CARVIN

X-30/X-60

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X-Amp

Compact Studio Guitar Amps

OPERATION MANUAL

Manual No. 5001 A

X-30 and X-60

The X-30 and X-60 have been created in response to numerous requests for a compact version of the highly acclaimed CARVIN X-Amps. Like the original X-Amps, these amps are all tube with remotely switchable dual channels and a full array of features designed for the professional recording and performing artist. Please take the time to read this manual thoroughly to get the maximum flexibility from your amp. We thank you for buying a CARVIN product. Please let us know if there is anything we can help you with concerning your X-Amp.

I. INSPECTION AND PRECAUTIONS

Inspect your X-Amp and the shipping carton for any damage which may have occurred in shipping. If damage is found, notify the shipping company immediately and file a damage claim with that company. All shipments are insured but the claim must be filed by you, the consignee. CARVIN cannot ship a replacement until you can provide a claim number. Save all packaging for proof of damage and please notify CARVIN of any damage incurred.

SAVE THE CARTON AND ALL PACKING MATERIALS. In the event you re-ship your amp ALWAYS use the original carton and packaging material to provide maximum protection for your unit. Neither CARVIN nor the shipping company can accept the liability for damage which occurs in shipping due to improper packing. SAVE YOUR INVOICE. It will be required for warranty servicing in the event that servicing is necessary. If you did not receive all the items you ordered, then the packages probably became separated in shipping. (Note that footswitches are shipped separately.) Please allow several days for the rest of your order to arrive before inquiring.

CAUTION — TO PREVENT ELECTRIC SHOCK DO NOT DEFEAT THE SAFETY GROUND ON THE POWER CORD. DO NOT REMOVE THE AMP FROM ITS ENCLOSURE. 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!

II. INTRODUCTION TO THE X-AMP

The CARVIN X-30 and X-60 compact studio guitar amps have evolved from our widely acclaimed 100 Watt X-Amps. Like their predecessors, these new X-Amps are "all tube" and have the same rich overdrive sound which has led many leading performers and recording artists to endorse the original X-Amps. The fact that the list of artist endorsements reads like a "who's who" of the music world is convincing evidence of the outstanding quality of the X-Amp. As one of the first remotely switched two channel guitar amps, the X-Amp has helped to establish channel switching as an industry standard feature. In order to assure the excellence of our amp we at CARVIN have constantly made sensitive comparisons between the X-Amp and other leading guitar amps both in the lab and in live performance situations. This close attention to the competition has allowed us to produce an amp which is superior by design to the rest. This is confirmed by the enthusiastic comments we receive from X-Amp owners (including many well known artists).

The following is a partial listing of well known artists who use the CARVIN X-Amp.

Elvin Bishop
Craig Chaquico (Starshp)
Roy Clark
George McCorkle (Marshall Tucker)
Marshall Crenshaw
Warren Cuccurullo (Missing Persons)
Neil Geraldo (Pat Benatar)
Howard Leese (Heart)
Alex Lifeson (Rush)
Ron Mancuso (Danny Spanos)
Jeff Cook (Alabama)
Pete Sears (Starship)
Steve Vai (Frank Zappa)
Snowy White (Thin Lizzy)

Guitar Player Magazine

"CARVIN has produced an affordable and versatile amp for the lead player that is astonishingly good in comparison to anything else on the market, some at a much higher price!"

— David Hicks, Guitar Player Magazine, Dec. 1983

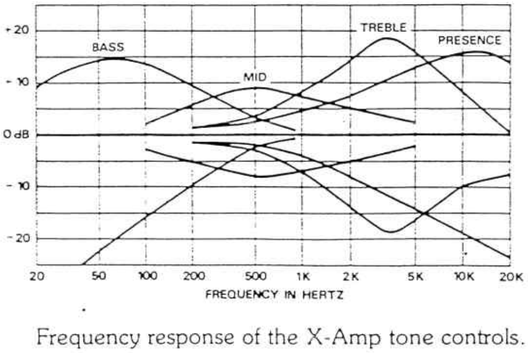
III. BRIEF SET-UP INSTRUCTIONS

If you're like most new X-Amp owners you're probably in a hurry to plug your amp in and play it. Here are some brief instructions to get you going quickly, but we want to emphasize that to really get to know all the features of your X-Amp you should sit down later and read this manual carefully. Plan to spend some time getting to know the wide variety of sounds you can create with the X-Amp.

Check your amp to make sure all tubes are fully inserted in their sockets. Make sure the speaker impedance switch is selected to 16 ohms for the Celestion speaker, or 8 ohms for the EV speaker (assuming no additional speakers are used).

Before plugging your amp in, check to make sure that the AC line voltage in your location is betwen 110 and 120 volts AC, at 50 or 60 Hertz. Place the power switch (located at the far right of the front panel) in the OFF position. Now, plug your X-Amp into a GROUNDED ("3 prong") power outlet. The X-Amp has been grounded internally to the line cord safety ground to assure your safety; but you, as the user, have a responsibility to make sure that the amp is properly connected to a good ground. This eliminates the need for a ground switch and the shock hazard such switches can create. Now you are ready to turn your amp on. If the STBY (standby) switch is in the "STBY" position then switch it on as well. Before you plug in your guitar turn the volume controls down. Now, plug in your guitar and slowly raise the volume control to the setting you wish. Use the pull switch on the lead drive control to switch between lead and rhythm channels. If you have an FS36-XLR footswitch, you can plug it into the rear panel XLR connector and use it to switch between the rhythm and lead channels of the X-Amp, turn the volume boost on and off, and turn the reverb on and off. The footswitch LED indications are as follows: CH, LED "On" for Lead Ch; EFF 1, LED "On" for Volume Boost on; EFF 2, LED "On" for Reverb on. If the footswitch is not used, then you can manually switch between channels by pulling the LEAD DRIVE control out to switch to the lead channel and pushing it in to select the rhythm channel. The front panel LED's always indicate which channel is selected and the appropriate controls to adjust. In order to use the lead channel, first raise the LEAD DRIVE control for the amount of overdrive you desire, and then raise the MASTER volume control for the sound volume you wish. Pull the MASTER control out for a crisp bright overdrive sound (HI LEAD) or push the control in for a more mellow and moody overdrive.

Hopefully, these brief set-up instructions will be enough to get you going until you can read this manual through more carefully. Enjoy your music!



Frequency response of the X-Amp tone controls.

X-30 and X-60 Rear Panel

1. AC LINE CORD
The X-Amp employs a heavy duty grounded line cord and should only be plugged into a grounded "3 prong" power outlet. When a grounded outlet is not available, a "3 prong" to "2 prong" adapter may be used to plug the amp into a "2 prong" outlet provided the wire "pigtail" from the adapter is connected to a suitable ground. **For your safety, no attempt should ever be made to defeat the ground pin of the AC line cord.**

2. AC LINE FUSE
For continued fire safety and product protection the AC line fuse should only be replaced with a fuse of the same rating. Should the fuse blow, determine the cause of failure and have the problem corrected before replacing the fuse. The correct fuse for the X-30 and X-60 amps is 3 amps/slow blow. Refer servicing to qualified personnel as hazardous voltages are employed in this unit.

3. XLR FOOTSWITCH CONNECTOR
This male XLR connector is for use with the CARVIN FS36-XLR footswitch. This accessory is highly recommended for performing musicians to take full advantage of the X-amps remote channel switching capability. Professional XLR connectors and rugged switches assure years of trouble free service from this quality footswitch. Read III. Brief Set-up.

4. SLAVE OUTPUT JACK (¼" phone)
The SLAVE output signal is taken from the speaker output jack through a 20 dB pad and is useful for feeding a recording console, PA mixer, outboard power amp, or even the mono headphones.

5. SPEAKER OUTPUT JACKS
The output of the X-Amps all tube power amp is available from two ¼" phone jacks wired in parallel. The amps internal speaker is normally connected by way of the first jack. This leaves the second jack free for connecting additional speakers. The net impedance for the combination of speakers connected to these jacks should be determined and the speaker impedance switch set accordingly.

6. SPEAKER IMPEDANCE SELECTOR
(4, 8, or 16 ohms)
For maximum output from the X-Amp the impedance selected at the speaker impedance switch should match the actual net speaker load on the power amp. For the normal case of the X-Amp used with only it's own internal speaker then the impedance switch should be set to the impedance of the speaker in your amp (8 ohms for the EVM-12L, or 16 ohms for the Celestion G12M-70). Use the table below to find the net impedance of the speaker combination you're using and set the switch to that value.

Using the X-Amp

A. Start with Bass, Mid, Treble, and Presence controls set at "5" as this is the natural or flat setting. It's not surprising that this is often a setting that sounds great in either the lead or rhythm channel.

B. If you like a bright clean sound, then try the BRIGHT switch on the rhythm volume control. Remember that the BRIGHT switch has less effect as the RHYTHM volume is increased past 3.

C. For the lowest possible noise in the overdrive mode (especially when recording) use the LOWEST lead drive setting that allows full sustain for your style of playing. Higher lead drive settings than necessary only compress the guitars dynamic range and increase background noise. This is true for any overdrive arrangement.

D. If you want moderate distortion that allows semi-clean chording, try exploring lead drive settings in the range from about 2 to 5.

E. For long overdrive sustain times the lead drive control must be set high (above 7) and the guitar volume control must be up full. Remember, your guitars volume control acts like a remote lead drive control.

F. When you want a bright "Marshall" overdrive sound pull the Master volume control out to switch to the Hi Lead mode.

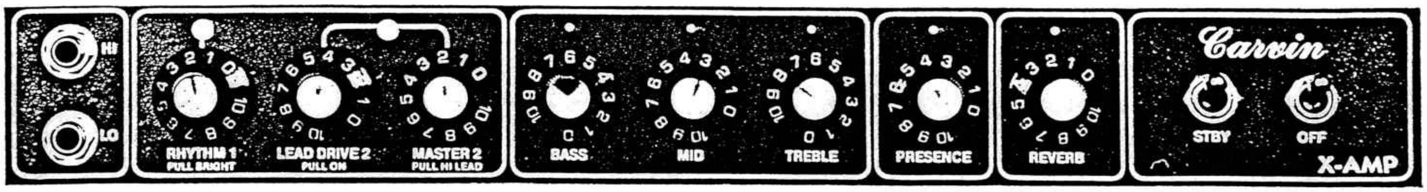
G. For mellow, less bright overdrive switch out of Hi Lead by pressing in the Master volume control.

H. Your amp has a Volume Boost (7dB) that is activated only by the FS36-XLR foot switch EFF 1. This allows you to "reach out" at the touch of a button in either the Rhythm or Lead channel.

EXAMPLES OF X-AMP CONTROL SETTINGS

In order to get "your sound" from the X-Amp you will probably need to spend a bit of time trying various combinations of amp settings and guitar settings. We have put together the following "recipes" for various sounds which we hope will help you get started. In order to get the sounds described below set the controls as described and then set your RHYTHM or MASTER volume control for the volume you want. Set your guitar volume at maximum and tone for full treble. Use your "lead" pickup for the "Marshall" type distortion and your "rhythm" pickup for the "Santana" type distortion.

	Bright	Lead Drive	Hi-Lead	Bass	Mid	Treb	Pres
Clean Rhythm Sound	Off	—	—	5	5	5	5
Bright Rhythm	On	—	—	5	5	6	6
Slightly Distorted Lead	—	On-2	On	6	5	5	5
"Marshall" Type Distortion	—	On-10	On	7	3	5	5
"Santana" Type Distortion	—	On-10	Off	6	5	8	3



1. POWER SWITCH

The power on/off switch is pushed up away from the off position to turn the amp on. One of the channel indicator LED's will light to indicate that the amp is powered.

2. STANDBY SWITCH

The standby switch must be pushed up away from the "STBY" position to turn the amp on. Placing the amp in the standby mode removes the plate voltage from the tubes but leaves the filaments on so that no warm up period is necessary when the amp is switched back on. We recommend that the standby switch be used whenever you wish to shut off the amp for short periods of time as this will extend the life of the tubes.

3. HI AND LO INPUT JACKS

The Hi input jack is normally used for guitar inputs to the amp. The Lo input is slightly less sensitive (6 dB) than the Hi input and can be used for lower volume practice or to accept the hotter input signals from effects boxes. For the least noise always use a high quality shielded guitar cord.

4. RHYTHM VOLUME CONTROL

The RHYTHM volume control sets the overall volume of channel one regardless of the LEAD DRIVE or MASTER volume settings of the lead channel. This allows the player to set up the two channels independently and then switch between them for two different sounds and playing levels. Pulling this control out provides a BRIGHT treble boost effect on the rhythm channel only. This BRIGHT effect is a maximum at a RHYTHM volume setting near "3" and decreases at higher volume settings. The LED above the RHYTHM volume pot indicates when the rhythm channel is selected. Note that the RHYTHM volume will have no effect if the rhythm channel is not selected.

5. LEAD DRIVE CONTROL

This control sets the overdrive level of the lead channel and can be varied all the way from clean (at a setting of "0") to rich long sustaining overdrive (at a setting of 10 with guitar volume full up). As the drive level is increased you can hear your guitar begin to overdrive at settings of 2 or 3. Settings in the range from 4 to 7 provide moderate levels of overdrive while higher settings provide longer sustain times. The LEAD DRIVE control is the only control which affects the amount of overdrive, so distortion setup is quick and easy. Unlike other amps, there is no interaction between the overdrive level and the master volume or the rhythm volume; each control works independently of the other.

There are two ways to switch the X-Amp from the rhythm channel to the lead channel. The first way is to pull out the LEAD DRIVE control. Try it and notice that the illuminated LED switches from the rhythm channel to the lead channel. To go back to the rhythm channel, press the LEAD DRIVE control back in and note that the LED switches back to the rhythm channel. The second way to switch between channels requires the use of a footswitch (CARVIN model FS36-XLR) and is the method most widely used by performers since it allows easy switching between channels while performing. Note that the front panel pull switch overrides the footswitch when selecting channels and should therefore be left pushed in when the footswitch is used.

6. MASTER VOLUME CONTROL (LEAD CH)

The MASTER volume sets the overall volume of the lead channel and has no effect on the rhythm channel or the amount of preamp overdrive.

A pull switch on the MASTER volume control allows the selection of two distinctly different overdrive sounds. With the switch pushed in, the lead channel produces a warm and mellow kind of overdrive. Pulling the master volume control out switches the lead channel to the "HI LEAD" mode and produces a brighter overdrive with more bite. Many players compare the X-Amp's hi lead sound to the sound of cranked Marshall stacks but they always seem to notice the extra control over tonal coloration that the X-Amp offers. The sonic difference between the standard overdrive and the Hi Lead overdrive is the result of different interstage equalization in the lead channel preamp section. The lead preamp tube circuits and equalization have been carefully tailored following extensive listening tests with a wide variety of guitar amps and experimental tube and solid state circuits. Double blind listening tests have been used to confirm that musicians prefer the sound of the X-Amp circuits over other products and other experimental circuits. That's why the X-Amp sounds so good!

7. BASS, MID, and TREBLE CONTROLS

The natural or "flat" setting for the X-Amp's tone controls is "5". When you are uncertain about the tone setting you desire then we recommend that you set all tone controls to "5" and experiment with variations from these settings. It is a good idea to get to know the tone controls by setting them all flat and then boosting and cutting each control so that you get to recognize the range of tones it affects. Because these EQ circuits employ active electronics there is virtually no interaction between the controls. This way, when you boost or cut the bass it has no effect on the action of the treble control, unlike the older passive tone control circuits which interact severely and have minimal action. See the tone control frequency response graphs for the exact range of action of each of these controls.

8. PRESENCE CONTROL

The PRESENCE control affects only the highest range of the guitar. Its sound is similar to the treble control but actually about one octave higher. Like the other tone controls, the presence control employs active circuitry and offers a good range of boost and cut with the natural or "flat" setting being "5". The action of this control is nicely enhanced by the rhythm BRIGHT switch or by a slight TREBLE boost. See the tone control frequency response graphs for the exact range of action of the presence control.

9. REVERB CONTROL

The compact X-Amps have a self contained three spring Hammond reverberation system. The amount of reverberation returned to the preamp is determined by the REVERB control. State of the art FET switching circuits are used to allow the reverb to be silently switched on and off by the FS36-XLR footswitch. The reverb sound has been carefully equalized to provide a bright sound similar to a studio plate reverb.

X-30/X-60

X-30 and X-60 TECHNICAL SPECIFICATIONS

Power Ratings		
	X-30:	30 Watts RMS
	X-60:	60 Watts RMS
Input Characteristics		
	Input Impedance:	2.2 Megohms
	Input Sensitivity: (for full output)	30 mV
	Maximum Input Level:	1.5Vrms
EQ Characteristics (see figures 1 and 2)		
	Bass:	± 15 dB shelving below 200 Hz
	Mid:	± 9 dB peak/dip at 500 Hz
	Treble:	± 17 dB peak/dip at 3.5kHz
	Presence:	± 15 dB shelving above 4kHz
Circuit Descriptions		
	Rhythm Pre Amp Type:	vacuum tube triode (12AX7A)
	Lead Pre Amp Type:	vacuum tube triode (12AX7A)
	Lead Overdrive Stages:	series connected triode stages (12AX7A)
	Power Amp Type:	triode phase inverter (12AX7A) with pentode power stage (6L6GC)
Vacuum Tube Complement		
	12AX7A Twin Triode:	3 per amp
	6L6GC Beam Power Pentode:	2 per amp
Model/Speaker Combinations		
	X-30:	Celestion G12M-70 speaker (16 ohms)
	X-60:	Celestion G12M-70 speaker (16 ohms)
	X-60E:	Electro-Voice EVM-12L speaker (8 ohms)
	X-60N:	No Speaker
General		
	Power Requirements:	110 to 120 VAC, 50 or 60 Hz
	Dimensions:	18"H x 18"W x 10.75"D
	Shipping Weight:	X-30 — 43 lbs X-60 — 45 lbs X-60E — 56 lbs X-60N — 36 lbs

Limited Warranty

Your Carvin Professional Series Product is protected against failure for 1 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. All tubes are warrantied for 90 DAYS.

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 or 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.

Factory Servicing

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 5 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 (in Calif. 800-542-6070). Occasionally we receive merchandise that works fine, but because of an oversight, the unit was returned needlessly.

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 1 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 strongly 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 because we have pride in our products and we want them to work properly for many years.

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 YOU.

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!

IV. TECHNICAL DESCRIPTION OF THE X-AMP CIRCUITS

(Refer to Schematic Diagram)

Signal input to the X-Amp is by way of either the HIGH or LO input jacks. These are shorting type jacks with input resistor arrangement (R62/R63) such that the LO input is attenuated 6 dB with respect to the HI input when either jack is used alone. If both jacks are used simultaneously then they each will have the same sensitivity. The input impedance at the HI jack is 2.2 Megohm (R14); the LO input impedance is 20k ohms (R62 plus R63).

The two triode stages of V1 serve as the input preamps for both the LEAD and RHYTHM channels. The LEAD channel preamp is operated with a cathode bypass capacitor for maximum gain whereas the RHYTHM channel preamp employs no cathode bypass so that maximum headroom can be provided for clean playing. Because V1 serves as the input preamps for both channels it is the most critical of the three 12AX7A's in the unit. This tube should be selected for low noise and low microphonics.

After the RHYTHM channel preamp the signal is processed through a fixed EQ network and then applied to the RHYTHM volume pot. When the RHYTHM channel BRIGHT switch is actuated C14 passes high frequencies around the volume control. For this reason the BRIGHT effect decreases as the RHYTHM volume control is increased past about "3". IC4(B) serves as a level recovery amp following the volume control. FET switch Q4 is used to mute the RHYTHM channel signal whenever the LEAD channel is selected. Note that logic line Q goes high when the RHYTHM channel is selected and goes low when the LEAD channel is selected. From IC4(B) the signal is routed to IC4(A) through FET switch Q5.

Following the LEAD channel preamp the lead signal is processed through a fixed EQ network which has two possible response characteristics depending on the setting of the HI LEAD switch. FET switch Q1 mutes the lead signal whenever the LEAD channel is not selected in order to prevent distortion products from leaking into the (clean) RHYTHM channel. The two triode stages of V2 are used in series with each stage clipping one half of the waveform. The MASTER volume pot (P3) sets the amount of overdrive signal to be passed on to the FET switch channel selector IC4(A).

At the channel selector stage Q2 selects the LEAD channel and Q5 selects the RHYTHM channel. A channel is selected when the control line at the gate of its FET is high. Logic lines Q and QNOT toggle in response to either the front panel PULL ON channel switch or in response to the foot switch; these lines also drive the front panel LED's via inverter buffers at IC5. The remaining FET switch at the channel selector (Q3) is used to control a 7dB volume boost at that stage. This volume boost can only be actuated by way of the footswitch.

The signal selected at IC4(A) is processed through two tone control stages at IC1(A and B) and then fed to both the reverb drive amp IC3(A and B) and the reverb return summing amp IC2(A). When the front panel tone controls are set to "5" these EQ stages have a flat frequency response and unity gain.

The three spring reverb tank is driven by the two op amps of IC3 operated in parallel for increased current capability. Reverb drive equalization is provided by R58 and C31. IC2(B) serves as the reverb return preamp and is operated with 33 dB of gain. Further equalization is provided by C32 and R56. FET switch Q6 turns the reverb on and off. Logic signal conditioning for Q6 is provided by Q7 and one of IC5's inverter buffers. The REVERB control (P8) sets the amount of reverb signal returned to the reverb summing amp. The output of the reverb summing amp IC2(A) constitutes the output of the preamp section of the X-Amp and is tied directly to the input to the power amplifier.

V3's two triode stages serve as a phase inverter for the power amps push-pull class A/B output stage. Beam power pentodes V4 and V5 drive the output coupling transformer T2. Grid biasing for V4 and V5 (approx. -52Vdc) is determined by the voltage divider formed by R126 and R127. Quiescent current (measured across the open standby switch) is normally 60mA ± 15mA. Power transfer to the loudspeaker is maximized by selecting the appropriate output transformer tap at the speaker impedance switch. Loop feedback around the power amplifier is provided by R97 and C55. The slave output signal is taken from the speaker output through a 20dB pad.

V. IN CASE OF TROUBLE

Practically all of the X-Amps we ship arrive at their destination without a scratch and in perfect working order. On those occasions when an X-Amp fails to operate properly when it is received the problem is almost always (approximately 85% of the time) with the vacuum tubes. The solution could be as simple as replacing a tube that has become defective as a result of shipping. As the owner of a tube amp, it is to your advantage to learn the symptoms of a bad tube so that you can avoid the inconvenience and expense of returning your amp to the factory for service. We think the troubleshooting hints provided below should prove helpful. However, if you're not sure your problem is a bad tube, then the best way to proceed is to replace all the tubes in the amp. For this reason we recommend that performers carry spare tubes at all times. The cost is minimal and spare tubes can save your show!

A. The most critical 12AX7A tube in the amp for low noise performance and for controlling acoustic tube feedback is V1. Viewing the amp from the rear, V1 is the small tube at the far right with a metal twist-on shield. At CARVIN we select this tube for low microphonics and we suggest that any time this tube is replaced it be checked by the following method to insure the best performance from the amp.

Power the amp up and select the LEAD channel. Unplug all instruments from the amp. Turn the MASTER volume and REVERB controls down to "0" and turn LEAD DRIVE, BASS, MID, TREBLE, and PRESENCE all the way up to "10". Pull out the MASTER volume control to switch to the HI LEAD mode. If you have a footswitch, unplug it or make sure the VOLUME BOOST (EFF 1) is off. Now, slowly raise the MASTER volume until the amp just begins to "ring" and feedback, note the setting of the MASTER volume and then turn the control back down. You should be able to raise the MASTER volume to a setting of "5" or higher before feedback occurs, if not, then V1 is not acceptable and should be swapped with either V2 or V3. If neither of the other two 12AX7A's provides acceptable performance then one or more new tubes should be purchased and tested this way until an acceptable tube is found. Should you have trouble finding good tubes locally then CARVIN can provide a selected tube for use in the V1 position.

Note that the extreme control settings used in this test procedure are not considered usable and we recommend they be avoided. Some of the symptoms of a bad 12AX7 tube are:

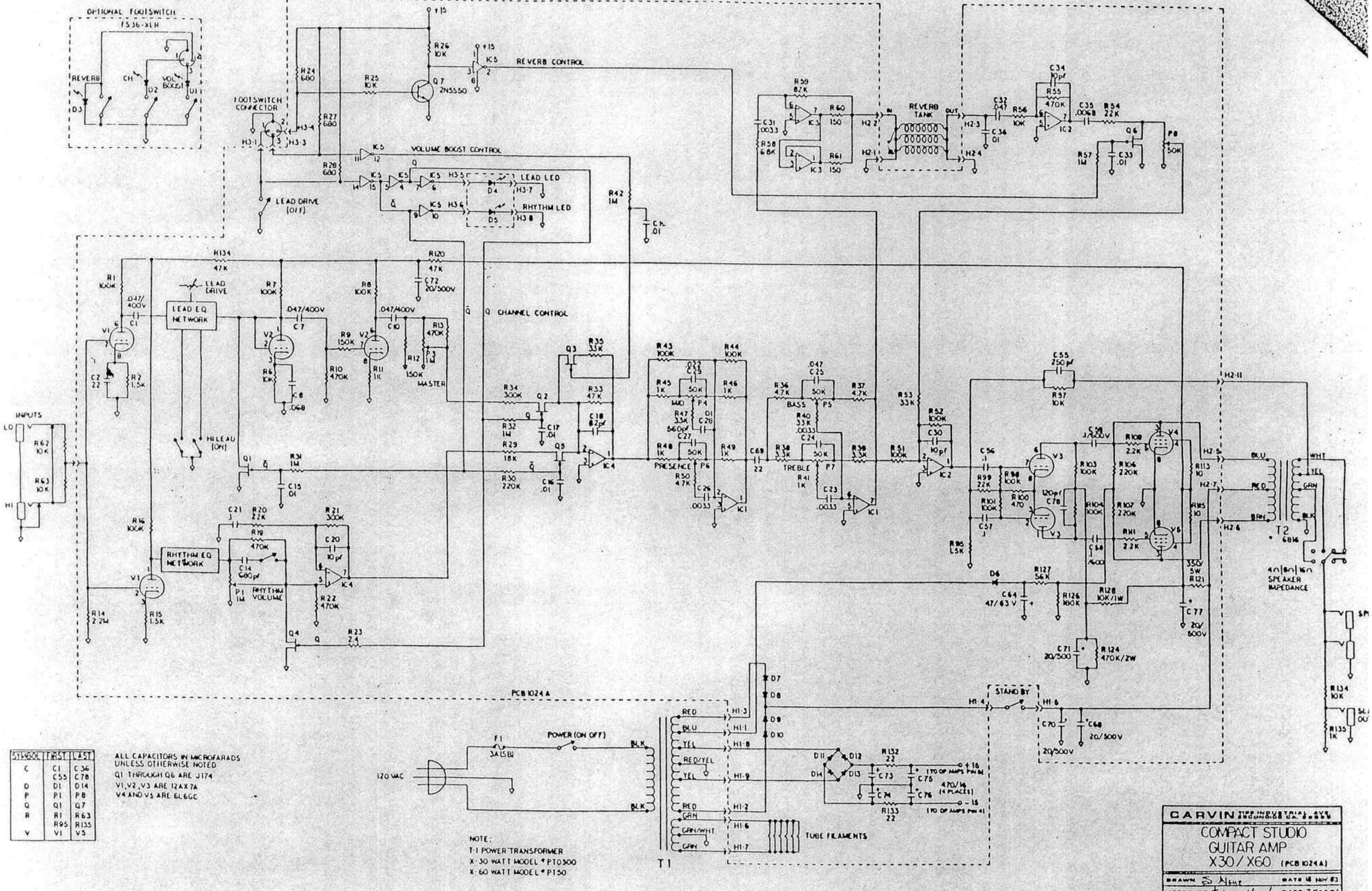
1. Intermittent Output
2. Static Interference
3. Popping
4. Loud Noise
5. Ringing
6. Microphonics
7. Low Power or Gain

B. The symptoms below could indicate a bad 6L6GC power tube. There are a total of 2 tubes to be checked. These are the two large tubes at the very back of the amp. A spring clip holds these tubes in place and must be depressed before they can be removed. Caution, these tubes normally run hot and may be hot to the touch. If in doubt, simply replace the tubes with new ones.

Some of the symptoms of a bad 6L6GC tube are:

1. Loud Hum
2. Popping
3. Low Power Output
4. Glowing Red Hot Tube(s) Note: the tubes normally have a "bluish-red" glow.
5. Microphonics
6. Distortion

Note: The customer is responsible for shipping charges both ways if the problem was only defective tubes. Please contact us before returning your amp. Tubes are guaranteed for 90 days.



NOTE:
T-1 POWER TRANSFORMER
X-30 WATT MODEL # PT0300
X-60 WATT MODEL # PT150

SYMBOL	FIRST	LAST
C	C1	C36
	C55	C78
D	D1	D14
P	P1	P8
Q	Q1	Q7
R	R1	R63
	R95	R135
V	V1	V5

ALL CAPACITORS IN MICROFARADS
UNLESS OTHERWISE NOTED
Q1 THROUGH Q6 ARE J174
V1, V2, V3 ARE 12AX7A
V4 AND V5 ARE 6L6GC

CARVIN	
COMPACT STUDIO GUITAR AMP X30 / X60 (PCB 1024A)	
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