



## *Ethernet Output Module*



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Patents. Various technology in the GlobeCaster System is patented in the United States, including without limitation patent numbers 5,941,997, 5,978,876, 5,872,565. Other patents, in the United States and other countries, are pending.

Acknowledgments. The Software is based in part on the work of the Independent JPEG Group. Artbeats Software, Inc. provided visual imagery for the Fire, Arc, Bloom, Cityscape, Waterfall, Smoke, Twwater, and FireStage effects.

## Ethernet Output Module

The purpose of this addendum is to provide you with an overview of the Ethernet Output Module. This addendum contains the following sections:

- How do We Define Streaming? .....4
- Features and Specifications of the Ethernet Output Module .....4
- Installing the Ethernet Output Module into a Studio Unit .....11
- Installing the Ethernet Output Module into a Live/Post Unit.....16
- Setting up Streaming Capabilities on a Media Encoder.....21
- Setting up Your GlobeCaster with a Media Encoder .....22
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### **How do We Define Streaming?**

Streaming is a technique for transmitting data in such a way that it can be received by a client and processed in a steady and continual stream to display audio and video over a network.

In the past, users had to download an entire file to their computer before they were able to view it. With streaming, the user doesn't have to wait and download the entire file before viewing. They can view the audio and video data as it is downloaded.

### **Uses for Streaming**

With the Ethernet Output Module in your GlobeCaster system, you can create and broadcast both audio and video.

Uses for streaming include:

- Live broadcasting of corporate presentations, distance learning, live entertainment broadcasting, etc.
- Video on Demand. Audio and video streams can be saved to a file that can be requested on demand by users on your local network or the Internet. This is also an efficient way of archiving live productions for later viewing.

### **Features and Specifications of the Ethernet Output Module**

- Auto-negotiating Ethernet 10/100Base-Tx Output module
- SMPTE 125M/ITU-R 601 BT component digital video output taken from GlobeCaster motherboard
- Programmable scaling ratio applied to output video
- Two-channel audio output, 16-bits per sample per channel, 48,000 samples/s taken from the GlobeCaster TDM bus
- Video scaling performed by hardware. Scaled sizes include 640 x 240, 320 x 240, 160 x 120, and many others in-between
- Video format conversion performed by firmware. Supported video formats include: UYVY (YUV 4:2:2), YV12, YVU9, RGB24, RGB16

### **Line Interface**

- Conforms to IEEE802.3 standard for 100Base-TX interfaces

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- IEEE 802.3u Auto-Negotiation between 10Mbit/s, half-and full-duplex operation
- Two shielded RJ45 jacks, one wired for connection to a hub or router, the other wired for connection to an NIC in a personal computer

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**Back Panel** Here is a view of the back panel of the Ethernet Output Module.

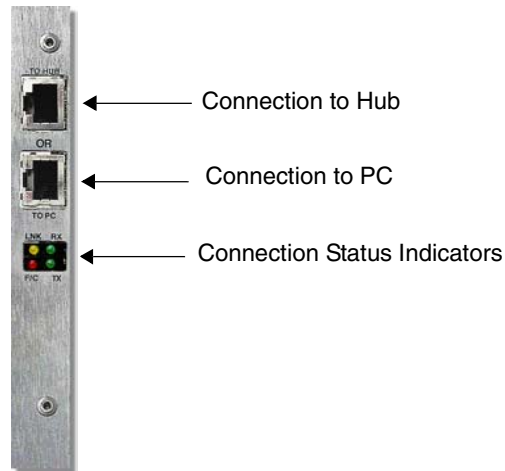


Figure 1.1: Back Panel of Ethernet Output Module

**NOTE:** You can have only one network connection at a time.

### Connection to Hub

Use this port when connecting to network equipment such as a hub, router, repeater, etc. To utilize this connector, use a category 5 or 5e cable with a non-keyed, 8-conductor RJ45 plug.

### Connection to PC

Use this port when connecting to a Network Interface Card (NIC) of a personal computer. To utilize this connector, use a category 5 or 5e cable with a non-keyed, 8-conductor RJ45 plug.

**Connection  
Status  
Indicators**

These indicators light up depending on your connection situation.

**RX**—lights green when receiving packets

**TX**—lights green when transmitting packets

**LNK**—lights yellow when a connection is made

**F/C**—lights red with full duplex mode (able to transmit and receive simultaneously) and lights in half-duplex mode if there are packet collisions

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**Side View** Here is the side of the Ethernet Output Module. For connection purposes, it is important to take note of where certain headers are located.

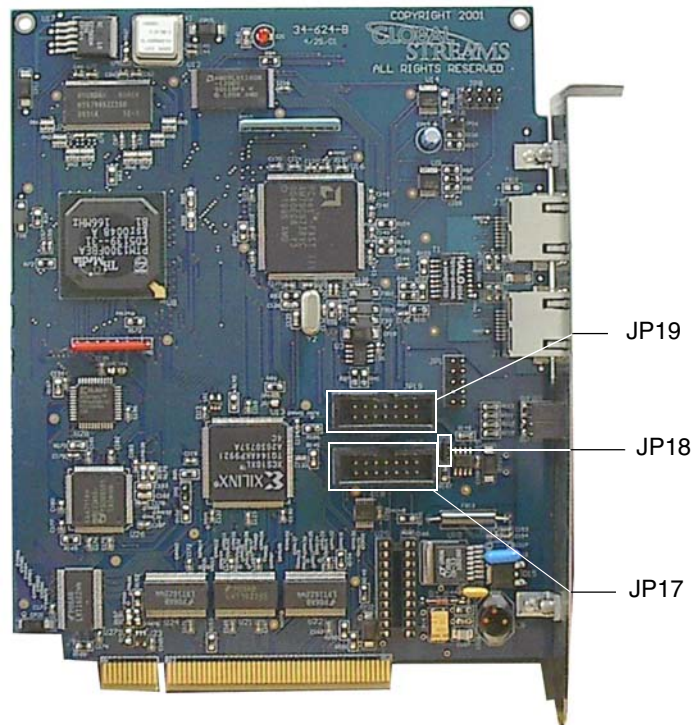


Figure 1.2: Side View of Ethernet Output Module

**JP17** Shrouded header that can receive the TDM ribbon cable.



- JP18** Header that comes with a jumper attached to it. Make sure that this jumper is on JP18. If you intend to install more than one Ethernet Output Module, you would need to remove the jumper from one of the Ethernet Output modules. Please see “Installing more than one Ethernet Output Module” on page 15.
- JP19** Shrouded header that can receive the TDM ribbon cable.

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### **Electrostatic Discharge**

First and foremost! Before installing the Ethernet Output Module (or any card) into your GlobeCaster, you must take a moment and read about preventing electrostatic discharge (ESD). While this may seem redundant to some, for others, this may be an important step.

Almost everyone is aware of static electricity and its effect when you rub your feet on the carpet and touch another object. But did you know how damaging static electricity can be to computer components?

For a human being to feel a static shock, the voltage must be around 1,500 volts. Really nasty shocks can be over 30,000 volts! Electronic components can be damaged by much lower voltages, about 20-30 volts. Therefore, the static electricity your body accumulates is enough to damage circuit boards by merely touching them.

Sometimes ESD damage is not readily apparent, and can cause a board to fail months after it was improperly handled. To avoid this type of failure, please take the following steps when working inside your GlobeCaster:

1. Remove any articles of clothing that gather static electricity. Wool sweaters are especially prone to this.
2. Work on the GlobeCaster in a reasonably ESD-free area. Don't work on the unit if it's sitting on a shag carpet.
3. When working on the GlobeCaster, keep it turned off and unplugged.
4. Before touching any boards inside GlobeCaster, touch the edges of the chassis *lightly* to discharge any static buildup you may have.
5. Handle only the boards you need to handle.

An ESD wrist strap can be found at most electronic supply houses, and ensures that your body does not have any static charge. Having an ESD wrist strap is recommended, but not required. Attach the alligator clip of the wrist strap cord to the GlobeCaster chassis or another common ground point.

Having said this, it's time to move on to installing your Ethernet Output Module.

## Installing the Ethernet Output Module into a Studio Unit

1. Turn off the power to the GlobeCaster.
2. Unscrew the three thumbscrews along the edge of the top cover.
3. Slide the top cover approximately one inch toward the back, and lift off.
4. Unscrew the thumbscrews on the retaining bars running across the GlobeCaster (figure 1.3).

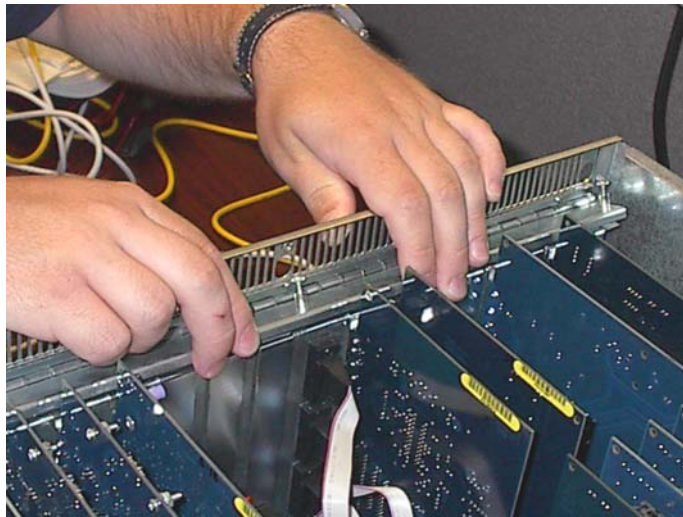


*Figure 1.3: Removal of Retaining Bar*

5. Remove the retaining bars.

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6. In order to access the I/O slots, you need to loosen and lift up on the rear lock-down panel (following figure).



*Figure 1.4: Lifting Up the Rear Lock-down Panel*

7. On the motherboard, the Ethernet Output Module can fit into any open input/output module slot (following figure).

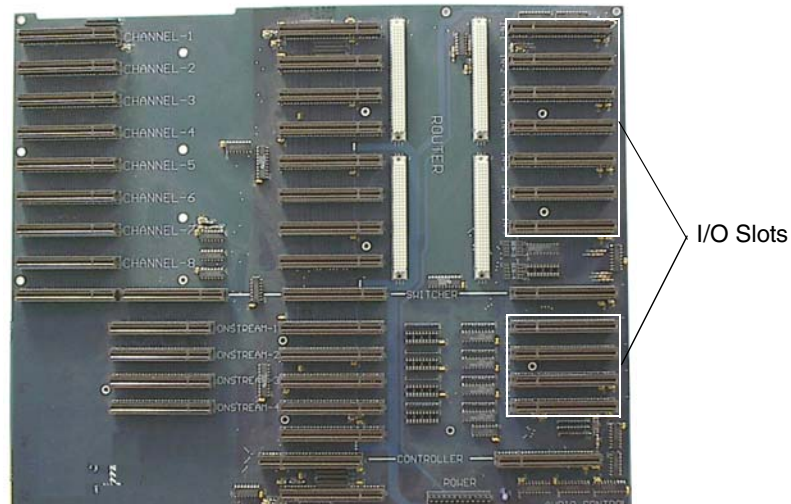
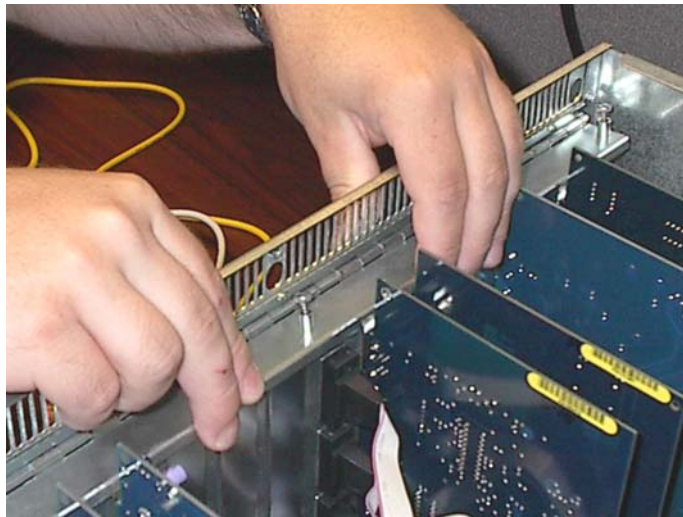


Figure 1.5: GlobeCaster Studio Motherboard

8. Before you insert the Ethernet Output Module into your GlobeCaster, you must make a connection from the Ethernet Output Module to the Audio Router. Using the provided TDM router 14-pin cable, connect one end to the JP17 or JP19 header (see figure 1.2) on the Ethernet Output Module. Connect the other end to any open header (channel) on the Audio Router.
9. With those connections in place, you can insert the Ethernet Output Module into the open I/O slot. Ensure that the TDM 14-pin cable runs up and over any adjacent I/O cards without any folds or twists.

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10. Push down the rear lock-down panel and re-tighten (following figure).



*Figure 1.6: Pushing Down on the Rear Lock-down Panel*

11. Re-attach the retaining bars and screw them into place.
12. Place the top cover back on the GlobeCaster.
13. If you are using a software version earlier than 2.6, you must install the **System** and **Application Software** on the GlobeCaster CD that came with the Ethernet Output Module.

### Testing Your Connection

1. Insert a Category 5 or Category 5e cable into the Ethernet Output Module. If you are connecting to a network hub or a router, use the **To Hub** port. If you are connecting to a network card on a personal computer, use the **To PC** port. For more information on connections, please see “Setting up your GlobeCaster with a Media Encoder” on page 22.
2. With everything in place, turn on the power on the GlobeCaster.

3. After you've made the connections to the network, load a GlobeCaster program, look for the yellow **LNK** light to illuminate. This will ensure that your module and connections are correct.
4. If your light does not illuminate, check your network connection.

### Installing more than one Ethernet Output Module

It is possible to install more than one Ethernet Output Module into your GlobeCaster system. If you choose to do so, it is preferred that you *daisy chain* your modules together. The process of daisy chaining involves using the same channel on the Audio Router.

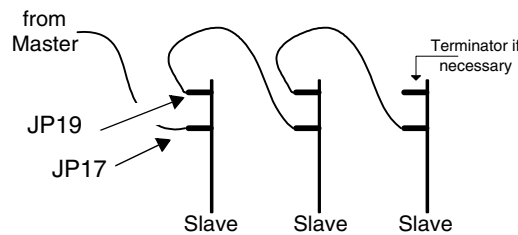


Figure 1.7: Daisy Chain Method

In figure 1.7, each slave represents one Ethernet Output Module. The cable from the master is attached to an open channel on the Audio Router. The TDM ribbon cable is attached to JP17 of the first module. Each Ethernet Output Module comes with its own TDM ribbon cable. Using the next ribbon cable, attach one end to JP19 of the first module and the other end to JP17 of the second module. Repeat this process until you come to the last module. Every module except the last module *must* have the jumper on JP18 removed. Only the last module can have the jumper on JP18.

### **Installing the Ethernet Output Module into a Live or Post Unit**

*The installation procedures for the Ethernet Output Module are the same for both GlobeCaster Live and GlobeCaster Post.*

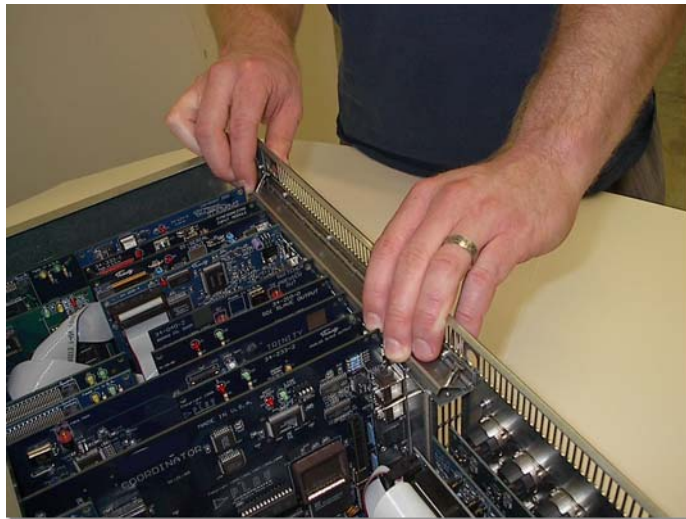
1. Turn off the power to the GlobeCaster.
2. Unscrew the three thumbscrews along the edge of the top cover.
3. Slide the top cover approximately one inch toward the back, and lift off.
4. Unscrew the thumbscrews on the retaining bars running across the GlobeCaster (next figure) and take them off.



Figure 1.8: Removing the Retaining Bars



5. In order to access the I/O slots, you need to loosen and lift up on the rear lock-down panel (following figure).



*Figure 1.9: Lifting up the Rear Lock-down Panel*

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6. On the motherboard, the Ethernet Output Module can fit into any open input/output module slot.(following figure).

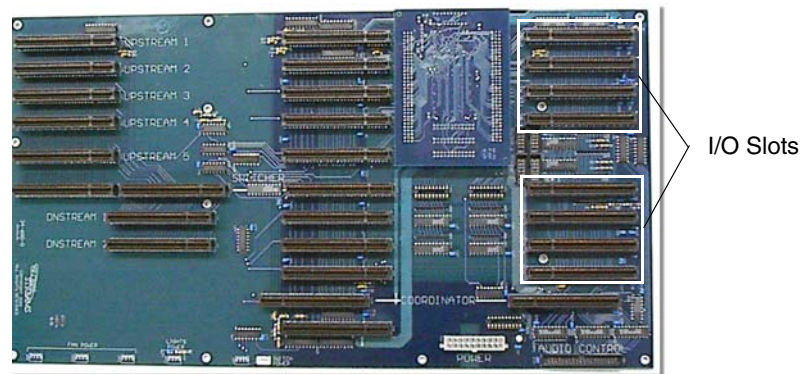


Figure 1.10: GlobeCaster Live/Post Motherboard

7. Before you insert the Ethernet Output Module into your GlobeCaster, you must make a connection from the Ethernet Output Module to the Audio Router. Using the provided TDM router 14-pin cable, connect one end to the JP17 or JP19 header (see figure 1.2) on the Ethernet Output Module. Connect the other end to any open header (channel) on the Audio Router.
8. With those connections in place, you can insert the Ethernet Output Module into the open I/O slot. Ensure that the TDM 14-pin cable runs up and over any adjacent I/O cards without any folds or twists.

9. Push down the rear lock-down panel and re-tighten (following figure).



*Figure 1.11: Pushing Down on the Rear Lock-down Panel*

10. Re-attach the retaining bars and screw them into place.
11. Place the top cover back on the GlobeCaster.
12. If you are using a software version earlier than 2.6, you must install the **System** and **Application Software** on the GlobeCaster CD that came with the Ethernet Output Module.

#### **Testing Your Connection**

1. Insert a Category 5 or Category 5e cable into the Ethernet Output Module. If you are connecting to a network hub or a router, use the **To Hub** port. If you are connecting to a network card on a personal computer, use the **To PC** port. For more information on connections, please see "Setting up your GlobeCaster with a Media Encoder" on page 22.
2. With everything in place, turn on the power on the GlobeCaster.

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3. After you've made the connections to the network, load a GlobeCaster program, look for the yellow **LNK** light to illuminate. This will ensure that your module and connections are correct.
4. If your light does not illuminate, check your network connection.

If you would like to install more than one Ethernet Output Module, please see "Installing more than one Ethernet Output Module" on page 15 for more information.

## Setting up Streaming Capabilities on a Media Encoder

The first step in setting up the encoder is to understand what a media encoder is and what the hardware/software requirements are to stream audio and video over a network.

**NOTE:** In order to stream audio, you must have a TDM router installed.

### How we define Media Encoder

A Media Encoder is a PC running special encoding software used to compress and stream the output of the Ethernet Output Module. The video and audio that streams out of the Ethernet Output is a high quality, uncompressed stream with a much higher data rate than is suitable for the Internet or most networking uses (35Mbits/Sec is typical for a 320x240 30fps stream). The Media Encoder takes the Ethernet Output stream and compresses it to a lower data rate. The data rate you choose depends on your application. Most encoding software will provide default settings to match different viewer needs such as 56K modem speed, DSL/Cable Modem speed, and higher. The goal is to find the highest quality stream that will still fit within the bandwidth constraints of the viewer. For example, a home user is probably willing to view a stream that uses the maximum bandwidth of their Internet connection. Alternatively, in a corporate environment, the stream must compete with other business related data, so it shouldn't take up all of the space on the 10Base-T or 100Base-T LAN.

### Encoder Requirements

Here are the minimum hardware/software requirements for the encoder:

- Dual Pentium III 800 Processors
- 256MB RAM
- Intel Pro 100 + Network Card (or)
- Netgear FA310TX 10/100 NIC
- Windows2000 or
- Windows NT 4 (Service pack 6 and Direct X Media Runtime 6)
- Supported encoding software includes: Windows Media Encoder 7, Windows Media Encoder 4, and Real Producer

### Setting up your GlobeCaster with a Media Encoder

This section is intended to provide you with illustrations on how to make the necessary connections between your GlobeCaster and an media encoder.

#### Using the To PC port on your Ethernet Output Module.

The following diagram illustrates how to set up your connection through the **To PC** port.

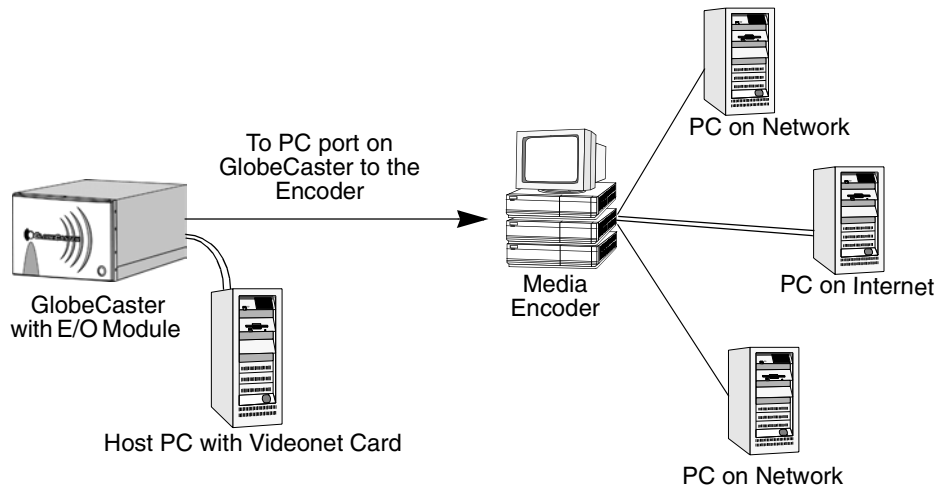


Figure 1.12: Connecting Using the To PC Port

In figure 1.12, a category 5 cable is connected from the **TO PC** port on the Ethernet Output Module. The cable is then connected to a network card on your media encoder. The media encoder often has two network cards. One is connected to the GlobeCaster and then accepts a high bandwidth audio/video stream. The second card streams one or more lower bandwidth Internet or LAN streams.

### Using the To Hub Port on your Ethernet Output Module

The following diagram illustrates how to set up your connection through the **To Hub** port on your Ethernet Output Module.

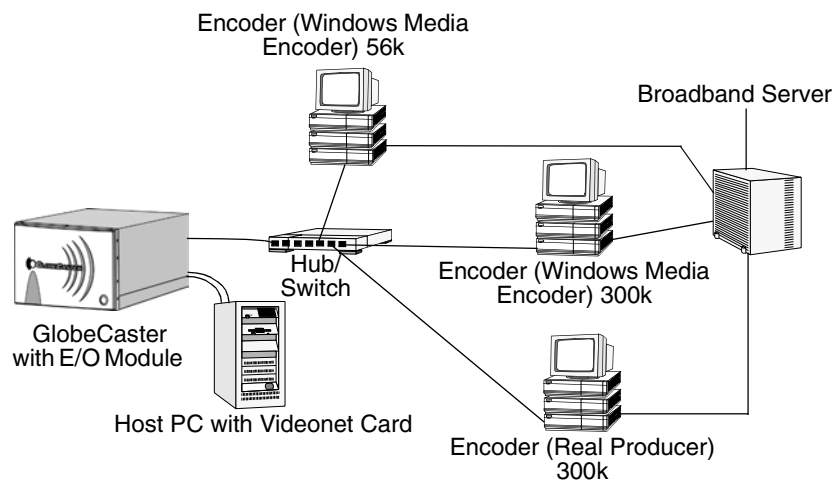


Figure 1.13: Connecting Using the To Hub Port

In figure 1.13, a category 5 cable is connected from the **TO HUB** port on the Ethernet Output Module. The cable is then connected to a hub or switch. Various media encoders running different encoding software can be connected to the hub or switch via one of their network cards. Each of the media encoders connect to a broadband server using another installed network card. From the broadband server, files are either archived for audio and video on demand or used for live streaming.

### Installing the Software onto the Encoder

Your GlobeCaster comes with software that you'll need to install onto the encoder. Follow these steps for installation:

1. Insert the Software Install Disc (disc 1) into the CD-ROM on your encoder.
2. Launch Windows Explorer and locate the folder called **Client** on this disc.

3. Double-click on the file named **GCClient.exe** in this folder. The executable contains audio and video capturing drivers.
4. When the executable is finished installing, you are ready to begin setting up the streaming information.

To eliminate confusion, the EO Client Software installation disables the older GlobeCaster streaming video driver if it is installed. If you wish to use the older driver, you can re-install it from an older GlobeCaster Software CD-ROM.

**NOTE:** To uninstall the software, select **Uninstall** from the **GlobeCaster** folder in the **Programs** menu.

For more information on streaming, please see “Start Streaming” on page 32.

### Getting Familiar with the Software

To launch the software, Click on **Start < Programs < GlobeCaster < EO Configuration**. This brings up the **Ethernet Output: Device Selection** panel (following figure).

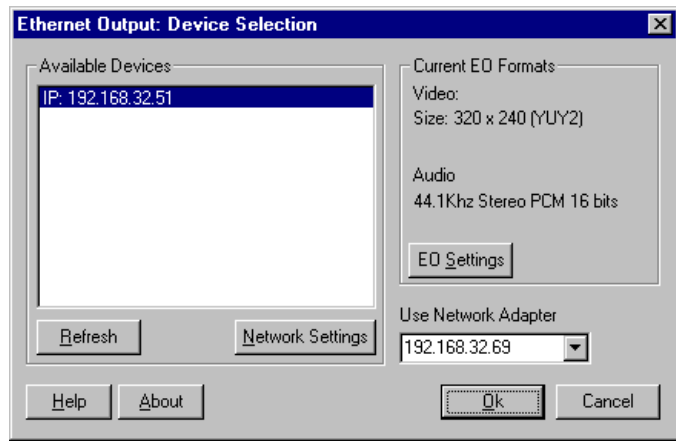


Figure 1.14: Ethernet Output: Device Selection Panel



This is the main interface that users will use to control their devices and streaming features. This panel has the following sections:

|                             |  |
|-----------------------------|--|
| <b>Available Devices</b>    | Displays your available Ethernet Output Modules. If you have more than one available module, you have the option of choosing any one of them.                                      |
| <b>Refresh</b>              | Rebuilds the list of all visible Ethernet Output Modules.  |
| <b>Network Settings</b>     | Opens and displays the Network Settings panel.   |
| <b>EO Settings</b>          | Opens and displays the Ethernet Output settings. From this panel, users can alter their video, audio, and streaming settings.  |
| <b>Current EO Formats</b>   | Displays your current audio and video streaming information.   |
| <b>User Network Adapter</b> | Displays a list of the IP addresses of the network cards attached to your Ethernet Output Module. The user must choose the network card connected to their Ethernet Output Module. |
| <b>Help</b>                 | Displays help for this software.   |
| <b>About</b>                | Displays the current version of the GlobeCaster Streaming Software.  |
| <b>Ok</b>                   | Closes the panel with your settings saved.   |
| <b>Cancel</b>               | Closes the panel without your settings saved.  |

### Network Settings Panel

This panel (following figure) is displayed by clicking on the **Network Settings** button on the **Ethernet Output: Device Selection** panel.

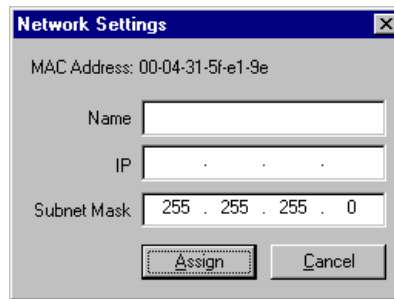


Figure 1.15: Network Settings Panel

The Network Settings panel allows the user to make network settings for the Ethernet Output Module. The Network Settings panel has the following fields:

- |                    |   |
|--------------------|---|
| <b>Name</b>        | Lets the user type in a new name to their Ethernet Output Module.   |
| <b>IP</b>          | Displays the IP address of the Ethernet Output Module in your GlobeCaster. This defaults to 127.0.0.1 which is <i>not</i> a valid address. You must change the number. The number should be set to an IP address on the same network as the ethernet card in the encoder that the Ethernet Output Module is connected to. |
| <b>Subnet Mask</b> | Displays the subnet of the IP address associated with the Ethernet Output Module. If you need to change this, first consult your system administrator.  |

### Ethernet Output Settings Panel (Video)

This panel (following figure) is accessed by clicking on the EO Settings button on the **Ethernet Output: Device Selection** panel.

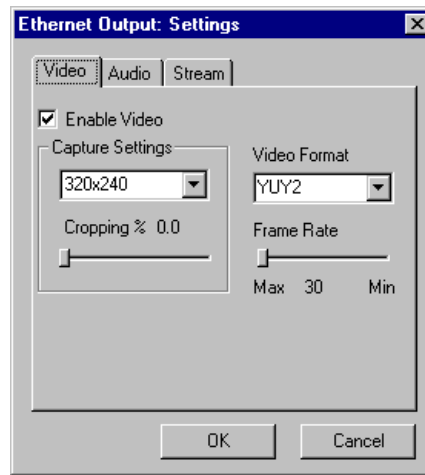


Figure 1.16: Ethernet Output Settings Panel (Video)

This panel is used to configure the settings for streaming video and has the following features:

- Enable Video** If this box is checked, then video will be streamed. If this box is unchecked, all other fields on this tab will be greyed out and video will not be streamed.

### **Video Format**

This drop-down menu allows you to choose the video format streamed from the Ethernet Output Module.

All of the video formats are based on the YUV or RGB color spaces. RGB video is made up of three primary colors: red, green, and blue. Most computer monitors display RGB video. YUV video represents colors by their luminance (Y) and chrominance. The video output of GlobeCaster is YUV.

In most cases, you should choose a YUV format. Listed below with each format are the bits per pixel (bpp) of each format. A higher number will consume more bandwidth between your GlobeCaster and your Media Encoder, which may affect what frame size and frame rate you can reasonably stream.

The Format options are:

- **I420 (16 bpp)** - A YUV video format made up of 16 bits per pixel.
- **IYUV (16 bpp)** - A YUV video format made up of 16 bits per pixel.
- **YV12 (12 bpp)** - A YUV video format made up of 12 bits per pixel.
- **YUY2 (16 bpp)** - A YUV video format made up of 16 bits per pixel.
- **UYVY (16 bpp)** - A YUV video format made up of 16 bits per pixel.
- **YVU9 (9 bpp)** - A YUV video format made up of 9 bits per pixel.
- **RGB (24 bpp)** - An RGB video format made up of 24 bits per pixel.
- **RGB (16 bpp)** - An RGB video format made up of 16 bits per pixel.

|                         |  |
|-------------------------|--|
| <b>Frame Rate</b>       | Allows the user to select the rate of the frames per second for the video that is being broadcast. The rates range from 30 frames per second to 1 frame per second.  |
| <b>Capture Settings</b> | Drop-down menu that allows the user to choose the size of the video that is being broadcast. The larger the size, the more bandwidth that is taken up by the streaming video.  |
| <b>Cropping</b>         | Clicking-and-dragging this slider left (decrease) or right (increase) zooms the program out video that is broadcast. Video that is streamed from GlobeCaster includes the entire video image, including outside the safe area. Clicking-and-dragging this slider crops out video distortion that may occur at the very edge of the video image when the source is from tape. |

### Ethernet Output Settings Panel (Audio)

The audio portion of the EO settings panel (following figure) is accessed by clicking on the middle tab on the panel.

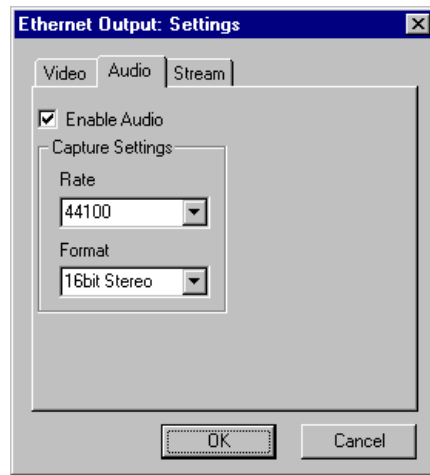


Figure 1.17: Ethernet Output Settings Panel (Audio)

The audio panel allows the users to select the format and the rate of their streaming audio and has the following features:

- |                     |  |
|---------------------|--|
| <b>Enable Audio</b> | If this box is checked, then audio will be streamed. If this box is unchecked, then audio will not be streamed and all of features will be greyed out. |
| <b>Rate</b>         | Drop-down menu allows the users to select the audio rate. The rates range from 6 khz to 48 khz.  |
| <b>Format</b>       | Drop-down menu allows users to select the audio format. The choices are 16-bit mono or 16-bit stereo.  |

### Ethernet Output Settings Panel (Stream)

The stream portion of the EO settings panel (following figure) is accessed by clicking on the third tab on the panel.

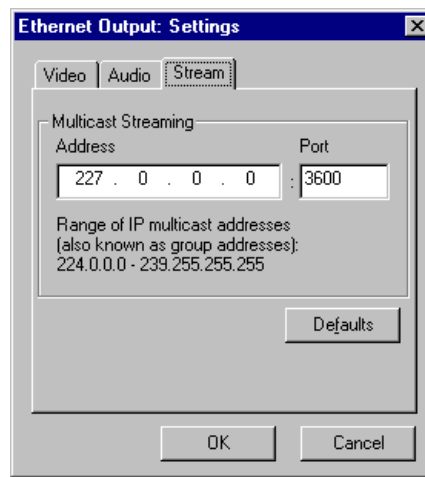


Figure 1.18: Ethernet Output Settings Panel (Stream)

The Stream panel allows the users to set the port and address of the device from which they're streaming and has the following features:

- Address**            Allows users to enter the address on which the device is sending the streamed information.
- Port**                Allows users to enter the multicast port on which the device is sending the streamed information.
- Defaults**           Sets the multicast IP address and Port to factory settings.

## Start Streaming

This section is intended to assist you with streaming both audio and video.

1. Launch the *GlobeCaster Streaming Software* by going to the **Start** menu, then selecting **Programs**, and then selecting **GlobeCaster**, and then **EO Configuration**.
2. The **Device Selection and Stream Settings** panel is displayed (see “Getting Familiar with the Software” on page 24 for more information on this panel). On this panel, select the appropriate available device (in some cases, there may only be one).
3. From this panel, you should open up the **Network Settings** panel and configure your network settings. You must set the IP address of the Ethernet Output Module to one that is valid for your network connection with your encoder PC.
4. Once you’ve made these settings, click on **OK** on the **Ethernet Output: Device Selection** panel to close the panel.
5. If you’re a *GlobeCaster Studio* or *Live* user, make sure you have GlobeCaster’s Switcher up and running. If you’re a *GlobeCaster Post* user, make sure you have GlobeCaster’s Editor up and running.
6. Assign whatever content you wish to stream to the **Program Out**. Whatever is being sent from the **Program Out** is what is being streamed.

**NOTE:** The streamed audio and video is always being sent from the **Program Out** of your GlobeCaster.

It’s important to understand that when you have content playing in the Program Out, the Ethernet Output Module is picking it up. The user must control the starting and stopping of the stream through the encoder.

7. On the encoder, open whatever encoding application you may have (Windows Media Encoder, Real Producer, etc.). Each application has different methods of achieving similar results, therefore consult the documentation that came with your encoding software. That being said, you want to create a custom encoding session. In this session, select the audio and video capture drivers for the Ethernet Output Module. The drivers are called **GlobalStreams Net Audio Capture** and **GlobalStreams Net Video Capture**, respectively.



8. On your encoding software, you can choose whether or not you want to stream the content live or save it to a file for users to download at their convenience. If you choose to save the file, you will be prompted for a storage location.
9. On your encoding software, you can start and stop the stream. To start the stream, press **Start**. To stop the stream, press **Stop**.
10. Try and experiment with different capturing and frame rate settings on the GlobeCaster Streaming Software.

### Fade to Black

The EO can fade the encoded video stream to black when the Switcher **Fade Enable** button is pressed (following figure).



Figure 1.19: Fade Enable Button in GlobeCaster's Switcher

This can be disabled from the Switcher EO Output Settings panel. If the "Fade Enable" button is selected on, then all EO streams will Fade to Black when the "FADE" button is pressed. If the "Fade Enable" button is selected off, then the EO stream will not be affected by the "FADE" button.

## Tips and Tricks

- For optimal audio and video quality, make sure the EO is streaming using the same audio and video settings that the encoder is expecting. If the encoder is set for video at 320x240, 15 fields per second and audio at 22KHz 16-bit stereo, then make sure the EO is streaming using the same parameters. In particular, encoders with profiles for "high-motion situations" may be expecting data at 60 fields per second while EO will stream at most 30 fields a second. Such a mismatch will not provide optimal results with some encoders.
- If you plan to have different encoding rates for different users, it's advised that you use different encoders for each rate rather than multiple rates with one encoder.
- Closing any Encoder Video Preview windows may improve streaming and networking performance on some Encoders. If you seem to be losing audio or video packets while encoding, closing the Preview windows can improve this.
- Using the RGB24 or RGB16 formats is not a recommended format between the EO and Encoders. This is because the RGB modes take more network bandwidth between the EO and Encoder without any improvement in video quality. In addition, most encoders prefer YUV formats such as YV12.
- In some configurations, the Encoder will consistently choose to broadcast using the same NIC as is attached to the EO rather than the second NIC. The Encoder is always picking the NIC that it thinks was installed "first". To fix this, do the following depending on your operating system.

For Windows 2000 and Windows XP:

1. Find the NIC that the Encoder should broadcast on using "Network Properties"
2. Temporarily disable ALL other NICs.
3. Re-enable the NICs disabled in step 2.

For Windows NT4:

1. Since NICs cannot as easily be disabled, change IP addresses assigned to ALL NICs, starting with the NIC the Encoder should

broadcast on. This way the Broadcast NIC will be the first NIC seen by the Encoder.

2. Reboot the system.

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## **FCC Notice**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



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11.4 Should any term of this Agreement be declared void or unenforceable by any court of competent jurisdiction, such declaration shall have no effect on the remaining terms hereof.

11.5 If any action is brought by either party to this Agreement against the other party regarding the subject matter hereof, the prevailing party shall be entitled to recover, in addition to any other relief granted, reasonable attorney fees and expenses of litigation.

11.6 The failure of either party to enforce any rights granted hereunder or to take action against the other party in the event of any breach hereunder

shall not be deemed a waiver by that party as to subsequent enforcement of rights or subsequent actions in the event of future breaches.

11.7 You will comply with the U.S. Foreign Corrupt Practices Act and all export laws and restrictions and regulations of the Department of Commerce, the United States Department of Treasury, or other U.S. or foreign agency and authority, and not export, or allow the export or re-export of any GlobeCaster System in violation of any such restrictions, laws or regulations. You will obtain and bear all expenses relating to any necessary licenses and exemptions with respect to the export from the U.S. of any GlobeCaster System to any location.

