





When I considered having a signature series amp built, there were several important issues that needed to be addressed. First, it had to sound superior to any other amp I 'd ever come across and it had to be built to withstand the abuse that a world tour could give it. It also had to be something affordable for most musicians and not just a few privileged ones! It had to have the appearance of class and integrity that reflects the sound. I'm thrilled to say The Legacy is all that I dreamed it could be.

Congratulations on your purchase of the Legacy all tube signature amplifier. Steve Vai worked very closely with Carvin Engineering to develop the sound and look of the Legacy Amplifiers. Exhaustive listening tests of various tube and electronic circuitry were performed by Vai. He also tested dozens of prototype enclosures loaded with various vintage and prototype speakers. His choice of EL34 tubes and Celestion™ Vintage 30 speakers provide the finishing touches on a truly original amp.

CLEAN AND OVERDRIVE CHANNELS

The equalization of the clean and overdrive channel is designed to offer clarity to your instrument. You will also take notice of the clean channels PRESENCE which adds acoustic voicing to your instrument. This switch boosts only the guitars very

highest harmonics which are in the 10k Hz range instead of the normal 3K Hz of a bright switch. The PRESENCE control on the lead channel is designed to adjust the "edge" on your sound. It's dynamic range allows for super-smooth sounds or turned the other way, it can add bite to your leads.

DYNAMIC EL34 POWER TUBES

Your amp is equipped with EL34 power tubes because of their smooth distortion, responsive sound and reliability. The compression characteristics of these "high-output" power tubes respond to the dynamic range of lead guitar playing. These tubes react even to the most subtle touch—if you play soft, the tubes remain clean and if you increase your attack they respond accordingly.

TONE CONTROLS

The T-Bridge passive BASS, MID and TREBLE tone controls offer a wide range of tone settings. Take full advantage by setting them where they sound best. Your sound may not be at center 5 on the dial. These controls will not affect or color your sound when set at extreme settings, nor do they interact with each other. The greater range of these controls comes from the high impedance 1 meg sealed pots (most guitar amps use 250k pots). The frequency of the bass control is set at 80 Hz while the mid control is set at 650 Hz. The treble control is set at a very high 11k Hz giving the Legacy it's dynamic highs.

REVERB

The FS22 footswith for the long tailed REVERB system in the Legacy switches only the reverb "send" leaving the tail of the reverb to decay naturally, the way it's done in the studio. A special pre filter eliminates the spring "boing" normally heard in other systems giving it a "lush" sound. The all tube reverb system offers vibrant clarity with full depth reminiscent of the sixties tube amps. Guitar Player magazine rated this system as one of the best they have heard.

RECEIVING INSPECTION—read before getting started

INSPECT YOUR AMP FOR ANY DAMAGE which may have occurred during shipping. If any damage is found, please notify the shipping company and CARVIN immediately. SAVE THE CARTON & ALL PACKING MATERIALS. In the event you have to re-ship your unit, always use the original carton and packing material. This will provide the best possible protection during shipment. CARVIN and the shipping company are not liable for any damage caused by improper packing.

SAVE YOUR INVOICE. It will be required for warranty service if needed in the future. SHIPMENT SHORTAGE. If you find items missing, they may have been shipped separately. Please allow several days for the rest of your order to arrive before inquiring. RECORD THE SERIAL NUMBER on the enclosed warranty card or below on this manual for your records. Keep your portion of the card and return the portion with your name and comments to us.

MODEL VL100 HEAD SPECS:

50 or 100 watts

RMS Power: Output Impedance: Input Impedance: Tone Controls:

Ch 1 Sensitivity: Ch 2 Sensitivity: Channels: Voiced Line Out: Preamp Tubes: Power Amp Tubes: USA Model: Export Model: Cabinet Size: Cabinet: Net Weight: Warranty: Options:

4, 8 & 16Ω 470,000 ohms BASS: 80Hz MID: 600-700Hz TREBLE: 11k Hz 16mV for clipping 30mV for full output 2—switching
1.5 VAC @ 100 watts RMS
5—12AX7's (dual stage)
4—EL34's (power pentode)
120VAC, 300VA
230VAC, 300VA 24.25W x 10.5H x 9.5"D 7-ply poplar wood 40 lbs

CV3200 cover, FS22 footswitch

MODEL VL212 COMBO SPECS:

Speakers: RMS Power: Output Impedance: Input Impedance: Tone Controls: (Both Channels)

Ch 1 Sensitivity: Ch 2 Sensitivity: Channels: Voiced Line Out: Preamp Tubes: Power Amp Tubes: USA Model: Export Model: Cabinet Size: Cabinet: Net Weight: Warranty:

Two Vintage 30 Celestion™ Speakers 50 or 100 watts 4, 8 & 16Ω 470,000 ohms BASS: 80Hz MID: 600-700Hz TREBLE: 11k Hz 16mV for clipping 30mV for full output 2—switching 1.5 VAC @ 100 watts RMS 5—12AX7's (dual stage) 4—EL34's (power pentode) 120VAC, 300VA 230VAC, 300VA 26W x 10.25D x 19.5"H 7-ply poplar wood 62 lbs CV3212 cover, FS22 footswitch

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

Invoice Date_ Serial No.

76-32100 0502

(800) 854-2235 www.carvin.com

VL100 / VL212 FRONT & REAR PANEL CONTROLS

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. In order to get started you will need your Legacy amp, a 120 or 230 AC grounded power outlet, your instrument and a standard guitar cord. With the amp turned off, plug it into the proper AC voltage.

Now turn all the volume and drive controls off and set tone controls at their mid center position. If you have purchased the FS22 footswitch, plug it into the rear foot switch jack for switching the channels and reverb. Note: The channel SELECT button must be in the OUT position (CH 1) for the FS22 to function

Now, turn the power switch and standby switch ON. Allow 60 seconds for the tubes to warm up. Gradually raise the volume controls and re-adjust the tone controls and your're ready to go. Please call if you feel your amp is malfunctioning. Occasionally tubes are damaged in shipping.

FRONT PANEL

1. GUITAR INPUT

A standard 1/4" input jack feeds both channels through using the SELECT switch. Use a professional quality guitar cord no longer than 25 feet. Typical cable capacitance should be under 50pf—the longer the cord, the greater the capacitance (you can measure this with a capacitance meter). A long cable with high capacitance will reduce the overall treble response from your guitar pickups.

2. CHANNEL SELECT

Set the channel SELECT switch to the desired channel. The LED's next to the volume controls will let you see what channel is functioning. Use channel 2 for clean playing. Use channel 1 for overdrive/sustain. For the FS22 foot switch to function, set the channel SELECT to the "OUT" channel 1 position.

LEAD CHANNEL 1

3. LEAD CHANNEL INDICATOR

The red LED will illuminate when the LEAD channel is selected

4. LEAD VOLUME

The volume of the lead channel is to be used as a master level control. For partial clean output, set the VOLUME control to 10 and turn the DRIVE nearly off—under 1. By reducing the guitar volume, you can use this channel as an alternate clean channel.

5. LEAD DRIVE

For mild tube saturation, set the DRIVE control between 1 & 2. For some of the best saturation, set the control around 3 & 6. For full blown overdrive, set the control between 8 and 10. Drive settings above 8 are subject to over saturation depending on the output of the guitar pickups used. High-output pickups can over saturate causing sluggish distortion. Play your guitar with it's volume at 10 and decrease the amount of drive until the crisp highs come back.

6. LEAD-BASS, MID & TREBLE

To start off with, set the BASS, MID & TREBLE controls at their center (5) position. These controls are to be set according to the type of pickups used (dual or single coil). It's normal to decrease the BASS at higher playing levels. Try the PRESENCE control also when adjusting the treble.

7. LEAD PRESENCE

Channel 1 features it's own LEAD PRESENCE control for added clarity. It's frequency range is set at the mid range of the tonal spectrum. Careful adjustment with the TREBLE control will make this feature very useful.

CLEAN CHANNEL 2

8. CLEAN CHANNEL INDICATOR

The red LED will illuminate when the CLEAN channel is selected.

9. CLEAN VOLUME

Channel switching from the Lead channel into Channel 2 gives you crisp, clean playing. Thanks to special mud-cutting circuits that work between the frequencies of 500 and 700 Hz, your quitar tones will be full and vibrant.

10. CLEAN PRESENCE

For added clarity, the CH 2 PRESENCE switch increases only the highest guitar harmonics in the 8-10k Hz range which is ideal for brightening up middy single coil neck pickups. A normal bright switch works only in the 3k Hz range leaving your sound somewhat flat. Single or dual coil pickups will determine the need for this switch.

11. CLEAN—BASS, MID & TREBLE CONTROLS

You can start at 5 on the dial for each of the tone controls. However, these settings do not represent a normalize (flat) sound. You need to set them where they sound best! Most musicians like to reduce the MID'S between 1 and 4 for deeper bass and crisper highs. If your sound is too bright with single coil pickups, you may want to keep the PRESENCE switch off.

MASTER SECTION

12. MASTER REVERB

Set the REVERB control for the desired amount (this works in both channels).

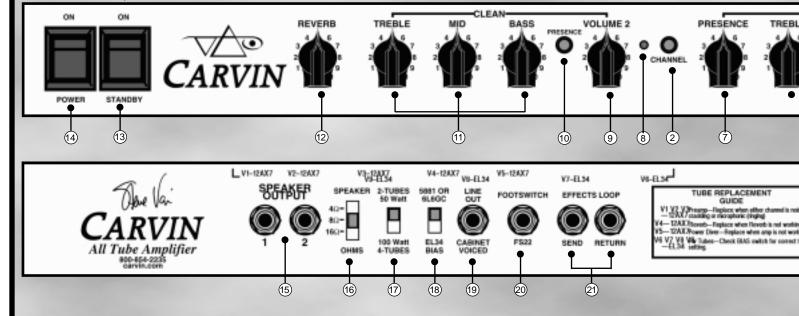
13. STANDBY SWITCH

Use the STANDBY SWITCH If you are taking a break. This turns the high voltage off, increasing the life of your power tubes while keeping the power and preamp tube filaments on for immediate use.

14. POWER SWITCH & INDICATOR

The power switch is to be utilized as the master ON/OFF switch. As the amp is turned on, the RED portion of the power switch will illuminate as your ON indicator.

VL100 Head as shown VL212 Combo front & rear panels reversed



REAR PANEL

15. SPEAKER JACKS

Two 1/4" SPEAKER JACKS are featured to operate several speaker systems at the same time. Calculate the total speaker impedance based on parallel wiring as both speaker jacks are wired in parallel. Select the IMPEDANCE SWITCH for the correct impedance.

16. SPEAKER IMPEDANCE SWITCH

The IMPEDANCE SWITCH offers the selection of 4, 8 or 16 ohms to match your speaker system. The correct setting for use with one C412 cabinet is 16Ω . For use with two C412 cabinets, the correct setting would be 8 ohms. The impedance of the Legacy VL212 combo amp is 8 ohms. In the case of adding another 8 ohm system such as the C212E 8 ohm extension cabinet, move the switch to 4 ohms.

17. 4 TUBE 100 WATT OR 2 TUBE 50 WATT OPERATION

For maximum output power, be sure the power tube selector switch is selected for 4 TUBE 100 watt operation. For lower overall levels and early power amp clipping, move this switch to the 2 TUBE 50 watt operation. The volume reduction will only be 3 dB.

18. POWER TUBE BIAS SWITCH

If you desire to change from EL34 to 5881 (6L6GC) power tubes, you may do so by selecting the external BIAS switch to the 5881 (6L6GC) position on the rear panel. Be sure that this switch is selected to the proper position or excessive heat will damage your tubes.

The internal P11 bias trim control can be set by a qualified technician. To set the bias, measure the current across the terminals of the STAND BY switch (set this switch to the off position when the amp is on). Set the idle current to 100 mA for all tube types.

19. VOICED LINE OUT

The LINE OUT 1/4" jack is "CABINET VOICED" to prevent excessive bass or highs going to your mixer. This greatly aids in sound quality because you do not have to move your mixer EQ setting to the extreme. The 1.5 VAC output (reference to 100 watts output at 8 ohms) is more than adequate to drive any professional mixer or power amp.

20. FS22 FOOTSWITCH

Most foot pedals with 2 switches, a stereo cord and plug will work. However, Carvin's FS22 is recommended because of the correct identification label on the foot switch. First, the channel SELECT switch on the front panel must be selected to the "OUT" channel 1 position before the footswitch will work. Now that you are connected correctly, the channels and reverb can be switched remotely. If a hum is heard in the speakers, the select switch is in the wrong position (this will not harm the amp).

21. EFFECTS LOOP

For the lowest possible noise from an effects processor, use the effects loop instead of plugging the guitar into the effects and then into the amp. To use the EFFECTS LOOP, plug the INPUT of your effects into the SEND jack and the OUTPUT of your effects into the RETURN jack. Use shielded cables, not speaker cables. It's possible to have a slight gain reduction of several dB with some effects units. However, the amp has plenty of gain to overcome any loss.

22. AC POWER & FUSE

The detachable AC POWER CORD supplied is designed to operate with one type of voltage (the European 230V export model uses a CEE-7 plug cord set). Check the rear power cord label for the proper voltage and fuse value. Make sure the cord is securely inserted

into the back of the unit. Plug the 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 Legacy features a circuit breaker that protects itself from damage that would otherwise be caused by power surges, or short circuits from damaged cables.

HELP SECTION

a) USING THE VAI "HIDDEN FEATURE"

One of the "hidden" features of the Legacy amp is using a technique that Steve Vai requested be part of the amp for his own use. While playing on the lead channel with a generous amount of DRIVE (around 6), back off the volume on your guitar. You will find the channel actually "cleaned up" with your guitar at a lower volume. This is a great feature for playing both rhythm and lead without switching channels. You will also find that the amp will be very responsive to your "attack". An advanced player knows how to vary his/her attack when picking or strumming, and the Legacy is designed to respond to this.

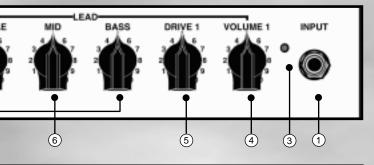
b) FEEDBACK FROM THE LEAD CHANNEL

The Legacy will feedback when the LEAD volume, DRIVE, TREBLE and PRESENCE are turned all the way up. Like other highly modified tube amps, this is normal. To help reduce feedback and noise, keep the DRIVE control set around 5 to 7 on the dial. Some of the best lead saturation will be at around 5—not 10. Sometimes replacing V1 (12AX7A) can help reduce feedback.

c) TUBE REPLACEMENT GUIDE

It is not uncommon for tubes to malfunction during shipping. If your amp is not working properly (popping noises, bad ringing, or power tube problems), please call for assistance or refer to the following tube replacement guide.

- 1) The 12AX7A preamp tubes V1 and V2 are the most critical tubes for noise problems with V1 being the most sensitive (try exchanging V1 and V2). Replace these tubes if you have poping or a bad ringing in the Lead Drive channel. Note: Low noise tubes are very hard to get and have to be tested for low noise. V3, V4, and V5 generally do not generate noise into the amp regardless of how noisy the tubes may be. V3 and V5 drives the Clean channel and power amp stage. V4 drives the Reverb system. If the reverb fails, check the cables before you replace V4. Sometimes the small lead wires inside the tank break. If the power amp section is not working, check V3 & V4 by inserting a signal into the rear EFFECTS RETURN jack. If the power amp still does not work, read about the power tubes V6 through V9. 12AX7 LOCATIONS: V1 is located next to the outside (left or right depending on the model). The other tubes following consecutively with V5 twards the middle of the chassis.
- 2) The EL34 power tubes are located in the following order on your chassis: V6, V7, V8, V9. Normally you'll want to replace these tubes as a set. Please call for our latest prices. Sometimes you can spot defective power tubes when they are glowing red-hot along with an audible hum in the speaker when the amp is idling. If this happens, shut the amp down immediately. Check the rear bias switch to be sure that it is selected for the proper tubes. After they have cooled down, remove by pushing the retainers on the base of the tubes down and rock the tubes in a circular motion while pulling them out. It is recommended to turn your amp upside down to replace tubes. All tubes are keyed in the same direction. Running defective power tubes could damage the amp. It is recommended that you have a spare set of power tubes along with several 12AX7A preamp tubes.







Visit the Carvin website for Steve Vai's amp settings, and sound samples. www.carvin.com/vai

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.



RISK OF ELECTRIC SHOCK DO NOT OPEN



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instruc tions 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, witchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

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

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

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

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

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

SAFETY INSTRUCTIONS (EUROPEAN)

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

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

LIMITED WARRANTY

Your Carvin product is guaranteed against failure for ONE YEAR unless otherwise stated. Vacuum tubes are guaranteed for 90 days. Carvin will service and supply all parts at no charge to the customer providing the unit is under warranty. Shipping costs are the responsibility of the customer. CARVIN DOES NOT PAY FOR PARTS OR SERVICING OTHER THAN OUR OWN. A COPY OF THE ORIGINAL INVOICE IS REQUIRED TO VERIFY YOUR WARRANTY. Carvin assumes no responsibility for horn drivers or speakers damaged by this unit. This warranty does not cover, and no liability is assumed, for damage due to: natural disasters, accidents, abuse, loss of parts, lack of reasonable care, incorrect use, or failure to follow instructions. This warranty is in lieu of all other warranties, expressed or implied. No representative or person is authorized to represent or assume for Carvin any liability in connection with the sale or servicing of Carvin products. CARVIN SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES

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

HELP SECTION

1) AMP WILL NOT TURN ON

Check the power to the amp. Check for tripped circuit breakers, unplugged extension cords or powerstrip 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.

REPLACEMENT PARTS LIST (for circuit cards)



REFER SERVICING TO QUALIFIED SER-VICE PERSONNEL! THIS UNIT CON-RISK OF ELECTRIC SHOCK TAINS HIGH VOLTAGE INSIDE!

Ref. N	la.	Carvin P/N	C37	Capacitor, Poly, 0.01µF 100V, 10%	46-10312
Rei. i	чо.		C38	Capacitor, Poly, 0.01pr 100V, 10% Capacitor, Electrolytic, 10µF 50V, 20%	47-10051
B1	Jumper, 0.35", 0Ω	50-00035	C39	Capacitor, Poly, 0.001µF 400V, 10%	46-10242
B2	Jumper, 0.50", 0Ω	51-00050	C40	Capacitor, Poly, 0.007µF 400V, 10%	
B3	Jumper, 0.35", 0Ω	50-00035			46-47312
B4	Jumper, 0.35", 0Ω	50-00035	C41 C42	Capacitor, Ceramic, 27PF 500V, 5%	45-27052 41-47342
B5	Jumper, 0.35", 0Ω	50-00035		Capacitor, Mylar, 0.047µF 400V, 10%	
B6	Jumper, 0.50", 0Ω	51-00050	C43	Capacitor, Mylar, 0.047µF 400V, 10%	41-47342
B7	Jumper, 0.50", 0Ω	51-00050	C44	Capacitor, Electrolytic, 47µF 63V, 20%	47-47061
B8	Jumper, 0.50", 0Ω	51-00050	C45	Capacitor, Mylar, 0.047µF 630V, 10%	46-47362
B9	Jumper, 0.8", 0Ω	44-18000	C46	Capacitor, Ceramic, 10PF 500V, 5%	45-10052
B10	Jumper, 0.35", 0Ω	50-00035	C47	Capacitor, Electrolytic, 1000µF 25V, 20%	47-10225
B11	Jumper, 0.8", 0Ω	44-18000	C48	Capacitor, Electrolytic, 22µF 500V, 20%	42-22052
B12	Jumper, 0.35", 0Ω	50-00035	C49	Capacitor, Electrolytic, 22µF 500V, 20%	42-22052
B13	Jumper, 0.35", 0Ω	50-00035	C50	Capacitor, Electrolytic, 22µF 500V, 20%	42-22052
B14	Jumper, 0.35", 0Ω	50-00035	C51	Capacitor, Electrolytic, 22µF 500V, 20%	42-22052
B15	Jumper, 0.50", 0Ω	51-00050	C52	Capacitor, Electrolytic, 22µF 500V, 20%	42-22052
B16	Jumper, 0.8", 0Ω	44-18000	C53	Capacitor, Mylar, 0.047µF 630V, 10%	46-47362
B17	Jumper, 0.50", 0Ω	51-00050	C55	Capacitor, Electrolytic, 2200µF 6.3V, 20%	47-22260
B18	Jumper, 0.35", 0Ω	50-00035	C56	Capacitor, Electrolytic, 22µF 500V, 20%	42-22052
B19	Jumper, 0.8", 0Ω	44-18000	C72	Capacitor, Ceramic, 180PF 500V, 5%	45-18152
B20	Jumper, 0.35", 0Ω	50-00035	C73	Capacitor, Poly, 0.0047µF 100V, 10%	46-47212
B21	Jumper, 0.8", 0Ω	44-18000	D1	Diode, 1N4745A 16V, 1W	60-47450
B22	Jumper, 0.50", 0Ω	51-00050	D2	Diode, 1N4745A 16V, 1W	60-47450
B23	Jumper, 0.8", 0Ω	44-18000	D3	Diode, 1N4745A 16V, 1W	60-47450
B24	Jumper, 0.50", 0Ω	51-00050	D4	Diode, 1N4745A 16V, 1W	60-47450
B25	Jumper, 0.50°, 0Ω	51-00050	D5	Diode, 1N4003, 1A 200V	60-40030
B26	Jumper, 0.30°, 0Ω2	44-18000	D6	Diode, 1N4007A 1000V, 1A	60-10000
B27		50-00035	D7	Diode, 1N4007A 1000V, 1A	60-10000
B28	Jumper, 0.35", 0Ω	50-00035	D8	Diode, 1N4007A 1000V, 1A	60-10000
B29	Jumper, 0.35", 0Ω	50-00035	D9	Diode, 1N4007A 1000V, 1A	60-10000
	Jumper, 0.35", 0Ω		D10	Diode, 1N4007A 1000V, 1A	60-10000
B30	Jumper, 0.35", 0Ω	50-00035	D11	Diode, 1N4007A 1000V, 1A	60-10000
B31	Jumper, 0.35", 0Ω	50-00035	D12	Diode, 1N4007A 1000V, 1A	60-10000
B32	Jumper, 0.35", 0Ω	50-00035	D13	Diode, 1N4007A 1000V, 1A	60-10000
B33	Jumper, 0.35", 0Ω	50-00035	D14	Diode, 1N4007A 1000V, 1A	60-10000
B50	Jumper, 0.50", 0Ω	51-00050	D15	Diode, 1N4007A 1000V, 1A	60-10000
B51	Jumper, 0.35", 0Ω	50-00035	D16	Diode, 1N4007A 1000V, 1A	60-10000
B52	Jumper, 0.50", 0Ω	51-00050	D17	LED, Red small, 3mm T-1.0	60-75320
C1	Capacitor, Electrolytic, 10µF 50V, 20%	47-10051	D18	LED, Red small, 3mm T-1.0	60-75320
C2	Capacitor, Mylar, 0.047µF 400V, 10%	41-47342	F1	Fuse Clips, (1 pair)	23-03529
C3	Capacitor, Poly, 0.001µF 100V, 10%	46-10212	H1A	Conn. Header, 4 Pin Vert, 2.5mm	23-11004
C4	Capacitor, Poly, 0.033µF 100V, 10%	46-33312	H1B	Conn. Header, 4 Pin Vert, 2.5mm	23-11004
C5	Capacitor, Ceramic, 120PF 500V, 10%	45-12152	H2A	Conn. Header, 2 Pin Vert, 2.5mm	23-10002
C6	Capacitor, Poly, 0.01µF 100V, 10%	46-10312	H2B	Conn. Header, 2 Pin Vert, 2.5mm	23-10002
C7	Capacitor, Ceramic, 330PF 1000V, 10%	45-33113	НЗА	Conn. Header, 4 Pin Vert, 2.5mm	23-11004
C8	Capacitor, Ceramic, 560PF 500V, 10%	45-56152	H3B	Conn. Header, 4 Pin Vert, 2.5mm	23-11004
C9	Capacitor, Electrolytic, 10µF 50V, 20%	47-10051	H5A	Conn. Header, 2 Pin Vert, 2.5mm	23-10002
C10	Capacitor, Mylar, 0.047µF 400V, 10%	41-47342	H5B	Conn. Header, 2 Pin Vert, 2.5mm	23-10002
C11	Capacitor, Poly, 0.001µF 100V, 10%	46-10212	H7A	Conn. Header, 2 Pin Vert, 2.5mm	23-10002
C12	Capacitor, Ceramic, 560PF 500V, 10%	45-56152	H7B	Conn. Header, 2 Pin Vert, 2.5mm	23-10002
C13	Capacitor, Electrolytic, 10µF 50V, 20%	47-10051	H8	Conn. Header, 4 Pin Vert, 2.5mm	23-11004
C14	Capacitor, Mylar, 0.0022µF 400V, 5%	46-22242	J1	Phone Jack, 1/4, 90° Rev Threaded Neck	21-01804
C15	Capacitor, Electrolytic, 10µF 50V, 20%	47-10051	J2	Phone Jack, 1/4, 3 Pin Plastic, 24mm	21-06453
C16	Capacitor, Mylar, 0.01µF 400V, 10%	41-10342	J3	Phone Jack, 1/4, 3 Pin Plastic, 24mm	21-06453
C17	Capacitor, Poly, 0.001µF 100V, 10%	46-10212	J4	Phone Jack, 1/4, 3 Pin Plastic, 24mm	21-06453
C18	Capacitor, Poly, 0.022µF 100V, 10%	46-22312	J5	Phone Jack, 1/4, 7 Pin Plastic Stereo, 24mm	21-06457
C19	Capacitor, Ceramic, 250PF 500V, 5%	45-25152			
C20	Capacitor, Electrolytic, 1000µF 25V, 20%	47-10225		Jumper .35 prep., 0.0Ω Relay, 30V/2A, 5V DIP DPDT, PCB MNT	50-00035
C21	Capacitor, Poly, 0.0022µF 100V, 10%	46-22212	L1		70-05305
C22	Capacitor, Poly, 0.0047µF 100V, 10%	46-47212	P1	Potentiometer, B100K, O Shaft, Pot 16, RX.250 90°	71-14052
C23	Capacitor, Poly, 0.022µF 100V, 10%	46-22312	P2	Potentiometer, B1Meg, O Shaft, Pot 16, RX.250 90°	
C25	Capacitor, Poly, 0.0047µF 400V, 10%	41-47242	P3	Potentiometer, 25A25K, O Shaft, Pot 16, RX.250 90°	
C26	Capacitor, Ceramic, 250PF 500V, 5%	45-25152	P4	Potentiometer, B1Meg, O Shaft, Pot 16, RX.250 90°	
C27	Capacitor, Electrolytic, 1000µF 25V, 20%	47-10225	P5	Potentiometer, 5A500K, O Shaft, Pot 16, RX.250 90°	
C28	Capacitor, Poly, 0.0022µF 100V, 10%	46-22212	P6	Potentiometer, B1Meg, O Shaft, Pot 16, RX.250 90°	/1-140/0
C29	Capacitor, Electrolytic, 2200µF 6.3V, 20%	47-22260	P7	Potentiometer, B1Meg, O Shaft, Pot 16, RX.250 90°	/1-14070
C30	Capacitor, Electrolytic, 2200µF 6.3V, 20%	47-22260	P8	Potentiometer, 25A25K, O Shaft, Pot 16, RX.250 90°	
C31	Capacitor, Ceramic, 82PF 500V, 5%	45-82052	P9	Potentiometer, B1Meg, O Shaft, Pot 16, RX.250 90°	
C32	Capacitor, Electrolytic, 10µF 50V, 20%	47-10051	P10	Potentiometer, B100K, O Shaft, Pot 16, RX.250 90°	71-14052
C33	Capacitor, Mylar, 0.047µF 400V, 10%	41-47342	P11	Potentiometer, Trimmer, 20K, PCB MTG	71-22012
C34	Capacitor, Poly, 0.0022µF 100V, 10%	46-22212	P15	Potentiometer, 5A500K, O Shaft, Pot 16, RX.250 90°	
C35	Capacitor, Electrolytic, 10µF 50V, 20%	47-10051	PL1	Receptacle AC, Jack AC w/ 20mm Fuse	21-02804
C36	Capacitor, Poly, 0.001µF 400V, 10%	46-10242	Q1	Transistor, 2N5550 NPN, 250V, TO-92	60-55500

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Q2 QC1	Regulator, 7805 +5V, 1A	60-78050 06-40045	R3
	Spade Terminal, QC Vertical, 0.205 Spade Terminal, QC Vertical, 0.205	06-40045	R3 R3
QC2 QC3	Spade Terminal, QC Vertical, 0.205	06-40045	R3
QC4	Spade Terminal, QC Vertical, 0.205	06-40045	R3
QC5	Spade Terminal, QC Vertical, 0.250	06-40050	R3
QC6	Spade Terminal, QC Vertical, 0.250	06-40050	R3
QC7	Spade Terminal, QC Vertical, 0.250	06-40050	R4
QC8	Spade Terminal, QC Vertical, 0,250	06-40050	R4
QC9	Spade Terminal, QC Vertical, 0.250	06-40050	R4
QC10	Spade Terminal, QC Vertical, 0.250	06-40050	R4
QC11	Spade Terminal, QC Vertical, 0.250	06-40050	R4
QC12	Spade Terminal, OC Vertical, 0.250 Spade Terminal, OC 90**Horizontal, 0.250 Spade Terminal, OC 90**Local, 0.250	06-40050	R4
QC13	Spade Terminal, QC Vertical, 0.250	06-40050	R4
QC14	Spade Terminal, QC Vertical, 0.250	06-40050	R4
QC15	Spade Terminal, QC Vertical, 0.250	06-40050	R4
QC16	Spade Terminal, QC Vertical, 0.250	06-40050	R4
QC17	Spade Terminal, QC Vertical, 0.250	06-40050	R5
QC18	Spade Terminal, QC Vertical, 0.250	06-40050	R5
QC19	Spade Terminal, QC Vertical, 0.250	06-40050	R5
QC26 QC27	Spade Terminal, QC 90 Horizontal, 0.250	06-40060 06-40060	R5 R5
QC28	Spade Terminal, QC 90 Horizontal, 0.250	06-40060	R5
QC29	Spade Terminal, QC 90 Horizontal, 0.250	06-40060	R5
QC31	Spade Terminal, QC Vertical, 0.250	06-40050	R5
QC32	Spade Terminal, QC Vertical, 0.250 Spade Terminal, QC Vertical, 0.250	06-40050	R5
QC33	Spade Terminal, QC Vertical, 0.250	06-40050	R5
QC34	Spade Terminal, QC Vertical, 0.250	06-40050	R6
QC35	Spade Terminal, QC Vertical, 0.250	06-40050	R6
QC36	Spade Terminal, QC Vertical, 0.250	06-40050	R7
QC40	Spade Terminal, QC Vertical, 0.250	06-40050	R7
QC41	Spade Terminal, QC Vertical, 0.250	06-40050	R7
QC42	Spade Terminal, QC Vertical, 0.250	06-40050	R7
QC43	Spade Terminal, QC Vertical, 0.250	06-40050	R7
QC50	Spade Terminal, QC 90° Horizontal, 0.250	06-40060	R7
QC51	Spade Terminal, QC 90° Horizontal, 0.250	06-40060	R7
QC52 QC53	Spade Terminal, QC 90° Horizontal, 0.250	06-40060 06-40060	R7 R7
QC54	Spade Terminal, QC 90° Horizontal, 0.250 Spade Terminal, QC 90° Horizontal, 0.250	06-40060	R7
QC55	Spade Terminal, QC 90° Horizontal, 0.250	06-40060	R9
QC56	Spade Terminal, QC 90° Horizontal, 0.250	06-40060	R9
R1	Resistor, 100K, .35 prep., 5% Carbon	50-10055	R9
R2	Resistor, 1.5K, .35 prep., 5% Carbon	50-15035	S1
R3	Resistor, 220K .5W, 0.5 prep., 5% Carbon	52-22055	S2
R4	Resistor, 150K, .35 prep., 5% Carbon	50-15055	S3
R5	Resistor, 100K, .35 prep., 5% Carbon	50-10055	S6
R6	Resistor, 1.5K, .35 prep., 5% Carbon	50-15035	S7
R7	Resistor, 220K .5W, 0.5 prep., 5% Carbon	52-22055	
R8	Resistor, 2.2M, .35 prep., 5% Carbon	50-22065	
R9	Resistor, 1.5K, .35 prep., 5% Carbon	50-15035	SP
R10	Resistor, 220K .5W, 0.5 prep., 5% Carbon	52-22055	SP
R11	Resistor, 47K, .35 prep., 5% Carbon	50-47045	T1
R12 R13	Resistor, 1.5K, .35 prep., 5% Carbon	50-15035	T2 V1
R14	Resistor, 220K .5W, 0.5 prep., 5% Carbon Resistor, 150K, .35 prep., 5% Carbon	52-22055 50-15055	VI
R15	Resistor, 100K, .35 prep., 5% Carbon	50-10055	V2
R16	Resistor, 22K, .35 prep., 5% Carbon	50-22045	٧2
R17	Resistor, 22K, .35 prep., 5% Carbon	50-22045	V3
R18	Resistor, 3.3K, .35 prep., 5% Carbon	50-33035	
R19	Resistor, 100K, 0.5 prep., 5% Carbon	51-10055	V4
R20	Resistor, 180K, .35 prep., 5% Carbon	50-18055	
R21	Resistor, 22K, .35 prep., 5% Carbon	50-22045	V5
R22	Resistor, 0.56Ω, .35 prep., 5% Carbon	50-05605	
R23	Resistor, 150Ω, .35 prep., 5% Carbon	50-15025	V6
R24	Resistor, 470Ω, .35 prep., 5% Carbon	50-47025	
R25	Resistor, 2.2K, .35 prep., 5% Carbon	50-22035	V7
R27	Resistor, 100Ω, .35 prep., 5% Carbon	50-10025	110
R28	Resistor, 100Ω, .35 prep., 5% Carbon	50-10025	V8
R29	Resistor, 0.56Ω, .35 prep., 5% Carbon	50-05605	V9
R30 R31	Resistor, 0.56Ω, .35 prep., 5% Carbon	50-05605 50-00035	٧9
R31 R32	Jumper, 0.0Ω 0.35 prep. Pesistor 2.2M 35 prep. 5% Carbon	50-00035	
NJZ	Resistor, 2.2M, .35 prep., 5% Carbon	JU-22003	

Resistor, 220 $\!\Omega_{\rm r}$.35 prep., 5% Carbon Resistor, 47K 1W, 0.8 prep., 5% Carbon 50-22025 53-47045 Resistor, 2.2M, .35 prep., 5% Carbon 50-22065 Resistor, 220K, .35 prep., 5% Carbon Resistor, 1.5K, .35 prep., 5% Carbon Resistor, 1.5K, .35 prep., 5% Carbon Resistor, 220K .5W, 0.5 prep., 5% Carbon 50-22055 50-15035 52-22055 Resistor, 100K, .35 prep., 5% Carbon Resistor, 1.0M, .35 prep., 5% Carbon Resistor, 1.5M, .35 prep., 5% Carbon 50-10055 50-10065 50-15035 Resistor, 100K, .35 prep., 5% Carbon 50-10055 Resistor, 22K, .35 prep., 5% Carbon Resistor, 22K, .35 prep., 5% Carbon Resistor, 22K, .35 prep., 5% Carbon Resistor, 100K, .35 prep., 5% Carbon 50-22045 50-22045 50-10055 Resistor, 560Ω, .35 prep., 5% Carbon 50-56025 50-10055 50-10055 50-10055 Resistor, 100K, .35 prep., 5% Carbon Resistor, 100K, .35 prep., 5% Carbon Resistor, 100K, .35 prep., 5% Carbon Resistor, 220K, .35 prep., 5% Carbon 50-22055 50-22055 50-22055 Resistor, 22K, .35 prep., 5% Carbon Resistor, 100K, .35 prep., 5% Carbon Resistor, 4.7K 1W, 0.8 prep., 5% Carbon Resistor, 2.2K 1W, 0.8 prep., 5% Carbon 50-22045 50-10055 53-47035 53-22035 Resistor, 350Ω 10W SDOF, Sand Bar, 10% 56-35010 Resistor, 0.56Ω , .35 prep., 5% Carbon 50-05605 50-05605 50-05605 Resistor, 100K, .35 prep., 5% Carbon Resistor, 4.7K, .35 prep., 5% Carbon Resistor, 4.7K, .35 prep., 5% Carbon Resistor, 4.7K, .35 prep., 5% Carbon Resistor, 350Ω 5W SDOF, Sand Bar, 5% 50-10055 50-47035 50-47035 50-47035 56-35025 Resistor, 350Q 5W SDOF, Sand Bar, 5% 56-35025 Resistor, 4.7K, .35 prep., 5% Carbon Resistor, 4.7K, .35 prep., 5% Carbon 50-47035 50-47035 Resistor, 350Ω 5W SDOF, Sand Bar, 5% 56-35025 Resistor, 350Ω 5W SDOF, Sand Bar, 5% Resistor, 100Ω , .35 prep., 5% Carbon Resistor, 100Ω , .35 prep., 5% Carbon 56-35025 50-10025 50-10025 Resistor, 10K, .35 prep., 5% Carbon Resistor, 470K, .35 prep., 5% Carbon Resistor, 22K, .35 prep., 5% Carbon Switch, DP3T Lft Tall Bat, PCB MTG 50-10045 50-47055 50-22045 25-76286 Switch, DP3T Lft Tall Bat, PCB MTG
Switch, DPDT Lft Sm Bat, DPDT, PCB MTG
Switch, DPDT Lft Tall Bat, DPDT, PCB MTG
Switch, DPDT 90° Lg, Chassis, PCB MTG
Switch, DPDT 90° Lg, Chassis, PCB MTG
Switch, Stand By, Switch LG DPDT, STAND BY
Switch, DN 70°F, Power with Light
Phone Jack, 1/4, 7 Pin Plastic Stereo, 0.25, 24mm
Transformer, 120V power
Transformer, 120V power
Transformer, 120V power
Transformer, Utput
Switch, 120K PL, 124K7A 12VAC, 9 Pin, SIN/RUS 25-62656 25-62657 25-32833 25-32833 25-31350 21-06457 21-06457 15-10711 15-02116 Transformer, Output Socket For Tube, 12AX7A 12VAC, 9 Pin, SIN/RUS Vacuum Tube, Type 12AX7 Socket For Tube, 12AX7A 12VAC, 9 Pin, SIN/RUS Vacuum Tube, Type 12AX7 23-91632 65-00127 23-91632 65-00127 Socket For Tube, 12AX7A 12VAC, 9 Pin, SIN/RUS 23-91632 Vacuum Tube, Type 12AX7 Socket For Tube, 12AX7A 12VAC, 9 Pin, SIN/RUS Vacuum Tube, Type 12AX7 65-00127 65-00127 Vacuum Tube, 12AX7A 12VAC, 9 Pin, SIN/RUS Vacuum Tube, Type 12AX7 Socket For Tube, 5881, 8 Pin, PCB MTG 23-91632 65-00127 23-26400 Vacuum Tube, Type 5881 65-05881 Socket For Tube, 5881, 8 Pin, PCB MTG Vacuum Tube, Type 5881 Socket For Tube, 5881, 8 Pin, PCB MTG 23-26400 65-05881 23-26400 Vacuum Tube, Type 5881 65-05881 Socket For Tube, 5881, 8 Pin, PCB MTG Vacuum Tube, Type 5881 23-26400