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Event Production and Recording: What is it?

Whenever people get together for an occasion, whether a one-time or regular occurrence, they may want to experience it again and again. This handbook will introduce techniques for the effective use of audio and visuals to make your event more enjoyable and memorable.

So, what really is an event? It is a live performance or experience that takes place in front of us as we witness it in real time. The “live experience” is the essence of an event whether it be a musical performance, theater, church service, speech or presentation, graduation or wedding ceremony.

So what does it really mean to “produce” an event? There could be various goals, but the ultimate goal is to not only capture but also bring more life to the experience of the occasion. We are now in an era that we can easily utilize and display video and images on large screen TV’s and projectors. Why not share the audio and visual experience that is happening right there with the audience.

While an “event” may only last for a few short hours, a “recorded event” can be shared and relived as an important moment or a “precious memory” forever. Now you can not only “capture” the event, but also replay it to enjoy the experience over and over again.
Equipment in this handbook

There are many different types of equipment for event production. However you can make an event happen by simply using a display and video player. Dedicated equipment for live event production such as the EDIROL P-10 and V-4 are easy to use, readily available and affordable. The example video products in this guide enable a simple and reliable system for live video production.

**Video Player**

Video playback equipment is a key component for live video production. Although cameras, VTR’s and DVD players can be used, this guide outlines some more specialized equipment that allows for more flexible, instantaneous video content playback to interact and follow live stage performances.

**Video Mixer**

Video mixers can switch between a number of inputs by selecting the button that corresponds to the video source or by using the T-bar fader. The LVS-800, V-8 and V-4 are standard definition (SD) video mixers providing SD switching and mixing, while the V-440HD is designed for high definition (HD) and computer (RGB) analog signals.

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**INPUT**

- Visual Sampler P-10
- DVD Player
- DV deck
- PC or Mac
- DV Camera
- iPod

**MIX**

- 8 Channel Video Mixer V-8
- V-4
- Live Mix/ Video Switcher LVS-800
- Multi-Format Video Mixer V-440HD
**RECORD**

**Video Recorder**
Video recorders allow you to record live events by connecting directly to a video mixer. The F-1 video field recorder is a hard drive based portable recorder, operated by battery, enabling live event recording anywhere. You can also use DVD or Blu-ray recorders to easily burn a disc to share and archive your live event.

**Audio Recorder**
Audio recorders are used for recording live sound by using the built-in microphones, connecting external microphones or taking a feed from a live audio mixing console. The R-09HR and R-44 audio recorders are solid-state field recorders that record to SD memory cards. The R-4Pro has a built in hard drive for recording live audio.

**Video Converter**
There are several different video formats for live events from SD to HD, interlaced or progressive along with various frame rates. Multi-Format video converters allow you to change formats, up scale, down scale, and cross convert in real-time enabling quick results.

**Output**
**Display**
A Display is used for showing video at a live event. Depending on the venue size and number of people you will need to determine the most appropriate display. Displays consist of projectors, or smaller LCD or plasma displays. If you choose to use a projector, a separate screen is needed. If there is no display equipment at a venue, you will need to make arrangements to rent the required audio/video equipment.
Equipment Operation

To provide visuals at an event, a video playback device and video mixer are essential tools. By focusing on these two items, we will introduce effective production methods and equipment setup ideas.

Presented by Hiroshi Kondo
Lesson 1

Show images on-demand
Show a pre-planned sequence of video cuts and photos on a large screen

- Set up a simple system for video playback
- Continuously monitor progress during the event
- Use the correct material at the right time

Part of the fun is when you “wow!” the crowd with the use of video and still images at just the right moment. Successfully grabbing everyone’s attention is the best reward!

First of all, show video and still images on the large screen that augments the event as it is being orchestrated by the host. For example, the host tells the crowd “this video has never been seen, so please look at the screen”. Then, if you instantly project the appropriate clip, on cue with no delay, you can effectively engage the crowd. If you have compiled interesting videos or special images, you will undoubtedly get the crowd excited. The key is in gathering material that will surprise and engage people.

TV monitors or projectors are commonly used to present visual data, but you need equipment to playback that data to the screen. You can use any device that sends visual data. However, personal computers are not always reliable at the critical moment, and DVD players and DV decks are slow to respond and difficult to cue. You will want to avoid swapping tapes or disks. In order to project a variety of materials without interrupting the event, you need a dedicated video playback device (shown to the right) which provides reliability and responsiveness.

From an equipment setup point of view, the advantage of an EDIROL P-10 Visual Sampler is the ability to store video, still images and sound, all in one unit. Taking less equipment to the event makes your job much easier. This is especially important when you have a limited number of staff. On the following pages, we’ll give you some concrete examples of how to operate the P-10 Visual Sampler.
Video playback equipment helps you keep on cue.

**Visual Sampler P-10**
- With this sampler, you can select and show video cuts and still images stored on an SD card simply by pressing the corresponding pads. 864 files can be accessed from 6 bank buttons and 12 pads. View the files on the 3.5-inch color LCD.

**Multi-format Real-Time Video Presenter PR-1000HD**
- In real time, you can play numerous data formats including High Definition, Digital Video, or JPEG and other still image files. You can cut and link the material and program looped playback content. Using the built-in scheduler, you can program automatic playback at specified dates and times.

**Real-Time Video Presenter PR-80/PR-50**
- Use the mouse and keypad to select icons for triggering playback. For automatic playback, you can program a sequence that matches the planned order. With the built-in 80GB hard drive, you can store about five hours of digital video content.

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**How does this differ from a tape deck or DVD player?**

The main characteristic of a dedicated video playback device is the ability to store and instantly transmit video and still data. Video playback devices such as the P-10, PR-1000HD, PR-80 and PR-50 provide instantaneous playback, looped or preselected sequences. Other advantages is unwanted text like `<PLAY>` never has to appear on the screen.
P-10 Visual Sampler Set Up

Acquiring usable material

First, try shooting some interesting clips that can be shown during the event. Acquiring such material with the P-10 is easy. Simply connect the P-10 to a video camera, video deck, or other device and capture the material. Audio can be captured simultaneously during the capture process by connecting audio cables. Now assign the clip or still image to banks accessed by buttons 1 through 12 (which are called pads), then just press the pad for instant playback. It is useful to create titles and other materials for events and live performances and register them in the unit for playback at critical moments or during breaks.

Store your material on SD cards

*A 1GB SD card is included with the P-10. It can store about 15 minutes of video or up to 2,000 still pictures. It also saves the pad assignment information. A 16GB SDHC card can store and playback about 4 hours of video. The file format is motion JPEG for movies and JPEG for stills. The resolution is 640 × 480 pixels for both formats.

Multiple pad banks

You can connect the P-10 to projectors, TV monitors, and other display devices at the venue while the sound can be output to the onsite PA system or speakers. Simply press the pad buttons to instantly playback the video or still images. Because we sometimes forget to make the screen dark or neutral when nothing is shown, the P-10 has a dedicated knob that makes it easy to fade to black or white. You can also adjust the audio volume in real time ensuring that the audio from the video clip is heard at an appropriate level.

Direct capture with the P-10

*After shooting your footage, connect the P-10 and record the video, or simultaneously project and record what the camera is capturing onsite.

Manage your clips and stills using a Mac or PC.

*You can download videos and still images from a computer via the USB connector for use with the P-10. The picture above is an operational screenshot from the included ‘P-10 Image Converter’ software.

Freely assign video clips and stills to pads

*The pads illuminate in red when a video clip is assigned, and in blue for a still image. Files assigned to a pad can be assigned to another pad or deleted.

Rear panel connectors

*By connecting a video camera to the video inputs on the rear panel, video shot at the event can be shown on the venue screens. The P-10 can easily switch between stored material and the live video feed.
Add variation to original material

Vary the speed of video playback

Video clips captured by the P-10 can be played faster or slower. If you adjust the video playback to slow motion it can provide a dramatic or emotional effect. You can easily use this as a production technique for pacing and enhancing critical moments. By contrast, you can speed up playback to create an alternative effect. This freedom of expression can help you make the event more interesting. These capabilities can also be applied for analyzing sporting and dance movements as well.

Project slideshows of still images

Slideshows are often used to present a record of past events or evoke memories. Although it is fine to use a slideshow, you can also create a certain mood by applying motion or using smooth transitions between images. Photos will be more effective if accompanied by music that matches the occasion. Using the P-10, you can assign 100 still photos to a single pad group. After setting up a slide show, it can be started simply by pressing the pad button.

Apply your favorite motion effects

†In addition to the ten motion effect presets, you can create your own user presets from among 79 different types of motion effects.

†Zoom In B-W is a basic motion. While zooming from a black screen, the picture gradually fades in and then fades out to white.

†In multi 2-1, you can show two images side by side on the same screen. They cycle from left to right.
Lesson 2
How to smoothly link multiple visuals

Using a mixer you can instantly switch between the camera, video playback and computer content.

Main Point!
- Use a video mixer for switching between visuals
- Create a production using live cameras and other equipment
- Assess the situation and select visuals to match the moment

You can now choose from video cameras, video decks, personal computers, and the P-10 for your event production. If you have two or more video playback devices to freely switch between, while one is projecting, you can prepare subsequent video content. This gives you more flexibility to develop your live production. This is where the concept of switching comes into play.

A video mixer is a very effective tool for organizing, switching and playing back many different kinds of images and information. Additionally, you can switch between videos or combine them to flexibly produce and enhance the event.

When you connect several video devices to a video mixer, there is no need to connect each device separately to a projector or monitor screen. You can easily switch the different output signals to the target screens.

For example, when combining the P-10 with a live camera, not only can you show prepared materials, but you can also create more excitement with live images of what is happening. This use of live video can increase the sense of involvement with the audience.

Switching is the task of the director, who produces the event by blending multiple visuals. This requires the ability to judge and select the best visual by assessing the situation at the moment.

In this Lesson we introduce the concept of how to set up the equipment and switch between visuals. We will use the V-8 as our video mixer and show the built-in functions for combining pictures and creating effects.
The video mixer with intuitive switching

8-Channel Video Mixer V-8

- In addition to the 8-video inputs, you can also connect a computer directly to this video mixer. Each input has a separate Monitor Out for previewing. The V-8 has 150 patterns of effects and over 260 transition effects.

4-Channel Video Mixer V-4

- Enables 4 input sources of mixing. With slightly fewer effects than the V-8, it still provides powerful video-mixing capabilities if you don’t require as many inputs and independent monitor outputs.

Live Mix/ Video Switcher LVS-800

- The LVS-800 is eight channel video mixer with dual outputs. Two mixable RGB computer inputs are also available. DSK (Downstream Keyer) enables graphic and title overlay.

What’s the difference between a switcher and a mixer?

Switching is simply the selection of which input to send to an output. When the switch is made, momentary on-screen flickers can occur with a typical switcher, but not with a video mixer. A video mixer enables smooth seamless switching and mixing of the inputs.
Setting up the equipment you need for switching

Main Point!
- Have a preview monitor
- Allow ample time for load-in and setup
- Set a uniform aspect ratio (4:3 or 16:9) for your equipment

With four channels on the V-4 Video Mixer and eight on the V-8, you have the ability to mix multiple video inputs. You can connect video sources according to the capacity of each unit. The V-8 has inputs for the P-10, video cameras, DVD or other types of video playback devices. You can also connect a computer using a 15-pin D-sub (VGA) connector. With this many inputs, you can handle a wide variety of media.

Previewing is essential in many live situations, and most video mixers have preview monitor outputs. You can preview the final output and the current status of each channel in case you need to change the mixer settings or camera position. Although not shown in the figure below, the event can also be recorded if you send the final video output to a video deck or DVD recorder. The end result is a system that can carry out live production and record the final output.

Even though you may construct an elaborate video production system, it is meaningless if it is not used effectively. The time and effort needed to load-in and set up such a system can be time consuming. Carefully select the appropriate items based on the number of assistants and available space. Lastly, do not forget to set your source outputs to the same aspect ratio of your displays (e.g., 4:3 or 16:9).
Switching using the V-8 Video Mixer

Controls used for switching

A Bus Input Select
The controls used to switch the output from the B signal inputs. The A and B buses are provided to select different visuals and apply effects according to your mixing needs.

A Bus Transformer
Used for switching between the A and B buses when not using the fader. The default setting switches to the A bus only when the button is pressed.

Output Fade
You can fade in the output visual from black or white, or fade out to black or white. Use the fader to control the amount and duration of fade. Select black or white using the switch on the left.

B Bus Input Select

Video Fader
Used for fading between the A and B bus. The lowest position shows only the A Bus video source and the highest position shows only the B Bus video source. The two visuals are mixed at their relative levels anywhere in between.

B Bus Transformer

Choose the switching method to suit the situation

There are two basic ways to switch on the V-8. One way is to switch directly by pressing the INPUT SELECT button. The other way is to use the video fader to make gradual transitions between the A and B bus inputs. The video fader enables you to change the way it switches by using various transition effects (as described later).

Let’s begin by pressing the INPUT SELECT button to easily switch from one channel to another. When a simple “cut” is too harsh, for example, during a concert or when you have a mellow classical music soundtrack, try using a dissolve effect with the video fader. Operating the video fader smoothly allows you to transition between the visuals at the speed you want. By stopping the fader midway, you can superimpose the two visuals to create a nostalgic mood. If not overused, fader transitions can be very effective.
Transition images creatively with the video fader

Become the master of switching effects

With 263 transition effects, you can use the video fader to control your choice of effects such as dissolve, wipe, slide, stretch, and key. Assign your favorite effects to the three buttons above the video fader for quick access. If you prefer a horizontal fader, you can rotate the lever assembly for left to right movement - the choice is yours.

Automatic switching to match musical tempo

The V-8 can automatically transition between the A and B bus in time with the music by setting BPM (beats per minute) synchronization. This unique function can be set between 20 to 240 BPM. The value is shown in the BPM display on the panel.

Typical transitions

MIX (Dissolve) An image is gradually superimposed over the current image and eventually replaces it.

WIPE A new image is pulled across the original with a straight, rounded, or angled leading edge. A soft-edge wipe can also be used to give a softer transition.

SLIDE Similar to wipe, but both pictures move. The old image is effectively pushed off screen by the new one. You can choose from 26 variations.
Use effect functions for real-time composite effects

Achieve the right effect

The advantages of using a video mixer are more than just switching between images. By using effects, you can make composites from two pictures, change colors, and display the resulting image. You can get more information across by using techniques such as keyed composites and Picture-in-Picture (PinP). Although effects can be used to make the pictures themselves more interesting, use effects sparingly to avoid making the visuals too "busy". At the event, keep an eye on viewers to gauge their reactions.

Freely assign effects to 8 buttons

On the V-8 you can assign any of the 100 variations of the 25 types of effects to the 8 EFFECTS buttons on the control panel. The screenshot on the left shows how you can check which effects are assigned to particular buttons.

Effects are executed by pressing the EFFECTS buttons that are located on either side of the control panel. You can apply effects simultaneously. Use the slider next to the buttons to control the strength and to vary the way the effects unfold.

Displaying Text on composite images

You can create text elements with a computer, and insert them on the main screen as captions or titles. To make these composite images you can select two keys. The chroma key specifies color and transparency and the luminance key standardizes brightness. In the example shown on the right, the text element is made to appear in the dark area by using luminance key to set the transparency. You can change the text element on the spot if you bring a computer to the event.

Using Picture in Picture (PinP)

PinP (picture in picture) enables an inset picture to be shown on the main screen. If desired, you can adjust the position of the inset using a menu function.

Create pictures that look like a Kaleidoscope

- Mirroring allows you achieve vertical and horizontal reflection effects. The kaleidoscopic effects applied to moving pictures can provide some very cool graphical elements to the presentation.
Practical Production

Now that you are familiar with the essentials of using visual playback devices and video mixers, let’s learn how to make practical use of the basic elements that were previously presented.
For effective and easy-to-understand presentations, we recommend that you use one or more projectors or large displays. Displaying a large image of data and a camera shot of the speaker, aids participants understanding. IMAG (Image Magnification) is becoming more commonplace at presentations. Here is an example of how you can do IMAG with several video sources including computer.

For this case, we recommend that you to use a video mixer which has PC(RGB) inputs. For example, 2 inputs for cameras shooting the speaker and a PC input for displaying the presentation data. An additional PC for displaying speaker’s name or subject can be used as well.

Using multiple displays will further engage the audience.
Using live video reaction shots within slideshow and video playback

1. Show previously recorded video
   - The producers of this event decided to show the wedding ceremony during the reception to share with people who did not attend. Then after the wedding, they loaded the P-10 with the video footage.

2. Feature reaction shots using a live camera
   - It is best to have a person switching the video mixer and a separate camera operator located on the floor. You should plan in advance what you want to feature.

3. Be aware of timing while using PinP with the V-8
   - Using the mixer’s ability to display PinP is a good way to show live camera feeds if you carefully time reaction shots and facial expressions.

Venues that can accommodate wedding receptions often have projectors or other displays in place. By taking cues from a skilled host you can use mixing to increase the enjoyment of the guests. During long speeches, you can sustain the party atmosphere if you show well chosen images on the large screen.

Showing front views of the wedding ceremony and congratulatory messages will allow everyone to feel included. Using the P-10’s slideshow capabilities, you can show photos of the bride and groom during their childhood years. You can create a slideshow by adding a soundtrack of selected music either of the era or of the choice of the bride and groom.

You can show pictures from the wedding ceremony simply by putting the SD card from the photographer in the P-10. Using the PinP effect on the V-8 you can show the bride’s reaction from a live camera during the slideshow. You will impress the guests with your “live coverage” of the celebration. It is equally impressive if you use key composites to title screens with the names of guest speakers. Everyone will be impressed when they instantly see the name of the speaker.
Case 03 Live video production for film screenings

Film screenings are held regularly. Rather than just showing the films, why not add some production value to the event! You could begin with an opening video, add some slides to introduce each film, or include video interviews with the filmmakers. You could also include clips of works in progress or trailers of upcoming attractions. Point out what is special about the films and include information about the history and footage of the film location to make the viewing more interesting and memorable.

Record the whole screening and make a valuable recording of the event using a DVD recorder. Record interviews with the filmmakers, as well as reactions at the time of the screening. Share them with people who were unable to attend, or friends anywhere in the world. The screening can also be archived as a history of your activities.

Distribute DVD copies to friends and acquaintances who will gain a better understanding of what you do, and attract new business, fans and support. Aside from the promotional value, distribution is also a good way to attract new collaborators.

1. Create a logo and countdown screen to be used at reoccurring film screenings and display them with the tap of a finger.

2. Used for showing films at the screening. Be sure the player is compatible with all required formats.

3. Used for interviews with the filmmakers. The camera should be operated by someone other than the person doing the switching.

4. Connect to a DVD recorder to document the film screening.

5. Used for recording the output of the connected video mixer. To record audio, plug in a separate line out from the PA system or other audio source. Once recorded on a DVD, it is easy to make copies for distribution.
Create a higher level of interest by making a logo for the film group or sponsors

Open the film screening with a sequence containing a logo, motion graphic, etc. This can be created with the titling capabilities of the DV-7DL or on a computer. If you record the film screening, the logo and opening sequence will also permanently title the production when it is archived.

Insert the title of the film and photo of the filmmaker

Before showing the film, you can insert stills of the filmmaker, the title of the work, a brief summary of the contents, and the running time. That will allow a break between different films and help viewers understand what they are about to see.

Show a live interview with the filmmakers after the screening

Capture a live interview of each filmmaker before the film screening to show onscreen during the event. Hearing what others have learned and the challenges they have faced can inspire other filmmakers.

**Example image of the venue**

- You must be able to clearly view the screen from the switching location, and the mixing should be done unobtrusively. If you can inspect the venue beforehand, it will help you locate the power sockets and determine the length of the cables needed for connecting the cameras, monitors and projectors, etc.
Practical knowledge about jacks and plugs

Poor cables and connections are a common source of problems
You will find an assortment of jacks on the rear panel of most equipment. Here, we will focus primarily on the connections for Standard Definition signals to learn the basics of what you need to know.

To start with, there are two types of connectors; those used mainly for consumer level video and those used with professional equipment. There is typically an effective locking mechanism for equipment used by professionals. This minimizes failure due to inadvertent disconnection. When sound or vision signals are disrupted or impaired, the cause is usually due to a poor connection. Make sure to firmly push the cables together when connecting them.

To help you become familiar with the many different types of signals and the connectors they require, see the table below. There are three main types of image signal connectors: composite; S-Video (separate Y/C); and component. You are probably familiar with the 15-pin D-Sub analog connector (sometimes referred to as a VGA) used with computers.

Pay special attention to the arrangement of your cables at the venue. When they cross over the floor, it is wise to secure them with gaffers tape or overlay a protective cover carpet to prevent a tripping hazard to those attending the event. Try to arrange the cables in a manner in which they will not disconnect or become disconnected if they are snagged. It is best to use thicker cables for video. If you encounter noise, try rerouting or vertically separating the crossed video cables from lighting, sound and power cables.

Delay is another potential problem. With the shift to digital technology, delays can result when the signals pass through time-based correctors (TBC) and frame sync (FC) circuitry. Usually any delays are well within the accepted level of not being noticed but pay attention to your signal path to minimize any latency.

<table>
<thead>
<tr>
<th>Video connectors</th>
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<tbody>
<tr>
<td>Connector type</td>
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<tr>
<td>BNC</td>
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<tr>
<td>RCA pin</td>
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<tr>
<td>S-Video (mini DIN)</td>
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<tr>
<td>BNC / 3 RCA pin</td>
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<tr>
<td>D-Sub 15-pin (VGA)</td>
</tr>
<tr>
<td>DVI (digital component)</td>
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<tr>
<td>DVI tLink</td>
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<td>AV connectors</td>
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<table>
<thead>
<tr>
<th>Audio connectors</th>
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<tbody>
<tr>
<td>Connector type</td>
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<tr>
<td>XLR (cannon)</td>
</tr>
<tr>
<td>RCA pin</td>
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<tr>
<td>Phones or standard jacks</td>
</tr>
</tbody>
</table>
Use V-LINK for simultaneous control of audio and video

What is V-LINK?

V-LINK is a technology that enables mutual control of audio and video devices fitted with MIDI terminals. V-LINK capable devices allow you to overcome the barrier between music and video by controlling video equipment using audio gear and vice versa.

For example, while playing a synthesizer, a musician can switch visuals or select the video mixer output. Also, you can cross fade audio by using the fader on the video mixer.

To use, connect equipment with a MIDI cable and simply switch on the V-LINK mode. Easily produce visuals to match the musical performance.

Electronic instruments
You can switch to the video mixer input or the video presenter output using MIDI information.

Audio equipment
You can switch audio inputs using MIDI information from electronic instruments and video devices.

Video equipment
You can control visuals, switch input signals, show composites, and perform other operations using V-LINK.

The MIDI standard is internationally recognized. Cables like this are mainly used for musical performance information and for controlling the operation and settings of equipment.

There are more than 60 different V-LINK compatible products available with sales of over 400,000 units.
Recording with multiple cameras

You can record multiple cameras at an event while simultaneously switching or mixing between them. TV broadcasts commonly use this technique. Now anyone can do this affordably.
Recording a multiple camera event is easier than you think

Step 1 What are the benefits of live mixing at an event?

Simple mixing system for multiple camera recording

Let’s start by looking at a Standard Definition (SD) system. You might be surprised by the high quality results that you get with affordable equipment. Even high-definition cameras that capture HD data have SD composite outputs which can simultaneously down-convert. Create a full-package DVD.
Video mixer that can connect up to four video cameras

Inputs
Similar to audio mixers, the inputs are located on the top panel rather than the rear. This is probably a new concept to the video user. It is easy to see the video connections at a glance.

Input Select
The A and B bus have four input sources each. Use the T-bar to switch transitions and wipes or composites from one bus to the other.

Effects
Still/strobe, multi-screen, picture in picture, and various other effects are built in. Chroma key and luminance key capabilities enable graphic overlays.

Have you ever wondered what it would be like to record with more than one camera?

Having multiple camera angles and shooting positions adds depth to the production. Choosing the best shot from multiple cameras and discarding the unneeded shots increases the quality of the final product.

Although setup will take extra time because of the need for additional equipment, using multiple cameras is well worth the effort.

There are two main methods for recording live with multiple cameras. The first method involves using video mixer switching at the event to create a basic master. The other method entails recording the event with multiple cameras in parallel and editing after the event. The advantage of using a video mixer on location is that you save time by minimizing the post-production process. The advantage becomes even more apparent the more cameras you use and/or when using a more sophisticated format like HD. This would result in the post production process becoming more complex.

The video switching you do during the recording process results in a finished product on the spot. Even with video mixing errors, as long as you have the recorded data from each camera, you can always fix it later. Therefore, with a video mixer you get the best of both worlds.

Video mixers tend to be graded by their number of channels and the formats they can support. EDIROL has video mixers ranging from standard definition to high definition and produces very affordable 4 and 8-channel mixers.

You may think you could never afford enough camera operators to use so many channels. By using unmanned fixed cameras, you can utilize these additional channels. Use your creative ingenuity for positioning, angling, and so on. Without a large crew - even on your own you can achieve superb multiple camera recordings.
Step 2 Shooting live with multiple cameras

Let’s look at an example of shooting with multiple cameras at a small to medium sized live music venue. You should design the shoot and plan the production before the day of recording. This includes camera positioning and how to record the audio. You need to consider all practical details like load-in, setup, recording and load-out. Work this out ahead of time with the managers of the venue. If you intend to use projector screens, factor in the influence of stage lighting.

In this example, we will try a simple live shoot so there is no need for tallies (red lights on camera that show when the camera is being used lived), wireless communications, and other commercial devices. The goal is to use a minimum crew with maximum effect. In a home, board room, party setting or small club, there usually isn’t enough space to set up a lot of equipment. The immediate proximity of guests or audience members can pose other problems. In short, gear should be kept to a minimum. Next, let’s look at how to set up the cameras and video mixer.

Camera and video mixer set up
Plan the location of the cameras well in advance of the day of the event. Be sure the cameras do not get in the way of the audience. (The location and required number of cameras and operators will be addressed later). Set up the video mixer at the center of operations (referred to as the ‘base’). Connect cables from each camera to the video mixer at the base. Use composite connections since longer cable lengths may be required. Set up the recorder as close to the video mixer so it is easy to start and stop the video recorder, and connect it to the video mixer output. If a projector will be used for live
video output during the performance at the venue, connect a video cable to the video mixer output as well.

**Setting up individual cameras**
Before the rehearsal starts, adjust the settings of each camera to create a uniform image between cameras. Start with the white balance, which will vary depending on the stage lighting at the venue. Setting each camera to 3200K for interior lighting is the easiest way to achieve uniformity. If you cannot manually set the color temperature, it is best to use the automatic white balance setting. If possible, use cameras from the same manufacturer for similar image settings and picture quality. Set the white balance to indoor illumination and compare the image quality when using cameras made by different manufacturers. If there are obvious differences, adjust the white balance using the same lighting source. Adjust the white balance for all the cameras when the lighting is flat during the rehearsal. It is best to match the picture quality of the cameras at the venue because it is difficult to correct color after-the-fact.

Pay special attention to the surface of the lens. Stages can have many light sources which can include back lighting, so be sure the lenses are clean. Live music venues produce dust and particles that can easily show up on the lens. Light can enter the lens directly, so use cameras that are less susceptible to smearing. Tripod mounting is recommended (handheld shooting is mentioned later). Choose the camera angles before the rehearsal begins.

If images will be shown on a projector during the performance, choose cameras that perform well under low lighting conditions.
**Step 3** How to decide on the number of cameras and their positioning? Application techniques for multiple cameras with a small crew

We’ve just seen how one person can record with up to four fixed cameras and a video mixer. Now let’s apply the same technique to several different filming patterns when recording using multiple cameras. The variables are the number of people, camera positioning, what to record and how to shoot it.

First, let’s consider the number of cameras and their positioning. The basic principle for shooting is to accurately capture what is happening on the stage and make it look great without missing anything. To accomplish that, you need to consider what will take place onstage and to anticipate the movements of the main subject and the supporting members. For example, at a piano recital or a lecture, movement is easy to anticipate because the main subject is mostly stationary. But at a live concert, you may need three cameras (preferably four or more) to capture the stage activity without missing anything. Let’s consider the strategy required when filming with a one or two man crew.

**One man filming with two cameras**

**Pattern A** In this situation, cameras cannot be placed near the stage as access is a problem for replacing videotapes.

- All filming is done from the base. Camera 1 is the main camera for zooming. Camera 2 has a fixed wide angle. Zooming and simple video mixing is done from the base. Use wide angle shots from camera 2 at the start and end of the song and use zoomed shots from camera 1 in the middle.

**Pattern B** In this situation, a camera can be placed near the stage as the camera is easily accessible to replace the tape or an EDIROL F-1 is being used.

- Camera 1 is the main camera for zooming from the base. Camera 2 is fixed in a position close to the stage. Place Camera 2 at the best angle for framing the main subject when filming a vocalist or piano player, etc.

**One Point Advice**

- **Develop your skill as a camera operator**

  The camera operator must decide what to shoot when not directed with a tally and headset. Develop your skill to constantly follow the action and pay attention to what you hear to judge who the main subject is and where to focus the camera.

  Another important point is to always use a tripod. Filming with a tripod during a classical music performance will work very well because the audience generally sits quietly. But in a crowded venue setting where the audience often gathers near the stage, a tripod may not work well because the audience could obscure the camera’s view, or a band member may suddenly jump off the stage. In situations like these, be ready to quickly shift the camera to the handheld position. Handheld shots can feel like you’re part of the action.

  Filming in the handheld position can continue for extended periods of time. You must creatively avoid becoming tired. At a concert or club, you can use the crowd control barriers or other fixed...
Filming with one operator using three or more cameras

Pattern A
In this situation, cameras cannot be placed near the stage because access is a problem for replacing videotapes.

- All cameras are placed at the base. One camera is used for zooming, while the other cameras are fixed on different sections of the stage. Switch between the cameras during the performance.

Pattern B
In this situation, a camera can be placed near the stage because access for videotape replacement is not an issue or EDIROL F-1s are being used.

- The main camera is operated from the base. Multiple cameras are placed in different venue locations. Use fixed cameras to film stationary subjects such as a lecturer, host, piano player, drummer, etc. Place a camera showing less visible areas of the stage to capture the most interesting views.

Filming with two operators using three cameras

- One person operates the main camera. The other person operates camera 2 and does the switching at the base. Camera 3 is placed at the base or near the stage and operated as a fixed, unmanned camera. A good placement for camera 3 is on the opposite side of the main camera. (Set up the camera accordingly if there is a stationary subject, such as a host.)

Filming with two operators using four cameras

- The three cameras placed at the center, left and right, will basically cover the entire stage. Use the fourth camera to be creative. If you can place this camera onstage, you can get effective close ups and capture the reaction of the audience.

Surfaces to support your arm or camera. Good luck and have fun!

- What about changing tapes in a parallel recording situation?
Use different tape lengths when filming with two or more cameras. For example, use 60 and 80 minute tapes so they don’t run out at the same time. This will allow time to comfortably change tapes.

- Tips for placing fixed cameras
Lock in the best camera angles during the rehearsal. Fixed cameras should be in accessible locations because you must manually press the record button before the event starts, and then press the stop button after it ends. To prevent theft, secure the cameras to an immovable object like a built-in theater seat, or rope off the area around the camera. If you have a remote control, use it to start and stop recording to avoid disturbing the camera angle. Set the cameras in spotlight mode to avoid a “washed out” appearance on the subjects’ faces, and be sure to set the autofocus.

- Go tapeless
When filming with a camera that uses mini-cassettes and the event lasts longer than 80 minutes, utilize the DV output and connect a video field recorder like the EDIROL F-1 or standard video tape deck capable of recording for 2 or more hours.

You will get better results for the fixed, unmanned cameras if you use cameras with good automatic functions instead of models with more sophisticated manual functions.
Selecting camera angles and positions

The basic camera arrangement consists of three cameras facing the stage: one left, one center, and one right. When you work with two cameras, one should be placed close to the stage on the left or right, the other placed further back for the best wide angle view. In this example, a fourth camera is fixed on the drummer. It would be ideal if each camera had its own operator, but when shooting with a small crew, a camera operator is not needed for fixed wide angle shots.

If you are filming alone, position the main camera near the video mixer. The other cameras are used in a supporting role. Mount all cameras on tripods because you will be operating the video mixer. You can operate the main camera with one hand by attaching the controls for zoom and focus to the pan stick, or you may need an attachment that enables two cameras to be mounted on a single tripod.
**Step 4** Don’t just film, make it a memorable

You should be familiar with the image of the artist when choosing the materials to enhance the music. First, consider the genre and style of the music. Choose casual materials for popular music, something formal for classical, and avant-garde for rock. Selecting the right material is like selecting the right outfit. You can use stills, movies, animations, and illustrations, when you produce material for the P-10.

Next, let’s consider the key points for switching. Different uses of switching techniques can transform the delivery of the material. Your fader movements should match the pace of the music. For example, use quicker cuts for up-tempo music and a dissolve effect for slower music. A monochrome effect could be an interesting choice as well.

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### Project visuals that match the song

You can do more than simply film when your system includes a P-10 and V-8. You can also project visuals and enhance the event. The key is to select the proper materials and have a good switching technique.

### Load the P-10 with material shot during the rehearsal and before the performance

You don’t need a computer with the P-10. On location, simply connect a camera and add new content to the stored material. Before the event starts, film some outside scenes and the audience as they enter the venue. You can build the anticipation of the audience with just the right timing. You will surprise the staff and management by including shots of the logo and signs of the venue. You might consider showing some slow motion shots of the vocalist’s expression during rehearsal, and the staff adjusting the equipment.

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Additional uses for the P-10

You can adjust the speed of the material loaded into the P-10 and add some effects. Then record the results to a DV deck, and reload them back into the P-10. Then instantly play back the clip by tapping a pad.
Standard Definition (SD) versus High Definition (HD)

The difference between SD and HD is not only the pixel count, but also the frame size. Be aware of the aspect ratio during production.

Today, though most new video cameras are High Definition (HD) capable, Standard Definition (SD) is still typical for video production. This is because DVDs for distribution use the SD format. Also, SD provides acceptable video quality for projecting at the venue.

However, we are now in a transitional period and equipment is available in both formats. This can cause confusion when building your system. If you mistakenly show a video with an incorrect aspect ratio on a 16:9 screen, people will appear wider.

Let’s discuss a few points about SD and HD.

First of all, SD and HD have a different resolution (pixel count). The SD screen contains 640×480 (or 720×480) pixels, while HD contains 1920×1080 (or 1440×1080, 1280×720). The aspect ratio of SD is 4:3 while HD is 16:9.

When filming with an HD camera to be displayed on an SD screen, there are three methods to deal with aspect ratio, as shown on the right. Insert black margins on the top and bottom, which is called letterbox; squeeze from both sides; or crop the left and right edges, which is called edge crop. Some HDV video cameras allow you to film with an aspect ratio of 4:3. In any case, you should set a consistent aspect ratio from the camera, to final recording, to projection.

You can create a 16:9 wide DVD package if the final format is DVD. Viewers with high definition TVs can fully enjoy them on their wide-screen TVs. It is possible to use the squeeze technique from filming, to video mixing and final recording.

The risk is higher on location than in the editing room where you have more time to think. The safer approach is to maintain an aspect ratio of 4:3 for SD and 16:9 for HD.

Nowadays, projectors are multifunctional and accept signals from computers, DVI and HDMI. Some venue projectors now use 16:9 panels. Be careful to avoid confusion with aspect ratios.
How do you record audio that matches the live video?

In this final section, let’s think about recording audio when filming events. In particular, how do you record audio when using multiple cameras? You can edit the visuals with the clips from different viewpoints, but you cannot use the audio from each camera. From the viewers’ perspective, it’s easy to understand why. If the sound field and sound quality changes when the scene switches, you can’t concentrate on what you are viewing. Therefore, the audio and video must be dealt with separately.

At an event, there are a variety of sound factors such as music, audience reaction, applause, and host using a microphone. In this section, we’ll introduce some stereo recording techniques that you can use when the priority is the sound quality of the music. The first thoughts that come to mind are to use the microphone on the camera or microphones at the venue where the sound balance is good. You can record the audio directly from a PA system when it is used at an event. However, the audio recorded directly from the PA line out doesn’t include background noise or ambient sound, so you may want to record the ambient sound separately and mix it in later. You can create a good balanced mix during the editing stage.

Good audio for visuals means clear sound that complements the images. You want an audio track that combines a feeling of live presence matching the visual. The key words are clear, presence and matching.

Unlike music production, there is more to consider than just the sound when recording an event. By using the equipment introduced here, you can achieve good sound quality. Let’s take a look.
Step1 Recording audio at the event

If you are filming alone and don’t have much setup time, you may have to settle for using the microphone on the camera. If you are using multiple cameras, you can try mixing the audio from each camera, or audio from the camera situated with the best audio balance in the venue. The audio with the best sound balance is when the music, ambient sound and live microphone can be heard equally well.

If the host uses a microphone often, use the audio from the camera closest to a PA speaker. In a small venue, use the audio from the camera closest to the subject.

In many cases, cameras can only be placed in the back of the venue. Audio recorded from these cameras will give you good presence, but lack clarity. For example, in a situation with acoustic music such as a piano recital, try using a stereo shotgun microphone mounted on the camera located in the back of the venue. Professionals don’t usually employ this technique, but you may be pleasantly surprised with the results.

Next, let’s consider recording audio with a separate microphone. You can connect a separate stereo microphone to the camera or to an independent audio recorder. These days, it is easy to use flash memory recorders with a built-in stereo microphone. Because they are extremely compact and do not require cabling, professionals use them frequently. These recorders can be placed in front of the stage or speakers.

There is another advantage with using a flash memory recorder. Because you only get one shot when recording a live event, professionals require various types of back up methods. They often use spare cameras and sometimes set up a camera to film a parallel recording independent of the video mixer, but flash memory recorders can also provide additional audio backup as well. Why not take advantage of their benefits?

Recording with the microphone on the camera

Record audio with the built-in camera microphone or a stereo microphone mounted on the camera. Use the audio recorded from the camera with the best sound balance when using multiple cameras.

Recording with the stereo shotgun microphone from the back of the venue

While most directional shotgun microphones are mono and designed mainly for isolating the human voice, they are also available in stereo, such as the EDIROL CS-50. You can get surprisingly good results using this mic.

Recording with the built-in microphone of a flash memory recorder

Many companies have recently released compact recorders with a built-in microphone which is very convenient for visual production. The EDIROL R-09HR can record to SD cards without picking up any mechanical noise. It can record 24-bit/96kHz audio, which is higher quality than CDs and video cameras. The R-09HR can be tripod mounted with the optional cover/stand set.

What is one-point recording?

Basically, it refers to recording audio with a microphone placed in a single location. Use two microphones for stereo recording. While there are no strict rules about the distance between the microphones or their relative angle, the most common mistakes are: the distance between them is too great or the relative angle is too wide.

The desire to capture the largest stereo field possible is understandable; however, one-point recording should be similar to normal human hearing. The microphones should be set about a foot apart and parallel to each other. This simulates the position and angle of the human ears, which never vary. In other words, record audio in the same manner we naturally hear it!
Step2  Recording audio from the PA and venue microphones

Recording acoustic music

In a venue where a PA system is not used, such as a classical music concert, microphones suspended from the ceiling can record clear sound to capture the ambience. The picture above shows microphones lowered from the ceiling. Let the house audio engineer choose the best vertical positioning for the microphones.

Recording popular music

If a PA system is the main audio source, try to record directly from the line out. However, this does not include the natural reverb or audience reaction and applause. You should also record additional audio with separate microphones to capture the ambient audio to mix along with the main sound later. You can bring your own mixer and record the mix on the spot, or use a recorder that has four independent channels and mix after the fact which allows you to match the balance with the scenes.

It is not always possible to use an independent microphone for each sound source. Also, unwanted sound from the PA system can bleed into the microphones. For these reasons, professionals prefer a shared line when recording on location. In other words, record the signal directly from the line out of the PA system.

Though this is a common practice, you should politely request a shared line from the house audio engineer because this can cause them additional work.

The ultimate goal is to mix the audio recorded directly from the PA system with audio from the microphones that you set up in the venue. Next, the discussion will focus on the audio obtained from the line out of the PA system.

Which audio do you want?

The PA mixing console receives many audio signals. While you could theoretically record all of these signals, it is impractical when considering the work involved for both you and the house audio engineer.

Let’s start with the PGM (program) out, which is the same audio signal that is sent from the mixing console to the amplifier which powers the speakers heard at the venue. However, it is not the identical sound because it is affected by the characteristics of the amplifier and speakers. Even so, audio recorded from the PGM out may not be suitable for your video recording because this sound is mixed strictly for room balance.

The PA audio may be mixed in a manner that does not work well for video. For example, the PA audio may need heavy suppression of some of the high frequencies if feedback is produced when sound from the speakers is picked up by the microphones. In addition, audio from the PGM Out may contain certain idiosyncrasies. Audio sent to the PGM Out is mixed to suit the venue and is adjusted for room acoustics. It is important to be aware of this fact.
A convenient recorder that records 4-channels simultaneously

4-Channel Portable Recorder R-44

This 4-channel portable audio recorder uses SD cards. It can record high quality 24-bit/192kHz audio with the convenience of a built-in stereo microphone and speakers. You can get up to four hours of continuous recording using four AA NiMH batteries, allowing video producers to concentrate on filming.

You need to know what to ask for to get the sound you want. There is a way to get the mix you want by asking for the channels you require. PGM Out is the post-fader audio signal which is mixed for PA balance and contains effects along with the PA sound. The pre-fader signal is closer to the original unaffected sound. However, since the PGM Out audio signal is post-fader, the levels are already mixed, but the pre-fader audio signal requires you to mix the audio yourself. Both have their advantages and disadvantages, so the decision is yours.

What do you need?

If the audio cables you provide that connect the output of the mixing console to your recorder are XLR connectors, you must request balanced analog outputs from the mixer.

Next, we’ll talk about cable specifications. There are various types of XLR connectors, which are usually compatible with most mixing console outputs. Sometimes the three connecting pins are wired differently with some cables, so keep this in mind (as shown on the right).

What to do about the levels?

As explained above, the audio level from the PGM Out has already been adjusted, but be sure to check it during the rehearsal. The sound engineer may be able to provide you with a reference signal.

Video Field Recorder F-1

This HDV/DV recorder has a 120GB removable hard drive. Aside from recording the HDV/DV stereo audio, it can also record audio from two separate channels simultaneously. The 16-bit/48kHz sound quality is recorded in wave file format. With this unit alone, you can record audio from the line out of a mixer, along with stereo audio from the camera to achieve a good sound balance.

The F1 is ideal for recording events because it can record for about 9 hours. Three power sources are available: AC adaptor, external battery, or AA batteries.

With the V-mount kit you can use widely available batteries to extend the operation time. If you use the down-conversion capabilities on the camera to output DV, you can record HDV on the tape as DV (PCM audio) on the hard drive. This enables you to get 4-channel uncompressed linear PCM sound.
The four camera setup

P-10 Visual Sampler
Images taken during rehearsal can be captured and used. Slide show stills should also be loaded and ready for use. See p. 36 for details.

R-44 4-Channel Portable Recorder
To record audio to the R-44 memory card, you need to get a feed from the house PA mixer.

For this recording project, we chose the V-8 because it has an RGB input which is used to acquire the titling data from a computer.
What you need to know about sound to avoid problems later

The audio you recorded during the filming must be mixed later, which generally involves editing and sound adjustment. Give yourself several options including some “backup” during the recording process and try to record the audio with a low signal-to-noise (S/N) ratio. This page contains tips to help you avoid problems with the sound later.

Level and impedance

PA outputs usually provide a signal level between 0dB and +4dB. Almost all mixers and decks for recording are designed to work with this signal level. The signal may need attenuation before connecting to consumer level devices. By contrast, some simple PA systems have outputs which use standard phone jacks or RCA pin connectors. While it is useful to have conversion plugs and cables on hand, it is best to choose equipment which can accept a wide variety of connectors like the EDIROL R-44.

Good sound is highly dependent on recording at the optimum recording level. The results will be next to useless if you exceed this level. Try to determine the optimum recording level during rehearsal. If you use equipment capable of 4-channel recording, reduce the Left and Right outputs by -10dB. This precaution is often taken by professionals.

What to do about noise

Some venues are a hotbed of noise. The main sources of noise are lighting and wireless devices, which can find its way into your recordings. Although you can’t eliminate it completely, there are some measures that can be taken.

If you must extend your audio cables, use the balanced Cannon (XLR) type cables mentioned earlier. If the output is a non-balanced standard phone jack, connect it as close as possible to a direct box (BOSS DI-1). This converts the signal to a balanced line which can then be extended.

The next consideration is the electrical power sources. We tend to simply look for the nearest wall socket, but they are for general use and other connected devices can sometimes introduce noise. When possible, request a separate electrical circuit from the venue management in advance to reduce this risk. In a case such as this, it may be a non-standard C-type connector. You must request a conversion cable from the venue to use it as a normal socket.

Make a separate “backup recording” with different sound levels

When you are concentrating on filming video, you cannot monitor the recording level. By using a 4-channel recorder, you can record two separate stereo signals from the same audio mixer, but record one set at a lower level. Even if spikes in the audio cause distortion, the lower level recording should be safe.