

Studiomaster

16x4x2 MIXER APPLICATIONS

LIVE SOUND REINFORCEMENT

The extreme versatility of the 16x4x2 provides a level of control more than equal to demanding live situations.

MULTITRACK

Interfaces perfectly with 4 track transports for superb multi-track masters as well as patching facilities for 2 track mix down.

THEATRICAL PRODUCTION

The flexibility and expandibility of the 16x4x2 allow the theatrical user more than enough options for dramatic and musical presentations.

VIDEO POST PRODUCTION

A superb unit for professional audio results in both the commercial film and video mediums.

PERMANENT INSTALLATION/CHURCHES/INSTITUTIONS

Multiple inputs and outputs allow for selective signal distribution formats not usually found in ordinary mixers.

Technical information, service and parts are available through any authorized dealer or representative world wide.

For further information on the entire Studiomaster line of products, write to either of the addresses listed below.

Studiomaster Inc., Division of I.M.C.

Recording Studio Design

RECORDING STUDIO DESIGN, FAIRCHARM TRADING ESTATE
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Thank you

for purchasing the Studiomaster 16x4x2 mixer.

The Studio master 16x4x2 mixer has been carefully designed for recording as well as live performance mixing. Further, this mixer can be used for simultaneous recording of live performances in addition to remixing of multi-track master recordings. This mixer has the flexibility to meet virtually any unique audio situation under the most strenuous conditions and provide superb audible results. The 16x4x2 perfectly matches any 4 track recording transport making this board perfect in both home and studio recording environments.

Read this manual carefully and familiarize yourself with the features and functions before operating. We suggest always keeping this manual with the mixer.

We at Studiomaster are proud of our mixers and we believe you will be equally proud with your purchase.



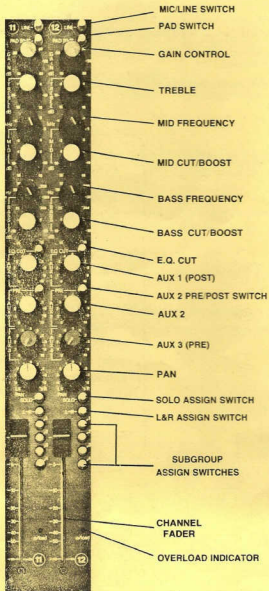
STUDIOMASTER

sound
centers



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Each input channel consists of the following controls and features:

MIC/LINE SWITCH

This switch allows for any channel to be used with either a microphone level input (balanced low impedance -200 ohm) or a line level input (unbalanced 600 ohm.) (see page 25 for details).

PAD SWITCH

This switch provides a 20dB pad directly to the mic input and 10dB to line, and can be used to attenuate high level signals.

GAIN CONTROL

The gain control is continuously variable from 10dB to 60dB. This control determines the nominal channel sensitivity by varying the pre amp gain, preserving maximum headroom and minimum noise without affecting input signal sensitivity.

EQUALIZATION

The 16x4x2 utilizes the famous Studiomaster semi-parametric E.Q. network. The treble control network is an active shelving-type high pass filter functioning from 10kHz, providing for 16dB boost or cut.

The midrange network consists of a continuously variable frequency control with a sweep of from 200Hz to 8kHz. This is combined with a separate gain control providing 16dB boost or cut over the chosen frequency band.

The bass network consists of a continuously variable shelving frequency control with a sweep of from 25Hz to 350Hz. This is combined with a separate gain control providing 16dB boost or cut on all frequencies below the chosen cutoff point.

E.Q. CUT

This switch allows the user to bypass the equalization network input.

***AUX 1**

This control allows for bussing of a post fader signal to the Auxiliary 1 master section. Post fader sends are commonly used for use with external echo and/or reverb devices.

*(Post E.Q.)

***AUX 2**

This control, like Aux 1, is normally post fader. Aux 2, however, is provided with a pre-fader selector switch for bussing of pre-fader signals to the Aux 2 master section.

***AUX 3**

The Auxiliary 3 control allows for bussing of a pre-fader signal to the Aux 3 master section. Pre fader signals are normally used for stage monitor, studio foldback or cueing.

PAN CONTROL

The rotary post fader pan control determines the left-to-right balance of the signal being sent to the output buses. If the channel signal is sent to the subgroups (1-4), the odd groups are left while the even are right.

***SOLO**

The solo switch allows the channel signal to be bussed at a pre fader level to the Monitor output. This signal can be used in a preview or cueing application. This signal automatically appears on LED ladder #4.

LEFT-RIGHT MASTER ASSIGNMENT

This switch allows for bussing the post pan signals directly to the left and right master output sections, bypassing the subgroups. This signal may be used for post production overdubbing in recording studios or for routing of single signals to the program outputs in live performance applications.

SUB GROUP ASSIGNMENT

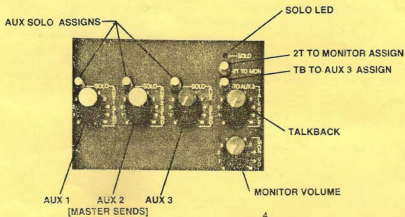
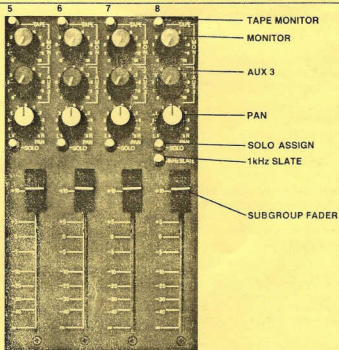
The four subgroup switches allow for bussing the channel signals to any combination of subgroups simultaneously. Subgrouping is provided for multi-track recording or for sub mixing signals/groups, such as drums, during live sound reinforcement.

LED OVERLOAD INDICATOR

The inset LED next to the channel fader provides a visual indication of the channels signal status. The LED fires at 4dB below clipping allowing the operator to know well in advance if the nominal signal level is approaching a distorted level. The LED detector circuit is post gain and E.Q.

CHANNEL FADER

The 100mm channel fader provides output level control from the channel to all post fader busses. The fader is calibrated for accurate relative level indications.



Each subgroup consists of the following features & functions:

TAPE MONITOR SWITCH

These switches buss the incoming multi-track tape inputs from the line input jacks on input channels 12-16 directly to the monitor outputs. This allows monitoring of the dry signal prior to remixing or effects addition or for off-tape monitoring.

MONITOR CONTROL

The monitor control busses the subgroup output to the left and right master outputs. Additionally, the signal is bussed directly to the monitor output jacks located on the rear panel. The left/right balance is controlled by the subgroup pan control (see below).

AUX 3

The subgroup signal can be bussed to the Aux 3 master section via this send control. The signal is monaural and is post subgroup fader.

PAN CONTROL

The pan control determines the left-to-right balance of the subgroup signal bussed to the monitor output and the master outputs.

SOLO SWITCH

The solo switch sends the subgroup signal to the monitor output directly, bypassing the monitor send and pan control.

FADERS

The subgroup fader is a 100mm control provided with dB calibrations for accurate relative signal indication. This determines the final signal level available at the subgroup output jack as well as to all post fader subgroup busses.

SLATE (located in Subgroup 4)

The slate tone switch applies a 1kHz tone to all 4 subgroups simultaneously. Additionally, this tone may be bussed to the left & right program outputs, thus, the tone may be used for lining up recording equipment, slating tapes and system check-out in live sound reinforcement applications.

AUXILIARY 1, 2 & 3 MASTER SECTIONS

Each Auxiliary Master section is identical, the difference being in the derivation of the incoming signals.

The master control determines the level of signal available at the corresponding output jack. The solo switch allows each auxiliary buss to be sent to the solo circuit, meter #4 and the monitor outputs.

SOLO INDICATOR

The solo LED will light when any signal is present in the solo circuit. This indicates the signal is visually present at meter #4 and audibly available at the monitor output.

2T MONITOR

This allows bussing of the incoming 2 track signal (from the 2 track return jacks) to the monitor outputs. This allows for playback monitoring of remixed tapes; thus remixed tapes can be compared in either "dry" or "wet" state for final overdubbing.

TALKBACK VOLUME AND ROUTING SWITCH

The talkback volume control determines the level of any mic signal within the buss. Access is via the XLR input on the rear panel (see rear panel features). The routing switch is a momentary push button opening the talkback circuit access to the Aux 3 buss output. This allows communications to the stage monitoring system during live sound reinforcement or to the foldback system during recording. The talk-back circuit, via Aux 3, may also be used as part of an intercom system for on and off stage direction communications during complex performance situations.

MONITOR VOLUME CONTROL

This determines the overall level of any subgroup signal bussed to the monitor output as well as the slate tone. the control does not effect the level of signals bussed to the left & right program outputs.

The left & right program master sections are identical in features and functions.

EQUALIZATION

The output equalization on the program masters consists of the following networks:

Treble - shelving type with 16dB boost or cut at 20kHz

Middle - reciprocal curve (peak/dip) network with
16dB boost or cut at 1.5kHz

Bass - shelving type with 16dB boost or cut at
20Hz

MASTER FADER

The program master faders are dB calibrated for accurate relative signal level indications. The 100mm units control the final signal bussed to the program left & right XLR connectors.

AUXILIARY 1 & 2 RETURNS

These two networks are identical in both features and functions. Auxiliary return networks do not necessarily require their inputs to be derived from the correspond-

ing auxiliary sends and thus can be driven with any unbalanced line level signal.

AUXILIARY LEVEL CONTROL

This determines the amount of returning signal available for bussing to the subgroups and/or program outputs.

PAN

This determines the left-to-right balance of the incoming signals routed to the various busses.

RETURN ASSIGNMENTS

These switches determine the routing of the auxiliary signals (post pan & level). The signal may be bussed directly to the left & right program, subgroups 1 and 2 and 3 and 4 or all of the above.

AC SWITCH AND PILOT LIGHT

The AC switch energizes the entire console. An "AC on" condition is indicated by the red LED located to the left of this switch.

CHANNEL INPUTS 1-16

Each of the sixteen channels have the following input connections and access points.

MICROPHONE INPUT

Mic level (low impedance) signals are introduced to the channel through the XLR connector. This routes the signal to the balanced discrete preamplifier section.

LINE INPUT

Line level signal (unbalanced) can be inserted via the 1/4" phone jack located below each mix XLR.

CHANNEL PATCHING ACCESS

Line level signals may be derived or added to the individual channels via the 1/4" stereo phone jack. This allows individual channel signals to be bussed, for example, to an external signal processing device such as an echo or delay unit and returned to the channel for normal routing to the outputs. These jacks can be easily modified for post fader operation for larger multi-track situations. (See page 10 Auxiliary Bussing).

AUX 1, 2 & 3 SENDS

The auxiliary send jacks derive signals from their respective master send controls. Aux send 1 is designed

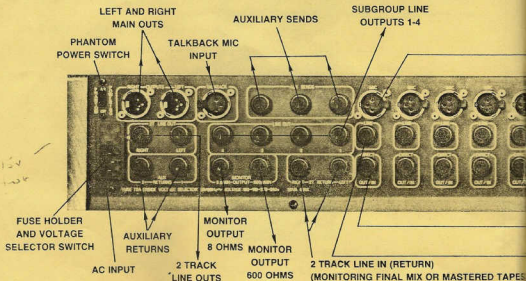
primarily for use with external signal processing and effects devices such as echo or digital delay. Aux 3 is provided primarily for studio foldback or live sound stage monitor feeds. Auxiliary 2, which is selectable as either a pre or post fader signal buss, may be used for either of the above functions, depending on the situation and/or user preference.

SUBGROUP LINE OUTPUTS 1-4

These 4 outputs provide an unbalanced line level signal (+4 dBm level) for 4 track recording. The signals available are derived post fader and are primarily designed for use with 4 track tape machines or for live sound applications requiring multiple, independent program lines. These outputs may also be used for bussing signals to external devices, such as limiters, wherein the processed signal is returned to the program outputs via the auxiliary 1 and 2 return networks.

2 TRACK LINE IN (RETURN)

These 1/4" phone jacks provide return access for -10dB signals from 2 track tape machines for playback of mastered tapes. The signals are routed to the Monitor outputs when the 2 Track-to-Monitor switch is depressed.



MONITOR OUTPUTS

The two 1/4" stereo phone jacks are provided for driving headphones or small, low power speakers (8 ohm jack) or full size studio reference monitor systems (600 ohm jack). The signals present are identical except for the load requirements and are derived from the subgroup monitor send and pan controls. The final level is determined by the monitor master control.

TALKBACK

This XLR accepts a standard low impedance microphone for use as a cueing or intercom connection to the Aux 3 output buss.

AUXILIARY RETURNS

The two auxiliary jacks are designed to accept line level signals for bussing to the programs or to the subgroups (refer to the section on Front Panel Controls — Auxiliary Returns). The signals may be returned from the auxiliary sends, subgroup sends or from independent external sources.

2 TRACK LINE OUT

The two track line out jacks provide a -10dB signal for recording of remixed master tapes. The signals present are identical to the main left and right program outputs,

except in output level.

PROGRAM OUTPUTS - LEFT AND RIGHT

The signals present at the program XLR connectors are balanced with a nominal level of +4dBm. These are derived from the master sections described in the Front Panel Features section of this manual. These signals may be used for live sound reinforcement or for two track recording where professional (+4) levels are required.

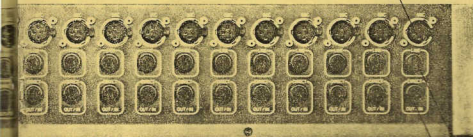
PHANTOM POWER SWITCH

48v of phantom power is available to all mic connectors by actuating the phantom power switch.

AC POWER CONNECTION, VOLTAGE SELECTION AND FUSE HOLDER

The 16x4x2 is designed to operate on any of 4 voltages at either 50 or 60Hz; 100V, 120V, 220V and 240V. The voltage should be selected before attaching the AC power cord. The selector can be changed by lifting the square insert and turning the insert until the proper voltage is aligned with the arrow on the right edge of the holder. The AC is introduced via a standard IEC connector. The AC fuse, a T2A type, is located inside the voltage selector insert.

CHANNEL INPUTS 1-16



CHANNEL PATCHING JACKS
(DIRECT IN OUT LOOPS)

LINE INPUTS 1-16

Since the 16x4x2 mixing console may be used for a variety of audio mixing applications, it is extremely important to fully understand the various functions which may be required. It is also important to understand the total aspect and capability of the unit, even those not necessarily applicable to the final, immediate setup, in order to realize the best format for any given situation or application.

LIVE SOUND REINFORCEMENT

The 16x4x2 may be used for live sound reinforcement in a number of ways. Two examples are shown for concert or live music situations and a third example shows a typical theatrical application. The actual set up selected will depend on the amount and type of external equipment (mics, amps, speakers, etc.) used in the overall system as well as other variables such as type of venue, mixer locations, type of performance, etc. No attempt is made here to dictate final gain and e.q. settings or signal bussing, except by example for instructional purposes, as these depend entirely on input type and sensitivity, signal composition, environmental conditions and personal taste. Careful study of the following examples will result in a better understanding of the mixers overall adaptability and flexibility.

INITIAL INPUT SET-UP

In most applications, a logical, well planned layout of channel dedication will ease the mixing engineers job. Live sound engineering often requires rapid changes of key settings or groups, thus it is usually better to group the lead or critical inputs nearest the subgroup and master controls. Less critical inputs (those requiring few changes after the initial setting) are better left out of the way and are usually placed away from the subgroups and masters. Groups of inputs which are to be routed to the same subgroups may be placed in adjacent channels, however, any critical inputs to be routed to that subgroup may be isolated near the subs and masters to facilitate easier changes.

For starting purposes, mic level signals should have a gain setting of 30 with no pad and e.q. flat. Line level inputs should be initially set at 20 with no pad and e.q. flat. E.Q. settings may be initially performed by routing the

input to the headphones via the solo buss. Proper mixing techniques should result in the channel fader falling between -5 and -20 on the scale, although not all signals are so obliging!

When finalizing the gain and E.Q. settings, keep in mind the overload indicator fires at 4dB prior to clipping, thus it is often normal for the LED to fire in a sporadic, momentary manner. True overload and distortion is indicated by a strong, continuous "on" condition.

AUXILIARY BUSSING

During live performances it is often necessary to assign various input signals to multiple access points or busses. For this reason, the 16x4x2 has been designed with 2 primary busses (Program Left and Right), 4 subgroup busses (1, 2, 3 and 4) and 3 auxiliary busses (Aux 1, 2 and 3) as well as channel patch points. This allows the operator a choice of 10 distribution routes for any incoming signal. In many applications it may be required to add external effects or controls, such as echo, delay or limiting, to specific inputs. Additionally it is often a requirement for the on stage talent to have a reference signal or monitor. If the monitor signal requirements are simple, a single send may be adequate and can be generated by routing the necessary signals via the aux 3 buss. If a more complex monitor mix is required, the aux 2 send may be assigned a pre-fader status and a second, independent monitor signal generated.

Perhaps one of the most critical factors of high quality live performance reinforcement is the addition and mixing of external signal processing devices such as reverbs, delays, compressors, etc. The Studiomaster 16x4x2 is designed to interface with virtually all such devices capable of using line level inputs and supplying line level outputs (Note: Some effects devices are designed for use with high impedance input signals, such as guitars and generate a high impedance output signal. Such units are not directly compatible with the 16x4x2 unless impedance matching devices are used on the input and output signals.) For effects which are to be used on multiple input signals, e.g. reverb on vocals, the input signals may be routed through Aux 1 as well as assigned to submaster 1. The returning "wet"

signals can be returned via either the Aux 1 or 2 returns and assigned to sub 1. Alternate methods are also available, such as assigning the above example to the master program left and right outputs directly, or by taking the line out of the subgroups to drive the external device and returning the signals to the program masters. This latter method is especially effective on signal groups requiring compression and/or level limiting.

Some incoming signals may require special effects which are not required or desirable on any other signal. Examples would be flanging on a keyboard, a harmonizer on a guitar or limiting on a snare or bass drum. These types of effects can be used by patching the processing device directly to the input channel via the stereo break or normal jack. This jack uses the tip connector as the output send, the ring connector as the input return and the sleeve connector as the common shield for both lines. Mating cord assemblies may be purchased or constructed by the user. (Note: If the need arises to route an input signal from the channel without interrupting the normal signal flow through the mixer, the mating plug wired as above must have a jumper wire added between the tip and ring connectors. When using this type of passive signal split arrangement, care must be taken to avoid excessive control changes in either the channel fader or post fader controls or those on the device fed by the split signal. Since there is no isolation control variations made at either end of the signal path may affect the other side.)

SUBGROUPS

Live Sound reinforcement mixing often is an easier task if similar types of inputs are grouped together and controlled as a single signal. Examples of this type of use would be microphones used on drum kits, harmony and/or background vocal mics and multiple keyboard inputs. As various inputs are routed to a subgroup, individual channel levels can be set so as to provide a proper blend and balance within the subgroup mix. If, for example, the level of the drums needs to be raised or lowered relative to the overall program level, the subgroup fader can be re-positioned without destroying the balance. This still allows for individual channels within the group to be raised or lowered as necessary as that channel

signal strength will change in the sub as well as the master. Another advantage of sub-mastering or grouping is the ability to audibly place the subgroup signal relative to the master left-to-right balance. This is accomplished via the subgroup pan control, which allows the engineer to sweep the subgroup send for effect. By way of an example, a particular drum passage or solo may be panned to follow the movement of the drummer without having to amend or alter the settings of the individual inputs.

Another benefit of subgrouping on the 16x4x2 is the ability to send the subgroup signals out of the mixer without:

1. Interrupting the signal flow to the masters, or;
2. The need to assign the subgroup signal to the masters.

This flexibility allows the user to add effects to a total subgroup or to control the level externally by way of a limiter. In both instances, the subgroup output would be brought back into the mixer through either of the two aux return networks after being processed by the external device.

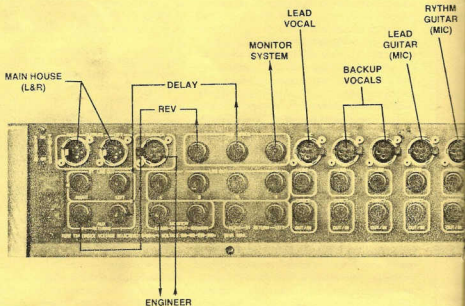
MASTER OUTPUTS - LEFT AND RIGHT

The chief function of the master outputs is to determine and control the overall final output levels. Additionally, the 16x4x2 masters are provided with a three band equalization network for making adjustments in the signal tonality. While this E.Q. is not designed to eliminate the use of external multi-band equalizers in those applications requiring extensive fine tuning for volatile room environments, it can reduce the amount of external changes required. It should be noted that, while Studiomaster does not produce external equalization networks, we believe many sound systems would be vastly improved by the addition of such devices. Additionally, the human ear, while extremely sensitive, cannot adequately provide frequency identification during the setup of multi-band e.q. networks, thus we equally believe no professional system is truly complete without the inclusion of a real-time audio spectrum analyzer. Many high quality equalizers and RTA's are available and no specific product recommendation is made or implied by Studiomaster.

The following system diagrams illustrate just a few of the many setups feasible with the 16x4x2. These diagrams use suggested channel dedications for various applications; you will undoubtedly arrive at different arrangements which may suit your particular needs more effectively. Keep in mind signal level, equalization and bussing are as important to the application as the proper connection. Please refer to the appropriate application section for additional information.

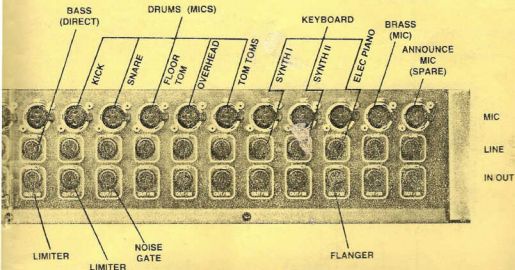
TYPICAL LIVE SOUND REINFORCEMENT

In this example, all 16 inputs are utilized by signals from the performers and instruments on stage. This setup allows sixteen inputs to be bussed to any or all of the 4 subgroups which, in this application, are used as submasters. The program signals, left and right, are derived from the main outputs. This setup allows pre-mixing of various inputs within the subgroups prior to the final output controls.



Individual channels may be patched to external effects devices as shown on inputs channels 3, 9, 10 and 11. This allows the engineer to isolate specific effects to single channels while allowing bussing, via aux 1 and 2, of any channels to additional external effects as illustrated. Additionally, aux 1 and 2 returns may be bussed to any subgroup allowing further blending of "wet" or "dry" signals or the selection of one in place of the other for specific program portions.

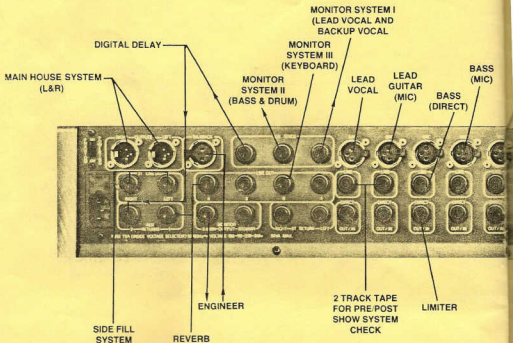
The signal for a simple stage monitor system is derived from the aux 3 output. The signal available may be bussed either pre-fader or both.



In this larger live system, additional input channel patching is utilized and specific subgroup assignments become more critical even though the channel utilization is the same as the previous example. Significant changes are obvious in the output area, indicating an entirely different approach to the input/output matrix as well as output function.

Primary and secondary program signals are derived from the program and 2 track outputs, fulfilling a need for additional fill signals.

The three separate, independently controlled monitor signals are derived from aux 2 and 3 as well as from

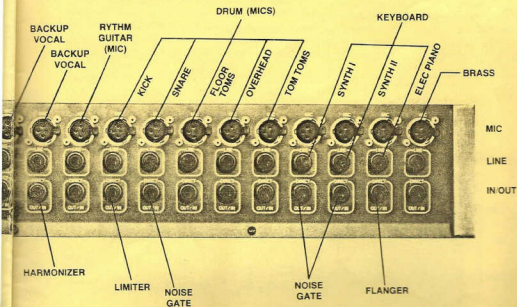


subgroup 2. Since different reference materials are needed in each, assignment is done via the channel aux send controls and by subgroup assignment.

Aux 1 is dedicated to a digital delay which may be used on instruments and/or vocals, while subgroup 4, containing only the vocals feeds to an external reverb which

is bussed, via the return network, directly to the master output section.

If desired, a 2 track tape machine can be added, as shown, for pre or post system checkout as well as intermission fill material.



For multi-track recording the basic input setup is similar to that used for live sound. The primary difference is in the buss assignments, as the subgroups are now used as masters for individual tracks, thus any signal desired on track # 1 would be assigned only to subgroup # 1 with the channel pan turned all the way counter clockwise or left. The same applies to any signal assigned only to track 3 via subgroup 3 while signals to subgroups and tracks 2 and 4 would be panned hard right or clockwise.

Foldback signals for the performers may be generated in any of 3 ways. Live foldback may be derived using the aux 3 send on each input desired in the foldback system. The same method can be performed by using the auxiliary 3 send in the subgroups, thus allowing the artists to hear either single instruments, an entire group of instruments or the overall mix. For foldback during overdubbing, the previously taped material can be brought back into the mixer by using the line inputs jacks on channels 13, 14, 15 and 16. The tape monitor switches can then be depressed which then busses these inputs to the monitor output section directly. The final method of foldback uses the monitor send from the subgroups to provide the foldback signal. This can be accomplished from either the subgroups or may be combined with routing of the playback as previously outlined.

For multi-track recording, the levels may be adjusted prior to the actual recording by using the 1kHz slate tone as an alignment reference. This tone can also be used to record a slate signal to ease relocation of various starting points on the actual multi-track master tape.

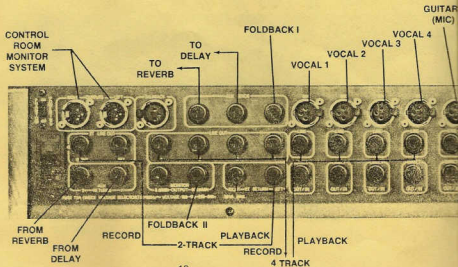
4 TRACK TO 2 TRACK

If the master tape is a 4 track, the output from the transport should be brought back to the line inputs of channels 13, 14, 15 and 16. These channels should be routed to the left and right program masters, by-passing all subgroups. The two track master can be re-mixed to either a -10dBm level using the 2 track line out jacks or a +4dBm level using the program XLR outputs.

Playback of the finished 2 track master can be accomplished via the 2 track line in jacks which match the output of -10dBm transports or through the aux 1 and 2 return jacks which will accept a +4dBm level. The 2 track line ins route directly to the program masters while the aux returns may be re-routed to the subgroups or the masters. Either method allows accessing the signals for playback listening.

8 OR 16 TRACK TO 2 TRACK

When multi track masters of either 8 or 16 tracks are to be re-mixed to 2 track, the outputs from the tape trans-



port should be connected to the line inputs of the input channels. These inputs may, in turn, be routed directly to the program outputs, as in the above example, or may be submixed using the four subgroups as discussed in the previous section on live sound reinforcement use. Any signal or signals routed to the subgroups could then be bussed to the final outputs via the monitor send and pan controls.

One of the most unique features of the Studiomaster 16x4x2 is the ability to immediately remix 4 track or larger multi-track tapes. The 16x4x2 line inputs are designed to interface with most transports without the necessity of large patch bays and/or adaptors or requiring wholesale equipment changes.

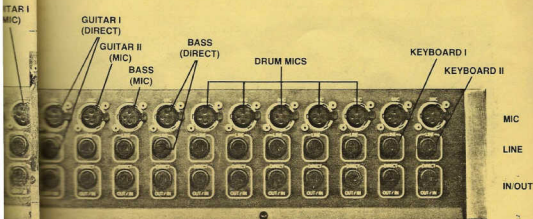
As shown in the example, the channel inputs are fully dedicated to studio signal feeds, allowing external effects to be added either via the channel patch points or the aux 1 and 2 access busses. The multi-track transport record signals are derived from the four subgroup line outputs, while the playback signals from the transport are terminated at the channel input line jacks (13-16). Although not used during the recording of the multi-track master, a two-track mastering machine can be tied to the 2-track line inputs and outputs in the same manner.

The control room monitor system is driven from the program outputs which derive their signals via the subgroup monitor sends. This allows the engineer to listen to a separate track or groups of tracks while headphone monitoring the same signals or single channel (via solo).

Studio foldback signals for the musicians is taken from the aux 3 output, with a second system fed from the 600 monitor output. This allows the engineer to supply either "wet" or "dry" signals for reference.

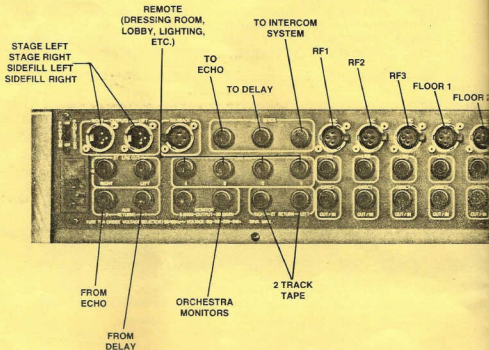
For recording the multi-track master, each input is assigned to the desired subgroup(s), the outputs of which feed to single tracks. During remix, the channels used are assigned directly to the program left and right masters which in turn buss to the corresponding 2 track outputs. By routing back through the inputs, via line, the signal composition of any track or tracks may be altered and/or audibly relocated.

Playback of the 2 track master may be accomplished without any alteration of the system or assignments. The incoming signals will be present only in the program outputs or can be bussed to the monitor outputs as well.



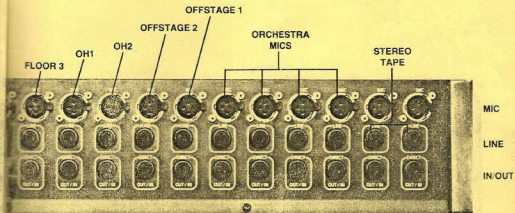
Mixing sound for theatrical productions, which are greatly dependent upon hearing and providing audio cues, requires a console of extreme flexibility, such as the 16x4x2. The various styles of microphones and pickups used, combined with their placement, require the engineer to have complete equalization control at all times. The 16x4x2 with its semi-parametric e.q. on each input channels meets this difficult criteria.

In this system, each input may be assigned to several or all subgroups even though all the subs may not be in use simultaneously. This allows for pre-setting of scenes which may then be changed by cross fading between subgroups.



Since many stage productions use a combination of live and taped music, this system shows both types of inputs. Additional recorded material (effects, music, etc.) may be patched into any unused line level inputs, then introduced by switching from mic to line input with the corresponding channel switch.

Effective inter communications between the audio engineer and other offstage personnel (stage manager, lighting director, etc.) can be supplied via the talkback input and aux 3 output.



The Studiomasster 16x4x2 is designed for extreme flexibility and can easily interface with a variety of video and cinematic equipment, including VTR's, VCR's, cart machines, multi-track tape recorders and film chains.

Depending on the final number of audio tracks required, the 16x4x2 can route the incoming signals (line level and/or overdub mics) to the masters for the final audio tracks or to the subgroups. Limiters can be patched either at the inputs or the subgroups, or can be placed after the final output as in the case of VTR's with built-in limiting.

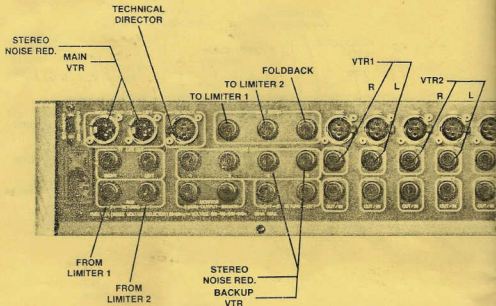
Channel patching also allows for noise gating of seldom live inputs and yet doesn't use valuable auxiliary busing for special effects.

The compact design helps to keep the size of the editing bay to a minimum in those applications where space is a critical factor.

The standard E.Q. defeat eliminates the genuine concern for accidental tonal changes, while the parametric design of the e.q. network allows the technical director to roll off unwanted rumbles at specific bass frequencies and eliminate high frequency noises while accentuating, if necessary, the critical mid-range for maximum presence and clarity.

Mixing of the audio signals can be done in the same manner as both live and recording depending on the final track requirements.

Note: The standard Studiomasster 16x4x2 can be suc-



cessfully used with most video equipment by simply using a limited quantity of adaptors. Studiomaster also offers a modified version of the 16x4x2 with several modifications to reduce interfacing difficulties. The changes include balanced transformer isolated outputs with a +24dBm maximum output level (Program left and right output only, other options are also available. Contact Studiomaster for details).

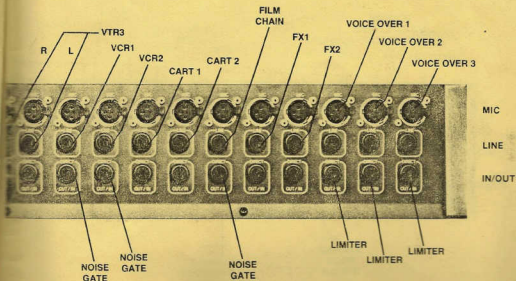
Mixing audio for video applications is similar to multi-track recording, the chief difference being input routing and the need for a back up master.

External control devices such as noise gates and limiters can be added either through the individual channel patch points or via the aux 1 and 2 networks.

Primary recording of the master audio tracks may be derived from either the program outputs as shown while the backup can be obtained from any two subgroups. Additional outputs may also be derived from the 2 track output jacks and from the monitor master output (600 ohm).

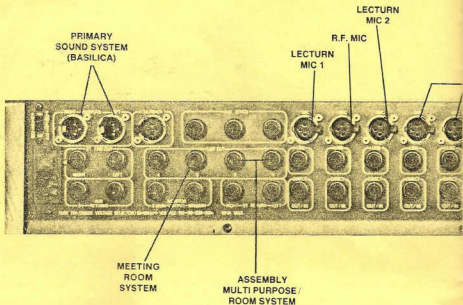
Foldback for the voice-over talent can be provided from aux 3 as shown or from the Monitor output (8 ohm). Talkback for communications is available for directions and cues sent from the Tech. Director.

The main outputs can also be fed to a stereo distribution amplifier then to multiple VTR's and VCR's to generate multiple masters and back-ups. This allows for multiple formats (1" & 3/4") to be mastered simultaneously for later distribution to affiliates or bicycle stations.



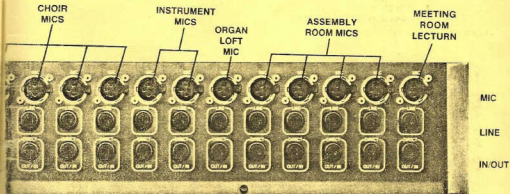
The features and flexibility of the 16x4x2 make it ideal for institutional sound systems such as churches, auditoriums, medium size meeting rooms and any other permanent installation situations. By centrally locating

the mixer, various signal feeds can be mixed and distributed. The subgroups can be used as independent outputs. The example shown illustrates a typical church application with provisions for a meeting or assembly hall



reinforcement. Channels 6 - 16 are assigned directly to program left and right and furnish signals to the basilica sound system. Inputs 2 - 5 are assigned to subgroups 1 and 2 and provide sound reinforcement to the assem-

bly/multipurpose room. Input 1 is used in a separate meeting room and is assigned to subgroup 3 for the feed back to the meeting room system.



MAX INPUT LEVEL

+8dBm MIC, +18dBm Line, 0dBm Aux In

OUTPUT

Max Program Out +20dBm, Nom. +4dBm

Max Subgroup Out +20dBm, Nom. +4dBm

GAIN

MIC in to Subgroup Out; +70dB MAX

MIC in to Program Out; +70dB MAX

MIC in to Subgroup to Program Out; +80dB MAX

Line in to Subgroup Out; +40dB MAX

Line in to Program Out; +40dB MAX

Line in to Subgroup to Program; +50dB MAX

NOISE

Equivalent input noise -126dBm @ MAX GAIN

FREQ RESPONSE

20Hz to 20kHz ± 0, -1.5dB (DIN AUDIO BAND)

THD

Less than 0.015% @ 1kHz ref 0dBm

Less than 0.015% @ 1kHz ref +15dBm

Less than 0.1% @ 20-20kHz at any level prior to clipping.

S/N

Better than 85dB

CROSSTALK

-60dB between adjacent input channels or outputs

EQUALIZATION

Channel Inputs ±16dB @ 10kHz

±16dB @ 200Hz to 8kHz Continuously Variable

±16dB @ 25Hz to 350Hz Continuously Variable

Program Outputs

±16dB @ 20kHz

±16dB @ 1.5kHz

±16dB @ 20Hz

LED METERS

Illuminated displays meters calibrated to read 0 V.U.

= +4dBm.

POWER INPUT

240, 220, 120 and 100 volts

50/60 Hz switch selectable.

Max. power consumption 50 V.A.

NOTE:

In these specifications 0dBm is treated as a VOLTAGE reference of 0.775V R.M.S. regardless of impedance level.

