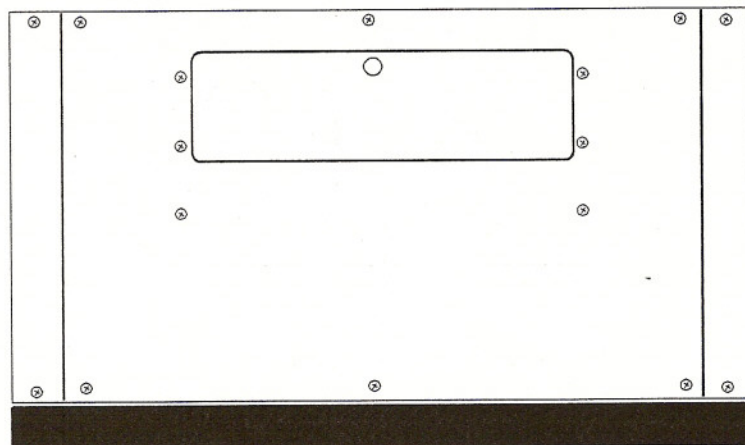


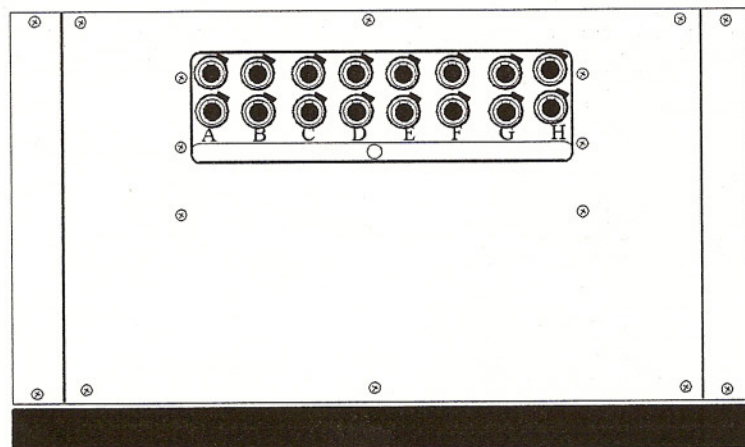
Henry 3K Ultra and 8K Ultra Operating Controls (Continued)

Controller Top with Access Door Closed



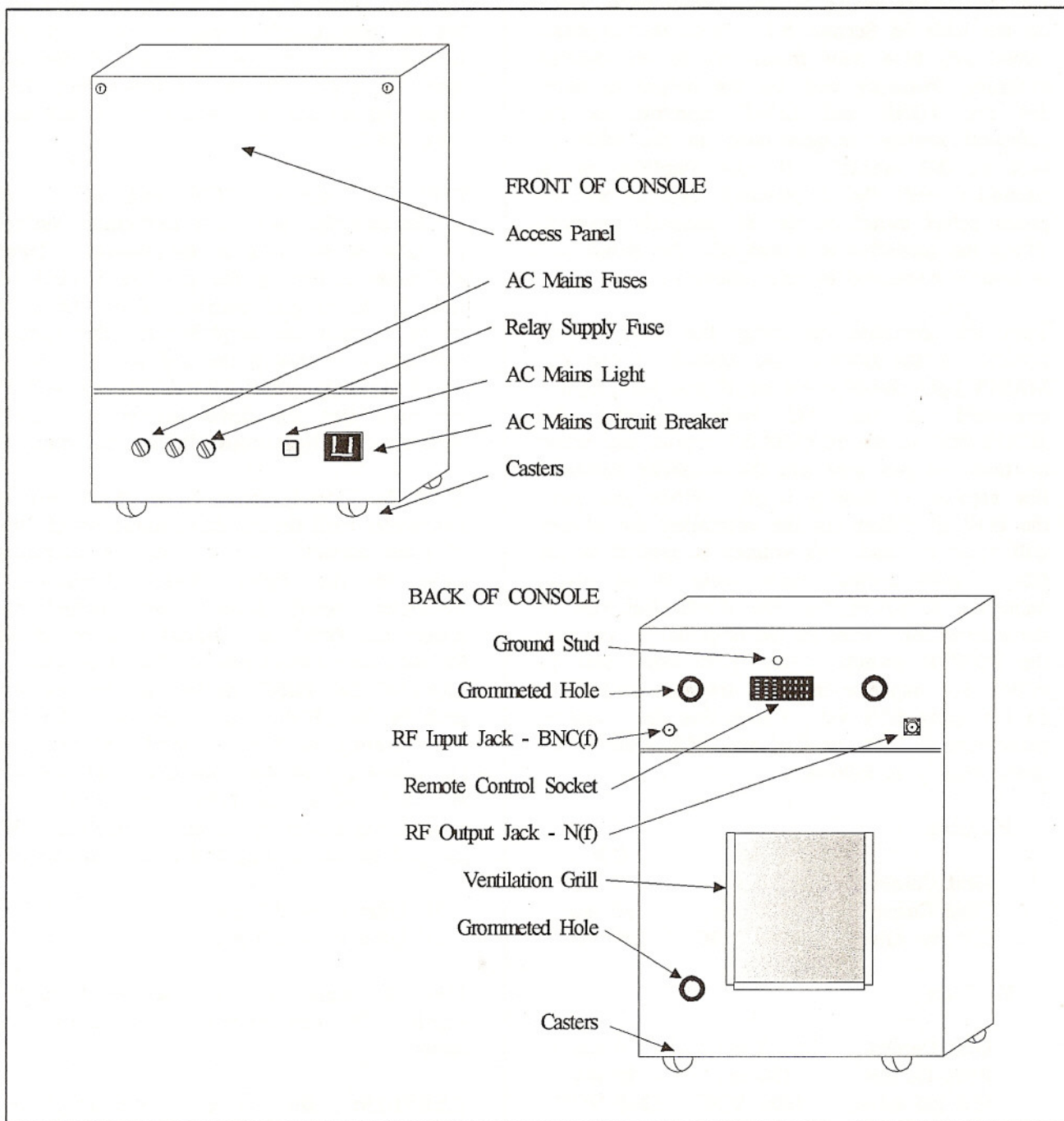
3K Ultra and 8K Ultra Controller with 8 Memory Presets (Top)

Controller Top with Access Door Open



3K Ultra and 8K Ultra Controller with 8 Memory Presets (Top)

Henry 3K Ultra and 8K Console Operating Controls



Section 6: Operation

SECTION 6.1: PRELIMINARY SETTINGS

Set the BAND switch to the desired band based on the table in Section 5.1. With the amplifier turned off, tune your transceiver to the desired operating frequency and set the output to zero. Set the TUNE and LOAD controls to the calibrated settings recommended in the table at back of this manual. If your amplifier has a controller with the 5 memory option, set the preset select switch in the M (manual) position. When the amplifier is turned off, the transceiver is directly connected to your antenna.

Turn the amplifier on using the main circuit breaker on the front of the console. The AC MAINS light should come on if you are properly connected to the AC mains. Neither the 3CX1200D7 or the 3CX3000A7 require any warm up time, so you may use the amplifier within a few seconds of turning it on. When you push the POWER button on the controller, the blower will come on, and high voltage is applied to the tube. With ceramic tubes there is no visual indication of power, but you should feel heat in the exhaust air. Turn on the amplifier by pushing the POWER switch. Key your transceiver to switch the amplifier into the transmit mode, but do not apply drive yet. Check that the operating parameters in both the CW and SSB position are approximately as follows:

3K Ultra	SSB	CW
Grid Current	0 ma	0 ma
Plate Current	120 ma	65 ma
HV (no drive)	4200 VDC	3200 VDC

8K Ultra		
Grid Current	0 ma	0 ma
Plate Current	150 ma	70 ma
HV (no drive)	5800 VDC	4200 VDC

If the values of the high voltage and the resting current are significantly different than above, then there may be a problem with the amplifier, or the taps on the high voltage and filament transformer may need to be changed.

SECTION 6.2: CW OPERATION

Push the POWER button to turn off the amplifier. Set the transceiver's output to zero and set the BAND switch on the amplifier to the correct operating range. Set the transceiver into the CW mode and set the wattmeter select switch to read FWD PWR.

STEP 1: Preset the TUNE and LOAD controls of the amplifier using the calibration settings in the table at the back of the manual. Turn the multimeter switch to the position marked IG to read the tube's grid current. Press the POWER button to turn the amplifier on, then press the CW button to switch the HV to the CW mode. The band light for the band selected will blink, indicating that the drive motors are operating. Wait until the light stops blinking and stays on.

STEP 2: Slowly increase the drive from your transceiver until the amplifier draws about 200 ma of plate current. If the operating frequency is close to the factory tested frequency, the wattmeter should indicate some output power. Adjust the TUNE and LOAD controls alternately for maximum output power. For fine tuning, the speed of the TUNE motor can be reduced by push in the 15/10m band light and holding it in while turning the TUNE control. Slowly increase the power out of the transceiver and continue to alternately adjust the TUNE and LOAD controls to peak the output power of the amplifier. Watch the grid current reading and try not to exceed:

3K Ultra - - - 200 ma
8K Ultra - - - 350 ma

With 100 watts of drive, the 3K Ultra should supply 1500 watts out with about 800 ma of plate current.

CAUTION: Do not drive the amplifier for more than 10 seconds when it is not tuned to resonance! Ten seconds tune and 10 seconds off is a good operating habit when tuning up.

When the amplifier has been tuned to resonance and loaded up properly, write down the control

settings so that you can return to that frequency again without retuning. As long as the tube is in good condition and your load stays constant, the dial settings should stay constant.

Switch the transceiver into the SSB mode, key the microphone, and speak into the microphone to drive the amplifier. Since the meter reads average power (rather than peak power), the meter reading will be different than the readings seen in the CW tune-up.

The ALC circuit is designed to prevent overdrive and distortion for a high power transceiver. The control (on the back panel of the controller) is adjusted off at the factory (fully counterclockwise). If the ALC circuit is used, you need only adjust the control during initial setup.

If you want to use the ALC circuit, tune up the amplifier for SSB operation at the desired output level. Rotate the ALC potentiometer clockwise until the grid current just begins to decrease. This feedback circuit prevents the transceiver from driving the amplifier with any greater power. Once the adjustment is made, use the locknut on the control shaft to lock it in place. If your transceiver is unable to drive the amplifier to full output, there is no need to use the ALC circuit.

SECTION 6.3: SSB OPERATION

Tune the amplifier as described in Section 6.2. Then push the SSB switch to select the higher HV circuit. As long as your load has not changed, the amplifier should still be in tune. You can fine tune by alternately adjusting the TUNE and LOAD controls while driving the amplifier with a constant input.

SECTION 6.4: OPERATING PRECAUTIONS

Please keep the following precautions in mind when you operate your amplifier to insure its safe and reliable operation for years to come.

Voltages inside the amplifier can be **LETHAL!** Never disable the protection or interlock circuits built into the amplifier. **NEVER** operate the amplifier with any of the panels removed.

ALWAYS tune the amplifier to resonance at the operating frequency and load it into your antenna or dummy load before transmitting.

NEVER switch the BAND switch when the amplifier is keyed. You will have a very expensive repair bill. Hot switching can burn and melt the contacts on the remote relays. It can also melt, crack, or destroy capacitors, chokes or tuning inductors in the output circuit. Even the tube can be damaged. Only a lightning strike can produce equivalent damage.

Get in the habit of pushing the POWER switch off before changing bands. Always retune the amplifier whenever you change frequencies.

NEVER operate the amplifier into a load with SWR greater than 2:1 (The reflected power is 10% of the forward power.)

The components in the amplifier are specifically rated for the service and operating parameters listed in Section 1. Excessive drive will cause excessive output and will shorten the life of the tube and other components.

SECTION 6.5: PRESET OPTION

Your amplifier is available with a factory option of 8 preset channels, designated A through H on the controller panel. The preset select switch is located below the RF power meter in the center of the front panel of the controller. An additional 16 channels can be installed externally.

If you specified frequencies when you placed your order, the presets were set at the factory. To use a preset channel, select the proper band and the associated preset and turn on the amplifier. The band light will begin blinking and will stop once the TUNE and LOAD motors have reached their proper positions.

SECTION 6.6: PRESET TUNING

The preset tuning can be changed at any time. Turn the preset select switch to M for manual tuning. Tune up the amplifier as previously described for the desired frequency. When the amplifier is tuned correctly, unkey it, and move the preset select switch to the desired channel. Slide open the access door on the top of the con-

troller and locate the controls for the selected channel. Set the dials to the same readings as the front panel TUNE and LOAD controls. Key the amplifier and fine tune the preset TUNE and LOAD controls for maximum output. Lock the dials with the dial locks when you are finished tuning the preset controls, and close the access door.

SECTION 7: Maintenance/Troubleshooting**SECTION 7.1: MAINTENANCE PROCEDURES**

Any time you have a problem with your amplifier, be certain to check that it is properly connected to the AC mains and that all the fuses are good. There are two AC mains fuses, and a cathode protection fuse. NEVER replace a fuse with one of higher value than specified. You could cause extensive equipment damage!

SECTION 7.2: INPUT MISMATCH

The Ultra series of amplifiers are built with a broadband, unum type input circuit. The input SWR to the amplifier should always be better than 2:1. Experience has shown that some transceivers with automatic tuners have trouble matching this circuit. If you turn off the tuner, the transceiver should be able to drive the amplifier directly.

SECTION 7.3: RELAY PROBLEMS

SYMPTOM: High input SWR all bands.

- Possible Cause: Input relay is bad.
- Possible Cause: Input relay out of socket.
- Possible Cause: Bad drive cable.

SYMPTOM: Reduced receiver sensitivity.

- Possible Cause: Input relay is bad.
- Possible Cause: Output relay stuck.
- Possible Cause: Input relay out of socket.
- Possible Cause: Bad input or output cable.

SYMPTOM: Resting current - amp not keyed.

- Possible Cause: Relay cable shorted.
- Possible Cause: Transceiver connection incorrect.
- Possible Cause: Transceiver malfunctioning.
- Possible Cause: Band bias relay.
- Possible Cause: Short in relay supply.

SYMPTOM: Amplifier will not key.

- Possible Cause: Bad relay cable.
- Possible Cause: Transceiver connection incorrect.
- Possible Cause: Transceiver malfunctioning.
- Possible Cause: High resistance relay contact in transceiver.
- Possible Cause: Relay supply failed (no pilot lights). Voltage should measure between 20 and 30 VDC. Check AC mains fuse.

SECTION 7.4 TUBE PROBLEMS

SYMPTOM: Excessive plate current.

- Probable Cause: A bad tube. The normal failure mode is a short, but a failing tube can draw excessive current.
- Probable Cause: A failure of the cathode bias circuit. It is not simple to test diode D1 without special test equipment. It is not a zener diode. The failure of the resistor in the circuit is also a possibility.

SYMPTOM: Negative grid current.

- Probable Cause: Grid-to-filament tube short.
- Probable Cause: A failure of the cathode bias circuit.

SYMPTOM: Excess plate current when amplifier is not keyed.

- Probable Cause: Grid-to-filament tube short.

SYMPTOM: Low Output:

- Probable Cause: Tube is worn out. Ceramic triodes can offer many years of reliable service when operated properly, but they will eventually wear out.

SYMPTOM: Circuit breaker blows.

- Probable Cause: Plate short in the tube.

SECTION 7.5 HIGH VOLTAGE PROBLEMS

CAUTION: The high voltage in your amplifier can be lethal! Always disconnect the amplifier from the AC mains and turn off the power at the main circuit breaker before you work on the equipment!

SYMPTOM: High grid current - no plate current.

- Probable Cause: No high voltage to the tube. With the amplifier unplugged, use an ohmmeter to find the circuit fault.

SYMPTOM: Circuit breaker trips.

- Probable Cause: A high voltage short.

- Probable Cause: A short in the RF chassis. Confirm by unplugging the high voltage lead to the chassis to see if problem goes away. Make sure the HV shorting switch is properly engaged. If the short still exists, the problem is in the power supply. With the amplifier unplugged, look for arc traces or burned components. If necessary use an ohmmeter to trace the short. Remove the tube to eliminate it as a source of the short. If necessary unsolder components until the short disappears.
- Probable Cause: HV short in the power supply. The usual suspect in the power supply is the HV rectifiers. If necessary, unplug the amplifier, and one-by-one unsolder components from the HV circuit until the short disappears.

NOTE: A high voltage short will probably blow the cathode protection fuse.

SYMPTOM: No high voltage meter reading.

- Probable Cause: A blown cathode fuse.
- Probable Cause: A defective meter.
- Probable Cause: An open resistor in the HV measuring circuit.

SYMPTOM: Low HV reading.

- Probable Cause: A failure in the step start circuit in the power supply.
- Probable Cause: The HV transformer is incorrectly tapped.

SECTION 7.6: BLOWER PROBLEMS

SYMPTOM: Blower is noisy or rough.

- Probable cause: The bearings on the blower should be lubricated twice a year.
- Probable Cause: The blower was knocked out of balance because of shipping damage.

SYMPTOM: Blower does not operate.

- Probable Cause: Blown AC mains fuse.
- Probable Cause: Bad blower motor.

SYMPTOM: Blower not operating.

- Possible Cause: AC cable wired incorrectly.
- Possible Cause: Shipping damage to blower.

SYMPTOM: Blower is noisy or cabinet shakes.

- Possible Cause: Shipping damage, blower out of balance.

SECTION 7.7 OUTPUT PROBLEMS

SYMPTOM: Low output.

- Possible Cause: Low drive from transceiver. Indicated by low grid current.
- Possible Cause: Bad drive cable.
- Possible Cause: Bad output cable.
- Possible Cause: Low filament voltage.
- Possible Cause: Bad tube.

SECTION 7.8 AC LINE VOLTAGE PROBLEMS

SYMPTOM: Amplifier will not turn on.

- Possible Cause: Incorrectly wired AC plug.
- Possible Cause: Bad circuit breaker.

SYMPTOM: High voltage readings out of spec.

- Possible Cause: AC mains too low or high - you must retap the transformer.

SECTION 7.9 OTHER PROBLEMS

SYMPTOM: Blower operates, but not lights.

- Possible Cause: Amplifier still in warmup mode.
- Possible Cause: Warmup relay defective or out of its socket.
- Possible Cause: Relay supply defective.

SYMPTOM: Amplifier will not turn on or off.

- Possible Cause: Defective circuit breaker.
- Possible Cause: AC plug wired incorrectly.

SECTION 7.10 MAINTENANCE

Many Henry amplifiers still remain in the field after more than 30 years of service. To insure maximum reliability you should unplug the unit, remove the top cover and make sure that the interior of the console is free of dust, lint, and dirt. If necessary, vacuum the interior to clean it. Also make sure that the airflow in and out of the amplifier is unrestricted.

SECTION 7.11 FACTORY SUPPORT

If you have questions about servicing your equipment, you should mail, fax, or e-mail your questions to:

Henry Radio
2050 South Bundy Drive
Los Angeles, CA 90025 USA
Fax: 310-826-7790
e-mail: henryradio@earthlink.net

Should it ever be necessary to return your amplifier to the factory for repair, please call for authorization first. Also consider the possibility of returning just the RF chassis to save transportation costs.

If you return your equipment to the factory, pack it extremely well to avoid shipping damage. Include a short description of the problem and insure the package for the replacement cost of the amplifier. Ceramic tubes may be shipped in their socket. Glass tubes should be removed for shipment. The shipping address will be given when you call for authorization.