Live Sound Mixers

C3248

C2448

C1648
C1648P

C1648P • C1648 • C2448 • C3248 4-BUS MIXERS BROCHURE/ USER GUIDE

CARVIN

Overview

CARVIN has been serving the music community since 1946. From touring professionals to bands at local clubs, the heart of every system has been our consoles. Noted musicians such as Frank Zappa, Steve Vai & Craig Chaquico, have used Carvin consoles over the years.

Whether you are a rental company, touring band, recording artist, nightclub, house of worship, school or theater, Carvin has the features and performance you can rely on night after night.

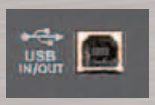
Improving Your Live Sound

Your decision to own a C Series mixer will not only be for its ease of use, but also for its incredible sonic capabilities. Your audience will quickly notice how everything just sounds better with clear highs, natural mid tones and a bass that's deep and punchy. Musicians on the stage will appreciate the clarity they'll get from their monitors. With THD less than .01%, every sound will remain pure to its source.

Simplicity In Operation

Ease of operation is incredibly important. The C Series consoles are designed with the operator in mind. Everything is logically arranged. Simply plug-in the channels, adjust the monitor levels and bring up the main L/R faders and you're up and running. If you need EQ (tone changes), simply dial in the sound you want. The C Series is designed on a small-scale platform making it easy to transport. No other console offers more channels per linear inch.

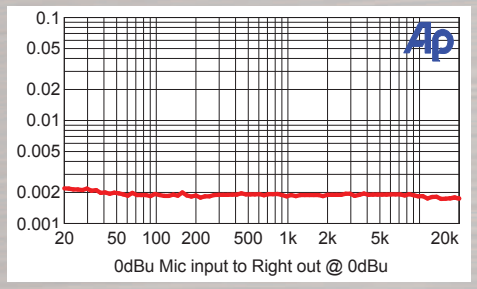
USB Recording



The USB connectivity allows for ease of recording using a single cable to record your L/R stereo mix direct to your computer. The digital interface gives you the highest quality audio output for recording. Inversely, you can send audio from your computer into the console via USB. Set-up playlists on your computer for hours of automated playback through your sound system.

Stringent Testing

Our Quality Control Department personally inspects every mixing console. After the physical inspection, the most critical and most important part of QC testing is running every channel, master section and connector through Audio Precision™ computers to verify every function. This means everything meets 100% of its specifications. This is great assurance that every EQ section, every output delivers the highest voltages with the lowest possible THD. The below chart shows that the THD is actually .002% which is about 5 times lower than our stated THD of .01%.

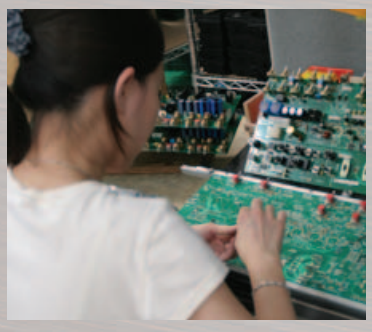


Construction

The engineering and design is what you'd expect from Carvin's high-end manufacturing. Ultra low-noise, high slew rate IC's for exceptional sound. Sealed controls and switches guard against the elements while the "SMT" Surface Mount Technology construction ensures the integrity of each component. The rugged chassis incorporates the integral SwitchMode™ 90V-260V 50-60 Hz power supply.

Made in the USA Matters

With most companies turning to off-shore manufacturers, Carvin has made the commitment to make mixing consoles in the USA. We feel it's so important that you not only receive the very best workmanship, raw materials but the highest standards in quality control. Not only do we strive for perfection by making everything in San Diego at our 80,000 square foot factory, but we're committed to saving jobs in America.



Carvin's San Diego Factory

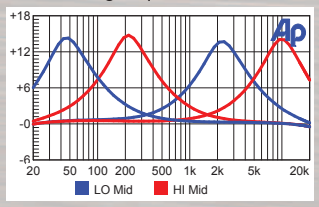
Key Features

CHANNEL
- 16, 24 and 32 ch models
- 4 Buses + L/R
- 4 Band EQ w dual Mid sweeps
- High pass filter
- 6 Ch Monitor Sends
- 2 Ch Effects Sends
- Ch mute/Peak indicator
- Adjustable Gain attenuator

MASTER
- 4 Sub Groups + L/R
- Center/Sub output
- 4 Buses Compressors
- "Link" switches for compressors
- 2 processors – 256 effects each
- Effects to monitors
- 2 9 band L/R-Moinitor EQ's
- 2 USB power ports
- USB L/R recording output
- USB L/R PC input
- Rear slots for wireless options (up to 4 mics or beltpacks)
- SwitchMode™ 90-260 VAC input

4 BAND CH EQ

The 4-band Ch equalizer offers both HF and LF shelving EQ plus two mid sweeps one for the LO MID from 80 to 2k Hz and the other for the HI MID sweep 500 Hz to 10k Hz. The below chart displays the mid sweep ranges. You can now dial in the entire audio spectrum from 6 knobs eliminating undershooting or overshooting frequencies.



6 CH MONITOR SENDS

6 monitors per channel allows greater monitoring capabilities.

2 CH EFFECT SENDS

2 effects sends permit two simulations effects for each channel utilizing the two on board effects processor or external processors.

BUSS COMPRESSORS

Each of the 4 Buss (sub-outs) have their own compressor, which is a great addition to control peaks such as drums. These professional 1 knob compressors are designed to hold the level you want.

LINK COMPRESSORS

You may link the compressors together for the convenience of controlling them in stereo pairs.

STUDIO/HEADPHONE MONITORING

You have your choice of headphone or studio loudspeaker monitoring of any combination of the 6 ch monitors, MONO/Center channel, L/R outputs and USB IN/OUT.

USB POWER PORTS

Convenient USB power ports allow the recharging of your iPod™ or the use of our LED desk lights (sold seperately).

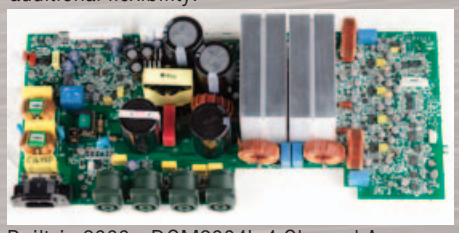
Mixer Rear Receivers

WIRELESS OPTIONS

The exclusive True Diversity USM16 built-in wireless systems allows up to 4 wireless systems whether it be mics or belt-pack systems. This eliminates cable clutter. Each system is connected with a simple plug-in connector. For more information, read about the UX16 wireless products, which is the outboard version of the USM16. See Carvin.com/USM.

POWERED OPTION FOR C1648P

Carvin's 4 channel DCM2004L amplifier is built-in to the C1648P to deliver 500w RMS per channel for a total of 2000w. These very efficient, cool running Class D amps power the Main L/R speakers and 2 monitor mixes. Or, you can switch to have these amps power 4 monitor mixes using external power amps for the main L/R speakers. All amps feature premium Speakon™/1/4" combo speaker output connectors. Insert jacks are featured for additional flexibility.



Built-in 2000w DCM2004L 4 Channel Amp which only adds 8Lbs.

Concert Series Specs

Freq. response:	20-20k Hz ±1 dB
THD distortion:	.01% 20-20k Hz
E I N:	-117 dBm
S/N Ratio	90 dB
Dynamic Range:	104 dB
Mic Gain:	52 dB
Line Gain:	30 dB
Total Gain:	72 dB (balanced)
Max Output:	+28 dBm
Power Req.	90 to 250VAC 50-60Hz

C1648P Power Amp Specs

4 ohms:	500w x 4 (2000w)
8 ohms:	300w x 4 (1200w)
Freq. Resp.:	±0.5dB, 20Hz-20kHz ±1.5dB, 10Hz-25kHz
THD: (50% output)	0.09%
Output Mode:	95% Efficeint Class D
Protection Circuits:	Soft Start, Short Circuit, No Load, SpeakerGuard, Thermal Shut-Off, Protect and Clip Indicators, Amp Peak Limiters
Power Req:	90 to 250VAC 50-60Hz, 1000VA

C1648:
56.3cm W x 41.5cm D x 9.5cm H wt: 8.2kg
22.2"W x 16.3"D x 3.75"H wt: 18.1 lbs

C1648P:
56.3cm W x 41.5cm D x 14.6cm H wt: 11.4kg
22.2"W x 16.3"D x 5.75"H wt: 25.1 lbs

C2448:
76.3cm W x 41.5cm D x 9.5cm H wt: 11.1kg
30.1"W x 16.3"D x 3.75"H wt: 24.5 lbs

C3248:
96.7cm W x 41.5cm D x 9.5cm H wt: 13.4 kg
38.1"W x 16.3"D x 3.75"H wt: 29.5 lbs

C3248

Channel

1/4" LINE INPUTS
Connect balanced and unbalanced instruments and line level sources such as drum machines, keyboards, ETC.

XLR BALANCED MIC INPUTS
Both the LINE and XLR MIC inputs can be used simultaneously.

CHANNEL INSERT/DIRECT OUT
Insert channel effects, compressor, etc. with a 1/4" TRS (Tip, Ring, Sleeve) cable. To achieve a direct out from the channel, insert a standard 1/4" cable to the first "click" (1/2 insert).

MIC PHANTOM POWER Provides +48v power for condenser mics in groups of 8 channels.

The GAIN controls the input level for the channel.

LOW CUT SWITCH is a 75 Hz filter that helps eliminate unwanted low frequencies.

4 BAND CHANNEL EQ WITH DUAL MID SWEEPS
Studio quality EQ is featured on every channel. The ±15 dB boost or cut gives an overall 30 dB range for powerful EQ control. The active circuits deliver deep bass from the 20-80 Hz LOW control. The MID controls work at 45Hz to 10kHz, depending on the MID FREQ controls. The HI control functions at 11-20k for crisp highs.

MONITOR 1 THRU 6 SEND CONTROLS
The channel MONITOR controls allow you to create six independent monitor mixes. The MONITOR signals (pre-EQ, pre fader) are routed to the master MON 1, 2, 3, 4, 5 and 6 controls respectively. Since the monitor sends are pre-fader, you can set your monitor mix on stage without having to set the channel fader level.

EFF 1 & EFF 2 SEND CONTROLS
The EFF 1 or EFF 2 control sends signal (post EQ, post fader) from the channel to the master EFFECTS 1 or EFFECTS 2 level controls.

PAN control allows stereo imaging by panning Left or Right. The PAN control also works for the sub-mix groups. A center position will send a channel's signal to a pair of sub-group faders (1-2, 3-4 when assigned).

GREEN SIGNAL LED is pre-fader and post EQ.

CHANNEL RED PEAK LED is pre-fader and post EQ. A "solid" lit PEAK LED indicates a muted channel.

CHANNEL MUTE SWITCH will interrupt the channel signal.

CHANNEL PFL SWITCH allows the operator to listen to a channel (pre fader listen) in the headphone mix.

CHANNEL ASSIGNMENT SWITCHES Assign the channels' signal to the Master L/R faders, or to the SUB-GROUP faders 1 & 2, 3 & 4 for sub-mixing in stereo pairs.

The CHANNEL FADER adjusts the output level of the channel.

Master

MONITOR 1-6 XLR OUTPUT CONNECTORS The C-SERIES provides balanced XLR outputs.

GROUP 1-4 OUTPUT JACKS The C-SERIES provides 4 balanced 1/4" outputs.

RETURNS 3 & 4 L-R INPUT JACKS Connect your effects processors' stereo outputs to these jacks.

REC OUT L-R RCA JACKS for recording.

HEADPHONE 1/4" JACK for headphone or control room.

LEFT & RIGHT XLR OUTPUT CONNECTORS for connecting the main L/R output to power amps or recording gear.

MONO/SUB XLR OUTPUT CONNECTOR A balanced XLR output is featured for center mono main mix or subwoofers.

USB POWER PORTS supplies +5V allows powering/recharging your I-Pod™ or the use of our LED desk lights (sold seperately).

9-BAND EQ SWITCH 1 & 2
These switches swap the 9-band EQ's from the standard L/R main outputs, to the MON 1 & MON 2 outputs.

DUAL PRECISION 9 BAND GRAPHIC EQs
are one octave filters at 63,125, 250, 500, 1k, 2k, 4k, 8k & 16k Hz centers that offer ±12dB adjustment to help eliminate feedback & enhance tone for the main or monitor mix.

L/R LED VU METERS 10 LED's offer 6 dB increment resolution that give the operator a visual indication of the mixer's output levels, selectable by the METER SOURCE or PFL switches.

DUAL STEREO EFFECT PROCESSORS The dual internal 24-BIT stereo processors feature Echo, Reverb, Chorus and Flange. Each effect has selectable parameters (up to 256) to tailor the effect. Both processors feature a RETURN TO MONITORS.

EFFECTS 1,2, 3 & 4 Returns.

PHONES & METER SOURCE
The stereo PHONES control sets the level of the PHONES jack. The PFL, L/R, MONO, MON 1-MON 6, USB IN, and REC OUT USB switches allow for monitoring of these sources through the headphones and the L/R LED METERS.

MONITOR 1-6 MASTER OUTPUT CONTROLS

MONO/SUB CONTROL
A mono output is created from the L/R master faders (post) for center, subwoofers, or side fill speakers.

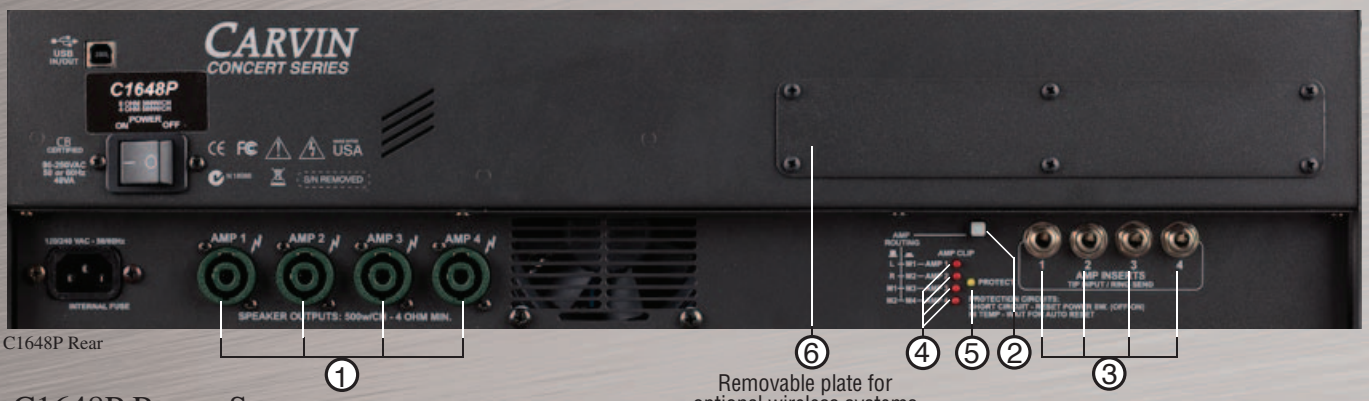
4 BUS COMPRESSORS & LINK SWITCHES

GROUP/SUB-MIX FADERS 1-4
Once a channel has been assigned to one of these faders, the mixing process is simplified to using these four faders. By assigning the 4 faders to the Master L-R faders, the operator can use the faders to sub-mix groups.

GROUP ASSIGNMENT SWITCHES send the sub-group mix to the main L/R faders. For mono mixing, assign to both L/R.

MASTER L/R FADERS adjust the level of the main stereo output created by all channels and groups assigned to L/R faders.

Powered C1648P

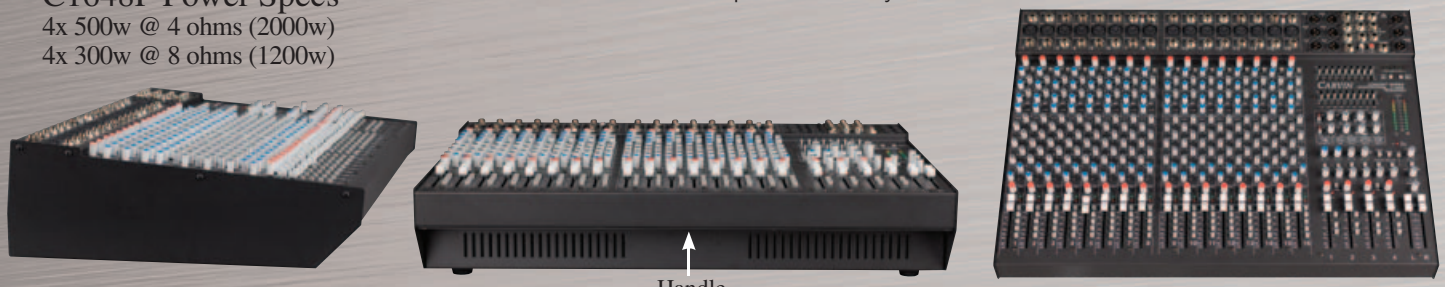


C1648P Rear

Removable plate for optional wireless systems

C1648P Power Specs

4x 500w @ 4 ohms (2000w)
4x 300w @ 8 ohms (1200w)



Handle

C1648P REAR PANEL OPERATION:

1. SPEAKER OUTPUTS The combination SPEAKON jacks also accept 1/4" plugs. 12 Gauge SPEAKON speaker cables are an industry standard for high power applications (pin 1+ is POS, pin 1- is NEG, pins 2+ and 2- are not used). Use only 16 gauge (or heavier) 1/4" speaker cables, NOT shielded instrument cables. Turn power off before connecting speaker cables.

The minimum load for each amp is 4 OHMS. Chaining together more than one speaker on an output is fine as long as the total impedance is not below 4 ohms. If the speaker load is lower than 4 ohms, the amp may go into one of the PROTECT modes. (Two 8 ohm speakers in parallel = 4 ohms). **FREE Carvin Impedance Calculator iPhone App at Carvin.com/iphone.**

2. AMP ROUTING **switch** will select between two internally routed configurations. **OUT**: AMP1-LEFT, AMP2-RIGHT, AMP3-MONITOR1, AMP4-MONITOR2. **IN**: 1 amp each, for Monitors 1 thru 4. Speaker output levels are adjusted from the Left/Right faders or Monitor 1-4 controls. The front panel GRAPHIC EQs function with the amps, depending on the front panel EQ1 and EQ2 switch settings.

3. AMP PATCH INSERT jacks offer flexibility for mixer to amp signal routing. These jacks are T-R-S (Tip-Ring-Sleeve). **TIP** is the power amp input. **RING** is the signal sent from the mixer determined by the AMP ROUTING switch. The limiters are post insert. Patching a compressor or equalizer between the mixer and the amp can be done by using a stereo insert cable (like Carvin's AP1). Connect the **RING** signal to the INPUT of the external device, and the **TIP** signal from the OUTPUT of the device. Plugging in a standard 1/4" cable (mono) into the AMP PATCH INSERT jacks allows any external signal to be sent to the internal power amps. For example, you may want to patch the GROUP outputs (1-4) into the power amps. Plug one end of each cable into the GROUP jacks on the top panel of the mixer. -Plug the other ends of the cables into the AMP PATCH INSERT jacks. The GROUP 1-4 faders will now control what is heard at the SPEAKER OUTPUTS.

4. AMP CLIP LEDs - The red CLIP LEDs will flash when an amp has reached it's maximum output. Occasional flashing caused by bass frequencies is OK. Consistent flashing caused by higher frequencies may damage drivers due to excessive distortion. This will not damage the amp.

5. PROTECT LED - The yellow LED indicates the power amp system has gone into one of its protection modes. There will be no output from the amps. If the amp output has been short circuited, or overloaded by putting less than 4 ohms on the output the amp will go into protection. Check for shorted speaker cables and speaker impedance, then reset the POWER switch (off-on). If the amp has overheated, lower the volume and make sure the fan vents are not blocked. Wait for the fan to cool the amps. Normal operation will return in about 1-3 minutes.

Accessories

This rear USB connector will transmit audio to and from a computer for recording with compatible software and drivers. Output signal is the pre-fader L-R stereo mix sent via the REC OUT USB LEVEL. Input from a computer comes into the RETURN 4 bus, controlled at the RTN4/USB control.

USM WIRELESS

All models feature ports for optional wireless receivers. Purchase the antennae kit (USMKIT) and transmitter/receiver systems (USM16-MC or USM16-BP) separately. Choose from the handheld wireless vocal mic or the beltpack transmitter. With the beltpack transmitter, you may purchase the optional guitar cable, lavaliere mic, or headset mic.

Dual Diversity UHF 16 Channel Wireless
USM16-MC Handheld Mic & USM-16 Receiver
USM16-BP Beltpack transmitter & USM-16 Receiver
USMKIT antennae mounting kit

Mixer Model	Max Receivers accepted
C1648	2 USM receivers
C1648P	2 USM receivers
C2448	4 USM receivers
C3248	4 USM receivers


USM16-MC Handheld Mic & Receiver


USM16-BP BeltPack & Receiver


USMKIT for 2 receivers

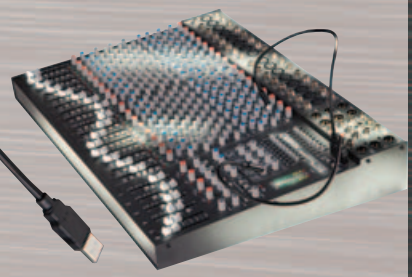
BELTPACK ACCESSORIES


UX-HM2
Headset mic


UX-LP1 Lavaliere mic


UX-GT
Mini XLR to 1/4” instr. cable


USB-L
USB LED light



ROAD WARRIOR CASES

Mixer Model	Road Warrior Case
C1648	RW1648
C1648P	RW1648P
C2448	RW2448
C3248	RW3248

OPERATING INSTRUCTIONS

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 240VAC (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 connectors.

• For high level balanced or 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 GRAPHICS to their center positions.

• Adjust the Channel "PAN" controls to their center positions.

• Turn the mixer on by the rear panel POWER SWITCH and watch for the POWER LED. Your mixer is now ready to operate.

C SERIES CONTROLS

CHANNEL FEATURES

1. 1/4" LINE INPUTS

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

2. XLR MIC INPUTS

The balanced Mic inputs are for connecting microphones that use XLR connections. Both the LINE and XLR MIC inputs can be used simultaneously.

3. CHANNEL INSERT/DIRECT OUT

To insert channel effects, compressor, etc. use a 1/4" TRS (Tip Ring Sleeve) cable (see **INSERTS AND DIRECT OUT** illustration on page 13). To achieve a direct out from the channel, insert a standard 1/4" cable to the first "click" (1/2 insert).

4. GAIN

The **GAIN** controls the input level for the channel. If the **GAIN** is set too high, the **PEAK** LED will flash and distortion may occur. Decrease the amount of **GAIN** until the **PEAK** LED does not flash. It is important that the gain control should be kept next to the **PEAK** LED flash point to maintain the lowest noise of the channel. You can use the channel **PFL** switch to monitor the channel input level and use the meters to adjust the **GAIN** control to **0**dB. This will give a good reference where the **GAIN** control should be set.

5. LOW CUT SWITCH

A 75 Hz **LOW CUT** filter helps eliminate unwanted low frequencies. Great for reducing "boom" noise from mic stands or from acoustic/electric guitars. Turning up the **LOW** EQ when using this filter can help create a punchier bass response.

6. 4 BAND ACTIVE EQ WITH DUAL MID SWEEPS

The **C48 SERIES** mixers provide studio EQ. The ±15 dB boost or cut gives an overall 30 dB range for powerful EQ control. The active circuits deliver deep bass from the 20-80 Hz **LOW** control. The **MID** controls work at 45Hz to 10kHz, depending on the **MID FREQ** controls. The **HI** control functions at 11-20k for crisp highs.

Start out with all tone controls at their center "zero" position. Determine which position your **MID FREQ** sounds best, then cut or boost your **HI**, HI **MID, LO MID**, and **LOW** frequencies 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. A typical setting may be: **HI -3, HI MID+5 (MID FREQ set at 4kHz), LO MID -4** (**MID FREQ** set at **700Hz**), and **LOW +3**. *Don't be afraid to adjust the HI and LOW controls to get good presence and depth while reducing the LO MIDs to clean up your sound. This is one of the keys to great sound.*

7. HI & LO MID SWEEPS

These controls allow you to select which frequency (from 200Hz-10kHz or 45Hz-2kHz) that the **MID** controls will boost or cut. By adjusting the **MID FREQs**, you can select the exact frequency that will best complement various inputs. 700Hz and 4kHz are recommended settings for the **MID FREQ** control for guitar & vocals.

8. MONITOR 1 THRU 6 SEND CONTROLS

The channel MONITORS allow you to create six independent monitor mixes. The **MONITOR** signals (pre-EQ, pre fader) are routed to the master **MON 1, 2, 3, 4, 5 and 6** controls (**#22**) respectively before going to the XLR output connectors (**#40**).

9. EFF 1 & EFF 2 SEND CONTROLS

The **EFF 1** or **EFF 2** control sends signal (post EQ, post fader) from the channel to the master **EFFECTS 1** or **EFFECTS 2** levels to the internal processors (**#18**) and to the **EFF 1** or **EFF 2 output** (**#38**).

10. PAN CONTROL

Each channel's **PAN** control allows stereo imaging by panning Left or Right during recordings or live performances. The **PAN** control also works for the sub-mix groups. A center position will send a channel's signal to a pair of sub-group faders (**1-2**, **3-4** when assigned). By panning hard left, the signal is routed to only sub-group fader 1 or 3 when assigned. Panning hard right routes the signal to sub-mix fader 2 or 4. Dual element pan controls provide 15dB greater separation than standard pan controls

11. CHANNEL SIGNAL GREEN LED

The **SIGNAL LED** is pre-fader and post EQ. This LED helps the operator verify that the channel is receiving a signal from the mic or instrument inputs even when the channel fader is off.

12. CHANNEL RED PEAK LED

This peak indicator is pre-fader and post EQ. If the **PEAK** LED flashes, the channel needs a reduction with the **GAIN** control (**#4**) to prevent distortion. A "solid" lit **PEAK** LED indicates that the channel has been **MUTED**.

13. CHANNEL MUTE SWITCH

The **MUTE** switch will interrupt the channel signal. This feature saves having to reset your faders and monitor sends. The PEAK LED will light solid ON with no SIG LED.

14. CHANNEL PFL SWITCH

This switch allows the operator to listen to a channel (pre fader listen) in the headphone mix to set tone and gain levels as well as see the channel at the LED meter output (**#33**).

15. CHANNEL ASSIGNMENT SWITCHES

These switches assign the channels' signal to the Master **L/R** faders, or to the **SUB-GROUP** faders **1** & **2**, **3** & **4** for sub-mixing in stereo pairs. For mono, **PAN** fully to the left and assign a channel to Sub-Group fader 1 or 3 only. **PAN** fully to the right and assign a channel to Sub-Group fader 2 or 4. Likewise assigning the **L/R** switches sends the channel directly to the main **L or R** faders.

16. CHANNEL FADER

The **CHANNEL FADER** adjusts the output level of the channel. The signal will go to one or more of the Master Faders, depending on both the Channel Assignment switches and the **PAN** control. Calibrated **60mm FADERS** with audio tapers are featured for smooth fade-outs. Slide all faders down when connecting your inputs.

17. MIC PHANTOM POWER SWITCH/RED LED

This switch provides +48v power for condenser mics such as Carvin's **M90S** in groups of 8 channels. This leaves the remaining MIC inputs for sources that don't require phantom power. The LINE inputs are unaffected.

MASTER SECTION

18. DUAL STEREO 24-BIT EFFECTS

The internal 24-BIT stereo processors receive signals from the channel **EFF1 and EFF2** controls and the master **EFF1 and EFF2** controls. If the adjacent **PK** (peak) LED flashes, reduce the level from the channel or master **EFF1 or EFF2** send controls. A "solid" **PK** LED will show **EFFECTS 1** or **2** have been muted by the **MUTE** switches. The RETURN control will adjust the volume level of the selected effects. Remember each channel has its own two EFFECT sends that will send the signal to the effects processors. The red PK LED will indicate when the effects signal from the channel is distorting. Reduce the level of the channel EFFECT control until the PK LED stops flashing.

EFFECT AND PARAMETERS

a.)ECHO: When the **SELECT** control is at the "seven O'clock" position, it is selected to the first **ECHO** setting where you get a single repeat echo (minimal regeneration). Turning the **PARAMETER** control to 1 will provide the shortest delay time between the original signal and the echo. Increasing the **PARAMETER** control to the right will increase the time delay between the original signal and the echo. To increase the number of echo repeats, turn the **SELECT** control clockwise to "9 O'clock" (maximum regeneration).

b.)REVERB: When the **SELECT** control is at the "ten O'clock" position, it is selected to the first **REVERB** setting. Turning the **SELECT** control clockwise will increase the amount of high frequencies in the reverb. Turning the **PARAMETER** control to 1 will provide minimal decay time of the reverb. Increasing to the right will increase the reverb decay time.

c.)CHORUS: When the **SELECT** control is at the "one O'clock" position it is selected to the first **CHORUS** setting. Turning the **SELECT** control clockwise will increase the amount reverb in the chorus. Turning the **PARAMETER** control to 1 will provide a minimal chorus depth setting. Increasing to the right will increase the chorus depth.

d.)FLANGE: When the **SELECT** control is at the "four O'clock" position it is selected to the first **FLANGE** setting. Turning the **SELECT** control clockwise will increase the flanger's speed. Turning the **PARAMETER** control to 1 will provide minimal flanging depth. Increasing to the right will increase the flanger's depth.

To send effects to the monitors, use the "**TO MONITORS"** controls, **MON 1/MON 2** & **MON 1/MON 3**. The center position on both controls is OFF.

19. SEND 1 & 2

Sends signals from the channel EFF 1 and EFF2 controls to the internal processors and to the EFF1 and EFF2 output jacks.

20. RETURN 3 L-R

Receives stereo or 2 mono effect signals from the **RETURN 3 L /R** jacks. These signals will also be present at **MON 1** (**#40**).

21. RETURN 4 L-R/ USB IN

Receives a signal from the **RTN 4 L/R** 1/4" jacks (**#39**) and from the **rear USB port**. These signals will also be present at **MON 1**.

22. MONITOR 1-6 CONTROLS

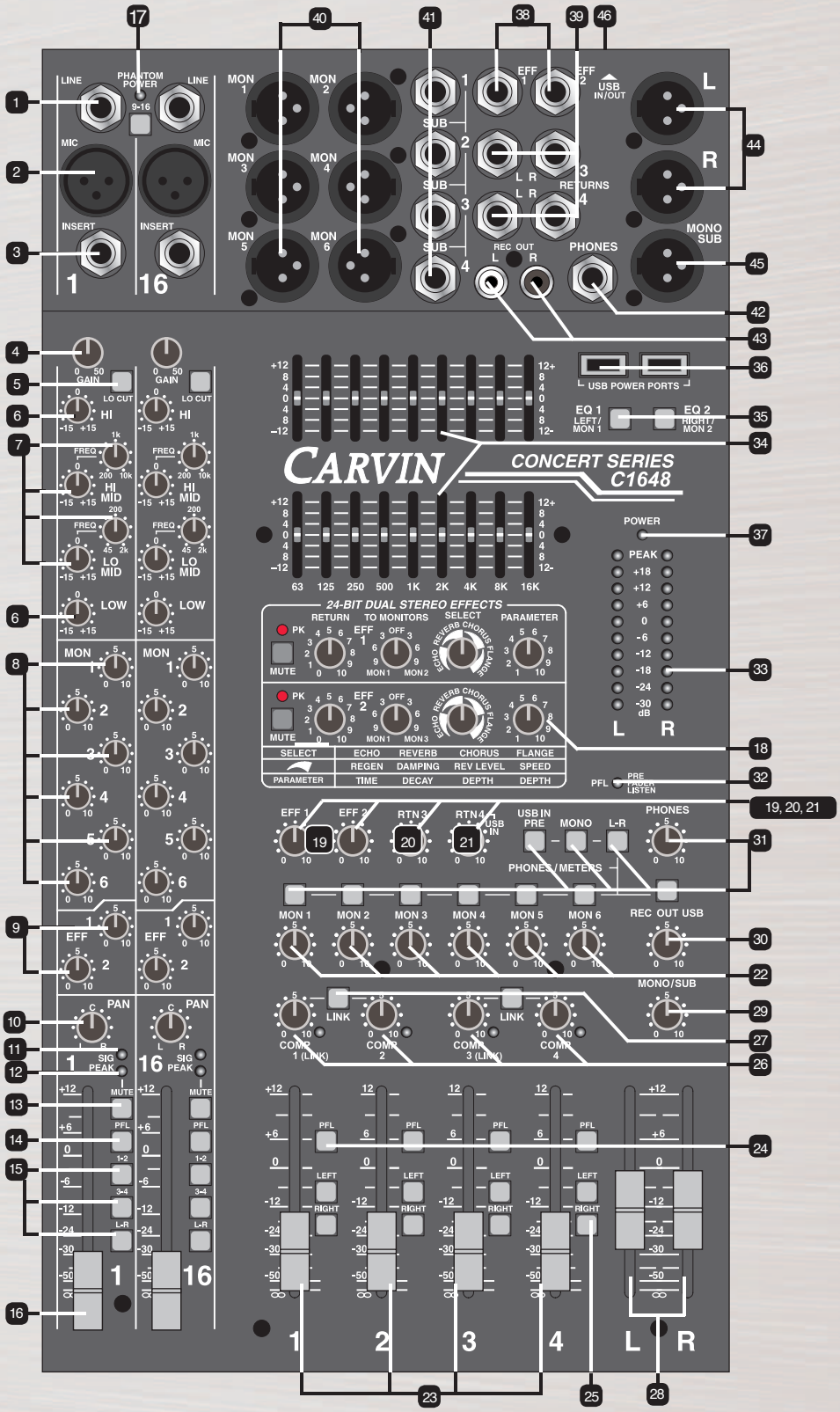
These are the master outputs for the six monitor sends. These correspond to the **MON 1-6** XLR output jacks (**#40**).

23. GROUP/SUB-MIX FADERS 1-4

Once a channel has been assigned to one of these faders, the mixing process is simplified to using these four faders. If these faders are not assigned to the Master **L-R** faders (**#28**), then each fader is bused to the corresponding **4 GROUP** 1/4" outputs (**#41**). By assigning the 4 faders to the Master **L-R** faders, the operator can use the faders to sub-mix groups.

24. GROUP PFL SWITCHES

These **PFL** switches allow the operator to monitor the entire GROUP mix. If distortion is heard or if the PFL level is near PEAK on the Master **L/R METERS,** lower the channel faders assigned to that group. Also check the channel **PEAK** LEDs.



25. GROUP ASSIGNMENT SWITCHES
These switches send the sub-group mix to the main **L/R** faders. For mono mixing, assign to both **L/R**.

26. 1-4 GROUP COMPRESSORS/LEDs
Each of the 4 sub groups features a compressor, which will reduce the output when it gets above the level you set with the COMP control. Set at "0" there is no effect. As you turn UP the COMP knob, the lower the maximum level. The compressor circuit is pre-fader, so you can set the COMP once and still adjust the group fader as needed. The LED will indicate when the compressor is working.

27. COMP LINK SWITCHES
These switches link the COMP controls for stereo pairs of equal setting. The COMP1 or COMP3 control becomes the master for the pair. Link 1-2 or 3-4.

28. MASTER L/R FADERS
These faders adjust the level of the main stereo output created by all channels and groups assigned to **L/R** faders. Output appears at the **L/R** balanced XLR connectors (**#44**).

29. MONO/SUB CONTROL
A mono output is created from the **L/R** master faders (post) for center, subwoofers, or side fill speakers. The output is at the **MONO**/SUB XLR connector (**#45**).

30. REC OUT/USB CONTROL
This control sets the level sent to REC OUT L-R RCA jacks and to the rear USB port. The signal source is the main L-R mix (pre-fader).

31. HEADPHONE AND METER SOURCE
The stereo **PHONES** control sets the level of the **PHONES** jack (**#42**). The **PFL**, **L/R**, **MONO, MON 1-MON 6, USB IN, and REC OUT USB** switches allow for monitoring of these sources through the headphones and the **L/R LED METERS** (**#33**).

32. PFL RED LED
Indicates that the headphone & meters are monitoring only the channels or groups where the **PFL** is switched on.

33. L/R LED VU METERS
This group of 10 LED's offer 6 dB increment resolution that give the operator a visual indication of the mixer's output levels, selectable by the **METER SOURCE** or **PFL** switches (**#31**).

34. DUAL 9 BAND GRAPHIC EQs
are one octave filters at 63,125, 250, 500, 1k, 2k, 4k, 8k & 16k Hz centers that offer ±12dB adjustment to help eliminate feedback & enhance tone for the main or monitor mix.

35. EQ SWITCH 1 & 2
These switches swap the 9 band EQ's from the standard **L/R** main outputs "OUT" to the **MON 1** & **MON 2** outputs "IN" respectively.

36. USB POWER PORTS
Use these ports to supply +5V USB power to run accessories like LED lighting or to charge MP3 players. Connect audio outputs to RETURNS 3 or 4, or to channel inputs.

37. POWER BLUE LED
Verifies the mixer is on.

38. EFFECTS 1 & 2 OUTPUT JACKS
1/4" outputs drive external effects. Connect your effects processor's inputs to these jacks.

39. RETURNS 3 & 4 L-R INPUT JACKS
Returns a stereo signal from an external effect. Connect your effects processors' stereo outputs to these jacks. If only one jack is used, the mono signal will go to both L/R .

40. MONITOR 1-6 XLR OUTPUTS
The C SERIES provides balanced XLR outputs. Connect your monitor power amps to these connectors.

41. GROUP 1-4 OUTPUT JACKS
The C SERIES provides 4 balanced 1/4" outputs. Connect your 4-track recorder or side fill power amps to these jacks.

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

43. REC OUT L-R RCA JACKS
RCA jacks for connecting to a recorder input.

44. LEFT & RIGHT XLR OUTPUT CONNECTORS
This set of balanced XLR connectors are for connecting the main L/R output to power amps or recording gear.

45. MONO/SUB XLR OUTPUT CONNECTOR
A bal. XLR output is featured for side fills or subwoofers.

46. REAR USB CONNECTOR
This rear USB connector will transmit audio to and from a computer for recording with compatible software and drivers. Output signal is the pre-fader L-R stereo mix sent via the REC OUT USB LEVEL. Input from a computer comes into the RETURN 4 bus, controlled at the RTN4/ USB control.

SOUND CHECK

In a live sound reinforcement system, the input signals to the mixer will come from the microphones and instruments. Each microphone or instrument 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 control of the instruments as they are mixed together and then amplified by the system. The mixer can be operated on the stage or from a remote location in the audience 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 mixed from the audience's perspective. NOTE: Most snake cables are not designed for speaker connections.

THE SOUND CHECK

The sound check takes some skill but mostly patience from the performers and especially "you" the system operator. If you miss something during the sound check, the sound may suffer during the performance. 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 drummers, set each drum mic individually then the drum set as a whole. This is also a good time to make some channel EQ 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 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 operator's microphone should only be directed through the monitors when addressing the on stage performers, especially if something needs to be checked during the show.

CHANNEL CONNECTIONS AND SUB-MIXING

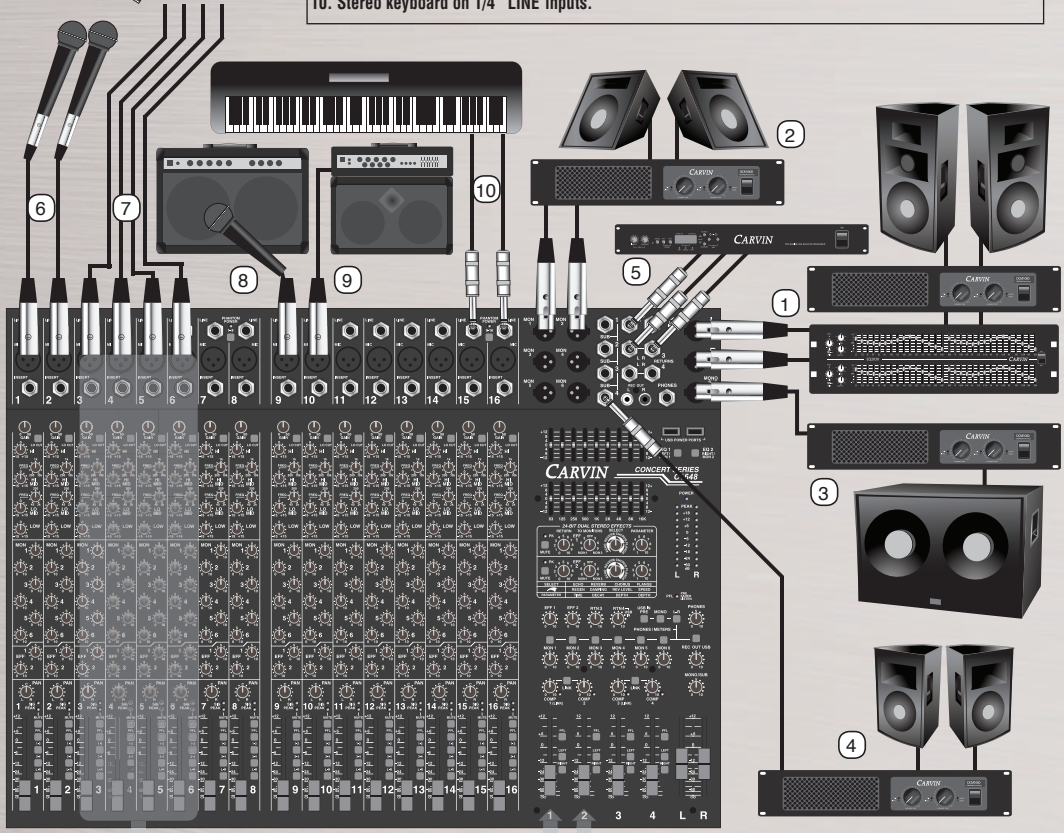
The XLR Mic inputs are balanced low impedance inputs. +48V Phantom power for condenser mics is available in channel groups of eight. This enables the user to group all mics that require phantom power together, leaving the rest of the channels available for dynamic microphones or line inputs. The XLR Mic inputs and balanced 1/4" Line inputs on each channel can be used simultaneously, however the two signals will be controlled by the channel GAIN control. Adjust the level of the instruments to balance the mix. For stereo instruments, such as keyboards or drum machines, use two consecutive channels to connect the Left and Right outputs from the instrument. Then use the PAN controls on the two channels to pan hard left and right for a stereo mix. If a pair of individual channels are not available, one of the stereo returns in the master section can be used.

Whenever possible, try to group all related instruments or mics near each other on the mixer. For example: put all drum mics on channels 1 through 8, guitars, bass and keyboards on 9 through 16, and vocals on 17 through 24. This will make mixing, channel assigning and sub-mixing easier to manage.

The 4 bus section on the C48 mixers can be used for main outputs, surround outputs, side fills, outputs to a multi-track recorder, etc. but the most common use is for sub mixing. Sub grouping is the process of assigning multiple channels to a sub group fader in the master section. This is usually done to decrease the number of faders needed to adjust a group of channels. For example: a drum kit with 6 or more microphones mixed in mono can be assigned to a sub-mix fader. If the drums need to be adjusted in the main mix, only one group fader needs to be adjusted instead of 6 channel faders. The individual microphones all use different fader settings, so it is important to get a balanced mix of the entire drum kit during the sound check. The drum sub-group fader is then assigned to the L-R main faders. For a mono mix, use the channel pan controls to pan the audio "hard left" and the audio will only be assigned to sub- group fader 1 or 3. Panning "hard right" will bus the audio to sub-mix faders 2 or 4. Always keep channel and sub group faders higher than the master L-R faders. Using the L-R fader or sub group fader to boost the level of a weak channel signal can result in excess noise.

The diagram depicts a standard live sound system

1. **Stereo EQ and power amp for the main speakers on the Left/Right outputs.**
2. **Stereo power amp for two monitor mixes on the MON 1 and MON2 outputs.**
3. **Bridged power amp for a subwoofer on the MONO/SUB output.**
4. **Power amp for side fill or back of room fill on the Group output 4.**
5. **External effects processor connected to EFF 1 SEND and RETURNS 3.**
6. **Vocal mics.**
7. **Four drum mics on channels 2-6, assigned to subgroups 1 & 2 for sub mixing.**
8. **Mic'd guitar amp.**
9. **Direct Out from bass amp.**
10. **Stereo keyboard on 1/4" LINE inputs.**



channels 2-6 assigned to sub-mix group faders 1 and 2

MASTER OUTPUTS

The main amps and speakers should contain an overall mix of all channels. The sub-group faders 1-4 can have certain channels assigned to them before the mix arrives at the master L-R faders. This is known as sub-mixing and can improve the efficiency of mixing a large number of channels (see above).

The six independent monitor mixes use the MON 1 through MON 6 sends. On the channel these sends are pre-EQ, pre-fader. The MONO/SUB output can be used for a main mono mix, a center mix or as a subwoofer output.

The sub group outputs can also be used as side or back fill speakers. Long rooms can have poor sound at the back of the room. Set up a set of back fill loudspeakers to fill in and add a digital delay to the main speakers to correct the time delay from front to back. This can improve the sound of the room considerably.

9-BAND EQ

When the 9 band graphic EQ sliders are in the center "0" position, they do not affect the audio signal. When the EQ sliders are raised or lowered from this position, they boost or cut respectively a narrow band of frequencies. Start with the "0" setting and move each slider up and down to hear the difference.

For tone enhancement, you may want to raise 62Hz or 125Hz (for fuller sounding bass) and the 8kHz or 16kHz (for crisper highs).

Sometimes lowering one slider can be more effective than boosting several. If the mix sounds too raw or harsh try reducing the 1kHz or 2kHz slider, if the mix is too boomy try lowering the 250Hz or 500Hz slider.

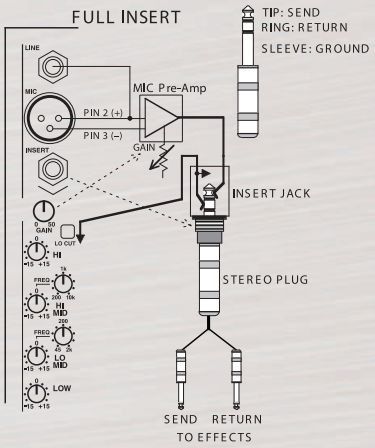
To reduce feedback in the low frequency range, try lowering one of the 63, 125 or 250 Hz sliders. High frequency feedback is usually reduced by lowering the 2kHz or 4kHz slider.

To help with feedback reduction, the microphones should be placed further back on the stage than the main speakers.

INSERTS AND DIRECT OUTS

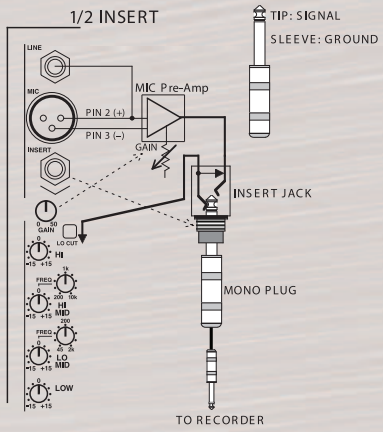
FULL INSERT

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 channels signal path. The signal coming from the microphone preamplifier will go out through the external equipment before it can continue back through the channel, re-entering before the channel EQ controls. Most external equipment is not set up for the TRS plug directly so an adapter cable is required. Plug the adapter's 1/4" stereo TRS end into the mixer insert all the way. The two mono 1/4" jacks at the opposite end are the send and return cables. If both an INSERT and a DIRECT out is required, put a "Y" adapter on the SEND cable.



DIRECT OUT (HALF INSERT)

Plug a 1/4" mono cable "half way" into the Channel Insert Jack. The "half" insert connection creates a send signal without breaking the channels signal path. The insert in this mode is no longer used as an insert but becomes what is called a DIRECT out.



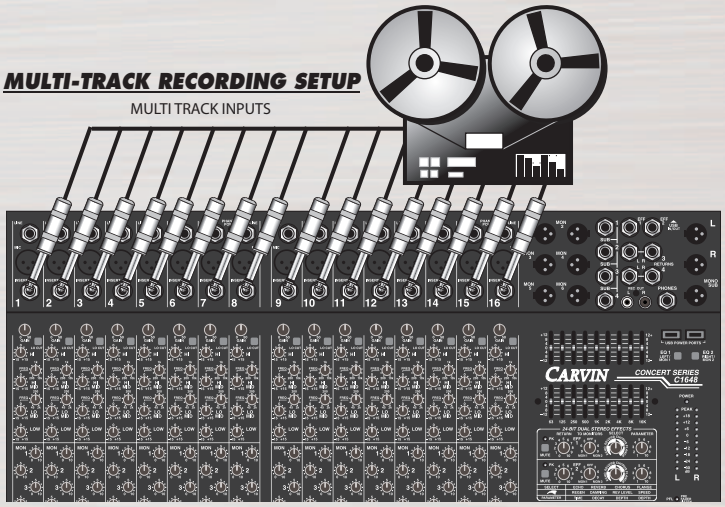
MULTI-TRACK RECORDING

A multi-track recorder can be connected to the channel INSERT jacks (1/2 plugged for Direct Out). This set up could be used with a live set up to record a live show.

Set the GAIN control at the top of each channel so the signal going to your recorder is not too loud or too weak. Too loud of a signal will distort the input of your recorder, and there is no correction for a distorted track. Too weak of a signal will reduce recording quality and increase noise.

With this setup, note that the channel EQ will not affect what is being recorded. The EQ for each track will be adjusted at mixdown.

MULTI-TRACK RECORDING SETUP



MULTI-TRACK EDITING

To re-record or edit a certain track while listening to the tracks you want to keep, you can setup only the channel you want to re-record for "Recording". Have the other channels set up for "Mixdown". On the multi-track recorder, enable "Record" ONLY for the channel you want to edit or the other recorded tracks will likely be erased.

MULTI-TRACK MIXDOWN

Use this set up for mixing down from a multi track recording to a two track recorder, or to the built-in USB stereo output. Connect the Multi-track recorder's outputs to the LINE inputs of the channels. Each channel's Gain control should be set to minimum and use the channel fader for level. Monitor your mixdown sessions with high quality headphones connected to the Headphone jack, or connect a professional power amplifier (Carvin's **DCM** power amps) and high quality studio monitors to your main L/R outputs. The internal DSP or the external effects loops can both be used during mixdown.

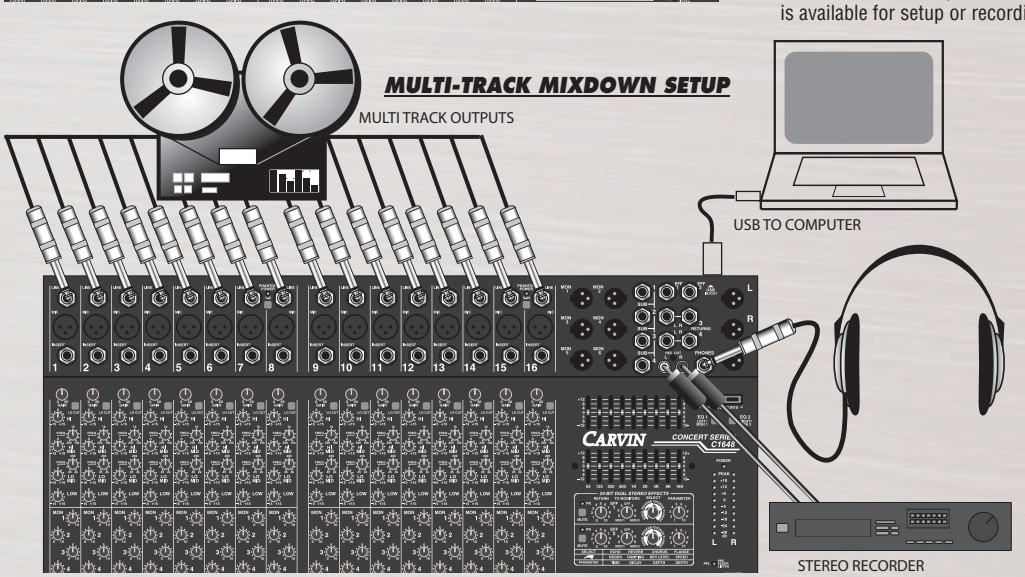
Mixing is a practiced skill. A trained ear will know when to add EQ, effects, compression, gate. Listen to your favorite CD through the same headphones or monitoring system you plan to mix through. Note each instrument's level and position in the stereo mix. Use this as a guide to help mix your project.

ALTERNATE RECORDING SETUPS

Another way to connect your multi-track recorder is to use an insert adapter or TRS cable on each Channel Insert for each track. Use the "tip" connection for the recorder inputs, and the "ring " connection for the recorder outputs. With this setup, you can record, then mixdown without changing cabling.

A much simpler recording setup would be to use a 4-track recorder, and use each of the 4 subgroups as your track outputs. For example, record drums on subgroup 1, vocals on 2, guitars on 3, and bass or keys on group 4. This is much more limited to what you can to with mixdown, but can be great for a live recording at a show when limited time is available for setup or recording.

MULTI-TRACK MIXDOWN SETUP



USB IN/OUT

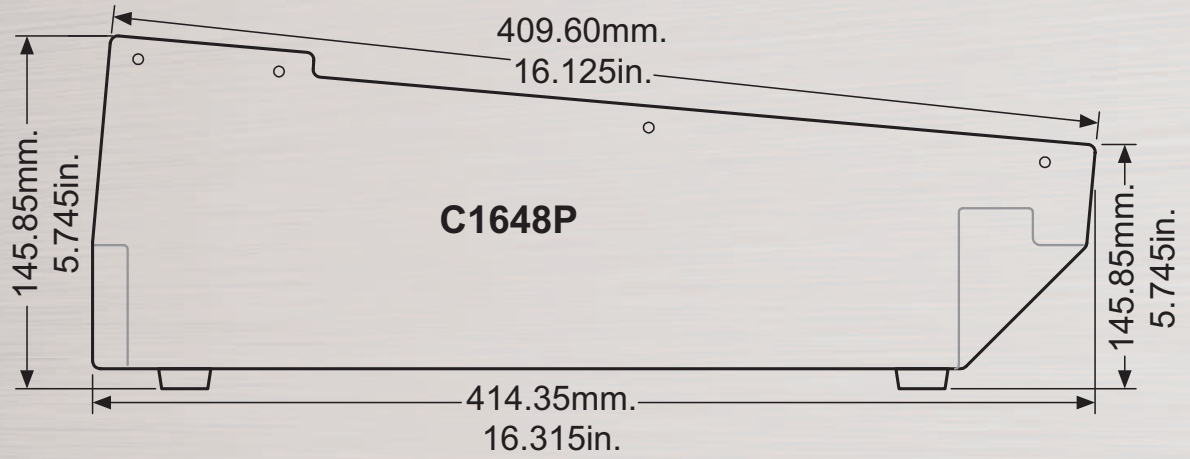
The rear USB connector offers an added interface for recording. Connecting a USB cable between a computer and a USB equipped Carvin mixer will allow recording on a computer (with compatible USB drivers and software).

The L-R stereo mix, (pre-fader, pre-graphic EQ) is sent via the REC OUT USB LEVEL to the rear USB port.

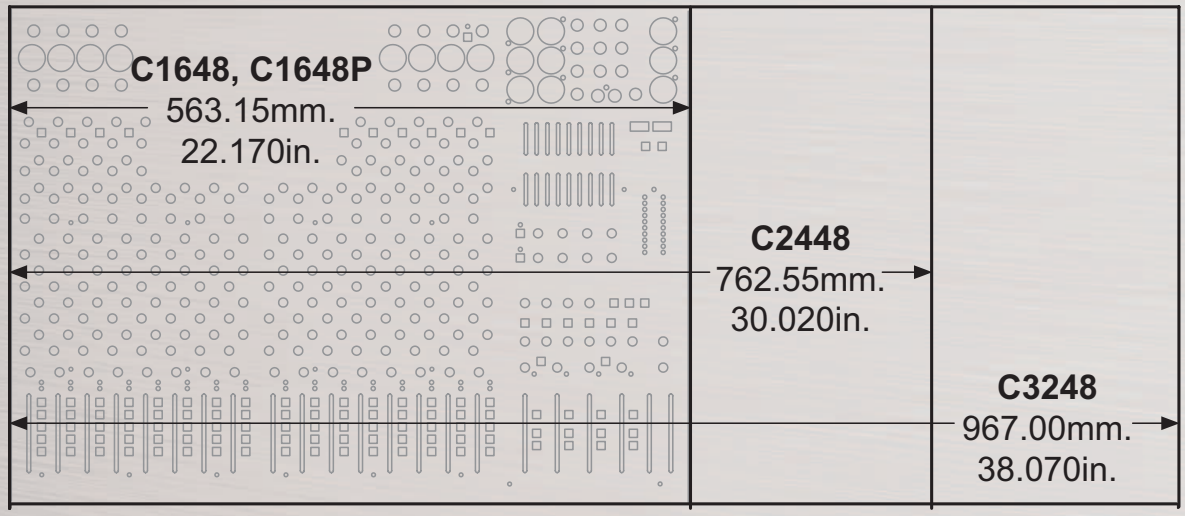
Inversely, you can bring audio in from computer playback via USB. The audio comes into the RETURN 4 bus on the mixer to the RTN4/USB LEVEL control.

The USB features up to 48kHz, 16 BIT audio resolution.

FRAME PROFILES:



FRAME WIDTH:



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.

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.NG: 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)

CE

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.

LIMITED WARRANTY

Your Carvin mixer 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.

SERVICE:

In the USA go to www.carvinservice.com

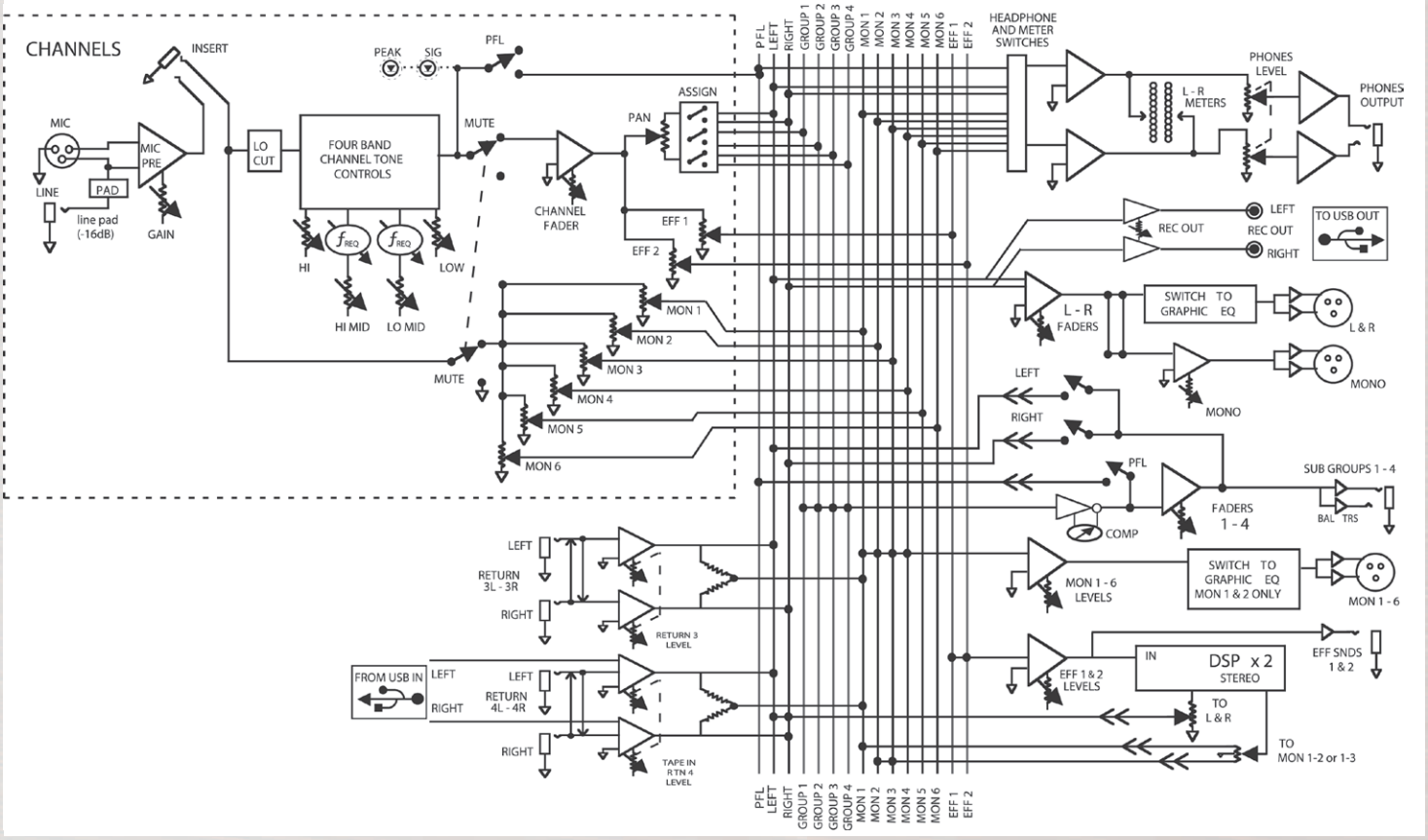
Outside the USA, contact your dealer or go to http://www.carvinworld.com for your nearest service center. Include a written description of the problem with serial number and date of purchase.

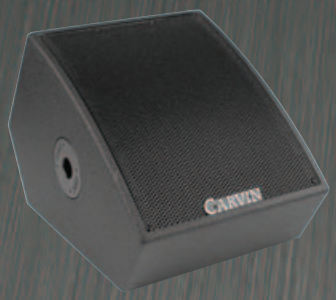
MAINTAINING YOUR EQUIPMENT

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 such as dust or salt air. When used in such an environment, be sure the mixer is adequately protected by a cover.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL!

BLOCK DIAGRAM





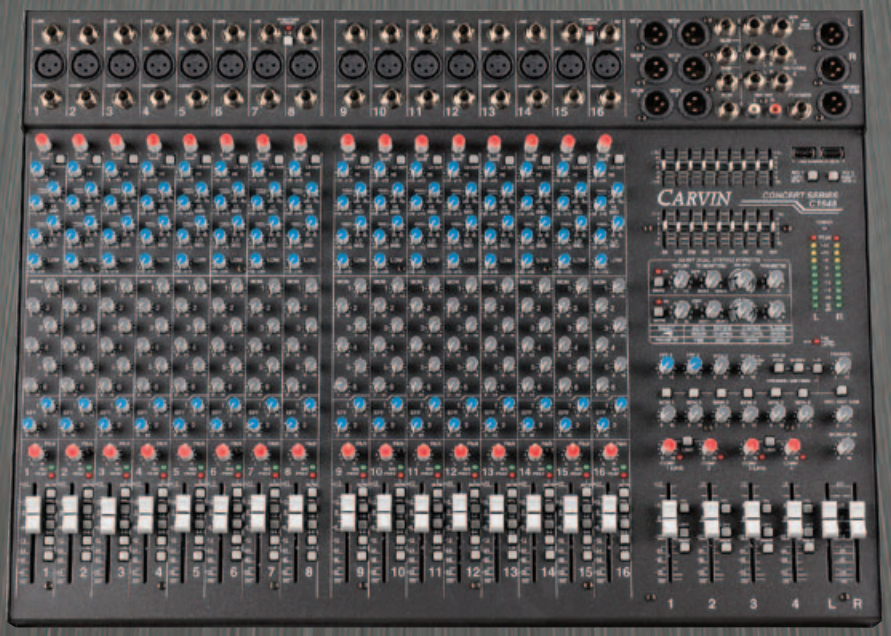
TRX12N - Coaxial Neo Monitor

TRX153N - 3-way Neo Loudspeaker

DCM Lightweight Power Amps

Road Warrior™ Cases

M90S Condenser
M68 Vocal Mics



C1648 • C1648P

SNK24P Snake
featuring Neutrik™
connectors

XD88 - 8x8 Loudspeaker Management System/Equalizer/Limiter

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