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05 May 1980

Documetation on Micro Complex's "PHASE LOCK II" Dual Density Disk Controller and McDos (TM) Disk Operating System.

1. The Micro Complex disk controller has been designed to be Plug Compatible with the North Star, Inc. controller board. Therefore, it is capable of executing software programs which will execute on the North Star, Inc. controller. This compatiblity has been intentionally maintained in order to support the large number of software packages which are being written by many other companies and users.

2. The Micro Complex "PHASE LOCK II" has several features which are extentions beyond the capiblities of the North Star, Inc. controller board. These are;

a. The controller's memory address can be re-located by an on-board dip switch. This is provided as an optional addition and should be specified when odering the board. The switch is not normally installed. This is due to the fact that most users will operate the board at the standard address of E800H. The "PHASE LOCK II" is delivered with the address E800H selected by circuit etch connections. However, the Dip Switch Option can be easily installed by cutting the two traces on the component side of the board. These traces presently run vertical between pins 4 & 9 and pins 6 & 7 at the dip switch location E3. Installation of the Dip Switch Option consists of cutting the two traces and soldering in the 6 pole dip switch. The memory address of the board may then be set by the switch. The switch sets the upper six bits of the address. Since the lines are normally pulled up to a logical one, the open position on the switch represents a 'logical one' for the address. Therefore, if the switch is installed, the E800H address would be set by a switch selection (reading left to right) of

OPEN/OPEN/OPEN/CLOSED/OPEN/CLOSED

Operation of the board at a different address also requries that the Boot Prom software and DOS software be modified. Source listings of both are available at additional costs, either printed-out or on diskette. A simple means of re-loction this is being developed, and will be available very soon. If you are interested in re-addressing your board, please advise us.

b. There is some confusion in the industry as which pin on the ribbon cable header should be used to select drive #4 if installed. North Star, Inc. uses pin # 34. Pertec, Inc. and Tandon, Inc. uses pin #6. Suggart, Inc. uses pin #34 with user modification required for selection of a forth drive. On the "PHASE LOCK II" controller, the select line can be changed to pin #6 by jumpering between Pin #6 and Pin #34. Note: when looking at the front of the board, the header pins are numbered from "right to left, all odd numbered pins are grounded. The even numbered pins are the row nearest to you. Pin #6 is the third one from the right, in the lower row.

c. The interrupt circuit may be connected by simply jumpering between which ever of the interrupts you select (VI0 thru VI7 or NMI) as marked on the board. The other end of the jumper should connect to the plate through hole located between the V and I letters at the VI5 interrupt select label. After the jumper is added, the software must arm the interrupt in a manner similair to North Star, Inc.'s board.

d. The Automatic Motor-Off timer is user selectable to 4, 8, 16, or 32 seconds. As delivered it is set to 32 seconds. The option selection holes are located below the IC at location 3B on the board. The four holes in a row are left to right the 4, 8, 16 , & 32 second selection holes. The single hole, centered beneath these holes is for the other end of the timer selection jumper. You may note that this hole is jumpered, on the back of the board, to the 32 second selection holed. If you desired to change the selection, then cut this circuit, near the 32 second hole, on the backside, and then solder in a jumper to the desired timing hole.

******** "McDos" Disk Operating System Features ********

1. The McDos provides all the functions of the North Star, Inc. DOS. However, it's structure is considerably different. It uses no memory above 2A00H, so compatibility with all old programs is maintained. Instead, it uses a buffer area at 1D00H and 100H at 1F00H. Both of these areas will automatically re-load themselves if they are destroyed by user program execution. The re-load is not done until the function at that address is required for McDos to complete it's assigned command.

2. Copies of McDos can be made using either the LF/SF sequence or th RD/WR sequence of commands. It will not function properly if you save a copy of it'self from it's operating location in memory. If modifications to McDos are desired, they can be made by loading the code into memory and modifing it. Then re-save it on the disk. It should be noted that the McDos code for addresses 2000H to 2A00H is in sectors 4 thru 8 and that the code for 1E00H thru 1FFFH is in sector 9. This inverse order is necessary due to the method of bootstrapping which is employed. Therefore, if you are assembling a new version of McDos, it is necessary to load the new version with an off-set, for example with a bias of 2000H. Then McDos will be at addresses 3E00H to 4A00H. Then put it on the Disk by typing;

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WR 4 4000 10
WR 9 3E00 2
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3. A full source listing of the McDos is available for $40.00. Source code of McDos in CP/M assembly format is available for an additional $40.00. It includes code for the following special features;

a. Auto-Load of a user designated file at boot-up is triggered simply by putting it's name in the Keyboard Buffer, at 28B0H. You can easily do this using the commands; LF DOS 4000. Then insert the ASCII code for the filename at address 48B0H, followed by a RETURN code, 0DH. Then type; SF DOS 4000 and the DOS will automatically load and execute the file when you boot-up.

b. GO commands are not required, typing the file followed by a RETURN will automatically load and execute a file.

c. All six of the disk function error messages are output in plain text;

(1)SYNC
(2)CRC
(3)VERIFY
(4)INDEX
(5)DENS
(6)WRIT-P

d. An RN command is provided to rename files. It's form is;

RN Filename1,<Unit#> Filename2

e. An exit from the LI command is provided to escape in the middle of long file directory listings. Either the mode key or Control-C will abort the listing.

f. Additional jump vector commands are available;

B = Jump to Re-Boot
BA = Return to Basic at 2A00H
WP = Return to Word Processor at 2A00H
M = Jump to the Monitor (Solos at C004H)

These commands may be modified to different two letter commands and/or vector addresses by changing the table which begins at address 280AH

g. The I/O area is at 2900H and can be modified to suit your requirements.

h. The start-up initialization and Banner may be modified by changing the code at 1E00H. This code gets over-written after boot-up is completed.

i. The SOL computer McDos is set up to provide protocol handshake with a Diablo printer on the serial port. If this is not desired, the replace the RNZ code at (SOL version) 2910H with a RET code, i.e., the C0 becomes C9.

j. McDos commands and Hexidecimal numbers may now be entered in either upper or lower case. Note: Commands CO,CF,CD, etc. are really calls to files stored on the disk and therefore the upper/lower case must be the same as the filename as listed in the disk directory.

k. Two new file routines are provided on the system disk to allow you to MERGE DISKS. They are, MD.S and MD.D, which will merge the files from a single or double density disk in drive #2 onto a disk in drive #1. This is very useful when converting from single density systems to double density systems.

That's about all the information we have prepared at present. Schematics for the boards are available.

Micro Complex will repair all boards returned, if user pre-pays postage both ways. Subject to our evaluation as to wheather the board has been abused, the repair will be free except for the postage, until 90 days after purchase date.

More detailed information and coding to provide board address re-location is available for those of you who would like to re-map your memory configurations.

If you need additional aid in the operation of McDos, please call me at Micro Complex (714) 770-2168,

Robert Lee Hogg.