Introducing the COMTROL ULTRA Controller

COMTROL's ULTRA controller is an intelligent multiuser controller that supports up to 16 serial ports from one expansion slot in your personal computer. The 80286 processor provides fast data communication and input/output (I/O) support. The COMTROL ULTRA controller plugs into the AT bus in your personal computer.
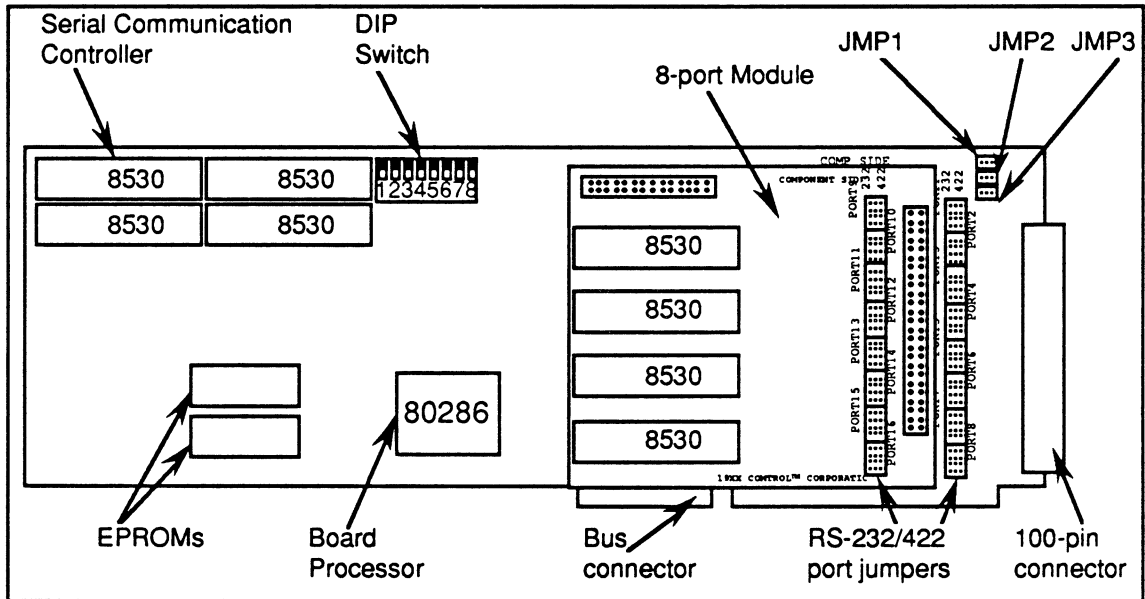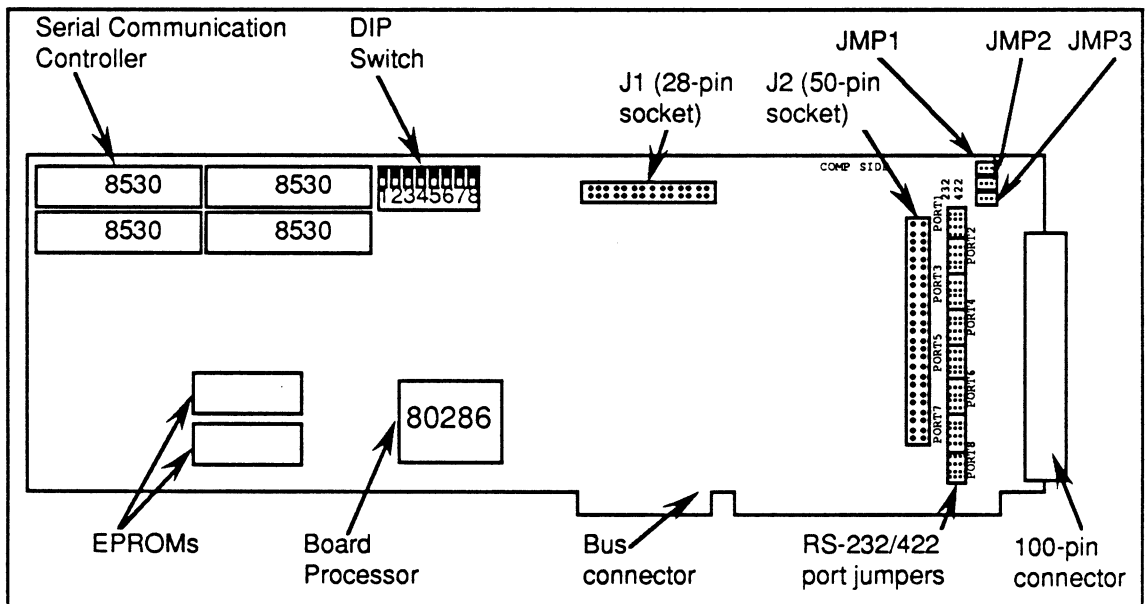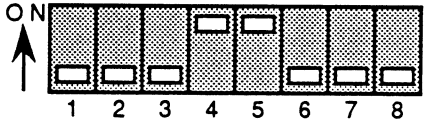

Figure 1-1. The COMTROL ULTRA 16 Controller.

Figure 1-2. The COMTROL ULTRA 8 Controller.

COMTROL ULTRA Controller Settings

COMTROL ships the COMTROL ULTRA controller set to operate at base
memory address F00000 (hexadecimal), and input/output (I/O) address range
218 through 21B (hexadecimal). Your computer's operating system may
require different addresses, and your computer system may require an
interrupt request (IRQ) setting.

Table 1-1. Factory Settings for the COMTROL ULTRA controller.

Factory Settings for the COMTROL ULTRA Controller	
Communications protocol	Asynchronous
Operating mode	AT
Hexadecimal Memory Address and	
Hexadecimal I/O Address Ranges (DIP switch SW)	F00000 - F1FFFF 218 - 21B
Standard Interface	EIA-232-D

Note that the *base memory address* is the address that is the starting location
of the memory found on the controller. The *input/output base address* is the
start of a reserved range of memory location for each controller in the system.
This range is a distinct I/O address space and is unrelated to ordinary
memory addresses. An *interrupt vector* is a reserved location in memory that
specifies where the interrupt handler program for that interrupt type is
located. IRQs differ depending on the operating system you use; your
operating system may use different interrupts, or none at all.

The Dual In-line Package switch, commonly known as a DIP switch, sets the base memory address and the I/O base address. The jumper header pins, commonly referred to as jumpers, set the interrupt request. The following sections in this chapter explain how to set DIP switches and how to place shorting jumpers on header pins.
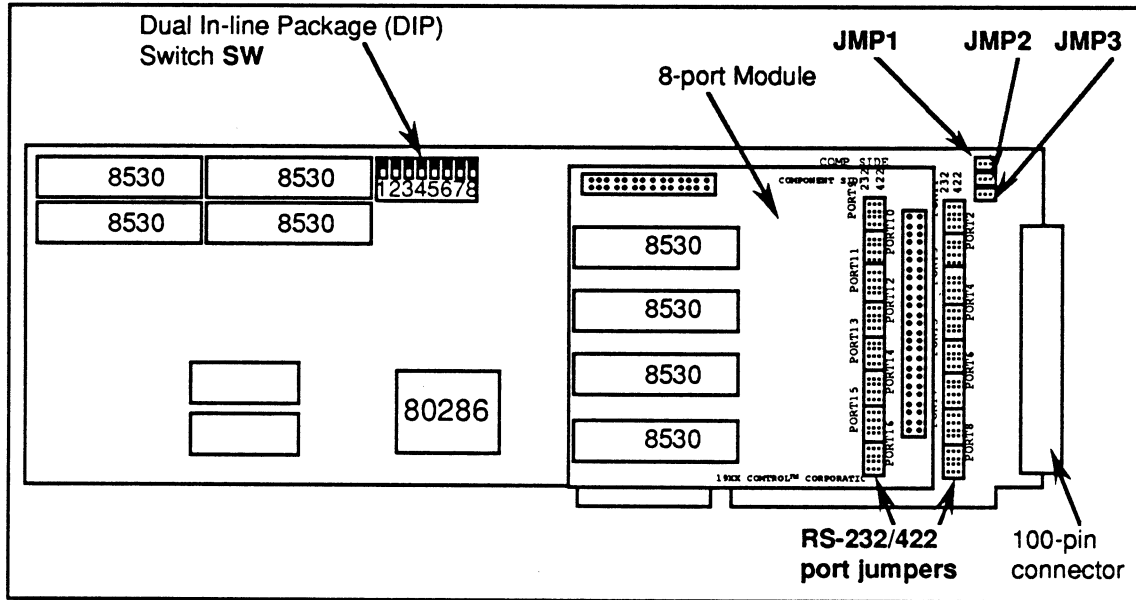
Figure 1-3. Location of DIP switch block SW, the IRQ jumpers JMP1, JMP2, and JMP3, and interface port jumpers on the COMTROL ULTRA 16.

Setting Switches for Your Operating System

Before you install the COMTROL ULTRA controller into your system, you set the appropriate memory address for your operating system. The Dual In-line Package (DIP) switch sets both the base I/O address and the memory address for the COMTROL ULTRA controller. A base I/O address is the address for I/O throughput. The memory address identifies where the controller's 128K of dual-ported RAM starts. The system needs these addresses identified to pass data to and from the controller.

There are two things to consider when setting addresses. The first is that you can place up to four COMTROL ULTRA controllers in your system, however, controllers cannot use the same address. The second is that system architectures are not standard and therefore have different addressing requirements.

For the SCO XENIX, SCO UNIX, AT&T UNIX, and INTERACTIVE 386/ix operating systems, there are seven possible base memory address and base I/O address pairs to use. For the SunOS operating system, there are four possible base memory and base I/O address pairs to use. The next pages list the primary and secondary address switch setting to use for the SCO XENIX, SCO UNIX, AT&T UNIX, and INTERACTIVE 386/ix multiuser operating systems. The last page of this section lists the address switch settings for the SunOS operating system.

If you look at the controller with the component side up, and the bus connector pointing down, the switch block to set the address is at the top center of the controller.
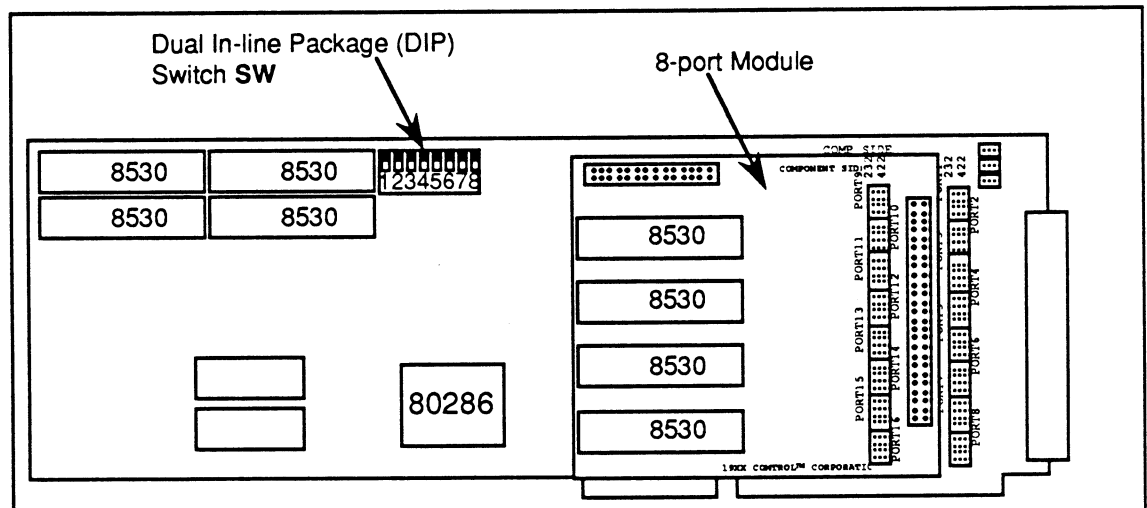
Figure 1-4. The DIP switch sets the memory addresses.

In this section's tables, a white square shown at the top of the switch indicates ON. A white square at the bottom of the switch indicates OFF. One switch setting sets both types of addresses. For example; this diagram shows that switches one, three, five, and seven are ON, and switches two, four, six, and eight are OFF:
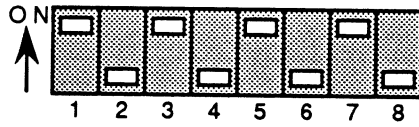
For the **SCO XENIX, SCO UNIX, AT&T UNIX, and INTERACTIVE 386/ix operating systems,** use this set of addresses for the Compaq 386, the PC's Limited 386, the Kaypro 386, the Mylex, the AMI, and most other computer systems. These are 24-bit addressed machines.

Table 1-2. Primary Address Switch Settings.

Controller:	Switch Block:	Base Memory Address:	Base I/O Address:
First		F00000 - F1FFFF hex	218 - 21B hex
Second		EE0000 - EFFFFF hex	21C - 21F hex
Third		EC0000 - EDFFFF hex	238 - 23B hex
Fourth		EA0000 - EBFFFF hex	23C - 23F hex
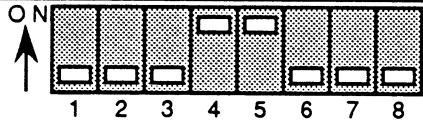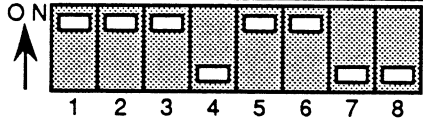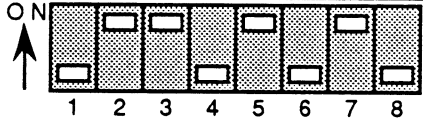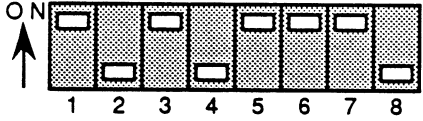
For the **SCO XENIX, SCO UNIX, AT&T UNIX, and INTERACTIVE 386/ix operating systems,** use this set of addresses for the ALR FlexCache 20386, the Mitsubishi MP386, the Olivetti 386, and the AT&T 6386 WGS. These are 32-bit addressed machines.

Table 1-3. Secondary Address Switch Settings.

Controller:	Switch Block:	Base Memory Address:	Base I/O Address:
First	ON ↑ 1 2 3 4 5 6 7 8	D00000 - D1FFFF hex	218 - 21B hex
Second	ON ↑ 1 2 3 4 5 6 7 8	D20000 - D3FFFF hex	21C - 21F hex
Third	ON ↑ 1 2 3 4 5 6 7 8	D40000 - D5FFFF hex	238 - 23B hex
There is no fourth option for secondary addresses			

For the **SunOS operating system**, there are four possible base memory address and base I/O address pairs to use. If you look at the controller with the component side up, and the bus connector pointing down, the switch block is at the top center of the controller. In the table below, a white square shown at the top of the switch indicates ON. A white square at the bottom of the switch indicates OFF. One switch setting sets both types of addresses.

Table 1-4. Addresses Switch Settings.

Controller:	Switch Block:	Base Memory Address:	Base I/O Address:
First	ON ↑ 1 2 3 4 5 6 7 8	F00000 - F1FFFF hex	218 - 21B hex
Second	ON ↑ 1 2 3 4 5 6 7 8	EE0000 - EFFFFF hex	21C - 21F hex
Third	ON ↑ 1 2 3 4 5 6 7 8	EC0000 - EDFFFF hex	238 - 23B hex
Fourth	ON ↑ 1 2 3 4 5 6 7 8	EA0000 - EBFFFF hex	23C - 23F hex

Setting Jumpers for Your Computer System

The next task before installing the COMTROL ULTRA controller into your system may be to set shorting jumpers. There are six jumper headers on the COMTROL ULTRA controller. Of these jumpers:

▲ JP6 is the development controller jumper header, and

▲ JMP1, JMP2, and JMP3 set interrupt requests (IRQs).

An *interrupt vector* is a reserved location in memory that specifies where the interrupt handler program for that interrupt request is located. IRQs differ depending on the operating system you use; your operating system may use different interrupts, or none at all.

The **SCO XENIX and SCO UNIX operating systems** have no IRQs to set.

For the **AT&T UNIX** and **INTERACTIVE 386/ix operating systems**, there are six possible IRQs: 3, 4, 5, 10, 11, and 15. If your system includes more than one COMTROL controller, **set only one controller to an IRQ number**. This IRQ should not be used by any other device in the system.

For the **SunOS operating system**, there are four IRQs; 3, 5, 10, 11. SunOS specifies a default IRQ for each of the following base memory addresses:

Controller:	Base Memory Address	Default IRQ:
First	F00000 - F1FFFF	3
Second	EE0000 - EFFFFF	5
Third	EC0000 - EDFFFF	10
Fourth	EA0000 - EBFFFF	11

The IRQ headers are located along the connector edge of the COMTROL ULTRA controller. The jumper header JMP1 is in the corner, by the cable. Jumper headers JMP2 and JMP3 are found in the lower center of the controller.
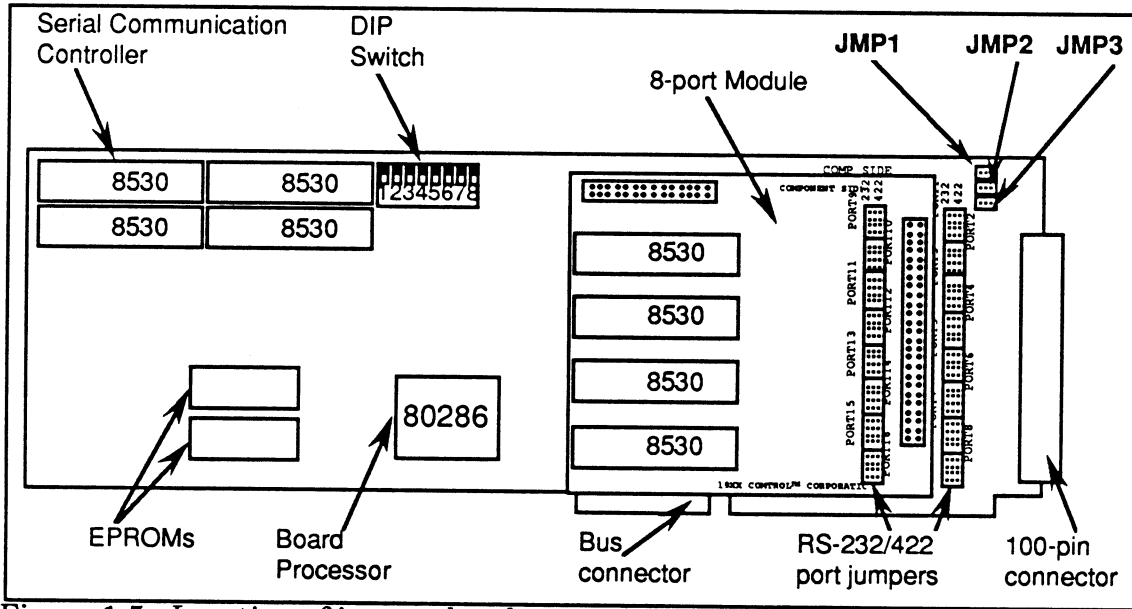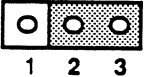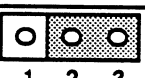
Figure 1-5. Location of jumper headers on the COMTROL ULTRA 16 controller.

Select the IRQ for your COMTROL ULTRA controller and set the jumpers according to table 1-5 below. You set an IRQ by placing a shorting jumper over two pins of the header.
Note: Only **one** jumper should be set.

Table 1-5. Hardware Interrupt Selection for the COMTROL ULTRA controller:

Interrupt Request Number:	Jumper Header:	Set Shorting Jumper over Pins:	
3	JMP2		1 and 2
4	JMP1		1 and 2
5	JMP1		2 and 3
10	JMP2		2 and 3
11	JMP3		2 and 3
15	JMP3		1 and 2

Installing for SCO UNIX 386

To install the SCO UNIX driver for the COMTROL ULTRA controller, use the custom utility. This utility allows you to install drivers, check the configuration of the drivers, and remove drivers from your system.

Installing the SCO UNIX Device Driver

To install the COMTROL ULTRA controller device driver, follow these steps:

1. With the the controller(s) installed in the system, boot, and log in as root.

2. Invoke the custom program.
    (For a thorough definition of this utility, see the *SCO UNIX® System V Operating System System Administrators Guide*.)

```
$ custom
```

3. Select "Install."

```
┌INSTALL┐ REMOVE LIST QUIT                                    ┌CUSTOM┐
Install software                     .
┌/                                            Friday March 30, 1990  12:00┐
┌───────────────── Products Currently Installed ─────────────────┐
│                                                                │
│    The Operating System                                        │
│    Software Development System                                 │
│                                                                │
│                                                                │
└────────────────────────────────────────────────────────────────┘
```

4. Select "A New Product."

```
                                                          ┌INSTALL┐
Select a product to install and press <Return>
Press <ESC> to cancel, movement keys are active
┌/                                            Friday March 30, 1990  12:00┐
┌───────────────────────── Install ─────────────────────────┐
│    Select a product: [                                    ]  │
│    Choose an option: [Entire Product] Packages  Files        │
│                                                              │
│                            ┌──────────────────────────────┐  │
│                            │ * A New Product              │  │
│                            │   The Operating System       │  │
│                            │   Software Development System │  │
└────────────────────────────┴──────────────────────────────┘
```

5.   Select "Packages."

```
┌──────────────────────────────────────────────────────────────────┐
│  Install functional groupings of files                 ┌─────────┐ │
│                                                        │ INSTALL │ │
│  ┌─────────────────────────────────────────────────────────────┐ │
│  │ /                                    Friday March 30, 1990  12:00 │
│  └─────────────────────────────────────────────────────────────┘ │
│  ┌──────────────────────── Install ────────────────────────────┐ │
│  │                                                              │ │
│  │   Select a product: [A New Product                        ]  │ │
│  │   Choose an option:  Entire Product │Packages│ Files         │ │
│  │                                                              │ │
│  │                                                              │ │
│  └──────────────────────────────────────────────────────────────┘ │
└──────────────────────────────────────────────────────────────────┘
```

6.   Insert the COMTROL ULTRA controller device driver diskette in drive A and press <Enter> when asked to insert the Distribution volume 1 diskette.

```
┌──────────────────────────────────────────────────────────────────┐
│                                                        ┌─────────┐ │
│                                                        │ INSTALL │ │
│  Insert the requested volume and press <Return> to continue the installat │
│  ┌─────────────────────────────────────────────────────────────┐ │
│  │ /                                    Friday March 30, 1990  12:00 │
│  └─────────────────────────────────────────────────────────────┘ │
│  ┌──────────────────────────────────────────────────────────────┐ │
│  │                                                              │ │
│  │      Insert : Distribution                                   │ │
│  │      Volume : 1                                              │ │
│  │      │Continue│ Quit                                         │ │
│  │                                                              │ │
│  └──────────────────────────────────────────────────────────────┘ │
└──────────────────────────────────────────────────────────────────┘
```

7.   Select "ULTR."

```
┌──────────────────────────────────────────────────────────────────┐
│  Installing custom data files . . .                    ┌─────────┐ │
│                                                        │ INSTALL │ │
│  ┌─────────────────────────────────────────────────────────────┐ │
│  │ /                                    Friday March 30, 1990  12:00 │
│  └─────────────────────────────────────────────────────────────┘ │
│  ┌──────────────────────────────────────────────────────────────┐ │
│  │      Insert : Distribution                                   │ │
│  │      Volume : 1                                              │ │
│  │      │Continue│ Quit                                         │ │
│  └──────────────────────────────────────────────────────────────┘ │
└──────────────────────────────────────────────────────────────────┘
```

```
┌──────────────────────────────────────────────────────────────────┐
│  Select package(s) to install and press <Return>       ┌─────────┐ │
│  Press <ESC> to cancel, movement keys are active       │ INSTALL │ │
│  ┌─────────────────────────────────────────────────────────────┐ │
│  │ /                                    Friday March 30, 1990  12:00 │
│  └─────────────────────────────────────────────────────────────┘ │
│  ┌──────────────────────────────────────────────────────────────┐ │
│  │      Insert : Distribution                                   │ │
│  │      Volume : 1                                              │ │
│  │      │Continue│ Quit    ┌──── Comtrol Intelligent Device Driver ──── │
│  │                         │  Name Inst Size Description         │ │
│  │                         │* ULTR  No  XXXX Comtrol Intelligent Device Dri│
│  │                         └──────────────────────────────────── │
│  └──────────────────────────────────────────────────────────────┘ │
└──────────────────────────────────────────────────────────────────┘
```

8. Press <Enter> at the next prompt as you already put the diskette in drive A. You will see the message "Extracting files ..." and then the installation script will execute.

```
┌─────────────────────────────────────────────────────────┐ INSTALL
│ Creating file lists . . .                                        │
│ ┌──────────────────────────────────────────────────────┐        │
│ │ /                              Friday March 30, 1990  12:00 │        │
│ ├──────────────────────────────────────────────────────┤        │
│ │                                                      │        │
│ │    Insert : Distribution                             │        │
│ │    Volume : 1                                        │        │
│ │    [Continue]  Quit                                  │        │
│ │                                                      │        │
│ └──────────────────────────────────────────────────────┘        │
└─────────────────────────────────────────────────────────┘

┌─────────────────────────────────────────────────────────┐ INSTALL
│ Insert the requested volume and press <Return> to continue the installation │
│ ┌──────────────────────────────────────────────────────┐        │
│ │ /                              Friday March 30, 1990  12:00 │        │
│ ├──────────────────────────────────────────────────────┤        │
│ │                                                      │        │
│ │    Insert : Comtrol Intelligent Device Driver        │        │
│ │    Volume : 1                                        │        │
│ │    [Continue]  Quit                                  │        │
│ │                                                      │        │
│ └──────────────────────────────────────────────────────┘        │
└─────────────────────────────────────────────────────────┘
```
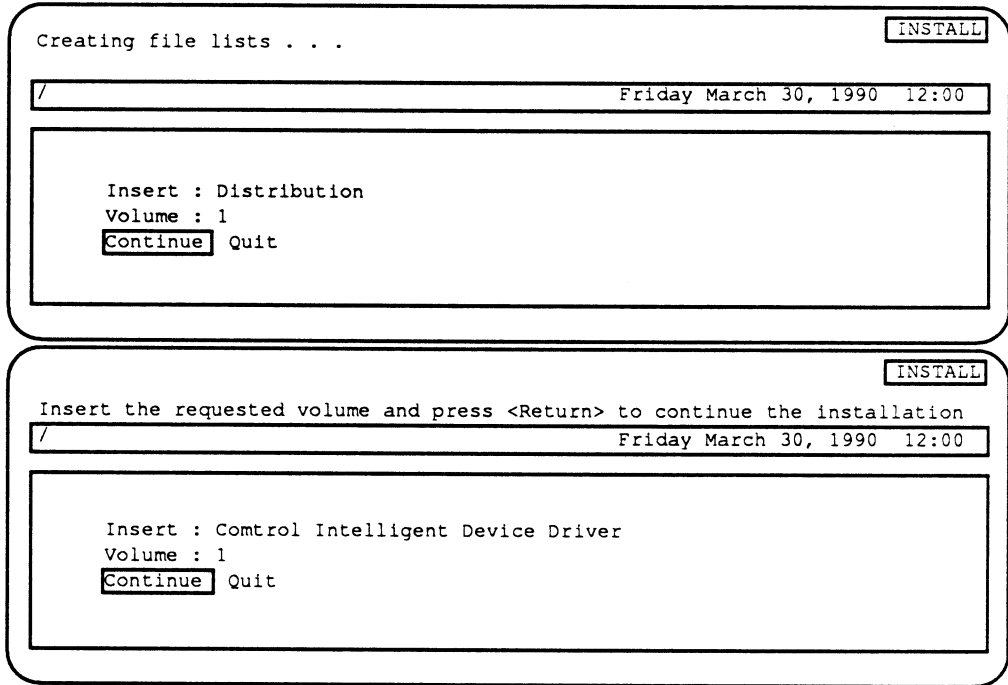
9. Identify which type of computer system you have.
    The device driver uses this information to set up memory caching bypasses.

10. Identify that the controller is physically installed in your system, and the number of ports that controller has.
    The address number corresponds to the controller installed in the system. For example, if you installed two controllers at the first and fourth base memory addresses, you would answer y to the first and fourth questions, and n to the second and third questions. A maximum of four controllers is allowed in a system.

    If you change the address of a controller after the device driver has been installed and you did not select that address in the installation, you will need to reinstall the driver. You may answer y even if a controller is not currently at that address, however, nodes and entries will be made for that address that take up system resources.

    After you type y, you will be asked to identify the number of ports that the controller has. Type 8 for the eight-port ULTRA 8, and 16 for ULTRA 16.

```
Executing Comtrol Intelligent Device Driver Init Script

Describe your computer:
  1) Compaq 20Mhz or higher; or Dell System 310
  2) AMI motherboard that caches memory between 14-16 Mbytes
  3) Hauppauge motherboard 25Mhtz or higher
  4) Other
Enter [1-4]:_

Is there a controller installed at address #1 [y/n]:_
Is there a controller installed at address #2 [y/n]:_
Is there a controller installed at address #3 [y/n]:_
Is there a controller installed at address #4 [y/n]:_
    How many ports are on this controller [4/8/16]:_

Is transparent print support required [y/n]:_

Configuring ULTR device entry points at major number ## ...
Modifying /etc/conf/init.d/ultr ...
Modifying /etc/ttytype ...
Modifying /etc/auth/system/ttys ...
Modifying /etc/conf/node.d/ultr ...

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

Root for this system build is /.
Do you want this kernel to boot by default (y/n) y

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 the kernel environment rebuilt? (y/n) y

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

Setting up new kernel environment
Press any key to return_
```

Steps 9 — 14

15. Quit the `custom` utility.
    Select "Quit" and "Yes."

```
┌──────────────────────────────────────────────────────────┐
│ INSTALL REMOVE LIST│QUIT│                        ┌CUSTOM┐ │
│ Quit                                                      │
│ ┌──────────────────────────────────────────────────────┐ │
│ │/                            Friday March 30, 1990  12:00│ │
│ └──────────────────────────────────────────────────────┘ │
│      ┌───────────── Products Currently Installed ──────┐   │
│      │                                                 │   │
│      │  The Operating System                           │   │
│      │  Software Development System                    │   │
│      │  Comtrol Intelligent Device Driver              │   │
│      │                                                 │   │
│      │                                                 │   │
│      └─────────────────────────────────────────────────┘   │
└──────────────────────────────────────────────────────────┘
```

```
┌──────────────────────────────────────────────────────────┐
│ │YES│ NO                                        ┌Quit┐    │
│ Exit Custom                                               │
│ ┌──────────────────────────────────────────────────────┐ │
│ │/                            Friday March 30, 1990  12:00│ │
│ └──────────────────────────────────────────────────────┘ │
│      ┌───────────── Products Currently Installed ──────┐   │
│      │                                                 │   │
│      │  The Operating System                           │   │
│      │  Software Development System                    │   │
│      │  Comtrol Intelligent Device Driver              │   │
│      │                                                 │   │
│      │                                                 │   │
│      └─────────────────────────────────────────────────┘   │
└──────────────────────────────────────────────────────────┘
```

16. Remove the COMTROL ULTRA controller device driver diskette.

17 Restart your system.
    Halt the SCO UNIX system, turn the computer off, and then turn it back
    on. At the "boot:" prompt, press <Enter> to boot the default kernel.
    After typing ^D to go to multiuser mode, and setting the date and time,
    you will see the COMTROL device driver messages and banner. Next
    you will see a line for every COMTROL controller found in the system.
    Finally, you should see a statement when each controller becomes active.

```
┌──────────────────────────────────────────────────────────┐
│  Comtrol Intelligent Controller Reset Program            │
│    Do software reset on controller #                     │
│  Waiting for software reset to complete ...              │
│                                                          │
│  ------------------------------------------------------  │
│  Comtrol Intelligent Controller Program Loader   Release x.xx │
│  Copyright (c) 199X Comtrol Corporation    All Rights Reserved │
│  ------------------------------------------------------  │
│  Device Driver - Release x.xx                            │
│                                                          │
│  xxx Controller: # Ports, xxxK Memory, Firmware Release x.xx, type │
│                                                          │
│  xxx Controller Active                                   │
└──────────────────────────────────────────────────────────┘
```

Removing the SCO UNIX Device Driver

1. Log in as `root` and invoke `custom`.

2. Select "Remove."

```
 _____
/                                                                         \
|  INSTALL  REMOVE  LIST QUIT                                   CUSTOM     |
|  Remove software                                                        |
| /                                             Friday March 30, 1990  12:00 |
|  ┌──────────────── Products Currently Installed ──────────────────────┐  |
|  │                                                                     │  |
|  │   The Operating System                                              │  |
|  │   Software Development System                                       │  |
|  │   Comtrol Intelligent Device Driver                                 │  |
|  │                                                                     │  |
|  │                                                                     │  |
|  └─────────────────────────────────────────────────────────────────────┘  |
_____/
```

3. Scroll through the box of options to remove and select "`Comtrol
    Intelligent Device Driver.`"

```
 _____
/                                                                         \
|  Select a product to remove and press <Return>              REMOVE      |
|  Press <ESC> to cancel, movement keys are active                        |
| /                                             Friday March 30, 1990  12:00 |
|  ┌──────────────────────── Remove ────────────────────────────────────┐  |
|  │                                                                     │  |
|  │    Select a product:                                      ]         │  |
|  │                                                                     │  |
|  │                                 ┌─────────────────────────────────┐ │  |
|  │                                 │ The Operating System            │ │  |
|  │                                 │ Software Development System      │ │  |
|  │                                 │* Comtrol Intelligent Device Driver│ |
|  └─────────────────────────────────────────────────────────────────────┘  |
_____/
```

4. Select "ULTR" to verify the removal of the device driver.

```
 _____
/                                                                         \
|  Select package(s) to remove and press <Return>            REMOVE       |
|  Press <ESC> to cancel, movement keys are active                        |
| /                                             Friday March 30, 1990  12:00 |
|  ┌──────────────────────── Remove ────────────────────────────────────┐  |
|  │   Select a product: [ Comtrol Intelligent Device Driver      ]      │  |
|  │                         ┌──────── Comtrol Intelligent Device Driver─│  |
|  │                         │ Name Inst Size Description                │  |
|  │                         │* ULTR Yes  XXXX Comtrol Intelligent Device Dri|
|  │                         └─────────────────────────────────────────────│  |
|  └─────────────────────────────────────────────────────────────────────┘  |
_____/
```

5. Select "Yes" to verify the removal of the device driver.
    The removal process will display the removal messages.

```
┌──────────────────────────────────────────────────────────────────────┐
│ Proceed                                                    [REMOVE]    │
│ ┌────────────────────────────────────────────────────────────────────┐ │
│ │ /                                    Friday March 30, 1990  12:00   │ │
│ ├────────────────────────────────────────────────────────────────────┤ │
│ │                                                                      │ │
│ │    Please verify the removal of the following packages:              │ │
│ │                                                                      │ │
│ │       ULTR                                                           │ │
│ │                                                                      │ │
│ │    Do you wish to continue?   [YES] NO                               │ │
│ │                                                                      │ │
│ └────────────────────────────────────────────────────────────────────┘ │
└──────────────────────────────────────────────────────────────────────┘
```

6. Type y to boot this kernel by default.

7. Type y to rebuild the kernel environment.

```
┌──────────────────────────────────────────────────────────────────────┐
│ Executing Comtrol Intelligent Device Driver Removal Script            │
│                                                                        │
│ Removing ULTR device entry points ...                                 │
│ Removing entries from /etc/ttytype ...                                │
│ Removing entries from /etc/auth/system/ttys ...                       │
│                                                                        │
│ The UNIX Operating System will now be rebuilt.                        │
│ This will take a few minutes. Please wait.                            │
│                                                                        │
│ Root for the system build is /.                                       │
│                                                                        │
│ Do you want this kernel to boot by default? y                         │
│                                                                        │
│ 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 the kernel environment rebuilt? y                         │
│                                                                        │
│ The kernel environment has been successfully linked and installed.    │
│ To activate it, reboot your system.                                   │
│                                                                        │
│ Setting up new kernel environment.              Steps 6 and 7         │
└──────────────────────────────────────────────────────────────────────┘
```

8. Press any key to return to the custom menu.

```
Creating file list . . .

┌──────────────────────────────────────────────────────────────────┐
│ /                                                                  │
└──────────────────────────────────────────────────────────────────┘




┌─────────────────────────────────┐
│ Press any key to continue       │
└─────────────────────────────────┘
```

9. Quit the custom utility.
    Select "Quit" and "Yes".

```
INSTALL REMOVE LIST│QUIT│                                    │CUSTOM│
Quit
┌──────────────────────────────────────────────────────────────────┐
│ /                                    Friday March 30, 1990   12:00 │
└──────────────────────────────────────────────────────────────────┘
    ┌─────────────── Products Currently Installed ───────────────┐
    │                                                            │
    │   The Operating System                                     │
    │   Software Development System                              │
    │   Comtrol Intelligent Device Driver                       │
    │                                                            │
    │                                                            │
    └────────────────────────────────────────────────────────────┘
```

```
│YES│ NO                                                     │Quit│
Exit Custom
┌──────────────────────────────────────────────────────────────────┐
│ /                                    Friday March 30, 1990   12:00 │
└──────────────────────────────────────────────────────────────────┘
    ┌─────────────── Products Currently Installed ───────────────┐
    │                                                            │
    │   The Operating System                                     │
    │   Software Development System                              │
    │   Comtrol Intelligent Device Driver                       │
    │                                                            │
    │                                                            │
    └────────────────────────────────────────────────────────────┘
```

The COMTROL ULTRA controller device driver has been removed and will take effect on the next kernel reboot.

The devsetup Device Configuration Program

For the **SCO UNIX and SCO XENIX operating systems,** the `devsetup`
program allows you to configure transparent print operations on a port-by-
port basis. The program may be invoked at any time, and as often as desired.
The syntax of the command is as follows;

```
/comtrol/ultr/devsetup sep port prefix suffix balance options ...
```

sep
This parameter is the separator character to use on command line in place of
a space character. This is a required parameter.

port
This parameter is the port name to configure (for example, tpri00). This is a
required parameter.

prefix
This parameter is the prefix string, where each character of the string is
separated by the separator character. This is a required parameter; however,
if there is no change to the prefix string, it may be indicated by just the
separator character. The mnemonics from Table 3-2 may be used, and literal
hexadecimal numbers may be indicated by a preceding forward slash
character (for example, /4 is the hexadecimal value 4).

Table 3-2. ASCII Control Character Mnemonics.

ASCII hex code:	mnemonic:	ASCII hex code	mnemonic:
00	NUL	10	DLE
01	SOH	11	DC1
02	STX	12	DC2
03	ETX	13	DC3
04	EOT	14	DC4
05	ENQ	15	NAK
06	ACK	16	SYN
07	BEL	17	ETB
08	BS	18	CAN
09	HT	19	EM
0A	LF	1A	SUB
0B	VT	1B	ESC
0C	FF	1C	FS
0D	CR	1D	GS
0E	SO	1E	RS
0F	SI	1F	US