



CIRCUIT SALAD Hybrid Amplifier

Model: MKPH SIXTY

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SAFETY PRECAUTIONS:

The amplifier chassis should only be opened by a factory-authorized technician. Any internal modification or parts replacement (except for AC power fuses or tubes) will void the warranty and expose the user to hazardous voltages.

When replacing the AC power fuses, or tubes, unplug the power cord. For fuse values follow the label on the rear panel. Replace the rear panel AC power fuses with exact same value and type- Littlefuse® (2.0 amp Slo-Blo) part number 0313002 and (0.2 amp Slo-Blo) part number 0313.200.

This amplifier requires a grounded power outlet to operate safely.

When replacing the tubes, use the same type 6CY7, or an exact equivalent. If the wrong type of tube is used, the amplifier may be damaged and the warranty voided. Do not force tubes into the socket. Check to be sure the pin orientation is correct then use a gentle rocking motion to insert or remove the tube.

When performing the offset adjustment, don't use a metal screwdriver; use the provided adjustment tool located in a grey plastic retaining clip on the rear panel. If it is lost a replacement adjustment tool can be ordered from Mouser Electronics®, (part number 6594-8T000).

Whammerdyne strongly urges the owner to avoid aftermarket services that modify, upgrade, or improve the parts or circuit of this amplifier. Extensive damage may occur if parts or circuits are modified.

INTRODUCTION:

Congratulations on purchasing the CIRCUIT SALAD Hybrid amplifier, a dual mono design, which combines the beautiful tonality of a zero-global feedback, indirectly-heated triode drive front-end tube, and a unique solid state quasi-complementary output stage. The amp has amazing speed, presence, and immediacy made possible by the 8.5 Hz to 380 KHz bandwidth. The reason for the extraordinary bandwidth is plenty of current to drive all the various stages capacitances. Distortion measures less than .05% THD. The Whammerdyne line-up of amplifiers has enjoyed high praise worldwide for over a decade. The new hybrid topology is no exception.

The 6CY7 tubes operate in fixed-bias mode directly connected to a solid state Quasi complementary solid state output sections. A window comparator circuit looks for any DC offset. The offset reading is displayed on an accurate LED DC panel meter that will never need calibration. Offset is easily adjusted by the end user in only seconds using this innovative circuit topology. The comparator circuit also protects the speakers from damage by muting the preamp section if a tube should fail, or if the offset is outside the window. This type of circuit design eliminates the need for sonically detrimental, unreliable output relays and fuses. The front-end triode tubes are operated in Class "A" and fed with fully regulated power supplies. Based on conservative operating points tube life is estimated to be over 20 years. The result is a difference you can hear and enjoy for many years.

We've poured our dedication, love for music, and decades of engineering talent into this amplifier- "Always True to the Music".

Whammerdyne Team

DESIGN FEATURES:

The volume control is a highly regarded ALP's® blue velvet potentiometer carefully selected for accurate channel tracking. It is connected to the input grid of the front-end, dual dissimilar 6CY7, drive vacuum tube for premium sonic performance.

The output of the 6CY7 triode is closely monitored for DC offset level by a window comparator circuit. If the DC level deviates outside of the precision set window, the comparator circuit tells the preamp to mute the output. The comparator continuously monitors offset during tube warm up, and if the tube were ever to fail for any reason the large output DC offset that would be applied to the speaker terminals is cutoff.

The comparator circuit measured voltage is easily adjusted by pots (trimming controls) on each side of the amplifier using a small plastic adjustment tool. The DC offset voltage is displayed by an accurate digital Voltmeter. The meter switch selects (LEFT), or (RIGHT) channels, or center (OFF) position, eliminating noise injection from the meter into the audio signal path.

The output stage is MOSFET's in a quasi-complementary architecture, just like the famous Julius Futterman OTL amps that sound so good. Engineering wise this design is not a symmetrical circuit, but it has many of its own technical merits. Unlike most solid state amplifiers this design incorporates accurate internal thermal tracking of the output devices for the best sonic's. The choice of output stage makes for very well behaved clipping behavior and excellent square-wave response.

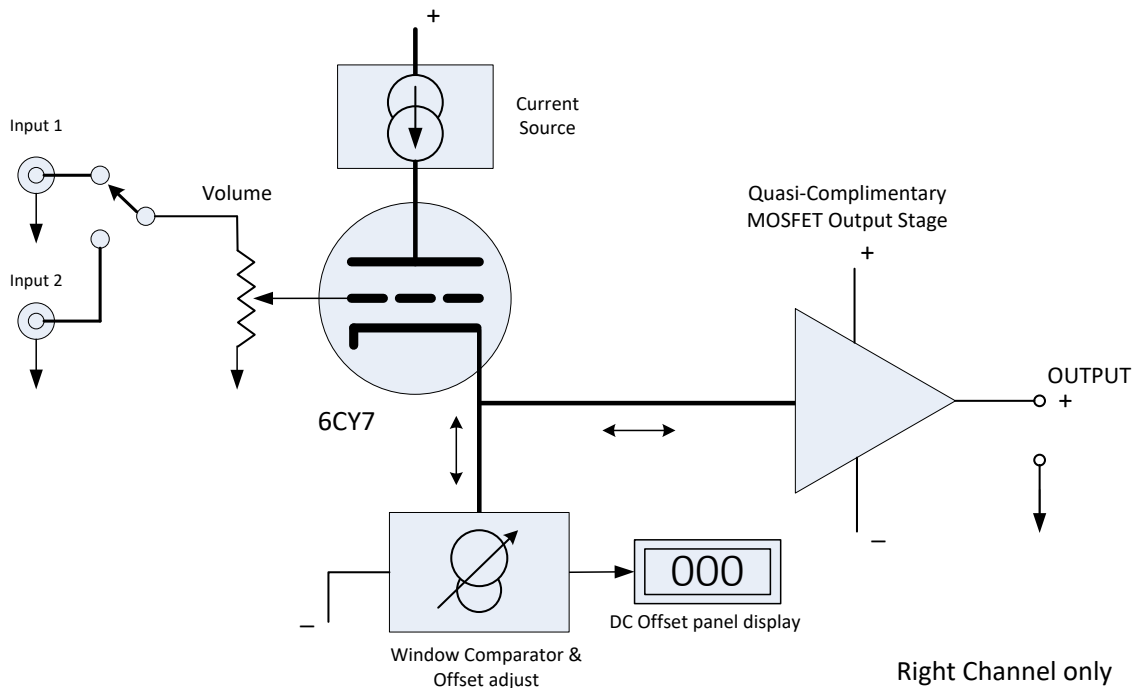
Red LED clipping indicators are highly accurate under all loads and output stage power supply voltages. Thermal protection automatically limits the output power should the unit be driven into heavy loads for long sustained periods.

Independent low noise power supplies are regulated for all support and front-end circuits. The main power transformers are electrostatically shielded toroidal types. These features help block any external noise sources like switching power supplies that are in everything these days. High capacity electrolytics are utilized in all power supplies, and are bypassed by polypropylene types.

In this amplifier the ground plane circuit board is not just something to hold and connect all the parts. It is an integral part of the circuit, carefully designed to give consistent performance. The board optimizes crosstalk, shielding, bandwidth, capacitance, inductance, resistance, and thermal performance.

Capacitor coloration, a notorious sonic concern in audio amplifiers, is avoided by direct coupling and no cathode bypass caps.

FUNCTIONAL DIAGRAM



CONTROLS:

The unit uses a large 1.5" polished solid aluminum knob to adjust the volume (LEVEL). There are two line level inputs of which you can use either or both. Flip the switch forward to use (INPUT 1) or rearward for (INPUT 2). You do not need a pre-amplifier with this amp, but contrary to popular belief it may have sonic benefits. Any line level source, DAC, music streamer, tuner, or CD player should have enough gain to work by themselves. A phono pre-amplifier may be connected to the other input, but it may need a preamp for additional gain. If you do use a preamp connect it to an unused input. Set the volume control on the hybrid to maximum and use the pre-amp's volume control. Don't forget to turn the volume back down on the amp before switching to another source on the 2nd input. Best performance will be had if only one input source at a time is producing a signal. The other input channels source should be off or muted.

The output offset adjust potentiometers are Vishay® Bulk Metal® foil, ultra-high precision, 26-turn gold plated parts. The adjustment potentiometers (Pot's) do not have a hard stop at the end of the travel, it's a clutch that makes a small clicking sound when at either end.

SPEAKERS:

The CIRCUIT SALAD Hybrid team has spent a lot of time listening to many different speakers powered by this amplifier. An 8 Ohm nominal speaker load, or higher, with >86 dB SPL 1W/m efficiency will perform the best. It's possible with lower impedance speaker loads to run the MOSFET output junction temperatures up to where the thermal limit protection kicks in.

Speaker interconnect cables are hooked to the amp through 5-way binding posts. Be sure to observe speaker polarity (+ to red), and (- to black).

CARE and CLEANING:

Remove dust with a soft lint free cotton, or micro fiber cloth.

Do not use water, cleaning solvents, window type, or household cleaners on any surfaces.

Canned air dusters are great for vent holes and the meter. Some cleaning chemicals can scratch or melt the meter display window.

Operate in a well-ventilated area that is dust free.

Operating range should be between 60-80 degrees F.

Input RCA connectors cleaning once a year using Q-Tip and Caig Products D-5 Deoxit (Recommended) this is good for all Line level patch cables and connectors

INSTALLATION and SETUP:

The CIRCUIT SALAD amplifier should be placed on a hard surface, not carpet, or in an enclosure without good air circulation everywhere around it.

Install the unit's 6CY7 tubes. NOTE: they will come boxed and marked for the left and right channels. NOTE: On the tubes base there is a missing pin. Use this missing pin to index the tube in the socket, which has a corresponding open space. Push downward firmly, gently rocking the tube a little as it goes inward. If removing the 6CY7's, wait until cool, grasp the tube, and use a gentle rocking motion while pulling upward.

The hybrid is shipped with a 14 AWG IEC power cord. We don't recommend aftermarket power conditioners, since they increase power source resistance, and may have unintended resonances, but transient suppression devices are recommended.

For interconnects, we recommend Blue Jeans Cable LC-1 RCA cables. These are double shielded and have very low capacitance, which lowers the high frequency drive current needed from your source components.

For speaker cables, a quality 12 or 14 AWG cable with 5/16" gold plated spade ends will be sufficient. Again, Blue Jeans speaker Cables are great performers.

Once all cables are connected, power-up your source components first. After they come up, switch on the amplifier and wait about a minute. It is normal to hear a very small turn-on transient (tick) out of the speakers. Turn up the volume and enjoy. After a few minutes flip the meter switch to the (LEFT) then (RIGHT) check that the DC offset on either channel reads less than about +/-050 on the meter. Adjust using the Adjusting the DC Offset instructions if needed.

About DC Offset:

As tubes age, temperatures change, or get jarred, internal mechanical shifts can occur, the output offset may change some. If you replace tubes, the amp must be readjusted. New tubes will especially drift during the first 100 hours of operation so multiple adjustments may be needed. Tubes supplied with a new amplifier are already burned in and calibrated, but sometimes the offset may change when you set up your system for the initial power up. Note: your signal sources must not have any DC output offset!

Most solid state amplifiers have DC output offset. As the offset drifts up and down, you may never realize it because no one continually monitors it with a meter. Most manufacturers calibrate their amps to +/-100 mV or less. A meter offset reading of +/- 50mV or less is the goal here.

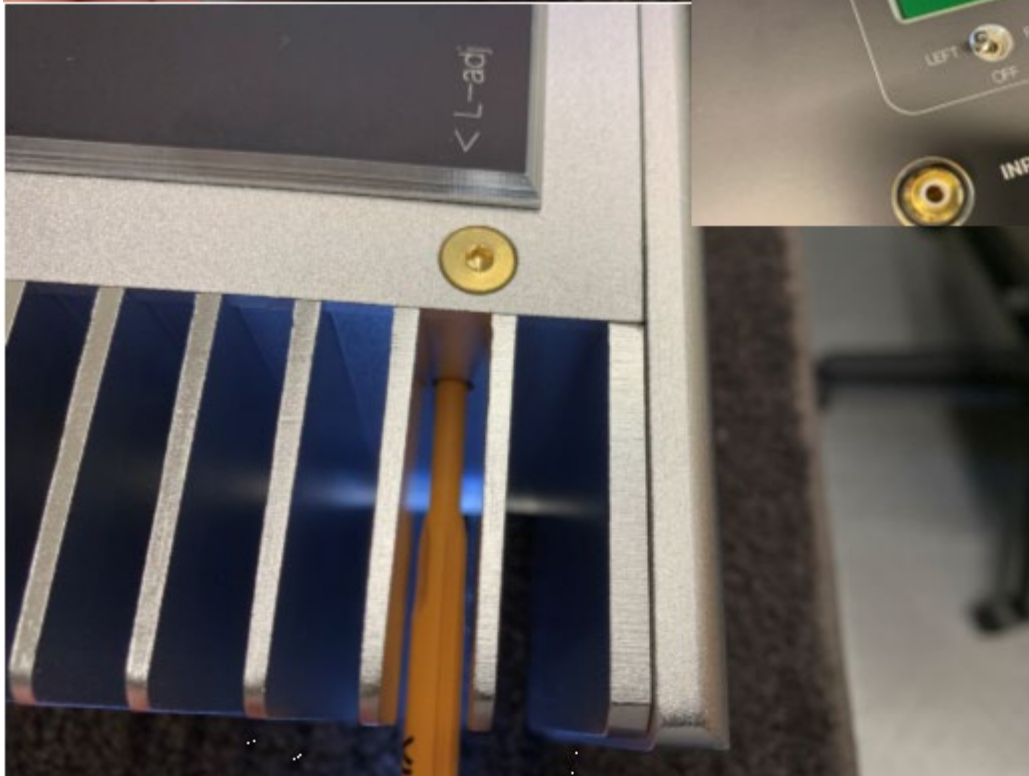
It's normal to hear a slight noise out of the speaker when adjusting the offset pot trimming controls, since the amp is DC coupled.

Adjusting the DC Offset:

To make offset adjustments, first have the amplifier warmed up. One-hour or more will yield the best results. It's best to have the volume all the way down. The adjustment tool is located on a clip secured to the back panel of the amp. Adjusting the amp is as easy as 1-2-3!

1. Flip the meter switch to the (RIGHT) to read the right channel.
2. Carefully insert the adjustment tool into the right side access hole between the heat sink fins. The location is labeled on the top plate (R-adj. >). Make sure you have the adjust tool inserted into the slotted adjust screw. It may take a bit of practice to get it engaged. As one slowly rotates the tool using a very light pressure, you will feel a slight resistance when it engages the pot leadscrew. The goal is to slowly adjust until you have a "000" meter reading. If you hear a mechanical clicking sound, rotate the pot in the reverse direction. If you can't get the desired reading, the right most 6CY7 tube may need to be swapped out.
3. Flip the meter switch to the (LEFT) channel and repeat this process. This time adjust the (< L-adj.) pot to get a reading of about "000", and your amp is calibrated. Don't worry if it drifts up or down a few counts. By trying to forever set the meter to a zero or a near zero reading, you will "chase your tail" with no sonic improvement. After all, remember the target is +/- 050 or less.

Flipping the meter switch to the center (OFF) position will result in the lowest output noise by not injecting any low level meter noise into the audio signal path. If you choose to leave the meter on for looks it will not hurt the operation of the amplifier.



SPECIFICATIONS: (Typical into 8 Ohms)

CIRCUIT SALAD Hybrid: Model: MKPH SIXTY

Power Output- both channels driven: 60 Watts RMS

Distortion: <.05% THD+ Noise

Frequency Response -3 dB: 8.5 Hz-380 KHz

S/N Ratio- wideband no weighting: 98 dB

Damping Factor: 114

Amplifier Gain: 27.7 (28.8 dB)

Input Sensitivity: 1 Vrms

Input Impedance: 20 K Ohms

Chassis:

Elegant, durable satin aluminum with coarse glass beaded texture. 0.295" thick front panel, 0.118" thick machined aluminum panels, 0.118" thick plain black anodized top trim plate, machine engraved lettering, mostly white ink infilled. Sides are massive high efficiency aluminum heatsinks for, long life, cool operation. Bottom has vibration dampening feet.

Dimensions: 17"L x 12.6"W x 6.1"H

Weight: 32 Lbs. shipping 25 Lbs. unpacked

Power Consumption @ 120VAC, 60 Hz line voltage:

Idle, no signal- 32 Watts, 0.36 Amps

Max, both channels driven 4 Ohms- 380 Watts, 3.16 Amps

Vacuum Tubes:

2x... 6CY7's, NOS, input tube, dual dissimilar triode, selected and factory matched

Controls, Inputs, and Indicators:

1x... Volume control, input (LEVEL)

1x... Digital voltmeter, 0-2 VDC, 3-1/2 digit, 0.37" high green LED display

1x... Toggle-switch, 3-position, bat handle, offset meter select, (LEFT), (OFF), (RIGHT), gold plated

1x... Toggle-switch, 2-position, flatted handle, (INPUT 1) or (INPUT 2) select, gold plated

1x... Main power switch, push button, latching, w/decorative green LED

2x... Red LED, T1-3/4, (Clip R) or (Clip L) indicator

4x... RCA jack, female, Teflon[®] insulated, gold plated

4x... Speaker binding posts, 5-way, accepts 5/16" spade or wire to 6 AWG through opening, gold plated

1x... Jumbo green LED, 0.8" dia., decorative

Rear Panel:

1x...Power entry module, IEC-320 C14, 120/240 VAC, 10 Amp, 50/60 Hz

4x... Fuse holders, 3AG, finger or screwdriver push and turn fuse insert

1x... Storage clip and Vishay[®] ACCTRITOB308-T000 adjustment tool

1x... Manufacturing ID label

WHAMMERDYNE HEAVY INDUSTRIES RESERVES THE RIGHT TO CHANGE OR MODIFY THE SPECIFICATIONS WITHOUT FURTHER NOTICE. Rev.3 01/01/22

Warranty:

Parts and materials are (warranted for 1 year). Vacuum tubes (warranted for 90 days). Contact the factory for return and warranty RMA authorization. Our technical support will assist in this RMA procedure and provide detailed shipping instructions.

We are 100% committed to your satisfaction so if you have any questions always feel free to contact us

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The CIRCUIT SALAD Hybrid amplifier is designed, hand built, and tested in the United States of America.

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