adat HD24 FirePort 1394

Reference Manual
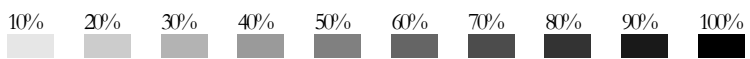
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Introduction

Welcome!

Thank you for selecting the Alesis FirePort 1394™, the perfect complement to your Alesis Adat HD24 hard disk recorder. Since 1984, we've been designing and building creative tools for the audio community. We believe in our products, because we've heard the results that creative people like you achieve with them.

One of Alesis' goals is to make high-quality music technology available to everyone. This Reference Manual is an important part of that, because in it we try to present the FirePort 1394's features in a way that is easy to understand and remember. If a feature were not properly documented, you might not discover its potential benefits for some time. So we strive to write our manuals as carefully as we build our products.

The goal of this manual is to get you the information you need as quickly as possible, with a minimum of hassle. We hope we've achieved that. If not, please drop us an email and give us your suggestions on how we could improve future editions of this manual.

We hope your investment will bring you many years of creative enjoyment and help you achieve your goals.

Sincerely,
The people of Alesis

For more effective service and product update notices, please register your FirePort 1394 online at:

http://www.alesis.com/support/warranty.htm

About the FirePort 1394 and FST/Connect software

The Alesis FirePort 1394 is designed to complement the ADAT HD24 hard disk recorder perfectly. It allows extremely fast and accurate transfers of audio data between an ADAT FST™ hard drive and your computer by using industry-standard IEEE 1394 connections (also known as FireWire). Tracks may be transferred at speeds up to 40 times faster than 10-BaseT Ethernet! This makes it even more practical for you to use your favorite editing platform to modify the tracks to your heart's content, after which they may be sent back with equal accuracy and even greater speed (which will be explained later).

Alesis, the company that revolutionized multitrack recording with the introduction of the ADAT, provided yet another major price-to-performance breakthrough with the ADAT HD24 hard disk recorder. Now with the advent of the FirePort 1394, the superior audio quality and portability of the HD24 can be married with the DSP-wrangling capabilities of your favorite audio editing software. Don't forget to eat.

Important features of FirePort 1394 and FST/Connect

Industry-standard IEEE 1394 connection

FirePort 1394 takes advantage of the high-speed, industry-standard FireWire connection for extremely rapid file transfers. Gone are the days of large periods of downtime while waiting for an entire song to make the jump to or from a computer-based audio editing software package. With the FirePort 1394 and FST/Connect software, the entire contents of a 24-track, 48k song can be transferred from one device to the other in far less time than it would take to listen to the song one time through.

Simple to hook up

Plug a FireWire cable from your computer into the FirePort 1394, plug one of your HD24's hard drive caddies into the FirePort 1394, and turn it on. The drive spins up in seconds and you're ready to go.

Easy-to-use software

Create, name and delete Projects and Songs, format and name your hard drives, export single tracks or whole songs to your computer and import them back to the FST drive with a few clicks of the mouse. Know at a glance the amount of free space available in your FST drive at any of the standard sample rates. Write-protect a song with a flick of the wrist. All of these functions are accessible from the main page of the included FST/Connect software.

Provides multiple file transfer formats

The FST/Connect software allows you to move data to and from an FST hard drive in the four most widely used formats: wav (Wave), aif (Audio Interchange File), sd2 (Sound Designer™ 2), and dig/sd (Sound Designer 1). There is also an option to export tracks to the PC as 16-bit files.

Support for multiple FirePort 1394 systems

Up to four FST hard drives can be connected to your PC at the same time through four separate FirePort 1394 systems and FST/Connect. All you need to do to take advantage of this capability is to "daisy-chain" four FirePort 1394 systems (each has two FireWire ports to facilitate this), or you'll need an interface card for your PC with as many as four external FireWire ports. A combination of direct and chained FirePorts is fine, too, as long as you don't exceed a total of four systems.

99 Projects, 99 Songs

The hard drives available to the consumer have become larger and cheaper with each passing day. But previously, the maximum number of songs you could record on one FST hard drive was 64, so it was difficult to fill up an 80-gigabyte drive, for example (unless the length of every song was over 5-1/2 minutes, on average).

Now the good news: with file system 1.10 on your FST drive and HD24 OS version 1.10, you have the ability to keep track of 99 Projects, each containing 99 Songs. That makes for a grand total of 9,801 songs possible on one hard drive! Even the most prolific songwriters among us would be hard pressed to run out of room. Another use for the Project function could be to keep the songs of different clients all together, without the need for a separate hard drive for each.

Your HD24 must be equipped with OS version 1.10 or higher to take advantage of all of the features offered by FST 1.10 and FST/Connect.

FirePort 1394 and FST/Connect will allow you to take full advantage of today's larger hard drives. And with a maximum possible hard drive size of 2.2 *Terabytes*, the FirePort is fully prepared for the future.

Track Preview

With the proper sound card installed in your PC, tracks of any sample rate may be previewed individually from the PC or directly from the FST drive. This is helpful in determining ahead of time which track or set of tracks you would like to transfer into the PC for editing, or transfer back into the FST drive for mixdown.

Key Features of the FirePort 1394 and FST/Connect software

1. Lightning-fast file transfer over industry-standard FireWire connections.

2. Transfer anywhere from 1 to 24 tracks of audio at one time between your FST drive and your computer.

3. Supported audio file formats include .wav, .aif, .sd2 and .dig/.sd.

4. Straightforward, easy-to-use interface, with all of the important information about your hard drives, Projects and Songs readily available.

5. Connect up to four FST drives at once.

6. Format an FST drive from your PC.

7. Hard drive sizes up to 2 Terabytes are supported.

8. Give each hard drive its own name.

9. Free Space Preview shows the amount of memory available on the hard drive at a glance.

10. 99 Projects and 99 Songs on one hard drive for extensive archival capability (file system 1.10 only).

11. Create, name, and delete Projects and Songs.

12. Song, Project, and hard drive names up to 64 characters in length (file system 1.10 only)

13. Song length, track depth, sample rate and bit resolution readily visible.

14. Write-protection for Songs with a single mouse-click.

15. Track preview for auditioning individual tracks from the PC or from the FST drive

16. 16-bit transfer option for exporting tracks to the PC

How to Use This Manual

This manual is divided into the following sections describing the various functions and applications for the FirePort 1394 and FST/Connect. While it's a good idea to read through the entire manual once carefully, those having general knowledge about computer software and hardware should use the table of contents to look up specific functions.

Chapter 1: Getting Started. This chapter covers the basics of connecting the FirePort 1394 to your computer and installing the FST/Connect software. System requirements are listed here as well.

Chapter 2: Operations will take you on a detailed tour of the various features of the FST/Connect software. It covers everything from hard drive formatting and naming to the selection and transfer of individual or multiple tracks, detailing Project and Song functions along the way.

Chapter 3: Applications could also be named "Tips and Tricks." It shows a number of ways to use FST/Connect to solve the varied needs that may arise in the course of working on a given project. It also covers in greater detail some of the particulars related to formatting an FST drive using Windows (don't!), as well as starting and restarting FST/Connect and/or the FirePort 1394. Also included is a list of characters that can be used in naming a hard drive, Project, or Song.

Near the end of the manual are some troubleshooting tips. Turn here if you are experiencing any difficulties with FST/Connect.

Helpful tips and advice are highlighted in a shaded box like this.

When something important appears in the manual, an exclamation mark (like the one shown at left) will appear with some explanatory text. This symbol indicates that this information is vital when operating the FirePort 1394.

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Important Safety Instructions

Safety symbols used in this product

This symbol alerts the user that there are important operating and maintenance instructions in the literature accompanying this unit.

This symbol warns the user of uninsulated voltage within the unit that can cause dangerous electric shocks.

This symbol warns the user that output connectors contain voltages that can cause dangerous electrical shock.

Please follow these precautions when using this product:

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with a damp cloth. Do not spray any liquid cleaner onto the faceplate, as this may damage the front panel controls or cause a dangerous condition.

7. Install in accordance with the manufacturer's instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11. Use only attachments or accessories specified by the manufacturer.

12. Use only with a cart, stand, bracket, or table designed for use with professional audio or music equipment. In any installation, make sure that injury or damage will not result from cables pulling on the apparatus and its mounting. If a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15. This unit produces heat when operated normally. Operate in a well-ventilated area with at least six inches of clearance from peripheral equipment.

16. This product, in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.

17. Do not expose the apparatus to dripping or splashing. Do not place objects filled with liquids (flower vases, soft drink cans, coffee cups) on the apparatus.

18. WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

Instructions de Sécurité Importantes (French)

Symboles utilisés dans ce produit

 Ce symbole alèrte l'utilisateur qu'il existe des instructions de fonctionnement et de maintenance dans la documentation jointe avec ce produit.

 Ce symbole avertit l'utilisateur de la présence d'une tension non isolée à l'intérieur de l'appareil pouvant engendrer des chocs électriques.

 Ce symbole prévient l'utilisateur de la présence de tensions sur les raccordements de sorties, représentant un risque d'électrocution.

Veuillez suivre ces précautions lors de l'utilisation de l'appareil:

1. Lisez ces instructions.
2. Gardez ces instructions.
3. Tenez compte de tous les avertissements.
4. Suivez toutes les instructions.
5. N'utilisez pas cet allareil à proximité de l'eau.
6. Ne nettoyez qu'avec un chiffon humide. Il est potentiellement dangereux d'utiliser des pulvérisateurs ou nettoyants liquides sur cet appareil.
7. Installez selon les recommandations du constructeur.
8. Ne pas installer à proximilé de sources de chaleur comme radiateurs, cuisinière ou autre appareils (don't les amplificateurs) produisant de la chaleur.
9. Ne pas enlever la prise de terre du cordon secteur. Une prise murale avec terre deux broches et une troisièrme reliée à la terre. Cette dernière est présente pour votre sécurité. Si le cordon secteur ne rentre pas dans la prise de courant, demandez à un électricien qualifié de remplacer la prise.
10. Evitez de marcher sur le cordon secteur ou de le pincer, en particulier au niveau de la prise, et aux endroits où il sor de l'appareil.
11. N'utilisez que des accessoires spécifiés par le constructeur.

11

12. N'utilisez qu'avec un stand, ou table conçus pour l'utilisation d'audio professionnel ou instruments de musique. Dans toute installation, veillez de ne rien endommager à cause de câbles qui tirent sur des appareils et leur support.

13. Débranchez l'appareil lors d'un orage ou lorsqu'il n'est pas utilisé pendant longtemps.

14. Faites réparer par un personnel qualifié. Une réparation est nécessaire lorsque l'appareil a été endommagé de quelque sorte que ce soit, par exemple losrque le cordon secteur ou la prise sont endommagés, si du liquide a coulé ou des objets se sont introduits dans l'appareil, si celui-ci a été exposé à la pluie ou à l'humidité, ne fonctionne pas normalement ou est tombé.

15. Puisque son fonctionement normale génère de la chaleur, placez cet appareil au moins 15cm. des équipments péripheriques et assurez que l'emplacement permet la circulation de l'air.

16. Ce produit, utilisé avec un amplificateur et un casque ou des enceintes, est capable de produite des niveaux sonores pouvant engendrer une perte permanente de l'ouïe. Ne l'utilisez pas pendant longtemps à un niveau sonore élevé ou à un niveau non confortable. Si vous remarquez une perte de l'ouïe ou un bourdonnement dans les oreilles, consultez un spécialiste.

17. N'exposez pas l'appareil à l'égoutture ou à l'éclaboussement. Ne placez pas les objets remplis de liquides (vases à fleur, boîtes de boisson non alcoolique, tasses de café) sur l'appareil.

18. AVERTISSEMENT: Pour réduire le risque du feu ou de décharge électrique, n'exposez pas cet appareil à la pluie ou à l'humidité.

Lesen Sie bitte die folgende Sicherheitshinweise (German)

Sicherheit Symbole verwendet in diesem Produkt

⚠️ Dieses Symbol alarmiert den Benutzer, daß es wichtige Funktionieren und Wartung Anweisungen in der Literatur gibt, die diese Maßeinheit begleitet.

⚡ Dieses Symbol warnt den Benutzer der nicht isolierten Spannung innerhalb der Maßeinheit, die gefährliche elektrische Schläge verursachen kann.

⚡ Dieses Symbol warnt den Benutzer, dem Ausgabestecker Spannungen enthalten, die gefährlichen elektrischen Schlag verursachen können.

Folgen Sie bitte diesen Vorkehrungen, wenn dieses Produkt verwendet wird:

⚠️ 1. Lesen Sie die Hinweise.

2. Halten Sie sich an die Anleitung.

3. Beachten Sie alle Warnungen.

4. Beachten Sie alle Hinweise.

5. Bringen Sie das Gerät nie mit Wasser in Berührung.

6. Verwenden Sie zur Reinigung nur ein weiches Tuch. Verwenden Sie keine flüssigen Reinigungsmittel. Dies kann gefährliche Folgen haben.

7. Halten Sie sich beim Aufbau des Gerätes an die Angaben des Herstellers.

8. Stellen Sie das Gerät nich in der Nähe von Heizkörpern, Heizungsklappen oder anderen Wärmequellen (einschließlich Verstärkern) auf.

9. Verfehlen Sie nicht den Zweck des grounging Terminals auf dem Netzstecker. Dieses Terminal wird für Ihre Sicherheit zur Verfügung gestellt.

10. Verlegen Sie das Netzkabel des Gerätes niemals so, daß man darüber stolpern kann oder daß es gequetscht wird.

11. Benutzen Sie nur das vom Hersteller empfohlene Zubehör.

12. Verwenden Sie ausschließlich Wagen, Ständer, oder Tische, die speziell für professionelle Audio- und Musikinstrumente geeignet sind. Achten Sie immer darauf, daß die jeweiligen Geräte sicher installiert sind, um Schäden und Verletzungen zu vermeiden. Wenn Sie einen Rollwagen benutzen, achten Sie darauf, das dieser nicht umkippt, um Verletzungen auszuschließen.

13. Ziehen Sie während eines Gewitters oder wenn Sie das Gerät über einen längeren Zeitraum nicht benutzen den Netzstecher aus der Steckdose.

14. Die Wartung sollte nur durch qualifiziertes Fachpersonal erfolgen. Die Wartung wird notwendig, wenn das Gerät beschädigt wurde oder aber das Stromkabel oder der Stecker, Gegenstände oder Flüssigkeit in das Gerät gelangt sind, das Gerät dem Regen oder Feuchtigkeit ausgesetzt war und deshalb nicht mehr normal arbeitet oder heruntergefallen ist.

15. Dieses Gerät produziert auch im normalen Betrieb Wärme. Achten Sie deshalb auf ausreichende Lüftung mit mindestens 15 cm Abstand von anderen Geräten.

16. Dieses Produkt kann in Verbindung mit einem Verstärker und Kopfhörern oder Lautsprechern Lautstärkepegel erzeugen, die anhaltende Gehörschäden verursachen. Betreiben Sie es nicht über längere Zeit mit hoher Lautstärke oder einem Pegel, der Ihnen unangenehm is. Wenn Sie ein Nachlassen des Gehörs oder ein Klingeln in den Ohren feststellen, sollten Sie einen Ohrenarzt aufsuchen.

17. Setzen Sie den Apparat nicht Bratenfett oder dem Spritzen aus. Plazieren Sie die Nachrichten, die mit Flüssigkeiten (gefüllt werden Blumevases, Getränkdosen, Kaffeetassen) nicht auf den Apparat.

18. WARNING: um die Gefahr des Feuers oder des elektrischen Schlages zu verringern, setzen Sie diesen Apparat nicht Regen oder Feuchtigkeit aus.

CE Declaration Of Conformity

See our website at:

http://www.alesis.com

FCC Compliance Statement

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.

1 Getting Started

Unpacking the FirePort 1394

In addition to this manual, you should find the following items inside the FirePort 1394's box:

• The FirePort 1394

• Four bracket stands, each with raised nubs on one side. These serve as "feet" for your FST drive, for the sake of traction and air circulation. They're also indented on the other side so you can stack FST drives securely.

• One FireWire cable

• A +5v/+12V AC/DC power adapter and power cord

• A CD-ROM, which contains the files you need in order to install FST/Connect on your computer

Materials You Will Need

It's easy to begin transferring HD24 tracks into your PC using the FirePort 1394, but you will need to provide a couple of key components in the chain.

First, you'll need an interface card with at least one FireWire port properly installed your computer. If you have more than one FirePort 1394, you can use their secondary FireWire ports to connect them together. Just be sure that at least one FirePort 1394 is connected directly to the PC!

Second, you'll need an FST drive to connect to the FirePort 1394. An FST drive is a hard drive that has been formatted for use with the ADAT HD24 hard disk recorder.

Of course, we hope you already own an HD24, but it's entirely possible that you could be working with material sent to you by someone else who owns one!

It isn't necessary to have audio material recorded on the hard drive already; you can transfer tracks from your PC to the FST drive if they are in one of the supported formats.

System requirements

Third, you will need an IBM-PC compatible computer that meets the following conditions:

• A properly installed FireWire/IEEE 1394 interface card (yes, we mentioned that already, but it's important!)

• Windows XP or Windows 2000 operating system (sorry, no Windows ME)

• 64 megabytes of onboard RAM

• 10 megabytes of available hard drive space (minimum)

• A sound card (optional). This will be necessary if you want to preview tracks from the FST drive or the PC.

Connecting/Disconnecting the FirePort 1394

The first thing to do is attach the four bracket stands to the FST drive caddy, one to each corner, as illustrated below:
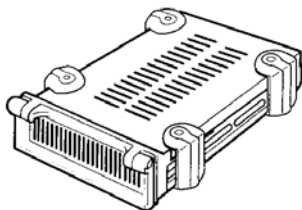
These raise the FST drive off the table or desk slightly, which will help keep air circulating around the drive and prevent overheating during use. The bracket stands, or "feet," also help the FST drive not to slide around while you're attaching it to/detaching it from the FirePort 1394.

Important!

Be certain the power switch on the FirePort 1394 is set to OFF before you perform any of the following steps.
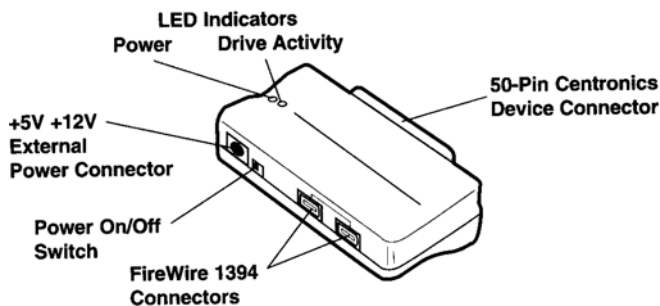
First-time connections

Here's what to do the first time you hook up the FirePort 1394:

1. Make sure the power switch on the FirePort 1394 is set to OFF.

2. Connect the 6-pin connector of the power adapter into the jack on the FirePort 1394 labeled **Ext. +5V +12V DC-IN**. Then plug the other end of the power adapter into a properly grounded and rated AC power supply socket.

3. Run a FireWire cable from the computer's FireWire interface card to either of the FireWire ports on the FirePort 1394.

4. Connect the FST drive to the FirePort 1394.

5. Turn the power switch on the FirePort 1394 to ON.

6. Install FST/Connect (the instructions are on page 20).

WARNING!
The power switch to the FirePort 1394 must be turned OFF before you connect the FST drive or any cables.

Routine connections

Once you have everything working, these are the steps to observe when connecting an FST drive to the FirePort 1394:

1. Make sure the power switch on the FirePort 1394 is set to OFF.

2. Connect the FST drive to the FirePort 1394.

3. Turn the FirePort 1394's power switch to ON.

4. Start FST/Connect. (If you were swapping FST drives, this step is not necessary because FST/Connect can be left active while you do so.)

Disconnecting an FST drive

When you want to spin the FST drive down and take it back over to an HD24, or if you would like to connect another FST drive with the FirePort 1394, follow these steps:

1. Use the Add/Remove Hardware utility in the Control Panel and go through the procedures to unplug a device. At the final step of this process, check the box that says "Show Unplug/Eject icon on the taskbar." You will only have to do this step the first time you disconnect the FST drive.

2. If you've already gone through step 1 above in previous disconnections, move your cursor to the lower right-hand portion of your monitor (the taskbar) and look for the following symbol:

3. Click on this icon and watch for a prompt to arrive on the screen that looks like this:

4. Click on that prompt, and a message will be displayed on the screen that tells you that the FST drive may be "safely removed from the system." This means it's okay to turn off the power to the FirePort 1394.

5. After the power has been turned off you may disconnect the FST drive from the FirePort 1394.

You don't have to shut down FST/Connect when swapping hard drives. Therefore, if FST/Connect is already running when you want to disconnect, simply follow the disconnect procedure and leave FST/Connect active.

Installing FST/Connect

The brain behind the FirePort 1394's "brawn" is FST/Connect. This is a software program developed by Alesis, and you will find it on the CD-ROM that was in the box with the FirePort 1394.

Installing FST/Connect is simple. Put the CD-ROM into your PC, navigate to the CD drive (usually the D drive), and locate the file called setup.exe. Clicking on this application and responding appropriately to all of the prompts will run the InstallShield Wizard, which will automatically choose the files needed to make the FirePort 1394 work in conjunction with FST/Connect on your computer.

To uninstall FST/Connect, use Add/Remove Programs in the Control Panel folder.

The big picture

Below is an example of what you might see during a typical session with FST/Connect.
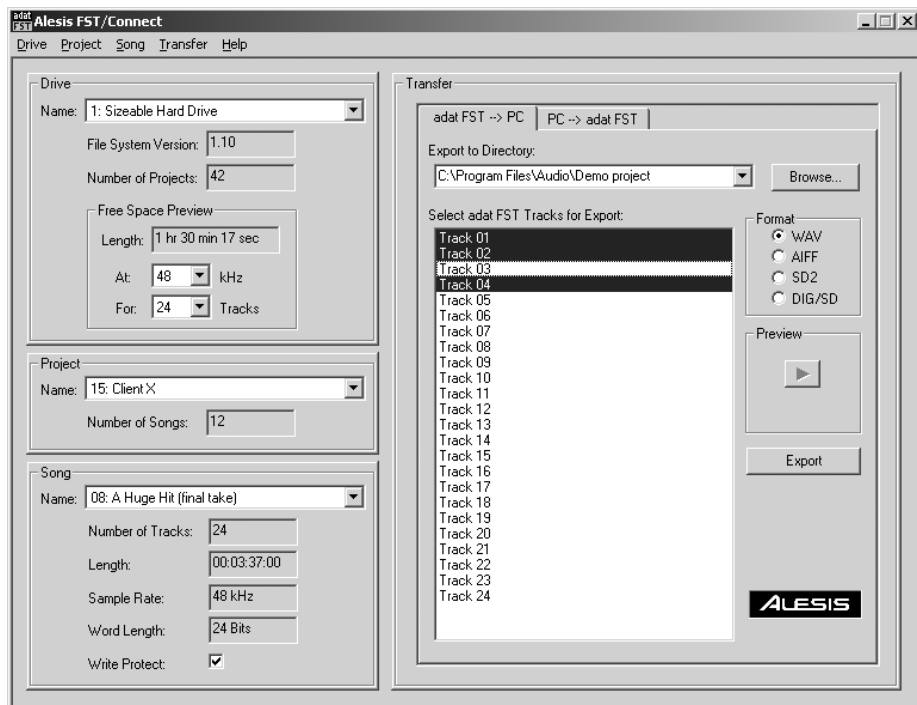
The FST/Connect Main Window

The main window of FST/Connect has four major subdivisions, each of which contains between two and nine functions. There are also five pull-down menus with additional functions. Everything you can do with FST/Connect happens from here, so let's go through the windows and menus one by one.

The Drive window

The boxed-in section in the left upper half of the main window is called the Drive window. It looks like this:

From this window you can see the name of the selected FST drive, its file system version, the number of projects it contains, and how much recording time it has available.

The Drive window has three sub menus that allow different choices. The first, "Name," has a pull-down arrow on the right side that allows you to select which FST drive you are using. This is for use with multiple FirePort 1394 systems.
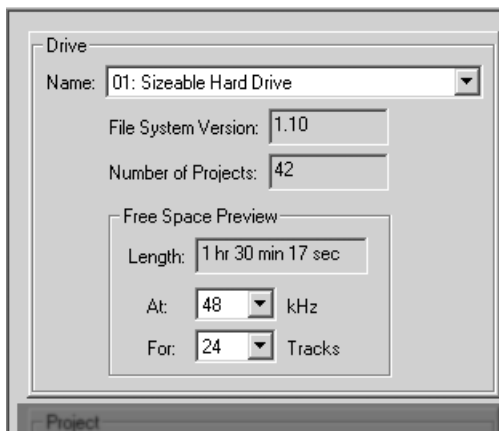
The second and third sub menus with selectable options are inside the Free Space Preview (FSP) window. As you can see, the smaller box "Length" does not have a pull-down arrow to its right; it will change automatically as you adjust the two boxes immediately below it. The "At" box allows you to select between four sample rates for the FSP reading (44.1, 48, 88.2, and 96). The "For" box allows you to select the track depth for the FSP reading: its choices can be 2, 6, 8, 12, 16, and 24 (depending on the sample rate selected in the "At" box). So on this particular hard drive you would have one hour, 30 minutes and 17 seconds available for recording a 24-track song at 48 kHz.

Window Navigation and Shortcuts

If you are new to using a PC, you may want to check out the section on window navigation and keyboard shortcuts found in Chapter Three: Applications. There are keystrokes that will be very familiar for long-time Windows users that you may find to be very useful. To see this information, turn to page 34.

It is possible to give the FST drive a name of up to 64 characters in length. This and other functions are handled inside the Drive pull-down menu. See page 28 for details.

To get the FSP reading for recording time available at 96 kHz, click anywhere in the window to the right of the "At" box and select the number 96 from the menu. If your 48k song has 16 or 24 tracks, the number in the "For" box will change automatically to 12. That's because 12 is the maximum number of tracks an FST drive can hold at a 96 kHz sampling rate. The Length, however, will remain the same in the example shown (half as many tracks at twice the sample rate uses exactly the same amount of memory).

The Project window

This is a small window with a big view: it allows you to call up the various Projects, or sets of Songs, that reside on the FST drive. It looks like this:
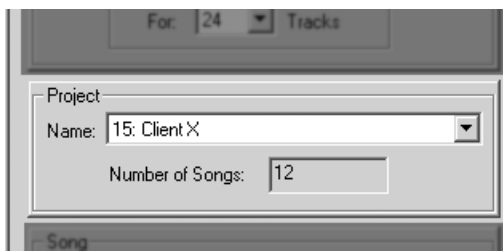
The window labeled "Name" is used to select the current Project. If your hard drive uses file system 1.10 or higher, there can be up to 99 of them! Use the numeric keys, the cursor keys or the pull-down menu on the Name window's right side to make your choice. And as you call up each Project, the second window shows how many Songs the Project contains.

The Song window

As stated earlier, each Project can hold up to 99 songs if you're using file system 1.10. The Song window is the one that allows you to choose the current Song within the Project. But it also contains five other fields that hold important information: the number of tracks in the song (also called "track depth"), the length of the Song, its sample rate and word length (sometimes referred to as "bit depth"), and a checkbox for write-protecting the current song.
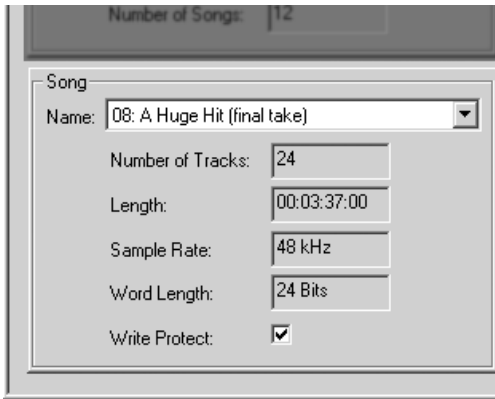
It is possible to give the Song a name of up to 64 characters in length (file system 1.10). This and other functions are handled inside the Song pull-down menu. See page 28 for details.

Selection of the Song within the Project is handled in the same way it is with other right-side pull-down menus. Click anywhere on the Name window and it will "explode," showing you up to nine Songs out of the possible 99 in the Project. If there are more than nine Songs available, a scroll bar on the right side will allow you to navigate through the Song list until you find the right one.

As with other windows, you can use the numeric keys to type in the number of the song you wish to access. You may also call up Songs one after the other by using the cursor keys. The Up and Left buttons decrement the choice, while Down and Right increment the choice. You can also "race" through the list by holding down one of the cursor keys.

The Transfer window

Occupying over half of the main window, the Transfer window sports a majority of the features found in FST/Connect. It is here you will select which tracks to send which way, decide where they will wind up, and determine what their format will be when they get there. Here's one view of the window:
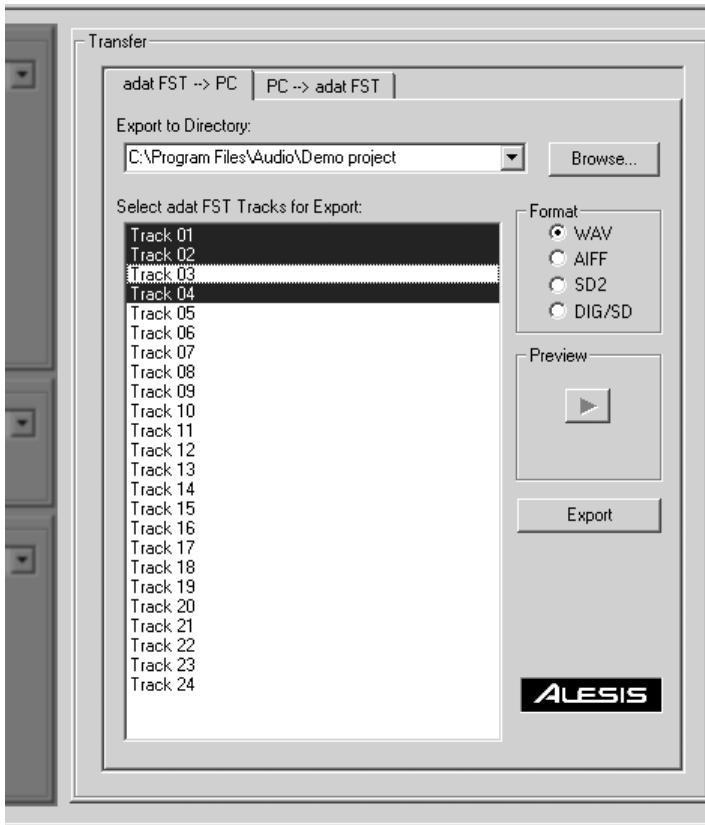
We'll go through the functions contained in this window one by one, starting with…

The Transfer tabs

At the top of the window there are two tabs: adat FST → PC and PC → adat FST. These determine which direction transferred files will go. Selecting the adat FST → PC tab means you are able to transfer tracks from the FST drive into your computer (export), while selecting PC → adat FST means FST/Connect is ready to send tracks from the computer into your FST drive (import).

To switch between the two tabs, click on one or the other with the cursor, or use the Left and Right cursor keys. You'll notice that as the tabs change, the button below the Preview box will change automatically from Export to Import or vice versa.

The Directory window & Browse button

The skinny little bar right below the Transfer tabs is called the Directory window. It displays the "path" you would follow to find the files related to the larger Track window immediately below.

This needs some careful attention, because the Directory path means different things depending on which Transfer tab is selected. If the PC → adat FST tab has been selected, the Directory path indicates the source folder on the PC from which audio files will be transferred into the FST drive. This is known as the "Import" option.

However, the illustration on page 24 shows the adat FST → PC tab having been selected. (This is also known as the "Export" option.) Those familiar with a PC will know at a glance that "C:\ProgramFiles\Audio\Demo Project" means that the tracks about to be exported from the FST drive will wind up on the C drive (a hard drive inside the PC) inside a folder called "Program Files," and that further inside that folder is another folder called "Audio," wherein resides a folder called "Demo Project." This folder will be the final destination of any exported track.

Unless you do something about it. There are two ways to select a different import/export folder. First, the Directory window has one of those pull-down arrows on the right side. If you click on that you will see up to five different paths. These are the last five folders you've selected as an import/export path.

The second way to choose a new import/export folder is to use the Browse button immediately to the right of the Directory window. Click on that to navigate to a new folder on one of your computer's hard drives. This new location will show up as an available choice in the Directory window list.

One other point regarding the Directory window: unlike the other "skinny" windows, you can't "explode" the Directory list by clicking within the Directory field. Doing this will highlight the entire Directory path. A second click will place the cursor at that spot in the Directory path name, ready for editing.

Selecting and Previewing (single tracks)

There are several methods for selecting a track within the Track window. The first few are obvious: click on a track, or use the Tab key until the cursor lands in the Track window. After that you can use the cursor keys to select different tracks; the Up and Left keys move the cursor up through the Track list, and the Down and Right keys move the cursor down.

Import or Export: keeping it straight

Is there an easy way to remember which term applies to which tab? We find it helpful to keep in mind that the focus of FST/Connect is the FST drive. A useful analogy is to think of the FST drive as your "country." When you send files from there into a PC, you are "exporting." If you are bringing files into the FST drive, you are "importing."

The Import/Export tabs each have their own set of five paths, so it is possible for the Import path to be different from the Export path. FST/Connect keeps track of these independently.

You may not see any files listed in the Track window when you have the PC->adat FST Transfer tab selected. They may be in a different format than you have selected in the Format window. Try the different format buttons before using the Browse button to go look for them.

If you have a single track selected, you can listen to it through your computer's sound card. It doesn't matter whether the file is on the FST drive or on your PC's hard drive; if the file shows up in the Track list, it can be previewed. To do this, find the button labeled "Preview" to the right of the Track window. When only one track is selected, the triangle inside the button will be black. Click on this button and the track will begin to play. As it does, the numeric counter will increment, displaying the current location within the audio file.

Some sound cards may not be capable of playing back files that were recorded at the higher sample rates (88.2k and 96k). If you are having trouble playing back files of this sort, refer to your sound card's technical documentation.

Selecting multiple tracks

It's also possible to select multiple files at once for importing or exporting. If one track is already selected, hold the Shift key and click on another track. All tracks between the two you've selected will be highlighted, indicating that they will be exported or imported when you click on the button below the Preview window. Of course you can select all the tracks in the Track window at once using the Control and A keys.

Once you've determined which tracks you want to export or import, look for the button below the Preview window. It will be labeled "Export" or "Import" depending on which Transfer tab you have selected at the top of the Transfer window. Once you click on this button, the transfer will begin. If you are exporting to your PC, the tracks you have selected will be transferred to the folder listed in the Directory window. If you are importing to the FST drive, the folder listed in the Directory window shows you the source folder that contains the tracks you are transferring.

Only one track may be previewed at a time. This is why the Play button is grayed out when more than one track is selected.

The Format window

This is actually a sub-window inside the Transfer window, but it handles such an important task that it needs its own section in this User Guide. Depending on which Transfer tab is selected at the top of the Transfer window, the button selection made inside the Format window will either translate an FST file into one of four audio formats as it is exported to your PC, or it will decide what sort of files you will be able to view within the Track window as you are preparing to import audio files into your FST drive.

PC → adat FST

This is the simpler of the two tabs to describe, so we'll start here. When it is selected, the Format buttons tell FST/Connect which of the four possible audio file types you want to see. In turn, FST/Connect will filter out audio files of the other three types, blocking them from view. All four may actually be inside the same folder on your PC, but only the type you select with the Format buttons will be displayed.

Remember, if you don't see any files listed in the Track window when you have the PC->adat FST Transfer tab selected, try checking the other three format buttons before using the Browse button to go look for the files.

Once you have selected the file type you want to see, you then may select one or more of those tracks in preparation for importing them to the FST drive. During the "Import" process, the audio file will be translated from its current format to the FST format.

For crucial notes on importing sd2 and dig/sd files, see pages 29-30.

adat FST → PC

When this is the selected Transfer tab, the Format buttons tell FST/Connect which of the four possible audio file types you want the exported FST tracks to become as they are transferred to your PC's hard drive.

We have given you these four options because they are the most widely used in audio editing platforms. They are:

WAV   This is the audio file type most prevalent in PC-compatible computers.

AIFF   This format is more likely to be found in Macintosh applications.

SD2   Also a Macintosh-native file type, the Sound Designer II format has made large inroads into the high-end musical and post-production environments.

DIG/SD This is the file type generated by Sound Designer I. It is expected by most audio applications to be a 16-bit format. If this is the file type you would like to generate, be sure to see page 28 for information on setting the export format to 16-bit.

In order to use either of the exported Sound Designer file types in a Macintosh computer, certain procedures must be followed. SD2 files the must be "unflattened," and DIG/SD files must have their File Type changed. These procedures are necessary because of differences in the way Macs and PCs handle files. For detailed instructions, see the section on pages 29-30.

The Pull-Down Menus

As in most applications, above the main window of FST/Connect you'll see a series of pull-down options. The first four correspond to the smaller windows inside the main window.

When you press the Alt key, you'll notice the first letter of each word in the pull-down menu has its first letter underlined. These indicate which key to press in order to access the contents of that particular menu. For example, Alt + P opens the Project pull-down menu as in the picture below:
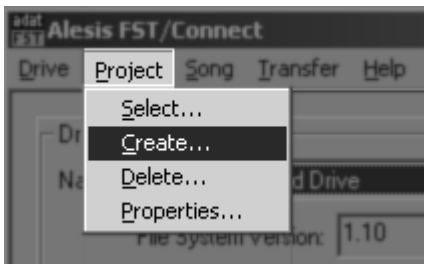
Pressing the C key will access the "Create" sub-menu of the Project pull-down menu, as shown.

Each pull-down menu provides most of the features and information found in the corresponding window, with the exception of the Transfer window. However, all of the pull-down menus offer features that are unavailable anywhere else in FST/Connect. These features are described on the next page.

Drive

There are five options here:

Select   Switch between multiple FirePort 1394 systems

Format   Completely erase or format an FST drive

Upgrade   Convert 1.0 FST drives to 1.10, leaving data intact. This option is grayed out if the FST drive is 1.10.

Properties View FST drive model, size, and give it a name

Exit   Quits FST/Connect

Project

This menu has four options:

Select   Switch between Projects via the usual keys

Create   Make a new Project

Delete   Choose and throw away a Project and its Songs

Properties Name the Project and view how many Songs it has

Song

There are four options here:

Select   Switch between Songs via the usual keys

Create   Make a new Song; define sample rate & track depth

Delete   Select and delete a Song

Properties Name the Song and view its track depth, length, sample rate, word length, and write-protect status

Transfer

Only one choice here:

Options   Choose whether exported files will be 24-bit or 16-bit. If you have an audio editor that can't open 24-bit files, select the 16-bit option. FST/Connect remembers this setting after you shut down.

Help

Only one choice here as well:

About…   Displays the revision number of FST/Connect

Naming conventions

Names can be up to 64 characters in length (file system 1.10 only), and may contain any letter, number, or character with certain exceptions. An error message will let you know if you have used an illegal character.

File system 1.0 allows only 10 characters in a name, and only letters, numbers, and spaces may be used in the names.

Essentials of Exporting and Importing

There are still some very important things to cover regarding exporting and importing. They are mostly related to the differences in the ways files are handled by PC and Macintosh computers. You probably won't have to do anything special to WAV and AIFF files, but the other two formats require a little more effort on your part.

Exporting and Importing SD2 files

Sound Designer II (SD2) files are used by many professional audio applications such as Digidesign's Pro Tools. But an SD2 file taken straight from one platform to the other generally won't be recognized properly without a little bit of doctoring.

Flattened vs. un-flattened files

Generally, Macintosh files have two "forks": the resource fork and the data fork. The resource fork contains "header" information that tells the Macintosh about the contents of the data fork.

On the other hand, PC files have no resource fork. All the essential information is there, but it is contained in a single stream of data. This is what is known as a "flattened" file; i.e., it is all one file, laid out in a row like dough "flattened" by a rolling pin. Conversely, a dual-forked Macintosh file is known as an "un-flattened" file.

So in order for a PC to view a Mac file as "one of its own," so to speak, the Mac file must be flattened. And in the case of a PC-generated SD2 file, in order for the Mac to handle the PC file properly the PC file must be un-flattened.

Exporting SD2 files to a Macintosh application

The first thing to do is use the Internet to locate a free software utility called **MacBinary II+**. It is a Macintosh application that alternately flattens and un-flattens files, depending on the initial state of the file. As of this writing, MacBinary II+ is available at http://www.mac.org/utilities/macbinary.

Once you have done that, follow this procedure to make the PC file Mac-ready:

1. Export the file from the FST drive using FST/Connect. Make sure the Format button is set to SD2.

2. Using a network connection or a form of storage medium recognized by both the PC and the Mac, get the file into the Macintosh.

3. Inside the Macintosh, drop the file onto the MacBinary II+ icon. An "un-flattened" file will be generated.

4. Open the un-flattened file inside the Macintosh's audio editing application.

If the Macintosh audio editor application will only open 16-bit files, remember to select the 16-bit Export option under the Transfer pull-down menu. For more information, see page 28.

Importing SD2 files from a Macintosh application

Once you are done editing the audio file on the Macintosh, here is what to do in order to get the resultant file back into the PC:

1. Inside the Macintosh, drop the file onto the MacBinary II+ icon. A "flattened" file will be generated.

2. The resultant MacBinary II+ file will have a three-letter extension of .bin. Change this to .sd2.

3. Using a network connection or a form of storage medium recognized by both the PC and the Mac, get the file into the PC.

4. Import the file into the FST drive using FST/Connect.

Exporting and Importing DIG/SD files

Sound Designer I files do not contain a resource fork, so they do not need to be flattened or un-flattened when exchanged between a PC and a Macintosh. This makes the process simpler, but there is still one extra step involved.

Exporting SD files to a Macintosh application

First, locate a freeware utility like **Type and Creator Changer** or Apple's **ResEdit**. These applications allow you to change the File Type and/or File Creator information of Mac files. As of this writing, Type and Creator Changer is available at http://alphaomega.software.free.fr/ and ResEdit is available at http://www.mac.org/utilities/resedit/.

Once you have that, here's how to make the PC file Mac-ready:

1. Export the file from the FST drive using FST/Connect. Make sure the Format button is set to DIG/SD.

2. Using a network connection or a storage medium recognized by both the PC and the Mac, get the file into the Macintosh.

3. Using the software utility, change the file's File Type from TEXT to SFIL. You won't need to change the File Creator.

4. Open the file inside the Macintosh's audio editing application.

Importing SD files from a Macintosh application

Once you are done editing the audio file on the Macintosh, here is what to do in order to get the resultant file back into the PC:

1. If the Mac's audio editor did not keep the two-letter extension of .sd, add this to the end of the file name. The three-letter .dig extension is acceptable as well.

2. It will not be necessary to revert the File Type to TEXT.

3. Using a network connection or a storage medium recognized by both the PC and the Mac, get the file into the PC.

4. Import the file into the FST drive using FST/Connect.

If the Macintosh audio editor application will only open 16-bit files, remember to select the 16-bit Export option under the Transfer pull-down menu. For more information, see page 28.

Other notes about importing

Bringing files from a PC into an FST drive is similar in some ways to copying tracks between songs on an HD24. If the segment you are pasting fits within the destination song, then when the track is pasted the song length does not change. But if the song is shorter than segment you are pasting, it must be lengthened before the pasting can take place.

The same is true of importing a file. If the song on the FST drive needs to be lengthened in order to fit the track you are importing, FST/Connect will do so. The good news is, since in many cases the tracks being imported are altered versions of the original tracks, no lengthening of the song may be needed. It's likely that the tracks will be imported more quickly than they were exported! The song is already "expecting" them.

Two other important points about importing: First, the sample rate of the destination song must match that of the tracks being imported. If this is not true, you will see an error message.

Second, you need enough tracks in the destination song to receive the tracks being imported. If you are trying to import too many tracks, an error message will alert you to this as well.

Import destination

When you tell FST/Connect to import a file to your FST drive, the first thing it will do is check the file name, starting from the end, for a number that looks like a track number. If the file has a valid number in its name, FST/Connect will automatically import it to that track number. But beware! Any number can be interpreted as a track number if it is the last or only number in the filename. For example, if you are importing a file called "Take_5_Vocal.wav" into a 16-track song, FST/Connect will assume you want to place that track on track 5. But if you're importing a file called "Take_23_Vocal.wav" into the same song, a screen prompt will ask you to choose the destination track (since there aren't 23 tracks in the song).

Likewise, if you import multiple files at once and they all have valid numbers in their names, FST/Connect will import each file to its track number. If any of the track names have out-of-range numbers, a screen prompt will ask you to choose the destination track before it imports each file.

Here's one scenario: Let's say you have a 16-track song on your FST drive, and you have selected tracks 9-24 for importing into that song. After you click the Import button and answer "Yes to All," tracks 9-16 will go immediately to tracks 9-16 on the FST drive. Then for each track between 17-24 you will be given the option to place the files at any one of the first 8 tracks.

Did you catch that? FST/Connect is smart. It knows you already imported to tracks 9-16, so it assumes you don't want to select any of those tracks as the destination for the remaining files. And once you've used track 1 to import track 17, it removes track 1 from the list of possible choices.

Attention Mac users! Don't forget to add the two- or three- letter extension name to the files you are trying to import (.sd2, .aif, etc.). Otherwise you won't be able to see the files in the Track window.

The Import/Export functions can be used to reclaim unused hard drive space on the FST drive. For an explanation of this concept, see page 33.

Warning! Importing a track will overwrite the destination track on the FST drive. Be sure this is what you want to do before initiating the import process.

Be careful! A number in the filename not intended as a track number may lead to loss of data! It could cause FST/Connect to overwrite a track on the FST drive that you wanted to keep. A final screen prompt will show you the track's destination; be sure to read this before you import the track.

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3 Applications

In this chapter we've compiled some points of interest about FST/Connect. They are divided into two categories: **Tips and Tricks**, with some timesaving tips and practical uses for FST/Connect, and **Useful Information**, which offers details about the way FST/Connect is integrated into the Windows environment on your PC.

No doubt you will develop some unique procedures of your own. If you come across something you think will help people get even more out of their FirePort 1394 systems, please e-mail the suggestions to us! We may include them in a later version of this manual, or put them on our website.

Tips and Tricks

HD24 memory conservation

As you may know, when you create a song on an FST drive you define the "track depth," or number of tracks in the song, from the very beginning. Even if you only record on one track, the HD24 will reserve hard drive space for each of the as yet unrecorded tracks in the song. This goes a long way toward preventing hard drive fragmentation, which in turn ensures that the HD24 will be able to access your tracks with a minimal amount of delay, no matter how far apart your locate points may be.

But occasionally you may discover that you reserved too many tracks; for instance, you may decide that a given song sounds better with fewer tracks than you originally anticipated. Instead of 24 tracks, you've only used 16 or less. So are you stuck? Is there nothing you can do to reclaim the unused memory?

The old standby method was to transfer the tracks to another Adat-compatible device through the optical ports in real time, and then back the same way. Besides being somewhat time-intensive, this process also requires a couple of extra Adats!

The FirePort 1394 will be a great help in scenarios like this. To solve this problem even more quickly and accurately, export all the song's tracks into your PC, create a new 16-track song at the same sample rate, and send the tracks back to the FST drive. After you delete the original song, this will have freed up the hard drive space being occupied by 8 tracks of audio for the entire length of the song. For a 48k track of 4 minutes in duration, that's a lot of memory freed up!

Window Navigation and Shortcuts

As you work with FST/Connect's main window, you'll want to remember that there are a number of keystrokes and key combinations that can make FST/Connect even easier to use.

The first thing to know is that you can jump from one window to the next by using the Tab key.

We've also built in several ways to select the different options in the smaller internal windows that have pull-down arrows to their right.

For example, once you're at the desired window, you can use the Up/Down or Left/Right sets of cursor keys to increment and decrement the choices. Holding one of those keys down will "race" through the list.

"Exploding" windows

Another option is to hold the Alt key and press the Down cursor key to make that window's list "explode." That will show you a list of some or all of the choices available at that window. Then you can use the cursor keys to select an option from there. When you've made your choice, either hit the Return key or hit the Escape key to close the list.

There are some keyboard shortcuts that are more specific to their functions. They are listed on the pages in Chapter Two where those functions are first introduced.

Free Space Preview: Using the numeric keys

You can use the numeric keys as an aid when selecting the sample rate or track depth for the Free Space Preview window. Once you've chosen the "kHz" window, press 9 to select 96k, press 8 for 88.2k, or press 4 repeatedly to toggle between 48k and 44.1k.

The "For" window has different sets of responses to the numeric keys, depending on the selected sample rate. As stated earlier, if the sample rate is 44.1 or 48k you can have up to 24 tracks, but you can have no more than 12 tracks for the higher sample rates of 88.2k and 96k. Some of the available choices are different for that reason.

So once you've clicked somewhere in the "For" window, your choices are as follows:
• for 44.1k/48k, press 2 repeatedly to toggle between 2 tracks and 24 tracks; use the 6 key to select 6 tracks, the 8 key to select 8 tracks, or the 1 key to select 16 tracks.
• for 88.2k/96k, press 2 to select 2 tracks, press 6 to select 6 tracks, press 8 to select 8 tracks, or press the 1 key to select 12 tracks.

Selecting certain tracks for import/export

When you're working in the Track window, you don't have to select only tracks or files that are all in a row. If desired, you can "leapfrog" over tracks which you do not want to import or export. To choose specific tracks, click on the ones you want to transfer while holding the Control key.

Another selection shortcut is to Select All (Control A) and then de-select the tracks you don't want to transfer by clicking on those tracks while holding the Control key.

Making imported tracks go where you want

An easy way to tell FST/Connect where you want certain tracks to be placed on the FST drive is to navigate within Windows to the folder that contains them, and then rename them using the desired track numbers somewhere in the file names (before the two- or three-letter extensions).

Useful Information

How the PC views your FST Drive

When you start using a hard drive with FST/Connect for the first time, you should use FST/Connect to format it. If you use Windows' Disk Management utility to format the drive, you will still need to format it using FST/Connect before you will be able to use it with FST/Connect.

Once you have used FST/Connect to format the drive, it will show up as an unrecognized drive in Windows. This means you will not be able to locate it using Windows Explorer. Also, your PC will not recognize the FST drive's format when you look at it using the Disk Management utility. It will be identified as "Unknown."

After there is FST data on the drive, you should not attempt to format the FST drive using Windows. If you do you will destroy your adat FST data.

It is also not possible to partition the hard drive so that it contains a combination of an FST partition and a Windows partition. The two formats are incompatible.

Neither should you attempt to defragment the FST drive using any form of disk utility. The Alesis file system was designed to keep file fragmentation to the absolute minimum. Besides, the FST drive has a proprietary method of file organization that a third-party disk utility would be highly unlikely to interpret properly.

Starting and restarting FST/Connect and FirePort 1394

You may start and restart FST/Connect without turning off the power to the FirePort 1394. But if you want to turn its power off you should dismount the hard drive first using the taskbar tool, as described on page 19, and then turn off the FirePort 1394.

But if you only go halfway by dismounting the FST drive without shutting off the FirePort 1394, then when you start FST/Connect again the program will display "No Drive Communication" in the Drive Name window. You will not see any Project, Song, or Track window information from the FST drive even though it has spun up normally.

In order for everything to operate as it should once more, you'll have to shut down the FirePort 1394, wait a few seconds, and then turn it back on.

Naming things: Characters you can use

The following chart shows the list of characters that are available to you when creating a name for a Drive, Project, or Song. Keep in mind that file system 1.10 has an extended character set available for use:

Letters and Numbers	A-Z, a-z, 0-9
Characters	(space)
Additional characters (1.10 only)	! # $ % & ' ( ) + , - . ; = [ ] ^ _ ` { } ~

Naming things: Forbidden characters

There are some characters that you will not be allowed to use when creating a name for a Drive, Project, or Song. The use of these characters might cause conflicts with the file system, and if you try to use them you will not be allowed to save the name until you remove them or choose one of the allowable characters from the chart above.

Here's the list of characters that are disallowed when creating a name:

Illegal name characters	\ / : * ? " < > |

4 **Troubleshooting**

Troubleshooting Index

Symptoms	Cause	Solution
FST Drive contents don't show up in window/ "No Drive Communication" message in main window	FirePort wasn't powered down after HD was disconnected from system via taskbar	Turn off FirePort and turn it back on again. For more information, see page 19.
	HD is attached, but FirePort is turned off	Turn on FirePort.
	Bad cables.	Replace the cables.
PC folder contents don't show up in window	Wrong Format button selected	Select the proper Format button in the Format window. For more information, see page 27.
	Directory path is incorrect	Use the Browse button to navigate to the proper folder. For more information, see page 25.
No output when auditioning tracks	Amplification system not turned on	Turn on amplification system.
	Sound card can't play back higher sample rate files	Refer to your sound card's technical documentation. You may need a different sound card if you want to preview 88.2k or 96k files.
My audio editor won't open the FST file	Audio editor is expecting a 16-bit file	Select the 16-bit word length export option in the Transfer pull-down menu. For more information, see page 28.

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Warranty / Contact

Alesis Limited Warranty

ALESIS CORPORATION ("ALESIS") warrants this product to be free of defects in material and workmanship for a period of one (1) year for parts and for a period of one (1) year for labor from the date of original retail purchase. This warranty is enforceable only by the original retail purchaser and cannot be transferred or assigned. For the most effective service, the purchaser should register the purchase on the ALESIS website at http://www.alesis.com/support/warranty.htm.

During the warranty period ALESIS shall, at its sole and absolute option, either repair or replace free of charge any product that proves to be defective on inspection by ALESIS or its authorized service representative. In all cases disputes concerning this warranty shall be resolved as prescribed by law.

To obtain warranty service, the purchaser must first call or write ALESIS at the address and telephone number available on the Alesis Website to obtain a Return Authorization Number and instructions concerning where to return the unit for service. All inquiries must be accompanied by a description of the problem. All authorized returns must be sent to ALESIS or an authorized ALESIS repair facility postage prepaid, insured and properly packaged. Proof of purchase must be presented in the form of a bill of sale, canceled check or some other positive proof that the product is within the warranty period. ALESIS reserves the right to update any unit returned for repair. ALESIS reserves the right to change or improve design of the product at any time without prior notice.

This warranty does not cover claims for damage due to abuse, neglect, alteration or attempted repair by unauthorized personnel, and is limited to failures arising during normal use that are due to defects in material or workmanship in the product.

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