TASCAM

TEAC Professional Division

M-200 Series

Mixing Consoles



OWNER'S MANUAL

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The guarantee provided for the 200 Series Mixers has several restrictions. The Series 200 Mixers will perform properly only if they are adjusted properly and we guarantee that such adjustment is possible. Setup is not covered by the Warranty. If your attempts at internal adjustment are unsuccessful, we will charge you for readjustments.

Mixing for sound reinforcement, recording or other audio endeavours is an art as well as a science. As a result, your finished product may by judged more by artistic criteria than technical performance. Art is the province of the artist and TASCAM can make no guarantee that the 200 Series Mixers, by themselves, will assure the quality of the work you produce.

Your skill as a technician and your abilities as an artist will be significant factors in the results that you achieve.

Understanding what is going on inside your equipment will help improve your sound. Think of this manual as a reference book. You won't need to memorize it to get started, but try to find the time to read it thoroughly at least once. That way, you will be familiar with its contents, and if you need answers, you'll know where to find them.

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WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

This apparatus has a serial number located on the rear panel. Please record the model number and serial number and retain them for your records.
Model number_____
Serial number_____

CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.
	The lightning flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to persons.
	The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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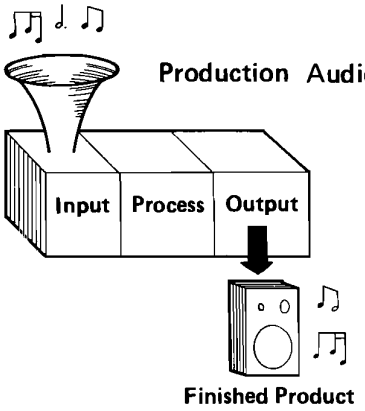
The TASCAM 200 Series Mixers were designed to provide the maximum flexibility and performance. They are equipped with a combination of features that allow them to be used successfully in a broad range of applications including: Sound Reinforcement, Studio Recording, Broadcast Production, and Video Assembly.

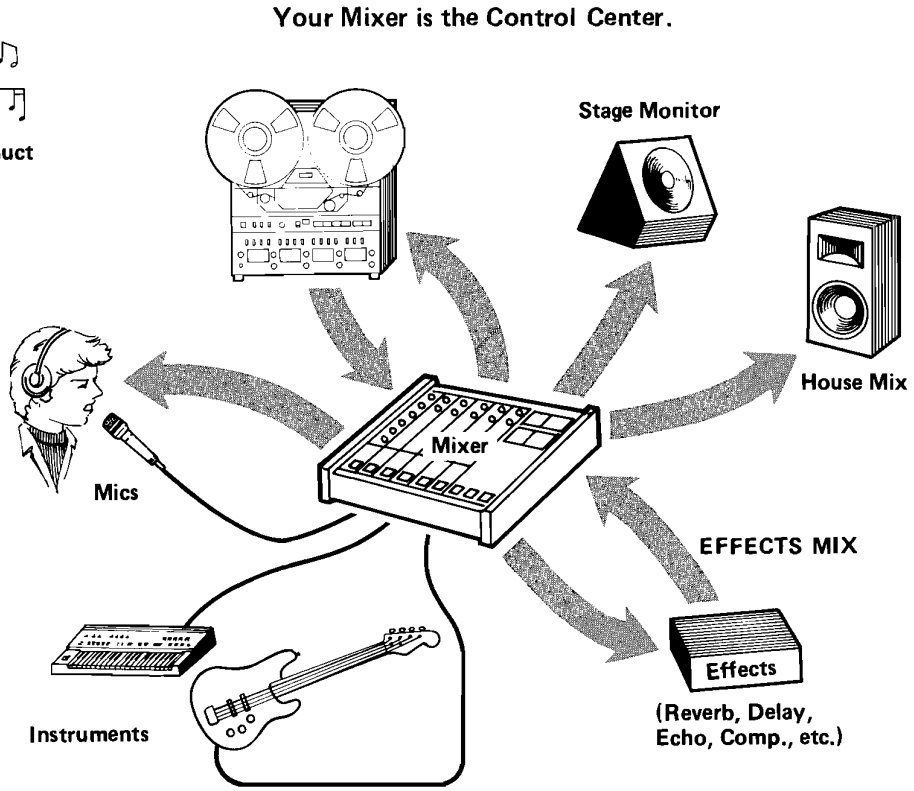
The more flexible a mixer is, the greater value it has. Flexibility on the scale of the Series 200 Mixers can make a mixer seem complicated because of the tremendous number of features and controls. All mixers share some fundamental principles that are not difficult to understand. This understanding, particularly when combined with some experience, will insure that your Series 200 Mixer will be a powerful creative tool that is also easy to use.

A SYSTEM OF SUB-SYSTEMS

Your mixer is a system, a group of individual elements working together as a unified whole. All audio systems have three things in common: Input, Process, and Output. In audio production systems, the Input consists of electrical signals from microphones, instruments, VCRs, turntables, tape recorders, etc. These signals are Processed electronically to balance their levels and tonal qualities. The resulting signals are then converted into sound, Output by amplifiers, speakers, and headphones.

A mixer functions as a traffic control center for audio signals on the move. It takes multiple inputs, processes them for level and tone, and sends, or routes, them to multiple outputs. So the mixer controls "where" signals go to and come from, and "how much" signal goes there.

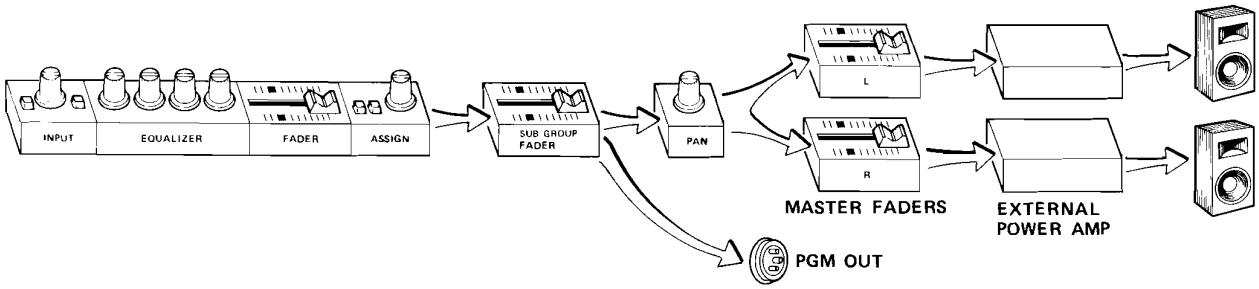




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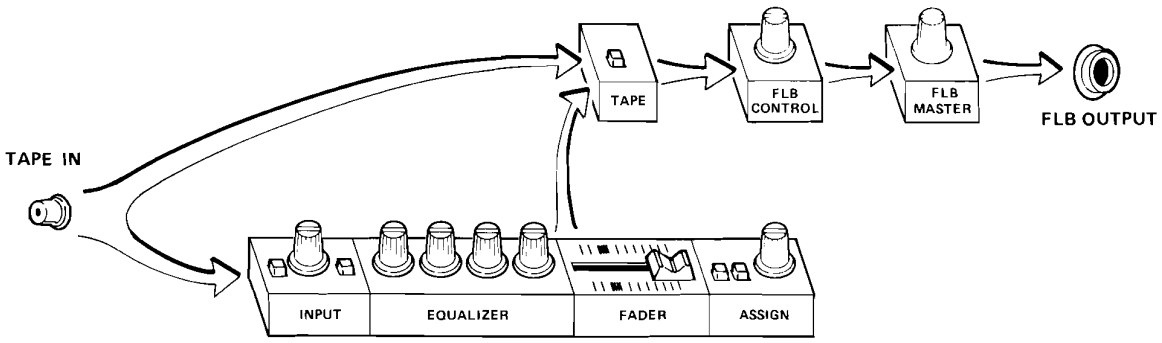
Large systems may be broken down into sub-systems – each of which is a system in its own right. Your Series 200 Mixer is actually made up of several of these sub-systems, known as sub-mixers, each of which posesses the system requirements of Input, Process, and Output.

The largest of these is the MAIN MIX. It receives signals from multiple inputs and routes them through the input channels to one or more program groups. The group faders then control how much signal goes to the rear panel output connectors. This gives you the ability to combine several mic or line inputs into one group so that the overal level is controlled by one fader. The signal present in each group also feeds the Stereo, or House Mix.



The Stereo Mix gets its signals from the four groups, routing them through the group PAN controls to the Left and Right outputs. These are used to create a House Mix for sound reinforcement, or as a Control Room Monitor when recording.

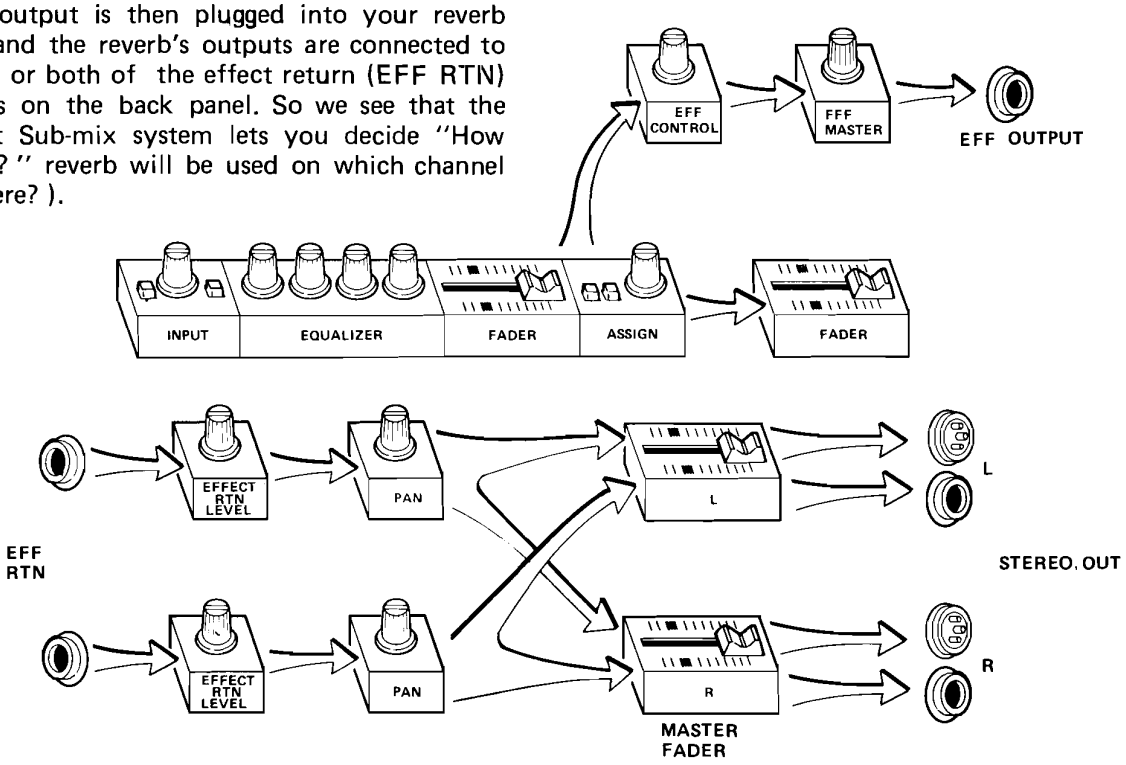
The Foldback (FLB) Mix takes its signals from the input channels or a recorder's playback. These signals are routed through their own level controls. Foldback Mixes are used so that the talent on stage can hear their music through a separate set of amps and speakers (stage monitors) during live performances, or so that the talent can hear previously recorded and new material while overdubbing. For the purposes of sound reinforcement, this mix is called a Monitor Mix, and in recording it is sometimes called a Cue Mix.



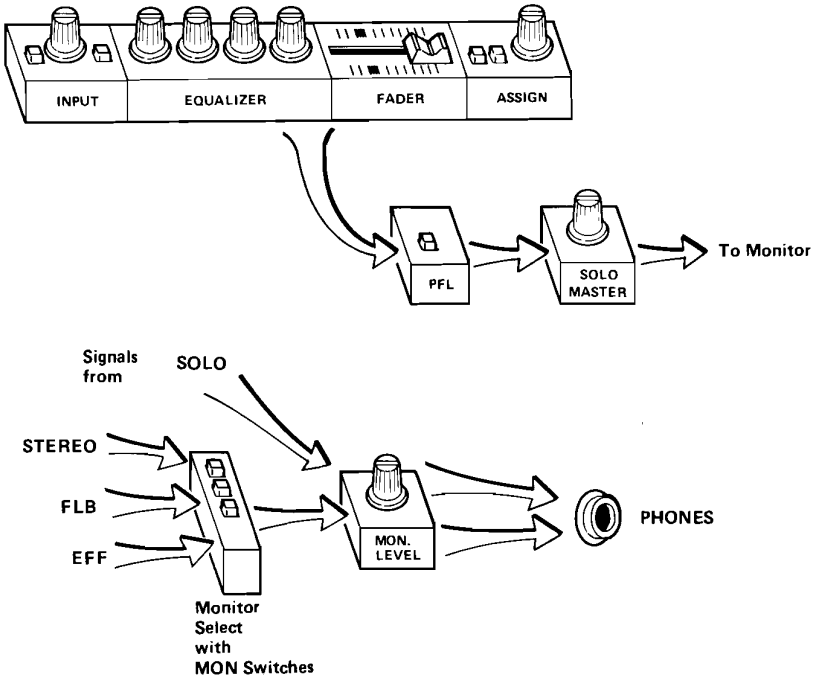
The Effect (EFF) Sub-mixer's signals come from the Main Mix system. Let's assume you have a digital delay, reverb, or another signal processor that you want to use on some of the material you're performing or recording. If you only want the effect on one channel, you could plug your instrument into the effect and plug the output of the effect into the mixer, or use the INSERTion jack in each channel. But suppose you want to use your reverb on your voice and your instrument, which you're running through different channels of the mixer, but using at the same time. Your Series 200 Effect Mixer is able to send the combined signal to the effect output on the back of the unit.

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This output is then plugged into your reverb unit and the reverb's outputs are connected to either or both of the effect return (EFF RTN) inputs on the back panel. So we see that the Effect Sub-mix system lets you decide "How Much? " reverb will be used on which channel ("where?).

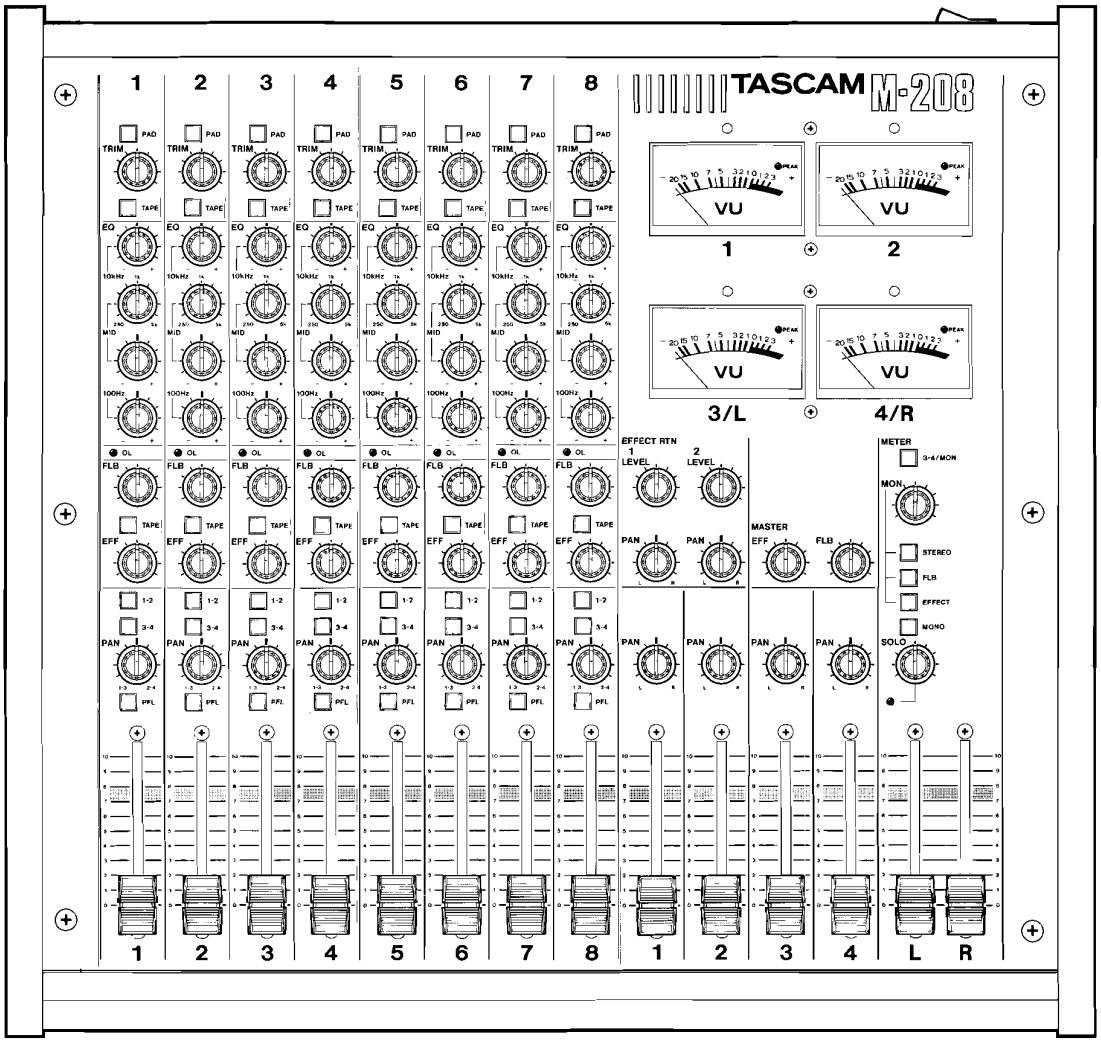


The Solo System gets its signals from the Main Mix channels. The Pre Fader Listen (PFL) switch in the channel sends that channel's signal to the Solo Master Control. The PFL switch automatically bypasses the Monitor Select switches and sends the Solo Mix to the headphone jack. This lets the user listen to selected sources through the headphones. In recording applications, Solo is used to adjust TRIM, level and tone in an individual channel or group of channels. In sound reinforcement, Solo is very useful for setting levels and tone, as well as for finding feedback and cable problems.



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Your Series 200 Mixers combines all these mixer systems into a complete audio production system.



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There are a few things you will need in order to hook up your new mixer. You may want to read through the following paragraphs so that you get what you need before you start. All connections should be made with the power off.

AC Power: You'll need some outlets, obviously. Try NOT to use outlets that are on the same circuit as air conditioners and old refrigerators. These things may introduce noise to your system. Keep all the elements of your system Plugged into the same circuit, but not the same plug. Have some three prong to two prong, ground lift/adapters on hand. You may need them for some of your other equipment. AC outlet testers are handy to have around and can be inexpensively purchased at electronics stores.

Cables: You will need a vareity of cables including: RCA-type, quarter inch phone-type, XLR-type, speaker wire, and TASCAM Insert Cables (model PW-2Y/PW-4Y). You will also need some RCA-to-phone adapters. These cables are used for the following:

RCA: Use TASCAM cables, or equivalent shielded, low capacitance, high RF resistant cables to connect PGM Outputs, effect devices, and tape recorders (you will need some RCA/phone adapters for recorder hook ups.)

Quarter-Inch Phone Cables: These should be shelded and are used to hook up musical instruments, unbalanced PGM Outputs, Effect Out and Returns, and Line Level Inputs.

XLR: These three pin connector cables should be shielded and are used to connect Low Impedance microphones, Input transformers, PGM Outputs, and Stereo Outputs. These connector cables are also used with some effects devices, direct boxes, and electronic musical instruments.

Speaker wire: This wire need not be shielded and its connectors will vary with the amplifier and speakers used.

Cables should always be as short as is possible to do the job. It's also a good idea to keep cables that do similar jobs together, audio input cables, output, effect send, etc. Use plastic cable ties to bundle them together. It's neat and it's quiet.

Microphones: Use high quality microphones with your TASCAM mixer. The fine electronics in your Series 200 Mixer will only sound as good as the input source will let them. Keep microphone cables short, particularly if you're using high impedance units.

Instruments: You may want to run direct boxes on some instruments. Be sure you have them before you start. Some instruments put out very hot signal levels and should be monitored closely. Synthesizers, drum machines, and all percussion instruments fall into this catagory. Even though drums may be miked, they create transient levels that need watching.

Headphones: They should be Stereo headphones. Never use monophonic headphones with your 200 Mixer.

SOUND REINFORCEMENT

The M-208 and M-216 Mixers are ideal for use in sound reinforcement, P.A. applications. Today's performers need a mixer that will allow them to reproduce in live performance the sounds of contemporary recordings. Such a mixer must provide: the ability to accept inputs from microphones, instruments, tape recorders, sub-mixers, other line level sources, and effects devices; a stereo house mix; a stage monitor mix; effect patch points for individual instruments and the overall mix; and the convenience of fader grouping for quick and easy sound adjustments during the performance by a sound man or from the stage. Many groups or individuals will also need the same unit to double as a multi-track recording mixer. The Series 200 mixers were designed to meet these needs.

In our application example, we used the M-208 with eight input channels. Instrumentation for our example will be a multi-keyboard setup using its own sub-mixer, an acoustic guitar, with piezo-pickup, acoustic drums with three microphones, and three vocal microphones. The group also has electric bass and electric guitar, but these are not run through the mixer in our example. Electric guitar and bass generate enough stage volume that they can be left out of the house and monitor mixes.

The vocal microphones are low impedance units that use the balanced XLR connectors in channels 1 – 3. The vocal microphone channels will be grouped on PGM Fader number 1. This grouping of the vocal mics will allow you to make changes of level for all three mics

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using a single fader and a single PAN control.

The acoustic guitar with the piezo pickup uses the MIC INput of channel 4. The electric guitar could be "close miked" at the amp and share the same channel as the acoustic guitar, if the acoustic is run through a direct box/pre-amp and the TAPE INput. You can then change the channel feed from acoustic to electric by using the TAPE button in the input channel. The guitar(s) will be assigned to PGM Fader and PAN number 2. The PGM Fader can then be used to adjust for level differences between the acoustic guitar and electric guitar sources.

Microphones are used to pickup the acoustic drums. One mic will pickup the kick drum. Another will be mounted overhead to pickup the cymbals and toms. The third will be stand mounted and positioned to pick up the snare and hi-hats. The drum mics are connected to channels 6, 7 and 8 and are grouped on PGM Fader 4.

The keyboard sub-mixer's outputs will be plugged into the SUB BUSS INputs. This assumes the keyboard sub-mixer is stereo. The monitor, or mono output of the sub-mixer will then be connected to the LINE INput of channel 5. The TASCAM M-1B, or MX-80 makes a great keyboard mixer. The channel 5 connection is necessary so that the keyboards can be heard in the stage monitor mix that will originate at the FLB OUTput of your M-208. If the keyboard mixer is mono, then its output can be connected directly to channel 5 LINE INput, disregarding the SUB BUSS INputs. The keyboards will be grouped on PGM Fader number 3. You can use PGM Fader 3 to add mono keyboard mix support to the stereo house mix should you need it. The electric bass could use a direct box and an extra channel of the keyboard sub-mixer, if it is needed in the house mix.

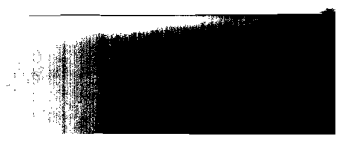
The House Mix will come from the Stereo Master Outputs via the main power amp and the speakers. The talent on stage will hear themselves by means of the FLB OUTput, power amp, and stage monitor speakers.

Effects devices such as reverb, digital delays, compressor/limiters, chorus effects, etc. can be connected to the mix at the INSERTion jacks in the individual channels or the EFFects sub-mixer system. Reverb and delays are often used for the house mix so they are best connected to the EFFect OUTput with the reverb and/or delay output(s) connected to the EFF RTN inputs. Effects that are intended to be used on individual instruments should utilize the INSERTion jacks.

This system's set up procedures are as follows:

1. Put all speakers, instruments, effects devices, and amplifiers in their proper positions.
2. Make all cable and wire connections. The power for all units in the system, including the M-208 should be off, and the fader controls on the M-208 should be at zero, off.
3. Begin turning the power on for the system. The M-208 goes on first followed by the sub-mixer, effects devices, and finally the power amps.
4. Set the M-208 EQ controls to the 12 o'clock position. You will feel a center detent on the control at this position.
5. Make sure the TAPE switches are up, in the off position.
6. Leave the FLB controls in their zero position, fully counterclockwise.
7. Assign the signal in the input channels, to PGM (Group) Faders by pressing the 1-2, 3-4 buttons in each of the eight input channels to the down position. Assign the vocals, channels 1, 2, and 3, to group 1 and rotate the PAN controls in these channels fully left, counterclockwise. Assign the acoustic guitar, channel 2, to group 2 rotating PAN fully right, clockwise. Assign channel 5, the keyboard mono mix, to group 3 rotating PAN fully left. Assign the drums to group 4 rotating PAN fully right.
8. Set the PAN controls for PGM to the 12 o'clock position. All PFL switches should be in the up position, off.
9. Raise the L and R Stereo Master controls to the shaded area between the 7 and 8 markings.
10. Begin setting the individual channel volumes using the channel faders labeled 1 – 8. The level is set while the talent plays the instrument or uses the microphone that is plugged into the channel. If the signal is too high, the OL indicator will be lighted. If the OL is on constantly, press the PAD switch. This should allow you to raise the channel fader to the proper position, but if the OL indicator continues to flash, or the channel fader cannot be raised high enough, then adjust the TRIM control counterclockwise until proper adjustment of the channel fader is possible.

The input level will be right when the meters read at or near 0 and the channel faders and L/R faders are in the shaded area between 7



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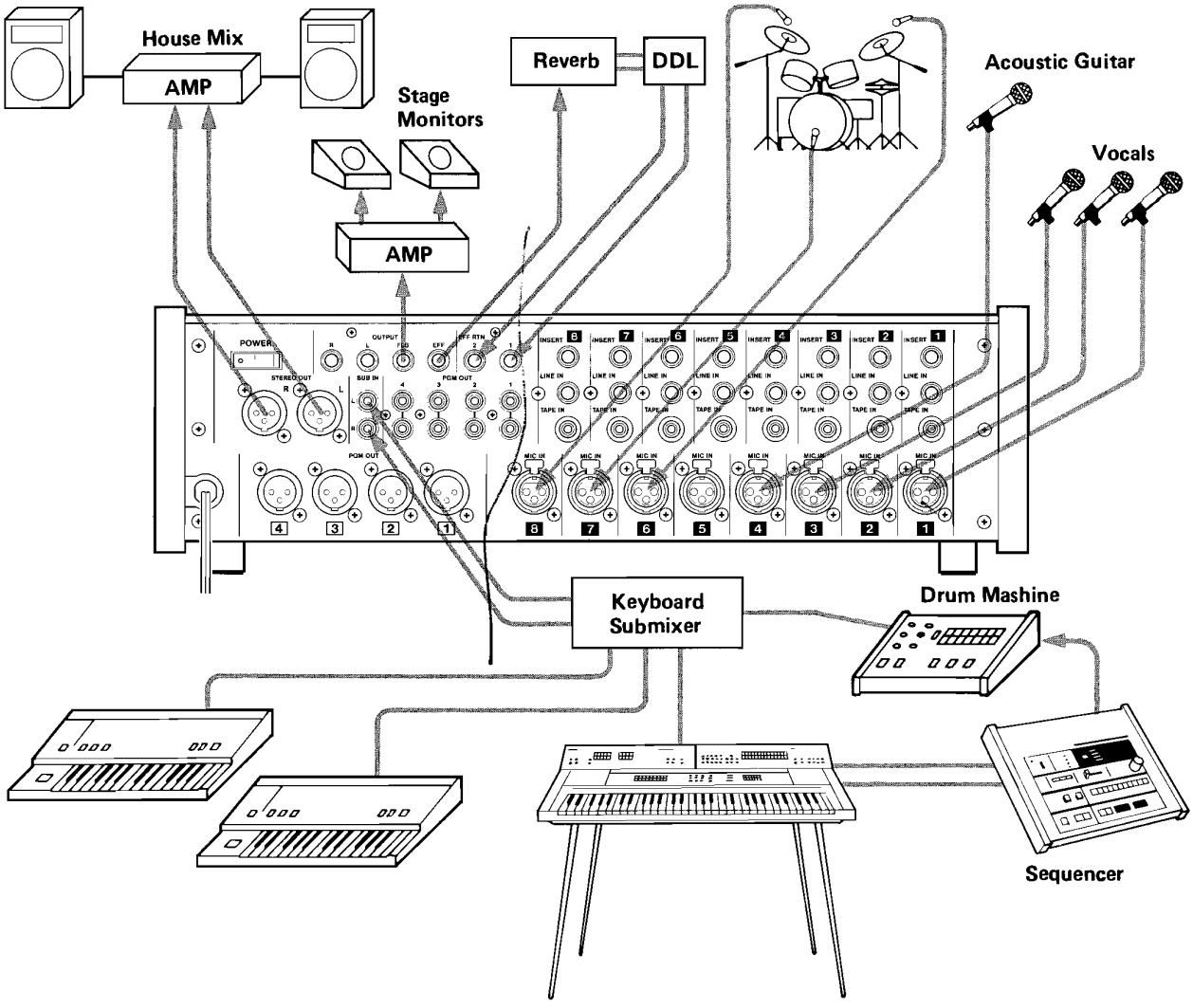
and 8. If the faders cannot be placed in their proper positions, then the input signals are too high, or too low.

Remember that musicians and singers tend to perform "harder" when they are in front of an audience than in sound checks. So your levels may have to be readjusted slightly once the performance begins.

11. Stage monitor levels are set in the same way as the house mix, except that the FLB channel and MASTER controls are used instead of channel and L/R faders. Set the FLB MONITOR switch to the on, down position so that your meters and phones will be following the Foldback mix.

If howling or feedback occurs, reduce FLB levels and reposition your monitor speakers or microphones. You may have to experiment a few times to determine the proper positions for speakers and mics. Keep in mind that monitor levels need not be as high as program levels. Certain elements of the mix may be eliminated entirely from the monitor. The drummer will need to hear his bass drum in the monitor, but the snare and cymbals can often be left out of the monitors. Electric guitars and basses have very high stage levels and need not be present in the monitors, should you be close-miking them for the main mix. In our sample mix, the vocals and acoustic guitar will need to be very strong in the monitor mix.

12. Effects levels are set using the EFFect controls in each channel and the EFFECT RTN 1 and 2 controls. You may also position the effect signals using the Effect PAN controls. Many effects have gain/level controls, so if proper levels cannot be achieved using the M-208 controls, adjust the levels on the effect device. Devices using the channel INSERTion jack should also be adjusted with their own level controls.



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RECORDING

Our recording application example will use a TASCAM model 234 Syncaset, a four track recorder, and your M-208. Although eight track recording using an M-208 and TASCAM models 38, 48 or 58 is possible, the M-216 is better suited to eight track work. Many of the techniques used in the preceding Sound Reinforcement example may also be used in the recording application. So we won't repeat the basics of level setting.

We will have to connect the 234 Syncaset so that it both receives signals for recording and sends signals back to the M-208 for overdubbing, ping-ponging, remix, and playback. All connections should be made with the power off in all the units involved. Connect the LINE OUTputs 1 – 4 of the Syncaset to the TAPE INputs 1 – 4 of the M-208. Connect PGM OUTputs of the M-208 to the LINE INputs of the 234. For the sake of clarity and reference, connect number 1 connectors on the mixer to number 1 connectors on the Syncaset, and so on through number 4.

Once these connections have been made, you will want to calibrate your system. Turn to the Work Methods section of this manual, page 21 for the exact procedures.

Recording the Basic Tracks

One of the primary differences between the sound reinforcement application and the recording application is a conceptual as well as practical one. In sound reinforcement, the action takes place simultaneously; what you hear is what you get. The recording process takes the music beyond the limitations of time. In the sense that a completed project sounds like all the tracks were cut at the same time, as in sound reinforcement. The multi-track recording processes of tracking, overdubbing, bouncing, and remix are used to make music that was recorded on Monday and Wednesday sound like it was recorded at the same time and place. One of the many advantages of multi-track recording is that one musician can sound like many by playing the various instruments and performing the vocals one-at-a-time until the project is complete.

The first track to be recorded is the rhythm or click track. Since our group has a drummer, the drum tracks would be recorded first. The drummer may not wish to play without accompaniment. If not, the keyboardist and bass can play the track with the drummer while the recorder is set to record only the drummer's performance. A click, or metronome track can be recorded first, if the drum tracks are to be recorded after other parts are layed down. The click track helps the musicians, who will record later, to play in the proper tempo so that the music will fit together properly.

A cue mix and/or control room monitor mix must be available for the musician or musicians recording subsequent tracks to hear and play with previously recorded tracks. This mix can be set up by using the FLB system and speakers as we did in the sound reinforcement application, or a headphone amp and headphones. Additional cue mixes are possible using the CUE OUTputs of the Syncaset and a TASCAM MH-40B Headphone Amplifier.

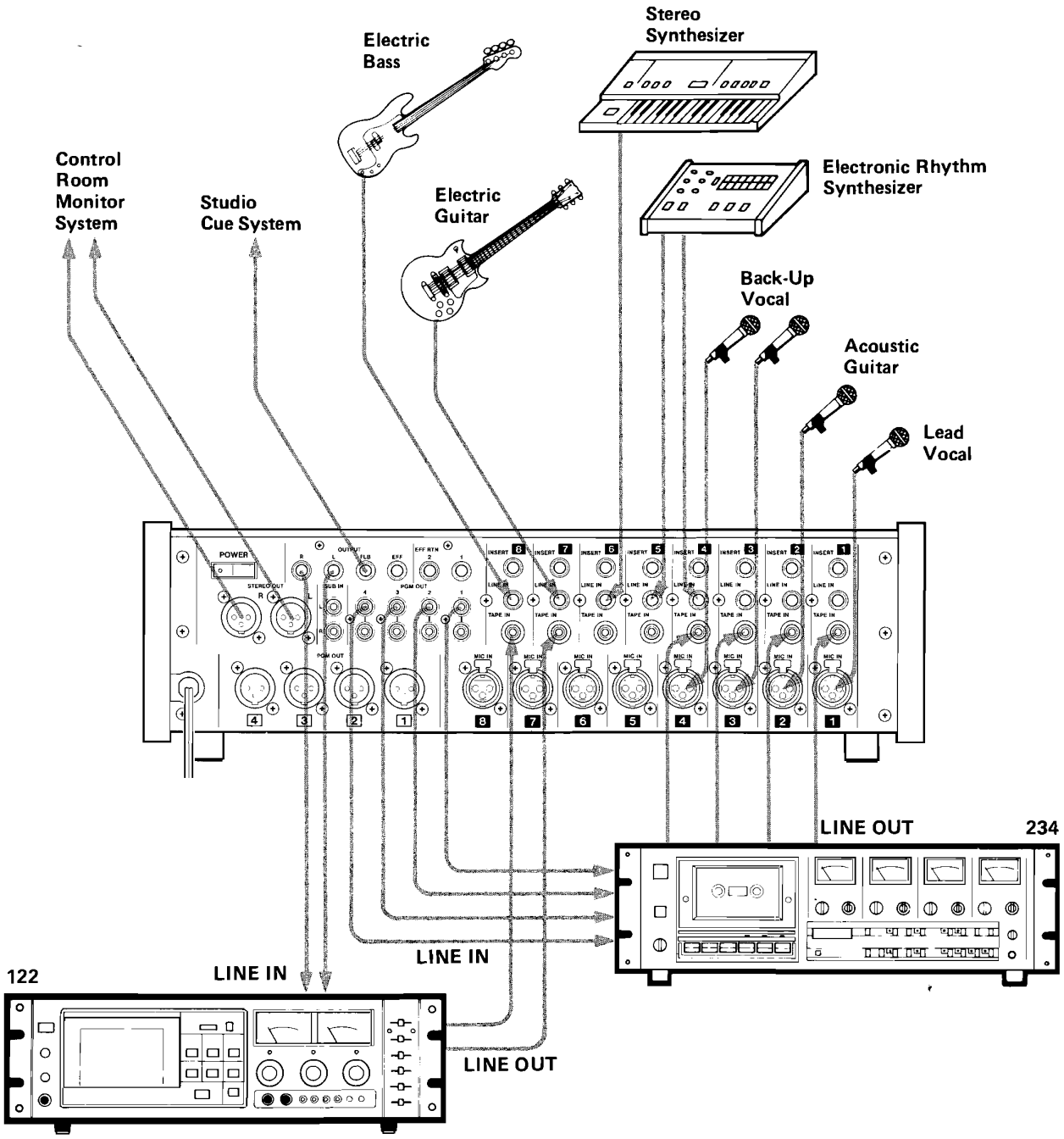
The Buss Assignment switches (1-2 and 3-4) and PAN controls of your mixer will determine the track destination of your music on the Syncaset. If you connected them the way we suggested, the Buss Assignment, PAN, and track numbers should be consistent. Track 1 of the Syncaset will come from Buss Assignment switch 1, Program Fader 1, etc.

Overdubbing

For the sake of this example, let's assume that you have recorded your first track, click or drums, onto track 3 of the 234 Syncaset. The process of recording your subsequent tracks is called "Overdubbing."

1. In order to hear your click/drum track while recording your next track, you will need to press the TAPE switch located just below the FLB control in channel 3 of your mixer. This brings the playback from the recorder back into the FLB/Cue system.
2. Use the Buss Assignment switches and PAN controls to determine the track destination of your new material.
3. Press the Record Function Select switch on the recorder for the new track, let's say track 1. Press PLAY and RECord and the recorder will playback your click track (3) while recording your new track (1). Consult the owner's manual of your recorder for the specifics of its operation.
4. Record track 2 in the same manner. You can continue to fill up all the tracks of your recorder (four/Syncaset, eight/model 38) in this way, but another recording technique will greatly expand your track capability. So record track 2 and proceed to "ping-ponging."

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Ping-ponging

Assuming that you have recorded music on tracks 1 and 2, and that you have your click on track three, we will now merge the material on tracks 1 and 2 together onto track 4. We will leave the click track where it is since we don't want it in the final mix. This merging of two or more tracks onto one is called Ping-ponging, Collapsing, or Bouncing, and its purpose is to free the old tracks, in this case 1 and 2, so that new material may be recorded there.

1. Press the TAPE switches in channels 1 and 2. You may not want to listen to the click track again, so turn off (up) the TAPE switch in channel 3. Press the 3-4 Buss Assignment switches in channels 1 and 2 of your mixer.
2. Rotate the PAN controls in channels 1 and 2 all the way to the right, clockwise.
3. Make sure that channel 3, the click track, has no buss assigned. So that it will not be recorded in the mix.
4. Press the Record Function switch for track 4 of the recorder. Press PLAY and RECord. Your multi-track recorder will now record both tracks 1 and 2 onto track 4. When this process is finished, you may record new material on tracks 1 and 2.

You may also add new parts during the ping-pong process. Connect the new sources to the mixer, make the proper Buss Assignments, and perform the new parts as the tracks are being bounced.

Repeat the process as often as desired but remember, that once material has been merged together through ping-ponging, and new material has been recorded on the old tracks, you will not be able to separete the original tracks to perform a new mix.

When you have completed your tracking, overdubbing, and ping-ponging, you will want to create a stereo master tape through the process of Remixing.

Remixing

You have filled the tracks of your multi-track recorder, and now you want to remix the four or eight tracks down to two tracks (stereo). You will need another recorder such as the TASCAM 122 or equivalent recorders. This new recorder is your "mastering" deck. Before you start, be sure to calibrate the mastering deck.

You will use the Stereo Master L and R OUTputs of your mixer to feed signal to the mastering deck.

1. Press the TAPE switches for channels 1 – 4 to the tape (down) position.
2. Press the Buss Assignment switch 3-4 in all four channels of the mixer that are receiving multi-track tape signal. Adjust PGM PAN controls for 3 and 4 full left and right respectively.
3. Adjust the PAN and levels in the channels as desired. You may want to rehearse this a few times. The pan of a signal is its relative placement (left or right) in the stereo panorama. There is no "right way" to do this, whatever sounds right to you is the only criteria.
4. Playback the multi-track tape and adjust the L and R Faders on the mixer. Check the record levels on the mastering deck. The mixed signal reaching it should register close to 0 on its meters.
5. When the levels have been adjusted properly so that the meters show the levels near 0, press Record, Play, and Pause on the mastering deck. Then press PLAY on the Syncaset. Release the Pause on the mastering deck. Repeat the process if necessary until you get the mix you want.

Effects can be added during any of these recording procedures. See the Sound Reinforcement segment for effects level setting.

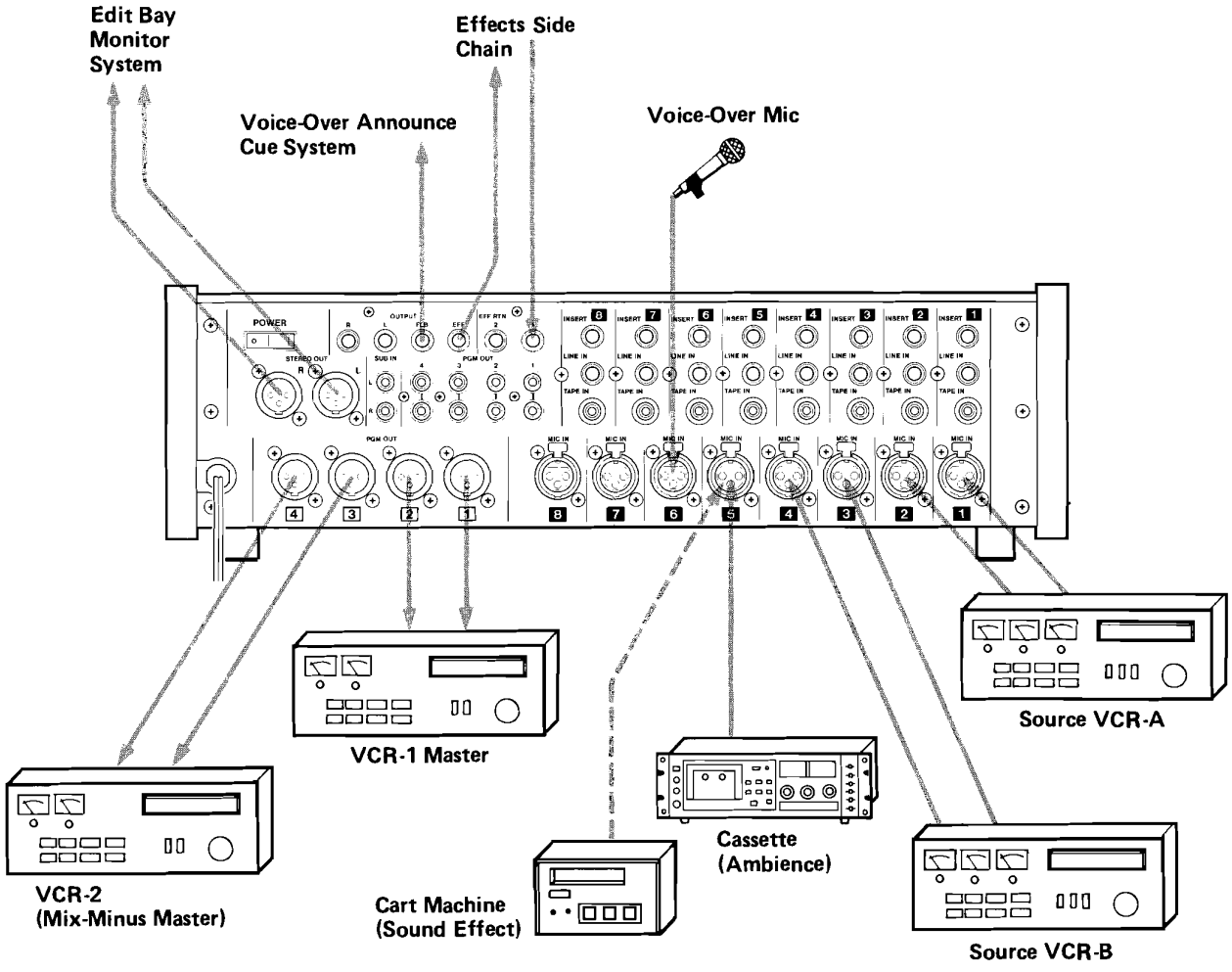
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VIDEO POST PRODUCTION AND AUDIO SWEETENING

The TASCAM Series 200 Mixers have all the necessary features to fulfill the audio control needs of the independent production house or editing/sweetening facility. Virtually all popular brands and models of 3/4 inch and 1/2 inch VCRs will interface directly with the Series 200 Mixers.

Mono or stereo audio signals from four (M-208 stereo) to sixteen (M-216 mono) can be mixed simultaneously. These signals could be combined with various other audio sources such as voice-over (VO) mics, turntables, cart machines, etc., and assigned to the program outputs feeding the edit master record VCR. Since the M-208 has four program busses, a mix-minus of the various ambient and wild track sources can be created simultaneously, without adding the narration and VO material. This can then be dubbed later in a different language in a typical audio-follow-video session. The Foldback send on the Series 200 can be used for cueing the VO announcer, while the effects send and return system can be used as a side-chain for special effects.

In the example shown, two stereo source VCRs are shown in a typical A-B roll editing situation while a VO mic is running through input 6. A cart or cassette machine could be connected to input 5 if needed for hot rolling effects onto the mix. Monitoring of the mix is done through the L and R Stereo Master Outputs, while cues are sent via the Foldback system to the VO booth. The master record machine is being fed signal from Program Outputs 1 and 2, while an international dub (mix-minus-narration and VO) is being recorded from Program Outputs 3 and 4. Additional dubs could be cut simultaneously from the parallel output jacks of the Program Outputs.



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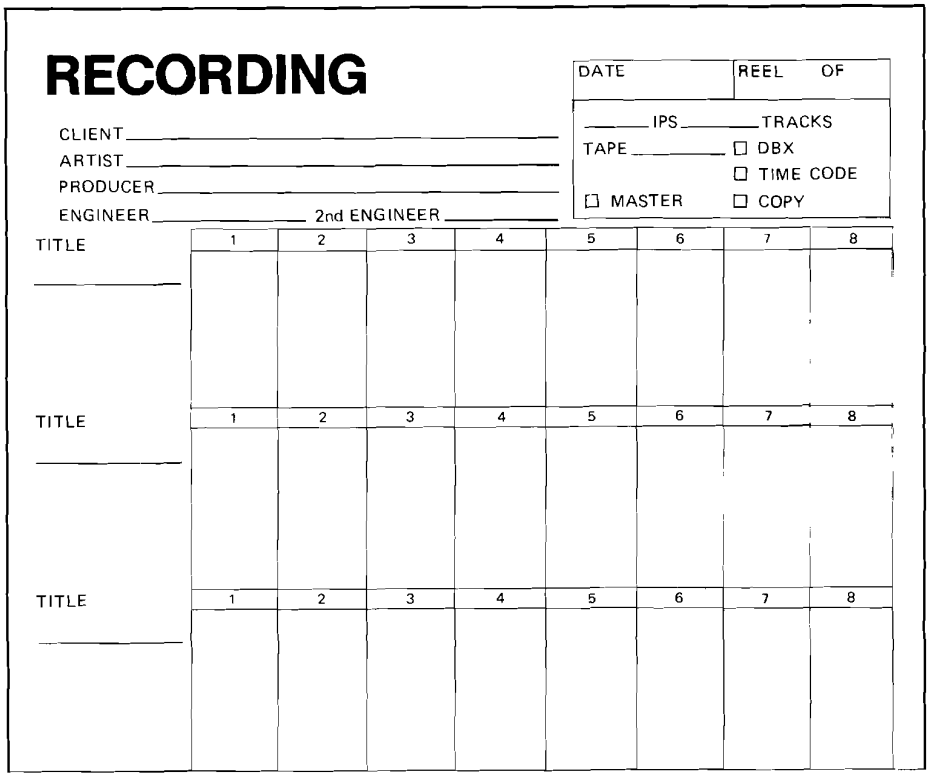
As we mentioned on the first page of this manual, recording is an art as well as a science. Art has a special and intangible quality that sets it apart. In order to create art, the artist must have the proper tools, command of the techniques of those tools, and a healthy dose of inspiration. Your Series 200 Mixer is the tool. The command of the techniques will involve some practice and some thought on your part. Inspiration is a matter for you and your muse.

The following paragraphs are here to provide you with information, suggestions, and some perspectives regarding the mixing processes and your M-208 or M-216. There are three fundamental notions upon which these suggestions are based; Planning, Apparent and Absolute Values, and Common Sense. We'll talk in detail about Planning and Apparent and Absolute Values, we hope that you bring Common Sense to all your endeavours.

PLANNING

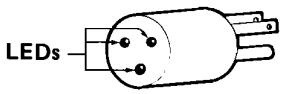
Planning is an obvious necessity when considering how many sources you need to mix, how many monitor mixes are required, when ping-pong and remix will happen, and which tracks will be ping-ponged, etc. Track sheets are handy sketch pads that will aid you in planning. Although track sheets are designed with recording in mind, they are very useful in sound reinforcement. Successful setups can be notated on track sheets for later reference.

Plan your work environment. If you are recording, you will need a room that is quiet and has sufficient electrical power. If there are appliances or air conditioners plugged into the same circuits as your mixer, they will probably cause hum, clicks, or other noises when their motors come on. More valuable tips regarding the recording environment can be found in TASCAM's "Multitrack Primer." If you're mixing for live performance in a night club, make sure the mixer isn't using the same circuit line as the espresso machine and the blender. Your mixer and all the stage equipment should be using the same circuit line.

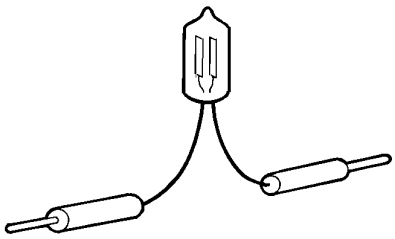


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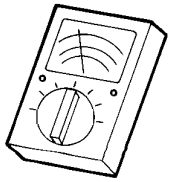
The condition of the AC circuit that you intend to use with your mixer is very important. Noise and safety problems can be both annoying and dangerous. There are a couple of inexpensive tools that you should have with you whenever and wherever you set up your mixer: an AC Outlet Tester, AC Adapter/Groud Lift, and an AC Neon Lamp tester (better yet, a Volt/Ohm Meter).



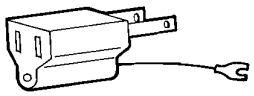
Outlet Tester



Neon Lamp Tester



Volt/Ohm Meter



AC Adapter

The AC Outlet Tester is very easy to use, just plug it into the outlet and its LEDs will signal whether or not the circuit is properly wired. If it is not, do not under any circumstances use that outlet. Faulty wiring in an AC circuit is potentially hazardous.

AC Adapter/Ground Lifts are used in two ways. They are useful if you are using older equipment that uses two prong plugs that are not properly grounded. Your Series 200 uses a two prong plug, but it will present no gounding problems by itself. The wire on the two to three prong adapter must be connected to the grounding screw on the outlet. These adapters are also useful as ground lifts. A ground lift is used in the event that a "ground loop" is created within the wiring of all the elements of your system. A ground loop will create a hum or buzz that will not go away no matter what remedy is used. Ground lifts should only be used as a last resort, since failure to have equipment properly grounded can create safety problems.

A Neon Lamp Tester, or Volt/Ohm Meter can be used to check the grounding of individual instruments and amplifiers. Guitar and bass amps are particularly vulnerable to grounding and shock problems when the guitarist or bassist is also using a microphone. Check the grounding by putting one of the tester or meter's probes on the metal chassis of the amplifier, or the strings of the guitar or bass and touching the other probe to the microphone. If the lamp or meter registers the possibility of a shock, reverse the ground of the instrument's amplifier by using the amplifiers polarity switch or reversing its AC plug. If the amp has a three prong plug and doesn't provide a polarity switch, which is rare, use one of your AC Adapter/Ground Lifts to reverse the plug.

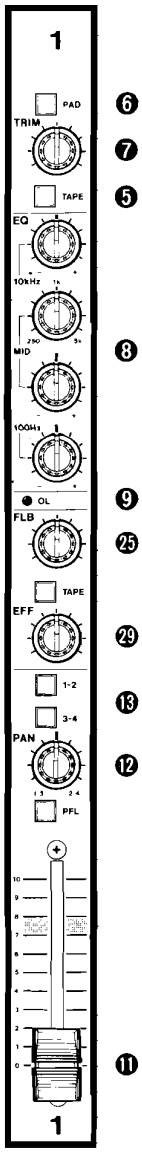
"Snakes" are very helpful when your mixer is used in a sound reinforcement application. A snake uses a connection box on one end of a properly shielded cable with individual cables and connectors on the other end. Snakes are very convenient, but the shielding in the cable can be damaged if the cable is bent, or kinked. Keep snakes out of the way so that people and equipment aren't banging them about.

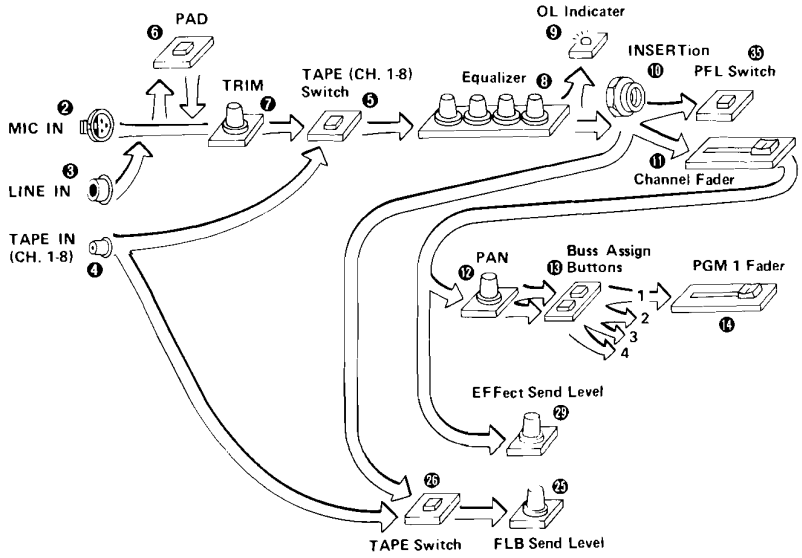
All your wiring should be neat. A snake is obviously neat and convenient, but provides an additional advantage. When cables that carry a similar signal (input, output, effects, etc.) are grounded together, there is less danger of creating a noise source called a ground loop. We mentioned an AC ground loop above, and a similar situation can be created with your audio cables. It follows that cables that carry different kinds of signals should be kept away from one another. A neat arrangement of cables also keeps them from being damaged by keeping them out of the way of the performers and audience. Damaged cables are the most frequent problem you will encounter during sound reinforcement. So keep the cable layout neat, and always have spare cables on hand.

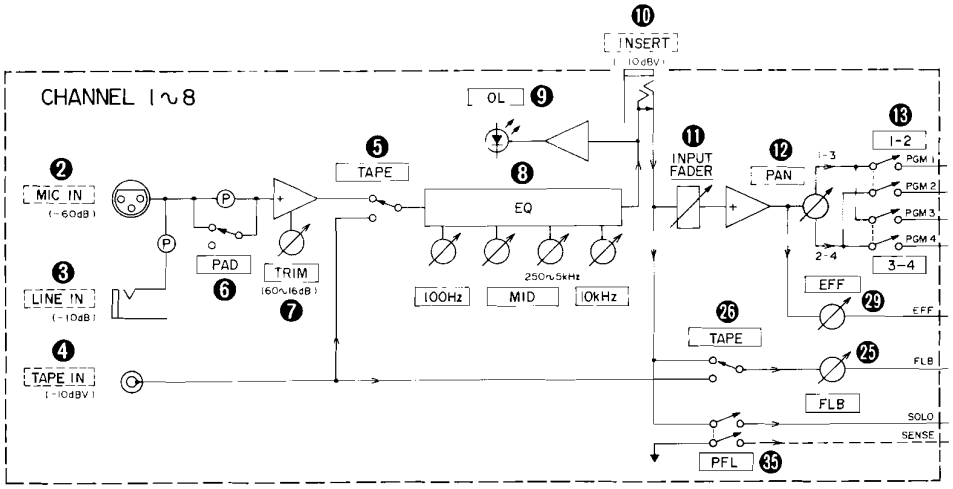
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If you intend to use effects devices with your mixer and amplifiers, then a rack-mount cabinet is a wise investment. The "rack" should have metal rails, these help ground all the chassis' of the amps and effects together, decreasing noise problems.

Understanding the inner workings and signal flow of your Series 200 Mixer will help you to maximize the features and functions of the mixer, find problems quickly, and, perhaps, come up with new applications. To help you in this understanding, we have provided you with three types of illustrations: the first is a line drawing of the unit; the second is called a pictogram, which is a representation of the controls and features placed in the proper sequence of signal flow; the third is a block diagram, which is the same as the pictogram using a different set of symbols for the individual features and controls. Learning to read a block diagram can be a tremendous help in your future dealings with audio equipment. An experienced studio engineer can usually operate even the most sophisticated equipment with only a block diagram as a guide.

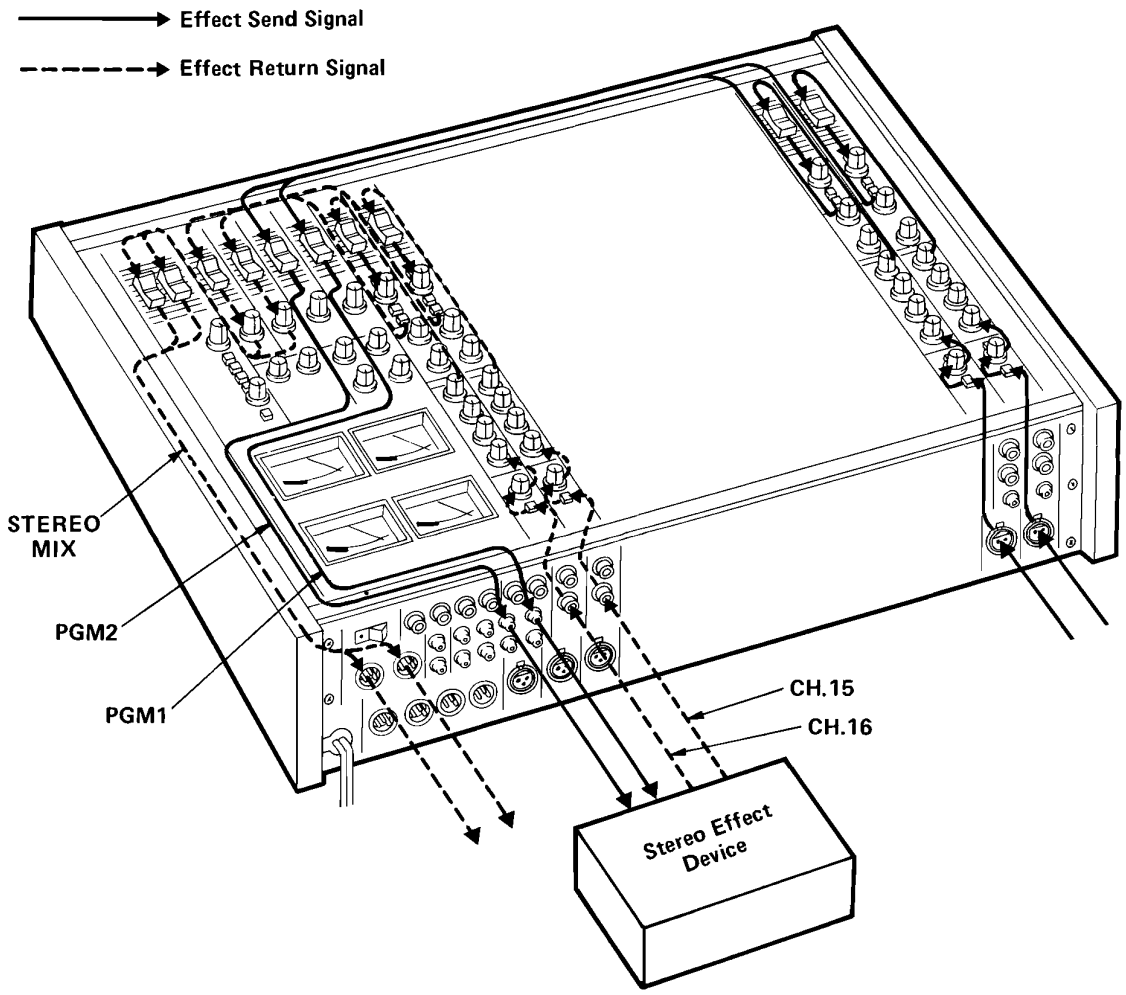






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The following is an example of the applications that can be discovered through a block diagram. Using an M-216 Mixer, we will create a stereo effect send using the program busses 1 and 2. All your input channels can be routed to the 1 and 2 buss. The PGM Outputs for 1 and 2 can then be connected to the stereo effects device. The devices stereo output is connected to input channels 15 and 16. Channels 15 and 16 are assigned to the 3 and 4 busses, and they are used for your stereo master mix.

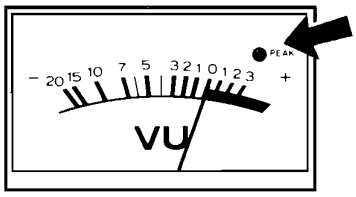


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APPARENT AND ABSOLUTE VALUES

The ear and the Series 200 Mixer perceive the same program material in very different ways. The ear deals in apparent, subjective values, while your mixer deals in absolute, objective values. This difference leads to the fundamental rule: trust your mixer, the meters and OL indicators, when the destination of your mix (the "where to") is another machine (recorder, amplifier, signal processor, etc.); and trust your ears when the destination is the realm of the ears (the air, reached via speakers or headphones). Remember too, until your ears reach the level of perception attained by experienced audio engineers, trust your mixer whenever in doubt.

The METERS show both the average program level with the needle of the meter and the peak program level and transients by means of peak LEDs built into the meters and overload LEDs in the channels. Percussive instruments and synthesizers can be difficult to mix properly. Believe your meters! Keep your levels under control when you mix these instruments. Their apparent loudness is not usually greater than other instruments, but their absolute signal value is much higher than the average program level. If these levels reach your tape or amplifiers without being trimmed, they will cause your sound quality to go down.



USING THE SERIES 200'S EQUALIZER

EQ can be used to change the tonality/timbre of a signal in an individual channel of your mixer. The 10 kHz control affects the relative "brilliance or brightness' of the signal, while the 100 Hz control affects the "boominess or bassiness" of the sound. Between these extemes is the midrange 250 Hz – 5 kHz control. This control affects the relative "presence" of the sound within the range of the voice, guitar and other midrange sources.

There are at least two sides to every story and the EQ story is no different. The ability to favorably change one signal may result in an unfavorable alteration in another. When using EQ, care must be taken not to " overdo it. " With the exception of boosting a signal to the point that it registers on the OL LED, EQ is a process for the apparent, subjective values of the ears. Your conception of what is good, will probably differ from ours. Make EQ adjustments to please yourself.

Your mixer's EQ controls perform in an interactive way. What is meant by that is, the tone or timbre of the sound in a channel can be altered to bring about a similar change by using any of the three EQ controls. How so? Suppose you want to change the "balance" of the timbre by accentuating the bass. Before your reach for the 100 Hz control and start adding bass, consider reaching for the 10 kHz and mid-range controls to "roll off" the highs and mids a bit. These three controls epitomize the team work approach to problem solving. Always consider all three alternatives whenever an EQ adjustment is necessary.

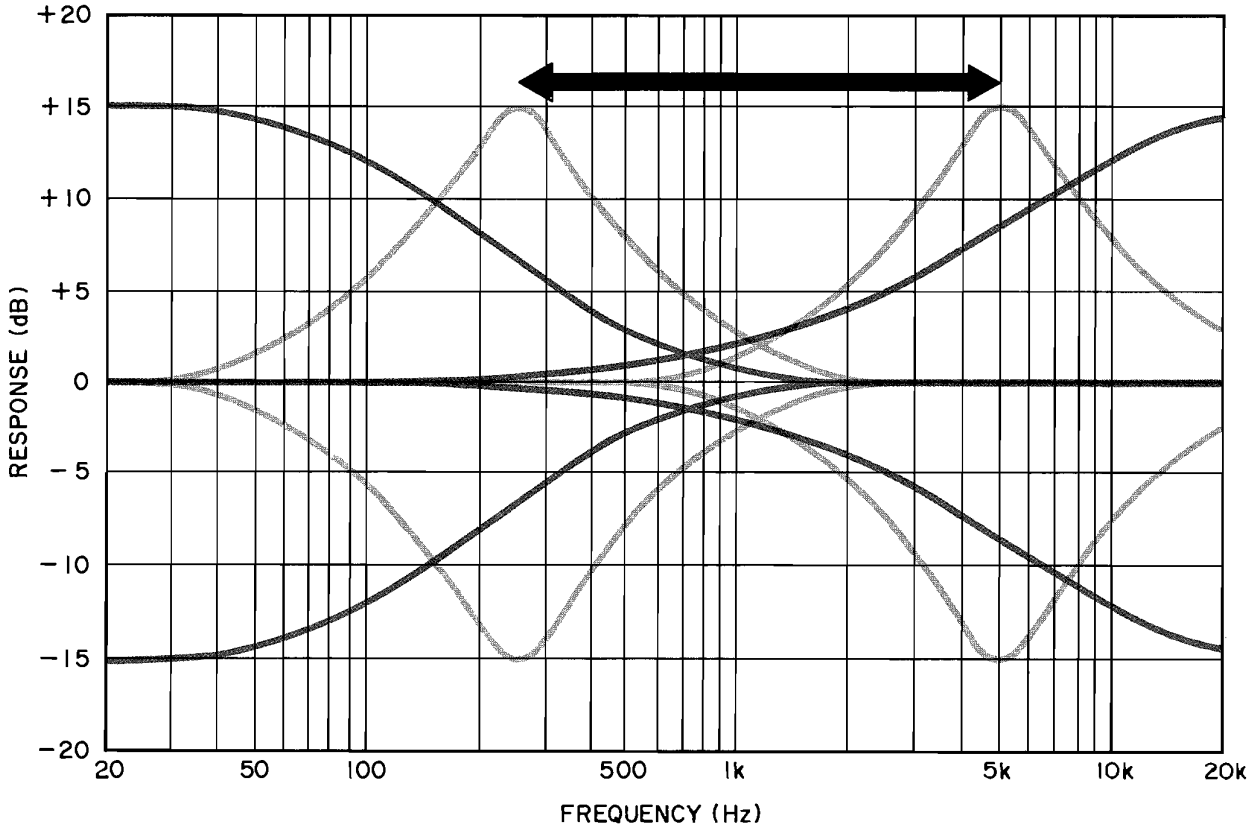
EQ controls tend to be over used rather than under utilized. If the sound is acceptable as it comes into the mixer, then don't EQ it. And don't over adjust any control. Be careful, only make the adjustments that are absolutely necessary. Less is definitely more when considering EQ.

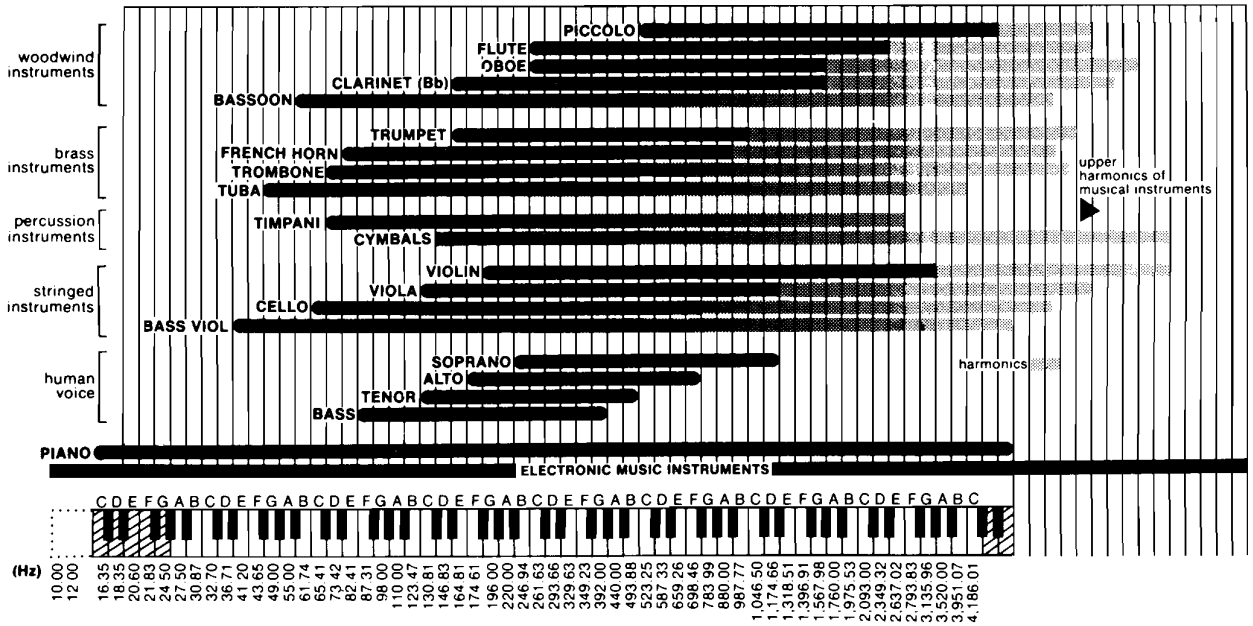
The EQ system in your Series 200 Mixer is a combination of a shelving-type, the 10 kHz and 100 Hz controls, and a sweep-type midrange equalizer. All three controls provide both cut and boost capability within their frequency ranges. The treble, 10 kHz, and bass, 100 Hz, have frequency ranges that are fixed. Your midrange, 250 Hz to 5 kHz, control is variable and will provide its cut or boost to a selected frequency within its outside limits. How do you tell the frequency range that needs attention?

Most of us can tell that Michael Jackson's voice is higher than Bruce Springsteen's. If you're not familiar with these singers, consider the roar of the lion and squeek of the mouse. These examples are extreme and, therefore, distinctions are easily made. Consulting the frequency range chart provided here, you can see that Michael and the mouse will be much

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more affected by an adjustment in the 10 kHz control than Bruce or the lion would be. Bruce and the lion will get more help from a control placed in the 400 Hz range. A bass drum will be more affected by the 100 Hz control than a cymbal would be, and so on.





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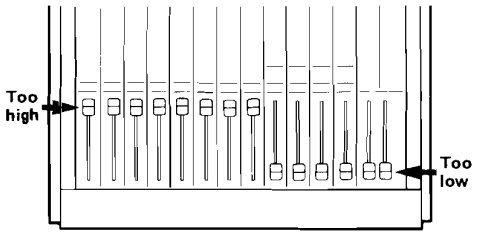
Once you have determined that 1) the signal does require EQ and 2) the proper frequency range has been identified, the final steps involve turning the proper controls. Sounds simple, doesn't it? If the frequency to be adjusted falls within the range of the mixer's midrange control, 250 Hz to 5 kHz, there are two controls to work. To determine exactly where the midrange control should be set, turn the Gain, the lower of the two knobs marked MID, to an exagerated position, almost all the way up. Then, slowly sweep the frequency range by turning the frequency control from its minimum to maximum settings in a clockwise motion. As the control is turned, you will hear the change in the signal's content. When the desired frequency is isolated, reset the Gain control to the necessary amount of boost or cut. Avoid making these changes during a performance or recording. The sweeping action can create undesireable timbral effects.

When EQing a track, remember that the control you use will affect all the music passing through the control's circuit. You may find that the necessary boost on one instrument also boosts another instrument on the channel in an unfavorable way. Experience will help you learn the limits of the EQ process.

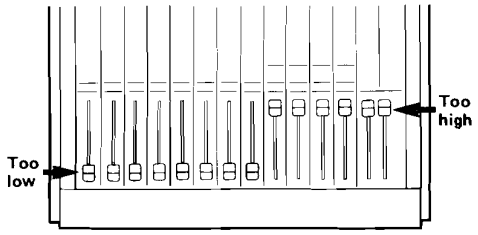
A WORD OF MIXING ADVICE

All finished tapes or live performances must be balanced for level. Do all the instruments and voices blend together in a way that is appealing? Is the lion roaring so loud that the mouse is "lost in the mix"? Your signal levels will affect the entire recording and mastering process, including the EQ process. So make sure that your levels are properly adjusted when recording or mixing for performance. This will let you use your EQ system to "fine tune" the music. You can't fix it if you can't find it.

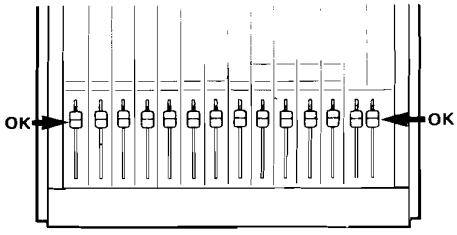
If your mixer's faders end up looking like this, then you're overloading your outputs. Pull down the input channel faders and raise the program master faders.



If this is the look your mixer is projecting, then you're pushing the master too hard. Your mix will be undistorted, but will have a lot of noise in it.



This picture is the reasonable compromise. It will give you the best results.



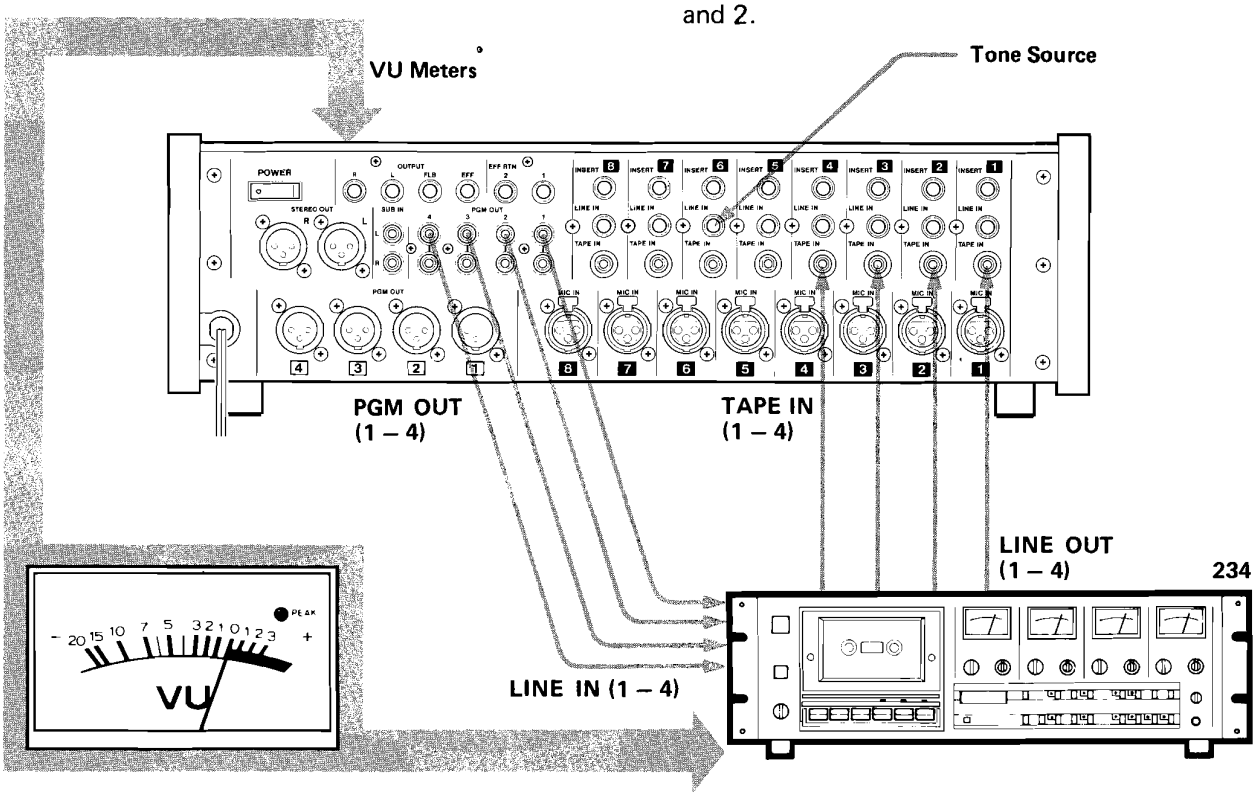
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CALIBRATING THE SERIES 200 MIXER

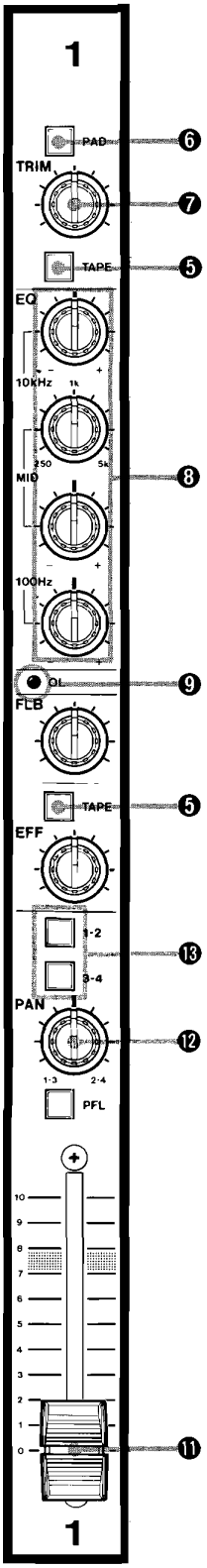
Calibrating your Series 200 Mixer is the process of matching its output to the rest of the equipment being used in the system. In this example we will assume you are using a four track recorder, the 234 Syncaset. The method used here can be used with virtually any type of equipment you are likely to encounter.

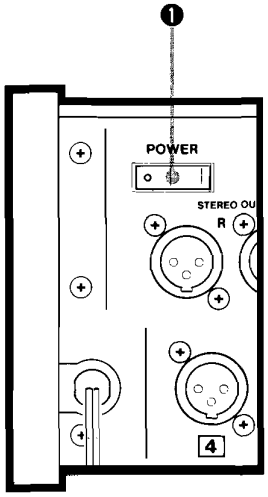
The first step is to connect the PGM OUTputs from the Series 200 to the inputs of the recorder. Once the equipment is connected, you can begin the calibration. A test tone generator. TO-122A, or test tape is handy to have for this purpose. If you have a constant tone test tape skip to step number 12 in the following sequence. Assuming you have a tone generator, or constant tone tape, set the frequency to 1 kHz then proceed as outlined below:

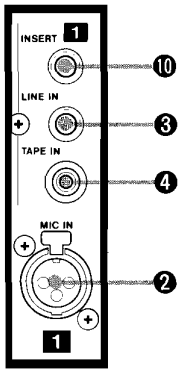
1. Connect the tone source to the channel 6 LINE INput. Any channel will do, we picked channel 6 at random.
2. Set the EQ and PAN to the 12 o'clock position.
3. Press both Assign switches, 1-2 and 3-4.
4. Raise the channel 6 fader to the shaded area between 7 and 8.
5. Raise the PGM 1 – 4 faders to the shaded area between 7 and 8.
6. Set the channel 6 TRIM to 12 o'clock position.
7. Raise the channel 6 fader until meters 1 – 4 read 0 VU. The channel fader should be in the shaded area. If it isn't adjust the TRIM control until it is correct. Use the PAD also if necessary.
8. Raise the input level controls on the front panel of the Syncaset recorder until the recorder's meters read 0 VU.
9. Using a fresh tape, record the 0 VU tone on all four tracks for about a minute.
10. Disconnect the tone source, and connect the outputs of the recorder to the first four TAPE INputs of the Series 200 Mixer.
11. Make sure all EQ controls are at their 12 o'clock settings.
12. Rewind the tape and play the tone. Set the recorder's output level controls so that the recorder's meters read 0 VU.
13. Pan channel 1 full left, channel 2 full right. Turn off the 3-4 Assign switch in channels 1 and 2.
14. Pan channel 3 full left, channel 1 full right. Turn off the 1-2 Assign switch in channels 3 and 4.
15. Raise the channel 3 and 4 faders until the meters read 0 VU. Do the same for channels 1 and 2.



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❶ Power Switch

This on/off switch is located on the back panel of the mixer. Make all connection with the power off. The correct sequences for turning your mixer and any power amps used with it on and off is as follows: turn mixer on before power amps: turn power amps off before mixer.

MAIN MIX SYSTEM

❷ MIC INput

These three pin XLR connectors are for use with balanced signals having an impedance range of 50 to 600 ohms. Balanced line level signals may also be plugged in here.

❸ LINE INput

These quarter-inch phone jacks accept unbalanced signal from a microphone or instrument with an impedance of 10 kohms or less. Guitars and basses may be connected directly to these inputs. Instruments used with direct boxes may be connected here or to the MIC INputs. Or effects returns can be patched into these jacks to be controled as if they were a regular line input. Don't use both the MIC and LINE INputs in the same channel at the same time. Disconnect one when the other is used.

❹ TAPE INput

These RCA jacks route signals from tape recorders, or other line level sources, to channels 1 through 8. Then pressing the TAPE Select Switch is all that is necessary to bring the signals into the mix. In sound reinforcement applications these inputs can be used for line level sources. The TAPE switches then function as an input selector, turning the sources plugged in to the TAPE INputs on and off in the mix.

❺ TAPE Select Switches

There are two buttons marked TAPE on each of the 1 – 8 input channels of your mixer. They are used to bring the signal from the mixers TAPE INputs into the mix at two different points. The first of these, located near the TRIM control, brings the tape signal into the mixer before the EQ controls. The signal is processed by the mixer in the same way that a microphone or instrument input would be.

The second of these TAPE buttons is located near the FoLdBack control. The tape signal is

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brought into the mixer at this point and is used only by the foldback mix subsystem. The FLB OUTput is usually used for a talent cue mix via headphones or monitor speakers.

❻ PAD Button

The PAD button is used to lower an incoming signal from the MIC or LINE INputs. PAD is particularly useful when microphone signals are very hot, the 200 Mixers will accept signals up to +28 dBm when the PAD is used in conjunction with the TRIM control.

❼ TRIM

TRIM is a variable control that increases or decreases the amount of signal coming from the MIC and LINE INputs. It should be used in conjunction with the PAD button when a signal is high.

❽ EQualizer Controls

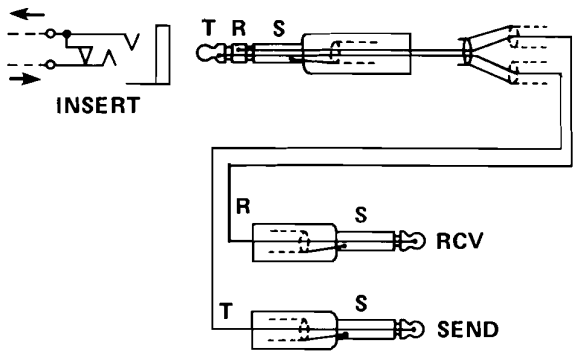
These controls adjust the timbre, bassiness or brightness, of your input signals. As rotary controls, they affect the various frequency ranges by reducing (counterclockwise movement) or increasing (clockwise movement) the presence in their ranges. The 10 kHz control is a shelving type that gives a 12 dB cut or boost at high frequency signals. The mid frequency range is affected by two rotary controls that make up a sweep-type EQ. One selects the frequency to be affected, from 250 Hz to 5 kHz, and the other controls the amount of cut or boost, 15 dB plus or minus. The low, or bass frequencies are affected by a shelving-type control with a center frequency of 100 Hz. 12 dB of cut or boost is possible.

❾ OverLoad Light

This light lets you know if the signal level in the channel is too high when it leaves the equalizer. If the light stays on, you must reduce the signal with the TRIM and PAD controls. If these controls don't lower the signal sufficiently, then you have boosted the signal too much with the EQ controls. Lower the boost settings of your EQ controls.

❿ INSERT Jack

These are located on the back panel of the mixer. They allow you to place a signal processor into the signal flow at this point in the mix. This is done using a single jack via the TASCAM PW-2Y/PW-4Y cables that access both a send and receive from the INSERT jack.



T – Tip, send signal
R – Ring, receive signal
S – Sleeve, ground

⓫ Input Channel Faders

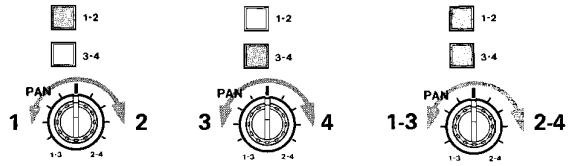
These linear, or slide, faders vary the amount of signal that is passed on to the PAN and Buss Assignment switches. They also control the amount of signal that reaches the EFFect control.

⓬ PAN

This control is similar to a "balance" control that is found on most home stereo receivers, radios, or amplifiers. They affect the degree to which a signal will be present in the left (and busses 1 and 3) and right (even busses 2 and 4) of the mixers busses.

⓭ Buss (Group) Assignment Switches

These switches turn the signal to the PGM busses off and on. In the down position they are ready to receive signal from the PAN control. In the up position they are closed to signals from the PAN.



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⓮ PGM Master (Group) Faders 1 – 4

These faders vary the amount of signal that is sent on the Master PAN controls and PGM MASTER OUTputs after it is received from the Buss Assignment on/off buttons.

⓯ PGM Master METERS 1 – 4

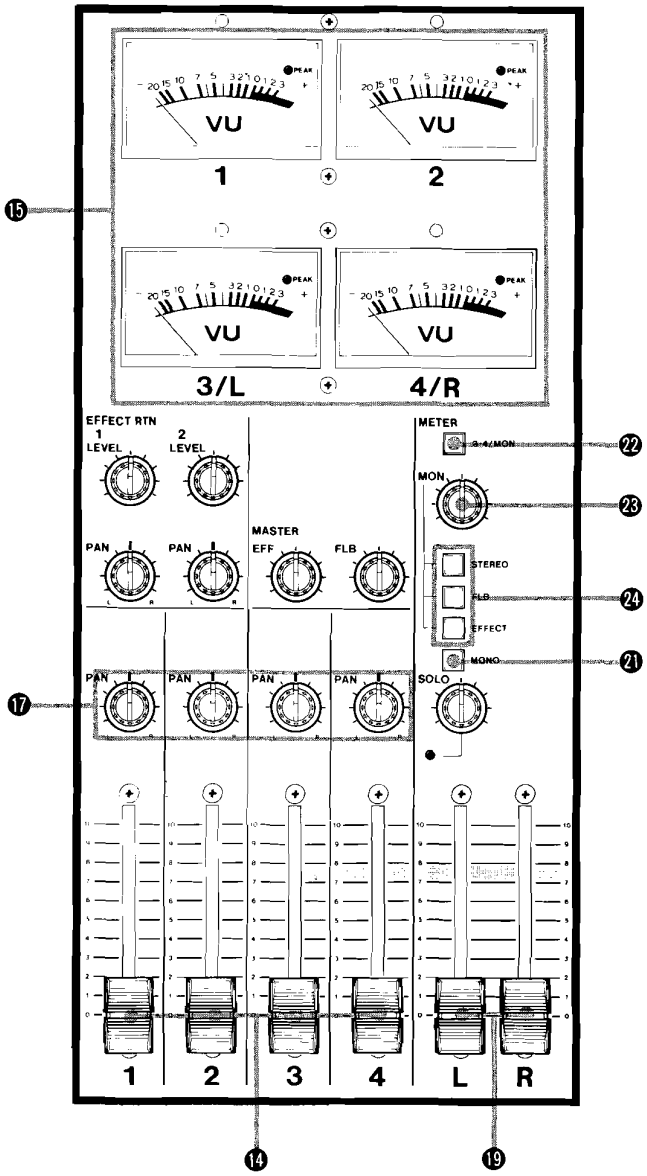
These meters give you a visual representation of the signal level as it appears at the PGM MASTER OUTputs and Master PAN controls. The METERS will show you two conditions: the average signal level, which is shown by the needle, and the peak or transient program level, which is shown by a PEAK Light.

⓰ PGM OUTputs

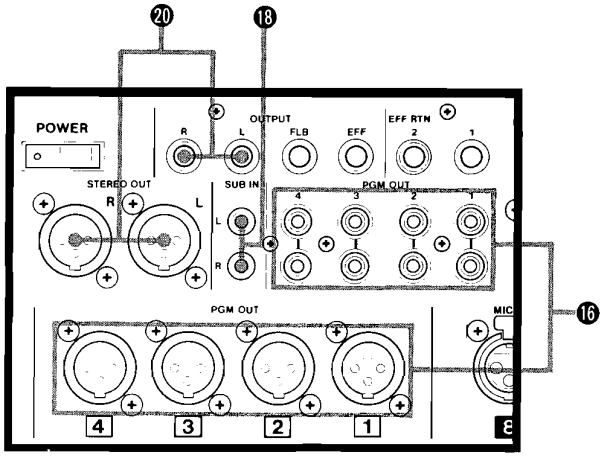
There are three outputs for each of the four PGM busses. An XLR connector provides an unbalanced output. Two RCA parallel connectors with line level signals are available for each buss. These are usually used to feed tape recorders.

⓱ Master PAN Controls

These rotary controls accept signal from the PGM Master Faders and determine the amount of signal that will be passed along to the left and right sides of the STEREO Buss.



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⑱ SUB Buss INputs

A stereo tape recorder, video recorder or other source may be connected at this point in the mix. It is also possible to "stack" or "cascade" mixers by using the SUB Buss INputs to bring the stereo outputs of another mixer into your Series 200. The connectors, located on the back panel, are RCA type.

⑲ Stereo Master Faders L and R

These faders vary the signal level that they receive from the Stereo Buss (a mixture of signals from PGM 1 – 4, SUB Buss INputs, and EFFect ReTurN 1 and 2). The signal goes to the STEREO OUTputs and R/L OUTPUTS.

⑳ STEREO OUTputs and R/L OUTPUTS

These are the outputs that you will use to feed your main power amp and speakers, if you're using the 200 for sound reinforcement. The STEREO OUTputs use XLR connectors and provide an unbalanced signal. The R/L OUTPUTS use quarter-inch phone connectors and supply an unbalanced signal. You will also use these outputs for your stereo remix during audio or video mastering.

㉑ MONO Button

This button is located just above the SOLO Level control. It is used to override your stereo mix, placing the same monophonic mix at all stereo outputs and the stereo headphone output. A mono mix is used to discern phasing problems and for mono sound reinforcement applications.

MONITOR SECTION

㉒ METER 3-4/MONitor Switch

This switch affects the 3/L and 4/R meters. It determines whether the meters display the signal level on the numbers 3 and 4 PGM Busses, or whether the meters will read the signals determined by the MONitor Select Switch including: the STEREO Master, FoLdBack, or EFFect mix.

㉓ MONitor

This is a level control for the MONITOR section. The MONitor Level controls the volume level at the Headphone jack on the front panel.

㉔ MONitor Select Switches

STEREO

If the METER button is in the MONitor position, pressing the STEREO button will allow the 3/L and 4/R meter to display the signals as they appear at the STEREO OUTputs. This also switches the Headphone jack to the same source.

FLB (Foldback)

With the METER button in the MONITOR position, the FLB button will switch the meters to display the foldback mix. The foldback mix will also be available at the Headphone jack.

EFFECT

If the METER button is down, pressing the EFFECT button will cause the meters to display the effect mix signals. It will also make the effect mix available at the Headphone jack.

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FOLDBACK MIX

㉕ FLB Controls

These rotary controls are present in each of the input channels fo your mixer. It controls the amount of signal that will be passed on to the MASTER FLB control. These controls are used to create the foldback mix in the same manner as your input channel faders are used to create the main mix. A foldback mix is used as a control room monitor mix, or cue mix in the recording process. It may be used as a stage monitor mix for sound reinforcement.

㉖ TAPE Select Switch (#2)

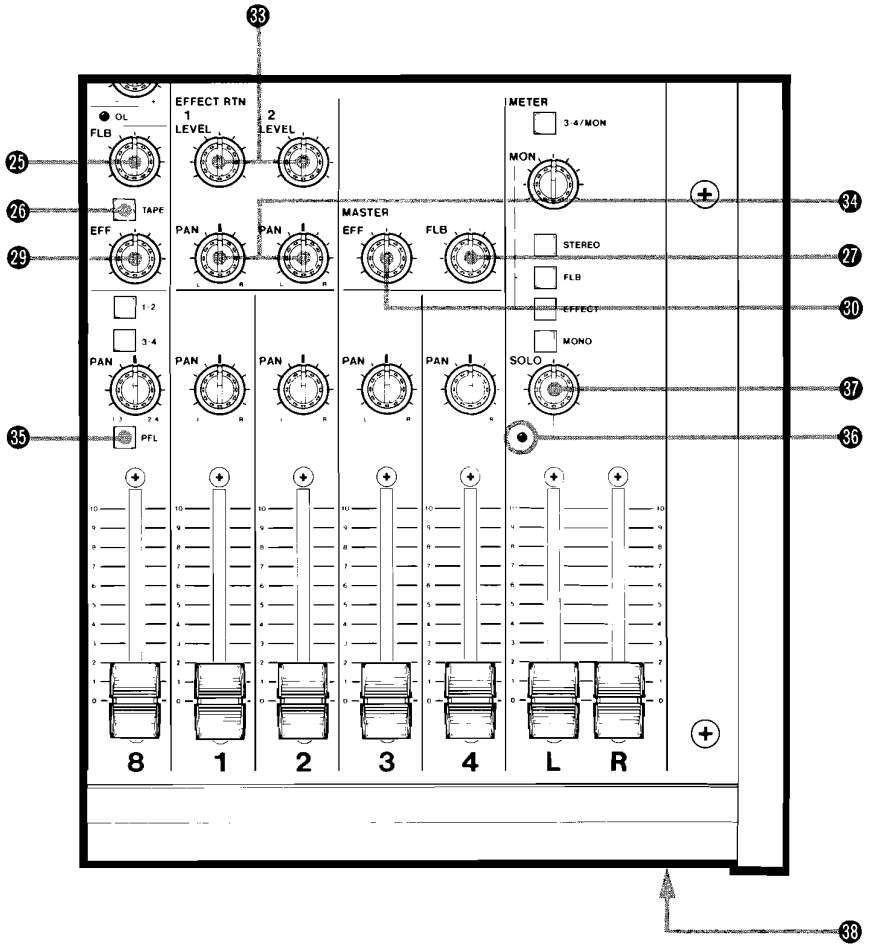
This switch determines whether the foldback system will take its signal from the TAPE INputs or MIC/LINE INputs. It is located below the FLB control. The foldback mix originates after the EQ section and prior to the Input Fader. The Input Fader, therefore, has no affect on the Foldback signal.

㉗ MASTER FLB Control

This is the final control in the foldback mix system. It controls the level of the signals from all your input channels that will be available at the FLB OUTPUT and FLB button in the MONITOR section.

㉘ FLB OUTPUT

This output may be connected to an amplifier to drive stage monitor or control room monitor speakers. It may also be connected to a MH-40B Headphone Amp for a talent cue mix.



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EFFECT MIX

㉙ EFF Controls

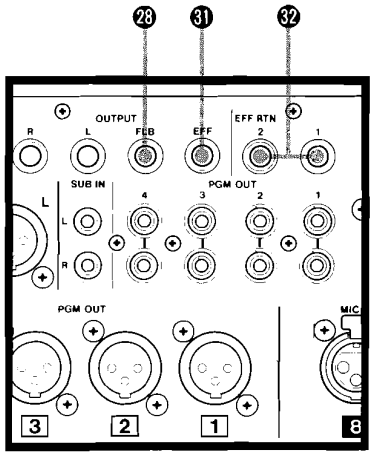
The rotary EFFect controls are present in each of the input channels and are located just below the FLB and TAPE controls and just above the Buss Assignment switches. These level controls take their signal from the input channels at a point just after the Input Faders and before the PAN controls. They determine how much signal will be sent to the MASTER EFFect control. Just as in the main mix and foldback mix, these controls create the overall balance (the mix) of the effect mix system.

㉚ MASTER EFF Control

The MASTER EFFect control receives the signal from the EFF controls in the individual channels and determines the level of signal that it passes to the EFFect OUTPUT on the back panel.

㉛ EFF OUTPUT

Located on the back panel of your mixer, this is the source for your signal processing equipment (reverb, delays, compressors, etc.). Since some devices do not have level or gain controls, the level of signal present at this output determines how hard the devices in the effects chain will be driven. The MASTER EFFect control becomes your gain control for the effects chain.



㉜ EFF RTN Connectors 1 and 2

These are located on the back panel of your mixer. Why are there two of them and only one EFFect OUTPUT? Many devices are capable of producing two or more signals from a single input. Often these signals will be a dry, unaffected signal and the effect signal. In some chorus devices, there is a stereo image, complete with panning, created from a single input. In any of the above cases, your 200 mixer gives you the opportunity to utilize these extra effect outputs.

㉝ EFFECT RTN 1 and 2 LEVEL Controls

These controls are present so that the signals returning from your effects devices can be adjusted so that their levels will match those of the other signals in your mixer. Equalizers can create signal levels that need attention.

㉞ EFFECT RTN PAN 1 and 2

The signals coming from your effects will be entering the mix at the Stereo Buss. As in other PAN controls, these rotary knobs control the placement in the stereo panorama of your effect signals. The signals are passed on to the Stereo Master Faders, and Stereo Master Outputs.

SOLO SYSTEM

㉟ PFL Buttons

These Pre-Fader Listen buttons are where the Solo system originates in each of the input channels of the mixer. These buttons may be used one-at-a-time or in any combination. Their purpose is to allow the user to listen to any channel or group of channels in order to set levels, adjust EQ, or find problems.

㊱ SOLO LED

This light is located near the SOLO control just above the Stereo L and R Faders. If any of the PFL buttons are activated, this light will come on.

㊲ SOLO Control

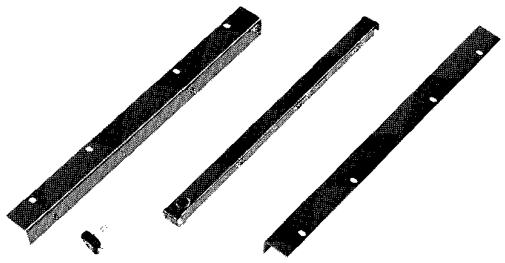
This rotary control varies the level that the Solo system will send to the Headphone jack on the front panel.

㊳ Headphone Jack

This quarter-inch stereo phone jack is located on the front panel of your Series 200 mixer. Never use mono headphones with this jack! They will cause circuit damage.

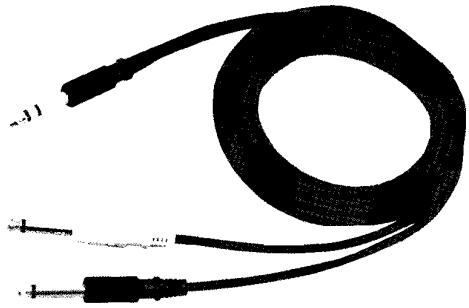
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RM-208 Rack Mount Kit



The RM-208 is designed especially for the TASCAM 208 and allows it to be mounted on an EIA standard 19" rack.

PW-2Y/PW-4Y Insertion Cable



The TASCAM PW-2Y/PW-4Y is a connecting cable that allows signal processing such as a graphic equalizer to be inserted at specific points of the signal path of the Series 200 Mixers. Its tip-ring-sleeve plug connects to the INSERT jack while its "Y'ed" end accommodates connection to the input and output terminals of the outboard equipment being used. Available in two lengths – 2 m (PW-2Y) and 4 m (PW-4Y).

TASCAM Cables

Cable, because of its inherent capacitance and resistance, is an active component in an audio system. There are vast differences in cable design and performance that have significant effect on the sound quality you'll get from your equipment. TASCAM Professional Audio Cables are the best available.

Our cables feature very low capacitance (under 15 picofarads/foot) so they don't act as low-pass filters and roll off high frequencies. The capacitance is also consistent; it doesn't change when the cable is bent or compressed. You don't get noise or degraded results when the cable has been used a while. Our cable's long-term stability is provided by a special insulator that is as flexible as foam core dielectrics, but far more resistant to extreme cold or heat, and it doesn't let the center strands migrate. It also avoids the possibility of shearing the center conductor when the cable is crushed, so that cable does not suddenly fail.

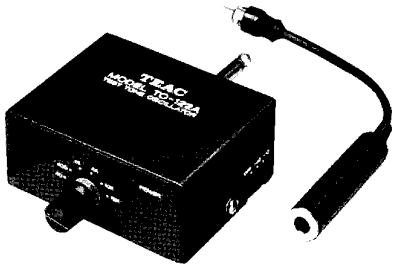
Rather than loosely braided shield or spiral wrapped shield that can open up, we use bare copper braided shield with 97 % coverage. This excludes electrostatic noise (buzz) and RFI (CB interference, etc.). We also use a 7-strand center conductor: 4 pure copper strands for minimum resistance and 3 copper weld stainless steel strands for strength. The multiple strands increase flexibility and strength while offering less resistance at ultra high frequencies due to increased surface area for the "skin effect." This improves transient response.

The outer PVC insulating jacket resists abrasion, and is tightly fitted to the shield so it will not elongate. The connectors are special, too. Their nickel-plated brass center pins are a bit longer than most to establish good contact in all RCA jacks. The cadmium-plated steel outer shell includes a gentle ridge which burnishes the mating jack when the connector is twisted to ensure good contact. For maximum RF shielding, the braid is terminated inside the shell and 2-radian soldered, not just spot soldered, for maximum strength. The plugs are clad with an oval jacket of molded plastic to further increase strength and make the ends easier to handle. TASCAM cable is available in lengths from 6 inches to 20 feet, or in color-coded sets of 8 for fast channel or function identification. TASCAM cable is also available in 500 foot spools.

If TASCAM professional cables are not available in your area, please try to find the next best cables. It really does make a difference in system performance.

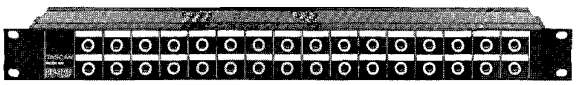
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TO-122A Test Tone Oscillator



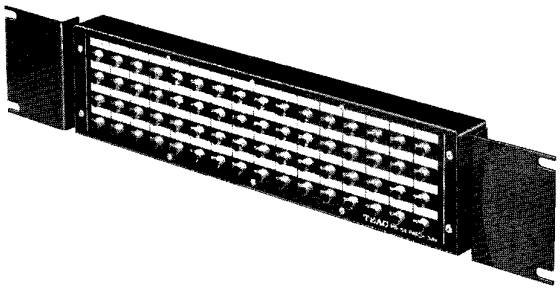
This compact, battery powered unit can be used to check the input/output levels, channel balance, and electronic alignment calibration of the Series 200 Mixers. It has an RCA jack output, switchable output levels of -10 dBV (line level) or -40 dBV (mic/instrument level). Frequency is switchable to 40 Hz, 400 Hz, 1 kHz, 4 kHz, 10 kHz or 15 kHz. The TO-122A is also useful for calibration and troubleshooting of entire recording systems.

PB-32 Series Patch Bays



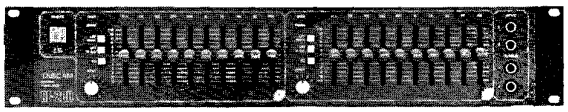
The PB-32 patch bay is today's simplest and most effective way to deal with the ever-increasing tangle of wires necessary for the recording and signal processing you want to do. Instead of leaning over, walking around, or turning consoles, racks, recorders and other equipment, you can bring all those confusing cable ends to one single spot in your rack, or next to your mixer, and get them under control. You can label inputs and outputs on the PB-32, and wan't have to guess anymore at what you might be plugging in. A few cords can save endless hours of searching around on the floor behind your console and, as the whole process of patching is made simpler, you'll probably find more flexibility in your recording setup.
The PB-32 comes in your versions. The PB-32P is equipped with 1/4" phone jacks only, the PB-32R with RCA jacks only, the PB-32H with 1/4" phone jacks on one side and RCA jacks on the other, and the PB-32W with 1/4" phone jacks for 6 channels and RCA jacks for the remaining 10 channels.

PB-64 Patch Bay



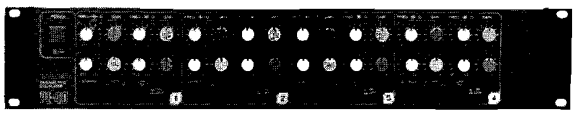
When your system begins to expand beyond the basic, sorting out where things go can take much time away from the recording process. This accessory will allow you to speed things up and get back to what you really want to do. Sixty-four RCA pins on a panel. So you can bring all those jacks to where you are. It will get you off the floor and back to recording. Connect all your inputs and outputs to the back, and you can reroute your signals with short jumpers quickly.

GE-20B Graphic EQ



The GE-20B is a 2-channel, 10-band graphic equalizer offering an easy means of controlling the tonal balance between channels. Rack mountable (19" EIA).

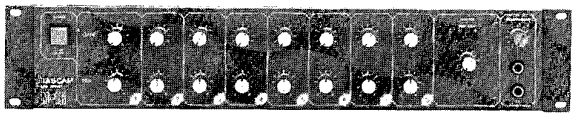
PE-40 Parametric EQ



The PE-40 is a 4-channel, 4-band parametric equalizer providing precise control over the frequency characteristics of any line level program. Rack mountable (19" EIA).

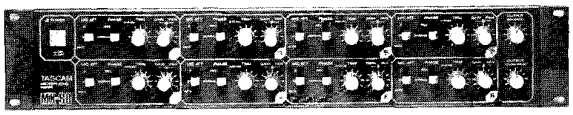
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M-1B Line Mixer



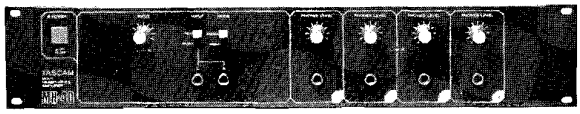
The M-1B is an 8-in, 2-out line mixer that provides you with an easy and practical way of creating an independent mix such as cue or monitor mixes. Rack mountable (19" EIA).

MX-80 Mixer



This is an 8-in, 2-out mic/line mixer useful as a fully functional, ingenious submixer for obtaining an extra mic or line mix. Versatility of your system will be considerably enhanced. Rack mountable (19" EIA).

MH-40B Headphone Amp



The MH-40B is a headphone distribution amplifier that can be used to feed four sets of studio cue headphones and can be mounted in a 19" EIA rack.

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das

AUDIO MISCHPULT TASCAM M-208/M-216

(Gerät, Typ Bezeichnung)

in Übereinstimmung mit den Bestimmungen der

AMTSBLATT 163/1984, VFG 1045/1984

(Amtsblattverfügung)

funk-entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

TEAC CORPORATION

Name des Herstellers/Importeurs

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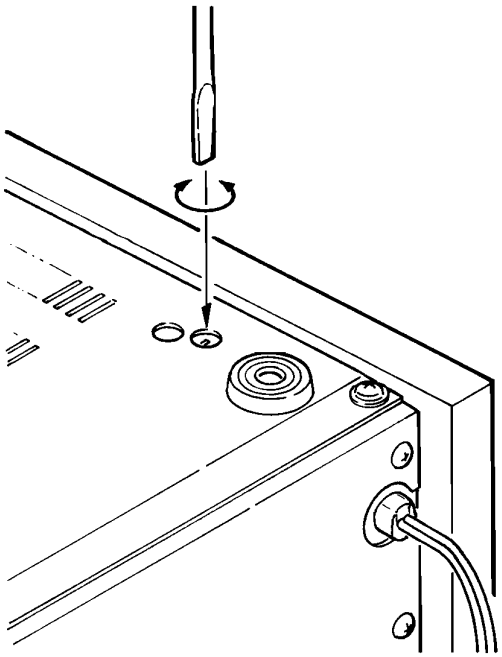
Voltage Conversion

This unit is adjusted to operate on the electric voltage specified on the unit, power cord tag, or packing carton.

NOTE: This voltage conversion is not possible on models sold in the U.S.A., Canada, UK, Australia or Europe.

For general export units, if it is necessary to change the voltage requirements of your mixer to match your areas, use the following procedures. ALWAYS DISCONECT THE POWER LINE CORD BEFORE MAKING THESE CHANGES.

1. Locate the voltage selector on the bottom of your mixer.
2. Using a regular (slot blade) screwdriver, turn the selector until the numerals corresponding the voltage requirements of your area appear.



Note for U.K. Customers

U.K. CUSTOMERS ONLY:

Due to the variety of plugs being used in the U.K., this unit is sold without an AC plug. Please request your dealer to install the correct plug to match the mains power outlet where your unit will be used as per these instructions.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

BLUE: NEUTRAL
BROWN: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured marking identifying the terminals in your plug, proceed as follows.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK. The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

This product is manufactured to comply with the radio interference of EEC directive "82/499/EEC."

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M-208

ELECTRICAL CHARACTERISTICS

Mic Input	XLR type, balanced
Source Impedance	200 ohms to 600 ohms nominal
Input Impedance	2.8k ohms
Nominal Input Level	-60 dBV (1 mV)
Minimum Input Level	-70 dBV (0.3 mV)
Maximum Input Level	+28 dBV (25 V)/TRIM to min., PAD on
Line Input	1/4", unbalanced
Input Impedance	22k ohms
Nominal Input Level	-10 dBV (0.3 V)/PAD on
Minimum Input Level	-50 dBV (3 mV)/PAD off
Maximum Input Level	+35 dBV (56 V)/TRIM to min., PAD on
Mic/Line Pad	30 dB attenuation
Channel Overload Indicator	Set to light at 25 dB above nominal
Tape Input	RCA Type
Input Impedance	10k ohms
Nominal Input Level	-10 dBV (0.3 V)
Maximum Input Level	+18 dBV (8 V)
Effect Return Input	1/4"
Input Impedance	4.3k ohms
Nominal Input Level	0 dBu (0.8 V)
Minimum Input Level	-10 dBu (0.25 V)
Sub Input (STEREO)	RCA Type
Input Impedance	22k ohms
Nominal Input Level	-10 dBV (0.3 V)
Maximum Input Level	+18 dBV (8 V)
PGM Output	
XLR Type, unbalanced	
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	0 dBu (0.8 V)
Maximum Output Level	+20 dBu (8 V)
RCA, unbalanced	
Output Impedance	490 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	-10 dBV (0.3 V)
Maximum Output Level	+10 dBV (3 V)
Stereo Output	
XLR Type, unbalanced	
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	0 dBu (0.8 V)
Maximum Output Level	+20 dBu (8 V)
1/4", unbalanced	
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	0 dBu (0.8 V)
Maximum Output Level	+20 dBu (8 V)
Effect Output	1/4"
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	0 dBu (0.8 V)
Maximum Output Level	+20 dBu (8 V)
Foldback Output	1/4"
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	0 dBu (0.8 V)
Maximum Output Level	+20 dBu (8 V)
Headphone Output	
Load Impedance	8 ohms, stereophones
Maximum Output Level	1.5 W + 1.5 W
Insertion	1/4"
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	-10 dBV (0.3 V)
Maximum Output Level	+18 dBV (8 V)
Input Impedance	5.2k ohms
Nominal Input Level	-10 dBV (0.3 V)
Maximum Input Level	+18 dBV (8 V)
Equalizer	
Type	Shelving-High, Low Sweepable-Mid
Frequency	10 kHz (High) 250 – 5kHz (Mid) 100 Hz (Low)
Boost/Cut	±12 dB (High, Low) ±15 dB (Mid)
Peak Indicator Level	10 dB above nominal
Power Requirements	
U.S.A./CANADA	120 V AC, 60 Hz, 27 W
Europe	220 V AC, 50 Hz, 27 W
U.K./Australia	240 V AC, 50 Hz, 27 W
General Export	100/120/220/240 V AC, 50/60 Hz, 27 W

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PERFORMANCE CHARACTERISTICS

Equivalent Input Noise	UNWTD (20 – 20 kHz)/ IHF A WTD
150 ohm source	-128 dB/-130 dB
Signal-to-Noise Ratio	
Input – Output	UNWTD (20 – 20 kHz)/ IHF A WTD
8 Mic – PGM	60 dB/62 dB
1 Line – PGM	81 dB/83 dB
8 Line – PGM	72 dB/74 dB
1 Line – Effect/Foldback	80 dB/82 dB
1 Line – Stereo	80 dB/81 dB
1 Tape – PGM	83 dB/84 dB
Total Harmonic Distortion (THD)	
1 Mic to 1 PGM Output[1, 3]	0.03 %, 20 Hz – 20 kHz
1 Line to 1 PGM Output[2, 3]	0.025 %, 20 Hz – 20 kHz
Intermodulation Distortion (IMD)	
1 Mic to 1 PGM Output[1, 3]	0.06 %, SMPTE
1 Line to 1 PGM Output[2, 3]	0.045 %, SMPTE
Frequency Response	
Any Input to Any Output	20 Hz – 25 kHz $^{+1\ dB}_{-2\ dB}$ nominal level
Cross-Talk (1 kHz)	Better than 60 dB
Dimensions (W x H x D)	442 x 132 x 425 mm (17-3/8" x 5-3/16" x 16-3/4")
Weight	8.5 kg (18-12/16 lbs.) net

1) Level for measurement – 50 dB above nominal with Pad engaged; EQ off.
2) Nominal input level used for measurement; EQ off.
3) 30 kHz Low Pass Filter connected during test.

In these specifications: 0 dBV is referenced to 1.0 Volt; 0 dBu is referenced to 0.775 Volt. Actual voltage levels are also given in parenthesis (0.316 Volt for -10 dBV is rounded of and given as 0.3 Volt, and 0.775 Volt for 0 dBu as 0.8 Volt).
Changes in specifications and features may be made without notice or obligation.

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M-216

ELECTRICAL CHARACTERISTICS

Mic Input	XLR Type, balanced
Source Impedance	200 ohms to 600 ohms nominal
Input Impedance	2.8k ohms
Nominal Input Level	-60 dBV (1 mV)
Minimum Input Level	-70 dBV (0.3 mV)
Maximum Input Level	+28 dBV (25 V)/TRIM to min., PAD on
Line Input	1/4", unbalanced
Input Impedance	22k ohms
Nominal Input Level	-10 dBV (0.3 V)/PAD on
Minimum Input Level	-50 dBV (3 mV)/PAD off
Maximum Input Level	+35 dBV (56 V)/TRIM to min., PAD on
Mic/Line Pad	30 dB attenaution
Channel Overload Indicator	Set to light at 25 dB above nominal
Tape Input	RCA Type
Input Impedance	10k ohms
Nominal Input Level	-10 dBV (0.3 V)
Maximum Input Level	+18 dBV (8 V)
Effect Return Input	1/4"
Input Impedance	4.3k ohms
Nominal Input Level	0 dBu (0.8 V)
Minimum Input Level	-10 dBu (0.25 V)
Sub Input (STEREO)	RCA Type
Input Impedance	22k ohms
Nominal Input Level	-10 dBV (0.3 V)
Maximum Input Level	+18 dBV (8 V)
PGM Output	
XLR Type, unbalanced	
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	0 dBu (0.8 V)
Maximum Output Level	+20 dBu (8 V)
RCA, unbalanced	
Output Impedance	490 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	-10 dBV (0.3 V)
Maximum Output Level	+10 dBV (3 V)
Stereo Output	
XLR Type, unbalanced	
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	0 dBu (0.8 V)
Maximum Output Level	+20 dBu (8 V)
1/4", unbalanced	
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	0 dBu (0.8 V)
Maximum Output Level	+20 dBu (8 V)
Effect Output	1/4"
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	0 dBu (0.8 V)
Maximum Output Level	+20 dBu (8 V)
Foldback Output	1/4"
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	0 dBu (0.8 V)
Maximum Output Level	+20 dBu (8 V)
Headphone Output	
Load Impedance	8 ohms, stereophones
Maximum Output Level	1.5 W + 1.5 W
Insertion	1/4"
Output Impedance	100 ohms
Minimum Load Impedance	2k ohms
Nominal Load Impedance	10k ohms
Nominal Output Level	-10 dBV (0.3 V)
Maximum Output Level	+18 dBV (8 V)
Input Impedance	5.2k ohms
Nominal Input Level	-10 dBV (0.3 V)
Maximum Input Level	+18 dBV (8 V)
Equalizer	
Type	Shelving-High, Low Sweepable-Mid
Frequency	10 kHz (High) 250 – 5 kHz (Mid) 100 Hz (Low)
Boost/Cut	±12 dB (High, Low) ±15 dB (Mid)
Peak Indicator Level	10 dB above nominal
Power Requirements	
U.S.A./CANADA	120 V AC, 60 Hz, 33 W
Europe	220 V AC, 50 Hz, 33 W
U.K./Australia	240 V AC, 50 Hz, 33 W
General Export	100/120/220/240 V AC, 50/60 Hz, 33 W

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PERFORMANCE CHARACTERISTICS

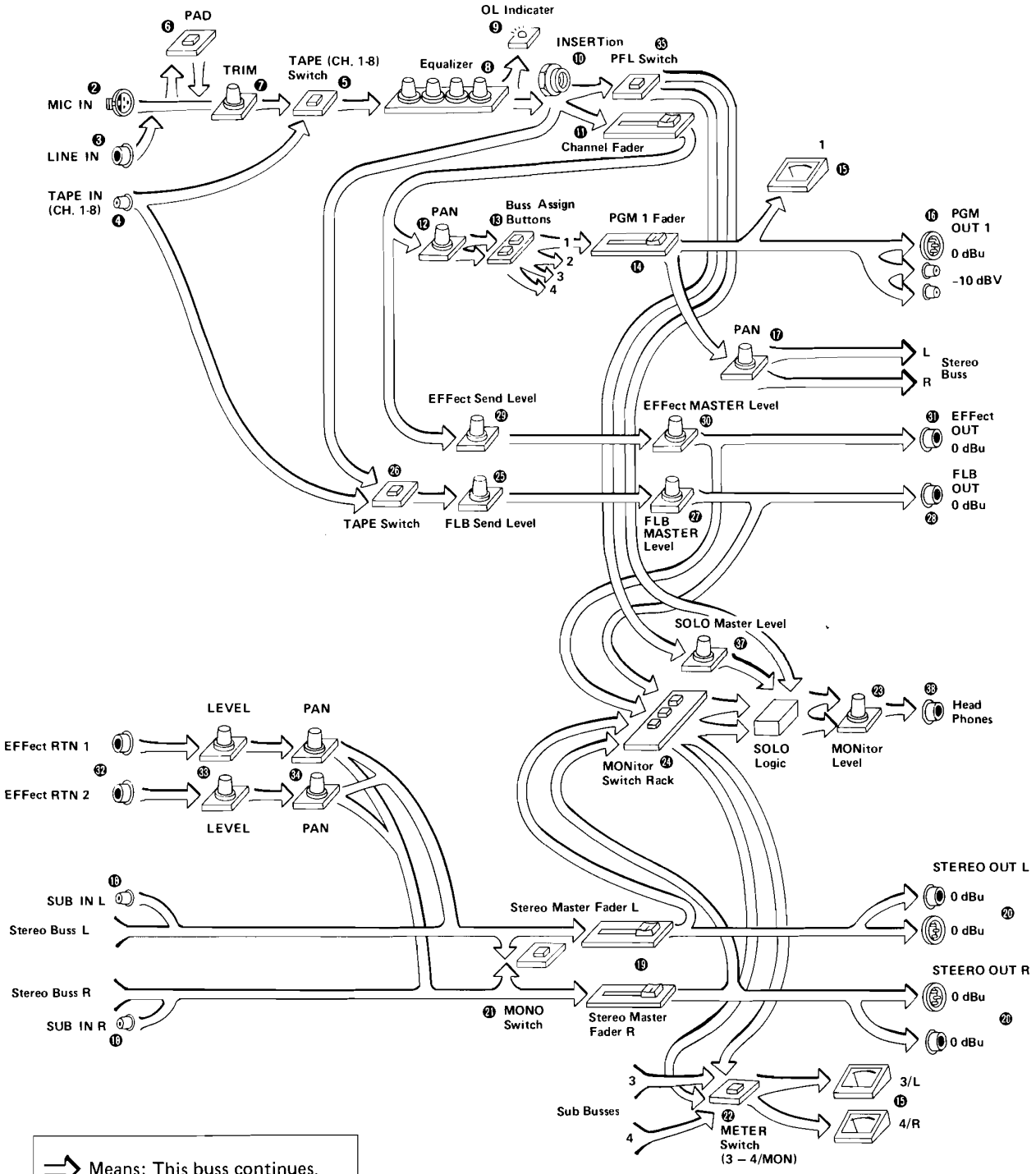
Equivalent Input Noise	UNWTD (20 – 20 KHz)/ IHF A WTD
150 ohm source	-128 dB/-130 dB
Signal-to-Noise Ratio	
Input – Output	UNWTD (20 – 20 kHz)/ IHF A WTD
16 Mic – PGM	57 dB/58 dB
1 Line – PGM	81 dB/83 dB
16 Line – PGM	67 dB/69 dB
1 Line – Effect/Foldback	78 dB/80 dB
1 Line – Stereo	80 dB/81 dB
1 Tape – PGM	83 dB/84 dB
Total Harmonic Distortion (THD)	
1 Mic to 1 PGM Output[1, 3]	0.03 %, 20 Hz – 20 kHz
1 Line to 1 PGM Output[2, 3]	0.025 %, 20 Hz – 20 kHz
Intermodulation Distortion (IMD)	
1 Mic to 1 PGMOutput[1, 3]	0.06 % SMPTE
1 Line to 1 PGM Output[2, 3]	0.045 %, SMPTE
Frequency Response	
Any Input to Any Output	20 Hz – 25 kHz $^{+1\ dB}_{-2\ dB}$ nominal level
Cross-Talk (1 kHz)	Better than 60 dB
Dimensions (W x H x D)	650 x 132 x 425 mm (25-9/16" x 5-3/16" x 16-3/4")
Weight	12 kg (26-7/16 lbs.) net

1) Level for measurement – 50 dB above nominal with Pad engaged; EQ off.
2) Nominal input level used for measurement; EQ off.
3) 30 kHz Low Pass Filter connected during test.

In these specifications: 0 dBV is referenced to 1.0 Volt; 0 dBu is referenced to 0.775 Volt. Actual voltage levels are also given in parenthesis (0.316 Volt for -10 dBV is rounded of and given as 0.3 Volt, and 0.775 Volt for 0 dBu as 0.8 Volt).
Changes in specifications and features may be made without notice or obligation.

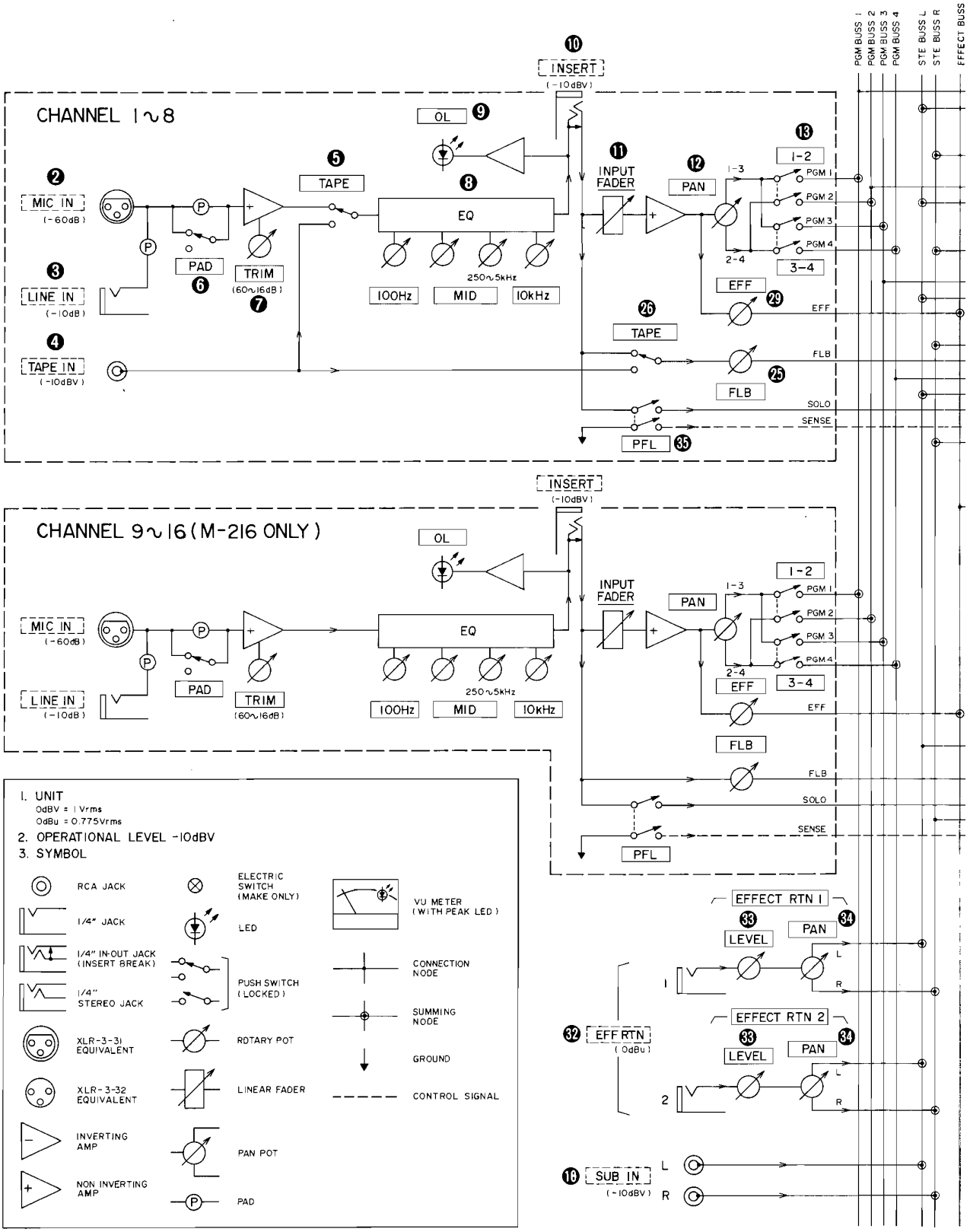
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Pictogram

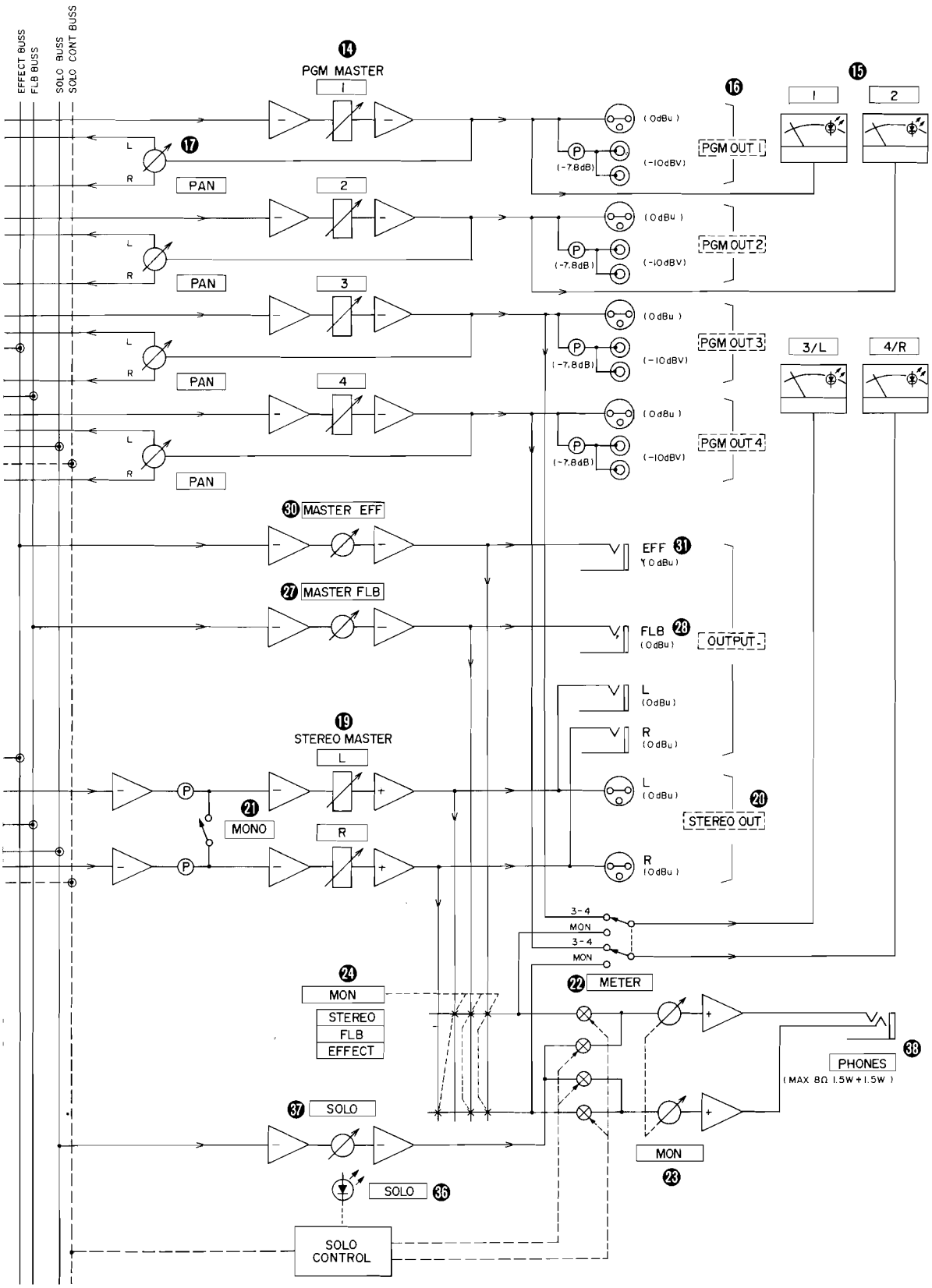


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Block Diagram

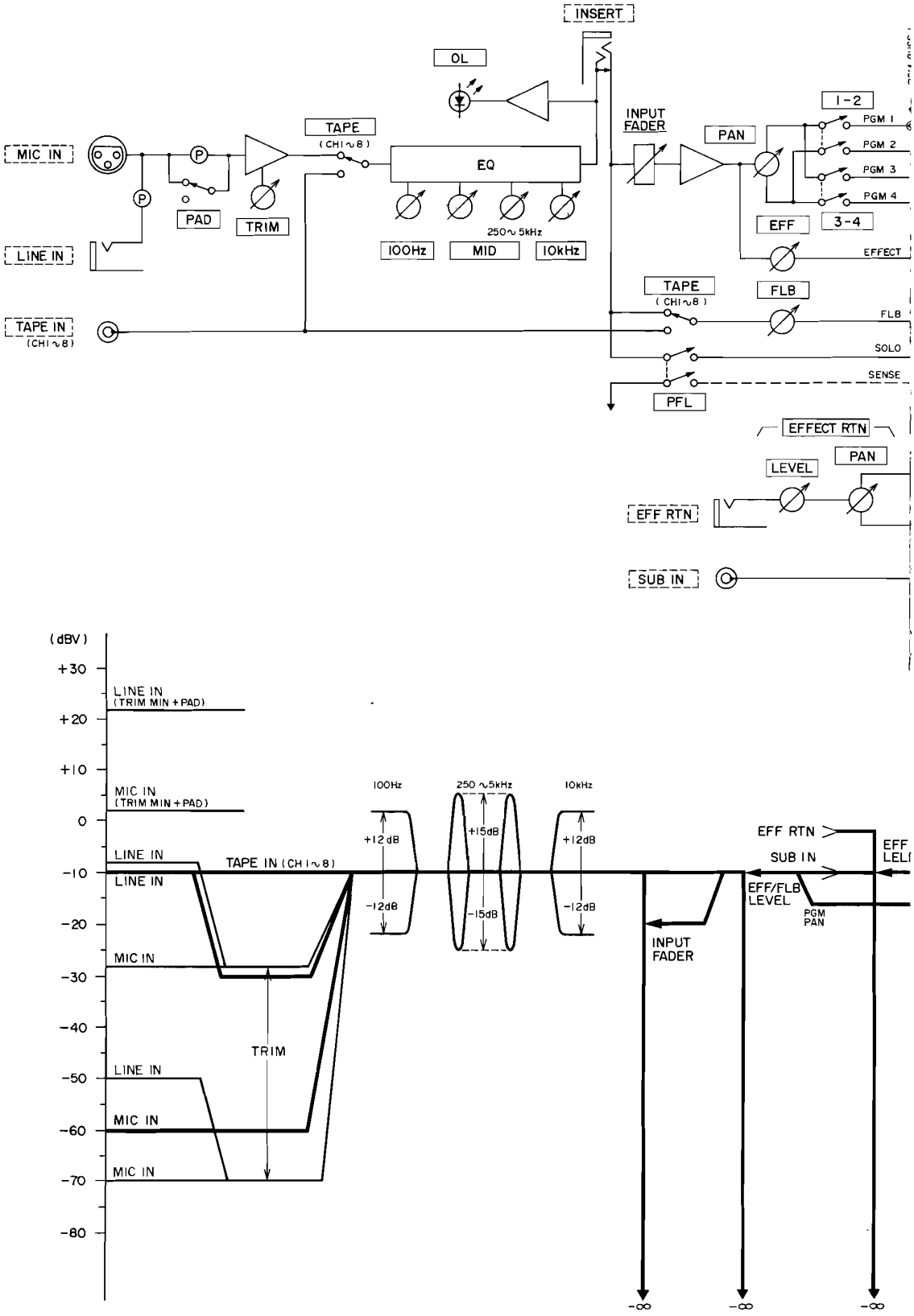


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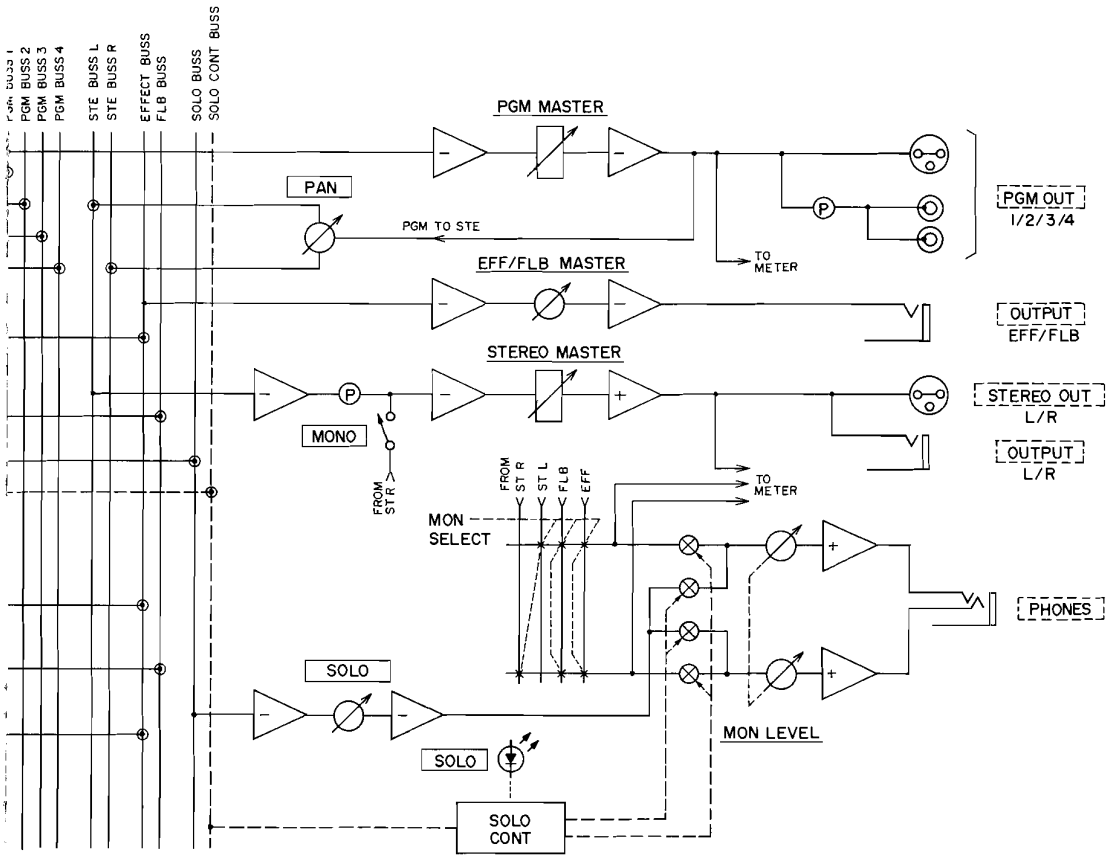


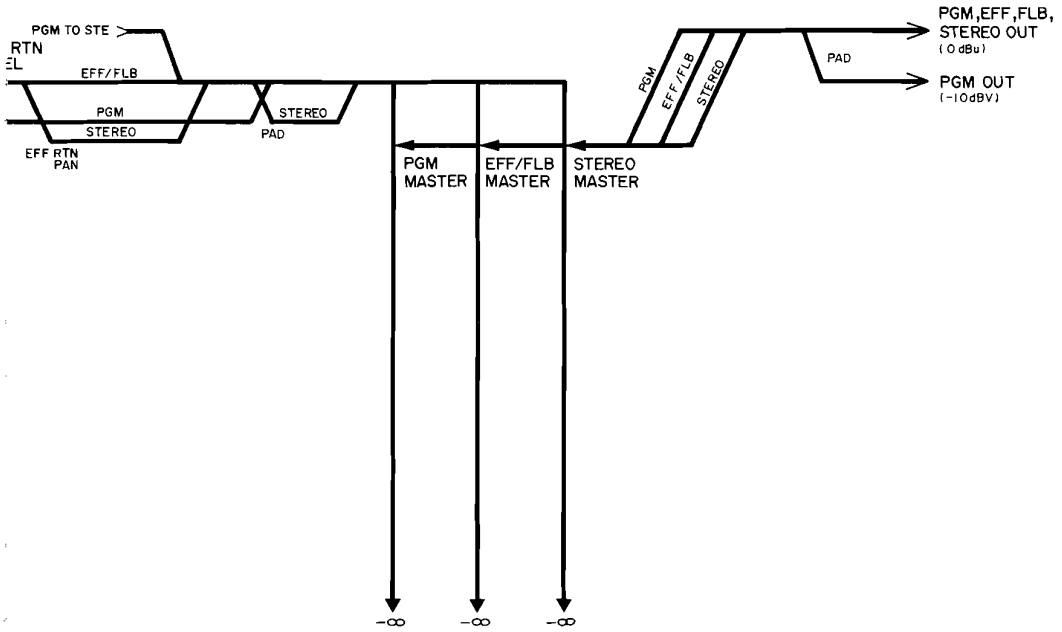
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Level Diagram



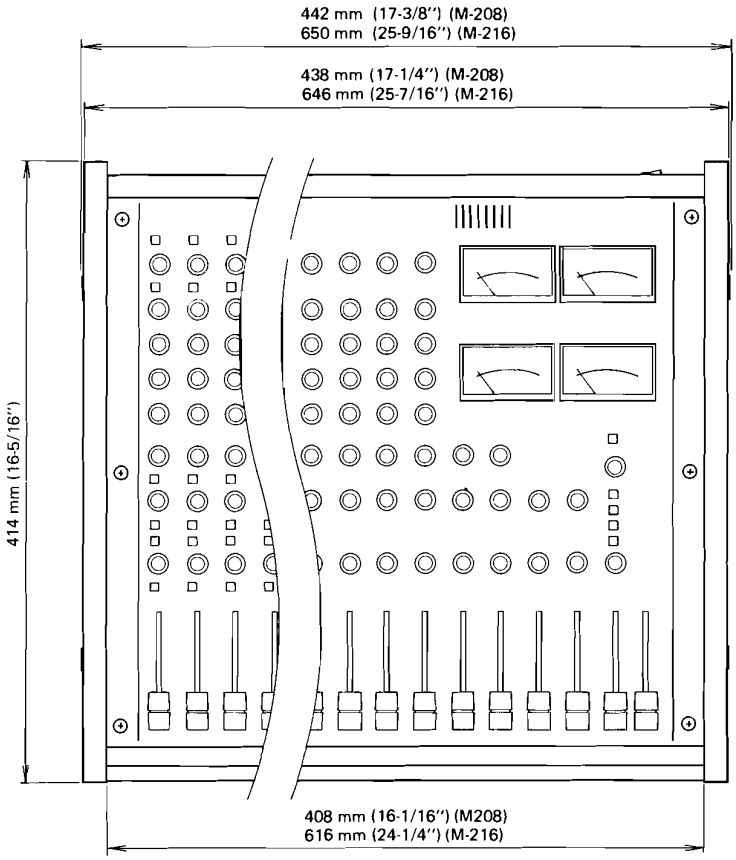
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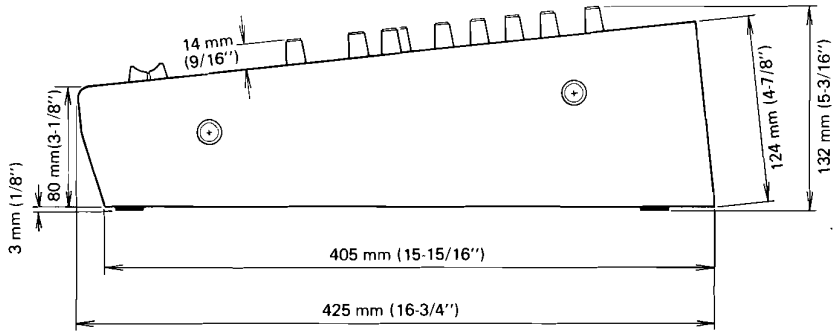




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Dimensions





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TEAC Professional Division

M-200 Series

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