

This symbol 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.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

LIMITED WARRANTY

Your Carvin product is guaranteed against failure for 1 YEAR unless otherwise stated. Carvin will service and supply all parts at no charge to the customer providing the unit is under warranty. Shipping costs are the responsibility of the customer. CARVIN DOES NOT PAY FOR PARTS OR SERVICING OTHER THAN OUR OWN. A COPY OF THE ORIGINAL INVOICE IS REQUIRED TO VERIFY YOUR WARRANTY. Carvin assumes no responsibility for horn drivers or speakers damaged by this unit. This warranty does not cover, and no liability is assumed, for damage due to: natural disasters, accidents, abuse, loss of parts, lack of reasonable care, incorrect use, or failure to follow instructions. This warranty is in lieu of all other warranties, expressed or implied. No representative or person is authorized to represent or assume for Carvin any liability in connection with the sale or servicing of Carvin products. CARVIN SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

When RETURNING merchandise to the factory, you may call for a return authorization number. Describe in writing each problem. If your unit is out of warranty, you will be charged the current FLAT RATE for parts and labor to your unit up to factory specifications.

MAINTAINING YOUR EQUIPMENT

Avoid spilling liquids or allowing any other foreign matter inside the unit. The panel of your unit can be wiped from time to time with a dry or slightly damp cloth in order to remove dust and bring back the new look. As with all pro gear, avoid prolonged use in caustic environments (salt air). When used in such an environment, be sure the mixer is adequately protected by a cover.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL!

IMPORTANT! FOR YOUR PROTECTION, PLEASE READ THE FOLLOWING:

WATER AND MOISTURE: Appliance should not be used near water (near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

POWER SOURCES: The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

GROUNDING OR POLARIZATION: Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.

POWER CORD PROTECTION: Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

SERVICING: The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

FUSING: If your unit is equipped with a fuse receptacle, replace only with the same type fuse. Refer to replacement text on the unit for correct fuse type.

SAFETY INSTRUCTIONS (EUROPEAN)

The conductors in the AC power cord are colored in accordance with the following code. GREEN & YELLOW—Earth BLUE—Neutral BROWN—Live

U.K. MAIN PLUG WARNING: A molded main plug that has been cut off from the cord is unsafe. NEVER UNDER ANY CIRCUMSTANCES SHOULD YOU INSERT A DAMAGED OR CUT MAIN PLUG INTO A POWER SOCKET.



REPLACEMENT PARTS LIST

Table with columns: REF, Carvin P/N, Description, and Part Details. Includes various electronic components like resistors, capacitors, diodes, and transistors.



Congratulations on the purchase of your mixer. Your new Concert Series mixer demonstrates CARVIN's commitment to producing the highest quality and most sophisticated engineering in the audio industry today. The "C" series mixers are designed to be professional mixers for use in live performance sound reinforcement systems. Features include a full function stereo mixer with two nine band graphic equalizers. Exclusive features include grouped phantom power and internal 24 BIT stereo digital effects. The high quality construction will provide years of performance in and out of the studio. Enjoy your new mixer.

OVERVIEW

The MIC/LINE input channels feature Balanced XLR and TRS 1/4" inputs with grouped phantom power for condenser mics. There are 3 bands of EQ with a MID SHIFT and LOW CUT, 2 post fader effect sends, and 2 monitor pre-fader sends on each channel. The master section features two 9 band graphic EQs, master stereo main and monitor mix controls, a mono main control, a complete 16 program effects processor with send and return controls that allow the effects to be heard through the main mix and monitor mix, and stereo external effects returns.

CHANNEL EQ WITH ACTIVE TONE CIRCUITS

The Concert Series incorporates 3 bands of EQ per channel. They offer smooth non interactive tone curves so your adjustments will sound natural and yet be effective. The high (treble) and low (bass) "shelving" type controls cover the complete upper and bottom portions of the audio range. The LOW CUT switch provides instant elimination of unwanted low frequencies below 75 Hz. The MID EQ controls are a "band pass" type which peak at 2.5k Hz or 700 Hz (depending on the MID SHIFT switch) for added presence to your mid range tones. Because CARVIN uses "active" tone circuits, you are able to boost or cut your tones without any signal loss to your sound.

RECEIVING INSPECTION—read before getting started

INSPECT YOUR MIXER FOR ANY DAMAGE which may have occurred during shipping. If any damage is found, please notify the shipping company and CARVIN immediately.

SAVE THE CARTON & ALL PACKING MATERIALS. In the event you have to re-ship your unit, always use the original carton and packing material. This will provide the best possible protection during shipment. CARVIN and the shipping company are not liable for any damage caused by improper packing.

SAVE YOUR INVOICE. It will be required for warranty service if needed in the future.

SHIPMENT SHORTAGE. If you find items missing, they may have been shipped separately. Please allow several days for the rest of your order to arrive before inquiring.

RECORD THE SERIAL NUMBER on the enclosed warranty card or below on this manual for your records. Keep your portion of the card and return the portion with your name and comments to us.

INTERNAL SIGNAL ROUTING

A balanced mic or instrument plugs directly into the high quality XLR Neutrik™ connectors and is then routed into the differential circuits for excellent hum and noise cancellation. As your signal continues within the console, a double-sided printed circuit board (FR-4 fire rated) carefully guards the circuit traces with a copper shield running over the traces. This reduces RF interference and crosstalk substantially. The printed circuit board has plated-through holes which means that every component is soldered securely in three places (on the bottom, in the hole and on top). This offers unsurpassed component security while reducing circuit resistance for pure dynamic sound.

HEADROOM

Headroom is very important when designing a mixer—especially for recording. Lack of headroom will cause your sound to become distorted and muddy. This can happen when you turn the volume too high, the input signal is too hot or excess EQ is added. With most mixers, you have to reduce the input gain to fight headroom problems, but this just increases noise. That's why we have taken great care in the "C" series to make sure that each gain stage is properly designed and balanced for more headroom along the entire audio path.

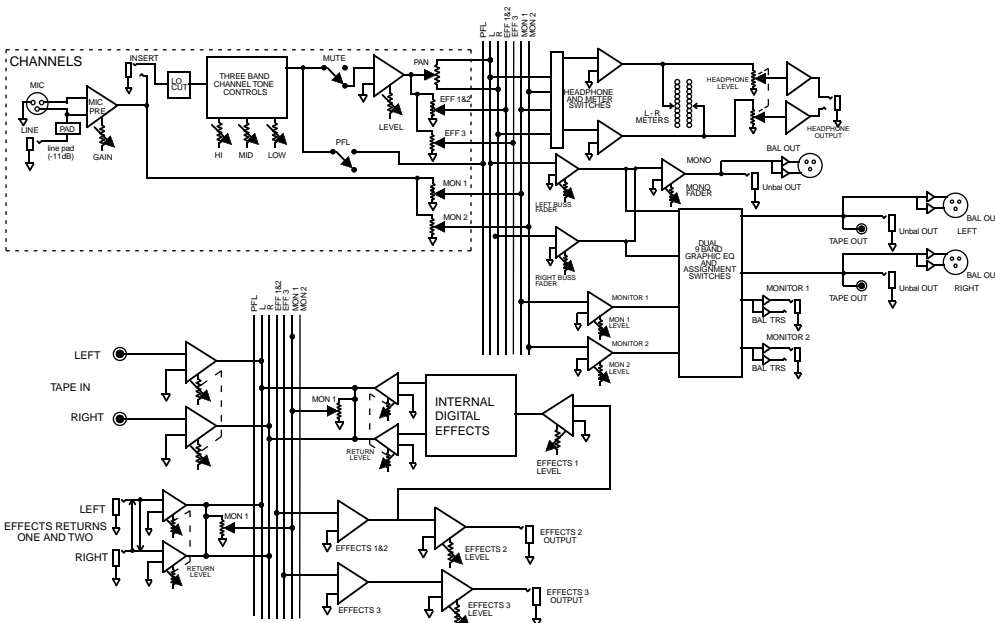
SWITCHING POWER SUPPLY

The Concert Series power supply offers unsurpassed rejection of noise and hum while providing precision voltage for all preamp stages. The internal switching power supply takes the 60 Hz AC line input and immediately converts it to 100kHz well outside of the audio range. The 100kHz AC is sent through a transformer and converted to precision DC voltages. Now you can go anywhere and never worry about inconsistent sound due to fluctuating voltages because your mixer automatically switches internally to use 120 or 240VAC. (120VAC & 240VAC compatible with the proper AC cable) CARVIN has spared no expense to achieve the best possible quality & performance.

For your records, you may wish to record the following information.

Serial No. _____ Invoice Date _____

C1600& C2400 BLOCK DIAGRAM



C1600 & C2400 SPECIFICATIONS:

Frequency Response:	Mic or Line Inputs: 20Hz-20KHz ±1dB
Total Harmonic Distortion:	Less than .01%
Equivalent Input Noise:	150 ohm source: -112dBu
Output Noise:	less than -90dBu Master Line Out (all levels minimum)
Output Headroom:	+28dB XLR bal, +20dB 1/4" unbal
Maximum Gain:	Mic in to Master Line Out: 74dB
Crosstalk:	Adjacent ch's: -60db at 1KHz
Common Mode Rejection:	-80db at 1KHz
Phantom Power:	All XLR Mic in (channel groups of 8)
Channel EQ.:	3 band active, LOW: 80Hz ±15dB MID: 2.5K or 700 Hz±15dB HI: 11.5KHz ±15dB
Graphic EQ.:	9 Band Oct. Intervals ±12dB
Mic Input:	Balanced XLR input
Line Input:	Balanced 1/4" Phone Jack
Power Consumption:	C1600: 30VA, C2400: 40VA
Size:	C1600: 14"D x 23"W x 3.1"H C2400: 14"D x 30"W x 3.1"H



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www.carvin.com

C1600 & C2400

QUICK START UP

If you're like most new owners, you're probably in a hurry to plug your mixer in and use it. Here are some brief instructions to get you going quickly. With the mixer unplugged and the unit turned off, complete the following procedures:

1. CONNECTING AC POWER TO YOUR MIXER

- The mixer can be used with 120 or 230VAC (it automatically switches internally)
- Use only a grounded (3 prong) power outlet to prevent a shock hazard. This gives the quietest grounding for your mixer.

2. CONNECTING INPUTS TO YOUR MIXER

- For low level balanced devices such as microphones, plug into the balanced **MIC** inputs using a shielded microphone cable with XLR ends.

- For high level unbalanced devices such as instruments & Keyboards, plug into the **LINE** input jacks using a shielded cable with 1/4" phone plugs. Adjust the **GAIN** knob for the mic or line input being used.

3. TURNING YOUR MIXER ON

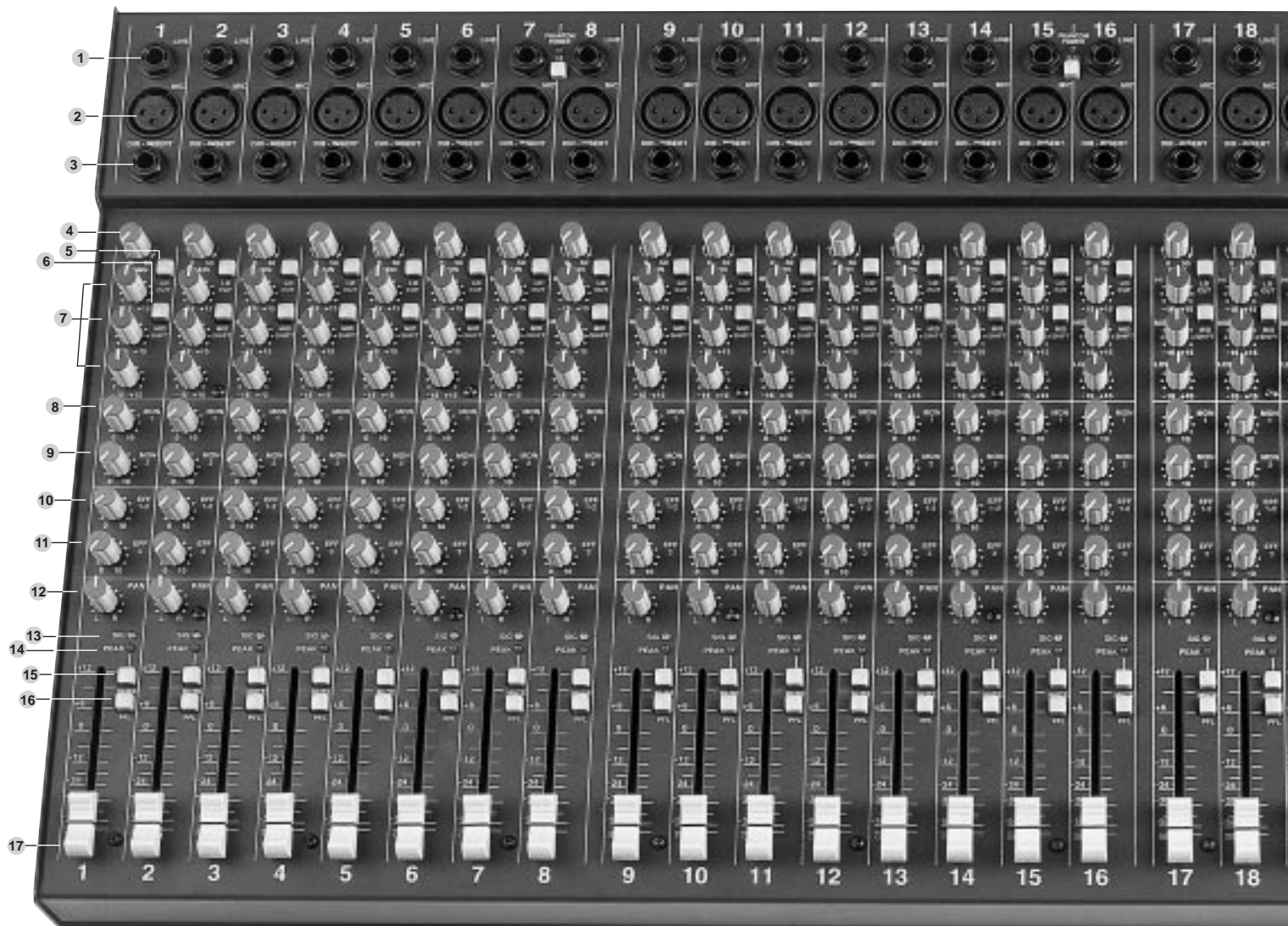
- Adjust all channel **FADERS** and master **LEVEL** controls to their **OFF** positions
- Adjust all channel's **HI**, **MID**, and **BASS** controls and the two master 9 Band Graphic EQ's to their **center** position.
- Adjust all the Channel "**PAN**" controls to their **center** position.
- Turn the mixer on by the rear panel **POWER SWITCH** and watch for the **POWER LED** to come on. Your mixer is now ready to operate.

6. MID SHIFT SWITCH

An exclusive feature giving you two different midrange center frequencies. This is ideal for vocals and/or instruments. The **MID** tone switch on each channel is easier to use than conventional sweep controls because they allow you to compare for the best vocal or instrument sound by switching between the two MID frequencies.

7. ACTIVE 3 BAND TONE CONTROLS

The C series mixers provide studio quality tone controls with distortion less than .009%—exceptionally clean for recording & live sound. The ± 15 dB boost or cut give an overall 30 dB range for powerful EQ control. The active circuits deliver deep bass from the 20-80 Hz **LOW** control. The **MID** control works in the 2.5k Hz range or the 700 Hz range depending on the MID SHIFT switch. The **HI** control functions at 11-20k for crisper highs. Start out with all tone controls at their



C1600 & C2400 CONTROLS

CHANNEL FEATURES

1. 1/4" LINE IN

The line connectors are for connecting balanced and unbalanced instruments, mics, and line level sources such as drum machines or keyboards.

2. **XLR MIC IN** The balanced Mic inputs are for connecting microphones that use XLR connections.

3. CHANNEL INSERT/CHANNEL DIRECT

For inserting channel effects, compressor, ETC. Or, as a direct output for multi-track recording. For a direct out use a 1/4" TRS (Tip Ring Sleeve) phone jack. To achieve a direct out from the channel insert to the first "click" (1/2 insert).

4. GAIN CONTROL

Adjusts the **GAIN** when connecting various instruments & mics. The type of mic (uni-directional, omnidirectional, etc) and model will require **GAIN** settings for each individual mic. Monitor the **GAIN** level with the PEAK LEDs. If an LED is constantly illuminated decrease the amount of **GAIN**. Too much **GAIN** may cause distortion. If distortion is present, decrease the amount of **GAIN** until the distortion is eliminated.

5. LOW CUT SWITCH

75 Hz low cut filter helps eliminate unwanted low frequencies from any particular channel. Great for reducing "boom" noise from mic stands or from acoustic/electric guitars. This filter can also help punch up the bass by turning up the **LOW** tone control while using the **LOW CUT** switch.

center zero position. Determine which position your MID SHIFT sounds best at, then cut or boost your **HI**, **MID** and **LOW** frequencies for each as needed. If you are trying to mic instruments such as acoustic guitar or drums, try various mics and mic placement before adjusting your tone controls (condenser mics work well for these applications). Cutting and boosting frequencies improperly can cause an "un-natural" sound to your vocals or instruments. Your goal is to achieve a natural sound for your entire performance or recording.

8. & 9. MONITOR 1 AND 2 CONTROLS

Separate MONITOR level controls for each channel allows you to create two independent monitor mixes. The MONITOR signals are routed to the master MON 1 & 2 faders respectively before going to the MONITOR output connectors. The mix you create with the MON 1 & 2 controls can also be heard

through your headphones. (see 24.)

10. EFFECTS 1 & 2

This control adjusts the level a signal being sent from each channel, one to the internal digital effects processor (**EFFECTS 1**), and one to the **EFFECTS 2** output jack via the **EFFECTS 2** master send control to drive an outboard processor. The internal **EFFECTS 1** are ready to use and do not require additional cable connections to achieve their full stereo imaging.

11. **EFFECTS 3** A third send routes a signal from each channel's **EFFECTS 3** control to the **EFFECTS 3** master send control.

12. STEREO PANNING

Each channel's **PAN** control allows sweeping stereo effects when panning from L to R for recordings or live sound. Superior channel separation is available over other mixers

won't lose the settings on your faders.

16. CHANNEL PFL SWITCH

This switch allows the operator to monitor a channel in the headphone mix to set tone and gain levels.

17. AUDIO TAPER FADERS

Slide all faders down when connecting your inputs. Increase each channel's fader to achieve the overall mix. Calibrated 60mm faders with audio taper are featured for smooth fade-outs.

MASTER SECTION

18. INTERNAL STEREO DIGITAL EFFECTS

The **MASTER EFFECTS SEND 1** control takes the effects send from the channels and sends it to the internal digital effects system. The **EFFECTS PEAK LED** helps to set the proper level and prevents overloading the internal digital effects

onboard EQ (HT760M) or use the EQ 1 & 2 switch (see 29.)

20. EFFECTS SEND 2 & 3

Two more sends for outboard effects processors. Each send feeds their respective effects output jack (EFF 2 AND EFF 3).

21. MASTER RETURN EFFECTS 2 & 3

Return up to 4 mono or 2 stereo effects from 2 stereo controls. You can also send effects to your MON 1 speakers.

22. MASTER LEFT & RIGHT FADERS

These faders send the main stereo mix created by all channel faders to the main balanced and unbalanced output connectors. The left and right signals will be identical if you do not pan your individual channels left or right to create a stereo image.

23. MASTER MONO FADER

The C series creates an extra mono signal from the R & L master faders to be used for a mono house PA or subwoofer.

24. HEADPHONE AND METER SOURCE

The **PHONES** control sets the desired level of the **PHONES** jack. The **PFL**, **L/R**, **MONO** and **MONITOR 1 & 2** switches allow for isolation of these events through the headphones.

25. PFL RED LED

Indicates that the headphone & meters are monitoring the channels where the **PFL** is switched on.

26. TAPE IN RETURN LEVEL

Controls the return levels of the L & R tape (CD) into the mixer

27. R/L LED VU METERS

This group of LEDs are ten segment 6 dB resolution meters that give the operator a visual of the mixer output.

28. DUAL PRECISION 9 BAND GRAPHIC EQs

are octave filters at 60, 125, 250, 500, 1k, 2k, 4k, 8k & 16k Hz centers that offer precise adjustment to help eliminate feedback & enhance tone of the main or monitor mix.

29. EQ SWITCH 1 & 2

These switches swap the EQ's from the standard LEFT, RIGHT main outputs (OUT) to the MON 1 & MON 2 outputs (IN) respectively. This allows the equalizers to be used with monitor amps and eliminates the need for outboard monitor equalizers.

30. POWER LED

Verifies the mixer is on.

31. RETURN 2 L/R CONNECTORS

Returns a stereo signal from an external effects processor. Connect the output of an external effect to these points.

32. RETURN 3 L/R CONNECTORS

Returns a stereo signal from an external effect. Connect your effects processors' stereo outputs to these stereo returns.

33. EFFECTS 2 & 3 CONNECTORS

1/4" output connectors drive external effects. Connect your effects processor's inputs to these outputs.

34. MONITOR 1 & 2 CONNECTORS

The Concert Series provides balanced 1/4" outputs for long cable runs. Connect your monitor power amp(s) to these outputs.

35. HEADPHONE JACK

1/4" stereo jack for headphone or control room output.

36. RCA R & L TAPE OUT

Stereo RCA jacks for connecting a tape recorder.

37. RCA R & L TAPE IN

For stereo playback of a tape/CD or use as a 4th stereo return.

38.-39. LEFT /RIGHT XLR & 1/4" CONNECTORS

This set of balanced and unbalanced connectors are for connect main mix to external power amp(s).

40.-41. MONO XLR & 1/4" CONNECTORS

A set of balanced and unbalanced mono outputs for PA or Subwoofer (requires subwoofer crossover & power amp).

42. MIC PHANTOM POWER SWITCH / RED LED

This switch provides phantom power for condenser mics in groups of 8 channels. This allows other channel groups to remain non-powered to use the LINE inputs for instruments and MIC inputs for mics that don't require phantom power.



because of the "dual element" pan controls providing 15dB greater separation.

13. CHANNEL SIGNAL GREEN LED

The signal indicator is pre-fader and post EQ. This LED verifies that the channel is receiving a signal from the mic or instrument inputs.

14. CHANNEL PEAK RED LED

This peak indicator is pre-fader and post EQ. A constantly lit LED indicates the signal is probably needs a reduction in GAIN to prevent input overloading.

15. CHANNEL MUTE SWITCH

Mutes a channel instantly without touching your faders. This is extremely useful when you need to mute channels. You

system. **RETURN 1** sets the effects level going to the LEFT/RIGHT mix **MONITOR 1** is an exclusive feature allowing you to send the internal digital effects to your MONITOR 1 speakers. Select from sixteen premium effects: four REVERBS—two rooms, plate & stadium, six ECHOES/REVERBS—50ms to 500ms, four sweeping CHORUS/REVERBS and two FLANGING/REVERBS—all in true STEREO!

19. MASTER MONITOR 1 & 2 FADERS

Large 60mm faders control the master output level of the monitors. Since the MONITORS are not affected by the channel's tone controls (pre-channel EQ and pre-channel insert) you are free to EQ your monitor signals externally to control stage feedback. You may use an external equalizer (Carvin's EQ2015 or EQ2030), a monitor amp with an

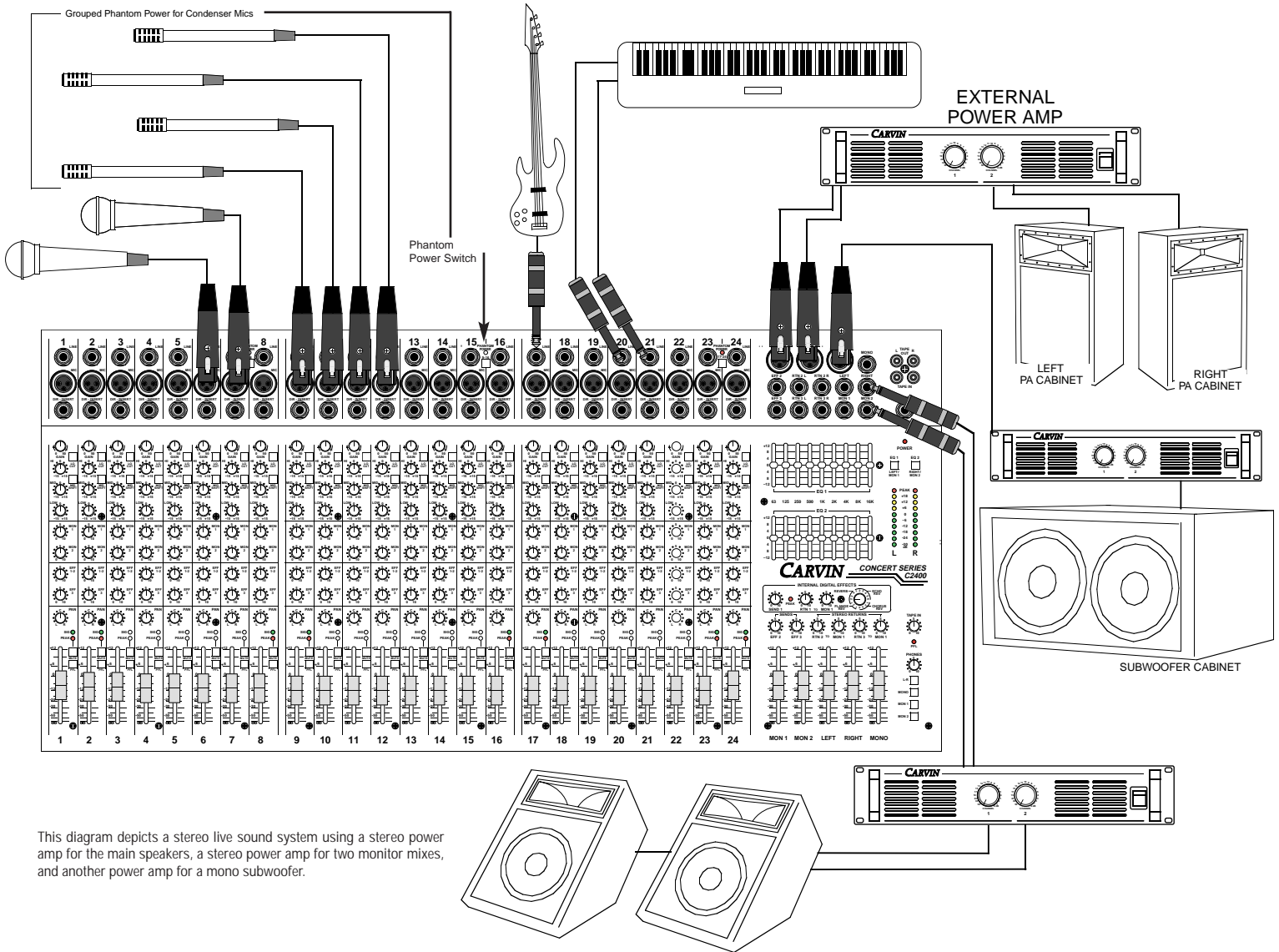
STEREO LIVE SOUND SYSTEM

In a live sound reinforcement or a public address system (P.A. System), the input signals to the mixer will come from the microphones and instruments on the stage. Each microphone or instrument to be amplified by the P.A. system must be connected to one of the mixing console inputs. It is preferred to have as many of the stage instruments as possible plugged into the mixer. This allows for the best overall sound control of the instruments as they are mixed together and then amplified by the P.A. system. The mixer can be operated on the stage or from a remote location in front of the stage using a snake cable to bring the signals from the stage to the mixer. The advantage of the remote operation allows the performance to be monitored and mixed from the audience's perspective.

THE SOUND CHECK

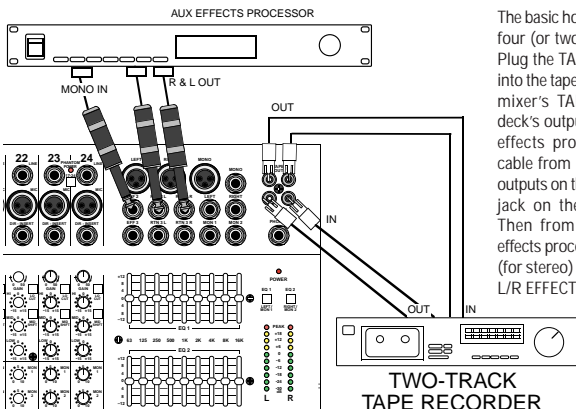
The sound check takes some skill, but mostly patience from the performers and especially you the system operator. If you get frustrated during the sound check, the performers can lose confidence and the sound may suffer due to things missed in the sound check. The basic sound check follows this format: First

test all microphones and other input devices (direct boxes, etc.) before the performers are included in the sound check. A good thing to also check here is feedback in the monitors from the microphones. Good positioning of the monitors and the use of a graphic equalizer solves most major monitor feedback problems. Now for a sound check with the performers. First set the level of each performer individually and in cases where a performer has multiple microphones, such as with drummers, set each drum mic individually then the drum set as a whole. This is also a good time to make some channel tone control adjustments to tailor the sound of the individual performers and instruments. After setting each individual, have the performers run through a song. Don't hesitate to stop the performers if something needs to be adjusted or a performer or microphone needs to be heard solo again. Remember the sound check is not a rehearsal, but a system check. It is always a good idea for the mixer operator to have a microphone to inform the performers of what is needed during the sound check. If a monitor system is being used, the mixer operator's microphone should only be heard through the monitors when addressing the on stage performers, especially if something needs to be checked during the show. If



This diagram depicts a stereo live sound system using a stereo power amp for the main speakers, a stereo power amp for two monitor mixes, and another power amp for a mono subwoofer.

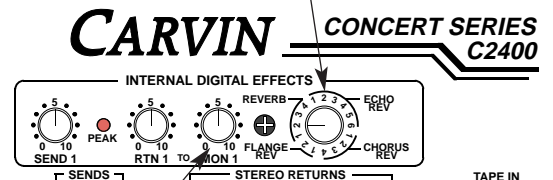
TAPE DECKS AND EXTERNAL EFFECTS



The basic hook up is simple, using four (or two stereo) RCA cables. Plug the TAPE OUT on the mixer into the tape deck's inputs and the mixer's TAPE IN's to the tape deck's outputs. With an external effects processor, plug a 1/4" cable from one of the EFF SEND outputs on the mixer into the input jack on the effects processor. Then from the outputs of the effects processor, plug one or two (for stereo) cables into one of the L/R EFFECTS RETURN.

DSP EFFECTS

Select from Reverb, Flange, Chorus, and Echo. Echo includes delay times of 50, 100, 150, 250, 350, and 500 milliseconds with background reverb.

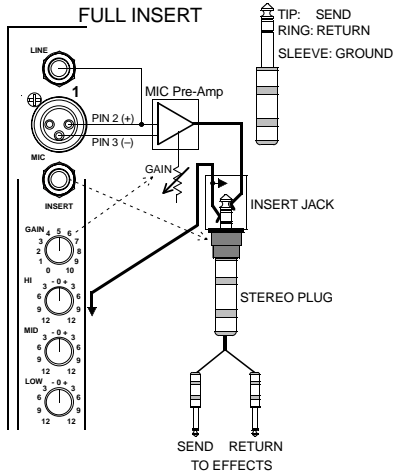


Put the effects on your on stage monitor mix. Ideal for vocalists to hear the vocal effects on stage.

INSERTS AND DIRECT OUTS

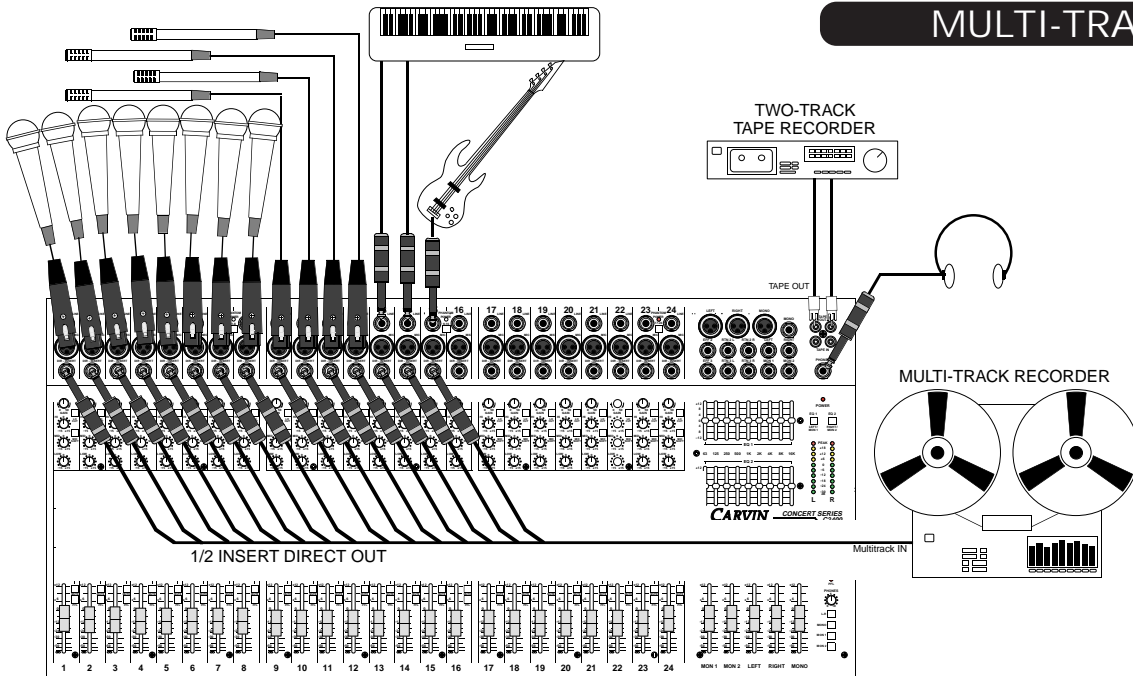
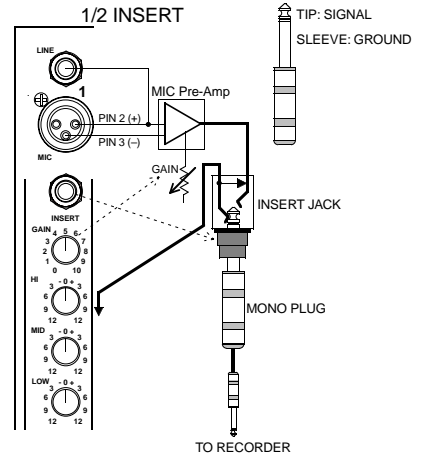
FULL INSERT

The insert jack is a Tip Ring Sleeve (TRS) 1/4" phone jack, where the tip is the send, the ring is the return and the sleeve is ground. When used as an insert point or in full insert mode, the channel is opened up to allow an external piece of equipment to be inserted into the channel's signal path. The channel signal coming from the microphone preamplifier will be forced to go through the external equipment before it can continue back through the channel re-entering before the channel tone controls. Most external equipment is not set up for the TRS plug directly so an adapter cable is required. The adapter cable will have on one end the TRS plug and two mono plugs either male or female, on the other end. The two plugs each have the ground connected to the sleeve, one has the return on its tip and the other has the send on its tip. This allows the send to be connected to the input of the external equipment and the return to its output completing the insert loop back to the channel.



HALF INSERT DIRECT OUT

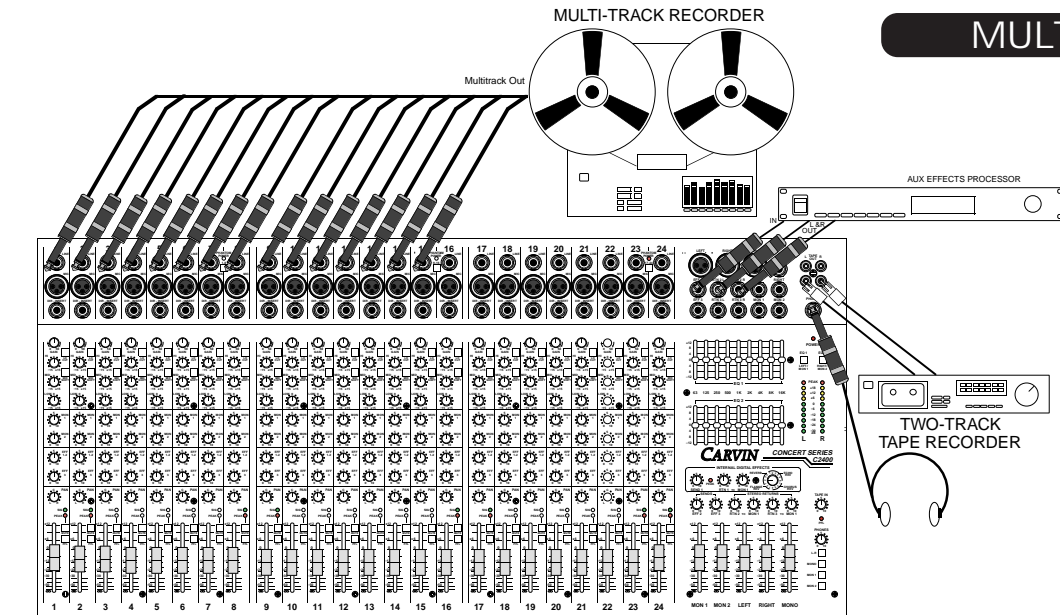
The half insert connection creates a send signal without breaking the channel's signal path. The insert in this mode is no longer used as an insert but it becomes what is called an "insert direct out". An insert direct out functions as a normal direct out but the plug has to be half inserted. If an insert is needed on the same channel, special cabling is required to perform both functions. The half insertion connects the tip of the plug being inserted to the ring of the jack. See the fig. If the jack is fully inserted to where the tip of the plug connects to the tip of the jack, the internal jack switch will open and the channel's signal path will be broken. The connection will still function as a direct out but the channel's signal will stop at the insert and not continue on to the rest of the channel and the masters. The result of the half insert is multiple outputs for use in multi-track recording.



MULTI-TRACK RECORDING

Although the Concert Series 16 & 24 channel mixers may be primarily used for live applications, the quality of these boards are also designed for use in multi-track recording. All channels are designed to meet the needs of cutting edge digital technologies. The C1600 & C2400 can handle 16 or 24 track recordings respectively. By combining this set up with a live system, you can record a performance and mix down to a two track recorder later.

Recording a live performance direct to two track (typically done by connecting a DAT or cassette recorder to the RCA TAPE OUT connectors) can also be done instead of a recording with a multi-track.



MULTI-TRACK MIXDOWN

Follow this set up for mixing down to a two track recorder. Connect the Multi-track recorders' outputs to the line inputs of the channels. Use the headphones or connect a professional power amplifier (Carvin's DCM and HT power amps) and high quality studio monitors to your main LEFT & RIGHT outputs to monitor your mixdown sessions. Mixing is a practiced skill. A trained ear will know when to EQ, add effects, compress, gate, and when not to. Listen to your favorite CD through the same headphones or monitoring system you plan to mix through. Note each instrument's level and position in the stereo mix. Use this as a guide to help mix your project. Mixing down to a digital format such as DAT or to an analog reel to reel will yield different results. Digital recorders are meant to accurately represent the original sound source, therefore you should get exactly what you heard while mixing.