384K

MULTIFUNCTION CARD

DOC : CB004

PART I. MFPLUS

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PART I.

I. INTRODUCTION

1.1 About this manual

This manual describes the use and operation of the MFPLUS Utility programs. The programs will work satisfactorily on most expension cards that are available for IBM PC-1, PC-2 or PC-XT Personal Computer and should be executed under all current releases of PC-DOS.

The MFPLUS Utility diskette supports six utility programs as following:

RAMDISK. COM – A program which simulates floppy disk drives with your PC system RAM. It makes you access data of execute program much faster than the floppy disk.

RAMHELP. COM – This utility lists the RAMDISK operation menu, gives you a brief listing of all options, types and their meanings. When you hesitate how to enter your command, execute this utility to get operation manual.

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 PC system interrupt.

PSPLHELP. COM – This utility list the PSPOOL operation menu, gives you a brief listing of all options, types and their meanings.

When you hesitate how to enter your command, execute this utility to get operation manual.

PSPL CONF. COM – A program which displays the message of current PSPOOL status.

1.2 Back up your MFPLUS Utility Programs

The MFPLUS Utility diskette is a single-side, 8 sector nonsystem diskette, can be used with PC-DOS 1.1 and DOS 2.0 The following steps tell you how to back up the MFPLUS Utility programs.

Step 1: Write – Protect your original MFPLUS Utility diskette Put a tab on the original diskette. This will prevent accidental erasure during the coping process.

Step 2: Boot PC system

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

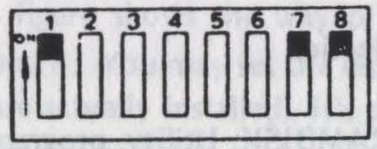
(i) If you have only one floppy drive, type COPY B:*.* A: <enter>
The system will prompt you to change source and destination diskette for coping programs.

(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:

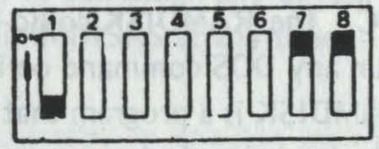
Step 4: The MFPLUS Utility Programs will be copied to your diskette.
Note: The MFPLUS Utility diskette should be kept in a safe place and should not be used during system operation.

SWITCH 1

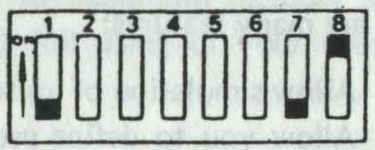
0-Drives



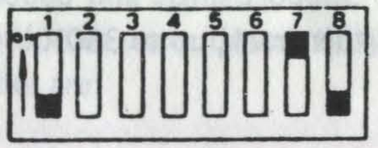
1-Drives



2-Drives



3-Drives



4-Drives

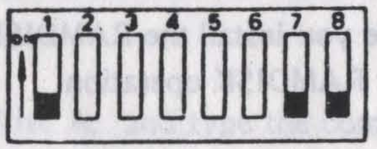


Fig: 1

II. RAMDISK

2.1 Introduction

The RAMDISK Utility programs allow you assign RAM space for use as up to four RAMDISKS, that will enhance the processing speed of PC. The RAMDISK could be thought as a floppy-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.

There are many features:

* Allow simulation of up to four disk drives.
* Allow you to define users memory space and RAMDISK size.
* Support single and double side drives, eight or nine sector per track, up to 360K in size.

2.2 Prepare your RAMDISK on Personal Computer

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 up the PC as described below, you don't need any hardware preparation.

(i) 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. These drive number must include

the RAMDISKS.

Refer to figure 1, 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 or D) to your RAMDISKS at any time.

(ii) Memory Setting

Refer to your PC Technical Reference Manual for memory setting, set the switch to maximum memory size of the system, this allows you full using of your memory spce.

2.3 Getting Start

To start the RAMDISK, you must copy three utility programs into your DOS diskette, the utilities are:

RAMDISK. COM
RAMHELP. COM
DISKCONF. COM

Insert the DOS diskette in drive A. and type the command you want to execute.

2.3.1 RAMDISK Help Command

RAMDISK Help Command is one of the RAMDISK Utility programs. It provides an operation manu, after you type the

command: RAMHELP, the screen will display as follows:

** 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 programs.
/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.

2.3.2 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 in which they must be entered.

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

RAMDISK X: [/M=X X X] [/U=X X X] [/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 or D.

/1 or /2: Side specification, creates a single-side drive with /1 option, the default drive size is 160K for DOS1.1, 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, default side specification is /2.

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

/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 RAMISK will reserve a minimum default program space of 64K memory space.

2.4 Some Examples About RAMDISK

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

RAMDISK B: <enter>

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 >

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 creating and using a RAMDISK.

Step 1: Creat 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 *.* D: <enter>

Step 3: Set drive to D:
Type:

D: <enter>

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

2.5 Execute the DISKCONF Command.

DISKCONF Command is one of the RAMDISK Utility program. 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 xxxxx bytes.
RAMDISK X: 2 sides 9 sectors, total xxxxx bytes.

. .
. .
. .

2.6 RAMDISK Error Message

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

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.

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

XXXXX Bytes Short – This is a message indicate the number of insufficient memory space that you specified for memory allocation.

RAMDISK CAN NOT BE REPLACED! – It attempts to specify an installed RAMDISK name.

INVALID PARAMETERS SPECIFIED! – It indicates an invalid parameter specified.

III. PSPOOL

3.1 Introduction

The PSPOOL Utility program is a print spooler which provids queued 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 queue, the PSPOOL program will handle output to the printer at printer speed.

PSPOOL has the following features:

* Provides queued output of print data to either a parallel or serial printer.
* Allows you to define the size of the spooler queue.
* Allows stop/restart, and line-per-page controls.

3.2 Prepare your PSPOOL on Personal Computer

Refer to your PC technical reference manual for memory setting to set the switch to maximum memory size of the system, this allows you full using of your memory space. Prior to entering your 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 serial printer, you must do the following:

1. Refer to DOS MODE command, initializes the Asynchronous Communications Adapter by using option 3.
2. Using PSPOOL command to redirect LPT1: to serial printer.

3.3 Getting Start

To start the PSPOOL, you must copy three utility programs into your DOS diskette, the utilities are:

PSPOOL. COM
PSPLHELP. COM
PSPL CONF. COM

Insert the DOS diskette into drive A, and type the command you want to execute.

3.3.1 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, the screen will display as following:

** PSPOOL HELP INFORMATION **
Command Format:

PSPOOL LPTn: [= COMn:] [/U=XXX] [/M=XXX] [/L=XX] [/S]
[/C] ½/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 options.
[ ] – Indicates an optional term. The [ ] is not part of the input.

3.3.2 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 in which they must be entered. 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 PSPOOL 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 that you must initialize the Asynchronous Communication Adapter by using DOS command MODE before you select this option.

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

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

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

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

/C: Continue output of print data.

/R: Continue output of print data at the beginning of the current page.

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

/ON= Turn on serial printer port handshake line protocol options.

/OFF= Turn off serial printer port handshake line protocol options.

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

3.4 Some Examples About 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. Use as much memory space as possible for spooler queue.

PSPOOL LPT1:=COM1: /ON= CTS

Redirects to 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 DOS for PSPOOL by using 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.

3.5 Execute PSPL CONF Command

Once PSPOOL has been activated, status can be checked at any time by enter PSPLCONF command. The current printer configuration and spooler queue will be displayed.

The PSPOOL directed printer port configuration can be changed when the spool queue is empty.

3.6 PSPOOL Error Message

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

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

INVALID PARAMETER SPECIFIED – It indicates an invalid parameter specified.

CAN NOT BE REDIRECTED – Redirect parameter specified error.

NO AVAILABLE MEMORY SPACE – This indicate that there are no available space for printer queue.

I. INTRODUCTION

The MF-100 is a flexible and powerful multifunction enchancement product for the IBM Personal Computer (PC) family. MF-100 provides memory expansion upgradeable to the maximum addressable user memory in the new PC and PC-XT systems. It is also a powerful data I/O accessory; standard features include the real-time Clock-Calendar with battery backup, a RS-232 asynchronous serial communication port, and a parallel printer port. An optional game adapter port is also provided.

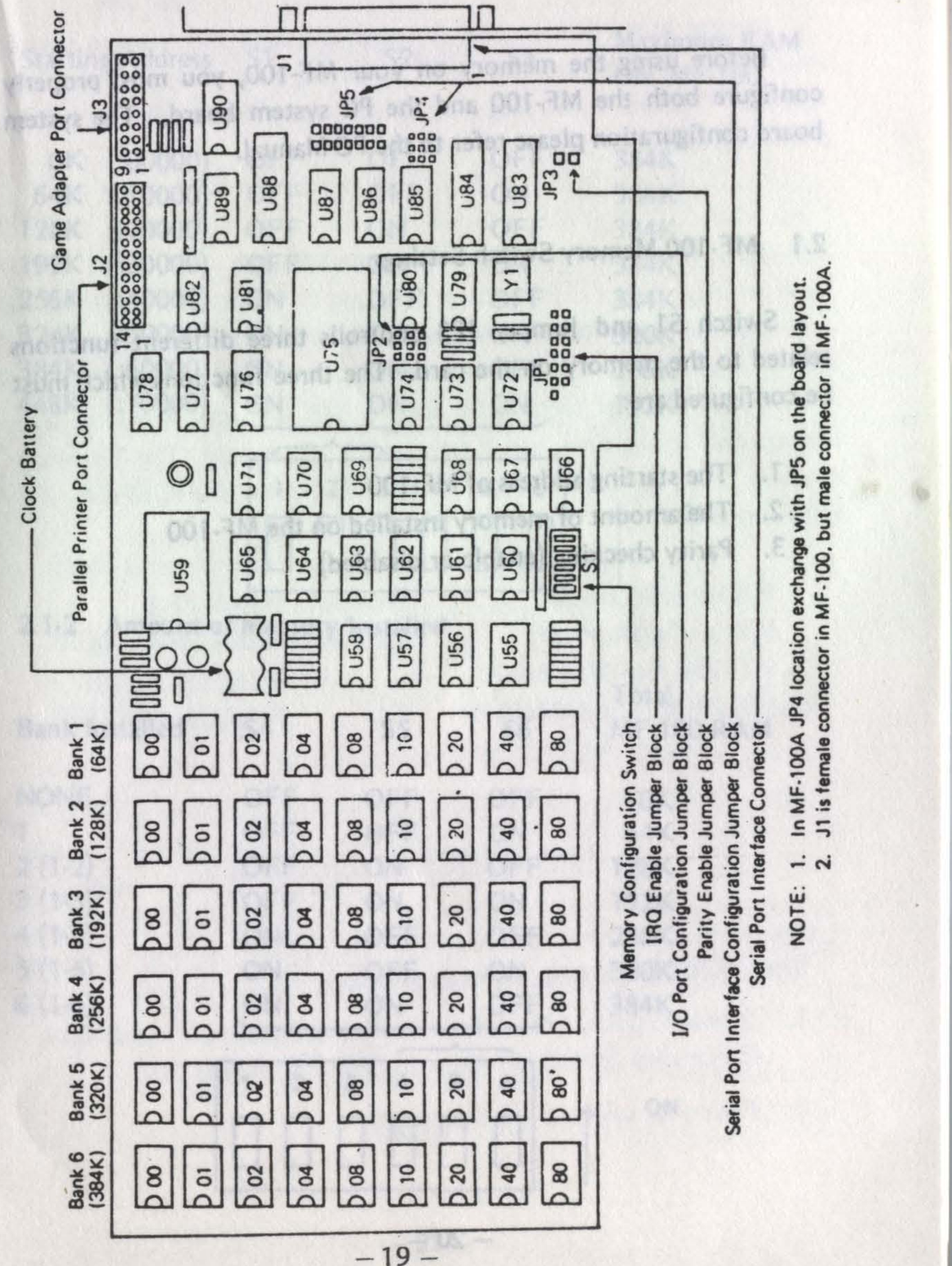
1.1 Standard Features

1. 64K RAM Memory.
2. An RS-232C serial interface to be used with a Modem, serial printer, Remote display terminal, or other serial device, or as an asynchronous communications port to another computer or peripheral operating under seperate asynchronous communications software control.
3. A parallel printer port to be used for connecting a parallel printer to the PC.
4. A Real-time clock-calendar with battery backup so that you don't have to reenter the time and date every time you start your system. The battery power is only used when your system is turned off.
5. The MF-100 utility diskette containing clock software, That support the clock-calendar. RAMDISK, PSPOOL Software are all also Provided. These software are described in MFPLUS manual.

1.2 OPTIONS

1. Memory expansion available in 64K increments up to 384KB. The 384K on the MF-100 Added to 256K on the PC-XT System board provides 640K, the maximum addressable User memory for these systems.
2. A game adapter port which can be used with an IBM compatible joystick. Add the upgrade kit MF-100G which contains 2 ICs and a cable.

1.3 MF-100 BOARD LAYOUT AND A BRIEF DESCRIPTION



NOTE: 1. In MF-100A JP4 location exchange with JP5 on the board layout.
2. J1 is female connector in MF-100, but male connector in MF-100A.

PART II.

II. MF-100 MEMORY CONFIGURATION

Before using the memory on your MF-100, you must properly configure both the MF-100 and the PC system board. The system board configuration please refer to the PC Manual.

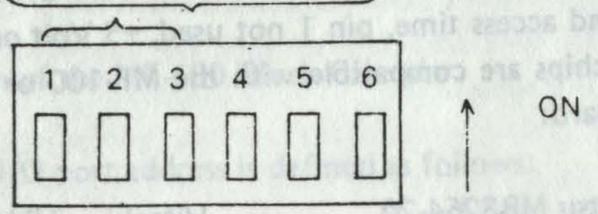
2.1 MF-100 Memory Switch Settings

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

1. The starting address of MF-100
2. The amount of memory installed on the MF-100
3. Parity checking (enable or disabled)

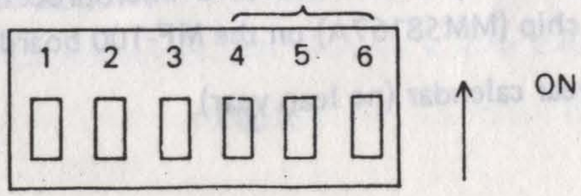
2.1-1 Set the Starting Memory Address

Starting Address	S1	S2	S3	Maximum RAM ON MF-100
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
32ϕK (: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-100 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-100 memory parity check is disabled.

2.2 Installing Additional Memory on the MF-100

A MF-100 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-100 or the PC and PC-XT system board:

Fujitsu MB8264-20	Hitachi	HM4864P-3
Micron Technology	Motorola	MCM6665AL-20
MT4264-3 or MT4264-20	or	MCM6665AP-20
Mitsubishi M5K4164NS-20	T.I.	TMS4164-20NLJ

III. 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-100 board.
2. Four-year calendar (no leap year)

3. Battery back up power supply (battery life approximately one year)
4. User-replaceable Lithium battery
5. Full PC-DOS Compatiblity.

The clock utility program GETCLOCK. COM and SETCLOCK. COM are supplied on your MF-100 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. Optional CP/M-86 and CCP/M-86 clock utility software is available from your dealer.

3.1 Configuration of the MF-100 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

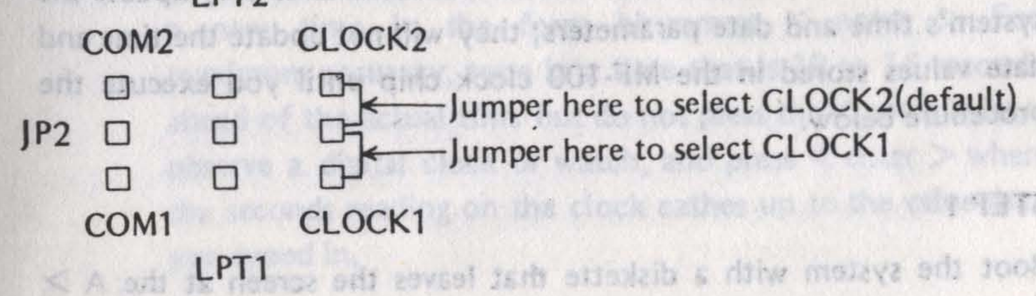


Fig. 2

Jumper setting as Fig. 2 to select clock 1 or clock 2, but only one can be select 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 MF-100 clock and other devices installed in your PC.

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-100 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 MF-100 TIME and DATE

You need to execute the SETCLOCK Utility whenever you want to correct the time or date of the MF-100 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-100 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 used before or you just replaced the Lithium battery, 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 just load into PC system by 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.

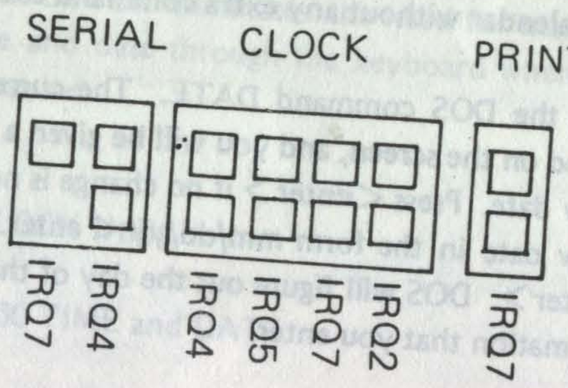
Step 4 Enter the DOS command TIME. The current date will be printed on the screen, and you will be given a chance to enter a new time. Press < enter > if no change is necessary or type a new time in the form hh:mm:ss < enter > For maximum accuracy, type in a time that is 10 to 15 seconds ahead of the 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-Calenda. feature of the MF-100 does normally need or support interrupts. By writing your own software, however, it is possible to program the MF-100 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 on the MF-100 by installing a shorting plug on the appropriate position of the interrupt select jumper block JP1 shown in figure 3:



2. Obtain data sheets for the National Semiconductor MM 58167AN clock chip from your local National Semi-conductor 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 Manuàl.

3.5 Preparing your Working DOS Diskettes

After installing your MF-100, you must prepare your working DOS diskettes to automatically initiallze 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 diskette supplied with your MF-100.

Step 2 If your working DOSdiskette 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 AUTOEXEC 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 Adress	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-days 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 (-80)
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 rest format

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

IV. PARALLEL PRINTER PORT

The MF-100 has a standard feature for interfacing the PC to a parallel printer such as the IBM/Epson MX-80. This port is completely compatible with the IBM PC and uses the same femal DB25 connector as an IBM port.

4.1 Configuration of the MF-100 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-100 has been configured at the factory to respond as LPT1. It can be configured to be LPT2 by moving the jumper to select LPT2.

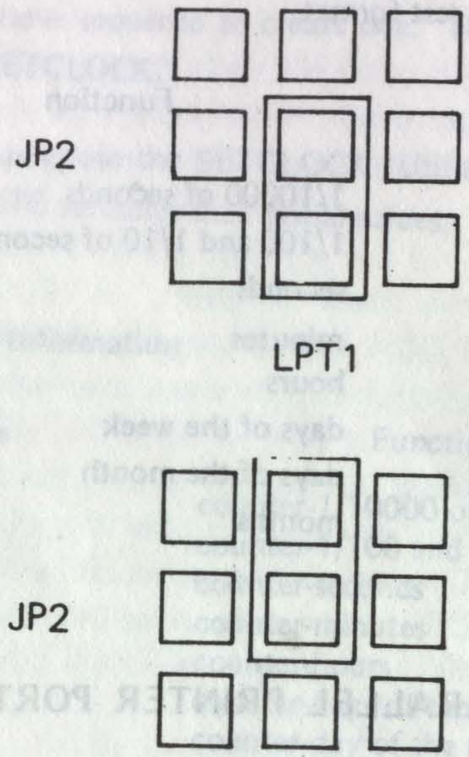


Fig. 4 Parallel Port Configuration

4.2 Parallel Port I/O Port Assignment and pinouts

The parallel port on the MF-100 uses the following system I/O ports:

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

PARALLEL PORT SIGNAL LINE CONFIGURATION

Line Name	J2 Pin	MF-100 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-100 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 50 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 50 cm cable plugs into J2 on the MF-100, while the cable from the printer plugs into the DB25S connector at the opposite end. Note that one edge of the 50 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-100.

V. SERIAL PORT

MF-100 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 a RS-232C interface. The MF-100A interface is a HOST/DTE type (Data Terminal Equipment) with a male. DB25 connector. (MF-100 use a female BD25S connector)

5.1 Configuration of the MF-100 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.

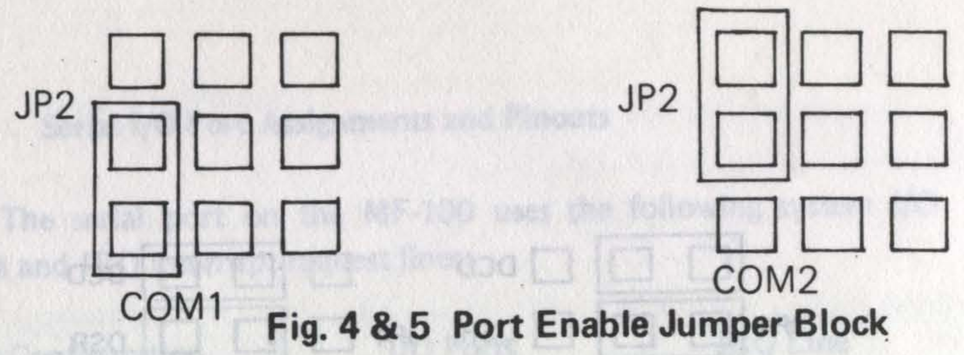


Fig. 4 & 5 Port Enable Jumper Block

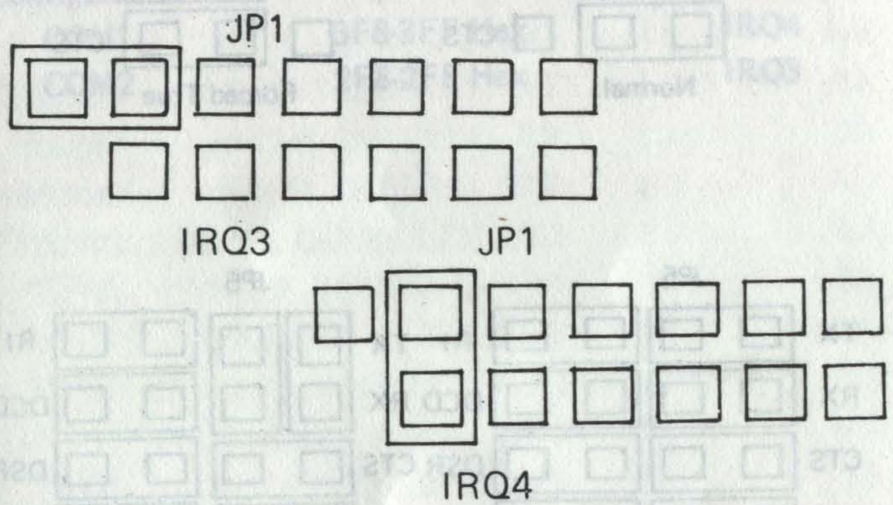
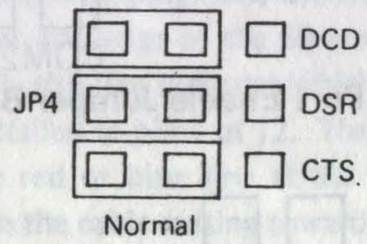
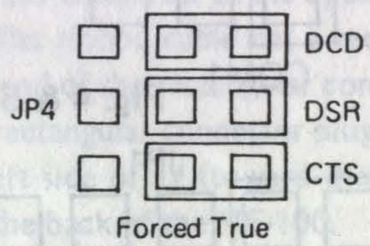


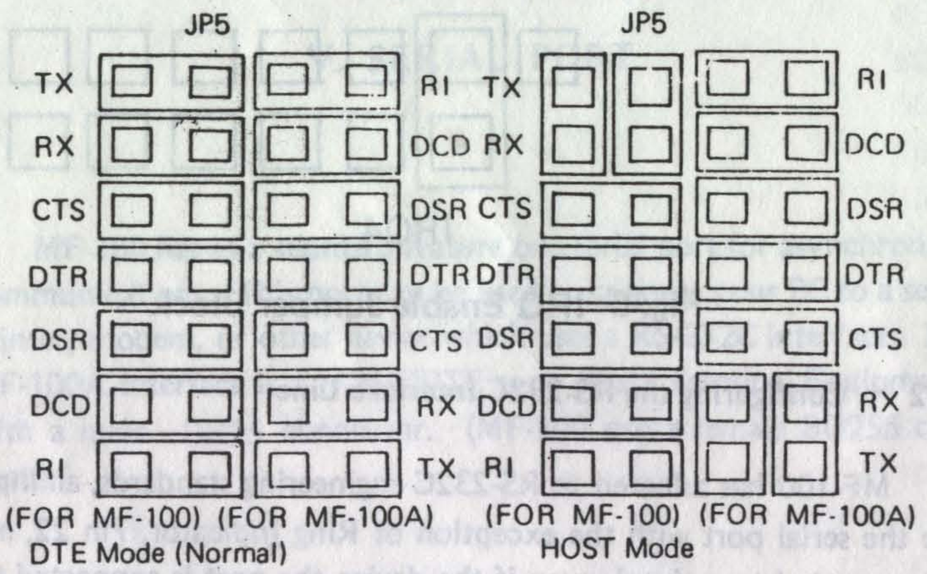
Fig. 6 IRQ Enable Jumper Block

5.2 Configuring the RS-232C Interface Line

MF-100 has adhered to RS-232C engineering standards, all inputs to the serial port with the exception of Ring Indicator, Pin 22, must be conected 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 two or more different serial devices at different times.

5.3 Serial I/O Port Assignments and Pinouts

The serial port on the MF-100 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-100 are as follows:

RS-232 Name	J1 pin #	Singnal 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

VI. GAME ADAPTER PORT

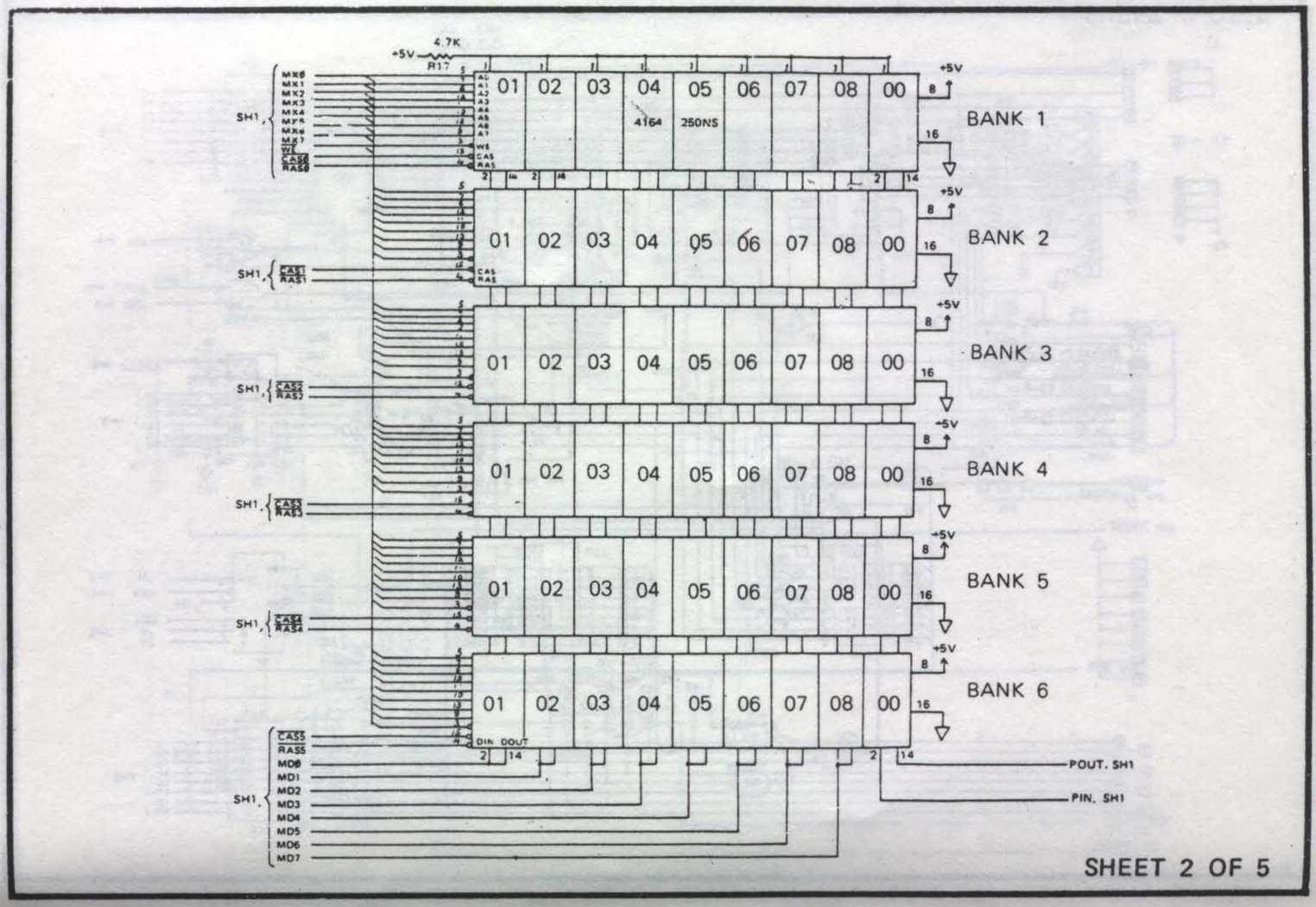
Game Adapter Port is optional to the MF-100 users, it can be used by installing a IC (NE558) in U90 and IC (74LS244) in U88, with one game adapter cable, IBM-compatible joy stick may be used.

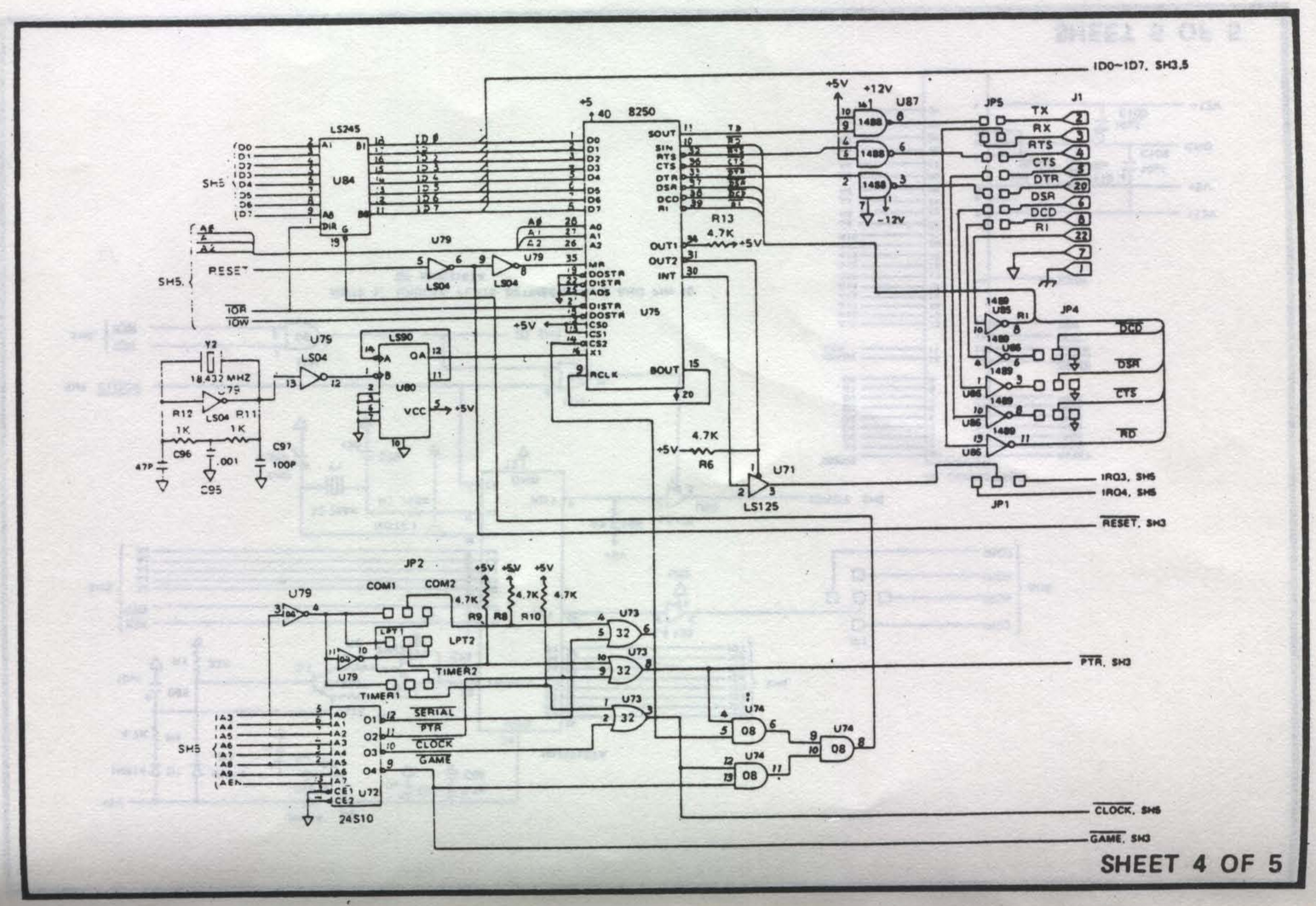
6.1 Game Port Pinout

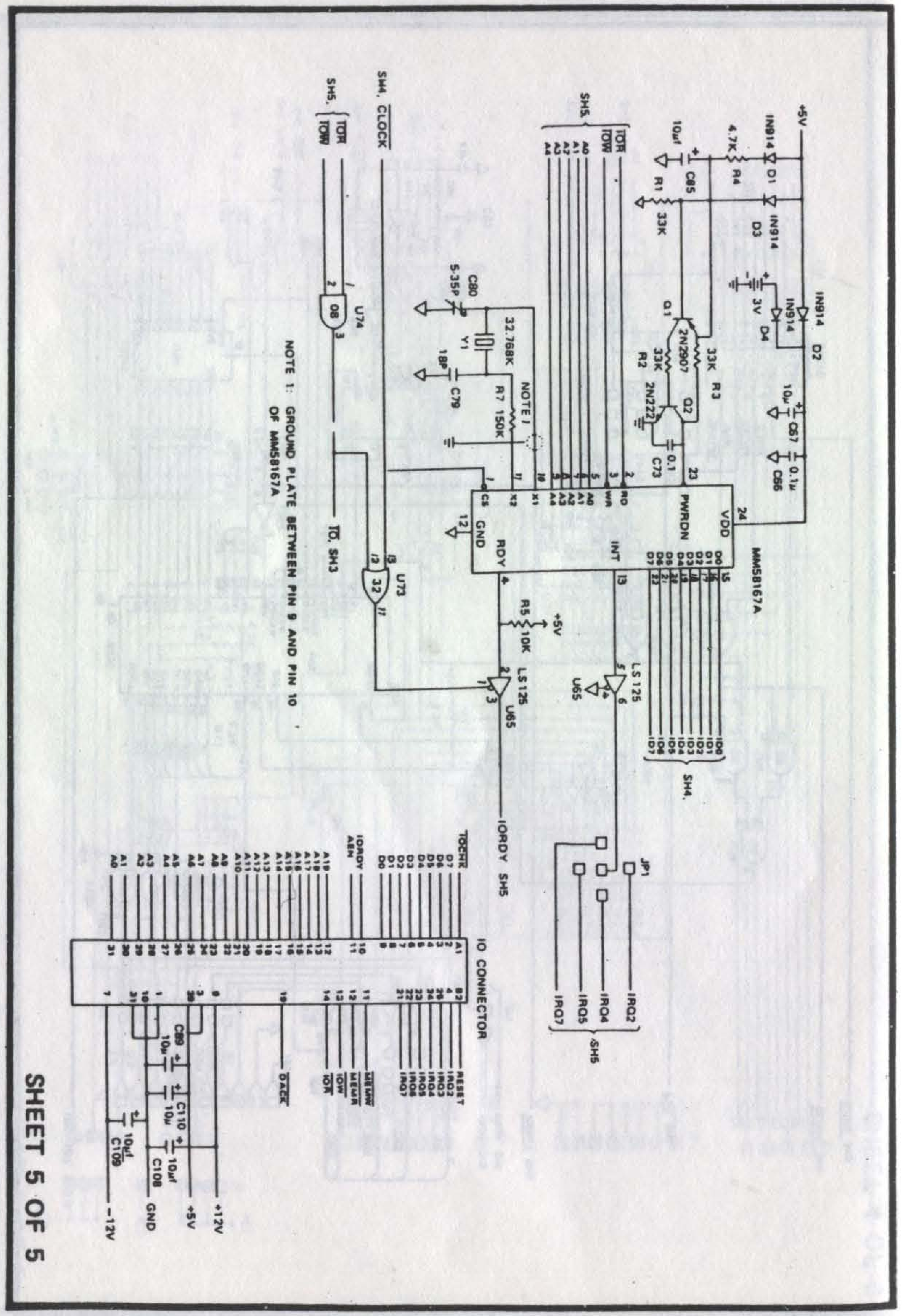
Line Name	J3 Pin	MF-100 Adapter Cable Output DB-15 S
+5VDC	1	1
Button 4	2	2
Position 0	3	3
Ground	4	4
Position 1	6	6
Button 5	7	7
+5VDC	8	8
+5VDC	9	9
Button 6	10	10
Position 2	11	11
Ground	12	12
Position 3	13	13
Button 7	14	14
+5VDC	15	15

6.2 Installing the Game Port Cable

The game port cable is optional to MF-100, user can get it from dealer to bring the game port interface out the rear of the PC. This cable is approximately 50 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-100, and mount the bracket on the rear panel. The rectangular connector plug into the J3 on MF-100 with red or blue color sie of ribbon cable as Pin 1. The IBM-compatible joy-stick DB15P male connector connect to the DB15S connector. Then the user can enjoy the game by executing game software with the joystick.


4.7K
+5V
R17
MX0
MX1
MX2
MX3
MX4
MX5
MX6
MX7
WE
CAS0
RAS0
SH1
01
02
03
04
05
06
07
08
00
4164
250NS
BANK 1
BANK 2
BANK 3
BANK 4
BANK 5
BANK 6
CAS1
RAS1
CAS2
RAS2
CAS3
RAS3
CAS4
RAS4
CAS5
RAS5
DIN
DOUT
MD0
MD1
MD2
MD3
MD4
MD5
MD6
MD7
POUT, SH1
PIN, SH1
SHEET 2 OF 5
LS158
RP4
22Ω
U67
U66
SH5
SH2
A8
A0
A9
A1
A10
A2
A11
A3
A12
A4
A13
A5
A14
A6
A15
A7
74S138
U56
U57
U58
S08
U62
S32
U63
32
PR2
RAS 0.
RAS 1.
RAS 2.
RAS 3.
RAS 4.
RAS 5.
WE. SH2
U69
08
SH5, MEMW
+5V
POUT
SH2
RP3
4.7K×6
24S41
U60
S1
SH5. DACK
MSEL
U55
RP1
CAS 0
CAS 1
CAS 2
CAS 3
CAS 4
CAS 5
U61
TIME DELAY
74LS245
U83
74S280
U68
SH5. MEMR
PIN SH2
U64
74
CLR
U81
LS05
JP3
IOCHK. SH5
MD0~MD7. SH2
SHEET 1 OF 5


ID0~ID7, SH3,5
8250
LS245
U84
U79
LS04
U75
LS90
U80
18.432 MHZ
R12 1K
R11 1K
C96
C95
C97
100P
R13 4.7K
R6 4.7K
U71
LS125
U87
1488
JP5
J1
TX
RX
RTS
CTS
DTR
DSR
DCD
RI
JP4
1489
IRQ3, SH5
IRQ4, SH5
RESET, SH3
JP2
COM1
COM2
LPT1
LPT2
TIMER2
TIMER1
SERIAL
PTR
CLOCK
GAME
U73
32
U74
08
24S10
PTR, SH3
CLOCK, SH5
GAME, SH3
SHEET 4 OF 5
374
U76
244
U77
U70
240
U82
U76
U71
ERROR
BUSY
ACK
PE
SLCT
SLCT IN
INIT
AUTO FDXT
STROBE
IRQ7, SH5
U81
RP5
10K R14
C107
U83
U85
U86
U90
2.2KΩ
C116 0.1μf
0.01μf
N.C
C117 47PF
C118 47PF
C119 47PF
SHEET 3 OF 5


MM58167A
IO CONNECTOR
NOTE 1: GROUND PLATE BETWEEN PIN 9 AND PIN 10 OF MM58167A
SHEET 5 OF 5