

How to Import and Export SD and HD(V) Content with the Grass Valley Turbo iDDR

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Introduction

The Grass Valley™ Turbo™ intelligent Digital Disk Recorder (iDDR) and playback system has increased in popularity since its introduction to the professional audio/video (A/V) market. And with good reason: it offers a cost-effective alternative to multiple VTRs for standard- and high-definition recording (SD and HD) and playback for live event and fixed facility media usage.

The Turbo platform is a bridging product between a traditional VTR-type product and a video server—one that builds on PC technology to offer a complete system that can function as a professional A/V center all in one package.

This application note details how the Turbo iDDR can import and export content and material in a variety of file types and formats using a built-in software application. You can operate this application via the iDDR's front panel or using its AppCenter workstation mode.

Step 1: Importing Content In Work Station Mode

With the Turbo iDDR operating in its Work Station view, pull down the Clips menu and click on Import. You will see that you can import from another Turbo unit via Stream or a File from a connected device or drive.

Click on My Computer from the AppCenter Import screen and you will see a familiar view of devices (Figure 1); any file type that Turbo can import will show up in its view. Double click on the file you want to Import and the name will appear in the lower part of the screen. Press OK and the content will start being transferred to the Turbo unit's internal hard drives.

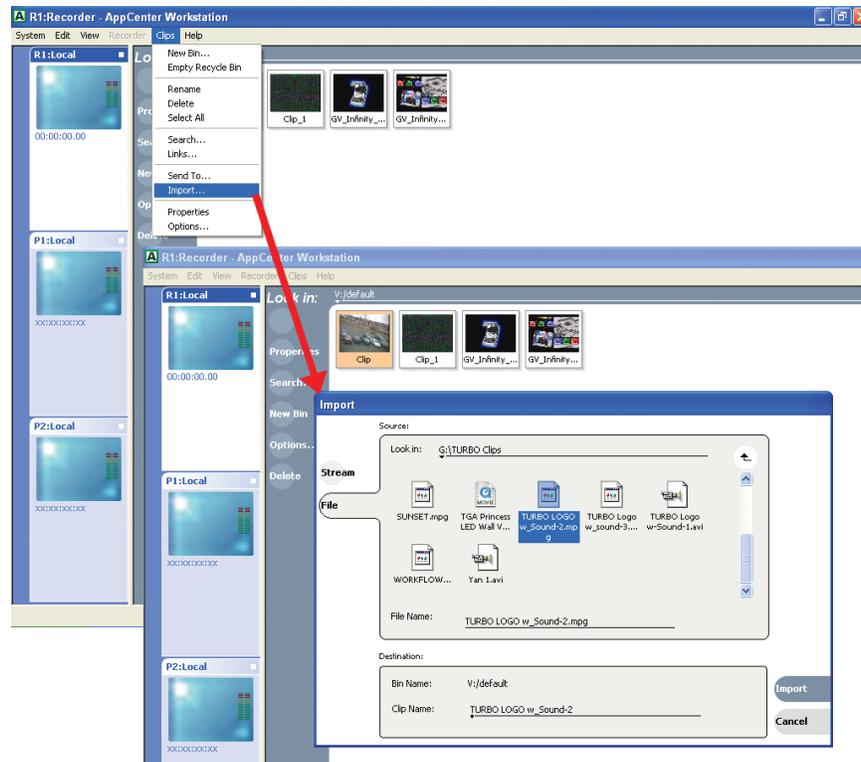


Figure 1 – Import drop-down menu and file import selection screens.

For this example, we are going to import an MPEG-2 file from a connected USB 2.0 disk drive. However, the iDDR can also import AVI (DV25), QuickTime, Windows Media Video (WMV), WMV HD, wrapper types, and many different still-type files and create clips that you can play back on either of its playout channels. The iDDR imports files into the MPEG-2, 4:2:0, Long GOP compression type. It keeps SD clips in their original bit rates or, if they are transcoded, generates a 15 Mb/s clip. And it processes HD files into 25 Mb/s clips.

You can import content into an iDDR via numerous connections, including, USB 2.0, IEEE 1394 (FireWire), Gigabit Ethernet, and shared drives. You can also connect devices such as DVD ROM disks, USB sticks, disk drives, and Iomega REV removable media drive with the Turbo-R model—even DV and HDV camcorders or VTRs—to the iDDR's FireWire connection. You can control the transport controls of these devices using the Turbo buttons, much operating nonlinear editor. As well, certain HDV cameras provide a live MPEG-2 transport stream that you can record by putting a Turbo Record channel in IEEE 1394 input mode and pressing Record.

Table 1 lists the most efficient parameters for importing MPEG-2 files into the Turbo system.

Standard	Resolution	Field Order	Color Sample	Bit rate	Frame Rate	Aspect Ratio
SD (NTSC)	720 X 480	Top field first	4:2:0	Equal to or less than 20 Mb/s	29.97 fps	4:3 or 1:9
SD (PAL)	720 X 576	Top field first	4:2:0	Equal to or less than 20 Mb/s	25 fps	4:3 or 1:9
HD	1920 X 1080	Top field first	4:2:0	Equal to or less than 25 Mb/s	25 or 29.97 fps	16:9
HDV-1 (JVC)	1280 X 720	Progressive	4:2:0	Equal to or less than 25 Mb/s	25 or 30 fps	16:9
HDV-2 (Sony, Canon)	1440 X 1080	Top field first	4:2:0	Equal to or less than 25 Mb/s	25 or 29.97 fps	16:9

Table 1 – Best MPEG-2 import parameters.

Step 2: Monitoring Content Transfer

You can monitor the importation of a file via the Turbo platform's built-in **Transfer Monitor** application. You can bring up this application by going to the System pull-down menu and clicking on Transfer Monitor. You can also start the application by clicking on the Transfer Monitor icon in the lower right-hand part of the screen which indicates that a transfer of some type is going on. When the application comes up, you can select to view a receiving, sending (export), or completed transfers.

In this example, we show a clip being received (Figure 2). The monitor shows the bit rate at which the transfer is occurring and approximately how much time is left in the transfer process. This display can be very useful in characterizing your workflow tasks and highlighting the software transcoding time that the iDDR uses when transferring clips to the internal MPEG-2 format.

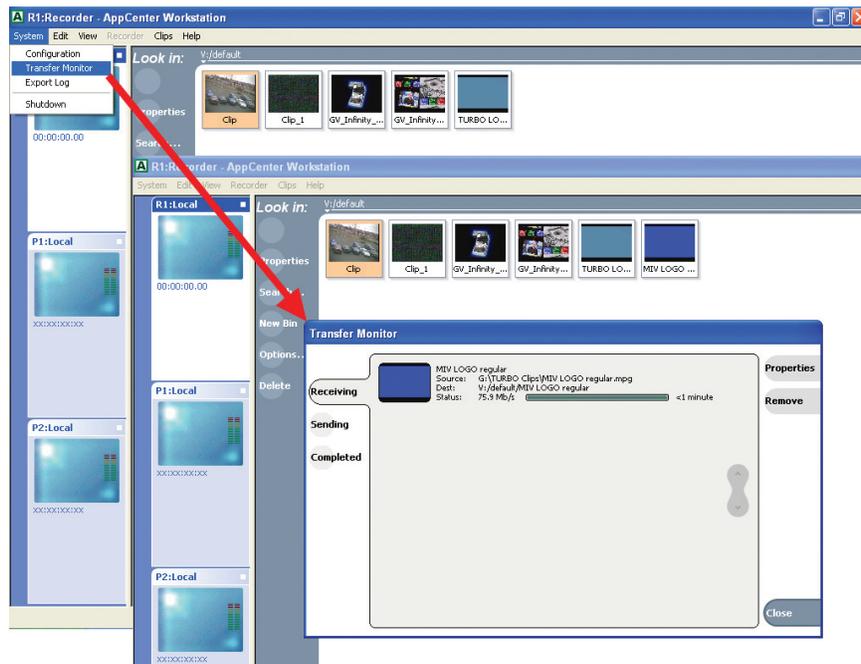


Figure 2 – File transfer monitoring screen.

Step 3: Playing Back Imported Content

A few seconds after you start to transfer a clip, its thumbnail icon will show up in the selected bin (Figure 3). To select the clip from the iDDR's Front Panel, simply push the Clips button, use the Jog/Shuttle knob to scroll through the clips in the selected bin (notice how the blue LEDs light up behind the knob indicating that you are in a menu-type operation), and push the knob in and the highlighted Clip will be loaded into the selected Player Channel. Push the Play button and the Clip will start playing.

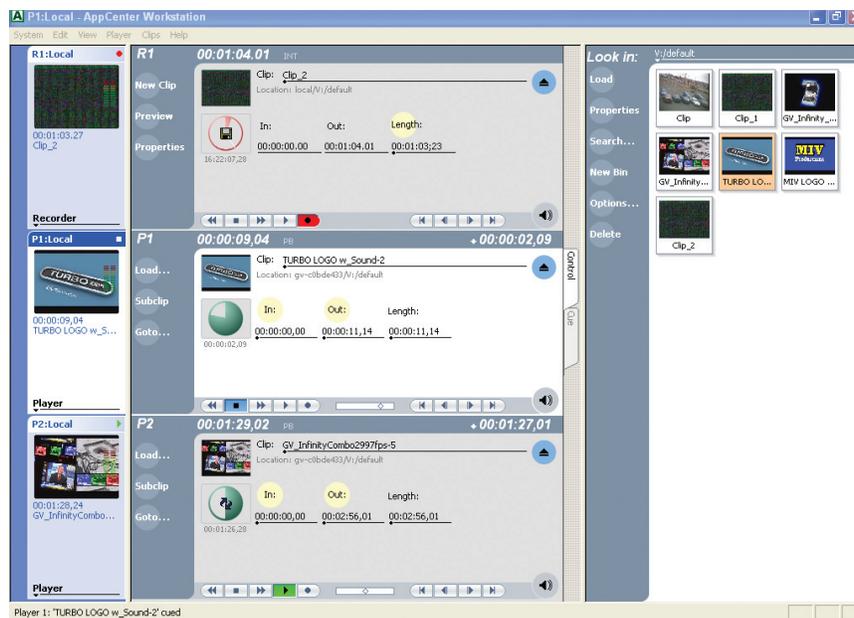


Figure 3 – Turbo workstation screen showing record channel and two player channels with clips bin.

In the iDDR's **Work Station** mode, you can load a clip by dragging it from a bin to a Player Channel. You can also double click on the clip; it will be loaded into the highlighted Player Channel automatically. To begin playback, push the Play button in the Player Channel or push the space bar key on the keyboard; you can also push the space bar to stop the Clip (helpful hint: the iDDR has a number of keyboard keys highlighted in the built-in help menu).

You are now free to trim the clip, create sub-clips as well as make playlists from clips and sub-clips by putting the Player Channel in Play List mode.

Step 4: Exporting Clips

Exporting clips from Turbo in various file types is just as easy as importing them. You simply highlight the Clip that you want to export in the clips bin and then click on the Clips pull-down menu in the workstation view. Under the Clips menu, click on **Send To (Export)**. You will see that you get a similar screen to the Import screen.

The Send To menu allows you to export a clip by various means. You can send it to another bin in the **Turbo Clips Bin management system**, stream it to another Turbo device on a Gigabit Ethernet network at very high speed, or export it as a File to devices that were outlined in Step 1 above.

In this example, the selected file is being exported to the Turbo-R unit's built-in Iomega REV drive for archiving. You will see that there is a pull down menu with in the Export screen that allows you to select different wrapper types to send the file out as (Figure 4). The wrapper types are MPEG-2, which is standard to the Turbo platform, GXF (SMPTE 360M), AVI to make DV25-type clips, and WMV. For WMV, Turbo can export SD clip at selectable bit rates to enable you to create Web-based streaming files for use on a separate streaming server. You can also create WMV HD clips from Turbo HD Clips.

So once you pick the output file type, press OK and the clip is on its way. You can monitor progress of the transfer using the Transfer Monitor as you did in Step 2 and clicking on the Send To button. It is just that easy.

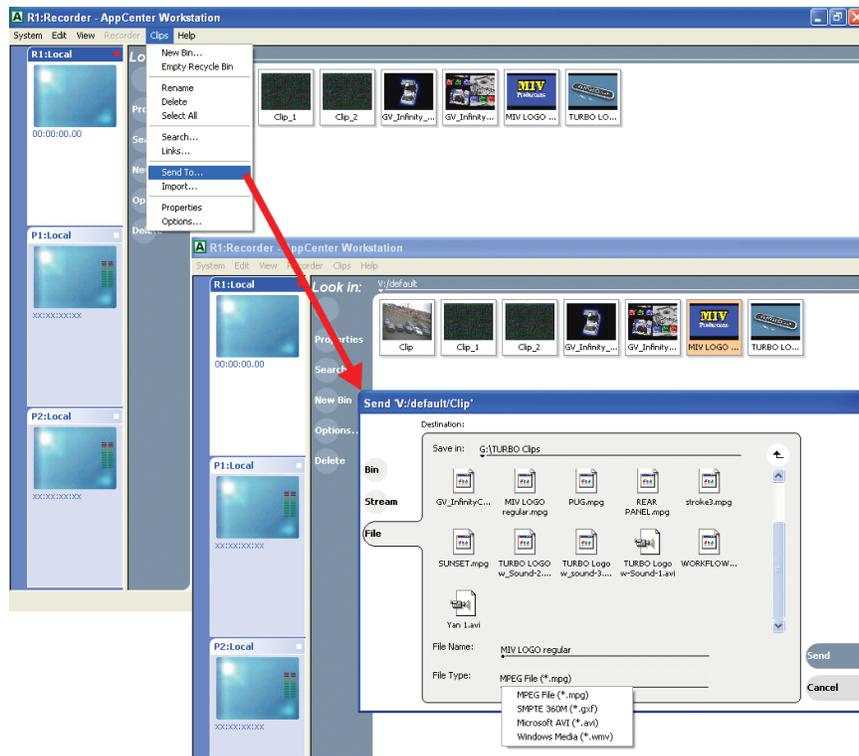


Figure 4 – Export (Send-To) drop-down menu and file export selection screens.

Step 5: Compatibility Chart

The Turbo system's import and export capabilities are very versatile. Table 2 outlines the various types of files it can support.

Type	HD or SD	Comments
Importing		
MPEG-2	Both	Turbo native format – use for fastest imports and archive applications
AVI Wrapper	Both	Best used for AVI DV 25 – Turbo iDDR transcodes DV 25 to 20 Mb/s MPEG-2, 4:2:0 Long GOP
QuickTime	Both	Can be used for QuickTime DV25, animation CODEC, uncompressed, and H.264 with Turbo 2.2 software
Windows Media Video	SD	WMV-encoded clips are transcoded into Turbo MPEG-2 files
WMV HD	HD	Great way to get low bit-rate HD content into Turbo unit and have it look very good – demo content available on Microsoft Web site
GXF (SMPTE 360M)	Both	Used by Turbo units for streaming over Ethernet
DVD .vob files	SD	Non-copyrighted DVD .vob MPEG-2 on DVD. Files can be imported from the VideoTS folder – bit rate is kept the same as .vob file
Exporting		
MPEG-2	Both	Turbo native format – use for fastest export and archive applications
AVI Microsoft	SD	Export Type 1 or Type 2 DV25 files for NLEs
Windows Media Video (WMV)	SD	Exporting SD files at lower bit rates creates small file sizes for Web, though it does take some time to SW transcode
WMV HD	HD	Good for lower bit-rate HD files to play on PCs
GXF (SMPTE 360M)	Both	Used by Turbo units for streaming over Ethernet

A product manager for Grass Valley, Matt Ivey has been in the broadcast and professional video industry for more than 28 years. He has been helping to bring state-of-the-art products to market that allow people to realize better workflow efficiencies through progressive technology designs.

More information about the Turbo iDDR, including a detailed product sheet, is available at www.thomsongrassvalley.com/turbo.