

# CARVER M-1.5t

## MAGNETIC FIELD POWER AMPLIFIER

**Uncharacteristic of a spec sheet, our M-1.5t description starts out with a story.**

Once Bob Carver visited a famous sound researcher who was attempting to recreate the "snip" of an ordinary pair of scissors. Between the microphone and the speakers he had installed TWENTY-FOUR 200-watt amplifiers. Yet when viewed on an oscilloscope it was apparent that the final tip of that instantaneous transient was being distorted. Believe it or not, he needed more power!

Bob was not exactly surprised. Even playing back a recording of his daughter's first cries had exhausted even HIS enormous sound system's power reserves. It was evident that real-world sound occurs very quickly and requires much more power than ANY current amplifier could produce.

The M-1.5t is a culmination of Bob's search for Enough Power.

It is intended to be the ultimate amplifier for the reproduction of music today and for years to come, far into the digital age. We recommend it without reservation for home listening, or even public address.

Although its power output capabilities are unapproached by any other commercially available audio amplifier, the M-1.5t is designed to be virtually indestructible under normal use and abnormal abuse.

**Why one thousand two hundred watts?** Music is full of surprises such as lightning transients, combinatorial crests of demand created by multiple music waveforms and the explosive levels that some well-recorded instruments can instantly attain. We hear all this in live music; indeed, this is what makes music live. But we don't hear these incredibly intense bursts of sound as being loud—they are too short in duration—just live, like the scissor snip.

Nonetheless these quick, high-intensity peaks MUST be reproduced to make recorded music feel live.

If the amplifier cannot provide the instantaneous power to surmount these rigorous musical peaks when they are presented at its inputs, it makes a sound of its own devising, literally an electronic squeal of anguish.

The result is audible degradation of your system's sound. Instantaneous clipping that has pervaded your listening for years. A form of distortion which has been difficult to avoid until the M-1.5t arrived.

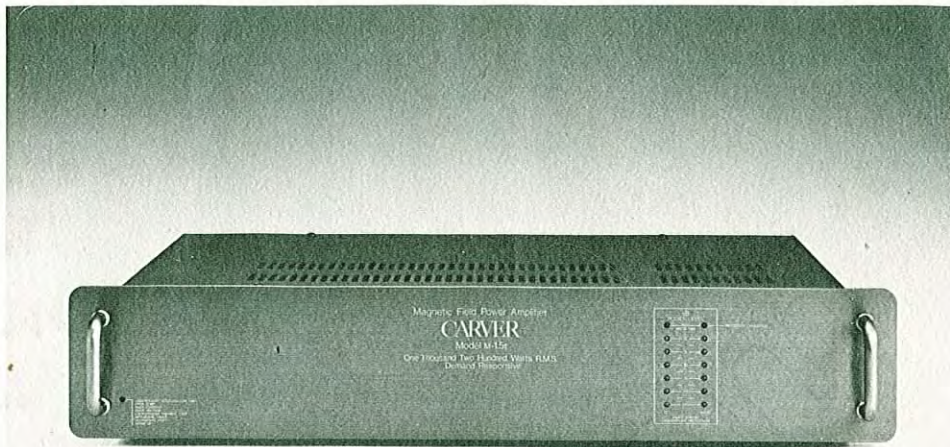
Accepting audible reasons for extremely high power means dissuading yourself that high power spells speaker burn-out. Actually, LOW power destroys many more speakers. Yes, illogical as it may seem, the lowly 40-watt receiver can "kill" a speaker far faster than the M-1.5t! Here's why.

To produce a bass note, a woofer cone must move up to a half inch in a few hundredths of a second against the static room air mass. That can take up to 80% of an amp's power. That's fine if it has the power. If it doesn't, clipping occurs. At reasonable levels, this generates distortion. At higher levels the speaker crossover duly routes this nasty pulse directly to the tweeter and midrange drivers which either cumulatively burn out or actually fry within seconds! With the power reserves of an M-1.5t, the tweeter and midrange are PROTECTED from the woofer's massive power consumption.

How can the M-1.5t weigh less than some preamps and yet pack more muscle than power amps weighing FIVE times as much?

**The M-1.5t vs. convention.** In a traditional amplifier, the power supply only has two chances during each AC line voltage cycle to recharge and store energy. To meet musical demands in between it must maintain a reservoir of energy. A good analogy would be a tank of water. A faucet periodically squirts some water into a tank, while on the other end, a valve opens in-time-with-demand, letting water (power) out. The tank has to be big enough to allow for the drain on it even when it can't be resupplied by the faucet (line current) at its top.

In reality this means as conventional amplifiers



grow more powerful, their transformers and supply capacitors (storage tank) must grow proportionately larger. The result is an increase in size, mass and expense. Electricity doesn't store as neatly as water: it dissipates itself in considerable, sometimes destructive heat.

But, while conventional amplifiers continually court meltdown by converting most of their energy into heat, the M-1.5t transforms almost all its energy into useable audio power with a patented power supply engineered to be directly responsive to the moment-to-moment power requirements of your music. In our water analogy, think of it as a direct valve from the water main to the outlet with no need for inefficient intermediate storage. Your speakers are literally getting their power from the power dynamo.

This is no simple feat, however and requires a special Triac switch and Magnetic Field Coil which actually spend most of their time stepping UP the line voltage values and are only called upon to handle maximum line voltages at times of maximum demand.

**Rating the M-1.5t.** We believe that there is more to performance-effective music amplification than the FTC "Power Disclosure" rating. The conservative 350 watt per channel rating on the back of the M-1.5t doesn't even hint at its true capabilities. Upon application of a musical input, each channel of the M-1.5t is regulated to put out 600 watts, diminishing over several seconds to the rated 350 watts.

Several seconds is a long time in the life of a music waveform. Any peaks requiring anything like 600 watts will come and go in a few HUNDREDTHS of a second and the M-1.5t will do them justice with 1200 watts of power. Let the waveform subside for as little as 1/100 of a second and the amplifier resets itself, capable of providing the full 600 watts per channel again. Because of the tremendous capacity of the M-1.5t's power supply, there has been no need to isolate the channels. Thus, when pressed hard, either channel is free to BORROW an additional 150 watts from the other for a total of 750 watts (so long as the summed output of both channels doesn't exceed 1200 watts max).

**Brute power controlled.** Implicit in this much power is a set of carefully designed protection circuits. For your speakers and for the 1.5t.

While it is unlikely you'll ever clip the 1.5t, a high-gain comparator circuit links input and output and responds to any significant difference between them, cutting input just enough to bring the 1.5t out of clipping. This protects your loudspeakers and protects against distortion. You'll know what form of protection has been activated just by watching the LED display.

Next we designed a set of total turn-off mechanisms into the 1.5t to protect against 1) temperatures above 70°C 2) excessive out-of-phase infrasonic/low frequency signals like dropping a tonearm 3) excessive DC currents. These protect speakers from ungrounded line-level connectors, oscillation, and real-world accidents like shorted speaker wires.

The M-1.5t's final protection mechanism is very

special. Driving your woofers with the tight high-excursion bass possible with a 1.5t, CAN heat the voice coils. While good speakers have heat dissipation safeguards, the 1.5t also keeps track. It actually averages loudspeaker input continuously and remembers for about three minutes backward in time. If it judges the amount to exceed the safe limits for high quality loudspeaker woofer voice coils, it will momentarily interrupt power to cool them.

**A window on power.** The fifteen LED's on the 1.5t's face do more than simply monitor power. The top LED signals headroom exhausted. When it blinks at high levels, you know the special anti-clipping circuits are operating and you've used up all the headroom.

The fifteenth LED is a diagnostic fault indicator. In conjunction with the two lowest level display LED's, and an internally generated warning sound, it informs you of internal problems, routine protection shut down and other occurrences.

**The music of power.** Of the Carver M-1.5t, Peter Aczel, Editor and Publisher of *The Audio Critic* has said, "... the equal of any power amplifier in transparency, focus and smoothness and, of course, far ahead of any other we tested in sheer gut-shaking power and dynamic range. We especially enjoy hearing spatial detail, instrumental definition and completely natural dynamics on familiar records to a degree we did not know was extractable from the grooves when we listened through lesser amplifiers. At this level of sonic performance, the astoundingly small size and cool operation of the M-1.5t become the icing on the cake, rather than the main attraction."

**Power for life.** The Carver M-1.5t is all the amplifier your hi-fi system will ever need. No matter what advances in digital playback find their way into your signal chain. If you like the final edge of reality in your playback, no matter what sound level you choose, the M-1.5t is your answer. That it is the ultimate power amplifier ever made can only be confirmed by listening. Are you ready?

### Specifications.

Power, 350 watts/channel into 8 ohms 20 Hz-20K Hz with no more than 0.1% THD; Power at clipping continuous per channel, 550 watts at 4 ohms, 430 watts at eight ohms, 240 watts at sixteen ohms. Dynamic headroom (each channel) 750 watts at 4 ohms, 750 watts at eight ohms, 380 watts at sixteen ohms. 600 watts per channel long-time-period reserve power at 8 ohms.

Noise, > 100dB down, IHF-A weighted, Harmonically related commutation noise is equal to or less than nonlinear distortion components. IHF-A weighted; IM Distortion, 0.1% SMPTE; TIM Distortion, Unmeasurable; Frequency Bandwidth, +0-3dB, 0Hz-250K Hz at 1 watt; Slew Factor, greater than 100 (small signal bandwidth equal to large signal bandwidth because of ultrasonic output filter), Display Tracking, ± 1 dB; Display Ballistics, Peak responding 10 millisecond attack. Input Impedance, 150K ohms. Infrasonic filter, -3dB at 0.4 Hz; Ultrasonic filter, better than -3dB at 80KHz (related to load impedance) 3 1/2"H, 19"W, 10 1/2"D. Wt. 16 lbs.