
Installation Guide

DTC6190-24 and DTC6290-24 EISA ESDI Disk Controller

Part Number 400321-89A2



DATA TECHNOLOGY
A DIVISION OF QUME CORPORATION

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WARNING

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. However, there is no guarantee that interference will not occur in a particular installation. Data Technology is not responsible for any television, radio, or other interference caused by unauthorized modifications of this product.

If interference problems do occur, try to correct the problem by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that the computer and receiver are on different branch circuits.
- If necessary, consult your dealer or an experienced radio/television technician.

For more information, consult the FCC publication, "How to Identify and Resolve Radio-TV Interference Problems", available from:

U.S. Government Printing Office
Washington, DC 20402
Stock No. 004-000-00345-4

NOTE: When interfacing with an external device, a shielded cable must be used to comply with FCC regulations. Modifications to this equipment that are unauthorized by the manufacturer may void the user's right to operate this device according to FCC rules.

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Introduction

The DTC6290-24 installation guide provides complete instructions for installing the DTC6290-24 hard disk controller board in an EISA computer. The DTC6290-24 controller board supports four 10 Mbit/sec to 24 Mbit/sec ESDI hard disk drives and three floppy disk drives. Any combination of 10 Mbit/sec to 24 Mbit/sec ESDI disk drives can be connected to the DTC6290-24 controller board.

This guide is divided into easy-to-follow steps, providing the user with comprehensive instructions on installing and running the DTC6290-24 controller in the EISA computer system.

System Requirements

Installation of the DTC6290-24 controller board requires the following equipment:

- EISA Computer
- One 20-pin flat ribbon data cable (for each hard disk).
- One 34-pin twisted or flat ribbon cable for hard disk drives.
- One 34-pin twisted ribbon cable for floppy disk drives

Once the equipment listed above is available, begin the installation of the DTC6290-24 with Step 1.

Step 1: Inspection

Prior to installing the DTC6290-24 controller board into your computer, inspect the controller board for damage. If the controller board is damaged, call your vendor's customer service department for a return material authorization (RMA) number. Otherwise, proceed to Step 2.

Step 2: Configuring The Hardware Switches

The DTC6290-24 controller board can be configured to your specific system requirements via hardware and software switches. The hardware switches define parameters that must be set prior to boot-up. The software switches are set while executing the configuration utility (Step 5). The hardware switches must be configured prior to installing the DTC6290-24 controller board into the computer. Refer to Table 1 for a summary of the hardware switches.

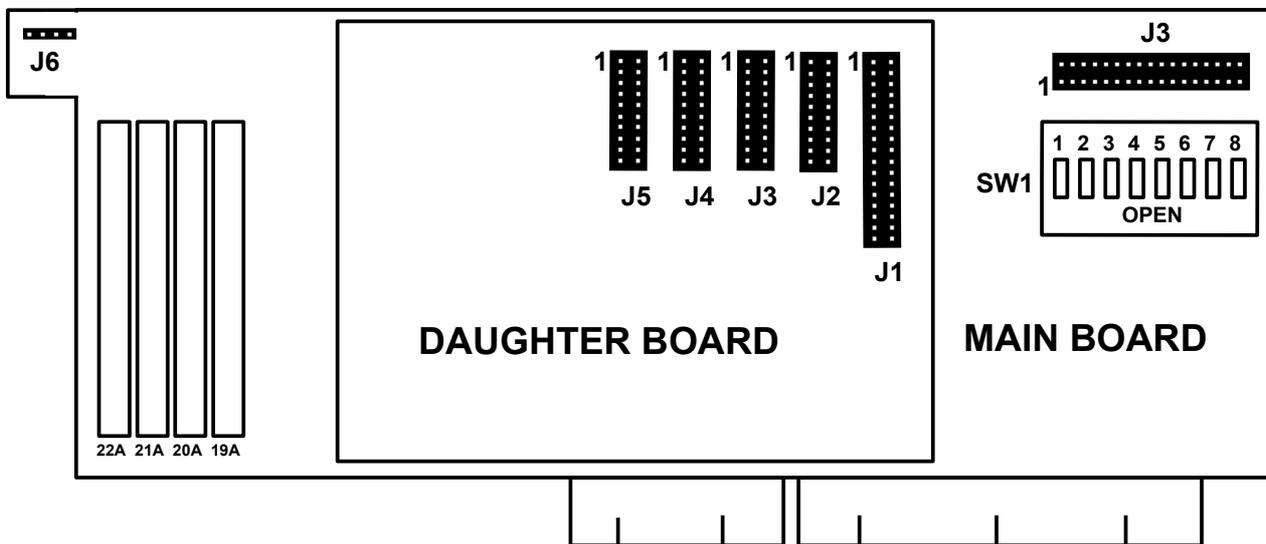


Figure 1
DTC6290-24 Controller Board Outline

NOTE:

There are two types of labels used on SW1, either OPEN-CLOSED or ON-OFF. OFF corresponds to OPEN and ON corresponds to CLOSED.

The function of each hardware switch is described in detail below. Review the hardware switch settings and make any appropriate changes. The factory default settings are suitable for most computer applications and typically do not need to be changed. After the hardware switches are properly set, proceed to STEP 3.

Table 1
DTC6290-24 Hardware Switch Summary

Switch Number	Function	Factory Setting	Default
SW1-1	Reserved	OPEN	----
SW1-2	Reserved	OPEN	----
SW1-3	Reserved	OPEN	----
SW1-4	Defect Cylinder	CLOSED	2 defect cylinders
SW1-5	Reserved	OPEN	----
SW1-6	Floppy Enable	OPEN	Enabled
SW1-7	Access Mode	OPEN	Unrestricted
SW1-8	I/O Port Address	OPEN	Primary

Defect Cylinder Select (SW1-4)

A list of the defective sectors is stored on the defect cylinder(s). The list of defective sectors is used during low-level formatting to map out the defective areas in the media. In ESDI disk drives, this list is held in the last cylinder, N-1 (where N equals the number of cylinders). A second identical copy of the defect list can also be held in the N-9 cylinder. The second copy of the defect list is kept in case the first copy becomes unreadable.

Selecting one defect cylinder reserves cylinder N-1 as the defect cylinder (open). Selecting two defect cylinders reserves cylinder N-1 and N-9 as the defect cylinders (closed). It is recommended that two defect cylinders be selected to minimize the possibility of data loss.

Floppy Enable (SW1-6)

The DTC6290-24 controller board contains circuitry for supporting floppy disk drives. If the floppy disk drives are to be connected to the DTC6290-24 controller board, the floppy circuitry should be enabled (open). If the floppy disk drives are to be connected directly to the motherboard or to a separate floppy disk controller board, the floppy circuitry should be disabled (closed).

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Access Mode (SW1-7)

Upon power-up or reset, EISA protocol is defined such that only the EISA registers are accessible. When only the EISA registers are accessible, the hard disk and floppy drives cannot be read or written. This can present a problem the first time a computer is powered-up. The system first initiates an ISA boot sequence before the EISA configuration is set. In order to alleviate this potential issue, the DTC6290-24 controller board can be configured to allow the hard disk, floppy disk, and EISA registers to be accessible upon power-up or reset.

When in the Unrestricted Access Mode, the hard disk, floppy disk, and EISA registers are accessible after power-up or reset (open). When in the Restricted Access Mode, only the EISA registers are accessible after power-up or reset (closed). It is recommended that the DTC6290-24 controller board be set to the Unrestricted Access Mode unless otherwise noted by the system manufacturer.

Whenever the Access Mode switch is changed, the configuration utility must be updated (Step 5 - Software Configuration).

I/O Port Address (SW1-8)

The addresses for the DTC6290-24 controller board registers can be set to either the primary port addresses or the secondary port addresses. The primary port addresses are 1F0H - 1F7H for hard disk registers and 3F2H - 3F7H for floppy disk registers. The secondary port addresses are 170H - 177H for hard disk registers and 372H - 377H for floppy disk registers.

In most cases, the primary port addresses should be selected (open). When two hard disk controller boards are installed, one of the hard disk controller boards must be set to the secondary port addresses (closed).

Whenever the I/O Port Address switch is changed, the configuration utility must be updated (Step 5 - Software Configuration).

Step 3: Installing the DTC6290-24 Controller Board

The following steps are required to install the DTC6290-24 controller board into a computer:

- Power down the computer and all devices connected to it.
- Remove the cover from the computer. Refer to the computer manual for the proper procedure.
- Remove one of the metal brackets from an empty EISA expansion slot.
- Slide the connector of the DTC6290-24 controller board into the expansion slot on the motherboard and screw the mounting bracket onto the chassis.
- Connect the 4-pin drive light connector from the front panel of the computer to connector J6 on the DTC6290-24 controller board. Refer to Figure 1 for the connector J6 location.
- Install the ESDI and floppy disk drives.

After installing the DTC6290-24 controller board, proceed to Step 4.

Step 4: Connecting the Disk Drives

The DTC6290-24 controller board supports up to four ESDI disk drives and three floppy disk drives. The ESDI disk drives can be any combination of 10Mbit/sec to 24Mbit/sec ESDI disk drives. The floppy disk drives can be any combination of 5 1/4" and 3 1/2" floppy disk drives.

Follow the directions described below for connecting the hard and floppy disk drives to the DTC6290-24 controller board. All references to drive selection numbers throughout this manual assume that the Drive Selects are numbered 1 through 4. Refer to the disk drive manual(s) to verify the drive selection numbers. After connecting the disk drives, proceed to Step 5.

Connecting ESDI Disk Drives

The ESDI disk drives are connected to the J1-J5 connectors on the daughter-board. The connector locations and Pin 1 orientation for these connectors are shown in Figure 1. The colored edges of the ribbon cables must always be aligned with Pin 1 of both the controller board and the ESDI disk drive(s).

Proceed to the appropriate set of instructions for connecting one, two, or more ESDI disk drives.

Connecting One ESDI Disk Drive

Installing one ESDI disk drive requires one 20-pin flat ribbon cable and either one 34-pin flat or twisted cable. Figure 2 shows a standard hard disk twisted cable. Follow the directions described below.

- Connect the header connector of the 34-pin ribbon cable to the J1 connector on the DTC6290-24 daughter-board.
- Connect the header connector of the 20-pin ribbon cable to the J2 connector on the DTC6290-24 daughter-board.
- Connect both the 20-pin and 34-pin ribbon cables to the edge connectors on the ESDI disk drive.
- Verify that the terminating resistor is installed on the disk drive.
- Set the Drive Select switches for Drive Select 1 when using a 34-pin flat cable.

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- Set the Drive Select switches for Drive Select 2 when using the end connector of a 34-pin twisted ribbon cable.
- Proceed to the next Section, Connecting Floppy Disk Drives.

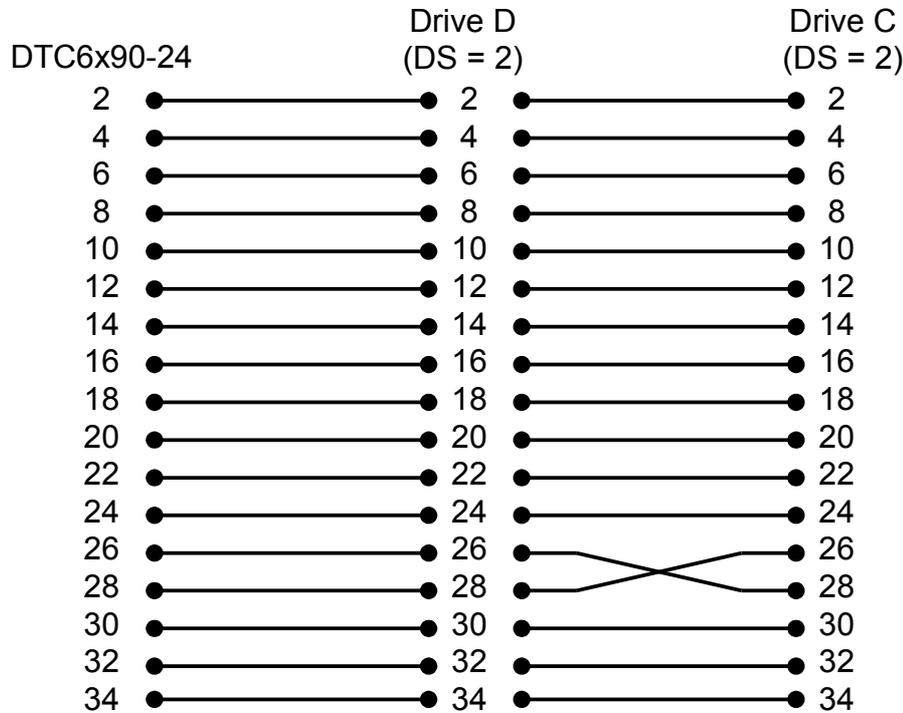


Figure 2
Standard Hard Disk Cable

Connecting Two ESDI Disk Drives

Installing two ESDI disk drives requires two 20-pin flat ribbon cables and one 34-pin flat or twisted ribbon cable. Figure 2 shows a standard hard disk twisted cable. Follow the directions described below.

- Connect the header connector of the 34-pin ribbon cable to the J1 connector on the DTC6290-24 daughter-board.
- Connect the header connector of the 20-pin ribbon cables to the J2 connector on the DTC6290-24 daughter-board for Drive 1 and to the J3 connector for Drive 2.
- Attach the connectors of the 20-pin ribbon cables and the 34-pin ribbon cable to the edge connectors of both disk drives.
- Verify that the last physical drive on the 34-pin ribbon cable has the

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terminating resistor installed. Remove the terminating resistor from the other disk drive.

- If a 34-pin flat ribbon cable is used, set drive 1 to Drive Select 1, and set drive 2 to Drive Select 2.
- If using a 34-pin twisted daisy-chained ribbon cable, set both drives 1 and 2 to Drive Select 2.
- Proceed to the next Section, Connecting Floppy Disk Drives.

Connecting Three Or Four ESDI Disk Drives

Installing three or four ESDI disk drives requires three or four 20-pin flat ribbon cables and one 34-pin twisted ribbon cable. Figure 3 shows how three or four disk drives are connected using a standard twisted cable. Follow the directions described below.

- Connect the header connector of the 34-pin ribbon cable to the J1 connector on the DTC6290-24 daughter-board.
- Connect the header connector of the 20-pin ribbon cables to the J2 connector on the DTC6290-24 daughter-board for Drive 1, to the J3 connector for Drive 2, to the J4 connector for Drive 3, and to the J5 connector for Drive 4.
- Attach the connectors of the 20-pin ribbon cables and the 34-pin ribbon cable to the edge connectors on the disk drives.
- Verify that the last physical drive on the 34-pin ribbon cable has the terminating resistor installed. Remove the terminating resistors from the other disk drives.
- Set the three drives connected between the DTC6290-24 controller board and the twist to Drive Select 2, 3, and 4. Set the other disk drive to Drive Select 2.
- Proceed to the next Section, Connecting Floppy Disk Drives.

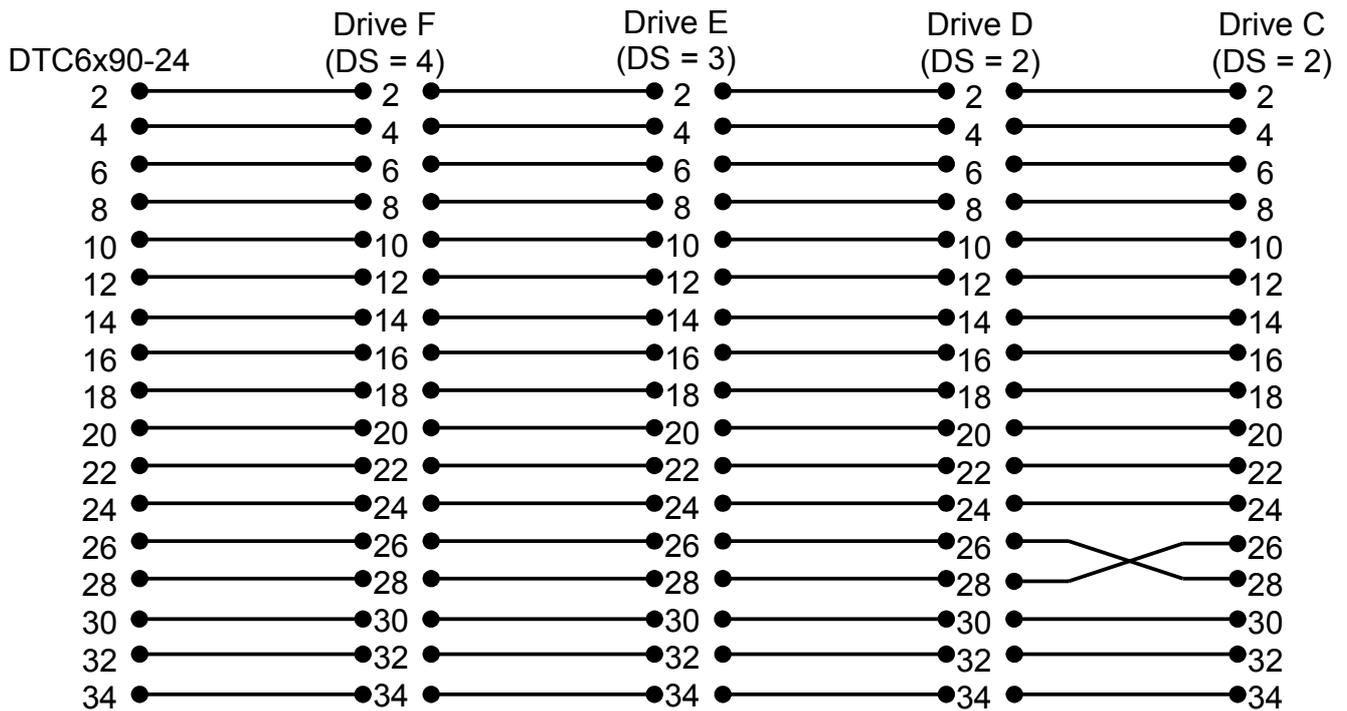


Figure 3
Three & Four Hard Disk Drive Cable

This cable may be purchased through normal distribution channels.

Connecting Floppy Disk Drives

The floppy disk drives are connected to the J3 connector on the main board. The connector locations and pin 1 orientation for these connectors are shown in Figure 1. The colored edges of the ribbon cables must always be aligned with Pin 1 of both the controller board and the floppy disk drive(s). If connecting a PS/2 type floppy disk drive, the PS/2 type floppy disk drive must be installed as Drive B.

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Proceed to the appropriate set of instructions for connecting one, two, or three floppy disk drives.

Connecting One Floppy Disk Drive

- Installing one floppy disk drive requires one 34-pin standard twisted cable. Figure 4 shows a standard floppy disk drive cable. Follow the directions described below.
- Connect the header connector of the 34-pin ribbon cable to the J3 connector on the DTC6290-24 main board.
- Connect the other end of the 34-pin ribbon cable to the edge connector on the disk drive.
- Verify that the terminating resistor is installed on the floppy disk drive.
- Set the Drive Select switch to Drive Select 2.
- Proceed to Step 5.

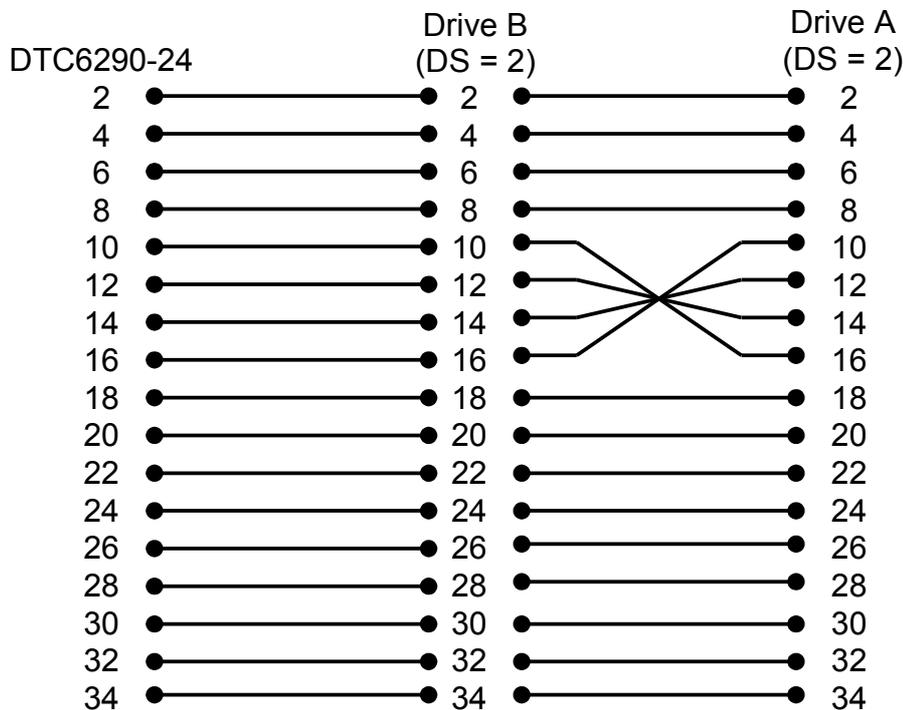


Figure 4
Standard Floppy Disk Drive Cable

Connecting Two Floppy Disk Drives

Installing two floppy disk drives requires one 34-pin standard twisted cable. Figure 4 shows a standard floppy disk drive cable. Follow the directions described below.

- Attach the header connector of the 34-pin ribbon cable to the J3 connector on the DTC6290-24 main board.
- Attach the other end of the 34-pin ribbon cable to the edge connector on Drive A. Attach the connector in the middle of the cable to Drive B.
- Verify that the last physical drive on the 34-pin ribbon cable has the terminating resistor installed. Remove the terminating resistor from the other floppy disk drive.
- Set both drives to Drive Select 2.
- Proceed to Step 5.

Connecting Three Floppy Disk Drives

Installing three floppy disk drives requires one 34-pin twisted cable as shown in Figure 5. Most computers support a maximum of two floppy disk drives. In order to support three floppy disk drives, a floppy driver is required. DOS 5.0 has a built-in device driver, DRIVER.SYS, to control up to four floppy disk drives. Refer to your DOS 5.0 manual for instructions. A floppy driver is available from the following company:

BASTECH
1018 Las Posas
San Clemente, CA 92672
Phone (714) 498-6269

TULIN
2156 H. O'Toole
San Jose, CA 95131
Phone (408) 432-9025

Follow the directions described below.

- Attach the header connector of the 34-pin ribbon cable to the J3 connector on the DTC6290-24 main board.
- Connect the three floppy disk drives to the 34-pin ribbon cable. Drive A should be attached to the middle connector. Drive B should be attached to the connector closest to the DTC6290-24 controller board. The third floppy disk drive should be attached to the connector at the end of the 34-pin cable.

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- Verify that the last physical drive on the 34-pin ribbon cable has the terminating resistor installed. Remove the terminating resistors from the other floppy disk drives.
- Set all three drives to Drive Select 2.
- Install the floppy driver after booting the computer.
- Proceed to Step 5.

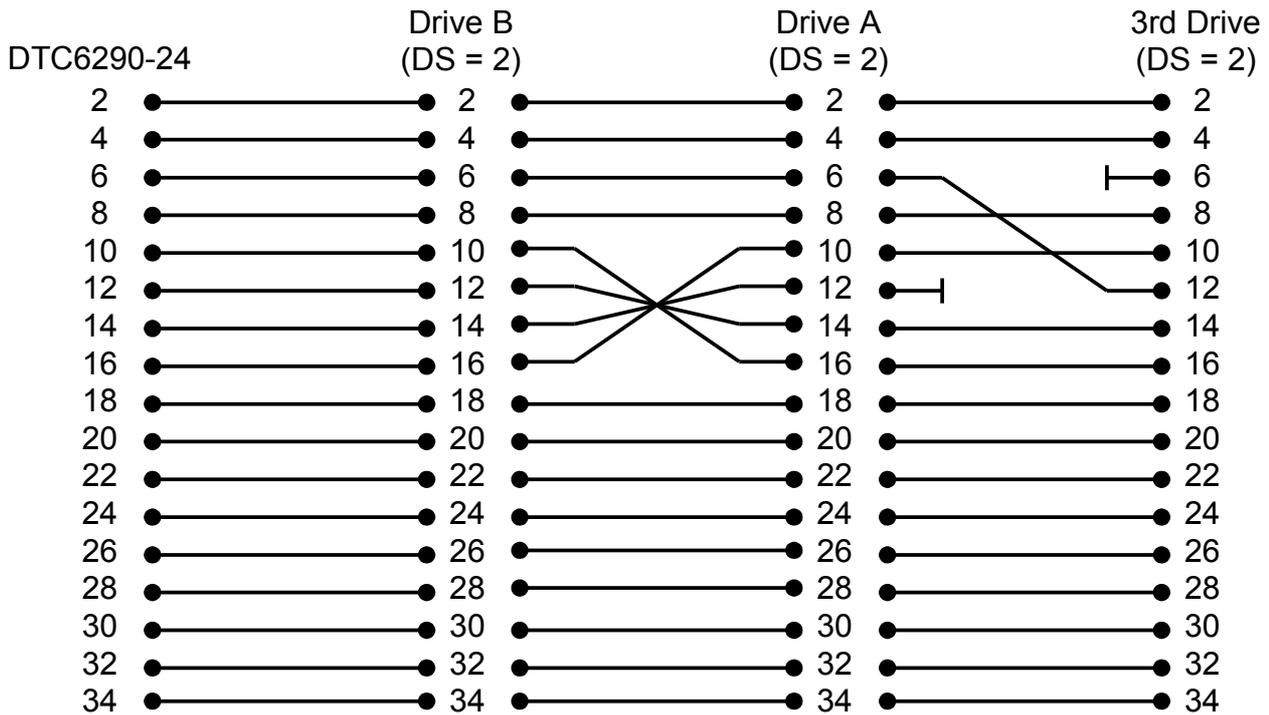


Figure 5
Three Floppy Disk Drive Cable

Step 5: Software Configuration

EISA computers provide the ability to define board parameters by executing a configuration utility. Execute the configuration utility as described in the computer manufacturer's user manual. The configuration file for the DTC6290-24 is called !DTC0110.CFG and is on the EISA Driver diskette (DOS format). The parameters that can be defined by executing the configuration file are described below. Refer to Table 2 for a summary of the software switches. The factory default settings are suitable for most computer applications and typically do not need to be changed. After executing the configuration utility, proceed to Step 6.

Table 2
DTC6290-24 Software Summary

<i>Function</i>	<i>Default</i>
Floppy Subsystem	Standard Logic
Access Mode	Unrestricted
I/O Port Address	Primary
Interrupt Request	IRQ14
Auto-Deselect Mode	Enabled

Floppy Subsystem

When standard AT-type floppy disk drives are connected to the DTC6290-24 controller board, select "Standard Logic" (default). When connecting a PS/2-type floppy disk drive, select "Reverse Logic". If the floppy controller is disabled (SW1-6 is closed), select "Disable Floppy Controller".

Access Mode

Set the mode to the same mode as defined by SW1-7. The default is Unrestricted Access Mode.

I/O Port Address

Set the address to the same address as defined by SW1-8. The default is Primary Port Address.

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Interrupt Request

This allows the user to choose IRQ14 or IRQ15 for the hard disk controller interrupt. The default is IRQ14.

Auto-Deselect Mode

The Auto-Deselect mode controls the drive select light. When enabled, the drive select light is illuminated only when a disk drive is selected. When disabled, the drive select light will remain illuminated after selection.

Step 6: Setup and Formatting

After executing the configuration utility, the next step is to setup and format the ESDI disk drives. Setup defines the parameters of the ESDI disk drives. Formatting prepares the ESDI disk drives for reading and writing.

Setup

Run the setup utility provided by the computer manufacturer and set the CMOS to type 48 or 49 (or the number that the system BIOS defines as user defined parameters). This allows the user to enter the number and types of drives to be installed. When using drive types 48 or 49, the user must enter the drive parameters (# heads, # cylinders, # sectors).

If the disk drive is to be used in native mode, enter the physical parameters of the drive. The maximum values you can enter are cylinders: 1024, heads: 16 and sectors: 63. The number of cylinders is equal to the number of physical cylinders minus the number of defect cylinders as defined by SW1-4. The number of sectors must also be reduced by 1 if sector sparing is selected. The control byte parameter should be 8 if the number of heads is greater than 8 and 0 if the number of heads is less than or equal to 8.

If the disk drive is to be used in the mapping mode (i.e. 17, 60, or 63 sector mapping), the parameters must be calculated. Mapping mode is recommended for drives containing more than 1024 cylinders.

If the disk drive is to be used in 63 sector mapping mode the 2BDFMT.EXE utility automatically calculates the parameters. This mode is recommended if the drive contains Novell NetWare, OS/2 or UNIX partitions. In addition, this mode overcomes the 1024 cylinder limitation imposed by DOS.

If the drive is to be used with 17 sectors per track formatting (required by Novell NetWare 286, 2.0A), enter 16 for the number of heads. Calculate the

number of mapping mode cylinders by using the following formula and rounding down the remainder:

$$\frac{(\text{phys cylinders} - \# \text{ of defect cyl}) * \text{phys heads} * (\text{phys sectors/trk} - \# \text{ of spare sectors})}{16 \text{ heads} * \text{translation sectors/trk}}$$

Repeat this procedure for each attached ESDI disk drive.

Low Level Formatting and Verification

The 2BDFMT utility is used to low level format and verify ESDI disk drives. This utility allows the user to define the interleave factor, head skew, cylinder skew, and sector sparing. It also allows users to manually enter defect sectors and can automatically map out the defect sectors defined by the drive manufacturer.

Note:

ESDI drives must be enabled for hard sector mode.

Low Level Formatting

Each disk drive must be low level formatted prior to partitioning and high level formatting. To low level format a disk drive, insert the DTC6290-24 [EISA Driver] diskette into the floppy drive A. At the DOS prompt, type "2BDFMT" and press <ENTER>. The physical parameters of each ESDI disk drive are shown on the screen as follows:

```
DATA TECHNOLOGY A DIVISION OF QUME CORPORATION
ESDI Hard Disk Format Utility Vx.x Date xx
This program provides drive mode selection, format, verify and defect mapping
```

Current drive types selected are:

DRIVE x is (HARD-SECTORED, NATIVE MODE, 2 RESERVED CYL)

CYL: xx HEAD: xx PRECOMP: NONE CTRL: 00H L-ZONE: xx SECTOR/TRK: xx

After the selected drives are shown, the following question appears:

Do you need to calculate the conversion parameter? (Y/N): N

If the answer is "y" the drive physical parameters will be converted to 63 sector mapping parameters and displayed as follows:

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DRIVE 1 is Converted From line 1 (Physical) To line 2 (Mapping).

*CYL: 1024 HEAD: 5 PRECOMP: NONE CTRL: 00H L-ZONE: 1024 SECTOR/TRK: 34
CYL: 172 HEAD: 16 PRECOMP: NONE CTRL: 08H L-ZONE: 172 SECTOR/TRK: 63*

After the parameters are shown, the following question appears:

Do you want to change number of drives in the system ? (Y/N): N

If you wish to change the number of ESDI disk drives, type "y" and enter the number of ESDI disk drives. After entering the number of disk drives, the computer will reboot. At the DOS prompt, re-enter the format utility by typing "2BDFMT" and press <ENTER>.

If the number of ESDI disk drives is correct, type "n" and the following message will appear on the screen:

FORMAT/VERIFY (Drive: 1/2/3/4 or "Q" for Quit): 1

Enter the number of the drive to be low level formatted or verified and press <ENTER>. The next question that appears is:

Do you want to format (low level) this drive ? (Y/N): N

Type "y" to low level format the selected drive. The selected drive will be low level formatted and verified. (To only perform verification, type "n". Verification performs a surface analysis on the selected disk drive). A series of questions will appear on the screen allowing the user to define low level formatting options. The next question that appears is:

All the data in drive x WILL BE ERASED. Are you sure (Y/N): N

The next question that appears is:

Do you want to have sector sparing ? (Y/N): N

Sector sparing allocates one sector per track to map out defect sectors. For example, if a defective sector is found, the spare sector is used in place of the defective sector. Sector sparing is recommended for use with disk drives that have a large number of media defects (50 to 100+). Sector sparing is not recommended for disk drives with only a few media defects. The next question that appears is:

Do you want to perform defect mapping ? (Y/N): Y

Defect Mapping automatically maps out all of the defective sectors defined in the defect table. Typing "y" will cause all of the defect sectors to be mapped out. Typing "n" will cause none of the defect sectors to be mapped out. Defect Mapping is recommended for most computer applications. The next

question that appears is:

Do you want to update the defect table ? (Y/N): N

Typing "y" will cause the manufacturer's defect table to be updated with any additional defects found during the verification pass. It is recommend that the manufacturer's original list be left intact. In either case all the manufacturer's defects and defects found during verification will be mapped out. The next statement that appears is:

Do you want to enter defect list? (Y/N): N

If you wish to manually update the defect table, type "y". Otherwise, type "n". Only experienced users should manually update the defect table. The next statement that appears is:

Enter interleave (1-9), default = 1):

The user is able to enter an interleave factor of 1 to 9. Maximum system performance is achieved with an interleave factor of 1. The next statement that appears is:

Enter cylinder skew (0-X, default Y):

Cylinder skew is the offset between consecutive cylinders. Selecting the proper cylinder skew will optimize disk drive performance. The DTC6290-24 controller board automatically obtains the cylinder skew from the disk drive and uses the cylinder skew from the disk drive as the default value. If the disk drive does not report any cylinder skew, the default value will be equal to one third the number of sectors per track. Most users should select the default value by pressing **<ENTER>**. The next statement that appears is:

Enter head skew (0-X, default = Z):

Head skew is the offset of the first logical sector from the index for each physical head. Optimum head skew maximizes system performance by allowing the ESDI disk drive to perform head switching without losing a revolution. The DTC6290-24 automatically obtains the head skew from the disk drive and uses the head skew from the disk drive as the default value. If the disk drive does not report any head skew, the default will be 1. Most users should select the default value by pressing **<ENTER>**. The next statement that appears is:

All the data in drive x WILL BE ERASED. Are you sure ? (Y/N): N

This utility gives you two chances to cancel the low level format because this operation will result in the loss of any data on the disk drive. If you type "y"

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and press **<ENTER>** twice, the selected disk drive will be low level formatted and verified.

After low level formatting the ESDI disk drive, the following question appears:

Exit this program ? (Y/N): Y

If the computer system has multiple ESDI disk drives, type "**n**" and repeat this procedure for each drive. If the low level formatting for all ESDI disk drives is completed, type "**y**" and proceed to "Partitioning and High-level Format".

Partitioning and High-level Format

After low-level formatting the ESDI disk drive, the user must partition the drive and perform high-level formatting. The primary operating systems (i.e. DOS, OS/2, Novell NetWare, and UNIX) all handle disk usage and system installation differently. Refer to the particular operating system manual in order to determine how to execute partitioning and high-level formatting. Repeat this step for each disk drive. After partitioning and high level formatting, proceed to Step 7.

Step 7: Installing Software Drivers

The DTC6290-24 controller board comes with a complete set of software drivers for the most popular operating systems, including DOS, Novell NetWare, ISC UNIX,, OS/2, and SCO UNIX. Most computer applications will not require the use of all of these software drivers. Only install the drivers that correspond to the operating system(s) that are to be used.

The software drivers allow the DTC6290-24 controller board to operate in the EISA mode. If the software drivers are not installed, the DTC6290-24 controller board will operate in the ISA mode. In the ISA mode, the performance of the DTC6290-24 controller board will be significantly less than in the EISA mode. Therefore, in order to achieve maximum performance, the software drivers should be installed. After installing the software drivers, the DTC6290-24 controller board installation will be complete.

The diskettes included with the DTC6290-24 controller board contain the following files:

EISA Driver Diskette

!DTC0102.CFG	DTC6290E EISA Config. File
!DTC0110.CFG	DTC6290-24 EISA Config. File
!DTC0180.CFG	DTC6295-24 EISA Config. File
2BDFMT.EXE	DOS Format Utility
DTCEISA.SYS	DOS EISA Driver
DISK01.SYS	OS/2 MSV1.21 & IBMV1.3 Driver
EISA100.DSK	Novell V3.0 Driver
NV316X9X.DSK	Novell V3.1 & V3.11Driver

ISC UNIX Diskette

The ISC UNIX Driver is in CPIO format.

SCO UNIX Diskette

ZDSMSC1	SCO V3.2.2 Driver V1.01
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ISC UNIX Device Driver Installation

Execute the following steps to install the ISC UNIX driver.

1. Install the ISC UNIX 386ix V2.0.2, V2.2 or V2.2.1 Operating System (include the core and kernel configuration). After completing the operating system installation, bring up UNIX and log in to the root directory.
2. Insert the DTC ISC UNIX driver diskette into drive A:
3. Type "**sysadm**" to run the system administration package.
4. Select "**5 softwaremgmt**" from the menu list. Select "**2 listpkg**" from the sub-menu to examine the existing packages.
5. Select "**1 installpkg**" from the sub-menu to install EISA driver.
6. Select "**3 360KB (5 1/2" low density)**" for package media.

Follow the instructions provided by the package to complete installation. The system will reboot and the UNIX kernel will be relinked. After reboot the EISA driver will have been successfully installed. You can check this by running the system administration package after reboot to view existing packages.

Should the EISA driver need to be removed, execute the following steps:

1. Type "**sysadm**" to run the system administration package.
2. Select "5 softwaremgmt" from the menu list. Select "**2 listpkg**" from the sub-menu to examine the existing packages.
3. Select "**3 removepkg**" from the sub-menu to remove the EISA driver.

Follow the instructions provided by the package to complete removal. You can check this by running the system administration package after reboot to view existing packages.

SCO UNIX Device Driver Installation

Prior to installing the SCO UNIX "ZDSMCS1" driver, check whether the complete "LINK" kit is installed in the UNIX systems as follows:

1. Login as super-user, type "**custom**" and press **<ENTER>**. The CUSTOM main menu appears with the following options:

Install Remove List Quit

2. Use the arrow keys to move the cursor to highlight a selection. Select "**LIST**" and press **<ENTER>**.
3. Select "**SCO System V Extended Utilities**" if it is shown, and go to step 6. Otherwise, select "**SCO System V Operating System**" and press **<ENTER>**.
4. Select "**Service Components**" and press **<ENTER>**.
5. Select "**SCO System V Extended Utilities**" and press **<ENTER>**.
6. Select "**Packages**" and press **<ENTER>**
7. Scroll to select "**System V Link Kit**". If the installation status is "**YES**", the kit is completely installed. To exit, press **<ESCAPE>** to go back to the previous menu and exit the CUSTOM program.
8. If the installation status is "NO" or "PART", press **<ESCAPE>** to go back to the previous menu. Select "Install" and press **<ENTER>**. Repeat Steps 3-6.
9. Scroll to select "System V Link Kit" and press **<ENTER>**.
10. The system will prompt you to insert diskette "N3". Follow instructions to complete installation.

You are now ready to use the "CUSTOM" installation program.

1. To begin installation, login as super-user, type "**custom**" and press **<ENTER>**. The CUSTOM main menu appears with the following options:

Install Remove List Quit

EISA ESDI Controller Installation Guide

2. Use the arrow keys to move the cursor to your selection and press **<ENTER>**. Select the "**Install**" option.

After selecting the "**Install**" option, a window appears in lower-right corner of the screen. The options that appear in the window include:

"**A New Product**" and a list of products that are currently installed on your system.

3. Select "**A New Product**" and press **<ENTER>**. The following choices are displayed:

Choose an option: [Entire Product] Package Files

4. Select "**Entire Product**" and press **<ENTER>**. The following prompt is displayed:

Insert the requested volume and press <RETURN> to continue the installation

*Insert: Distribution
 Floppy Volume 1*

Continue Quit

5. Insert the disk containing the DTC ZDSMSC1 driver for SCO UNIX and press **<ENTER>**. This message appears on the screen:

Executing ZDS MSC1 Driver Init Script

Which release of SCO UNIX are you running?

1. 3.2.2

Enter an option or 'q' to Quit:

6. If you are running a version of SCO UNIX listed in the menu, press **<ENTER>**. If you are running another version of SCO UNIX, press "**q**" to quit.

NOTE:

This driver does not support versions of SCO UNIX not listed in the menu above.

To continue, the following message is displayed:

*Installing ZDS MSC1 Driver
Do you wish to build a new kernel at this time? (y/n)*

7. Type "**y**" and press **<ENTER>**. This is followed by:

*The UNIX Operating System will now be rebuilt.
This will take a few minutes. Please wait.*

Root for this system built is /.

The UNIX kernel has been rebuilt.

Do you want this kernel to boot by default? (y/n)

8. Type "**y**" and press **<ENTER>**. The following messages are displayed:

*Backing up /unix to /unix.old
Installing new /unix*

*The kernel environment includes device node files
and /etc/inittab.
The new kernel may require changes to /etc/inittab or
device nodes.*

Do you want kernel environment rebuilt? (y/n)

9. Type "**y**" and press **<ENTER>**. The following messages are displayed:

*The kernel has been successfully linked and installed.
To activate it, reboot your system.*

*Setting up new kernel environment
Press any key to continue*

10. Press **<ENTER>** to continue. When installation is complete, the main menu is displayed. Select "**Quit**" and press **<ENTER>**.

11. A Yes/No prompt is displayed. Select "**Yes**" and press **<ENTER>** to exit the CUSTOM installation program.

Reboot the computer to use the new kernel.

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Removing the ZDSMSC1 Driver From SCO UNIX

Use the "CUSTOM" command to remove the "ZDSMSC1" driver from your system.

1. To begin removal, type "**custom**" and press **<ENTER>**. The CUSTOM main menu appears with the following options.

Install Remove List Quit

2. Using the arrow keys to move the cursor, select "**Remove**" and press **<ENTER>**.

A window appears in the lower-right corner of the screen. The options that appear in the window include a list of products that are currently installed on your system.

3. Select "**ZDSMSC1**" driver and press **<ENTER>**. The following choices are displayed:

<i>Name</i>	<i>Inst</i>	<i>Size</i>	<i>Description</i>
<i>*ALL</i>	<i>Yes</i>	<i>nnn</i>	<i>ZDS MSC1 Driver</i>
<i>ZDSMSC1</i>	<i>Yes</i>	<i>nnn</i>	<i>ZDS MSC1 Driver</i>

4. Select "**ALL**" and press **<ENTER>**. Proceed to follow the screen prompts to complete removal of the "ZDSMSC1" driver from your system. Refer to your SCO UNIX manual for detailed information.

Installing Additional Hard Drives under SCO UNIX

Prior to installing additional hard drives, use the "2BDFMT" utility to low-level format and verify them. This section takes you through the step-by-step installation procedure.

1. At the system prompt, type "**sysadmsh**" and press **<ENTER>**. The main menu appears with the following options:

System Backups Accts Printers Media Jobs Dirs/Files Filesystems Quit

2. Using the arrow keys to move the cursor, select "**System**" and press **<ENTER>**. A menu appears with the following options:

Report Configure Hardware Software Audit Execute Terminate

3. Select "**Hardware**" and press **<ENTER>**. This menu appears:

HardDisk Tape Printer Card_Serial Mouse Video

4. Select "**HardDisk**" and press **<ENTER>**. The screen will show the execution of the "mkdev hd" command.

Follow the menu prompts that follow as displayed under "System V Hard Disk Initialization", making selections based on your application.

DOS Device Driver Installation

The DTCEISA.SYS file is the DOS device driver for the DTC6290-24 controller board. Execute the following steps to install the DTCEISA.SYSD DOS driver:

- Install the DOS operating system.
- Insert the EISA driver diskette in drive "A". Copy the DTCEISA.SYS file into the root directory in drive "C".
- Add the line "**DEVICE=DTCEISA.SYS**" to your CONFIG.SYS file and reboot the system. The following message is displayed when the EISA driver is installed:

*COPYRIGHT (C) Data Technology a division of Qume Corporation
EISA EXTENDED DRIVER VERSION x.xx DATE
V20 REV: xx DTC269 REV: xx*

The DTCEISA.SYS driver supports Quarterdeck's QEMM, the expanded memory manager, under EISA mode. However, the command line added to the CONFIG.SYS file in this case is "**DEVICE=DTCEISA.SYS /Q**".

If this driver is to be used with Windows Smart Drive device driver, then the placement of the DTCEISA.SYS driver in the CONFIG.SYS file is important. The line "**DEVICE=DTCEISA.SYS**" must come before the line "**DEVICE=SMARTDRV.SYS**".

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OS/2 Device Driver Installation

Execute the following steps to install the OS/2 MSV1.21 and IBMV1.3 driver.

- Copy the DISK01.SYS file from the EISA Driver diskette to the OS/2 V1.21 and and IBMV1.3 INSTALL diskette.
- Reboot the computer with the OS/2 INSTALL disk in drive "A". Follow the on-screen prompts to install OS/2. Refer to the OS/2 installation guide for the proper installation.
- When OS/2 installation is complete, each attached drive must be PARTITIONED and FORMATTED before usage. Refer to the OS/2 installation guide for each of these steps.

Novell NetWare 3.0 Device Driver Installation

When installing the DTC6290-24 controller board in a computer with Novell NetWare, the ESDI disk drives must be mapped to 63 sectors/track. If ESDI disk drives are not mapped to 63 sectors/track, Step 6 must be repeated using 63 sector mapping for each ESDI disk drive.

Execute the following steps to install the Novell NetWare 3.0 Driver.

- Set the DTC6290-24 access mode to EISA mode via Step 5.
- Install Novell NetWare as described in the Novell NetWare manual. Name the file server and enter the IPX number.
- Insert the EISA Driver diskette into floppy drive A, type "**LOAD A:EISA100.DSK**" at the system prompt, and press **<ENTER>**.
- The system will ask you for the slot number. Enter the bus slot number in which the DTC61/6290-24 controller board is installed and press **<ENTER>**.
- Proceed with loading other drivers, following the instructions in the Novell NetWare manual.
- Execute the Novell NetWare installation program by typing "**LOAD INSTALL**" at the system prompt. The system will ask a series of questions about the ESDI disk drives. Answer each question as appropriate for your computer application. Proceed with the Novell NetWare installation as described in the Novell NetWare manual.

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Upon completion of the INSTALL program, the DTC6290-24 Novell NetWare 3.0 driver will be installed.

Novell NetWare 3.1 & 3.11 Device Driver Installation

When installing the DTC6290-24 controller board in Novell NetWare 3.1 & 3.11, the 63 sector mapping mode is required as in NetWare 3.0.

Execute the following steps to install the Novell NetWare 3.1 & 3.11 Driver.

- Set the DTC6290-24 access mode to EISA mode via Step 5.
- Install Novell NetWare as described in the Novell NetWare manual. Name the file server and enter the IPX number.
- Insert the EISA Driver diskette into floppy drive A, type "**LOAD A:NV316X9X.DSK**" at the system prompt, and press **<ENTER>**.
- The system will prompt you for the I/O port address. Type 1F0 for a primary controller, or 170 for a secondary controller (set by Switch 1-8), and press **<ENTER>**.
- The system will prompt you for the controller's interrupt number. Enter IRQ 14 for a primary controller, or IRQ 15 for a secondary controller and press **<ENTER>**.
- Proceed with loading other drivers, following the instructions in the Novell NetWare manual.
- Execute the Novell NetWare installation program by typing "**LOAD INSTALL**" at the system prompt. The system will ask a series of questions about the ESDI disk drives. Answer each question as appropriate for your computer application. Proceed with the Novell NetWare installation as described in the Novell NetWare manual.

Upon completion of the INSTALL program, the DTC6290-24 Novell NetWare 3.1 and 3.11 driver will be installed.

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Novell NetWare Duplexing

Duplexing allows Novell NetWare 3.1 & 3.11 to support two DTC6290-24 controllers for a total of eight ESDI drives to provide data protection. In order to duplex, the secondary controller must be configured prior to installing NetWare.

- After loading the Novell NetWare 3.1 & 3.11 driver, NV316X9X.DSK, for the primary controller, it must be loaded a second time for the secondary controller using the secondary I/O port address and interrupt number as shown in the steps above before loading Novell NetWare 3.1 or 3.11.

Memory Upgrades

The cache memory on the DTC6290-24 can be configured to be 512KB, 1MB, 2MB, or 4MB. The optimum size of the cache memory is dependent upon the computer environment. In general, a larger cache memory will result in a higher "hit ratio", reducing average access time. However, the extent to which the average access time is reduced depends upon the operating system, the application, and the type of data being accessed.

The cache memory on the DTC6290-24 controller board is designed to be easily changed. Any change in the memory configuration is automatically detected by the DTC6290-24 controller board, eliminating the need to change any jumpers or switches. Also, industry standard SIMM modules are specified to allow users to find readily available sources of SIMM modules. The DTC6290-24 controller board supports SIMM modules with the following specifications:

256Kx9 or 1MBx9 (3 chip SIMMs only)
CMOS Technology
100ns Access Time Maximum
Page Mode

The DTC6290-24 controller board supports 256K SIMM modules and 1MB SIMM modules. Table 3 shows the memory configuration for each available cache memory size. It is recommended when replacing the SIMM modules, a SIMM module tool be used to remove the SIMM modules to avoid the possibility of damaging the SIMM module sockets.

Table 3
Cache Memory Configuration

Memory Size	Sockets			
	19A	20A	21A	22A
512K	256	256	--	--
1MB	256	256	256	256
2MB	1MB	1MB	--	--
4MB	1MB	1MB	1MB	1MB

Technical Support

Data Technology has knowledgeable staff of Technical Support Engineers dedicated to assist our customers with any technical issues which they may encounter using or installing Data Technology products. These engineers are available Monday through Friday (excluding holidays) from 7:30am to 5:00pm (Pacific Time Zone). The Technical Support telephone number is (408) 262-7700.

Data Technology also maintains a 24-hour electronic bulletin board system (BBS) which contains application notes, installation guides, switch settings and driver file updates for our products. The Data Technology BBS can be

reached by calling (408) 942-4197.

The Bulletin Board System requires the following modem settings:

Baud Rate: 1200 or 2400bps **Data Bits:** 8 **Stop Bits:** 1 **Parity:** None



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