



*TS100 Tube Power Amplifier*

Pure tube warmth was the objective in designing the TS100 Stereo Tube Power Amp. With an all-tube circuit path, this objective has been met. A total of four 12AX7's tubes and four EL34 power output tubes deliver 50W per channel or 100W bridged of power to the speakers. From the mirrored chrome front panel, to the double sided, mil-spec FR4 circuit board, this amplifier offers total quality. Whether used as a guitar amplifier or as a home stereo amplifier, the tube purist can enjoy the sounds of the TS100.

#### **GETTING STARTED QUICKLY**

If you are like most players, you probably want to plug in your new amp and get started playing it right away. You can read the rest of the manual later to learn the finer points of operating your amp. You will need the TS100 amplifier, power cord, speaker cabinet, speaker cord and a signal source with cables. Plug the pre-amplifier output into the Channel 1 amplifier input. Plug the Channel 1 speaker output of the amplifier into the speaker cabinet. Select the correct impedance on the rear panel to match the speaker impedance. With the power and stand-by switches in the "OFF" position, plug the amplifier into the wall outlet. With all volumes down, turn on the pre-amplifier power and then the amplifier. After the tubes warm up, which takes about 30 seconds, turn on the "stand-by" switch. Increase the volume of the pre-amplifier and Channel 1 until desired loudness is reached.

#### **RECEIVING INSPECTION—read before getting started**

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

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

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

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

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

USA customers register online at: [www.carvin.com/registration](http://www.carvin.com/registration)

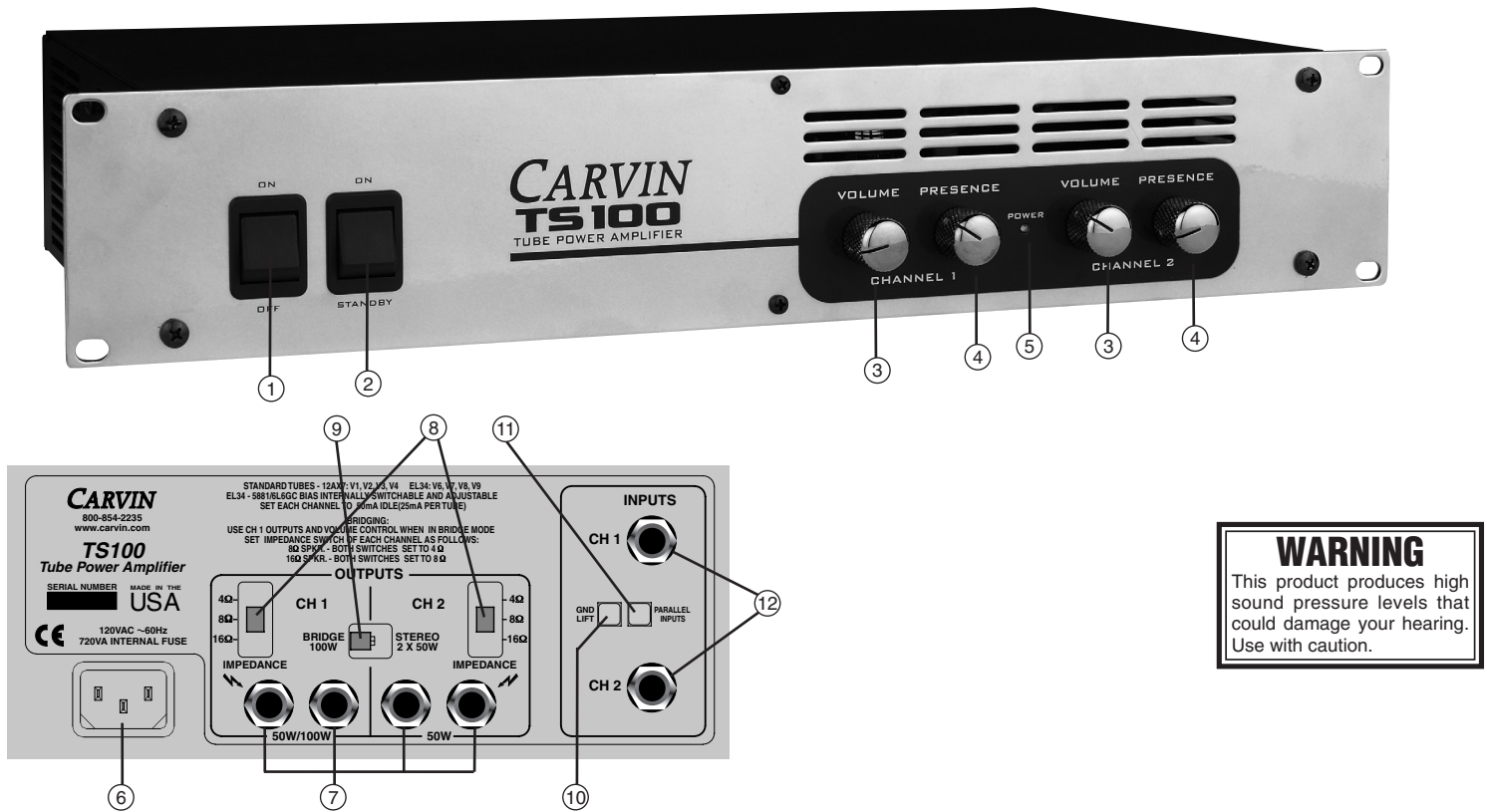
All other countries register online at: [www.carvinworld.com/registration](http://www.carvinworld.com/registration)

#### **TS100 TUBE POWER AMPLIFIER SPECIFICATIONS:**

<b>RMS Power:</b>	50W per channel or 100W bridged
<b>Output Impedance:</b>	4Ω, 8Ω, or 16Ω each channel (8Ω min. bridged)
<b>Channel Sensitivity:</b>	1V for full output (full volume per channel)
<b>Preamp Tubes:</b>	2 – 12AX7 (input buffer) 2 – 12AX7 (phase inverter)
<b>Power Amp Tubes:</b>	4 – EL34 (2 per channel switchable to 5881/6L6)
<b>USA Model:</b>	120VAC, 300VA
<b>Export Model:</b>	230VAC, 300VA
<b>Dimensions:</b>	3.5" High x 19" Wide x 10" Deep (2 rack spaces) 8.9 High x 48.2 Wide x 25.4 cm Deep
<b>Net Weight:</b>	26 lbs (11.3 Kgs)
<b>Warranty:</b>	1 Year (tubes 90 days.)

# CARVIN

## FRONT & REAR PANEL CONTROLS



### FRONT PANEL

#### 1. POWER

Turns on power to the unit.

#### 2. STAND-BY

Turns on high voltage to the tubes. Usually, this switch should be off when the amp is initially powered on until the tube filaments warm up (30 seconds, or more). The amplifier should be switched to stand-by whenever the amp will not be used for a short amount of time (like a set break) to increase tube life.

#### 3. VOLUME

Controls the amount of signal sent to the power amp, which controls the output level. Start with this control all the way down. Make sure the preamplifier is connected and turned on and it's level turned up. Bring the amplifier volume up to the desired loudness. Experimentation will be needed to get the correct volume balance between the preamplifier output and the amplifier output level. The amplifier should be turned up at least one half with the knob indicator lines running vertical. Note: When the amp is in bridge mode, Channel 1 will be the master volume control - Channel 2 volume will not function.

#### 4. PRESENCE

Controls the amount of clarity or crispness in the 6kHz range. When this control is all the way down, the frequency response will essentially be flat. Bringing this control up will create a "bump" in the upper frequencies. Note: In bridge mode, track both Channel 1 and 2 presence knobs to the same position.

#### 5. POWER LED

The blue LED indicates that the power supply has been turned on.

### REAR PANEL

#### 6. AC POWER AND FUSE

The detachable AC power cord is designed to operate with one type of voltage. Check the rear label above the AC connector for the proper voltage. Make sure the AC cord is securely inserted. If not, the power amp could become intermittent. Plug the AC cord into a grounded 3-prong power source. No attempt should ever be made to defeat, or use the amp without the ground connected. The fuse is internal to the unit. Replace only with the same type and rating.

#### 7. SPEAKER OUTPUT JACKS

Two 1/4" speaker output jacks are provided for each channel. Each pair of jacks are wired in parallel. Set the impedance switch accordingly for each channel. The total impedance for each channel should not be less than 4Ω. Note: when in bridge mode, only Channel 1 output jacks will work and the impedance switch for each channel must set to half of the total speaker load impedance.

#### 8. IMPEDANCE SELECTION SWITCH

Use the impedance switch to match the speaker load to the output transformers. This switch should be set to the equivalent load connected to the speaker outputs of each channel or loss of output power will result. The speaker output jacks are in parallel so if two 8Ω speakers are connected the total impedance would be 4Ω for that channel. Likewise if two 16Ω speakers are used, then move the impedance switch to 8Ω.

Note: when in the bridge mode, the impedance switch for each channel must be set to one half the total load impedance. This means for two 16Ω or one 8Ω speaker, set each channel to 4Ω. If you are using one 16Ω speaker, then set each channel to 8Ω. The minimum impedance for the TS100 in bridged mode is 8Ω.

#### 9. BRIDGE/STEREO SWITCH

For mono 100W output, set this switch to "BRIDGE". If using the bridge mode, use the speaker outputs from Channel 1 only and use the Channel 1 volume control. If stereo operation is desired, set to "STEREO" mode. In this mode, both channels operate as separate 50W amplifiers and each channel's controls can be adjusted independently. Make sure the impedance switch is properly selected for each channel.

#### 10. GROUND LIFT SWITCH

Many times amplifiers and preamps are connected in such a manner as to cause a grounded loop with the inputs which results in audible hum. To activate, press this switch in to lift the ground. If the hum has not been reduced, then try installing a Carvin MTF55 "Ground lifter" between the amplifier input and the signal.

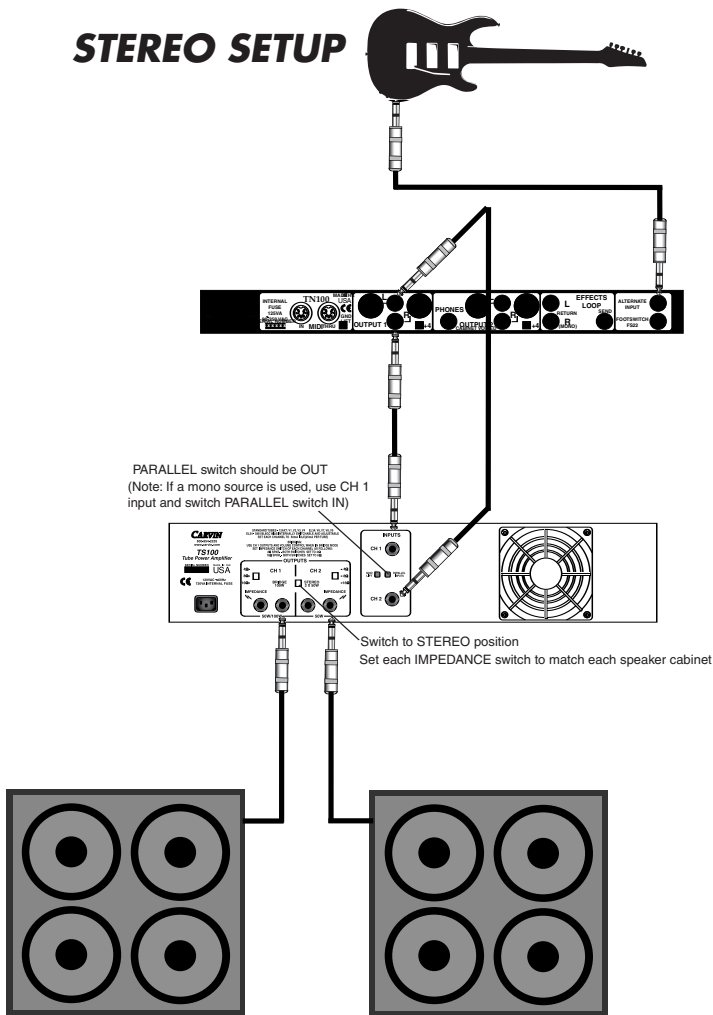
#### 11. PARALLEL INPUTS SWITCH

Pressing this switch in will split the signal that is plugged into the Channel 1 input to both Channel inputs. Channel 2 input will no longer function when this switch is activated.

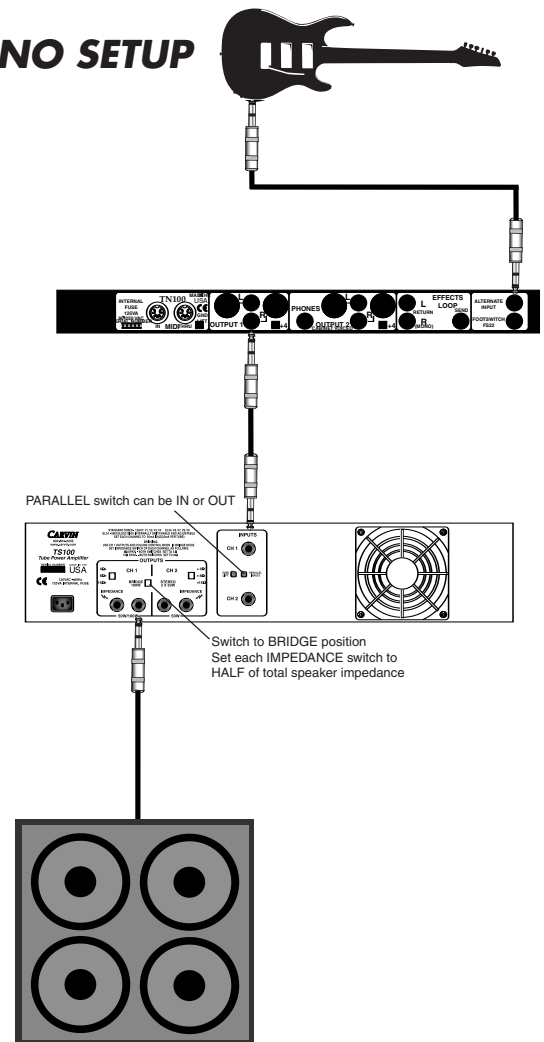
#### 12. CHANNEL INPUTS

A 1/4" unbalanced jack is used to deliver signal to each of the amplifiers channels. If it is desired to use the amplifier for home audio, an RCA to 1/4" adapter (Carvin #AD66) will most likely be needed. The amplifier can accept a wide range of signal levels.

## STEREO SETUP



## MONO SETUP



## POWER TUBE BIASING

(Note: Biasing should be left to a qualified technician due to the fact that lethal voltages near 500 volts are present inside the amplifier).

The TS100 can be set up to use either EL34's or 5881's (6L6GC) in each channel. If different tube type are used in each channel, the amp should only be used in STEREO mode

Inside the amplifier, on the component side of the power tube printed circuit card, are switches to select the tube type for each channel. Above those switches are markings that indicate the different tube types. Bias potentiometers are also near those switches for fine-tuning. Each side of the amplifier must be biased with ALL four power tubes installed.

a) Remove from the printed circuit board the red wires connecting from the output transformers to QC2 and QC16.

b) Two milliamp meters will be needed. Insert a milliamp meter in series with each of the red wires to the printed circuit board. Current can now be measured through both of the output transformers while no input signal is present. Make sure the leads don't touch anything such as the chassis, each other, or you- VERY HIGH VOLTAGES ARE PRESENT!

d) Make sure the bias select switch is in the correct position for the tube type and the meters are set to "mA" or milliamps.

e) Power up the amplifier – switch the stand-by switch on. Adjust the bias pots accordingly to obtain a 50mA reading on each of the milliamp meters. Leave the amp on for a few minutes making sure the readings don't change. Turn the amp off, leaving the standby switch on and let the residual high voltage bleed down. Remove the milliamp meters from the series connection and re-attach the red wires directly to QC2 and QC16 again. The amp is now correctly biased. CAUTION: The power supply capacitors will remain "charged" for a period of time after the amp has been turned off with voltages near 500 volts.

(If only volt meters are available, an alternate method of biasing can be used by substituting 1Ω, 1/2 watt resistors where the milliamp meters would be as described above. The voltage across each resistor should read 50mV corresponding to 50mA. The rest of the procedure outlined above is the same.)

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 product 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 is not defeated.

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

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

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

**SAFETY INSTRUCTIONS (EUROPEAN)**

The conductors in the AC power cord are colored in accordance with the following code.

**GREEN & YELLOW—Earth BLUE—Neutral BROWN—Live**

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

**LIMITED WARRANTY**

Your Carvin product is guaranteed against failure for ONE 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.carvin.com/cs](http://www.carvin.com/cs)

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.

**HELP SECTION**

**1) AMP WILL NOT TURN ON**

Check the power to the amp. Check for tripped circuit breakers, unplugged extension cords or power-strip switches that may be turned off. Check the fuse. If a dark brownish color or no wire can be seen within the glass tube, then replace. The amp may be perfectly fine but occasionally a fuse may blow because of high AC voltage surges. After the fuse has been replaced with the proper Slow Blow value and if the fuse fails again, the amp will require servicing.

**2) NO OUTPUT with POWER LIGHT ON**

Tubes damaged in shipping will be the primary reason for your amp to not function properly. Please give us a call to help guide you through this simple repair.

**3) KEEP YOUR AMP LOOKING NEW**

Use a damp cloth to wipe the controls on the front & rear chassis panels. Wipe the black vinyl covering with a damp cloth.

Parts List for TS100  
GUARD FAN PLASTIC 80x80mm  
PWR AC 3/16AWG 8" 2" W/PLUGS  
CABLE RIBBON 24AWG 4PIN 102MM  
CABLE RIBBON 24A 8P/16" W/HDR  
CABLE ASSY, SC 110MM  
KNOB CHROME W/BLACK LINE  
RETAINING CLIP EL34/5881  
CHASSIS 2 SPACE UNIVERSAL  
FRONT PANEL TS100  
BRACKET TS100  
LID DCM POWER AMPS  
TRANSFORMER OUTPUT 60W  
POWER TRANSFORMER 120VAC  
ROCKER SWITCH 16A 250V AC  
TUBE POWER EL34  
12AX7 PRE AMP TUBE  
FAN DC24V 80mm X 80mm X 25mm 4  
MANUAL TS100  
LABEL REAR TS100

Carvin P/N  
03-90080  
05-01603  
05-24102  
05-68440  
05-85611  
07-77710  
10-00034  
10-10008E  
10-10111A  
10-10117B  
10-82005  
15-02066  
15-10714  
25-31351  
65-00034  
65-00127  
70-02408A  
76-10111A  
77-10111A

D7 DIODE RECT GEN 1N4007 1000V 1A  
D8 DIODE RECT GEN 1N4007 1000V 1A  
D9 DIODE RECT GEN 1N4007 1000V 1A  
F1 FUSEHOLDER CLIPS 3AG VERT MTG  
H1 CONNECT HEADER, 086" 9 PIN  
H2 CONNECT HEADER, 100" 2 PIN  
H3A CONNECT HEADER 8 PIN STRAIGHT  
H3B CONNECT HEADER 8 PIN STRAIGHT  
H4A CONNECT HEADER 4 PIN STRAIGHT  
H4B CONNECT HEADER 4 PIN STRAIGHT  
H5A CONNECT HEADER, 086" 5 PIN  
H5B CONNECT HEADER, 086" 5 PIN  
J1 JACK .250 MONO PLASTIC WIN/SER  
J2 JACK .250 MONO PLASTIC WIN/SER  
J3 JACK .250 MONO PLASTIC WIN/SER  
J4 JACK .250 MONO PLASTIC WIN/SER  
J5 JACK .250 MONO PLASTIC WIN/SER  
J6 JACK .250 MONO PLASTIC WIN/SER  
K1 RELAY DPDT 2AMP@30V/5VDC COIL  
P1 POT VERT TRIMMER 20K 20%  
P11 POT VERT TRIMMER 20K 20%  
P2 POT 16" R" RX.250-5A500K METAL  
P3 POT 16" R" RX.250-5A500K METAL  
P4 POT 16" R" RX.250-25A25K MTL  
P5 POT 16" R" RX.250-25A25K MTL  
PL1 RECEPTACLE AC W/FAST-ON CHASS  
Q1 REGULATOR VOLTAGE 5 +1 AMP  
QC1 TERMINAL VERT MALE PC MTG. 250  
QC10 TERMINAL 90deg MALE PC MTG. 250  
QC11 TERMINAL 90deg MALE PC MTG. 250  
QC12 TERMINAL 90deg MALE PC MTG. 250  
QC16 TERMINAL VERT MALE PC MTG. 250  
QC2 TERMINAL VERT MALE PC MTG. 250  
QC26 TERMINAL 90deg MALE PC MTG. 250  
QC28 TERMINAL 90deg MALE PC MTG. 250  
QC3 TERMINAL VERT MALE PC MTG. 250  
QC31 TERMINAL VERT MALE PC MTG. 250  
QC32 TERMINAL VERT MALE PC MTG. 250  
QC33 TERMINAL VERT MALE PC MTG. 250  
QC4 TERMINAL 90deg MALE PC MTG. 250  
QC5 TERMINAL 90deg MALE PC MTG. 250  
QC51 TERMINAL 90deg MALE PC MTG. 250  
QC52 TERMINAL 90deg MALE PC MTG. 250  
QC53 TERMINAL 90deg MALE PC MTG. 250  
QC54 TERMINAL 90deg MALE PC MTG. 250  
QC6 TERMINAL 90deg MALE PC MTG. 250  
QC7 TERMINAL VERT MALE PC MTG. 250  
QC8 TERMINAL 90deg MALE PC MTG. 250  
QC9 TERMINAL 90deg MALE PC MTG. 250  
R1 RES 220.00KOHM .25W 5% CARBON  
R10 RES 100.00KOHM .25W 5% CARBON  
R11 RES 22.00KOHM .25W 5% CARBON  
R12 RES 100.00KOHM .25W 5% CARBON  
R13 RES 100.00KOHM .25W 5% CARBON  
R14 RES 220.00KOHM .25W 5% CARBON  
R15 RES 220.00KOHM .25W 5% CARBON  
R16 RES 68.00KOHM .25W 5% CARBON  
R17 RES 100.00KOHM .25W 5% CARBON  
R18 RES 47.00KOHM .25W 5% CARBON  
R19 RES 100.00KOHM .25W 5% CARBON  
R2 RES 220.00KOHM .50W 5% CARBON  
R20 RES 220.00KOHM .25W 5% CARBON  
R21 RES 220.00KOHM .50W 5% CARBON  
R22 RES 100.00 OHM .25W 1% METAL  
R23 RES 1.50KOHM .25W 5% CARBON  
R24 RES 100.00KOHM .25W 5% CARBON  
R25 RES 100.00 OHM .25W 1% METAL  
R26 RES 10.00KOHM .25W 5% CARBON  
R27 RES 4.70KOHM .25W 5% CARBON  
R28 RES 4.70KOHM .25W 5% CARBON  
R29 RES 100.00 OHM .25W 1% METAL  
R3 RES 1.50KOHM .25W 5% CARBON  
R30 RES 4.70KOHM 1.00W 5% CARBON  
R31 RES 220.00KOHM .50W 5% CARBON  
R32 RES 100.00KOHM .25W 5% CARBON

R33 RES 100.00KOHM .25W 5% CARBON  
R35 RES 220.00 OHM .25W 5% CARBON  
R36 RES 0.00 OHM 35X.20" JUMPER  
R37 RES 100.00KOHM .25W 5% CARBON  
R38 RES 100.00KOHM .25W 5% CARBON  
R39 RES 470.00KOHM .25W 5% CARBON  
R4 RES 100.00KOHM .25W 5% CARBON  
R40 RES 220.00KOHM .25W 5% CARBON  
R41 RES 47.00KOHM .25W 5% CARBON  
R42 RES 10.00KOHM .25W 5% CARBON  
R43 RES 22.00KOHM .25W 5% CARBON  
R44 RES 22.00KOHM .25W 5% CARBON  
R45 RES 100.00KOHM .25W 5% CARBON  
R46 RES 560.00 OHM .25W 5% CARBON  
R47 RES 100.00KOHM .25W 5% CARBON  
R48 RES 100.00KOHM .25W 5% CARBON  
R49 RES 100.00KOHM .25W 5% CARBON  
R5 RES 220.00KOHM .25W 5% CARBON  
R50 RES 220.00KOHM .25W 5% CARBON  
R51 RES 220.00KOHM .25W 5% CARBON  
R52 RES 220.00KOHM .25W 5% CARBON  
R53 RES 68.00KOHM .25W 5% CARBON  
R54 RES 100.00KOHM .25W 5% CARBON  
R55 RES 220.00KOHM .50W 5% CARBON  
R56 RES 2.20KOHM 1.00W 5% CARBON  
R57 RES 350.00 OHM 10W 10% SB SDOF  
R58 RES 1.00KOHM .25W 5% CARBON  
R59 RES 1.00KOHM .25W 5% CARBON  
R6 RES 220.00KOHM .25W 5% CARBON  
R7 RES 22.00KOHM .25W 5% CARBON  
R70 RES 4.70KOHM .25W 5% CARBON  
R71 RES 4.70KOHM .25W 5% CARBON  
R72 RES 350.00 OHM 5W 5% SB SDOF  
R73 RES 350.00 OHM 5W 5% SB SDOF  
R74 RES 4.70KOHM .25W 5% CARBON  
R75 RES 4.70KOHM .25W 5% CARBON  
R76 RES 350.00 OHM 5W 5% SB SDOF  
R77 RES 350.00 OHM 5W 5% SB SDOF  
R78 RES 100.00 OHM .25W 1% METAL  
R79 RES 100.00 OHM .25W 1% METAL  
R8 RES 100.00KOHM .25W 5% CARBON  
R9 RES 560.00 OHM .25W 5% CARBON  
R91 RES 10.00KOHM .25W 5% CARBON  
S1 SWITCH DP3T PC MTG EXT PC LEGS  
S2 SWITCH DPDT SELECT PC EXT LEGS  
S3 SWITCH DPDT SELECT PC EXT LEGS  
S4 SWITCH DP3T PC MTG EXT PC LEGS  
S5, S7 SWITCH DPDT PUSH PC MTG LOCKNG  
S6 SWITCH DPDT SELECT PC EXT LEGS  
S8 TERMINAL VERT FEML PC MTG. 250  
V1 SOCKET TUBE 9PIN 12AX7/EL84  
V2 SOCKET TUBE 9PIN 12AX7/EL84  
V3 SOCKET TUBE 9PIN 12AX7/EL84  
V4 SOCKET TUBE 9PIN 12AX7/EL84  
V6 SOCKET TUBE 8PIN EL34/5881/6L6  
V7 SOCKET TUBE 8PIN EL34/5881/6L6  
V8 SOCKET TUBE 8PIN EL34/5881/6L6  
V9 SOCKET TUBE 8PIN EL34/5881/6L6

**REFER SERVICING TO QUALIFIED SERVICE PERSONNEL! THIS UNIT CONTAINS HIGH VOLTAGE INSIDE!**

**Parts List for Printed Circuit Card**

Ref. Des.Description  
C1 CAP POLY .1000UF 100VOLT 10%  
C10 CAP POLY .0010UF 100VOLT 10%  
C11 CAP POLY .0470UF 400VOLT 10%  
C12 CAP ELEC 82UF 500V 20%  
C13 CAP ELEC 2.200 MFD 6.3V 20%  
C14 CAP ELEC 2.200 MFD 6.3V 20%  
C15 CAP POLY .0047UF 400VOLT 10%  
C16 CAP CERM 180PF 500VOLT 5%  
C17 CAP CERM 82PF 500VOLT 5%  
C18 CAP POLY .0100UF 100VOLT 10%  
C19 CAP POLY .0100UF 100VOLT 10%  
C2 CAP POLY .0010UF 100VOLT 10%  
C20 CAP POLY .0010UF 100VOLT 10%  
C21 CAP ELEC 470 MFD 25VOLT 20%  
C22 CAP ELEC 1.000 MFD 25V 20%  
C23 CAP ELEC 1.000 MFD 25V 20%  
C24 CAP CERM 82PF 500VOLT 5%  
C25 CAP CERM 250PF 500VOLT 5%  
C26 CAP CERM 250PF 500VOLT 5%  
C27 CAP CERM 250PF 500VOLT 5%  
C28 CAP CERM 250PF 500VOLT 5%  
C3 CAP POLY .0470UF 400VOLT 10%  
C37 CAP POLY .0001UF 100VOLT 10%  
C39 CAP POLY .0470UF 400VOLT 10%  
C4 CAP POLY .0010UF 100VOLT 10%  
C40 CAP POLY .0470UF 100V 10% PREP  
C41 CAP CERM 56PF 500VOLT 5%  
C42 CAP MYLR .0470UF 630VOLT 10%  
C43 CAP MYLR .0470UF 630VOLT 10%  
C44 CAP ELEC 47 MFD 63VOLT 20%  
C45 CAP MYLR .0470UF 630VOLT 10%  
C49 CAP ELEC 82UF 500V 20%  
C5 CAP CERM 56PF 500VOLT 5%  
C50 CAP ELEC 82UF 500V 20%  
C52 CAP ELEC 82UF 500V 20%  
C53 CAP MYLR .0470UF 630VOLT 10%  
C6 CAP POLY .0470UF 100V 10% PREP  
C7 CAP MYLR .0470UF 630VOLT 10%  
C70 CAP CERM 180PF 500VOLT 5%  
C8 CAP MYLR .0470UF 630VOLT 10%  
C9 CAP ELEC 47 MFD 63VOLT 20%  
D1 DIODE RECT GEN 1N4007 1000V 1A  
D10 DIODE RECT GEN 1N4007 1000V 1A  
D12 DIODE RECT GEN 1N4007 1000V 1A  
D14 DIODE RECT GEN 1N4007 1000V 1A  
D15 DIODE RECT GEN 1N4007 1000V 1A  
D16 DIODE RECT GEN 1N4007 1000V 1A  
D2 DIODE RECT GEN 1N4007 1000V 1A  
D3 DIODE RECT GEN 1N4007 1000V 1A  
D4 LED BLUE DIFFUSED 3MM T-1.00  
D5 DIODE RECT GEN 1N4007 1000V 1A  
D6 DIODE RECT GEN 1N4007 1000V 1A

Carvin P/N  
46-10412  
46-10212  
41-47343  
42-82052  
47-22280  
47-22280  
41-47242  
45-18152  
45-82052  
46-10312  
46-10312  
46-10212  
46-10212  
47-47125  
47-10225  
47-10225  
47-10225  
45-82052  
45-25152  
45-25152  
45-25152  
41-47242  
46-10412  
41-47343  
46-10412  
46-47312-1  
45-56052  
41-47362  
41-47362  
47-47061  
41-47362  
42-82052  
45-56052  
42-82052  
42-82052  
41-47362  
46-47312-1  
41-47362  
45-18152  
41-47362  
47-47061  
61-10000  
61-10000  
61-10000  
61-10000  
61-10000  
61-10000  
61-10000  
61-10000  
60-75350  
61-10000  
61-10000

R33 RES 100.00KOHM .25W 5% CARBON  
R35 RES 220.00 OHM .25W 5% CARBON  
R36 RES 0.00 OHM 35X.20" JUMPER  
R37 RES 100.00KOHM .25W 5% CARBON  
R38 RES 100.00KOHM .25W 5% CARBON  
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R42 RES 10.00KOHM .25W 5% CARBON  
R43 RES 22.00KOHM .25W 5% CARBON  
R44 RES 22.00KOHM .25W 5% CARBON  
R45 RES 100.00KOHM .25W 5% CARBON  
R46 RES 560.00 OHM .25W 5% CARBON  
R47 RES 100.00KOHM .25W 5% CARBON  
R48 RES 100.00KOHM .25W 5% CARBON  
R49 RES 100.00KOHM .25W 5% CARBON  
R5 RES 220.00KOHM .25W 5% CARBON  
R50 RES 220.00KOHM .25W 5% CARBON  
R51 RES 220.00KOHM .25W 5% CARBON  
R52 RES 220.00KOHM .25W 5% CARBON  
R53 RES 68.00KOHM .25W 5% CARBON  
R54 RES 100.00KOHM .25W 5% CARBON  
R55 RES 220.00KOHM .50W 5% CARBON  
R56 RES 2.20KOHM 1.00W 5% CARBON  
R57 RES 350.00 OHM 10W 10% SB SDOF  
R58 RES 1.00KOHM .25W 5% CARBON  
R59 RES 1.00KOHM .25W 5% CARBON  
R6 RES 220.00KOHM .25W 5% CARBON  
R7 RES 22.00KOHM .25W 5% CARBON  
R70 RES 4.70KOHM .25W 5% CARBON  
R71 RES 4.70KOHM .25W 5% CARBON  
R72 RES 350.00 OHM 5W 5% SB SDOF  
R73 RES 350.00 OHM 5W 5% SB SDOF  
R74 RES 4.70KOHM .25W 5% CARBON  
R75 RES 4.70KOHM .25W 5% CARBON  
R76 RES 350.00 OHM 5W 5% SB SDOF  
R77 RES 350.00 OHM 5W 5% SB SDOF  
R78 RES 100.00 OHM .25W 1% METAL  
R79 RES 100.00 OHM .25W 1% METAL  
R8 RES 100.00KOHM .25W 5% CARBON  
R9 RES 560.00 OHM .25W 5% CARBON  
R91 RES 10.00KOHM .25W 5% CARBON  
S1 SWITCH DP3T PC MTG EXT PC LEGS  
S2 SWITCH DPDT SELECT PC EXT LEGS  
S3 SWITCH DPDT SELECT PC EXT LEGS  
S4 SWITCH DP3T PC MTG EXT PC LEGS  
S5, S7 SWITCH DPDT PUSH PC MTG LOCKNG  
S6 SWITCH DPDT SELECT PC EXT LEGS  
S8 TERMINAL VERT FEML PC MTG. 250  
V1 SOCKET TUBE 9PIN 12AX7/EL84  
V2 SOCKET TUBE 9PIN 12AX7/EL84  
V3 SOCKET TUBE 9PIN 12AX7/EL84  
V4 SOCKET TUBE 9PIN 12AX7/EL84  
V6 SOCKET TUBE 8PIN EL34/5881/6L6  
V7 SOCKET TUBE 8PIN EL34/5881/6L6  
V8 SOCKET TUBE 8PIN EL34/5881/6L6  
V9 SOCKET TUBE 8PIN EL34/5881/6L6