Chapter 9
DAT Archive Option

Multi-Track DAT Backup

This optional feature can be added to any Audicy, regardless of age. It lets you store library elements or complete productions — including all the individual tracks, mixer settings, production notes, and even the last Undo — quickly and easily on low-cost Data DAT tapes. Dozens of productions, or hundreds of library sounds, can be saved on a single tape.

We use cutting-edge computer technology to make the DAT Backup System fast and reliable. Unfortunately, this means a little computer knowledge is necessary to work it. You can't learn the Multi-Track DAT Backup System just by playing with it. A few introductory concepts are necessary.

Please read this chapter before using the DAT Backup System. Use the *Help* button while you're working to refresh your memory.

About The DAT Backup System

We designed our Multi-Track Backup System just like the rest of Audicy: It's easy to operate, works quickly[1], and doesn't compromise your audio.

You can use the system to:

- Keep Multi-Track "work tapes" of every job you do, to make reusing or changing productions easier;
- Organize seasonal or recurring projects for easy access without wasting hard disk space;
- Maintain libraries of effects or production elements, transferring just the ones you'll need to hard disk before starting a production;
- Move productions or libraries from one Audicy to another[2];
- Make perfect protection copies of important productions.

[1]Unfortunately, linear tape storage systems just can't work as quickly as Audicy's hard disk and RAM audio memory. So while it's fast, don't expect miracles.

[2]Though you may find Audicy's Jaz option to be more convenient for this.

DAT System Versus Audio Backups

You can save time and money using Audicy Multi-Track DAT Backup System instead of conventional ways to store productions:

- It's faster than dubbing individual tracks to audio tape;
- It preserves Locator points, mixer setups, and even the last *Undo*;
- There's no quality loss, since the signal stays in digital format.

About The Tape

The Multi-Track Backup System uses Data DAT cartridges. These look like standard audio tapes, but the tape is more reliable and the shells are more precisely built. These tapes aren't even officially "DAT": that stands for Digital Audio Tape. These are "4mm DDS data cartridges" available in various lengths at computer stores[3].

We'll still refer to the data tapes as DATs in this manual, since almost everybody in the computer industry does. Besides, it's a lot shorter than the official name.

Name-brand DATs cost as little as $6 at computer stores, and they're a bargain. A single 60-meter tape can hold about four hours' worth of Audicy audio[4]: under 3¢ a minute. While DATs come in 120 and 90 meter lengths, we recommend you use 60 meter tapes. We've found these to be a little more robust.

Do not put standard audio tapes into Audicy: You're almost sure to lose important data, and you might damage the drive.

While we're on the subject, resist the temptation to use DDS cartridges in an audio recorder. While the cartridges work in standard DAT machines, it's not a good idea to use them in that manner.

- If you record conventional audio anywhere on a Data DAT, the computer codes can get contaminated and the tape will be useless for data.

  Under these circumstances, data that's already on the tape will probably be lost.

[3]If you walk into a computer store and ask for a "60-meter Data DAT" or "4mm Cartridge," they should know what you mean. If they don't know, ask for a Hewlett Packard HP 92983A.

[4]Some lower-price brands of tape may give you marginal performance. If in doubt, go for the better tape, saving a dollar on stock doesn't mean much if it puts hours of productions at risk.

- Conventional bulk erasing won't fix a data tape that's had audio recorded on it.
- You can't play computer data through audio recorders. Audicy backup tapes are readable only on Audicys.

About the Hardware and Software

The Multi-Track DAT Backup System comes in two configurations. The Internal version mounts inside the System Unit case, and is powered by Audicy. The External version has a separate case and power supply, and can be up to 6 feet from the System Unit, with high-quality SCSI cables.

Both versions are based on a Hewlett Packard 35470 DDS Transport, an extremely reliable drive from the inventor of the Data DAT format. We've added custom Orban hardware and software drivers which communicate directly with the drive's firmware.

Using the DAT Backup System

Despite all the warnings, using the Multi-Track DAT Backup System is simple. There are just two things to do:

- Put a tape in the slot; and
- Choose a menu command and press *Enter*.

If you're using the Internal version of the Backup System, you'll see a tape drive on Audicy's System Unit, a few inches below the audio connectors. It has a single slot on it for the tape, two LED indicators, and an Eject button.

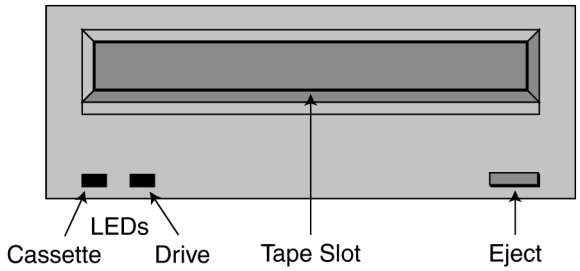

Figure 9-1: DAT Drive Faceplate

If you're using the External DAT drive, the front of the drive looks exactly the same, except it has an additional power-on LED. The power switch is on the rear of the unit.

The cartridges themselves look like audio DATs. They have a similar shutter, and a window where you can view the tape. Make sure the Write-Protect Tab is showing (you can slide it back and forth with a fingernail) before you insert a tape. Otherwise, you can't record on it.

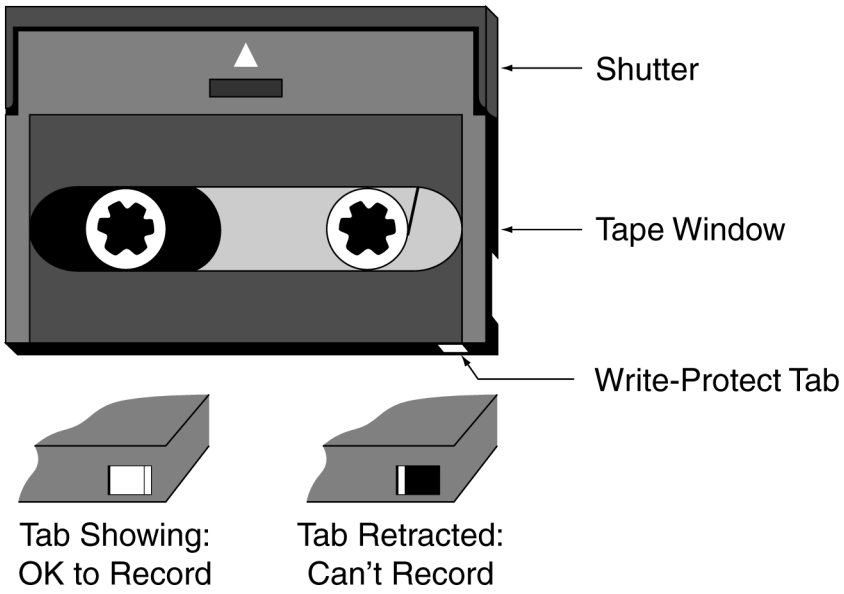

Figure 9-2: Data DAT Cartridge

Insert the tape into the drive shutter-side first, with the window facing up, and push gently. You'll feel the mechanism grab the cassette and pull it inside. Both lights on the drive will flash for about twenty seconds, while the tape is loading.

Backup System Menus

Our software lets you work the system from Audicy's Job Control screen. No computer commands are necessary. Most of the activities match ones you already know from Audicy disk operations.

There are a number of choices in the Job Controller that are active when you have the Multi-Track Backup System.

You'll notice the same archival choices under both the Production and Library headings. Tapes must be prepared to hold only productions, or only library sounds. You can't mix both on the same tape[5].

Except for one minor difference noted below, the similarly-named functions work the same under either menu heading. For simplicity, we'll discuss them as if you chose them from the Production heading. If you're working with Library sounds, make the appropriate mental adjustment.

[5]It's because the two kinds of files are organized differently on your hard disk.

Startup Sequence

The first time you press *Enter* on one of these menu choices after loading a new tape or restarting the Job Controller, the DAT system goes though a startup routine. The tape is locked in place and an identification header, including the tape's name and table of contents, is read into Audicy. This takes about thirty seconds, depending on the number of productions or sounds on the tape.

The system will remember a tape, as long as the tape stays in the drive and the Job Controller is on the screen. You can then use any other Job Control functions without going through the startup again.

Prepare DAT

Before you can use a tape the first time, press *Enter* on the sub-menu choice Prepare DAT. Use Production Manager: Prepare DAT for tapes that will archive productions and Library Manager: Prepare DAT for library sounds. The Job Controller checks the tape and determines whether the tape has been properly prepared for that kind of archive.

If the tape has already been prepared for Audicy backups, you'll see a confirmation screen identifying it. Check it before you continue: If there are any backups already on this tape, they'll be erased if you Prepare DAT again. Press *Esc* to cancel the operation, or *Enter* to proceed.

Audicy then shows you a standard form where you can enter a Tape Name, Creator, and Client Name. Use it just like the forms for naming new productions or library sounds.

If you're attempting to prepare a tape that's already been used for Audicy backups, you'll be given another chance to cancel by pressing *Esc*. If you don't cancel at this point, everything on that tape will be erased. (To see what productions are on the tape, press *Esc* and then choose *Restore*.)

Prepare DAT takes a little less than a minute for new or unidentifiable tapes, and about thirty seconds for tapes that have been already used for Audicy backups.

DAT Backup

Enter this choice from Production Manager to save a production to the backup tape. After the DAT startup sequence, you'll see a list of available productions on a hard disk — this can be your internal c:\ drive, or any externally-connected hard drive. Select a production by highlighting it, and *Enter*.

If you want to backup more than one production in the same operation, press *Set* as you highlight each one. A checkmark will appear next to each selected

production in the backup list. To remove a production from the list, highlight it and press *Set* again. After you've built the list, press *Enter*. Audicy will ask you to confirm that you want to backup all those productions: use the arrow buttons to select Yes to continue.

The Job Controller will then check the tape. If there isn't enough room to hold the selected productions, or the tape hasn't been prepared for Productions, you'll be notified and told how to prepare the tape.

Otherwise, you'll see a confirmation screen. You can *Esc* now to cancel, or *Enter* to continue.

Once a production has been backed up to DAT, you may Erase it from your hard disk. If you ever want to work on that production again, it'll be easy to get it back.

Not sure you've backed up a production before you Erase it? Don't worry. The Job Controller keeps track of which productions are backed up, and warns you if you try to erase one that isn't saved on DAT.

How Long Will A Backup Take?

Audicy has to do two things when it saves productions to DAT. First, it goes through some basic mechanical functions. These take about 25 seconds, regardless of the length of the production. Then it actually records the data. This happens a little less than three times faster than the audio it represents, at 32 kHz Sample Rate. Since there's more data to save at 44.1 kHz, backing up at that rate is about fifteen percent slower.

So a typical, heavy-production spot (e.g., a 60 second concert spot with four tracks of stereo music, an announcer and some sound effects that was digitally mixed onto a pair of Audicy tracks) might take about 2:30 to back up. This is considerably faster than dubbing individual tracks to an audio recorder.

Canceling A Backup In Progress

If you have to stop a backup, press *Esc*. This doesn't hurt the copy on your hard disk, but it does leave an unreadable partial archive for the production currently being backed up. If you're backing up a list of productions, any that have already completed will remain intact on the DAT tape.

The system has to clean up any partial archive before it can continue[6], and this might take longer than simply letting the backup finish. As a rule of thumb, there's no point escaping from a backup that has only a minute or so left to run.

Erasing A Backup?

Audicy will not let you erase an individual production or library sound from a DAT tape. This is to reduce unneeded wear and tear on the tape, and to keep all files stored on a tape in linear order. If you just backed up the wrong thing on a

[6]The process is called "flushing," so don't be upset if you see that term on the screen.

brand new tape, use Prep DAT to clear all archives off, and start over. If you have an archive that you know you'll never need stored with the good stuff, just ignore it.

DAT Restore

Press *Enter* on Production Manager: Restore to transfer a production from DAT back to a hard disk. The system will warn you if the tape isn't set up for productions; otherwise, you'll see a list of available productions on the tape (it looks like the list you see when you select Edit Old). Choose a destination hard drive and a production with the arrow buttons and press *Enter*. If you change your mind, you can *Esc* at this point.

If you want to restore a group of archived productions, you can build a list by highlighting each and pressing *Set*. A checkmark will appear next each set production. You can remove a production from the list by highlighting it and pressing *Set* again. When you're finished building the list, press *Enter* to continue.

Use Restore if you just want to check what productions are on a DAT. After you've examined the list, you can *Esc* and go onto something else.

Once you select a production and *Enter*, the system checks the selected hard disk to see if there's enough room to hold the audio. If there is, you'll see an estimate of how long the restore process should take. Press *Enter* to continue, or *Esc* to cancel.

How Long Does Restore Take?

Data DAT transports have to work a little harder to read data from a tape than to write it, so restoring a production takes longer than backing it up. The actual Restore time for a given production is about 30% longer than its usage. Our typical heavy-production spot would take a little less than eight minutes.

You can cancel a Restore safely while it's going on, by pressing *Esc*. The pieces of the production that have already been transferred to your hard disk will be unreadable, and Audicy will name them "Restore Incomplete!" Erase them when convenient, since they just waste hard-disk space.

Canceling Restore does not harm the DAT in any way. Whenever you want, you can go back and do a complete Restore of the same production.

Difference Between Production And Library Backups

There are similar choices for archiving Library sounds, under the Job Controller's Library menu heading. They work the same way.

Productions are often re-edited and changed, so Audicy lets you keep multiple versions on hard disk or backup tape. Each version is identified by the date and time you changed it, and those dates and times are displayed when you *Enter* most menu functions.

Library sounds can't be changed, so Audicy tracks them by creation date and time. This helps keep you from wasting space on multiple copies of the same sound. If you try to Backup a Library sound that's already on the tape, or to Restore one that's already on hard disk, the system will ask what to do with the duplicate, and overwrite it if you proceed.

DAT Usage

Enter this menu choice from Information Center menu, for information about the DAT tape in your drive. You'll see a display like the Disk Usage choice, also in the Information Center menu.

DAT Usage doesn't care if you're looking at Production or Library tapes; it'll give you full information on how the tape is being used, no matter how the tape was originally prepared.

Ejecting A Data DAT Tape

Press the Eject button on the front of the tape drive once it has stopped winding, lights have stopped flashing, and you are certain the drive is not in use. Once you press eject, the front panel LEDs will flash, the tape will automatically rewind to the head (this may take between fifteen and ninety seconds), and the cartridge will pop out.

Pull the tape gently from the drive. In some cases, if you pull too fast, the tape doesn't have time to retract into its shell, and it can get caught as the tape shell's hinge closes.

Under certain circumstances, if you press the Eject button while its activity lights are still flashing, before the drive is finished winding (even if the Audicy software says it is ready), your drive may fail to recognize the next tape you put in it. If you

experience this problem, restart your Audicy system by powering it off, then back on. This is a firmware issue with the drive, not with Audicy software. It is easily avoided by waiting for the drive to finish its operation before you press Eject.

If the tape is being used by any of Audicy's Backup functions — even a display of the tape's contents, or a simple confirmation screen — the Eject button will have no effect. If the drive's LEDs flash once, then stay lit, press *Esc* to cancel the current function and return to the main Job Controller screen, then press the Eject button again.

You don't have to wait while the tape is rewinding and ejecting. Once the process starts, you can go on to any other Audicy operation. But don't turn Audicy off — see the warning below.

As soon as you remove a DAT tape from Audicy, we recommend you open the Write-Protect Tab so the square hole is showing!

Otherwise, someone might accidentally record standard audio on the tape, making all the backups on that tape unreadable.

Shutting Down

As you can see, ejecting the tape takes a few moments after you press the button. Attempting to turn off Audicy during this process will probably damage the tape[7]. The LEDs on the front flash while the tape is moving or are otherwise in a vulnerable position. When in doubt, wait for the drive to stop.

The DAT drive has its own memory, and keeps on working while Audicy goes on to other things. This saves time in many cases, but it does mean the Job Controller might think things are ready for shutdown while the drive is still moving tape.

Always look at the DAT drive before ejecting the tape, or turning off the power.

If you see a flashing green or flashing amber light on the drive, WAIT!

Don't Be Afraid To Ask For Help

The Audicy Help System covers the entire Multi-Track Backup process. If you're unsure about any aspect of it, just highlight the appropriate command and press *Help*.

[7]What happens if the power goes out during a DAT operation? The tape can probably be repaired, but it takes a while. See the following pages.

Good DAT-Keeping

The warnings about tape in the front of this chapter are serious. Don't use standard audio DATs in your Audicy, and *never* try to record audio on a tape used for data.

Other than that, it's easy to take care of your tapes and Backup System:

- Make sure tapes are labeled "Audicy DATA," or something like that, so nobody tries to record audio on them.
- Open the Write-Protect Tab whenever the tape isn't in the Audicy DAT drive, so audio equipment can't record on it.
- Store the tape in its case, away from dust, heat, direct sunlight, or strong magnetic fields.

It's not a good idea to have a tape in the drive when you switch Audicy's power on or off. This can cause unnecessary wear on the tape, shortening its life.

Tape Life

Computer DAT tapes are pretty tough, but they're not immortal. A typical tape is good for about 2000 plays. There's no point to using marginal DATs. If you have any doubts about a particular tape, or if it's old or dirty, use a new or different one.

- Tape is mechanical. It *will* wear out after too many plays. Keep a stock of new tapes on hand — and if something's really important, save it to more than one tape.
- When a tape wears out, it's gone. It can't be fixed by running Prepare DAT again. Restore any important productions on it, and save them to a new tape.
- Tape is cheap. Your time is expensive. If in doubt, start a new one.
- If a tape starts having problems backing up or restoring, it may be telling you that its almost worn out. Put a questionable tape in write-protect mode, and try to restore what you can salvage from it.
- Don't try to pinch micro-pennies by jamming too many productions on a tape or by using extra-long ones. Standard Hewlett Packard 60 meter tapes have proven to be the most reliable.

- DAT drives wear out too. If brand new tapes are giving you problems, your drive may be going bad. Under heavy use, DAT drives may wear out in a couple years or less.

System Cleaning

DAT tape heads, like analog tape heads, should be cleaned periodically. We recommend cleaning the drive every 25 hours of tape use, using a special Data DAT cleaning tape.

Audicy automatically tells you when it's time to clean the heads. After 25 hours of use, a warning screen appears. You can suppress the warning and continue, and the reminder will come up again. Or you can clean the drive and confirm that you've done so. This resets the timer for another 25 hours.

To clean the drive, simply insert the cleaning tape that came with the Backup System, and wait a few seconds. It'll automatically eject when it's done.

Mark the cleaning tape each time you use it, and discard it after 25 uses. Then get a new tape. We recommend the Hewlett Packard HP-92283K, available from computer dealers or Orban.

Wipe dust off the outside of the drive with a soft cloth. Never stick anything inside the drive other than Data DAT and cleaning tapes.

And while a little cleaning is good, a lot of cleaning is not necessarily better! Cleaning tapes actually put wear on the heads. Don't over-clean your tape drive.

DAT Drive Front Panel Lights

The DAT Drive's front panel has two bi-color LEDs, that can glow green or amber, steadily or pulsing. If you're used to the way they flash during normal operation, you'll probably be able to spot trouble conditions before they hurt your production.

Usually, green means everything is okay, and amber means some operations are prevented.

If the LED on the left shows steady amber, it means the DAT's Write-Protect Tab is slid into the cassette, and recording is impossible. If the LED on the right shows steady amber, there's a tape or hardware problem. Use the following table to determine if it's something you can fix, or call Orban.

Normal Conditions

Cassette Light	*Drive Light*	*What it Means*
FLASHING GREEN	FLASHING GREEN	Tape loading or unloading.
GREEN	GREEN	Tape loaded and on-line (ready).
GREEN	FLASHING GREEN	Tape loaded and working.
GREEN	OFF	Tape loaded but off-line (not available).
PULSING AMBER	GREEN	Write-protected tape loading/unloading.
AMBER	GREEN	Write-protected tape on-line.
AMBER	FLASHING GREEN	Write-protected tape is working.
AMBER	OFF	Write-protected tape loaded but off-line.

Error Conditions

Cassette Light	*Drive Light*	*What it Means*
GREEN	FLASHING GREEN	Tape is worn. Be careful.
AMBER	AMBER	High humidity or SCSI isn't terminated.
PULSING AMBER	PULSING AMBER	Self-test underway.
PULSING AMBER	AMBER	Self-test failure.

Too much humidity can make the tape stick to the rotating heads. If the system finds that the tape is too damp (both lights will be steady amber), it will eject it and wait until things dry off.

Since most control rooms are air-conditioned, this shouldn't usually be a problem. But be aware that a very cold DAT tape — one left overnight in a car during Winter, for example — might get condensation on it when you bring it inside. As a general rule, don't insert a DAT tape that's colder than room temperature.

Sharing Productions With The DAT Backup System

While Audicy's Jaz option may be more convenient for this purpose, you can use backup DATs to:

- Share productions and library sounds;
- Move tapes from one studio to another, so different producers can work on them;
- Even use a single external DAT drive with more than one Audicy.
- Restore Productions and Library Sounds originally archived on Orban's first generation of workstations: DSE 7000 and DSE 7000FX[8].

Memory Limits

Different Audicys and DSE 7000s might have different amounts of memory installed, anywhere from four minutes on early DSEs to over two hours. Any production created on a smaller system can be opened on an equal or larger one with no trouble.

Productions from bigger Audicys, however, can't be opened on smaller systems unless the memory has been deliberately limited. This applies even if a production doesn't use a lot of audio, since Audicy saves important information throughout the available audio memory.

To check how much memory is installed in any Audicy, *Enter* on About in the Job Controller's Information Center[9] menu.

When you start a new production, you can set a Record Limit as part of the naming process. Choose a limit matching the smallest system that will work on the production.

This forces the larger system to keep its information where the smaller one can find it. (It also means you can't use all the memory of the larger Audicy for this production.)

For more information, see "Record Limit" or "defaults" in Chapter 3.

Library sounds aren't affected by system memory size, unless the sound itself is bigger than the system. Since sounds are seldom as long as four minutes — the smallest possible (and largely obsolete) DSE 7000 — this shouldn't be a problem.

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[8]The DSE 7000s should be running DSE Software Version 6.6 or higher for best compatibility. Productions created on Audicy are backward compatible to DSE 7000s running DSE Version 6.6.

[9]System menu in DSE 7000s.

Using The Backup Hardware On Multiple Systems

You can move our External DAT drive from one Audicy to another, if you follow a few simple precautions.

Each software disk is matched to specific DAT hardware. You may install the same software on multiple Audicys, but use it only with the DAT drive it came with. Don't try to use the software with a different Orban or third-party drive, and don't try to install Audicy's DAT software in a DSE 7000.

- Each Audicy must be equipped for external drives. Modifying an existing system takes only a few minutes, and is explained in the installation chapter of this manual.

Audicys equipped for external drives are vulnerable. High-speed system and audio data has to be available at the SCSI connector. **If this connector isn't handled properly, productions — and even parts of the Audicy system — can be destroyed.**

Audicys equipped for external DAT drives require an Orban Active SCSI Terminator. This must be connected at all times. Running the system without a terminator may cause total system failure!

The terminator is a small connector that plugs into a SCSI connector, either on the drive or on the System Unit.

Each system must have a terminator whenever it's turned on. If the drive is connected, plug it into the back of the drive. Otherwise, plug the terminator directly into the System Unit.

Therefore, you'll need one Active Terminator for each Audicy that's been equipped for an external DAT drive. If you're unsure whether an Audicy is set up this way, look for a warning label on the System Unit.

The point is, each Audicy system that's equipped this way should have a single Active Terminator connected at all times — either to the drive, or to the System Unit itself.

If you're using a single drive with multiple Audicys, get additional Active Terminators from Orban. Most terminators sold at computer stores don't have the proper circuitry inside them to protect Audicy's high-speed data.

Always turn both Audicy and the external drive <u>OFF</u> before changing SCSI connections. Failure to do so can cause serious hardware or file damage.