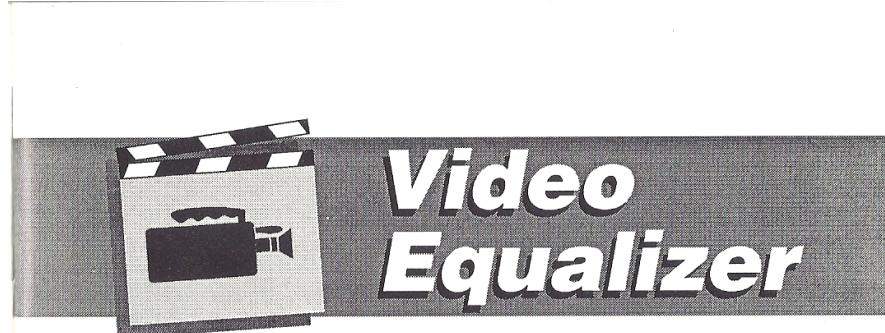


# Video Equalizer



**VIDEONICS**



# **Instruction Manual**

MANL-0190-03 • 10909

This device is not intended for the unauthorized copying of copyrighted material.

**WARNING:** To reduce the risk of fire or electrical shock, do not expose this appliance to rain or other moisture. If you spill liquid on the equipment, disconnect the power cord and consult authorized personnel. Moisture can damage internal parts.

**CAUTION**

RISK OF ELECTRIC SHOCK  
DO NOT OPEN

**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

The Videonics logo, DirectED PLUS, Video Equalizer, and ProED are trademarks of Videonics, Inc. Hi8 is a trademark of Sony Corporation. VHS is a registered trademark of JVC. Patents pending.

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## **Videonics Video Equalizer • Instruction Manual**

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Specifications subject to change without notice.

## IMPORTANT SAFEGUARDS

### INSTALLATION

Read all instructions. Save them for future reference. Adhere to all warnings on the Video Equalizer and in the operating instructions. Follow all operating and use instructions.

Power cords should be routed so they are not likely to be pinched by items placed on them or against them. Pay particular attention to cords near the plugs, convenience receptacles, and the point where they exit from the appliance. Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.

The slots on the top of the unit are provided for necessary ventilation. For reliable operation and to prevent overheating, *never allow the ventilation slots to be covered*. Don't locate the unit in a confined space such as a bookcase or entertainment center cabinet, unless there is proper ventilation.

Do not place the unit near heat sources, including radiators and heating vents, or in direct sunlight.

Never locate the unit near water (bathtubs, swimming pools, in a wet basement, etc.). Do not use outdoors.

### USE AND CARE

Do not use attachments not recommended by Videonics as they may cause hazards. Do not place this video product on an unstable cart, stand, tripod, bracket, or table. The video product may fall, causing serious injury to a child or adult, and serious damage to the appliance. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the video product. Any mounting of the appliance should follow the manufacturer's instructions and should use a mounting accessory recommended by the manufacturer. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

Never push objects of any kind into the unit through openings as they may touch dangerous voltage points or short-circuit parts that could cause electric shock or fire.

Unplug this video product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use only a lightly moistened cloth. Never use solvents of any kind.

### SERVICE

Do not attempt to service this video product yourself as opening or removing covers may expose you to dangerous voltage or other hazards.

Unplug this video product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power cord or plug is frayed, damaged, or worn.
- If liquid is spilled into the unit or objects have fallen inside.
- If the unit has been exposed to rain or water.

- If the unit has been dropped or the cabinet is damaged.
- If the unit exhibits a distinct change in performance.
- If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the unit to its normal operation.

For repair or warranty service in the United States and Canada, please contact Videonics and request a Return Authorization (RA) number. Pack the product well. Mark the RA number on the outside of the package and send, freight prepaid to: Videonics, 1370 Dell Avenue, Campbell, CA 95008.

### ABOUT RADIO INTERFERENCE

This equipment generates and uses radio frequency energy. If not installed and used according to the manufacturer's instructions, it may interfere with radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If you experience radio or television interference and suspect that this equipment is the cause, power the unit off, then unplug the unit to see whether the interference stops. If the equipment is the cause try the following:

- Reorient the radio or television's receiving antenna
- Move the equipment with respect to the receiver
- Plug the equipment into an outlet that is fed from a different circuit breaker

If necessary, consult your dealer or an experienced radio/television technician for suggestions. You may find the following booklet, prepared by the Federal Communications Commission, helpful: "How to Identify and Resolve Radio-TV Interference Problems." It is available from the U.S. Government Printing Office, Washington, D.C. 20402. Ask for stock number 004-000-00345-4.

### RADIO INTERFERENCE NOTICE FOR CANADA

This digital apparatus does not exceed the class B limits for radio noise emissions from digital apparatus, as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe B, prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

# Video Equalizer

# Introduction

The Video Equalizer is the perfect companion for VCRs, camcorders, and video editors.

With it, you can improve the color, brightness, and clarity of your videos. You can alter the sound as you copy tapes, replacing the old sound or mixing in new music and narration. You can add special effects to your videos, convert them to black and white, and even colorize the black and white version!

The Colorizer provides flexible control over the color. You can independently adjust all three component television colors (red, green, and blue). It's analogous to the controls on an audio equalizer. And with the revolutionary Digital Paintbrush™, you can change the color of some objects, without changing the color of the whole screen.

The Video Equalizer uses Videonics' Digital Video Technology (patent pending) for the best quality and flexibility. It has S-video connectors, dual outputs, and more. It's compatible with all videotape formats and with virtually all VCRs, camcorders, and video editing systems.

## Contents

Page	Section
2	Safety
4	Introduction
6	Front and back panel diagrams
8	QuickStart
12	Step 1 Connecting Video
18	Step 2 Connecting Audio
20	Step 3 Applying Power
20	Step 4 Check for a picture!
22	Step 5 Basic Operation
28	Step 6 Advanced Operations
34	Step 7 Editing with the Equalizer

## IMPORTANT!

### The Registration Card

The first step is to send in your registration card, so we can keep you informed of new developments and send you our newsletter. Note that Videonics does not sell its mailing list. Your name and address will remain confidential!

Note: The newsletter and certain other Videonics services are available for Videonics customers in the US and Canada. Elsewhere, contact your Videonics dealer or distributor.

## Equipment

Your Video Equalizer comes with a Videonics power supply, this manual, and a product registration card. You may need to purchase cables to connect audio and video equipment to the Equalizer. Your Videonics dealer can help you identify the cables you need.

## QuickStart

The QuickStart section is designed for people who are eager to get started. Whether you use the QuickStart section or not, we recommend you read the entire manual, especially Steps 5 and 6.

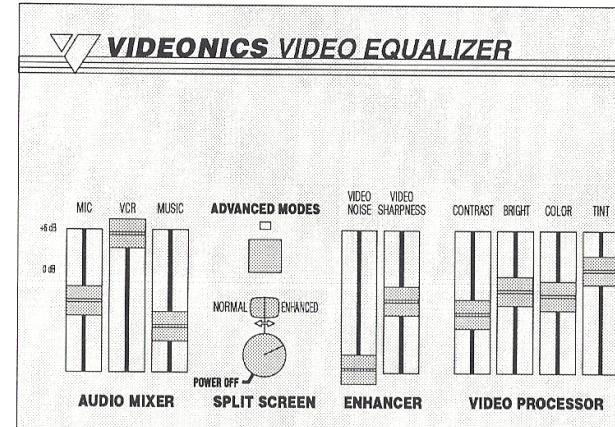
# Controls and Connections

## AUDIO MIXER

Adds music or narration to the sound on your videotapes. Three

controls allow you to independently adjust the sound from a microphone, a music source, and the original videotape. Music and VCR sound channels are stereo. The microphone channel is mono — it appears on both channels.

Raise a knob to boost sound, lower it to reduce the volume. Lower all three at once to fade all sound to zero.



## ADVANCED MODES

When the light is off, the advanced functions are off. Press once to convert the screen to black-and-white. The monochrome image can be tinted, colorized, etc.

Press again to "solarize" or "paint" the image. The contrast control adjusts the effect. Press a third time to change the whole image to color negative and again to create color bars. (Note: Color bars will not appear if there is no video coming in to the unit.)

## ENHANCER

Sharpness control sharpens the edges of objects, for clearer video copies. Video noise control reduces the snowy effects of video noise.

When all the way down, these controls do not affect the picture.

## POWER SWITCH (On SPLIT-SCREEN control)

Turns unit on and off.

## SPLIT-SCREEN

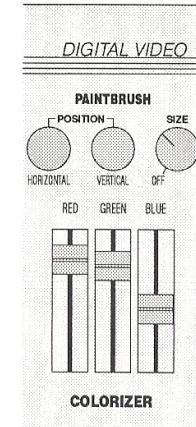
Position the moveable split-screen line in an area of interest. The right side shows the enhanced and corrected image; the left side shows the unaltered image for comparison.

## VIDEO PROCESSOR

Brightness and contrast controls give greater control than most television controls. Raise brightness knob to make picture whiter; lower it to make it darker. Contrast knob makes blacks blacker and whites whiter.

Raise the color control to make dull video more colorful; lower it to subdue overly vivid scenes.

The tint control shifts all the colors in the entire scene. Raise it to warm up a blue picture, lower to cool the colors. (The tint control is not available on units manufactured for the PAL television standard.)



## DIGITAL VIDEO TECHNOLOGY

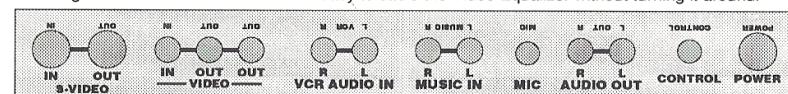
Fully digital technology for the clearest possible picture quality.

## COLORIZER and DIGITAL PAINTBRUSH

Unique colorizer gives separate control of all three of the primary television colors (red, green, and blue). To adjust entire picture, turn SIZE off and adjust the red, green, and blue colorizer knobs.

The Digital Paintbrush adjusts some of the colors in a scene without affecting others. Use the "paintbrush" controls to position on-screen crosshairs on the color you want to change. Use the "size" control to determine how many colors you want to change — a narrow brush affects only a narrow range of similar colors, a wide brush affects more of the screen. Then adjust the color controls.

Legends above connectors make it easy to cable the Video Equalizer without turning it around.



## S-VIDEO CON-NECTORS

S-video (Y/C) connectors, both in and out, are provided, as well as standard RCA video connectors. (S-connectors are used with Super VHS, Hi8, and ED-Beta VCRs.)

## VIDEO IN/OUT

Connect source video output to VIDEO IN. Connect VIDEO OUT to the recorder's video input.

## DUAL VIDEO OUTPUTS

Two video outputs for more flexibility. Allows you to make two recordings at once.

## POWER

Connect the VCR AUDIO IN to the audio outputs of your source deck. Connect a CD player, tape deck, or other music source to the MUSIC IN jacks. Plug a microphone into the MIC IN connection. MIC is mono (appears on both channels); others are stereo.

## CONTROL

Future accessories may use this connection.

## Quick Start

This section is designed for those people who would rather jump right in than read the manual. If you have any trouble with this section, please skip to Step 1.

In any case, we recommend you read the rest of the manual later, as it describes some features you may not discover on your own (particularly the advanced functions and the Digital Paintbrush).

Each of the sections in this chapter tell you where to turn for more information.

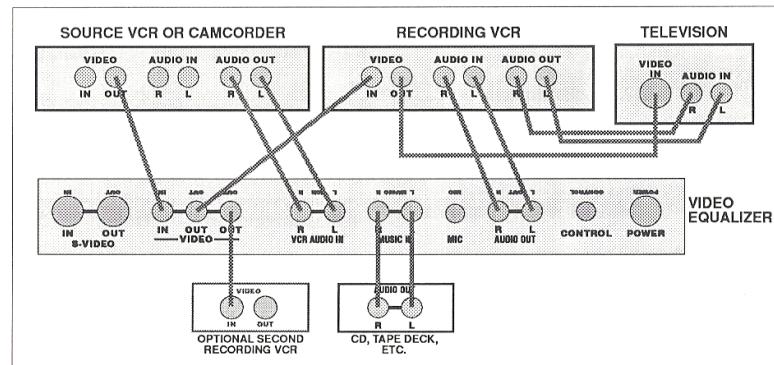
## Quick Start

### First: Send in your Registration Card!

Video is a fast-moving industry and we would like to keep you informed about new developments that can help you get the most out of your Videonics products. We also have an occasional newsletter with new product information, handy hints, and more. There are other benefits as well; see the enclosed literature for information.

Please return your card so we can send this information to you. Videonics does not sell its mailing list — your name and address remain confidential!

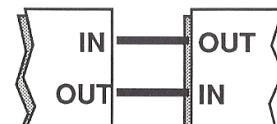
Note: The newsletter and certain other Videonics services are available for U.S. and Canadian Videonics customers. Outside these countries, contact your Videonics dealer or distributor.



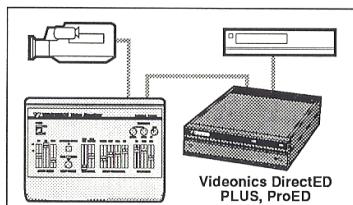
### Connect the Equalizer to your video equipment.

First, identify your equipment. In all cases, there is a *video source* (the signal you want to Equalize) and a *recorder* which will record the Equalized signal. Simply connect the Source's VIDEO OUT to the Equalizer's VIDEO IN. Then connect the Equalizer's VIDEO OUT to the recorder's VIDEO IN.

Hint: Always connect the output of one device to the input of another. Never connect an OUT to an OUT.



There are many, many types of equipment and many ways to hook the Equalizer up. The diagram shows the most common. Refer to the "Step 1" section of the manual if the diagram doesn't show your equipment. In particular, "Step 1" tells the differences between the various connector types — S-video (Y/C), RCA, RF, SCART, etc.



If you are using an edit controller, such as Videonics DirectED PLUS, connect the Equalizer between the play-VCR and the editor — do not connect it to the recorder.

Step 1.5 shows this connection in detail and Step 7 describes how to use the Equalizer with DirectED PLUS and other edit controllers.

### Connect your audio equipment.

Plug a microphone into the MIC jack. Connect a CD player, tape deck, or other music source to the MUSIC IN jacks. If you do not plan to use a microphone or music source, leave these jacks empty.

If all your equipment is stereo, connect both the L and R jacks. If all your equipment is mono, connect only to L. If some is stereo and some is mono you will need some "Y-adapters" — see "Step 2."

### Apply power.

Turn the POWER switch off. Plug the Videonics power supply into the power connector on the back of the unit. Plug the supply into the wall. Turn the POWER switch on. The POWER light should come on. If it does not, refer to the troubleshooting hints at the end of "Step 3."

### Look for a picture!

Turn on your television, VCRs, camcorders, etc. Press PLAY on your source VCR/camcorder. Set all the Equalizer's controls so they coincide with the white bars on the front panel. Set the PAINTBRUSH SIZE to OFF.

You should see a picture. If not, refer to the troubleshooting section at the end of "Step 4."

### Try the basic operating controls.

The "Front Panel" illustration just prior to this section tells what each control does. Try each control, starting with the Split Screen.

Try the Colorizer with the Paintbrush SIZE turned OFF. It allows you to colorize the entire screen (to adjust the white balance, for instance).

### Advanced modes.

Press the "Advanced modes" button. The light will come on. Keep pressing the button and you'll step through these modes. Note: You will probably need to adjust the processor controls, especially brightness, when using these modes.

- Black and white. The picture will lose all color. You can use the Digital Paintbrush and Colorizer to add color to the black and white picture.

- Posterization (also known as solarization, or paint). This is a special effect in which the picture's middle tones will appear as steps, or contours, rather than as smooth gradations. The CONTRAST control changes the number of steps.

- Negative. The picture will turn into a color negative.

- Color bars. This will produce a set of color bars, useful at the start of every tape to provide a reference. Note: Color bars are not produced unless a video signal is connected to the Equalizer input.

If you press the button once more, the light goes off and you'll be back in normal mode.

### The Digital Paintbrush

Try the Digital Paintbrush feature. It allows you to colorize part of the picture, without affecting the whole screen.

Turn the POSITION controls and use the on-screen crosshairs to select a color from the video you are watching. Adjust the SIZE control. The flashing areas show you which colors will be changed and the areas that don't flash will remain unaffected. A "narrow brush" affects only the exact color you pinpointed with the POSITION knobs; a wide brush affects the entire screen.

Adjust the red, green, and blue Colorizer controls. You can readjust the SIZE control to change the affected areas.

### For more information...

... refer to the sections "Step 5" and "Step 6," later in this manual. In particular, you will want to read "Step 6" to learn about the Digital Paintbrush. This feature is so unlike anything that has been available before, that even video experts will want to read about it to get full use.

Refer to Step 7 to learn how to use the Video Equalizer with video editing equipment.

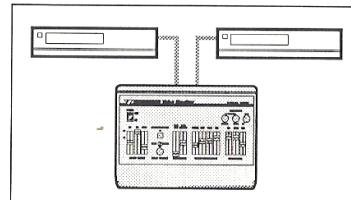
# Connecting Video

## Step 1

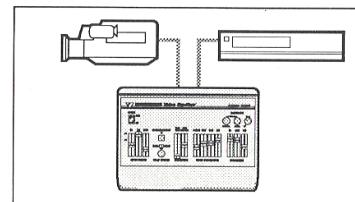
Sometimes, the most complicated part of installing the Video Equalizer is determining what equipment you have! There are many, many types of equipment and many ways to connect them together. This section shows several ways to use the Video Equalizer.

### Step 1.1: Identify your equipment.

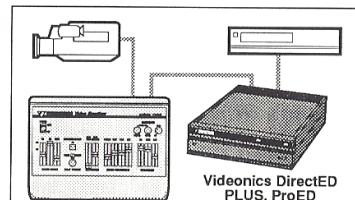
In all cases, there is a *video source* (the signal you want to Equalize) and a *recorder* which will record the Equalized signal. Simply connect the Source's VIDEO OUT to the Equalizer's VIDEO IN. Then connect the Equalizer's VIDEO OUT to the recorder's VIDEO IN. Here are the most likely setups:



**VCR to Equalizer to VCR.** Here, the Equalizer is used to enhance and correct the video as it is copied from one VCR to another. Note that many videotapes and broadcasts are copyrighted. Copying them may be illegal.



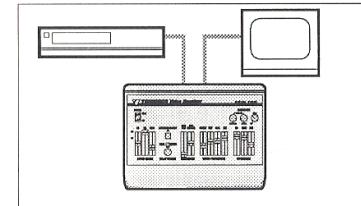
**Camcorder to Equalizer to VCR.** This is the same idea, except a camcorder is used to play the original tapes. This is a common setup for manual editing (that is, for editing tapes without the assistance of a video editor).



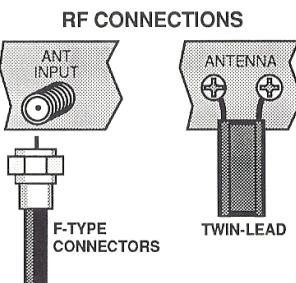
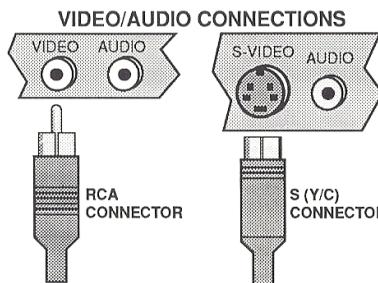
**Editing system use.** In video editing, the "good scenes" from an original tape are played by one VCR (or camcorder) and a second VCR/camcorder is used to record them. An editing system such as Videonics DirectED PLUS or

ProED is used to control the tape machines, making sure the correct scenes end up in the correct place. Some editors (including the Videonics products) can also create color titles, graphics, and special effects that are included in the edited production.

In an editing setup, the Equalizer is used to enhance and correct the image while it is being recorded. Step 7 describes how to use the Equalizer with an edit controller.



**VCR to Equalizer to television set.** The Equalizer is used to enhance and correct the tape as it is watched.



### Step 1.2: Identify your connectors: S-VIDEO, Y/C, RCA, RF, or SCART?

VCRs, televisions, and camcorders use one of four different connectors. The yellow ones are for video.

- The most common video connection is called an "RCA connector." The Equalizer is equipped with these — they're the red, white, and yellow connectors. The yellow ones are for video.

- Super-VHS, Hi8, and ED-Beta VCRs and camcorders are equipped with "S-connectors," also called "Y/C connectors." They give somewhat better color separation (bright colors tend to smear across the picture less). The Equalizer is equipped with S-connectors, as well as RCA connectors.
- RF connections are common in television sets. They are used to connect an antenna or cable TV.

An easy way to recognize RF connectors is that they combine both video and audio on one cable; RCA and S-connectors use separate wires for audio and video.

You cannot connect the Equalizer directly to a device that has only RF connectors. This is not a problem for most VCRs and camcorders because they almost always have non-RF connectors.

But you may want to connect the Equalizer to a television set that has only an RF input. The best way to do this is to connect the television to the VCR using the RF connections; then use the separate RCA or S-video and audio connections to connect the VCR to the Equalizer.

To connect the Equalizer outputs directly to a device's RF input, you will need a "modulator." Connect the Equalizer's VIDEO OUT and AUDIO OUT to the

modulator's inputs. Then connect the modulator's RF output to the television's cable TV or antenna input. Note that the video quality may be reduced by the use of a modulator.

- European video equipment often has SCART connectors. Adapters are commonly available to connect SCART-equipped units to the RCA and S-connectors provided on the Equalizer.

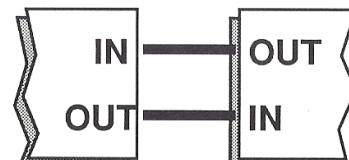
### Step 1.3: So what do I use?

- If both your source and recorder have S-connectors, by all means use them. The Equalizer maintains the integrity of the separated Y/C signal, for the best possible quality.

- If either the source or the recorder is not equipped with S-connectors, use the conventional RCA connectors for both. (It is possible to use the S-connector on one and RCA on the other, but results will probably be better using RCA connectors for both.)

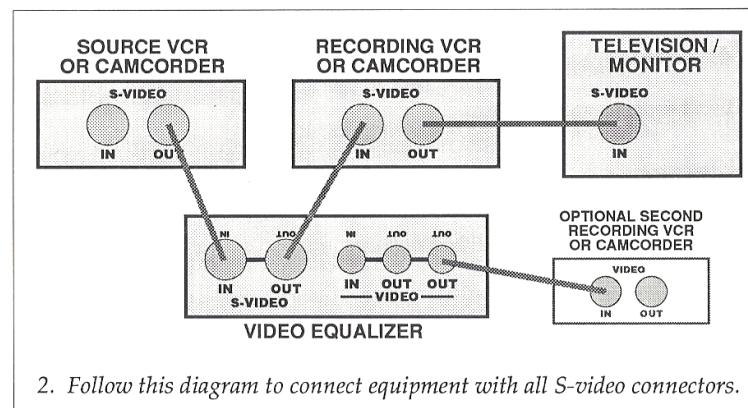
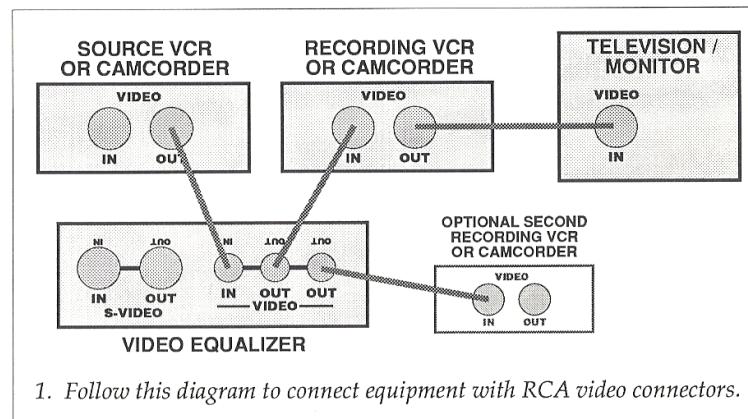
### Step 1.4: A hint

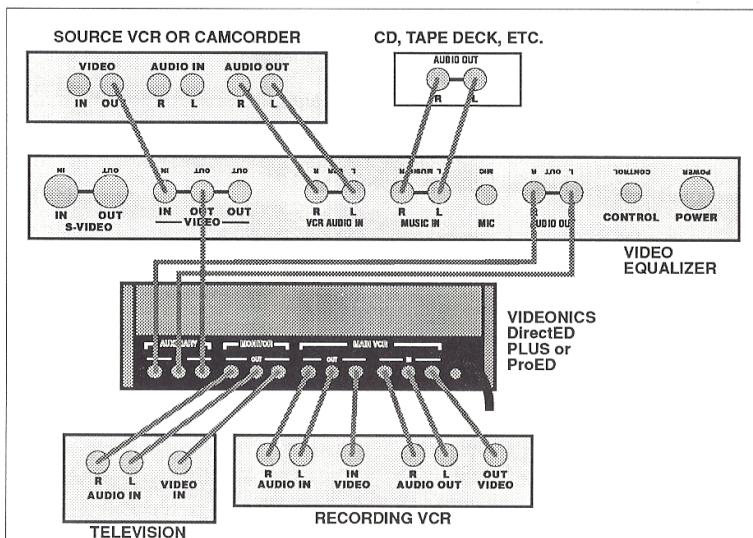
Always connect the *output* of one device to the *input* of another. Never connect an OUT to an OUT.



### Step 1.5: Connect the equipment.

Follow these diagrams to connect your equipment. While we can't show all the combinations, we show the most common: connecting to equipment with RCA connectors, connecting with S-video connectors, and connecting a video editing system. Other equipment would be cabled in similar ways.





3. Follow this diagram to connect the Video Equalizer to Videonics DirectED PLUS or ProED video editors. A similar hookup can be used for other video editing systems.

### Step 1.6: Set the recorder to watch the VIDEO IN jack.

The following sections assume you are using the Equalizer with a VCR as the source and another VCR to record. If you are using other equipment, make the appropriate changes. The idea here is to set up everything so that a video signal is coming out of the video source, into the Equalizer, and that the Equalizer output is being passed through to the television or VCR.

VCRs all have a mechanism to change what you are watching. You can watch a broadcast channel (channel 5, for instance) or you can watch whatever is coming in on the VIDEO IN jack.

Switch the recording VCR so it will record whatever is connected to the VIDEO IN jack. VCRs do this in many different ways. Some use a switch — look for a switch marked TUNER/LINE or such. Set it to LINE, AUX, EXT, A/V, S-VIDEO, etc. Others re-

quire that you set the channel changer a certain way (to channel A1, for instance). Some use an on-screen menu. Some switch automatically when you plug a cable into the VIDEO IN jack.

Some VCRs have multiple inputs, allowing you to switch between VIDEO 1 and VIDEO 2, for example; or between the RCA and the S-connectors.

You may need to refer to the VCR manual. Look for a section that shows how to connect a second VCR for the purpose of copying tapes.

### Step 1.7: Set the television so it is displaying the recorder's signal.

Many television sets have a switch that allows you to choose between watching a broadcast signal (coming in through its antenna or cable TV input) or watching an external video source. Be sure the television is set so that it displays the input you are using. For instance: If you are connected to VIDEO 2, be sure the TV/VIDEO switch is set to VIDEO 2. You may wish to refer to the television's manual.

### Step 1.8: Turn off other enhancement and correction circuits.

If your source VCR has an EDIT switch, turn it to ON. This disables circuits designed for non-editing viewing. If it has a SHARPNESS switch, turn it to the middle position. Do the same with the recorder VCR. These actions will remove any processing that is being done by the VCRs.

# Connecting Audio

## Step 2

The Equalizer's audio mixer lets you combine sound from three sources: the sound on your original videotapes; a separate music source, such as a CD player; and a microphone. You can turn each source on or off, raise or lower its volume, or "mix" them, varying the levels so all three are balanced the way you want them.

### Step 2.1: Mono or stereo?

Stereo equipment has two channels — right and left. Mono (for monophonic) gear has only one audio channel. It's easy to tell which is which — if a device has two audio outputs, marked L and R (Left and Right), then it is stereo. One audio output means it's mono.

All the Equalizer's audio channels are stereo, except for the microphone, which always appears on both channels at once.

### Step 2.2: Connect the audio.

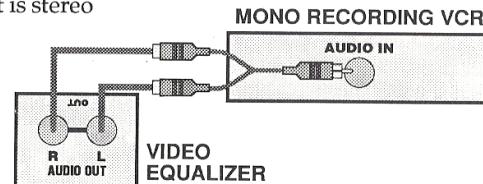
The way you connect your audio equipment together depends on which of your equipment is stereo and which is mono:

- All stereo: If all your audio devices, your video source, and your video recorder are stereo (that is, they each have a right and left audio connection), follow

the connection diagram in Step 1 to connect your audio devices.

- All mono: If all your audio and video devices are mono, with only one audio connection, follow the diagram in Step 1, but use only the L (left) audio connections. Leave the R (right) jacks unconnected.
- Mono recorder: If some of your equipment is stereo but the recorder is mono, you could just connect one channel. But anything on the unconnected channel would not appear on your recordings.

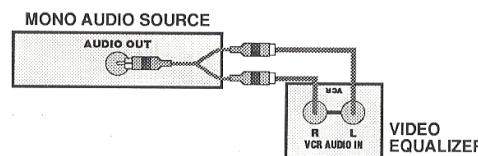
To combine right and left, use a Y-connector (available at electronics and TV/stereo stores) between the Equalizer audio out and the recorder's audio in:



Note that Y-connectors are available with a variety of male or female connector ends. You can use any combination of Y-connectors and cables that fits.

Another important note: The Y-connector connects two outputs (the AUDIO OUT L and R) together. For some equipment, this is not recommended — the Equalizer's audio outputs contain special circuitry to allow it. Do not use a Y-connector to connect the Equalizer's video outputs. And we do not recommend you connect outputs together on other equipment unless the instructions permit it.

- Stereo recorder but some mono sources: If you connect a mono source to one channel of an audio input, it will appear only on that channel. You can use a Y-connector to make the source appear on both channels:



This diagram shows a mono VCR connected to the Equalizer's VCR input but you can use the same scheme when connecting to the MUSIC input.

### Step 2.3: Connect a microphone.

If the plug on the end of your microphone does not match the input jack on the Equalizer, adapters are available at electronics and stereo stores. The microphone input is designed for standard (low-impedance) microphones. Connecting other sources may cause distortion.

### Step 2.4: Additional notes.

The VCR and MUSIC inputs are similar to the inputs you would find on the back of an audio receiver or amplifier. They are designed for signals such as those created by stereo components. Speaker and headphone outputs can be connected but may cause distortion or other problems.

## Power it up!

### Step 3. Applying power.

Turn the SPLIT SCREEN control fully counterclockwise, to OFF. Connect the Videonics power supply to the POWER connector on the rear of the unit and plug the supply into the wall socket.

**Important!** Use only the Videonics power supply supplied with the Video Equalizer. Any other supply will cause permanent damage and void the warranty.

Turn the SPLIT SCREEN control away from the OFF position.

#### Troubleshooting Hints: No power.

- Check the connections.
- Confirm that the wall socket is working — remove the Videonics supply and plug in a lamp to test the socket.

#### Troubleshooting Hints: Jumpy Recordings

Jumpy or off-color recordings are often caused by the use of commercially recorded videos as the source material. Many recordings carry copy-protection signals designed to prevent copying. The Equalizer is not designed to remove copy-protection signals.

### Step 4. Look for a picture!

#### Turn on the equipment.

- Turn on your television, VCRs — everything that is connected to the Equalizer.
- Press PLAY on the video source. If there is a tape in the recorder, press STOP.
- Set all the Equalizer controls so that the knobs match the white lines on the front panel. Set the Split Screen knob to the middle.
- Turn the Paintbrush SIZE knob OFF.

You should see a picture on the television set. If you do not, refer to the troubleshooting hints at the end of this step.

#### Confirm that the Equalizer is properly connected.

Next, make sure that the picture you are seeing is actually coming from the Equalizer, and not from the recording VCR or the television itself. Turn the SPLIT SCREEN knob. You should see a vertical line on the screen, separating the unchanged picture on the left, from the Equalizer-modified picture on the right. Adjust the other knobs and you should see changes in the area to the right of the split-screen line.

## Steps 3 and 4

#### Troubleshooting Hints: No picture or picture not affected by Equalizer.

The first thing to do is double-check the connections. Most problems are caused by a cabling mistake.

#### If you see no picture at all:

- First, check the obvious. Is everything turned on, are all switches set correctly? Are all connections correct, with OUTs going to INs?
- Temporarily bypass the Equalizer by connecting the video source's VIDEO OUT directly to the recorder's VIDEO IN. If you still do not see a picture, then you know the problem is not with the Equalizer.

Confirm that the source is creating a picture (is it in PLAY? Are all switches set correctly? Are you connected to the right output?).

Confirm that the recorder is passing the source's picture along. Try turning it off to confirm the connections — most VCRs pass signals straight through when they are off.

Be sure the recorder's input is set to LINE, AUX, EXT, A/V, S-VIDEO, etc. (See Step 1.6.)

Be sure the television is set to watch the correct input, as explained in Step 1.7.

If you are using S-connectors, try temporarily using the RCA connectors instead.

Try swapping cables — if the problem changes when you completely exchange two cables, you may have a bad cable.

#### If you see a picture but the Equalizer does not modify it:

- First, check the obvious. Is everything turned on, are all switches set correctly? Are all connections correct, with the source's VIDEO OUT connected to the Equalizer's VIDEO IN; and the Equalizer's VIDEO OUT connected to the recorder's VIDEO IN?

• Set the Split Screen to the middle.

• Be sure the television is set to monitor the video input you are using rather than, say, channel 7 (see Step 1.7).

• Be sure the recording VCR is set to the video input — is it set to LINE? Are there multiple inputs and are you switched to the right one? See Step 1.6.

• Is a tape playing in the recorder? When a tape is playing, the VCR will send the picture on the tape to the television, rather than the picture that's coming in.

# Basic Operation

This section explains the most common Video Equalizer functions. You can read through this section, step by step, to learn everything the Equalizer can do; or you can use it as reference section when you want an explanation of something you just tried.

To try the controls as you read, be sure you have a good video signal coming into the unit. A still picture is a good choice, since it lets you study the effects of each control. Place a camcorder on a tripod and aim it at a simple image — a few objects on a table, for instance. Make a long tape of the still picture, or simply set the camcorder in standby mode, without tape running, so you can use the camera's image.

## About the video source

The Equalizer's output depends very much on the quality of the source video. Poorly recorded, jumpy video will not be improved by the Equalizer. A video signal that has passed through several video processors may also be degraded. We suggest you avoid processing the video more than once.

Commercial recordings often carry special signals to prevent them from being copied. Using these as inputs to the Equalizer will generally give unsatisfactory results (and may be a copyright violation).

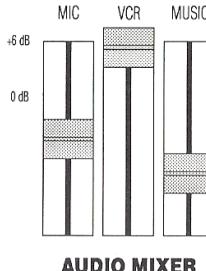
## Step 5.1: Neutral Setting

The Equalizer has very little effect when the advanced modes are off and the split screen knob is set to the far right (so the entire picture is "normal"). You can also defeat the effects by setting all the knobs to match the white lines and setting the PAINTBRUSH's SIZE control to OFF.

## Step 5.2: Audio Mixer

An audio mixer lets you change the sound as you record.

For instance, you can replace the sound on the original tape (the "native" sound) with voice or music; you can keep the native sound and add a voice-over; you can mix music on top of the native sound.



The Equalizer accepts three audio sources. The control marked "VCR" mixes in the sound from your original videotapes. The "music" knob brings in a separate music source, such as a CD player. "Mic" lets you mix in sound from a microphone. You can independently vary the three levels, creating the perfect mix.

When a control is all the way down, the sound is off. At the white line, the audio level is about the same as when it came in; at its topmost point, it is 6 dB higher. ("dB" stands for decibel, a measure of loudness. 6 dB is four times as large a signal as 0 dB, but to the human ear, it sounds a bit less than twice as loud.)

The 6 dB setting is useful for very quiet sources, but remember that when you boost the sound, you also boost any low-level noise that is present. In addition, boosting already loud sound will cause "distortion" — a noisy, buzzy quality, especially at the loudest parts.

The music and VCR channels are stereo. The microphone is mono and always appears on both channels at once.

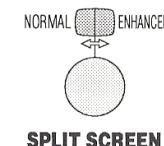
**About audio dub.** The most flexible way to modify the sound on a videotape is to use the audio mixer to change it as it is being re-

corded (or while the tape is being copied). It is also possible to change the sound on a tape that is already recorded. To do this, you need a VCR equipped with a feature called *audio dub*. This permits you to replace the sound on the linear (non-hi-fi) track without affecting the video on the tape. If there is a hi-fi sound track, it is unaffected by audio dub.

## Step 5.3: Split Screen

A split screen allows you to see a "before and after" view. A line divides the screen in two. On the left is the untouched video, as it appears at the input. On the right is the video, as it has been changed by the Equalizer

controls. The split screen on the Video Equalizer is moveable — it is not stuck to the exact middle of the screen. Use the knob to position the split on the middle of the object of interest, so you can see how your changes affect the object. Set fully clockwise, the entire screen shows the unchanged, normal image. Turned fully to the left, the whole screen is enhanced and corrected.



## Step 5.4: Enhancer

The Enhancer is designed to improve the appearance of a video image. It is optimized to partially compensate for the kinds of image degradation that occur when videotapes are copied.

### About video quality

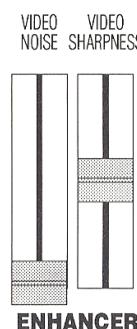
No enhancer can make a copy as good as the original. A certain amount of quality loss is unavoidable. Consequently, it is always best to avoid unnecessary duplication steps. If you are editing videos, try to make "second-generation" productions (ones that are copies of the original tape, rather than copies of copies).

Incidentally, an enhancer will do very little to improve a good quality tape, since there is little to correct. Enhancers are designed to improve copies that exhibit some image degradation.

Finally, note that using more than one video processor or enhancer (using a second Video Equalizer, for instance) is unlikely to improve the video quality and could easily degrade it. We suggest using the only the Equalizer and removing all other signal processors.

**Video noise.** Video noise is a grainy, snowy effect, most obvious in solid color areas of the picture. Look at a solid color object on a videotape. Noise is less apparent on very light or black objects, more apparent on dark or mid-toned objects.

When the VIDEO NOISE control is all the way down (even with the white line on the front panel), it has no effect. As you raise it, noise in the solid areas will start to be flattened out. Raise it until the areas look smooth and clear.



You can go too far. As you raise the knob, subtle variations that are supposed to be there — the rosy cheeks of a baby, for instance — will start to disappear and objects will start to look flat.

**Sharpness.** The SHARPNESS control accentuates the edges of objects by boosting changes between one color and another. Start with this control all the way down, where it has no affect. Raise it slowly, and object edges will become sharper.

It is also possible to overdo sharpness. As you raise the control, edges will develop an extra fringe — sort of an outline.

**Recommendations.** Start with both controls all the way down. Adjust the SHARPNESS first. Go to the point where the edges begin to look like outlines, then go back down, removing the outlines. Raise the VIDEO NOISE control until it begins to over-flatten the picture, then bring it down a bit.

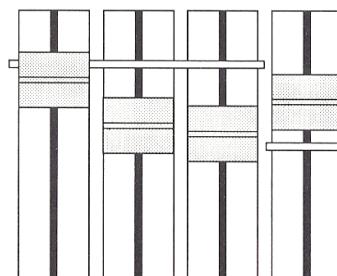
Go back and forth between the two controls. A subtle effect is generally the best.

**Other enhancement controls.** Many televisions and VCRs have sharpness and enhancement controls. It is generally best to turn those off. Place the VCR and television sharpness controls at their middle positions, or slightly below. If your VCRs have EDIT switches, turn them on, to remove the effects of the edge enhancers.

## Step 5.5: Video Processor

These four controls are similar to those on some televisions but their performance is designed for video production. Some of their

CONTRAST BRIGHT COLOR TINT



**VIDEO PROCESSOR**

ranges are wider than those on the typical television; others are more precise. The digital circuitry in the Equalizer affords greater control and better quality.

The white lines represent a neutral setting, with little effect on the picture. It is generally a good idea to start at the neutral setting and adjust from there.

**Contrast.** Raising the CONTRAST knob makes the whites whiter and the blacks blacker. Lowering it has the opposite effect. When it is all the way down, the picture will be solid gray.

This control does approximately the same thing as the "luminance" or "video level" control on other equipment.

**Brightness.** The BRIGHTNESS control makes everything in the picture whiter or darker.

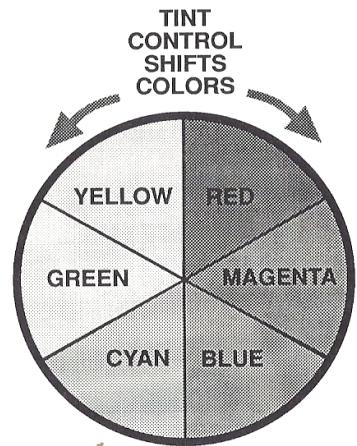
The "black level" control on other equipment operates in a similar fashion.

**Fade to black.** Lowering both CONTRAST and BRIGHTNESS at the same time will fade the entire picture to black. Lowering BRIGHTNESS and COLOR will perform a slightly different-looking fade — try both varieties to see the difference.

Note that because it is digital, the Equalizer fades in steps. Fast fades will look smoother than slow ones.

**Color.** This control makes the picture's color more or less vivid. Above the white line, it can actually boost color, improving dull videos. It can also reduce the color — all the way to black and white, if you like. (You can also create black and white using the advanced modes, explained in Step 6.)

**Tint.** The entire picture's color can be shifted with the TINT con-



The color wheel shows how the tint control affects television colors. Red tones can be shifted toward yellow or magenta; green tones toward yellow or cyan, etc. Skin tones, which are in the yellow-to-red range, will shift toward green or red.

trol. The scale behind the knob shows a red-to-green graduation because skin tones will go toward red or green as you adjust tint. However, note that all other colors will shift as well. Raise the knob to shift toward the warm, redder tones; lower it to move toward the cooler, greener tones.

Compared with most television sets, the TINT knob is subtle, allowing much more precision.

You can also use the Digital Paintbrush and Colorizer controls to adjust colors with greater flexibility. These controls are explained in Step 5.6 and Step 6.

Note: In the European PAL color television broadcast standard, there is no tint adjustment. Video Equalizers manufactured for PAL do not have a TINT knob.

### Step 5.6: Colorizer

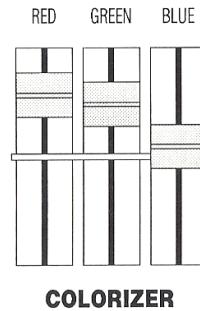
This section explains how the Colorizer controls behave when the Digital Paintbrush's SIZE knob is set to OFF. Step 6 explains its operation when it is on.

When the Digital Paintbrush's SIZE knob is set to off, the Colorizer controls affect the entire picture. Raising the red knob makes things redder, raising blue increases their blue content, etc.

The Colorizer does not simply adjust the color of the objects on the screen. Unlike any other color corrector or television control, it can add new color. The effect is

like shining a light on the scene, adding color that the scene did not originally contain.

You'll need to try this to appreciate it!



**Mixing red, green, and blue.** Changing two knobs at once changes the mixture of those two colors. Because most people have no experience with the mixing of the television colors, the shifts may seem surprising at first. The concept is similar to mixing paints

**RED + GREEN = YELLOW**

**RED + BLUE = MAGENTA**

**BLUE + GREEN = CYAN**

These are the colors produced when you mix the primary television colors. For example: To make a picture yellower, you would raise the red and green controls and lower the other control (blue).

(red, blue and yellow) or ink (magenta, yellow, cyan, and black) but the combinations are different.

If you find the process confusing, be patient — soon you'll be amazed at the degree of control provided by the red-green-blue system.

Step 6 contains a detailed description of how the red-green-blue television system works. You don't need to understand the system to use the Colorizer, but it will make your adjustments faster and more accurate.

### Step 5.7: Record the results!

When the picture looks the way you want, turn the split-screen knob fully counter-clockwise so the entire screen is enhanced. Leave the other controls as they are. Rewind the tape and press play. When the desired footage comes along, press play on the recording deck and the enhanced and modified image will be recorded. If you are using an edit controller such as Videonics DirectED PLUS, see Step 7 for instructions.

Keep in mind that the VCR will record just what you see. For instance: If you leave the split screen line on the screen, it will be recorded too!

# Advanced Operation

You could use most of the Equalizer's functions without the manual but you will probably need to read this section to make full use of the Digital Paintbrush.

## Step 6.1: Advanced Modes

Press the ADVANCED MODES button. Its light will go on. Each time you press the button, it will engage the next mode until it gets back to normal mode again. Here are the modes:

- **Black and white.** The picture becomes black and white. You can add new color to the black and white picture, using the Colorizer and Digital Paintbrush, described later in this section.

One popular effect is sepia tone — just use black and white mode, add red plus green for a golden, old-time look. You can also make a daytime scene look like night by subtracting most of the red and green from the black and white picture, leaving mostly blue.

- **Posterization.** This special effect, also called solarization or paint, replaces the smoothly graduated middle tones of the

image with stepped, contoured areas. The CONTRAST control determines how pronounced the effect is. At the top of the control, the image will be high contrast; at the bottom, it will be smooth and normal.

- **Negative.** This converts the image to color negative, useful as a special effect and for viewing color negative films. You can use a close-up lens attachment on a camcorder to focus on a color negative, then use this mode to transfer the photos to videotape. If the color of the original photograph was off, you can use the Colorizer controls to adjust it.

Hints: For best results with the negative effect, adjust the brightness and contrast. In particular, you will probably find that greatly lowering the brightness improves the results. Color negative films have an overall orange tint. With the paintbrush size set to OFF, lower the blue control and raise the red and green controls slightly to remove the orange tint.

- **Color bars.** Record these color bars at the start of each tape to create a reference screen, useful for adjusting the television set when the tape is played.

# Step 6

Color bars will not appear unless there is a video signal coming in to the Equalizer. The other controls have no effects on the color bars.

- Press one more time to return to normal (light off).

## Step 6.2: The split screen and advanced modes

The advanced modes modify both sides of the split screen. The rest of the controls affect only the enhanced side.

For example, suppose you use the advanced modes button to choose posterization, then use the brightness control to darken the posterized image. The left side of the split screen will show the effect with normal brightness; the right side will show the darkened negative image.

Note: The split-screen does not operate in the negative advanced mode.

## Step 6.3: The Digital Paintbrush and Colorizer: What are they?

The Digital Paintbrush and Colorizer are unlike anything else available in video equipment. The Digital Paintbrush selects items from the screen, based on how closely they match a color you pinpoint from the scene. The Col-

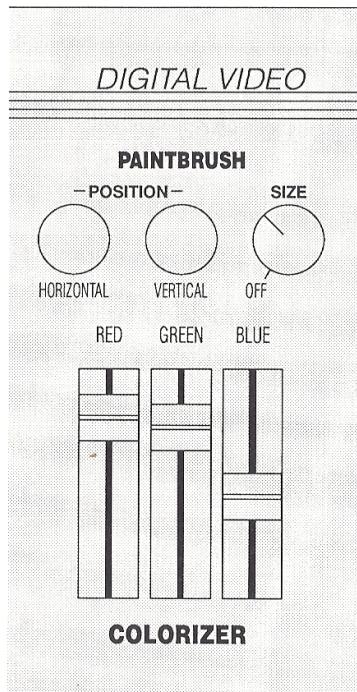
orizer adds color to the selected items (or to the whole screen). It works in a new, and exceptionally flexible, way.

With these tools you can:

- **Shift the colors of an entire scene.** The red, green, and blue controls give unprecedented flexibility because they independently control all three television primary colors.
- **Add color.** The Colorizer can do more than simply shift the colors that are already in the picture — it can add new color. The effect is like shining a colored light on the scene.
- **Colorize part of an image.** With the Digital Paintbrush, you can pick a color, or range of colors, to be changed, without affecting the rest of the scene. Change a blue car to red, make the kids' hair purple, or make a gray sky blue!
- **Colorize the advanced modes.** The Equalizer can colorize the negative, black and white, or posterized images for brand new effects!

## Step 6.4: Colorizing an entire scene

To shift the colors of an entire scene, simply turn the Digital Paintbrush's SIZE control OFF and adjust the red, green, and blue Colorizer controls. The section on the red, green, and blue additive color system, later in this section, will help you make the desired color adjustments.



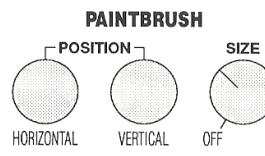
## Step 6.5: Using the Digital Paintbrush

The Digital Paintbrush allows you to select portions of the screen, based on color, and colorize only those portions. Here's how it works.

Imagine you have a video with a huge, gray horse that runs through the forest. Old Dobbin is a magnificent animal but you decide you would like a "horse of a different color." In fact, you want a purple horse. Conventional color correctors would work, but they would make the forest blue while they are making Old Dobbin purple.

**Step 6.5.1:** First, find a portion of the video where the horse is relatively still (or use the VCR's still frame feature to freeze the action).

**Step 6.5.2:** Adjust the two POSITION knobs. As soon as you start



turning either knob, two intersecting lines — crosshairs — will appear. Adjust the knobs until they intersect on an area that has the color you want to change — in this case, on the gray of the horse. Pick a middle tone, somewhere between the darkest, shadowed gray, and the lightest, sunlit portion of the horse. Think of the intersection

### Limitations of the Digital Paintbrush

As you might expect, there are limitations to this technique and there will be situations which will not permit colorization. For instance:

- Anything else in the scene with the same color will also be colorized. For example, if you colorized a gray horse and its rider was wearing a gray hat, the hat would also change.
- The paintbrush can pick up colors you didn't intend. A pale blue sky might be close enough to gray that it would be colorized along with the horse.
- As the colorized object moves, its color may change enough that it will lose its new color. As the horse runs into the shade, it may become gray again.

The technique works best when an object has a distinct color that does not occur elsewhere in the scene. It also works well for subtle changes, using a wide paintbrush setting and slight adjustments of the Colorizer controls.

of the crosshairs as a "paintbrush" that is "picking up" the color you wish to change. Remember that you are picking a *color*, not pointing at an object.

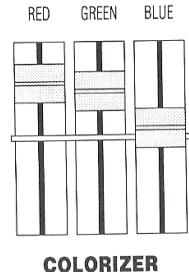
**Step 6.5.3:** Turn the SIZE knob. As soon as you do, the crosshairs will disappear and the gray parts of the scene will start to flash. The flashing portions are the colors that will be affected by the Colorizer! When the SIZE knob is near the OFF position, the only flashing areas will be those that have exactly the same color as the color you picked with the crosshairs. We call this a "narrow" paintbrush.

As you turn the knob clockwise, colors that are close to that color will start to flash along with those that match exactly. Turn the knob

some more and the paintbrush gets "wider," increasing the range of colors that flash. When the flashing portions match what you want to colorize, you can go on to the next step.

For example, the narrow brush will only capture portions of the horse — the portions that are exactly the same color as you pinpointed using the crosshairs. As the brush gets wider, more of the horse flashes, until the entire horse is selected. If the brush is too wide, other parts of the scene — the blue sky, for instance — will also flash. You can turn the brush back down until you get just the part you want.

**Step 6.5.4:** Adjust the Colorizer to colorize the parts that were flashing. As soon as you move the red, green, or blue knobs, the flashing will stop and the color changes will be visible.



The Colorizer does not shift colors. It mixes in a new color — like shining a light on the color that was in the scene before. It's a good idea to start with the

Colorizer controls set near the white line and move them gradually until you get the desired effect.

The farther the controls are moved from the white line, the greater the effect — near the line, the colors in the scene dominate; away from the line, the new color overpowers the scene.

Since red plus green plus blue is white, note that raising all three controls will lighten the selected areas. Lowering all three will darken them.

If you want a subtly purple horse, you would move the red and blue knobs up slightly and the green down a little. If you want a huckleberry-purple version of Old Dobbin, you would move the controls farther.

Feel free to experiment with the Colorizer controls. You can work by trial and error or, or for greater speed and accuracy, you can read the description of the red-green-blue additive system, later in this section.

**Step 6.5.5:** Next, you can fine-tune the SIZE control and the Colorizer controls until you have what you want, then play the tape with these settings. If all went well, you will have a purple horse, galloping through a normally-colored green forest.

**Step 6.5.6:** When you like the way the scene looks, you can record it.

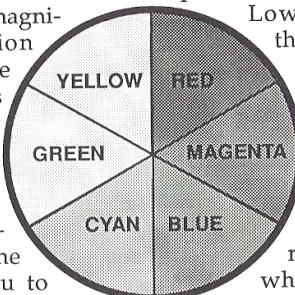
**Step 6.5.7:** While coloring objects can be fun, the Digital Paintbrush is most useful for gentler changes. You will probably find slight shifts, with wide paintbrush settings, most useful.

For example, if the bride's pink dress looks a little green because sunlight was reflecting off the grass, you can use the paintbrush to capture the greenish color; then use a fairly wide paintbrush setting and gently send that light green back toward pink, without making the groom's shirt pink as well.

## The red-green-blue additive system

This section explains how television's color system works. You can certainly colorize your videos by simply playing with the controls until you see what you like. But for those who are interested, understanding the red, green, and blue system will make it easier to get the desired results.

Red, green, and blue are television's "primary" colors. If you look through a magnifier at a television screen, you will see that every color is made up of tiny red, green, and blue dots or stripes. Red, green, and blue are known as the "additive" primaries. The Colorizer allows you to *independently adjust all three primary colors*, for the greatest possible color control.



or more cyan, since cyan (green plus blue) is the opposite of red. Lowering blue makes things look yellower. In fact, it is generally a good idea to lower one knob when you raise the other two. For example, if you wanted the scene yellower, you would raise red and green while you lower blue.

Similarly, if you raised one knob, you would lower the other two.

### Recommendations

It is not necessary to understand all this to use the Equalizer — you can certainly work by eye. The independent red, green, and blue controls give total creative color control whether you know the intricacies or not!

Always start with all three controls near the middle white line and deviate slightly. Remember that when you raise or lower controls, it is best to push the other controls in the opposite direction — in other words, keep some controls above the line and the others below the line.

# Editing

*This section describes how to use the Equalizer with the Videonics DirectED PLUS video editor but the techniques can easily be adapted for use with other editing accessories, or with simple tape-to-tape editing with no controller.*

## Step 7.1: Some examples of what you can do

The Equalizer is a terrific video editing accessory. With it, you can fix problems in the original footage. You can add new, dramatic effects. For example:

- You shot some footage indoors but left the camera set for outdoor shooting. The resulting footage looks too orange.

Remedy: Use the Colorizer controls to turn down the red and green, and turn up the blue.

- There just wasn't enough light in the church but you shot anyway. Now the video is dark and muddy.

Remedy: The video will never look as good as if there had been sufficient light, but you may be able to improve it by adding brightness and contrast using the video processor. You may also want to add some color. The video noise control may reduce the snowy appearance.

- You want to do something interesting to the footage you made at Amy's birthday party.

Remedy: Use the Digital Paintbrush to change the color of Amy's cake. Posterize the picture and add color using the colorizer. Make it look like the party happened at night by going to black and white, lowering the brightness and contrast a bit, adding some blue, and removing most of the red and green.

# Step 7

## Step 7.2: Setup

Use the connections as shown in Step 1.5. Most important: The Equalizer should be connected between the PLAY-ONLY VCR and the Videonics unit.

You can leave the Equalizer permanently connected. When you don't want the image altered, simply set the Equalizer to its neutral settings, with the advanced modes off and the split screen control set fully to the right (clockwise).

## Step 7.3: Equalizing a whole tape

If an entire tape is to be modified, simply make the desired adjustments when you insert the tape. Hint: During a final production, whenever DirectED PLUS asks you to insert or rewind an original tape, you can view the original tape by pressing the **CHG DISP** key. You can adjust the Equalizer, press **CANCEL** when it looks correct, and proceed normally with the final production.

## Step 7.4: Modifying a few scenes by "riding" the controls

One way to modify particular scenes is to watch DirectED PLUS carefully and adjust the Equalizer

controls as DirectED PLUS records the scenes of interest. This method is straightforward but requires that you be there at the right moment.

If you make a mistake using this method, the "Append" function, mentioned in the next step, will allow you to recover.

## Step 7.5: Modifying a few scenes using the "append" function

DirectED PLUS allows you to append scenes to a final production. Suppose you have a ten scene production and you want to use the Equalizer on Scenes 4 and 8.

First, create the production normally, choosing Scene 1 as the "**First scene to include**" and Scene 3 as the "**Last scene to include**". Chapter 8 of the Director's Manual describes how to select the first and last scenes of a production.

Next, use the append function (also described in Chapter 8) to append Scene 4 to the production. Adjust the Equalizer so that Scene 4 has the effects you desire.

Next, append Scenes 5 through 7. Then append Scene 8, adjusting the Equalizer as desired. Append the last scenes and the production is complete.

## NOTES

