

Black Magic
25
Stereo
vacuum tube amp



Operating Manual

Bob Carver

The lightning flash with arrowhead, within an equilateral triangle, 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.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING - TO REDUCE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.



CAUTION: To reduce the risk of electric shock, do not expose this appliance to rain and moisture. Do not expose this device to dripping or splashing liquids and no object filled with liquids, such as vases, should be placed on the device.

NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

IMPORTANT SAFETY INSTRUCTIONS! PLEASE READ THEM BEFORE OPERATING THIS EQUIPMENT.

1. Read these instructions.
2. Keep these instructions
3. Heed all warnings
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Install in accordance with the Bob Carver Company instructions.
8. Do not install in close proximity to heat sources such as radiators, heat registers, stoves, fireplaces, or other apparatus (including other amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the power amplifier.

11. Only use attachments/accessories specified by Bob Carver Company.

12. Use only with the cart, stand, tripod, bracket, or table recommended by Bob Carver Company. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15. Do not expose this equipment to dripping or splashing liquids, and ensure that no objects filled with liquids, such as vases, are placed on the equipment.

16. To completely disconnect this equipment from the AC mains, disconnect the power supply cord plug from the AC receptacle.

17. The mains plug of the power supply cord shall remain readily operable.

18. Connect mains power supply cord only to a mains socket outlet with a protective grounding connection.

19. If possible, save the shipping carton that contained your Crimson 275, as well as the individual tube boxes.

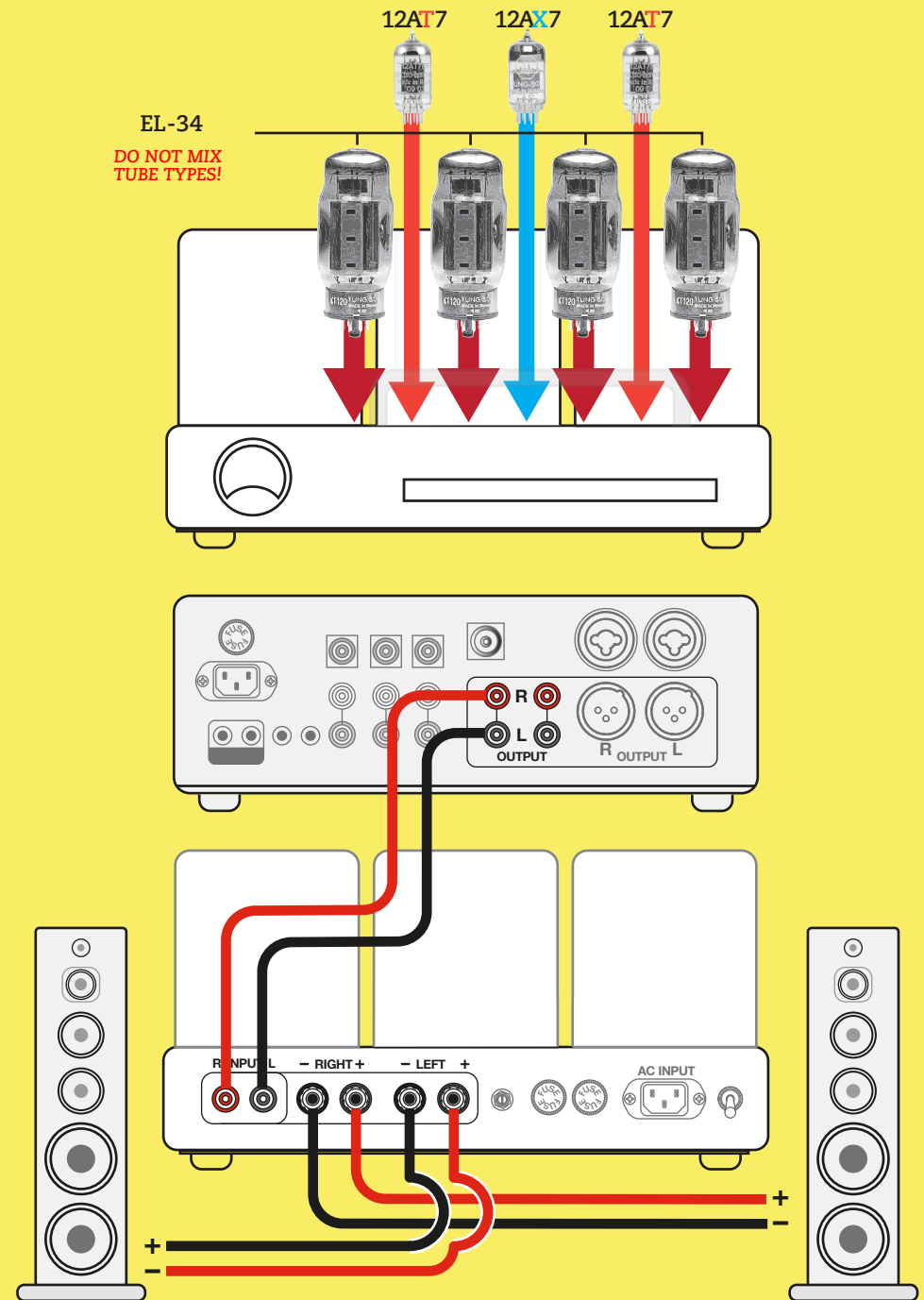
Quick Start Guide

1. Locate the seven vacuum tube boxes, four large and three small.
2. Place the Black Magic 25 according to the ventilation suggestions on page 6 of this manual.
3. Carefully insert the tubes into their sockets following the diagram at right and the further details on page 6 of this manual.
4. Connect the outputs of your preamplifier/DAC to the RCA inputs of the Black Magic 25. Make sure that the gain/volume control on your preamplifier/DAC is turned down. See page 8 for more hook-up instructions.
5. Connect the output terminals of the Black Magic 25 to your loudspeakers. See page 8 for more details.
6. Connect the IEC power cable between the Black Magic 25 power socket and the wall receptacle.
7. Power up your preamplifier/DAC.
8. Flip the Black Magic 25 rear panel POWER switch to ON.
9. Wait two minutes for the tubes to warm up.
10. Activate your music source and slowly advance the volume control on your preamplifier/DAC.
11. Enjoy! If you don't hear any sound, turn off your preamp/DAC and Black Magic 25, and re-check your connections, or contact Bob Carver LLC at

Bob Carver LLC

4563 Hydraulic Rd. Rockford, IL 61109 email:



Jim@bobcarvercorp.com



Thank You!

"I personally wish to thank you for choosing my Black Magic 25 amplifier. It has truly been a labor of love, incorporating many of the sonic improvements I developed for the Silver Seven 900 and Crimson/Raven 350, as well as those from previous designs. Along with the help of my wonderful staff, we believe that we have created both a sonic masterpiece and an excellent value.

"It's time to start enjoying years of musical enjoyment! But first, please take the time to read through this brief manual to get the most from your Black Magic 25."

Why we're so proud of the Black Magic 25

- Ample power for speaker loads from 2 ohms to 16 ohms, the musicality of premium vacuum tubes, and the accuracy and pristine specifications that come from Bob's 50+ years of design expertise.
- Bob's "listen to the room" innovation. Facilitated by a special current feedback loop, it allows the amplifier to 'hear' the room's reverb, along with its unique sonic signature. Each room plays its own tune, and this amp uses the speaker as a microphone by using the speaker in reverse to listen to the room, thereby allowing a portion of the room acoustic to be expressed through the main speakers. The room becomes an integral part of the music in a way no other

amplifier allows. Sound is more majestic, more realistic, and the sound stage is larger and more compelling.

This phenomenon is impossible to achieve with normal solid-state amplifier designs, whose low source (output) impedance effectively shorts out the speaker's ability to accomplish this feat

- DC Restorer circuit, an exclusive to Bob Carver designs, keeps the output tubes running cool, prolonging their life to beyond 50 years! Other amplifier tubes operate at a very high idle power to keep distortion low, frequency response extended, and for other technical reasons. The downside is that tube life is drastically shortened, about three to six years at the most. Worse yet, tube performance begins to deteriorate as soon as the amp is turned on. In addition to extended tube life, Bob Carver Company's DC Restorer eliminates the need to purchase expensive matched tubes for the Black Magic 25.
- Unique transformer design delivers enormous power through an increased turns ratio, with two extra interleaved windings, each bifilar wound on a core of highest quality, grain oriented, silicon steel (Bob's term for it is *admantine*. Google it.) with a pure nickel center section. The secondary's are wound with oxygen-free copper wire and 98% pure silver wire for the critical internal connections.



Record This Important Information

For possible insurance claims or factory repair, please record the serial number, purchase date and Bob Carver Company Dealer name in the spaces provided.

Serial Number: _____

Purchase Date: _____

Dealer Name: _____

Technical Assistance

Your Bob Carver Dealer welcomes questions about your Black Magic 25 and any other brands that may be part of your system. If you or your Dealer wish additional help concerning a suspected problem, we're here for you.

Bob Carver, LLC
4563 Hydraulic Rd.
Rockford, IL 61109
Email: Jim@bobcarvercorp.com

Customer Service

We are proud of the fact that we support our amplifiers far longer than any of our competitors. Your new Black Magic comes with a **FIVE YEAR** tube and service warranty!

If it is determined that your amp needs repair, you should first contact your Bob Carver Company dealer. If you cannot locate the dealer, contact us and we will provide you with a Return Authorization. For assistance, contact us at the phone and email addresses above.

Our Limited Warranty is on page 12 of this Manual.





Placement and Cooling

Cool air is drawn from under the chassis by the heat from the tubes acting as an air pump, and exhausting the warm air out the chassis through the vents.

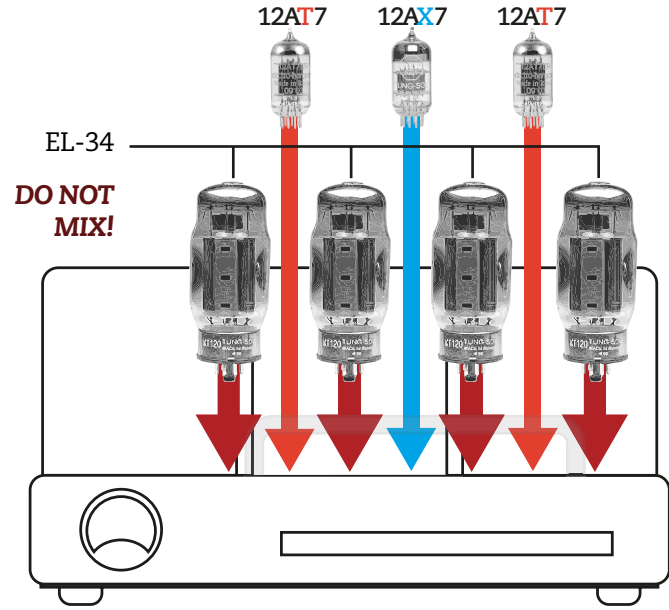
Place the amp on a hard surface. Do not place the amplifier on a carpet without something hard for it to sit on like a piece of nice glass cut to the same size as the unit. This will allow the feet to do



their job by keeping the bottom raised, allowing unimpeded airflow.

A glass shop can make such a base plate and in colors if you wish. A nice dark gray, smoke or opaque black looks beautiful. It should be at least a quarter of an inch thick.

We also don't recommend placing the Black Magic in a tightly-enclosed cabinet without sufficient ventilation. Allow at least 18 inches of free space above the amplifier.



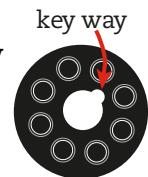
Inserting the Vacuum Tubes.

The Black Magic comes with three small and four large vacuum tubes: Two 12AT7's, one 12AX7, and four EL-34 output tubes.

Press the tubes into the bases (sockets) gently so that you don't bend the pins.

The bases for all three small tubes are identical, so take care to make sure that the 12AX7 is in the *middle* socket.

Tung-Sol in their infinite wisdom has configured their tubes' black, central base hole to be slightly different than our conventional tube bases. Look carefully so that you line up the raised portion of the tube's central base with the "key way" on the tube base.





More About the Tubes.

The output tubes do not need to be matched, as the sound of the amp does not at all depend on matched output tubes. That's because the DC restorer circuit eliminates the need to match tubes.

The only caveat here is that the output tubes should all be the same type and vintage.

Looking at the amplifier from the front, left to right: the first tube is a 12AT7, then a 12AX7, and finally a second 12AT7. We ship Black Magic with EL34 output tubes.

Why we can offer a 5-year warranty on Black Magic 25 tubes.

There is a meter on the front of the amplifier which can indicate the health of the tubes — get a bad reading, get free tubes!

As with our more expensive amplifiers, Bob employs his unique twist on a DC restorer circuit which has two main benefits — lower distortion without dissonant side effects and extended tube and amplifier life.

Our amplifiers simply do not run hot. Like their more expensive siblings, they are the coolest running tube type amplifiers ever, allowing you to actually touch the tops of the output tubes and never be burned!

The internal temperature of our amplifiers is a bit warmer than the inside of your mouth resulting in an extremely long lifespan.

Due to the unique design, all the components in the amplifier undergo much less stress than in conventional designs.

And, due to the efficiency of the concept, our transformers can be lighter and, despite Bob Carver specifying esoteric steel for their cores, it helps us sell a \$4000+ amplifier for under \$3000. As with his legendary Sunfire® tracking power supplies, the bottom line is that you may expect our amplifiers to outlive any other brand, and our extended warranties underscore that fact.

We warrant the Black Magic for a **full five years**; that's the amplifier *and* the tubes! We love the fact that our finest competitors warrant their tubes for three months. It's all about economics. If your tubes tend to fail, limit the warranty. A manufacturer has no option; they must. Since our tubes last for years, it costs us nothing to be heroic.

Perhaps even more importantly, not only do the tubes no longer fail every two or three years, they do not degrade sonically as all tubes must when boiling away in every one of our competitors amplifiers — a truly remarkable accomplishment and typical for Bob Carver, Absolute Sound Magazine Hall of Fame designer.

General Operation.

Bob has intentionally made the Black Magic extremely simple to operate. Volume (gain) is determined by your preamplifier or DAC.

Tube biasing, using the rear panel control, is optional and will be covered on page 9 of this manual.

That's all there is...except for connecting your sound source, loudspeakers and line cord.

Speaker Connections.

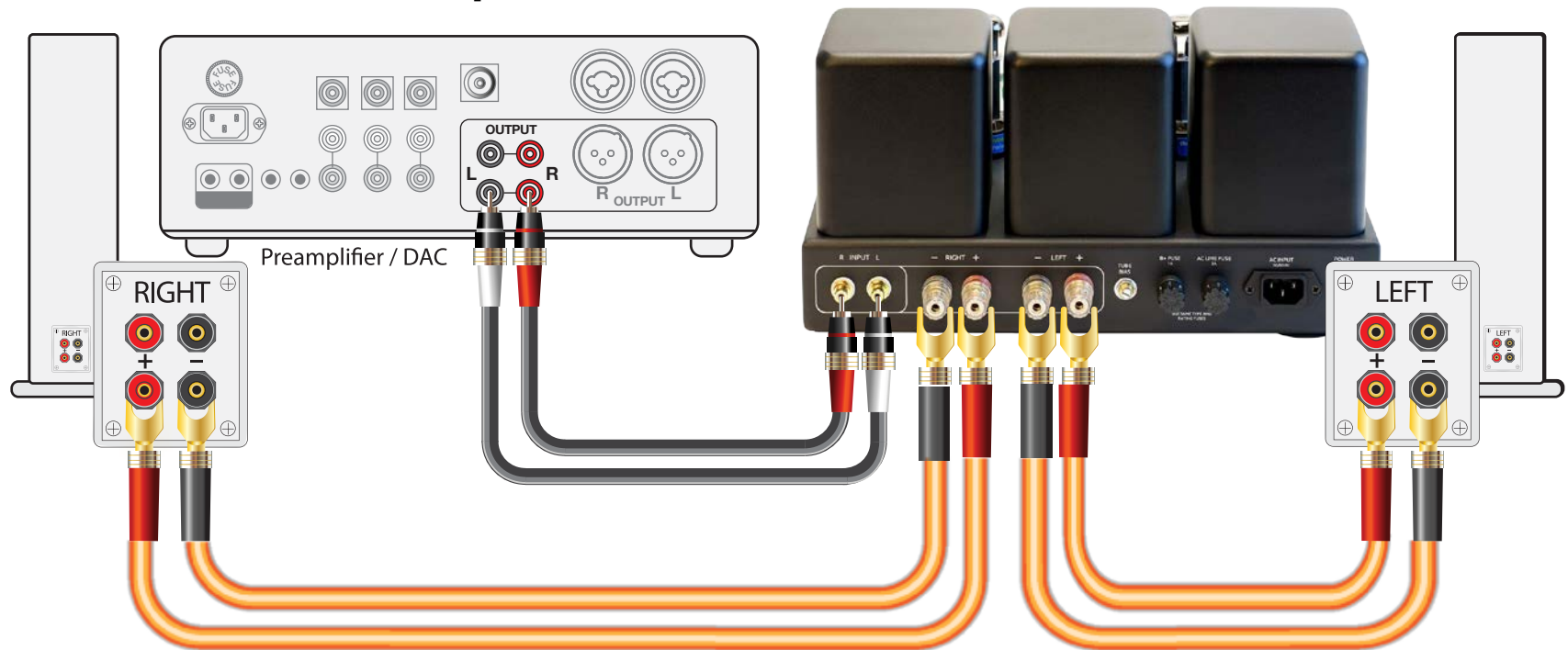
It is very important to use speaker cables of the correct diameter in order to reduce power loss. It is not within the scope of this manual to discuss

all of the esoteric cables available.

The Black Magic 25 speaker terminals will accept spade lugs, banana plugs or bare wire.

If using bare wire, remove half an inch of insulation and tightly twist the wire strands together. They may also be "tinned" with solder before insertion into the center hole in the speaker terminal.

From the rear view: the black binding post is common, and the red post is two or four or eight ohms. The power curve is quite flat, hence the taps may be used for one or two ohm speakers, or for sixteen ohm speakers.



Input Connections.

The red RCA-type input is for the right channel; black is for the left channel. As with speaker cables, you have many esoteric options as well as “conventional” connection cables. At the very least, use high quality RCA cables with gold plating and durable cable-to-plug connections. Cheap cables can fail and lead to frustrating trouble-shooting — who would ever suspect their connection cables?

Double-check that “left goes to left”, “right goes to right”, “plus (red) goes to plus (red)”, and “minus (black) goes to minus (black)”.

Line Voltage

This amplifier may be configured for operation with 120 volts or 240 volts, 50 / 60 Hz. The change-over must be performed by qualified personnel. It is a standard under-the-chassis wiring configuration.

When used with 240 volts, the AC line fuse must be replaced with a 1.5 Ampere unit.

Fuses

The rear panel line fuse is a 3 Ampere (1.5 Ampere for 240 volt operation), fast-blow type, and should be replaced with the same type and rating if it ever needs replacing. **Do not, under any circumstances, use a “slow-blow” fuse here.**

The (rear panel) vacuum tube cathode fuse



(B+) is a 1.0 ampere and should be replaced with the same type and rating. If the fuse blows during bench testing, it may be temporarily replaced with a 1.25 or 1.5 ampere

fuse. **Do not, under any circumstances, use a “slow-blow” fuse here!**

Normally, a 1.0 ampere fuse will be perfect for music because the peak-to-average power ratio of speech and music is about 10:1. If you find that the 1.0 amp fuse blows with music, you may replace it with a 1.25 ampere fuse, or even a 1.5 ampere unit.

Power Switch

Up is ON, down is OFF. There is no power-on indicator except for the glow of the tubes, so you will have to remember whether you turned it on for about 10 seconds until you can see the tubes glow. It is safe to switch the amplifier on and off at will.

Adjusting the Output Tube Bias.

The front panel incorporates a multi-purpose meter, one of the purposes of which is as a Tube Bias Meter. **IMPORTANT: Turn your preamp volume control all the way down while performing bias adjustments.**

Use a small screwdriver and adjust the BIAS



control (located on the rear of the amplifier) for 100 mA, after the unit has warmed up for about 20 minutes. The normal range to use is from 60 mA to 120 mA, and changes here will vary the damping factor of the amplifier slightly. More current increases the damping factor, whereas less current provides a softer more tube-like sound. The design center is 100 mA, and that should be your starting point if you want to experiment. It will vary from speaker to speaker, and most importantly with your taste.

The meter reads the combined current for all four output tubes, and it is normal for this current to vary slightly with changes in power line voltage.

Tube Substitution

The output tubes do not need to be matched, as the sound of the amp does not at all depend on matched output tubes. That's because the DC restorer circuit eliminates the need to match tubes. The only caveat here is that the output tubes should all be the same type and vintage.

Looking at the amplifier from the front, from left to right: the first tube is a 12AT7, then a 12AX7, and finally a second 12AT7. The output tubes are EL-34. Bias adjustment will be required when changing tube types. Output tubes must always be 4 of the same type. No mixing.

Monitoring and Tube Troubleshooting.

Once the idling current has been set, it will normally not need to be adjusted for several years unless you want to a) experiment for different sound; b) if you install different output tubes, or c) the amplifier suddenly starts to sound funny. If you hear a POP and see a flash, yet the amp continues to play, you should first check the current and then the output tube fuse.

If the fuse blows, the output current will drop to zero. If the tube fuse blows, replace it WITHOUT replacing any tubes.

Turn the amp on and monitor the current. If it climbs to within the range you had set, and if the amp sounds good, all is well.

Often, an output tube has a speck of dust-like impurity, which comes into contact with an internal element, shorting the element, and is vaporized into gaseous oblivion. The getter, the mirror-like shiny plating on the inside of the tube does its job, absorbs the vaporized material and the tube is new again. All it takes is a new fuse.

If you install a new fuse and it blows again, you will need to determine which tube is the culprit.

Proceed as follows:



- Remove all output tubes and turn the preamp volume control all the way down.
- Turn the amp on and leave it on.
- While monitoring the current, put a pair of tubes into sockets Number One and Number Two. Allow one minute on the clock for the two tubes to warm up.
- If the current comes up to about half the normal amount, both those tubes are good.
- Remove those tubes and install another pair, also in sockets Three and Four. Continue on until a fuse blows, or the tubes won't bias up.
- Then buy or borrow a known good tube (remember, if it is actually bad, we'll pay for the replacement), and using it as a mate, use the process of elimination to figure out which of the tubes is bad by substituting the good tube. At this point, if you get lucky, only one trial will be needed. If you are not lucky, then it will take two trials.
- Now you can turn the amp off.

You will be able to install and remove the tubes with your bare fingers if you do it within about a minute or so of installing each fresh set. That's because it takes substantially longer than a minute for the tubes to get too hot to hold.

Tube Tester

The front panel meter may be used to test the tubes.

- Remove all the power output tubes
- Plug the amp into the AC wall socket with the main rear panel power switch OFF.
- Insert the tube you wish to test into socket four (the far-right large tube socket).
- Turn the bias control fully clockwise, then turn the main power switch ON. With a watch, time the warm-up period for exactly one and a half minutes and note the current reading. Turn the amplifier OFF,
- Remove the tube and insert the next one. You can hold the tube with your bare fingers — it will not be too hot after only a minute and a half, provided it was cool to start with.





- Keep track of each reading, and repeat until all tubes have been checked. If any single tube does not bias up or “runs away” with its current climbing substantially higher, $\approx 200\%$ than the others, then it must be replaced.
- It is okay to turn the amp on and off at will.
- Return the BIAS CONTROL to its original position and put all the tubes back into their sockets.

This completes the tube testing operation.

Matching Output Tubes

Matching output tubes is not necessary, thanks to the DC restorer. But it’s fun to do anyway. As noted above, as you wrote down each bias current, you will end up with six numbers.

The goal is to select two groups of two whose sum (from any two tubes) is as close as you can get to the other group of two tubes. Install the first group in sockets and two.

Then install the other group into sockets two and four. The socket positions on the amp, from left to right, looking from the front are: #1, #2, #3, and #4.

The new tubes are quite variable, and we recommend that you should go through the exercise of matching them as outlined above.

New Amplifier Smell

Like a brand new car, this amplifier possesses a “new amplifier smell,” even though it has been built from both new and vintage parts. When powered up for the first time, the fresh paint and recent skin oils on the tubes will create a new, hot amp smell. I find it sort of pleasant, but you may not. It will dissipate with use, usually requiring about four weeks of normal operation.

Circuit Description

The input stage consists of a 12AX7 current sourced long-tailed class A amplifier, which is direct coupled to a long-tailed balanced pair comprised of a 12AT7. The 12AT7 drives the grids of the EL-34 output tubes through a pair of coupling capacitors that provide low frequency loop-gain stability. A dual-diode DC restorer ensures that the bias voltage remains correct over the entire audio signal cycle.

The output tubes are arranged in push-pull parallel, four in all. The screen grids are operated at approximately 340 Volts provided by a separate power supply formed by one- half of a voltage doubler supplying the plates with 685 Volts.

The power supply consists of a large power transformer, with energy storage that is far greater than necessary. AC filament voltage is biased to approximately 60 volts. Multiple decoupling filter

sections are used with load regulation obtained through constant current loading.

Turn-on in-rush current limiting is provided by a thermistor, bias voltage adjustment by a bias control, and bias current is measured by a meter that simultaneously senses current for all four output tubes. A tube fuse is mounted on the rear apron and provides protection for the output section in the event of a catastrophic vacuum tube failure. Additionally, a rear mounted power line fuse provides overall protection for the amplifier.

Specifications

Gain	29 dB
Power	More than 24 Watts Per Channel, both channels driven at eight ohms with no more than 1% Total Harmonic Distortion. Distortion decreases at lower levels
4Ω Power	25 watts
8Ω Power	25 watts
16Ω Power	25 watts
Noise	Better than 100 dB below 25 watts, A-weighted
Frequency Response	+0, -2 dB from 20 Hz to 20 kHz
Distortion	Less than 1%
Source Impedance	1.7 ohms
Input Impedance	100 kΩ
Vacuum Tubes	EL-34, 12AX7, 12AT7
AC Power	120 Volts, 60 Hz (US) 240 Volts, 50 Hz (EU)
Weight	19 lbs / 8.61 kg
Color	Satin Black, Chrome, Natural Aluminum
Country of Origin	USA

BOB CARVER COMPANY LIMITED WARRANTY

Bob Carver Company's Black Magic 25 is covered by a five (5)-Year Limited Warranty on parts and vacuum tubes. This Limited Warranty initiates from the date of purchase, and is limited to the original purchaser, or in the case of demonstration equipment, limited to the balance of warranty remaining after original shipment to the retailer.

CONDITIONS

This Warranty is subject to the following conditions and limitations. Only new products purchased through an authorized Bob Carver Company retailer are eligible for warranty coverage. The Warranty is void and inapplicable if the product has been used or handled other than in accordance with the instructions in the owner's manual, abused, or misused, damaged by accident or neglect or in being transported, or the defect is due to the product being repaired or tampered with by anyone other than Bob Carver Company or an authorized Bob Carver Company repair center. In the event that the owner's Bob Carver Company dealer cannot effect repairs, the product must be packed and returned to Bob Carver Company by the customer at his or her sole expense — only after obtaining a Return Authorization approval. Bob Carver Company will pay return freight of its choice.

A RETURNED PRODUCT MUST BE ACCOMPANIED BY A WRITTEN DESCRIPTION OF THE DEFECT AND A PHOTO-COPY OF THE ORIGINAL PURCHASE RECEIPT.

This receipt must clearly list model and serial number, the date of purchase, the name and address of the purchaser and authorized dealer and the price paid by the purchaser. Bob Carver Company reserves the right to modify the design of any product without obligation to purchasers of previously manufactured products and to change the prices or specifications of any product without notice or obligation to any person.

REMEDY

In the event the above product fails to meet the above Warranty and the above conditions have been met, the purchaser's primary remedy under this Limited Warranty shall be to return the product to their Bob Carver Company dealer. If they cannot contact or reach their dealer, the owner should directly contract Bob Carver Company and obtain a Return Authorization approval. Then the defect will be rectified without charge for parts or labor, including vacuum tubes during the 5-year Warranty period.

TRANSFER OF WARRANTY

This Warranty is transferable from the original purchaser of the covered product.

IMPORTANT: The new owner must receive a copy of the original purchase receipt from the original owner in order to continue warranty coverage.

DURATION OF WARRANTY

This Warranty expires on the fifth anniversary of the date of purchase or fifth anniversary of the date of shipment to the authorized Bob Carver Company.

VACUUM TUBES

Vacuum tubes are warranted for five years or the fifth anniversary of the date of shipment to the authorized Bob Carver Company. .

DEMONSTRATION EQUIPMENT

Equipment used by an authorized dealer for demonstration purposes is also warranted to be free of manufacturing defects in materials and workmanship for a period of five (5) years from the date of shipment to the dealer. After the first year, demo equipment needing warranty service must be packed and returned to Bob Carver Company by the dealer at his sole expense. Bob Carver Company will pay return freight of its choice. A returned product must be accompanied by a written description of the defect on an BOB CARVER Company RETURNED GOODS AUTHORIZATION form.

Dealer-owned demonstration equipment sold

at retail within five (5) years of date of shipment to the dealer is warranted to the first retail customer to be free of manufacturing defects in materials and workmanship for the duration of the 5-Year Limited Warranty remaining (as measured from the date of shipment of the equipment to the dealer). In the event warranty service is needed under these conditions, the owner of the equipment must provide a copy of his purchase receipt, fulfilling the requirements described under "Conditions" above. The product must be packed and returned to Bob Carver Company by the customer at his or her sole expense. Bob Carver Company will pay return freight of its choice.

MISCELLANEOUS

ANY IMPLIED WARRANTIES RELATING TO THE ABOVE PRODUCT SHALL BE LIMITED TO THE DURATION OF THIS WARRANTY. THE WARRANTY DOES NOT EXTEND TO ANY INCIDENTAL OR CONSEQUENTIAL COSTS OR DAMAGES TO THE PURCHASER.

Some states do not allow limitations on how long an implied warranty lasts or an exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

This warranty does not cover claims for damage due to abuse, neglect, alteration, or attempted repair by unauthorized personnel and is limited to failures arising during normal use that are due to defects in material or workmanship in the product. Any implied warranties, including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this limited warranty. Bob Carver Company does not warrant compatibility of its products with future operating systems and / or hardware of other manufacturers.

WARRANTOR

Inquiries regarding the above Limited Warranty may be sent to the following address:

Bob Carver, LLC
4563 Hydraulic Rd.
Rockford, IL 61109
ATTN: Customer Service

A handwritten signature in black ink that reads "Bob Carver". The signature is written in a cursive, flowing style with a long horizontal line extending from the end of the name.

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