

# CARVER

SONIC HOLOGRAPHY—  
AUTOCORRELATION  
PREAMPLIFIER  
MODEL C-4000



Under all the buttons and knobs is, first and foremost, one of the finest audio preamplifiers in the world. Although the C-4000 can combine up to five separate functions to recreate the vivid reality of live sound, its primary role is that of a fine "straightwire" preamplifier, dedicated to perfectly amplifying real-world musical signals without a trace of distortion.

Its phono stage lets you match virtually any cartridge to the ultra-sensitive phono preamp stage where the infinitesimal impulses from your cartridge are raised to line level and equalized. Not only does the C-4000 allow capacitance matching between itself and the cartridge/cable load, it treats the signal to state-of-the-art ultra low noise, high current transistors in the first critical stages, eliminating a main source of noise and distortion. As the signal passes through successive stages it retains fidelity to the point where one watt of real-world output results in just 0.000000251 watts of distortion. Zero normalized phase shift. Zero group delay. Noise performance within 1dB of the theoretical limit of real-world cartridges. No slew limiting. No overload.

Put simply, the specs, features and performance of the C-4000's preamplifier section alone place it in the \$1000 to \$3000 price range. Its use of precision goldband laser-trimmed resistors, 24K gold contacts, G-10 glass epoxy circuit boards, machined metal parts, and lifetime lubricated, fully sealed switches further prove it.

**A superb range of controls.** There are separate tone controls for each channel plus a choice of turnover frequencies with a defeat for instant comparison. A 12dB/octave infrasonic filter helps eliminate speaker woofer cone flutter and distortion caused by warped records, acoustic feedback, tonearm resonances and floor movement. A discrete headphone amplifier is included. A speaker mute switch allows you to cut sound momentarily without changing master volume control setting. A stereo-mono switch lets you instantly check for cartridge and speaker phasing errors. You can dub between two tape decks interchangeably. Additional external processors may be added at any time and switched from the front panel. While the antitheses of "straightwire" thinking, these human-engineered controls let you truly enjoy your music. And of course ALL sound processing circuitry is instantly defeatable for comparison and for the pursuit of eternal flatness, may it exist in all our hearts and longings.

Yet we think there is more to reality than flatness...

**Consider the nature of music.** Music arrives at our ears in-phase, alive with all nuances of the reverberant room, the crisp dynamics of instruments, the position, sound quality and even natural spectral frequency responses all vivaciously present. It was this challenge of reproducing reality which set Bob Carver to creating the complete C-4000.

**The miracle of Sonic Holography.** Consider each sonic event of a musical performance. For example, when a drum strikes a note in front of you, each ear receives a sound arrival which tells it just where that drum is in space by comparing the two sounds. One sound source: two sound arrivals. A stereo speaker simulates this effect by beaming sounds from two points ahead of you. For a split-second, your ear is deceived by the two sound arrivals, just like in real life. But then each ear gets another sound arrival from the opposite speaker. Two sound sources; four sound arrivals. The ear-brain localizing center is confused with multiple sound arrivals and can barely perceive a "center" to the sonic event.

Sonic Holography generates another set of signals which exactly cancel the spurious second set of sound arrivals. Thus unconfused, your ear again hears true sound. Just two sound arrivals as in real life, once again. Instead of merely "imaging" between the speakers, sound suddenly bursts forth wider than your speakers.

Higher (and lower) than your speakers. Closer and farther back — even to the sides of you. Instead of a

tiny window, the image of sound is a giant panorama, freeing you from the room's dimensions.

Popular Electronics said "... the result was positively breathtaking! When the lights were turned out we could almost have sworn that we were in the presence of a real live orchestra."

Omni Magazine noted that "Instruments and performers are located where they belong whether to the front of, between, beside or behind the speakers — in short, anywhere in a 180 degree arc facing the listener."

Julian Hirsch said "The effect strains credibility — had I not experienced it I probably would not believe it myself!"

Example: "Time" from Dark Side of the Moon by Pink Floyd. Each clock is individually discernible. Did you know that they were set up in rows?

Example: Suite in F by Holst. You can discern the position of the first and second trumpet sections and even the three saxophones; The tuba's valve sounds are discernible below the sound emanating from his bell!

Example: Your favorite music no matter what your tastes.

Note that the Sonic Hologram Generator costs just under \$300 separately.

**Restoring the hall: Built-in Time Delay.** Now that the sound field in front of us has been made real again, it is time to consider the total listening environment including reflected sounds received from behind us. These place us within the listening environment, giving depth and dimension. The emotional impact of music is increased, yielding the impression that your body is immersed in sound rather than simply being present near the source.

The time delay system built into the Carver C-4000 is designed to re-create the larger feeling of acoustic space. Delayed sounds are reproduced by small secondary sound sources of fifteen watts each, freeing the main front channels to reproduce the direct sound of music. This requires just two inexpensive speakers which may be unobtrusively placed behind the listener. Adjustments allow you to control the "size" of the environment you wish to simulate and match the output to the needs of your listening space. A line level output is provided should more than fifteen watts per channel be desired.

Such an integrated unit would cost from \$300 to \$800 if bought separately.

**Putting the punch back in: The Peak Unlimiter Circuit.** Recording tape simply cannot capture the dynamics of sound. Soft passages mix with tape hiss; loud passages saturate and distort the tape. Recording engineers compensate with electronic devices that "limit" loud sections and boost or "compress" soft sections. The result is a dynamically neutered sound unlike the delicate pianissimos and thundering forte's of live sounds. The C-4000's Peak Unlimiter circuit automatically senses when the dynamics have been "squashed" and restores their punch, quickly

and without distortion. Thus you hear louder louds and softer softs; in short, a sound dynamically closer to reality.

A dynamic expander costs a minimum of \$200 when purchased as an outboard device.

**Eliminating the medium: The Autocorrelator Noise Reduction System.** Tape inevitably adds hiss to recordings. Vinyl adds surface noise. So do your cartridges, electronics and turntable. Eliminating this final veil between you and reality is achieved by a special circuit which discriminates between random noise and musical information, removing hiss over the range of 2kHz to 20Khz. Non-random, low frequency noise such as hum and rumble are removed by a level-sensitive dynamic filter that operates below 200Hz. You get as much as 10dB less noise so that music emerges from an almost silent background.

Units which approximate the Autocorrelator start at \$450.

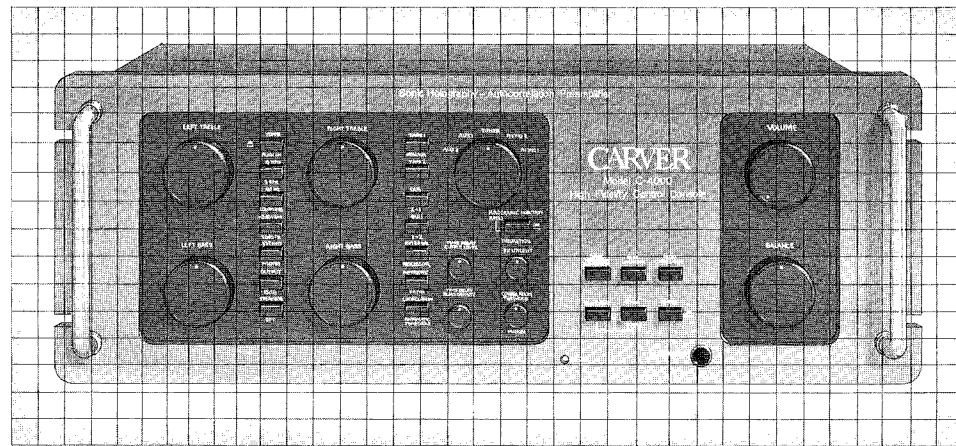
**A superb combination.** The C-4000 offers you at least fifteen hundred dollars worth of valuable, reality-heightening add-on sound enhancement devices. Yet you probably set out just to buy a preamplifier, and the C-4000 is worth its full price as a "straightwire" preamp alone.

Think of the C-4000 as a control CONSOLE. A virtual keyboard of sound enhancement devices IN ADDITION to preamplification. Listen to what the C-4000 can do to your favorite records.

With Sonic Holography to restore the image. With Autocorrelation to eliminate the medium. With Peak Unlimiting to put back the punch. And with Time Delay to immerse you in the sound. Then compare it to any other mere preamplifier. And opt for the world of sonic reality.

## SPECIFICATIONS

Phono stages, Frequency response: within  $\pm 0.25$ dB extended RIAA. Phono 1: moving magnet. Phono 2: moving coil. Frequency response: 20Hz to 20k Hz  $\pm 0.25$ dB, 1.5Hz to 60k Hz  $\pm 0, -3$ dB. S/N ratio (IHF "A"): 86dB re 0.5V. Distortion: THD 0.05% at rated output. Typically 0.003%. SMPTE IM 0.05% at rated output. Typically 0.003%. T.I.M. unmeasurable. Infrasonic Filter,  $-3$ dB at 15Hz, 12dB/octave,  $-22$ dB at 5Hz. Autocorrelation. High-frequency noise reduction,  $-3$ dB at 1.5k Hz, reaching  $-8$ dB at 2.5 k Hz, extending to 20k Hz. Low-frequency noise reduction  $-3$ dB at 200Hz, reaching  $-10$ dB at 100Hz extending to 20Hz. Peak Unlimiter, Total dynamic range recovery approximately 5.5dB. Sonic Hologram Generator, Image resolution: better than  $5^\circ$  arc in the horizontal plane, better than  $20^\circ$  arc in the vertical plane (Holographic Injection Ratio set to Theoretical). Time Delay, Delay: 15 or 25 ms, switch selectable. Echo recirculation: variable from 0 to 100%. Distortion: less than 0.25%. Dimensions 19  $\times$  6  $\frac{3}{4}$   $\times$  8  $\frac{1}{2}$ ". Weight: 11 lbs. (5 kg).



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