ALESIS
1622 Mixer

Reference Manual

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Alesis *1622*

Monolithic/Integrated Surface™ Audio Console

USER'S MANUAL

Alesis *1622*

***Monolithic/Integrated Surface*™ Audio Console**

INTRODUCTION

The **Alesis *1622 Monolithic/Integrated Surface*™ Audio Console** is a 16 channel, two buss audio mixing console which features the new *Integrated Monolithic Surface*™ technology. This technology makes available a number of features at low cost which previously could only be found in much more expensive consoles .

The **1622 MIXER** provides excellent sonic qualities, with extremely low noise and crosstalk, flat wideband frequency response, and the superb sweet sound normally associated with consoles costing many times more. Thus the **1622 MIXER** can be used as an additional "Musical Tool" .

Because of the built-in flexibility of the **1622 MIXER**, the unit is at home in any application, be it recording, sound reinforcement, post-production, or as a dedicated keyboard mixer.

WHAT IS A MIXING CONSOLE?

As the name implies, a mixing console "mixes" audio signals together from various sources (microphones, keyboards, tape machines, reverbs, etc.). But unlike a simple "mixer", a mixing console is really the "brain" or center of the entire sound system, regardless of the application, since it not only mixes the signals together, but also provides routing of these signals to tape recorders, effects devices, and other audio systems. The console also allows for adjustment of monitoring levels independent of recording levels.

FEATURES

- ***16 INPUT CHANNELS WITH EQ*** - Plenty of inputs for keyboards, microphones, or effects
- ***6 AUXILIARY SENDS* -** Sends signal to up to 6 outboard effects devices, or 4 outboard effects devices and 2 mono or 1 stereo headphone cue mixes
- ***8 AUXILIARY RETURNS*** - Special dedicated inputs designed to blend the returns of any combination of 8 mono or 4 stereo outboard effects devices
- ***SOLO FUNCTION ON INPUT CHANNELS*** - Enables any overloads or unwanted background noise to be easily detected
- ***2 SUB MASTERS*** - Makes it easy to control several input channels with just one fader (or two for stereo), or control record levels during multitrack recording
- ***CONTROL ROOM MONITOR SECTION*** - Sets a level for the control room monitor speakers that is independent of the main mix
- ***ELECTRONICALLY BALANCED MIC INPUTS*** - A feature normally found on consoles that are many times more expensive, this allows for both lower noise and greater headroom in the most critical stage of the console
- ***MIXDOWN TAPE DECK RETURN* -** Allows you to hear playback of your mix from the stereo mixdown tape machine just by flipping a switch
- *I**NSERTS ON ALL INPUTS AND OUTPUTS*** - Allows for patching outboard signal processing devices such as EQ's, compressors, and effects directly into the signal path
- ***8 DIRECT OUTPUTS*** - Allows for the quietest operation by bypassing unused electronics and sending the channel signal directly to the input of a Multitrack Tape Machine

SECTION 1

DESCRIPTION OF CONTROLS

TOP PANEL

INPUT TRIM
The INPUT TRIM is a variable gain control that allows the preamp stage of the mixer to boost the level of a mic or line level signal being fed into the input. The input section of any mixer is the most critical due to the high gain required to amplify such a low level signal (such as that of a microphone) to a usable level. If the gain is set too high, a hot signal from a synthesizer or loud vocalist will cause the input stage to overload and distort. If the gain is set too low, additional gain must be added at some other point in the mixer (such as the faders) which could cause excessive background noise at the output.

EQ
The equalizer, or EQ, section consists of simple bass and treble controls similar to that of a guitar amp or home stereo. EQ allows for any tonal shaping that might be required by a signal. For the technically minded, these are known as shelving equalizers and have turnover points at 10KHz and 100Hz. This means that the maximum boost or cut begins from 10KHz (and 100Hz for the low frequency EQ) and maintains this "shelf" or plateau from 10KHz to 20KHz. The frequencies below 10KHz are also affected, but less and less so as the frequency of the signal gets further away from 10KHz. *See Figure 1*

FIGURE 1
HI AND LO SHELVING EQ OF THE *1622* MIXER
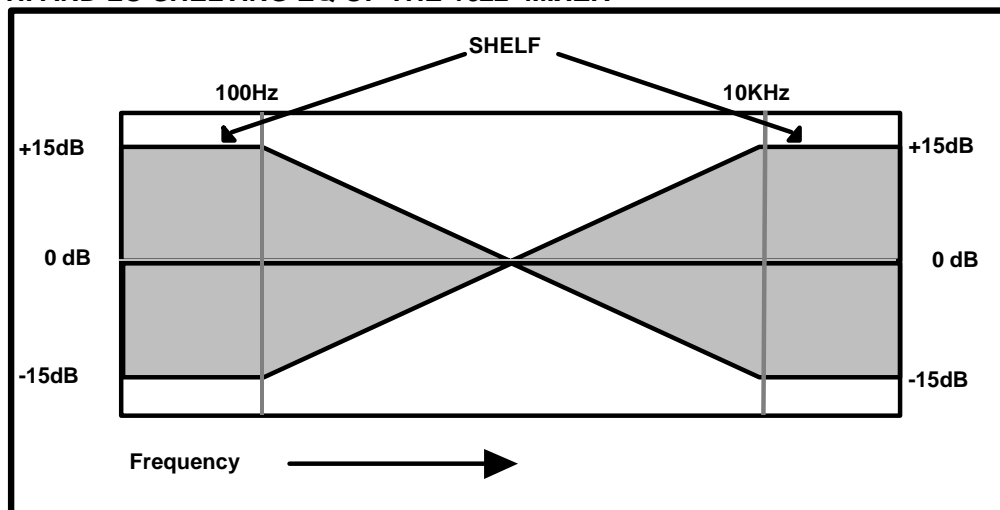
SENDS
SENDS (sometimes called "Auxiliary Sends" or "Aux's") are adjustable feeds from the input channel that are used to send part of the signal to an outboard effect, like a reverb, delay, or chorus, or to set up a separate cue (headphone) mix for musicians headphones during recording and overdubbing. There are two different types of SENDS included in the *1622*. These are:

PRE-FADER SENDS
SENDS 1 and 2 are derived from the signal path before the Channel Fader. This means that movements of the channel fader will have *no* effect on the amount of signal being sent to any equipment connected to these SENDS. For this reason, these auxiliary sends are normally used as cue sends (sends to headphones while recording) because any movement of the channel

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faders will not upset the headphone balance. Pre-Fader SENDS can also be used to send a signal to outboard effects as well. ***See Figure 2A and 2B***

FIGURE 2A
PRE-FADER SEND LEVEL FROM THE *1622 MIXER* TO EFFECTS DEVICE WITH CHANNEL FADER UP
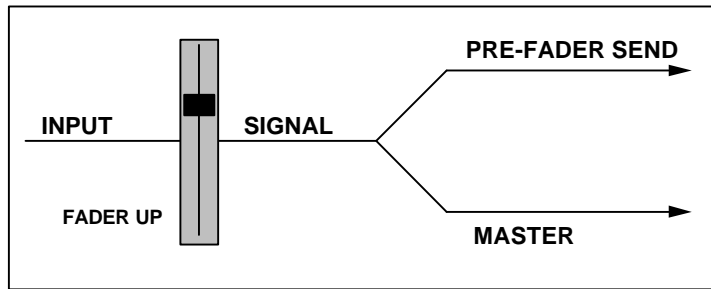
FIGURE 2B
PRE-FADER SEND LEVEL FROM THE *1622* TO EFFECTS DEVICE WITH CHANNEL FADER
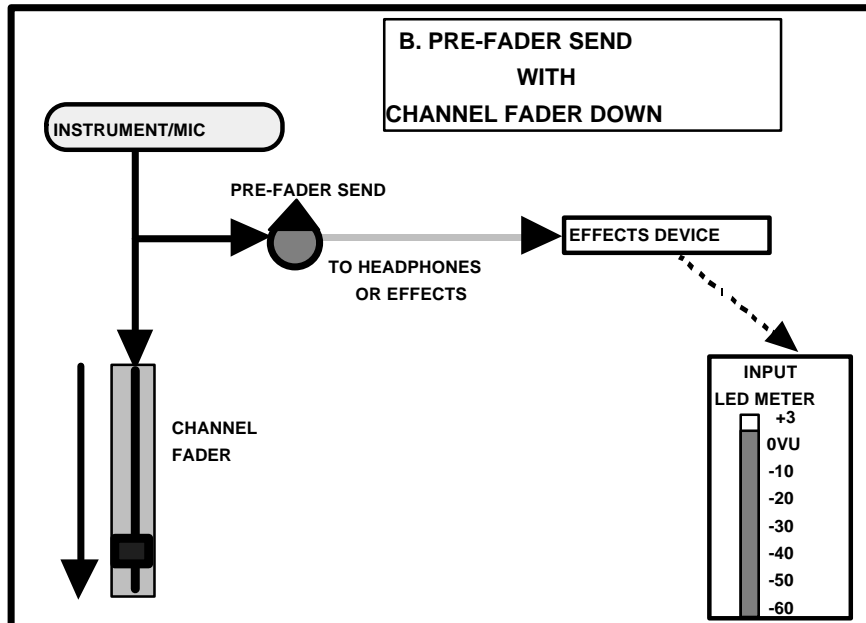
POST-FADER SENDS
SENDS 3 through 6 are derived from the signal path after the Channel Fader which means that their levels will be changed in direct relationship to the Channel Fader level. This means that when the Channel Fader is either increased or decreased, the send level will also be increased or decreased and the effects (or headphones) would get louder or softer. Since this wouldn't be too great for a headphone balance, these Post-Fader sends are normally used to send to outboard effects devices such as reverbs. Unlike most other mixers which may have only 1 or 2 Post-Fader Sends, the **1622 MIXER** has a total of 4 Post-Fader Sends. ***See Figure 3A and 3B***

FIGURE 3A
POST-FADER SEND LEVEL FROM THE *1622 MIXER* TO EFFECTS DEVICE WITH CHANNEL FADER UP

A. POST-FADER SEND
WITH
CHANNEL FADER UP

INSTRUMENT/MIC

CHANNEL FADER

INPUT
LED METER
+3
0VU
-10
-20
-30
-40
-50
-60

POST-FADER SEND

TO HEADPHONES
OR EFFECTS
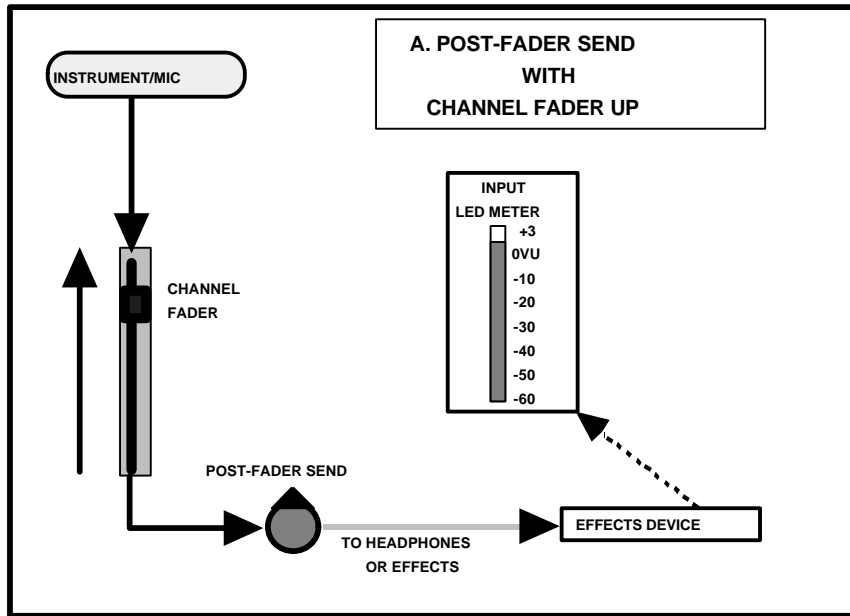
EFFECTS DEVICE

FIGURE 3B
POST-FADER SEND LEVEL FROM THE *1622 MIXER* TO EFFECTS DEVICE WITH CHANNEL FADER DOWN

B. POST-FADER SEND
WITH
CHANNEL FADER DOWN

INSTRUMENT/MIC

CHANNEL FADER

INPUT
LED METER
+3
0VU
-10
-20
-30
-40
-50
-60

POST-FADER SEND

TO HEADPHONES
OR EFFECTS

EFFECTS DEVICE
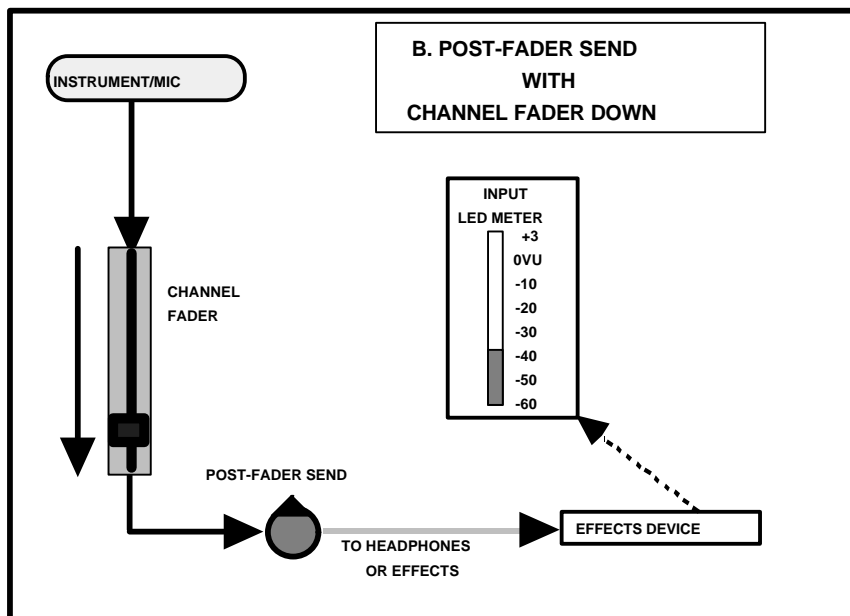
MASTER ASSIGN SWITCH
Routes the channel signal directly to the MASTER Stereo Buss.

SUB MASTER ASSIGN SWITCH
Routes the channel signal directly to the SUB MASTER.

MUTE SWITCH
Turns the channel off. The MUTE switch does not affect the signal on SENDS1 and 2 but will mute SENDS 3 through 6.

SOLO SWITCH

SOLO disconnects the normal signal feed to the monitor speakers and replaces it with the signal present at the Channel Fader. When a channel is soloed, the signal will be heard in mono regardless of the position of the pan pot, and without any effects via the Sends and Returns.
Soloing enables the engineer to hear exactly what is being recorded by eliminating the masking effects caused by the presence of other signals. When soloed, distortion caused by overloading or other undesired background noises in an input channel can be heard easily.
SOLO switches can be used at any time without interrupting the signals sent to the headphones or recorded on tape since the soloed signal is only heard through the Monitor Speakers. By engaging additional SOLO switches, as many signals as desired can be soloed simultaneously.

PAN POT
The PAN POT places the signal of the channel anywhere in the stereo field between the left and right channels of the MASTER or SUB MASTERS (or both) depending upon which is assigned. If the PAN is set all the way to the left, the signal will appear only on the left SUB MASTER or MASTER fader. If the PAN is set all the way to the right, the signal will appear only on the right SUB MASTER or MASTER fader.

CHANNEL FADER
The CHANNEL FADER determines the overall volume level of the channel. It is normally best to keep this FADER at about the 3/4 level for the most headroom and least background noise.

SEND MASTERS 1 through 6
This is the overall master for the corresponding SEND of each channel. Therefore, if the level of SEND 1 was too hot and causing distortion, the overall level could be trimmed by adjusting SEND MASTER 1, which would lower the signal without having to individually adjust each channel SEND.

TAPE/MONITOR SWITCH
When the *1622 MIXER* is used for recording, this switch will determine what you hear in the control room monitor speakers. When in the TAPE position, the signal from the Mixdown Tape Deck will be heard and can be adjusted from the MONITOR VOLUME pot. When in the MONITOR position, the signal from the console, as adjusted by the MASTER Faders and MONITOR VOLUME pot, will be heard.

MONITOR DEFEAT SWITCH
This switch will mute the signal going to the control room monitor speakers in the event that it is necessary to monitor with headphones via the headphone jack. This switch has no effect on the signals appearing at the MASTER Faders.

MONITOR VOLUME
The MONITOR VOLUME Control adjusts the volume level of the control room monitor speakers only. When the *1622* is used as a recording console, it is necessary to be able to control the level of the control room monitor speakers and the MASTER Fader output levels independently. Without the separate MONITOR VOLUME control, both the control room speakers and the mixdown tape level would be controlled by the MASTER Faders, which would cause either a distorted or noisy signal going to tape when the speaker levels were correct, or too loud or soft speaker levels when the tape machine levels were correct.

EFFECTS RETURNS
The EFFECTS RETURNS are additional inputs (besides the 16 Channel Inputs) especially for outboard effects such as reverbs, delays, chorus, etc. These inputs eliminate the need to connect effects to channel inputs and, therefore, keep the input channels available for additional microphones, synthesizers, etc.
There are 8 EFFECTS RETURNS on the *1622 MIXER* . RETURNS 1 through 4 each have a PAN control which allows the the return signal to be placed anywhere in the stereo spectrum from left to right. RETURNS 5 and 7 are permanently assigned to the Left MASTER Buss, and RETURNS 6 and 8 are permanently assigned to the Right MASTER Buss.

SUB MASTER FADERS

The SUB MASTER Faders can serve several different functions, depending upon the application. In sound reinforcement or in recording during mixdown, the SUB MASTER Faders will act as a group master for a number of input channels. For instance, if Input Channels 1 through 8 contained drum mics, and you wanted to control the overall level of the drums with just one fader, this could be achieved by assigning input channels 1 through 8 to the SUB MASTER ASSIGN, and then panning each channel either hard left or hard right (for mono). The SUB MASTERS could also be assigned in stereo by panning the input channels to any point in the stereo spectrum, in which case the composite signal will appear on both the right and left SUB MASTER faders. *See Section 3.*

During recording, the SUB MASTERS can be used to mix several signals together onto a single track (or two tracks for stereo) by assigning those input channels to the SUB MASTERS and connecting the SUB OUT jack to the track that you wish to record on. *See Section 3.*

SUB MASTER TO MASTER ASSIGN SWITCH
This switch routes the signal on the SUB MASTERS to the MASTER Faders.

MASTER FADERS
The Left and Right MASTER Faders control the main output of the console to either the mixdown deck (in recording) or the sound system (in sound reinforcement).

MAIN STEREO METERS
The main STEREO METERS, each consisting of 7 green, 4 yellow, and 4 red LEDs, show the relative output levels of the MASTER Faders. The METERS will also show the level of any input channel that has its SOLO engaged.

SOLO/POWER LEDS
The SOLO LED lights whenever a solo is switched on. The POWER LED lights whenever AC power is connected to the unit.

BACK PANEL

MIC/LINE INPUTS
Channels 1 through 16 can be accessed via a 1/4" phone jack. Normally, this would be used for line level signals such as synthesizers or tape machines but it is also possible to feed a microphone signal into this jack.   In 4 or 8 track recording applications, channels 9 through 16 would normally be used for tape returns of tracks 1 through 8, while channels 1 through 8 would be used for mic or instrument inputs.

MICROPHONE INPUTS
 Channels 1 through 8 contain an XLR jack which provides an electronically balanced input ideally suited for a microphone. *This input is overridden should a plug be inserted in the corresponding Input phone jack* (XLR #1 is defeated if a phone plug is inserted in phone jack #1).

DIRECT OUTPUTS
Channels 1 through 8 contain a DIRECT OUTPUT jack. Each channel routes its own input signal, after it has been amplified and EQ'd, to the Direct Output jack. This is generally used to feed a single track of a Multitrack Tape Deck. Because the Direct Output is the path with the least amount of circuitry and therefore the lowest possible background noise, it is most desirable to use when recording the signal of only a single channel.

CHANNEL INSERTS
Channels 1 through 16 each contain a stereo jack called an INSERT. This consists of an insert send (the tip of a stereo phone plug) and insert return (the ring of a stereo phone plug) and is used to insert an outboard effects device, such as a compressor, EQ, or chorus, directly into the

signal path of only that channel. A special cable consisting of a single stereo 1/4" jack on one end and two mono 1/4" jacks on the other is required. ***See Section 2 - INSERT INTERFACING***

SENDS
These jacks feed the signal from SEND MASTER 1 through 6 to an outboard effects device or headphone amplifier. SENDS 1 and 2 are derived Pre-Fader while SENDS 3 through 6 are derived Post-Fader.

RETURNS
The RETURN jacks are especially dedicated to the signals returning from any outboard effects devices back into the ***1622 MIXER.*** RETURNS 1 through 4 are pannable between the Left and Right MASTER buss. RETURNS 5 and 7 are permanently assigned to the Left MASTER. RETURNS 6 and 8 are permanently assigned to the Right MASTER.

HEADPHONE
Controlled from the MONITOR VOLUME pot, the HEADPHONE jack provides substantial level to drive most headphones. It is not affected by the MONITOR DEFEAT switch.

SUB OUT
The outputs of the SUB MASTERS are available for connection to the inputs of a tape machine. In certain applications, such as video post production, the SUB OUTS may also have a different mix, such as a mix containing music and effects but minus the dialog, from the one available at the MAIN OUTPUTS.

SUB INSERT
A ring-tip-sleeve jack that allows insertion of an outboard effects device, such as a compressor like the ***Alesis MICRO LIMITER*** or reverb like a ***MICROVERB II***, into the signal path of the SUB MASTER.

MAIN OUT
The outputs of the MAIN OUT are available for connection to the inputs of a Mixdown Tape Machine, sound system, or amplifier.

MAIN OUT LEVEL SELECTOR
This switch selects the proper level for use with either professional or semi-professional equipment. Select the +4dBV position (switch pressed in) for most sound systems and professional tape machines. Select the -10dBV position (switch out) for connection to guitar amplifiers or cassette decks. Generally speaking, use the -10dBV setting if you are connecting to a device that uses RCA jacks. Use the +4dBV setting for a device that uses XLR inputs. For a device that uses 1/4" phone jacks, try both settings and choose the one with the lowest background noise (hiss and hum).

MAIN INSERT
Allows for the insertion of an outboard effects device, such as the ***Alesis MICRO LIMITER*** or the ***Alesis QUADRAVERB,*** into the signal path of the MAIN Outputs.

MONITOR OUT
The outputs of the MONITOR OUT are available for connection to the inputs of the amplifier for the control room monitor speakers. The level is controlled by the MONITOR VOLUME pot.

TAPE INPUT
For connection of the output of a mixdown deck during recording. This will allow you to hear the playback of your mix without repatching.

POWER SUPPLY CONNECTOR
Connection for ***Alesis 1622*** power supply.

ON/OFF SWITCH
Turns power on or off to the *1622*. This should always be the first device turned on in the system and the last device turned off.

SIGNAL FLOW IN THE *1622*

To help you better understand the way that the *1622* operates, the following is a Signal Flow Diagram of the complete signal path of the *1622*.

FIGURE 4
1622 SIGNAL FLOW

Input

Input Trim

EQ Section

Aux Sends 1 - 2
(Pre-Fader Sends)

Channel Insert

Mute

Solo

to Solo Buss

Input Fader

Aux Sends 3 - 6
(Post - Fader Sends)

Direct Out
(Channels 1 - 8)

Left/Right Pan
Control

Submaster
Assign Switch
(Channel)

Master Assign Switch (Channel)

Sub Inserts 1 - 2

Aux Returns 1 - 4
(Pannable)

Sub Faders 1 - 2

Aux Returns 5 - 8
(Hardwired L - R)

Sub Outs 1 -2

Submaster to
Master Assign
Switch

Master Inserts (L - R)

From
Mixdown
Deck

Tape/Line
Monitor
Switch

Master Faders (L - R)

Control
Room
Monitor
Volume

To
Headphone
Jack

Monitor
Outputs
(L - R)

Master Outs (L - R)

Now, using the above Signal Flow Diagram, let's see what happens to a vocal as it goes from the input of a channel all the way to tape.

Starting at the top of the diagram, the signal from the mic enters the console through the channel's XLR **Input** jack. (As you'll remember, channels 1-8 have XLR jacks in addition to their unbalanced line ins. It is important to note that anything plugged into the line in jacks on

channels 1-8 will defeat the XLR jack for that channel). The signal is then boosted by the **Input Trim** to a level that the board can deal with easily. Now, you can adjust the tone of the singer's voice with the **EQ Section**, perhaps boosting the presence range a bit, or rolling off the low end to compensate for close miking. After you've done this, you can grab the signal via **Aux Sends 1 - 2** and send it out of the first two Send jacks. Since these are Pre-Fader sends, the level of the signal going out of these jacks will not be affected when the input fader's level is adjusted. Because of this, they're perfect for setting up a cue mix, allowing the singer to hear the optimum blend of vocals, instruments, and effects.

Next comes the **Channel Insert**. This is a combination Send/Return accessed via the stereo Insert jack. Since the jack contains both the send and return, a special cable must be used, with the tip being used as the Send and the ring as the Return. Using the Channel Insert, we can smooth out the level of the vocal with a *MICRO LIMITER* before it goes to tape.

After the signal passes through the Input Fader, it can be sent out the other Send jacks via **Aux Sends 3 - 6**. Since these sends are taken from a point after the Input Fader, the level of the signal going out of them *will* be affected when you adjust the Input Fader. These sends are more suited to outboard effects like reverb, flanging, or delay. Later, when we mix down, we'll use these sends to set up a cool blend of *QUADRAVERB* and *MICROVERB II* to accentuate the performance.

Channels 1-8 each feature a **Direct Out**, which is generally used to feed a multitrack tape machine. The signal that is sent out of this jack is taken from the same point as the Post-Fader Sends. The vocal will then be sent through a **Left/Right Pan Control**, which determines its position in the stereo field relative to all of the other instruments and effects. We'll use this to set the vocal just a little off to the left of dead center in the mix, with the vocal effects panned a little right to make the vocal sound big and spacious. Then, depending on how the **Submaster** and **Master Assign Switches** are set, the vocal channel's signal is grouped with signal from other channels and sent to the submaster buss, the master buss, or both.

First off, let's say the Submaster Assign Switch is enabled. Before the vocal and the other instrument signals get to the faders that will determine their overall level, you have a chance to send them out of the board, effect them as a group, and return them back into the SubMaster buss using either of the **Sub Inserts**. We could use these to run all of the instruments through a single reverb for overall ambience. These inserts work along the same lines as the Channel Inserts. The only difference is that an effect inserted at this point will effect all of the channels that have been assigned to SubMaster 1 or 2 (depending on which insert you are using). Next, you'll set the overall level of the combined (and effected) signals with **Sub Faders 1 - 2**, and the signal will then be sent out of the jacks marked **Sub Outs 1-2**.
Depending on how you're using the SubMaster busses, you may or may not want the grouped Sub signals to be routed into the Master buss. You can determine whether or not this will happen by enabling or disabling the **SubMaster to Master Assign Switch.**

Backing up a bit, let's say that our vocal channel's **Master Assign Switch** (just after the Pan Control) is enabled. *These* grouped signals will be sent through an insert/fader/output jack system similar to the one found on the SubMaster, but first they will be mixed with the aux returns. **Aux Returns 1-4** are mono returns pannable to any point in the stereo field. This is where we'll control the level and panning of the *QUADRAVERB/MICROVERB II* effects blend on the vocal during mixdown. You can use one as a mono return, or you can group together two as a stereo return by panning them hard left and right. **Aux Returns 5-8** are hardwired left and right as shown, providing two more pairs of stereo returns.

Next on the flow chart are the **Master Inserts**. These work the same as the Sub Inserts, but since the SubMasters feed into a point before the Master Inserts, any effect that is inserted into the Master Inserts will also effect the signal coming from the SubMasters (as long as the SubMaster to Master Assign switch is enabled).

Next are the **Master Faders** and **Master Outs**. The Faders set the overall level of the grouped signals in the Master buss, which are then sent to the Master Out jacks. This is where we'll do the

long fade on the whole mix at the end of the tune. This mixed signal, however, is also sent to the monitoring system. Since the Master Out jacks are generally connected to a stereo mixdown deck, your monitoring system (amp/speakers, headphones, etc.) has its own set of jacks - the **Monitor Outputs** - that are fed from the same source as the Main Outs.

There's also a **Headphone Jack** that is fed from the same source, and the volume for both of these outputs is controlled by the **Control Room Monitor Volume,** which is the big knob up in the corner of the board.

After you've finished your mix and you want to hear it back through your monitors, instead of repatching, you can connect the mixdown deck's outputs to the **Tape In** jacks, flip the **Tape/Line Monitor Switch**, and presto! - you're listening to your mix.

SECTION 2

SETTING UP THE *1622*

CONNECTIONS TO THE MIXER

The *1622* Mixer easily interfaces to most other audio equipment. All input and output jacks, with the exception of the dedicated microphone inputs, are 1/4" phone jacks. The microphone inputs are standard balanced XLR type jacks. ***See Figure 5.***

FIGURE 5
CONNECTOR TYPES ON THE *1622*

| INPUT	CONNECTOR	TYPE
MIC INPUTS	XLR	BALANCED
LINE INPUTS	1/4" Mono	UNBALANCED
DIRECT OUTPUTS	1/4" Mono	UNBALANCED
INSERTS	1/4" Stereo	UNBALANCED
SENDS	1/4" Mono	UNBALANCED
RETURNS	1/4" Mono	UNBALANCED
SUB-MASTER OUTPUTS	1/4" Mono	UNBALANCED
MAIN STEREO OUTPUTS	1/4" Mono	UNBALANCED
CONTROL ROOM MONITOR	1/4" Mono	UNBALANCED
TAPE RETURN	1/4" Mono	UNBALANCED
HEADPHONE	1/4" Stereo	UNBALANCED

INTERFACING TO A MULTITRACK TAPE RECORDER: 4 TRACK THROUGH 8 TRACK RECORDING

Interfacing the *1622 MIXER* to your Multitrack Tape Deck is easy to do. ***See Figure 6.***

1) Connect any microphones or instruments to be recorded into the MIC or LINE INPUTS of Channels 1 through 8.

2) If only the signal from a single channel is to be recorded, it is also possible to use the DIRECT OUTPUT of that channel to patch directly into the track that is to be recorded on. Using the DIRECT OUTPUT results in a slightly quieter signal being recorded since there are fewer electronic components in the signal path to add background noise.

3) Connect the Inputs of Channel 9 through 16 (9 through 12 for a 4 track) to Outputs of the Multitrack Tape Machine. This means that whenever you want to hear the playback of the tape machine, Track 1 will appear on Channel 9, Track 2 will appear on Channel 10, etc. This is because you will use Channels 1 through 8 for *input sources* such as microphones, synthesizers, or drum machines, and use Channels 9 through 16 to *monitor* (listen to) the tracks of the Multitrack Tape Deck.

4) Now connect the outputs of the SUB MASTERS (SUB OUT) to the tracks that you wish to record the grouped instruments on. ***See Section 1 - SUBMASTER FADERS***. For instance, if you desire to record on tracks 3 and 4 (a stereo

piano or the output of a drum machine, perhaps), then you would connect the SUB OUT Left and Right Jacks to the INPUT of Tracks 3 and 4. If you only wanted to record on track 7, you would connect either SUB OUT Left *or* SUB OUT Right to the input of track 7.

FIGURE 6
INTERFACING THE *1622 MIXER* TO A MULTITRACK TAPE DECK
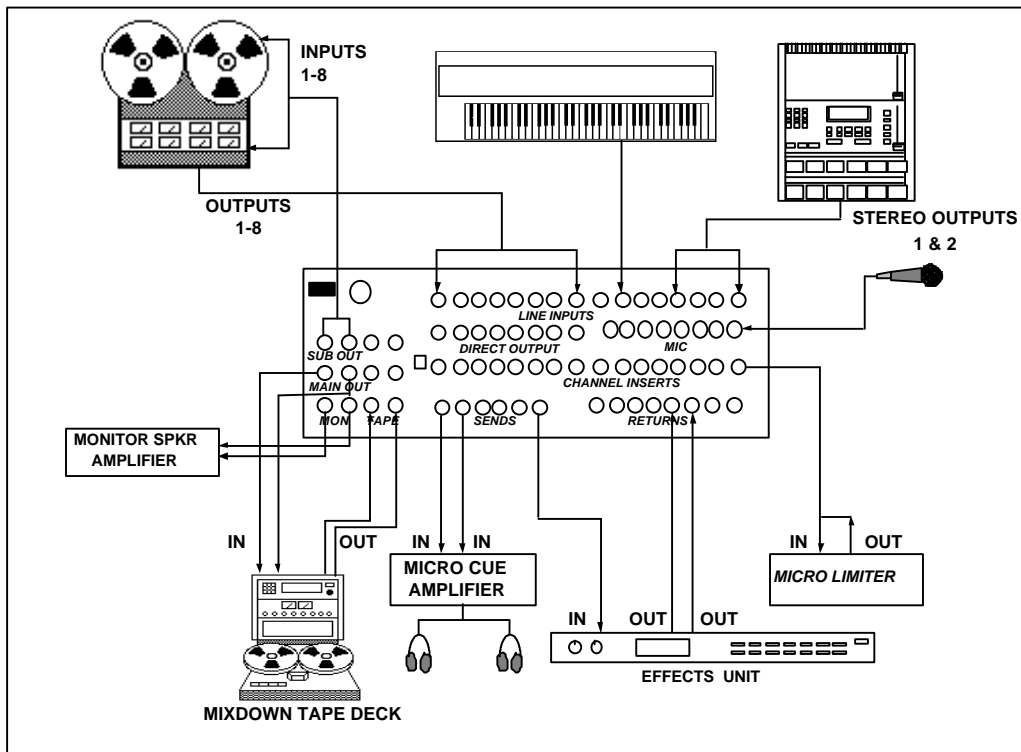
INTERFACING TO THE MULTITRACK TAPE RECORDER VIA A PATCHBAY
It is also possible to access the Multitrack Tape Recorder by the use of a Patchbay, which is several rows of jacks that are permanently connected to both the inputs and outputs of the *1622 MIXER*, Multitrack Tape Deck, and all of the outboard equipment. *This is a slightly more convenient but more expensive method and is not absolutely necessary for operation; you can get along just fine without it.* In this case, the patching is the same as in the above example except that it is now done on the patchbay instead of at the rear of the Console and Multitrack Tape Deck. ***See Figure 7.***

FIGURE 7
A TYPICAL PATCHBAY FOR THE *1622 MIXER*
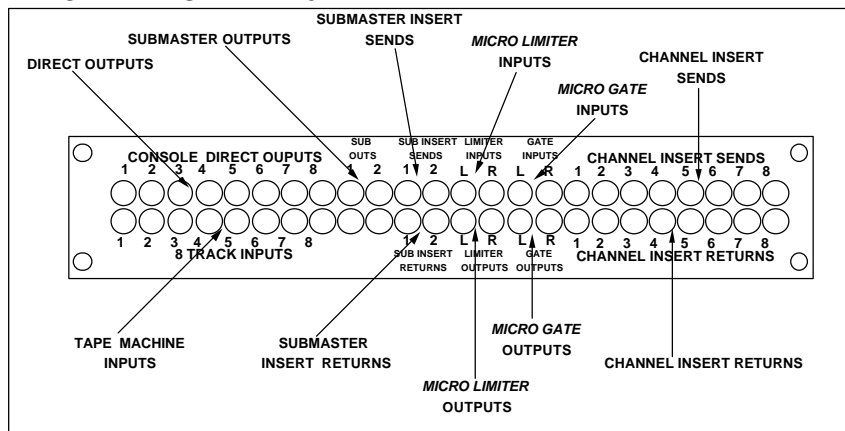
With a Patchbay, it is also easier to make use of the DIRECT OUTPUTS of the *1622*. A DIRECT OUT is used when only one signal is going to be recorded on tape at a time. Using the DIRECT OUT has the advantage of a cleaner and quieter signal since there are fewer electronic stages in the signal path. *See Figure 8.*

FIGURE 8
USING A PATCHBAY TO INTERFACE THE *1622 MIXER*
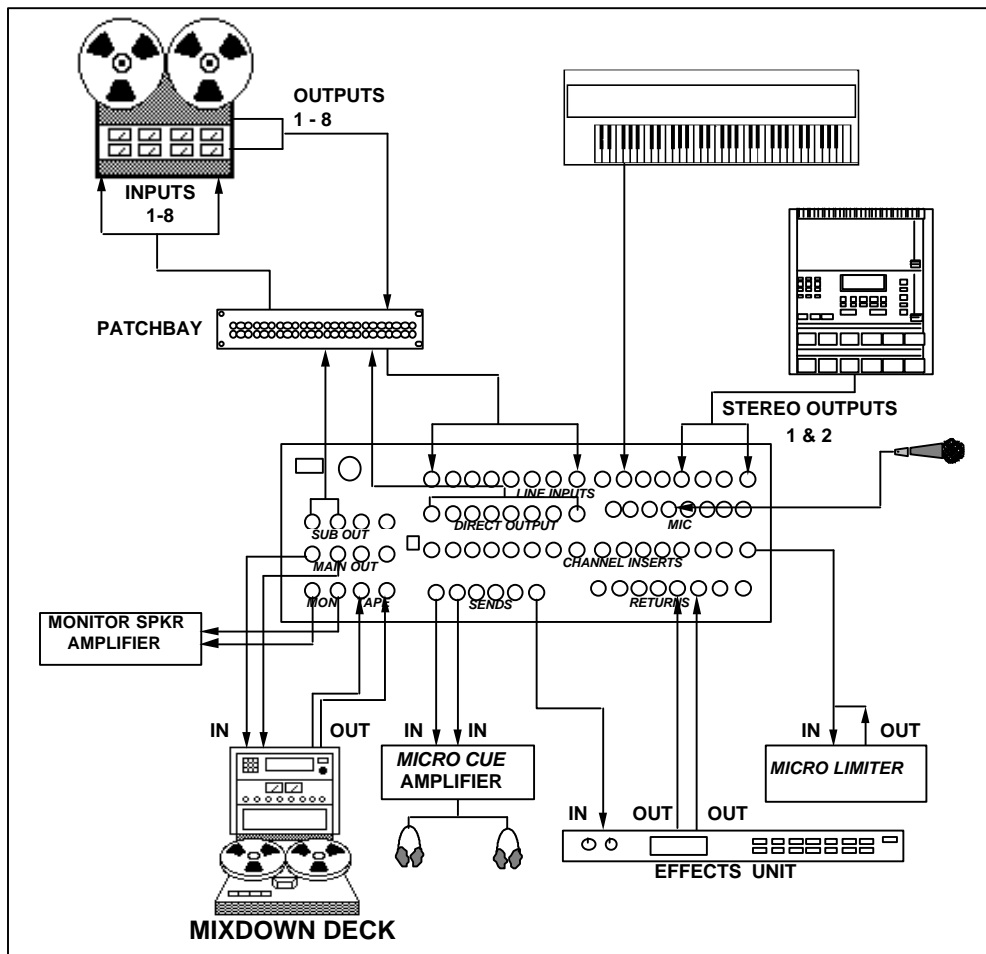
INTERFACING THE *1622 MIXER* TO THE MIXDOWN DECK

1) Connect the MAIN OUT Left and Right to the Inputs of the Mixdown Deck.

2) Connect the Outputs of the Mixdown Deck to the TAPE Left and Right jacks of the *1622*. *In order to hear the playback of the mixdown deck, the TAPE/MON switch must be in the TAPE position. See Figures 6 & 8.*

INTERFACING THE *1622 MIXER* TO THE CONTROL ROOM MONITOR SPEAKERS

1) Connect the MON left and Right jacks to the inputs of the amplifier used for the Control Room Monitor Speakers. The rotary MONITOR VOLUME control will now control the level of the Monitor Speakers. *See Figures 6 & 8.*

PLEASE NOTE: *If the TAPE/MON switch is in the MON position, the MASTER Faders must be raised for signal to be heard. If the switch is in the TAPE position, only the playback signal from the mixdown tape deck will be heard and the MASTER Faders will have no affect on the monitor level.*

INTERFACING THE 1622 MIXER TO A HEADPHONE AMP

There are two different sets of Sends on the *1622 MIXER*. Sends 1 and 2, which are derived before the Channel Fader, are used primarily for setting up a separate Cue mix for musicians to overdub to, since any changes in the Channel Fader level will not affect the signal level of these Pre-Fader Sends.

   1) Connect the output of Sends 1 and 2 (SEND 1, SEND 2) to the **Alesis *Micro Cue Amp*** or other suitable headphone amplifier. ***See Figures 6 & 8.***

INTERFACING THE SENDS AND RETURNS OF THE *1622 MIXER* TO EFFECTS

Sends 3, 4, 5, and 6 are derived post-fader which means that any changes in level in the fader will also cause a change in level at the send as well. These sends can be used as "Effects Sends" and connected to whatever outboard effects that are desired (reverbs, chorus, multi-effects processors, delays) to be blended into the mix. These effects sends allow all 16 channels to be processed simultaneously, as opposed to using a separate effect on each channel.

   1) Connect the output of the effects sends (SEND 3, SEND 4, SEND 5, SEND 6) to the input or inputs of your outboard effects devices (***MICROVERB II, MIDIVERB III, QUADRAVERB)***.

   2) The outputs of these effects devices are connected back into the console through dedicated inputs called RETURNS. There are 8 returns, enough for either 4 stereo, 8 mono, or any combination of mono or stereo devices. *If a mono device such as a delay is to be used, connect it to any of Returns 1 through 4 since these returns are pannable.* Stereo effects devices can be connected to either 1-2, 3-4, 5-6, or 7-8. ***See Figures 6 & 8.***

PLEASE NOTE: *Sends 1 and 2 can also be used as extra Effects Sends while mixing.*
While sends 1 and 2 are pre-fader, and normally used for monitoring, 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 of the effect, since it is independent of fader movement on sends 1 and 2. As you change fader levels, you will need to make corresponding adjustments to sends 1 and 2 to maintain the desired balance between dry and effected signal.

INSERT INTERFACING

Inserts are used to connect signal processing devices 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 one of these devices into the signal path of either the SUB MASTERS or MAIN OUTPUTS since they also have INSERT jacks available. This is desirable when either a group of instruments, or the entire mix, is to be processed.

Any INSERT jack of the *1622 MIXER* is a stereo jack containing both an input and an output (the output is the *1622's* Send and the input is the *1622's* Return).

   1) To connect an outboard processor by way of the Insert requires a stereo plug to operate properly.

   2) The *tip* of the plug is the *Send* and will be connected to the input of the effects device, and the *ring* of the plug is the *Return* and will be connected to the output of the effects device or processor.   ***See Figure 9.***

FIGURE 9

WIRING OF INSERT CABLE

TIP (SEND)

RING (RETURN)

SEND (TO INPUT)

RETURN
(FROM
OUTPUT)
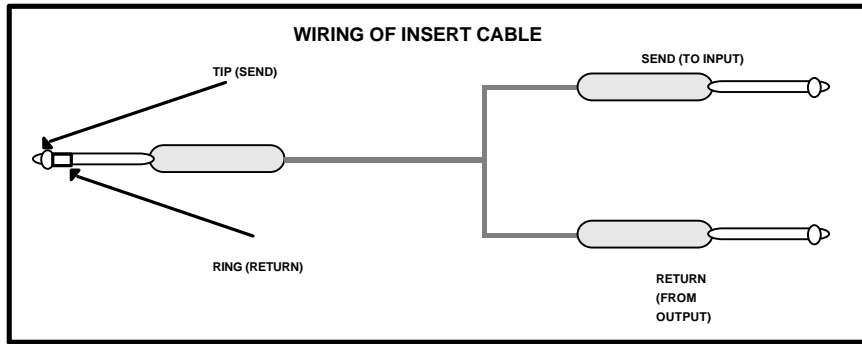
HOW TO ADJUST LEVELS

In order to ensure the cleanest signal with the least amount of background noise (hiss and hum), it is extremely important for the proper levels to be maintained not only within the *1622 MIXER* itself, but throughout the entire audio system. Therefore, it's best to observe the following guidelines when initially setting up your *1622 MIXER*, and during daily use.

> **A)** *MAINTAIN PROPER INPUT LEVELS -* To set proper input levels on either a mic or line level signal, follow this procedure:
>> **1)** With mic or line level signal flowing through the channel, engage the channel SOLO.
>> **2)** Observe the SOLO level on the MAIN LED Meter. Adjust the TRIM control until the first red LED lights on the loudest peaks. If any distortion from signal overload is still heard (due to possible brief peaks that don't register on the meter), continue to decrease the TRIM control until the distortion goes away. *See Figure 11.*
>
> **B)** *MAINTAIN PROPER FADER LEVELS -* Ideally, both the input and output faders should be run at about the "0" position (about the 3/4 of the way up the fader travel) if possible. This position gives the greatest amount of headroom and lowest background noise. It also allows for any additional increase or decrease in level that might be required during mixing. Ultimately, the fader levels are dependent on the requirements of the mix; the 3/4 level is only a starting point. *See Figure 10.*

FIGURE 10

IDEAL FADER POSITION DURING RECORDING OR MIXING

+10

+5

-5
-10
-15
-20
-25
-30
-35

1   2   3   4
CHANNEL FADERS
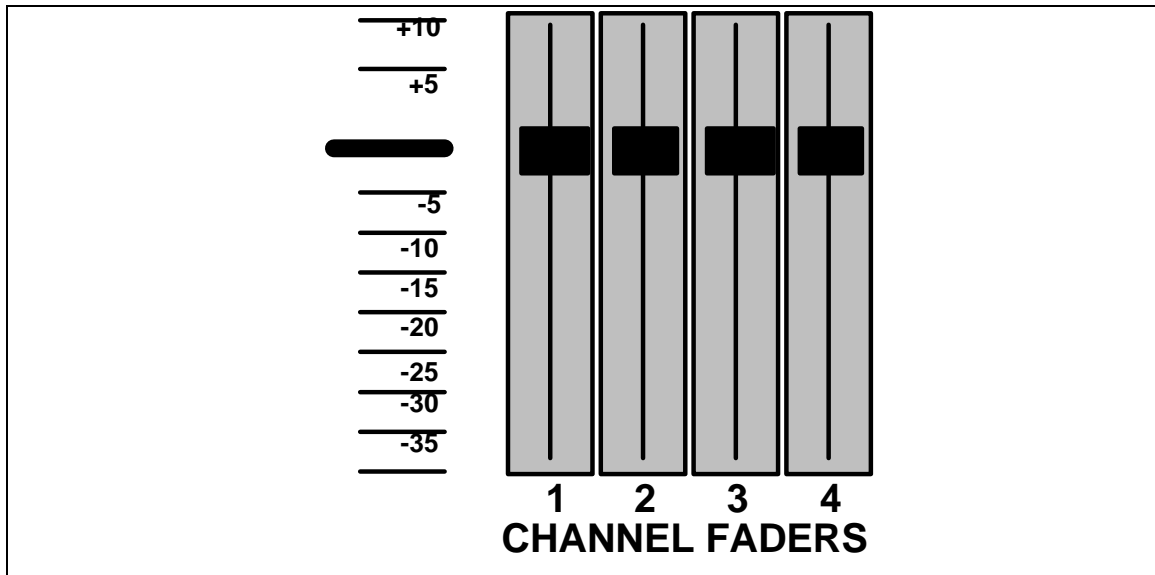
> **C)** *MAINTAIN PROPER SYSTEM LEVELS -* As a good rule of thumb, it is always best to try to run most volume level controls of your other equipment as well. This will

decrease the possibility of overload distortion and keep the amount of background noise to a minimum.

SEVERAL CAUTIONS!!   Even if you observe the above guidelines, it is still possible to run into some distortion in the following instances:

---

1) *If a large amount of EQ is used, it may be necessary to decrease either the TRIM control, 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. See Figure 11.*

2) *If several "hot" channels are assigned to a SUB MASTER, it is possible that the SUB MASTER will overload. Once again, it may be necessary to decrease either the TRIM controls, the Channel FADERS, or both, of each of the channels assigned to the SUB MASTER. See Figure 11.*

FIGURE 11
POSSIBLE POINTS OF SIGNAL OVERLOAD
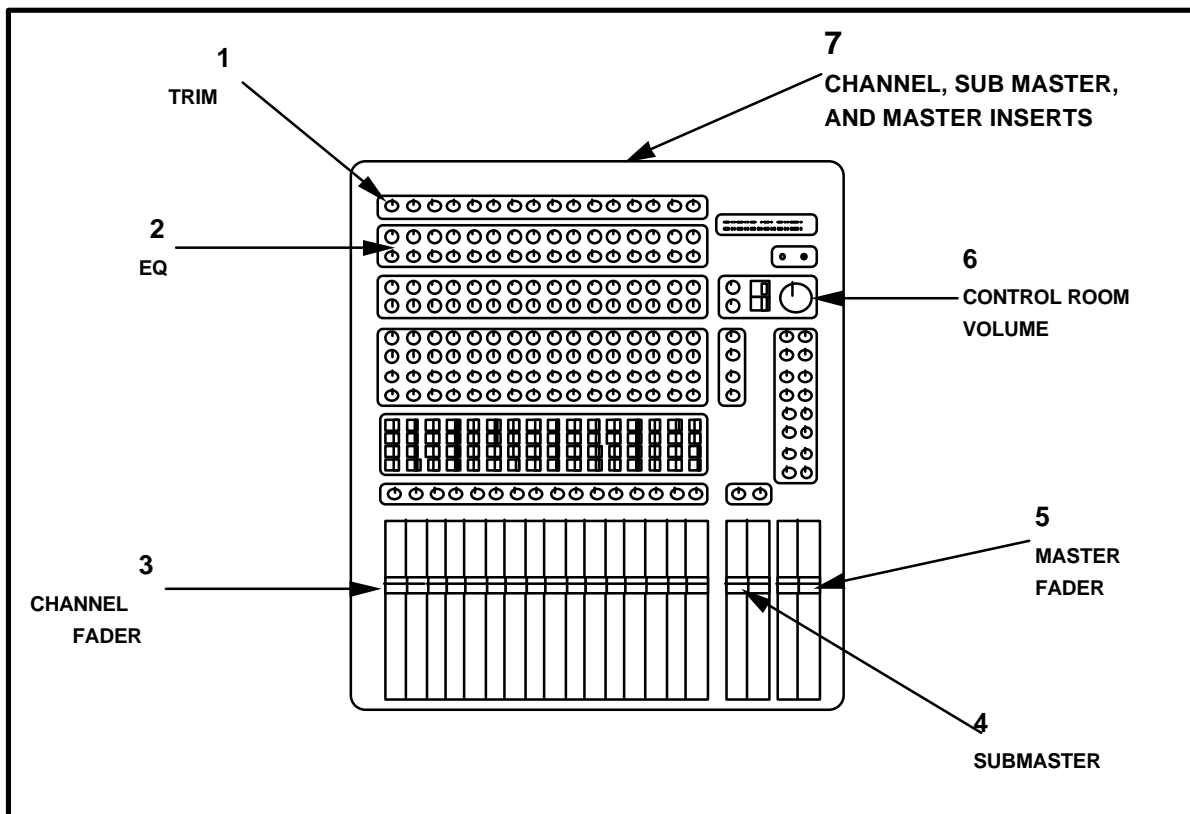
SECTION 3

APPLICATIONS

MULTITRACK RECORDING

Before we talk about the specifics of using the *1622 MIXER* for recording, a brief discussion of multitrack recording is in order.

INTRODUCTION TO MULTITRACK RECORDING

The function of the *1622 MIXER*, or any recording console for that matter, is to provide control of volume, tone, and spatial positioning of signals from microphones, electronic instruments, and tape machines, then to route these signals to a monitor system and tape recorder so they can be heard and recorded. Before the introduction of multitrack tape recorders, these signals had to be mixed together as a "live" performance. If the desired performance wasn't correct because of a musical mistake or balance problem, the performance had to be recorded again and again until the performance was deemed satisfactory.

The introduction of multitrack tape machines changed this recording method forever. Most recording today has evolved into a multi step process. These are:

RECORDING (or Tracking) - Instead of needing an entire band available to capture a live performance, recordings can be made one instrument at a time and constructed in a building block fashion. With the advent of drum machines and sequencers (such as the *Alesis HR-16, HR-16:B,* and *MMT-8)* it is possible to build an entire song before ever having to record on tape. Using this method of recording one instrument at a time also allows for fixing the mistakes (normally called "punching in") of an incorrectly played part. By "punching in", or replacing, the misplayed part, you can record a performance over and over again until it's perfect.

MONITORING - In order to properly record a performance, both the engineer, producer, and all of the players must be able to hear the performance first. This is called Monitoring when listening to the speakers in a control room, and Cue when the musicians are listening to headphones while overdubbing.

Monitoring is a more complex operation than it might seem at first glance since there are many mixes that can occur simultaneously. Often, there are 3 separate mixes (sometimes more) happening simultaneously in order to complete the task of just a simple overdub. The comprehensive systems and logistical layout of the *1622 MIXER* will make it relatively easy for you to accommodate even the most complex monitoring requirements. The following are a few of the typical mixes that can occur during a session:

MULTITRACK MIX
The first mix would be the mix that is being recorded onto tape. This mix is derived from the channel faders and the direct outs (channels 1-8, typically) or the submaster outputs. These levels are normally adjusted so that the optimum signal level reaches tape in order to insure the least amount of noise and distortion. This level is usually about 0 VU (on the tape machine meters) although signal levels as low as -10 VU may be appropriate for instruments with high frequency transients, such as cymbals and snare drums.

MONITOR SPEAKER (CONTROL ROOM) MIX
If you were to only listen to the multitrack mix (see above), you would probably find that it would be terribly out of balance since the optimum recording level is the primary concern of that mix. Therefore, a second mix is required which is called the monitor mix. This is a separate mix which provides the engineer with a useful instrument balance and enables him to make changes and adjustments to the mix (such as muting or soloing channels) without disturbing the signals being recorded on tape. The *1622 MIXER* can be configured to create a control room mix. *See Section 2 - INTERFACING TO THE MULTITRACK TAPE RECORDER*

CUE MIX
Many times a third separate mix is required as well. This mix is sent to the musicians headphones for overdubbing and is called a CUE mix. This mix can be radically different from what the engineer is listening to since the musician may need certain instruments louder or even absent in the mix in order to cue off of (hence the name). This mix is derived from the PRE-FADER SENDS,

which means that the headphone mix will not change if the fader level changes while the engineer makes adjustments to his monitor mix. Since the *1622 MIXER* has 2 Pre-Fader Sends, either 2 separate mono Cue mixes or 1 stereo Cue mix can be provided.

MIXDOWN - After all of the desired musical parts have been performed and recorded satisfactorily, the mixdown stage takes place. During this stage, the musical parts are blended together, tonally enhanced with EQ and effects, positioned in the desired stereo spectrum with the PAN controls, and finally recorded onto a DAT (Digital Audio Tape), 2 track reel to reel, or cassette recorder. The *1622 MIXER* provides a separate facility for both a mix to the mixdown recorder, and for playback as well.

THE *1622 MIXER* AND A 4 OR 8 TRACK TAPE DECK
USING THE *1622 MIXER* TO RECORD:

A SINGLE SOURCE TO 1 TRACK
1) With a microphone or instrument connected to the desired input channel, set the input level correctly. ***See Section 2, INTERFACING, and HOW TO ADJUST LEVELS***

2) Connect the DIRECT OUT of the input channel to the input of the desired tape track. ***See Section 2, INTERFACING,***

3) To monitor (listen to) the track through the Multitrack Tape Deck, place the desired track of the tape machine into "source" or "input" and raise the Channel Fader of the *1622 MIXER* where the tape return from the Multitrack is connected; i.e Track 1 to Channel 9, Track 2 to Channel 10, etc. (***See Section 2, INTERFACING, and HOW TO ADJUST LEVELS)*** Follow instructions for playback.

OR FOLLOW THE INSTRUCTIONS FOR TWO OR MORE SOURCES TO 1 TRACK.

TWO OR MORE SOURCES TO 1 TRACK
1) With microphones or instruments connected to the input channels, set the input levels correctly. ***See Section 2, INTERFACING, and HOW TO ADJUST LEVELS.***

2) If more than 1 instrument is to be recorded on 1 track at the same time, assign it to a SUB MASTER by switching the SUB switch to the "On" position on the desired channel.

3) Use the PAN control on all of the assigned channels to position the channels *fully* either to the left or right. If the panning is fully left, then you will be using SUB MASTER 1 (the left). If the panning is fully to the right, then you will be using SUB MASTER 2.

4) Connect the output of the SUB MASTER of the *1622 MIXER* to the input of the track to be recorded on the Multitrack Tape Deck.

5) The SUB MASTER Fader will now control the level going to tape. For cleanest recording, the SUB MASTER Fader should be adjusted so that the level going to tape should reach 0 VU on peaks on the meters of the Multitrack Tape Deck. The exception to this would be for percussive instruments with lots of high

frequency information, such as cymbals, which should be recorded at -10 or -15 VU to prevent unwanted peaks which the meters won't indicate.

6) Be sure that the SUB ASSIGN switch (the one above the SUB MASTER Fader) is in the "Off" position. Otherwise, the signal will be assigned twice to the Master buss and may cause the signal to be too loud in the Monitor Mix.

7) To monitor (listen to) the track through the Multitrack Tape Deck, place the desired track of the tape machine into "source" or "input" and raise the Channel Fader of the *1622 MIXER* where the tape return from the Multitrack is connected; i.e Track 1 to Channel 9, Track 2 to Channel 10, etc. (*See Section 2, INTERFACING, and HOW TO ADJUST LEVELS).* Follow instructions for playback.

2 OR MORE SOURCES TO 2 TRACKS

1) With microphones or instruments connected to the input channels, set the input levels correctly. *See Section 2, INTERFACING, and HOW TO ADJUST LEVELS.*

2) Assign the channels to a SUB MASTER by switching the SUB switch to the "On" position on the desired channel.

3) Since the tracks are to be recorded in stereo (you will have to record simultaneously on 2 tracks of the tape recorder), pan SUBMASTER 1 hard left, pan SUMBASTER 2 hard right, then pan the channels to the desired position in the stereo spectrum using the channel pan controls.

4) Connect the output of the SUB MASTERS of the *1622 MIXER* to the inputs of the 2 tracks to be recorded on the Multitrack Tape Deck.

5) The SUB MASTER Faders will now control the level going to tape. For cleanest recording, the SUB MASTER Faders should be adjusted so that the level going to tape should reach 0 VU on peaks on the meters of the Multitrack Tape Deck. The exception to this would be for percussive instruments with lots of high frequency information, such as cymbals, which should be recorded at -10 or -15 VU to prevent unwanted peaks which the meters won't indicate.

6) Be sure that the SUB ASSIGN switch (the one above the SUB MASTER Fader) is in the "Off" position. Otherwise, the signal will be assigned twice to the Master buss and may cause the signal to be too loud in the Monitor Mix.

7) To monitor (listen to) the track through the Multitrack Tape Deck, place the desired track of the tape machine into "source" or "input" and raise the Channel Fader of the *1622* where the tape return from the Multitrack is connected; i.e Track 1 to Channel 9, Track 2 to Channel 10, etc. (*See Section 2, INTERFACING, and HOW TO ADJUST LEVELS).* Follow instructions for playback.

CAUTION*: BE SURE OF THE FOLLOWING WHEN RECORDING!*

A) *Be sure that the SUB ASSIGN is **NOT** switched to the "On" position on the Tape Return Channels. This will cause feedback to occur.*

B) *Be sure that the MASTER ASSIGN is **NOT** switched to the "On" position on the Input Channels. This will cause the monitoring to be false since the signal will be heard from two sources; the Input Channels and the Tape Return Channels.*

RECORDING TIPS

- For cleanest recording, the SUB MASTER Faders (or Channel Faders if the DIRECT OUTPUTS are being used) should be adjusted so that the level going to tape should reach 0 VU on peaks on the meters of the Multitrack Tape Deck. The exception to this would be for percussive instruments with lots of high frequency information, such as cymbals, which should be recorded at -10 or -15 VU to prevent unwanted peaks which the meters won't indicate.

- If signal peaks cause the record meter to vary by more than 10VU, a limiter, such as the **Alesis *MICRO LIMITER***, should be used on that channel to even the peaks out. In general, things will sound better if the meters remain at roughly the same level throughout the recording.

HOW TO PLAYBACK FROM MULTITRACK

1) Place the Multitrack Tape Deck into the "Tape" or "Playback" position.

2) Raise the Channel Faders that are being used as Multitrack Tape Returns.. This will usually be Channels 9 through 16. ***See Section 2, INTERFACING.***

3) Assign the Channel Faders that are being used as Tape Returns by switching their "MASTER" assign switches to the "On" position.

4) Raise the MASTER Faders to where the peaks briefly light the red LED's.

5) Turn the rotary MONITOR VOLUME pot to the desired volume level.

The TAPE/MON switch must be in the MON position.

HOW TO SET UP A CUE MIX

The Cue mix will be created using SENDS 1 & 2 on the *1622* because the signals from these sends are derived Pre-Fader *(See Section 1)*. SENDS 1 and 2 will have to be connected to a headphone amplifier such as the **Alesis *MICRO CUE AMP*** (as described in ***Section 2, INTERFACING THE 1622 MIXER TO A HEADPHONE AMP)*** before proceeding to the following steps.

1) While monitoring on headphones, turn up SEND 1 and SEND 2 (for a stereo mix), or just SEND 1 (for mono) on the Channels used as Tape Returns until the desired Headphone Mix is obtained.

Normally, an easy headphone mix to overdub to will be similar to the Control Room mix (See the following; "Mixdown Basics") except that the vocal or instrument that is being recorded will be a bit louder in the mix. Sometimes, the Kick or Snare is also raised a bit louder than normal to make it easier to stay in time or "lay in the pocket".

2) Use SEND MASTER 1 and 2 to increase or decrease the overall volume.

MIXDOWN BASICS

Below is a simplified step by step way to establish a mix. For a more complex (but better sounding) method, see the following "How to Create a Great Mix".

1) Raise the Channel Faders that are being used as Tape Returns to the desired levels.

2) Adjust the EQ as needed*(refer to HOW TO ADJUST LEVELS in Section 2)*

3) Add the amount of effects desired by adjusting the SEND levels of each Tape Return Channel. If required, adjust the MASTER SEND levels to eliminate overload of outboard effects. For quietest operation with the greatest amount of headroom, it's best to run the individual channel SENDS at about the 3/4 level and the SEND MASTERS at about half or less.

4) Raise the effects RETURN level controls and pan as desired (typically hard left and hard right).

5) Adjust the MASTER Faders so that the desired level is sent to the Mixdown Tape Machine.

HOW TO CREATE A DEPENDABLE MIX

Creating a mix is easy; creating a great mix, one that jumps off of the tape, is a lot harder. There are those engineers who are in demand just for mixing because their sense of balance between instruments causes the mix to come alive with excitement. Although outboard effects and tonal adjustment are important, you'd be surprised at how good a dry (meaning no effects or EQ) mix can be if the balances between the 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 be effective. So we've decided to include a method to help you quickly create a "dependable" mix; one that sounds good no matter what speakers you mix or play back on.

It would be easy to give a basic reference mixing formula just for the instruments normally found in pop music (Kick, Snare, Hat, Percussion, Bass, Guitar, Synthesizers, etc), but with a addition of a little orchestration theory, this method can be applied to any type of music regardless of the instruments used.

A BIT OF MIXING THEORY

Any mix can be separated into 5 parts or "Elements". It is the balance between these elements that is responsible for the mix balance. The five mix Elements can be broken down as follows:

ELEMENT 1 - RHYTHM

The Rhythm is usually just the bass guitar and drums but really can be any instruments that keeps steady time. Too many instruments in the Rhythm element causes a mix to be too "busy" and as few as 1 instrument can be more than sufficient in some cases. The Rhythm instruments in our example are: Kick, Snare, and Bass.

ELEMENT 2 - MOTION

Motion is distinctly different from Rhythm. Where the Rhythm Element is responsible for keeping the beat (and time), the Motion Element usually fills in the rhythmical spaces where the Rhythm instruments are not playing. Motion instruments are usually Rhythm Guitars, Percussive Keyboards such as Clavinets or pianos, or Percussion instruments. Motion instruments tend to play double-time of the Rhythm instruments.

ELEMENT 3 - PAD

The Pad Element is usually only one instrument that plays long sustaining notes or chords that support the other elements. These instruments are usually strings, organs, sustained guitar chords, or a synthesizer.

ELEMENT 4 - MELODY

The Melody Element is the focal point of the mix. This is usually a lead vocal or solo instrument.

ELEMENT 5 - FILLS

Fills are instrumental or percussion (occasionally vocal) passages that occur between the melody line.

Most of the time, only 4 Elements should occur at any one time, with the Melody and Fills alternating between each other (they may overlap a bit) but usually never occurring at the same time.

LET'S MIX

To create your mix, just do the following. *Remember that this is only a reference point; each song is unique and calls for different balances. Use the following as a starting point.*

1) Begin with all Faders in the "Off" position. Set the MASTER Faders to the "0" point on their travel.

2) Raise the Kick Drum Channel Fader until the LED meters read "-2".

3) Now mute the Kick Drum Channel by switching the Mute Switch to the "Off" position so the Kick can no longer be heard. DO NOT MOVE THE FADER! Just mute the Kick Channel.

4) Raise the Snare Drum Fader until the LED meters read "0".

5) Mute the Snare Drum the same as the Kick.

6) Raise the High Hat Fader until it reads "-15" on the LED meter. If any cymbals (ride or crashes) occur in the song, set them also to read "-15".

7) Mute the High Hat and Cymbals.

8) Raise the Tom Channel Faders. Set so that the LED meter indicates "0".

9) Mute the Toms

10) Bring up the Bass Guitar Channel Fader. Set so that the meters read "-6".

11) Mute the Bass

12) Raise the Channel Faders with the Motion instruments. Set so that the meters read "-10 " unless percussion instruments such as cowbell, triangle, or shaker are involved in, which case the meters should read "-15".

13) Mute the Motion instruments.

14) Raise the Channel Faders with the Pad instruments. Set so the meters read "-30".

15) Mute the Pad instruments.

16) Raise the Channel Faders with the Melody and solo instruments. Set so the meters read "-8".

17) Mute the Melody instruments.

18) Raise the Channel Faders with the Fill instruments. Set so the meters read "-10".

19) Unmute all channels and make balance adjustments as necessary.

The above can be done very fast 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, then a second time after all of the effects and EQ have been added.

FIGURE 12
MIX LEVEL REFERENCE CHART

RELATIVE MIX LEVELS				
RHYTHM	**MOTION**	**PAD**	**MELODY**	**FILLS**
Snare 0 VU VU	Rhythm Gtr -10 VU	Keys -30 VU	Lead Vocal -8 VU	All Inst.-10
Kick -2 VU VU	Perc Keys -10 VU	Strings -30 VU	Solos -8 VU	Toms 0
Hat -15 VU	Percussion -15 VU			
Cymbals -15 VU				
Bass Gtr -6 VU				

Once again, *THIS IS ONLY A STARTING POINT*. Each song is unique as are your mixing preferences. Blending the levels, EQ, and effects is the fine art of mixing. We hope that this section will help you achieve dependable mixes that sound good no matter where you play them or what equipment you play them back on.

HOW TO GROUP SEVERAL CHANNELS TOGETHER WHEN MIXING
A SUB MASTERcan be very useful in controlling several channels with the movement of only one fader. For example, if you wish to control your rhythm section via a SUB MASTERand the instruments were located on tracks 1 through 4 *(raise the Channel Faders used as Tape Returns , faders 9 through 12 to monitor),* do the following: ***See Section 2, INTERFACING WITH A MULTITRACK TAPE RECORDER***

    1) Raise the SUB MASTER Fader to the 0 position.
   **2)** Now assign the SUB MASTER by switching the "SUB MASTER TO MASTER" assign switch to the "On" position.

3) Unassign the Channel Faders that are being used as Tape Returns (in this case Channels 1 through 4) by switching the "MASTER" assign switch to the "Off" position.
4) Now assign the Channel Faders that are being used as Tape Returns by switching the "SUB MASTER" assign switch to the "On" position.
5) Raise the Channel Faders that are being used as Tape Return to the desired balance. The SUB MASTER Fader will now control those channels assigned to it.

PLEASE NOTE: Ideally, the SUB MASTER Fader should always be higher than the Channel Faders assigned to it. This is a sure way to prevent any possible overload. *See Figure 13.*

FIGURE 13
PROPER FADER LEVELS DURING SUBGROUPING
(SubMaster Higher than the Channel Faders)
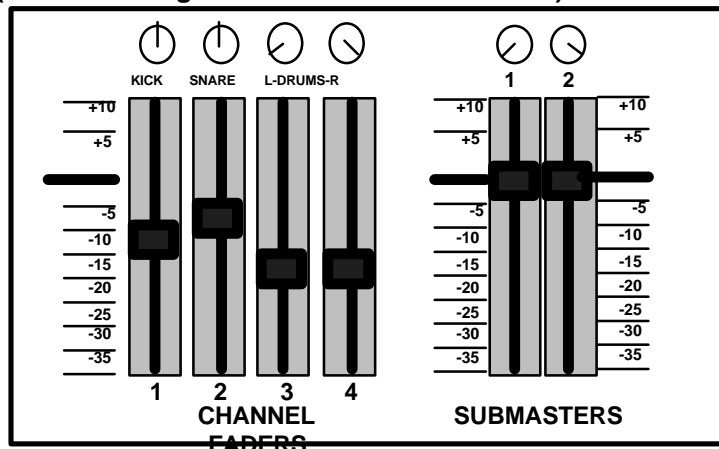
HOW TO PLAYBACK A MIX FROM THE MIXDOWN TAPE DECK

1) Place the TAPE/MON switch of the *1622 MIXER* to the TAPE position. *See Section 1, TAPE/MON SWITCH, and Section 2*

2) Turn the rotary MONITOR VOLUME pot to the desired volume level. *See Section 1, MON VOLUME*

PLAYBACK TIPS

- For best mixing results, get comfortable at a reasonable level (not too loud; not too soft) and DON'T CHANGE IT! Playback levels are extremely important since the ear can easily be tricked if the level is constantly changed up and down.

- Find a comfortable mixing/playback level that isn't too loud. Almost anything will sound good if it's played back loudly but will usually not translate well at softer volumes. Also, loud levels cause ear fatigue which means that the ear will be deceived by balances and tonal quality of instruments. In other words, WHAT SOUNDS GOOD LOUD, PROBABLY WON'T SOUND GOOD SOFT; WHAT SOUNDS GOOD SOFT, WILL PROBABLY SOUND GREAT LOUD.

SOUND REINFORCEMENT

The *1622 MIXER* performs well in a Sound Reinforcement application. Here are some helpful hints to help you get the most out of your unit.

SOUND REINFORCEMENT APPLICATIONS IN MONO

Most sound reinforcement applications work best in mono. This is because so few members of the audience are actually seated in the ideal spot to hear the balance of a stereo sound system effectively. Also, a stereo sound system is much more difficult to mix, especially if you don't have a sound man.

There are two ways to configure the *1622 MIXER* in order to achieve a mono mix.

METHOD A

1) Pan all of the input channels all the way to the left (or all the way to the right).
See Section 1, PAN POT

2) A mono mix will now be present at the Left MASTER Fader (or Right MASTER Fader if all of the input channels were panned that way).

This method will make RETURNS 6 and 8 unavailable (or 5 and 7 if all of the input channels are panned to the right) since these returns are dedicated to the right MASTER Fader. Use the following method if all 8 RETURNS are needed.

METHOD B

1) Pan all of the input channels to the center.

2) Use a Y cord from the MAIN OUT jacks on the backpanel. The output is now mono and all eight RETURNS are available for use. *See FIGURE 14.*

FIGURE 14

MONO OUTPUT FROM THE *1622 MIXER* FOR SOUND REINFORCEMENT USING ALL 8 RETURNS

INSTRUMENTS OR MICROPHONES

LINE INPUTS

SUB OUT

DIRECT OUTPUT

MIC

MAIN OUT

CHANNEL INSERTS

MON TAPE

SENDS

RETURNS

"Y" LEFT AND RIGHT TOGETHER FOR MONO

IN IN

STAGE MONITOR AMP

IN OUT

MICRO LIMITER

IN

HOUSE SPKR AMP

IN OUT OUT

EFFECTS UNIT

MONITOR SPKR
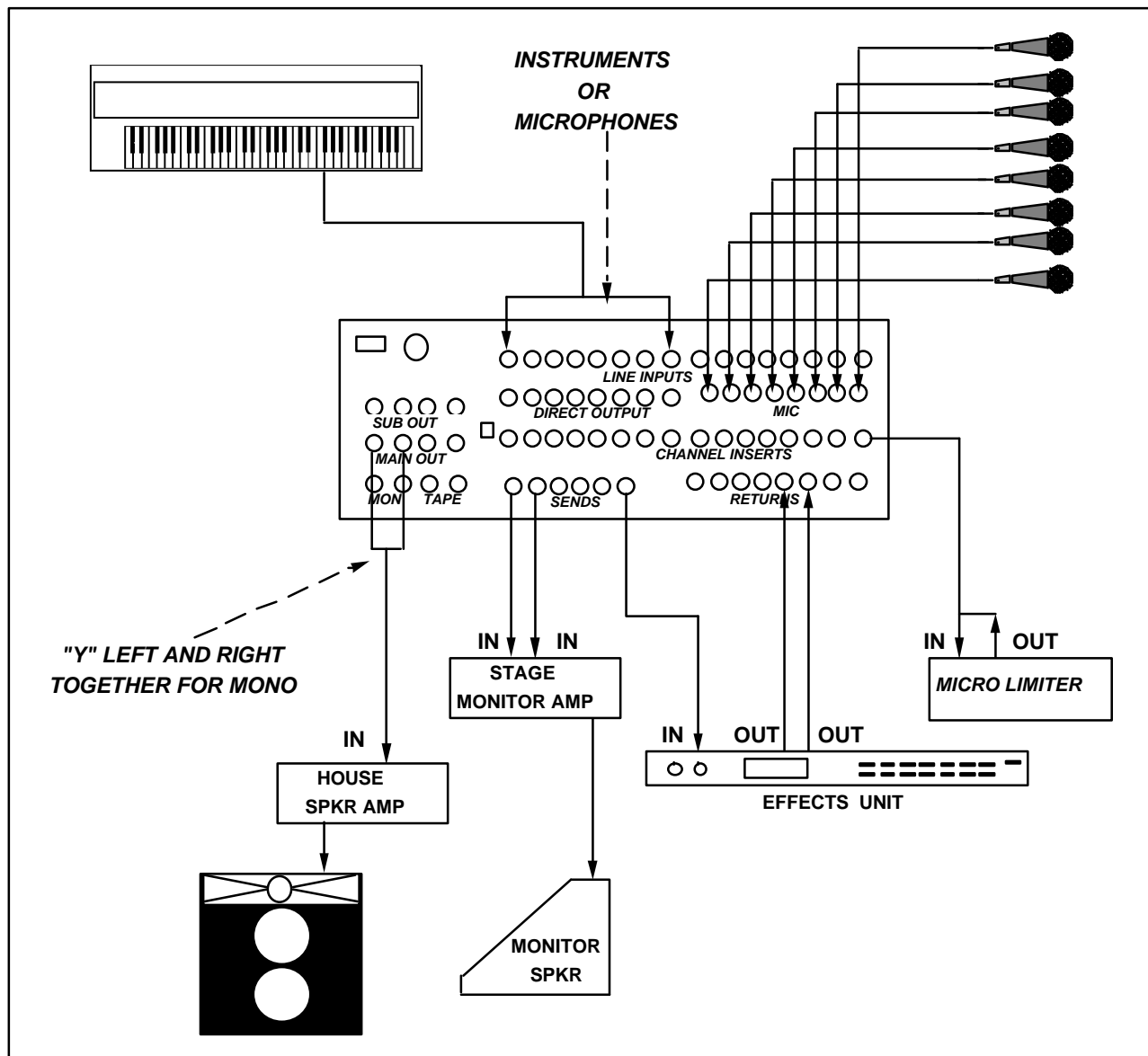
USING THE SUB MASTERS

The SUB MASTERS are extremely useful in sound reinforcement work. A SUB MASTER can be very useful in controlling the level of several channels with the movement of only one fader. For example, if you wished to control your group vocals via a SUB MASTER, and the vocal mics were located on channels 1 through 6, do the following:

1) Raise the selected Channel Faders to the desired levels *See Section 2, HOW TO ADJUST LEVELS*
2) Unassign the selected Channel Faders by switching the "MASTER" assign switch to the "Off" position. *See Section 1, MASTER ASSIGN SWITCH*
3) Now assign the Channel Faders by switching the "SUB MASTER" assign switch to the "On" position. *See Section 1, SUB MASTER TO MASTER ASSIGN SWITCH*
4) Now assign the SUB MASTER by switching the "SUB MASTER TO MASTER" assign switch to the "On" position. The SUB MASTER fader will now control those channels assigned to it.

LINE INPUTS USED AS ADDITIONAL MIC INPUTS

The *1622 MIXER* is not limited to only 8 microphone inputs. Besides the XLR connections on Input Channels 1 through 8, Channels 9 through 16 may also be used as additional microphone inputs. This is accomplished by using the 1/4" plug as the microphone input and will require either an XLR to 1/4" adapter or a mic cable with a 1/4" plug on the end. *See Figure 14.*

USING THE SUB MASTERS FOR SEPARATE OUTPUTS

There may be situations that call for a separate controlled output level beside the ones available from the MAIN OUTPUT, such as when the *1622   MIXER* is used as an on-stage keyboard mixer. In this case, one set of outputs will feed the keyboard players on-stage amplifier, and the 2nd set of outputs will feed the house sound system. *See Figure 15.*

In order to accomplish this, do the following :
1) Raise the Channel Faders to the desired levels
2) Assign the Channel Faders by switching both the "MASTER" assign switch and the "SUB MASTER" assign switch to the "On" position.
3) Now unassign the SUB MASTER by switching the "SUB MASTER TO MASTER" assign switch to the "Off" position. The SUB MASTER Fader will now separately control one set of outputs while the MASTER Faders will control the other.

FIGURE 15
USING THE SUB MASTERS OF THE *1622 MIXER* FOR SEPARATE OUTPUTS
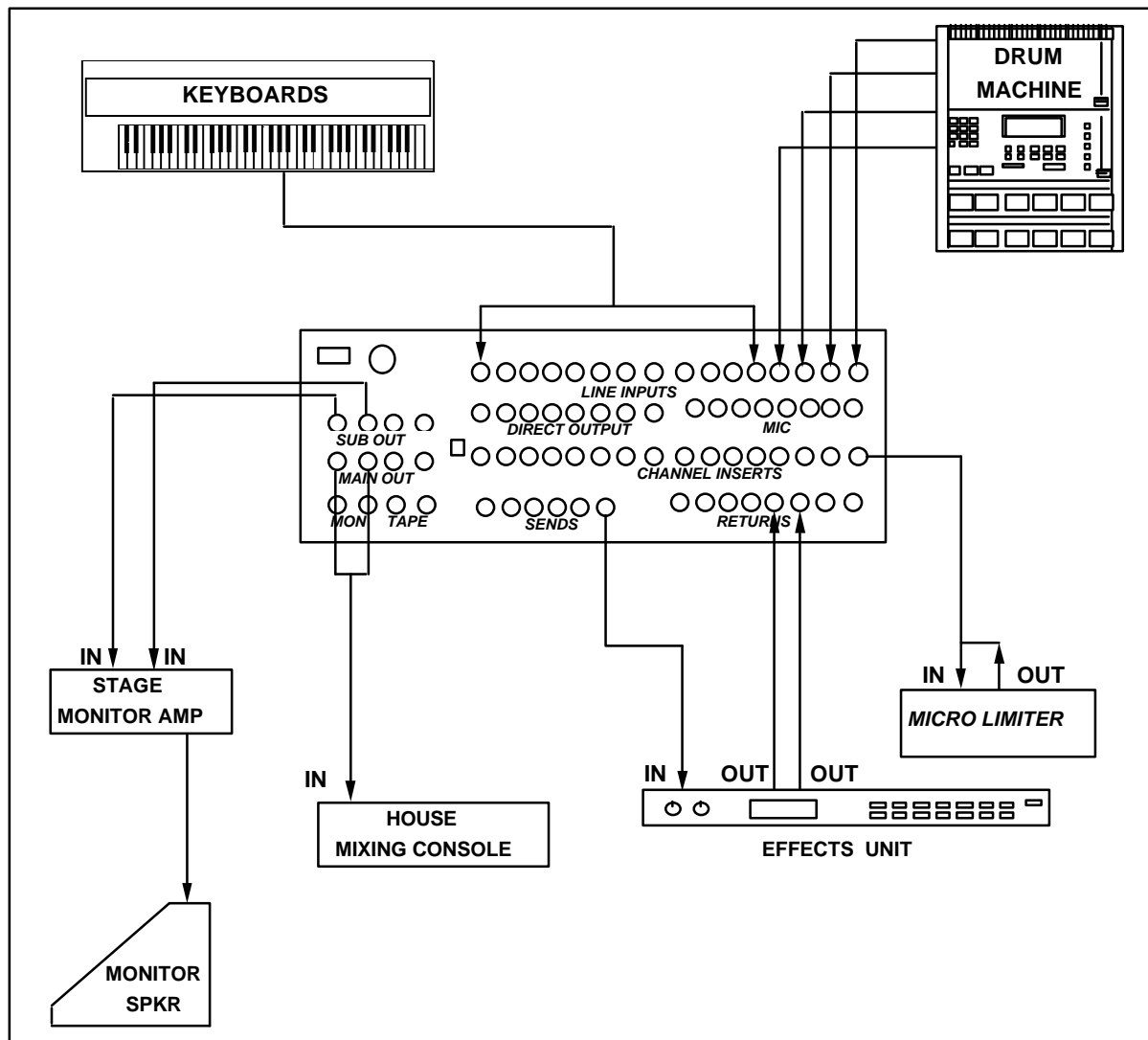
STAGE MONITOR MIX FROM THE PRE-FADER SENDS

It is possible to create up to two separate stage monitor mixes by using the PRE-FADER SENDS. Although it is possible to use the Post-Fader Sends as well, the Pre-Fader Sends are better suited to this application since any movement of the Channel Faders will not affect the Pre-Fader send level. ***See Figure 16.***

1) On the Input Channels, turn SEND 1 and SEND 2 (for 2 separate mixes) or just SEND 1 (for a single, mono mix) until the desired balance is obtained. ***See Section 1, SENDS, and Section 3, HOW TO CREATE A CUE MIX***

2) Use SEND MASTER 1 and 2 to increase or decrease the overall volume.

3) 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.

DEDICATED MIDI KEYBOARD MIXER

The use of the *1622* as a dedicated mixer in a MIDI keyboard setup is very similar to a sound reinforcement application except that the MAIN OUTputs will usually be in stereo rather than mono. ***See Figure 16.***

FIGURE 16
**THE *1622 MIXER* USED AS A DEDICATED KEYBOARD MIXER**
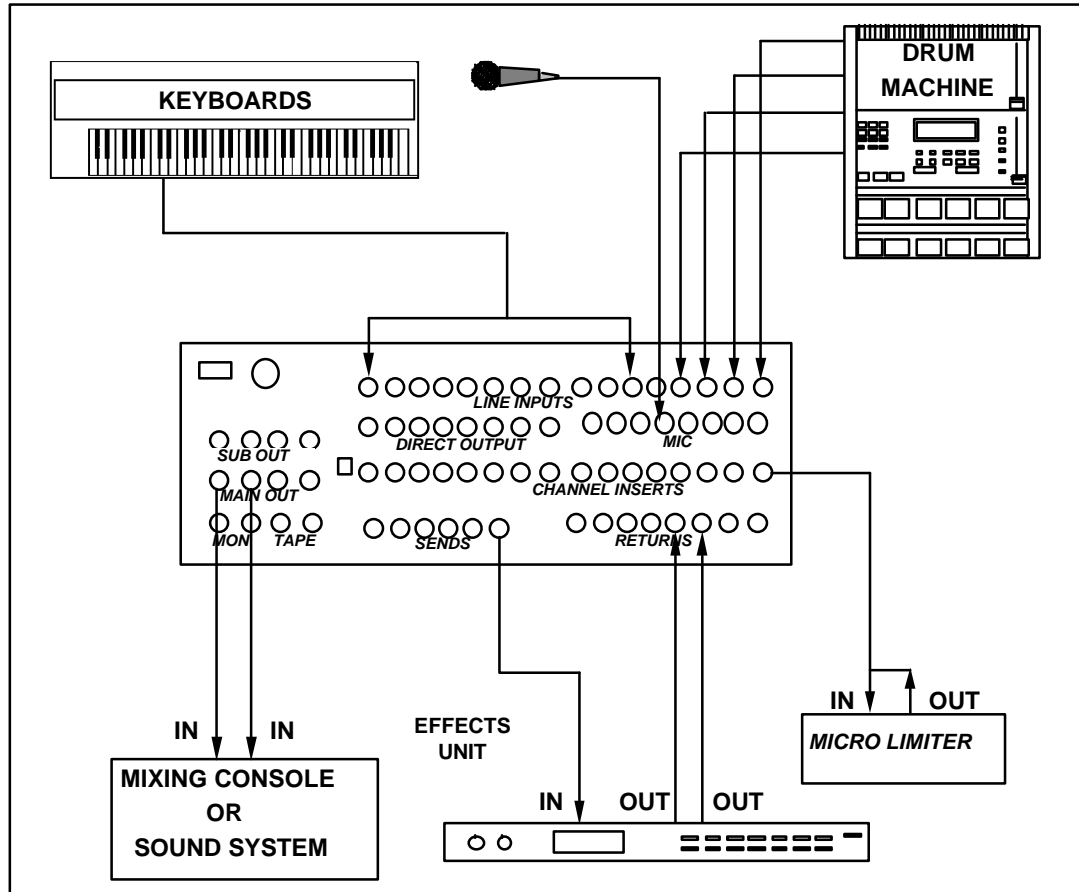
VIDEO POST-PRODUCTION

The *1622 MIXER* can easily be used in editing bays or video post-production facilities. The availability of separate output jacks on the SUB MASTERS make the unit ideal for making simultaneous mix-minus feeds. A mix-minus feed, which is used for international versions of a film or video, is a separate mix containing all music and effects, but no dialog (which is usually dubbed in later). *See Figure 17.* To accomplish a mix-minus feed, do the following:

1) Raise the Channel Faders to the desired levels. *See Section 2, HOW TO ADJUST LEVELS*

2) Assign the Channel Faders by switching both the "MASTER" assign switch and the "SUB MASTER" assign switch to the "On" position. *See Section 1*

3) Unassign the Input Channels that contain the dialog (or any information not desired in the mix-minus feed) by switching the "SUB MASTER" assign switch to the "Off" position.

4) Now unassign the SUB MASTER by switching the "SUB MASTER TO MASTER" assign switch to the "Off" position. The SUB MASTER Fader will now separately control the mix-minus outputs while the MASTER Faders will control the full composite output.

FIGURE 17
USING THE *1622 MIXER* FOR A MIX MINUS OUTPUT
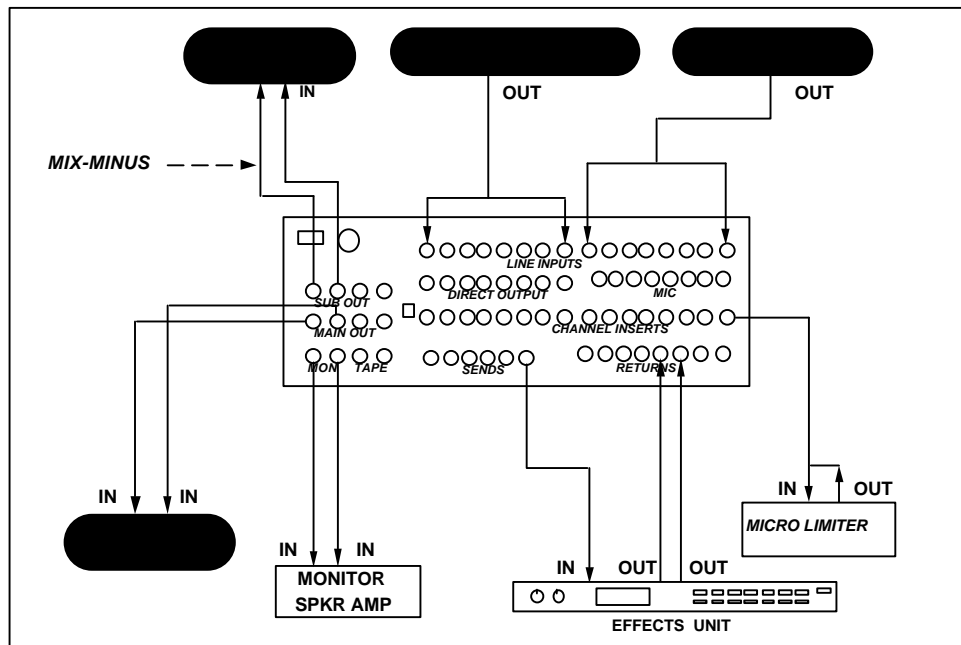
SECTION 4

TROUBLESHOOTING

NO SOUND

NO SOUND WHEN CHANNEL IS SOLOED
    1) Plug is inserted into LINE input, which has priority over MIC input.
    2) Open circuit in the INSERT signal path. Remove plug from INSERT jack.

NO SOUND WHEN MONITOR LEVEL TURNED UP
    1) MONITOR MUTE is engaged. Switch to "Off" position.
    2) SOLO is activated. If SOLO LED is lit, find the channel soloed and switch to "Off" position.
    3) TAPE/MON Switch in the wrong position. Swith to MON position to hear the console signal.
        Switch to TAPE position to hear the mixdown tape deck.

OVERLOAD PROBLEMS

DISTORTION HEARD WHEN INPUT CHANNEL IS SOLOED
    1) Input too hot. Decrease TRIM level.
    2) Excessive use of EQ. Decrease TRIM level or EQ levels.
    3) Cable fault. Check the cable from the mic or instrument.
    4) Trouble at the source. Try a different mic or instrument.

DISTORTION IS BEING RECORDED ONTO TAPE, BUT DISTORTION NOT HEARD WHEN INPUT

CHANNEL IS SOLOED
    1) SUB MASTER is overloaded. Decrease the fader levels of the channels assigned to the
        SUB MASTER.

2) Tape Machine input is overloaded. Set tape recorder input level control or SUB MASTER levels so that the meters of the tape deck hit 0 VU or less when recording.

3) Monitor input of the *1622 MIXER* is overloaded. Decrease TRIM control or output of Multitrack Tape Deck.

DISTORTION AT MIXDOWN MACHINE OR SOUND SYSTEM

1) Input Channel is overloaded. Solo each channel until distortion is found, then decrease either TRIM level or Fader level or both.

2) SUB MASTER is overloaded. Decrease the Fader levels of the channels assigned to SUB MASTER.

3) MASTER Faders are overloaded. If LED meters are in the red, decrease MASTER Fader level until distortion disappears. If LED meters are not in the red yet distortion is still heard, decrease all Input Channel Faders.

4) Overloaded Return. Decrease output level of effects device or decrease RETURN level.

5) Effects unit is overloaded. Decrease output of SEND MASTER level or input level of effects device.

DISTORTION ON THE RETURNS

1) Overloaded return. Decrease output level of effects device or decrease RETURN level.

2) Effects unit is overloaded. Decrease output of SEND MASTER level or input level of effects device.

SECTION 5

GROUNDING

Grounding problems ("Ground Loops") are probably one of the most common and annoying problems that plague not only home studios, but professional and commercial studios and sound reinforcement systems as well. 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. Since this is far from practical in the majority of situations that the *1622 MIXER* will be used in, 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.

Without getting too technical, 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 the 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 A HUM IF THE ABOVE HAS FAILED:

A) Disconnect the power from all outboard devices and tape machines except for the *1622 MIXER* and control room monitor power amp.

B) If the hum still exists, flip the polarity of the plug (turn it around in the socket) of the power amp and *1622 MIXER* until the hum disappears or is

diminished. If the power amp has a grounded type plug (3 pin), use a 3 to 2 pin adapter (ground lift) instead of flipping the plug.

C) Plug in each tape machine and outboard effects device one at a time. Either use a ground lifter or flip the polarity until the quietest position is found.

D) You should've done this in the first place, but in case you haven't yet, make sure that all of the audio cables are in working order. Cables with a detached ground wire will cause a very loud hum!!

SECTION 6

SPECIFICATIONS

ELECTRICAL CHARACTERISTICS

FREQUENCY RESPONSE	+0/-2 dBV 20 to 20KHz
HARMONIC DISTORTION	Better than .015% @ 1KHz @ 0dBV
CROSSTALK	-91 dBV Channel to Channel @ 1KHz @ 0dBV
SIGNAL TO NOISE RATIO	Worst Case -78dBV Master or Monitor with 16 inputs @ unity gain @ 0dB

INPUTS

GAIN	+70 dB Mic Input to Master Output
MAXIMUM LEVEL	+17dBV
IMPEDANCE	3K Mic/1M Line

OUTPUTS

MAXIMUM LEVEL	+17dBV
IMPEDANCE	500 All Outputs

FRONT PANEL

CONTROLS   Trim x 16   Hi EQ x 16
Lo EQ x 16   Pre-Fader Sends 1 &2 x 16
Post Fader Sends 3 - 6 x 16   Pan Control x 18
Channel Fader x 16   Send Masters 1 through 6
                            Return Level 1 - 8   Return Pan 1 - 4   SubMaster Faders 1 & 2
                            Master Faders 1 & 2   Monitor Volume

INDICATORS   15 Segment LED VU Meters x 2   Power LED
Solo LED

SWITCHES   Master Assignment x 16   SubMaster Assignment x 16
                          Mute x 16   Solo x 16
                          Tape/Master   Control Room Defeat
                          SubMaster to Master Assignment

REAR PANEL

JACKS   Microphone Inputs - XLR   Main Outputs - mono 1/4"
Line Inputs - mono 1/4"   Main Out Inserts - 1/4"TRS
                   Aux Sends - mono 1/4"   Sub Out - mono 1/4"
                   Channel Inserts - 1/4" TRS   Sub Out Inserts - 1/4" TRS
                   Direct Outs - mono 1/4"   Monitor Outputs - mono 1/4"
                   Tape Returns - mono 1/4"   Aux Returns - mono 1/4"
                   Power - 5 pin XLR   Headphone - 1/4" TRS

SWITCHES   Main Outputs +4/-10dBV Operation
                   On/Off

POWER REQUIREMENTS   External 9VAC, UL approved and made in USA
**DIMENSIONS (W x H x D)**   19" x 21" x 1.5" - 6"
WEIGHT appx**.**14lbs

GLOSSARY

1/4" plug - Also known as a phone plug, this is the common "guitar" type plug used on most electronic music instruments and amplifiers. All connections except for the microphone inputs on the *1622 MIXER* are done with 1/4" plugs. *See Figures 9 & 30.*

Balanced Line - A circuit incorporating 2 wires to carry the signal voltage, wrapped with a shield that is grounded. This method is preferred over an unbalanced type line *(see unbalanced)* because it cancels any stray hum or noise that may be induced in the line from outside sources. An input or an output using an XLR type connector *(see XLR)* is usually, but not always, balanced. A 1/4" phone plug is almost always unbalanced. The 8 microphone inputs of the *1622 MIXER* are balanced.

Buss - A buss is a junction line where a number of signal lines are commonly joined. It is similar in concept to the way that electricity arrives at your house. Each house on the block is connected to a line on the pole outside in order to draw electricity. The power line on the pole is a buss line. The *1622 MIXER* has 4 busses; the MASTER Left and Right, and the SUB GROUP Left and Right. *See Figure 18.*

FIGURE 18
A TYPICAL BUSS LINE

BUSS LINE

TO OUTPUT JACK

BUSS MASTER
OR
SUBMASTER

CHANNEL FADERS
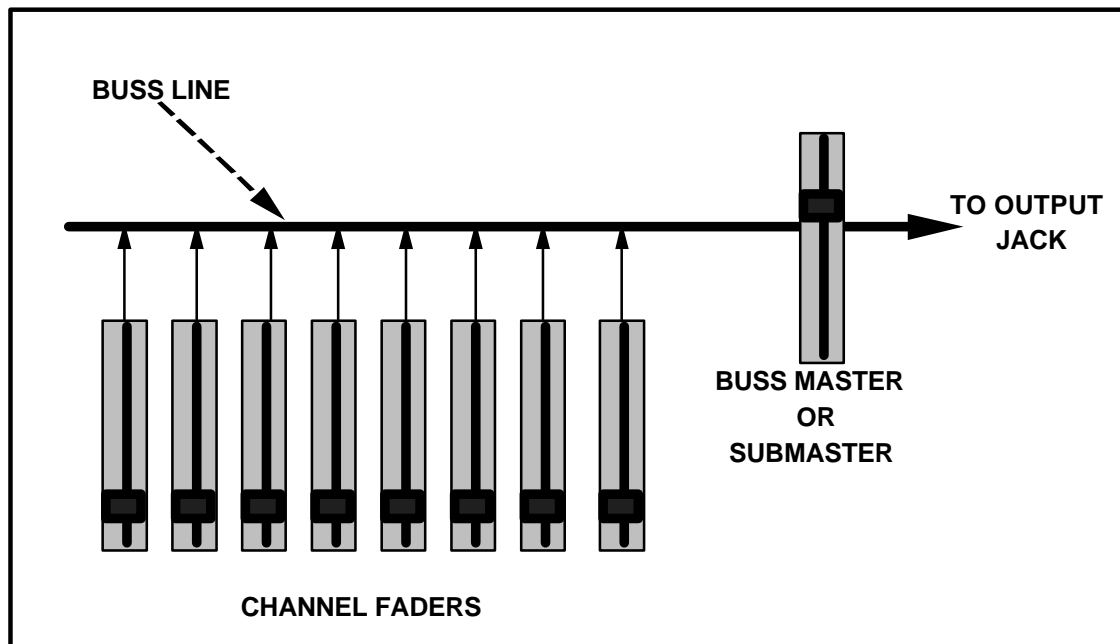
Chorus - A popular signal processing effect, Chorus attempts to simulate the sound of a group of instruments by introducing minute changes in pitch and time. This is done by splitting the signal of an instrument into two parts. One signal remains unchanged while the second is slightly delayed in time and detuned in pitch.

Compressor/Limiter - A compressor/limiter, which can be thought of as an automatic fader, very quickly reduces gain and attenuates the signal once it exceeds a predetermined level. The number of dB increase of the input signal needed to cause a 1 dB increase in the output signal of the compressor/limiter is called the "Compression Ratio". Thus, for a ratio of 4 to 1, an 8 dB increase of the input produces a 2 dB increase in output.
A low compression ratio (2:1 to 8:1) causes the compressor/limiter to act in the compression mode. A compressor is usually used to even out the volume differences of an instrument or

vocal. A compression ratio of 10:1 or above changes the compressor into a limiter. A limiter is used to prevent short term peaks, which add little information to program material, from overloading amplifiers or tapes.   The **Alesis MICRO LIMITER** is an example of a compressor/limiter.

Cue Mix - The mix sent to musicians studio headphones is called the Cue Mix. This mix is usually different from the one that is being heard in the control room, since the musicians frequently require certain instruments to be of a different volume or absent altogether in order to "cue" off of. The **1622 MIXER** is capable of supplying either 2 mono or 1 stereo Cue Mix.

dBV - Decibels per Volt. This is a unit of measurement normally applied when measuring the inputs and outputs of most modern sound equipment. Technically speaking, this is measured when a low impedance source is fed into a high impedance input, as is the case in nearly all current sound equipment. +4dBV = 1.4 volts AC, 0dBV = .778 volts AC.

Delay - An electronic effect in which the original signal is repeated and mixed back in with the original signal. Usually, the number of repeats and the length of time between the repeats can be adjusted. Also sometimes known as Echo.

Direct Outputs - This jack contains the amplified (and EQ'ed) signal of only one channel, which has not been mixed together with other signals in the mixer. This is generally used to feed a single track of a tape machine. Because the Direct Output is the path with the least amount of circuitry and therefore the lowest possible background noise, it is most desirable to use. The **1622 MIXER** has a Direct Output on each of the first 8 Input Channels.

Distortion - Any deviation in the amplified signal from its original. Distortion may take many forms such as certain frequencies becoming louder or softer after being amplified (frequency response), unwanted signal artifacts when two or more signals are amplified at the same time (intermodulation distortion), or certain harmonics of a signal being favored over others (harmonic distortion).

Echo - See Delay.

Edit Bay - An Edit Bay is the equivalent of a video mixdown studio, where shots from different reels are assembled onto a master reel. At this point, video effects such as wipes and fades are also added.

Effects - The term used for signal processing that is added to a signal to enhance its tonal quality. These effects may be reverb, echo, EQ, compression, chorusing, flanging, etc.

Equalization (EQ) - Equalization is the ability to adjust the tonal balance of a signal. This can be of a very broad nature, such as the bass and treble controls of a home stereo unit, or of a finely tuned nature, such as a graphic equalizer. The **1622 MIXER** has 2 bands of shelving type EQ *(see shelving)* per Input Channel.

Fader - The Channel Fader determines the overall volume level of the channel. It is normally best to keep this Fader at about the 3/4 level for best headroom and lowest background noise.

Feedback - Whenever a portion of an amplifier's output is returned to its input, and therefore re-amplified, a loud howl called "feedback" is created. Most commonly, this occurs in sound systems when the output of the loudspeakers is picked up again and again by a microphone forming a feedback "loop".

Flanging - First used in the sixties, "flanging" was achieved by the use of two tape recorders that would record and play back the same program in synchronization. By alternately slowing down one tape machine, and then the other, different frequency cancellations would occur. Since the slowing down of the tape machines was done by hand pressure against the flanges of the tape supply reels, the term "flanging" came into being. Today, flanging can be closely simulated by most outboard effects processors such as the **Alesis MIDIVERB II, MIDIVERB III,**

or **QUADRAVERB.** The effect of flanging, either electronically or mechanically done, is achieved by slightly delaying a signal, then constantly varying the amount of time delay. The delayed signal is then mixed back with the original signal to produce the "swishing" or "tunneling" sound.

Gate - See "Noise Gate".

Graphic Equalizer - Seen on sound systems, some home stereos, and many guitar type amplifiers, this device gets its name from the fact that the control settings actually form a graph of the frequency spectrum. While shelving equalizers work on broad sections of the frequency bandwidth, a graphic equalizer divides the frequency spectrum into sections called bands which are normally measured in musical octaves. An example of a graphic equalizer is the **Alesis M-EQ 230** .

Ground Lift - An adapter for an AC line plug that converts it from 3 pin operation to 2 pin. This is frequently used to avoid ground loops **(see Ground Loops).**

Ground Loops - When a sound system or recording system has a loud hum or buzz, a Ground Loop is usually the cause. Ground Loops are created by having more than one ground point in a sound system. **(See Section 5 - GROUNDING)**.

Headroom - The amount of available operating level before a circuit is overloaded and begins to distort. For example, the nominal operating level of the **1622 MIXER** is +4dBV and the maximum output level is +20dBV which means that there is 16dB of headroom available. If the nominal operating level is -10dBV and the maximum output level is +20dBV, then there is 30dB of headroom available.

High Impedance - Any impedance which is 10,000 ohms or more is considered a High Impedance. The *inputs* of most audio devices are High Impedance. All inputs except the microphone inputs of the **1622 MIXER** are High Impedance.

Inserts - Inserts are used to connect signal processing devices into the signal path of a single channel. Normally, this is a device 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.
An insert consists of both an input and an output and is used to place an outboard effects device, such as a compressor, EQ, or chorus, into the signal path of only that channel. Each Input Channel, the Sub Groups, and the Master Outputs of the **1622 MIXER** have inserts.

LED - LED is an abbreviation for Light Emitting Diode and is commonly used as an indicator on audio and musical equipment.

Line Level - The output of most mixers and outboard equipment, which may be nominally -10dBV or +4dBV, or approximately .1 to 1 volt AC. Because the signal level is so high, costly low noise precision amplifiers are no longer required. **See "Nominal Level"**

Low Impedance - Any impedance 1,000 ohms or lower is considered to be Low Impedance. The outputs of most audio devices and electronic musical instruments are Low Impedance. Most microphone inputs are Low Impedance. The microphone inputs of the **1622 MIXER** are Low Impedance.

Mix-Minus - A mix-minus feed, which is used for international versions of a film or video, is a separate mix containing all music and effects, but no dialog (which is usually dubbed in later). **See Section 3, VIDEO POST PRODUCTION**

Mixer - A unit which blends several audio sources, such as microphones, tapes, records, or CDs, together in a single mono or stereo output.

Mixing Console - A Mixing Console blends several audio sources together with the capability of routing different mixes to several different output combinations.

Monitor - In recording, Control Room Monitors are the primary speaker for listening to either a performance or tape playback. In sound reinforcement, a Monitor is a separate on-stage sound system intended only for the performer so he can hear himself.

MultiTrack - A tape machine that has 4 or more independent recording tracks, and is capable of recording on any channel while remaining in sync with previously recorded tracks.

Mute - To turn off or disengage. On a mixing console, a Mute switch is an On/Off switch for a particular function. The *1622 MIXER* has a Mute switch for each of its 16 inputs.

Noise Gate - As the name suggests, a noise gate is sort of an electronic fence gate. When there is enough pressure on the gate (the signal is loud enough), the gate will open to let the signal through. You can control how much level it will take to open the gate (or how much pressure), how long the gate will stay open, and how fast it will close. Because of this amount of control, a Noise Gate such as the *Alesis MICRO GATE* can be set to eliminate any noises, clicks, or buzzes which might be a component of the signal by closing the gate (turning off) either when a signal is not present, or when the signal drops below a preset threshold (or pressure).
The Noise Gate will not actually eliminate all noise that is a component of the signal, just the noise that exists when the signal is not present. It can also be used for a variety of special effects such as gating the reverb on a snare drum to achieve the popular 80's style drum sound effect, or tightening up the sound of a live drum kit by suppressing leakage between drum mics.

Nominal Level - Typical operating level. This is usually -10dBV for semi-pro and stereo equipment, and +4dBV for professional quality equipment. The *1622 MIXER* can accommodate either.

Outboard - Refers to any piece of equipment that is connected to a mixing console but not an integral part of it.

Overdubbing - A basic process of multitrack recording, Overdubbing is the recording of a new part in sync with previously recorded material.

Pan Control - The Pan Control determines the spatial positioning of a signal and places it anywhere between the left and right speakers.

Patchbay - Refers to a row of jacks that are permanently connected to various pieces of equipment. This allows immediate access to inputs and outputs for fast and easy interconnection. *See Section 2, INTERFACING WITH THE MULTITRACK TAPE DECK VIA A PATCHBAY*

Patching - The process of interconnecting one piece of equipment to another.

PFL - Stands for Pre-Fader Listen. A type of solo, PFL allows the engineer to listen to the signal as it enters the console but before it travels through much of the circuitry of the console. Thus, if an overload occurs , the engineer can easily tell at what point in the signal path. The *1622 MIXER* uses a Pre-Fader Listen scheme in that the Fader position has no bearing on the volume of the soloed channel because the Solo signal is taken from before the Channel Fader in the signal path.

Phase Cancellation - The change in timbre that occurs when a signal partially cancels itself out. This frequently happens when a sound appears at a microphone at the same time as its reflection.

Phone Plug - See 1/4" plug

Phono Plug (RCA) - A connector commonly found on hi-fi equipment and semi-pro audio equipment. Although inexpensive, RCA phono plugs are not used in professional applications since the connectors don't lock together and are subject to frequent accidental unplugging.

Post-Fader - A signal that is derived from a point in the circuitry after the Channel Fader. This means that the Post-Fader signal is subject to any changes in volume level of the Channel Fader; i.e. when the Channel Fader level is increased, the Post-Fader signal increases; when the Channel Fader level is decreased, the Post-Fader signal decreases.

Post-Production - In video and film, the portion of production that occurs after the initial shooting takes place on stage or location. This entails many phases which include editing, dialog looping, adding sound effects, etc.

Pre-Fader - A signal that is derived from a point in the circuitry before the Channel Fader. This means that the Pre-Fader signal is not subject to any changes in volume level of the Channel Fader; i.e. when the Channel Fader level is increased or decreased, the Pre-Fader signal remains constant.

Preamp - A high quality, low noise amplifier especially designed to accept low level signals from microphones or phono cartridges and boost the signal to a more easily used Line level. *See "Line Level"*

Punching In/Punching Out - The process of replacing just a part of a previously recorded part by listening to the playback, "Punching In" to record at the desired place, and "Punching Out" of record at the appropriate moment.

Return - A Return is an additional input besides the Channel Inputs on a mixing console that are used especially for outboard effects such as reverbs, delays, chorus, etc. These inputs eliminate the need to plug effects into channel inputs and therefore keep the input channels available for additional microphones, synthesizers, etc. The *1622 MIXER* is unique in that it has 8 separate Returns as opposed to the average 2 or 4.

Reverb - Reverb can be thought of as a great number of distinct echos, called reflections, that occur so fast that our ear hears them blurred together as one. In nature, different size spaces give distinctly different sounding reverbs, depending upon the size and shape of the space, and the texture of the surfaces that the reflections bounce off of. Nearly any natural reverberant space that can be imagined, and a few artificial ones as well, can be simulated by many by the many digital signal processors on the market today including the **Alesis MIDIVERB II**, **MIDIVERB III**, **MICROVERB II**, and **QUADRAVERB.**

Send - Sends (sometimes called "Auxiliary Sends" or "Aux's") on a mixing console are adjustable feeds from the input channel that are used to send part of the signal to an outboard effect (like a reverb, delay, or chorus) or to set up a separate cue mix for musicians headphones during recording and overdubbing. The *1622 MIXER* has 6 Sends.

Shelving - The most common type of equalizer is the *Shelving* type. This is the simple bass and/or treble control normally found on stereo systems, guitar amplifiers, and the like. These are called shelving because the maximum boost or cut is at its maximum (usually 100Hz for the bass and 10KHz for treble) and maintains this maximum amplitude "shelf" or plateau on all frequencies from this point (called the "turnover") to beyond the range of audibility. The frequencies below the turnover point of the shelf are also affected, but less and less so the further away from the turnover point. The *1622 MIXER* has Shelving type EQ. *See Figure 1.*

Solo - Solo on a mixing console stops the normal Master Stereo signal feed to the monitor speakers and replaces it with the signal present in the input fader of the channel. Soloing enables the engineer to hear exactly what is being recorded by eliminating the masking effects caused by the presence of other signals. When soloed, any signal overloading or other undesired sounds in an input channel can be heard easily and corrected.

Studio Quality - Since the equipment used in a recording studio must be of the highest quality in order to accurately reproduce every nuance of sound, any piece of equipment which measures up to this standard is known as Studio Quality.

Sub Master - A Sub Master (sometimes called a "SubGroup" or "Group") is used to control the level of several channels with the movement of only one fader. The *1622 MIXER* has 2 Sub Masters.

Tape Returns - Inputs on a console specifically dedicated to receiving the signal from a tape deck. This may either be from a Mixdown Tape Deck (cassette, two track, DAT), or Multitrack Tape Deck.

Transients - Extremely brief, high output audio signals, usually the attack portion of a signal. For example, when looking at a signal meter, even though the meter of a signal may indicate an acceptable level, the transient portion of the signal (such as a cymbal crash) can very briefly rise far above what the meter is capable of reading, causing a moment of overload and therefore, distortion.

Trim - A control on a mixer or console that sets or "Trims" the gain of the microphone preamp. There is a Trim control on each Input Channel on the *1622 MIXER* .

TRS - A stereo phone plug is also commonly known as a TRS plug because of the arrangement of construction; i.e. T stands for tip, R for ring, and S for sleeve. *See Figure 9.*

Unbalanced Line - A circuit that uses a single wire to carry the signal voltage. Although unbalanced circuitry is simpler to build than balanced equipment, unbalanced lines are more susceptible to outside induced hum and noise. This is not a problem at line level where the signal is strong and the induced hum and noise is weak. But weak microphone level signals would suffer from outside induced hum and noise. This is why balanced lines are nearly always used for microphone level signals. *See Figure 19.*

VU - VU stands for Volume Units, which is one common standard of measurement of metering on professional audio equipment such as tape recorders and consoles.

XLR - A mating male and female jack and plug used for balanced operation and normally found on professional audio equipment. These are desirable because of their locking feature (making them difficult to accidentally disconnect) and sturdy construction. Most professional applications use the 3 pin type which are a requirement for balanced operation *(see Balanced)*, although others with more pins are used for other applications. The 8 microphone inputs of the *1622 MIXER* use XLR type connectors.*See Figure 19.*

APPENDIX

There may be situations that arise that the 1/4" type outputs of the *1622 MIXER* must be interfaced to a balanced XLR type input. This is fairly easy to do and will have no effect on the performance of the unit. There are two methods to accomplish this since there is currently no adhered to international standard.

METHOD A

The published Audio Engineering Society standard for the pin out of an XLR connector is:

Pin 1	Ground
Pin 2	+
Pin 3	-

To change this connection from balanced to unbalanced, simply solder pins 1 and 3 together.
See Figure 17A.

This convention is followed throughout most of the world, except for the United States. If you are connecting the *1622 MIXER* to a device of European origin, chances are it is probably wired this way. Check your owners manual to be sure.

METHOD B

The typical way that an XLR connector is wired in North America is:

Pin 1	Ground
Pin 2	-
Pin 3	+

To change this connection from balanced to unbalanced, simply solder pins 1 and 2 together.
See Figure 17B.

This convention is followed only in the United States. If you are connecting the *1622 MIXER* to a device made for the American market, chances are it is probably wired this way. Check your owners manual to be sure.

If you have chosen the wrong method of wiring, DON'T WORRY since you cannot harm your 1622. The audio quality may suffer slightly, however, due to possible phase cancellation. If you are unsure, try both ways and chose the one that sounds best!

FIGURE 19

WIRING OF UNBALANCED XLR

METHOD A - EUROPEAN EQUIPMENT

HOT   SHIELD

METHOD B - AMERICAN EQUIPMENT

HOT   SHIELD

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