

1. Introduction

These release notes describe the software contained in the 4D/30-Series Support Option. This software is installed as part of the hardware upgrade to the 4D/30 or 4D/35, or in the factory on new systems and does not normally need to be reinstalled. In this document, you will often see references to 4D/35 as a machine type. Except where otherwise stated, all references to the 4D/35 also apply to the 4D/30.

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This document contains the following chapters:

1. Introduction
2. Software Installation
3. Support for High Quality Audio
4. 4D/30-Series Features
5. Bug Fixes
6. Known Problems and Workarounds

1.1 Release Identification Information

Following is the release identification information for 4D/30-Series Support:

Software Option Product	4D/30-Series Support
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Version	1.1
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Product Code	S4-4D/35-1.1
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System Software Requirements	4D1-3.3.2 or 4D1-3.3.3
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1.2 4D/30-Series Support Option Subsystems and Disk Use

This section lists the subsystems (and their sizes) on your option tape. Those marked ``defaults'' are the default subsystems. If you are installing this option for the first time, the default subsystems are installed when you choose the ``defaults'' or ``automatic'' menu items during the installation procedure.

If you are updating from an older version of software, and you select ``defaults'' or ``automatic,'' the system installs new subsystems that correspond to those that are already installed. Note that in most cases, the files installed replace existing files, so no additional space is used after installation is complete.

Subsystem	Default	(512-byte blocks)
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<u>4D35.man.unix</u>	no	153
<u>4D35.man.al</u>	yes	58
<u>4D35.sw.al</u>	yes	288
<u>4D35.sw.audio</u>	yes	859
<u>4D35.sw.cdsio</u>	yes	46
<u>4D35.sw.debug</u>	no	548
<u>4D35.sw.dev</u>	yes	3286
<u>4D35.sw.dskless</u>	no	36
<u>4D35.sw.ikc</u>	yes	30
<u>4D35.sw.moregltools</u>	no	209
<u>4D35.sw.unix</u>	yes	9591
<u>4D35.sw.vadmin</u>	yes	1834

2. Software Installation

The 4D/30-Series Support tape replaces several system files that were contained in previous releases of the base system software. This makes the order in which certain system software is installed on the machine important. The general order in which software should be installed is:

1. Execution Only Environment Release 3.3, tapes labeled eoel and eoe2.
2. Software option tapes. These include any networking options or program development tools that you may have purchased.
3. Maintenance upgrade releases. Your system software and options must be equivalent to IRIX 3.3.2 or 3.3.3 release levels. This release contains all fixes to machine-specific modules in the IRIX 3.3.2 and 3.3.3 maintenance releases.
4. 4D/30-Series Support Release 1.1. This adds support for the Personal Iris 4D/35 or 4D/30 to the system.

If you ever need to reinstall software from the list above, the software from every succeeding step must also be reinstalled. This usually requires that you set the variable neweroverride in the inst program; otherwise the files not reinstalled because inst thinks they are already installed. To set the variable, enter this command at any of the inst prompts:

```
set neweroverride on
```

The 4D/30-Series Support Option includes the installation software needed to install all system software on a Personal IRIS 4D/35 or 4D/30. Only the installation tools on the 4D/30-Series Support tape work with a 4D/35 or 4D/30.

To install other system software on a 4D/35 or 4D/30, you must use the 4D/30-Series Support tape to load and start the installation program, remove the 4D/30 tape, insert and install the desired tapes, then finally reinstall the 4D/30 tape.

2.1 Additional Installation Documentation

The following table shows you where to look for the base software and additional installation documentation.

Execution-only Environment	<u>3.3 Standard System Release and Installation Notes</u>
Development Environment	<u>4D1-3.3 Development Release and Installation Notes or IRIX System Administrator's Guide</u>
3.3.2 or 3.3.3 Maintenance Release	<u>4D1-3.3.2 Maintenance Release and Installation Notes</u>

2.2 On-Line Release Notes

The options to the relnotes command for viewing on-line release notes have changed slightly from earlier releases. When you install the on-line documentation for a product, you can view the release notes on your screen as you would an on-line manual page.

The relnotes command now accepts the following arguments:

-h	describes how to use relnotes
<u>product</u>	displays a table of contents for <u>product</u>
<u>number</u>	displays the chapter number of <u>product</u>
-t <u>number</u>	prints a copy of the given chapter

To see a description of how to use the on-line release notes tool, type:

```
relnotes -h.
```

To see which products have on-line release notes installed, type:

```
relnotes
```

To see which chapters of a product are installed, enter the command below, replacing the word product with a product name generated when you type the previous command. For example

```
relnotes 4D35
```

To view a specific chapter of product, replace the words product and chapter in the next command. For example, to view Chapter 1 of the 4D/35 release notes, type:

```
relnotes 1 4D35
```

To page through a chapter press <Space>, and to quit press or <Ctrl-C>. See relnotes(1) for more information.

2.3 Installation Instructions

To install the 4D/30-Series Support software on a 4D/20 or 4D/25 system that already has 3.3.2 or 3.3.3 system software, use the following procedure.

1. The machine must be upgraded to a 4D/35 or 4D/30 before the 4D/30-Series Support Option can be properly installed. If the 4D/30-Series Support Option is installed on a 4D/25, an incomplete installation occurs, and the system software must be reinstalled.
2. If the system is not yet powered on, turn it on with the front panel switch. If it is up and running, use the halt command or the ``System Shutdown'' option from the System menu to bring the system down.
3. When the message Starting up the system... appears, press the <Esc> key. You should see a menu with five options on it.
4. If your system is equipped with a tape drive, but you want to install software from a remote machine via the network, select ``Command Monitor'' from the menu. Then at the >> prompt, type:

```
setenv notape 1  
exit
```

This tells the system that even though you have a tape drive, you will not be using it to install software.

5. Select ``Install System Software`` from the menu. If you are installing from a tape drive on your system, skip the next step.
6. You are asked if the software is to be loaded from a tape drive on a remote system, or from a software distribution directory. If you are installing from a tape drive on a remote system, answer the question, ``Are you using remote tape? (y/n):`` with a y. If you are installing from a distribution directory on a remote system, answer with an n. The system then prompts for the name of the remote machine. If you are installing from a distribution directory on the remote machine, enter the name of the remote machine followed by a colon and the name of the directory containing the software distribution. Otherwise, simply enter the name of the remote machine.
7. If you are installing from tape, the system prompts you to put the tape in the drive and press the <Enter> key. Put the 4D/30-Series Support tape in the drive. Even if you are installing other system software, you must use the 4D/30-Series Support tape at this point because it is the only tape that contains the proper installation tools for the 4D/30 and 4D/35 systems. If you put another tape in the drive, you see a message something like:

Unable to load tpssc(0,7)sash.IP12: file not found
8. The system copies the installation program to the disk. Depending on the installation method being used, this can take from 5 to 15 minutes.
9. Eventually the system enters the installation tool and presents you with a menu of installation options. If you need to install other system software such as the Execution-Only Environment, the NFS option, or a maintenance release, remove the 4D/30-Series Support tape, place the desired tape in the drive, and continue.
10. You can choose ``Automatic Install`` from the Installation menu, or use the other options to gain more control over which software is installed. The release notes that accompany the Execution-Only Environment contain a detailed description of the installation tool and its options. Also, Section 2.5

in these release notes describes the various subsystems on the 4D/30-Series Support tape.

11. Install the 4D/30-Series Support Option tape only after you have installed all other software products. Even if the 4D/30-Series Support Option has already been installed, you must reinstall it if any other system software is installed after it. See the note about the neweroverride variable in inst at the beginning of this chapter.

2.4 4D/30-Series Support Subsystems

The 4D/30-Series Support Option is made up of 12 subsystems.

<u>4D35.sw.unix</u>	This subsystem contains the basic system software necessary to support the 4D/35. It supplements the 3.3 Execution-Only Environment software and the 3.3.3 maintenance release software. It is a required part of the system software on 4D/30 and 4D/35 systems.
<u>4D35.sw.al</u>	This subsystem contains the new audio library that provides support for using the audio hardware supported in this release. It also contains some header files for the library, and sample programs (in the <u>/usr/people/4Dgifts/examples/audio</u> directory) that use the library.
<u>4D35.sw.audio</u>	This subsystem contains programs that allow you to control and use the audio hardware.
<u>4D35.sw.cdsio</u>	This subsystem contains software necessary to support the VME Serial Expander board. It is required only on machines equipped with that board.
<u>4D35.sw.ikc</u>	This subsystem contains software necessary to support the VME Parallel Port board. It is required only on machines equipped with that board.
<u>4D35.sw.debug</u>	This subsystem contains software needed to debug kernel device drivers. It is needed only for developing kernel device drivers and should not normally be installed.

<u>4D35.sw.vadmin</u>	This subsystem contains updates to the System Manager package for administering the two additional serial ports on the 4D/35.
<u>4D35.sw.dev</u>	This subsystem contains an updated version of the Graphics Library programming library. It is needed for developing graphics applications. It is upwardly compatible with that supplied with the Personal IRIS, so programs linked with this library can also run on the 4D/20 and 4D/25.
<u>4D35.sw.moregltools</u>	This subsystem contains a new version of the scanner program that is capable of controlling a scanner connected to the 4D/30 or 4D/35's bidirectional parallel port, in addition to the IEEE-488 and SCSI scanners.
<u>4D35.sw.dskless</u>	This subsystem contains updates to the diskless support software and is needed on machines that support diskless clients.
<u>4D35.man.unix</u>	This subsystem contains updates to the IRIX on-line manual pages.
<u>4D35.man.al</u>	This subsystem contains manual pages for the new audio library.
<u>4D35.man.relnotes</u>	This subsystem contains an on-line version of these release notes. Refer to the manual page <u>relnotes</u> (1) for information on how to read the on-line release notes.

2.5 Product Support

Silicon Graphics, Inc., provides a comprehensive product support and maintenance program for its products. If you are in North America and your system is under warranty or you have a maintenance contract with Silicon Graphics or would like one, contact the Technical Assistance Center at 1-800-800-4SGI. Otherwise, contact your support provider.

3. Support for High-Quality Audio

The IRIS Audio Processor is included with the Personal IRIS 4D/35. This processor enables the IRIS to manipulate not only real-time graphics, but simultaneously, real-time sound as well. Its features include: digitizing sound from a microphone or from standard audio line-in, receiving input and playing output using the serial digital audio interconnect, and playing back sounds through headphones or through a standard line-out. Additionally the input gain, the headphone volume, the input and output sample rates and the input source are all independently controllable through software. Finally the analog signal quality of the IRIS Audio Processor is high enough for demanding professional applications such as stage performances, radio and television production, CD mastering, computer speech research and audio-annotated documents.

3.1 Audio Control Panel

The audio control panel, named apanel, is available from the Tools menu of the toolchest. apanel displays and allows you to control the input source, the input gain level, the headphone gain level, and the input and output sampling rates via an interactive display. Additionally, apanel includes an input peak level meter to make it easy for you to set the input gains to a correct level.

One notable feature of apanel is the little yellow indicator light labeled Listening. When this indicator light is on, it means that another program has opened an input (recording) connection to the Audio Processor. If the Listening indicator is lit and the input source is set to Mic, the microphone is live and a program may be recording from it.

apanel is a good choice for the first audio program to run. Plug the microphone into the microphone jack in the back of the computer, set the input source to Mic, turn the peak meter and monitor on, and have fun!

Note: For apanel to run, you must have the X server installed, because apanel is an X application. To install the X server, you must install the relevant options from your original 3.3 tapes, for example, eo2.sw.X11, eo2.sw.Xfonts, and maint2.eo2 sw.X11.

3.2 AIFF Files

Silicon Graphics supports the AIFF (Audio Interchange File Format) for storage and interchange of audio sample data. Both 8-bit and 16-bit samples are supported in stereo or monophonic form at the full range of rates handled by the IRIS Audio Processor. This includes the DAT, CD, and Apple Computer 22K and 11K rates.

AIFF files can be recorded and played back under several different computers and software packages. The AIFF format is described in "Audio Interchange File Format/AIFF" from Apple Computer company.

3.3 AIFF Reader and Writer

Two command line programs are provided with the IRIS Audio Processor for recording and playing AIFF files. Recordaiff and playaiff record and play AIFF files. Man pages and source code for these programs are included in this release. Please refer to them for more information.

3.4 Audio Demo Programs

The Audio submenu of the Demos toolchest contains two new audio demo programs, amesh and clipit.

amesh is a program that demonstrates the use of graphics and audio together to create a real-time display of the time-varying spectral content of sound. Included in this release is a man page that describes the details of operation of amesh. To run amesh, set the input and output sample rates on the audio panel to 8kHz, select amesh from the toolchest, play some sounds into the microphone, or line-in input (depending on what you have selected for input source in apanel), then watch the spectral display.

clipit is a program that displays sound waveforms. To run it, set the input source on the audio panel to microphone and select clipit from the Demos toolchest. clipit is controlled with a right-mouse pop-up menu. For more information on clipit, see the clipit man page or source code.

3.5 Boot PROM

The 4D/35 boot PROM plays a tune when the 4D/35 is turned on. The tune is played out of the line-out, headphone, and digital audio jacks simultaneously. It is useful for verifying that the audio connections between the 4D/35 and other devices are correct before booting IRIX.

The volume that the tune plays out of the headphone jack is controlled with the boot PROM environment variable volume . A volume setting of 255 is the loudest and a setting of 1 is the quietest. A setting of zero causes the boot tune not to be played at all.

The boot PROM hinv command can be used to verify that the audio board is properly installed. If the board is correctly installed and working, the hinv command reports:

System option: Iris Audio Processor, rev 3

3.6 passthru Program

The passthru program allows the audio input to be passed through to the audio outputs. This is useful for setting up audio devices, adjusting gains and monitoring inputs. Please note that the IRIS Audio Processor does not automatically pass input sounds through to the output because that would not be desirable in many applications.

The passthru program is run from the shell. See the passthru man page and/or source code for more details. The Monitor button on apanel performs a similar function, passthru exists mostly for pedagogic reasons.

3.7 Installation Manual

The IRIS Audio Processor comes with manuals titled Audio Board Installation Guide and Audio Users Guide and Man Pages. These manuals explain how to install and use the IRIS Audio Processor.

3.8 Audio Specifications

3.8.1 Stereo Line-Level Analog Input Computer-controlled attenuators (trims) adjust for a variety of levels. Each input channel can be adjusted in 1.5 dB steps.

Nominal Input Impedance: 5 kOhm

Input Signal:

Max Amplitude 10 Vpp

Minimum Level 1 Vpp (for full-scale input)

3.8.2 Mono Microphone Input A high-quality condenser microphone is included with the IRIS Audio Processor.

Nominal Input Impedance: 47 kOhm

The high-quality condenser microphone supplied with your audio system obtains a very small amount of power from the microphone input jack (2V through 2 kOhms). The microphone input jack is compatible with other conventional microphones besides the supplied one.

3.8.3 Stereo Serial Digital Audio I/O Interconnect, IEC958
The Stereo Serial Digital Audio interconnect is a coaxial digital interconnect that makes noiseless audio connections to DAT machines, professional audio gear, CD players, and so on. The interconnect is transformer coupled to prevent ground loops and provide isolation. It supports up to 24 bit, 48kHz sampling. It is based on the following standards:

Document	Organization
CP-340	EIAJ
AES3	Audio Engineering Society
IEC958	IEC

3.8.4 Stereo Line-Level Analog Output

Output impedance: 600 Ohms
Full-scale amplitude: 6 Vpp

3.8.5 Stereo Headphone Output The stereo headphone output includes separate volume controls for each channel. Volume for each channel can be adjusted to one of 256 linear steps.

Output Level Maximum, each channel:

64 ohm load: 125 mW
16 ohm load: 195 mW

High-quality headphones are included with the 4D/35 Audio Processor.

3.8.6 Connectors All audio connectors are 1/8 inch (3.5mm) stereo mini phone jacks

Connector	Tip	Ring	Sleeve
Microphone	Input	Not Connected	Ground
Line In	L	R	Ground
Line Out	L	R	Ground
Headphone Out	L	R	Ground
Digital I/O	Output to Device	Input to Computer	Ground, for this circuit alone

Tip is the tip of the plug, Ring is the center conductor of the plug, and Sleeve is the innermost (cable side) conductor of the plug.

3.8.7 Converter Technology

A/D Converter:	Stereo 16 bit, delta-sigma modulation, 64x oversampling converter
D/A Converter:	Stereo 18 bit, 8x oversampling converter
Output Digital Filter:	Stereo 16 bit input, 18 bit output, 8x oversampling, FIR in three stages of order 225, 41 and 21.

3.8.8 Available sampling rates (kHz) Here is a table of the input and output rates that the hardware is capable of generating internally. The top row consists of the master clock rates and 2/3 those rates. Subsequent rows result from dividing the top row by an integer between two and eight.

Fs	48	44.1	32	29.4
/2	24	22.05	16	14.7
/3	16	14.7	10.6667	9.8
/4	12	11.025	8	7.35
/5	9.6	8.82	6.4	5.88
/6	8	7.35	5.33333	4.9
/7	6.85714	6.3	4.57143	4.2
/8	6	5.5125	4	3.675

Input and output sample rates are independent. This is, the ADC master clock source (48 kHz, 44.1 kHz, or serial digital input) and divisor are selected with complete independence from the output (DAC and IEC958) master clock source and divisor.

In addition to these fixed rates, a sample rate derived from the IEC958 receiver is available for analog input and output. The basic received rate on the serial digital input varies between approximately 30 and 50 kHz, depending upon the source. The received rate can be used as an alternate master clock, optionally scaled by , and divided by an integer from one to eight.

3.8.9 Analog Quality Target Measurements (48 kHz Sampling)

	Line In	Line Out	Conditions
Frequency Response	+/- 0.25dB	+0,-.25dB	(20-20kHz)
THD+N	<.01%	<.01%	(@1kHz)
SNR	>80dB	>80dB	(20-20kHz)

3.9 Suggested Audio Practices

You can get the best performance out of your IRIS audio processor by following some basic audio connection and recording practices:

3.9.1 Digital Transfers The best quality recording is made by transferring audio material entirely in the digital domain. If the source of your recording has a serial digital output, use that connection to the workstation's serial digital audio input port for noise-and-artifact-free audio data as your recorded sound.

For example, if you are using the output of one IRIS audio processor as the input to another, using a serial digital audio transfers the audio information exactly, bit-for-bit, with no loss of dynamic range, added noise, or distortion.

If you use the analog line-out of the first (playing) workstation as the line-in to the recording workstation, you

can still make very good recordings, but not as precise as the digital transfer. Note that serial digital transfers can be made for any sampling rate between 30kHz and 50kHz. So if you want to use other sampling rates, you must use the analog interconnect.

3.9.2 Equipment and Connections The microphone input is monaural; either a stereo or mono plug will work in it, although it senses only the left channel of a stereo mic plug. The other four inputs use stereo plugs. Avoid using mono plugs in the stereo jacks, or cables that short some of the signals together. Some cables have attenuation built into them; avoid these as well for most applications.

3.9.3 Setting Input Levels The IRIS Audio Processor provides easy ways to make great analog recordings without a great deal of complicated equipment or specialized knowledge. There are, however, a few guidelines to follow that significantly improve the signal quality.

3.9.3.1 Minimizing Input Gain/Maximizing Input Signal The analog input circuitry for microphone and line-in recording has a software-controlled gain setting. The first step in the process of making a good analog recording is to get a 'hot' (loud, big) enough signal to the input jack before it gets to the input gain circuit. The input circuitry accommodates signal levels of up to 10Vpp (peak-to-peak) at the line-in jack. This exceeds the levels produced at most modern consumer equipment line-out jacks. If the source machine for your recording has an output level control, turn it up as far as you can, but do not exceed the 10Vpp level, which introduces clipping distortion. Clipping distortion of this kind can be fairly easily detected by careful listening.

Try the input gain level setting at the factory preset level, which corresponds to 8 on the scale. Adjust the input gain level setting so that loudness peaks of the input material almost light up the entire level meter. A low setting of the input gain control with a signal that registers nearly the entire span of the meter gives the best results.

3.9.3.2 Minimizing Output-to-Input Crosstalk The headphone output amplifiers in your workstation are very powerful devices relative to the extremely sensitive circuits used for analog-to-digital conversion in the analog recording process. You can minimize distortion and crosstalk effects between these systems by reducing the headphone volume level as much as possible during critical analog recording. This does not affect the line-out levels.

3.9.4 Avoiding Ground Loops The high-quality analog audio instrumentation circuits in your workstation are very sensitive to the implementation of an analog ground voltage reference. You can achieve the best performance by letting the workstation be the only machine in your system of audio equipment that connects its system electrical ground to the AC power ground. Most modern consumer equipment uses only two-prong power plugs and remains ground-isolated from the power lines, so this type of equipment does not typically cause a problem.

The Silicon Graphics workstation is intended to be electrically grounded. This equipment is equipped with a three-wire grounding plug—a plug that has a third (grounding) pin. Do not defeat the purpose of the grounding plug!

Take care when connecting the workstation with other professional-type audio equipment (such as another Silicon Graphics workstation) that connects its chassis ground to the AC power ground. In a professional environment, these problems are typically addressed by signal isolation transformers and other techniques.

The serial digital audio ports on your workstation are already isolated by transformers within the machine, so ground-reference problems do not typically apply to serial digital audio connections.

3.9.5 Other Cautions and Advice

- o If your workstation is connected to a monitoring system such as a power amplifier driving speakers or headphones, turn the monitoring system volume down or off before you power the workstation on or off.
- o Do not wear headphones that are plugged into the workstation during power on or off cycles.
- o Do not record or monitor from an input jack that has nothing plugged into it.
- o Never connect a high-power output, such as the speaker output of a power amplifier, to any of the audio jacks on your workstation.
- o Be sure to use the line-out port of the workstation to the line-in port of your monitoring equipment; do not use the headphone output as a line-level source.

3.10 Developer Support

3.10.1 Audio Library The new IRIS Audio Library is included with the first release of the Audio Processor. The Audio Library is a C-language procedure-call library for inputting and outputting audio samples and for controlling the Audio Processor. Man pages describe the procedures in the audio library.

Procedure Call	Summary
----------------	---------

Configuration

ALnewconfig	Create and initialize an ALconfig structure
ALfreeconfig	Deallocate an ALconfig structure
ALsetchannels	Set mono vs stereo in an ALconfig structure
ALgetchannels	Get mono vs stereo in an ALconfig structure
ALsetwidth	Set a sample width in an ALconfig structure
ALgetwidth	Get the sample width from an ALconfig structure

Port Control

ALopenport	Open an audio port
ALcloseport	Close an audio port
ALgetconfig	Get an ALport's ALconfig structure
ALsetconfig	Change an ALport's ALconfig structure
ALsetqueuesize	Set the number of slots in an ALport's queue
ALgetqueuesize	Get the number of slots in an ALport's queue

Device Control

ALgetdefault	Get the default value for a device state
ALsetparams	Set a device state variable
ALgetparams	Get a device's state variable
ALgetname	Get a human-readable name for a device state variable
ALgetminmax	Get max and min allowed values for a device state variable
ALqueryparams	Get descriptor/description pairs for device state variables

Procedure Call	Summary
<hr/>	
Select Handling	
ALgetfd	Get an ALport's file descriptor for <u>select</u> (2) or <u>poll</u> (2)
ALsetfillpoint	Set the <u>select</u> (2) unblock level for an ALport
ALgetfillpoint	Get the <u>select</u> (2) unblock level for an ALport
Sample I/O	
ALreadsamps	Read audio samples from an ALport
ALwritesamps	Write audio samples to an ALport
Flow Control	
ALgetfillable	Get the number of fillable slots in an ALport's buffer
ALgetfilled	Get the number of filled slots in an ALport's buffer
Error Handling	
ALseterrorhandler	Establish an alternate error handling routine

3.10.2 4Dgifts Example Code

Example source code can be found in </usr/people/4Dgifts/examples/audio>.

3.11 Thanks

We appreciate your purchase of the IRIS Audio Processor and we especially appreciate the patience of the early adopters of the 4D/35 who waited patiently for their Audio Processor to arrive.

We hope that you find it both useful and fun.

Thanks.

4. 4D/30 Series Features

The Personal IRIS 4D/30 and 4D/35 are designed to be upward compatible with previous Personal IRIS models. This section highlights a few of the differences.

4.1 New Serial Ports

The 4D/30 and 4D/35 feature two additional serial ports with DIN-8 style connectors. These ports operate identically to the first two ports except for the connector difference. The new ports are referred to as `/dev/tty[dmf]3` and `/dev/tty[dmf]4` by the software. The pinout is documented on the serial manual page.

4.2 Bidirectional Parallel Port

The 4D/30 and 4D/35 support a bidirectional Centronics-style parallel port. The scanner demonstration program has been enhanced to support a parallel port mode in the scanner. The pinout and new ioctls are documented on the plp manual page.

4.3 PROM Password

It is possible to set a password in the 4D/30 and 4D/35 PROM that prevents unauthorized users from performing system maintenance procedures. To set a password, the PROM's manual mode must be entered and the passwd command executed. After a password is set, any attempt to do anything but boot the system normally requires that the password be reentered. The password can be removed with the resetpw manual mode command.

You can also clear the password (but not set it) when the system is running, by using the command nvr passwd key "".

Finally, if the password is set and forgotten, or set inadvertently, the whole password requirement can be bypassed by unplugging the cable connecting the nvram chip to the CPU card. Contact your service organization for details on this operation, should the need arise.

5. Bug Fixes

This chapter describes bug fixes to IRIX in the 4D/30-Series Support Option release 1.1. This includes bug fixes from the 3.3.3 IRIX release that affect machine-specific files. Bug fixes in the 3.3.3 release that were not machine-specific are not in this release; if they are desired, the 3.3.3 update tape should be installed prior to this release; it is highly recommended that you do so.

A Silicon Graphics software change request (SCR) number appears with some of the bug fixes in this chapter.

5.1 Bug Fixes to IRIX

- o Problems with parallel printers. Some printers that worked on the 4D/20 and 4D/25 did not work properly with the 4D/30 and 4D/35. The parallel port driver has been fixed so that these printers now work correctly.
- o The mkcentpr command incorrectly defaulted to using the VME Parallel Option port instead of the on-board parallel port. It now defaults correctly.
- o The hiny command incorrectly reported the CPU speed as 37 Mhz in some cases on the 4D/35. The correct value of 36 Mhz is now reported. The 4D/30 incorrectly reported a clock speed of 33 Mhz; it now correctly reports 30 Mhz.
- o A bug that caused the system to crash when configured with MSGTQL greater than the shipped default (50) has been fixed (SCR #11244).
- o Fixed a problem where exclusive locking of an NFS file appeared to be corrupted. (SCR #10894)
- o Some problems in the ide diagnostic program relating to SCSI and memory tests were fixed. Additionally, some new tests were added for testing the audio hardware.
- o Some problems using the bootp protocol from the PROM that could prevent remote installs from working were fixed.

5.2 Bug Fixes to Graphics

- o The setmon program was not shipped in the previous release, and the older version was not compatible with the Graphics Library change. It is included in this release.

- o Programs that used the GL blink function could cause visible flickering at the bottom of the screen. The associated timing code has been fixed.

5.3 Bug Fixes to Networking

- o In 4D1-3.3.2, diskless workstations would sometimes hang during periods of heavy swapping. This occurred whenever the Ethernetr driver tried direct memory access (DMA) on consecutive virtual pages pointing to the same physical page in memory.
- o Some problems with the integral (ec) ethernet driver that could cause the system to panic in rare cases have been fixed.

6. Known Problems and Workarounds

Every effort has been made to maintain full binary compatibility with the 4D/20 and 4D/25 models as well as the POWER Series machines. Known problems and potentially confusing aspects of the 4D/30 and 4D/35 are listed below:

- o Graphics compatibility requires that programs use the shared version of the GL graphics library. Programs that are linked against the static version of the GL might not run and will produce a message regarding their incompatibility in the console window and/or in the system log via syslogd.

If a program must be linked with the static version of the GL, it should be relinked with the version supplied in this update, in the 4D35.sw.dev subsystem.

- o Programs that depend on the results of queries to the operating system concerning the CPU board designation might encounter difficulties because the results are different when run on a 4D/30 or 4D/35 versus a 4D/20 or 4D/25. Specifically, the CPU board on the 4D/30 and 4D/35 is designated ``IP12`` by the operating system whereas the CPU board designation on a 4D/20 and 4D/25 is ``IP6``.
- o A hardware problem has been found that might cause problems for some devices connected to the serial ports if modem (ttym[1-4]) or flow control (ttyf[1-4]) devices are used. The problem occurs if no device is attached to the port, or the device is powered off. The DCD and RTS lines are in the incorrect state in this case, opens do not block, and output is not blocked. For example, if a serial printer is connected to ttyf2, but is powered off, any jobs submitted to that printer are transmitted, rather than blocking until the printer is turned on.

There is no problem if the device is both connected and turned on, which is the most common case.

A hardware fix is available for this problem; contact the Technical Assistance Center for more information.

- o If you are installing a 4D/30 or 4D/35 as a diskless client, you will need to take a few extra steps. The diskless share and client trees need to have the system software installed in a specific order. The base 3.3 release needs to be installed first; followed by any maintenance releases, for instance 3.3.3; then (after

all other installs) the 4D/30-Series Support Option.
These are the general steps:

1. Install 3.3 and 3.3.3 in the share tree using the same procedures as for a 4D/20 (IP6), except when invoking clinst you need to specify -c IP12 as an option on the command line.
2. Quit the installation tool by typing quit.
3. Change the definitions of CPUBOARD and MACH in clinst.dat from ``IP6`` to ``IP12``.
4. Install the 4D/30-Series Support Option tape on the share tree. When doing the installation, you must use manual mode by typing select. Then type go When the installation is complete, type quit.

Setting up the client tree also requires that 3.3 be installed first, then 3.3.2 or 3.3.3, and finally the 4D/30-Series Support Option. To ensure the correct order, you must use the manual mode of the installation tool. Continue the installation with these steps.

1. Start clinst as described in the diskless installation instructions.
2. Enter manual selection mode by typing select.
3. Select all of eoe2 by typing install eoe2.
4. Deselect all of the 4D/30-Series Support Option by typing remove 4D35.
5. Install the base software by typing go.
6. You might see some error messages regarding missing files ``m333X25`` and ``sat``; type continue if you do.
7. Install any maintenance options that are needed, again excluding the 4D/30-Series Support Option by typing keep *.* , remove 4D35, install maint1 maint2, and go.
8. Lastly, install the 4D/30-Series Support Option by typing keep *.* , install 4D35, and go.
9. Exit the install program with the quit command.

10. You might see an error message about a file
``tagscript`` missing; you can ignore it.