DISTO
SUPER PRODUCTS

MULTI-BOARD
(3 in 1)
ADAPTER

C.R.C COMPUTER inc
C.R.C ORDINATEUR inc

Congratulations on the purchase of your new DISTO Multi-Board-DC Adapter. The quality materials and workmanship used in this product insures years of trouble free use. The Multi-Board-DC Adapter will work with the original DISTO Super Controller, SCII, MEB & MEB II Adapters or the Super RamDisk.

FEATURES.

* RTC (Real Time Clock) Gives you the real time, date, and year in an instant.

* Parallel Printer Port lets you use any printer that has a Centronics compatible connector.

* True RS232 Communications Port. A serial port that lets your computer talk to a Modem or other Computer via a DB-25 connector (included).

* All components rated at 2 mega hertz. No need to slow down the CPU to do any I/O.

* OS9 drivers for RTC and PPP and RS232 included.

INSTALLATION INSTRUCTIONS.

1 - Turn your computer, and any another devices connected to it, off. Remove the controller or any MEB adapter holder, from the computer and remove the drive cable. Remove the cover of the device by removing the 2 screws on each side and locate the 17 pin connector J1 on the board. See its user's manual.

2 - To access the parallel printer port and the serial port, punch out the rectangle cutout in the controller's upper cover. A small flathead screwdriver and long-nose pliers are needed. Insert the flathead

in the middle of the cutout from the inside and pry it open. Using the pliers, bend the cutout back and forth until it breaks off.

     3 - To connect a printer to the Multi-Board-DC adapter, insert (Radio Shack catalog #26-1409 printer cable, not included, or equivalent) the smaller (26 pin) connector of the cable through the slot you just punched and into the 26 pin connector (J2) of the adapter. Note that if the connector has a notch, you may need to trim it in order to fit it in properly. Pin #1 of the connector is next to U9 closest to the board. Insert the other end of the printer cable into your printer.

     4 - Locate the single row female connector on one edge of the adapter. Hold the adapter so that the components face towards the device. Insert the adapter into the device so that the solder side of the adapter faces upwards and the adapter completely fits inside the case. You may have to slightly bend some components to fit. Make sure that the connector is properly positioned so that there are no pins sticking out on either side. Also make sure that the printer cable is in place.

     5 - To connect an RS232 device to the adapter, insert the 10 pin to DB-25 cable into connector J3. Pin #1 of the connector is next to D4 and closest to the board. To operate the RS232 port, a separate power adapter (not included) is required. A DC adapter 9 to 12 VDC at 150 ma is required. (Radio Shack cat #273-1651 or 273-1652) Connect the mini adapter to J4, the tip is positive polarity. J5 must also be connected from the Multi-Board-DC to; J3 of the Super Controller I or J2 of the Super Controller II and MEB II. This is the IRQ line and is only necessary when using the serial port.

     6 - Tape on or glue the Multi-Board-DC's protective plastic sheet to the inside of the cover. Make sure that it is properly positioned, directly above the Multi-Board-DC. Replace the cover and replace the 4 screws to the cover.

Real Time Clock;

     The RTC used in the Multi-Board-DC is the OKI M6242B. It is used, here, in the latched address mode. The data register is mapped at $FF50. To access the time data you want, you must first latch its address in the address register. The address register latch is mapped at $FF51. The following is a list of address locations and the data contained within;

Address	Description
0	1s of seconds
1	10s of seconds
2	1s of minutes
3	10s of minutes
4	1s of hours
5	AM/PM 10s of hours
6	1s of days
7	10s of days
8	1s of months
9	10s of months
A	1s of years
B	10s of years
C	Day of week
D	Control Reg D
E	" " E
F	" " F

     For more details on the RTC chip, see the OKI Peripherals Data Book. When the address of the data you want is latched in the address register, then a read or write to the data register affects that particular register only.

Parallel Printer Port;

The parallel printer port consists of only one memory mapped byte. It is $FF52. Any write to that byte will latch the data to an eight bit port and automatically strobe the printer. The printer strobe pulse width is 2 microseconds long and is independent of the CPU speed. Reading bit D7 of $FF52 indicates the printer's BUSY condition. All other bits are not valid. When this bit is 1 (HI) the printer is NOT busy and ready to receive data. When it is 0 (LO) the printer is BUSY and cannot receive data. Due to the nature of the auto strobe, it is recommended that you check BUSY before writing to the printer port data latch.

RS232 Communications Port;

The Multi-board-DC uses the R6551P2 as its main ACIA. It will run at 2 mhz and is functionally the same as the Tandy Deluxe RS232 Pak. The only difference being address location and the status of CTS, RTS and DSR, see pinout below. The Deluxe Pak is mapped starting at $FF68 while the Multi-Board-DC is mapped starting at $FF54. For more details on how the ACIA works, see the Rockwell Controller Products Data Book. The following is a memory map of the ACIA;

Location	Function
	Read / Write
$FF54	Data
$FF55	Status / Reset
$FF56	Command Register
$FF57	Control Register

The following is a pinout of the 10 pin RS232 connector (J3);

Pin	Function	Direction
1	DCD	Input
2	RXD	Input
3	TXD	Output
4	DTR	Output
5	GND	-
6	DSR**	Input
7	RTS*	Output
8	CTS**	Input
9	N/C	-
10	N/C	-

* The RTS (Request To Send) output signal is always enabled. This means any RS232 device connected to this port will be always be activated, if RTS is used.

** The CTS (Clear To Send) and DSR (Data Set Ready) input signals to the ACIA are always enabled. This means the ACIA device will always transmit, reguardless of what is connected to it.

SOFTWARE FOR OS9 LEVEL 2

These instructions assume you are familiar with the OS9 command set and concepts. If you are using 'config', remember that, you chose the descriptors and it will automatically include the driver for it. In order for OS9 to use the RTC, a software module is required. OS9 has its own clock module which must be removed and replaced with the Disto RTC clock module. In order to do this, a new bootdisk must be made. Note the name of and delete the clock module in a copy of your Boot/Config disk. Choose the proper clock module, from the Disto disk, according to the slot number that the Multi-Board-DC will reside in, if you are using a Multi-Pak. Ignore any slot number if you are not using a Multi-Pak. Copy it to the Modules directory of your Boot/Config disk. Rename the new clock module to what

the old clock module was. Now, make a new bootdisk. Delete the setime command in any startup file you might have. The system clock will automatically be set when you start up OS9. Use setime only if you have to change the RTC time.

The parallel printer port also requires a driver module to work with OS9. To permanently install this module, you must make a new bootdisk. Copy the parallel_AS.dr module of the Disto disk to the modules directory of your Boot/Config disk. There are two descriptors for the parallel printer port; /P and /P1 named P_parAS.dd and P1_parAS.dd on the disk. The only difference between the two descriptors is the name. If you want to include the OS9 serial printer port, then use /P and /P1_parAS.dd descriptor. If you want to replace the serial port, then delete it and use the new /P_parAS.dd or /P1_parAS.dd descriptor. If you are using a Multi-Pak, the parallel printer port descriptors default to run in slot #4. To change the descriptor to operate in another slot, use the baud selector of the 'xmode' command. Baud rates have no function in parallel devices, but they are included in the OS9 device descriptor. All you need to do is subtract 1 from the slot number and assign that number to the new baud rate. Example; if the Multi-Board-DC is in slot #2, then, 2 minus 1 equals 1. Then type; xmode /P1 baud=1. If you are not using a Multi-Pak, then ignore any reference to slot numbers or baud rates. Note that if you 'iniz' or print to /P_parAS.dd or /P1_parAS.dd and the printer is off or 'off line', you will get an immediate 'error 246' (device not ready). On the other hand, once the operation has started, and the printer becomes busy or gets turned off, the system will wait indefinitely.

In the modules directory of the Boot/Config disk is the driver for the Tandy Deluxe RS232 Pak. This is what you must use to drive the RS232 portion of the Multi-Board-DC. In order for it to work properly, since it is not mapped at the same location as that of the Tandy's Pak, you must use a different /T2 descriptor. It is named T2_FF54.dd on the Disto disk. Copy it from the the modules directory to your Boot/Config disk. Make a new bootdisk using the /T2_FF54.dd descriptor and aciapak.dr and use it as you would the Tandy Deluxe RS232 Pak. Due to the memory mapping techniques (the SCS pin) and the IRQ handling of the COCO, the Multi-Board-DC's RS232 port will only work in slot #4 inside the controller (1 or 2). If you are using a COCO 3, the aciapak.dr driver can inadvertently turn off the interrupts via the GIME chip. A fix using modpatch will prevent this. With Aciapak.dr and modpatch in memory type;

        modpatch <aciapak.mod

Then you can cobbler another bootdisk to make the mod permanent. If you have the Tandy hard disk, you must fix, it for the RS232 interrupts as well.

Credits:

The DISTO Multi-Board-DC and all its documentation are conceived and designed by Tony DiStefano. The DISTO Multi-Board-DC is manufactured and distributed by;

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