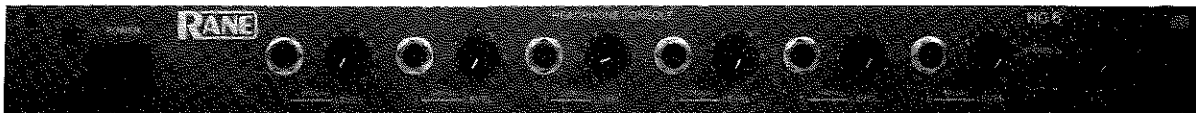


HC 6



OPERATING
AND
SERVICE
MANUAL

RANE
CORPORATION

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I. WARRANTY EXPLANATION

Rane offers a limited warranty which covers both parts and labor necessary to repair any defects in the manufacturing of the HC 6.

The warranty period for the HC 6 is two (2) years, and is determined from either of these two methods, whichever is longer:

1. Starting from the date of retail purchase as noted on either the sales slip from an authorized Rane dealer, or on the warranty registration card sent in to the factory;

or:

2. starting from the date of manufacture which is coded on both the inside and outside of the HC 6 chassis, in case the sales slip or warranty card is not available.

If you send in the registration card or retain your sales slip as proof of purchase, you will receive a full two (2) year warranty period from the date of purchase regardless of the date of manufacture. If you do not send in the registration card ("I forgot..."), or you do not have a sales slip from an authorized Rane dealer ("My dog ate it..."), the HC 6 will be under warranty only within two (2) years from the date of manufacture.

All registered warranties are tracked by SERIAL NUMBER, not by owner. Once your HC 6 is registered it will be covered the full two (2) years regardless of any change in ownership.

Should you encounter any problems with the HC 6, be sure to contact either your local Rane dealer or the Rane factory before taking the HC 6 anywhere for repairs. We will help you to identify and locate any specific malfunctions, possibly avoid needless shipment, or instruct you as to the speediest method for authorized repair.

If you must send the HC 6 to the factory or warranty station, BE SURE TO INCLUDE THE FOLLOWING INFORMATION:

1. YOUR COMPLETE NAME AND RETURN SHIPPING ADDRESS.

2. THE SERIAL NUMBER OF YOUR HC 6.

3. A COMPLETE DESCRIPTION OF ANY AND ALL PROBLEMS YOU ARE EXPERIENCING WITH THE HC 6.

Never ship the HC 6 in any shipping carton other than the original or a replacement supplied by Rane. Ship only by a reputable carrier--we do not recommend parcel post due to a high incidence of damage or loss. Be sure to insure the package for the full replacement value.

NOTE: Be sure to remove the HC 6 from any rack or carrying case prior to shipment to the factory or a warranty station, otherwise you will be charged for the additional time to remove and re-install the unit.

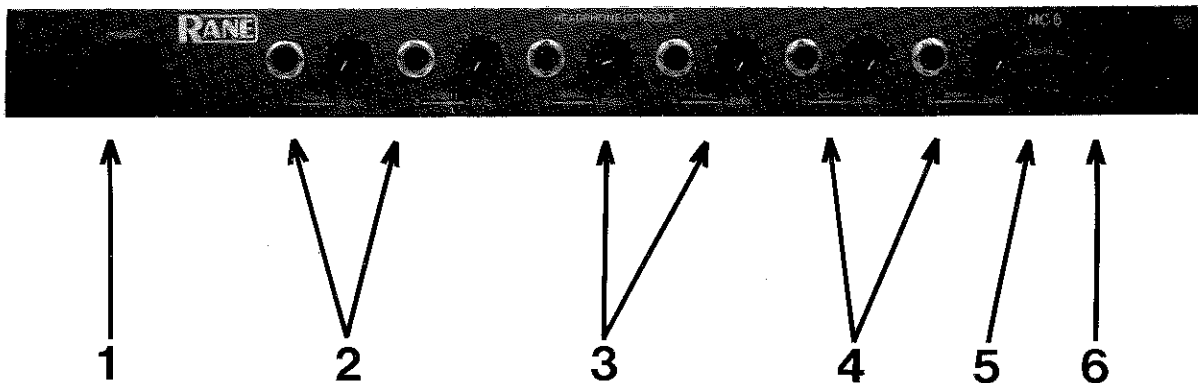
If you need further assistance concerning the repair, installation or operation of your HC 6, please feel free to contact Rane galactic headquarters at:

Rane Corporation
6510-D 216th SW
Mountlake Terrace, WA 98043

Phone: (206) 774-7309

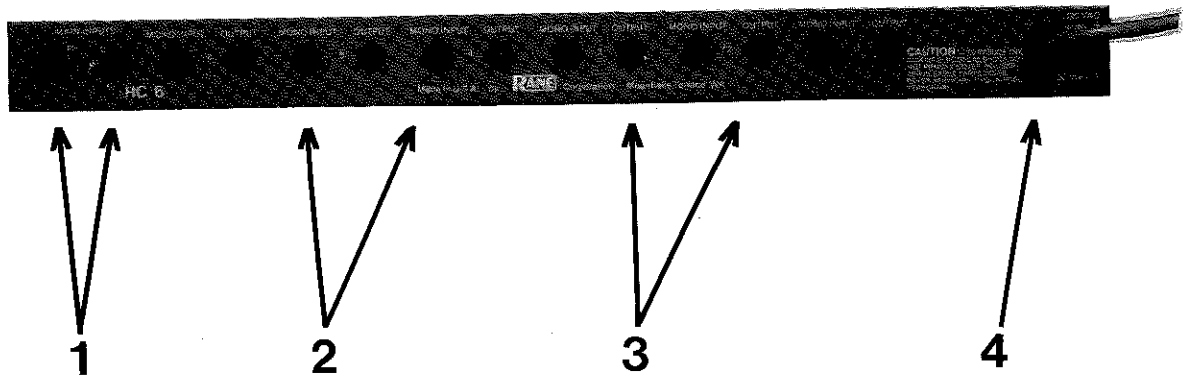
II. PANEL DESCRIPTIONS

FRONT PANEL



1. **POWER SWITCH:** Your basic, straightforward power switch--when the yellow LED is lit, the HC 6 is ready to go.
2. **FRONT PANEL OUTPUT JACKS:** These stereo $\frac{1}{4}$ " jacks are in parallel with the rear panel outputs, and can be used to monitor any of the six stages for level or mix adjustments, or for easy access when the HC 6 is rack mounted. Plugging into these front jacks does NOT disengage the rear outputs.
3. **INDIVIDUAL LEVEL CONTROLS:** These control the volume for each individual set of headphones, regardless of whether they are driven from the master stereo inputs or from the direct mono inputs.
4. **SIGNAL-PRESENT INDICATORS:** These green LEDs light with any input signal above -20dBm. See OPERATING METHODS for further explanation.
5. **STEREO/MONO SWITCH:** Converts the master inputs from stereo to mono so that both sides of the headphones can be driven from a single input cable.
6. **MASTER STEREO LEVEL CONTROL:** This controls the volume simultaneously to any and all headphones which are driven from the master stereo inputs. This will not affect the volume on headphones which are driven from any of the six direct mono inputs.

REAR PANEL



1. **MASTER STEREO INPUTS:** These are automatic balanced/unbalanced inputs which accept a stereo $\frac{1}{4}$ " jack for balanced operation (see diagram III-1) or a standard $\frac{1}{4}$ " patch cord for mono operation.
2. **DIRECT MONO INPUTS:** These inputs allow each stage to be driven separately, from any source. Whenever a plug is inserted into one of these inputs, the master stereo inputs are disconnected from only that stage.
3. **STEREO HEADPHONE OUTPUTS:** Plug any impedance headphone from 4 ohms to 2000 ohms into these outputs.
4. **POWER CORD:** Plug this into an AC outlet of the appropriate line voltage as indicated on the rear panel.

III. INSTALLATION

1. With the power switch in the OFF position, plug the HC 6 line cord into the appropriate AC power source, as indicated on the rear panel.
2. Plug the outputs from a mono or stereo source, such as tape deck, mixing board, etc., into the master stereo input(s). For unbalanced systems use a standard $\frac{1}{4}$ " mono patch cord. For balanced operation, use a stereo $\frac{1}{4}$ " plug with hot on the tip, circuit ground on the ring, and chassis or case ground on the sleeve, as shown in the diagram below. This corresponds to pins #2, 3, and 1 respectively on a three-pin connector.

Note: Rane Corporation recognizes the international standard for three-pin connectors in a balanced operation, which is:

- Pin #1: Case Ground
- Pin #2: Positive (signal "hot")
- Pin #3: Negative (signal ground)

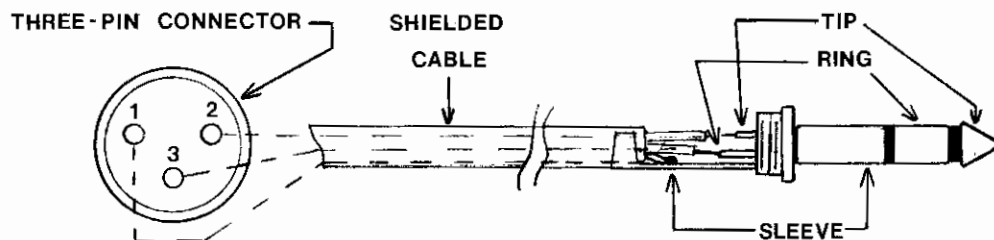


DIAGRAM III: Wiring connections for balanced operation.

3. If the HC 6 is to be rack mounted, you may wish to permanently wire the rear headphone outputs to any remote jack locations such as in various walls of a studio or other rooms. The front panel outputs can then be used for local or control room monitoring.
4. You might also consider wiring the 6 direct mono inputs permanently to a patch bay or monitor mixer, but ONLY if you do not plan to use the master stereo inputs

as well. Whenever a plug is inserted into these direct inputs, the master stereo inputs are bypassed. So for maximum flexibility it is suggested that only the master stereo inputs be permanently wired and that the direct inputs be patched in as necessary during regular use.

5. The HC 6 may be installed into any rack which utilizes EIA standard mounting hole spaces. The front panel of the HC 6 is heavy guage steel which will adequately support the unit. For portable rack mounting where extreme vibration and/or shock is anticipated, it is recommended that the rear of the HC 6, along with any other product in the rack, be stabilized to prevent possible damage to the chassis should the rack be dropped, beamed up, or spindled.

IV. OPERATING METHODS

1. Once connected as described in the Installation Procedure, Section III, the HC 6 is ready to drive any impedance headphones from 4 to 2000 ohms. Plug the headphones into any of the 6 outputs, front or rear.
2. If using the master stereo inputs, apply a source program to these inputs and turn up the master level control until the green signal-present LEDs light up. This control can be further adjusted to raise or lower the volume level in all headphones simultaneously which are being driven from the master stereo inputs. The master level control does NOT affect channels which are driven from the direct mono inputs.
3. Use the individual level controls to adjust volume in each set of headphones to the desired loudness. When using the direct input, only this individual control will affect the volume in the headset--the master level control is bypassed.
4. Use of the direct mono inputs allows for completely independent operation of up to 6 different programs. These inputs are mono only, and are automatic balanced/unbalanced with connections as shown in diagram III. Connecting these inputs to a monitor mixing console, submaster sends on a recording console, monitor busses, or even direct channel outputs will enable you to send a custom monitor program to each of several different musicians simultaneously. This produces the same advantages as in stage monitor mixing, where each musician can hear a custom balance for much more effective and inspiring monitoring. Any channel which does not have anything plugged into the direct input will automatically be driven from the master stereo inputs.
5. The signal-present LEDs light up with any signal input above -20dBm. They are located in the signal path AFTER the master inputs and BEFORE the individual volume controls. This means that adjusting the master level will affect the signal present LEDs, but the individual controls will not affect these LEDs. Whenever a direct input is used, the LED in that stage will respond to that input and will be

unaffected by the master level control. Therefore these indicators can aid in quickly identifying which stages are being driven by the master inputs and which by the direct inputs: simply turn the master level control up and down and observe which LEDs respond, indicating that those stages are being driven by the master inputs.

6. The stereo/mono switch serves a basic function of allowing both left and right channels of all headphones to be driven from a single input, without having to use a "Y" adapter or separate cables. In some instances a stereo program can be confusing for live monitoring purposes, due to extreme separation and the increased difficulty in perceiving several different volume levels. Using the stereo/mono switch will convert the system to mono operation quickly to better suit these particular monitoring needs.
7. The front panel output jacks are in parallel with the rear outputs to provide easily accessible patching into any output stage for cueing or additional monitoring, even while the unit is in a rack. The HC 6 is rated to deliver a minimum of 100mW into 6 sets of 8 ohm headphones. If more than 6 sets of headphones are to be used simultaneously, which is possible since there are actually 12 output jacks, keep two things in mind:

A. There are still only 6 volume controls, so additional headsets will have to be doubled up with those plugged into the rear outputs. To avoid intolerable volume differences to two listeners on the same stage of the HC 6, either make sure that both or one set of the headphones is the type which has volume controls built in.

B. If you must use more than 6 sets of headphones at once, use some discretion: the HC 6 has limited output capability. The more headphones you connect to it, the less power there is available to each set and the more strain on the HC 6. Blasting 10 or 12 sets of 8 ohm headphones to a gaggle of half-deaf rock burn-outs is asking too much from the HC 6--you may cause a blown fuse which must be replaced internally. If you must use more than 6 sets of headphones simultaneously, make sure that most of these are of the higher impedance type to lessen the power drain from the HC 6.

V. SPECIFICATIONS

HC 6 FEATURES AND SPECIFICATIONS

Power: Six stereo headphone amplifiers deliver a minimum of 100mW per channel into 8 ohms, all channels driven; will drive any impedance headphones from 8 ohms to over 2000 ohms.

Inputs: Two $\frac{1}{4}$ " master stereo inputs, auto-balanced/unbalanced, with 20K ohms impedance.

Six separate $\frac{1}{4}$ " auto-balanced/unbalanced mono inputs for direct drive of each headphone amplifier, independently overriding the master stereo inputs; impedance is 20K ohms each.

Outputs: Six $\frac{1}{4}$ " stereo jacks on the rear panel; six $\frac{1}{4}$ " stereo jacks on the front panel, each in parallel with appropriate rear panel jack.

Distortion: THD + noise: less than .05% typical, less than .25% 20Hz to 20kHz.

IM: Less than .05%, 60/7kHz, 4:1

Frequency Response: 5 Hz to 24kHz, +0/-3dB.

Slew Rate: Better than 12 volts/microsecond.

S/N Reference 100mW into 8 ohms (20kHz BW): Better than 93 dBv.

Stereo/Mono switch for converting master stereo inputs to mono.

Signal Present LEDs: light with input above -20dBm.

Dimensions: 19" W x 1.75" H x 8.2" D, EIA rack-mountable.
Chassis all-steel.

Weight: 9 lbs. net.

VI. SERVICE INFORMATION

CAUTION: THIS SECTION IS INTENDED FOR USE ONLY BY QUALIFIED SERVICE PERSONNEL. USE EXTREME CAUTION AND READ ALL INSTRUCTIONS CAREFULLY.

1. Test Procedure:

A. With the power switch ON, turn the master level control fully clockwise and apply .25 volts of 1K Hz signal to the left master stereo input of the HC 6, with no other inputs plugged in. Verify that all signal-present LEDs are lit. Repeat using the right master input.

B. Turn all individual level control fully clockwise and put the stereo/mono switch in mono. Using a stereo $\frac{1}{4}$ " plug, verify approximately 3.0 volts output in both left and right channels of all 6 headphone amplifiers.

C. Connect a 10 ohm $\frac{1}{2}$ watt resistor from left channel to ground and another from the right channel to ground in order to load the outputs of the HC 6-- connect these resistors at the voltmeter or scope connections, whichever is most convenient. Repeat Step B with these resistors installed and verify at least 1.20 volts RMS output before clipping.

D. Apply an input signal of 0.10 volts at 1K HZ to the direct mono input of stage #1 of the HC 6, either balanced or unbalanced. With the level control fully clockwise verify approximately .70 volts output. Increase the input signal level until the output clips and verify at least 1.2 VRMS before clipping. Turn down the input until the green signal-present LED just goes off, then verify an input voltage of approximately .086 VRMS or less (-20 dBm). Repeat this step for the remaining 5 stages of the HC 6.

2. Schematics and Layouts:

Diagram VI-2.1: Main schematic
Diagram VI-2.2: Main layout

3. Disassembly Procedure:

A. Remove the top cover: 9 phillips HP 5 thread-forming screws.

B. Remove the bottom cover: There are both HP 5 screws (around the perimeter) and #6-32 machine screws, for a total of 16 screws. Since these are of different lengths, keep track of these by placing them in order somewhere on the bench where they will not be disturbed.

4. Troubleshooting and Alignment:

The HC 6 design incorporates close-tolerance components where necessary to eliminate the need for any alignment procedure. Due to the straightforward and repetitive nature of the circuit and layout, troubleshooting of the HC 6 is a simple matter of tracing the signal path from inputs to outputs as is clearly defined on the schematic. All component values, necessary test points and voltages are clearly marked on the schematic and layout provided in part 2 of this section.

NOTE: If a component failure should cause considerable power supply sag which makes identifying the faulty channel difficult, you may disconnect the positive and negative supply voltages from the various stages by de-soldering the jumper wires leading from the power supply.

