

**Decision 1 Alteration Guide
for the Oasis Operating System**

Preliminary Edition
Rev. 0 - 4/82

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MODIFICATIONS

The Oasis operating system requires that the first 16K of user memory be global, that is, shared by all the users. For this reason, a non-extended address board (i.e., Morrow Designs Super-ram 16) is addressed at XX0000h - XX3FFFh, where the operating system will reside. This memory will be common to all tasks running. In addition to this memory, each user will have 48K of memory at his disposal. In order to minimize the changes to Oasis, the MPZ80 will control the upper four address lines (A20 - A23) to simulate a bank select type of system with the extended addressing. This requires that the user memory be extended address memory (a Morrow Designs MM65KS16 static memory depopulated to 48K or with two 16K banks overlapping each other). The operating system allows only 16 users and the memory must be addressed to take into account the switching of the upper four address lines when users swap in and out. This would mean the users' memory maps would be as follows:

User Memory Maps

<u>User</u>	<u>Extended Memory Address</u>
0	004000 - 00FFFFH
1	104000 - 10FFFFH
2	204000 - 20FFFFH
3	304000 - 30FFFFH
4	404000 - 40FFFFH
5	504000 - 50FFFFH
6	604000 - 60FFFFH
7	704000 - 70FFFFH
8	804000 - 80FFFFH
9	904000 - 90FFFFH
10	A04000 - A0FFFFH
11	B04000 - B0FFFFH
12	C04000 - C0FFFFH
13	D04000 - D0FFFFH
14	E04000 - E0FFFFH
15	F04000 - F0FFFFH

Global Memory

The global memory part of the system may be composed of any board which does not respond to extended address. This can be any of the following Morrow Design products:

- 16K Superram
- 16K Memory Master
- 24K Memory Master
- 32K Superram
- MM65KS16Memory Board (setup for bank select)

Switch settings for 16K Superram:

Far Left Switch

<u>Paddle</u>	<u>State</u>
1	ON
2	ON
3	ON
4	ON
5	ON
6	ON
7	ON
8	OFF

Middle Switch

<u>Paddle</u>	<u>State</u>
1	ON
2	ON
3	OFF
4	ON
5	ON
6	ON
7	OFF
8	OFF

Right Switch

<u>Paddle</u>	<u>State</u>
1	ON
2	ON
3	ON
4	ON
5	ON
6	ON
7	ON
8	ON

Switch settings for 16K Memory Master:

Switch 6A

<u>Paddle</u>	<u>State</u>
1	ON
2	ON
3	ON
4	ON
5	ON
6	ON
7	ON
8	ON

Switch 7A

<u>Paddle</u>	<u>State</u>
1	OFF
2	OFF
3	OFF
4	OFF
5	OFF
6	OFF
7	OFF
8	ON

Switch 8A

<u>Paddle</u>	<u>State</u>
1	OFF
2	OFF
3	ON
4	OFF
5	OFF
6	OFF
7	ON
8	ON

Switch 8D

<u>Paddle</u>	<u>State</u>
1	ON
2	ON
3	ON
4	ON
5	ON
6	ON
7	ON
8	OFF

Switch 7E

<u>Paddle</u>	<u>State</u>
1	ON
2	ON
3	ON
4	ON
5	ON
6	ON
7	ON
8	ON

Switch 7F

<u>Paddle</u>	<u>State</u>
1	ON
2	ON
3	ON
4	ON
5	ON
6	ON
7	ON
8	ON

Extended Address Memory
(MM65KS16 Addressing/Jumpering)

The following procedures set up the MM65KS16 memory board for the Oasis operating system.

I. Depopulate board to 48K. Remove RAM chips at board locations:

1A, 2A, 3A, 4A, 1B, 2B, 1C, 2C

The board now has 48K of RAM.

II. Addressing the board:

The following are the switch settings for MM65KS16 for a multi-user Oasis system:

MM65KS16 USER 0

<u>Paddle</u>	<u>S1</u>	<u>S2</u>
1	ON	ON
2	ON	OFF
3	ON	ON
4	ON	OFF
5	ON	OFF
6	ON	ON
7	ON	OFF
8	ON	OFF

MM65KS16 USER 1

<u>Paddle</u>	<u>S1</u>	<u>S2</u>
1	ON	ON
2	ON	OFF
3	ON	ON
4	ON	OFF
5	OFF	OFF
6	ON	ON
7	ON	OFF
8	ON	OFF

MM65KS16 USER 2

<u>Paddle</u>	<u>S1</u>	<u>S2</u>
1	ON	ON
2	ON	OFF
3	ON	ON
4	ON	OFF
5	ON	OFF
6	OFF	ON
7	ON	OFF
8	ON	OFF

MM65KS16 USER 3

<u>Paddle</u>	<u>S1</u>	<u>S2</u>
1	ON	ON
2	ON	OFF
3	ON	ON
4	ON	OFF
5	OFF	OFF
6	OFF	ON
7	ON	OFF
8	ON	OFF

MM65KS16 USER 4

<u>Paddle</u>	<u>S1</u>	<u>S2</u>
1	ON	ON
2	ON	OFF
3	ON	ON
4	ON	OFF
5	ON	OFF
6	ON	ON
7	OFF	OFF
8	ON	OFF

MM65KS16 USER 5

<u>Paddle</u>	<u>S1</u>	<u>S2</u>
1	ON	ON
2	ON	OFF
3	ON	ON
4	ON	OFF
5	OFF	OFF
6	ON	ON
7	OFF	OFF
8	ON	OFF

MM65KS16 USER 6

<u>Paddle</u>	<u>S1</u>	<u>S2</u>
1	ON	ON
2	ON	OFF
3	ON	ON
4	ON	OFF
5	ON	OFF
6	OFF	ON
7	OFF	OFF
8	ON	OFF

MM65KS16 USER 7

<u>Paddle</u>	<u>S1</u>	<u>S2</u>
1	ON	ON
2	ON	OFF
3	ON	ON
4	ON	OFF
5	OFF	OFF
6	OFF	ON
7	OFF	OFF
8	ON	OFF

Note the progression of the extended address switch: S1 paddles 5 through 8 form a binary progression. By incrementing these four bits, you will increment the upper four bits of the extended address to which the memory will respond and thus increment users.

The memory board should be set as extended address (not bank select) meaning a 25LS2521 should be installed in location 1D and no chip should be installed in location 2D.

MM65KS16 Jumpers

J1	-	In
J2	-	In
J3	-	Out
J4	-	In
J5	-	Out
J6	-	In
J7	-	Out

No jumpers in area 17D (bank select jumpers).

MPZ80 Hardware Modifications

Normally the Decision 1 is designed to trap on a 'Halt' instruction (system calls from UNIX) but the Oasis operating system will trap on a 'RST 6' instruction instead. At present, this requires a hardware modification to the MPZ80 board. The modification requires four jumpers and is performed as follows:

1. Lift pins 9 and 10 of IC 8D.
2. Connect pin 9 of chip 8D to pin 1 of chip 6D.
3. Connect pin 10 of chip 8D to pin 13 of chip 6D.
4. Connect pin 9 on the socket of 8D to pins 2 and 3 of chip 6D.
5. Connect pin 10 on the socket of 8D to pins 11 and 12 of chip 6D.

MPZ80 Firmware Modifications

The firmware on the MPZ80 CPU board has also been changed to accommodate this hardware change and the operating system. Whenever a 'RST 6' instruction is executed in the first 4K of memory of any task, it is assumed to be an Oasis system call. The EPROM code on the MPZ80 will then latch the contents of the upper 4 bits of the 'A' register onto the S-100 address line A19 - A23. The lower 4 bits of the 'A' register are masked off. Operation then resumes at the instruction immediately following the 'RST 6' instruction with all registers preserved.

If a 'RST 6' is executed above the first 4K by any user, it is assumed to be a user wishing to use a 'RST6' instruction and the program will continue execution at location 30 in the global memory as though it were actually executing the 'RST 6'. It is in fact interpreting this instruction for the user. Users are warned that the memory location of all the Restart vectors is common to all users and should use care when using these areas.

The switches on the MPZ80 are the same as for the standard EPROM:

Switches 1 - 5 control the power on jump address. Normally these switches are all off to boot up a DJ 2D/B at F800h. If these switches are all on, the Morrow Designs BOOTH program is executed to boot up a HDCA hard sectored hard disk. If all switches are on except for 5, the HDC/DMA boot routine is executed.

When ON, switch 6 causes the monitor to be invoked, OFF allows power on jump to the address determined by S1 - S5. See MPZ80 manual for details on the monitor commands.

Switch 7 is unused.

Switch 8 must always be on in systems requiring MWRITE (with DJ 2D/B for instance).

Mult I/O Switches and Jumpers
(Revision 3 and 4)

Mult I/O Switches

Switch 2D
(Address 0F0000h)

<u>Paddle</u>	<u>State</u>
1	ON
2	ON
3	ON
4	ON
5	OFF
6	OFF
7	OFF
8	OFF

Switch 7B

<u>Paddle</u>	<u>State</u>
1	ON
2	ON
3	OFF
4	ON
5	ON
6	OFF
7	OFF
8	OFF

Switch 1ØB

<u>Paddle</u>	<u>State</u>
1	OFF
2	ON
3	ON
4	ON
5	ON
6	ON
7	OFF
8	OFF

Mult I/O Jumpers

<u>Jumper</u>	<u>Location</u>	<u>State</u>
J1	1A 1A	A to H B to I
J2	5A 5A	A to H B to I
J3	8A 8A	A to H B to I
J4	11C	B to C
J5	3D	B to PINT
J6	7A	Installed (Rev. 4 only)
P5	11A	Not installed
P6	14D	Clock battery back-up

WB I/O Switches and Jumpers

Switch 7C

<u>Paddle</u>	<u>State</u>
1	ON
2	ON
3	OFF
4	ON
5	ON
6	OFF
7	OFF
8	OFF

Switch 10A (9600 Baud)

<u>Paddle</u>	<u>State</u>
1	ON
2	OFF
3	ON
4	OFF
5	OFF
6	OFF
7	OFF
8	OFF

<u>Jumper</u>	<u>Location</u>	<u>State</u>
J1	8A	not installed
J2	8C	Jumper A to B
J3	8C	Installed
J4	2C	No jumpers
J5	13A	Battery back-up for clock
J6	8E	Reset switch input

DJ 2D/B Floppy Controller Settings

Switch 5D

<u>Paddle</u>	<u>State</u>
1	OFF
2	OFF
3	OFF
4	OFF
5	OFF
6	OFF
7	OFF
8	OFF

Switch 13C
(9600 Baud)

<u>Paddle</u>	<u>State</u>
1	OFF
2	OFF
3	OFF
4	ON
5	OFF
6	OFF
7	OFF
8	OFF

DJ 2D/B Jumpers

<u>Jumper</u>	<u>Location</u>	<u>State</u>
J1A	3D	Not installed
J2	4D	Installed
J3A	11C	J3A to Data 0
J4	4A	A to B

HDCA Winchester Controller Jumpers and Settings
(Revisions 3 and 4)

Switch 8C
(Port 50 - 53h)

<u>Paddle</u>	<u>State</u>
1	OFF
2	OFF
3	ON
4	OFF
5	ON
6	ON
7	ON
8	ON

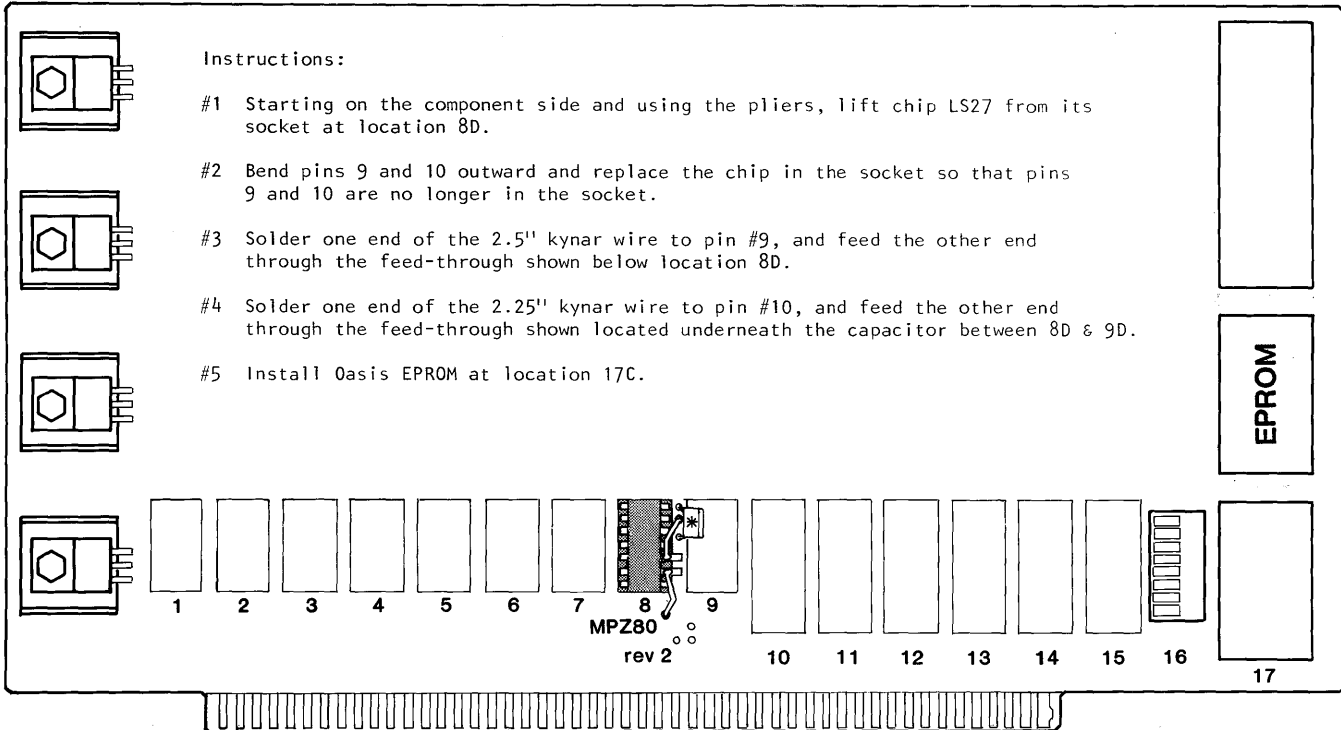
HDCA Jumpers

<u>Jumper</u>	<u>Location</u>	<u>State</u>
J1	6C	Not installed
J2	6C	Not installed
A	0C	Not installed
B	0C	Not installed

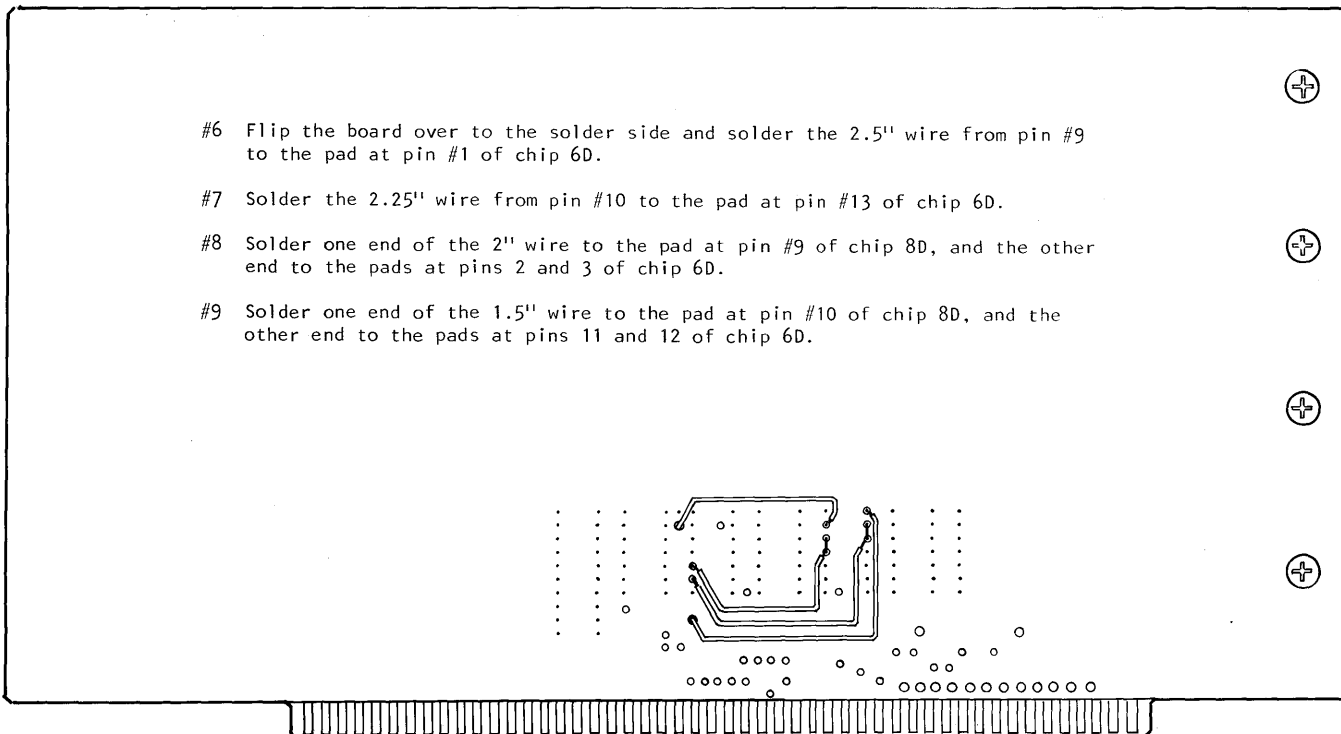
Oasis EPROM Installation

Parts list:

- (1) Decision 1 CPU, MPZ80 rev 2
- (1) Oasis EPROM (to be located at 17C)
- (4) pieces of 30 gauge insulated (Kynar) wire: 2.5", 2.25", 2" & 1.5"
- (1) 6" length of solder (60/40 recommended)
- (1) solder iron
- (1) pair of pliers



#1 Component Side



#2 Solder Side