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# ***CARVIN***

**MX621 & MX641  
RACK MOUNT MIXERS**

**MX601 SERIES CONSOLE MANUAL**

**REVISED 2/16/88**

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## SECTION I

### UNPACKING & INSPECTION

#### UNPACKING

Carefully remove your new Carvin power amplifier from its carton by turning the unit upside down (referenced by the lettering on the outside of the box). Pull the staples, remove any tape securing the box flaps and hold the flaps out. Gently turn the product right side up and lift the box off of the amp.

#### INSPECTION

##### TRUCK FREIGHT SHIPMENTS:

NOTE: INSPECT YOUR AMPLIFIER AND THE SHIPPING CARTON FOR ANY DAMAGE that may have occurred in shipping. If damage is found, notify the shipping company and Carvin immediately and obtain a DAMAGE INSPECTION REPORT from the shipping company. BE SURE TO SAVE ALL PACKING MATERIALS FOR PROOF OF DAMAGE). Send a copy of the damage inspection report to Carvin and return the goods to Carvin. This will allow us to process any damage claim with the shipping company and provide you with the fastest return of new goods. All goods must first be received back at Carvin prior to exchanging or shipping a new item to you. This is both for yours and our protection.

Also, please note: if you file a "Damage Claim", you will have to settle directly with the shipping company. Upon receiving your settlement you will then have to re-order a new replacement.

##### UPS SHIPMENTS:

If damage is found, and the unit was shipped UPS, first make note of the damage to the unit and SAVE ALL PACKING MATERIALS. Then, call Carvin and notify UPS of the damage. Have UPS inspect the damage and issue a damage report number. Then have your unit picked up and returned to us. Carvin will handle the damage claim with UPS, and upon receipt of your damaged unit, a new amplifier will be shipped to you immediately.

NOTE: Have UPS issue the damage report because if you file a claim with UPS, you will have to wait until you receive your settlement before re-ordering from Carvin. This could delay your receipt of a properly operating unit from 2 to 3 weeks. If you are at all in doubt, call Carvin and we'll be happy to assist you.

Also, be sure to insure the returned goods for the full amount. This will assure proper protection against further damage that could result in the return shipment.

**Save the carton and all packing materials.** In the event you have to re-ship your amplifiers "ALWAYS" use the original carton and packing materials. This will provide the best possible protection for your unit during shipment. Both Carvin and the shipping company will not accept liability for damage caused by improper packing. (Replacement cartons are available from Carvin at \$10.00 + \$2.00 shipping).

**Save your invoice.** It will be required for warranty servicing of your unit in the event such servicing is necessary. Always check your invoice against the items you have received. If you find some items missing it may be that they were simply split up during shipment. Please allow several days for the rest of your order to arrive before inquiring. If you determine (after allowing an appropriate amount of time) that you have not received all your items, please call Carvin in order that we may take the necessary steps to assure that you receive all the items in your order.

**CAUTION--TO PREVENT ELECTRIC SHOCK, DO NOT DEFEAT THE SAFETY GROUND CORD.**

**WARNING--TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE UNIT TO RAIN, MOISTURE, EXPLOSIVE ATMOSPHERE, OR INSTALL AN IMPROPER FUSE.**

Questions? Call our toll-free number (800)854-2235.

## SECTION II

### ABOUT THE MX601 SERIES RACK MOUNT MIXERS

MODELS: MX621, MX641

The MX601 series mixers are professional rack mountable consoles with built-in power amplifiers. They are designed to meet the requirements for full function mixing in a rack package. The MX601 series consoles are currently offered in two models: MX621 and MX641. The MX621 model delivers 200 watts rms into a two ohm load (150 watts into four ohms)! The MX641 delivers 400 watts rms into a two ohm load (300 watts into a four ohm load)! PLEASE NOTE: For simplicity, the manual will refer to both models as the MX641.

The features of the MX641 are well engineered to provide the most flexibility. The quiet input preamp circuitry and high input headroom coupled with the MX641's responsive power output make the MX641 consoles a great choice for stage or keyboard amplification. As a mixer for a small group or band, you will find the compact (and rack mountability) an advantage in utilizing space while not compromising performance. Additionally, if you ever require more channels, simply add another MX641 to your rack, and utilizing the patch jacks located on the front panel, you can have 12 input channels with powered mains and monitors, with separate graphic EQ's ! The MX641's are designed for the traveling band who want the best possible performance value in a compact size without a lot of setup hassles.

Carvin is proud of the engineering and design of the MX641 series mixers. This series offers a noncompromised approach to signal quality and performance. The MX641 features recording quality XLR balanced microphone inputs. These inputs provide -126dB input signal-to-noise ratios (over 8dB quieter than comparable mixers). The input summing circuitry will allow for both the line and mic inputs to be used at the same time. In addition, the 1/4" line inputs will accept high impedance instrument inputs. The MX641's balanced inputs are phantom powered allowing the console to also accept condenser mics (the MX621 does not have this feature). Virtually any type of microphone currently available may be used with the MX641. Each channel features active high and low band EQ with exceptional summing accuracy and range of control. Each tone control features over 15dB range of boost and cut. These controls should accommodate any tonal compensation required to provide the best possible sound. At the top of each channel is a "monitor" send control allowing for a separate stage monitor mix. Although the monitor signal is not internally powered, it is designed to drive long cable runs. This will allow you to remotely power the stage amplifiers dedicated to driving the monitor speakers. Since the internal power amplifiers are patchable on the MX641 you may elect to use the mixers' internal power to drive the monitors, or you elect to separately power your monitors. If you own two MX641's you can assign the monitor sends to be powered by one console, while the mains are powered by the other! Each channel also features a separate Effects/Reverb send control. This will allow you to adjust the desired amount of reverb and effects (digital delay, chorus, doubling, etc.) desired per channel. Properly using this control can allow you to fine tune your mix with the desired range of ambience. If you desire special effects, you simply add them to the patch loop located on the front panel and adjust the intensity of the signal using the effects return control located on the "RTN TO MAIN" master control section. You will find that the built-in reverb is "studio quality" and the ability to add ambience to the monitors will be a great plus in making your monitor mix more accurate and full.

The channel level and main level controls are reliable rotary potentiometers. They will allow precise adjustments to establish the appropriate levels for your mix.

The output graphic equalizer incorporates the same circuitry used in our highly praised EQ2029 1/3 octave equalizer. Its summing accuracy and natural response will allow you to finely tune your main speakers and achieve the most natural response. This equalizer will provide a responsive tool for maintaining the linearity of your speaker system while ensuring the most volume prior to feedback. The graphic equalizer is also "patchable". This means that it may be used to equalize the monitors or the mains.

The patch section of the MX641 is both functional and extensive. It will allow you to patch a tape deck into the unit (without using up any channels). It has auxiliary inputs to allow you to chain another console to the MX641 without tying up channels. The equalizer can be patched via the front panel access. The MX641 also features main preamp outputs, monitor preamp outputs and power amplifier input patching. The accessibility of this patch panel as well as its many patch point further extend the versatility of this mixer.

All Carvin consoles including the MX641 series mixers, are built by using only the finest components available. All internal electronic circuitry is designed for low noise performance and high reliability. Extensive shielding and RFI suppression circuitry provide immunity to radio frequency interference and maintains best signal-to-noise performance. Each channel of the MX641 features a separate circuit card for modularity and reliability. The channel cards are connected using highly reliable modular connectors allowing a channel to be easily removed for servicing or replacement.

The MX641 series mixers are reliable, high quality performance mixers. They are backed by Carvin's commitment to excellence and experience in both designing and manufacturing thousands of professional consoles, speaker systems, amplifiers, signal processing and instruments. The MX641's are engineered to provide you with the best possible design in rack mountable mixers. They are an excellent example of modern mechanical and electronic design. Thank you for your support of Carvin and your dedication as a professional musician.



## SECTION II

### IMPORTANT:

#### READ THE FOLLOWING BEFORE USING YOUR MIXER

#### FACTS ABOUT USE

Your new MX641 series mixer is designed to offer many years of trouble free performance. Understanding the following concepts about the use of your new mixer will help greatly in maintaining its best performance and reliability.

1. The wires used for your speakers should be 16AWG or heavier in order to retain the highest possible damping factor from the amp. All speaker wires should be NON-SHIELDED. Shielded speaker wires can cause high frequency oscillations that result in excessive heat build-up and eventual amplifier shut down or failure. See section #3 "Rear Panel Features" (speaker outputs) for additional information outlining the difference between shielded and non-shielded cables.
2. The high power output capability of the MX641's amplifier is capable of damaging almost any loudspeaker. Each speaker should be fuse protected. This will ensure the best possible protection for your speaker system. If your speakers are not fuse protected, you may insert a fuse "In-line" (in series with the hot speaker line) of your speaker cord. Usually the fuse will be in series with the lead going to the "red" terminal of the speaker (or tip of the 1/4" phone speaker jack). Please remember that fuses are not 100% fail safe. There are instances where fuses blew and damage was still done to the speaker. However, fuses do offer protection not otherwise achieved and they have received a good reputation (overall) for adequate speaker protection.
3. Periodic cleaning of your unit is strongly recommended. One of the major contributors to reduced reliability is dust and dirt. Keeping your amplifier dusted and free from excessive build-up of dirt will help provide extended reliability from your mixer.
4. You will note that the MX641 series mixers do not have a ground reversal switch. It has been eliminated to prevent shock hazard. All grounding is done through the ground lug of the three conductor A.C. plug. This is the safe and proper way to ground all electrical appliances. If for any reason you require an A.C. line phase reversal, you may do so by utilizing a three to two prong adaptor and flipping the plug. **NEVER DEFEAT THE USE OF THE THIRD PIN GROUND LUG ON THE A.C. RECEPTACLE. WHEN USING A THREE TO TWO PRONG ADAPTOR, BE SURE THE GROUND LINE IS PROPERLY CONNECTED TO A 'GOOD' GROUND. THIS IS TO PROVIDE THE BEST MARGIN OF SAFETY AND PERFORMANCE FROM YOUR AMP.**
5. Always be sure you are plugging the amp into the proper A.C. voltage. Be sure the voltage is properly regulated. The MX641 features dual voltage capability 120V/220V switching. If the unit is going to be powered from a generator, be sure the generator has proper "electronic" voltage regulation and that the A.C. lines are free from voltage surges.

6. Whenever turning on or off external amplifiers such as monitor amplifiers connected to your MX641, you should follow this rule: "**LAST ON-FIRST OFF**" This means that you will turn on all associated pre-amp (mixers) and associated equipment prior to turning on the amp. When you are finished with a performance, the amplifier will be the **first** item shut down. Following this procedure will help eliminate pops and power surges (created by preceding equipment) that are annoying to audiences and potentially harmful to speakers.
7. Do not remove the MX641's cover at any time while the unit is plugged in or turned on. **THERE ARE POTENTIALLY LETHAL VOLTAGES INSIDE THE UNIT.**

## **PRECAUTIONS**

Observing the following precautions concerning the use of your MX641 will help extend its reliability and will help provide for the most dependable operation.

1. All connections to the unit should be made with the power off.
2. Do not connect an input ground lead to an output ground lead. This could potentially cause a ground loop or oscillation.
3. Do not use shielded or "Coax" type cables for speakers. All speaker cords should be "NON-SHIELDED".
4. Make sure your speakers are properly protected with fuses.
5. Never connect the output of the amplifier to the input of another amplifier. Never connect the output of the amplifier to any other power source such as a battery, output of another amp, power main, etc.
6. **DO NOT** expose the amplifier to corrosive chemicals such as soft drinks, corrosive cleaning chemicals, salt water, etc. Never immerse the amplifier in any liquid.
7. **NEVER** operate the amplifier in an explosive environment, such as closed garage with open gasoline containers.

## **PROCEDURES BEFORE TURNING ON THE UNIT**

The MX641 mixers are designed for "table top" or "rack mounting". The four rubber feet may be removed if amps are to be stacked. Removing the four screws at the bottom of the unit will allow it to be removed from its cabinet for rack mounting.

When "rack mounting" the MX641, be sure to allow for sufficient air flow. The rack must have an open back to allow for the normal flow of hot air up and away from the rack.

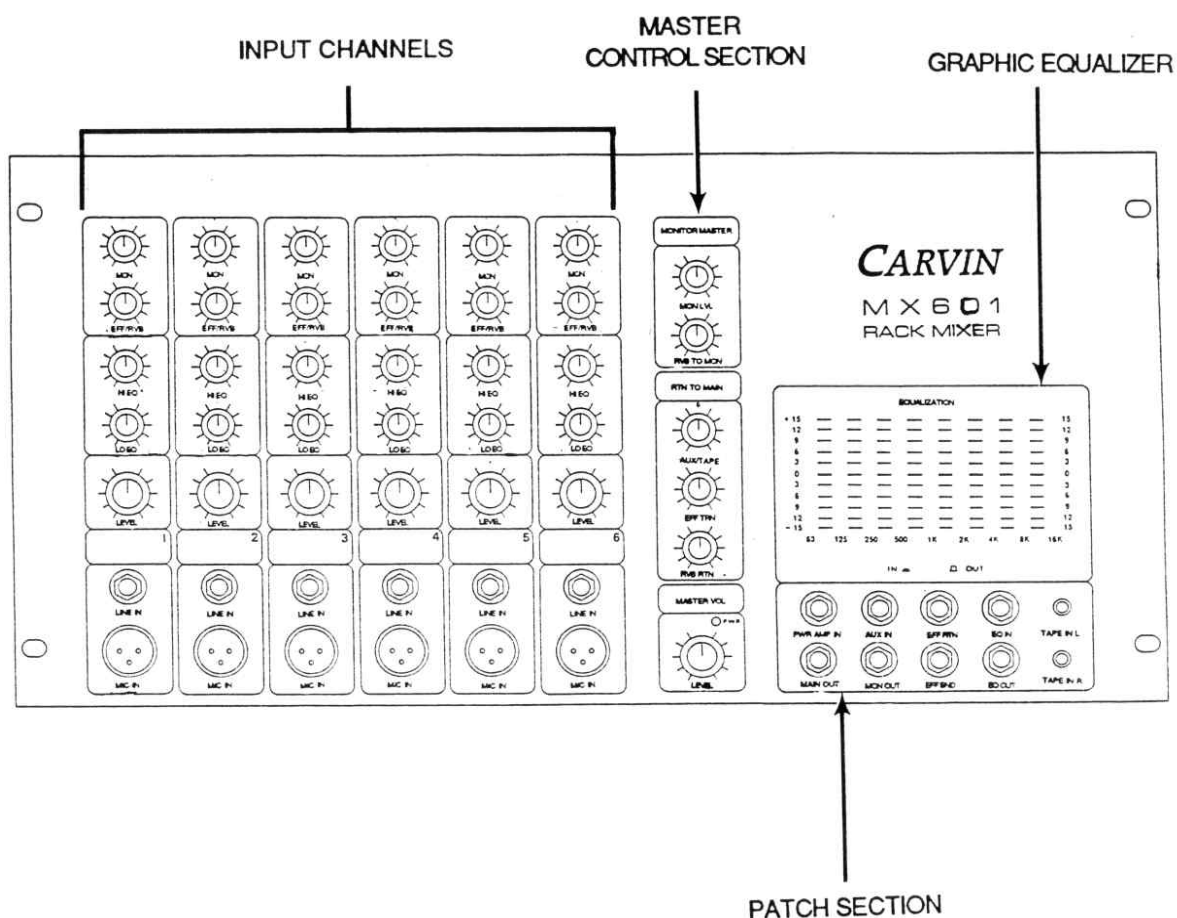
Make all connections to the unit (input and output) prior to turning on the unit. Be sure all cords are well maintained. The proper type of cord will ensure the correct input and output connections to the unit. (All input connections should be shielded cable, and all output connections should be non-shielded cable, and all output connections should be non-shielded 16AWG gauge wire or greater).

Use your MX641 with common sense and caution. The amplifier in the MX641 is capable of delivering enough power to damage hearing as well as harm any speaker!



## SECTION III

### FRONT PANEL FEATURES



#### INPUT CHANNEL

##### 1. XLR MIC INPUT-

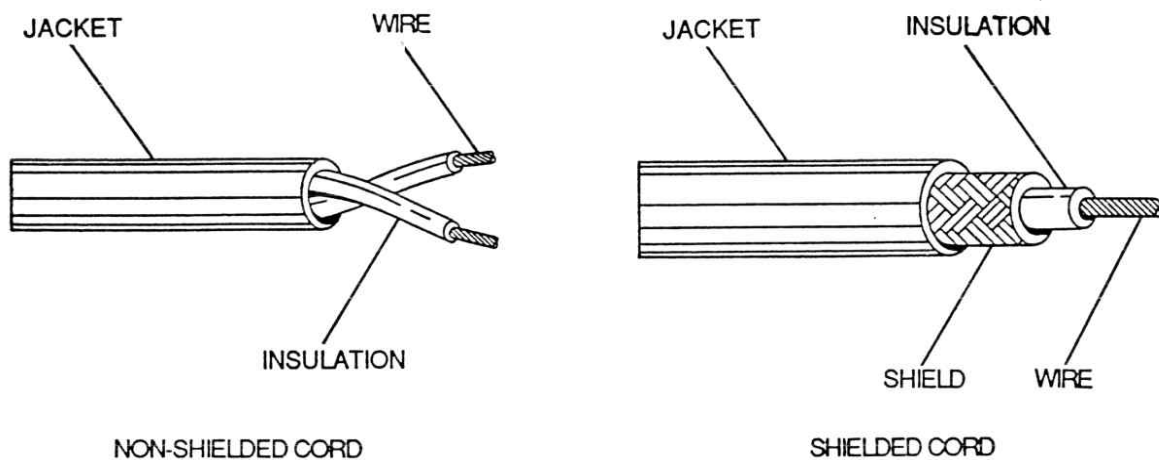
This "XLR" input is designed for balanced low impedance (microphone) input signals. This allows for long microphone cable runs without significant signal or high frequency loss. Low impedance mics also offer greater signal strength (compared to conventional high impedance mics) resulting in lower overall noise and higher performance from your mixer.

The input channel is "balanced". Since the signal level transmitted by the microphone is very low, it is susceptible to interference by "injected signals" from other voltage sources. This

"hum" can be injected onto the cable by AC lines, stray field from electric motors or other sources. Balancing the input signal has the result of cancelling this extraneous hum. The net effect results in the lowest possible noise from long cable runs. The result is low impedance (allowing for long cable runs) and balanced (long runs with out hum) will offer the best overall performance from both your microphones and sound system.

All microphone cable currently sold are "shielded". This means that the signal wire within the cord is surrounded by a tightly braided or solid shield "ground" wire. This is done so that any potential injected signals "stray field" will be passed through a ground plane prior to reaching the signal wire at the center of the cord. All mic or preamp cables should be shielded for the best possible performance. See the following diagram for comparison between shielded and non-shielded cords.

### COMPARISON OF SHIELD/NON-SHIELDED CABLES



### 2. CHANNEL LINE INPUT JACK-

This jack is designed to accept signals normally too strong for the microphone input underneath. Line level (or preamp level) signals typically range from 200 millivolts to 2 volts. This input will accept both high and low impedance input signals. It is sensitive enough to directly accept the output of a guitar or similiar instrument, yet it will also accept line level signals such as preamp outputs from amplifiers or keyboard systems. It utilizes a standard 1/4" phone plug connection.

### 3. CHANNEL LEVEL-

The level control adjusts the volume of the channel. It is calibrated from 0 to 10 and will allow you to set the level of each channel independently from the other channels of the mixer. The combinations of these various levels and the tonal adjustments will ultimately become your main level mix. Although each channel's volume can be set with respect to each other, the overall output level (loudness) of the console is determined by the main level control located on the master control strip. Typically you want to run these volumes higher than the master volume. This will provide the best overall signal-to-noise ratio.

#### **4. CHANNEL TONE CONTROLS-**

The active tone controls will adjust the overall response of the channel. The high frequency (treble) control is at the top, and the low frequency (bass) control is at the bottom.

How a tone control works is roughly similar to a volume control. The main difference is that a tone control adjusts the volume of a specific range. The proper use of these controls will allow you to properly balance the level of the high frequencies and the low frequencies for the most natural tone. You should experiment with these controls to become familiar with their respective sounds and to determine how they will best suit your needs. If you are making excessive adjustments with these controls it may be due to poor microphone response or improper micing technique. Changing to a different microphone, or changing the angle (or proximity of the mic or the sound source) may offer the best solution to the problem.

#### **5. CHANNEL EFF/REV SEND-**

The Effects Send Control is a "post volume" control. This means that when the channel volume is OFF, so is the Effects Send Level. This is done because the control is used to set the level (per channel) of the signal sent to the internal reverb system or an external effect. Also, the reverb and/or effect should vary in intensity along with variations in the channel volume. This control is normalized to the internal reverb system and will control the level of the signal sent to the internal reverb system.

**NOTE:** In order to hear reverb from you system you will also have to turn up the RVB RTN (Reverb Return) control located on the control level master section of the console. And, you may hear reverb in the monitors as well by turning up the RVB TO MON control also located on the control level master section.

#### **6.CHANNEL MONITOR LEVEL-**

This is a "prefader" signal that is used to send signals from the channel to the stage monitors. Any channel volume changes will not affect the response of this control. The MON level control will select the desired monitor level of a channel relative to the other channels. These levels will then be "bussed" to the main monitor level control that will establish the overall level of the stage monitors.

It is possible to have an entirely different stage monitor mix than the main mix. For instance, you could have a vocal louder in the monitors while feeding a lower volume signal (adjusted by the channel volume control) to the main speakers. Since stage monitors are typically right next to the microphones, they are usually the most susceptible to feedback. You should use caution when adjusting monitor levels during a live performance. It will take a certain amount of "feel" for addressing the proper monitor mix, however experimentation and practice are the key to consistent results and professional performances.

## **MX641 MASTER CONTROL SECTION**

### **1. MAIN LEVEL CONTROL-**

The main level control adjusts the overall volume level of the mix. The "channel" volume levels will set the relative levels of each channel with respect to each other. The Main Level Control will then adjust the "overall" level of the entire mix, and ultimately the listening volume of the system. It is usually best to operate the Main Volume Level control at the same level as the channel volume controls. This will provide the best signal-to-noise ratio, and ultimately the quietest mix.

### **2. PWR LED-**

The power LED illuminates to indicate the A.C. power has been applied to the unit.

### **3. RETURN TO MAIN-**

This section of the console allows the control over signals being returned to the main mix. These three controls adjust the level of the Tape Returns, the Effects Returns, and the Reverb as it will be heard in the main mix. The following will discuss each of these features:

- A. The AUX/TAPE return level functions as a seventh channel. This will control the level of the tape source plugged into the "TAPE IN" jacks. The output level of most tape decks is preset, which means that without some sort of level control, the overall level of the tape deck may be too loud. The AUX/TAPE return level will allow you to adjust the appropriate level that you need for playing tape signals through the "TAPE IN" feature.

The AUX/TAPE return also adjusts the level of any signal that is returned to the "AUX IN" (auxiliary input) of your console. This 1/4" phone jack is also located on the patch section of your console. If you have both a tape deck and another signal source returned via the "AUX IN", this control will adjust both of these signals simultaneously.

- B. The EFF RTN or "Effects Return Level" will adjust the level of any effects that you may have patched into the MX641. Normally you will send signals to your external effects (such as digital delays, chorus units, doubler, etc.) using the EFF/RVB send controls on each channel. These signals are then fed to your effect by patching an appropriate cord from the EFF/SEND jack (at the patch section of the MX641) to the input of your effect. You will then adjust the appropriate input sensitivity of your effect its input level control. You should drive your effect with the optimum signal level to achieve the best performance from your effect. The output of the effect is then returned to the console via the EFF/RTN control. You may wish to experiment with various effects to enhance your mix.

Digital delays, and chorusing can really add extra ambience and depth to your mix for a more full sound. Additionally, the effects send and receive capability of the MX641 should be exploited to obtain more dimension to your mix. Experiment with this feature--you will enjoy the variety.



- C. RVB/RTN - or Reverb Return Level adjusts the level of the internal reverb system for your mix. The EFF/RVB send controls simultaneously adjust the level of the internal reverb system (per channel) along with the effects send level. So, it is best to use ambience-type effects to best compliment the internal reverb system. If you do not wish to use the internal reverb system, simply adjust the RVB/RTN control to the OFF position.

**NOTE:** Sometimes you may wish to have two different effects at different levels in addition to the internal reverb system. To achieve this you simply use the effects send control to send the effects mix to both effects (you may need to use a "Y" cord). Then simultaneously return the output of the effects to the EFF/RTN jack and the AUX in jacks on the patch section of the MX641. You may independently adjust the level of the effect by using the AUX/TAPE control and the EFF/RTN control. (Remember the AUX/TAPE control adjusts the level of both the AUX IN and TAPE IN connections). You may leave your tape deck connected to the TAPE IN connections, but remember to return your TAPE/AUX control back to its appropriate aux return level for your effect.

#### **4. MASTER MONITOR LEVEL-**

This is the main level control for the monitor output of the console. Each channel's individual monitor level will be controlled by the channel monitor level control. The overall volume of the monitor system will be controlled using the MON LVL (Master Monitor Level Control). As with the main fader level control, this control should be run at a slightly lower setting than the channel monitor level controls. This will provide the least electronic noise and offer the best overall signal-to-noise ratio.

### **PATCH SECTION**

#### **1. TAPE IN (L,R)-**

This patch connection is designed to accommodate the standard RCA type jacks used with normal consumer tape recorders. The output of your tape recorder will plug into these connections and will be adjusted in level by the AUX/TAPE control located on the Master Control Section.

#### **2. EQ (IN,OUT)-**

The MX641's graphic equalizer may be accessed using these jacks. Any external signal may be inserted into the "EQ IN" jack (subsequently equalized by the graphic equalizer) and the resultant "equalized" signal is then accessed by the EQ OUT connection. This is a very useful feature for equalizing other signals (other than the main mix on the MX641). For example, the monitors may be internally powered and equalized by using the patch jacks as follows:

- A. MON OUT jack is fed into the EQ IN using a standard 1/4" shielded guitar type cord. (Be sure the EQ "Patch" button is "OUT"). This ensures that the EQ is unassigned and available to be patched).
- B. The EQ OUT jack is fed into the PWR AMP IN jack using a shielded 1/4" shielded type guitar cord. This connections allows the power amplifier to the equalized monitor signal. The main signal feeding the power amplifier is disconnected when a cord is patched into the PWR AMP IN connection.

- C. You now have the monitor output feeding the equalizer and subsequently powered by the internal power amplifier. If you wish to simply equalize the monitor signal without internally powering it, you may send the EQ OUT signal to your monitor power amplifier remotely.

### **3. EFF (Send, Return)-**

The Effects send jack will feed the effect signal to your effect(s). The Effects return jack accepts the output of your effect chain to be summed in the mix. The Effects send level is controlled by the individual EFF/RVB level control on the channels. The Return Level of the effects are adjusted using the EFF RTN control located on the Master Control Section of the console.

### **4. AUX/IN-**

The Auxiliary Input acts as another "line input" channel. It allows line level signals to be returned to the MX641 without using any of the channels. The volume of this signal as it appears at the main outputs is controlled by the AUX/TAPE return control on the Master Control Section. This input may be used to chain other consoles, effects, tape decks or any other preamp level signal to the MX641. In many ways it can be considered a seventh channel.

### **5. MON OUT-**

This is the monitor output connection. The monitor signals from the MX641 are low impedance. This means that you may run this signal through a snake cable (100' to 1000') and remotely powering of your monitor amplifiers. This is a pre-amp level signal and will drive power amplifiers or inputs that will accept preamp levels. If you are not using stage monitors, you may use this output to drive a tape deck for recording (offering independent channel record levels while performing).

### **6. MAIN OUT-**

This jack will access the preamp level signal from the main mix. Internally this signal is connected (through the PWR AMP IN) jack to the internal power amplifier. This output may be used to record, or feed additional power amps if you expand your system.

**NOTE:** If you wish to record using the MX641, you do not need to have your speakers plugged in. The MX641 will operate without speaker loads allowing you to use the MX641 as a preamp mixer for recording or simple subgrouping.

### **7. PWR AMP IN-**

This jack will access the internal power amplifier in your MX641. As soon as a connection is made into this jack the internal routing of the signal from the main buss to the power amp (through this jack) is disconnected. Any signal that is then inserted is then directly sent to the power amplifier. The powered signal is then available at the speaker jacks at the rear of the console. This feature is especially useful for internal powering of the monitors, bi-amplification or simple access to the internal power amplifier of the MX641.

## GRAPHIC EQUALIZER

The graphic equalizer is designed to offer extensive control over the tonal response of your main speakers. It will ultimately allow you to achieve the most natural "flat" response from your speaker system. Graphic equalizers are aptly named for their "graphic representation" of the volume level of various frequency bands. Instead of calling each bandpass, midrange, or treble, each band is listed according to its exact frequency reference. Therefore the bands are listed as 63Hz, 125Hz, 250Hz, 500Hz, 1000 Hertz 1k, 2k,4k, 8k, and 16k. These numbers refer to the exact band that you will be adjusting as there are a few more controls than a standard three band equalizer, and that setting up a graphic equalizer may appear more difficult. This is "not" the case. In fact, you will probably find that using the graphic equalizer will be simple--probably more simple to use than a conventional rotary control three or four band equalizer.

At this point the best way to set your equalizer would be to experiment with the different bands to become familiar with the different sounds of the equalizer. Set each of the bands at "0" and boost/cut each band one at a time to become familiar with their respective sounds. Then experiment with the overall sound of all the bands of the equalizer until it sounds good to you. Let your ear be the best judge. Although there are more sophisticated methods of electronically setting your equalizer for a flat response, the ear is usually the final judge of the best overall sound. In addition, proper ear training will ultimately offer the most consistent results when mixing your sound in various rooms.

In setting up your system, you should begin by setting the channel equalizers to the "0" position and adjust the main graphic equalizer to deliver the best sound that suits your ear. You should then make the appropriate adjustments on each channel to achieve the correct tonal response and obtain the most uniform mix. Experimentation and use of this feature is the key to mastering the best sound for your ear using the graphic equalizer.



## SECTION III

### REAR PANEL FEATURES

#### 1. A.C. LINE CORD-

When plugging in your MX641 console, be sure that you check the A.C. power source to be sure it is from 110V to 120V, 50Hz or 60Hz. Also, recommended is using an A.C. power strip that is both surge and broad band noise filtered. This will provide an extra margin of safety and reliability for your console. **FOR YOUR SAFETY - NEVER DEFEAT THE 3RD GROUNDING PIN ON YOUR A.C. CORD.**

#### 2. POWER ON/OFF SWITCH -

This is the main A.C. switch for the mixer. It is normal to hear a slight thump when turning ON and OFF your console. This "turn on transient" will not harm your speakers. It is always a good idea to have your main level control "OFF" when turning on your mixer. This will eliminate any possibility of feedback or excessively loud noises from too much gain when initially turning on the mixer.

#### 3. A.C. LINE FUSE -

The A.C. main fuse is a protective safety feature. If your mixer should have an electrical malfunction, this fuse will protect the unit from further damage. You should never attempt to increase the value of this fuse from the value listed on the back of the chassis. To do so could cause damage to the mixer.

**NOTE:** If you ever need to run your mixer from an A.C. source produced by a generator, you should use a properly "regulated" generator that will eliminate A.C. power surges. Such surges could damage your console or result in blown fuses.

The recommended fuse values for the MX601 series consoles are as follows:

MX621..... 3 amp

MX641..... 5 amp

#### 4. 120V/240V SWITCH-

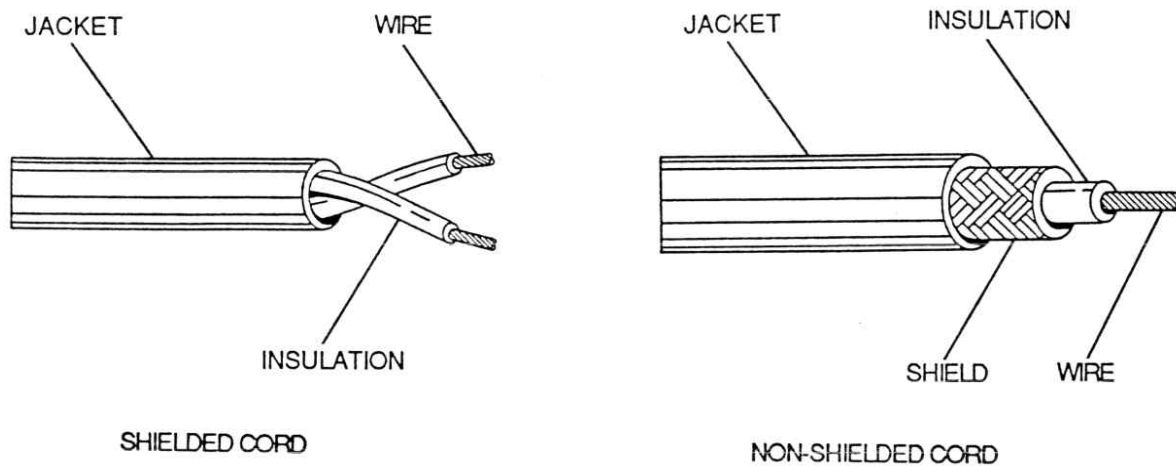
This switch selects the appropriate voltage. 120V/240V switching is only available on the MX641 (higher powered) model. To determine if the switch is properly selected, simply look at the switch. The voltage that you read on the switch indicates the voltage that is selected. You may select the voltage by inserting a small screwdriver and moving the switch to the appropriate position.

#### 5. POWER AMP SPEAKER CONNECTIONS-

There are two 1/4" phone type speaker output jacks. These two jacks are wired in parallel. It is very important that all your speaker cords be "non-shielded". This is the only place where you will use a non-shielded cable with your system. Shielded cables (such as guitar cords) can cause high performance amplifiers (as the one in the MX641 mixer) to oscillate due to cable

capacitance. Oscillation is a form of electronic feedback that can ultimately damage your amplifier. See the following diagram to properly determine if your cables are shielded or not:

### COMPARISON OF SHIELD/NON-SHIELDED CABLES



For speaker cable lengths up to 100', it is recommended that you use a 16 gauge or larger wire. For speaker runs up to 300', it is recommended that you use 14 gauge wire. This will provide the best possible "damping" performance from your amplifier and offer the greatest power delivery to your speakers. It is also advisable that you turn your unit "OFF" when connecting or disconnecting your speakers.

### 6. FORMULA FOR PARALLEL IMPEDANCE

Usually when you are simply plugging two or more speakers into your amplifier you will be paralleling them to the output of your amp. In Series connections you will simply add the rated impedance of the speakers together to find the loading:

EXAMPLE: 2 ohms + 2 ohms = 4 ohms

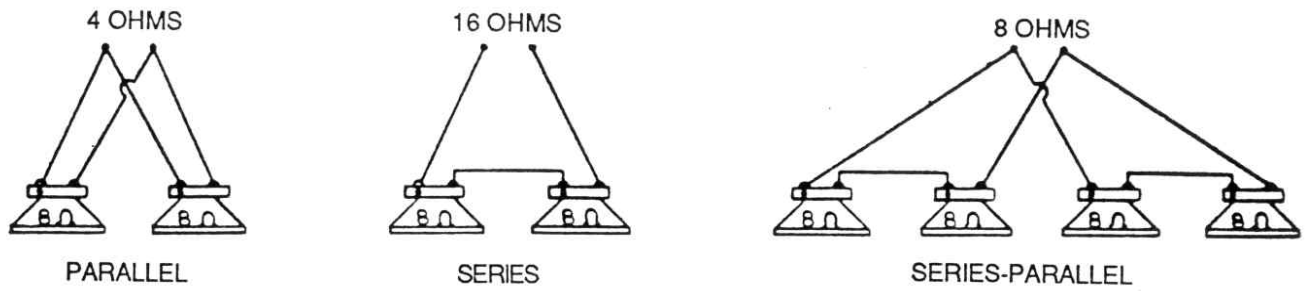
When you are paralleling speakers, you should utilize the following formula to determine your amplifier loading:

Take the rated impedance of each of your speakers, whether it is 8, 4, 3, 16 ohms or whatever. Invert these numbers into fractions. For instance 8 ohms would become 1/8, 4

ohms would become 1/4, and so on. Add each of these fractions together and divide the numerator by the denominator. The result will be your load impedance produced by your speaker system. For instance, two 8 ohm speakers connected in parallel would provide the following calculation:

$$\begin{aligned} 1/8 + 1/8 &= 2/8 \\ \text{Inverted} &= 8/2 = 4 \text{ ohms -TOTAL LOAD IMPEDANCE} \end{aligned}$$

Do not load the MX641's amplifier below its rate minimum impedance (2 ohms). To achieve this you may have to utilize parallel, or series speaker connections. Please see the following diagram for the difference between series and parallel connections.



The actual formula for calculating parallel impedances is  $Z_{\text{parallel}} = \frac{1}{\frac{1}{Z_1} + \frac{1}{Z_2} + \frac{1}{Z_3} + \dots + \frac{1}{Z_n}}$

The formula for series impedance is  $Z_{\text{series}} = Z_1 + Z_2 + Z_3 + \dots + Z_n$

If you have any questions regarding how many speakers you can run off your amplifier, please do not hesitate to call CARVIN. We will be more than happy to help you determine if you are operating your amplifier properly.

## 7. AMPLIFIER COOLING FINS-

These are the cooling fins for convective cooling of the power amp. You should be sure to provide at least 4" space at the rear of your mixer (when using it against a wall) to provide for sufficient cooling. Cooling air is drawn through the ifns and ventilated at the rear of the mixer.





## SECTION IV

### CONNECTIONS TO THE MX641 MIXER

#### INPUT CONNECTIONS

##### 1. A.C. INPUT-

The A.C. main voltage should be 120V. The MX641 model console has dual voltage capability 120V/220V. Both units will operate on 50/60Hz. The 3-pin grounded type plug is standard and is accommodated by all standard 3-pin American sockets. The color code of the cord is as follows:

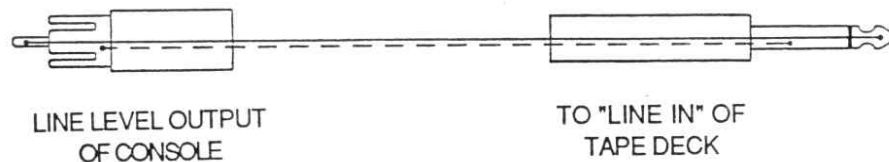
HI (Switched Leg).....	Black
LO (Neutral).....	White
EARTH (Chassis Ground).....	Green w/Yellow Tracer

##### 2. "XLR TYPE BALANCED INPUT"-

The 3-pin XLR input is provided on the front panel (channel input) of the MX601 series mixers. This is a balanced bi-polar differential input capable of accepting impedances from 150 to 50,000 ohms. If you will be using microphone cables that are longer than ten feet, it is recommended that you utilize the balanced inputs on your unit. Low impedance characteristically allows for the best input performance from long cable runs, while electronic balancing helps to reduce stray field "hum".

If you need to connect a single ended (RCA phono, or 1/4" phone connection) to the XLR or 1/4" phone plug input, you may utilize the following diagram for achieving the connection:

RCA TO 1/4" PHONE DIAGRAM  
RCA TO XLR DIAGRAM





## SECTION V

### SERVICE /WARRANTY

#### SERVICING IN YOUR AREA

You may select your own service center or have your own qualified technician work on the unit at your own expense. This will not void the warranty for future repairs unless damage was done because of improper servicing or component replacement. If damage was done, a normal fee for parts and servicing will be charged.

Under the ONE YEAR WARRANTY, Carvin will ship parts pre-paid to you or your technician providing that the defective part(s) are first returned for our inspection.

If you do not have a qualified service person, we ask that you do not involve yourself in servicing the unit. By sending the unit back to us, you may save time, money, and frustration. Also, you will know that your unit was serviced according to factory specifications.

If it is necessary to have your unit serviced locally, we recommend that you have your technician call us before servicing your unit. We find that those who do this are able to make necessary repairs faster, and for less money. We are glad to help in this manner.

**REMINDER:** CARVIN DOES NOT PAY FOR SERVICING OR PARTS OTHER THAN OUR OWN - NO EXCEPTIONS. IF YOU ELECT TO HAVE YOUR OWN SERVICING DONE, THESE BILLS MUST BE PAID BY THE CUSTOMER.

**CAUTION:** TO PREVENT ELECTRIC SHOCK DO NOT DEFEAT THE SAFETY GROUND ON THE POWER CORD. DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE.

**WARNING:** TO PREVENT FIRE OR SHOCK HAZARD DO NOT EXPOSE TO RAIN, MOISTURE, EXPLOSIVE ATMOSPHERE OR INSTALL AN IMPROPER FUSE!

#### FACTORY SERVICING PROCEDURES

We highly recommend utilizing our specialized servicing staff to bring your unit up to factory specifications. Regardless of your warranty status, please follow these guidelines when returning units for service:

1. Enclose a full description of the malfunction. Please use the "Service Authorization Form" included with this manual.
2. Include a copy of the original invoice to verify your warranty.

3. Return the product in its original carton with the original packing material. NEITHER CARVIN NOR THE SHIPPING COMPANY WILL ASSUME LIABILITY FOR IMPROPERLY PACKED UNITS. Ship the unit by UPS if possible. You must pre-pay the shipping cost.
4. Please allow five working days for servicing plus shipping time to and from destination. All repairs in by MONDAY will be ready by the following MONDAY.
5. Carvin will pre-pay the shipping back to you providing the unit is covered under warranty. If you wish to have it sent back by AIR, you will be required to pay the difference COD.
6. If your unit is out of warranty, you will be charged a modest fee (generally lower than typical repair shops). You must pay shipping charges both ways. These charges will be collected COD.
7. If in doubt about the malfunction, please call a Carvin salesman toll-free at 800-854-2235. Occasionally we receive merchandise that works fine, but because of an oversight, the unit was returned needlessly.

## LIMITED WARRANTY

Your Carvin Professional Series Product is protected against failure for ONE YEAR. Carvin will service the unit, supply all parts, and pay the RETURN shipping charges at no charge to the customer providing the unit is under warranty. CARVIN WILL NOT PAY FOR PARTS OR SERVICING OTHER THAN OUR OWN.

This warranty is extended to the original purchaser only and is not transferable. THIS WARRANTY DOES NOT INCLUDE FAILURES CAUSED BY INCORRECT USE, INADEQUATE CARE OF THE UNIT, OR NATURAL DISASTERS. A COPY OF THE ORIGINAL INVOICE IS REQUIRED TO VERIFY YOUR WARRANTY.

Carvin takes no responsibility for any horn driver speaker damaged by this unit.

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. No liability is assumed for damage due to accident, abuse lack of reasonable care, loss of parts, or failure to follow Carvin's directions. CARVIN SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

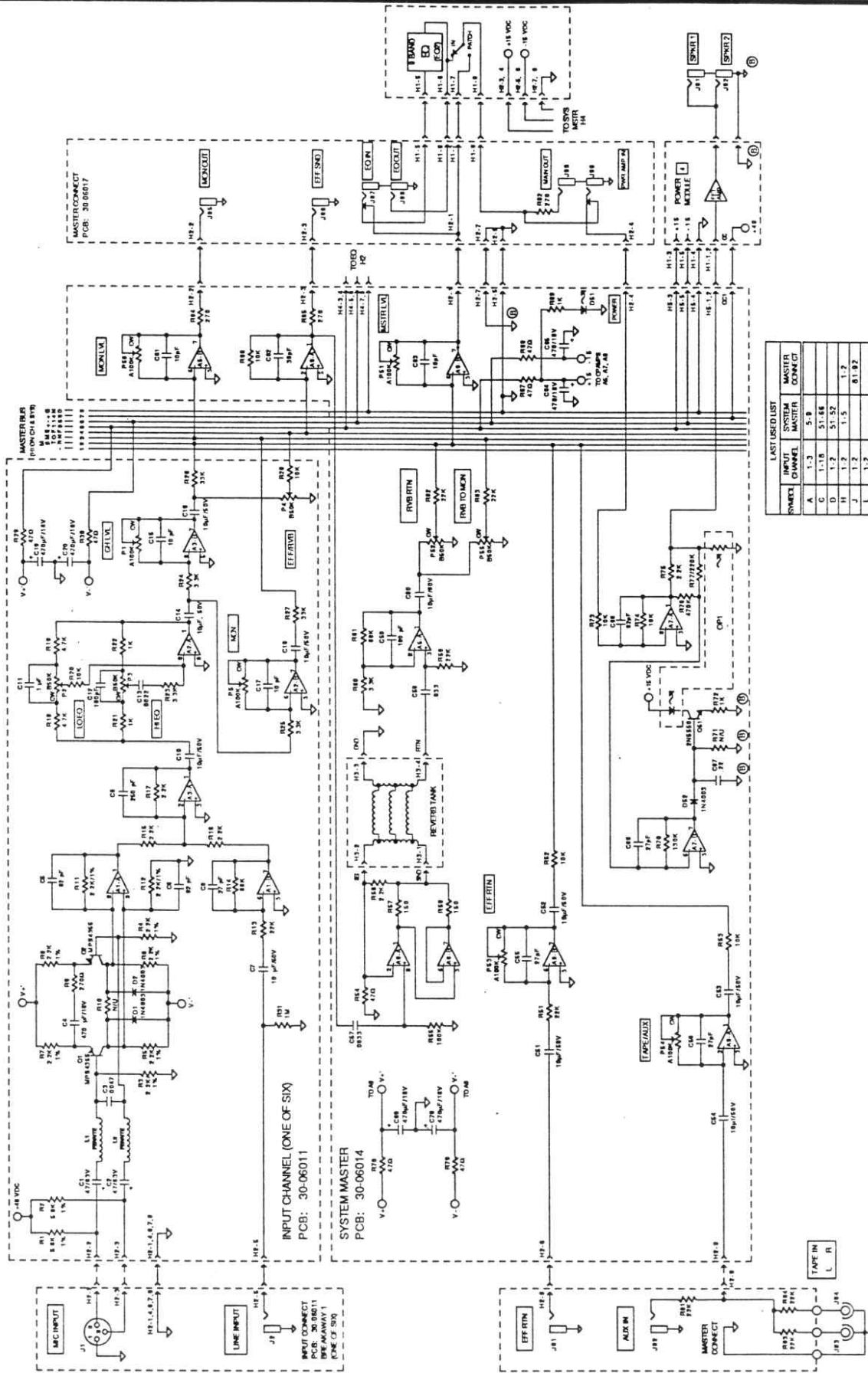
In the interest of creating new products and improving existing ones, Carvin is continually researching the latest state-of-the-art audio design methods, and modern packaging and production techniques. Thus, Carvin reserves the right to make changes in its products and specifications without notice or obligation.

## TECHNICAL SPECIFICATIONS

<b>Frequency Response</b>	Mic or line inputs: 20 Hz-20kHz $\pm$ 1 dB
<b>Total Harmonic Distortion</b>	Mic in to main out 30 dB gain 0 dBv output, 20-20kHz: less than .03% Line in to main out 6 dB gain +10 dBv output, 20-20kHz: less than .02%
<b>Equivalent Input Noise</b>	unweighted, 150 $\Omega$ source: -126 dBv
<b>Output Noise</b>	(unweighted/20kHz B/W) All controls minimum: -80 dBv Master controls nominal w/ Channel controls minimum: (non-powered models) -80 dBv (powered models) Master controls nominal w/ one channel set for 40 dB gain: -79 dBv (powered models)
<b>Crosstalk</b>	Adjacent channels: -60 dB at 1kHz -50 dB at 10kHz
<b>Common Mode Rejection Ratio</b>	-75 dB at 1kHz -60 dB at 100 Hz
<b>Phantom Power (MX641)</b>	+48V DC applied to pins 2 and 3 of XLR
<b>Channel Equalizer</b>	Type: 2 band active Hi-band: $\pm$ 15 dB @ 10kHz Low band: $\pm$ 15 dB @ 80Hz
<b>Graphic Equalizers (2)</b>	Type: 9 band at octave intervals Max boost/cut: $\pm$ 15 dB Center frequencies: 63, 125, 250, 500, 1k, 2k, 4k, 8k, 16k
<b>Mic Input</b>	Connector: 3-pin XLR type Input impedance: 3k $\Omega$ (balanced) Source impedance: nominal "low impedance" (50 $\Omega$ to 1K $\Omega$ ) Nominal input range: -70 to -10 dBv (.3mV to 300mV) Maximum input level: +10 dBv (3.3 V)
<b>Line Input</b>	Connector: 1/4" phone jack Input impedance: 22k $\Omega$ (unbalanced) Nominal input range: -20 dBv to +10 dBv (100mV to 3V) Maximum input level: +10 dBv
<b>Maximum Gain</b>	Mic in to main out: 60 dB Line in to main out: 20 dB Effects return to two-track out: 22 dB
<b>Output</b>	Unbalanced output: 1/4" phone jack Maximum output level: +20 dBv unbalanced (10k $\Omega$ load) +26 dBv balanced
<b>Monitor and Effects Outputs</b>	1/4" phone (unbalanced) Nominal output level: +4 dBv Maximum output level: +20 dBv (10k $\Omega$ load)
<b>Power Amplifier</b>	MX621 200 W @ 2 $\Omega$ 150 W @ 4 $\Omega$ 100 W @ 8 $\Omega$ MX641 400 W @ 2 $\Omega$ 300 W @ 4 $\Omega$ 150 W @ 8 $\Omega$ Total harmonic distortion: 0.1% (20 Hz to 20kHz) Frequency response: 20 Hz to 60kHz (-3dB)
<b>Power Supply</b>	Fully regulated & protected
<b>Power Requirements</b>	MX621 120V, MX641 120 240V
<b>Warranty</b>	1 year parts and labor

CARVIN





1. POWER MODULE: MIXER1 USES RD 02011A, MIXER41 USES RD 0401A.  
 2. ALL CAPACITORS ARE IN MICROFARADS (EXCEPT AS NOTED).  
 3. OP1 IS VTL502.  
 4. ALL OP AMPS ARE 4508 TYPES.  
 NOTES: UNLESS OTHERWISE SPECIFIED







