

ALESIS Studio 32

Reference Manual

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CHAPTER 1

INTRODUCTION

How to use this manual

You've taken the leap and purchased an Alesis Studio 32 Recording Console with Inline Monitor. Congratulations. At Alesis, we design equipment that's used by everyone from first-time users to engineers with decades of experience. In either case, the Studio 32 packs a lot of power into a small package, and we wrote this manual so that no matter what your background is, you can get the most out of it.

For beginners

The first two chapters are designed to give you a background in console operation. If you read them carefully, the rest of the manual will be easier to understand, and you'll be happier with your results. Mixers really aren't as difficult as they seem to be, but there's a lot of things going on at one time.

Chapter 1: Introduction describes the capabilities of the Studio 32 and explains the basic principles of mixing and recording.

Chapter 2: Guided Tour provides a brief tour of the Studio 32, and shows you how the basic principles of all console operation apply to the particular features of the Studio 32.

Chapter 3: Connections details installation and power hookups, rear panel connections (inputs, outputs, and cables), and typical hook-up procedures.

Chapter 4: Effects and Signal Processing contains information on how to connect external effects and how to use them properly. *If you don't read any other chapter, read this one—effects send and return is one of the most misunderstood aspects of mixing consoles.*

Chapter 5: Recording Applications covers the various uses for the Studio 32 in multitrack recording, with step-by-step instructions on setting up and mixing techniques.

Chapter 6: Sound Reinforcement Applications covers the Studio 32's features when it's connected to a PA system; but this chapter will also be useful for those doing live recording.

Chapter 7: Description of Controls is a "dictionary" of each control for fast reference.

Chapter 8: Troubleshooting. A guide to trouble-free operation, maintenance and service information.

We have also included a block diagram, Gain Structure Chart and an Index.

We appreciate your feedback. If you have any suggestions on how to improve this manual, please write to us at:

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Conventions

The buttons, knobs, and rear panel connectors are referred to in this manual just as their names appear on the Studio 32, using all capital letters (*Example:* TRIM control, PAN knob, MIC IN jack, etc.).



When something important appears in the manual, an icon (like the one on the left) will appear in the left margin. This symbol indicates that this information is vital when operating the Studio 32.

For the experienced: a quick overview

If you're already familiar with mixing consoles, here are some important points you need to know about the Alesis Studio 32 Recording Console. The Studio 32 follows commonly-accepted traditions for signal levels and routing.

Channel Input Jacks: All inputs and outputs are balanced except the INSERT jacks and Stereo Aux Returns. All other 1/4" jacks are TRS 3-conductor types and may be used with +4 dBu balanced or -10 dBV unbalanced systems. The XLR and LINE IN jacks do not have a switch between them, and use the same TRIM control, so you can only use one of them at a time. The TAPE IN jacks are entirely independent, have no TRIM control, and can handle input levels up to +25 dBu.

PEAK indicator headroom: The PEAK LED in each channel will light 5 to 6 dB before the onset of actual channel clipping. The same is true for the PK segment of the main meter (which corresponds to +18 dB over reference). PEAK is monitored both pre- and post-EQ.

Monitor LINK TO L/R: Unlike most other monitors, the Studio 32's monitor busses are independent from the L/R mix, unless you LINK them to the L/R using the switch. Think of them as an AUX 1/2 send with independent input source selection from the channel source, which can be submixed into the L/R if desired.

EQ: The 75 Hz high-pass filter switch is independent of the EQ and may be used even if the EQ IN switch is out. The midrange controls are fully parametric. The EQ section affects the channel path only, not the MONITOR 1/2 section.

AUX: There are four post-fader Aux send busses, with two knobs from each channel. Both knobs in a channel are assigned to a pair of auxes by the same AUX ASSIGN switch: 3/4, or 5/6. The upper control can send from the Monitor or the Channel; the lower control is always from the channel.

SOLO: Whether the SOLO keys function as SIP (stereo solo-in-place, also known as After-Fader-Listen or AFL) or PFL (Pre-Fader-Listen) is selected by a master solo status switch next to the Control Room section. The Stereo Aux Returns can only be soloed in SIP mode.

FADERS and gain structure: The Group and L/R master faders are designed with a nominal "0" position at the top of their travel, not the 3/4 position. The channel faders have 10 dB of gain from the nominal position to the top of fader travel. Most other pots are marked with a nominal position (usually "2 o'clock"). The L/R, Group, and Direct outputs add an extra 6 dB of gain when used in balanced mode.

Chapter 5 "Description of Controls" gives a knob-by-knob definition of each feature of the Studio 32, so if you know what the "Q" controls do, but you need more information on "LINK TO L/R", this is where you can look it up. In any case, please remember after you get started that this manual contains information that will help you get the highest level of performance from your Studio 32. Even an expert may pick up some creative alternative techniques that aren't obvious at first glance.

To find what you need quickly, refer to the index at the back of the manual, or the Table of Contents.

About the Studio 32

The Studio 32 is an extremely flexible, 16-channel, 4-group plus L/R output, in-line monitor professional audio mixing console. The MONITOR 1/2 path of each channel has its own volume, pan, and access to the channel's upper Aux send knob, so you can mix or monitor the tape input while the main channel path mixes a mic or line input. Each monitor control has its own source switch, so it may be used as a conventional pre-fader auxiliary send as well as a tape monitor section. The MONITOR 1/2 mix may be linked to the main stereo output, but also features its own 1/4" output jacks. This flexible design allows full mix control of 32 sources, plus 8 aux returns, for a total of 40 sources at mixdown. For this reason, the Studio 32 is perfectly suited for professional project studios with a large number of MIDI sequencer-controlled sources that are synchronized with 16 tracks of ADAT. It also makes an excellent console for live sound reinforcement use.

Each channel features a high-quality 3-band equalizer with a fully parametric (not just sweep) midrange band. The midrange Q (bandwidth) can be set as narrow as 1/6th of an octave, or as wide as several octaves, for boosting or cutting any frequency range desired. An EQ IN/OUT switch permits the entire EQ circuit to be bypassed when desired, maintaining the minimum signal path. A switchable 75 Hz high-pass filter removes low frequency rumble and noise.

The Studio 32 uses fully balanced +4 dBu inputs on 1/4" jacks for all LINE IN and TAPE IN connections. The Studio 32 may also be used with unbalanced -10 dBV level equipment. Each channel has its own balanced Direct Out, so that simultaneous 16-track recording is possible.

All channels feature a high-quality, low-noise balanced microphone preamp with globally switchable 48-volt phantom power for condenser microphones. Each input channel features a green "-20 dB signal present" LED and a red PEAK LED to warn of input signals that are too high for the present trim or EQ setting. The MUTE and SOLO switches use these same LEDs to indicate when a channel is muted or soloed.

Effects mixes are handled by four post-fader Aux send busses, with two controls in each channel that are assignable to either Aux 3-4 or Aux 5-6. The upper control, labeled Aux 3(5), features its own input source select switch that allows it to provide an effects send from either the channel fader or monitor level control. The lower control, Aux 4(6), is a post-fader send that's always sourced from the main channel fader. Four Stereo Aux Returns (labeled A, B, C, and D) are provided, each with its own assignment switches and MON 1/2 send control. Returns may be routed to the stereo mix, the groups, soloed to the control room, and added to the monitor mix, so that effects may be added to the final mix, printed to multitrack, monitored on headphones, or any combination desired. The Studio 32 provides insert points on each channel and the stereo main outputs, for use with compressors and graphic equalizers.

Control room monitoring is made simpler by stereo-in-place Solo on each main channel, which is globally switchable to PFL (Pre-fader listen). Each Auxiliary mix and Group may be previewed in the control room while leaving the rest of the signal path undisturbed. Two built-in headphone jacks with a separate source select switch allow you to hear either the control room source, or the monitor mix.

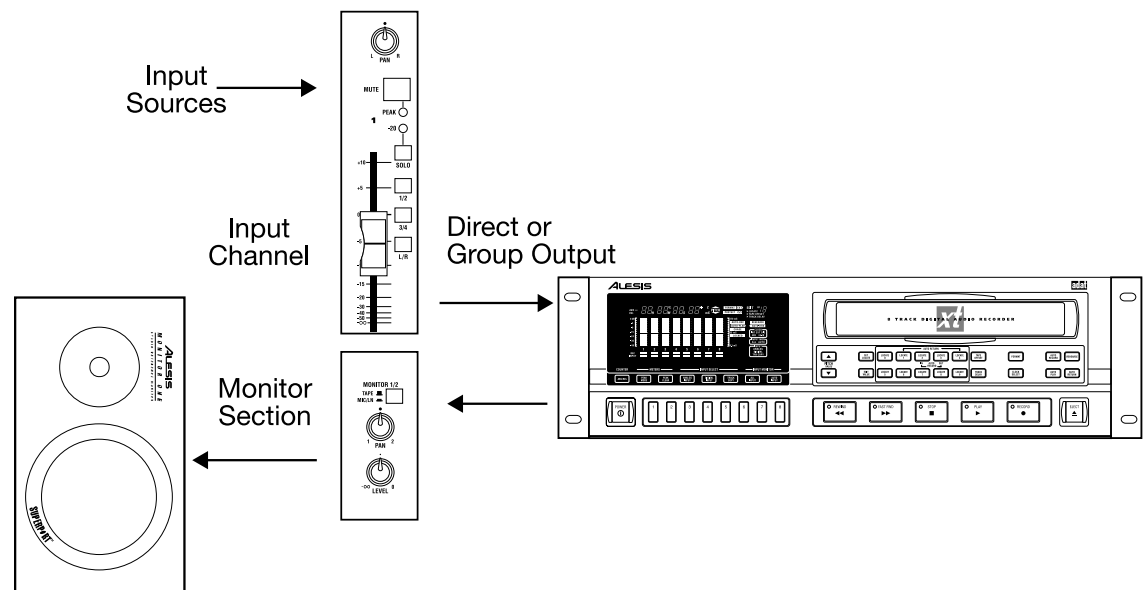
Basic Principles of Mixing & Multitrack Recording

Source select, level control, and destination assignment

When it's being used in a recording studio, the Studio 32's job is to control the volume, tone, pan and effects for many different inputs such as microphones, electronic instruments, and tape machines. You could think of this as the “where from” (source select) and “how much” (level control) function of the console. Then, it must route these signals to a monitor system and tape recorder so they can be heard and recorded: this is the “where to” (assignment) function of the console.

The two-way signal flow of multitrack recording

Using a console for recording is very different from a live PA application, where signal basically flows in one direction from the microphones to the speakers. During multitrack recording, signal flows two ways: from the input sources through the mixer to the recorder, and simultaneously back from the recorder through the monitor section to speakers or headphones so the musicians can play along with previously-recorded tracks. This two-way flow is what makes a true recording console more versatile than a PA-only console.



The stages of multitrack recording

Most multitrack recording is a three-stage process. Instead of recording an entire musical group in a single take of a live performance, recordings are usually made one instrument at a time and built up in layers. Recording one instrument at a time makes it easier to fix mistakes of an incorrectly played part. The signal flow may seem complex, but it's easy to understand the functions of the Studio 32 once you understand the basic signal flows of each stage: tracking, overdubbing, and mixdown.

Recording/Tracking

When recording the first tracks, which define the tempo and basic structure of the song, signal flows in one direction: from the sources through the mixer to the recorder. Monitoring the playback from the multitrack isn't necessary, although you may need to provide a headphone mix, which can come either from the sources or through the multitrack (because at this stage, they're the same thing).

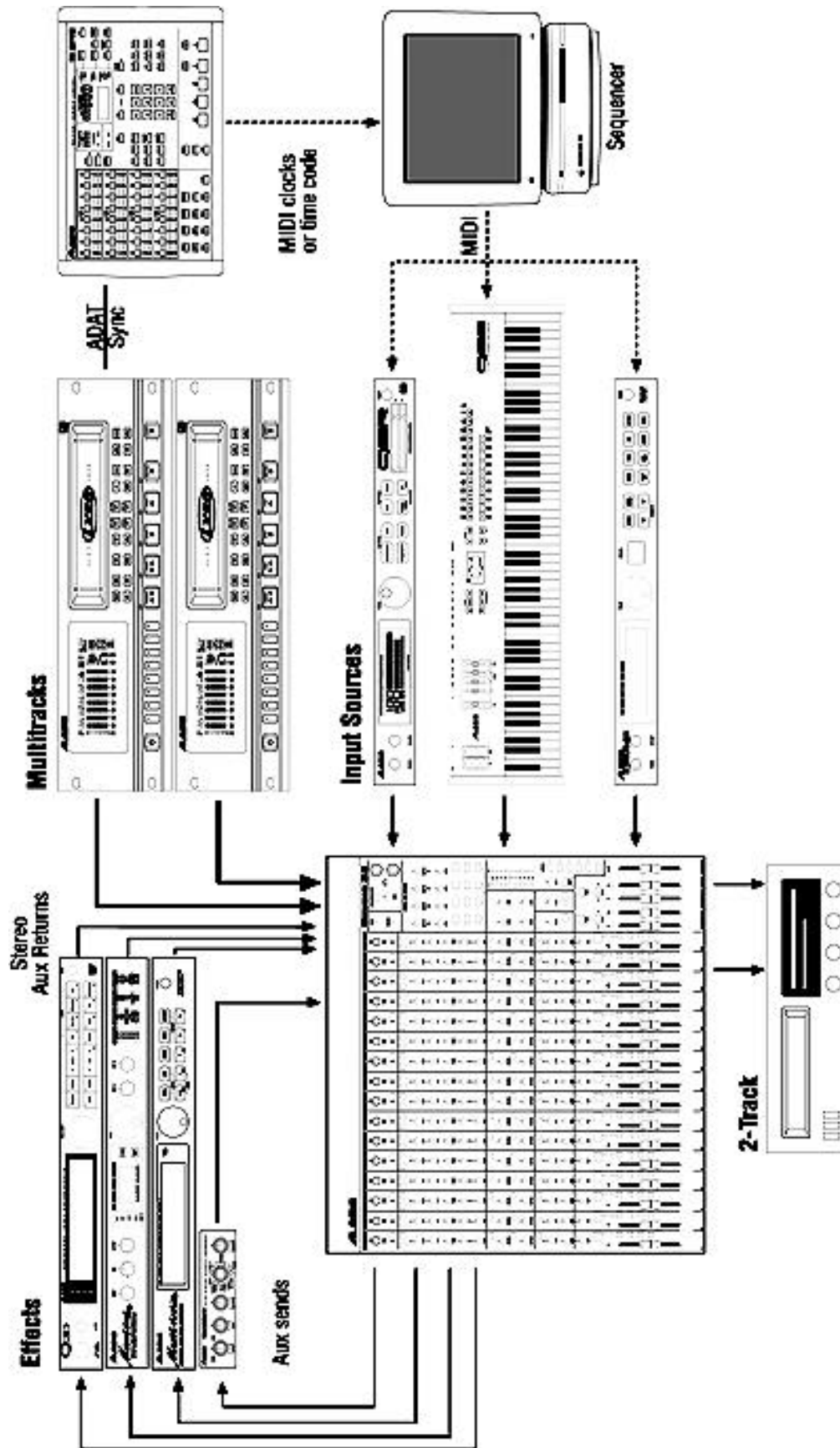
Monitoring/Overdubbing

In order to properly record a performance, the engineer, the producer, and all of the players must be able to hear what's going on. Traditionally, the engineer listens to speakers in the control room (where the mixer is). This is called *monitoring*. In the studio, the musicians listen to a *cue mix* in headphones while overdubbing. Adjustments to monitor or cue mixes should not affect the mix going to the recorder, so that recording levels remain set at the optimum, regardless of what the monitor mix needs to be.

During overdubbing, it's easy to get confused, since there may be three or more separate mixes happening at the same time. As long as you keep them separate in your mind, and keep track of what's going where, the Studio 32 will let you get almost any sound mix you want.

Mixdown

In the final stage of multitrack recording, you take all the parts that were separated so they could be perfected, and recombine them so an audience can hear them. Mixdown is the "reverse flow": now the multitrack is the source (sometimes supplemented by MIDI-controlled "virtual tracks") and a 2-track stereo recorder is the destination. During this stage, the tracks are blended together, tonally enhanced with EQ and effects, positioned in the stereo field with the PAN controls, and finally recorded onto a mixdown tape deck (such as a DAT machine, 2-Track reel-to-reel or cassette recorder, or 2 tracks of an ADAT). During mixdown, the engineer must hear the exact same mix the recorder is receiving. For this purpose, the Control Room section of the Studio 32 provides an external 2 TRACK input for listening to the output of the mixdown tape deck.



The different mixes and what they're needed for

Now that you understand the different sources and different destinations used during the three stages of the multitrack recording process, let's look at each one individually, without the other components getting in the way. *Please note that these illustrations show the controls in the order they are electronically, and omit controls that don't apply to the mix being explained.* Here are the mixes that you will control during a typical multitrack recording session:

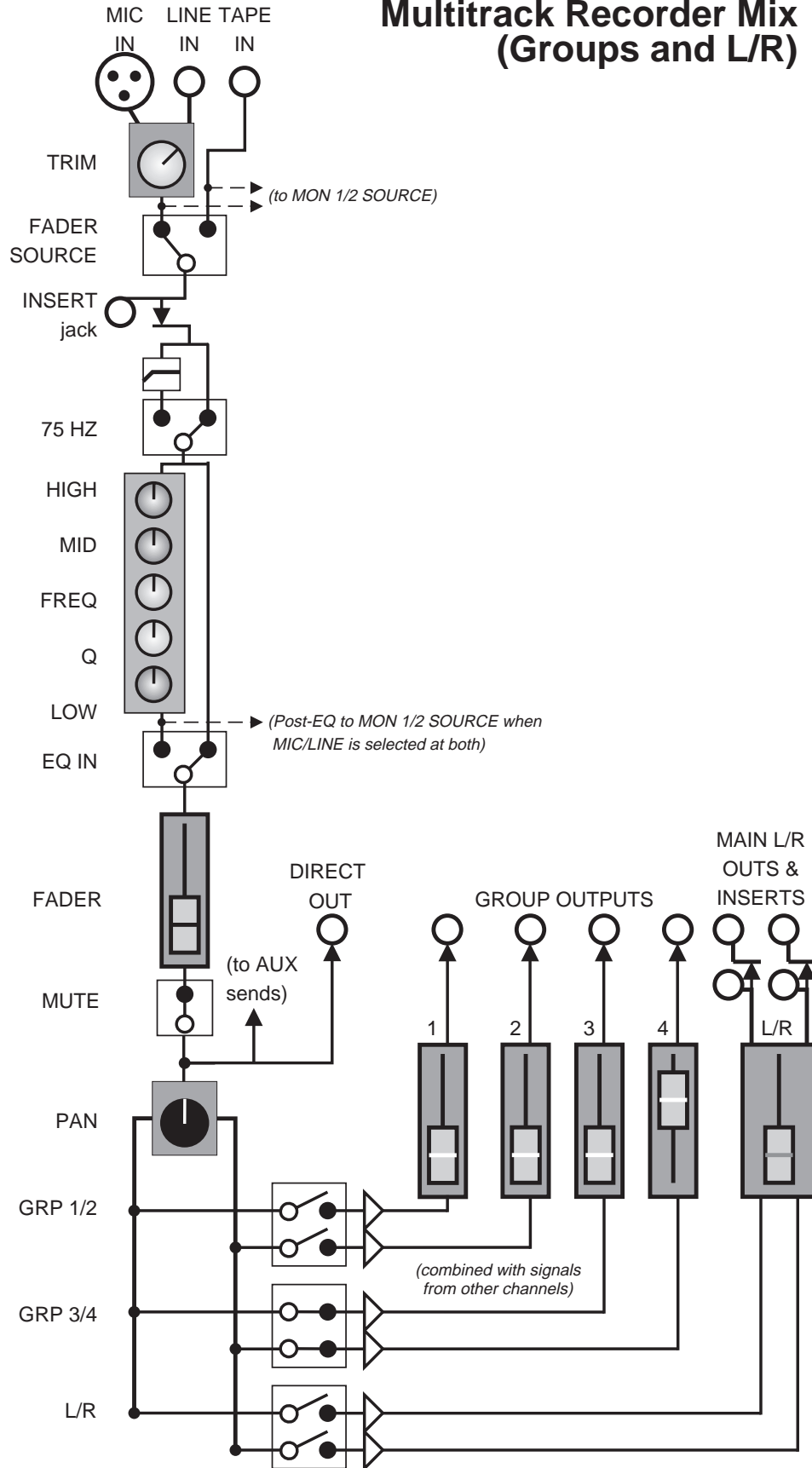
Multitrack Mix

This mix goes from the sources (microphones or line inputs) to the tracks of the multitrack recorder. It is controlled by the Channel Faders and sent via the four Group Master Faders to the Group Output jacks. (If you need to record more than four tracks at once, some signals will go to the multitrack directly from Channel Faders via the Direct Out jacks.) In the multitrack mix, the goal is to set the controls so that each track is recorded as loud as it can be without distorting the recorder.

For example, a microphone is plugged into channel 1, and its level is set by the TRIM control. The FADER SOURCE switch is left in the UP position (MIC/LN). After passing through the INSERT jack on the rear panel, signal may then pass through the 75 Hz filter (if its switch is down) and the EQ (if the EQ IN switch is down) on its way to the Channel Fader and MUTE switch. At this point, signal is available to the DIRECT OUT jack (where it may be connected to the multitrack); in any case it then goes on to the channel PAN and the 1/2, 3/4, and L/R assignment switches. The channel PAN affects what group (odd, even or both) the mic will be sent to. The mic is mixed with any other channel sources feeding the same group, via the Group Master faders to the selected track (in the illustration, Group and track 4).

Please note a key concept: you can go from any channel input to any of the group or main outputs. Inputs and tracks are independent of each other. You can plug a mic into channel 1, and record it on track 4 without repatching.

Multitrack Recorder Mix (Groups and L/R)



Monitor (Control Room) Mix

This mix is what the engineer and/or performer hears in headphones or the control room speakers. During overdubbing, this mix is typically controlled by the Studio 32's MONITOR 1/2 section, and sometimes by the L/R mix. In the monitor mix, the goal is to set the controls so the performer gets whatever mix they need so they can perform their overdubs as well as possible. In the engineer's mix, the goal is to make sure that he or she can hear any problems with the tracks being recorded, so they can be fixed before making more overdubs. In either case, the Studio 32 allows you to adjust the monitor and control room mix (change levels, pan position, or solo individual channels) **without disturbing the signals being recorded to the multitrack.**

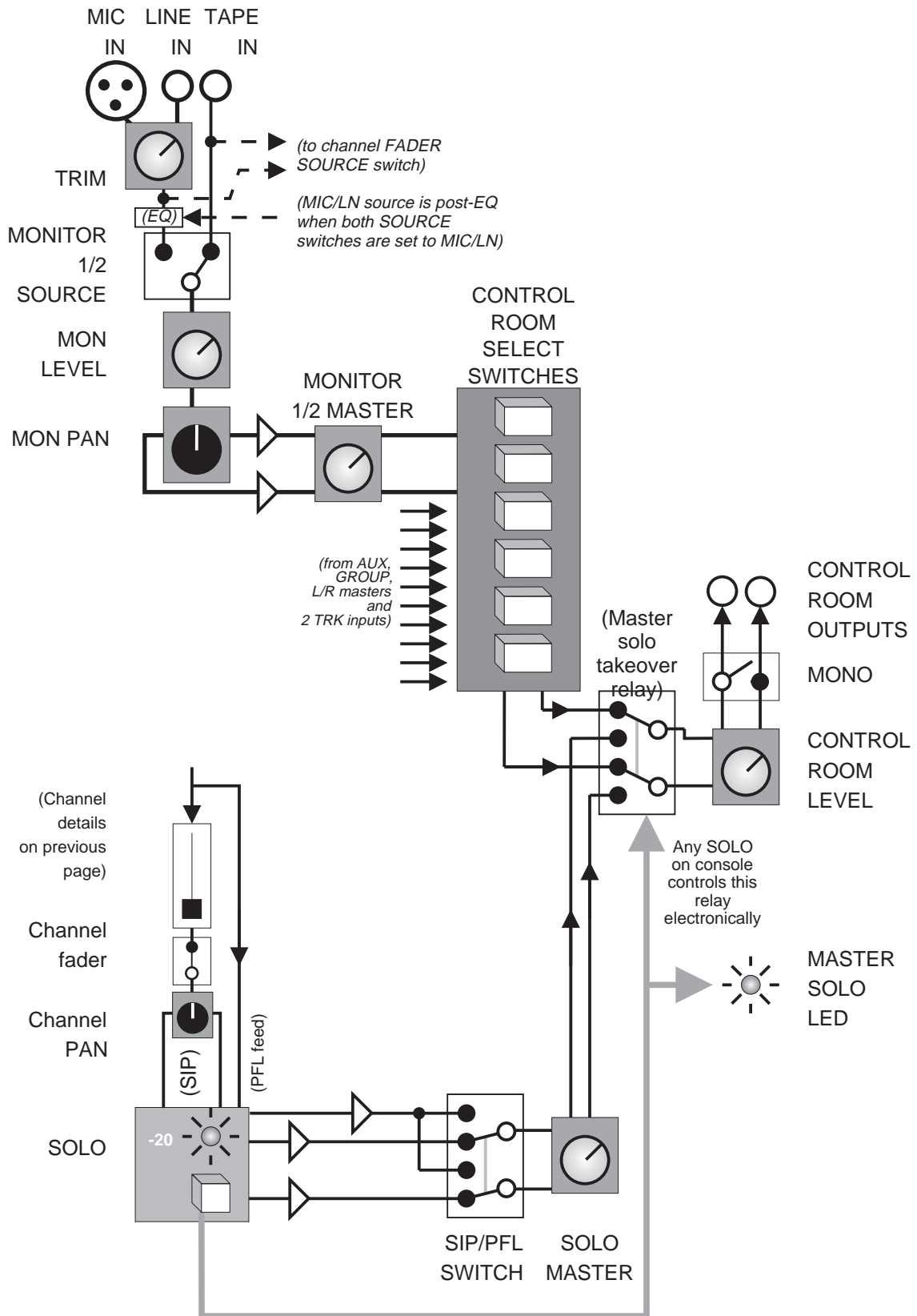
In the illustration, the microphone we recorded on track 4 comes back on TAPE IN #4. The MONITOR 1/2 source switch is set to the TAPE (up) position. The LEVEL pot (with the purple knob), and the MONITOR PAN determine the mix going to the MONITOR 1/2 MASTER. At this point, the CONTROL ROOM SOURCE switch is set to MON 1/2, so the engineer can adjust the monitor mix, and the HEADPHONES SOURCE switch is set to MON 1/2 as well, so that if the engineer hits any SOLO buttons, only the control room mix will be affected, not the headphone mix.

Monitor PAN: Note that the Monitor PAN controls (the black knobs above the purple knobs) will not affect what track a signal is recorded on. They only affect the position in the control room speakers or headphones. On the other hand, the lower row of PAN controls for the channel faders will pan the signal from the microphone between two tracks of tape (if you're recording using the Groups instead of the Direct Outs).

Sometimes you may need another mix for the musicians' headphones, since some musicians may need certain instruments louder or softer in the mix in order to hear their cues. In the Studio 32, a complicated cue mix will usually come from MONITOR 1/2, and less complicated ones may come from the post-fader AUX sends (if it's OK for the Aux mix to change if the engineer makes adjustments to the channel fader). Don't forget that MONITOR 1/2, instead of being used as one stereo mix, may be used as two mono mixes, with careful setting of the MONITOR PAN controls.

Post-EQ, Pre-Fader: The EQ, 75 HZ filter, and INSERT jack do not affect the MONITOR 1/2 mix unless both the FADER SOURCE and MONITOR SOURCE switches have selected MIC/LINE as the source. This feature allows you to hear what the engineer is doing to the EQ, or to an effect device in the INSERT jack, when you're using the MON 1/2 mix for headphones or a stage monitor mix. But the EQ and INSERT never affect the TAPE side of the MONITOR SOURCE switch, or if the MIC signal is going through MON 1/2 while TAPE is going through the CHANNEL FADER. (For clarity, the drawing on the next page doesn't show this detail; see the Block Diagram on page **Error! Bookmark not defined.** for the complete signal flow.)

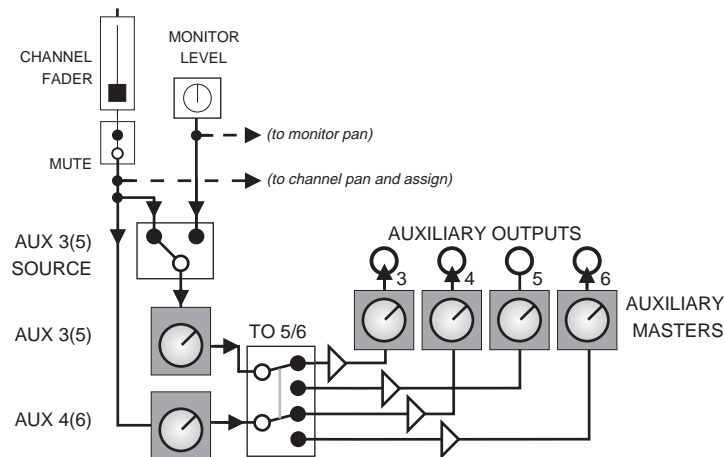
Monitor/Control Room/Solo System



Aux Sends and Returns: Effects

The last important mix is usually used for adding effects (such as reverb, delay, chorus, etc.) to the mix. This may be part of the tracking and overdubbing stage, and is almost always part of the mixdown stage. The rows of blue knobs running across the center of the Studio 32 may be thought of as secondary submixers, with a little less independence from the other mixes, because they follow them in the signal path. This is the “send” side of the “effects send/receive” process. The upper row of AUX controls is capable of sending from either the MONITOR 1/2 mix (the row of purple knobs) or from the channel faders.

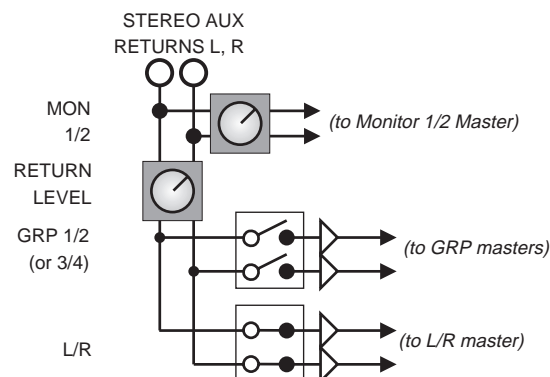
Aux Sends (16)



Once you’ve made an effect, it’s no use unless you hear it, so the STEREO AUX RETURNS are four “miniature stereo channels” designed for effect returns. You may want to record effects to the multitrack, so they have GRP ASSIGN switches. The musicians may want some reverb in their headphones to help them stay on pitch, so it has a row of four MON 1/2 controls. The engineer may need to hear the output of a single effect device to change the delay time, so there are SOLO switches. And, of course, you want effects on the final mix, so they all have L/R ASSIGN switches.

Except for the limitations of not having a mic preamp, EQ, post-fader Aux Sends, or mute, the Aux Returns are just like channels—they don’t have to be used for effects. Consider them as an extra eight input channels especially for stereo line instruments such as synthesizers that already have their own internal effects.

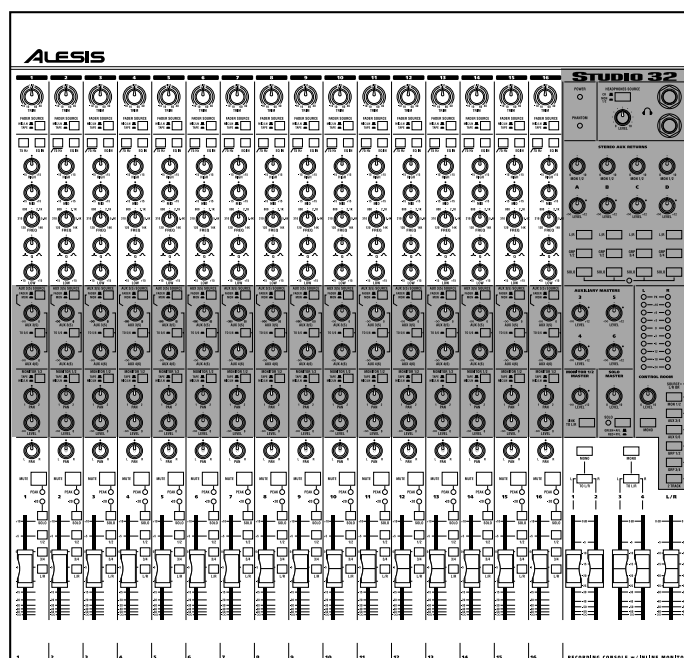
Stereo Aux Returns (4)



CHAPTER 2:

GUIDED TOUR

Recorder Mix/Monitor Mix System



The Studio 32 is designed to accommodate the two-way signal flow required in a recording console. This is where signals are mixed, EQ'd and routed to the Aux sends, Groups and Left and Right Master outs. Each channel provides a Mic and Line Input plus a Tape In connector, where signals return from the multitrack recorder. Any input may be routed to either the main or monitor section of the channel, or even to both at once. This allows you to mix an input and monitor a tape signal simultaneously. Counting the Stereo Aux Returns, the Studio 32 has a total of 40 inputs to the main mix. These can all be mixed down to a master tape deck via the L/R Main outs.

Starting at the source: input and TRIM

Let's trace the signal flow from beginning to end. Note that the controls from top to bottom of each channel are not placed in the same order as they appear in the signal flow. To see the paths of the signal flow, refer to the block diagram on page **Error! Bookmark not defined.**

Each input module has three possible sources (line, mic and tape in) and two paths (the main channel and the monitor). First, **the signal arrives at either the line or mic input of a channel; you should not plug into both at once.** If using the mic input with a condenser microphone, the rear-panel PHANTOM switch will be turned on to provide phantom power (after the mics have all been plugged in). Next we come to the gray TRIM knob, which is used to set the initial level of the signal. It is

important to set this level properly, since high levels could lead to distortion and levels set too low will cause noise (see *Setting Levels*).

Channel and Monitor source select switches: Each channel has its own FADER SOURCE SELECT switch, under the TRIM control, and MONITOR 1/2 SOURCE SELECT switch above the MONITOR 1/2 PAN control. These two switches are completely independent.

- If both switches are **up**, the TAPE INPUTS can be heard through the MONITOR 1/2 controls, while the MIC/LINE input appears at the main channel controls. This is the position normally used for tracking and overdubbing.
- If both switches are **down**, the tape returns are on the main channel while the MIC/LINE input appears at the monitor controls. This is the position normally used for mixdown (with the main channel assigned to L/R) or for bouncing tracks (with the main channel assigned to the appropriate Group or Groups).
- If the FADER SOURCE switch is up and the MONITOR SOURCE switch is down, MIC/LN is chosen for both. This is the position that would be used if MON 1/2 is going to be used for a pre-fader stage monitoring mix.

The equalizer

EQ section: The EQ section affects only the signal on the Channel fader, not the signal of the monitor section. An EQ IN switch allows you to hear the signal “flat” with no EQ at the touch of a button. Once the fader source has been chosen, and the EQ IN switch is down, signal will flow through the green knobs in the EQ section.

The EQ has three bands: the Hi & Lo EQ, and the fully-parametric Mid EQ. The Hi & Lo EQ are shelving-type EQs, with 12 kHz and 80 Hz shelving points and an adjustable boost or cut of ± 15 dB. These act much like the bass and treble knobs found on most audio equipment: the “12 o’clock” position has no effect, and you turn to the right to get more of the frequencies and to the left to cut them.

The Mid EQ has three knobs: one to set the amount of boost or cut, one to select the frequency you want to control (adjustable from 150 Hz to 15 kHz), and a “Q” or bandwidth control. The Q control adjusts how wide an area around the selected frequency should be cut or boosted, allowing you to be extremely specific about how you tailor your sound.

To avoid low-end rumble and noise, turn on the 75 Hz high-pass filter, which removes frequencies below 75 Hz at a rate of 18 dB per octave. The 75 HZ switch has this effect even if the EQ IN switch is off.

Fader and assignment section

Channel controls: Finally, at the bottom of each channel we find the channel’s fader, PAN knob, SOLO and MUTE buttons, PEAK and -20 LEDs, and a set of buttons that let you determine the channel routing, i.e., where it’ll go to. The assignment switches can route the channel’s signal to any of the four Groups and to the L/R Master.

Group mix: Once signals are routed to the Group section, you can use the GROUP FADERS to determine the total volume of all channels assigned there. In the studio, the Group output usually is connected to the inputs of a multitrack recorder, such as the Alesis ADAT. But in live performance applications, the Group Out jacks may be used to feed other amplifiers, broadcast feeds or even other mixers. Some engineers even use the Groups for extra effect sends.

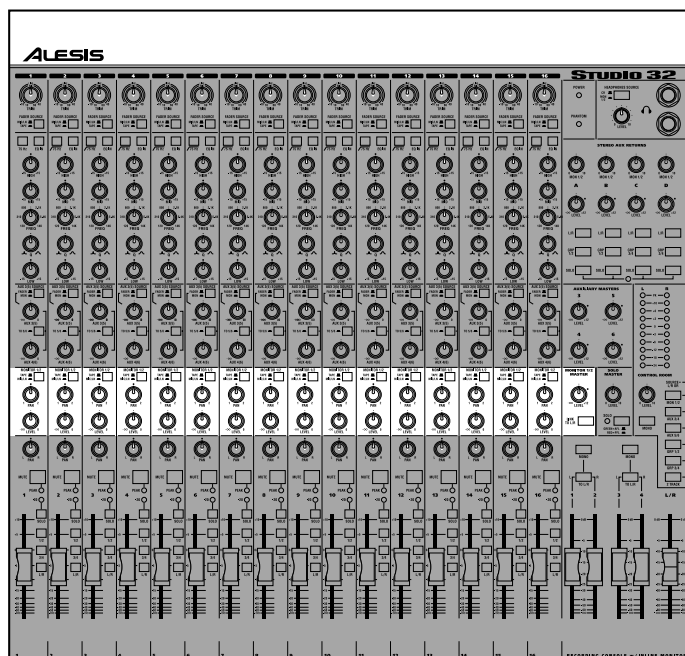
Subgrouping: During mixdown or in PA applications, the Groups may be “subgrouped” or assigned to the L/R Main mix, using the TO L/R buttons above the GROUP FADERS. so that the Group Master faders can be used to adjust the volume of several different inputs at once, such as multiple channels of drums or vocals.

L/R master: Every input may be routed to the main left and right outputs, either directly or via a Group Master or the Monitor Link to L/R.

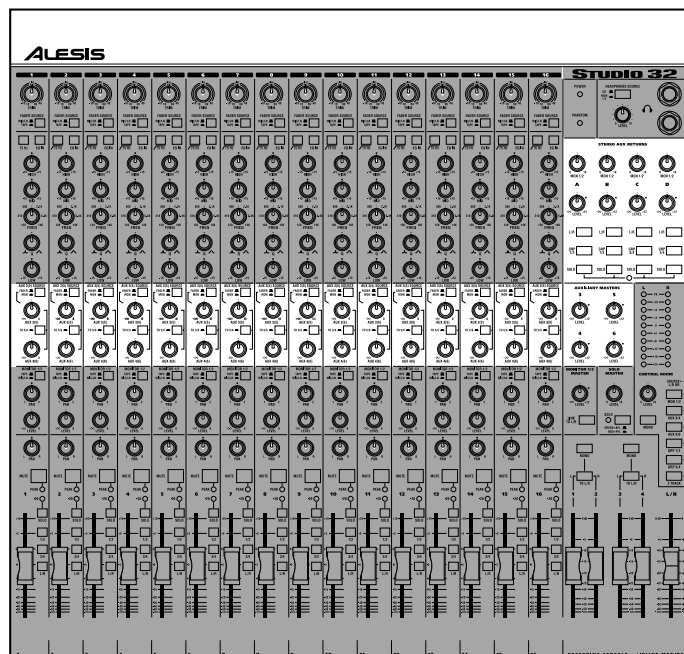
Monitor 1/2 section

In multitrack recording, once signal goes from the Group Outputs to the recorder, it comes back to the tape inputs. The TAPE IN jack has no trim control of its own; it is designed to handle the balanced or unbalanced line levels that all multitrack recorders generate. Each channel features an in-line monitor which selects either the tape return or the mic/line input source for the MONITOR 1/2 mix. The MONITOR 1/2 mix has its own MASTER LEVEL control and may be heard in several different ways:

- From its own output jacks connected to an external headphone amplifier
- the HEADPHONE jacks of the Studio 32, with the SOURCE switch down
- in the Control Room mix, with the MON 1/2 switch down
- in the L/R mix, if the LINK TO L/R switch is down



Aux Send/Return System



Aux sends

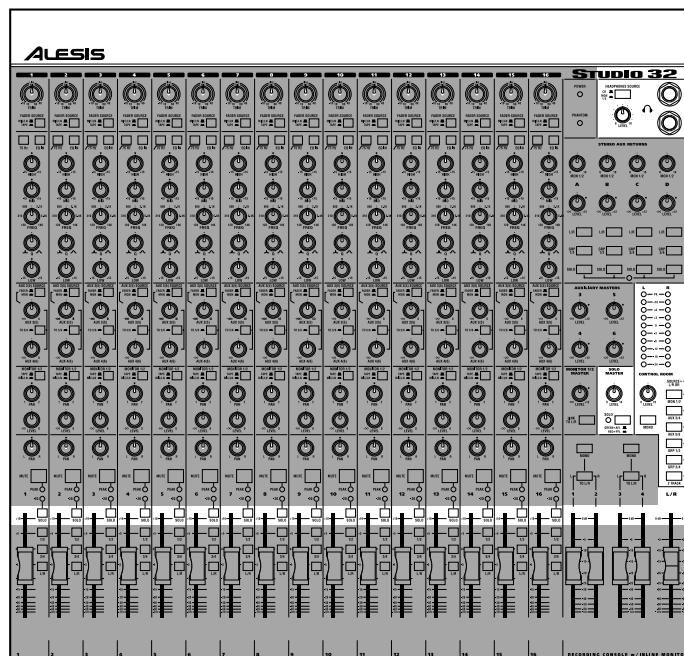
In the center of each channel module are the blue knobs that make up the Auxiliary Send section, which allows the signal to be routed to outboard signal processing equipment. There are two Aux knobs in each channel, but there are four different Auxiliary Masters and outputs. Since some people will use the Monitor section as an auxiliary send, it's numbered 1/2, and the other auxes are numbered 3 through 6. Both Aux Sends of any channel may be sent to Aux 3/4, or to Aux 5/6 by using the switch in the middle of the knobs: this is the AUX ASSIGN switch and it affects both knobs in the channel. The upper Aux knob has a unique capability: by pressing the AUX 3(5) SOURCE switch it can select either the Channel's signal or the Monitor's signal to send to Aux 3/5. In the Master section you'll find master level controls for all four Aux Sends.

Stereo Aux Returns

The Stereo Aux Returns, found near the top of the master section, are extra input channels designed for routing the signals back from signal processing equipment. Aux Returns can be thought of as very basic line input channels. The gray LEVEL knobs control how much effect will be added to the mix, either while tracking or mixing down. The purple MON 1/2 knobs control how much effect will be sent to the monitor section so you can hear it in the headphone or control room mix, independently of the amount going to the multitrack or stereo mix.

If you are using a MIDI system with several keyboards, each with stereo signals, you can alternatively use the Stereo Aux Returns as additional line inputs. This is especially useful for keyboards that provide their own on-board signal processing, and therefore do not need to be routed to the other Aux Sends.

Control Room System



The SOLO switches in each channel, along with the Control Room switches and Headphone section, make up the Control Room system of the Studio 32. This is the engineer's mix. It allows you to audition the different mixes that are going on at any given time and to hear individual inputs when needed, all without disturbing the other mixes that are going to the musicians, the PA system or recorder. It also controls the stereo meter display.

Normally, the CONTROL ROOM OUT jacks are connected directly to the inputs of a stereo amplifier such as the Alesis RA-100, which power a set of near-field monitors such as the Alesis Monitor One or Point Seven reference monitors mounted within a few feet of the console.

Control Room source

The Control Room can selectively monitor the Main outputs (L/R), MONITOR 1/2, the Aux mixes, the Group mixes, or an external mixdown tape deck. The lowest switch which is pressed will be the source; if no switches are down, the L/R mix will be heard. Press the MONO button when you want to hear how a mix will sound in a single speaker; this will help you avoid phase cancellation problems.

The Headphone outputs may receive signal either from MONITOR 1/2, or the same signal that the Control Room is hearing.

Solo/PFL

Regardless of what's chosen as the control room source, if any of the twenty SOLO buttons are pressed anywhere on the console, the solo mix automatically becomes the control room source. Because there are so many solo buttons, we make it easy for you to find the one that's "taken over" by turning on a green LED over the SOLO

switch. (When SOLO is not in use, these green LEDs will flash in response to input level, but they won't turn on solid.) There's also a master solo LED that shows you when the solo system is active.

Like all mixes in the Studio 32, the solo system has its own MASTER control, which is used to adjust the level feeding the Control Room knob. Right below that is the **SIP/PFL** switch, which is a source-select switch for the entire solo system. When the switch is up, the solo source is SIP (for Solo-In-Place). This is the traditional "stereo solo" position that puts the soloed signal in the mix at the same volume and pan position as it is when the solo system is off. When the switch is down, the solo source is PFL (for Pre-Fade Listen), which allows you to hear what the channel source is in the control room, even if the fader is down, muted, or not assigned. The advantage of PFL is that you can use it to check signals before bringing them into the main mix (for example, to cue up a tape for playback or check to see what microphone is plugged in).

In either SIP or PFL mode, the SOLO switches of the Studio 32 are "nondestructive", meaning that they never affect any other mix than the Control Room mix.

Meters

Generally, whatever you're hearing in the Control Room is what's being displayed on the L/R meters, including SOLO/PFL. Any channels that are soloed will appear on both the left and right meters. In PFL mode, this is a good way to set the TRIM level for the proper headroom. (See page **Error! Bookmark not defined.** for more about using the meters.)

CHAPTER 3:

HOOKING IT UP

Unpacking and Inspection

Your Studio 32 was packed carefully at the factory, and the container was designed to protect the unit during shipping. Please retain this container in the highly unlikely event that you need to return the Studio 32 for servicing.

Upon receiving the Studio 32, carefully examine the shipping carton and its contents for any sign of physical damage that may have occurred in transit. If you detect any damage, do not destroy any of the packing material or the carton, and immediately notify the carrier of a possible claim for damage. Damage claims must be made by you. Contact your Alesis dealer.

The shipping carton should contain the following items:

- This instruction manual and a quick reference sheet
- Alesis Studio 32 with the same serial number as shown on shipping carton
- A pair of rack rails with screws to mount them to the side panels
- AC Power Cable
- Alesis warranty card and other literature



It is important to register your purchase; if you have not already filled out your warranty card and mailed it back to Alesis, please take the time to do so now.

Installing in a Rack

The Studio 32 may be simply set on a table, or installed in a standard 19" audio equipment rack. To rack mount the Studio 32, simply attach the provided rack ears to each side using the screws provided. If you wish to save rack space, you may remove the hand rest below the faders:

1. Remove the screw holding the plastic end caps to the sides of the hand rest. Remove the end caps.
2. Remove the four screws attaching the hand rest to the front panel.



Make sure you leave enough space at the top of any rack installation for the cables which must be plugged into the back panel. By using right-angle plugs, this may be kept to a single rack space if needed.

Power



Make sure you read the initial Important Safety Instructions chapter at the front of this manual.

The Studio 32 works with a single standard line voltage and comes with a detachable AC line cord suitable for the destination to which the mixing console is shipped. Units sold in the United States are designed for use with 110 to 120 volt AC power only (nominal 60 Hz).

The line cable is a IEC-spec AC power cable (do not substitute any other AC cord), which is designed to be connected to an outlet that includes three pins, with the third, round pin connected to ground. The ground connection is an important safety feature designed to keep the chassis of electronic devices such as the Studio 32 at ground potential. Unfortunately, the presence of a third pin does not always indicate that an outlet is properly grounded. You may use an AC line tester to determine this. If the outlet is not grounded, consult with a licensed electrician. When AC currents are suspected of being highly unstable in VAC and Hz, a professional power conditioner should be used.

To connect power to the Studio 32:

- 1 Attach the female end of the AC power cord to the Studio 32's back panel and the male end to a good quality, noise-free AC power source of the proper rating.
- 2 To apply power to the Studio 32, switch on the POWER switch on the back panel, so that it is in the | (on) position.



Do not operate any electrical equipment with ungrounded outlets. Plugging the Studio 32 into an ungrounded outlet, or "lifting" the unit off ground with a three-to-two wire adapter, can create a hazardous condition.

Alesis cannot be responsible for problems caused by using the Studio 32 or any associated equipment with improper AC wiring.

Avoiding ground loop noise

In today's studio, where it seems every piece of equipment has its own computer chip inside, there are many opportunities for ground loop problems to occur. These show up as hums, buzzes or sometimes radio reception and can occur if a piece of equipment "sees" two or more different paths to ground. While there are methods to virtually eliminate ground loops and stray radio frequency interference, most of the professional methods are expensive and involve installing a separate power source just for the sound system. Alternatively, here are some easy helpful hints that a professional studio installer might use to keep those stray hums and buzzes to a minimum.

- 1 KEEP ALL ELECTRONICS OF THE SOUND SYSTEM ON THE SAME AC ELECTRICAL CIRCUIT.** Most stray hums and buzzes happen as a result of different parts of the sound system being plugged into outlets of different AC circuits. If any noise generating devices such as air conditioners, refrigerators, neon lights, etc., are already plugged into one of these circuits, you then have a perfect condition for stray buzzes. Since most electronic devices of a sound system don't require a lot of current (except for power amplifiers), it's usually safe to run a multi-outlet box or two from a *SINGLE* wall outlet and plug in all of the components of your system there.

- 2 KEEP AUDIO WIRING AS FAR AWAY FROM AC WIRING AS POSSIBLE.** Many hums come from audio cabling being too near AC wiring. If a hum occurs, try moving the audio wiring around to see if the hum ceases or diminishes. If it's not possible to separate the audio and AC wiring in some instances, make sure that the audio wires don't run parallel to any AC wire (they should only cross at right angles, if possible).

- 3 TO ELIMINATE HUM IF THE ABOVE HAS FAILED:**
 - A) Disconnect the power from all outboard devices and tape machines except for the Studio 32 mixer and control room monitor power amp.
 - B) Plug in each tape machine and outboard effects device one at a time. If possible, flip the polarity of the plug of each device (turn it around in the socket) until the quietest position is found.
 - C) Make sure that all of the audio cables are in good working order. Cables with a detached ground wire will cause a very loud hum!!
 - D) Keep all cables as short as possible, especially in unbalanced circuits.

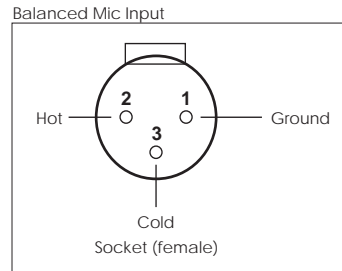
If the basic experiments don't uncover the source of the problem, consult your dealer or technician trained in proper studio grounding techniques. In some cases, a "star grounding" scheme must be used, with the Studio 32 at the center of the star providing the shield ground on telescoping shields, which do NOT connect to the chassis ground of other equipment in the system.

Channel Inputs and Outputs

Each of the 16 channel modules on the Studio 32 contains an XLR balanced MIC IN connector, a 1/4" TRS balanced LINE IN jack, a 1/4" TRS balanced TAPE IN jack, a balanced 1/4" TRS DIRECT OUT jack, and a 1/4" TRS INSERT jack. Here are more detailed descriptions of each of these, and what they should be connected to.

Mic Inputs

The MIC IN of each channel is a standard female XLR-3 connector. The cable wiring is illustrated below:



The MIC Input is designed to accept a wide range of balanced or unbalanced low impedance input signals. Each input can provide the +48 volts necessary for phantom-powered microphones on pins 2 and 3; this may be turned on and off with the PHANTOM switch.

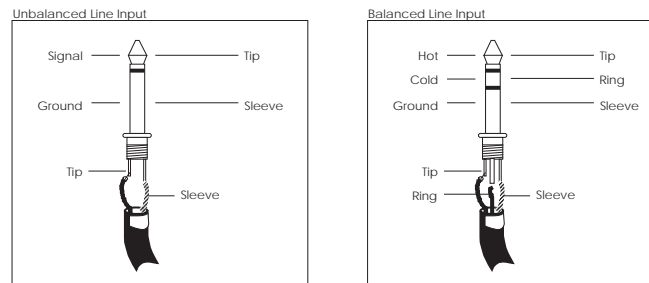


Avoid connecting a mic while the fader is up and phantom power is on. Do not connect a microphone and a line input to the same channel.

Line Inputs

The LINE IN of each channel is a 1/4" jack which will accept balanced or unbalanced line-level sources.

“Line level” means that signals are typically in the 1/3 of a volt to 2-volt range, such as the output of synthesizers, keyboards, CD players, etc. This is in contrast to the much lower levels usually output by microphones (measured in millivolts).



Unlike the low impedance microphone input, this connection provides a high impedance ($>10k\Omega$) to the input signal, enabling most instruments to be plugged straight in without direct boxes or external preamplification. While the output of a standard synthesizer (or other equipment) can be plugged in using a 2-conductor

1/4" plug, balanced line sources may also be connected here using a "stereo" TRS plug as shown above. Line inputs may also be used for connecting additional effects returns, where additional post-effect equalization is required.



Do not connect a line input and a microphone to the same channel.

Tape Inputs

The TAPE IN jacks are 1/4" balanced TRS connectors which will accept either balanced or unbalanced inputs. Usually, you'll connect the outputs of your multitrack tape machine here. There is no TRIM control for the tape input; it is designed to work with +4 dBu (balanced high level) or -10 dBV (unbalanced medium level) line signals.

Depending on the position of the source switches of a channel, you can hear the tape input in the main channel, the monitor, or both at once.

Tip: If you don't have a 16-track studio, you may use extra TAPE IN jacks to connect to the outputs of any line-level unit such as synthesizers or effects devices.

Direct Outputs

The DIRECT OUT jack on each channel is a balanced 1/4" connector which provides a direct output of the post-fader channel signal. It is set for a unity-gain output, so it can drive either +4 dBu or -10 dBV devices depending on the setting of the TRIM control and the fader. If you want to record a single source to a track of tape, connect this to the inputs of your multitrack tape recorder, or for any other application where you need a direct output. (The other option is to connect the Group Out jacks to the recorder, as explained on page 31.)

Insert

The INSERT connector is a TRS 1/4" jack which consists of an insert send (the tip of the TRS plug) and an insert return (the ring of a TRS plug), and is used to insert an outboard effects device (such as a compressor, EQ, or chorus) directly into the signal path of only one channel: the channel it is connected to (as opposed to the Aux system, which combines many different channels into an effect). For details on this, see page **Error! Bookmark not defined.**

Master Inputs and Outputs

Along the top of the back panel above the master section of the Studio 32 you'll find most of the connectors that provide the outputs of the console: two 1/4" MAIN OUT connectors (plus two MAIN INSERT jacks), and four 1/4" GROUP OUT connectors. The CONTROL ROOM OUT jacks are under the power connector. See the next chapter "Effects and Signal Processing" for information about the Auxiliary Outputs.

Main Outputs

The left and right MAIN OUT jacks are two balanced TRS 1/4" jacks which provide the primary stereo mix of the Studio 32. These are normally connected to the inputs of a mixdown tape machine or a PA system amplifier.

Main Inserts

These are two TRS 1/4" jacks, each of which consists of an insert send (the tip of the TRS plug) and an insert return (the ring of a TRS plug). One is for the left channel and one is for the right channel of the stereo mix. They are used to insert a outboard stereo effects device (such as a compressor, limiter, reverb or EQ) directly into the main signal path, before the fader. A special Y-cable (stereo 1/4" plug to two mono 1/4" plugs, as shown on page **Error! Bookmark not defined.**) is required.

Group Outputs

The GROUP OUTPUTS are balanced 1/4" connectors which are usually connected to the inputs of a multitrack tape machine. If you want to send a mix of several channels to a single track, you'll use a Group Output. (The DIRECT OUT jacks can only send one source to one track.)

Other uses for Group Outputs: In certain applications, such as video post-production, a pair of Group Outputs may be used to provide a different mix than the Main Outputs, such as a mix containing music and effects but minus the dialog. Group Outs may also be used as a feed to an effect device, a separate section of a PA system, or for a surround sound encoder.

Using four groups for eight tracks: Alesis ADAT recorders have normalizing input features, which allow you to record on tracks 5-8 without repatching, even when the mixer output is connected only to tracks 1-4. There's more about this later in this manual, and in the ADAT manual as well.

Control Room Outputs

These outputs consist of two balanced TRS 1/4" jacks for the left and right signals coming from the Control Room Select switch. Normally, you'll connect these to the inputs of the amplifier for your control room monitor speakers. The signal level is controlled by the CONTROL ROOM knob.

2 Track Inputs

These balanced 1/4" jacks are intended for the outputs of a mixdown tape machine, so you can hear it in the control room output without using up an input. This allows you to playback your mix without repatching.

Stereo Aux Returns

The STEREO AUX RETURNS are eight balanced 1/4" line input jacks that are most often used to connect to the stereo outputs of four external effect units. However, these may also be used as additional inputs for stereo sound modules, samplers or synthesizers, if desired.

Monitor and Auxiliary Outputs

The MONITOR and AUXILIARY OUTPUTS are six balanced 1/4" jacks which feed the signals from Monitor 1/2 and Aux 3-6. MON 1 and 2 are pre-fader, and are ideal for feeding a headphone amp for musicians in the studio to monitor themselves and other tracks already recorded onto tape. However, depending on your studio hookup, you may find it more flexible to connect headphones to the jacks on the top panel, which may be switched to receive the MONITOR 1/2 signal or the Control Room mix. Aux 3 - 6 are post-fader, and are normally connected to the inputs of outboard effects devices, like reverbs and digital delays.

Headphones

The headphone connectors (found on the upper right side of the console) are stereo 1/4" jacks which can drive most headphones. The signal level is controlled by the PHONES knob. The wiring scheme is shown below; most headphones label which side is left and right.

Headphones

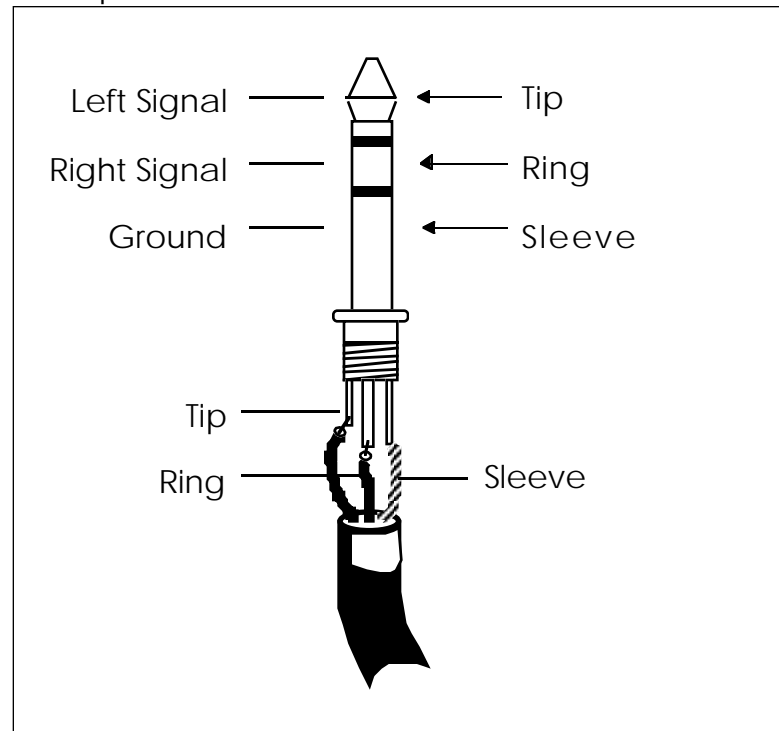


Chart of Connections

The Studio 32 may be easily interfaced with most other professional recording and audio equipment. All inputs and outputs, with the exception of the microphone inputs, use 1/4" jacks, and may be used with balanced or unbalanced circuits. The microphone inputs are standard balanced XLR type jacks.

Input	Connector	Type
Mic Inputs	XLR	Balanced
Line Inputs	1/4" TRS	Unbalanced or Balanced
DIRECT OUT (Direct)	1/4" Mono	Unbalanced or Balanced
Tape In	1/4" TRS	Unbalanced or Balanced
Inserts	1/4" TRS	Unbalanced
Aux Sends	1/4" Mono	Unbalanced or Balanced
Aux Returns	1/4" Mono	Unbalanced or Balanced
Group Outs	1/4" Mono	Unbalanced or Balanced
Main L/R Outs	1/4" TRS	Unbalanced or Balanced
Main Inserts	1/4" TRS	Unbalanced
Control Room Outs	1/4" TRS	Unbalanced or Balanced
2 TRACK IN	1/4" Mono	Unbalanced or Balanced
Headphone	1/4" TRS	Unbalanced

Connecting to an Unbalanced -10 dBV Multitrack Recorder

Interfacing the Studio 32 with a typical multitrack recorder using semiprofessional unbalanced phono or 1/4" phone jacks is a simple process. Alternatively, if you are using one or more ADATs, it is recommended that you use the balanced inputs and outputs using the ELCO-type connector on the ADAT (see next page).

To interface with a typical unbalanced multitrack recorder:

- 1** Connect any microphones or instruments to be recorded into the MIC or LINE INPUTS of channels 1 through 16.
- 2** Connect the four GROUP OUTs to the corresponding tape tracks by using either 1/4"-to-RCA cables or 1/4"-to-1/4" cables. Alternatively, you may decide to connect individual channel DIRECT OUT jacks to the track you want to record, but this will require you to repatch every time you want to record a different channel on that track of the recorder.
- 3** Connect the tape machine's outputs to the TAPE IN jacks of the same-numbered channels of the Studio 32. Whenever you want to hear the playback of the machine, track 1 will appear at the FADER SOURCE and MONITOR SOURCE switches of channel 1, track 2 will appear at channel 2, and so on.

Connecting your recorder(s) at the -10 dBV unbalanced level can yield good results, provided that the cables between the multitrack and the Studio 32 are no more than 20 feet long. If cable runs must be longer than that, or if your studio has noise and grounding problems, we recommend a +4 dBu balanced hookup if possible (see next page).

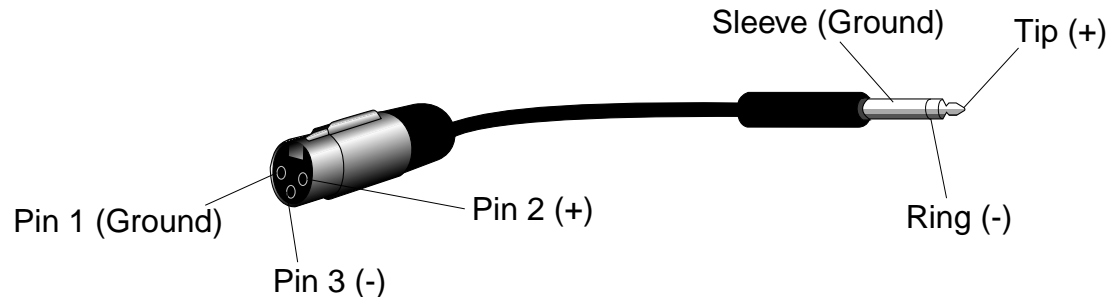
Connecting to a Professional +4 dBu Multitrack Recorder

Professional recorders typically feature 3-pin XLR connectors on their inputs and outputs. ADATs feature a multipin ELCO connector that takes care of all the channels (8 inputs, 8 outputs) on a single connector. The nominal signal level of these units is +4 dBu (1.23 volts). In either case, connect these decks to the TAPE IN jacks, not the MIC IN XLR jacks.

ADAT: The best method for connecting an ADAT is to purchase an ELCO-to-TRS multipair cable, available from many different cable manufacturers. This will connect from the ELCO-type connector on the ADAT on one end, fanning out to sixteen tip-ring-sleeve quarter-inch phone plugs (labeled INPUT 1, OUTPUT 1 and so on) on the other end. This method assures full-balanced outputs from the ADAT to the TAPE IN jacks. The connection from the Studio 32's GROUP or DIRECT OUT jacks to the ADAT's inputs will also be balanced. The GROUP and DIRECT OUTS have plenty of headroom, with a maximum balanced output of +27 dBu before mixer distortion (although the ADAT's own maximum is +19 dBu). Balanced cables between the recorder and the mixer can be very long, if necessary, without adding noise.

XLRs: If you have a video or old analog deck with XLR inputs and outputs, you will need:

- An XLR female to 1/4" TRS cable for each output of the tape recorder; and,



- An XLR male to 1/4" TRS cable for each send to the tape recorder.

This arrangement will give you a balanced connection for recording and playback in most cases. However, some recorders with XLRs may not be truly balanced, with pin 2 or 3 (depending on vintage) tied to ground, which may cause a ground loop. Also, depending on the characteristics of the deck, metering levels may not match between the deck and the Studio 32.

You may need to increase the Studio 32's fader level in order to get enough level on the multitrack's meters. Some multitracks have high/low level input switches; follow the manufacturer's instructions on setting these properly.

Connecting to a 2-Track Mixdown Deck

The mixdown deck is where everything comes together: the final mix. This is your stereo master recording of the finished project (or a rough mix of a work in progress). A special pair of inputs of the Studio 32 are provided to hear the mixdown deck in the Control Room mix only. If you connect the mixdown deck to regular line inputs, you run the risk of feedback by accidentally recording the output of the 2-track to itself.

To connect the mixdown deck to the Studio 32:

Unbalanced connection:

- 1 Connect the Studio 32's MAIN OUTS Left and Right to the inputs of the Mixdown Deck using the appropriate cables (usually 1/4" phono to "RCA" phono).
Note that the nominal output of the MAIN OUT in unbalanced operation is -2 dBu, about 6 dB "hotter" than the nominal level of an unbalanced mixdown deck. Lower the input level controls of the mixdown deck to achieve the desired signal level, or lower the L/R master fader a little to compensate.
- 2 Connect the Mixdown Deck's outputs to the Studio 32's 2 TRACK IN Left/Right Inputs using 2-conductor cables (usually phono-to-phonc cables) or adapters.

Balanced connection:

If the mixdown deck has XLR outputs, make or purchase XLR-to-TRS phone plug adapters or cables, with pin 1 connected to the sleeve, pin 2 connected to the tip, and pin 3 to the ring. The phone plugs will always be male; 2 XLRs will be female and 2 will be male. (The convention is that XLRs always point in the direction of signal flow, so the mixdown deck's outputs are male and the inputs are female).

- 1 Connect a 1/4" TRS (3-conductor) -to-XLR male cable from the MAIN OUT L/R jacks to the XLR inputs of the mixdown deck.
- 2 The 2 TRACK IN jacks of the Studio 32 are TRS balanced, and will accept +4 dBu balanced sources. Connect the output of the mixdown deck to these jacks.

In the rare event that the 2-track has balanced 1/4" jacks, use TRS-to-TRS cables in place of XLRs.

Connecting to a Control Room amplifier

Connect the Studio 32's Control Room L & R Outs to the inputs of the amplifier used for the control room monitor speakers. The CONTROL ROOM knob on the Studio 32 controls the level of the control room monitor speakers.

Note: These jacks are also TRS balanced. You may use unbalanced 2-conductor cables if the power amp doesn't have balanced inputs. If the amp features XLR inputs, use a TRS 3-conductor phone-to-XLR-male cable.

Connecting to a Headphone Amp

Monitor 1 and 2 may be used to set up a separate cue mix for musicians to overdub to while listening to headphones. Connect the AUXILIARY OUTPUTS MON 1 and 2 to a suitable headphone amplifier, if you will use the monitor section separately.

Tip: If you'd like your studio headphones to switch between MONITOR 1/2 and the Control Room mix, the HEADPHONE OUTS may be connected to an amplifier's inputs using a tip-ring-sleeve stereo splitter cable (the same type used for Insert cables). This also may be used for a second set of Control Room or studio playback monitors. Just keep the PHONES level control at 2 o'clock or less.

Connecting to a Patchbay

It may be easier in some installations to access everything by the use of a patchbay, which is several rows of jacks that are permanently connected to both the inputs and the outputs of the Studio 32, the multitrack tape machine, and all of the outboard equipment. This is much more convenient, but a more expensive method than described in the last section, and is not absolutely necessary for operation. In this case, the patching is the same as in the previous example except that it is now done on the patchbay instead of at the rear of the console and multitrack tape machine.

With a patchbay, it is also easier to make use of the AUX SENDS and RETURNS of the Studio 32. Different effects may be repatched to receive signal from whatever Aux Send the session requires.

For information on connecting to effects, see the next chapter.

CHAPTER 4:

EFFECTS AND SIGNAL PROCESSING

Connecting Aux Sends and Returns to Outboard Effects

Aux Sends 3 through 6 are derived post-fader, which means that any changes in level in the fader will also cause a change in level at these as well. The Auxiliaries are normally used as effects sends and are connected to whatever outboard effects that are available (reverbs, chorus, multi-effects processors, delays) to be blended into the mix.

Before you connect the Aux Sends, consider where you want the signals to come from:

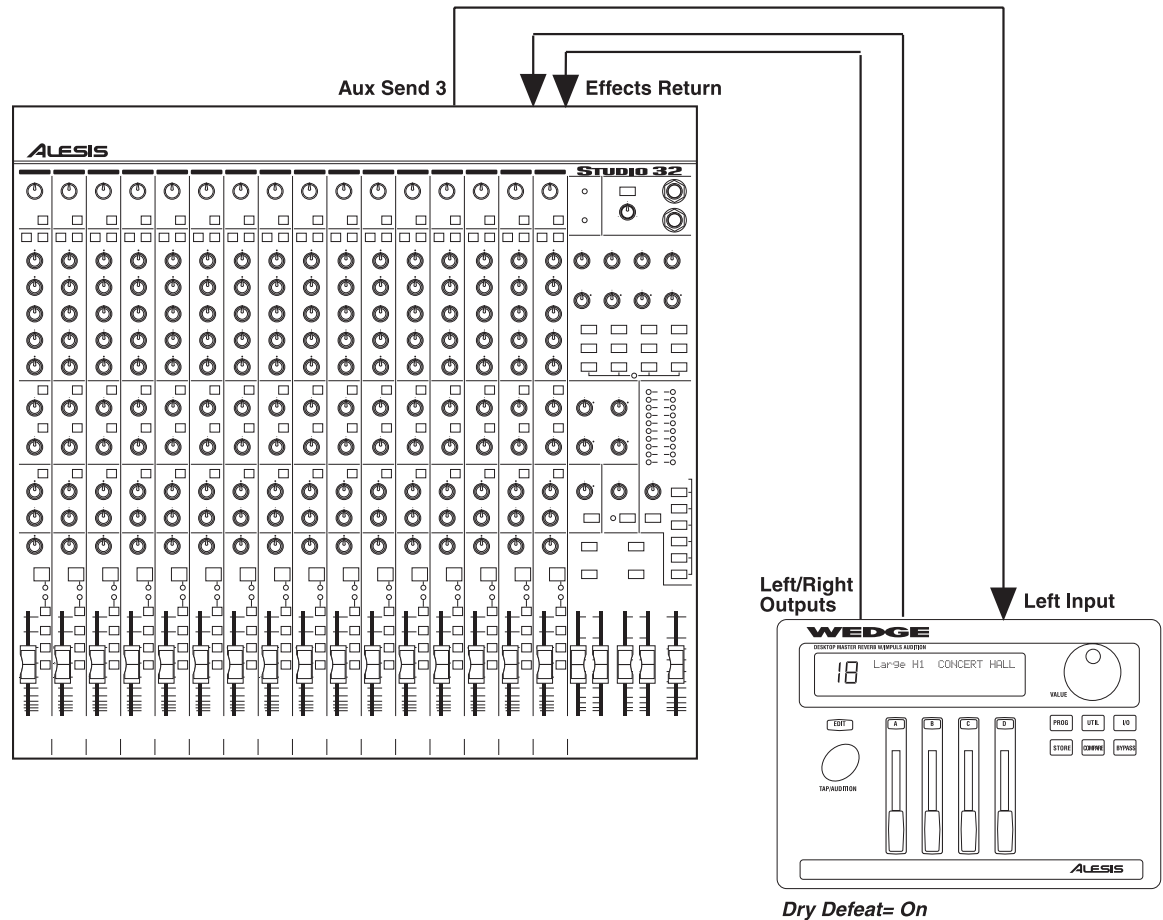
- All Auxes can receive signal from the channel fader if desired.
- Alternatively, Auxes 3 and 5 can receive signal from the Monitor.
- Auxes 3 and 5 can receive signals from Faders and Monitors from different channels simultaneously, if desired.

Note: If you want to use a separate effect on each channel, use the INSERT jacks, not the Aux Sends (see next section).

To connect the Aux Sends and Stereo Aux Returns to outboard effects:

- 1 Connect the Aux Sends (AUX 3, AUX 4, AUX 5, AUX 6) to the input or inputs of your outboard effects devices (like the Alesis QuadraVerb 2 or Midiverb 4). See the next page for more information about using stereo inputs (or not).
- 2 Connect the Outputs of these effects devices back into the Studio 32's dedicated inputs, called STEREO AUX RETURNS. There are eight 1/4" STEREO AUX RETURN connectors (labeled in pairs as A, B, C, D as on the front panel), enough for 4 stereo, 8 mono, or any combination of mono and stereo devices.

You can use any Aux Returns you wish; but most people connect the outputs of the unit being fed by Aux Send 3 into Stereo Aux Return A, plug the unit fed by Aux Send 4 into Stereo Aux Return B, and so on. The only difference between the Returns is what groups they can be assigned to. Returns A and B may be assigned to Groups 1/2, and Returns C and D may be assigned to Groups 3/4. All Aux Returns can be sent to the L/R Main mix, which is the most common assignment for effect returns.



Should you use one or two inputs to effects?



If your effect unit has two inputs, in most cases you only need to connect from ONE Aux Send to the LEFT (mono) INPUT of the effect unit, but you will still connect both the LEFT and RIGHT OUTPUTS of the effect to the Stereo Aux Return.

You may not need to connect anything to the right input of the effect, since many effect units use it only if the effect is connected directly between an instrument and an amplifier. In most mixing applications, you will set the effect's wet/dry balance all the way to wet. The effect device will generate an artificial stereo output from the signal input. Check the manual for your effect device for more information.

On the other hand, true dual-channel effects processors (such as the Alesis Wedge and QuadraVerb 2) should be connected to two different sends to take advantage of the dual processing capability.

Using MONITOR 1/2 as effects sends

Note that Mon 1 and 2 can also be used as extra effect sends while mixing. Although Mon 1 and 2 are pre-fader, and normally used for monitoring while recording, they are perfectly suitable as effect sends, especially during mixdown, when you will want to maximize your ability to add effects to independent channels. Just remember that when you move a FADER up or down you won't be changing the level going to the effect via MON 1/2, since "pre-fader" means that they are independent of fader movement (the signal is not affected by the

Channel's MUTE button, either). As you change fader levels, you may need to make corresponding adjustments to MON 1 and 2 in order to maintain the desired balance between dry and effected signal.

Using Aux Returns for extra line inputs

The four Stereo Aux Returns also serve well as additional inputs, in case you run out of Channels. These are especially good for connecting the outputs of stereo keyboards, many of which provide on-board signal processing and do not require any equalization.

Using Effects

Effects such as reverb, chorus and delay are typically wired in a loop from an Auxiliary Send to a Stereo Aux Return (see the illustration on page **Error! Bookmark not defined.**). There are two basic stages to getting a low-noise, distortion-free signal flow from an effect device:

SEND

Adjust the send level from the Studio 32 to the effect device using the channel Aux Sends, the AUXILIARY MASTER, and the input controls of the effect device itself. This level should be as strong as possible without clipping the effect device, and without extreme settings on either the mixer or the effect.

RETURN

Assign the Stereo Aux Return to the destinations you want:

- **To hear effects in the headphone mix**, raise the purple MON 1/2 controls in the Stereo Aux Return section.
- **To hear effects in the control room or record them onto the mixdown deck**, press the L/R assignment switch.
- **To record effects onto the multitrack tape deck**, press a GRP switch. Aux Returns A and B can send to GRP 1/2, and Aux Returns C and D can send to GRP 3/4.

Most complaints of “noisy effects” are due to send levels that are too low and return levels that are too high. You must structure the gain properly between the Studio 32 and the effect device.

Selecting an Aux Send:

First, you must decide which Auxiliary Sends to use. There are four post-fader sends from the Studio 32, labeled Aux 3 through Aux 6 because MON 1/2 is considered a special type of auxiliary send.

- **To send a signal to the effect device from the monitor section**, press the AUX SOURCE button down. This selects the post-monitor fader signal as the source of the AUX 3(5) knob directly below the switch. In a typical installation, Aux 3 is used for effect sends from the monitor.
- **To send a signal to the effect device from the channel**, use AUX 4 or AUX 6. The signal source for the lower AUX control always comes from the channel fader.

In a typical installation, Aux 4 is used for effect sends from the channel.

- **To send signal from the monitor and the channel to the same effect device(s)**, press the AUX SOURCE button down and press the TO 5/6 switch. Use AUX 5 and 6 for a combined effect send.

To set the level going to the effects device:

- 1 Set the Aux Send(s) in the input module to about “2 o’clock.”
- 2 Start the signal source(s); i.e., play the tape or instrument at typical levels.
- 3 Raise the appropriate AUXILIARY MASTER to about “2 o’clock.”
To check the output level, select AUX 3/4 or AUX 5/6 as the Control Room Source, and set the Aux Master to a setting that gives an average meter reading of “0 dB” on the L/R meter.
- 4 Raise the input control of the effects device until its meter or clip LED shows peak level, then lower the input control a bit. Consult the manual for the effect device for more information.
Some effect devices have level setting switches on the back; these should be set so that a peak level can be reached with reasonable settings (neither too high nor too low) of the input control.

To set the level coming FROM the effects device:

In most cases, the output level of the effect device itself should be set relatively high, at nominal or maximum. Lower the output of the device only if the meter keeps the +10 LED on when the Stereo Aux Return is soloed, or if the effect levels are too loud even at low settings of the Stereo Aux Return LEVEL controls.

To hear effects in the control room monitors:

It’s possible to put effects into the monitor or headphone mix without recording them to the multitrack.

- 1 Press the L/R switch of the Stereo Aux Return.
Make sure the GRP 1/2 or GRP 3/4 switches are in the up position. Otherwise, the signal will be assigned to the group and effects may be sent to the multitrack recorder.
- 2 Raise the Stereo Aux Return’s LEVEL control until you hear the desired volume of effect return.

Remember that you can SOLO the Aux Return to make adjustments to the sound, if desired, as long as the master solo select switch is in SIP (solo in place) mode (green solo master LED). You will be hearing the output of the effects device only, without any “dry” signal coming from the channel.

To hear effects in the headphone/cue mix:

Often while recording, musicians would like to hear some reverb or delay in their headphone mix. It is possible to meet this need without actually recording the effect. *If you're using L/R as the cue feed, follow the steps for "control room monitors" above.* If the headphone mix's source is MON 1/2:

- 1 Select MON 1/2 as the Control Room source so you can hear what the studio is hearing.
- 2 Raise the MON 1/2 control (the purple knobs) of the Stereo Aux Return(s) until the desired balance is heard.

To record effects onto the multitrack:

In most cases, effects are added at mixdown instead of during tracking and overdubbing. However, you can "record wet" (with effects) in order to use the same device for some other effect at mixdown, or because the effect is essential to the part. To do this, you simply:

- 1 Assign the Stereo Aux Return to the Group that you're recording, by pressing the GRP switch. Returns A and B can be sent to Groups 1 and 2, and Returns C and D can be sent to Groups 3 and 4. (If this doesn't fit your needs, you will have to repatch.)
- 2 To make sure you're hearing what's actually going to tape, make sure the L/R switch is up, and follow the procedure earlier in this section under "Recording Multiple Sources."

If the effect is stereo, it must be recorded onto two tracks. The left Aux Return input will go to the odd-numbered group (1 or 3) and the right Aux Return input will go to the even-numbered group (2 or 4).

To record effects onto the mixdown deck:

This procedure is the same as for hearing effects in the control room monitors described earlier: assign the STEREO AUX RETURNS to L/R and adjust the LEVEL controls.

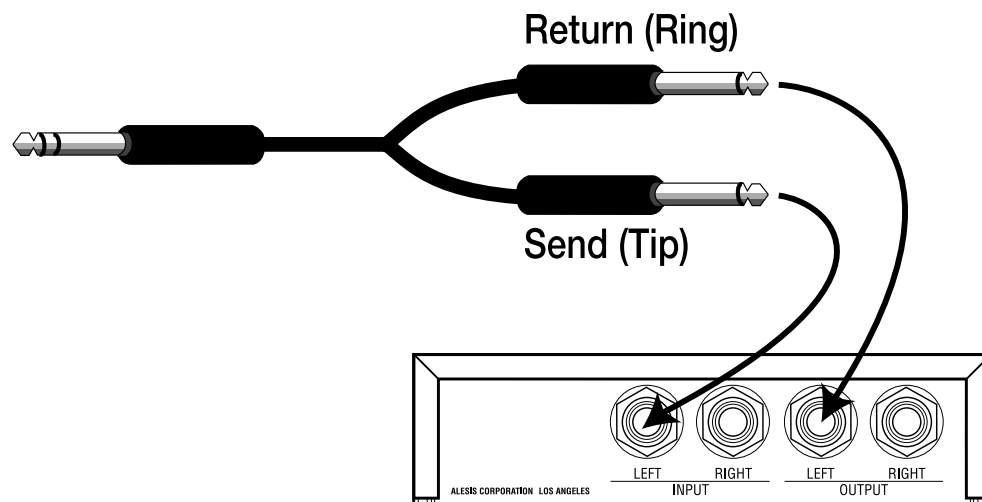
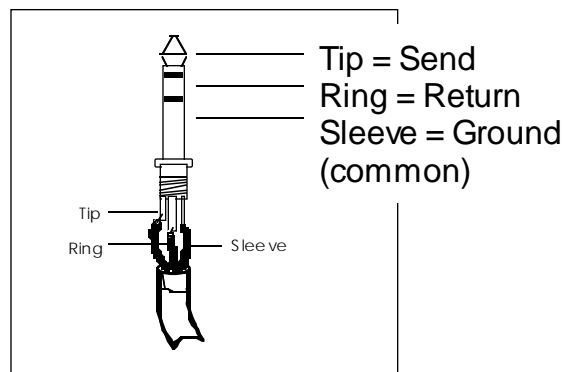
Connecting Signal Processors to Insert Jacks

Inserts are used to connect signal processing devices directly into the signal path of a Channel. Normally, the device connected would be one that shapes the dynamics or tone of a signal (such as a compressor, gate, or EQ), rather than an effects device (such as a reverb). It is also possible to insert a stereo signal processor into the signal path of the MAIN L/R OUTS, using the MAIN INSERT jacks. This is desirable when either a group of instruments, or the entire mix, needs to be processed.

All INSERT jacks on the Studio 32 are TRS jacks containing both an output (send) and an input (return). The *tip* of the plug is the *Send* and will be connected to the Input of the effects device or processor, and the *ring* of the plug is the *Return* and will be connected to the Output of the effects device or processor.

A special Y-cable consisting of a TRS 1/4" plug on one end and two mono 1/4" plugs on the other end is required. See the illustration below.

Insert Jack



CHAPTER 5:

MULTITRACK RECORDING APPLICATIONS

Recording

Setting Levels

Your job as operator is to set the audio levels in order to ensure the cleanest signal with the least amount of background noise (hiss or hum). To do this, it's important to set proper levels not only within the Studio 32 itself, but throughout the entire audio system. Here are some procedures to follow when you're operating the Studio 32 to achieve a *gain structure* (the signal level within each part of the system) that will give you professional results.

Maintain Proper TRIM and Input Levels

To set proper input levels on either a mic or line level signal:

- 1 With the mic or line level signal flowing through the Channel, depress the Channel's SOLO button. If there are any volume controls on the instrument itself, they should be set to maximum.
- 2 Set the SOLO SIP/PFL switch to PFL (the MASTER SOLO LED will turn red). It doesn't matter if the channel fader is up or assigned to anything at this point.
- 3 Observe the level on the MASTER LED Meter. Adjust the TRIM knob until the signal is above 0 (the top green LED) but below the yellow LED (labeled +10). It's OK if the top yellow lights during the loudest peaks, but if you ever see the CHANNEL PEAK LED flash, you are within 5 dB of signal overload. Turn down the TRIM knob until the PEAK LED stops flashing.

Note: There is no TRIM control for the TAPE IN jack, because it is designed to handle the full range of inputs generated by modern tape recorders.

Maintain Proper Fader Levels

In typical operation, the Channel, Group and Master FADERS should be run at about the "0 dB" or "nominal" position. **NOTE: that's about 2/3 of the way up the channel fader travel, but all the way up on the Group and L/R faders.** This position gives the best balance between maintaining adequate headroom and lowest noise. It also allows for any additional increase or decrease in level that might be required during mixing. Ultimately, the channel fader levels are dependent on the requirements of the mix; the nominal level is only a starting point.

If a large amount of EQ is used, it may become necessary to decrease either the TRIM control, or the Channel FADER, or both. The EQ is capable of adding quite a bit of gain and is a frequent cause of overload distortion problems.

The Studio 32 has been designed with plenty of headroom on the internal summing amplifiers (23 dB of headroom above a +4 dBu balanced output level). It is only possible to clip the mixer internally if several channels are at or near their maximum clipping point (with PEAK indicators flashing) and then sent at maximum gain to an output. You are in danger of this if:

- the meter is hitting the top of its range (“PK”) with the GROUP MASTER FADER set to nominal level, or
- the GROUP or MASTER FADER is set to -20 or lower, and the meter is reading 0 dB or above.

Once again, it may be necessary to decrease either the TRIM control, the Channel FADERS, or both, of each of the Channels assigned to the Group.

Maintain Proper System Levels

As a good rule of thumb, try to run most volume level controls of other equipment receiving signal from the Studio 32 (amplifiers, effect devices) at 3/4 or 75% of full, as well. This will decrease the possibility of overload distortion and keep the amount of background noise to a minimum.

How to Record a Single Source to One Track

When recording a single source appearing on one Channel onto a single tape track, it is usually best to use the DIRECT OUT of the Channel. This provides the most direct connection between the Studio 32 Mixer and the multitrack.

To record a single source to a single track:

- 1 With a microphone or instrument connected to the desired input channel, set the TRIM and fader level correctly (see page 45, *Setting Levels*). Make sure the channel's FADER SOURCE switch is up.
- 2 Connect the channel's DIRECT OUT to the Input of the desired tape track (see page **Error! Bookmark not defined.**, *Connecting to a Multitrack Recorder*).
- 3 Place the track you want to record into the "source" or "input" mode (usually by arming the track for recording). At this point, you may see the channel meter of the recorder respond to the microphone or instrument. Adjust the fader for the proper recording level.
- 4 To monitor (listen to) the signal through the multitrack tape machine, make sure the TAPE/ML switch of MONITOR 1/2 is up and raise the Monitor 1/2 LEVEL of the track being recorded.

Note that this Monitor control may be in a different channel strip, if you're recording onto a different-numbered track.

- 5 To hear MONITOR 1/2 in the control room, raise the MONITOR 1/2 MASTER control, select MON 1/2 as the control room source (by making sure all other Control Room Select switches are up), and raise the control room level. To hear it in the headphones, you may select MON 1/2 directly as the headphone source.



Be sure the L/R and Group Assign buttons of the Channel being recorded are in the "Off" position (up). Otherwise, this will cause the monitoring to be false since the signal will be heard from two sources: the Channel (source) and the Tape Monitor (return).



NEVER select tape as the source of the channel (by pushing the upper FADER SOURCE switch down) when the tape recorder is in input or record mode and the DIRECT OUT is connected to the track input. This will cause feedback, since the tape will be trying to record its own output.

Recording Multiple Sources to One Track

When more than one Channel is to be recorded onto the same track of a multitrack recorder, it is necessary to assign all desired Channels to a Group, and connect the Group Output jack to the input of the multitrack.

If you're recording no more than 4 tracks at a time, you may find it easier to use the Groups even if you're recording one source per track, since you won't have to repatch as you would if you use the Direct Outs.

To record two or more sources to a single track:

- 1 With microphones or instruments connected to the desired input channels, set the input level correctly (see page 45, *Setting Levels*).
- 2 Assign each of the Channels you wish to record onto the same track to GROUPS 1 and 2 by pressing the 1/2 button situated next to the Channel FADERS.
If you want to record effects or other devices from a Stereo Aux Return, you may also press the ASSIGN keys in the Stereo Aux Return section.
- 3 Use the PAN control on each of the assigned Channels to position the signals either fully to the left or fully to the right. If the panning is fully left, the Channel will be routed to Group 1. If the panning is fully right, the Channel will be routed to Group 2.
- 4 The GROUP FADER will now control the level going to tape. Raise the GROUP FADER to its maximum position. To check the level of the group on the Studio 32's meter, press the GRP 1/2 switch in the control room section.
- 5 Be sure that the Group's TO L/R switch is in the "Off" position (up). Otherwise the signal will be assigned to the Main L/R Output directly, instead of monitoring what's coming back from the multitrack via the MONITOR 1/2 section.
- 6 To monitor the track through the multitrack tape machine, place the tape machine track you are recording on into record or "input" mode, and raise the MONITOR 1/2 control the track's output is connected to.



Be sure the L/R buttons are in the "Off" position (up) for the Channels being recorded. Otherwise, this will cause the monitoring to be false since the signals will be heard from two sources: the Channels and MONITOR 1/2.

Recording Multiple Sources to Two Tracks (Stereo)

Recording multiple sources onto two tape tracks is simple--you just use two Groups. Pan hard left all channels going to the odd-number Group, and pan hard right all channels going to the even-number Group. You can pan each channel to obtain the proper stereo positioning between left and right.

To record multiple sources to two tracks in stereo:

- 1 With microphones or instruments connected to the desired input channels, set the input level correctly (see page 45, *Setting Levels*).
- 2 Assign each of the Channels or Aux Returns you wish to record onto the same track of tape to GROUPS 1 and 2 by pressing the 1/2 button situated next to the Channel FADER.
- 3 Use the PAN control on each of the assigned Channels to position the signals as desired between the left (Group 1) and right (Group 2).
- 4 The GROUP 1 and GROUP 2 FADERS will now control the levels going to tape. Raise them to the full up position (0).
- 5 Be sure that the Groups' TO L/R buttons are in the "Off" position (up). Otherwise the signals will be assigned to the Main Output directly, instead of monitoring what's coming back from the multitrack on the small fader.
- 6 To monitor the tracks through the multitrack tape machine, place the tape machine tracks you wish to record on into the record-ready or "input" mode, and raise the MONITOR 1/2 LEVEL controls the tracks' outputs are connected to. Set the Monitor PAN controls to hard left and right to hear the proper stereo image in the control room.

If you don't perform this last step, the main PAN settings you make on the channels you're recording in step 3 will be incorrect in the final stereo image.



Be sure the L/R buttons are in the "Off" position (up) for the Channels being recorded. Otherwise, this will cause the monitoring to be false since the signals will be heard from two sources: the Channels and the Tape Monitors.

Recording Tips

For the cleanest possible recording, the Group FADERS (or Channel FADERS if the DIRECT OUTS are being used) should be adjusted so that the level going to tape averages 0 VU on the meters of a typical analog multitrack tape machine, or peaks just below MAX or 0 dBFS on a digital multitrack machine such as the Alesis ADAT.

About Metering

The meters of the Studio 32 are the instantaneous peak reading type, which are preferred in digital recording where the “ideal” recording level comes close to, but never exceeds the point where all the bits are filled (called 0 dBfs, for full scale). Note that “0 dB” on the Studio 32’s meters means that the output of the Studio 32 is at “nominal” level (either +4 dBu balanced or -2 dBu unbalanced, depending on the connector), as opposed to “0 dB” on a digital recorder like ADAT which means “maximum” level (+19 dBu balanced, +5 dBV unbalanced). Peaks well above the “0 dB” level on the Studio 32’s meters should be common at normal operating levels for almost all types of tape deck. Analog tape decks typically have between 10 and 13 dB of headroom above the nominal level, depending on the tape type and any noise reduction being used, and ADAT has 15 dB of headroom above nominal. Other digital decks have anywhere from 12 to 20 dB of headroom.

Meters of the tape deck will not necessarily match those of the Studio 32 on dynamic program material. With typical metering, analog VU meters may only read 0 dB, even though the Studio 32’s peak meters are reading levels between +5 and +10. However, a steady-state tone (such as that from the built-in oscillator) will read 0 dB on both the Studio 32 and most VU meters. Readings on combined peak/VU meters, such as those found on semiprofessional multitracks, will vary. Take the time to learn the relationship between the Studio 32’s meters and your deck’s meters, using both steady-state tones and dynamic material.

If signal peaks cause the record meter to vary by more than 10 dB, a limiter or compressor such as the Alesis 3630 Stereo Compressor may be used on that channel to even out the peaks. In general, things will sound better if the meters remain at roughly the same level throughout the recording.

The two LED ladder meters of the Studio 32 will follow the Control Room source switch and SOLO system. Pressing MONO or changing the Control Room Level control will not affect the meters.

Overdubbing

Using MONITOR 1/2 to Monitor the Multitrack

Once you have recorded onto the multitrack tape machine, you'll need to hear the playback of those tracks, as you record new tracks in sync with the material already on tape (see next section, *Getting the Mix to Headphones*). The signals coming back from the multitrack tape machine connect to the TAPE IN connectors of each channel, and during the overdubbing stage you'll usually hear them via the MONITOR 1/2 system.

To listen to tape tracks via MONITOR 1/2:

- 1 Place the tracks of the tape machine you wish to monitor into the "Tape" or "Playback" position.
- 2 Make sure the MIC-LINE/TAPE switches above the MONITOR 1/2 PAN pots are **up** (TAPE position). Raise the MONITOR 1/2 LEVEL controls being used for the tape tracks you want to hear.
- 3 Select MON 1/2 as the Control Room Source and turn the CONTROL ROOM control up to the desired listening level.

Alternatively, you may select L/R as the Control Room source, and press the "LINK TO L/R" switch under the MONITOR 1/2 MASTER. This will allow you to hear other sources from the channel faders if they are assigned to L/R.

- 4 Play the tape and raise the MONITOR 1/2 MASTER until the peaks of the signal briefly light the yellow LEDs in the meters.

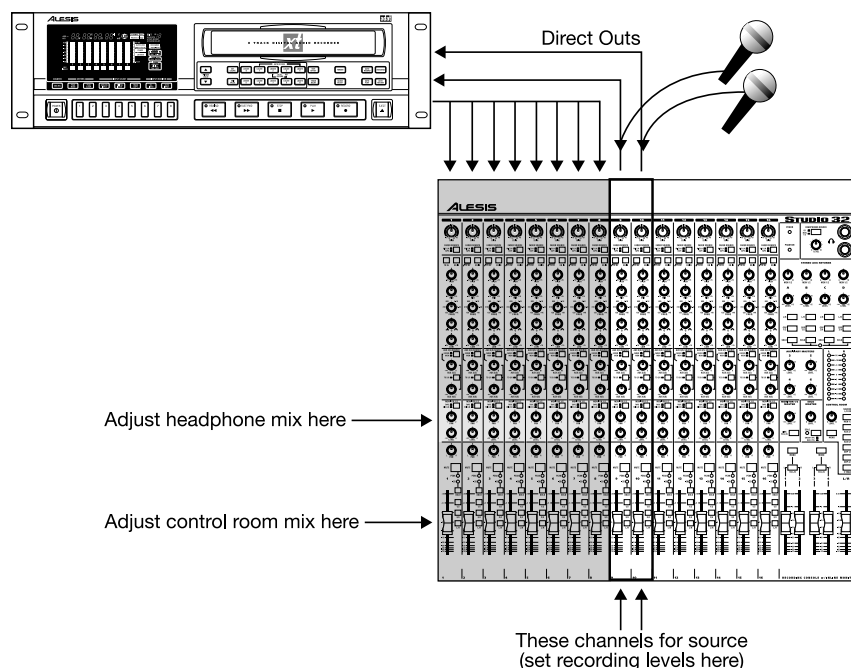
Using the Channel Faders to Monitor the Multitrack

If you're only recording a few inputs at a time, you may want to use a different technique for monitoring. Monitoring on the channel faders gives you a head start on your mixdown, and also allows you to start using the parametric EQ. Another advantage of using the L/R mix for monitoring in the control room is that it frees the MONITOR 1/2 mix to provide an independent mix for musicians' headphones.

Keep in mind, however, that you will not be able to record any Mic or Line source that's plugged into a channel being used to monitor a tape return.

To listen to tape tracks on the Channel faders:

- 1** On the multitrack, set the tracks you want to monitor into playback mode (Record switched OFF).
- 2** Make sure the Group Assign 1-4 switches of the tracks you want to hear are all UP (off).
- 3** Press the FADER SOURCE switch at the top of the channel (below TRIM) down (to the TAPE position), for all tape tracks you want to hear. This makes the tape input jack the source of the large Channel FADER. *Note: to avoid confusion, make sure you're not simultaneously monitoring the tape return via MONITOR 1/2 in the same channel.*
- 4** Assign the tape track channels to L/R (the switch lowest on the channel strip).
- 5** Raise the Channel FADERS being used for the tape tracks you wish to listen to.
- 6** Raise the L/R MASTER FADER, make sure all CONTROL ROOM SOURCE switches are UP (L/R) and adjust the CONTROL ROOM settings, as in the previous section.



Once you have the tape tracks returning to the mixer, it is simple to create a cue mix for the musicians to listen to over headphones while overdubbing. The cue mix is created using MONITOR 1/2 on the Studio 32, because it is a pre-fader mix that is independent from all other mixes. Follow the instructions in the previous pages to get a monitor mix if you have not already done so.

Built-in headphone amp

The simplest solution for headphone monitoring is to simply plug into the headphone jacks at the upper right hand side of the Studio 32. You may run stereo extension cables from these jacks; they will power most standard headphones. (If the phones aren't loud enough, consider trying some more efficient headphones with a lower impedance and a closed-cup design.)

The HEADPHONES SOURCE switch may be set to either position:

CR: The headphones will hear exactly what's heard in the Control Room, as set by the CONTROL ROOM SOURCE switch. Pressing SOLO will also affect the headphones. Only the CONTROL ROOM LEVEL pot will not affect the headphones.

MON 1/2: In this position, the headphones will hear only the MONITOR 1/2 mix, regardless of how the control room is set.

The HEADPHONES SOURCE switch is usually set to MON 1/2 while tracking and overdubbing, so the engineer can solo and change things without affecting the headphone mix. Then, if you want the headphones to hear the 2 track or L/R mix, set it to the CR position.

Using an external headphone amp

AUXILIARY OUTPUTS 1 and 2 (MON is labeled underneath) may be connected directly to the inputs of a headphone amplifier (see page **Error! Bookmark not**

defined., *Connecting to a Headphone Amp*). In this case, the MONITOR 1/2 MASTER control will set the overall level going to the headphones.



Turn down the input controls (if provided) of the headphone amplifier itself so that average levels from the monitor section (up to +10 on the meter) do not make the headphones too loud.

Option: You may use a standard “stereo splitter” cable with the TRS 3-conductor end plugged into the Headphone output jack and connect it to an amplifier, with the headphone level set to about 12 o’clock.

Monitoring MIDI Virtual Tracks

If you are using a MIDI sequencer, the tracks being played “live” from sound modules in synchronization with the tape are effectively the same as additional tracks on tape -- which is why they are called “virtual tracks.”

Synthesizers and drum machines are normally plugged into the LINE IN jacks of the channels, and can be monitored on the Channel FADER or MONITOR 1/2, using the procedures above. Since the point of virtual tracks is not to use up a track of tape, just make sure that when the synthesizer is on the Channel FADER, that its Group Assign switches are OFF, so it doesn't get recorded. Assign virtual tracks to L/R only.

If you are using Monitors and Channels simultaneously for tape return and virtual track monitoring, the L/R mix should be used for the performers' headphone mix, not MON 1/2.

- 1 Set the Control Room source to L/R (all CR Select buttons up).
- 2 Press the LINK TO L/R switch. This mixes the MON 1/2 mix onto the L/R buss.
- 3 Set the HEADPHONES SOURCE switch to CR (up).
- 4 Set the MONITOR 1/2 SOURCE switches for the channels with virtual tracks to MIC/LN (down).
- 5 Set the FADER SOURCE switches to TAPE (down).
- 6 Set the MONITOR 1/2 MASTER LEVEL control to its nominal position (about “2 o'clock”). Adjust all other levels to taste. If you want to turn all the virtual tracks up or down in the mix simultaneously, use the MONITOR 1/2 MASTER LEVEL control.

Bouncing Tracks

Sometimes it is necessary to combine several tracks onto another track, particularly when you are running out of tape tracks. *Example:* Once you've recorded the vocal harmonies on four different tracks, you could bounce them all over to one track, or two tracks for a stereo mix, thereby freeing up the original four tracks.

When bouncing tracks, you must control the tape tracks being bounced with the Channel FADERS, instead of hearing them through MONITOR 1/2. You then route the signals to a Group which corresponds to the track(s) you wish to bounce to.

Example: If we were bouncing those four vocal tracks to track 5, we would press the FADER SOURCE button for those channels (TAPE position), route them to Group 1 (which is "normalled" to the input of track 5 on the tape deck), create a desirable mix, and place track 5 in record. Here's the recipe:

To bounce tracks to a single track (mono):

- 1 For each Channel (tape track) you wish to bounce, press the FADER SOURCE button so it is down.
This selects the TAPE IN jacks as the source of the Channel FADERS.
- 2 Assign the Channels to Group 1 by pressing the 1/2 button next to the long fader. *Make sure none of these channels is assigned to L/R. Also make sure that no unwanted channels or Aux Returns are assigned to Group 1/2, and that none are being heard through the MONITOR 1/2 mix.*
- 3 Turn each Channel's PAN knob hard left.
This routes the signals to Group 1 only.
- 4 Place track 5 into record-ready, and adjust the Group 1 MASTER FADER to maximum.
If you have an ADAT-XT, press and hold ANALOG INPUT and one of the first four track keys, so that Input 1 will "normal" to Input 5. For other multitrack recorders, check to see if they have normaling or electronic patching.
- 5 In the Control Room section, press the GRP 1/2 switch and make sure all other switches are off.
This will allow you to hear Group 1 in the left Control Room monitor, and bring it up in the Studio 32's meter. If you wish, you may press the MONO switch so it's in both speakers.
- 6 Adjust each Channel FADER to achieve a desirable mix.
If necessary, you may adjust the Group Fader down to avoid clipping the tape track.
- 7 Rewind the tape, and record onto track 5 those portions you wish to bounce.
- 8 Tracks 1-4 are now available for recording new parts.

Monitoring through the recorder: Instead of monitoring the GRP 1/2 feed in the control room, you may want to use MON 1/2, turning off all other monitor level controls except the track you're bouncing to (track 5, in this example). This method ensures that the patching, track arming, and levels are correct.

To bounce multiple tracks to two tracks (stereo):

- 1** For each Channel (tape track) you wish to bounce, press the FADER SOURCE button so it is down.
This sends the tape tracks to the Channel (long) FADERS.
- 2** Assign the Channels to Groups 1 and 2 by pressing the 1/2 buttons next to the channel faders.
- 3** Raise the Group 1 and Group 2 MASTER FADERS to the maximum position.
- 4** Place tracks 5 and 6 into record-ready, and select either GRP 1/2 or MON 1/2 as the Control Room source. If you're using MON 1/2, turn the monitor pan (the upper black knob, not the one next to the MUTE key) for track 5 hard left, and the monitor pan for track 6 hard right.
- 5** Adjust each Channel's PAN knob and FADER to achieve a desirable mix.
- 6** Rewind the tape, and record onto tracks 5 and 6 those portions you wish to bounce.
- 7** Tracks 1-4 are now available for recording new parts.

Playback/Mixdown

Getting the Mix to the 2-Track Deck

Once you have established a satisfactory mix, it's time to get it over to the tape deck. This involves connecting the L/R MAIN OUT jacks to the mixdown tape deck's left and right inputs. For more information on connecting the Studio 32 to a two-track mixdown deck, see page **Error! Bookmark not defined.**

Assign all Channels, Monitors, Stereo Aux Returns and Groups being used to the L/R MASTER FADER, by making sure the L/R buttons for each is down. Then create a mix using the Faders for the selected channels.



Make sure the L/R switches of all unused channels, monitors or aux returns are UP, to keep the noise floor to a minimum.

Mixdown Basics

Here is a simplified step-by-step way to establish a mix:

- 1** On the channels where you want to hear tape track, press the FADER SOURCE switch down. *Now the TAPE IN will appear at the channel input.*
- 2** Make sure the channel L/R switches are down. Set the Main L/R fader at full and raise the channel FADERS being used as tape returns to the desired levels.
- 3** Add the amount of effects desired by adjusting the AUX levels of each Channel. If required, adjust the AUX MASTERS to avoid overloading outboard effects.
- 4** Assign the STEREO AUX RETURNS to L/R.
- 5** Raise the level of the STEREO AUX RETURNS. For quietest operation with the greatest amount of headroom, it's best to run the individual channel AUX Sends at about the "2 o'clock" level, the AUXILIARY MASTERS at the same position, and if the effects are too loud, turn down the AUX RETURNS, not the sends.
- 6** Adjust the input of the mixdown deck, or if necessary the Master L/R FADER, so that the desired level is sent to the mixdown tape machine.
- 7** Press 2 TRACK as the source in the CONTROL ROOM section. This assures that you are hearing only what is actually reaching the mixdown deck, and that it is in RECORD mode when you want it to be.

Guidelines for a rough mix

Creating a mix is easy; creating a great mix (one that jumps off the tape) is a lot harder. There are those engineers who are in demand just for mixing because of their sense of balance between instruments causes the mix to come alive with excitement. Although outboard effects and tonal adjustments are important, you'd be surprised at how good a dry (meaning no EQ or effects) mix can be if the balances between parts are right. When you add effects and EQ, it will sound that much better.

Since much of the art of mixing is totally subjective and up to the taste of the engineer, a basic balance between instruments is necessary first before any tonal or effect enhancements can really become effective. Here's a method to help you quickly create a "dependable" mix; one that sounds good no matter what speakers you mix or play back on. Although our example involves mixing the instruments found in popular music, this method can be applied to any type of music regardless of the instruments being used. *Note:* This is only a reference or starting point. Each song is unique and calls for different balances.

To create a dependable mix:

- 1 Begin with all the Channel FADERS in the "-∞" (down) position.
- 2 Set the L/R MASTER FADER to the "0 dB" point (all the way up).
- 3 Raise the Kick Drum Channel FADER until the LED meters read "-3."
- 4 Mute the Kick Drum Channel by switching the MUTE button to the "On" (down) position, so that the Kick can no longer be heard. DO NOT MOVE THE FADER! Just mute the Kick Channel.
- 5 Raise the Snare Drum Channel FADER until the LED meter reads "0." Mute the Snare Drum Channel, the same as the Kick.
- 6 Raise the Hi-Hat Channel FADER until it reads "-12" on the LED meter. If any cymbals (ride or crashes) occur in the song, set those Channels to "-12." Mute the Hi-hat and Cymbals Channels.
- 7 Raise the Toms Channel FADERS. Set them so that the LED meter indicates "0." Mute the Toms Channels.
- 8 Bring up the Bass Guitar Channel FADER so that the LED meter reads "-6." Mute the Bass Channel.
- 9 Raise the Channel FADERS with the rhythm guitar and/or keyboards so that the LED meters read "-12," unless percussion instruments are involved (such as cowbell, triangle or shaker), in which case the meters should read "-18." Mute these Channels.
- 10 Raise the Channel FADERS with the keyboard pads, strings and/or organ so that the LED meters read "-24 ." Mute these Channels.
- 11 Raise the Channel FADERS with the melody and solo instruments (such as

lead vocal, solo guitar, etc.) so that the LED meters read “-8.” Mute these Channels.

12 Raise the Channel FADERS with the background vocals and/or incidental instruments so that the LED meters read “10.”

13 Unmute all Channels and make balance adjustments as necessary.

The above process can be accomplished very quickly once you get the hang of it. Usually, it is done at least twice when “getting up” a mix. The first time is without effects or EQ to see what (if anything) the mix needs. The second time is after all the effects and EQ have been added.

CHAPTER 6:

SOUND REINFORCEMENT APPLICATIONS

Though the Studio 32 has been designed as a recording console, it makes an excellent console for live PA applications. It has just as much (if not more) headroom as a PA console, is more flexible, and has a much more powerful EQ than the typical stereo PA console.

Creating a mono house mix

Most sound reinforcement applications work best in mono, since so few members of the audience are seated in the ideal spot to hear the balance of a stereo sound system effectively. Also, a stereo sound system can be much more difficult to mix.

To configure the Studio 32 mixer in order to achieve a mono mix:

- 1 Pan all of the Channels fully left (or fully right).
- 2 A mono mix will now be present at the MAIN OUT L jack (or the MAIN OUT R jack, if all Channels were panned to the right).

Note that the MONO switches above the GROUP faders may be used to assign the Group signals to left and right equally, no matter what the pan position is. Follow the instructions below for subgrouping, making sure that no channel is assigned to L/R directly. Also note that the MONO switch in the Control Room section only affects the Control Room output, which usually isn't used for connections to a PA system because it is affected by the SOLO switches.

Subgrouping with the Group Faders

The Groups are extremely useful in sound reinforcement work. A Group can be used to control the overall level of several Channels with the movement of only one fader. Here are two examples:

To control all the vocal mics from the Group 1 master fader:

- 1 Raise the selected Channel FADERS to the desired levels.
- 2 Unassign each of the selected Channels from the L/R Master Fader by switching their respective L/R buttons to the "Off" (up) position.
- 3 Now assign each of the selected Channels to Group 1 by switching the 1/2 button to its "On" (down) position. Make sure the 3/4 switch is off.
- 4 Adjust the PAN control of each of the selected Channels so that it is fully Left.
- 5 Assign the Group to the Master FADERS by switching the TO L/R switch to its "On" (down) position. The Group 1 FADER will now control the selected

Channels, and the combined signal will appear at the L/R MASTER FADER along with the other Channels directly assigned to L/R.

To control a stereo submix of all the vocal mics from the Group 1 and 2 faders:

If you are doing a stereo mix, you may use two groups for a submix. Follow the instructions above; but pan the microphones anywhere from left to right during step 4. Make sure Group Faders 1 and 2 are both set to the same level to keep the proper stereo balance.

Stage Monitor Mix

In stage/PA applications, the MONITOR 1/2 section is usually used to provide stage monitor mixes. MON 1/2 is pre-fader, so any changes made to the house mix will not affect the stage monitors.

In this application, the MONITOR 1/2 SOURCE switch is pressed down (MIC/LN position) so it receives the same input as the channel fader. The TAPE IN jacks aren't usually used, unless you need more inputs.

It is possible to create two separate stage monitor mixes by using the MONITOR PAN controls carefully. For example, the lead singer may wish to hear more drums and vocals in his or her monitor, while the lead guitarist wants more bass.

To create two different stage monitor mixes:

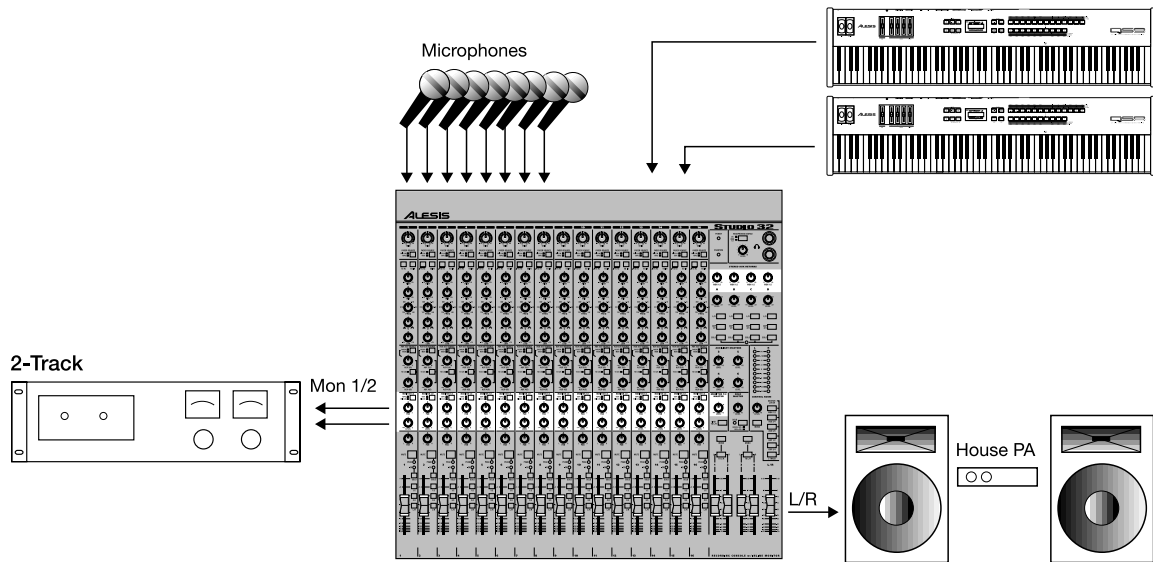
Set the HEADPHONES SOURCE switch to MON 1/2 (down), or connect your own monitor speaker to the CONTROL ROOM output to hear the stage monitor mixes.

- 1 On the Channel modules that you wish to be part of the stage monitor mix, turn up the MONITOR 1/2 control until the desired balance is obtained. (Make sure the MONITOR SOURCE switch is in the down position.)
- 2 To send a Channel only to MONITOR 1, adjust the PAN control (the upper black knob above the purple LEVEL control) fully left (MONITOR 1). To send a Channel only to MONITOR 2, adjust the PAN control fully right (MONITOR 2).
- 3 Use the MONITOR 1/2 MASTER to increase or decrease the overall volume going to the AUX SEND 1/2 jacks. The default (unity gain) position is marked with a heavy dot at the "2 o'clock" position.
- 4 Route the AUXILIARY OUTPUT 1 and 2 jacks to the input of a stereo power amplifier.
Usually, a 1/3 octave graphic equalizer is patched into the line to notch out feedback frequencies. The Alesis M-EQ 230 is a perfect unit for this application.
- 5 Route the two speaker outputs of the amplifier to two different sets of stage monitors.

Usually, some channels will have to be heard in both monitors. This requires adjusting the monitor pan and level controls to taste.

Alternate uses for the Monitor 1/2 section: Stereo recording during a live concert

The most popular and obvious application of the MONITOR 1/2 section to hear the tape tracks in the control room or headphones while using the main faders for the sources, during multitrack studio recording. But you should think of the MON 1/2 section as an independent, 16x2 mixer with an effects send, like this:



At a major concert, feeds from microphones are often “split” so they can be sent to two different consoles: a monitor mixer on stage, and a house mixer in the audience (and, sometimes, a third console for multitrack recording). This allows engineers to change the controls without affecting each other. Here are some examples of why separate mixes are needed:

- the recording truck needs to have microphones in the audience to record the applause; but it would cause feedback if these microphones were sent to the PA system.
- the PA engineer needs to raise and lower levels during the show, with different mixes for each song. But the multitrack recording engineer tries to set levels so that each track is at the ideal maximum recording level for that track. (The recording’s final mix levels will be set later, in a studio mixdown session.)

If you can afford several consoles and an expensive 2-way splitter box, good for you. But if you think of the monitor section of your Studio 32 as if it were a separate mixer being fed by the same microphone, a whole set of possibilities open up.

Using Monitor 1/2 to feed a cassette deck

Since the Studio 32 has a true stereo mixer independent of the main console, it can be used to create a stereo reference mix of a live concert, while the main faders set the PA mix. This technique is popular especially with artists who want to hear a tape to evaluate each performance. If you just record the mix going to the PA, the

balance will be wrong on the tape for instruments that don't need to go to the PA (for example, the lead guitarist's kilowatt stack may be too loud to need PA reinforcement, but if you rely on bleed through the vocal mics for the recording, the guitar won't sound right).

- 1 Connect the MON 1/2 OUT jacks to the input of your stereo tape deck.
- 2 Make sure the MON 1/2 LINK TO L/R switch is OFF. *Otherwise, the mix you want for the recording will also go to the PA system.*
- 3 Set both the channel and monitor input source select switches to MIC/LN (channel switch UP, monitor switch DOWN).
- 4 Set the monitor LEVEL and PAN controls for the recording mix you want.

This is what will happen with this setup:

- There will be no EQ on the recording mix.
- Any changes you make on the main channel (lowering the fader, muting the channel, or changing the group or L/R master levels) will NOT be heard on the recording.
- Any effect that goes to the STEREO EFFECT RETURNS (ABCD) will be recorded on the cassette deck only if the purple MON 1/2 controls in this section are raised.
- If you want reverb or other effects on the recording, but not on the PA, you can set AUX 3 to the MON position, and use the upper row of AUX knobs as a dedicated recording effects buss. Dedicate one RETURN channel to this, make sure it is not assigned to L/R, and turn up its MON 1/2 level.
- If you have house mics for recording audience reaction or hall ambience, make sure to mute the main faders of those channels so they aren't brought up in the PA system.

Using Monitor 1/2 as the PA mix during multitrack recording

You may run into some situations where you need the opposite hookup from the above, especially with acoustic jazz or folk recordings where a minimum of PA or monitoring is needed, but the recording must be digitally pristine. For example, suppose you're recording in a very small club, and only the vocalist needs any sound reinforcement because the instruments are loud enough acoustically or through their own amplifiers.

- 1 Use MON 1/2 as the PA feed, with only 3 channels used (one for vocal, and two effect returns).
- 2 Use Group 1/2 as a stereo drum mix, Group 3/4 as a keyboard mix, the L/R master as a guitar mix (there were acoustic and electric guitars, both in stereo).

Patch these six outputs (Groups 1-4 and L/R) to the first six tracks of the recorder.

- 3 Patch the vocal and bass from their respective TAPE OUTs without assigning them to any of the main outputs:

Voila, an 8-track digital recording that is easy to manage, and a happy audience and vocalist.

The point of all these techniques is: don't limit yourself in how you use the different sections of the Studio 32. What works in one situation will require a different solution in another.

Video Production and Post-Production

The Studio 32 lends itself extremely well to post-production applications where a soundtrack is being developed for video or film. In most situations, a synchronization system is being used, which ties together all of the time-based equipment including one or more video tape recorders (VTRs), a multitrack tape recorder, and in many cases a computer running MIDI software. The software usually performs as a sequencer for adding virtual tracks (sequenced parts not recorded to tape), and recalling effects programs on MIDI-compatible outboard effects devices.

Video deck outputs may be patched to either the LINE IN or TAPE IN jacks in most cases. To feed the output of the Studio 32 into a video deck, set the input of the video deck to "line level" or "+4", and connect either the GROUP or MAIN L/R OUTPUTS to the video deck using appropriate adapter cables (usually 1/4" TRS to XLR/Male). Make sure the input level of the video recorder is not set to "mic" or "-40" level.

In live production, a typical setup would be to plug microphones into the Studio 32, with direct outputs feeding an ADAT. Using the techniques listed above ("Using Monitor 1/2 to feed a cassette deck"), make a reference stereo mix to record onto the VTR's audio tracks (or onto a single audio track if one must be used to record time code).

CHAPTER 7:

DESCRIPTION OF CONTROLS

Channel Input Controls

Trim

The TRIM knob adjusts the sensitivity of both the Mic and Line inputs. Proper setting of this control is essential for low-noise, distortion-free operation. In most cases, microphones require from 30 to 60 dB of preamplification, while line sources need much less or none at all. If the Channel PEAK LED lights when the FADER SOURCE switch is up, lower the TRIM control.

- Mic input gain: +10 dB (minimum) to +60 dB (maximum)
- Line input gain : -10 dB cut to +40 dB gain.

Fader Source switch

This switch selects the source of the Channel (which includes the Channel Fader, EQ, INSERT jack, and lower Aux send). In other words, where is the signal coming from?

- When this switch is UP, the LINE IN/MIC IN jack (having already passed through the TRIM control) is the source of the channel.
- Press this switch DOWN to select the TAPE IN jack as the source of the Channel.

Example: If all the console's FADER SOURCE switches are down, all the main Channel FADERS will be getting signal from their respective Tape Returns. This would be a typical mixdown patch. By releasing the FADER SOURCE switch, the large Channel FADERS will get signal from the Line inputs, which is the typical patch for recording & overdubbing.

The MONITOR SOURCE switch, lower in the channel strip, works the same way but in reverse: down for MIC/LN, up for tape.

Equalizer section

75 Hz switch

The graphic under this switch shows what this does: it cuts frequencies below 75 Hz at a rate of 18 dB per octave. This is called a “high pass filter”, but some people prefer to think of it as “low cut filter”. It’s always available to the channel path, even if the EQ IN switch is out. It is used to filter out undesirable subsonic frequencies which may be present in the signal (air conditioning rumble, mic stand noise, etc.).

If you push this switch, you often won’t hear any difference, because so few instruments (and no voices) actually have harmonics below 75 Hz, and many loudspeakers don’t have good response below this point. As a rule of thumb, you don’t want to press the 75 Hz switch on instruments such as kick drum, bass, or keyboards; but it can be very useful on voices (especially if you’re boosting the 125 Hz region to get an effect using the LOW or MID controls).

EQ IN Switch

This inserts the equalizer controls (with the green knobs) into the channel signal path. When down, the EQ is in the signal path. This switch has no effect on the 75 Hz control (see above). If you’re not using the EQ, the channel path will be a little bit quieter if you bypass the EQ by leaving this switch UP. It’s also helpful to see if the EQ you’ve spent 10 minutes adjusting is actually helping the sound, by comparing the in and out positions.

HIGH and LOW

These are standard shelving “treble and bass” tone controls. The HIGH knob range is +/- 15 dB at a fixed frequency of 12 kHz. This means that frequencies above 12 kHz will be boosted or cut by the same amount, and frequency response between 1 kHz and 12 kHz will gradually rise or fall to the shelving point. The LOW knob range is +/- 15 dB at a fixed frequency of 80 Hz. This means that frequencies below 80 Hz will be boosted or cut by the same amount, and frequency response will gradually rise or fall from 80 Hz to about 1 kHz.

MID EQ controls: LEVEL, FREQ, and Q

The Studio 32 features a “fully parametric midrange”, which means that you can control several *parameters* or aspects of the midrange, besides just cutting and boosting a predetermined frequency range. Combined with the HIGH and LOW EQ controls, these make up a 3-band equalizer that can create the vast majority of tones you may need.

The Mid controls consist of three knobs: FREQUENCY, MID GAIN and Q (bandwidth). Notice that the FREQ and Q controls are a lighter shade of green, to help you identify them.

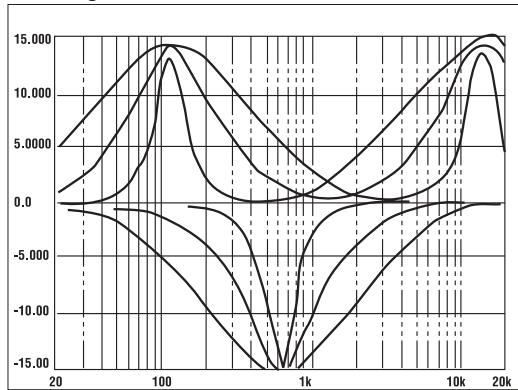
The FREQ knob changes the center frequency of the EQ. The range is sweepable between 120 Hz (bass) to 14 kHz (extremely high treble).

The MID GAIN knob controls how much boost or cut is applied to the band chosen. At the center detent position, there is no effect (flat response). Turning to the right amplifies the band, to a maximum of 15 dB. Turning to the left cuts the band, to a maximum cut of -15 dB.

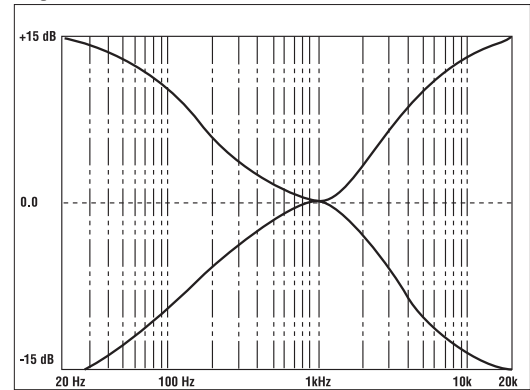
The Q, or bandwidth, can be adjusted to select the range of frequencies around the center frequency that will be most affected by the boost or cut. It can be set to as little as 1/6th of an octave when turned completely left, or to almost 2 octaves when turned completely clockwise.

To learn how the midrange EQ works, put some broadband material (like a CD) into a channel at a low level, and press the EQ IN switch down. Boost the mid level to its maximum, turn the Q control all the way to the left, and then sweep the FREQ control to hear the effect. You usually won't use such a dramatic EQ setting on a mix, but it will help you get acquainted with the center frequencies this affects.

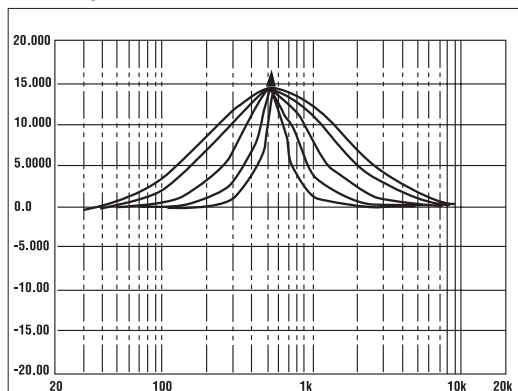
Midrange EQ



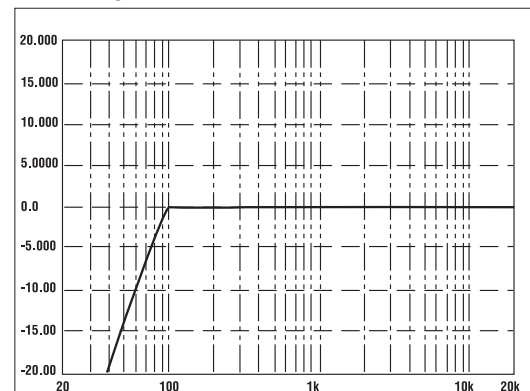
High and Low EQ



Midrange: Broad To Narrow Q



75 HZ High-Pass



Auxiliary Send Section

AUX 3(5) SOURCE Switch

The AUX SOURCE switch selects the input for the Aux 3(5) Send control directly below it, and only for that one control.

- When this switch is up, Aux 3(5) is a post-fader send from the Channel fader.
- When this switch is down, Aux 3(5) is a post-fader send from the Monitor LEVEL control.

The purpose of this switch is to let you send to effects from the Monitor section on some channels if you wish, while sending to two different effects from a Channel fader simultaneously on other channels. **The Aux 3(5) Source switch affects the upper AUX send only; it has no effect on the lower AUX send. AUX 4(6)'s source is always the channel FADER.**

AUX 3(5) and AUX 4(6) Sends

These blue knobs are both mono post-fader sends typically used for effect sends. The upper AUX 3(5) knob controls how much signal will be sent to either AUX SEND 3 or AUX SEND 5, as set by the TO 5/6 switch. The AUX 4(6) knob controls how much signal will be sent to either AUX SEND 4 or AUX SEND 6, as set by the TO 5/6 switch. Aux 3(5)'s input can be derived from either the Channel or Monitor, as determined by the AUX SOURCE switch (see above); **the lower AUX 4(6) send always gets its signal from the channel fader.**

The unity-gain position of the AUX SENDS is at full rotation. Additional gain is available at the AUX MASTERS.

TO 5/6 Switch (Aux Assign Switch)

The TO 5/6 switch, found between the 3(5) and 4(6) knob, is an auxiliary assignment switch. As you can tell from its placement inbetween the two aux send controls, it affects both knobs simultaneously.

- When this switch is up, the AUX 3(5) knob sends signal to Aux Send 3, and the 4(6) knob sends signal to Aux Send 4.
- When this switch is down, the AUX 3(5) knob sends signal to Aux Send 5, and the 4(6) knob sends signal to Aux Send 6.

The reason for this switch is to allow you to use the Aux controls for different purposes on different channels. For example, you may connect your primary reverb effect to Aux sends 3 and 4, since you'll use it on many channels at once. But a special effect (a slap-back delay, or a gated reverb) may only need to be used on a few channels (guitars, or drums), so Aux sends 5 and 6 are the logical choice here.

MONITOR 1/2 SOURCE switch

This selects the source of the monitor controls beneath it in the same way that the FADER SOURCE switch at the top of the input channel selects the source of the channel fader. It determines where the monitor signal is coming from.

- When this switch is UP, the TAPE IN jack is the source of the Monitor send.
- When this switch is DOWN, the LINE IN/MIC IN jack (having already passed through the TRIM control) is the source of the monitor send. Whether the MIC/LINE signal is pre- or post-EQ is set by the position of the CHANNEL SOURCE switch: if the channel and monitor are both set to MIC/LINE, it will be post-EQ. In all other switch positions, the MONITOR 1/2 feed is pre-EQ.

MONITOR 1/2 LEVEL, MONITOR 1/2 PAN

The purple LEVEL knobs control how much signal will be sent to the MONITOR 1/2 MASTER. The left/right balance of the MON 1/2 mix is set by the black PAN control directly above this knob. MONITOR 1/2 is a pre-fader, pre-mute stereo send typically used for control room monitors and headphone feeds. By turning the PAN fully left, the signal is routed only to MON 1. When turned fully right, the signal is routed only to MON 2. Its input can be derived from either the Channel or Monitor, as determined by the MONITOR SOURCE switch (see above). Its unity-gain position is at full rotation.

Channel Output Section

Channel PAN

The Channel PAN control sends the output of the channel in continuously variable degrees to either side of the stereo mix (if L/R switch is pressed -- see below), or to odd-even sides of the Group Assignment switches (pan left for Groups 1 and 3, pan right for Groups 2 and 4). The PAN control is a combination “where to/how much” control, in that it controls both the level and direction of a signal.

MUTE

The MUTE switch turns off the signal from the Channel Fader. It disconnects the signal from the L/R Main outputs, the Group outputs, the DIRECT OUT, and any Aux Sends. When pressed, the PEAK LED will light solid.

The MUTE switch has no effect on the MONITOR 1/2 control.

PEAK LED

The red Channel PEAK LED will flash when the channel’s signal level (measured at several places in the channel) is within 5 dB of “clipping” or distortion. If it flashes, reduce the TRIM knob (or the EQ, or the gain of any device at the INSERT jack) until it stops flashing.

The PEAK LED will come on solid when the MUTE key above it is pressed.

-20 dB (Signal Present) LED

The green “-20” LED will light whenever a signal of -20 dB or higher is present anywhere in the channel circuit. This will help you determine what instruments are on what channels, and if the TRIM controls are set properly. The “-20” LED has a second function as an indicator for the SOLO switch, described below.

SOLO

The SOLO button sends the channel's signal (and only that Channel's signal, if no other SOLO buttons are pressed) directly to the Control Room monitors, cutting off any other signals to the Control Room. It allows the engineer to focus on one signal without disturbing any other mixes. When SOLO is pressed, the green "-20" LED will light solid (even if no signal is present). The soloed Channel also feeds the headphone outputs if the HEADPHONE SOURCE button in the master section is in the up or "CR" position (see page 73). The master SOLO LED will light in the Master module section, to alert you that Solo is active. You can adjust the output level of the signal(s) being soloed by turning the SOLO knob in the Master module section. The meter will show the level of the soloed signal, unaffected by the master solo level knob, so you can easily compare the level of individual channels and, in PFL mode, set the TRIM control accurately.

Group Assign Switches (1/2, 3/4)

The GROUP ASSIGN switches (1/2, 3/4) assign the output of the Channel (large fader) to any of the four Group output busses, usually for recording on a multitrack. Each switch is an odd-even pair, and the amount of signal sent to odd or even numbered groups is determined by the Channel PAN knob. These may be used in any combination.



Note that even when a Group switch is down, no signal will go from the channel to the Group if the Channel PAN knob is turned to the wrong side.

L/R Switch

The L/R switch sends the channel's signal to the Master L/R FADER, depending on the setting of the Channel PAN knob. This switch is normally pressed for final mixdown, or if the channel is being used for monitoring.

Channel Fader

This linear 60 mm slide fader varies the level feeding the Channel PAN control and Assignment switches, Aux 4(6), and Aux 3(5) (if the AUX 3(5) SOURCE switch is in the up or FADER position). The fader is set for unity gain (level in = level out) when it is set at the "0 dB" mark, 2/3 of the way up. When the fader is raised to its maximum, there is 10 dB of gain added to the signal.

MASTER SECTION

On the right hand side of the console are controls that affect the outputs of the mixer.

Power and Phantom indicators

The switches for these indicators are located on the back panel. The PHANTOM LED indicates that 48 volt phantom power is being applied to all 16 XLR jacks

Headphones Level and Source

The LEVEL knob sets the overall level of the two headphone output jacks next to it. The HEADPHONES SOURCE switch has two positions: CR (CONTROL ROOM) and MON 1/2. When CONTROL ROOM is selected (switch UP), the headphone is sent the same signal appearing at the Control Room outputs (but independent of the Control Room's level control). When the switch is down, the Headphones are sent the signal at the MON SEND 1 and 2 outputs. This allows you to hear the pre-fader monitor mix.

Phone jacks

The headphone jacks on the front panel are designed for most stereo headphones. The internal headphone amplifier outputs the maximum power allowed by safety standards. The impedance and efficiency of the headphones will determine the maximum volume available. Eight-ohm headphones may be louder at a given setting than 150-ohm or 600-ohm headphones; however, there should be enough gain to drive any dynamic headphone to reasonable levels if the mixer is being run properly.

Stereo Aux Return Section

This section is essentially an eight-input addition to the channels, squeezed into the top of the master section. This section is where you determine how much signal will be heard from effect devices.

MON 1/2

Turn these purple knobs in order to hear the Stereo Aux Returns in the Monitor 1/2 mix. This is a pre-fader stereo send typically used for performer monitors and headphone feeds. Signals from the left input will go to Monitor 1, and signals from the right input will go to Monitor 2. The MON 1/2 send is not affected by the LEVEL control beneath it.

LEVEL

The grey LEVEL controls set how much signal from the Stereo Aux Return inputs will be sent to the Aux Return ASSIGN switches. In that sense, they are just like the Channel Faders in function.

L/R Assign Switch

This switch routes the signal from the Stereo Aux Return jacks to the Master L/R FADER, with the left input going to the left and right going to right. If no plug is inserted into the Right input, the left signal will be connected to both sides, appearing in the center of the stereo image.

GRP 1/2 Assign Switches (Stereo Aux Return A and B Only)

GRP 3/4 Assign Switches (Stereo Aux Return C and D Only)

The Aux Return Assign switches (1/2, 3/4) route a Stereo Aux Return to two of the four Group outputs, as written. They work in the same way as the CHANNEL ASSIGN switches (see page 72). Press these switches if you want to record an effect (or other device plugged into the Stereo Aux Return inputs) onto the multitrack. Left inputs will be routed to the odd-numbered groups, and right inputs to the even-numbered groups. If no plug is inserted into the Right input, the left signal will be connected to both groups, appearing in the center of the stereo image.

SOLO IN PLACE Switch

The SOLO IN PLACE switches in the Stereo Aux Returns are a special kind of SOLO switch to allow you to hear the effect returns in the control room mix. It sends the return's post-fader signal (and only that Monitor's signal, if no other SOLO buttons are pressed) directly to the Control Room monitors, cutting off any other signals to the Control Room. Unlike the channel SOLO switches, however, the SOLO IN PLACE switches do not work when the master solo section is in PFL (Pre-Fade-Listen) mode, denoted by the red LED next to the solo master. The control room signal will be cut off, but you will not hear anything from the Aux Returns until you set the solo status switch to SIP (green LED).

Aux Master Controls

Auxiliary Masters

The four blue knobs in the Aux Master section provide the final overall level control for the Aux Send mixes. They get their signal from the individual Aux Send level controls to the left. The signal then goes to the respective AUXILIARY OUTPUT jacks on the back panel, and to the appropriate Control Room select switch. Adjust the Aux Masters for the correct level feeding your external effects device. The nominal (unity gain) setting for these controls is approximately “2 o’clock.”

Monitor 1/2 Master

This purple knob is the final overall level control for the Monitor 1/2 mix (the sixteen controls to its left, plus the four in the Stereo Aux Return section). This controls the level at the AUXILIARY OUTPUT 1/2 (labeled “MON” underneath) jacks on the back panel, the MON 1/2 switch in the Control Room section, and the MON 1/2 selection of the HEADPHONES SOURCE switch. Adjust the Monitor 1/2 Master for the correct level feeding your external headphone or stage monitor amplifier. The nominal (unity gain) setting for this control is approximately “2 o’clock.” Set it there if the MON 1/2 mix will be used to add more inputs to the final mix using the LINK switch, described below.

LINK TO L/R switch

This is a powerful switch that allows you to turn the Studio 32 into a 32-input stereo mixer, instead of a 16-input mixer with an in-line monitor section. The LINK TO L/R switch routes the MONITOR 1/2 MASTER signal to the Master L/R FADER.

Regardless of whether the LINK switch is up or down, the MONITOR 1/2 signal always feeds the headphone source and control room source switches, as well as the AUX 1/2 output jacks on the rear panel. The LINK switch simply mixes or assigns the 16x2 monitor mix to the L/R mix buss as well.

If you are sending the Monitor signal to the headphones or control room, but don’t want that signal on the Master L/R stereo output, leave the LINK TO L/R switch off (up).

If monitors are not being used as extra inputs during mixdown, turn the LINK switch off for the best signal-to-noise ratio.

Control Room/Solo Section

The Control Room section determines what you'll hear in the control room and see on the meters. The Control Room section does not affect any other mix of the Studio 32—it just eavesdrops on them. The Solo controls are a special part of the Control Room mix, “taking it over” anytime any SOLO switch is pressed anywhere on the console, allowing you to hear only the soloed source instantly.

Solo Master Level

If any SOLO switch is pressed anywhere on the console, the MASTER SOLO LED will light indicating that the Control Room is receiving signal from the Solo buss instead of the Control Room Source switch (see below).

Note that if SOLO is engaged on a Channel that has no signal in it, you will hear nothing in the Control Room until SOLO is turned off on that Channel.

The SOLO knob sets the level you will hear in the Control Room when SOLO is pressed. Typically it is set a little above unity gain (about 2 o'clock), so that a single instrument will sound about as loud in the Control Room as the entire mix does, allowing you to focus.

Solo SIP/PFL switch

The Studio 32 allows you to use the SOLO system in two different ways:

- SIP (Solo In Place): In this mode (SIP/PFL switch UP, green MASTER LED), you will hear instruments in their post-fader, post-pan arrangement. This is the mode to use when mixing down, so you can adjust the levels of a stereo track, etc.
- PFL (Pre Fade Listen): In this mode (SIP/PFL switch DOWN, red MASTER LED), you will hear instruments in the control room pre-fader. This means that even if their faders are down or MUTE is on, you will hear it in the center of the control room mix and see the level of that input on the meter. Use this mode to check an input before bringing it into the mix, or to set the proper TRIM level.

The SOLO signals from the channels and Aux Returns are stereo, coming from post-fader, post-pan. The PFL signals are mono.

The Stereo Aux Returns work only in SIP mode, not in PFL mode.

Control Room Level and Source

The CONTROL ROOM knob sets the overall Control Room level. Ideally, the control room amplifier's input controls should be set so that full rotation of this control does not exceed the maximum level you want in the control room.

The Control Room switches select the source of the Control Room mix (provided that no SOLO source is turned on to override them). They also select the source of the two meters.

When all switches are up, L/R will be selected, providing the Main L/R mix. If any switches are pressed, you'll hear the lowest switch (for example, if “2 TRACK” is selected, you won't be able to hear MON 1/2 even if it is pressed).

Press MON 1/2 when you wish to route the headphone mix (Aux Send 1 and 2 output) to the Control Room. AUX 3/4, AUX 5/6, GRP 1/2, and GRP 3/4 may also be selected. 2 TRACK corresponds to the 2 TRACK INPUT jacks on the rear of the Studio 32. These can be used to listen to the output of a mixdown tape recorder, or CD player.

MONO

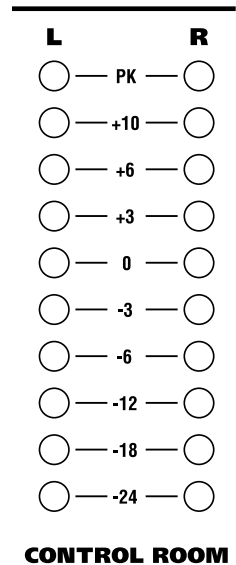
The MONO button, when pressed down, sums the left and right sides of the selected Control Room mix to monophonic. By using MONO mode, you can check for phase cancellation and mono capability. This is good to use when you want to hear how your mix will sound on AM radio or television.

Master L/R Fader

The Master L/R fader adjusts the total output level of the stereo signal. It gets its signal from the stereo busses, which are fed by any Channels, Monitors, Groups and Aux Returns which have their L/R switch down. They send signal to the MAIN OUT L and R jacks, and the CONTROL ROOM switch (where it can be heard if all other switches are up). Unity gain is achieved when the fader is all the way up.

Meters

The L and R meters will display whatever is selected as the Control Room source, including SOLO. When SOLO is on, the meters show you the pre- or post-fader level of an individual channel. These are peak-type meters which respond to the immediate level.



When the meters read “0” (top green LED), the signal is at its nominal output (+4 dBu balanced, -2 dBu unbalanced) RMS. Typically, signals should be lighting a few yellow LEDs. When the top red LED “PK” flashes, signal is at +18 dB over nominal (that’s +22 dBu in a balanced circuit, +16 dBu in an unbalanced circuit). But you still have 5 to 6 dB of headroom before the summing amps distort (although, depending on your settings, you may be clipping some other part of the mixer in order to get level).

In PFL mode, both meters will show you the post-TRIM/pre-fader level, so you can adjust it for the best balance between low distortion and low noise. You’ll find in this mode that the main meter’s PK LED will light at almost the same level the PEAK LED in the channel does. Adjust your trim so that such flashes are rare, but make sure you’re getting some yellow segments in the meter. (For more on metering, see page **Error! Bookmark not defined.**)

Group Master Controls

The Groups may be used as sends to the tape recorder in recording applications, or as subgroups or zone masters in PA applications.

TO L/R switches

These switches are primarily used when submixing for PA applications, or possibly during a complicated recording mixdown. The first TO L/R sends Group One's signal to the left side only and Group Two to the right side only of the Main L/R mix. The other TO L/R switch does the same for groups 3 and 4. They're essentially the same as the LINK TO L/R switch under the MONITOR 1/2 MASTER: if these switches are up, anything routed to a group only goes to the group output. When these switches are down, the group is sent to the L/R mix as well.

For example, if you have ten different drum mics that are in perfect balance with each other, but you need to bring the level down in the PA, turn the drum channels' L/R switches off, assign them to Group 1/2, and press Group 1/2's TO L/R switch. The Group 1/2 faders are now a submaster for the entire drum mix in the left/right stereo mix feeding the PA or mixdown deck.

MONO switch

Sometimes you may need four separate subgroups, instead of two stereo pairs. The MONO switches allow you to do this. When MONO is down, Group 1 will feed both left and right of the L/R mix, so, for example, it may be used as a vocal subgroup. (If there was no MONO switch and you did a subgroup, all the vocalists would wind up hard-panned to the left side of the mix only.) Group 2 will also appear in the center of the L/R mix. Because there is a separate MONO switch for Groups 3 and 4, you can make four mono subgroups or two mono subgroups and a stereo subgroup for instruments.

Group 1—4 Master

The four Group Master FADERS adjust the total output level of all signals assigned to each Group. They get their signal from the ASSIGN switches in the Channels and the Stereo Aux Returns. They send signal to the four Group output jacks, the GRP Control Room switches, and the TO L/R switches explained above.

Note: The GROUP FADER of the Studio 32, like the L/R Master, is at unity gain ("0 dB") when all the way up, not at 2/3 travel as with some other consoles. This allows you a greater range of control on fadeouts, and makes it easier to "dial in" the best gain structure, since the "sweet spot" of the fader is actually in a useful part of the taper.

L/R Master Fader

This is a stereo 60 mm fader with its unity 0 dB position at the top of its travel, like the group faders. Signal from the L/R output feeds the Control Room switch, and the back panel MAIN OUT jacks which are normally connected to a mixdown deck, or to a PA system.

Back panel

POWER switch

This is the master power switch for the Studio 32. When it's ON, the red LED on the front panel will light.

Power cable

An industry-standard removable power cable is shipped with your Studio 32. If you lose it, or need a longer or shorter length, compatible cables are available from electronics and computer stores. The type is sometimes referred to as a "NEMA to CEE" cable, or an "IEC power" cord.



Never defeat the grounding pin of the power cable. Use only approved power cables.

PHANTOM Switch

When this switch is pressed, it applies phantom power to the XLR microphone jacks on all channels, and the yellow PHANTOM LED on the front panel will light. 48 volts DC appears equally on pins 2 and 3 to be used by condenser-type microphones requiring external power. Since this voltage is equal, it is "invisible" to standard balanced dynamic microphones, hence the name, "phantom power." Check the manual for the mics you plan on using to make sure that this phantom method is correct before you apply power.



*The PHANTOM switch must be turned off if any electronically balanced line source (such as the balanced output of a tape recorder or CD player) is connected to any XLR MIC IN jack; it could damage the output circuitry of such units. **When you turn PHANTOM off, it is normal for it to decay gradually**; make sure the yellow PHANTOM LED is totally off before plugging electronic units in to the MIC jacks.*

Note: Make sure the channel volumes are set to minimum or are muted before switching the PHANTOM switch on. The voltage surge at initial turn-on may cause a loud "pop" in the system.

Control Room Out

Connect these jacks to the input of your control room amplifier. Signal comes here from the Control Room section of the speaker. The jacks are 3-conductor with a forward-referenced ground to avoid ground loops, and may be used balanced or unbalanced.

2 Track Tape In

Connect the output of your 2-track (cassette, DAT, CD-R, reel-to-reel, etc.) to these jacks. Any stereo source connected here may be heard in the control room mix only. As with all Studio 32 input jacks, you may connect balanced TRS or unbalanced sources here.

Main Outs

Connect these jacks to your primary destination: the PA system's inputs, or the 2-track mixdown recorder. Signal comes here from the L/R MASTER FADER, and passes through the Main Inserts. This output is a true, 3-wire balanced differential output with a maximum output level of +28 dBu.

Main Inserts

If you want to compress or equalize the stereo mix before it hits the L/R fader, connect your processing device to these jacks using a 1/4" TRS 3-conductor "splitter" cable ("tip" connector to the input of the device, and "ring" to the return), same as for the channel insert jacks. See page **Error! Bookmark not defined.**

Group Outputs

Connect these jacks to the first four inputs of a multitrack recorder such as the ADAT, whose input normalizing feature allows you to go to any of the eight tracks (Group 1 will feed tracks 1 and 5, etc.). In PA applications, you may connect these jacks to amplifiers for specific zones (Group 1 feeds a center cluster, Group 2 feeds side fills, etc.). In broadcast applications, these may be used to provide "mix minus" or matrix feeds. These jacks are true balanced +4 dBu nominal level (+28 dBu maximum) outputs on a TRS 3-conductor phone jack.

Stereo Aux Return Input Jacks

These eight balanced TRS input jacks are arranged along the top of the jack field for easy repatching. Connect the output of your effects devices, or any other stereo input that doesn't require EQ here. Traditionally, the "A" inputs are fed by an effect device fed by Auxiliary Output #3, the "B" by a device fed by Aux 4, etc.

Auxiliary Outputs (including Mon 1/2)

Auxiliary Outputs 3, 4, 5 and 6 are normally connected to the inputs of effect devices. The MON 1/2 jacks may be fed to a headphone amplifier in recording applications, or to a stage monitor system in PA applications. These jacks are 3-conductor TRS with a forward-referenced ground to avoid ground loops.

Channel Input/Output Jacks (16)

Direct Out

This jack provides the output of the channel, post-fader. Connect it to the input of a multitrack tape recorder if you need to record more than four tracks at a time, or if you only need one microphone per track. Unlike most DIRECT OUT jacks on other consoles, these are true +4 dBu balanced outputs, so you can easily repatch the sends to the tape recorder between the group and direct outs.

In theory, the DIRECT OUT jacks provide a cleaner signal than that of the GROUP OUT jacks, but the difference is almost unmeasurable. You can be confident that if it's more convenient for you, it's perfectly OK to record from the Groups.

Tape In

Connect the outputs of your multitrack tape recorder to these jacks. It may be +4 dBu balanced (+26 dBu maximum level) or -10 dBV unbalanced. Actually, any typical line input (such as the output of a synthesizer or effect device) may be connected to these inputs, so you could use the Studio 32 as a 32-input line mixer, by running the “tape inputs” through the MONITOR 1/2 section, linked to the L/R Master. However, note that the TAPE IN jack does not pass through the TRIM control, so extremely low-level or high-level signals should be connected to the LINE IN jack instead.

Insert jack

This is a 3-conductor unbalanced send/receive jack for whatever is selected by the FADER SOURCE switch. The post-trim, pre-EQ, pre-fader signal appears at the tip connector, and the ring connector is an input to the Equalizer section of the channel. This is normally connected to an in-line effect processor such as a compressor or equalizer. See page **Error! Bookmark not defined.** for more information on how to use the insert jack.

Line In jack

This input jack may be used with balanced 1/4” TRS or unbalanced 1/4” sources. It connects to the Mic/Line side of the FADER SOURCE and MONITOR 1/2 SOURCE switches of the channel. Line signals pass through the TRIM control, which allows them to accept a wide range of input level (from +14 dBu nominal to -36 dBu nominal). When the TRIM is set to maximum, the LINE IN signal will be amplified 40 dB. When TRIM is at minimum, it will be attenuated (lowered) 10 dB.

The LINE IN and MIC IN jacks of a single channel may not be used simultaneously.

Mic In jack

This balanced XLR connector is intended for use by low-impedance microphones needing preamplification. It is wired in the standard configuration (Pin 1 shield, Pin 2 “hot”, Pin 3 “cold”) and will receive 48-volt phantom power when the PHANTOM switch is on.

When the TRIM is set to maximum, the MIC IN signal will be amplified 60 dB. When TRIM is at minimum, it will be amplified 10 dB.

Warning for use with line sources: Though the MIC IN may be used with a balanced line-level source such as the output of a VCR, headroom will be limited; even with the TRIM at minimum, it will clip at +11 dBu. For this reason, it’s better to connect balanced line sources to the LINE IN jack using an XLR-to-1/4” TRS adapter or cable.



Never connect an electronic line input to the MIC IN jack if phantom power will be turned on. Doing this could damage the equipment and the Studio 32.

CHAPTER 8:

TROUBLESHOOTING

Troubleshooting Index

If you are experience problems while operating the Studio 32, please use the following table to locate possible causes and solutions before contacting Alesis customer service for assistance.

Symptom	Cause	Solution
The POWER LED does not light when the ON/OFF switch is turned on.	No power.	Check that the power cable is plugged in properly.
Hiss/noise in output, faders must be raised to top to hear.	Input level is too low.	Turn up the TRIM controls, lower the faders. Set the source(s) to a higher level.
Effects are noisy.	Effects send too low, return too high.	Turn output of effect device up and reduce Aux Return level on mixer. Increase Aux Send levels.
Noise/hum.	Ground loop between devices in system.	See page Error! Bookmark not defined.
	Unshielded cables.	Don't use speaker cables for mixer connections.
No signal from channel.	Device in INSERT jack is stopping the signal.	Remove insert jack, set it to bypass, or reverse input/output of device.
	PAN pot set in wrong direction.	Set to left for GRPs 1 & 3, to right for 2 & 4
	Microphone requires phantom power.	Turn PHANTOM switch on.
Feedback when REC is pressed on recorder.	TAPE OUT is feeding its own input.	Set channel source to MIC/LN or turn off GRP 1/2 & 3/4 switches on tape channels. Use MON 1/2 to hear tape.
Crackling sounds.	Dirty or corroded connections on back of mixer.	Unplug and replug connectors several times, clean plugs.
	A microphone cable has a small short or break.	Use SOLO to find the noisy channel, and replace the cable.

Maintenance/Service

Cleaning and Maintenance

Disconnect the AC cord, then use a damp cloth to clean the console's metal and plastic surfaces. For heavy dirt, use a non-abrasive household cleaner such as Formula 409 or Fantastik. **DO NOT SPRAY THE CLEANER DIRECTLY ONTO THE FRONT OF THE UNIT AS IT MAY DESTROY THE LUBRICANTS USED IN THE SWITCHES AND CONTROLS!** Spray onto a cloth, then use the cloth to clean the unit.

Here are some tips for preventive maintenance:

- Periodically check the AC cord for signs of fraying or damage.
- Unplug the Studio 32's power supply when not in use for extended periods of time.
- Place a dust cover over the console when it is not in use.
- Vacuum around the faders to keep dust from falling into them. **DO NOT SPRAY ANY KIND OF "FADER CLEANER"** or lubricant into the faders. These chemicals may work for a time but over the long run they attract more dirt and will make it noisy again.
- The one place where contact cleaner is useful is on the rear panel jacks and cables. Periodically disconnect the mixer from AC power and all cables, and clean the 1/4" and XLR cable ends with rubbing alcohol or electronic contact cleaner, then work the plug into the jack repeatedly. **DO NOT SPRAY CONTACT CLEANER DIRECTLY INTO THE JACKS OF THE MIXER.** It's better to use a damp plug to clean the jacks, or use a cotton or foam swab (but be careful not to get cotton or foam stuck in the mixer). While Alesis does not endorse the use of any specific product, certain contact enhancers (such as Cramolin) may be used to keep the connections from corroding in the future.

Warranty Information

This product is warranted by Alesis to the original purchaser against defects in material and workmanship for a period of 1 year for parts and labor from the date of purchase. Complete terms of the Limited Warranty are stated on the Warranty Card packed with the product. Please retain a copy of your dated sales receipt for proof of warranty status should repairs be necessary.

Refer All Servicing to Alesis



We believe that the Studio 32 is one of the most reliable mixing consoles that can be made using current technology, and should provide years of trouble-free use. However, should problems occur, DO NOT attempt to service the unit yourself. Service on this product should be performed only by qualified technicians. **THERE ARE NO USER-SERVICEABLE PARTS INSIDE.**

Obtaining Repair Service

Before contacting Alesis, check over all your connections, and make sure you've read the manual. Your Alesis dealer may be able to offer further assistance.

Customers in the USA:

If the problem persists, copy down the serial number of the Studio 32 and call Alesis USA at 1-800-5-ALESIS and request the technical support department. Talk the problem over with one of our technicians; if necessary, you will be given a return authorization (RA) number and instructions on how to return the unit to Alesis or the nearest authorized service center. All units must be shipped prepaid and COD shipments will not be accepted.

You must indicate the RA number on the shipping label or the shipment will not be accepted. If you do not have the original packing, ship the Studio 32 in a sturdy carton or road case, with shock-absorbing materials such as foam or "bubble-pack" surrounding the unit. Shipping damage caused by inadequate packing is not covered by the Alesis warranty. Ship the unit with insurance via a carrier that provides a tracking system.

Tape a note to the top of the unit describing the problem, include your name and a phone number where Alesis can contact you if necessary, as well as instructions on where you want the product returned. Alesis will pay for standard one-way shipping back to you on any repair covered under the terms of this warranty.

Field repairs are not authorized during the warranty period, and repair attempts by unqualified personnel may invalidate the warranty.

Customers outside the USA:

Contact your local Alesis dealer for warranty assistance. Do not return products to the factory unless you have been given specific instructions to do so. **Your warranty is valid only in the country of purchase.**

Internet address: Important information and advice is available on our web site:

<http://www.alesis.com>

E-mail may be addressed to:

alecorp@alesis1.usa.com

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