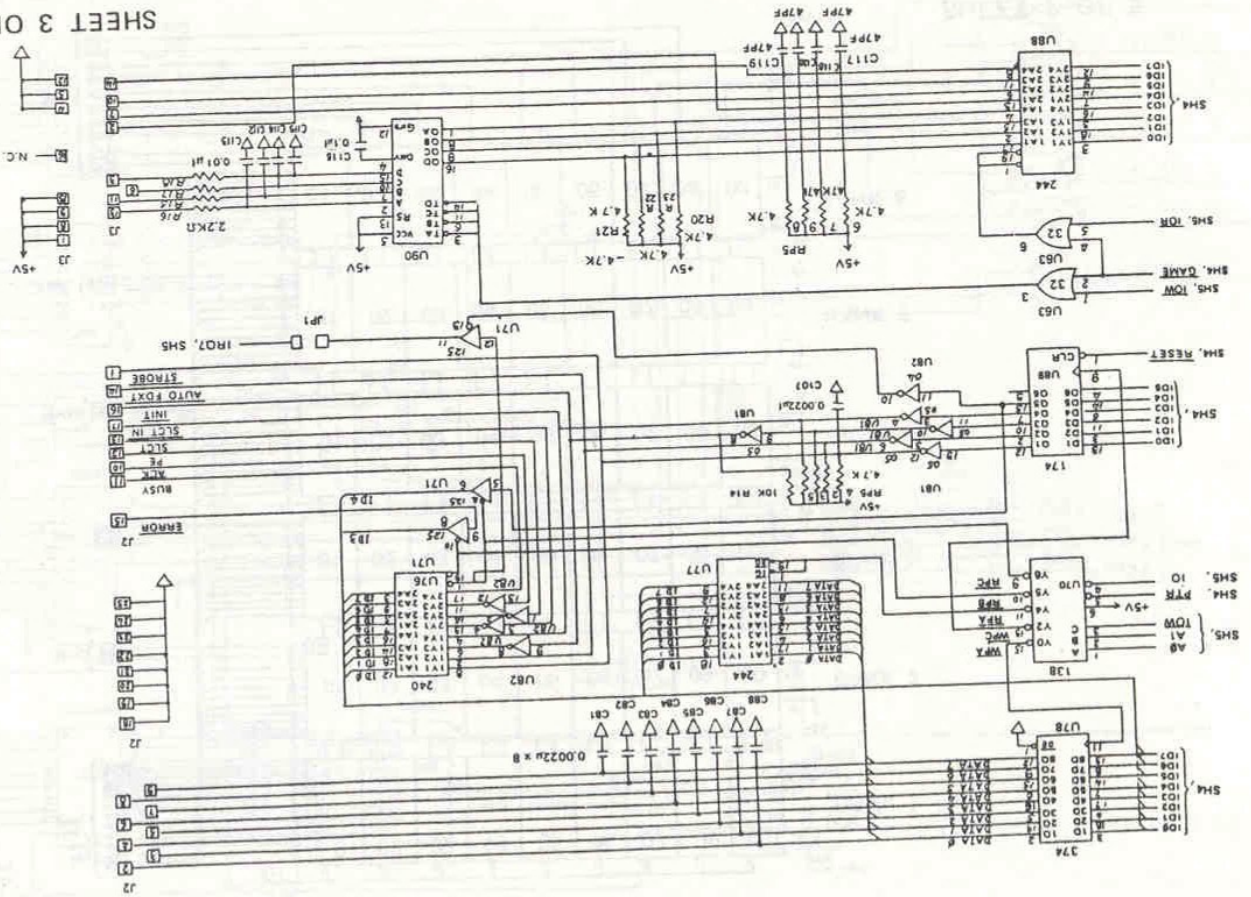
D: NO AVAILABLE MEMORY SPACE – This indicate that there is no available space for printer buffer.

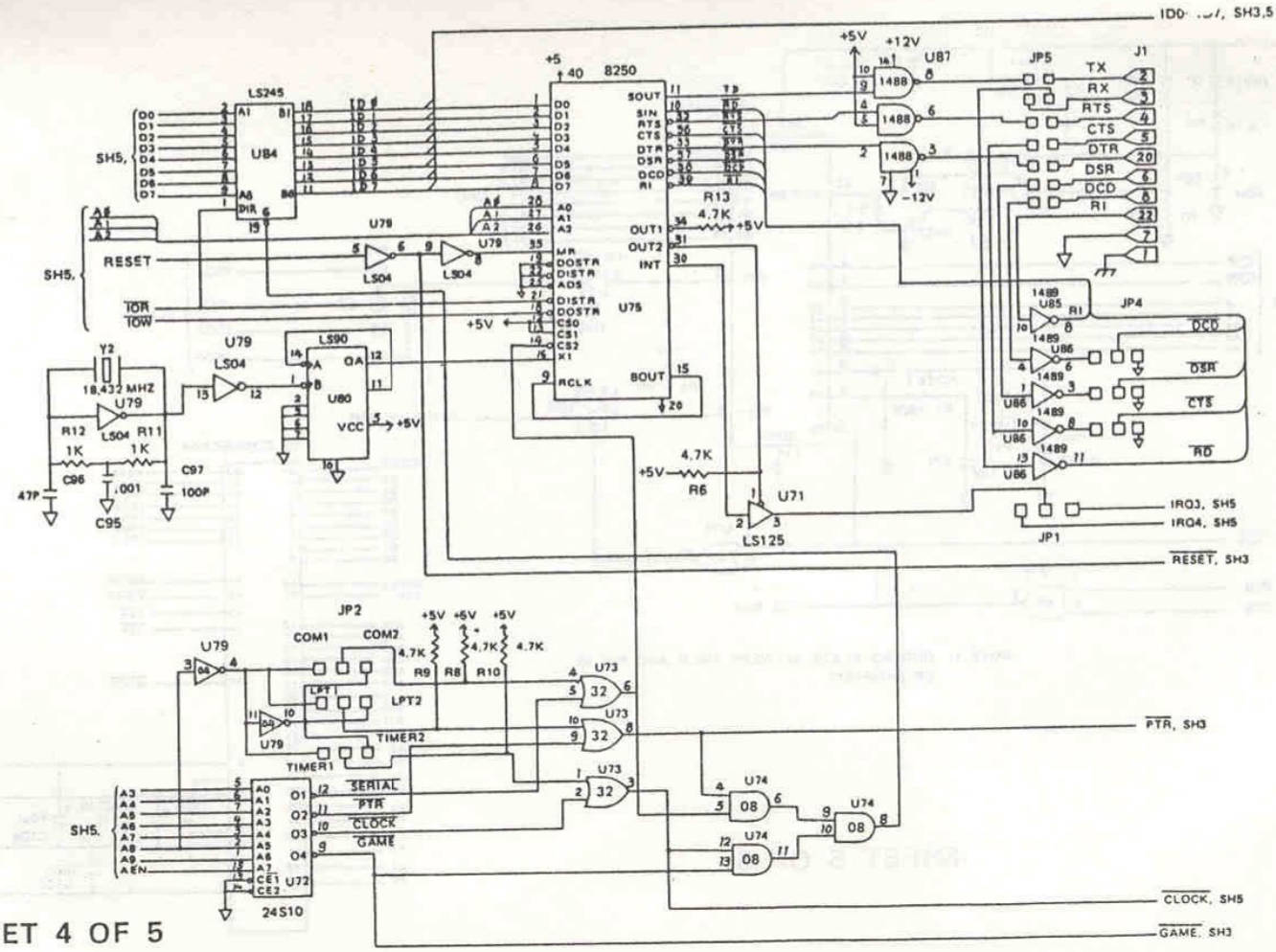
SHEET 1 OF 5



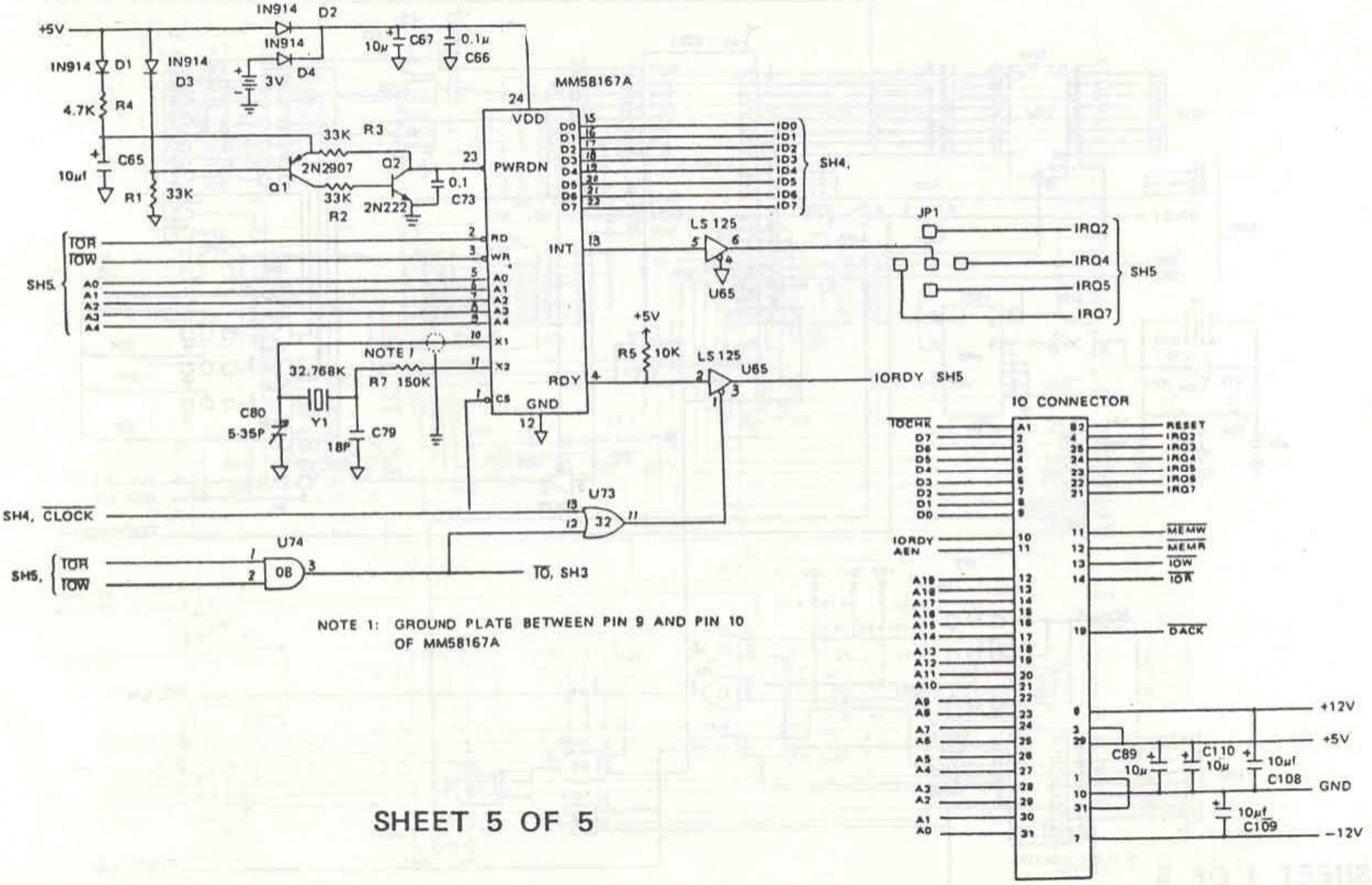


SHEET 2 OF 5


SHEET 3 OF 5


8250
LS245
U84
U79
LS04
LS90
U80
Y2
18.432 MHZ
R12
R11
1K
C96
C95
C97
100P
.001
47P
R13
4.7K
R6
U71
LS125
U87
1488
JP5
J1
TX
RX
RTS
CTS
DTR
DSR
DCD
RI
JP4
1489
JP1
JP2
COM1
COM2
LPT1
LPT2
TIMER1
TIMER2
R9
R8
R10
U73
32
U74
08
U72
24S10
SERIAL
PTR
CLOCK
GAME
SH5.
SH4.
SH3.
IRQ3, SH5
IRQ4, SH5
RESET, SH3
PTR, SH3
CLOCK, SH5
GAME, SH3

SHEET 4 OF 5



NOTE 1: GROUND PLATE BETWEEN PIN 9 AND PIN 10 OF MM58167A

SHEET 5 OF 5