EPSON

Product Support Bulletin

Subject: Proper Method for Running Benchmark and Diagnostics Programs

Date: 06/04/93   PSB No: S-0158
Page(s): 1 of 1   Originator: MWT

This bulletin describes the proper method for running any benchmark or diagnostics programs. This applies to any computer system.

In most cases, the computer should be started using an MS-DOS boot diskette that's 'clean' - in other words, one with no CONFIG.SYS or AUTOEXEC.BAT files. The appropriate executable can then be run, either from diskette or hard drive.

There will be some exceptions to the above rule. In attempting to benchmark or troubleshoot any add-on that requires a device driver (CD-ROM, local area network, etc.), obviously the necessary device driver(s) must be loaded. Also, some programs will require a minimum number of FILES or BUFFERS to be defined in the CONFIG.SYS file. Such programs will usually display this requirement if they are run without the necessary CONFIG.SYS file.

For the most consistent results, use the absolute minimal boot configuration that's allowed by the hardware being tested.

Product Support Bulletin

Subject: Equity/Apex Compatibility with the SOTA 386si

The purpose of this bulletin is to provide the 80386 Accelerator board test results, conducted by the Computer Product Support Center, involving the SOTA 386si from SOTA Technology, inc.

The Equity models tested were the Equity I, Equity II Equity I + and Equity Ie. The Apex models tested were the Apex, Apex Plus and Apex 100. All were tested with Norton Utilities and MS - DOS.

The table below shows compatibility and the Norton SI rating of the various systems.

Model	Norton SI	Compatibility
Equity I	12.0	Functioned normally with Norton Utilities and MS- DOS 2.11
Equity I+	12.0/16.9	Functioned normally with MS - DOS 3.3 and Norton Utilities at both CPU speeds.
Equity Ie	NA	Unable to boot at 10MHz. Performance erratic at 4.77MHz
Equity II	14.3	Functioned normally with MS - DOS 3.2 and Norton Utilities. (Tested only at 7.16MHz.)
Apex	15.9	Unable to boot at 4.77MHz. Functioned normally at 8MHz with MS - DOS 3.2 and Norton Utilities.
Apex Plus	11.5	Unable to boot at 9.54MHz. Functioned normally at 4.77MHz with MS - DOS 3.2 and Norton Utilities.
Apex 100	12.0/16.9	Functioned normally with MS - DOS 3.3 and Norton Utilities.

Installation of the board in most of the units was quick and simple to do when following the installation instructions accompanying the boards. Installation of the SOTA 386si in the Equity I and the Equity II is rather difficult. Due to the amount of disassembly required, we strongly recommend that only Authorized Service Centers install the board in the Equity I and Equity II.

<u>Installation Instructions</u>

Equity I

1. Remove the following from the main unit:
    a) upper case
    b) rear panel
    c) front panel
    d) FDD/power supply block.

2. Follow instructions for a standard installation for the SOTA 386si in an 8088 - based system.   Take care to fold the SOTA connector cable so as not to prevent reassembly.   The cable is sturdy and will tolerate being folded.

3. Reassemble the main unit and go through the testing and initialization procedure outlined in the SOTA manual.

Equity II

1. Remove the following from the main unit:
    a) upper case
    b) rear panel
    c) front panel
    d) FDD/power supply block.

2. Follow instructions for a standard installation for the SOTA 386si in an 8086 - based system.   Take care to fold the SOTA connector cable so as not to prevent reassembly. This will necessitate routing the cable so that it does not conflict with the power connection to the main system board. The cable is sturdy and will tolerate being folded.

3. Reassemble the main unit and go through the testing and initialization procedure outlined in the SOTA manual.

Our Computer Product Support Center receives numerous calls requesting information and recommendations on 80386 Accelerator boards for use with the Equity and Apex (8088- and 8086 - based) personal computers.

We have found that the SOTA 386si may meet your requirements and are competitively priced!

Although these boards were tested by qualified product support specialists, Epson America makes no representations that these third party products are compatible with all hardware configurations or software applications.

We recommend that you certify these products with your specific hardware and software requirements and consult with the third party vendor to ensure reliable operation.

SOTA Technology can be reached at:

> SOTA Technology, Inc.
> 657 N. Pastoria Ave.
> Sunnyvale, CA 94086
> Phone: (408) 245 - 3366

Product Support Bulletin

Subject: Equity and Apex Series Compatibility with the Sysgen OmniBridge Controller and BridgeFiler External Floppy Drives

The purpose of this bulletin is to provide the results of compatibility testing conducted by the Computer Product Support Center with the Sysgen OmniBridge controller and Bridge - Filer external floppy disk drives.

Model	Comments
Equity I	The Equity I was found compatible with the OmniBridge controller. It was able to support one or two external disk drives (daisychained) together. The external drives could be used as high density (1.2M and 1.44M) or normal (360K and 720K) disk drives.
Equity II	The Equity II was found to be totally incompatible with the OmniBridge controller.
Equity III	The Equity III was found compatible with the OmniBridge controller. It was able to support one or two external disk drives (daisychained) together. The external drives could be used as high density (1.2M and 1.44M) or normal (360K and 720K) disk drives.
Equity I +	The Equity I + was found compatible with the OmniBridge controller. It was able to support one or two external disk drives (daisychained) together. The external drives could be used as high density (1.2M and 1.44M) or normal (360K and 720K) disk drives.
Equity le	The Equity le was found compatible with the OmniBridge controller. It was able to support only one external floppy drive, unlike the other models tested. The drive could be used as a high density (1.2Mb and 1.44Mb) or normal (360K and 720K) disk drive.

Equity II +   The Equity II + was found compatible with the
                     OmniBridge controller.   It was able to support one or
                     two external disk drives (daisychained) together. The
                     external drives could be used as high density (1.2M and
                     1.44M) or normal (360K and 720K) disk drives.

Equity IIe   The Equity IIe was found compatible with the
                     OmniBridge controller.   It was able to support one or
                     two external disk drives (daisychained) together. The
                     external drives could be used as high density (1.2M and
                     1.44M) or normal (360K and 720K) disk drives.

Equity III +   The Equity III + was found compatible with the
                     OmniBridge controller.   It was able to support one or
                     two external disk drives (daisychained) together. The
                     external drives could be used as high density (1.2M and
                     144M) or normal (360K and 720K) disk drives.

Equity 386SX   The Equity 386SX was found compatible with the
                     OmniBridge controller.   It was able to support one or
                     two external disk drives (daisychained) together. The
                     external drives could be used as high density (1.2M and
                     144M) or normal (360K and 720K) disk drives.

Equity 386/20   The Equity 386/20 was found compatible with the
                     OmniBridge controller.   It was able to support one or
                     two external disk drives (daisychained) together. The
                     external drives could be used as high density (1.2M and
                     1.44M) or normal (360K and 720K) disk drives.

APEX   The Epson APEX was found compatible with the
                     OmniBridge controller.   It was able to support one or
                     two external disk drives (daisychained) together. The
                     external drives could be used as high density (1.2M and
                     1.44M) or normal (360K and 720K) disk drives.

APEX +   The Epson APEX was found compatible with the
                     OmniBridge controller.   It was able to support one or
                     two external disk drives (daisychained) together. The
                     external drives could be used as high density (1.2M and
                     1.44M) or normal (360K and 720K) disk drives.

APEX 100   The Epson APEX 100 was found compatible with the OmniBridge controller. It was able to support one or two external disk drives (daisychained) together. The external drives could be used as high density (1.2M and 1.44M) or normal (360K and 720K) disk drives.

APEX 200   The Epson APEX 200 was found compatible with the OmniBridge controller. It was able to support one or two external disk drives (daisychained) together. The external drives could be used as high density (1.2M and 1.44M) or normal (360K and 720K) disk drives.

NOTE: The recommended switch settings for the OmniBridge controller are as follows:

          1-1 DOWN   2-1 DOWN
          1-2 DOWN   2-2 DOWN
          1-3 DOWN   2-3 UP
          1-4 DOWN   2-4 UP

These settings select NO ADDRESS for the OmniBridge BIOS and allow it to coexist with the internal FDC of the computer in which it is being installed. This way you do not need to disable the internal FDC or connect any cables from the OmniBridge to internal floppy drives. This was found to be a universal setting for all of the computers listed above as compatible with the OmniBridge controller.

Product Support Bulletin

Subject: Apex / Apex Plus / Equity Series Keyboards

Date: 4/19/89
Page: 1 of 1

PSB No: S-0080
Originator: REM

The purpose of this bulletin is to provide information on the various keyboards used with the Apex, Apex Plus and Equity series computers and the part numbers of the keyboard subassemblies used with these keyboards.

The Apex and Apex Plus computer keyboards are to be replaced as whole units.

The Equity series keyboards are repaired to the subassembly level.   The Equity III keyboard PCB assembly is the only one that comes with the key top set attached.

Since some of the keyboards have the same model numbers, the difference can be determined by the FCC ID number in those cases.

The chart below provides a quick reference to determine the part number of the main keyboard PCB assembly, key top set, control logic subassembly, and keyboard cable.

Apex / Apex Plus

Model	Keyboard Unit
Apex	A265091A
Apex Plus	93553905410

Equity I, II, III

Model	Keyboard PCB Assy	Key Top set	Keyboard Cable
Equity I/II	Y145501001	Y145501021	Y144305000
Equity III	KAFLZ3AEPS1	attached	KACCL060UCA

Equity I +, II +, III+, 386/20

Model	Code	FCC ID	Keyboard PCB Assy	Control Board	Key Top set	Keyboard Cable
Q203A	AA	BKM9A8Q203A	Y127501001	attached	Y127501022	Y127501031
Q303A	AA	BMK9A8Q303A	Y127501001	attached	Y127501022	Y127501031
Q203A	A103A – AA	C9S4D7Q203A	Y163502001	none	Y127501022	Y163502020
Q203A	A103A – AA	C9S4D84701	Y163504007	Y171501017	Y127501022	Y163504006

Equity Ie

Model	Code	FCC ID	Keyboard PCB Assy	Control Board	Key Top set	Keyboard Cable
E1160A	-	C9S4D84701-201	Y163504007	Y171501017	Y171501007	Y171501006

Product Support Bulletin

Subject: Equity Series HDD Controllers Jumper Settings
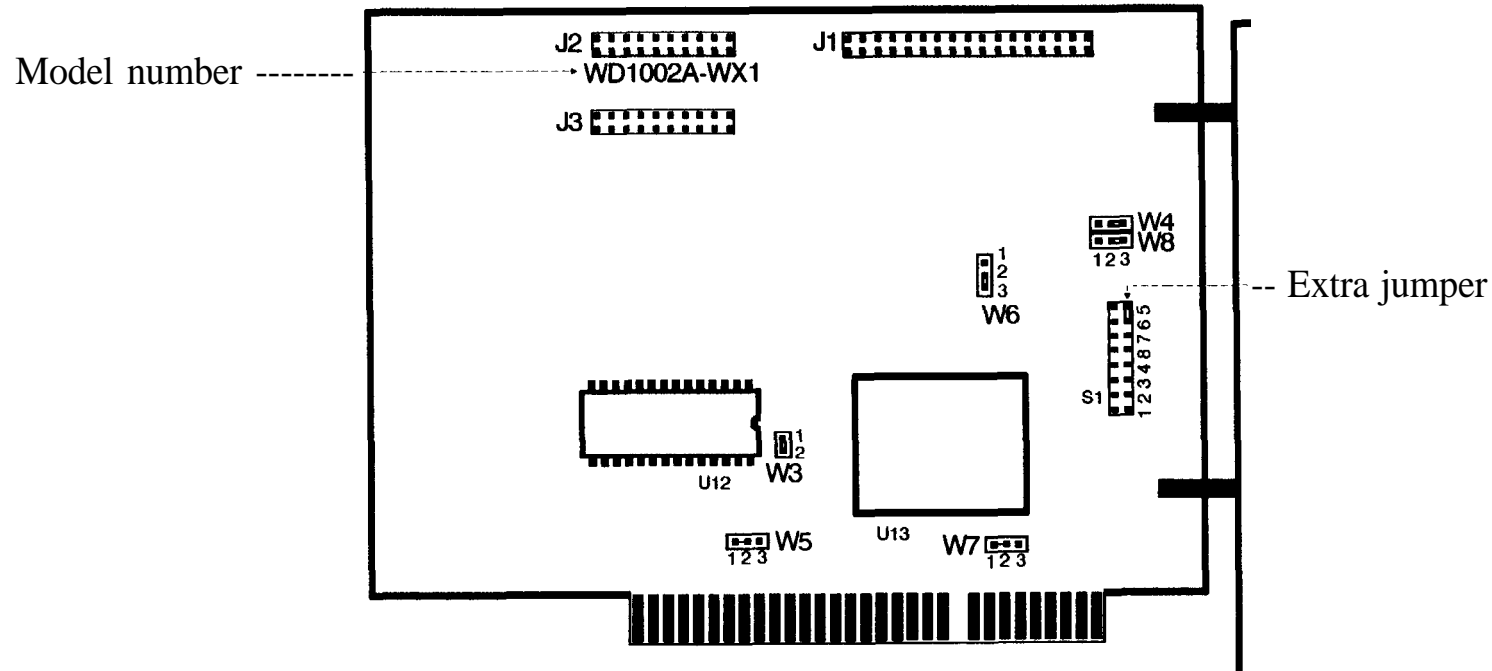
This bulletin provides information on the jumper settings for the hard disk controllers used in Epson Equity computers.

Please refer to the following pages for information regarding specific hard disk controllers:

HDD Controller WD1002A-WX1 (8-bit)

Model number -------- WD1002A-WX1

-- Extra jumper

FACTORY SETTINGS

Jumper	Position	Description
W1	N / A	Not used.
W2	N / A	Not used.
W3	1 to 2	BIOS ROM is enabled (on controller).
W4	2 to 3	Device address 320H.
W5	* hard-wired 1 to 2	BIOS ROM size (32K or 64K).
W6	2 to 3	Reduced write current ($< = 8$ heads).
W7	* hard-wired 1 to 2	IRQ 5.
W8	2 to 3	Disk controller I. D. (set to be the first).

* No jumper pins - 1 and 2 are connected by a PCB board etch.

HDD Controller WD1002S-WX2 (8-bit)

'--Extra jumper

Model number--j
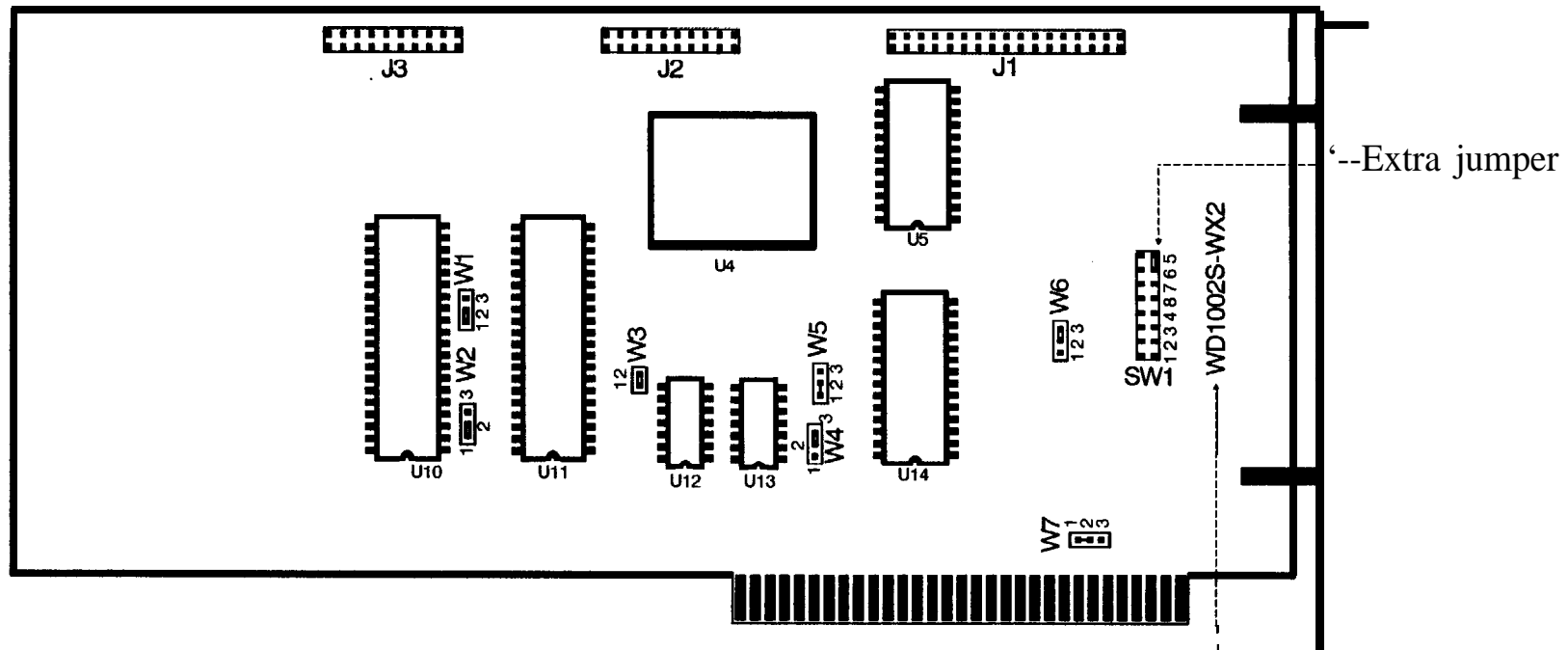
FACTORY SETTINGS

Jumper	Position	Description
W1	1 to 2	Required for this configuration.
W-2	1 to 2	Required for this configuration.
W3	1 to 2	BIOS ROM is enabled (on controller).
W4	2 to 3	Device address 320H.
W5	* hard-wired 1 to 2	BIOS ROM size (32K or 64K).
W6	2 to 3	Reduced write current (< = 8 heads).
W7	* hard-wired 1 to 2	IRQ 5.

* No jumper pins - 1 and 2 are connected by a PCB board etch.

HDD Controller WD1003-WAH (16-bit)

Model number
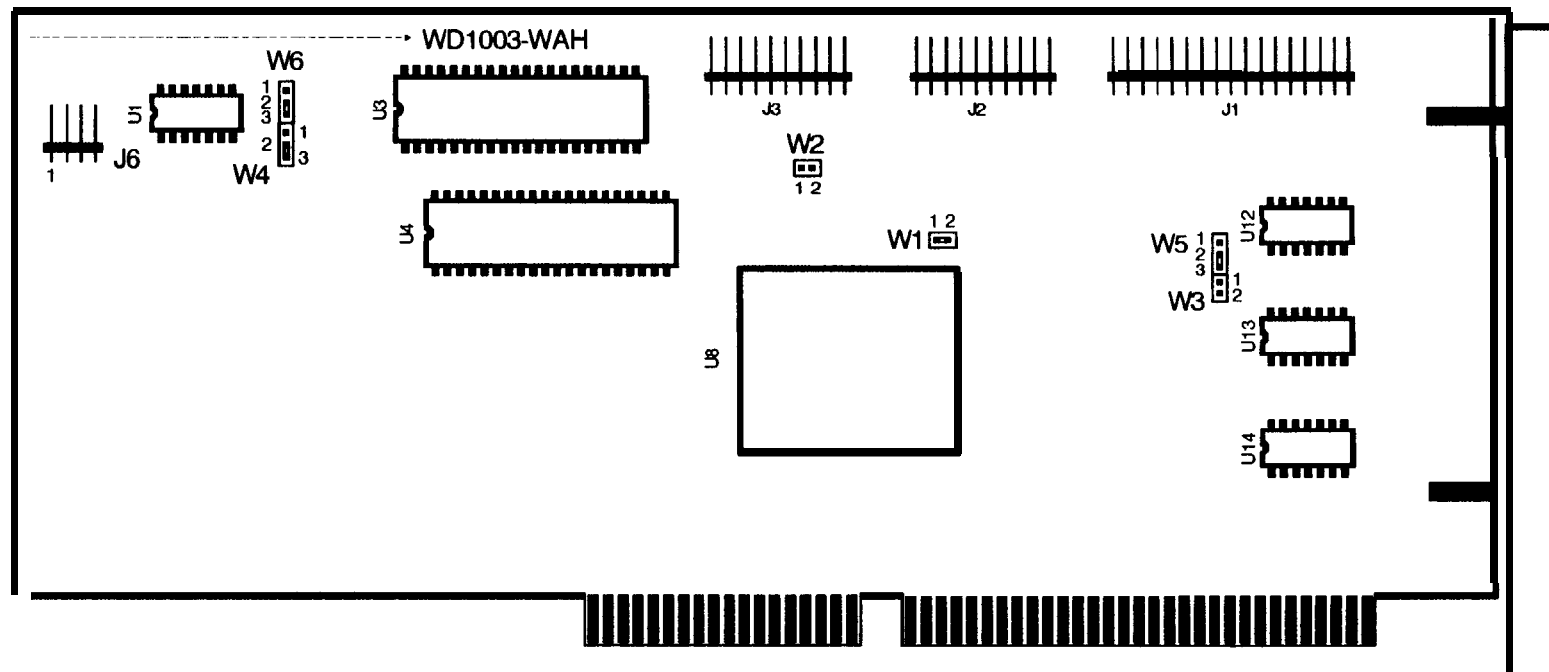
WD1003-WAH

W6
W4
W2
W1
W5
W3
J6
J3
J2
J1
U3
U4
U5
U8
U12
U13
U14

FACTORY SETTINGS

Jumper	Position	Description
W1	1 to 2	Status read is latched.
W2	No jumper	Primary address selected.
W3	* No jumper	Required for this configuration.
W4	2 to 3	Required for this configuration.
W5	2 to 3	Standard configuration.
W6	2 to 3	Standard configuration.

* No jumper pins.

Connection of LED indicator cable :

Model	Pin 1 of J6
Equity III	Orange wire
Equity II +	Blue wire
Equity III +	Red wire

HDD Controller WD1002-WAH (16-bit)
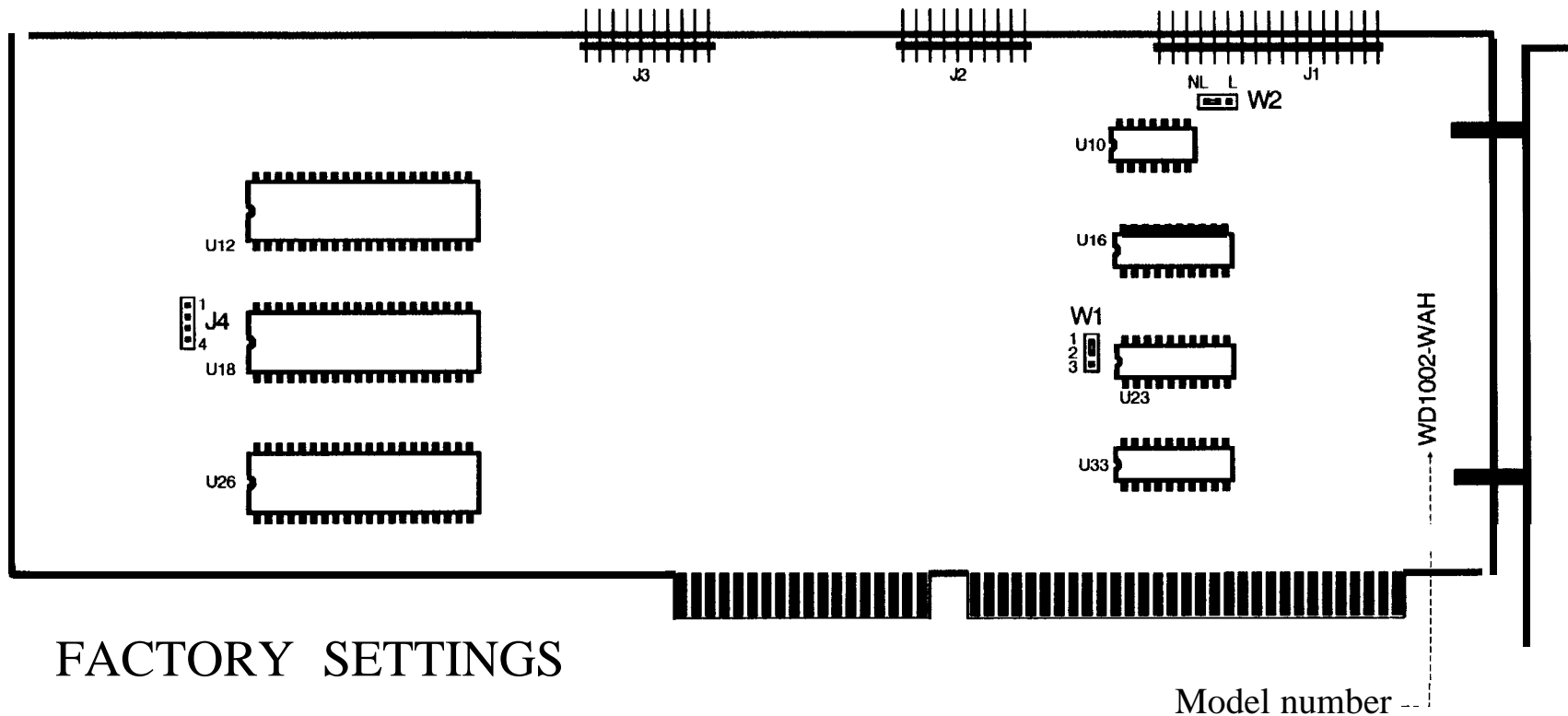
FACTORY SETTINGS

Jumper	Position	Description
W1	1 to 2	Primary base address.
W2	Center to NL	HDD activity LED only lights when the controller accesses the drive.

Connection of LED indicator cable :

Model	Pin 1 of J4
Equity III	Orange wire
Equity II +	Blue wire
Equity III +	Red wire

HDD Controller WHDC (16-bit)
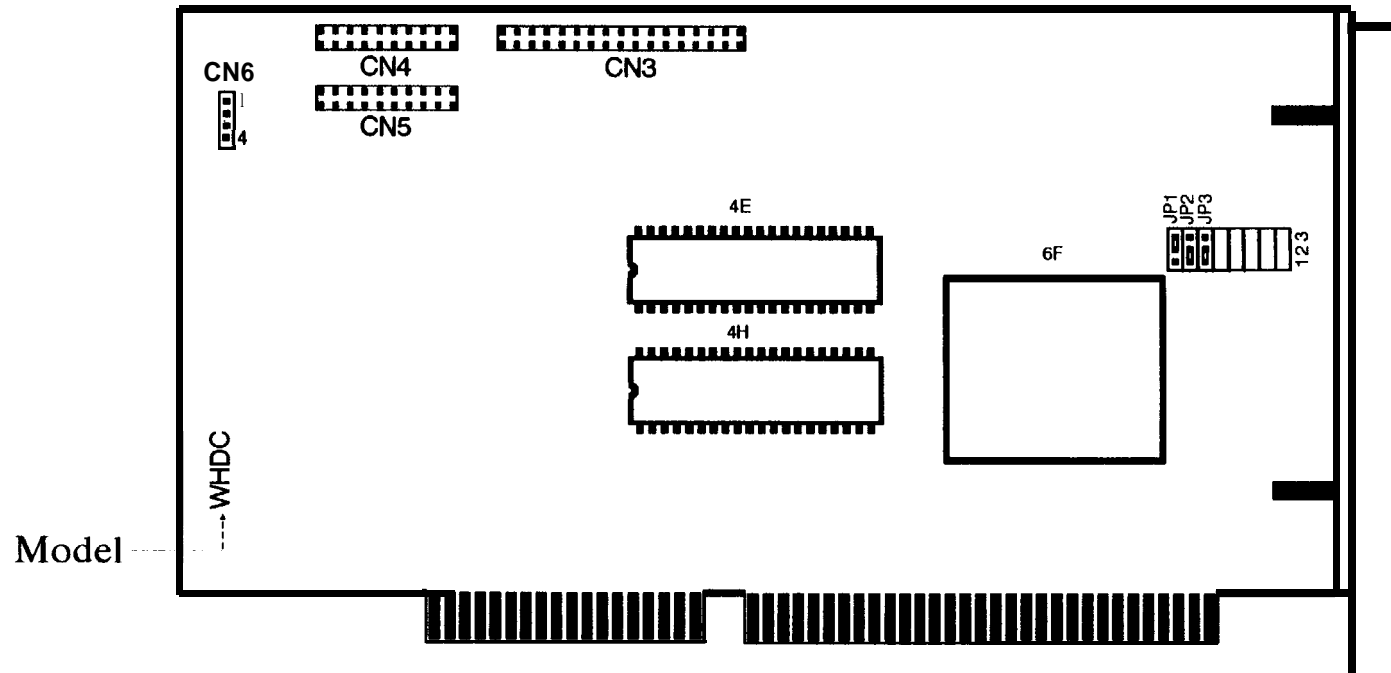
FACTORY SETTINGS

Jumper	Position	Description
* JP1 (J1)	*2 to 3 (B to C)	Primary address selected.
* JP2 (J2)	* 1 to 2 (A to B)	Status read is non-latched (select = drive busy).
* JP3 (J3)	* 1 to 2 (A to B)	WAH mode (dual HDD controller).
JP4 to JP8	No jumper pins.	Hardwired to factory settings.

* "JP" may labeled as "J", "1" as "A", "2" as "B" and "3" as "C".

Connection of LED indicator cable :

Model	Pin 1 of CN6
Equity III	Orange wire
Equity I I +	Blue wire
Equity I I I +	Red wire

HDD Controller WD1006S-WAH (16-bit)
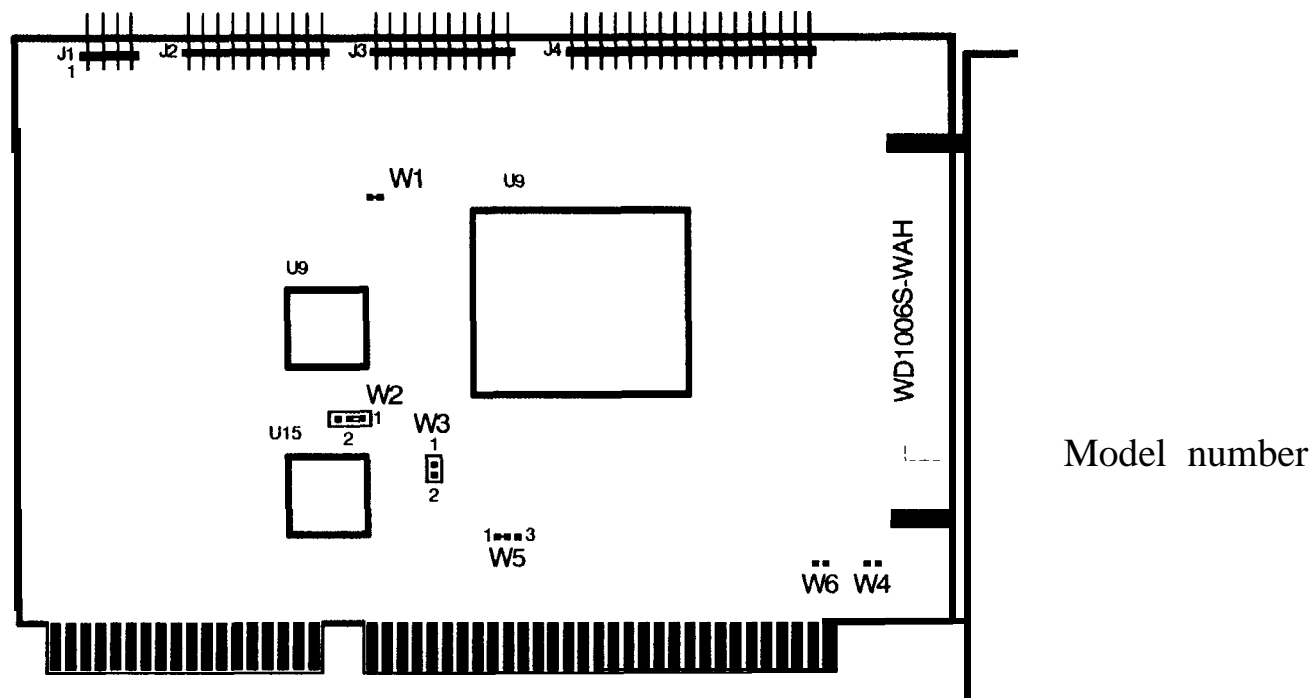
Model number

FACTORY SETTINGS

Jumper	Position	Description
W1	* 1 to 2	LED lights for drive selection (non- latched).
W2	1 to 2	No reduced write current,
W3	No jumper	Enables cacheing.
W4	* No jumper	Isolates mounting bracket from logic ground.
W5	* 1 to 2	Primary controller port.
W6	* No jumper	Non-latched mode.

* No jumper pins.

Connection of LED indicator cable :

Model	Pin 1 of J1
Equity 386/20	Red wire

HDD Controller ACB-2320 (16-bit)

Model number
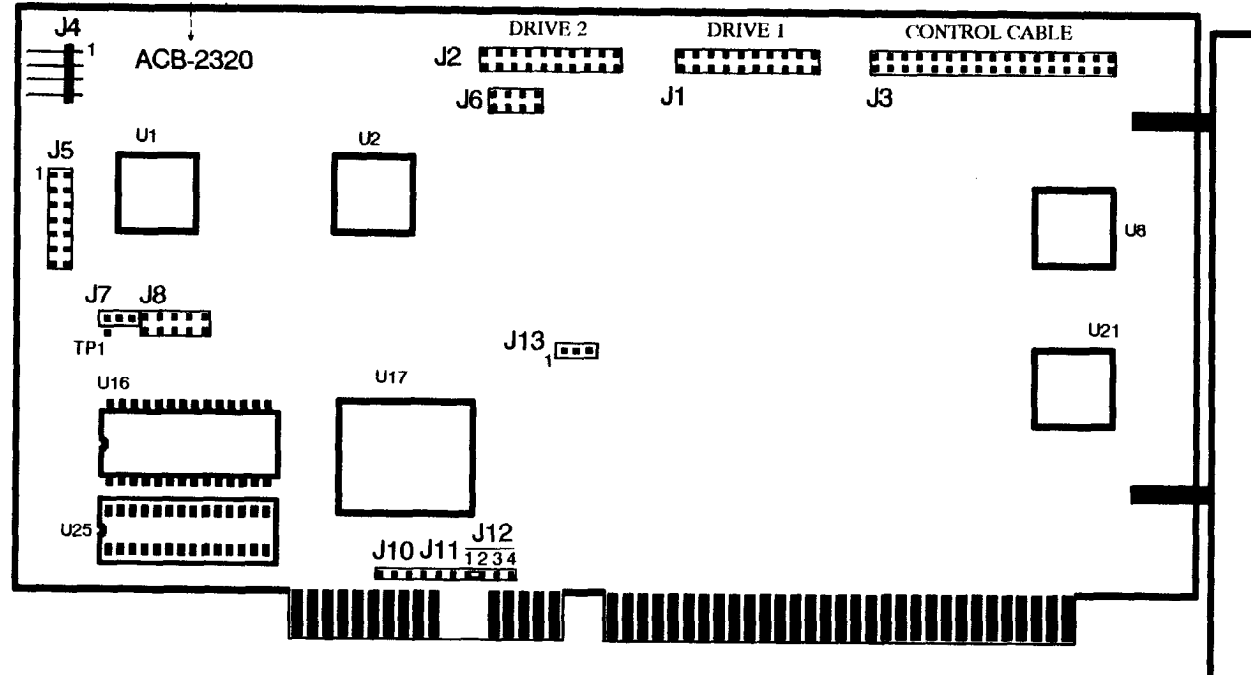
FACTORY SETTINGS

Jumper	Position	Description
J5	No jumpers	Used for hardware port addressing.
J6	No jumpers	Manufacturing test points (DO NOT JUMPER).
J7	No jumper	Serial monitor output (DO NOT JUMPER).
J8	No jumpers	Manufacturing test points (DO NOT JUMPER).
J9, J10, J11	No jumpers	Not used.
J12	1 to 2	Selects IRQ 14.
J13	No jumper	ACB-BIOS disabled (no ROM present in location U25).

Connection of LED indicator cable :

Model	Pin 1 of J4
Equity 386/20	Red wire

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EPSON AMERICA, INC.

SERVICE

PRODUCT SUPPORT BULLETIN

PSB NO. : S-0068	**DATE:** 1/25/89	**ORIGINATOR:** REM	**PAGE:** 1 of 6

SUBJECT: EQUITY I, II **AND** III MAIN **BOARD** JUMPER CONFIGURATIONS

This bulletin describes the jumper locations and settings on the Equity I MRS board and Equity II MCY board used for configuring the computers for third party keyboards and for enabling an 8087 math coprocessor. It also describes the various releases of the Equity II MCY boards and the features that each version supported.

The Equity III main board dip switch settings, to set up or change system configuration, are also provided.

Index

EQUITY I MARS BOARD JUMPER CONFIGURATIONS

```
            Parallel        Serial
             CN1             CN2
                                              8250

              CN3        8087  socket  3D

                         80C88   CPU   4D


MRS-MT  BOARD             MARS  BOARD         CN12  CN11

              Power
              CN4                             FDD(B)  (A)

                         9D  8237

            [ROM OS ]                         CN10  CN9
                                  J1
                         13D  765
                                              14A  VFO


                         opt.  256KB          82C59
                         RAM  Board
                         CN5
                                        82C55     82C54

                                     J2
                                          J3    CN6
                    Reset   Dip  Switch        Keyboard
```

PLEASE NOTE

Since setting the jumpers requires almost complete disassembly of the Equity I computer it should be done only by authorized Epson Customer Care Centers.
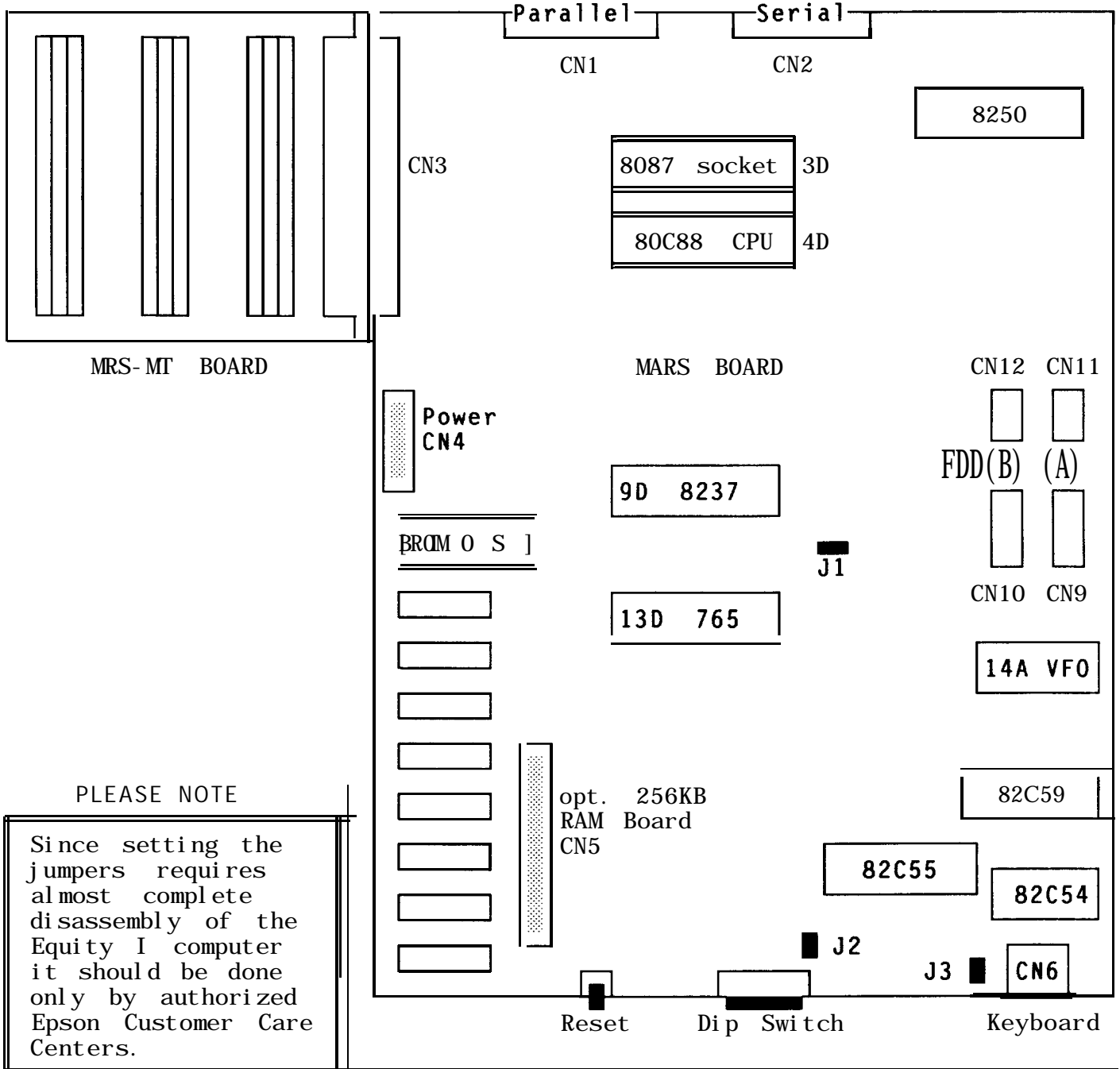
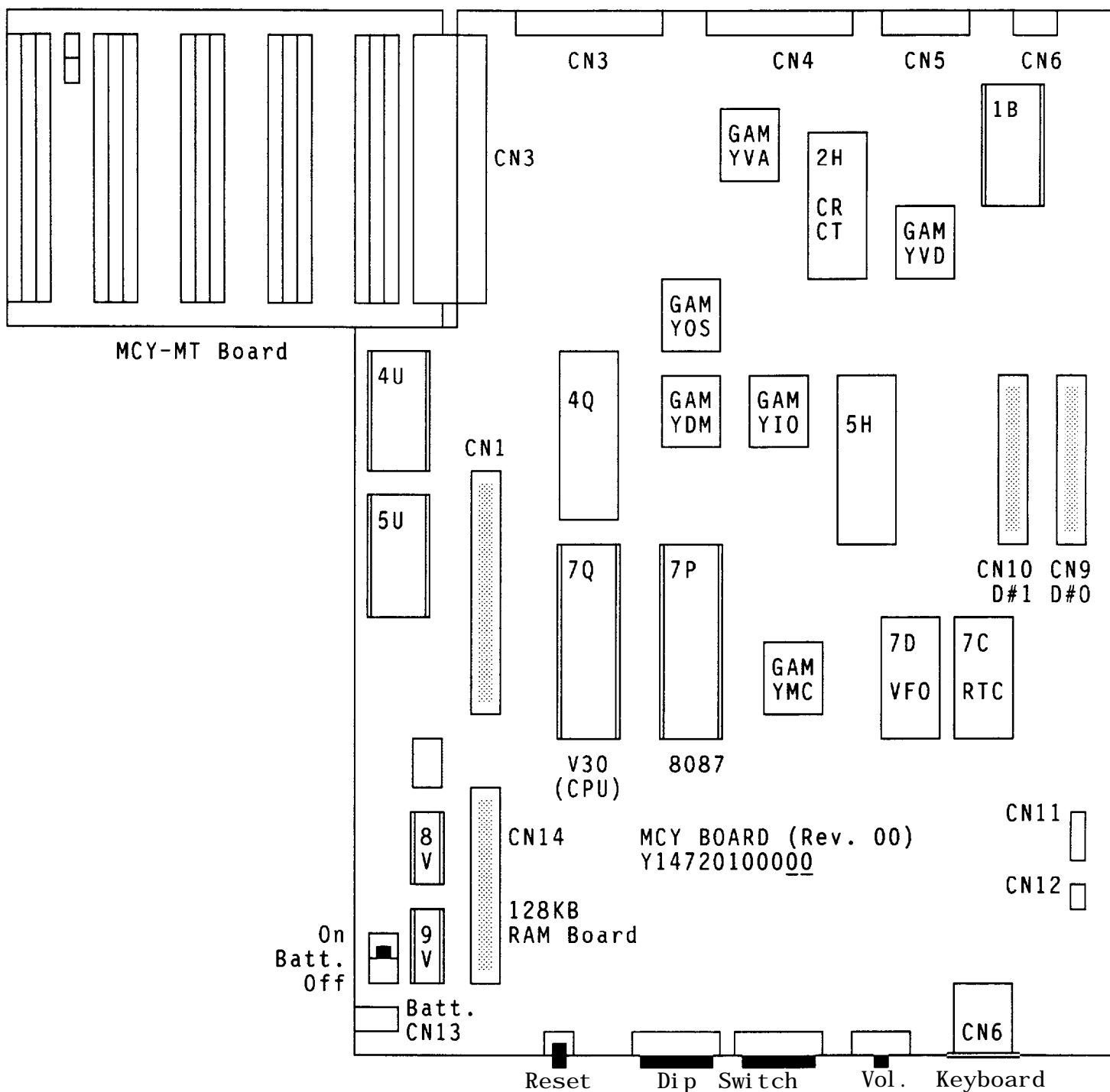* **NON-EPSON KEYBOARD SUPPORT** - Install jumpers in positions J2 and position J3 (Early systems did not have this capability and do not have these jumper positions installed.)

  NOTE: DO NOT ATTEMPT TO USE THE EPSON KEYBOARD WITH THESE JUMPERS INSTALLED AS DAMAGE WILL RESULT!

* **8087 SUPPORT** - Remove the jumper from position J1.

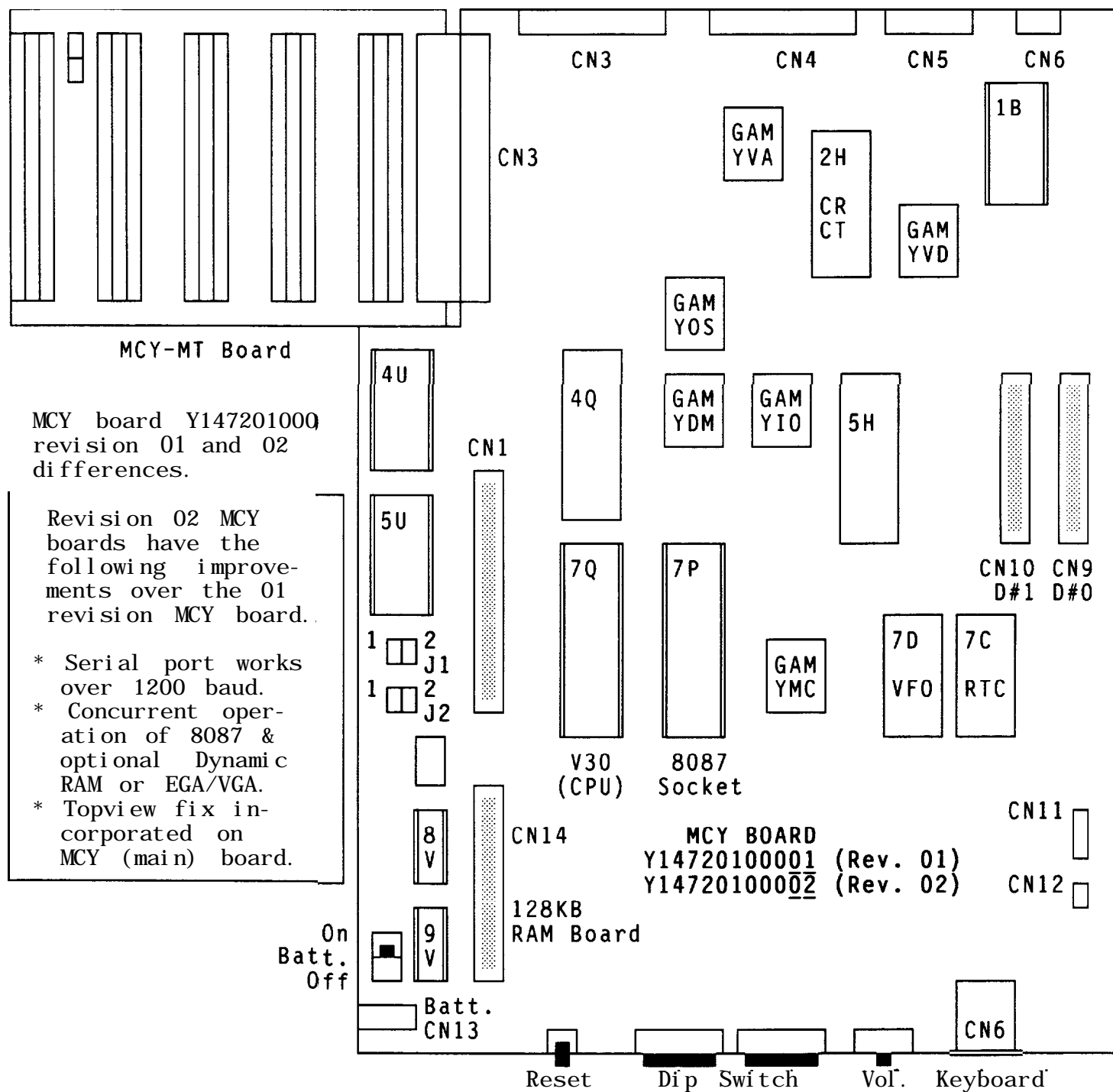* **EGA MONITOR SUPPORT** - Set dip switches 6 and 7 to the on position.

```
                                    CN3          CN4        CN5      CN6

                                                                    1B
                                    GAM
                                    YVA     2H
                                            CR         GAM
                                            CT         YVD

                                    GAM
                                    YOS
                            4Q
         4U                                 GAM   GAM
CN3                                CN1      YDM   YIO    5H
         5U

MCY-MT Board
                                   7Q     7P                  CN10   CN9
                                                             D#1    D#0

                                   GAM                7D    7C
                                   YMC                VFO   RTC

                                   V30    8087
                                   (CPU)

                          CN14     MCY BOARD (Rev. 00)        CN11
         8                         Y14720100000
         V
                          128KB                              CN12
On                        RAM Board
Batt.    9
Off      V
         Batt.                                         CN6
         CN13

         Reset      Dip   Switch      Vol.   Keyboard
```

JUMPER CONFIGURATIONS

* There are no jumpers on this version board. The board is hard-wired to provide RAM refresh to the option slots.

* An 8087 coprocessor cannot be used.
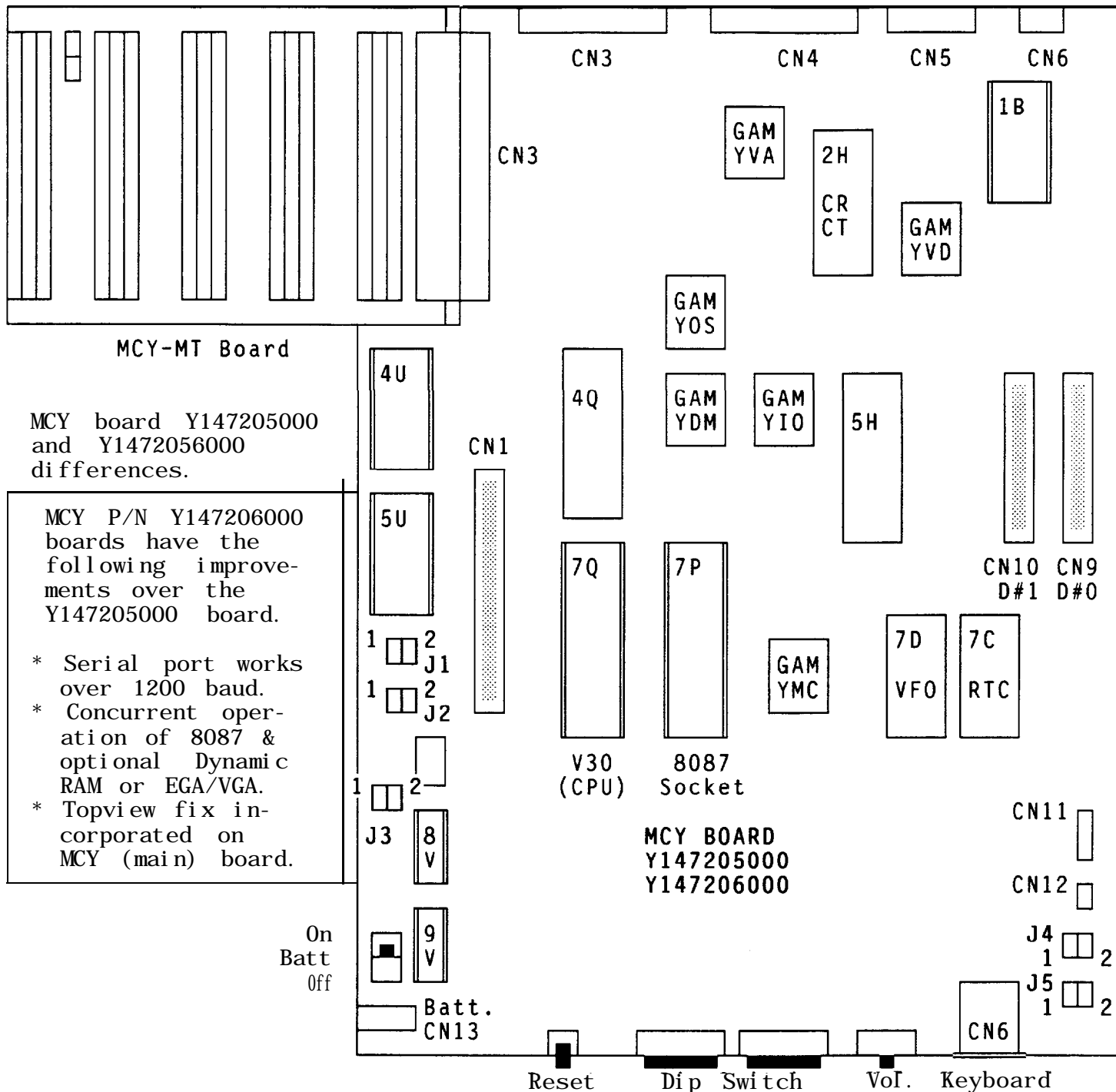
* There is no provision for using alternate keyboards.

MCY-MT Board

CN3

CN4   CN5   CN6

GAM YVA

2H
CR CT

GAM YVD

1B

GAM YOS

CN3

4U

4Q

CN1

GAM YDM

GAM YIO

5H

5U

7Q   7P

CN10   CN9
D#1   D#0

1 ▢ 2
J1

1 ▢ 2
J2

GAM YMC

7D   7C
VFO RTC

MCY board Y147201000, revision 01 and 02 differences.

Revision 02 MCY boards have the following improvements over the 01 revision MCY board.

* **Serial port works over 1200 baud.**
* **Concurrent operation of 8087 & optional Dynamic RAM or EGA/VGA.**
* **Topview fix incorporated on MCY (main) board.**

V30
(CPU)

8087
Socket

CN11

CN12

8 V

CN14

On
Batt.
Off

9 V

128KB
RAM Board

MCY BOARD
Y14720100001 (Rev. 01)
Y147201000<u>02</u> (Rev. 02)

Batt.
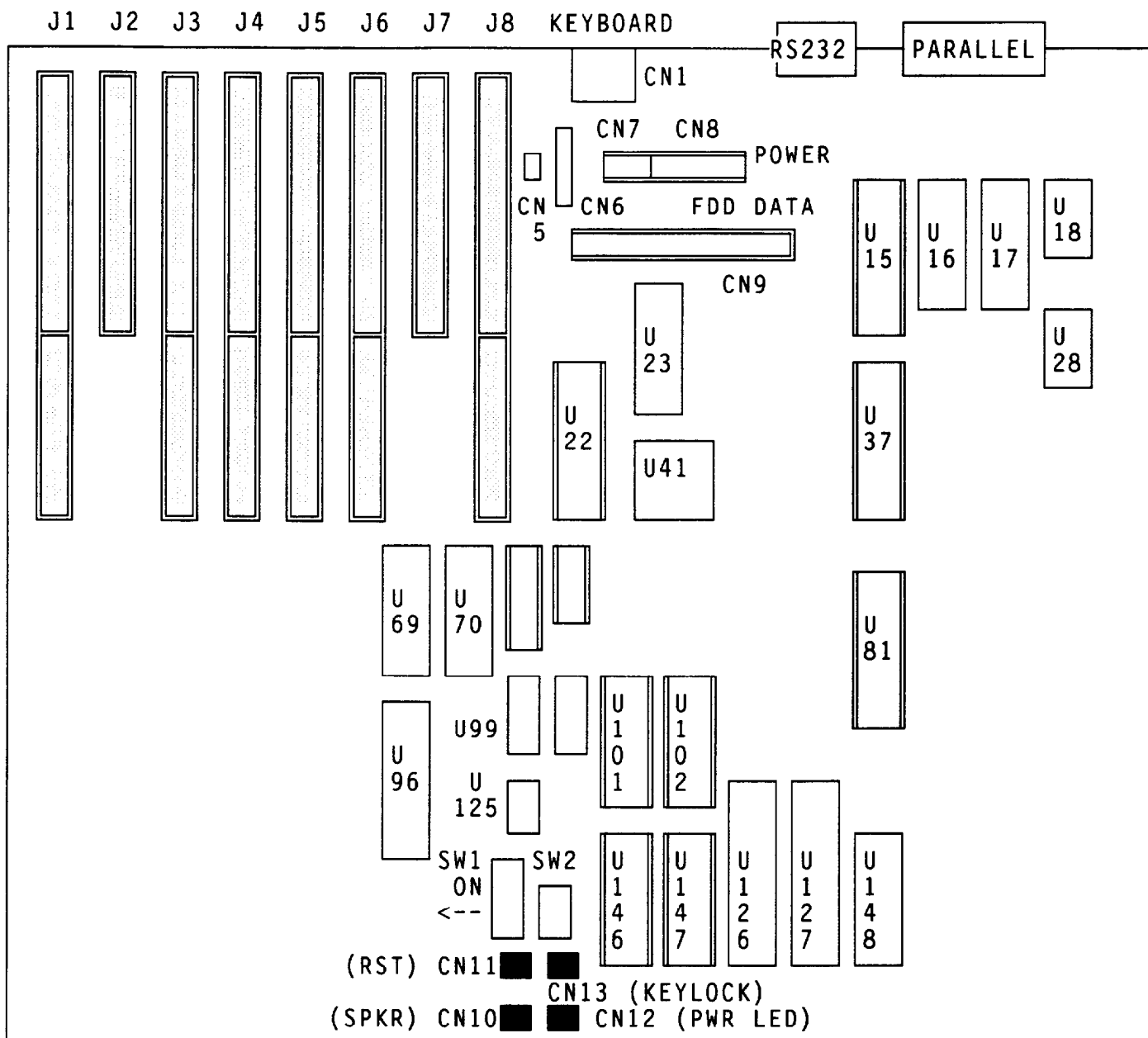CN13

CN6

Reset   Dip Switch   Vol.   Keyboard

JUMPER CONFIGURATIONS

* **J1 and J2 should be in position 2 to enable DMA RAM refresh to the option slots for expanded memory boards or EGA/VGA video boards. An 8087 will function concurrently with dynamic RAM boards on Rev. 02 boards with the jumpers in position 2.**
* **J1 and J2 should be in position 1 to disable DMA RAM refresh. The V30 runs about 20% faster in this position. 8087-2 enabled on Rev. 01 MCY board.**
* **J3 and J4 are not available on these versions of MCY board. Non-Epson keyboards cannot be used.**

CN3   CN4   CN5   CN6

MCY-MT Board

MCY board Y147205000
and Y1472056000
differences.

MCY P/N Y147206000
boards have the
following improve-
ments over the
Y147205000 board.

* Serial port works
  over 1200 baud.
* Concurrent oper-
  ation of 8087 &
  optional Dynamic
  RAM or EGA/VGA.
* Topview fix in-
  corporated on
  MCY (main) board.

CN3

CN1

4U

5U

1 ☐ 2
J1

1 ☐ 2
J2

1 ☐ 2

J3   8 V

On
Batt   9 V
Off

Batt.
CN13

4Q

7Q   7P

GAM
YVA

2H
CR
CT

GAM
YVD

1B

GAM
YOS

GAM
YDM

GAM
YIO

5H

GAM
YMC

7D
VFO

7C
RTC

CN10   CN9
D#1   D#0

V30
(CPU)

8087
Socket

MCY BOARD
Y147205000
Y147206000

CN11

CN12

J4 ☐ 2
1

J5 ☐ 2
1

CN6

Reset   Dip Switch   Vol.   Keyboard

JUMPER CONFIGURATIONS

* J1 and J2 should be in position 2 to enable DMA RAM refresh to the
  option slots for expanded memory boards or EGA/VGA video boards.
  The 8087 will work in DMA refresh mode with the Y147206000 board.
* J1 and J2 should be in position 1 to disable DMA RAM refresh.
  The V30 runs about 20% faster in this position. The jumpers must be
  in position 1 to enable an 8087 with the Y147205000 MCY board
* J3 and J4 should be in position 1 to use an IBM compatible keyboard.
* J3 and J4 should be in position 2 (default) for the Equity II
  keyboard.
  NOTE: DO NOT ATTEMPT TO USE THE EPSON KEYBOARD WITH JUMPERS J3 AND
        J4 IN POSITION 1 AS DAMAGE MAY RESULT!

EQUITY III MAIN BOARD DIP-SWITCH SETTINGS

J1 J2 J3 J4 J5 J6 J7 J8 KEYBOARD

RS232 — PARALLEL

CN1

CN7 CN8

POWER

CN6 FDD DATA

CN5

CN9

U15 U16 U17 U18

U28

U23

U22

U41

U37

U69 U70

U81

U99

U96

U101 U102

U125

U126 U127 U148

SW1 SW2 U146 U147

ON

<--

(RST) CN11 ■ ■

CN13 (KEYLOCK)

(SPKR) CN10 ■ ■ CN12 (PWR LED)

DIP SWITCH FUNCTIONS (*Factory settings)			
Switch	**Function**	**On**	**Off**
1-1	RAM size	640KB*	Disable
1-2	Monitor type	Color	Monochrome*
1-3 - 1-6	PROM size	See Table	4-2 in User's Guide
2-1	Serial Port	Enable*	Disable
2-2	Unused		Disable*
2-3	Floppy Disk FDC	Enable*	Disable
2-4	Parallel Port	Enable*	Disable

Product Support Bulletin

Subject: Equity Compatibility with the SOTA 286i and the PC Technologies
           286 Express

The purpose of this bulletin is to provide the 80286 Accelerator board test
results, conducted by the Computer Product Support Center, involving the
SOTA 286i from SOTA Technology, Inc. and the 286 Express from PC
Technologies, Inc.

The Equity models tested were the Equity I, Equity II and Equity I+. All three
were tested with Norton Utilities and Windows/286. (The memory of the Equity
I used in the test was upgraded to 512K in order to accommodate
Windows/286.)

The table below shows compatibility and the Norton SI rating of the
various combinations.

Model	Accelerator	Norton SI	Compatibility
Equity I	286 Express	NA	Not able to load driver to access 80286.
Equity I	SOTA 286i	11.5	Functioned normally with Windows/286, Notion Utilities and MS-DOS 2.11.
Equity II	286 Express	NA	Not able to load driver to access 80286.
Equity II	SOTA 286i	13.7	Functioned normally with Windows/286, Norton Utilities and MS- DOS 3.1 and 3.2.
Equity I +	286 Express	16.5	Functioned normally with Windows/286, Norton Utilities and MS - DOS 3.2.
Equity I+	SOTA 286i	13.7	Functioned normally with Windows/286, Norton Utilities and MS - DOS 3.2.

Installation of either board in the Equity I + was quick and simple to do when following the installation instructions accompanying the boards.
Installation of the SOTA 286i in the Equity I and the Equity II is rather difficult. Due to the amount of disassembly required, we strongly recommend that only Authorized Service Centers install the board in the Equity I and Equity II.

Installation Instructions

Equity I

1. Remove the following from the main unit:
    a) upper case
    b) rear panel
    c) front panel
    d) FDD/power supply block.

2. Follow instructions for a standard installation for the SOTA 286i in an 8088 - based system.   Take care to fold the SOTA connector cable so as not to prevent reassembly.   The cable is sturdy and will tolerate being folded.

3. Reassemble the main unit and go through the testing and initialization procedure outlined in the SOTA manual.

Equity II

1. Remove the following from the main unit:
    a) upper case
    b) rear panel
    c) front panel
    d) FDD/power supply block.

2. Follow instructions for a standard installation for the SOTA 286i in an 8086 - based system.   Take care to fold the SOTA connector cable so as not to prevent reassembly.   This will necessitate routing the cable so that it does not conflict with the power connection to the main system board. The cable is sturdy and will tolerate being folded.

3. Reassemble the main unit and go through the testing and initialization procedure outlined in the SOTA manual.

Our Computer Product Support Center receives numerous calls requesting information and recommendations on 80286 Accelerator boards for use with the Equity I and I + (8088 - based) and the Equity II (8086 - based) personal computers.

We have found that the SOTA 286i and 286 Express products may meet your requirements and are competitively priced! They join the PC Elevator board (for use with the Equity I + and Equity II) as accelerator boards recommended for use with Epson 8088 and 8086 - based personal computers.

Although these boards were tested by qualified product support specialists, Epson America makes no representations that these third party products are compatible with all hardware configurations or software applications.

We recommend that you certify these products with your specific hardware and software requirements and consult with the third party vendor to ensure reliable operation.

Vendor Reference

**   Applied Reasoning   (PC Elevator)
86A Sherman St.
Cambridge, MA 02140
Phone: (617) 492-0700

PC Technologies, Inc.   (286 Express)
704 Airport Blvd.
Box 2090
Ann Arbor, MI 48106
Phone: (313) 996-9690

Sota Technology, Inc.   (SOTA 286i)
657 N. Pastoria Ave.
Sunnyvale, CA 94086
Phone: (408) 245-3366

** NOTE: Applied Reasoning is no longer producing the PC Elevator board that is recommended as an accelerator board for the Equity I+ and Equity II. However, it may still be available in distribution stock.

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EPSON AMERICA, INC.

SERVICE PRODUCT SUPPORT BULLETIN

PSB NO.: S-0065	DATE: 1/5/89	ORIGINATOR: REM	PAGE: 1 of 1

SUBJECT: DISABLING **THE FLOPPY** DISK **CONTROLLER IN EPSON COMPUTERS**

This bulletin covers the ability or inability to disable the floppy disk controller in the Epson computers.

COMPUTER	FDC CAN BE DISABLED	HOW
Equity I	No	
Equity II	No	
Equity III	Yes	CPU Board - Switch 2-3 off
Equity I+	Yes	CPU Brd - Jumper 1 in Position B
Equity II+ 10MHz 12MHz	No Yes	Multi-function Board - Jumper 2 in Position B
Equity III+	Yes	Multi-function Board - Jumper 1 in Position B - Jumper 2 in Position B
Apex	Yes	Motherboard - Remove Jumper E1
Apex Plus	No	

EPSON AMERICA SERVICE, 23610 TELO AVENUE, TORRANCE, CALIF. 90505

Product Support Bulletin

Subject: History of ROM Versions for the Equity Computers

Date: 12/03/93
Page(s): 1 of 18

PSB No: S-0062I
Originator: MTD

The purpose of this Product Support Bulletin is to provide a comprehensive history of the ROM versions released for use in the Equity series computers.

EQUITY I					
VER	PART #	DESC	TYPE	LOC	REASON
2.1D	Y144800101	MSA-B1	M27128	12F	INITIAL RELEASE
2.1I	Y144800102	MSA-B2	M27128	12F	
2.20	Y144800301	MSA-B3	M27128	12F	Corrects problems with EGA, PC-NET, and hardcards. Adds support for 4 FDDs. See MIB SM0003 (6/2/86) and ECN EQ1-001 (7/29/86).
2.21	Y144800401	MSA-B4	M27128	12F	Allows use of the Canon MD-5201-55 FDD. See ECN EQ1-002 (1/19/87).

EQUITY I+					
VER	PART #	DESC	TYPE	LOC	REASON
1.00	Y144519071	AGB-A1	M27128	5M	INITIAL RELEASE
1.03	Y144803000	AGB-A2	M27128	5M	Fixes serial port problem with MS Word and keyboard problem with 3COM software.

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INFORMATION
Product Support Bulletin

Subject: Equity I Computer - Answers to Common Questions

Date: 4/23/90
Page: 1 of 8

PSB No: S-0060A
Originator: REM

The following questions and answers have been compiled from the support calls received at the Epson Product Support Center.

Floppy Disk Drives

Q1. What type of floppy disk drives are used in the EQUITY I? Can other IBM compatible floppy disk drives be used?

 A. The following models of half - height, 5.25", 360KB floppy disk drives have been used. The most common type was the MD- 5201- 55.

   1. CANON MDD- 531- 51
   2. CANON MD- 5201- 55
   3. EPSON SD- 525- 501

   Because of the non-standard FDD interface, other floppy disk drives cannot be used.

Q2. Can a 3.5", 720KB or 1.44MB Floppy disk drive be installed?

 A. No, the Equity I does not support 3.5" floppy drives.

Q3. Can a 1.2MB floppy disk drive be installed?

 A. No, the Equity I does not support 1.2MB floppy disk drives.

Q4. What is a "601" error on power - up?

 A. This is a floppy disk controller (FDC) error caused by an invalid response during the FDC status check. Refer to the Equity I diagnostics manual. It may indicate that the FDD cables are not connected properly or the controller is faulty.

Q5. Is it possible to disable the Equity I floppy disk controller?

 A. No. the floppy disk controller cannot be disabled.

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Hard Disk Drives (See Hardware Update information on page 7)

Q6. Does the Equity I have enough power to support 2 floppy disk drives and a
 hardcard type hard disk drive?

 A. Yes, although the power supply is rated for 53 watts the Equity I main system board
 was designed with many low power custom C - MOS components which draw
 very little current.   In order to conserve available power, it is recommended to
 use a hardcard which draws 12 watts or less.

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Q7. Is the Plus Development Hardcard 20 compatible with the Equity I?

 A. Yes, the manual installation procedure in the Plus Development installation
 instructions must be followed.

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Q8. Can a hardcard be installed in addition to a hard disk drive?

 A. No, this is not recommended as it may overload the power supply.

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Q9. What type of hard disk does Epson supply with the Equity I and what is the
 average disk access time.

 A. Epson originally supplied a half - height, 5.25", 20 MB, Epson model HD- 860 hard
 disk (89ms) with controller.   This drive has since been replaced with the
 HMD - 720 with an average access time of 69ms.

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Q10. What hard disk controllers can be used?

 A. The Western Digital (WD1002A - WX1 or WX2) hard disk controller is recommended
 for use in the Equity I for MFM type HDDs.   Most other IBM PC/XT compatible -
 controllers will also work.

Q11. Can hard disks from other vendors be used?

   A. Yes, the customer should purchase a 1/2 height, low power unit such as the HMD- 720 offered by Epson.

Video

Q12. Can an EGA or VGA adapter board and monitor be used with the Equity I? What are the dip switch settings for EGA and VGA video mode?

   A. Yes, but ensure the ROM BIOS is version 2.20 or 2.21 and set the front panel dip switch 1 - 6 and 1 - 7 to "on".

Q13. Some programs requiring Hercules graphics will not display graphics on the monochrome monitor used with the Epson MGA multigraphics adapter. Is there anything to correct this?

   A. It may require a patch program that has been developed to overcome some compatibility problems that may occur with a few application programs. See PSB# 0024. The patch utility files (PATCH.ARC) can be downloaded from the Epson Product Support RBBS system and from Compuserve's Epson Forum. They are compressed and can be uncompressed with ARC.

   The Product Support RBBS system can be accessed anytime by remote modem at Tel. (213) 534- 8506.

   Protocol: no panty, 1 stop bit, 8 data bits, 1200/2400 Baud.

Q14. Is the NEC Multisync monitor compatible with the Equity I?

   A. Yes, with the appropriate EGA video card.

Q15. My color monitor display blinks on and off when in 40 column mode using the Epson MRS- CR, CGA color video board.

   A. This can be corrected by replacing the MRS - CR board with an MGA video board or by modifying the MRS - MT board. The modification consists of cutting the printed circuit between CN1 - B30 and CN2 - B30 and adding a 39 Ohm 1/4 watt resistor in series with the OSC dock to the option slots.

General Information

Q16. What is the latest MS - DOS version available for the Equity I?

A. Epson's MS - DOS 3.2 has been certified for use with the Equity I. It is available from Epson's Accessories Sales Department at 1-800- 873- 7766.

Q17. What is the latest ROM BIOS version for the Equity I?

A ROM BIOS version 2.21 (P/N Y144800401).

Q18. What kind of memory upgrade is available for the Equity I?

A. Epson offers a 384KB RAM board with Real Time Clock and Calendar (part number Q515A - AA).   It replaces the MRS - MT expansion slot board and provides 640KB memory. It is available from Epson's Accessories Sales department. A similar board called the Tahiti Board is available from Image Technology Inc. at Tel. # (383) 799-8433. If the Equity I originally came with 512KB, the 256KB RAM board plugged into the system board next to the floppy disk drive assembly must be removed.

Q19. How do you set the Epson 384K RAM Board Real Time Clock, date and time?

A. Use the SETRTC utility program supplied with the 384K RTC board.

Q20. After installing a 384K RTC board the Equity I will no longer boot What could the problem be?

A. Make sure the Epson RTC driver (RTCDEV.SYS) is the first file loaded from the CONFIG.SYS file.

Q21. Does The Equity I have panty check for RAM?

A. No, the Equity I does not have panty checking capability.

Q22. Which Math- Coprocessor chip do I need?

A. An 8087 Math-Coprocessor chip which runs at 4.77MHz is recommended. Jumper J1 must be removed for 8087 operation. Refer to figure 1 on page 8.

Q23. Where is the 8087 socket located?

A. The 8087 socket is located on the main system board next to the CPU chip toward the rear of the board. The upper chassis, which holds the power supply and FDD assembly must be removed to install the 8087. Refer to figure 1 on page 8.

Q24. Will IBM compiled BASIC programs run on the EQUITY I?

A. BASIC programs written for the IBM PC- XT will run as long as they do not require IBM's BASICA. BASICA is resident in IBM's copyrighted ROMs. Equity computers. use a version of GW - BASIC which is loaded from diskette.   Due to some differences in BASIC, some programs will not operate correctly if they require BASICA. Some applications look for the file name BASICA. Renaming the GW - BASIC file to BASICA can sometimes solve these problems.

Q25. I can't find some of the programs referred to in the MS - DOS manual on the MS - DOS diskette. Where are they?

A. The GW - BASIC diskette contains many of the utility programs, such as EDLIN and XTree, which are referred to in the MS - DOS manual.

Q26. Can I use a third party type keyboard with the Equity I?

A. Yes, except for early production units which do not have any keyboard jumpers on the main logic board.   Third - party "enhanced- style" keyboards such as the IBM XT - 101, NorthGate C/T - 101, Datadesk Turbo - 101, Keytronics 101, 5150 and 5151 or the standard PC/XT type 84 - key keyboards can be used. Jumpers must be installed in positions J2 and J3 on the main MRS board. The original keyboard may not be used once the jumpers have been installed. Refer to figure 1 on page 8.

Q27. Can the Epson Plus series "Enhanced" keyboard be used with the Equity I?

A. No, the Epson Enhanced keyboards are not supported.

Q28. Is the Equity I compatible with any 286 or 386 accelerator boards?

A. Yes, it has been tested with the Sota 286i from Sota Technologies, Tel.# (408) 245- 3366 and the PC Elevator board from Applied Reasoning Corp, (617) 492-0700.   It has not been tested with any 386 accelerator boards.

Q29. Can the 8088 CPU be replaced with an NEC V20 CPU chip to increase the processing speed?

A. Yes, but Epson does not support this configuration.

Q30. Is there any upgrade to run copy protected software?

A. No, due to the copy protection scheme used on various software programs such as most Electronic Arts game software, they are not compatible with the Equity I. A non - copyprotected version is sometimes available from the manufacturer.

Q31. Can BACKUP and RESTORE be used to copy files over to an Equity I hard disk from another system?

A. Only if the Equity I is using MS - DOS version 3.2.   BACKUP and RESTORE was not supported with MS - DOS 3.1 or earlier.

Q32. What streamer tape drives can I use for high speed backup?

A. The Equity I is compatible with most IBM PC/XT streamer tape backup units.

Q33. Will the Equity I work in foreign countries?

A. Yes, the Equity I computer can be used internationally by using a 220 VAC to 110 VAC voltage stepdown transformer.

*** HARDWARE UPDATES ***

EQUITY I MRS - BD (Main Board)

Initial Release

P/N Y144201000 00 (With VFO SUB BOARD)
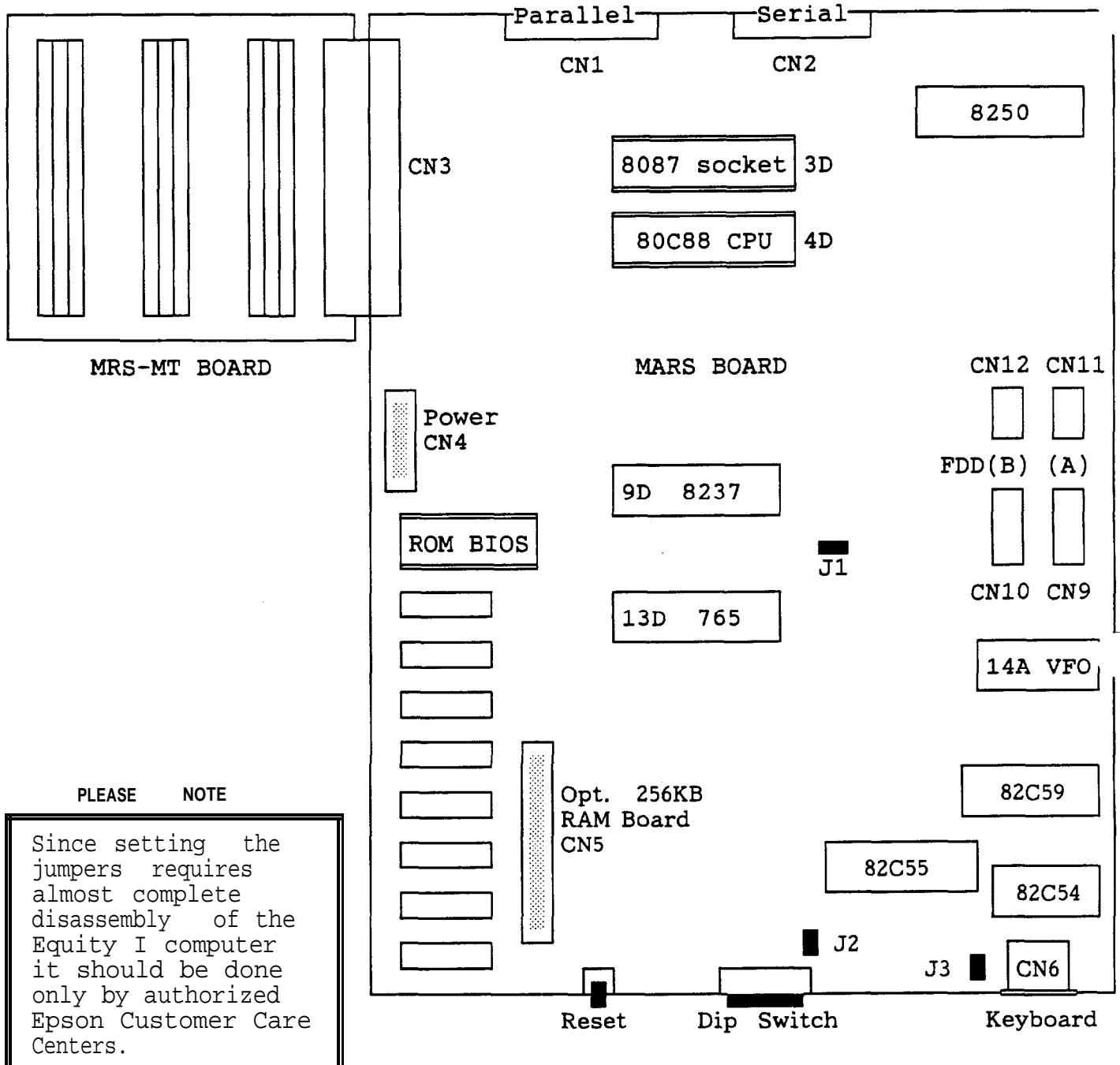P/N Y144201000 01 (VFO SUB BOARD eliminated)

VFO/MRS - SUB BOARD

Initial Release - Version CAA (wouldn't work with a hard disk)
VFO upgraded to Version CAC (Required for HDD operation)

Units beginning with the following serial numbers have the CAC version VFO.

Model	Serial Number
Q501A-AA (1 FDD)	018670
Q501A-AB (2 FDD)	022722
Q501A-AE (2 FDD)	024510

Parallel   Serial

CN1   CN2

CN3

MRS-MT BOARD

8250

8087 socket | 3D

80C88 CPU | 4D

MARS BOARD

CN12 CN11

Power
CN4

FDD(B) (A)

9D   8237

J1

ROM BIOS

13D   765

CN10 CN9

14A VFO

PLEASE   NOTE

Opt.   256KB
RAM Board
CN5

82C59

Since setting   the
jumpers   requires
almost complete
disassembly   of the
Equity I computer
it should be done
only by authorized
Epson Customer Care
Centers.

82C55

82C54

J2

J3 ▮ | CN6

Reset   Dip Switch   Keyboard

* **NON-EPSON KEYBOARDSUPPORT** – Install   jumpers   in positions   J2 and
  position   J3 (Early   systems did not have this capability   and do not
  have these jumper positions   installed.)

  **NOTE: DO NOT ATTEMPT TO USE THE EPSON KEYBOARD WITH THESE JUMPERS
         INSTALLED AS DAMAGEWILL RESULT!**

* **8087 SUPPORT –** Remove the jumper from position J1.

* **EGA/VGA SUPPORT** – Set dip switches   6 and **7** to the on position.

Product Support Bulletin

Subject: Using Expanded Memory with Equity and Apex Computers

Date: 3/2/90   PSB No: S-0047C
Page: 1 of 6   Originator: KAS ⨍ᴄᴅ

Q1.   What is Expanded Memory?

A.   Conventional memory, managed by MS - DOS, is limited to 640K. In
response to the need for greater amounts of accessible memory, the
LIM EMS (Lotus/Intel/Microsoft Expanded Memory Specification) was
introduced in 1984. EMS, version 3.2, provides usable memory
beyond the 640K limit through "bank switching". The expanded
memory is divided into 16K portions called "pages". The computer
accesses these pages through a "page frame" or "window" which is
64K of memory located between 768K and 896K in 80286 - based
systems and between 800K and 960K in 8086 - or 8088 - based
systems.   16K pages of memory are allocated for an application's
use and the EMM (Expanded Memory Manager) handles the job of
mapping the pages in and out of the page frame as they are
needed. However, in order to make use of expanded memory, the
software must be written to take advantage of the EMS. Software
such as Lotus 1 - 2 - 3, Microsoft Windows and Borland's SideKick
Plus make use of expanded memory. EMS is limited to 8Mb of
expanded memory.

Q2.   What is EEMS?

A.   A superset of EMS, AQA EEMS (AST/Quadram/Ashton - Tate
Enhanced Expanded Memory Specification) provides greater flexibility
in the mapping of expanded memory. However, it also uses the
technique of "bank switching" and has its own memory manager
which accommodates such specially written software as Quarterdeck's
DESQview. EEMS is also limited to 8Mb of expanded memory.

Q3.   What about the 155Mb RAM listed as the maximum for the Equity III +?

 A.   This larger amount of RAM is the maximum usable memory range for an 80286 microprocessor and generally refers to extended memory. Extended memory starts at the 1Mb boundary and extends out to 16Mb. As it requires a 24 - bit address to access memory in this range, extended memory is handled by the protected mode of the 80286. Examples of currently available software that can switch into protected mode to use extended memory are Framework II, AutoCAD, the VDisk RAM disk and Xenix OS.

Q4.   How does LIM EMS 4.0, the latest version, differ from the earlier version, LIM EMS 3.2?

 A.   EMS 4.0 supports up to 32Mb of expanded memory where EMS 3.2 supported only 8Mb. EMS 4.0 has been changed to make it easier for applications to share expanded memory. In EMS 4.0, page mapping has been streamlined and new functions allow application programs to dynamically increase and decrease the amount of expanded memory allocated to them. In previous versions of EMS, the page frame was located in an unused 64K block of memory between 640K and 1Mb. EMS 4.0, subject to limitations in the system hardware, supports the page frame anywhere in the first 1Mb of memory. Before EMS 4.0, the page frame held four pages. Now you can define a page frame of up to eight pages in memory above 640K. The size of the page frame is limited only by the amount of available memory.   There has also been a change to support the smaller than standard (16K) memory pages used by some expanded memory boards.

Q5.   Is EMS 4.0 compatible with my old expanded memory board?

 A.   The EMM 4.0 driver works with existing hardware. You don't need to buy a new expanded memory board. However, until you use applications that have been written to take advantage of EMS 4.0, you probably won't notice much improvement in performance over your older version.

Q6.   What memory expansion boards are compatible with the Equity I and Equity II?

 A.   The following boards have been tested by Epson in the Equity I and II:

All Card w/MMU Multifunction	All Computers, **Inc.**
Liberty PC	Quadram Corporation
Mini Magiccard (EV - 138)	Everex Systems, Inc.
AST SixPak Premium	AST Research
AST Rampage	AST Research

Q7.   What memory expansion boards are compatible with the Equity III?

 A.   The following boards have been tested by Epson in the Equity III:

Grande Byte	STB Systems
Intel Above Board AT	Intel Corporation
Liberty AT	Quadram Corporation
AST Advantage	AST Research
AST Rampage AT	AST Research
AST Ramvantage	AST Research

Q8.   What memory expansion boards are compatible with the Equity I +?

 A.   The following boards have been tested by Epson in the Equity I +:

64/256KB Expansion Option	IBM
Above Board PC (1985)	Intel Corporation
Fastcard IV (1.6)	Thesys

Q9.   What memory expansion boards are compatible with the Equity Ie?

 A.   The following boards have been tested by Epson in the Equity Ie:

64/256KB Expansion Option	IBM
Quad Board II	Quadram
Fastcard IV	Thesys
RAMpage	AST Research

 Note: The Intel Above Boards do not currently operate reliably with the Equity Ie.

Q10.   What memory expansion boards are compatible with the Equity II +
and Equity III + (10MHz models)?

A.   The following boards have been tested by Epson in the Equity II +
and Equity III + (10MHz models):

Advantage Premium	AST Research
Rampage 286 *	AST Research
Above Board 286	Intel Corporation
Above Board 286 p/s	Intel Corporation
Grande Byte *	STB Systems
Rio Grande	STB Systems
Elite 16	Profit Systems

* Will run at 8MHz, not at 10MHt.

Q11.   What memory expansion boards are compatible with the Equity II +
and Equity III + (12MHz models)?

A.   The following boards have been tested by Epson in the Equity II +
and Equity III + (12MHz models):

Rampage 286 Plus	AST Research
Elite 16	Profit Systems
Above Board Plus	Intel Corporation

NOTE: Previously boards from Micron Technology were listed as compatible
with the 12MHz models of the Equity II + and Equity III +. They
have been removed from the list because Micron no longer produces
ISA memory boards.

Q12.   How do you expand the memory of the Equity 386/20?

A.   Memory expansion in the Equity 386/20 can be accomplished by
adding SIMMs (single - in - line memory modules) to the CHET - RM
board. Both 256K and 1Mb SIMMs are available from Epson
America. The 256K SIMMs are sold in 1Mb kits and the 1Mb
SIMMs are sold in 2Mb kits. Compatible third party 1Mb SIMMs are
available from Matsushita, Toshiba and CDC Enterprises. You can
also use third party memory expansion boards such as those listed
above for the Equity II +/III +.

Q13.   Are there any guidelines to installing the SIMMs in the Equity 386/20?

A.   Yes, when SIMMs are installed to increase memory beyond 1Mb, they must be installed so that banks of SIMMs are installed as matched pairs.   See the matrix below:

Memory	Bank 0	Bank 1	Bank 2	Bank 3
1MB	4X256KB			
2MB	4X256KB	4X256KB		
4MB	4X256KB	4X256KB	4X256KB	4X256KB
4MB	4X1MB			
8MB	4X1 MB	4X1 MB		
10MB	4X1 MB	4X1 MB	4X256KB	4X256KB
16MB	4X1 MB	4X1 MB	4X1 MB	4X1 MB

Note: Refer to PSB S - 0095 for 18MB RAM Setup information.

Q14.   Is there a driver supplied with the Equity 386/20 to allow the use of the extended memory as expanded memory?

A.   Yes, the Equity 386/20 system software includes the device driver EEMM386EXE. This driver emulates LIM EMS 4.0 memory using the extended memory supplied by the additional SIMMs. It will support only the onboard memory above 1 MB, up to 15MB. This is the maximum memory that can be installed on the CHET- RM board. It will not support memory installed on memory expansion boards.

Q15.   Are there any expanded memory boards that are compatible with the Equity LT?

A.   No, the option slots on the LT require a special connector. The hard drive controller and the LT cartridge modem are the only option cards currently available from Epson America.

Q16.   What expanded memory boards are compatible with the Apex by Epson?

A.   The Above Board PC from Intel Corporation has been tested by Epson in the Apex.

Q17.   Are there any general guidelines for determining the chip speed to install on the memory expansion boards?

A.   Yes, if the CPU speed is 8MHz or less, use 150ns RAM chips. If the CPU speed is 10/12MHz, use 120ns RAM chips.

Q18.   Is there anything that should be kept in mind during the installation procedure for the memory expansion boards?

A.   Yes, when installing the memory boards in the Equity II + and Equity III + (12MHz models), remember that the bus speed is 12MHz. For example, the Intel Above Board 288 and Above Board Plus allow you to set up the bus speed and chip speed in their installation programs.

Q19.   What is meant by backfilling memory when using software such as DESQview?

A.   Backfilling is a function of many expanded memory boards which allows a portion of the board's memory to be used as conventional memory. In this way, you could turn a 256K system into one with 840K memory or more.   In certain situations, you may want to disable some of the computer's conventional memory and the use the memory on the expansion board (i.e. DESQview).

Q20.   Which Epson computers have memory settings that allow backfilling memory?

A.   The Equity I, Equity I +, Equity II + and Equity III + allow backfill. The Equity I comes with 256K standard and the Apex comes with 512K, thus allowing backfill. The Equity I + has DIP switch settings allowing system memory to be disabled to 256K or 512K. The Equity II+ and Equity III + have jumpers on the system memory boards to allow memory to be disabled to 256K and 512K.

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EPSON AMERICA INC.
SERVICE DEPARTMENT

PRODUCT SUPPORT BULLETIN

DATE: 3/28/88   NUMBER: S-0041
SUBJECT: EPSON EQUITY I/II/III ENHANCED KEYBOARD COMPATIBILITY

The purpose of this bulletin is to provide information regarding
the compatibility of third party enhanced "AT" style keyboards
with the Equity I, Equity II and Equity III computers.

1. Keyboard Compatibility

   The enhanced Equity "Plus" series keyboard <u>cannot</u> be used on an
   Equity I, II or III.   The enhanced Equity keyboard (as with
   IBM's) requires explicit ROM BIOS support which is not
   available in the earlier machines.

   It is possible, however, to use a third-party "enhanced-style"
   keyboard such as the IBM XT-101, NorthGate C/T-101, Datadesk
   Turbo-101, Keytronics 101, 5150 and 5151. Please note that
   early versions of the Equity I (serial numbers unavailable) and
   Equity II (below serial number 29875) were not designed to
   support any third party keyboards (they do not have any
   keyboard-select jumpers on the main board).

   The correct jumper settings for non-Epson keyboards are:

      Equity I: J2 and J3 jumpered
      Equity II: J3, J4 and J5 set for position 1

+---+
| PLEASE   NOTE |
| |
| Once the above jumper changes |
| have been made, attempting to |
| use the original Epson keyboard |
| will result in damage to the |
| keyboard and Equity main board. |
+---+

EPSON

EPSON AMERICA INC.
SERVICE DEPARTMENT

PRODUCT SUPPORT BULLETIN

DATE: 3/3/88   NUMBER: S-0039
SUBJECT: EQUITY SERIES POWER AVAILABLE & CONSUMPTION

The purpose of this bulletin is to provide information regarding the available power and the power consumption of the option boards and system subassemblies of the Equity series computers.

Page 2 provides the Equity series computer power supply available current output and typical current draw of the individual subassemblies found in each computer.

Page 3 provides information on the typical current draw of Epson supplied option boards, floppy disk drives and hard disk drives for the Equity series computers.

EQUITY SERIES COMPUTERS AVAILABLE POWER VERSUS
SYSTEM BOARD SUBASSEMBLIES CURRENT DRAW REQUIREMENTS

Output Voltage	+12V	+5V	-12V	-5
Equity I Avail. power	1.6A	6.0A	200mA	250mA
MRS Board	40mA	650mA	15mA	0
MRS-RM 256KB RAM BD	0	30mA	0	0
Keyboard	0	110mA	0	0
Equity I+ Avail. power	3A	7.5A	300mA	300mA
AGENA board	0	1.2A	0	0
Equity II Avail. power	4.4A	7.5A	300mA	300mA
MCY board	0	1.8A	0	0
Keyboard	0	110mA	0	0
Equity II+ Avail. power	4.5A	10A	300mA	300mA
ANDRO Board (Including ADR-RM3)	0	2.5A	0	0
SPFG/SPF2	0	600mA	0	0
Equity III+ Available power	4.8A	20A	300mA	300mA
ANTA Board	0	1.23A	0	0
ANT-RM	0	500mA	0	0
SPFG	0	540mA	0	0
WHDC	0	530mA	0	0

EQUITY OPTIONS POWER CONSUMPTION

OUTPUT VOLTAGE	+12V	+5V	-12V	-5V
Color Video Adapter	0	500mA	0	0
Monochrome Video Adapt.	0	270mA	0	0
MGA Multimode Video Bd.	TBA	TBA	TBA	TBA
EGA Video Adapter Bd.	TBA	TBA	TBA	TBA
Epson Mouse & Interface	0	50mA	0	0
8087/80287 Coprocessor	0	310/375mA	0	0
WD1002-WAH HDC	0.5mA	1.5A	0	0
WD1002-WX2 HDC	0	630mA	0	0
WD1003-WAH HDC	0.5mA	1.0A	10mA	0
MD5201-57/58 360KB FDD Equity II/II+/III+	250mA(Typ) 460mA(Max) 1.31A Start	140mA(Typ) 180mA(Max)	0	0
MD-5501-61 1.2MB FDD Equity II+/III+	240mA(Typ) 1.66A(Max)	150mA(Typ) 170mA(Max)	0	0
FD1155C 1.2MB FDD Equity II+/III+	210mA(Typ) 390mA(Max) 900mA Start	460mA(Typ)	0	0
SMD-489 3.5" 720KB FDD Equity I+/II+/III+	0	400mA(Typ) 1A(Max)	0	0
HMD-720 3.5" 20MB HDD	580mA(Typ) 2A Start up	200ma(Typ) 360mA(Max)	0	0
NEC D5146 (40MB) HDD (Half height) Equity III	1.2A(Typ) 2A Seek 3A Start	1A(Max)	0	0
CDC 92405 (40MB) HDD (Half height) Equity II/III+	1.5(TYP) 2A (Max) 4.5A Start	400mA(Typ) 600mA(Max) 1A Start	0	0
Miniscribe (40MB) HDD (Full Height) Equity III+	800mA(Typ) 1.8A (Max) 3.5A Start	900mA(Typ)	0	0

EPSON

EPSON AMERICA INC.
SERVICE DEPARTMENT

PRODUCT SUPPORT BULLETIN

DATE: 3/3/88   NUMBER: S-0038
SUBJECT: EQUITY   SERIES   FLOPPY   DISK   DRIVE   SPECIFICATIONS

The   purpose   of   this   bulletin   is to   provide   information   on
technical   specifications   of   Epson   supplied   floppy   disk   drives
used   in   the   Equity   series   computers.

Also   contained   in   this   document   is   information   on   floppy   disk
drive   adjustments,   test   points,   and   service   tools.

FDD TECHNICAL SPECIFICATIONS

Rev. B   '87.9

DRIVE SIZE	FDD MODEL	MAKER	PRODUCT NAME	FORMATTED CAPACITY(KB) Byte/Sector/Track	EPSON MEDIA	TPI	NUMBER OF TRACKS	TRACK TO TRACK	MOTOR SPEED(rpm) [INDEX](ms)	OFF TRACK A/B (TRACK No.)	AZIMUTH A/D B/C	INDEX POSITION (μs)	READ AMP	GND	INDEX	T00	EXTENSION CABLE	CE DISK (PARTS No.)	HEAD CLEANING DISK	GREASE
	--- NEC 1.2MB ---																			
	FD1155C	NEC	EQUITY II+ EQUITY III+	1.2(MB) 512/15/T	2HD	96	160	3 (ms)	360 166.7±2.5	NOTE 1 (32)	NOTE 1 68Tr	167±125 68Tr	TP3,TP4	G	TP5	TP6	*	NOTE 4	NOTE 4	NOTE 4
	FD1157C	NEC	EQUITY II+ EQUITY III+	1.2(MB) 512/15/T	2HD	96	160	3	360 166.7±2.5	NOTE 1 (32)	NOTE 1 68Tr	NOTE 2 68Tr	TP3,TP4	G	TP5	TP6	*	NOTE 4	NOTE 4	NOTE 4
	— EPSON 1.2MB --																			
	SD-581L	EPSON	EQUITY II	1.2(MB) 512/15/T	2HD	96	160	3	360 166.7	0.8 (68)	*	NOTE 3 68Tr	TP-1,3	TP1-2	TP3-1	TP3-3	*	DK-502-11D (B777701301)	3M-7440 (B777701001)	G-51 (40g) (B705100001)
	--- CANON 1.2MB ---																			
	MD5501-61	CANON	EQUITY II+ EQUITY III+	1.2(MB) 512/15/T	2HD	96	160	3	360 166.7±2.5	NOTE 1 (32)	NOTE 2 68Tr	167±100 68Tr	CK1,CK2	GND	IDX	TK00	*	NOTE 4	NOTE 4	NOTE 4
5.25"	--- CANON 360KB (NO P.C.B TYPE) ---																			
	MD531-51	CANON	EQUITY I	360(KB) 512/9/T	2DS	48	80	6	300 200	0.8 (16)	*	150~500 34Tr	CHK1-2,3	CHK1-4	CHK2	J1-26	#E144 (B777602201)	STA-0007 (B777601801)	STA-1003 (B777701601)	E73-113003 (B777701701)
	MD5201-55	CANON	EQUITY I	360(KB) 512/9/T	2DS	48	80	6	300 200±3	0.8 (16)	NOTE 2 34Tr	200±140 34Tr	CHK1-1,2	CHK1-4	J1-17	CHK2	NOTE 4	STA-0007 (B777601801)	STA-1003 (B777701601)	NOTE 4
	--- EPSON 360KB (NO P.C.B TYPE) ---																			
	SD-525	EPSON	EQUITY I	360(KB) 512/9/T	2DS	48	80	6	300 200	0.8 (34)	0.65 0.8	150~500 34Tr	TP1-1,3	TP1-2	J2-8	TP3	#E135 (B777601701)	DK-592-11 (B777700101)	3M-7440 (B777701001)	G-51 (40g) (B705100001)
	— CANON 360KB (WITH P.C.B TYPE) ---																			
	MD5201-57 -58	CANON	EQ I+,II+,III+ EQ II	360(KB) 512/9/T	2DD	48	80	6	300 200±3	0.8 (16)	NOTE 2 34Tr	200±140 34Tr	CK1,CK2	GND	IDX	TK00	*	STA-0007 (B777601801)	STA-1003 (B777701601)	NOTE 4
	MDD-531-31	CANON	EQUITY II	360(KB) 512/9/T	2DS	48	80	6	300 200	0.8 (16)	*	200±50 34Tr	CHK1-2,3	CHK1-4	CHK2	CHK1-1	*	STA-0007 (B777601801)	STA-1003 (B777701601)	E73-113003 (B777701701)
	--- EPSON 360KB (WITH P.C.B TYPE) ---																			
	SD-521	EPSON	EQUITY II	360(KB) 512/9/T	2DS	48	80	6	300 200	0.8 (34)	0.65 0,8	150~500 34Tr	TP1-1,3	TP1-2	J2-8	TP3	*	DK-592-11 (B777700101)	3M-7440 (B777701001)	G-51 (40g) (B705100001)
3.5"	-- EPSON 720KB --																			
	SMD-489M	EPSON	EQ I+,II+,III+ EQ II	720(KB) 512/9/T	2DD	135	160	3	300	*	*	*	*	*	*	*	*	*	*	*

/// NOTE DESCRIPTION ///

NOTE 1 : This depends on each CE disk.
NOTE 2 : Please refer to Technical Manual.
NOTE 3 : 250±100μs. Also, the time difference between SIDE 0 and SIDE 1 must be 130μs or less.
NOTE 4 : This part will be available soon.
* : Not applicable

EPSON

EPSON AMERICA INC.
SERVICE DEPARTMENT

PRODUCT SUPPORT BULLETIN

DATE: 12/14/87   NUMBER: S-0031
SUBJECT: Equity Series with Microsoft Word and Serial Printers

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This bulletin is to inform you of a potential problem when using
Microsoft Word, certain Equity computers and a serial printer. The
situation exists on:

            Equity I   BIOS rev. 2.21 or earlier
            Equity I+   BIOS rev. 1.02
            Equity II+   BIOS rev. 2.00
            Equity III+ (10 MHz)   BIOS rev. 1.50 or earlier
            Equity III+ (12 MHz)   BIOS rev. 2.00
            Apex   BIOS rev. 1.00

When Word is configured to drive a serial printer via COM1 or
COM2, it will print a character every 1 to 2 seconds. A single line
of text may take up to a minute to print.
Word uses BIOS interrupt 14h (serial output) function 1 (send
character to port) for driving either COM port. The function number
is placed in the AH register and the interrupt called. On return, AH
is supposed to contain the line control status. However, AH is still
set to 1, indicating that a character is ready to be received. Word
then calls interrupt 14h, function 2 (receive character) and attempts
to receive the character. After 1 to 2 seconds, the routine times out
and transmission is resumed.

There are three methods of correcting this situation:

    1)   If the printer supports hardware handshaking, redirect
         the printer output (MODE LPT1:=COM1:) and configure
         Word for LPT1. This works reliably with Epson printers
         or similar devices.

    2)   Epson has developed a patch program (SERFIX.COM).
         This is a TSR that insures that proper status is
         returned from INT 14h, function 1. This program is
         available   from   CompuServe (Epson and Microsoft
         Forums) and the Product Support Center BBS.

    3)   A revised ROM BIOS has been developed for 'the above
         systems. This is a limited release and will only be
         supplied on an as-needed basis.

Method 1 is the easiest solution. Method 2 is effective and is
recommended for individual users. Method 3 should be reserved for
large, multi-unit upgrades on an as-needed basis.

Please contact the Systems Support Group if you need additional
information.

EPSON

EPSON AMERICA, INC.

SERVICE   PRODUCT SUPPORT BULLETIN

PSB NO.: S-0028A	DATE: 6/29/88	PAGE: 1 of 1

SUBJECT: EPSON 3.5" 720KB FLOPPY DISK DRIVE COMPATIBILITY

The purpose of this bulletin is to provide information regarding the compatibility of the Epson 3.5", 720KB floppy disk drive (Product Code A112A-AA) with the Apex and Equity series computers.

The 3.5" floppy disk drive must be used with MS-DOS 3.2 or higher.

Please refer to the following table for compatibility information.

Apex	No special setup required
Equity I	Not supported
Equity II	Must include DRIVPARM = /D:1 /F:2 in CONFIG.SYS
Equity III	Not supported*
Equity I+	No special setup required
Equity II+	No special setup required
Equity III+	No special setup required

The Epson 3.5" floppy disk drive is not compatible with the Equity I or the Equity III.

* Manzana Microsystems Inc. offers a 3.5", 720KB floppy disk drive which is compatible with the Equity III computer when used with their 3FIVE device driver.

Refer to Product Support Bulletin # S-0027A for detailed information on using the DRIVPARM command to configure Equity II systems for using the 3.5" floppy disk drive.

EPSON AMERICA SERVICE, 23610 TELO AVENUE, TORRANCE, CALIF. 90505

E P S O N

EPSON AMERICA INC.
SERVICE DEPARTMENT

PRODUCT   SUPPORT   BULLETIN

DATE: 11/3/87   **NUMBER: S-0024**
SUBJECT: EQUITY I/II PATCH PROGRAMS

The purpose of this bulletin is to provide information on the
availability of patch programs which have been developed to
overcome some compatibility problems which may occur with a few
application programs on the Equity I and Equity II computers.

These programs are available from the Epson America Inc. Service
Department, Product Support - Systems Group on diskette.
The patch disk files (PATCH.ARC) can also be downloaded from the
Epson Product Support RBBS system and from CompuServe's Epson
Forum, they are compressed and can be uncompressed with ARC.

The Product Support RBBS system can be accessed 24 hours/day -
7 days/week by remote modem at Tel. (213) 534-8506.

Protocol: no parity, 1 stop bit, 8 data bits, 1200/2400 Baud.

The following is a list of the files which comprise the Patch disk:

AUTOEXEC.BAT	HARDISK.BAS	PATCHES2.TXT
COMPOSIT.BAT	HERCDUMP.ASM	PATCHES3.TXT
COMPOSIT.MOD	HERCDUMP.COM	PSHERC.ASM
EGAN-PAT.ASM	HGC.COM	PSHERC.COM
EGAN-PAT.COM	HGC.DOC	READYPAT.ASM
EQRAMDVR.DOC	MATHBLAS.DOC	READYPAT.COM
EQRAMDVR.SYS	MODE.COM	ROMPATCH.COM
FIXRPORT.ASM	MODE.DOC	ROMPATCH.DOC
FIXRPORT.COM	MODEHERC.COM	VPHERC.COM
FLOPPY.BAS	MODEHERC.DOC	VPREAD.ME
GOLDCARD.BAT	MUSTREAD.DOC	
GOLDCARD.MOD	PATCHES.TXT	

The disk contains patch programs and documentation (TXT and DOC)
files which are also contained in this Product Support Bulletin.

A detailed explanation of each patch program and their use is
explained on the following pages.

FOR EQUITY I:

COMPOSIT.BAT - Modifies DU.EXE, SETUP.EXE, ARCHIVE.EXE and
                HDSIT.EXE to improve the brightness of
                messages when using a composite monitor.

GOLDCARD.BAT - Modifies DU.EXE, SETUP.EXE, ARCHIVE.EXE,
                SETPRINT.EXE and XTREE.EXE so they will run
                with the QUADRAM Goldcard with the Keysaver
                enabled.

EQRAMDVR.SYS - For those RAM DISK utilities which need it, an
                "empty" space disk drive is created. (See pages
                6 and 7 for instructions on installing and using
                this file.)

ROMPATCH.COM - Equity I systems with ROM BIOS versions earlier
                than 2.20 will require this patch to increase the
                stack space in order to run certain application
                programs (Lotus 1-2-3 Version 2, for example).
                (See page 9 for instructions on installing and
                using this file.)

READYPAT.COM - Allows screen dump to take place while Living
                Videotext's READY! is loaded.

MATHBLAS.COM - Allows Math Blaster to run correctly. (See page
                5 for instructions on using this file.)

 PSHERC.COM   - Allows Print Shop to run in Hercules graphics
                mode. Run PSHERC.COM before loading Print Shop.

EGAN-PAT.COM - Allows use of Honeywell's PC VIP terminal
                emulation software.-

ROMPATCH.COM - Equity II systems with ROM BIOS versions earlier
               than 1.11 will require this patch to increase the
               stack space in order to run certain application
               programs (Lotus 1-2-3 Version 2, for example).
               (See page 9 for instructions on installing and
               using this file.)

MODE.COM - The supplied version of MODE did not function
           properly when used to switch from color to
           monochrome display (MODE MONO); this version does.
           MODE.COM is a modified version of the Equity II
           MODE utility. The MODE utility supplied with the
           Equity II will not work properly in the following
           configuration:

               Internal video: Set to monochrome mode with
                               monochrome monitor attached.

               External video: IBM Enhanced Graphics Adapter (or
                               equivalent) installed with color
                               monitor attached.

           Using the MODE utility to switch from color to
           monochrome display (MODE MONO) will freeze the
           cursor in one position on the monochrome display,
           or the cursor will disappear completely. The
           modified MODE utility will fix this problem. It
           will work exactly the same as the normal MODE
           utility in all situations, even when the IBM EGA
           adapter (or equivalent) is not installed.

MODEHERC.COM - RAM-resident utility which allows the use of
               Hercules monochrome graphics. MODEHERC.COM allows
               programs such as Lotus 123 release 1A to use
               Hercules emulation on the Equity II. These programs
               require that you run the Hercules utility HGC.COM
               (usually HGC FULL) to be able to utilize graphics.

               SuperCalc 3 exhibits a different problem. It will
               display one graph successfully, then subsequent
               graphic displays will be garbled. MODEHERC.COM
               will also fix this problem.

               Since MODEHERC.COM remains resident in memory, it
               only needs to be run once. It is recommended that
               MODEHERC.COM be the last memory resident program
               loaded on the system. For example, if you will be
               using Sidekick, run MODEHERC after Sidekick has
               been loaded into memory.

HGC.COM - Epson utility which allows the use of Hercules monochrome graphics. (See page 8 for instructions on installing and using HGC.COM.

PSHERC.COM - Allows Print Shop to run in Hercules graphics mode. Run PSHERC.COM before loading Print Shop.

EGAN-PAT.COM - Allows use of Honeywell's PC VIP terminal emulation software.

HERCDUMP.COM - Allows screen dump in Hercules Graphics mode. It is a memory resident program used in conjunction with GRAPHICS. The GRAPHICS program must be run first.

VPHERC.COM - Allows VP Planner to work in Hercules mode.

READYPAT.COM - Allows screen dump to take place while Living Videotext's READY! is loaded.

HGC.COM - Epson utility which allows the use of Hercules monochrome graphics. (See page 8 for instructions on installing and using HGC.COM.)

FIXRPORT.COM - Program to let Lotus Report Writer use Equity II Color mode. Report Writer apparently forces the Equity II into monochrome video mode even when a color video adapter is attached.

MATHBLAS.COM INSTALLATION

Math Blaster is an educational game produced by Davidson and
Associates in Torrance Calif. It works well with the entire
Equity series except the Equity 1 running color mode. The large
numbers that Math Blaster places on the screen are done in
graphics mode. These numbers appear as square blocks of garble
on the Equity 1 color screen. Unlike the GWBASIC used on the Equity
II and III, GWBASIC for the Equity 1 does not initialize
certain memory areas. In particular, area 510 of segment 0 is
not initialized (this area is used by BASIC to hold the default
data segment value).

Tests have been run on ROM BIOS versions 2.1i, 2.20 and 2.21.
The following programs have proved to be an effective fix for
cases tested so far:

HARDISK.BAS - For hard disk versions:

```
10  PRINT)" This patch will not work with config.sys files"
20  DEF SEG =0
30   POKE  &H510,&HC9
40   POKE  &H511,&H14
50  RUN  "color
```

FLOPPY.BAS - For Floppy disk versions.

```
10  DEF SEG =0
20  PRINT "this is a fix for the floppy disk system"
30  PRINT "make sure no CONFIG.sys file is active"
40  PRINT "try this version on floppy systems"
50   POKE  &H510,&HC3
60   POKE  &H511,&H14
70  RUN  "color
```

CONFIG.SYS and AUTOEXEC.BAT move things around in memory. These
patch programs will not work if either of these two programs are
activated on boot up.

Please copy the appropriate program to the disk that contains your
Math Blaster program. Run these programs and they will run the
Math Blaster program for you.

WHY AND HOW TO USE EQRAMDVR.SYS

Many RAM disk programs supplied with expansion boards do not
work with an Equity I with dual floppy disks. The Equity I
supports only two floppy disk drives, and these programs
expect the operating system to treat it as a floppy disk.
RAM disk utilities that are in device driver form (must be
specified in CONFIG.SYS) should have no problems. Any RAM disk
utility that is executed from the system prompt will have problems
on a dual floppy Equity. These are the programs EQRAMDVR.SYS
was designed to support. The device driver EQRAMDVR.SYS provides
the support needed for these utilities by creating an 'empty' disk
drive that a RAM disk program can use when it is executed.

HOW TO USE EQRAMDVR.SYS

Since EQRAMDVR.SYS is a device driver, it must be specified in
the CONFIG.SYS file on your boot disk. See pages 3-1 to 3-4 in
"MS-DOS for the Equity I" for a description of the CONFIG.SYS
file. The boot disk can either be a floppy disk or a hard disk.
The file EQRAMDVR.SYS must also be copied to your boot disk.
In the following instructions, [ENTER] means press the ENTER key,
and [F6] means press the F6 key.

1. Boot your system with your working copy of MS-DOS.
   If you have a hard disk that is set to autoboot, boot
   from the hard disk.

2. When the MS-DOS prompt appears, place the disk with
   EQRAMDVR.SYS in drive B: (A: for hard disk systems).
   For a floppy disk system, type:COPY B:EQRAMDVR.SYS [ENTER]
   For a hard disk system, type: COPY A:EQRAMDVR.SYS [ENTER]

3. Check if CONFIG.SYS already exists on your boot disk by
   typing: DIR CONFIG.SYS [ENTER]
   If the message "File not found" appears, follow step 4a,
   otherwise follow 4b.

4a. Type: COPY CON: CONFIG.SYS [ENTER]
           DEVICE=EQRAMDVR.SYS /2 [ENTER]
           [F6] [ENTER]

4b. Type: COPY CONFIG.SYS + CON: CONFIG.SYS [ENTER]
           DEVICE=EQRAMDVR.SYS /2 [ENTER]
           [F6] [ENTER]

 Note: The /2 above is optional. It **will** be explained in the
        following section.

5. Reset the system, and your Equity I is now ready to use
   a RAM disk program.

EQRAMDVR.SYS   OPTIONS   AND   OPERATION

There is one option for EQRAMDVR.SYS. Typing a /n (where n is a number from 1 to 4) after DEVICE=EQRAMDVR.SYS sets the number of RAM disks that can be supported. In the instructions above, the /2 will allow the Equity I to support two RAM disks. If the /n option is omitted,- EQRAMDVR.SYS sets up support for one RAM disk.

When the system boots, EQRAMDVR.SYS will display a sign on message similar to this:

RAM disk emulator support installed at drive(s)-C:, D:

There will from one to four drive letters shown, depending on the /n option. When you execute your RAM disk program, be sure to use the drive letter shown in the sign on message. For example, using Tecmar's MEMDISK program, you would type this command at the MS-DOS prompt:

MEMDISK D: -BUF160

This would set up a 160K RAM disk at drive D:.

If you attempt to use one of the EQRAMDVR.SYS drives before running your RAM disk program, you will get one of the following error messages:

Not ready error reading drive x
Abort, Retry, Ignore?

or

Bad command error reading drive x
Abort, Retry, Ignore?

The x would actually be the letter of the drive you tried to access. Press A to abort, then run your RAM disk program.

The Equity II offers Hercules compatible graphics.   In order to
use Hercules modes with certain applications, for example Lotus 123
release 1A, you must select "HGC FULL" and for Enable V2.0 you must
select "HGC HALF" with the program HGC.

The program HGC.COM is designed to act like the Hercules Graphics
utility of the same name.   It supports three commands, which must
be on the command line after program name:

DIAG   -   Enter diagnostic mode (IBM monochrome mode 7
           compatible). Type: HGC DIAG

HALF   -   Enter half-memory mode.   This enables Hercules graphics
           for page 0 at b0000-b8000. Type: HGC HALF

FULL   -   Enter full-memory mode.   This enables Hercules graphics
           for both pages 0 at b0000-b8000 and 1 at b8000-c0000.
           Type: HGC FULL

Note: 1.   Commands may be upper or lowercase.
      2.   This version does not support the SAVE command.

VP PLANNER PATCH

SYSTEM: EQUITY II HERCULES MODE

VPHERC.COM is a TSR (MEMORY RESIDENT) program which enables VP
PLANNER to function properly when running on the Equity II
configured for HERCULES video support.   Run VPHERC before running
VP PLANNER.   It is suggested that you make a batch file in order to
accomplish this.

ROMPATCH   INSTALLATION   INSTRUCTIONS

Some Equity I and Equity II computers have trouble running certain application programs (Lotus 1-2-3 Version 2, for example) because they have an early version of ROM BIOS. This diskette contains a patch named ROMPATCH.COM which either corrects the problem (by patching the ROM) or tells you that your computer does not need it.

Follow the instructions below to install the patch if you have an Equity I or an Equity II,

Installing   the   Patch

At the MS-DOS system prompt, type: ROMPATCH and press Enter. One of the following messages appears:

Resident   portion   of   ROMPATCH   version   1.0   loaded

This indicates that the patch was necessary and has been properly installed in the lowest available memory. If you see this message, you need to install this patch every time you load MS-DOS. You may want to include ROMPATCH in your AUTOEXEC.BAT file, so it is installed automatically every time you boot your Equity. (See your MS-DOS manual for instructions on creating an AUTOEXEC.BAT file.)

ROMPATCH   version   1.0   already   installed

This indicates that ROMPATCH.COM has already been properly installed since you last booted your Equity.

No   need   to   install   ROMPATCH   version   1.0

This indicates that your Equity's ROM BIOS does not need the patch and you can disregard this patch and these instructions.

If your system does need the patch, remember to install it each time you boot your Equity or include it in your AUTOEXEC.BAT file.

E P S O N

EPSON AMERICA INC.
SERVICE DEPARTMENT

PRODUCT   SUPPORT   BULLETIN

DATE: 12/2/87   NUMBER: S-0019B

SUBJECT: EQUITY SERIES/APEX MATH CO-PROCESSOR SELECTION GUIDE

The purpose of this bulletin is to assist in selecting the
appropriate numeric co-processor for use in the Epson,Equity
series computers and the Epson Apex computer.

Use the following table to determine which type of Numeric
Co-Processor is recommended for the corresponding computer.

EPSON COMPUTER	CPU SPEED	NUMERIC CO-PROCESSOR	NXP SPEED
Equity I	4.77MHz	8087	5 MHz
Equity I+	4.77/10MHz	8087-1	10 MHz
Equity II	4.77/7.16MHz	8087-2	8 MHz
Equity II+	8/10MHz	80287-8	8 MHz
Equity III	6/8MHz	80287-6	6 MHz
Equity III+	6/8/(10/12)MHz*	80287-8	8 MHz
Apex	4.77/8MHz	8087-2	8 MHz

* Product enhanced with increased CPU speed of 6/8/12Mhz
  starting with all units manufactured in the U.S.A..

EPSON

EPSON AMERICA, INC.

SERVICE

PRODUCT SUPPORT BULLETIN

SUBJECT: EQUITY COMPUTERS AND FLOPPY DISK DRIVES

There is still some confusion regarding which FDDs will work with which Equity. Here is a quick reference for FDD selection (for detailed information, refer to PSB Number S-0001).

Equity I	Epson Q520A-AA (360 KB)[1]
Equity I+	Epson Q213A-AA (360 KB)
	Epson A112A-AA (720 KB, 3.5")
Equity II	Epson Q213A-AA (360 KB)
	Epson Q911A-AA (1.2 MB)[2]
Equity II+	Epson Q213A-AA (360 KB)
	Epson Q212A-AA (1.2 MB)
	Epson A112A-AA (720 KB, 3.5")
Equity III	Epson Q213A-AA (360 KB)
	Epson Q212A-AA (1.2 MB)
Equity III+	Epson Q213A-AA (360 KB)
	Epson Q212A-AA (1.2 MB)
	Epson A112A-AA (720 KB, 3.5")

[1] - **This is the only FDD compatible with the Equity** I.

[2] - **This is the only 1.2 MB FDD compatible with the Equity** II.

One of the key issues is: **NEVER USE ANY 1.2 MB FDD OTHER THAN THE Q911A-AA IN THE EQUITY II!** The interface is slightly different from the AT "standard". As a result, an AT-type drive will work erratically (if at all). One of the problems is a disk change error, or continuing to use the directory from a previous disk.

Also on the Equity II, MS-DOS 3.2 does not allow sufficient retries on diskette read/write with the Q911A-AA. Consistent "Abort, retry, ignore?" messages result when attempting to log a new disk. Typically, "r" for retry will overcome this situation. MS-DOS 3.2 operation with the Q213A-AA is correct.

EPSON AMERICA SERVICE, 23610 TELO AVENUE, TORRANCE, CALIF. 90505

E P S O N
EPSON AMERICA **INC.**
SERVICE DEPARTMENT

PRODUCT   SUPPORT   BULLETIN

DATE: 08/25/87   **NUMBER: S-0016**
SUBJECT: Equity Series Compatibility Certifications

Recently, four leading vendors of communications products have issued certifications of compatibility for the Epson Equity series of PCS. The products range from local-area networking to multi-user applications to micro-to-mainframe connectivity.

Arnet Corporation

Arnet Corporation produces multi-user expansion boards that allow terminals to be connected to PCs using multi-user operating systems. They have certified the Equity I+ and III+ for use with their products.

A typical configuration would be an Equity III+ host, the Xenix operating system, an Arnet Multiport Multi-8 board and cabling to connect other PCs (such as the Equity I+) or standard ASCII terminals. Other compatible operating systems include Microport Unix, Theos, BOS, PC MOS and Others.

The Arnet Twin port offers 2 serial ports for smaller installations. The Multiport board is available in Multi-4 or Multi-8 configurations, and the Multi-4 can be upgraded; The Smartport is an intelligent version of the Multiport that uses the 80186 processor to handle heavy data transfer. The Smartport is compatible only with the Equity III+.

Confirmation of Compatibility		
Arnet Product	Equity It	Equity III+
Twinport	Yes	Yes
Multiport	Yes	Yes
Smartport	N/A*	Yes

* Smartport is compatible only with AT type systems

IDEAssociates, Incorporated

Offering a wide range of micro-to-mainframe and other connectivity and enhancement products, IDEAssociates has certified the Equity It and III+ for use with their 327x and 525x mainframe products (both bisync and SNA/SDLC), their async 1200 baud modem, plus their range of hard disk and tape drives and memory products.

Recognized as a top alternative to **IBM** connectivity products, IDEAssociates provides a full selection of 3270/78 and 5250/51 hardware and software solutions for micro-to-mainframe applications. Please see the following list for a complete breakdown of their Epson-compatible products.

Epson-compatible Products - IDEAssociates

PRODUCT NAME	IDEA PROD. CODE	PRODUCT DESCRIPTION	COMMENTS
IDEAcomm 3278	CPR-3278	3278 COMMUNICATIONS EMULATOR SOFTWARE VER. 4.0	INTERFACE BOARD AND EMULATION SOFTWARE. TESTED ON I+ & III+
IDEAcomm 3287	CPR-3287	3287 PRINTER EMULATOR MAINFRAME PRINTER EMULATOR S/W VER. 1.01	INTERFACE BOARD AND EMULATION SOFTWARE. TESTED ON I+ & III+
IDEAcomm 5251	CPR-5251	5251 COMMUNICATIONS EMULATOR FOR IBM SYSTEM 3x. H/W REV E, S/W V4.0	INTERFACE BOARD AND EMULATION SOFTWARE. TESTED ON I+ & III+
IDEAcomm 5250/R	CPR-5250/R	5251 REMOTE COMM. EMULATOR FOR SYSTEM 3x CONNECTIVITY. S/W V1.01	INTERFACE BOARD AND EMULATION SOFTWARE. TESTED ON I+ & III+
IDEAcomm 1200S	CPR-1200/S	1200 BAUD ASYNC. MODEM. HALF SLOT. SOFTWARE V2.02	MODEM CARD AND COMM. SOFTWARE. TESTED ON I+ & III+
Backup Diskit	TEX-60	60MB STREAMING TAPE BACKUP. INTERNAL OR EXTERNAL. S/W V1.01	I/F BOARD, DRIVE AND SOFTWARE. TESTED ON I+ & III+
DISKIT 2 PLUS	D1010 PLUS	DUAL EXTERNAL REMOVABLE DISK SYSTEM. SOFTWARE V2.02	I/F BOARD, DRIVE AND SOFTWARE. TESTED ON I+ & III+
IDEAmini	YPR-SSPC	HALF SIZE I/O BOARD. 2 SERIAL PORTS, CLOCK, 1 PARALLEL. H/W REV B	TESTED ON I+ & III+
OVERBOARD	OB-EGA	ENHANCED GRAPHICS ADAP. SERIAL & PARALLEL, CLOCK H/W REV B	TESTED ON I+ & III+
IDEA SUPERMAX	EMX-4096	4MB OF RAM. 2 SERIAL, 1 PARALLEL. H/W REV E	16 BIT BOARD. TESTED ON III+

3Com Etherlink/Etherlink+

3Com Corporation has certified the entire Equity series for use with the Etherlink and Etherlink+ networks, as follows:

	Certified As	
System	Workstation	Server
Equity I	Yes	N/A*
Equity II	Yes	Yes**
Equity III	Yes	Yes
Equity I+	Yes	Yes
Equity III+	Yes	Yes

*   Equity I not tested as a server. Workstation compatible.
** Equity II has limited server capability; intended primarily as a workstation.

We are uploading a copy of 3Com's Application Note for the Equity II to the Product Support BBS. Please feel free to read and/or download it.

Standard Microsystems Corporation

Finally, SMC has certified their ArcNet Network Controller Boards* on the Equity I+ and III+. They have verified correct operation with all hardware topologies - bus, star, and fiber optic. The software tested includes:

> SMC NETBIOS Emulator
> Novell Advanced Netware/86
> Novell Advanced Netware/286
> Novell SFT Level 1
> Western Digital ViaNet

* ArcNet PC100, PC200, PC300 -- Rev. D and above
  ArcNet PC110, PC220, PC330 -- All

EPSON

EPSON AMERICA INC.
SERVICE DEPARTMENT

PRODUCT SUPPORT BULLETIN

DATE: 3/9/88   NUMBER: S-0014A
SUBJECT: MS-DOS 3.2 FOR THE EQUITY I/II/III

The purpose of this bulletin is to provide information on the availability of MS-DOS 3.2 for Equity I, Equity II and Equity III systems. Also included are instructions for installing MS-DOS 3.2 on hard drive systems currently using earlier revisions of MS-DOS.

The Equity I+ MS-DOS 3.2 package has been certified for use with the Equity I, Equity II and Equity III. This software is now available for customers who wish to upgrade their system.

It can be ordered under Product Code Q390A-AA - $85.00 retail. This package includes MS-DOS 3.2/GW-BASIC software with documentation for the Equity I+.

The following is a simple procedure to perform the transfer of the new MS-DOS 3.2 files to an existing hard disk system.

1. Insert the MS-DOS 3.2 diskette into drive A.

2. If the system is powered up, press RESET. If not, turn the system on.

3. At the A> prompt, type SYS C: and press ENTER. The system will respond with the message, SYSTEM TRANSFERRED.

4. At the A> prompt, type REPLACE A:*.* C:\ /S and press ENTER. This will replace the existing MS-DOS files with version 3.2 files.

5. At the A> prompt, type REPLACE A:*.* C:\[path] /A and press ENTER. This will copy new MS-DOS files to the subdirectory indicated by [path].

6. Remove the MS-DOS diskette and insert the GW-BASIC diskette into drive A.

7. At the A> prompt, type C: and press ENTER.

8. Repeat steps 4 and 5 above.   (Prompt, listed in steps 4 and 5 as A>, will now be C>.)

9. Remove the GW-BASIC diskette from the drive. Put the original diskettes in a safe place for storage.

E P S O N
EPSON AMERICA INC.
SERVICE DEPARTMENT

PRODUCT   SUPPORT   **BULLETIN**

The purpose of this bulletin is to provide information regarding the compatibility of the enhanced "AT" style Equity Plus series keyboard with the Equity family of computers and a general statement on software support.

With the introduction of the Equity It and III+, Epson brought out an enhanced keyboard design - very similar to the enhanced keyboard introduced by IBM on the Model 339 AT. There are a couple of areas to make note of.

1. Keyboard Compatibility

    The enhanced keyboard cannot be used on an Equity -'I, II or III. The enhanced keyboard (as with IBM's) requires explicit ROM BIOS support. The Equity It and Equity III+ incorporate this support; the earlier machines do not.

    It is possible, however, to use a third-party "enhanced-style" keyboard (such as the Datadesk Turbo-101) which offers switch selection for PC/XT or AT usage. (Please note that early versions of the Equity I and II did not support any third party keyboards.)

    The correct jumper settings for non-Epson keyboards are:

        Equity I: J2 and J3 jumpered
        Equity II: J3, J4 and J5 set for position 1

    Also note that once the above jumper changes have been made, attempting to use the Epson keyboard will result in damage to the keyboard-and main board.

2. Software Compatibility

    Not all applications "know" about the enhanced keyboard. The scan codes and mapping are subtly different. If you experience difficulties with certain applications (particularly any that re-program the keyboard), contact the software vendor and ask about enhanced keyboard support.

E P S O N

EPSON AMERICA INC.
SERVICE DEPARTMENT

PRODUCT   SUPPORT   BULLETIN

DATE: 2/6/87   NUMBER: S-0005

SUBJECT: EQUITY I/II HARD DISK INITIALIZATION

This is a basic guide for the installation and initialization of hard drives for the Equity I and II, Those of you that have the SPHDD.BAT may continue to use it; there are also a number of excellent third-party utilities, such as SpeedStor, that may be used. However, this method can used with just 'the systems software as provided with each machine.

1. Before physically installing the drive, either copy the information from the defect list on the top of the drive or make sure that you have the copy that was included with the drive. What you'll be needing is the cylinder/head information - you don't need the byte location.

2. Verify that the terminating resistor pack is installed and that the drive select jumper or switch is correctly set. The drive should be selected as the lowest number - i.e., DS0 assuming a range of DS0-DS3.

3. Some drive manufacturers do the physical or "low-level" format at the factory. DON'T ASSUME THIS! One indication is this: start the HDFMTALL program. If the cylinder count-down goes quickly (approx. 1 sec. per cylinder), then the physical format is very likely sound. If it takes longer than this, other measures are called for. Re-boot the system and proceed to step 4.

4. Invoke the DEBUG program. At the dash (-) prompt, enter: g=c800:5 and press ENTER. At this point, DEBUG executes (Goes to) the instructions at hex address c800, offset 0005. This is the ROM BIOS on the HD controller card. Stored at this address is the physical formatting routine provided by the controller manufacturer: You may encounter two types: Western Digital or National Computer Labs (NCL). The Western Digital is the simpler of the two. It presents you with information about how the drive number and interleave factor are stored in the AX register and prompts "Press y to begin formatting drive C with interleave 03". Press any key other than "y" and it aborts. If you enter "y", it IMMEDIATELY proceeds with the format. DON'T PRESS "Y" UNLESS YOU REALLY MEAN IT! It will then inform you when the format is complete and return you to the A prompt.

The NCL format is somewhat more complicated. It will ask you for drive number (0), number of cylinders (615), number of heads (4), reduced write current (615), write precompensation (615) and maximum ECC data error burst length (11). The numbers given here in parentheses would be typical for the HMD-720-802. It will then ask if all is correct; if yes, it proceeds with the format. If not, it returns you to the top of the input menu. In any case, when it completes the format, it may ask you if you wish to enter alternate track selections. Tell it "no".

5.. Invoke the program HDFMTALL. This program will allow you to reconstruct the bad track table, which we just knocked out with the physical format. HDFMTALL will ask if you want a "standard" format; press "N". It will then ask if you want the default interleave of 3; you can accept this or change it. (I've found that an interleave of 6 seems to be pretty optimal on the I and II.) HDFMTALL will then display the bad track table and give you the chance to edit it. If any bad tracks are displayed, make sure that any bad locations from the error list you took off of the drive are indeed flagged. If not, enter them manually. If the scan turned up an excessive (more than 50) number of bad tracks, you might want to delete them and then manually enter the ones from the error list. Press "F" when you are finished and HDFMTALL will proceed with the warnings and then the actual format.

6. You're now ready to use HDPART. This program sets up the MS-DOS partition and writes the DOS file structure to the disk. Typically' you'll use the entire disk for DOS, so that simplifies matters. Just make sure that the DOS partition is specified as BOOTABLE. When you exit HDPART, the system automatically re-boots.

7. The final step - HDFORMAT. From the A prompt, enter the following: HDFORMAT C: /s/v. The /S switch transfers the operating system to the hard drive. The /V switch causes HDFORMAT to prompt you for a volume name for drive C. HDFORMAT now performs the logical format. When finished' remove the floppy from drive A and press CTRL-ALT-DEL. The system should boot from the C drive.

For those of you familiar with the IBM world, the DEBUG format is the same. HDFMTALL is the equivalent to IBM's Diagnostics level format; HDPART is our version of FDISK, and HDFORMAT is the same as IBM's FORMAT.

E P S O N

EPSON AMERICA INC.
SERVICE DEPARTMENT

PRODUCT   SUPPORT   BULLETIN

DATE: 2/4/87   NUMBER: S-0003
SUBJECT: NEW   RELEASE - EQUITY I SOFTWARE/DOCUMENTATION PKG.

A   new   EQUITY I MS-DOS 2.11 Software/Documentation package
(Product   Code   Q595A-AB)   was   released   from   Epson   America's
Computer Products Division in January 1987.

Product Code	HP Class	Mini Class	Unit of Measure	Std. Ord. Quantity	Sugg. Retail
Q595A-AB	SDYS	SD3	EA	4	$85.00

This new version supports the floppy drive units (MD-5201-55)
currently being shipped with the Equity I CPUs as well as all
previous floppy drive models. This version of software has been
shipped with all Equity I units since approximately 10/86
(starting with serial number 080001) with the introduction of the
Canon MD-5201-55 floppy drive. At that time the Equity I ROM BIOS
was also updated to MSA-B4 to support the step rate of the new
floppy drives. The MS-DOS 2.11 version software should be used
with the MSA-B4 Equity I ROM BIOS.

This new software package is already included in Equity I boxes
with the "S1" product code.

If you   currently have Q595A-AA software packages in your
inventory, they should only be used to replace software in Equity
I units not having the "S1" product code (units with serial
numbers below 080001), unless they are being retrofitted with the
MD-5201-55 floppy drives. In that case the ROM BIOS must also be
updated.

The new MS-DOS 2.11 software and new ROM BIOS have no other
functional differences from the previous version other than
compatibility to the MD-5201-55 floppy disk drive.

E P S O N

EPSON AMERICA INC.
SERVICE DEPARTMENT

PRODUCT   SUPPORT   BULLETIN

DATE: 2/4/87   NUMBER: S-0002
SUBJECT: USING THE PLUS DEVELOPMENT "HARDCARD" WITH EQUITY I/II

The Plus Development "HardCard" is a 20 megabyte fixed disk
mounted on an expansion slot card, for use in IBM PC/XT and
compatible computers. The unit employs controller circuitry from
OMTI/Scientific Micro Systems, and uses 2,7 RLL encoding.

The HardCard has been found to be compatible with the Equity I
and II computers, but there has been some confusion among
customers who are running through the installation procedures.
This is due to the HardCard's special installation procedure
which has been designed specifically for use with PC-DOS.
Because of certain file name differences between Epson's MS-DOS
and IBM's PC-DOS, the Plus install program will not run using
Equity MS-DOS.

Unfortunately, Plus Development does not officially support the
use of the HardCard in the Equity computer series, because it has
not been formally tested and approved by Plus Development. It
has, however, been tested and officially approved by Epson's
Vendor support staff.

The HardCard is shipped in a partitioned and formatted state,
with a number of files included on it. The directory of files is
as follows:

```
INSTALL    EXE     47479    1-01-80    12:06a
HCD        BAT        30     1-01-80    12:07a
HCD1       BAT       128     1-01-80    12:07a
HCD2       EXE     54769    1-01-80    12:07a
HCD3       DAT     13440    1-01-80    12:07a
HCD3       DIF       704     1-01-80    12:07a
HCD6       SCR      4224    1-01-80    12:07a
PREPARE    BAT       235     1-01-80    12:08a
SHELL      BAT        18     1-01-80    12:07a
LIGHT      COM       145     1-01-80    12:07a
SOUND      COM       145     1-01-80    12:07a
PATCHFMT   EXE     12670    1-01-80    12:08a
INSTALL    DAT       425     1-01-80    12:06a
```

These files comprise the installation routine (INSTALL.EXE, INSTALL.DAT, PATCHFMT.EXE, PREPARE.BAT, and SHELL.BAT), the Plus Development fixed disk menu program (HCD*.*), and supplemental utilities (LIGHT.COM and SOUND.COM).

Once the HardCard has been physically installed in the computer, the user boots the system with PC-DOS/MS-DOS (from the floppy drive), runs SYS.EXE (which is named SYS.COM on Equity MS-DOS) to transfer the o/s to the HardCard, then copies several DOS files to the root directory of C:. The user then invokes INSTALL.EXE which runs an 8-10 minute "hands-off" procedure that fully prepares the HardCard for use. This consists of partitioning and formatting, and loading their menu program and preparing it for auto execution.

For Equity "power users" who are comfortable with MS-DOS, and who don't wish to use the Plus-supplied menu program, they can set up the HardCard by simply copying the Plus files to a formatted floppy diskette, and then using HDPART and HDFORMAT in the normal fashion (Equity II users should run SETUP.COM first to make sure that drive C: is properly specified - for the HardCard, it should be set as "Not installed or other"). Users may want to copy the LIGHT.COM and SOUND.COM utilities back to the HardCard, as these files control visual and audible signals that are used to indicate HardCard access. The visual indicator is a flashing "+" sign at the upper right of the display (defaults to ON), and the audible indicator is a buzzing sound (defaults to OFF). However, if the user would like to set up the HardCard as though the Plus installation was performed (i.e. complete with their "shell"), then they should manually duplicate the Plus routine, as detailed in the following section. This procedure was outlined by the Plus Development technical staff, and I have substituted the alternate commands that the Equity MS-DOS uses.

Note that, while some of the steps seem redundant, the procedure was designed so that disk swapping on a single floppy system would be minimized, and also for automatic operation.

HARDCARD INSTALLATION - MODIFIED FOR EPSON EQUITY I/II

1. Boot the computer using the Epson MS-DOS disk (EQUITY II USERS ONLY: run SETUP.COM and set drive C: for "Not installed or others").
2. Enter SYS c: to transfer the operating system to the hardcard.
3. Copy COMMAND.COM and FORMAT.COM from the MS-DOS diskette into the root directory of the HardCard.
4. Remove the MS-DOS diskette and insert a blank diskette in drive A:. Log onto C: and enter FORMAT A: to prepare the blank diskette.
5. COPY all files from the HardCard to the formatted diskette. Label this diskette "Plus Utilities".
6. Remove the Plus Utilities diskette and press the RESET button on the Equity. The system should reboot from the HardCard.
7. Reinsert the Equity MS-DOS diskette (EQUITY II: insert the Equity GW-BASIC/UTILITIES diskette), log onto drive A: and run HDPART and HDFORMAT/S to partition and format the HardCard. When finished, remove the Equity diskette and reset the system. Ensure that the Equity boots from the HardCard.
8. Reinsert the Plus Utilities diskette. Copy all the files from the Plus Utilities diskette back into the root directory of the HardCard. Remove the Plus Utilities diskette and-store in a safe place.
9. Copy all files from the Equity diskette(s) into the root directory of the HardCard.
10. Log into the root directory of drive C: and enter the command PREPARE. This will run a batch file that will create 16 empty subdirectories on the HardCard, into which applications software will later be loaded.
11. Also in this directory, rename the program SHELL.BAT to AUTOEXEC.BAT. This will cause the system to automatically load the Plus menu "shell" on bootup.12). Finally, erase PATCHFMT.EXE, PREPARE.BAT, and INSTALL.* from the root directory of C:.
12. The HardCard installation is now complete. Test the system by rebooting - the Plus menu "shell" should run.

NOTE: The original Plus install program creates a floppy diskette containing the Plus files, as above, but also performs several other operations to make it what they refer to as the "REINSTALL" diskette. This Reinstall diskette can later be used for reformatting of the HardCard. Using the modified Equity procedure, however, the "Plus Utilities" diskette that is created cannot be used as the Reinstall diskette. If an Equity user wants to reformat the HardCard, the user should use ARCHIVE to back up the contents, run HDFORMAT/S, then use ARCHIVE to restore the files.

EPSON

EPSON AMERICA, INC.

SERVICE PRODUCT SUPPORT BULLETIN

SUBJECT: **EQUITY SERIES FDD/HDD** COMPATIBILITY MATRIX

This document provides updated compatibility information on floppy disk drives, hard disk drives and hard disk controllers which have been supplied or are currently being supplied with the Equity series computers from Epson America, Inc.

Also included is information on which low level hard disk format procedures should be used with the various versions of hard disk controller boards.

Please refer to the Equity I, II, III **IBM PC COMPATIBLE HARDWARE/ SOFTWARE DIRECTORY** supplied by Epson America's Marketing Department for information regarding third party floppy disk and hard drive compatibility.

EQUITY SERIES FLOPPY DISK DRIVE COMPATIBILITY MATRIX

PRODUCT DESCRIPTION	COMPATIBLE WITH EQUITY MODEL						COMMENTS
360KB 5.25" FDD	I	I+	II	II+	III	III+	
MDD-531-51 (CANON)	X						
MD-5201-55 (CANON)	X						C
SD-525-501 (EPSON)	X						
MDD-531-31 (CANON)			X		X		A,J
MD-5201-57 (CANON)		X	X	X	X	X	D,E
MD-5201-58 (CANON)		X	X	X	X	X	D,E,I
SD-521-506 (EPSON)		X	X	X	X	X	B
1.2MB 5.25" FDD	I	I+	II	II+	III	III+	
SD-580 (EPSON)					X		G
SD-581L-501 (EPSON)			X				B,F,G,H
JU-595-10 **PANASONIC**					X		
MD-5501-61 (CANON)				X	X	X	
FD1155C/FD1157C NEC				X	X	X	
720KB 3.5" FDD	I	I+	II	II+	III	III+	
SMD-489M (EPSON)		X	X	X		X	

COMMENT CODE EXPLANATIONS:

A. Requires insulating sheet when installed in lower position in Equity II. See TIB Equity 11-006.
B. Jumper block SS1 - Position DS0 for drive A, DS1 for drive B
C. Equity I must have ROM BIOS version 2.21(MSA-B4) and MS-DOS 2.11 Release 1.04 or higher to use this drive.
D. Must set drive select jumpers on FDD logic board for A (position S1) or B (position S2).
E. It is not necessary to remove the terminating resistor pack.
F. Handle drive with care - possibility of short circuit between screw head on frame and FDD logic board (could damage FDD)!
G. Terminator must be removed when used as 2nd floppy drive unit.
H. See Product Support Bulletin S-0020 for set-up information.
I. Same as MD-5201-57 except comes configured as 2nd drive.
J. Jumper block JJ1 - Position S1 for drive A, S2 for drive B.

EQUITY SERIES HARD DISK DRIVE COMPATIBILITY MATRIX

PRODUCT DESCRIPTION	COMPATIBLE WITH EQUITY MODEL						COMMENTS
20MB HARD DISK DRIVES	I	I+	II	II+	III	III+	
DK-505-2 (HITACHI)	X		X				C
HD-860-501/502/503	X	X	X				
HMD-720-802 EPSON	X	X	X		X		D
HMD-720-803 EPSON				X	X	X	
HD-860-504/505 EPSON	X	X	X	X	X	X	A, B
HD-860-506 EPSON	X	X	X	X	X	X	B
40MB HARD DISK DRIVES	I	I+	II	II+	III	III+	
D5146 (NEC)				X	X	X	
6053 (MINISCRIBE)				X		X	
94205-51 (CDC)				X		X	

COMMENT   CODE   EXPLANATIONS:

A.   Comes with black front bezel.

B.   When used with Equity III use format procedure #2 on page 5.

C.   Follow format procedure #2 on page 5. The NCL Hard Disk
     Controller Board (NDC5027-49) and DK-505-2 HDD must be used
     together.

D.   For Equity III - Only use HMD-720 hard drives NOT stamped
     with: "Do not use with Equity III".

EQUITY **SERIES HARD** DISK **CONTROLLER** COMPATIBILITY **MATRIX**

PRODUCT DESCRIPTION	COMPATIBLE WITH EQUITY MODEL						COMMENTS
HARD DISK **CONTROLLER**	I	I+	II	II+	III	III+	
WD1002S-WX2C027 **ROM 62-000062-010**	X						**B, E**
WD1002S-WX2C027 **ROM 62-000062-010-1**	X	X	X				**B**
WD1002A-WX1E027 **ROM 62-000062-010-1** or 62-000062-13	X	X	X				**B, C, D**
NCL NDC5207-49	X		X				**A**
WD1002-WAH **ROM 62-001020-10** **AND** 62-001027-11					X		
EPSON WHDC BOARD **P/N Y127203000** **ROM VERSION** **WD1015PL-27** or -27B **62-002008-011** or -061				X		X	**F, G**

CODE EXPLANATIONS:

A. Follow format procedure #2. NCL Hard Disk Controller Board (NDC5027-49) and DK-505-2 HDD must be used together.

B. Follow format procedure indicated on PSB # S-0005.

C. Short version Western Digital HDC board. Released late 1986.

D. ROM BIOS 62-000062-010-1 and 62-000062-13 are equivalent. Either ROM may be found on this board.

E. This version HDC ROM BIOS with WD-1015-24 firmware CPU will not allow auto-boot from hard disk. WD-1015-14 firmware CPU will work.

F. ROM BIOS # WD1015PL-27 is equivalent to 62-002008-011 these ROMs have been updated to # WD1015PL-27B or 62-002008-061 which are also equivalent to each other.

G. HDC ROM BIOS must be revision "B" to work with XENIX software.

HARD DISK FORMATTING INFORMATION

```
*****IMPORTANT**************IMPORTANT ****************IMPORTANT*****
*                                                                 *
*     ALWAYS  FORMAT  THE  HDD  WITH  THE  SAME  VERSION  CONTROLLER   *
*     BOARD  AND  HDC  CPU  FIRMWARE  VERSION  IT  WILL  BE  USED  WITH.   *
*     IT  IS  NOT  NECESSARY  TO  REFORMAT  IF  THE  ROM  BIOS  IS          *
*     UPGRADED  AS  LONG  AS  THE  SAME  FIRMWARE  CPU  IS  USED.      *
*                                                                 *
******************************************************************
```

FOR LOW LEVEL FORMATTING:

   1. EQUITY I/II **FORMAT**

      **See PSB # S-0005 titled Equity I/II HDD intialization
      procedure using software which is included with each system**

   2. EQUITY III **FORMAT**

      a. **Run PFORMAT - Enter bad tracks - Time approx. 5 minutes.**

      b. **Run HDFMTALL - Time approx. 8 minutes.**

      c. **Run HDPART - Time approx. 2 minutes.**

      d. **Run HDFORMAT - Time approx. 5 minutes.**

   3. **EQUITY** III+ **- See Product Support Bulletin # S-0006**

Notes:

   1. **Early production Equity I units without HDDs must be
      upgraded with the CAC version VFO SUB-board to operate
      with a hard drive.**

   2. **Equity I, DOS ver. 2.11 problem - Bad sector information
      erased when HDFORMAT (MS-DOS utility) executes formatting.
      Corrected in DOS version 2.2 (MSA-B3) and 2.21 (MSA-B4).**

   3. **Equity I/II - HDFMTALL erases bad sector information.
      Delete HDFMTALL from the system disk.**