datavideo®

Digital Video Switcher

HS-500

INSTRUCTION MANUAL
Http://www.datavideo-tek.com

Table of Contents

Warnings and Precautions

1. Read all of these warnings and save them for later reference.
2. Follow all warnings and instructions marked on this unit.
3. Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this unit in or near water.
5. Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6. Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8. Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9. If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord's rating.
10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:
    a. When the power cord is damaged or frayed;
    b. When liquid has spilled into the unit;
    c. When the product has been exposed to rain or water;
    d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;
    e. When the product has been dropped or the cabinet has been damaged;
    f. When the product exhibits a distinct change in performance, indicating a need for service.

Radio and Television Interference

UNITED STATES: The equipment described in this manual generates and uses radio frequency energy. If it is not installed and used in accordance with the instructions in this manual, it may cause interference with radio and television reception.

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

1. Reorient or relocate the receiving antenna;
2. Increase the separation between the equipment and the receiver;

3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

If necessary, consult your dealer or an experienced radio/TV technician for help and/or additional suggestions.

N.B.: Changes or modifications not expressly approved by the party responsible for compliance could void the user's right to operate this equipment.

Peripherals used in conjunction with this equipment must be connected via shielded interface cables. Use of unshielded interface cables may result in interference to radio and TV reception, and may void the user's right to operate this equipment.

Warranty

Datavideo warrants that the equipment it manufactures shall be free from defects in material and workmanship for a period of 12 months from the date of product purchased. If equipment fails due to such defects, Datavideo will, at its option, repair or provide a replacement for the defective part or product. Equipment that fails after the warranty period, has been operated or installed in a manner other than that specified by Datavideo, or has been subjected to abuse or modification, will be repaired for time and material charges at the Buyer's expense. This warranty does not affect your statutory rights within the Country of purchase.
Note: Datavideo except no responsibility for compensation for the loss of data that could not be recorded or transmitted due to problems such as unit malfunction, loss of signal etc.

For EU Customers only - WEEE Marking.
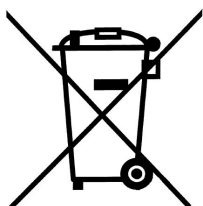
This symbol on the product indicates that it will not be treated as household waste. It must be handed over to the applicable take-back scheme for the recycling of electrical and electronic equipment. For more detailed information about the recycling of this product, please contact your local Datavideo office.

Introduction

Thank you for purchasing Datavideo's HS-500 Mobile Video Studio. We hope you will be pleased with your purchase, and with what you can achieve with this advanced piece of technology. In order to get the most out of your new switcher, we recommend that you spend some time getting familiar with this manual, as it will describe in detail all the functions of this unit. In addition, you'll find some useful background information on video and audio, and some detailed examples of ways to use your new switcher.

Product Overview

The Datavideo HS-500 combines the SE-500 4 channel switcher with the TLM-702 dual 7" TFT Monitor, both fitted and wired into a custom built metal case. All you need to add is your 4 camera feeds, audio feeds, and your choice of output device to record to, or transmit from, and you're ready to go.
The instruction manual is broken down into three sections; HS-500 general operation, SE-500 and TLM-702, please read each section carefully.

Features

Digital Processor, high image quality
Four inputs of S-Video (Y/C) or Composite video
Quad video preview monitor output with tally & transition indicators on screen
Built in Dual 7" Monitors (TLM-702)
Optional YUV output – via supplied breakout cable
Quad, Split, PIP, Wipe, and Fade digital video effects
T-Bar control of digital video effect transitions
Color processor for video correction
RS232 remote control
MIDI control interface
Tally output
Audio mixer with two microphone channels and one auxiliary input
Self contained in metal transit case for rapid set up / breakdown
Compact and lightweight one box solution

Packing List

1. HS-500 Mobile Video Studio x 1
2. BNC to BNC 1.2m cable x 2
3. S-Video 1.2m Cable x 1
4. YUV Breakout cable (BNC x 3 to S(Y/C)+BNC cable) 1.2m x 1
5. RCA to RCA stereo cable 1.5m x 1
6. AC Power Cable x 1
7. Allen Key x 2 (1.5 ψ & 2.5 ψ)
8. Instruction Manual x 1

HS-500 General Operation

Some General Notes on Installation
Before setting up the HS-500, please make sure you have read the **Warnings and Precautions** section on *page 3.* The internal wiring between the SE-500 and TLM-702 is already installed and ready to go.

Setting Up
Place the HS-500 on a stable, flat surface, such as a desk with the handle of the case facing towards you.

Ensure that the larger of the two sections, which has the handle attached, is on top.
Unlock the two locks and lift the lid.
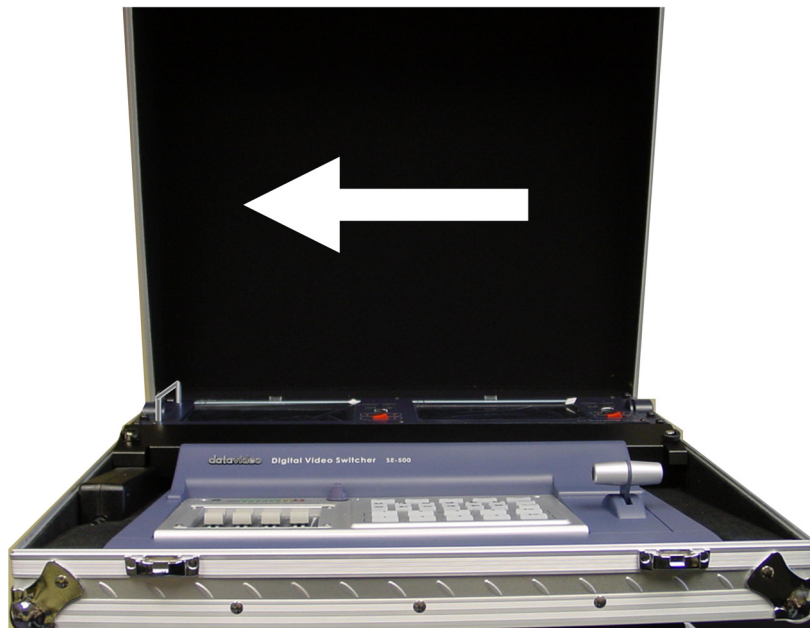
The hinges at the back of the HS-500 have been designed so that once the lid is at an angle of 45 - 90 degrees it can be slid to the left and removed.

Connecting Video Sources and Power Cable

Firstly remove the cover by unscrewing the two thumb screws, this allows easier access to the rear of the SE-500

With the cover removed you can see the rear panel of the SE-500

At the rear of the case there is a cable flap, unlock it so that it hinges down to allow access.

Thread the power cable through the cable access flap and insert it into the PSU.

Now connect your video and audio inputs and outputs from your cameras etc. For more details see the SE-500 section of this manual.
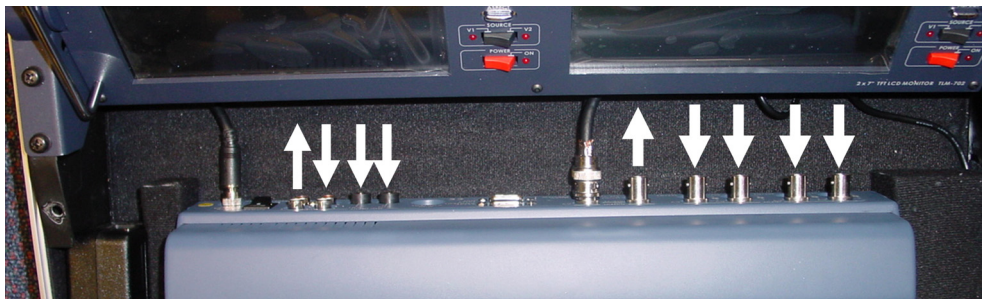
With everything connected switch the SE -500 on and then replace the cover.

Switch on the two monitors and set them to a comfortable viewing angle. For more details of the monitors see the TLM-702 section. The HS-500 connections use the V1 inputs on both monitors. Make sure that the source switches are both set to V1.
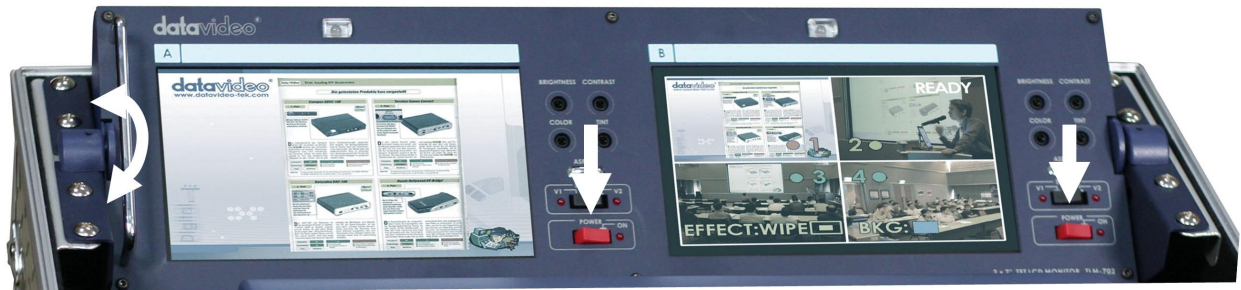
NOTE: When packing away the HS-500 please ensure that the monitors are folded flat before replacing the lid on the transit case.

SE-500

SE-500 Front Panel
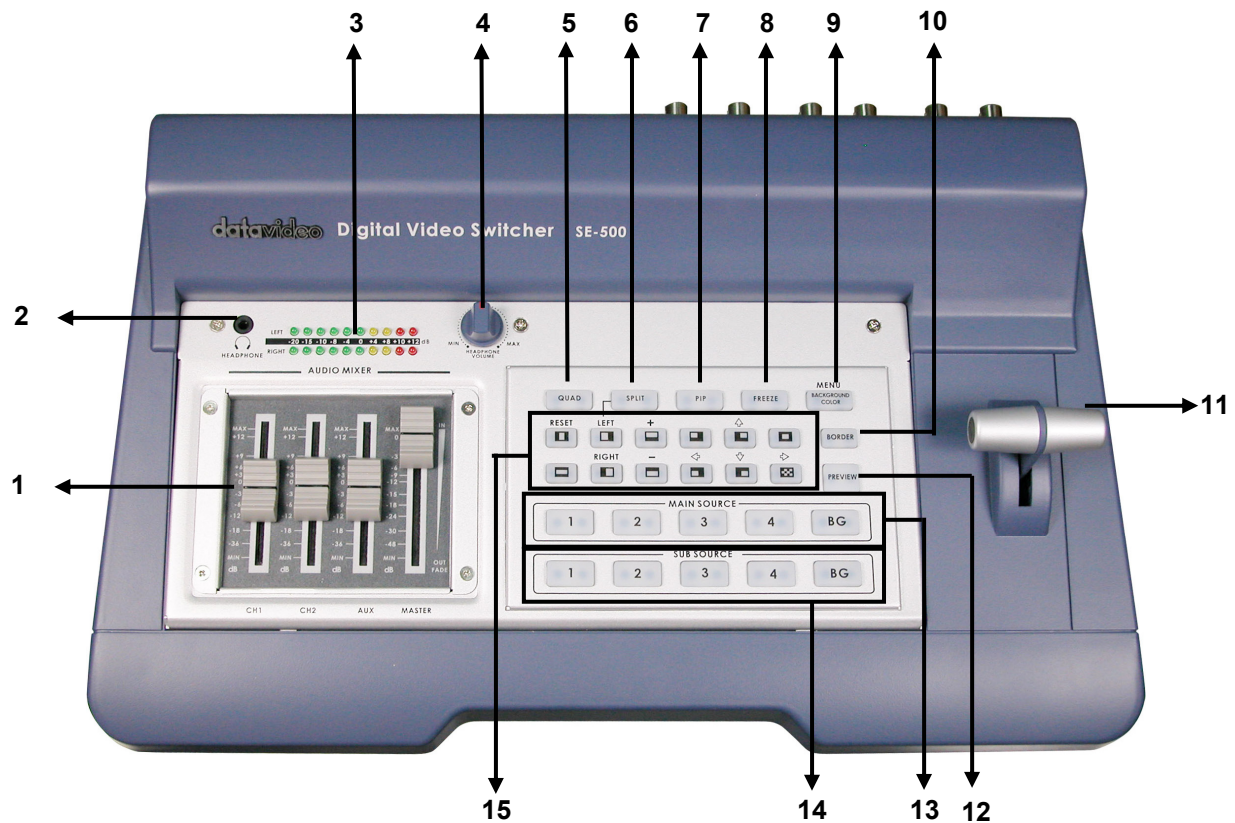
1. **Audio faders**
2. **Headphone Socket**
3. **Audio meters**
4. **Headphone Volume Control**
5. **Video Effect: Quad**
6. **Video Effect: Split**
7. **Video Effect: PIP**
8. **Video Effect: Freeze**
9. **Background color selection/Menu**
10. **Border On/Off**
11. **T-Bar**
12. **Transition Effect preview**
13. **Main Video Source selectors**
14. **Sub Video Source selectors**
15. **Transition mode selectors**

1. Faders: sliders to control audio levels for the Main audio output mix. These Audio Level pots are the first stage in the audio signal path. Analog audio comes in through the 1/4 inch phono jack and RCA connectors on the rear panel see **Rear Panel**, *page 14*.
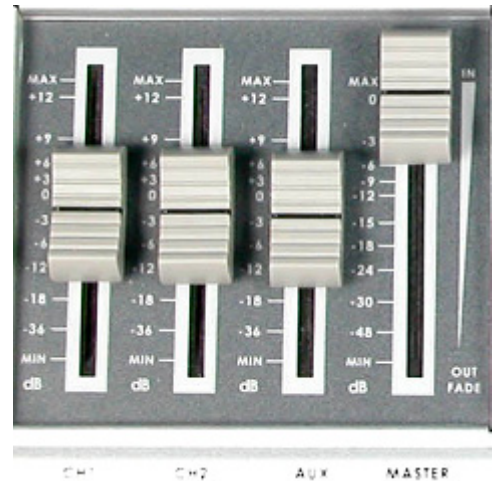
2. Headphones jack: accepts a stereo mini jack plug for stereo headphones. The headphone volume is controlled by the Headphone volume control (**4.**).

3. Audio Meters: LED style meters, which show the signal strength at the Audio Output. The signal measured is determined by the levels set with the Faders (**1.**). The LEDs turn red at +10 dB to indicate clipping distortion. For more information, see **Audio Inputs, Levels, and Meters**, *page 23.*

4. Headphone volume control: controls Headphone level and signal(s) present at the Headphone jack (**2.**). Level is controlled by the rotary knob. For more information, see **Using Video and Audio Monitors**, *page 16* and **Audio Inputs, Levels, and Meters**, *page 23.*

5. Quad Video Effect: combines four different input sources into one single output on program monitor.

6. Split Video Effect: split the selected Sub Video Source and the Main Video Source into left and right half size video screen. Use left and right function key to swap sides. For more information, see **Using Effects: Split**, *page 28.*

7. Picture in Picture: puts the selected Sub Video Source in a window on the Main Video Source, with control over window size and placement. Used in conjunction with the Border keys (**10**.) For more information, see **Using Effects: Picture in Picture**, *page 28.*

8. Freeze Video Effect: will grab the last field from the Main video output and hold it as a still image. For more information, see **Using Effects: Freeze**, *page 28*.

11
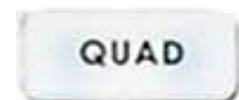
9. Background: When Background is selected in either the Main or Sub Video Source (**13, 14.**), and the button is pressed (and the LED is lit except with black color background), repeated presses of the color button cycle through the 8 possible solid backgrounds. For more information, see **Background**, *page 29*.

10. Menu: Press and hold the button "BACKGROUND COLOR" for 2 seconds or more, a menu will pop up. You are able to change the camera settings, which include Brightness, Contrast, color, Tint (NTSC only). For more information, see **Color Processor**, *page 21.* Press it again, and you can change output format between YUV or S-video out, select RS232C or MIDI control, and color bar output.

11. Border: controls the border style and color for the Picture in Picture effect, and the color edge for the Wipe effect. This control is accessible when the Picture in Picture controls and Wipe transitions (**15.**) are engaged. For more information, see **Using Effects: Picture in Picture,** *page 28* and **Using Transitions: Wipe** *page 24.*

12. T-Bar: used to manually perform a transition. For more information, see **Playing a Transition**, *page 24.*

13. Preview: preview the selected transition effect, and background color by pressing the "Preview" button.

14. Main Video Source Selector: Used to select which of the four video input channels or background is sent to the Main video output. For more information, see **Video Source**, *page 20.*

15. Sub Video Source Selector Used to select which of the four video input channels or background will be transitioned to or used as a sub source in an effect.

16. Transition selectors: These twelve selection buttons determine the transition type and allow for the selection of certain effects that are performed on the selected Main Video Input channel. For more information, see **Using Transitions**, *page 24* and **Using Effects**, *page 27.*
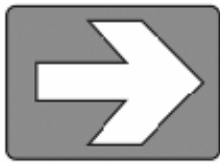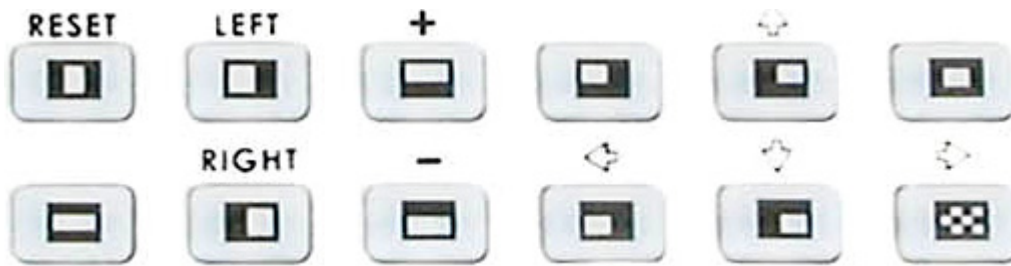
Tech note: Transcoding is the act of changing video from one format to another, for example, from composite video to S-video. The SE-500 has been designed to perform transcoding, as part of its standard operating procedure. Select a video source on the Main Source Input bus, and it will be available at the Main Output in all formats, S-Video and Composite, simultaneously.

N.B. The output format can be S-Video and Composite or Component Video (YUV) and Composite. It is not possible to output S-Video (Y/C) and Component Video (YUV) at the same time.

SE-500 Rear Panel
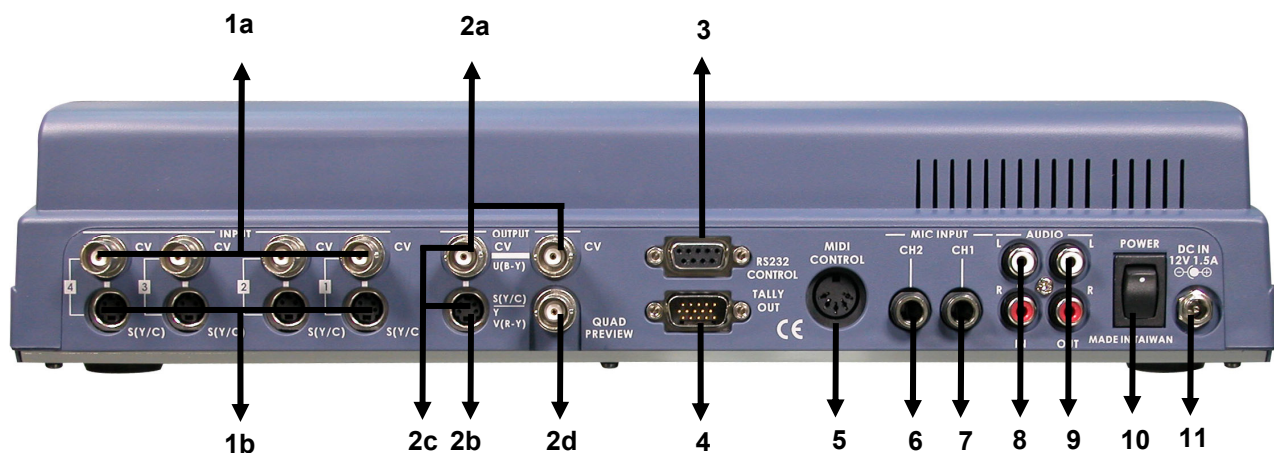
1. **Video inputs, Channels 1, 2, 3, 4.**
   1a. **Composite video input (BNC)**
   1b. **S-Video (Y/C) input**
2. **Video outputs**
   2a. **Composite video out (BNC)**
   2b. **S-video (Y/C) out**
   2c. **Component (Combine Composite &**
       Y/C with supplied breakout cable)*
   2d. **Quad preview output (BNC)**

3. **RS-232 Control**
4. **Tally Signal out**
5. **MIDI Control***
6. **Microphone input Ch2 (1/4" jack)**
7. **Microphone input Ch1 (1/4" jack)**
8. **Audio inputs (Stereo, RCA connector)**
9. **Two Stereo Audio outputs (RCA)**
10. **Power On / Off switch**
11. **DC Power input 12V 1.5A**

1. Video In (Channels 1, 2, 3, and 4 are all set up the same way)
   a. Composite video input: takes a BNC connector from the composite output of a VCR, camera, DVD player, etc.
   b. S-Video (Y/C) input: takes a standard 4 pin S-video cable from the output of a VCR, camera, DVD player, etc.
   N.B If S-Video (Y/C) is connected it will be automatically selected in priority over Composite.

2. Video Output. These ports carry the Main video output of the SE-500.
   a. Composite video out: BNC connector typically connected to a program monitor.
   b. S-video out: standard 4 pin S-video (Y/C) connector, typically connected to a VCR, projector, or monitor.
   c. Y.U.V. video out: Combine Composite & Y/C with the supplied breakout cable. These BNC connectors carry the analog component Main video signal, and would typically be connected to a master recorder (Betacam, DVCPro, or DVCam, for example), component video monitor, or a satellite uplink. (See *page 17* for more information on connecting these ports to a device.)
   d. Quad preview out: BNC connector carrying a quad video signal with effect, Tally light, background, and speed indicators.

3. RS-232 control: for PC or other devices to remote control via RS-232 protocol. Please read the Appendix of RS-232 Protocol for more information.

4. Tally Out: send out Red, Amber, and Green color tally signals to each channel. Red means On-Air, Amber means next camera source, Green means free to move.

5. MIDI Control interface: for connecting to other MIDI devices, such as MIDI keyboard, and electronic piano. Please read the Appendix of MIDI Control Protocol for more information

6. MIC CH2: A ¼" jack connector for a high impedance analog audio source, such as a microphone. MIC inputs 1 and 2: accept ¼" Inch mono plugs, carrying high impedance signals from one or two mono microphones. With high impedance MIC, the longer the cable from microphone to the SE-500, the more noise is introduced into the signal.

7. MIC CH1: When a stereo ¼" jack is connected to CH1 only, the CH1 and CH2 **Faders** (page 13) will have equal volume on each channel. When both CH1 and CH2 have a MIC connected, each fader channel will adjust the respective input from the rear panel.

8. Audio Inputs: A RCA stereo for a line level auxiliary analog audio source, such as a CD player or tape deck. If you are using more than two sources via an external audio mixer, connect the audio mixer's line level output to this unbalanced Audio input.

9. Audio Output: A RCA stereo line level analog audio output, carrying the signal present at the output of the audio mixer section (see **Controls and Operations**, *page 20)*.

10. Power: Switches the unit On / Off.

11. DC Input: connect the power supply that came with the SE-500, and only the power supply that came with the SE-500, here, and plug the other end into an electrical outlet, preferably on a surge suppressor for added protection.

Selecting video input formats and adjusting audio levels

(Numbers refer to the Front Panel illustration above)*.

Verify that there is a valid source at each input you've connected by using the Main Source Select buttons (**13.**) to select a channel and view the output on the main monitor.

For each input channel (1, 2, 3, 4): connect either a Composite or S-Video source to each channel. For more information please see below.

Adjust any audio input levels you will be using, for example microphones, Aux in from a mixer, etc. Set the level of the LEDs in the Audio Meters (**3.**) to occasionally peak at +8 or +10 and there is no audible distortion.

Tech Note: The SE-500 will automatically detect which connector is plugged in. Therefore, there is no need to change the setting when you switch the video source from S-Video to Composite, and vice versa. However, if you connect both S-Video and Composite inputs on the same Channel, the SE-500 will automatically select the S-Video as main input source.

Selecting video output format

In addition to the Composite Video Output the SE-500 can output either S-Video (Y/C) or Component Video (YUV). To output Component Video there is a special breakout cable that connects to the (Y/C) out and one of the Composite Outputs.

To switch the SE-500 Video Output to S-Video (Y/C) or Component Video (YUV):

Press and hold the Background Button for 5 Seconds until the On-Screen Menu appears.

Press the Background Button again and the second page of the menu will appear.

Use the UP and Down Buttons to navigate the menu and highlight Video Output.

Video Output can be set to Y/C C C or Y.U.V. C.

If you want to output S-Video use the Left or Right Arrow Buttons to select Y/C, C, C.

If you want to use Y.U.V. Component Output via the supplied Breakout Cable then select Y.U.V, C.

Using Video and Audio Monitors

Without reliable video and audio monitors, you won't be able to tell what's what in your mix.

The SE-500 provides the ability to easily and reliably monitor video and audio at the output stages.

All video input channels can be monitored on one monitor, via the Quad Preview Monitor Output.

You should have a video monitor displaying the Main Output. This could be a composite monitor, for example, connected to the one of two CV plug (Composite) in the Video Output section, or to the composite output of a VCR connected to the Video Output.

For output audio monitoring with headphones, set the rotary headphone volume control knob to the center. (**4.**); to monitor through an amplifier and speakers, push the MASTER fader to -12 in the Audio Faders (**1.**) section. For more information, see **Controls and Operations**, *page 20*.

Cutting between sources

The simplest way to cut (switch) between source video inputs: use the Video Main Source buttons (**13.**) to select which input goes to the program monitor (output). Look at the results on your program or record monitor.

Dissolving between sources

Select the Main Video Source (**13.**) by pressing the appropriate channel button. The LED for the channel you have selected should be lit and you should see that source on the program monitor.
Select the Sub Video Source (**14.**) you want to dissolve to.
The default transition is fade (The LED should be lit when you turn on the switcher. If a different transition is selected at power up, press it to deselect.) Move the T-Bar (**11.**) to the opposite position and watch the fade happen on the program monitor. You can stop the fade part way through and watch the Main source fade away.

Other transitions between sources

Select Main and Sub sources as above.
Select the wipe you wish to use. There are total 11 different Wipe styles and the corresponding icon will be displayed on the preview monitor when you press it.
At this point you can hit Preview (**12.**), to see the transition on the preview monitor. Then, use the T-Bar to perform the transition manually.
For more information, see **Using Transitions**, *page 24*.

Effects

There are two places on the SE-500 where you can add effects: in the Transition Effects section (**15.**) and in the Video Effects section (**5-8.**). Some of these work on a single source, and some need two or four sources to work.

Select a Main Video source and try the following:

In the Transition Effects section, select the WIPE effect you wish to use. You could also add a border to the edge by turning on the **BORDER** effect (**10.**).

For more information, see **Using Transitions**, *page 24*
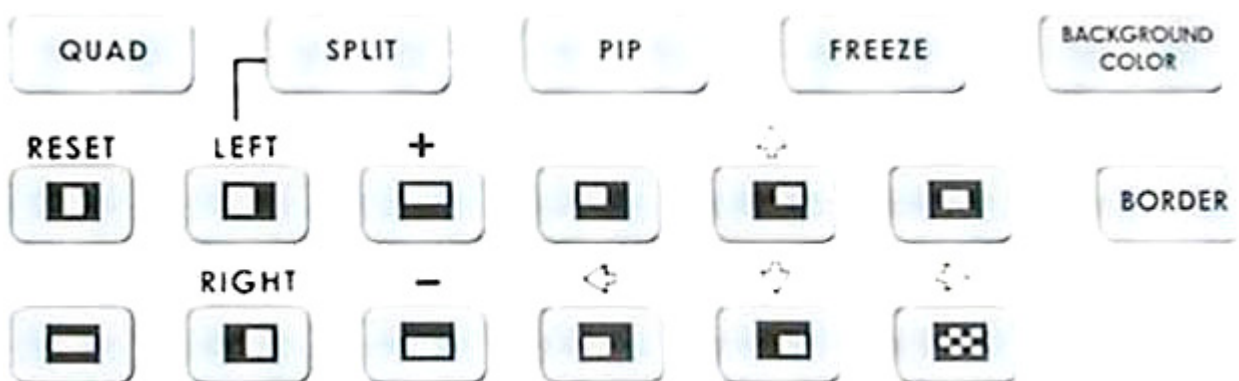
In the Video Effects section, try the Quad effect (**5.**). Press the button to engage the effect; the LED will light. You can see 4 input sources showing on the program monitor at the same time.

For Split effect (**6.**), select a sub source for right hand side window. Then, press the "SPLIT" button. You will see Main source on left hand side, and Sub source on right hand side.

PIP effect (**7.**), which stands for Picture in Picture. As you might guess, this effect requires a Main and Sub Video Source. Assuming you have valid inputs on Channel 1 and 2, select Channel 1 as the Main Source and Channel 2 as the Sub Source. When you engage the effect by pressing the PIP button (and verifying that the LED on the button is lit), on the program monitor you will have Channel 1 as the Main Source and Channel 2 as a smaller window inset. There are two choices for window size. Change these by pressing the + and - buttons, see below. You can position this window using the other five different position buttons on (**15.**), with the button set to Position Control (LED is lit). You could also add a border by turning on the Border control (**10.**).
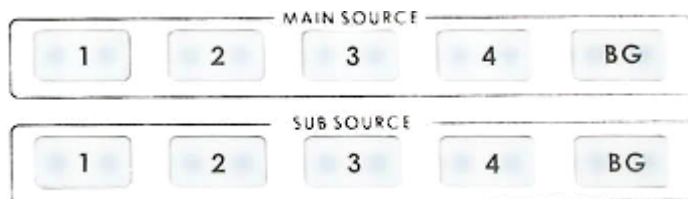
Next, try the Freeze effect (**8.**) to grab a still frame of the Main Source video. Move the T-Bar to manually dissolve to the Sub Video Source.

For more information, see **Using Effects**, *page 27*

Controls and Operations

Video Source

The first thing to do when using the SE-500 is to select the Main and Sub Video Sources.

The source you select (by pressing one of the buttons; a bright red LED on the selected button lights for confirmation) on the Main Source bus is what is sent to the Video output. This means that you can perform cuts between sources by simply pressing different buttons.

The Sub Source selection determines which input will be transitioned to when using any of the transition controls (Wipe and Fade) and provides the video for Picture in Picture and Split functions. (See **Using Transitions**, *page 24*, and **Using Effects**, *page 27* for more details.)

In addition to selecting which video input channel will be present in the Main and Sub Source busses, you must check the appropriate input for each channel in use. (See **Selecting video input formats and adjusting audio levels**, page 19.) The SE 500 has automatic input select; if there is an S-Video cable connected to the S-Video input, the channel will automatically switch to S-Video input. However this means that, if both composite and S-Video inputs are connected and there is no valid video signal present thru S-Video, you will see a black video when that channel is selected for output. For example, if you have a camcorder connected to channel 1 through the composite input, and you also have channel 1's S(Y/C) connected to another non-working device, you will see a black video, even if the camcorder is supplying a signal. You will also see a black video if the camcorder is not supplying a video signal, such as when it is powered off, or in playback mode with no tape loaded.

Tech note: The frozen image is a function of how the time base corrector (TBC, a.k.a. frame synchronizer) works. The SE-500 has a TBC at the Main Video Source and the Sub Video Source input on each channel. Their purpose is to stabilize the video signals as they come into the switcher, and to synchronize their timing so that they can be switched and otherwise combined with no disruption to the video signal.
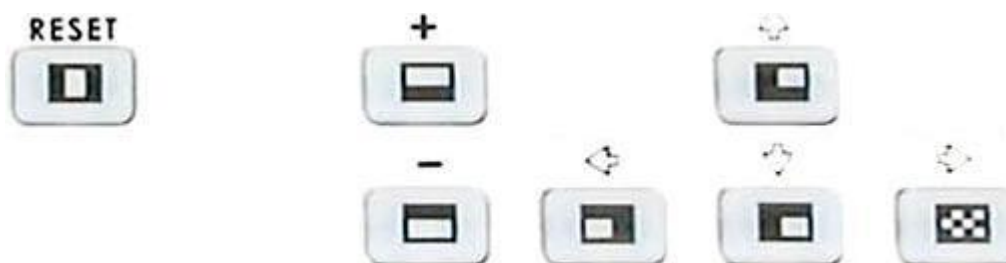
Color Processor

The Color Processor controls work when you press and hold the "**Background**" (**9.**) button for 2 seconds or more, which is temporarily displayed at the Preview Output. For more information, please see the "**MENU**" section. These controls are like picture controls on a video monitor or the proc amp (processing amplifier) controls on a time base corrector. In fact, they are the proc amp controls of one of the SE-500's 4 internal TBCs.

On the top of screen you can see 4 different numbers, each represent the input channel from the SE-500 rear panel. On the left side of this section are the 4 controls (Brightness, Contrast, Color, and Tint (NTSC only)). 0 stands for Unity, or perhaps Unchanged. In either case, it shows that the signal passing through that particular control is being neither boosted nor cut. To move to another control, press the **up** or **down** arrow button. To move to another channel, press the **left** or **right** arrow button. To change the settings, press the **+** or **-** buttons.

	1	2	3	4
Brightness	±0	±0	±0	±0
Contrast	±0	±0	±0	±0
Color	±0	±0	±0	±0
Tint*	±0	±0	±0	±0

You can see the extent of color processing available in this section by experimenting with the controls. Brightness adjusts how light or dark the colors in the image will appear at the Video Output. The Y-Gain controls affect the range between the lightest and the darkest parts of the image, including how much shadow and highlight detail can be seen. Color controls the saturation or intensity of the color image, from fully saturated or extremely intense at the top of the scale to completely de-saturated or monochrome (black and white) at the bottom. The Tint buttons (NTSC only) control the actual hue or specific colors in the image, in effect rotating all the colors equally around an imaginary color wheel.

Reset works on the selected input source, and when pressed and held for 2 seconds, resets the Color Processor controls for just that input to 0 or unity. (Press and hold the Reset button until you see the image shake a bit and return to it's unprocessed state.)

So how do you know for certain how effective any of these adjustments are? You can see the changes by looking at the Main Output on a video monitor, but how do you know if that reference is accurate?

The first part of the answer is: by having an accurately calibrated monitor that shows exactly, with reference to a standard, what the video looks like. That standard has been described and agreed to by the Society of Motion Picture and Television Engineers (SMPTE) and the European Broadcasters Union (EBU), and is most commonly shown as "color bars." Color bars are an image consisting of columns and blocks of specific colors and gray tones. Because of differences in television standards, SMPTE bars and EBU bars do not look the same. They are used in much the same ways: when these are displayed on a monitor, the monitor can then be adjusted to meet the standard.

The most serious, accurate color correction is done with the aid of a waveform monitor/vector scope, a signal analysis instrument (actually a pair of instruments) common in video editing suites, which shows precisely the details of the video signal. With one of these instruments, you can see at a glance (once you know what you are looking for) the most intimate electronic details and irregularities of the video signal.

Many users may not have access to a waveform monitor or vector scope, but this does not necessarily condemn them to produce less than high quality video. It means that more care must be taken and some different procedures must be followed.

Nothing will take the place of a calibrated, properly adjusted monitor, so that must always be your first step. For more information on monitor calibration procedure, see **Appendix: Monitor Calibration**, *page 38.*

If you don't have any video test equipment, follow the suggested procedure to adjust all the video sources, which is described at the end of **Appendix: Monitor Calibration**, *page 38.*

Settings made in this section are "remembered" by the SE-500 after you power down the unit. In other words, these settings remain in effect until they are changed or the Reset button is pressed.

 MENU

The MENU works when you press and hold the "**BACKGROUND**" (**9.**) button for 2 seconds or more, which is temporarily displayed at the Preview Output. The first adjustment is the "Color Processor" as described above. Press the button again, and you can select IRE, video output format, remote control protocol, and color bar output. Use the **up** or **down** arrow keys to move to different categories, and then use **+** or **-** to change the setting.

You may select between Y/C, C, C or YUV, C (Composite) for video output formats. If you want to output S-Video select Y/C, C, C. If you want to run a Component (YUV) output, select YUV, C and use the supplied breakout cable to get a Component output signal.

If you use a MIDI keyboard in live concerts, you can control the SE-500. Go to "Remote Control", use **+** or **-** to change the setting from RS-232C to MIDI. Press "**BACKGROUND**" again, select the desired MIDI channel you wish to use. While you are setting the channel on the SE-500, please also set up the channel on your MIDI device. After you finish setting, press the button again. Turn off the unit, and then turn it back on. Now you can start to use the MIDI device to control the SE-500. For more detailed information on MIDI control protocol, please refer to the Midi Control Protocol section.

Tech Note: All the settings will be memorized except color bar output.

Audio Inputs, Levels, and Meters (Faders, bus selectors,)

Audio Input Level Calibration Procedure

The first step in setting up the audio for a session with your SE-500 consists of adjusting the levels on which channel you will be using. Slide the Master fader to Max, and set the other faders to 0. Then, listening to the audio and watching the Audio Level Meters (see below), set the level with the fader so that the sound is consistently at between +0 dB (green LED) and +8 dB (yellow LED) and just barely peaks occasionally to +10 dB (red LED). The idea is to avoid any audible distortion (clipping), caused by making the signal level too high at this stage.
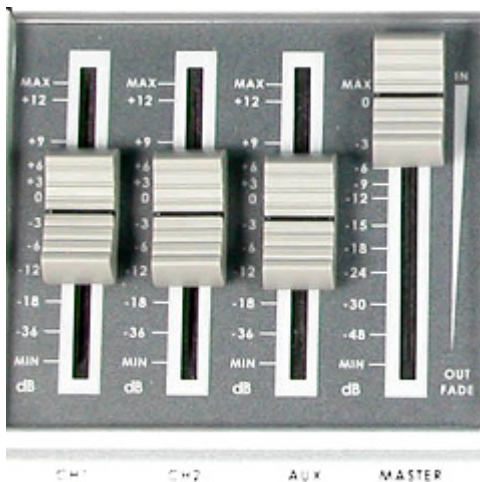
Three faders on the left represent the input volumes (CH-1, CH-2, AUX), which determine what signals are present at the Main Output. If any of the faders are all the way down, there will be no audio from that input channel heard at the output.

These faders correspond with each input and control the relative volume of each input in the master output as well as the master output level. When the faders are set to 0, they pass the audio signal through at the same level it was at when it entered this bus. You can increase or decrease the volume of each channel by moving the fader up or down.

These meters show the audio signal level at the Main output. The strength of any audio signal that is routed to the output will be displayed here. As mentioned above, these meters play a vital part in correctly setting the audio levels to avoid clipping or other distortion. You'll notice that the LEDs are green up through the +0 dB level, turn yellow at +4 dB, and turn red at +10 dB. As you set the audio level for each input, make sure that the signal peaks to +8 dB or very occasionally to +10 dB. Every time the signal goes to +12 dB, it will be distorted.

Use the Headphone section to accurately monitor with the "Master" volume output. In many cases, headphones may be a more useful and accurate choice than speakers for audio monitoring. For example, in a noisy club or at a concert, you won't be able to hear any additional sound coming through speakers. Headphones will also more accurately reproduce the sound you wish to monitor at a lower cost than speakers.

Using Transitions

The SE-500 can do 3 kinds of transitions: cut, fade, and wipe. The cut is a simple switch from one input source to another, and can be accomplished by selecting a source on the Main Source Bus, and then selecting a second one. One source is replaced by the next at the video output. Not flashy, not fancy, nothing to customize, but gets the job done. In fact, if you watch a film or video, paying attention to transitions, you'll see that the cut is far and away the most often used transition.

When you want a transition that is more stylish or fancy, see the next section.

Selecting a transition: Fade, Wipe

First, some definitions:
A fade, also known as a dissolve, is a transition wherein all the pixels of one source are replaced by all the pixels of another, at a smooth rate, and at the same time.

In a wipe transition, the change from one source to another happens along a predefined edge. It is like one source is being pulled back or pushed on to the other.

But a picture is worth a thousand words, so...
Select a main source and sub source, select Wipe, or Fade from the buttons above, press "**Preview**" button to see what it would like on program. Then, perform the actual transition manually by moving the T-bar up and down. See below for a list of transitions and variations.

Playing a transition

The T-Bar is the traditional switcher device for performing transitions; it can be either all the way up, all the way down, or anywhere in between. The up and down positions are relative, meaning one position is before and one position is after the transition.

The T-Bar performs the selected transition between the selected sources as fast as you move the T-Bar. And it performs as much of the transition as you want.

If no transition is selected, moving the T-Bar performs a fade between the selected sources.

Playing a transition automatically

The auto transition can be performed by RS-232 or MIDI control. In the auto-take, there are three different speeds you could select. For further detail please refer to the **RS-232 Remote Control Command** and **MIDI Remote Control Command** *sections.*

List of transitions and parameters (suitable for photocopying)

Wipe (works in conjunction with Border controls):

1: Block wipe from center to full screen.

2: Right angle wipe on, upper right to lower left

3: Right angle reveal, lower right to upper left

4: Right angle wipe on, upper left to lower right

5: Right angle reveal, lower left to upper right

6: Horizontal wipe, top to bottom

7: Horizontal wipe, bottom to top

8: Vertical wipe, left to right

9: Vertical wipe, right to left

10: Vertical wipe, middle to left and right

11: Horizontal wipe, middle to top and bottom

Using Effects

The SE-500 is capable of producing a wide variety of digital effects. These falls into 2 categories: single channel and dual channel effects.

Single channel effects are produced on the source selected in the Main Video Source bus and need no second video input. Single channel effects include Freeze.

For example, select any input channel having a valid signal as the Main Video Input. Press the Freeze button once. You'll see, on the program monitor, that the source video stops instantly. Press the button again, and watch the source video return to full motion. With the Freeze effect, there are no parameters, just a single source stopping and starting.

For more information on single channel effects, see the appropriate section (Freeze) below.

Dual channel effects are produced on the source selected in the Main Video Source bus and require a second source, which is always selected in the Sub Video Source bus. Dual channel effects include Picture in Picture.

For example, select Main and Sub Video Sources, and then press the PIP (Picture in Picture) button; immediately, on the program monitor, you will see the Sub Video Source in a small window.

For more information on these dual channel effects, see the appropriate sections (Quad, Split, and Picture in Picture) below.
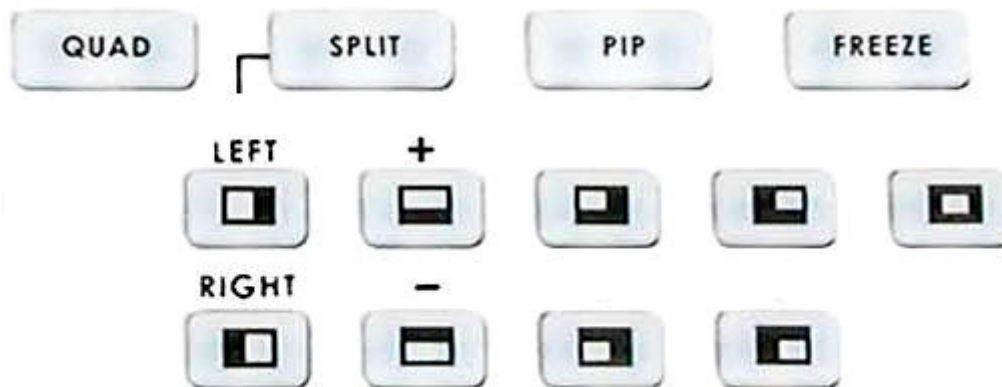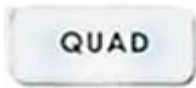
QUAD **Effects: Quad**

The Quad effect combines 4 input videos into 1 output. When this effect is activated, it shows 4 video sources on 1 single monitor. Each source takes one quarter of the entire screen. Press the button again, and it returns to the previous selected source in full screen.

This is a dual channel effect, and cannot be used with any other transitions or effects.

SPLIT **Effects: Split**

This effect will squeeze the Main Video Source and Sub Video Source into a half size screen. The default setting is Main Video Source on the left, and the Sub Video Source on the right. Select different sources for the left window by pressing different channels on the Main Video Source. You could switch from left to right, or right to left by pressing the "LEFT" or "RIGHT" button. You could also select different sources for the left window by pressing 1-4 channel on Main source or pressing 1-4 channel on Sub source for right window.
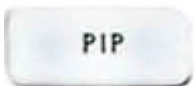
PIP **Effects: Picture in Picture**

The Picture in Picture effect puts the selected Sub Video Source in a window on the Main Video Source. Variables for this effect include window size and position. Engage the effect by pressing the Picture in Picture button and verifying that the LED on the button is lit.

Window size (2 sizes are available); change the window size by pressing the **+** and **-** buttons on the left of the Wipe transitions. (**+** is larger, **-** is smaller).

There are 9 different positions that are located on the right of the Wipe transition effects. Select from one of the preset locations by using the buttons. On each corner, use "Right" and "Left" to move the window closer to the edge or to the center.

This effect may also be used in conjunction with the Border keys (see below).

This is a dual channel effect, and cannot be used with any other transitions or effects.

FREEZE **Effects: Freeze**

This effect freezes the incoming video, as selected on the Main Video Source Bus. There are no parameters, no variations. Press the button once and the video freezes, press it again, and it returns to the selected source in full motion.

The Freeze effect is single channel, and can work in conjunction with any transition.

BORDER **Border**

These controls are used in conjunction with the Picture in Picture Effect and Wipe transition only, and can only be activated when the Picture in Picture or Wipe control is active.

8 Colors are available for the wipe border: black, blue, magenta, red, green, cyan, yellow and white. See "Background Color" below. (Wipe only). In PIP mode the border can only be white.

BACKGROUND COLOR **Background**

While not strictly an effect, these controls are in the same general area, and we thought you'd look here for any information you might need. These controls select what solid color the background will be when selected on either the Main or Sub Video bus. There are eight possible background colors; see below, the LED lights up in the selected color (except for black where the LED goes out), and it is indicated on the preview monitor output.
The background colors are: black, blue, magenta, red, green, cyan, yellow, and white.
Engage this control by pressing the button. The LED's color will correspond with the background color (except black) to indicate that the controls are active. Repeated presses of the button select different colors.

Sample applications

The best way to show off what the SE-500 can do is to give you some examples of how it could be used in real life situations. Each example refers to a block diagram for set up and connections.

Each of these examples is meant to illustrate a typical type of use for the SE-500. Needless to say, there will be many variations on any of these themes. Try to look for the principles of each set up and adapt these to your particular situation.

Four Camera Shoot: Live Stage Performance / Sporting Event
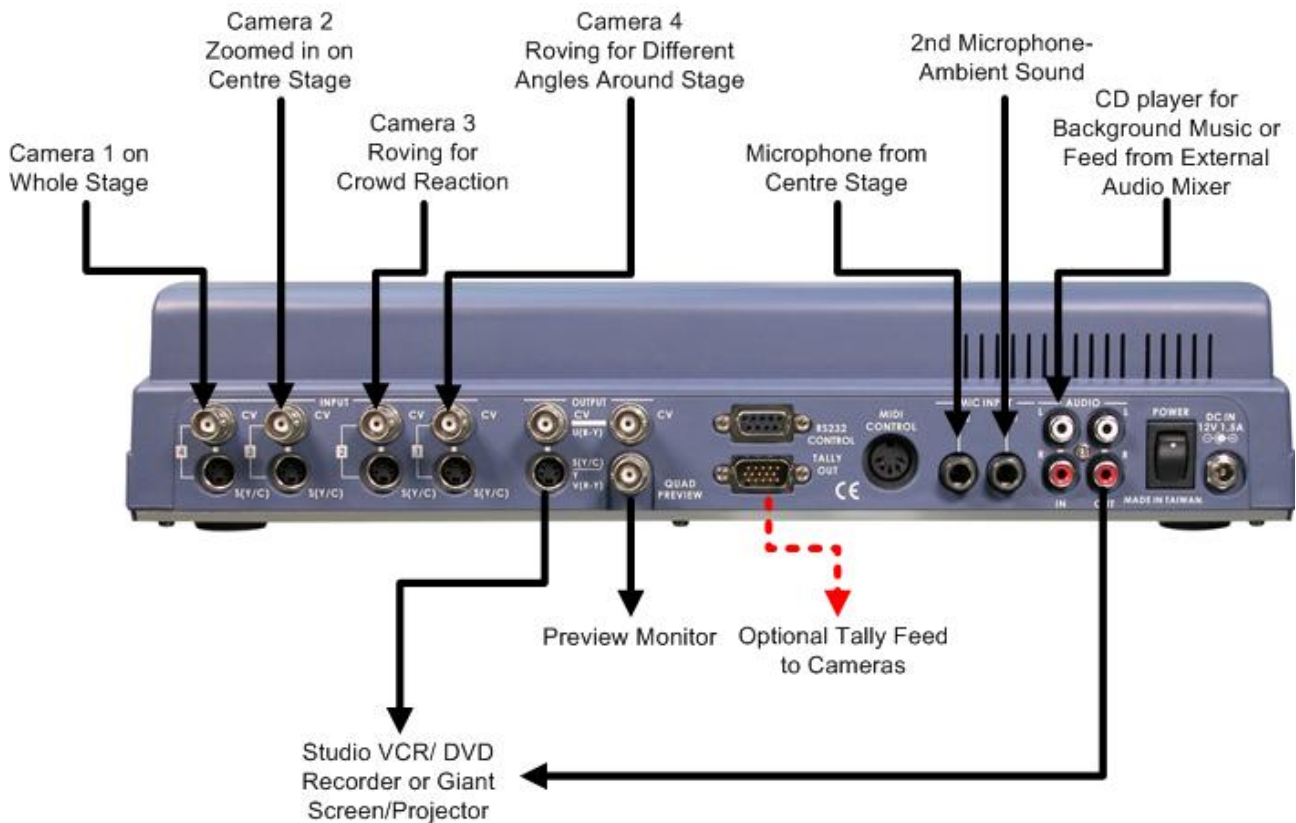
The first example is a typical four-camera shoot. The example is based on a stage performance such as a play or a band, but it could just as easily be slightly modified for other live situations such as sporting events. The four cameras are feeding analogue signals to the SE 500, via Composite or S-Video. It would be possible to use DV cameras by adding a Datavideo DAC 6 to each of the channels that you want to run DV. With four cameras it may be worth using the Tally Light feed, so that the camera operators will be aware when they are live, or save to re-position.

Depending on the complexity of the shoot, you may want to use an external Mic/Audio Mixer to handle the audio and then channel the output of the audio mixer to the SE 500, or simply use the two Mic inputs and have an audio source, such as a CD player for background music. If you shooting a sporting event the main microphone would be the commentator and the second Mic would be crowd noise.
The output can be recorded live to tape or DVD, or alternatively it could be sent to a giant screen or projector. The vision mixer operator will be responsible for ensuring the right camera feed is selected and that switching from camera to camera is carried out at appropriate times.

Live Conference
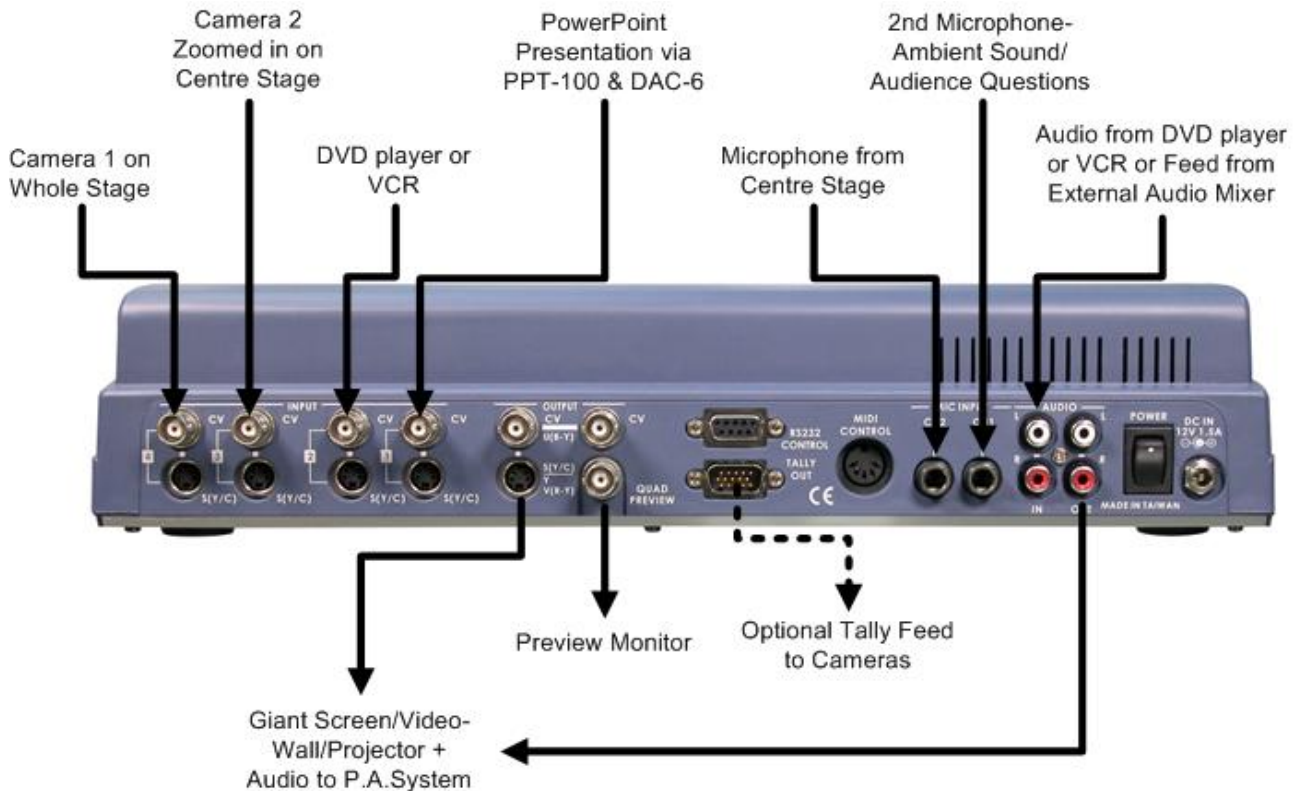
In this second example we see a typical conference set up.

There are two cameras to handle the speaker and the overview, with audience reaction or other action on the stage. Both cameras are analogue, but by adding a DAC 6 to any of the channels it would be possible to use a DV camera.

There is a VCR or DVD player cued up with footage to enhance the speaker's presentation, and a feed from a laptop of a PowerPoint presentation that the speaker will be referencing throughout his speech.
There is a microphone feed from centre stage, and the possibility of a second microphone for ambient sound or perhaps to field questions from the audience.

The output can be fed to a giant screen, video-wall or projector; the audio output can be fed to the P.A. System.

In this situation the vision mixer operator will take cues from the speaker for when to introduce the video footage and PowerPoint presentation. The operator will also control the volume levels of the two microphones and the audio feed from the VCR / DVD.

Live Event Mixing: Club VJ / Concert
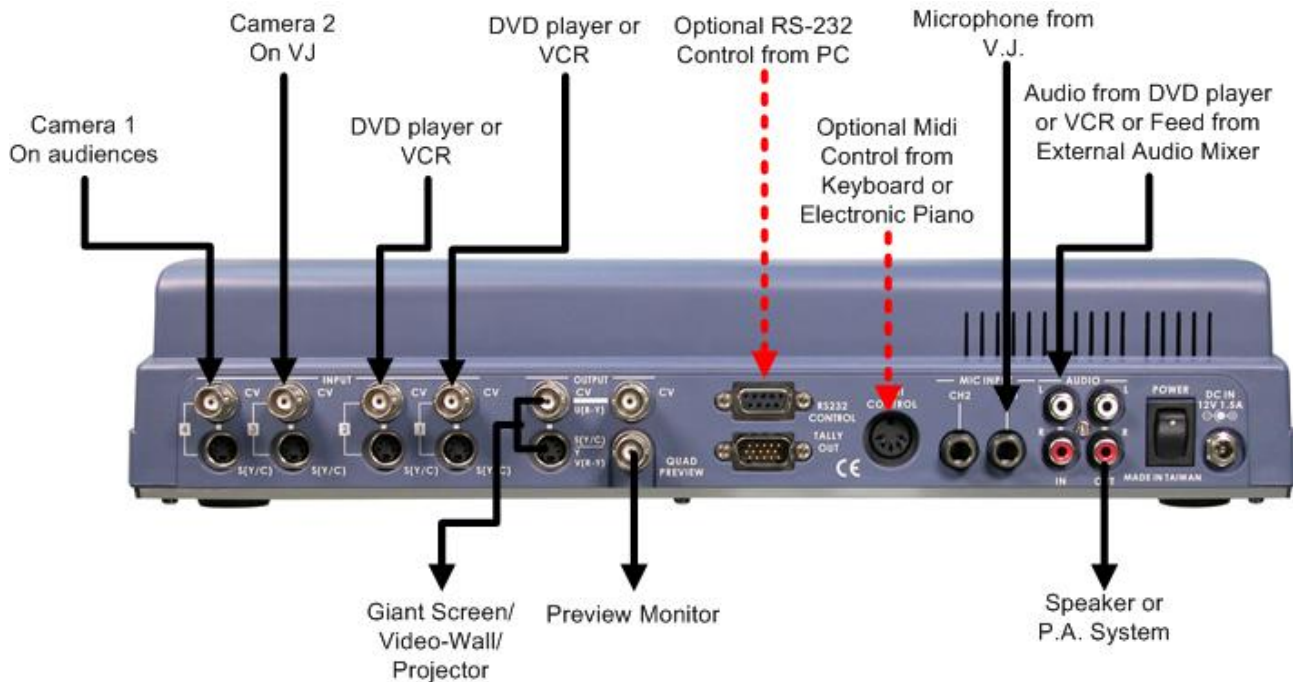
In our final example we are looking at a typical V.J. set up. Increasingly in clubs video images are used to add to the overall effect and atmosphere, they are combined with light displays and other audio / visual effects.

In the set up above we see two cameras being used, one on the audience and the second on the V.J, it could just as easily be a second angle of the audience.

There are two DVD or VCR sources, these could be showing animated patterns or backgrounds, promotional videos, music videos, just about anything. The audio from one of the DVD decks is being fed into the aux audio input; although it is more likely you would run both the DVD player audio feeds into an external audio mixer, together with CD players, keyboards and other audio feeds. The mixed output from the audio mixer would then be fed into the SE 500.

The job of the V.J is to control everything that is seen and heard. Combining video and audio images together in an entertaining way. It is possible the V.J may control the SE 500 via MIDI control from a Keyboard, or sequences the whole show via RS 232 and run it all from a PC.

Using SE-500 with CG-100 for Titles/Graphics/Logos overlay

Connect to DecklinkSP
YUV input on a PC with
CG-100 installed

To Master Recorder
Deck

Or

To Projector
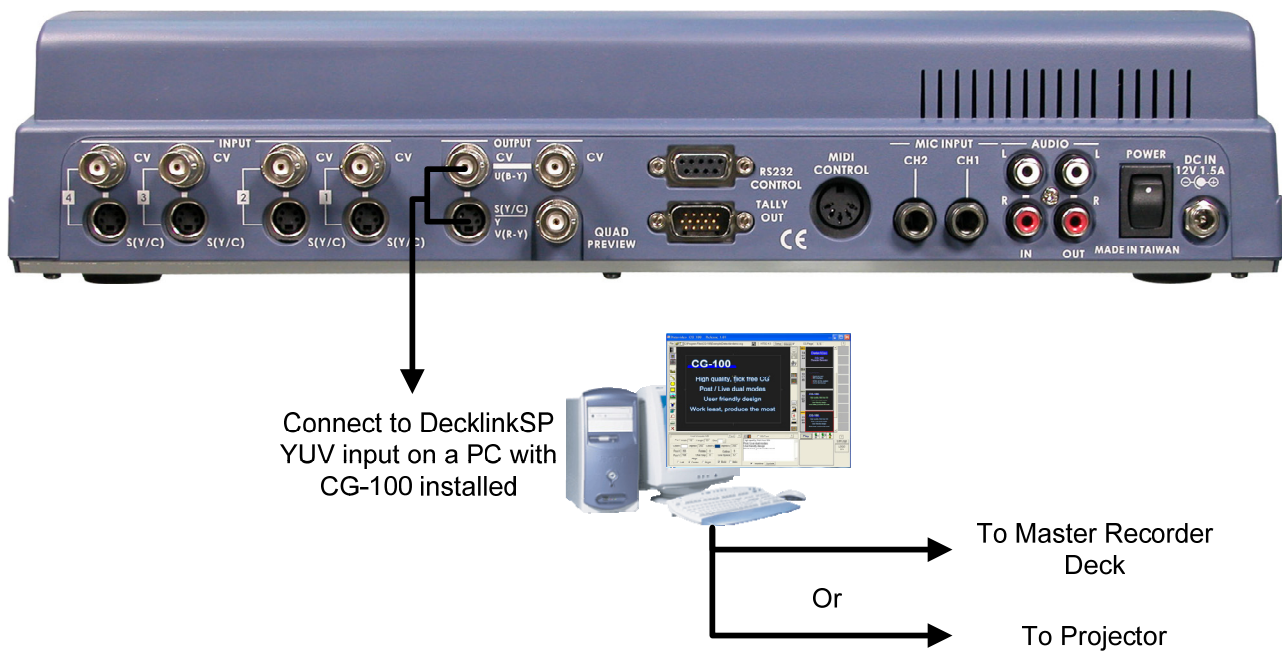
Using YUV output (with a breakout cable) on SE-500 to communicate with a PC with Decklink SP CG
overlay card and CG-100 CG software *(page 42)* to perform a text overlay for the output video.

Troubleshooting / FAQ

No power

No image at output / black and white output from S-Video (Y/C)

Audio clipping

Audio or video feedback

Frozen image at output

Image distortions

How does the RS 232 work in practice

- **No power**
  1. Check that the power supply is plugged into the SE 500, and to a suitable mains outlet, and that it is switched on.
  2. Move the SE-500 to a cooler location and allow the unit time to cool off before powering on again.

- **No image at output / black and white output from S (Y/C)**

  1. Make sure that there is an image from all your Video Input sources on the quad preview monitor.
  2. Check that the output format is set correctly for S (Y/C) or Component.

  Press and hold the Background Button for 5 Seconds unil the On-Screen Menu appears.
  Press the Background Button again and the second page of the menu will appear.
  Use the UP and Down Buttons to navigate the menu and highlight Video Output.
  Video Output can be set to Y/C C C or Y.U.V. C.
  If you want to output S-Video use the Left or Right Arrow Buttons to select Y/C, C, C.
  If you want to use Y.U.V. Component Output via the supplied Breakout Cable then select Y.U.V, C.

- **Audio clipping**
  1. Audio input level is too high.
  2. Incorrect calibration of audio input level.

- **Frozen image at output**
  1. The Freeze function was activated
  2. The video input source is no longer valid, or playback has stopped.

- **Image distortion**
  1. The video input level is too high, check the color processor settings
  2. The video quality is poor from video input source.

- **How does the RS 232 work in practice?**

  For those wishing to use RS232 control, here is an example of RS 232 data for the SE-500

  Enable RS232 Tbar control: 1) F0,32,0E,05,02,01,00,0A,00,00,00,32,34,FF

  * F0=preamble,32=SE500 ID,0E=length,05=command group,

  * 02=Tbar control,01=TBar enable,00= tbar_value_L,0A=tbar_value_H

  (The three 00 after 0A are dummy data, don't care)

  2) F0,32,0E,05,02,01,00,10,00,00,00,38,34,FF

  3) F0,32,0E,05,02,01,00,14,00,00,00,3C,34,FF

  Release RS232 Tbar control:

  F0,32,0E,05,02,00,00,00,00,00,00,37,33,FF
  * the 00 after 02 = disable RS232 Tbar

SE500 RS-232 Remote Control Command
VER: 1.01
Release date: 2006/01/19

1. Physical layer

   1.1   Control output format: RS-232C
   1.2   Communication rate: 57600 BPS
   1.3   Data format: 8 bits serial, LSB first, 1 start bit, 1 stop bit, odd parity
   1.4   Must delay 100uSEC between 2 bytes

2. Data link layer
2.1 Frame format

1st	2nd	3rd	4th	5th	6th	7th	,,,	Last-2	Last-1	Last
Header	ID	Length	Data0	Data1	Data2	Data3	,,,	Chksum_L	Chksum_H	End

1) Header

Code consisting of one byte for frame synchronization.
The frame header send from the master machine is termed the command header.
The frame header send from the slave machine is termed the return header.

The command header byte is fixed as fallow.
1st: F0h (base 16)

The return header byte is fixed as fallow.
1st: FCh (base 16)

2) ID number

The equipment ID number is composed of 8 bits
The ID of SE500: 32h (base 16)

3) Length

The length is the sum of bytes from the header to the end.
It is composed of 8 bits.
6h (base 16) < Length <= 80h (base 16)

4) Data

Data block used by application layer.
Refer to Section 3.

5) Checksum

The 8 bits checksum is obtain from header to the last data, and then convert to two numeric ASCII code.

Checksum=header+ID+legth+data0+data1+…+data_last
chksum_L=(low nibble of checksum) + 30h
chksum_H=(high nibble of checksum) + 30h

6) End

The end byte are fixed to FFh(base 16).

3. Application layer

The application layer designates the command structure and contents.

3.1 Command data format

4th	5th	6th	7th	8th	9th	10th	11th	…
Command Group	Operated #0	Operated #1	Operated #2	Operated #3	Operated #4	Operated #5	Operated #6	…

1) The command group
    05h (base 16) = SE500 control command
2) The operated refer to section 4.

3.2 Return data format

4th	5th	6th	7th	8th	9th	10th	11th	…
Command Status	parameter #0	parameter #1	parameter #2	parameter #3	parameter #4	parameter #5	parameter #6	…

1) The command status
    05h=SE500 control command status

2) The parameter refers to section 6.

4.   The operated of SE500 control command

5th	6th	7th	8th			
Operated #0	Operated #1	Operated #2	Operated #3			
Mode Code	Key code	T-bar low	T-bar high			

4.1. OP#0 = Control mode code
    00H = Ask status
    01H = Normal key control
    02H = T-BAR control

4.1. OP#1 = control key code.(refer to section 5) when OP#0=01H
    = 00h= disable remote control T-bar when OP#0=02H
    = 01h= enable remote control T-bar when OP#0=02H

4.2. OP#2 and OP#3 = T-BAR control value when OP#0=02H
    The T-bar control value is 10 bits
    The bit4 to bit 0 of OP#1 = the low 5 bits of the T-bar control value.
    The bit4 to bit 0 of OP#2 = the high5 bits of the T-bar control value.

5. The SE500 control key code
(Base 16)
01h = key_main_A
02h = key_main_B
03h = key_main_C
04h = key_main_D
05h = key_main_BK

06h = key_sub_A
 07h = key_sub_B
08h = key_sub_C
09h = key_sub_D
0ah = key_sub_BK

0bh = key_QUAD
0ch = key_POP
0dh = key_freeze
0eh = key_preview
0fh = key_take

10h = key_fade
11h = key_center_block   (wipe)
12h= key_right_top_block   (wipe)
13h= key_right_bottom_block   (wipe)
14h= key_left_top_block   (wipe)

```
15h= key_left_bottom_block        (wipe)
16h= key_top_block          (wipe)
17h= key_bottom_block       (wipe)
18h= key_right_block        (wipe)
19h= key_left_block         (wipe)
1ah= key_horizontal         (wipe)
1bh= key_vertical           (wipe)

20h= key_border_on
22h= key_background_color
24h= key_speed*
26h = key_PIP

3bh = key_menu
3ch = key_up
3dh = key_down
3eh = key_left
3fh = key_right

40h = key_reset
41h = key_plus
42h = key_minus
```

*Note: Send the key_speed code to the SE500,the speed of effect will be changed follow below rule.
    SPEED_1 →SPEED_2→SPEED_3→SPEED_1→,,,,

6. The return parameter of SE500 control command status

5th	6th	7th	8th	9th	10th	11th	12th
parameter #0	parameter #1	Parameter #2	parameter #3	parameter #4	parameter #5	parameter #6	Parameter #7
Error code	Busy flag	Effect Mode +Speed	Effect No.	Background Color & border	LED1	LED2	LED3

13th	14th	,,,
parameter #8	parameter #9	,,,
LED4	LED5	,,,

1) The error code
   01h = Time out (over 15ms)
   02h = length error
   03h = checksum error
   04h = not support command
   05h = operated error

2) The Busy Flag
   00h = ready
   01h = busy
   11h = busy + T_bar active

3) The effect mode & effect speed
   The bit 3 to bit0 is the effect mode
   x0h=cut mode, x1h=MENU mode, x2h=fade mode, x3h=wipe mode, x4h=QUAD mode, x5h=POP mode, x6h=PIP mode

   The bit6 to bit4 are the auto effect speed
   0xh = SPEED_1, 1xh= SPEED_2
   2xh = SPEED_3

4) The effect No.
   The value from 0 to 99(63h)
   Fade effect No. = 0
   Wipe effect No.= 0 to 10
   Quad effect No.= 0
   POP effect No. = 0 to 1
   PIP effect No.:bit3 to bit0= x0h to x4h (position)
   Bit4=0=big size, bit4=1=small size
   Bit5=0=not shift, bit5=1=shift to close center.

5) The background color & border
   The bit4 to bit0 are the background color
      x0h=Black , x1h=Blue , x2h=Magenta , x3h=Red
      x4h=Green , x5h=Cyan , x6h=Yellow , x7h=White

   The bit5 are the border flag
      0xh= border off
      1xh= border on

6) LED data
   The bit = 1 = LED on, the bit = 0 = LED off
   Bit0 of LED1 = LED of key_main_a
   Bit1 of LED1 = LED of key_main_b
   Bit2 of LED1 = LED of key_main_c
   Bit3 of LED1 = LED of key_main_d
   Bit4 of LED1 = LED of key_main_bk
   Bit6 of LED1 = LED of key_take

   Bit0 of LED2 = LED of key_sub_a
   Bit1 of LED2 = LED of key_sub_b
   Bit2 of LED2 = LED of key_sub_c
   Bit3 of LED2 = LED of key_sub_d
   Bit4 of LED2 = LED of key_sub_bk
   Bit6 of LED2 = LED of key_preview

   Bit0 of LED3 = LED of key_FADE
   Bit1 of LED3 = LED of key_QUAD
   Bit2 of LED3 = LED of key_POP
   Bit3 of LED3 = LED of key_PIP
   Bit4 of LED3 = LED of key_freeze
   Bit5 of LED3 = LED of key_border
   Bit6 of LED3 = LED of key_MENU

   Bit0 of LED4 = LED of key_center_block
   Bit1 of LED4 = LED of key_right_top_block
   Bit2 of LED4 = LED of key_right_bottom_block
   Bit3 of LED4 = LED of key_left_top_block
   Bit4 of LED4 = LED of key_left_bottom_block
   Bit5 of LED4 = LED of key_top_block
   Bit6 of LED4 = LED of key_bottom_block

   Bit0 of LED5 = LED of key_right_block
   Bit1 of LED5 = LED of key_left_block
   Bit2 of LED5 = LED of key_horizontal
   Bit3 of LED5 = LED of key_vertical
   Bit4 of LED5 = LED1 of speed
   Bit5 of LED5 = LED2 of speed
   Bit6 of LED5 = LED3 of speed

7. EXAMPLE

1) PC control SE500, key command = key_take= 0fh

   a.) The command stream = F0h,32h,0eh,05h,01h,0fh,,30h,34h,ffh

    Header=F0h
    ID=32h
    Length = 9 bytes=09h
    Command group=05h
    Command mode=normal control code=01h
    Control key code=key_take =0fh
    checksum= (f0h+32h+09h+05h+01h+0fh) = 40h
     checksum_low =00h+30h = 30h
     checksum_high=04h+30h = 34h
     END =ffh

   b.) SE500 return data,
    The return data stream =
    Fch,32h,11h,05h,00h,01h,10h,00h,07h,41h,42h,01h,00h,20h,30h,30h,ffh
    Header=fch
    ID=32h
    Length = 17 bytes=11h
    Command status=05h
    Error code =00h
    Busy flag=01h
    Effect mode & speed=fade +speed_2=00h+10h=10h
    Effect No. =00h
    Background color & border =white + border off =07h +00h=07h
    LED1=41h
    LED2=42h
    LED3=01h
    LED4=00h
    LED5=20h
    Checksum = (fch+32h+11h+05h+00h+01h+10h+00h+07h+41h+42h+01h+00h+20h) =x00h
    checksum_low =00h+30h = 30h
    checksum_high=00h+30h = 30h
    END=ffh

SE500 MIDI Remote Control Command
VER: 1.00a
Release date: 2005/06/03

1. Physical layer
  1.5 Follow the MIDI SPEC. 1.0
  1.6 Communication rate: 31250 BPS
  1.7 Data format: 8 bits serial, LSB first, 1 start bit, 1 stop bit, none parity

2. Data link layer
  2.1 Control messages = MIDI Channel voice messages
   * Received only if Note Mode is ON
   * The input of each channel is selected.
   * Ignored if a non-selectable note message is received.

  2.2 Control messages
   * Note –on

Status	2nd byte	3rd byte
9nH	kkH	vvH

Symbol	Meaning	Range
n:	MIDI channel	0H-FH(ch.1--ch.16)
kk:	Note number = SE500 control command	00H-7FH(0--127)
vv:	Velocity value,etc. Only in the case of Note-on Velocity	00H-7FH(0--127) 01H-7FH(1--127)

3. SE500 control command correspond to note number as follows

Note	Note No.	SE500 command
;	;	;
C4	48	fade key
C#4	49	wipe key
D4	50	wipe key
D#4	51	wipe key
E4	52	wipe key
F4	53	wipe key
F#4	54	wipe key
G4	55	wipe key
G#4	56	wipe key
A4	57	wipe key
A#4	58	wipe key
B4	59	wipe key
C5	60	SUB A key
C#5	61	QUAD key
D5	62	SUB B key
D#5	63	SPLIT key
E5	64	SUB C key

F5	65	SUB D key
F#5	66	PIP key
G5	67	SUB BG key
G#5	68	Freeze key
A5	69	Preview key
A#5	70	NC
B5	71	TAKE key
C6	72	MAIN A key
C#6	73	Background color key
D6	74	MAIN B key
D#6	75	Border key
E6	76	MAIN C key
F6	77	MAIN D key
F#6	78	Speed _1 key
G6	79	MAIN BG key
G#6	80	Speed_ 2 key
A6	81	Change Speed key
A#6	82	Speed_ 3 key

4. Example

1. Change the transition effect to fade = 90H, 30H, 64H
    90H= Note on, Channel =1 (IF the SE500's MIDI channel is 1)
    30H=Note No 48=fade key
    64H= Velocity value > 0

2. Take the transition effect = 90H, 47H, 64H
    47H=Note No 71=Take key

* Very Easy to use, any MIDI keyboard can control the SE500.

SE500 Tally Pin Outs Cross Reference
VER: 1.00
Release date: 2005/07/07

LED A3   = pin 1   = 1R (Main1)
LED A2   = pin 2   = 1G
LED A1   = pin 3   = 1Y (Sub1)
Ground   = pin 4   = GND
LED D3   = pin 5   = 4R (Main4)
LED B3   = pin 6   = 2R (MAIN2)
LED B2   = pin 7   = 2G
LED B1   = pin 8   = 2Y (Sub2)
Ground   = pin 9   = GND
LED D2   = pin 10   = 4G
LED C3   = pin 11   = 3R (Main3)
LED C2   = pin 12   = 3G
LED C1   = pin 13   = 3Y (Sub3)
Ground   = pin 14   = GND
LED D1   = pin 15   = 4Y (Sub4)

Video Channel	Red LED (On Air)	Green LED (Off line)	Yellow LED (Next)
1	Pin 1	Pin 2	Pin 3
2	Pin 6	Pin 7	Pin 8
3	Pin 11	Pin 12	Pin 13
4	Pin 5	Pin 10	Pin 15
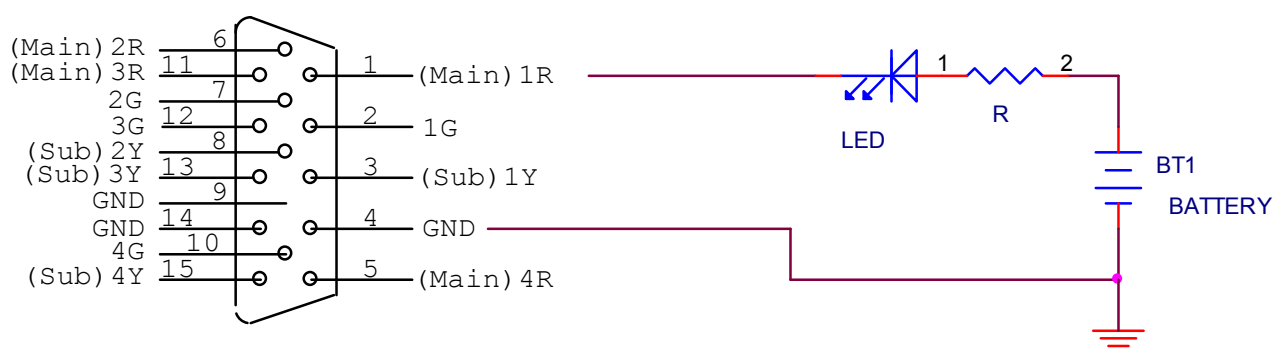
Specifications

Video Formats
Analog Y/C, Composite CCIR601 NTSC and PAL (PAL and NTSC are separate models)

Video Inputs
4 – S (Y/C), Composite

Video Output
1 – Quad Video source monitoring (Composite)
2 – Composite
1 – S (Y/C)
1 – Component (With breakout cable, it uses the S (Y/C), and one Composite output.)

Audio Inputs
1 – Stereo input (RCA connector)
2 – Mono Microphone (1/4" phono jack)

Audio Output
1 – Stereo main outputs (RCA connector)
1 – Stereo headphone (Mini jack with volume control) 0.3Wrms 8 ohm

Quad Channel Time Base Correction
Full Frame Synchronization, 4:2:2, 13.5MHz

Digital Effects including
A/B dissolves, PIP, border lines, and over 12 Wipes with various manually transition speeds

RS-232 Data Control Port
Connecting PC RS-232 for remote control

Color Processing
Brightness +/-10%
Y-gain +/- 3dB
Color +3/-10dB
Tint +/- 10 degrees (NTSC only)

Video Bandwidth
Component 5.2 MHz
S (Y/C) 5.0 MHz
Composite5.0 MHz
DG, DP +/- 3%, 3 degrees

Signal/Noise Ratio:
Video > 50 dB
Audio > 65 dB

Audio
20 to 20KHz +/-1dB
Audio THD <0.1%

Dimensions W x D x H
15.75" x 10.5" x 3.25" (Approx)
400mm x 265mm x 83mm (Approx)

Weight
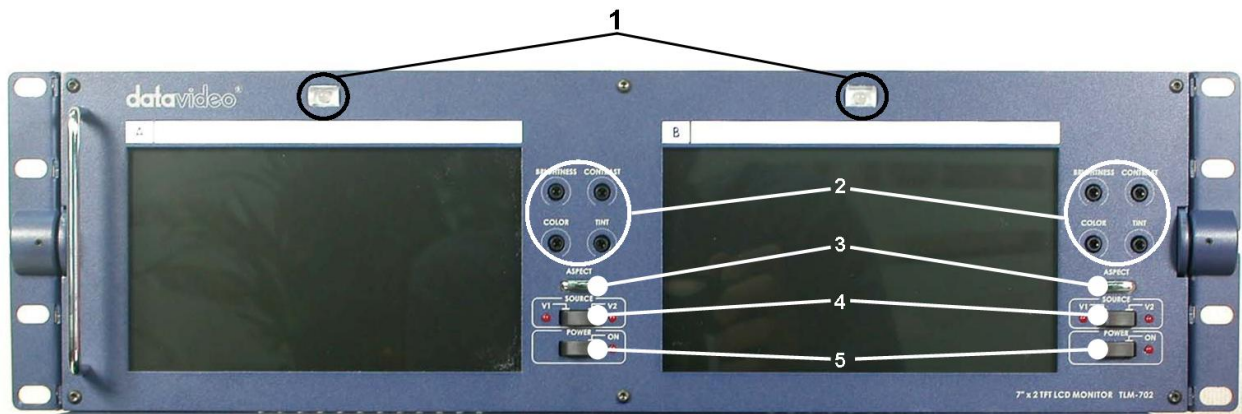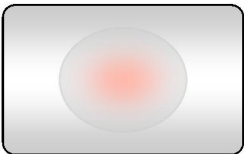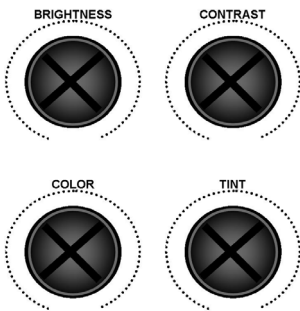13.8 lb, 5.5 Kg

Power
Input: DC 12V, 1.5A

TLM-702

Functions - Front Panel

1.

Each monitor has a two color tally light indicator which can be connected to the Datavideo RMC 140, SE500 or similar products. AMBER indicates Cued and RED indicates Live.
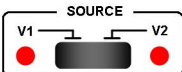
2.

Each Monitor has individual adjustments for Brightness, Contrast, Color and Tint (Tint is for NTSC only).

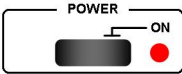These four adjustments can be adjusted with a X headed screwdriver.
It is recommended that you use a Test Pattern to adjust the monitors.

3.

The ASPECT button switches the aspect ratio from 16:9 and 4:3.

4.

Source select switches between video input 1 and video input 2. (Each monitor has a choice of two video inputs)

5.

Power On / Off switches the monitor On or Off

On either side of the TLM-702 are small Allen Key screw tension adjustments. These alter the tension on the pivoting mechanism. If you want to change the angle of the monitors, i.e. aim them up or down, you can loosen these screws and adjust the TLM-702. Once you have set the correct angle tighten the screws back up.

Functions - Rear Panel
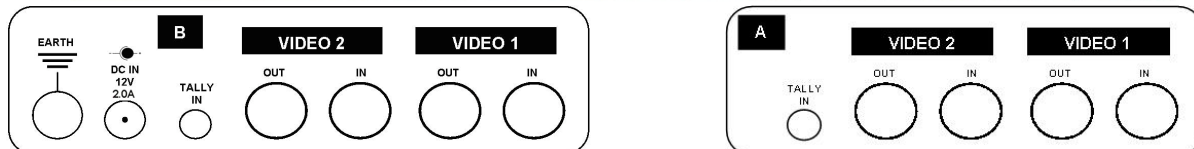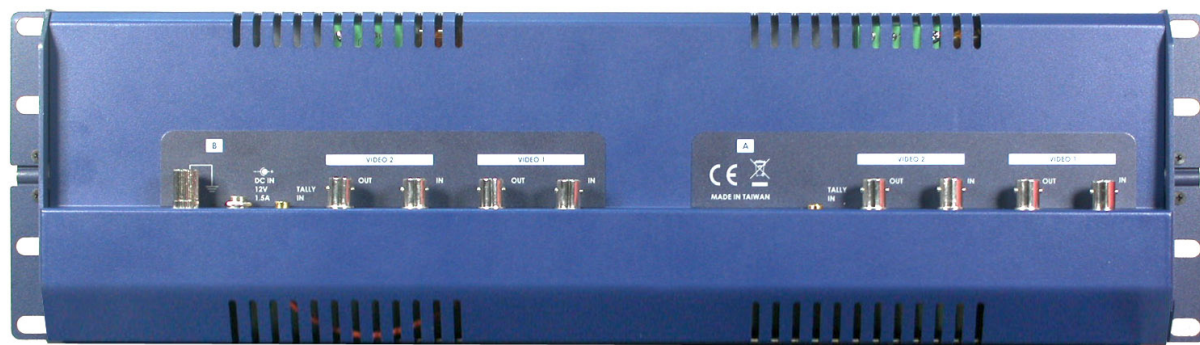
The earth terminal can be used with other equipment that has the same feature. Connect all items together to ensure that they are grounded.

Connect the supplied switch mode power supply to this socket. The locking collar screws into place once the plug has been inserted. It is also possible to power the TLM-702 from other regulated 12V supplies (min 1.5A).

3.5mm Jack Socket for tally light connection. You can connect the tally feed from the Datavideo SE 500, RMC-140, RMC90 or other similar equipment.
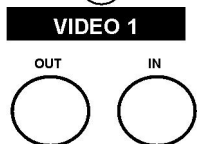
Each monitor has two composite video inputs, each with a loop-through output. The video input can be PAL or NTSC, the TLM-702 will automatically detect the video standard.

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Specifications

LCD Display	7" x 2 TFT LCD active matrix, resolution 1440 x 234 dots
Aspect Ratio	4:3 and 16:9 selectable
Brightness (Luminance)	500 cd/m²
Contrast Ratio	300

View Angle	Top:	40 deg
	Bottom:	60 deg
	Left:	60 deg
	Right:	60 deg

|	
Video Input	CV input 1.0Vp-p, with self Loop-Through output
	(75 Ohm-terminated)
Video System	NTSC/PAL auto recognition
Color Adjustment	Brightness, Contrast, Color, Tint (Tint is NTSC only)
Tally Indication	Two Color Tally LED indicators
Operation condition	Operation temperature from 0℃ to 50℃, RH less than 90%
Power Consumption	DC12Volt, 2.0Amp
Dimension of LCD Panel	484mm x 133mm x 50mm (W x H x D)

Useful Accessories from Datavideo
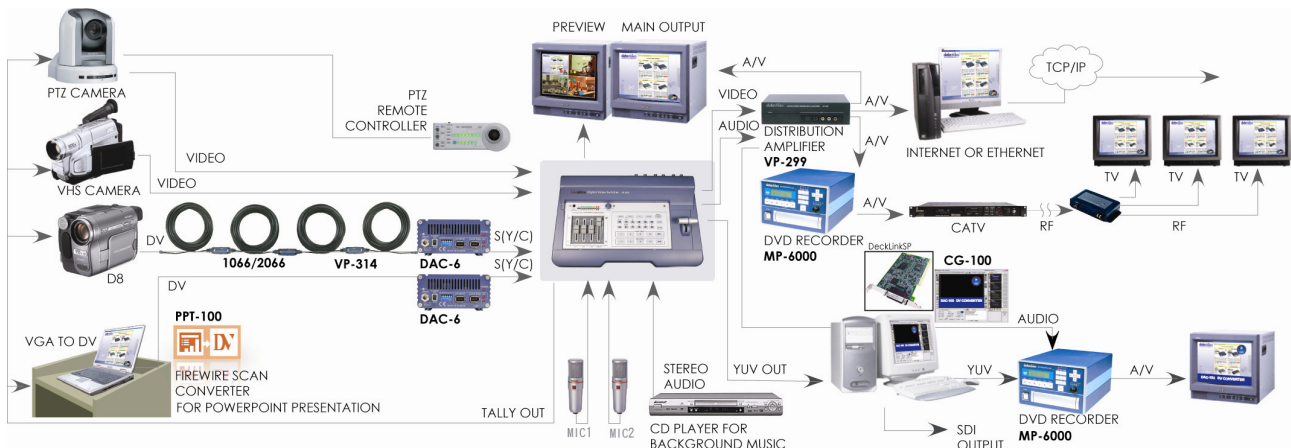
Datavideo CG- CG-100

THE FIRST AFFORDABLE SDI CG SOLUTION LIVE SDI TITLE / GRAPHIC / LOGO OVERLAY

CG-100 can be used in any SDI or YUV input switchers. It can be also used in SE-500 via YUV output interfaces.

SDI overlay offers the best, broadcast quality, CG solution in the industry today. However, it has always been beyond the budget of small studios and production houses - The Datavideo CG-100 has changed that!

The CG-100 combines with a Blackmagic Design Decklink Card to bring you live SDI CG overlay at an affordable price. It supports NTSC and PAL video standards and is able to generate graphics for 16:9 or 4:3 aspect ratios. Pages can be composed and combined with animation effects, to run as a sequence, or they can be displayed and edited live. The CG-100 combines perfectly with the SE-500/SE-800 to give superb quality graphics / text / logo overlay on live production mixes.
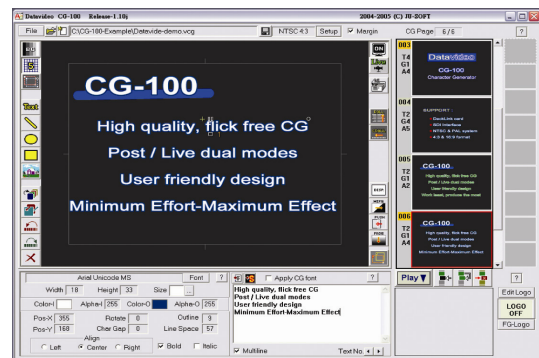
Datavideo VGA to DV converter- PPT-100

In many conferences and seminars, lecturers need to present videos and additional PC information to the audience. When they switch sources between PC and other medias on the projector, will cause the transient black picture and then interrupt the meeting process. The solution is a high-end VGA to video converter, which converts VGA to high-resolution video, enabling the PC output to be selected via a video switcher.

Thanks to Blackmagic Design and Datavideo the solution is at hand. Blackmagic Design have introduced a low cost range of SDI solutions, which are called the "Decklink Series", and Datavideo have developed the first software for displaying VGA directly out thru these Decklink SDI cards. The Datavideo PPT-100 takes full advantage of the Decklink card and Intel 915 chipset technology. Users can easily convert PC images (VGA) to SDI, change image position and size, and select
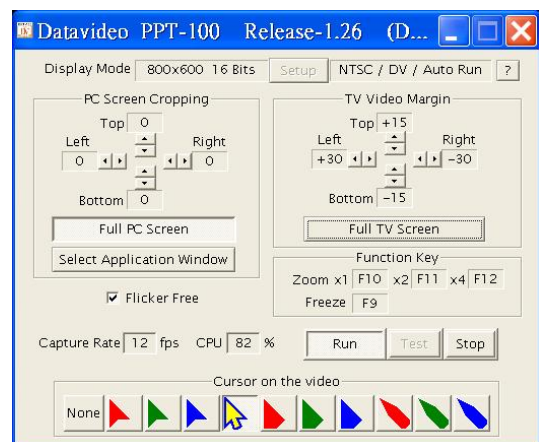
different colors for the pointer; and then, display on projector or large TV wall. With a vision mixer / switcher such as the SE-800, you can also combine DVD player, DV camera, VCR, VHS and CD player for a perfect presentation.

Datavideo TLM-70D 7" TFT LCD

Datavideo TLM-70D is a 7" TFT LCD monitor, 3U height design with TLM-70JF you can easily insert it in to a standard 19" rack cabinet. NTSC/PAL video format auto recognition (Analog video only) with video pass through, 75-ohm self-terminated video output connector. The "AUX" input provides options for external format converters such as SDI input converter. With contrast, brightness, color and tint (Tint only available for NTSC) controls for a best view quality of display.

|		
●	LCD Display	7" TFT LCD active matrix, resolution 1480 x 234
●	Aspect Ratio	4:3/16:9
●	Brightness (luminance)	250 NITs
●	Video Input	1.0 Vp-p, 75 Ohm
●	Video Output	Loop-through with self 75 Ohm-terminated
●	Video System	NTSC/PAL auto recognition (Analog only)
●	Tally Indication	3-color Tally LED indicators
●	Power Consumption	DC12Volt. 50W.

Datavideo DAC-6 DV to Analog (One way converter)

The DAC-6 is designed to allow DV cameras to be used with the SE 500. It is a stand-alone converter that takes a DV signal in and converts it to an analog output, in Composite, S (Y/C) or Component format. It is a very compact converter and can be run from a 12 Volt battery in the field, or via the power adaptor supplied.

Datavideo BAC-03 Balanced-Unbalanced Audio converter
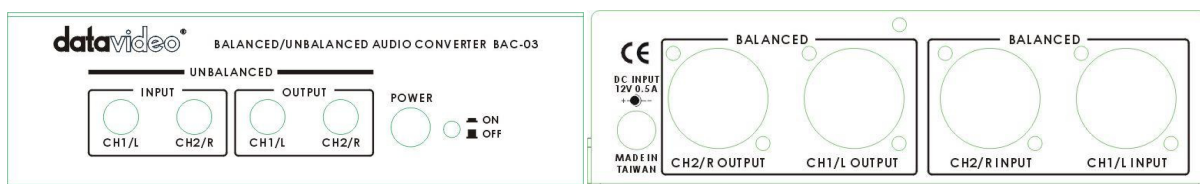
The BAC-03 is a bi-directional unbalanced to balanced and balanced to unbalanced audio converter, with four independent amplifiers providing stereo audio input and output.

SPECIFICATIONS	UNBAL to BAL output	BAL to UNBAL output
INPUT LEVEL	-10dBv nominal	0dBm to +8dBm nominal
INPUT IMPED	50K ohms	0K ohm
GAIN	+4 to +20dB	-20dB to +18dB
OUTPUT LEVEL	0 to +8dBm nom, +22dBm max	-10dBv nom, +20dBv max
OUTPUT LOAD	600 ohms or higher, balanced	600 ohms or higher, unbalanced
FREQ RESPONSE	DC to 25kHz, +/-0.5dB	DC to 25kHz, +/-0.5dB
NOISE LEVEL	80dB below nom output level	80dB below nom output level
DISTORTION	<0.01% at any frequency	<0.01% at any frequency
POWER INPUT	DC 12V, 200mA	
DIMENSION	140(W) x 112(D) x 40(H) mm	

Bi-Directional IEEE/1394 DV Format Repeater:

Allows extended DV cable runs. If you want to run a DV cable more than 20 meters an in-line booster is required, the DV repeater is just that. Use one every 20 meters for cable runs of up to 200 meters

One channel DV repeater (VP-314)

One input to five channels output DV-DA (VP-332)

20/10 meter DV cable
P/N: 2066/1066

Please check website (www.datavideo.info) for the most up to date list, descriptions, and pricing of accessories for the HS-500.

Service and Support

It is our goal to make your products ownership a satisfying experience. Our supporting staff is available to assist you in setting up and operating your system. Please refer to our web site www.datavideo-tek.com for answers to common questions, support requests or contact your local office below.

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