The Advent Model 300 Stereo Receiver

Designed to offer the kind of sound associated with far more expensive and complex equipment.

The Advent Model 300

The Advent Model 300 is a unique stereo receiver with audible performance that compares directly, in every respect except total power output, to that of the most expensive separate-chassis components.

Like Advent speaker systems, the Advent Model 300 is based on the idea that a moderate price doesn't have to place any important limitation on the usable sound quality of audio equipment. Within its power capabilities, which are more than adequate for driving most loudspeakers (including all Advents) under home listening conditions, the Model 300 is designed to sound as good as the best equipment we know of at any cost. Its overall listening quality is comparable to that of the best separate-chassis preamp, tuner, power amplifier combinations.

The Model 300 doesn't have the power of more expensive equipment, and its control features are limited to the ones most people find useful in home listening. But it produces a maximum of audible performance at very moderate cost, and brings the highest level of sound quality within reach of many more people than ever before.

What's behind it

We are in business at Advent to make products that go well beyond accepted limits and explore new or significantly different approaches to design.* Instead of making a broad line of equipment in every price and performance category, we look for opportunities for individual products that can be exceptional in performance and value.

There are many good receivers on today's market. But the differences between them (particularly between models from the same manufacturer) have a lot more to do with selling equipment than with buying it. Excellent sound and FM performance tend to come in the medium-high to very-high price categories. Low-price receivers, on the other hand, tend to give up some sound quality and FM capabilities for the sake of power-per-dollar.

The Model 300 represents our best effort to produce a single receiver that can provide a maximum of the things we feel most people will value under real listening conditions at home at a price well within the lower half of the current range.

We began work on it with the conviction that it shouldn't have to cost a great deal more to provide excellent tuner and preamp circuitry than to do conventional circuits. What it required was design attention – at least the same level of attention given to those areas in high-priced units.

We also felt sure that a clean, moderate-power amplifier design would more than do for the needs of the great majority of listeners, *provided* that a unit's full rated power was actually available into a loudspeaker. (That isn't always true, a subject we will have more to say about when we cover amplifier power a bit later.)

Those were the premises with which we went ahead toward the Model 300. The process took three years of research and development, including exhaustive listening tests and the use of sophisticated computer programs. On the way, we made some discoveries that enabled us to do more than we expected.

* Our audio products so far have included a series of bestselling speakers, the first high-performance cassette equipment, and recorded cassette releases (Advent Process CR/70™ recordings) that have been called a new standard for the recording industry. We are also interested in high-performance video, and have developed the first home television receiver – the Video Beam® projection TV set – with a life-size (six-foot diagonal measure) color picture.

The Model 300 uses an entirely new phono preamp design (developed by Tomlinson Holman) that plays a critical role in its overall performance. It makes a major improvement in exactly the area — music on records — that's most important to most people's listening. And it offers at least the level of overall sound quality for which critical listeners often buy separate preamps that cost as much as, or considerably more than, our complete receiver.

We think the preamp circuit's performance is important enough to warrant our talking about it at length in slightly technical terms.

The new circuit came about after a great deal of research into the audible differences between preamps of all kinds and prices. Our listening comparisons among existing units kept turning up no consistent correlation between conventional performance measurements and what actually sounded good. There also seemed to be no reliable relationship between price and audible performance.

We felt sure that something had to be wrong with accepted measurement techniques, and that at least one missing factor in tests covering preamp development could have a lot to do with the amazingly audible differences between apparently identical units.

There turned out to be several factors:

- Tests of phono preamps were being made using signals from test generators rather than from phono cartridges. This meant that the tests weren't picking up major impedance interaction effects that exist between various cartridges and preamps in actual use. These effects were causing variations as great as 8 dB in high-frequency response and correspondingly major differences in sound quality.

- Response outside the audible range — particularly in the subsonic region — was causing audible difficulties inside the range under actual conditions of use. The difficulties from response below 20 Hz included acoustic feedback, waste of low-frequency amplifier power from pulses caused by warped records and turntable rumble, and (for the same reason) unnecessarily high IM distortion in both power amplifiers and loudspeakers.

- The background noise of preamps — and the annoyance value of that noise — was also being misgauged by the failure to have a cartridge connected to the preamp during the measurements. The standard practice of simply shorting the phono input for noise tests wasn't predicting what would happen in real use.

It seemed obvious, then, that the failure to test preamps under conditions simulating actual use accounted not only for major audible differences among preamps themselves but equally big differences in the effective performances of the amplifiers and speakers connected to them. That led Tom Holman to develop new, pertinent test methods, correlated with extensive "double-blind" listening tests, to determine the overall system-performance of preamps in connection with other pieces of equipment.

As a result, the new design he developed for the Model 300's phono preamp effectively handles the problems discovered on the way. It eliminates impedance interaction between preamp and cartridge, thereby assuring that frequency response is always that of the cartridge used with the Model 300. It reduces effective phono background noise to as low a point as we know of in any preamp. And it incorporates a unique subsonic filter that is flat at 25 Hz and cuts response by only 1 dB at 20 Hz, but is down by more than *30dB* at 4Hz (the worst record-warp frequency) without audible side effects.

The difference the new preamp design makes is anything but hard to hear. The factors involved may not seem dramatic in print, but they add up to the kind of audible change that comes very rarely in basic audio design. The Model 300's preamp not only performs exceptionally in its own right, but helps take fullest advantage of the receiver's low-distortion amplifier circuitry—and of whatever speakers you attach to it. (If you would like a full technical description of the Holman circuit, we will be happy to send a copy of a paper prepared for the Audio Engineering Society.)

We approached the design of the Model 300's FM tuner section with the same investigative, what's-worth-doing approach we had applied to its preamp. We did a great deal of listening under very different reception conditions to tuners and receivers in all price categories, to see what they were really like and why. And we again explored the relation of test procedures (and on-paper performance specs) to effective, usable performance.

It didn't take long for us to agree with the premise that sensitivity is a crucial element in tuner design, and that high sensitivity is an obvious must even in urban areas for receiving weak stations. But it also became clear very quickly that many tuners had been designed one-sidedly for maximum sensitivity (and the best possible number on a specifications chart) at the expense of other factors.

Any difference between a sensitivity rating of 1.7 microvolts and 2.5 microvolts is likely to be useful only on paper. And the sensitivity-is-everything approach to design tends to produce units that overload very badly when receiving typical strong signals in urban and suburban areas. The overload generates spurious images at various points along the FM dial, which interfere with, or entirely cancel out, stations that units of high rated sensitivity should be receiving with ease. This problem seriously degrades the overall station-getting ability of these units.

Our findings also convinced us that the one-sidedness of some tuner designs isn't necessarily intentional. Part of the problem seems to be that measurement standards for tuners aren't of the strength and complexity needed to simulate a wide range of in-use conditions. The most important limitation is that test generators provide such limited maximum signal strength that they don't come close to duplicating the levels actually broadcast by medium-to-strong FM stations (and the resulting effects).

With these and other factors in mind, and with actual broadcast signals as a constant test source, we developed the Model 300's tuner circuitry both to achieve high sensitivity and to combine it with excellent selectivity and overload margin. It combines these factors as effectively as separate-chassis tuners costing far more. And while its on-paper sensitivity may give up a microvolt (or fraction) to some receivers', it will run rings around many of them in the number of stations it will receive clearly and pleasurably for the listener, without spurious images. It is as "hot" a tuner design overall as most separate-chassis tuners of many times its cost.

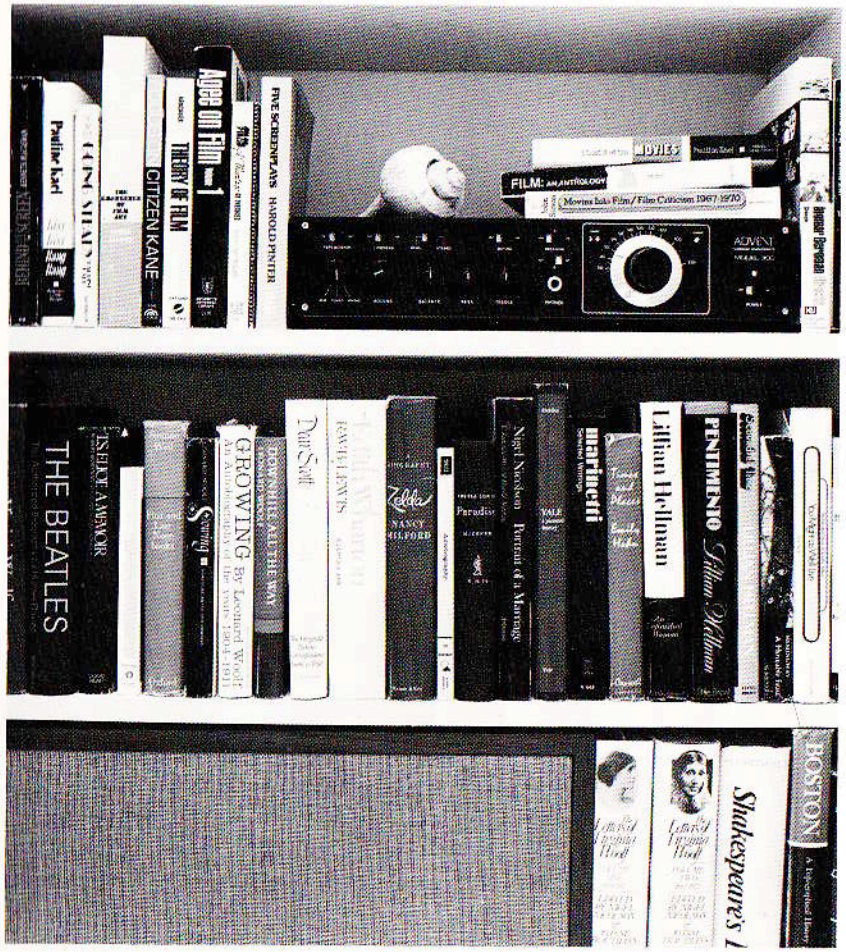
The Model 300's overload margin was obtained without resorting to Automatic Gain Control. AGC has the crucial disadvantage of tending to suppress—and often wipe out—weak stations located next to strong ones on the dial.

The way in which the Model 300's front-end design combines high sensitivity and high overload margin is due in part to the use of a fourth transistor to drive the IF stage, which is unusual in a unit in or near the Model 300's price class. This added transistor provides steep limiting while maintaining overload performance.

The tuner's multiplex circuit is a Phase Locked Loop design generally used in expensive equipment. Its advantages are excellent stereo separation, lower distortion at high frequencies, and less "beat note" distortion ("birdies") from stations that broadcast SCA signals (background music service for paid subscribers such as restaurants) along with their regular stereo broadcast. If, like us, you have a problem SCA station in your area, the Model 300's performance will be very welcome.

The visibly different thing about the Model 300's tuner is its use of a vernier tuning system instead of the usual dial-cord and slide-rule dial. Vernier tuning is employed in a good deal of professional communications equipment. It is simple, precise, and a genuine pleasure to use. And it stays that way over years of use.

The Model 300's vernier tuning is combined with an equally effective tuning indicator that uses Light-Emitting Diodes. Correct tuning is indicated when the two LED's match in light output. Interstation muting helps provide quiet, easy tuning.



As with the Model 300's preamp, we think you will easily hear what its FM reception has to offer. In urban and suburban reception areas, and in many distant fringe areas, its performance is an effective match for any tuner we know of. And no receiver in or near its price class approaches its overall FM performance.

Power, speakers, and home listening

Because of the emphasis placed on power output in most coverage of audio subjects, manufacturers in the highly competitive receiver market are under some pressure to offer the highest *rated* power per dollar. We have taken a different route with the Model 300, and the difference is worth explaining.

In order to provide the highest power rating per dollar, most receiver manufacturers operate output transistors in their units at or near their limits. To protect them in this kind of design, they then employ voltage-current limiting circuitry. A receiver designed in this way will deliver its rated power into the usual test load (a resistor across the output terminals) without difficulty. But a speaker presents a more complex load than a simple resistor, and when such a receiver operates into a loudspeaker, the protective circuitry usually triggers at *less* than rated power. The result is that a typical receiver of this design is simply not as powerful, in actual use with speakers, as its rating indicates.

The Model 300's output stage doesn't operate its transistors close to their limits, and doesn't require the usual protection. It uses the comparatively rugged and expensive devices usually found in units rated at twice the power but employs them conservatively for 15 watts per channel into 8 ohms, with less than 0.5% harmonic distortion, from 40 to 20,000 Hz. Since it will deliver its *full rated power* into an actual speaker load as well as the usual test resistor, *the actual loudness it can achieve before clipping is as great as receivers rated at twice the power.*

Equally important is that there are no audible side effects in the Model 300 during clipping at maximum output. The protective circuits in many receivers can and often do cause disturbingly audible side effects during clipping. The Model 300's design avoids these problems.

The Model 300 will provide ample acoustic output levels with virtually any loudspeaker we know of under the usual home listening conditions – with no sense of strain or constricted sound. As a speaker manufacturer, we have a good idea of what it takes for an amplifier-speaker combination to sound satisfying at home. The Model 300 meets our standards with ease. We have used it with full satisfaction with our own Advent Loudspeaker (which isn't light in its power demands), and we would have no reservations in recommending it for that use under the usual conditions.

The Model 300 as a tuner-preamp

As we developed the Model 300, it became clear that one feature that is usually present only in high-price receivers was well worth including. That is a preamp output jack that allows the Model 300 to be used as a tuner-preamp of superb quality in connection with a separate-chassis power amplifier.

For people who have use for a separate high-power amplifier, the Model 300 can serve as a fine control center, with sound quality that can't be improved on in any significant respect. Its control flexibility isn't as great as that of most expensive separate-chassis units, but its sound is as good as the best available at any price.

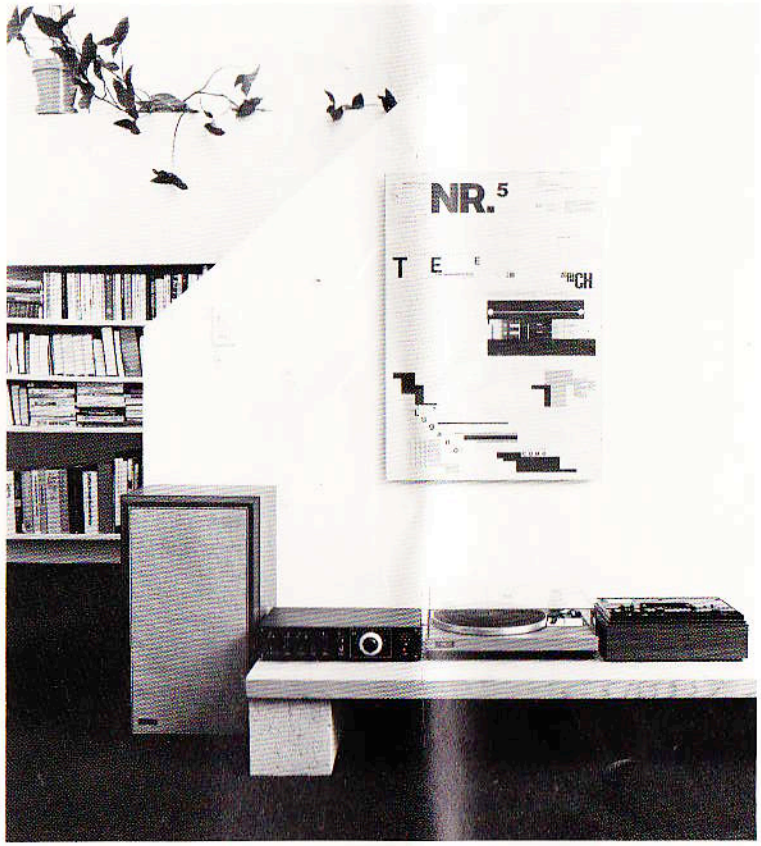
(If the Model 300 is used as a separate tuner-preamp, its power amplifier section provides an input jack that allows it to be used as a basic stereo amplifier. This could be useful in connection with a remote speaker installation, or some four-channel equipment, or one of the new time-delay devices that call for a second amplifier.)

What isn't there – and why

There is one thing missing from the Model 300 that a good number of people are likely to think they might enjoy. That one thing is an AM tuner.

We haven't included AM in the Model 300 because, even at its rare best, it isn't a high-fidelity medium – or even very pleasant to listen to over wide-range speakers. Many people buy receivers with the expectation of getting real use and enjoyment out of AM, but what they actually hear when they tune-in at home is generally so disappointing that they seldom or never bother with AM thereafter.

We realize there will be times when it might be desirable to have AM, but we believe that any money going toward AM would be better put into a small portable radio that can go to the beach or keep you in touch when the power goes off.



Why we have said the things we have

We have gone to some length to explain what the Model 300 offers, and how it is designed, because we feel it is a unique product that is best presented to people with something more than a by-the-numbers-and-features approach.

We hope that we have covered everything that might be important to you. If we haven't, an inquiry to our Customer Relations Department will get a quick reply.

Specifications

Amplifier section

Continuous power output, both channels driven, 8 ohms
40 Hz to 20 kHz: 15 watts + 15 watts
1 kHz: 18 watts + 18 watts

Total harmonic distortion, 40 Hz to 20 kHz
15 watts per channel: less than 0.5%
7.5 watts per channel: less than 0.1%

Intermodulation distortion
60/7000 Hz; 4:1: less than 0.15%

Power amp in: 775 mV/100k ohms

Preamp section

Input sensitivity/impedance, for rated output, 1 kHz
Phono: 2 mV/47k ohms in parallel with 40 pf
Phono overload: 100 mV rms
Aux, Tape monitor: 100 mV/25k ohms

Output level/impedance/recommended minimum load impedance with rated input
Tape out: 100 mV/600 ohms/10k ohms
Preamp out: 1.0V/3.5k ohms/10k ohms

Maximum output: greater than 6V

Hum and noise, shorted input, A-weighted
Phono ref 10 mV @1 kHz: better than 80 dB
Aux, Tape monitor: better than 80 dB

Total harmonic distortion
20 Hz to 20 kHz: less than 0.1% (2.5V)

Intermodulation distortion
60/7000 Hz; 4:1: less than 0.1% (2.5V)

Tone controls
Bass: ± 10 dB @ 100 Hz
Treble: ± 10 dB @ 10,000 Hz

Subsonic filter
Phono: 0 dB @ 25 Hz
− 1 dB @ 20 Hz
− 31 dB @ 4 Hz

FM tuner section

Mono sensitivity
IHF 30 dB: 2.5 μV*
IHF 50 dB: 3.5 μV

Stereo sensitivity
IHF 50 dB: 35 μV

Ultimate quieting
IHF mono: 73 dB
IHF stereo: 70 dB

Frequency response
Mono: 30 Hz to 15 kHz ± 1 dB
Stereo: 30 Hz to 15 kHz ± 1 dB

Total harmonic distortion, 400 Hz, IHF
Mono: less than 0.15%
Stereo: less than 0.2%

Stereo separation, IHF
400 Hz: greater than 40 dB
30 Hz to 10 kHz: 28 dB

Alternate channel selectivity: 70 dB

Image rejection: 55 dB

IF rejection: 70 dB

Spurious rejection: 70 dB

AM suppression: 60 dB

Capture ratio: 1.6 dB

Antenna input: 300 ohms balanced

Power requirements

120 VAC, 60 Hz,
100 watts maximum

Dimensions

Height: $3^{7}/_{16}$" (8.7 cm)
Width: $15^{13}/_{16}$" (40.2 cm)
Depth: $9^{5}/_{16}$" (23.7 cm) including terminals

Weight

11 lbs. (5 kg)

ADVENT

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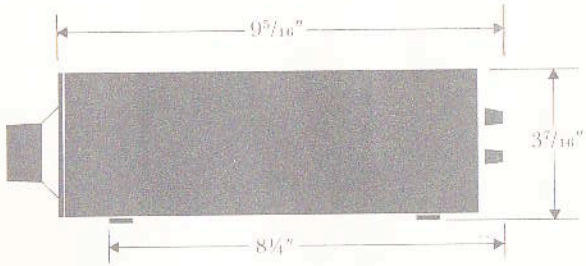
*This specification is given for reference only. An FM signal with only 30 dB of quieting is unlistenable on any FM tuner. The 50 dB specification is a more accurate measure of a tuner's true sensitivity since it is the minimum signal strength required to provide a listenable signal.

Specifications subject to change without notice.



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