08/23/95

!!!

!!   The included drivers and documentation are for use on   !!

!!   DTC Data Technology Corporation IDE controllers only   !!

!!   !!

!!   Please take the time to identify the specific DTC Controller !!

!! Model that you have. Each DTC Controller Model may have several !!

!! versions, which can cause some confusion. You can identify your !!

!! specific Model by checking the cover page of your Install Guide,!!

!! or by comparing your card to the card descriptions below.   !!

!!   This README.1ST file uses the specific controller versions   !!

!! when indicating unique issues that pertain to each controller   !!

!!!

FOR USE WITH THE FOLLOWING DTC EIDE AND IDE CONTROLLERS:

ISA Bus:

  DTC 2280 - IDE W/IO; Supports 2 Devices; 16 Bit IO;

        16450 UARTs; Standard Parallel Port;

  DTC 2280E - IDE W/IO; Supports 2 Devices; 16 Bit IO;

        16550 UARTs; SPP/EPP/ECP Parallel port;

  DTC 2183/2183E - IDE Secondary Port; Supports 2 Devices; 16 Bit IO;

EISA Bus:

  DTC 2290 - IDE; PIO Mode 2; Supports 4 Devices

VESA Bus:

  DTC 2270VL - IDE W/IO; PIO Mode 2 Max; Supports 2 Devices; 16450 UARTs

DTC 2278VL - IDE W/IO; PIO Mode 2 Max; Supports 2 Devices; 16450 UARTs

This board is identified by 1) Drive transfer speed jumpers

W1-W5 on the left side of board and 2) uses the DTC 805 chip at

location U4.

DTC 2278S - IDE W/IO; PIO Mode 4 Max; Supports 2 Devices; 16450 UARTs

This board does not have jumpers for setting drive transfer

speed, and uses the DTC 803 chip at location 3A.

DTC 2278D - IDE W/IO; PIO Mode 4 Max; Supports 4 Devices; 16450 UARTs

This board does not have jumpers for setting drive transfer

speed, and uses the DTC 803 chip at location 3A.

DTC 2278D Plus - IDE W/IO; PIO Mode 4 Max; Supports 4 Devices;

16550 UARTs; SPP Parallel port.

This board does not have jumpers for setting drive transfer

speed, and uses the DTC 803 chip at location 3A. This board

uses the Winbond W83787F or W83797 chip at location 2A.

DTC 2278E/B - EIDE W/Enhanced IO; PIO Mode 4; Supports 4 Devices;

32 Bit IO; 16550 UARTs; SPP/EPP/ECP Parallel port.

This board does not have jumpers for setting drive transfer

speed, and uses the DTC 803 chip at location 3A. The "EB"

version includes a "EDPT" BIOS.

PCI Bus:

DTC 2130PC - IDE; PIO Mode 3 Max, Supports 2 Devices.

Uses PCTech RZ1000 chip. Supports PCI Interrupt INTA only.

DTC 2130S - IDE; PIO Mode 3 Max, Supports 2 Devices.

Uses DTC 801 chip. Supports PCI Interrupts INTA - INTD.

DTC 2130D - IDE; PIO Mode 3 Max, Supports 4 Devices.

Uses DTC 801 chip. Supports PCI Interrupts INTA - INTD.

DTC 2130D - IDE; PIO Mode 4 Max, Supports 4 Devices

Uses DTC 803 chip. Supports PCI Interrupts INTA - INTD.

Others:

DTC 1181 - BIOS Card; For use with Hard Drives > 528 MB (LBA and EDPT).

Table of Contents

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1.0 DTC Enhanced IDE Driver Statistics

==

README.1ST   This File

LICENSE.DTC   DTC License Agreement (ASCII)

DOSEIDE.SYS   DOS Device Driver   #1, #2

WINEIDE.386   Windows 3.1X Device Driver #1

DTCIDE.ADD   IBM OS/2 V2.x Device Driver #3

ATDISK.SYS   Windows NT Device Driver

DTCIDE3.DSK   Novell 386 V3.1x Device Driver

DTCIDE4.DSK   Novell 486 V1.X Device Driver

DTCIDE4.DDI   Novell 486 Information File

DTCSPEED.EXE   DTC Benchmark utility

EZIDE.EXE   DTC IDE Install Utility

NOTES:

#1   Supports drives with cylinders > 1024 if motherboard BIOS

implements Enhanced Drive Parameter Table (EDPT), sometimes

referred to as LBA or TRANSLATION mode in CMOS setup. If your

motherboard does not support this feature truncate CMOS setting to

1024 cylinders.

#2   DOSEIDE.SYS replaces DTC2270.SYS, DTC2278.SYS or DTC2290.SYS.

#3   For drives with cylinders > 1024, truncate CMOS setting to

1024 cylinders

2.0 Configuration

====================

2.1 Hardware Installation

Setup and Install your DTC IDE controller per the instructions provided

in the Install Guide shipped with your specific card.

2.2 "EZIDE" Install Utility

DTC provides a utility to automatically install the DOS and Windows

device drivers into your Hard Disk Drive. This utility will copy all

necessary files and update your CONFIG.SYS and SYSTEM.INI files.

This utility requires that the C: drive has been Partitioned (DOS FDISK)

and Formatted (DOS FORMAT).

To use EZIDE, insert the DTC Enhanced IDE driver diskette in the

A: drive and type:

A:EZIDE <CR>

Follow the on screen instructions. The EZIDE utility will walk you

through the installation.

   2.3 Software Device Drivers

The DTC Enhanced IDE Drivers will automatically configure the drives and

the DTC IDE card for maximum performance/features.

!!! The DTC 2278S/D/E and DTC 2130 products do automatic speed setting

for each drive attached. You can combine drives with different speeds

and multi-sector transfer capabilities on the same card.

!!! The DTC 2278VL does not allow automatic programming of the IDE

transfer rate. You will need to set the IDE transfer rate with

jumpers W1-W5 provided on the card. The speed can not be greater than

the speed of the slowest drive attached.

A set of Software switches have been included to:

1) Aid in debug

2) Work around HDDs that may not conform exactly to the ATA 3.0 and

  ATA-2 Specifications, or

3) Work around bugs that may exist in a HDD. Refer to Software

  Switches section for definition and use.

   2.4 CMOS Settings

The System CMOS settings for Hard Disk Drive Types are for Hard Disk

Drives attached to the PRIMARY PORT ONLY!

Drives attached to the SECONDARY PORT are installed by the DOSEIDE.SYS
driver. DO NOT modify the System CMOS Drive Types for Hard Disk Drives
attached to the Secondary Port.

   2.5 New IDE Hard Drive Installation

If your new IDE HDD is NOT DOS Partitioned and DOS Formatted, then you
will need to do so, refer to your DOS manual for instructions on the
use of these utilities.

If your new HDD is < 528 MBytes capacity and attached to the Primary
port, it is NOT required to have the DTC Enhanced IDE Driver DOSEIDE.SYS
loaded.
If your new HDD is attached to the Secondary port, it requires that the
DTC Enhanced IDE Driver DOSEIDE.SYS be loaded. (REF section 3.1)

If your new HDD is > 528 MBytes capacity, supports LBA, is attached to
the Primary port, and your motherboard BIOS supports an Enhanced Drive
Parameter Table (EDPT), it will be required that the DTC Enhanced IDE
Driver DOSEIDE.SYS be loaded to access the full capacity of the drive.
(REF section 3.1).
The Enhanced Drive Parameter Table (EDPT) support is typically referred
to as LBA or TRANSLATION mode in the system CMOS setup.
Use the "/V" Verbose switch to determine what your system supports.
(REF section 4.0)

   2.6 Existing IDE Hard Drive Installation

If you are attaching an existing IDE Hard Drive (previously Partitioned

and Formatted), then check the following:

HDD Physical capacity < 528 MBytes

* If the drive is Less Than 528 MBytes, then go to Section 3.1, and skip

the DOS Partition and Format step.

HDD Physical capacity > 528 MBytes

* If the drive was formatted on a system that supported an Enhanced

Drive Parameter Table (referred to as EDPT or LBA mode), then go to

Section 3.1, and skip the DOS Partition and Format Step.

* If the drive was Partitioned and Formatted using a proprietary Head

mapping technique (referred to as Big/Large Drive or Head Mapping mode),

then you will be required to Re-Partition and Re-Format the drive.

!!! WARNING !!! Before Re-Partitioning or Re-Formatting the drive, make

a backup copy (Floppy disk or other HDD) of all important data from the

drive. All data will be erased from drive.

* If the drive's total Partition capacity is less than the drive's

Physical capacity, then you may want to Re-Partition and Re-Format the

drive to the full capacity.

!!! WARNING !!! Before Re-Partitioning or Re-Formatting the drive, make

a backup copy (Floppy disk or other HDD) of all important data from the

drive. All data will be erased from drive.

If you choose not to do this, then you must add a switch to the driver

line in the CONFIG.SYS file as follows:

device=doseide.sys /d#:l0

See Section 4.0 for details on switch usage and function.

   3.0 Installing Enhanced Device Drivers

==

   3.1 DOS

The DOS driver, DOSEIDE.SYS, needs to be loaded to support the

Secondary Port, turn on 32-bit mode, enable multi-sector transfers, and

program the DTC IDE card and each IDE device for optimal performance.

New C: drive installation:

* Insert MS-DOS boot disk in drive A: and reboot system.

* Partition the IDE drive with DOS FDISK and then perform DOS

   FORMAT. Install DOS on the hard drive.

Existing C: drive has DOS installed and is bootable:

* Copy the DOSEIDE.SYS file to the root directory of the boot

   drive.

* Add the following statement to the CONFIG.SYS file:

      device=DOSEIDE.SYS

* To ENABLE the Secondary port on a Dual Port Card, modify the

   CONFIG.SYS file by adding a "/2" to the driver lines as follows:

device=DOSEIDE.SYS /2

* Re-boot the system.

   3.2 Windows 3.1x and Windows for Work Groups 3.11

All 32-bit DTC IDE controllers support 32-Bit Disk Access and 32-Bit

file access under Windows 3.11. The DTC Windows driver, WINEIDE.386, is

a Virtual Mode Driver (VxD) that can be used in place of WDCTRL.

* IT IS RECOMMENDED TO FIRST VERIFY THAT YOUR SYSTEM AND HARD DRIVE IS

* COMPATIBLE WITH THE 32-BIT DISK ACCESS FUNCTIONS UNDER WINDOWS USING

* THE BUILT IN WDCTRL DRIVER. IF YOU HAVE BEEN SUCCESSFUL USING THE

* WDCTRL DRIVER, THEN PROCEED WITH THE INSTALLATION OF THE DTC WINDOWS

* DRIVER - WINEIDE.386

The WINEIDE.386 driver provides the same functions, but also includes

32-bit PIO transfers to the DTC IDE card, supports multi-sector

transfers, and programs the DTC IDE card and each IDE device for optimal

performance.

* Copy the WINEIDE.386 file from the DTC Driver diskette into

   the C:\WINDOWS\SYSTEM directory.

* Edit the file SYSTEM.INI located in the C:\WINDOWS directory.

   Locate the [386Enh] section. If "32BitDiskAccess" is already

   enabled (=on), you must disable the WDCTRL Driver by placing a

   semi-colon (;) at the beginning of the line. Then add the

   WINEIDE.386 driver line as follows:

32BitDiskAccess=on

device=*int13

;device=*wdctrl

device=wineide.386

If "32BitDiskAccess" is not enabled (=off), then add the
following lines to the beginning of the [386Enh] section:

32BitDiskAccess=on

device=*int13

device=wineide.386

3.3 Windows 95

The DTC Enhanced IDE product line is supported in Windows 95 with
WINEIDE.386. This Protected mode Enhanced IDE driver is a Virtual Mode
Driver (VxD) that offers features not found in the built-in driver.

* IT IS RECOMMENDED TO FIRST VERIFY THAT YOUR SYSTEM AND HARD DRIVE ARE
* COMPATIBLE WITH THE 32-BIT DISK ACCESS FUNCTIONS UNDER WINDOWS USING
* THE BUILT IN DRIVER. IF YOU HAVE BEEN SUCCESSFUL USING THE BUILT IN
* DRIVER, THEN PROCEED WITH THE INSTALLATION OF THE DTC ENHANCED IDE
  WINDOWS DRIVER - WINEIDE.386

The WINEIDE.386 driver provides the same functions as the built in
driver, but also includes 32-bit PIO transfers to the DTC IDE card,
supports multi-sector transfers, and programs the DTC IDE card and each

IDE device for optimal performance.

* Copy the WINEIDE.386 file from the DTC Driver diskette into
   the C:\WINDOWS\SYSTEM directory.

* Edit the file SYSTEM.INI located in the C:\WINDOWS directory.
   Locate the [386Enh] section. You must disable the WDCTRL Driver if
   you installed Windows 95 over Win 3.1x by placing a semi-colon (;) at
   the beginning of the line. Then add the WINEIDE.386 driver line as
   follows:

   ;device=*wdctrl   ; Comment this line if exists

   device=wineide.386   ; Add this line

   3.4 IBM OS2 V2.x & V3.x (WARP)

If you have an EIDE BIOS (creates an Enhanced Drive Parameter Table)

in your system, there are no OS2 limitations on the Partition size.

Skip to the next section.

FOR IDE HARD DRIVES WITH > 1024 CYLINDERS

There are two restrictions associated with OS2 and drives with Cylinders

counts > 1024.

  1) The Primary Bootable OS2 partition must be less than 504 MBytes.
   This applies to both FAT and HPFS file systems.

  2) Any Additional OS2 FAT partitions can NOT extend beyond the 504
   MByte boundary.

3.4.1 Installation, where OS/2 was previously installed

----

* Boot OS2

* Copy the DTCIDE.ADD file from the DTC Driver diskette to

   the /OS2 directory on the bootable hard disk.

* Edit the CONFIG.SYS file in the root directory:

     1. Remark out the current driver as follows:

        REM BASEDEV=IBM1S506.ADD

     2. Add the DTC Enhanced IDE device driver statement.

        BASEDEV=DTCIDE.ADD [Software Switches]

* Reboot the System.

  3.4.2 New Installation

----

* Create a DTC Installation Diskette DTC D1 as follows:

     1. Backup original OS2 Diskette 1 to new diskette DTC D1.

     2. Edit the CONFIG.SYS file on the DTC D1 diskette.

        REM BASEDEV=IBM1S506.ADD

        BASEDEV=DTCIDE.ADD [Software Switches]

     3. Delete the IBM1S506.ADD file from DTC D1.

     4. Copy DTCIDE.ADD file from the DTC Driver diskette to

        the DTC D1 diskette.

* Install OS2 according to the OS2 installation guide. When

   Diskette 1 is prompted, insert the DTC D1 diskette.

#NOTE#

Any Software switches entered must be the same as the DOS Software

switches, in a dual boot configuration.

3.5 Novell NetWare

3.5.1 NetWare 386 V3.1, V3.11, & V3.12

----

* Copy the file DTCIDE3.DSK from the DTC driver diskette to the

   directory where the Novell "server" is installed.

* At the NetWare console prompt (:) type:

    LOAD DTCIDE3 [Software Switches]

#NOTES#

1. For a Dual Port configuration, load the DTCIDE3 driver twice. Once

for each port, or add a "/2" Software Switch to the load line.

2. Any Software switches entered must be the same as the DOS Software

switches.

3.5.2 NetWare 486 V4.x

----

* Copy the files DTCIDE4.DSK and DTCIDE4.DDI from the DTC driver

   diskette to the directory where the Novell "server" is

   installed.

* At the NetWare console prompt (:) type:

    LOAD DTCIDE4 [Software Switches]

#NOTES#

1. For a Dual Port configuration, load the DTCIDE4 driver twice. Once

for each port.

2. Any Software switches entered must be the same as the DOS Software switches.

3.6 Windows NT

----

* Install the Windows NT Operating System. Follow the instructions provided with the OS, using the built in IDE Driver, ATDISK
   DO NOT use the DTC ATDISK.SYS driver to replace the original ATDISK.SYS in the original NT Boot Disk.

* After completion of installation:

   1. Locate the Drivers Directory . At the prompt, type:

       CD C:\WINNT\SYSTEM32\DRIVERS

   2. Backup existing IDE driver. At the prompt, type:

       COPY ATDISK.SYS ATDISK.ORG

   3. Insert the DTC Driver Diskette in Drive A:. Copy the DTC Windows NT driver to the C: Drive. At the prompt type:

       COPY A:ATDISK.SYS C:\WINNT\SYSTEM32\DRIVERS

   5. Reboot the system by Shutting Down and Restarting.

3.6.1 DTC Windows NT Driver Configurable Parameters

Windows NT contains a Registration Database called REGISTRY. During

Initialization/Configuration Device drivers can use the Registry

Database to get Parameters. Typically the creation of the Registry

Database is NOT required. The DTC Windows NT driver will auto

configure itself and the attached HDDs for the maximum performance.

The Configurable Parameters are used to resolve problems that may

occur with specific HDDs. The default values are highlighted.

Modifying/Creating Registry Database

* Open a working window. At the prompt, type:

        REGEDT32

  The DTC Window NT driver's parameters will be located under

  the following tree string:

  \HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Atdisk

* In the HKEY_LOCAL_MACHINE screen, Traverse down through the

  tree string until you are at \Atdisk

3.6.2 Creating Parameters Registry Database

If you have previously created a Parameters Registry database for the

DTC Windows NT driver , then skip to Modifying Parameters Registry

Database.

1. Select EDIT from the Registry Menu.

2. Select the Add Key... menu entry.

3. When the Add Key Window appears, type Parameters for the Key Name and press OK.

3.6.3 Modifying Parameters Registry Database

If you have NOT previously created a Parameters Registry database for the DTC Windows NT driver, then go back to Creating Parameters Registry Database.

1. Select Parameters under ..\Atdisk.

2. Select EDIT from the Registry Menu.

3. Select the Add Value... menu entry.

4. When the Add Value Window appears, enter a Value Name defined in Table 1.

5. Select REG_DWORD for the Data Type Field.

6. When the DWORD Editor Window appears, enter a Data Value associated with the Value Name, and Select OK.

7. Repeat steps 2 thru 6 for each Registry Database entry.

8. When completed, select Registry from the Registry Menu and EXIT.

Table 1: DTC Windows NT Registry Options

Value Name	Data Type	Data Value
Cx-Dy-MultiSector	REG_DWORD	0, 1, 2, 4, 8, 16, 32
Cx-Dy-LBA_On	REG_DWORD	0 = LBA OFF, 1 = LBA ON

Cx-Dy-PioMode   REG_DWORD   0 = Blind PIO Mode 0

                          1 = Blind PIO Mode 1

                          2 = Blind PIO Mode 2

                          3 = Blind PIO Mode 3

Cx-Dy-32Bit_On   REG_DWORD   0 = 16 bit mode Xfer

                          1 = 32 bit mode Xfer

C1_On   REG_DWORD   0 = Bypass Secondary

                          1 = Control Secondary

  Cx selects the Controller, where x is 0 (Primary) or 1 (Secondary).

  Dy selects the Drive, where y is 0 (Master) or 1 (Slave).

  4.0 Software Switches

========================

The Software switches are NOT required for normal operation, but have

been included to;

1) Aid in debug

2) Work around HDDs that may not conform exactly to the ATA 3.0 and

   ATA-2 Specifications, or

3) Work around bugs that may exist in a HDD. Refer to Software

   Switches section for definition and use.

Software Switch Definitions

The following section provides a description for each of the outlined

software switches available for use with the appropriate software

driver(s) mentioned in parenthesis.

/v or /V   Verbose Mode, Display Drive Setup   #1, #3

          (DOS,WINDOWS)

          The drive configuration is displayed as follows:

   >>>> CHS: 1024, 16, 63; P4; M16; LBA; IORDY; EDPT; 32 Bit I/O;

/2   Secondary IDE Port Enable. Any software switch

          for a secondary device must follow the /2 switch

          (DOS,OS2,Novell)

/ndisp or /NDISP   Disable Windows Sign On message.

          (WINDOWS)

/32   Force 32 Bit IO cycles.

          for secondary port must follow the /2 switch

          for Vesa Local Bus or PCI controllers ONLY

          (DOS,WINDOWS)

/16   Force 16 Bit IO cycles.

          for secondary port must follow the /2 switch

          (DOS,WINDOWS)

/IRQ:#   Alternate Secondary Port Interrupt. Hardware must

          also support alternate interrupts.

(example /irq:15)   # = 15 - Use ISA Interrupt IRQ15

          (IRQ15 is default, if not specified)

          # = 12 - Uses ISA Interrupt IRQ12

          # = 11 - Uses ISA Interrupt IRQ11

          (DOS)

/IO:#   Alternate Secondary Port IO Address. Hardware must

also support alternate IO Address decodes.

(example /io:170)   # = 170 - Use IO Base Address 170H - 177H & 376H

(default, if not specified)

= 1E8H - 1EFH & 3EE

Alternate Status address = IO Base + 206H

(DOS)

/dx: or /Dx: Switch Identifier and Drive number "x"

"x" = 0 = Master Drive, 1 = Slave Drive

One of the following switches must follow the

semi colon. (can use upper or lower case)

m or M   Multi Sector Transfer, Sectors Per Interrupt

(example /d0:m0)   0, 1, 2, 4, 8, 16(default), 32

p or P   Blind PIO Data Transfer Mode   #2

(example /D1:p3)   0 = PIO Mode 0 (3.33 MB/S)

1 = PIO Mode 1 (5.22 MB/S)

2 = PIO Mode 2 (8.33 MB/S)

3 = PIO Mode 3 (11.1 MB/S)

4 = PIO Mode 4 (16.6 MB/S)

l or L   LBA Support

(example /D0:L0)   0 = Disable LBA, 1 = Enable LBA

NOTES:

#1 On the DTC 2278VL the IDE Transfer rate displayed is the "Blind"

Transfer rate returned from the drive. Use this information to

set the IDE Transfer Rate jumpers W1-W5 on the card.

On the DTC 2278S/D/E/Plus and DTC 2130 products the IDE Transfer rate

displayed is the actual transfer rate for each drive. This transfer

rate is determined from operational information provided by the drive.

#2 On the DTC 2278VL the IDE Transfer rate can only be set with

jumpers W1-W5 on the card. Refer to your Install Guide for details.

#3 Verbose Display

"CHS:" refers to Cylinder, Head, Sector. This is obtained from the CMOS

settings for primary port drives, and from the drives for secondary

port.

"P#" is the IDE PIO Transfer Mode, refer above for details.

"M#" is the Multi-sector number. The number of sectors transferred per

interrupt, refer above for details.

"LBA" if displayed, indicates that the drive supports Logical Block

Addressing.

"IORDY" if displayed, indicates that the drive supports the "IORDY"

signal, and IO Ready has been enabled.

"EDPT" if display, indicates that the System BIOS supports a Enhanced

Drive Parameter Table. This along with LBA support will allow

installation of drives greater than 528 MBytes.

"32 Bit I/O" if displayed, indicates that PIO transfers are 32 bits wide.

"16 Bit I/O" if displayed, indicates that PIO transfers are 16 bits wide.

Examples; Using the Software switches

The following examples will: disable multi-sector transfers and force

PIO Mode 1 on the Primary Port Master drive. Set multi-sector transfers

to 4 on the Primary Port Slave drive. Enable the Secondary Port and

disable logical block addressing on the Secondary Port Master drive.

DOS: (Enter in CONFIG.SYS file)

   Device=DOSEIDE.SYS /d0:m0 /d0:p1 /d1:m4 /2 /d0:l0

Windows V3.1x: (Enter in SYSTEM.INI file, [386Enh] section)

   WINEIDESWITCH= /d0:m0 /d0:p0 /d1:m4 /2 /d0:10 /NDISP

OS2 2.x, 3.x: (Enter in CONFIG.SYS file)

   Device=DTCIDE.ADD /d0:m0 /d0:p0 /d1:m4 /2 /d0:l0

Novell 3.1x   (Enter at the Novell Prompt)

   Load DTCIDE3 /d0:m0 /d0:p0 /d1:m4 /2 /d0:l0

Novell 4.x   (Enter at the Novell Prompt)

   Load DTCIDE4 /d0:m0 /d0:p0 /d1:m4 /2 /d0:l0

   5.0 ATAPI Devices - IDE CDROM

================================

ATAPI is an acronym for ATA Packet Interface. ATAPI is a specification

that defines a SCSI like command interface on the ATA (IDE) hardware

register set (WD1003). The implementation of the ATAPI specification

will allow device types other than Hard Disk Drives to work on ATA/IDE

cards. The first device types available are CDROMS, but Tape devices are

expected in the future.

ISSUES:

----

1) The ATAPI device will come with a ATAPI device driver. This device
driver MUST be installed before you can access the ATAPI device. Follow
the installation instructions provided with your ATAPI device.

2) Typically the ATAPI device driver will be installed in the CONFIG.SYS
file. You should always load the ATAPI device driver AFTER any device
driver that works with the Hard Disk Drives. In DOS, you would install
the ATAPI device driver after the "device=DOSEIDE.SYS" line.

3) In Windows 3.1 or Windows for Work Groups, it is recommended that
any ATAPI Devices, including IDE CDROMs be installed on a secondary IDE
port. This will allow you to Enable the "32 Bit Disk Access" feature
using either the WINEIDE.386 or WDCTRL.386 VxD drivers.
One of the features of WDCTRL.386 and WINEIDE.386 is to support Virtual
Memory. Virtual Memory is memory data that is stored on a Hard Disk
Drive. This memory data is swapped between the physical memory and a
Swap file on the drive as it is needed by applications. Because of this
feature the VxD drivers will not allow access by other device drivers
(ATAPI) to the IDE registers, for fear of corrupting the Virtual Memory
data.

  6.0 Dual Port Issues

=======================

  There are several issues that you will need to be aware of when using

a dual port configuration.

1. The secondary port uses IO addresses 170H-177H & 376H. The secondary
port interrupt is typically IRQ15 (default), but alternate interrupts
IRQ12 and IRQ11 can also be used if IRQ15 is unavailable. To use an
alternate interrupt, the DTC IDE card Hardware must support alternate
interrupts, and the Device Driver must be informed (REF section 4.0).
The secondary port still uses the Master/Slave convention of identifying
and accessing the drives. You do NOT set the CMOS for any HDDs on the
secondary port.

2. After installing a Dual Port Configuration, you then go back and
add another partition or a drive. In this situation the Drive Letter
assignments will be changed the next time you reboot. You must under-
stand the drive assignments before using the DOS FORMAT command to avoid
formatting the wrong drive. Review the following example.

Example:

Initial DOS Drive Letter assignment   Adding Partition with DOS FDISK
  Primary Master   500MB
    Single Partition 250MB   C: First Partition 250MB   C:
    unused disk space 250MB   Second Partition 250MB   G: !!!!
  Primary Slave   210MB
    Single Partition 210MB   D: Single Partition 210MB   D:
  Secondary Master   1.2GB
    First Partition   500MB   E: First Partition 500MB   E:
    Second Partition 700MB   F: Second Partition 700MB   F:

After Reboot DOS will assign the Drive Letters as follows:

Primary Master   500MB

  Single Partition 250MB   C:

  Second Partition 250MB   E: (G:)

Primary Slave   210MB

  Single Partition 210MB   D:

Secondary Master   1.2GB

  First Partition   500MB   F: (E:)

  Second Partition 700MB   G: (F:)

3. The Secondary Port Drive Letters are assigned differently than the

Primary Port.

The Primary Port drives are assigned in the following sequence:

  1. Primary Master is Drive C:

  2. Primary Slave (if present) is Drive D:

  3. Primary Master Logical drives are assigned starting at the next

    available drive letter. (either D: or E:)

  4. Primary Slave Logical drives are assigned starting at the next

    available drive letter.

The Secondary Port drives are assigned in the following sequence:

  1. Secondary Master drive is assigned to next available drive letter.

  2. Secondary Master Logical drives are assigned in order.

  3. Secondary Slave drive is assigned to next available drive letter.

  4. Secondary Slave Logical drives are assigned in order.

  7.0 Q&A and Troubleshooting

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This section lists common questions and some of the problems the user

might encounter following installation and configuration of a DTC IDE

card.

For additional troubleshooting information:

1) Refer to the Install Guide that you received with your DTC IDE card.

It will contain information that may be specific or unique to your card.

2) For a copy of the DTC "IDE Troubleshooting Guide", call the DTC Fax

Back at (408) 942-4005, and request document # 526.

%%
%%%%%%%%%%%%%%

PROBLEM: When the DTC Enhanced IDE driver loads, you get an error

message "Can Not Find COMMAND.COM". The DTC IDE card Hangs or Fails when

you access the Hard Disk.

SOLUTION:

1. Verify that the CMOS settings are correct for the drives attached.

2. Check that the drive has been Partitioned (FDISK) and DOS formatted.

3. If a PCI/IDE card, verify that you have properly redirected the

Primary Port interrupt to IRQ14, and the Secondary Port interrupt to

IRQ15.

4. The information obtained from the drive about its operational

capability, may be incorrect. Use the Software switches to put the

drive in a standard operation mode.

   Step 1: Determine if Drive Transfer rate is the problem by setting

   drive to standard PIO Mode 0. /dx:p0

   If you have a DTC 2278VL set the IDE transfer rate jumpers

   (W1-W5) to 3.3 MB/s.

   Step 2: Determine if Multi-Sector is the problem by disabling

   Multi-Sector transfer. /dx:m0

5. Some third party software packages that allow access drives with

greater than 528 MBytes are not compatible with the DTC Enhanced IDE

drivers.

6. If your motherboard has an IDE port built-in, make sure that you

have disabled the built-in IDE port and its features. Use the system

CMOS setup utility.

%%
%%%%%%%%%%%%%%%

PROBLEM: Unable to run Windows 95, Windows 3.1 or WFWG 3.11 in

the Enhanced Mode.

SOLUTION: The DTC IDE card does support WFWG 3.11 and Windows 3.1

in Enhanced mode. Check the following:

1. Verify that you have installed the latest DTC Windows Driver

WINEIDE.386 in the SYSTEM.INI file correctly. See DTC Windows

driver installation instructions.

2. If running in the Enhanced mode, any ATAPI Devices must be attached

to the Secondary Port.

3. If you get a message indicating a Validation failure, write down the

two numbers indicated and contact Microsoft or the drive's manufacture.

This failure indicates that the drive/system is not compatible with

Windows Enhanced mode. The most common failure is caused by setting the

Cylinder # in the System CMOS to greater than 1024. Verify this by

reducing the CMOS cylinder number to 1024 and then run windows.

4. Verify that the Windows supplied VxD Hard Disk Driver WDCTRL.386

functions without problems (ref. section 3.2). If WDCTRL.386 does not

work properly, neither will WINEIDE.386. This indicates that either the

drive or the system has an incompatibility with Windows.

%%

PROBLEM: Get error when Exiting Windows 95, Windows 3.1, or WFWG 3.11

in the Enhanced Mode.

SOLUTION: Move the "device=wineide.386" line to the end of the [386enh]

section of the SYSTEM.INI file.

%%

PROBLEM: Can not access Secondary Port drives.

SOLUTION:

1. Check that the /2 switch is included on the driver line.

2. If a PCI/IDE card, verify that you have properly redirected the

Secondary Port interrupt to IRQ15.

3. Check that the drives have been partitioned (FDISK) and DOS

formatted.

4. In Windows Enhanced mode (32BitDiskAccess=on), then the WINEIDE.386

driver must be loaded. In addition the DOSEIDE.SYS driver must be in-

stalled.

%%

PROBLEM: Performance is not up to expectation. Data transfer

rates appear slow.

SOLUTION:

1) Verify that the DOS device driver, DOSEIDE.SYS, is installed.

2) Use an IDE hard drive that supports multi-sector transfers and has

   a fast data transfer rate as reported by the drive manufacturer.

   New drives that support the ATA-2 Specification show the best results.

3) Some benchmark programs do not properly measure data transfer rates

   and therefore show no improvements. Use DTCSPEED.EXE included on this

   disk or Coretest which is available on the DTC BBS.

4) Re-Run benchmark using a "Vanilla" CONFIG.SYS and compare results.

%%%
%%%%%%%%%%%%%%

QUESTION: What are the differences between IDE, EIDE and FAST ATA Hard

Disk Drives?

ANSWER: DTC has generated a white paper "Explanation of Enhanced IDE

and FAST ATA". This paper can be obtained by calling the DTC Fax Back

at (408) 942-4005, and request document # 529.

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QUESTION: Can the DTC Enhanced IDE driver "DOSEIDE.SYS" be loaded into

high memory?

ANSWER: YES, follow the instructions from your DOS Manual for loading

device drivers into high memory.

%%%
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QUESTION: How can I obtain the latest drivers for the DTC Enhanced IDE

products?

ANSWER: The latest release of DTC Enhanced IDE driver set is available

from the DTC BBS. See the Technical Support section for details on the

DTC BBS. You must join one of the following conferences VESA, PCI, or

IDE. Download the file "EIDEVxy.ZIP", where "xy" refers to the revision

of the driver set (i.e "13" equates to 1.3A). The "EIDEVxy.ZIP" file

requires the utility PKUNZIP.EXE to release the individual drivers. If

you do not have this utility, download "PKUNZIP.EXE" from the same

conference.

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QUESTION: Can the DTC Enhanced IDE products support Hard Disk Drives

with capacities greater than 528 MBytes?

ANSWER: YES, The DTC Enhanced IDE drivers require that the Hard Disk

Drive supports Logical Block Addressing (LBA) and the system CMOS

supports an Enhanced Drive Parameter Table (EDPT). EDPT support may be

referred to as the LBA option in the System CMOS Setup. You can use the

"/V" software switch to determine your configuration (REF section 4.0

Software Switches).

For installation and setup refer to sections 2.5 New IDE Hard Drive

Installation and 2.6 Existing IDE Hard Drive Installation.

  8.0 IDE Drive Compatibility

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For the most up to date copy of the DTC "IDE Drive Compatibility List".

Call the DTC Fax Back at (408) 942-4005, and request document # 524.

9.0 "DTCSPEED" benchmark utility

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DTCSPEED is a simple hard disk benchmarking program which measures

data transfer rate between the drive(s) and the host. DTCSPEED will

benchmark up to four (4) drives. This includes any drives attached to

the Secondary port. The results are displayed in KBytes/Sec.

When DTCSPEED is run, it will display 2 columns of information.

The first column, **Read**, displays the results of reading:

(Measures the maximum transfer rate from a cache hit)

1) a fixed 16 KByte block of data repeatedly.

2) a fixed 64 KByte block of data repeatedly.

The second column, **SeqRead**, displays the results of reading:

(Measures a mix of the drive's head data rate (Cache miss), track

switching and the drive's read ahead capability)

1) sequentially 16 KByte blocks of data.

2) sequentially 64 KByte blocks of data.

Typically the results from the second column will be lower than the

first column.

Typically you will see an increase in performance when you have the

DTC Driver loaded versus when it is not loaded.

If you do NOT see an increase in performance when you have the DTC

driver loaded, it could be because:

     * the drive does NOT support multiple sector per transfer

     * the drive is slow. Find out how fast the drive is rated

       (contact drive manufacturer or use the /v option on the

        DOS driver line)

A DTCSPEED Help file can be accessed by typing "DTCSPEED /?", or "DTCSPEED /h" at the DOS Prompt.

10.0 Technical Support

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To obtain Installation Guides, Data Sheets, or Application Notes, via FAX, please call the DTC Automated Fax Response system at:

  DTC Automated FAX   (408) 942-4005 (24 hours)

To obtain Driver updates, Install Guides, or Application Notes, via MODEM, please call the DTC BBS at:

  Bulletin Board System (BBS)   (408) 942-4010 (24 hours)

The BBS setup requires the following modem settings:

Baud Rate: 1200 - 14400 bps, Data Bits: 8, Stop Bit: 1, Parity: None

After you have registered and created your own password, you will be brought to the Main Board Menu. To access a conference from the Main Board, use the "J" command to Join a Conference. Once you have joined the appropriate conference, type "F" for a list of the Files Directories. The Files Directories are divided into three (3) subdirectories: "1" is Install Guides and Application Notes, "2" is Drivers, and "3" is for Uploads.

11.0 Sales Support

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DTC Data Technology Corporation offers a full line of AT, EISA, VESA,

and PCI bus controllers for IDE/ATA and SCSI. For information, contact

the nearest distributor or contact DTC at the following number:

Sales Support FAX   (408) 942-4027 (24 hours)

Data Sheets for all DTC products can be obtained using the DTC Automated

FAX response system. Using a touch tone phone call the following number:

DTC Automated FAX   (408) 942-4005 (24 hours)