DISTO

SUPER PRODUCTS

SUPER CONTROLLER

MANUFACTURED & DISTRIBUTED BY

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THE DISTO SUPER CONTROLLER

INTRODUCTION:

Congratulations, you have just bought one of the finest Color Computer disk controllers available today. The DISTO Super Controller employs the latest state-of-the-art technology for floppy disk controllers, the Western Digital WD1773. Also, the premium-quality, solid-state circuitry assures high reliability for your personal or business use. This controller is upward compatible with the Radio Shack Color Computer disk controller. This means that it will do everything the Radio Shack controller can do and more.

FEATURES:

* Gold contacts on all connectors.
* Shielded metal box for low RF noise.
* 4 28-pin sockets for software expandability.
* Uses 2764 or 27128 EPROMS.
* EPROMS are software selectable.
* Internal Mini-Expansion Interface for:
    - -Real Time Clock and/or
    - -Parallel Printer or
    - -EPROM Programmer or
    - -80 * 24 Character Display or
    - -User Projects.
* Complete Radio Shack compatibility.
* New technology, no adjustments needed.
* Very accurate 16MHz High Speed Master Clock.
* Needs +5 Volts only, works on all COCOs or COCO IIs.

DESCRIPTION:

The major features (other than it is a floppy disk controller) of this controller are the extra sockets included inside for software expansion and the Mini-Expansion Bus (MEB for short), used to add optional peripherals. First, this controller has four, yes count them – 4, 28 pin sockets for you, the user, to install whatever DOS (Disk Operating System) or other saftware and utilities you wish. That gives you a total of 64k of user EPROM memory at your disposal. You can have 1 to 4 DOSes present inside your controller and switch between them with a simple POKE. Next, the MEB is a 17 pin internal expansion bus. Its main use is for our optional Real-Time Clock and/or Centronics Compatible Prallel Printer Adapter. Other options, such as a low cost EPROM Programmer or an 80 * 24 display, are also available.

MEMORY MAP (SCS):

Though this controller's memory map is compatible with the Radio Shack controller, it is somewhat modified to accommodate the extra features. Table #1 is a Memory Map of the SCS select pin of the Color Computer as used by this controller. This I/O select is mapped at $FF40 (65344) to $FF5F (65376).

Table #1 (SCS) Memory Map

LOCATION HEX	LOCATION DECIMAL	DESCRIPTION DISTO	DESCRIPTION RS
FF40	65344	Drive Selector	Drive Selector
FF41	65345	Active Chip Select	Mirror of FF40
FF42	65346	Mirror of FF40	Mirror of FF40
FF43	65347	Mirror of FF41	Mirror of FF40
FF44	65348	Mirror of FF40	Mirror of FF40
FF45	65349	Mirror of FF41	Mirror of FF40
FF46	65350	Mirror of FF40	Mirror of FF40
FF47	65351	Mirror of FF41	Mirror of FF40
FF48	65352	FDC Status Reg	FDC Status Reg
FF49	65353	FDC Track Reg	FDC Track Reg
FF4A	65354	FDC Sector Reg	FDC Sector Reg
FF4B	65355	FDC Data Reg	FDC Data Reg
FF4C	65356	Mirror of FF48	Mirror of FF48
FF4D	65357	Mirror of FF49	Mirror of FF49
FF4E	65358	Mirror of FF4A	Mirror of FF4A
FF4F	65359	Mirror of FF4B	Mirror of FF4B
FF50	65360	A0 - Mini-Expansion	Mirror of FF48
FF51	65361	A1 - Mini-Expansion	Mirror of FF49
FF52	65362	A2 - Mini-Expansion	Mirror of FF4A
FF53	65363	A3 - Mini-Expansion	Mirror of FF4B
FF54	65364	A4 - Mini-Expansion	Mirror of FF48
FF55	65365	A5 - Mini-Expansion	Mirror of FF49
FF56	65366	A6 - Mini-Expansion	Mirror of FF4A
FF57	65367	A7 - Mini-Expansion	Mirror of FF4B
FF58	65368	Not Used	Mirror of FF48
FF59	65369	Not Used	Mirror of FF49
FF5A	65370	Not Used	Mirror of FF4A
FF5B	65371	Not Used	Mirror of FF4B
FF5C	65372	Not Used	Mirror of FF48
FF5D	65373	Not Used	Mirror of FF49
FF5E	65374	Not Used	Mirror of FF4A
FF5F	65375	Not Used	Mirror of FF4B

MEMORY MAP – (CTS):

Each socket is made to occupy either an 8K EPROM #2764 (or equivalent) or a 16K EPROM #27128 (or equivalent). If you use the "HIGH SPEED POKE" then the maximum access time for the EPROM is 300nS, otherwise a 450nS EPROM will work. Refer to the EPROM manufacturer's data sheets for the specifications on these EPROMs. Each of the sockets can access 8K or 16K depending on whether an 8K or a 16K EPROM is used. The memory map of this area is from $C000 (49152) to $FEFF (65279) for a 16K EPROM and $C000 (49152) to $DFFF (57343) for an 8K. Since all four sockets are mapped to the same area, only one chip must be active at the same time. The Active Chip Byte is a location in memory in which there is a latch that contains the necessary data to select which socket is active. Depending on the current value of the Active Chip Byte (Write Only), one of the four sockets will be active. Your software can change the Active Chip Data, therefore changing which chip will be active. As shown in Table #1, the Active Chip Select Byte is memory mapped at $FF41 (65345). From BASIC, to change the Active Chip Select Data, use the POKE statement:

```
POKE 65345,X
```

If this does not cause a cold start, some problems might appear. To remedy this, type in this statement, hit the [ENTER] key and then hit the **RESET** button. This will force a cold start:

`POKE 65345,X : POKE 113,0` [ENTER] & HIT **RESET**.

Or from machine language:

```
LDA     #X
STA     $FF41
```

where X is a value from 0 to 3. Any socket can be selected at any time, but care has to be taken in order that the

software does not switch itself off. In this case the computer would most certainly crash. This would be like a Robot pulling out its own plug and never being able to plug itself back in. The following is a table of what value is needed to activate which chip.

Table #2 Active Chip Select

ACTIVE CHIP SELECT Value	Active CHIP
0	S1
1	S2
2	S3
3	S4

Since only the first 2 bits are used in the Active Chip Byte, all other values for the Active Chip Select will be a multiple of the first 2 bits. When the computer is first powered up, the default socket is S0. (See Diagram #1 for the location of each socket.) As is, the active chip can only be changed by software. When the RESET button is pressed, the active chip will remain the same as it was before the RESET button was pressed. This is for when the user wants to stay in the same DOS (or game or utility) after the RESET button is pressed. J2 is a DEFAULT RESET jumper. When a jumper is present at J2, pressing the computer's RESET button will also reset the Active Chip Byte to 0. In most cases this will cause the computer to restart as if it was just turned on (cold start) returning you to the default socket. If the computer does a warm start, and just clears the screen, you will have to force it to do a cold start, unless you are sure that the software did not get lost. A good understanding of machine language programming is necessary in order to use J2 properly. Unless you know what you are doing, leave J2 open. When using this controller with a multi-pak, sometimes it will not startup on S0. To avoid this, turn the computer and the multi-pak on at the same time.

MINI-EXPANSION BUS:

J1 is the internal Mini-Expansion Bus. It consists of a 17 pin Single Inline Header. Table #3 shows the pinout of the Mini-Expansion Bus. I call it a "Mini", because it includes only 8 memory locations. It is memory mapped from $FF50 (65360) to $FF57 (65367). This area of memory is normally not available using a regular controller, due to memory mirroring of other functions. The DISTO Super Controller, however, properly decodes this area, therefore leaving a small area open for the Mini-Expansion. Table #3 details the pinout of this Expansion Bus. Any peripheral device needing 8 address locations or less can be attached to the Mini-Expansion.

Table #3 Mini-Expansion Bus Pinout

Pin #	Function
1	RESET
2	E CLOCK
3	Address 0
4	Address 1
5	Data 0
6	Data 1
7	Data 2
8	Data 3
9	Data 4
10	Data 5
11	Data 6
12	Data 7
13	Chip Enable (CE)
14	GND
15	R/W
16	+5V
17	Address 2

INSTALLATION:

The DISTO Super Controller is very simple to install, however if you follow these few rules, you will prevent any accident that you might be sorry for later. Never, I said NEVER plug or unplug the controller when the power is on. Always turn the disk drive off before connecting or disconnecting the drive cable. When you take the cover off, to change DOSes, or to add in an option, make sure that you and the controller are grounded. Static electricity can damage the components inside the controller. When replacing the lid, do not over-tighten the screws. If the contacts are dirty, clean them with a swab and a little lighter fluid.

EXPANSION ADD-ONS:

There are currently four add-ons available from DISTO for this controller:

PPRINT The first is a Centronics Compatible Parallel Printer Adapter. This adapter will allow you to connect a Centronics compatible printer directly to your controller, leaving the serial port of your computer free for your modem. Printer driver software included.

RTIME The second is a Real Time Clock. This is a clock chip that will keep the proper time, date and year. A small battery keeps the time when the Computer is off. Retrieve and set the time by using simple BASIC POKEs. Also available with the Real Time Clock is the optional Centronics Compatible Parallel Printer Adapter. Software to set the clock and printer driver included.

MPROM The third is a Mini EPROM Programmer. Yes, a low cost programmer that attaches to the disk controller. A must for the DISTO Super Controller. Program those often used utilities into EPROM and plug them directly into your controller. Will program 2764's or 27128's, a perfect mate

for the DISTO Super Controller.

DISPLAY80 The fourth is a real knock-out. This is a three in one card. It's major function is to add an 80 * 24 display to your computer. A feature packed package also includes RTIME and PPRINT. All in one neat package that fits inside the controller. OS9 software available. Call for more information.

OTHER DISTO SUPER PRODUCTS

SUPER RAM DISK This is a 256K or 512K memory RAM DISK that is the size of the disk controller. Must be used with an expansion interface. Also has the same MEB as the Super Controller. That means that any of the expansions mentioned above that fit the Super Controller, will work with the Super Ram Disk. OS9 and RS DOS ram disk software available.

Credits:

The DISTO Super Controller, add-ons and all its documentation are conceived and designed by Tony Distefano. The DISTO Super Controller and add-ons are manufactured and distributed by:

CRC Computers

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DOS SOCKET ADDENDUM

Starting with revision R1.4 of the Super Controller I (SC-I), a modification has been made to the controller, in order to allow easy installation of a 24 pin DOS ROM. This option is available on the first socket only. To one side of S1 are nine pins. To install a 24 pin ROM, or a 24 pin EPROM in this slot, insert three post to post jumpers as follows: the first goes between 2 & 3, the second goes between 4 & 5, and the third goes between 7 & 8. To install a 28 pin EPROM, the three jumpers should be inserted as follows: the first goes between 1 & 2, the second goes between 5 & 6 and the third goes between 8 & 9. Refer to Figure 1 for proper location of these jumpers.

FIGURE 1

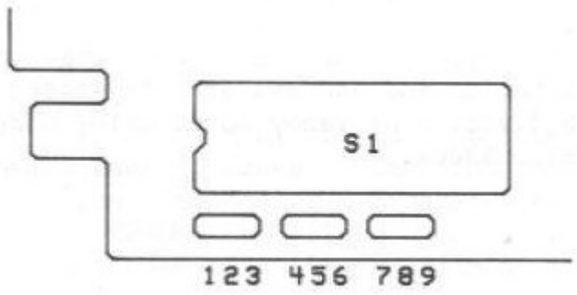
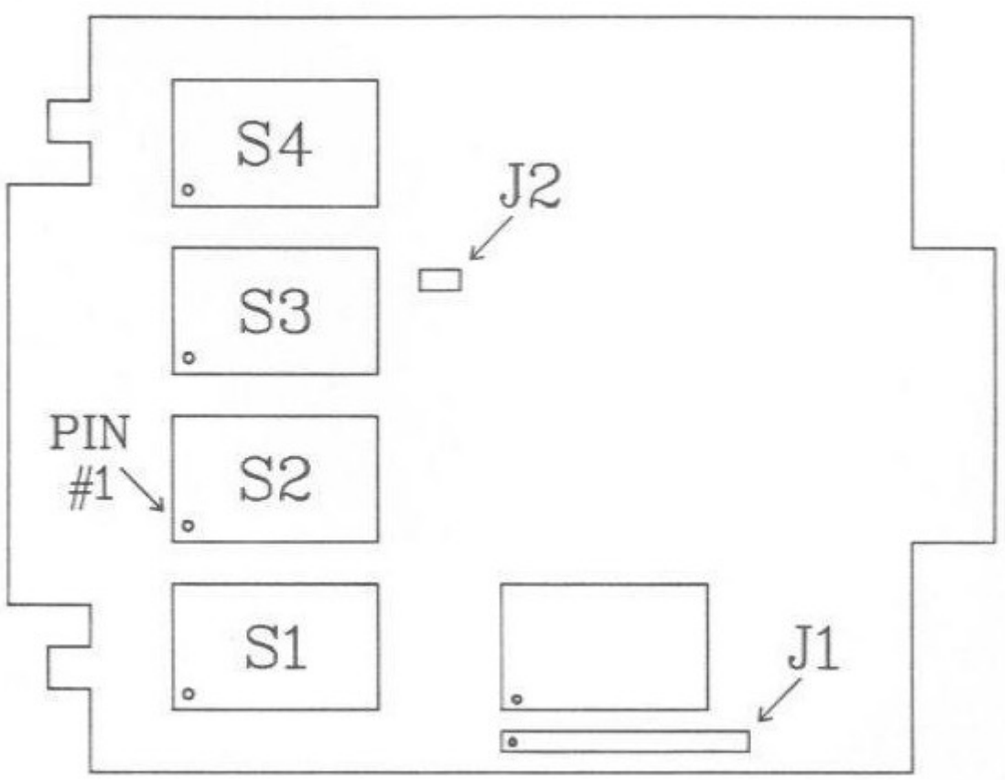


DIAGRAM #1



C-DOS for the COCO III

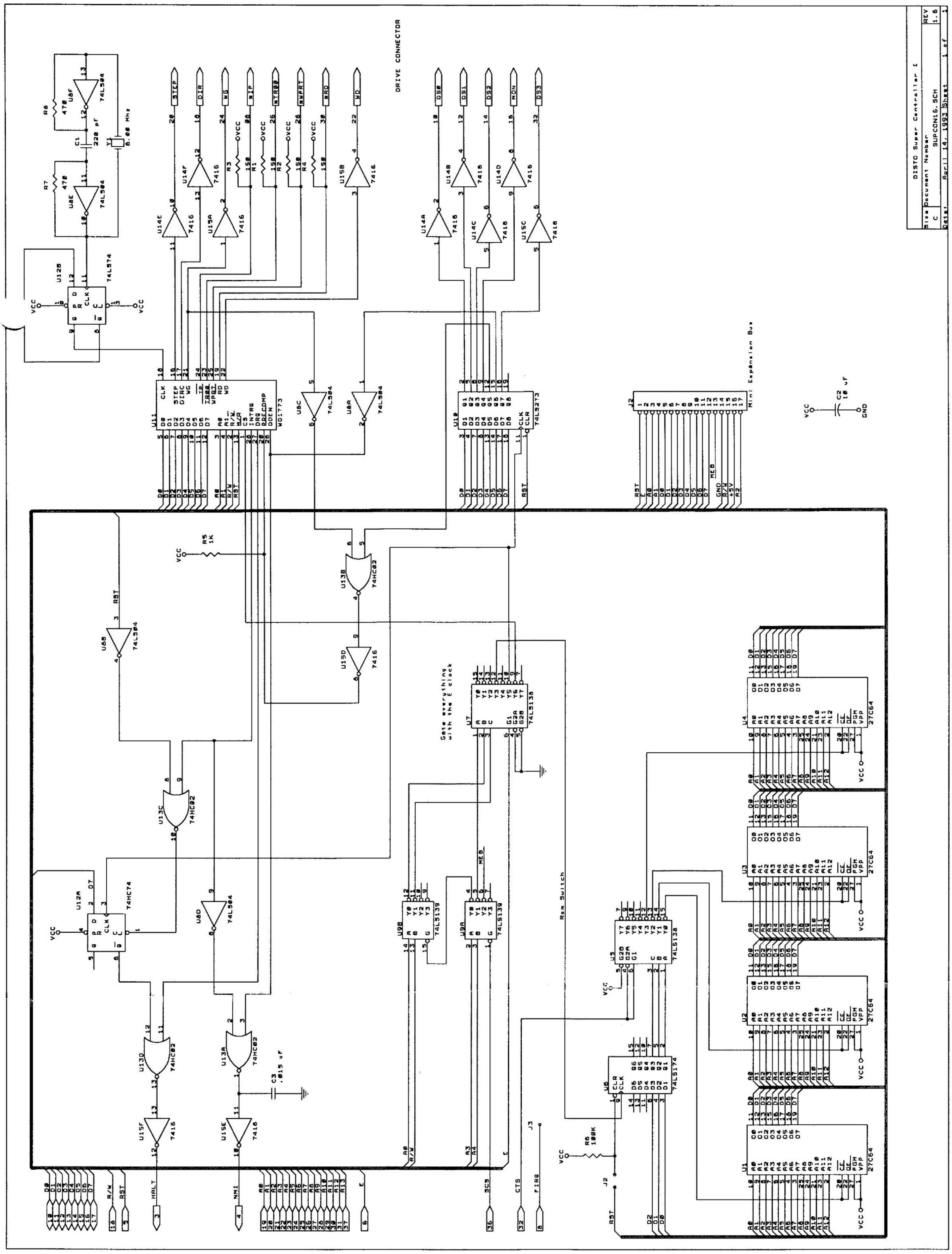
The COCO III version of C-DOS will only work with a COCO III. However, if you have both a COCO III and a COCO II or I, then you will also need the version of C-DOS that works with the COCO II/I. If you put C-DOS III in the first slot of the controller, then you can use your COCO III without any problems. If you put the C-DOS II in the first slot of the controller, the COCO III will not work. If you want to be able to use both the COCO III and the COCO II/I without changing chips every time, here is a suggestion:

Insert the C-DOS III in the first slot of the controller. Insert the C-DOS II in the second slot of the controller. This way, when you plug your controller into a COCO III, you are up and running. Now, when you want to use your COCO II/I, all you have to do is to "poke in" the COCO II/I C-DOS chip. Plug the controller into a COCO II/I. When you turn the computer on, you may see a bit of garbage on the screen. This is normal. Now type in this simple command:

`POKE 65345,1 : POKE 113,0` [ENTER]

This will change the active DOS to the COCO II/I. At this point you may get more garbage on the screen or the computer may lock up, this also is normal. Hit the **RESET** button and the computer will do a cold start into the C-DOS II/I.

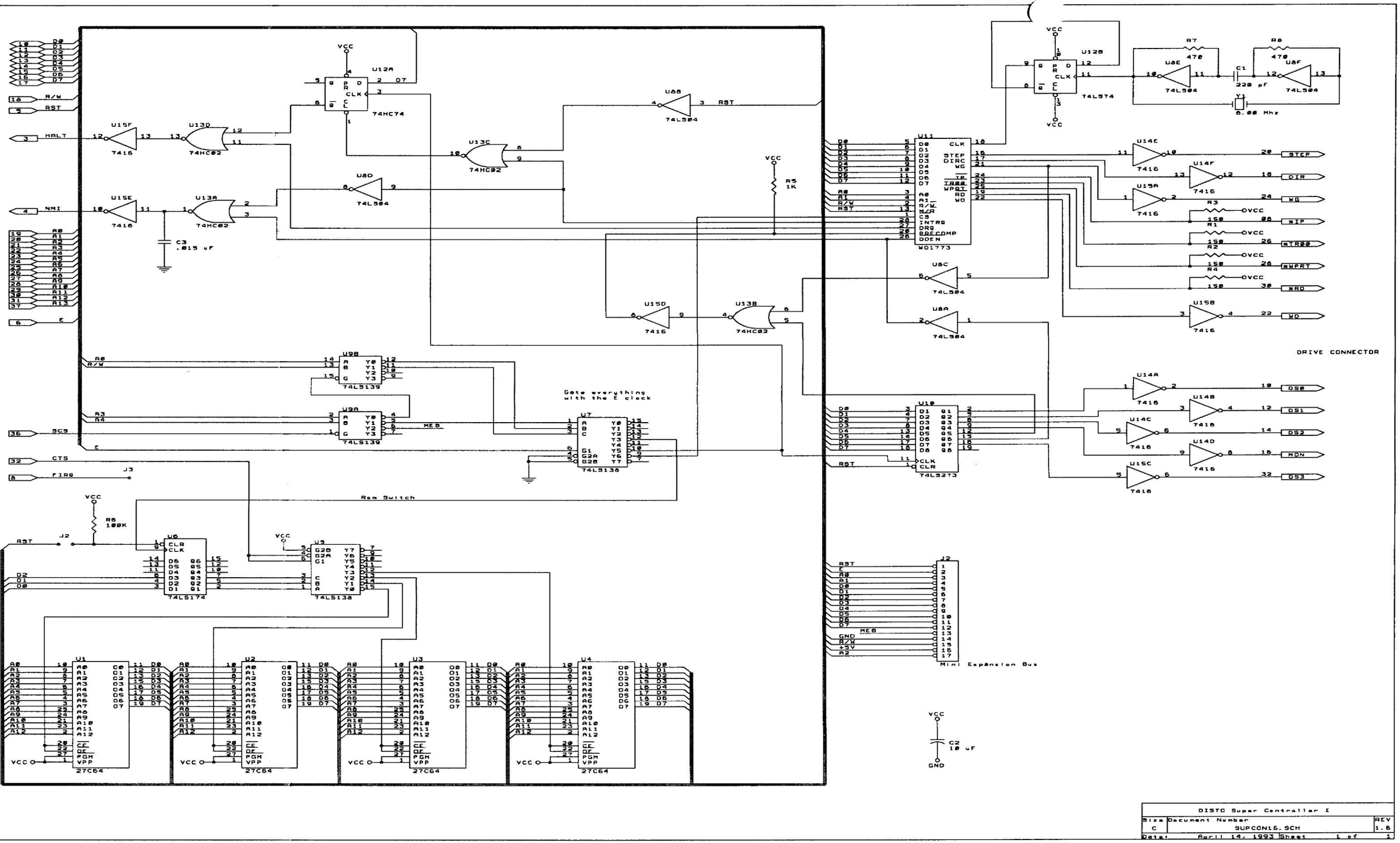
DIAGRAM #2


DRIVE CONNECTOR
DISTO Super Controller I
SUPCON16.SCH
April 14, 1993
Mini Expansion Bus
Gate everything with the E clock
Rom Switch
WD1773
74LS273
74LS138
74LS139
74LS174
27C64

Errata Regarding The Schematic

1) The quartz crystal should be 16MHz.
2) The connections to pins 5 and 6 of U5 should be swapped.
3) It is also a good idea to add a small value capacitor (say .1µF) from pin 1 of U6 to GND. This will solve the problem of ROM 0 not being properly selected at cold-boot (see page 5) when used with a multi-pak interface.

Erratum provided by “The R.A.T.”



DISTO Super Controller I		
Size: C	Document Number: SUPCON16.SCH	REV: 1.5
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