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Press comments on the Advent Model 300 FM Stereo Receiver



Advent Model 300 Stereo FM Receiver

In the face of a trend toward stereo receivers whose power ratings, size, and weight rival those of many "super power" amplifiers and whose control panels combine the features of a recording console and the flight engineer's desk on a 747, Advent Corporation has chosen to develop a very basic, high-quality receiver - literally a "no frills" product. The Advent Model 300 is a low-power stereo FM receiver rated to deliver 15 watts per channel to 8-ohm loads with both channels driven, from 40 to 20,000 Hz, with less than 0.5 per cent total harmonic distortion.

The 300 is easily the most compact stereo receiver we have seen. In its black semi-gloss metal cabinet, it is approximately 16 inches wide, 9 inches deep, and 3 1/2 inches high, and it weighs a mere 11 pounds. The tuning dial is a round, silver-finish plate with a concentric black knob that operates a smooth vernier reduction mechanism (similar to the dial used on Advent's Model 400 monophonic FM radio). The dial is framed in a white rectangle together with a red LED STEREO light and two closely spaced LED's that serve as a tuning indicator. As the receiver is tuned through a station, one light comes on brightly and dims as the other begins to glow. When the two are of equal brightness, the receiver is tuned to the exact center of the channel. There is a fourth LED pilot light next to the power slide switch.

Across the lower portion of the front panel are the input selector knob (AUX, TUNER, and PHONO) and the volume-control knob, followed by three smaller knobs for channel BALANCE and the BASS and TREBLE tone-control functions. The knobs are black with white index lines that make their settings clearly visible even at a distance.

Above the knobs are slide switches for the TAPE MONITOR, LOUDNESS, MONO/STEREO, and FM MUTING functions. Two switches separately activate the two pairs of speaker outputs, and there is a headphone jack on the panel. In the rear of the receiver are jacks for the various inputs and outputs, plus two pairs of jacks, normally joined by removable jumper links that carry the preamplifier outputs and power-amplifier inputs. Insulated binding posts are used for the speaker outputs and the 300-ohm antenna inputs. A covered phono jack supplies +18 volts to power an accessory such as the Advent MPR-I microphone preamplifier. Circuit protection is supplied by an a.c. circuit breaker whose red reset button protrudes from the rear of the receiver.

Advent's philosophy holds that a high-quality FM tuner and phono preamplifier need not cost more than a run-of-the-mill design. The major reason for the high cost of many receivers is the heavy-duty power supply and output transistors that go with their admittedly impressive

power capabilities. The Advent's actual sensitivity (ability to receive weak stations without excessive noise and distortion) is as high as will ever be needed by the majority of users. The phono preamplifier was designed to be immune to interaction with phono-cartridge inductance, which affects the high-frequency response of many preamplifiers, and to have an effectively negligible noise level (inaudible under conditions of practical use). In addition, the frequency response outside the audio range - particularly below 20 Hz, where turntable rumble and record warps can produce subsonic overload and muddy the sound - has been sharply attenuated. Advent's high-pass filter, which affects the response by less than 1 dB at frequencies of 20 Hz and above, cuts the output at 4 Hz (the area where warp effects are at their worst) by more than 30dB.

As for the power output of the Model 300, Advent points out that it can deliver an adequate sound level with speakers of normal efficiency (such as their own) in typical home environments without a sense of strain or audible distortion. The preamplifier output and main amplifier input connections make it a simple matter to use an external power amplifier, retaining the virtues of the receiver's tuner and phono preamplifier. In a four-channel installation, the 300's own amplifier will usually be more than sufficient for the back channels.

The Advent Model 300 is also available as the Model 300/12 for operation from a 12-volt battery in cars, boats, trailers, and the like. An a.c.-operated Model 300 can be converted by Advent for 12-volt operation, though it will then no longer be usable on a.c. without a 5-amp d.c. adapter. Full power and performance of the receiver are available when operating from a 12-volt source.

Laboratory Measurements. After one hour of preconditioning at one-third power output, the cabinet of the receiver was about as warm as it becomes in normal operation. The 1,000 Hz output at the clipping point was 18 watts into 8 ohms, 18.5 watts into 4 ohms, and 11.7 watts into 16 ohms.

The 1,000 Hz total harmonic distortion (THD) with both channels driven into 8-ohm loads was under our measurement limit of 0.003 per cent up to 1 watt output and rose to 0.045 per cent at the rated 15 watts. The intermodulation distortion (IM) was less than 0.05 per cent from 0.5 to 8 watts output, rising to 0.09 per cent at 15 watts. It also rose somewhat at lower power levels, reaching 0.085 per cent at 0.1 watt (this reflects the residual noise contributed by the tone-control section, since the power amplifier alone has substantially lower IM at very small outputs).

At the rated power output, the THD was between 0.04 and 0.05 per cent from below 30

to above 1,000 Hz, falling to 0.015 per cent at 5,000 Hz and rising to 0.18 per cent at 20,000 Hz. Although Advent's full-power ratings for the Model 300 do not extend below 40 Hz, we measured its distortion at 0.67 per cent at 20 Hz. At half power and lower levels, the THD was lower still, typically between 0.01 and 0.03 per cent from 20 to 1,000 Hz and about 0.1 per cent at 20,000 Hz.

The RIAA phono equalization was as flat as our measuring equipment (± 0.25 dB) from 50 to 15,000 Hz, and very nearly as good over an extended measurement range of 20 to 20,000 Hz (the low-frequency filter caused a slight rise of about 1 dB at 25 Hz). Measured through the inductance of typical phono cartridges, the phono response changed by no more than 0.5 dB up to 20,000 Hz.

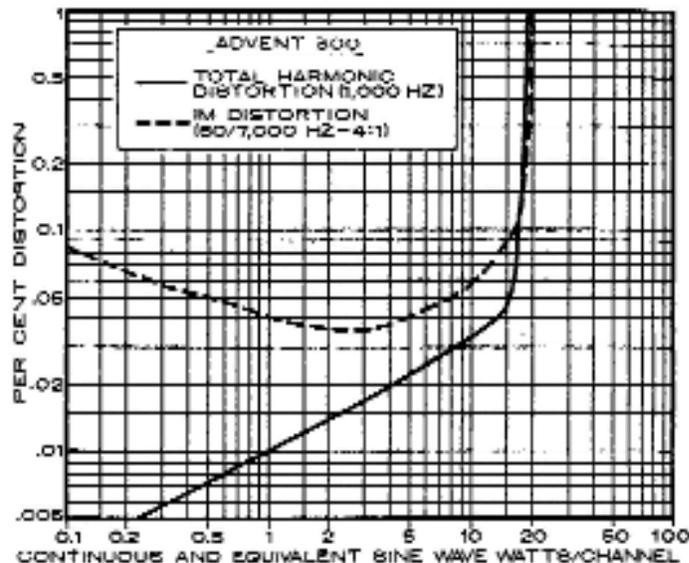
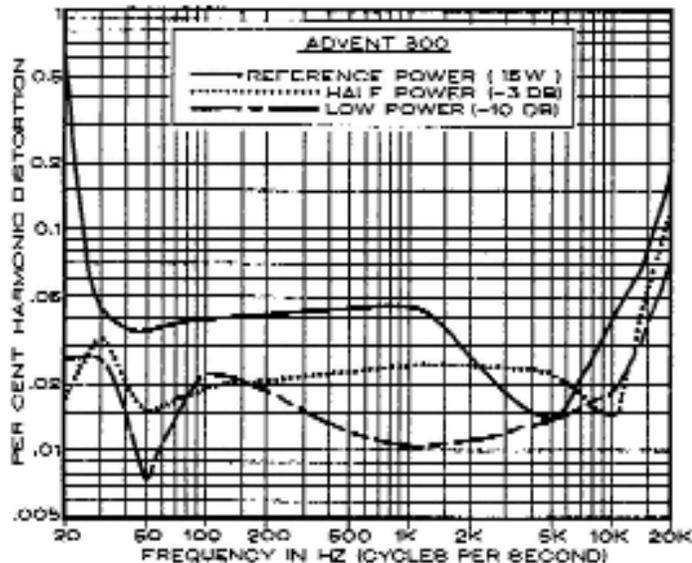
The tone controls had conventional characteristics, with the bass-turnover frequency shifting between approximately 200 and 800 Hz as the control was varied and the treble response hinging at about 2,500 Hz. The maximum control range of about ± 10 dB is more than adequate and helps avoid the risk of exceeding the amplifier's power capabilities. The loudness contours showed a moderate low-frequency boost and a smaller high-frequency boost as the volume-control setting was reduced.

To drive the Model 300 to a reference output of 10 watts, a 0.07 volt signal was required at the AUX input and 1.5 millivolts at the PHONO input. The respective unweighted SIN figures were 72 and 70 dB. The phono preamplifier overloaded at 110 millivolts, a perfectly safe level for any magnetic cartridge of reasonably good quality.

The FM tuner had an IHF sensitivity of 14 dBf (2.7 microvolts, or mV) in mono. In stereo, the IHF sensitivity was 19 dBf (5 mV). More important than this figure is the 50-dB quieting sensitivity, which was 16 dBf (3.5 mV) in mono with 0.9 percent THD, and 38.5 dBf (46.3 mV) in stereo with 0.5 per cent THD. The ultimate quieting, at 65 dBf (1,000 mV) input, was 70 dB in mono and 65 dB in stereo, with respective distortion levels of 0.21 and 0.24 per cent. The stereo distortion with out-of-phase (L-R) modulation of the two channels was 0.45 per cent at 100 Hz, 0.21 per cent at 1,000 Hz, and 0.2 per cent at 6,000 Hz.

The FM frequency response was flat within ± 0.6 dB from 30 to 15,000 Hz. The stereo channel separation was more than 50 dB at 1,000 Hz, 30 and 27 dB at 30 and 10,000 Hz, and still a very good 24 dB at 15,000 Hz. The low-pass filter in the tuner output reduced the 19-kHz pilot carrier leakage in the audio output to a good -67 dB without impairing the high-frequency response of the FM section.

The capture ratio of the tuner at 45 dBf (100 mV) was 1.5 dB with 60 dB of AM rejection. At



a higher input of 65 dBf, the capture ratio was nearly the same (1.6 dB), and the AM rejection improved to an excellent 70 dB. The image rejection at 98 MHz was 60 dB, and the alternate-channel selectivity was also excellent at 83 dB. Adjacent-channel selectivity, always much less than the alternate-channel measurement, was 5.5 dB. The muting threshold was set at 24 dBf (9mV) and the automatic stereo threshold was at 15 dBf (3 mV). The twin-LED tuning indicator was very accurate, providing minimum distortion when the two intensities matched. However, this called for some critical judgment by the user, as compared with the relatively simple task of centering a meter pointer.

Comment. Probably one of the factors contributing to our enthusiasm for the Advent Model 300 was its nearly flawless execution of the "no-frills" concept. We have always admired value engineering of the sort associated with products from Advent and a few other companies, in which a maximum of consumer-benefiting performance and features are provided for a minimum cost. It is relatively easy to make a "super" product if price is no obstacle, but it requires some ingenuity to achieve a high level of performance at a relatively low cost. This is exactly what Advent has done in the Model 300.

An economical approach to product design

does have its negative aspects, too. For example, the tuning-dial scale, though quite accurate, is cramped over much of its range and widely spread out at the high-frequency end. Many times we had to guess which station was tuned in since 1 megahertz occupies about 1/8 inch at most points on the dial scale.

The LED tuning indicator, as we have stated, was very accurate. As a matter of fact, it was more precise in its function than most of the meters we have seen on tuners and receivers, as well as being much smaller and probably less expensive. On the other hand, it requires more care than we suspect many users will give it in order to realize the full tuning accuracy of the receiver. Fortunately, a moderate amount of mistuning is not noticeable in use, and we assume that if anyone hears distortion or noise because of mistuning, he will correct it on the spot. We also noted a slight warm-up drift, lasting a few minutes, in our sample. Although this drift was sufficient to extinguish one of the tuning lights, it was of questionable significance because it could not be heard as an increase of noise or distortion. In any case, if the tuning is set correctly after about 5 minutes of operation, it will remain as set indefinitely.

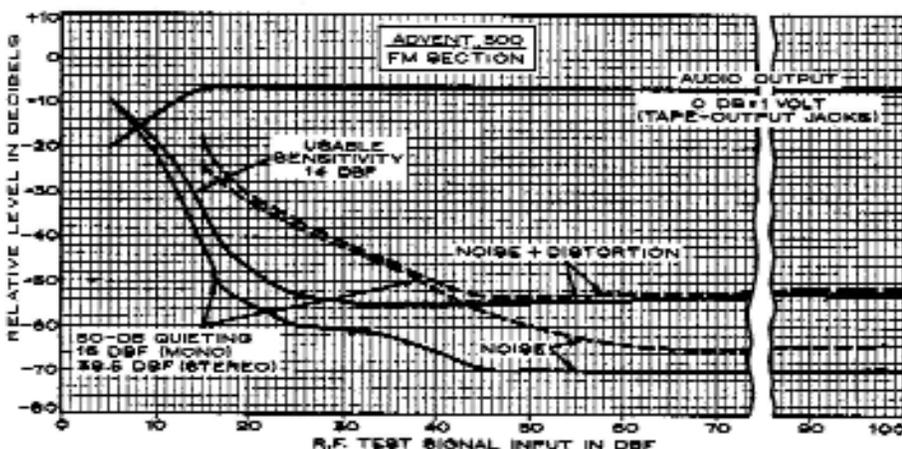
The Model 300 lacks such refinements as time delays in the turn-on and turn-off cycle to pre-

vent speaker thumps. Of course, with powerful amplifiers these are vital for the preservation of one's speakers. With the Model 300, the "thump" is audible but hardly disturbing, let alone dangerous. The FM muting is good, with enough time lag to permit quick scan across the band in total silence. There is only a trace of a noise burst while tuning slowly through a signal, as would normally be done.

All of which brings us to the question how a 15-watt receiver sounds in this day 100 to 200 watt amplifiers and receivers. In a word, great! Critical A-B tests in FM reception between the Advent Model 300 and a receiver with more than ten times its power a three times its price revealed absolutely no audible difference between the two at any listening level within the sound output level capability of the Model 300 (of course, the other receiver could play much louder). Even that limit is surprisingly loud, despite our use fairly inefficient acoustic-suspension speakers. Obviously, this is not a receiver one would choose to play music at rock-concert-hall levels, but at somewhat lower volumes it does as good a job as anything we have heard.

The phono preamplifier sounded first-rate, and as a demonstration of its low noise level, at maximum gain only a faint hiss could be heard within a foot or so of the speakers.

We find it refreshing that this caliber of sound, combined with reasonable control flexibility, has been designed into a really small, light package, one whose installation does not call for the services of an Olympic weight lifter or specially reinforced furniture. Although one can buy less expensive receivers, some of which may have a few more watts or a couple of extra features, it is a safe bet that they will be two or three times the size (and weight) of the Advent Model 300, far more formidable for the uninitiated to operate, and will sound no better—probably not as good.



Advent's 300 Receiver: Simple is Beautiful

The Equipment: Advent 300 stereo FM receiver in metal case. Dimensions: 15 7/8 by 3 1/2 inches (front panel), 9 7/8 inches deep plus clearance for controls and connections. Warranty: "limited," three years parts and labor. Manufacturer: Advent Corporation, 195 Albany St., Cambridge, Mass. 02139.

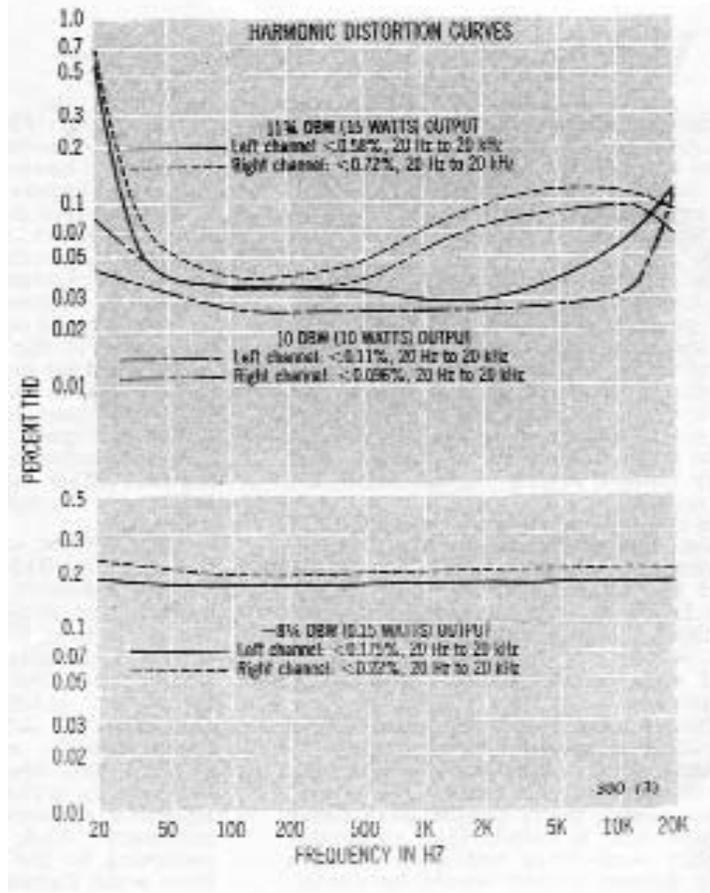
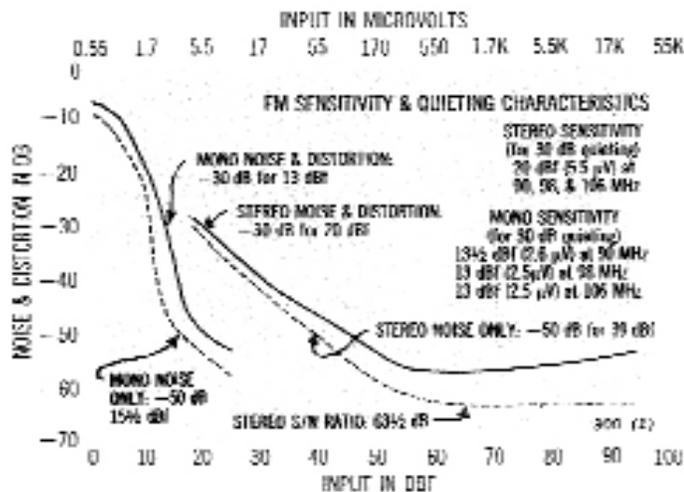
Comment: If it were possible to devise a performance-to-appearance ratio for audio products, those of Advent Corporation would, in all likelihood, be strong contenders for top honors. It's not that they don't look good, but that there has been no attempt to make them into sculptures. The value (and thus the cost) has been put inside the box and is directed at the consumer's ears, not his eyes. And, typically, the resulting sound has been very good. This is the tradition that the 300 springs from and is meant to advance - and as far as we are concerned the advance has been made.

The FM section is spartan in its simplicity and has nary a meter in sight. Channel center tuning is accomplished - and very effectively - by setting a pair of light-emitting diodes (one indicates "too high," the other "too low") for equal brightness. Antenna rotation for minimum multipath is done by ear - even the scope outputs are missing. But, as the CBS data show, the goodies are there. The 1 1/4 dB capture ratio, comparable to that of far more expensive equipment, will help a lot in getting rid of that multipath, and the alternate-channel selectivity (71 dB) falls in the good-to-excellent class. Suppression of stereo noise by 50 dB is accomplished with an RF input of just over 39 dBf, a signal level easily come by in urban and near-urban environments. Total harmonic distortion (which includes miscellaneous spurious products as well as distortion) is kept well in check, even at 10 kHz, where it can often be troublesome. Separation could almost be mistaken for that of a supertuner. In fact, when reasonably strong signals are available, it is amazing how closely the FM sound of the Advent resembles that of tuners - without a preamp and power amp - whose prices are close to twice as much.

Perhaps the most striking feature of the 300 is its new phono preamp circuit. Its measurements are respectable enough (signal-to-noise ratio of 65 1/2 dB re full output, equivalent to 76 1/2 dB noise suppression re the conventional 10 millivolts; 100-millivolt overload; RIAA equalization accurate to within ± 1 dB, 20 Hz to

20 kHz despite a nondefeatable rumble filter), but conventional measurements don't tell the whole story. The key question is: What will it sound like with a cartridge rather than a test generator connected, when it has to operate with a complex source impedance? Advent's engineers have studied this matter in depth and have designed the circuit for minimal impedance interaction. We found that an otherwise fine pickup that seemed somewhat shrill was much smoother than we had thought possible - when it was connected to the Advent preamp. This tends to support the company's boast that the 300 will audibly surpass many far more expensive units.

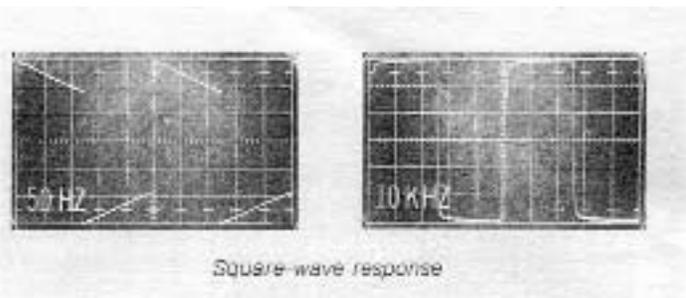
Of all the features of a receiver, power is probably the most costly, and by today's standards the output of this model appears modest. But realistically the 11 3/4 dBW (15 watts) per channel - 40 Hz to 20 kHz at 0.5% distortion - offered is perfectly adequate for most listening. With moderately efficient speakers, we were able to generate substantial sound pressure levels before clipping set in. And the recovery from clipping, an important consideration in a small amp, is instantaneous and graceful. Had Advent chosen to rate the power section a tiny 13/4 dB lower, at 10 dBW (10 watts) per channel, the power bandwidth (FTC style) would extend 20 Hz to 20 kHz and distortion diminish to less than half the rated amount. Thus the 300 has substantially half the sonic output capability of a good quality 20-dBW (100-watt) per channel power amp. If you must have more than this,



removal of two jumpers makes the preamp output accessible. These jumpers, connecting PRE-OUT and MAIN-IN pin jacks, are on the back panel, which is generally as spartan as the front. There is only a 300-ohm FM antenna input for example (if you use 75-ohm lead-in, you can couple it to the 300 via a balun transformer), and there is a single (switched) AC convenience outlet. There is one "extra," however; an 18-volt DC output that can be used to power the Advent mike preamp.

The basic simplicity of the control section is consistent with the principal features of the unit. Tone-control and LOUDNESS responses seem well judged, as are the FM muting and automatic stereo switching.

The design is, overall, economical and without frills. Advent's announced intention with the 300 is to make a receiver that, within its power capability, sounds as good as anything available at any price. While we cannot substantiate that claim - it is, after all, a partially subjective one - we cannot dismiss it as untenable either. And that, considering the price of the product, constitutes a remarkable accomplishment.



Advent 300 Receiver Additional Data

Tuner Section

Capture ratio 1'14 dB

Alternate-channel selectivity 74 dB

S/N ratio (mono, 65 dBf) 66 dB

| THD | Mono | L ch | R ch |
|--------|-------|-------|-------|
| 80 Hz | 0.11% | 0.18% | 0.16% |
| 1 kHz | 0.12% | 0.15% | 0.14% |
| 10 kHz | 0.25% | 1.05% | 1.15% |

IM distortion 0.18%

19-kHz pilot -69 dB

38-kHz subcarrier -58 dB

Frequency response

| | |
|------|----------------------------------|
| mono | +1/2, -1 1/2 dB, 20 Hz to 15 kHz |
| Lch | +3/4, -2 dB, 20Hz to 15kHz |
| R ch | +1,-2 1/4 dB, 20Hz to 15kHz |

Channel separation >40 dB, 190 Hz to 4.2 kHz
>30 dB, 20 Hz to 13 kHz

Amplifier Section

Power output at clipping (channels driven simultaneously)

| | |
|------|-------------------------------------|
| L ch | 12 1/4 dBW (17 watts) for 0.10% THD |
| R ch | 12 1/2 dBW (18 watts) for 0.09% THD |

Frequency response +0, -1/2 dB, 20 Hz to 10 kHz
+0, -1 dB, 15 Hz to 30 kHz

RIAA equalization ±1 1/2 dB, 20 Hz to 20 kHz
+ 1 1/2, -0 dB, 40 Hz to 20 kHz

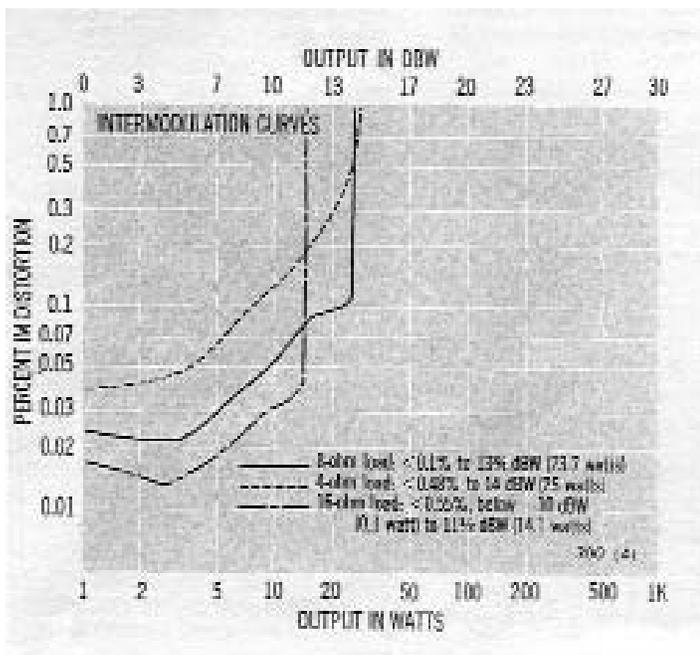
Input characteristics (for rated output-t full gain)

| | Sensitivity | Noise | S/N ratio |
|-------|-------------|-------------|-----------|
| phono | 2.75 mV | -53 3/4 dBW | 65 1/2 dB |
| tape | 110 mV | -63 3/4 dBW | 75 1/2 dB |
| aux | 110mV | -63 3/4 dBW | 75 1/2 dB |

Phono overload (clipping point) 100mV at 1 kHz
Damping factor at 1 kHz 48

Cartridge-Preamp Interaction: Tracking Down a Glitch

In our review of the Sonus Blue Label cartridge (September 1976), we complained of an edginess that creeps in at high frequencies. At the time we investigated the matter carefully, playing the cartridge through several preamps - including the phono section of the Crown IC-150A-that had been giving us excellent results. We were delighted to find, therefore, that connecting the Sonus Blue to the Advent 300 receiver virtually banished the edginess. Comments from users suggest that the Advent is not the only preamp with which the Sonus can produce similar results. Accordingly, we would revise our conclusions about the Sonus and say that the excellent performance at lower frequencies extends to the highs as well - as long as a compatible pre-amp is used.



Advent Enters the Conventional Market

Thomas Lyles

Advent - the company that brought Dolby noise reduction to home tape recording, made what many people consider a standard reference loudspeaker and developed the VideoBeam® for home use - has made its first move into "conventional electronics" with the introduction of the Model 300.

Rather than taking the component route, Advent has built a modest receiver that may lead to a reexamination of the component/integrated unit feud that swings back and forth every few years.

According to Advent, three years of research and development went into the 300 with only the FM section culling part of its design from another Advent product - their FM radio. In fact, the tuner section of the 300 physically seems to be the same design as the radio sharing its four-inch vernier tuning dial that sweeps the FM band in three turns.

Features and developments that lie beneath the skin of the new receiver include:

*A conservatively designed stereo FM tuner with a sensitivity rating of 2.5 microvolts for 30 dB quieting. In a day of 1.7 microvolt figures and lower, 2.5 seems a bit slim. But Advent has approached the numbers race more with an eye on quality than quantity, it would seem.

Realizing that excessively high sensitivity figures ultimately represent a compromise with selectivity, the 2.5 microvolt figure represents, Advent says, an optimum usable figure that allows the tuner to capture comparatively weak signals while limiting strong local signals to their assigned frequencies. Some high-sensitivity tuners "tune" strong signals at frequency locations other than those assigned to them, thus Advent's reason for reduced sensitivity.

The phased locked loop multiplex circuit, Advent says, gives excellent stereo separation while lowering high frequency distortion and the seemingly natural proclivity many tuners have in receiving beat frequencies from sideband carriers some FM stations use for commercial music services.

*A preamplifier that was designed using music as a program source to uncover problems of cartridge/preamplifier interaction. Both resistance and capacitance loading (for cables as well as the cartridge) were examined in the development of the circuit, which Advent named after its designer, Tomlinson Holman. Results of his tests showed that, of 15 preamplifiers tested, all but one of the group demonstrated a high-frequency interaction that caused severe deviation from the RIAA curve.

Holman discovered capacitance interaction was not the entire problem, but that impedance in the RIAA circuit fell as frequency increased, causing in some instances, a 40 percent impedance drop over a range from 1 kHz to 20 kHz.

So, in the first gain stage of the phono section Holman designed the circuit such that there would be sufficient gain to offset the impedance drop at high frequencies. Resultingly, distortion at a 7 volt output is negligible.

A 15-watt per channel amplifier that, Advent claims, will drive their large speaker. The output transistors operate below maximum power so that only simple protective circuitry (fusing) is used. Because of the conservative rating, Advent claims there are no "audible side effects" when the amplifier clips at maximum power.

Controls most people want and find adequate are incorporated in the receiver. The FM section has an interstation muting switch and center tuning is accomplished with two LEDs. There are concentric bass, treble, balance and volume controls as well as a tape monitor switch, a "sliding" loudness circuit, a stereo/mono switch and provisions for two pairs of speakers that may be operated either independently or together. With a front pane output for headphones and a 12-volt model available as an option, the Advent 300 looks like a

A Wide Range Receiver

Thomas Lyles

good buy.

With the introduction of their Model 300, Advent said the receiver was "designed to offer the kind of sound associated with far more expensive and complex equipment."

They appear to have realized that claim.

The Advent 300, first of all, is a very easy receiver to use. Controls are logically grouped along two horizontal rows and the only apparent deficiency is the use of slide switches to control some functions. Because the switches are "sticky" the receiver moves when they are used. Toggle switches, it seems, would have been a better choice. The rotary control knobs, though small, are easy to use.

To the right of the controls is the FM section. The vernier tuning dial is quick, its tuning responsive, especially compared to "sliderule" dials. Two of the three LEDs are visual tuning indicators, the third a stereo light. At the bottom right is the off/on switch. The front panel also has an output for dynamic headphones.

Missing from the front panel - and something inexpensive to incorporate - is a tone circuit defeat switch. Since the introduction of this feature on several control units, many people have come to appreciate a switch that eliminates circuitry sometimes not used. Also a stereo reverse switch would be useful.

The stereo FM tuner's sensitivity - on paper - seems inadequate. Its performance, however, contradicts what you might expect.

Side-by-side comparison with a separate FM tuner costing three times as much as the entire Advent 300 receiver proves the Advent's FM circuitry leaves little to be desired.

The Advent received only two fewer stations than the elaborate Marantz 10B - 37 stations compared to 39 (using a folded dipole). Although the Marantz is easier to tune because its oscilloscope shows multipath present in a signal, the Advent performed remarkably well using two LEDs that are "tuned" to equal brightness for maximum center of channel signal.

The Advent was not able to tune out the annoying 9 kHz sub carrier on WETA, despite Advent's claim that the phased locked loop design probably would lessen such beat frequencies. Considering that the Marantz could not tune it out either (and few people seem to have found an antenna-tuner combination that can), the Advent at least meets the competition - at a much lower price.

With the Muting switch activated, the tuner's initial sensitivity is considerably reduced, making slow tuning necessary. And, despite the distance, switching to the

mono mode brings in most weak Baltimore signals.

The heart of the 300, however, is the preamplifier. Advent said a great deal of work went into developing a circuit that reduced distortion and lowered noise. They succeeded to an admirable degree. It is, with one exception, one of the finest preamplifiers heard recently - regardless of price.

Bass is clean, deep and well-detailed and transient response throughout the audio spectrum rivals units costing significantly more. Advent says the preamplifier has a signal to noise ratio (shorted, A-weighted) of 80 dB, assumedly below a 10 millivolt input, but the unit tested has considerably more hum than that, raising the question of a defective unit because the receiver seems to meet every other claim made of it.

The amplifier's 15-watts-a-channel admittedly won't drive a pair of low-efficiency monsters but it is more than adequate for "average" loudspeakers played at "average" listening levels. Because the amplifier is somewhat masked, Advent might consider some work in cleaning up the circuit. Fortunately, they realize many people want to pepper their rooms with thunder, and thoughtfully put jumper plugs between the preamplifier and the amplifier, making substitution of a more powerful (and cleaner) amplifier no problem.