General Description

Very simple. You and up to three other friends want to listen to the same mix under headphones. Just take the HC 4, plug in, turn on, adjust your individual volumes, and groove.

The HC 4 provides master stereo Inputs which can be used to drive the four stereo headphone amplifiers. A Mono switch is provided on the front panel to drive both channels of all four amplifiers from a common mono source.

The HC 4 is capable of delivering up to 200 milliwatts into headphones with rated impedances between 32-600Ω. The precise amount of power depends on the exact impedance of the headphone in use and the number of headphones connected to the unit. Under most conditions, the HC 4 produces sound pressure levels in excess of 120 dB. This level is more than adequate for most listeners.

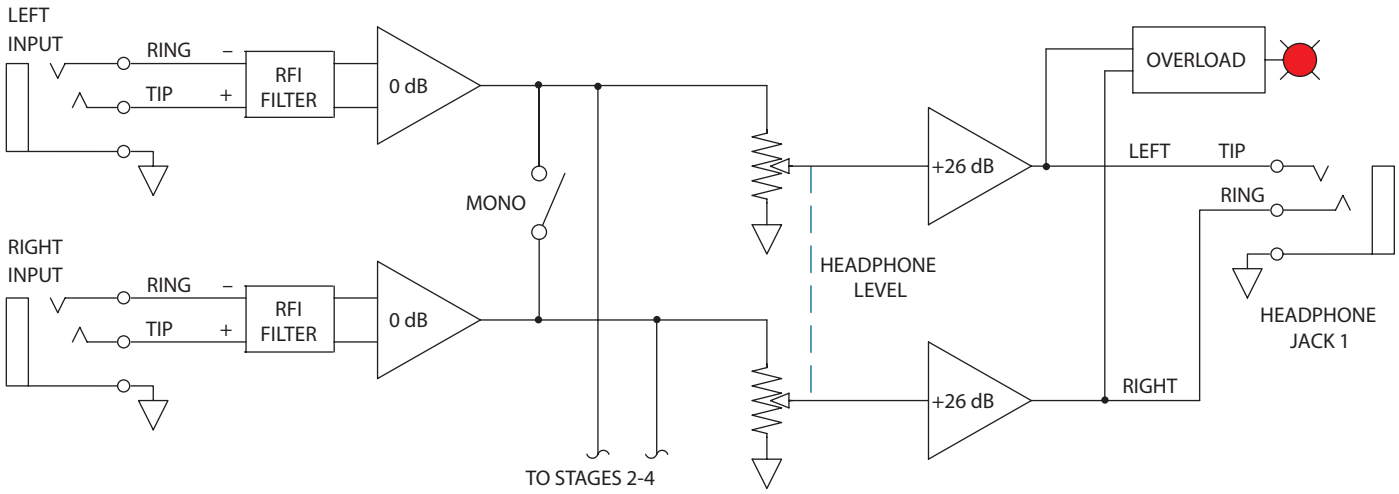
Features

- Four Stereo Amplifiers
- Balanced ¼" Stereo Master Inputs
- Extremely Low Noise
- Stereo/Mono Switchable
- Master Balanced/Unbalanced ¼" TRS Stereo Inputs
- Individual Level Controls and Overload Indicators
- Drives 32-600 Ω Headphones
- Drives Most Phones to 120 dB SPL
- UL/CSA Remote Power Supply (120 VAC)
- CE (Low Voltage & EMC) Remote Power Supply (230 VAC)

Features and Specifications

Parameter	Specification	Limit	Units	Conditions/Comments
Headphone Impedance Range	32-600	10%	Ω	For best performance
Inputs: Type	Active Balanced/Unbalanced			
……Connectors	¼" TRS			
……Impedance	20k	1%	Ω	
……Maximum Level	+20	1	dBu	
Outputs: Type	(4) Stereo Amplifiers			
……Connectors	¼" Tip = Left, Ring = Right			
……Impedance	1	max.	Ω	
Power	200	min.	mw	32 to 150 Ω
Overall Gain Range	Off to +26	±0.5	dB	
LED Overload	3	min.	dB	Before clipping
Frequency Response	10-45 kHz	+0/-3	dB	
Common Mode Rejection Ratio	40	min.	dB	20 Hz-20 kHz
THD+Noise	0.1	max.	%	re 200 mW / 150 Ω
Crosstalk, Left to Right	-50	max.	dB	re 200 mW / 150 Ω, 20 Hz-20 kHz
Signal-to-Noise Ratio	94	min.	dBr	re 200 mW / 150 Ω, 20 kHz BW
Unit: Agency Listing				
……120 VAC model	Class 2 Equipment			National Electrical Code
	UL			Exempt Class 2 equipment
	CSA			Exempt Class 2 equipment
……230 VAC model	CE-EMC EN55020, EN55013			EMC Directive 89/336/EEC
	CE-Safety EN60065			LV directive 73/23/EEC
Power Supply: Agency Listing				
……120 VAC model	UL			File no. E88261
	CSA			File no. LR58948
……230 VAC model	CE-EMC			EMC Directive 89/336/EEC
	CE-Safety			LV directive 73/23/EEC
.....100 VAC model	Built to JIS			Japan only
.....Requirement	18 VAC with Center Tap	10%	Vrms	Rane RS 1 Supplied
.....Maximum Current	750		mA	RMS Current From Remote Supply
Unit: Construction	All Steel			
……Size	1.75"H x 19"W x 5.3"D (1U)			(4.4 cm x 48.3 cm x 13.5 cm)
……Weight	6 lb			(2.7 kg)
Shipping: Size	4.5" x 20.3" x 13.75"			(11.4 cm x 52 cm x 35 cm)
……Weight	12 lb			(5.4 kg)
Note: 0 dBu = 0.775 Vrms				

HC 4 Block Diagram



Application Information

Two balanced Inputs provide a master stereo signal to four stereo headphone amplifiers, with individual stereo Level controls and Overload indicators. A Stereo/Mono switch converts the stereo Inputs to mono operation when required.

The HC 4 makes a valuable tool for any band wanting to practice anywhere, anytime, at any volume, without disturbing a soul. By connecting the HC 4 directly to the mixer outputs and using headphones instead of amps and speakers, the entire band can perform at ear shattering levels, with no feedback, with amazingly cleaner, clearer sound. The HC 4 is a very cost-effective alternative to renting a practice studio for every rehearsal.

Architectural Specifications

The headphone console shall have two (2) master inputs driving four (4) stereo amplifiers wired to four (4) outputs on the front panel. Sufficient output power shall be provided to drive most stereo headphones to levels of 120 dB SPL.

Input level controls shall be provided on all inputs with a gain range from off to +26 dB. A stereo/mono switch shall be located on the front panel.

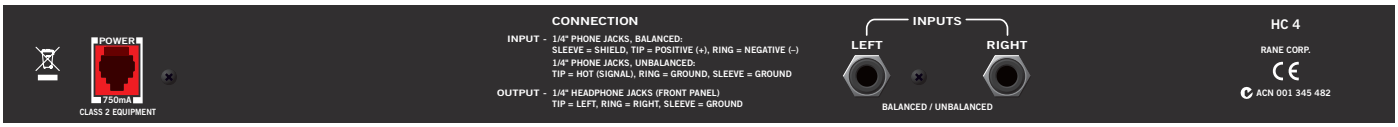
The master inputs shall be active balanced/unbalanced designs terminated with ¼" TRS (tip-ring-sleeve) connectors. The outputs shall be ¼" TRS connectors wired tip-left, ring-right, sleeve-common.

LEDs shall be provided to indicate overload conditions on each amplifier input.

The unit shall be powered from a U.L. Listed, C.S.A. Certified, (120 VAC) external power supply, or a (230 VAC) supply meeting CE requirements. This external supply shall be provided with each unit.

The unit shall be a Rane Corporation Model HC 4.

HC 4 Rear Panel



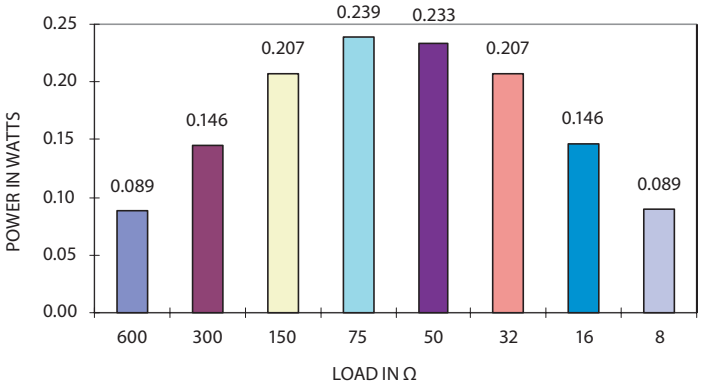
Headphone Sensitivity

Headphone manufacturers specify a "sensitivity" rating for their products that is very similar to loudspeaker sensitivity ratings. For loudspeakers, the standard is to apply 1 watt and then measure the sound pressure level (SPL) at a distance of 1 meter. For headphones, the standard is to apply 1 milliwatt (1 mW = 1/1000 of a watt) and then measure the sound pressure level at the earpiece (using a dummy head with built-in microphones). Sensitivity is then stated as the number of dB of actual sound level (SPL) produced by the headphones with 1 mW of input; headphone specifications commonly refer to this by the misleading term "dB/mW." What they really mean is dB SPL for 1 mW input.

Think about these sensitivity definitions a moment: headphone sensitivity is rated using 1/1000 of a watt; loudspeaker sensitivity is rated using 1 watt. So a quick rule-of-thumb is that you are going to need about 1/1000 as much power to drive your headphones as to drive your loudspeakers since both of their sensitivity ratings are similar (around 90-110 dB SPL). For example, if your hi-fi amp is rated at 65 watts, then you would need only 65 mW to drive comparable headphones. (Actually you need less than 65 mW since most people don't listen to their loudspeakers at 1 meter.) And this is exactly what you find in hi-fi receivers—their headphone jacks typically provide only 10-20 mW of output power.

Take another moment and think about all those portable MP3 players. They sound great, and loud. Why, you can even hear them ten feet away as the teenage skateboarder that ran over your foot escapes. Power output? About 12 mW.

As you can see from the chart below, headphones near 75 Ω impedance produce the highest power levels from the HC 4. However, heaphone sensitivities vary widely, and are not merely a function of power. *Note: headphones with an impedance of less than 32 Ω are not recommended for use with the HC 4.*



HC 4 power with all channels driven simultaneously or in any combination.