



## Sansui AU-919 Integrated Amplifier

**S**ANSUI's most powerful integrated stereo amplifier, the AU-919, is rated to deliver 100 watts per channel to 8-ohm loads from 20 to 20,000 Hz with no more than 0.008 per cent total harmonic distortion. It is a "fast" amplifier, even by today's standards, with a slew-rate specification of 200 volts per microsecond. The direct-coupled power-amplifier section has a rated frequency response of +0, -3 dB from d.c. to 0.5 MHz.

The AU-919 has five power supplies using two power transformers. Separate rectifier and filter systems are used for the output stages of the two channels, and another pair of electronically filtered supplies powers the driver stages. A separate highly regulated supply serves the various low-level stages in the amplifier. The circuits of the phono-preamplifier and power-amplifier driver stages are not shown in the schematic diagram that accompanies the amplifier. In each case, the circuit is indicated by a box marked "Diamond Differential DC Circuit," which is apparently a proprietary Sansui development whose details they do not wish to disclose at this time.

An elaborate protection system senses overloads, output short circuits, or the presence of a d.c. potential at the speaker outputs and shuts down the amplifier instantly with a relay if any of these conditions is detected. A red light on the front panel blinks when the circuit operates (the protective system also provides a turn-on time delay of several sec-

onds, during which time the light blinks). Under normal conditions, the light is steady and serves as a pilot light.

In many of its control features and circuit details, the AU-919 is unlike most other integrated amplifiers. It has a built-in head amplifier for moving-coil phono cartridges which can be connected to one of its two phono inputs. The input-selector switch has three phono positions: PHONO 1 for either moving-magnet (MM) or moving-coil (MC) cartridges, and PHONO 2 for MM cartridges only. There are two high-level inputs, which are marked TUNER and AUX.

The tone controls appear conventional, with eleven-position stepped controls for bass and treble. Next to each is a pair of pushbuttons that select its turnover frequencies (3,000 or 6,000 Hz for the treble, and 150 or 300 Hz for the bass). However, the range of the control action is considerably less than that of typical tone controls, being rated at  $\pm 6$  dB maximum at 50 and 15,000 Hz.

Toggle switches control some familiar functions, such as tone defeat, subsonic filtering (a 6-dB-per-octave slope below 16 Hz), and muting (a 20-dB level reduction). A fourth switch is marked JUMP. This rather cryptic term is explained in the instruction manual; the switch not only eliminates the tone controls from the circuit (as the TONE DEFEAT switch does) but removes all active circuitry between the inputs (or outputs of the phono preamplifier) and the power-amplifier input. Operating

this switch also reduces the amplifier gain by 16 dB.

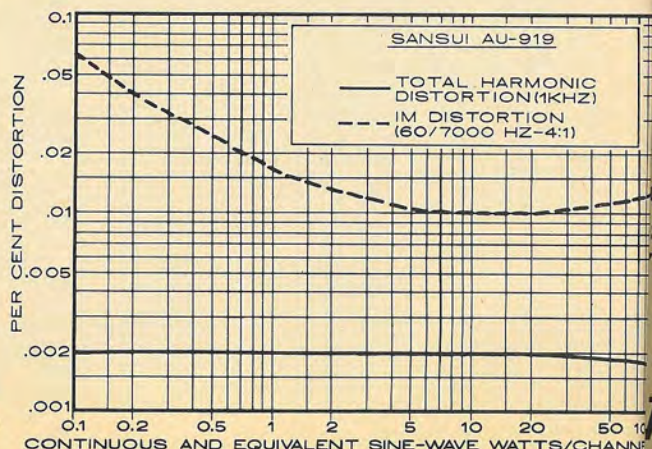
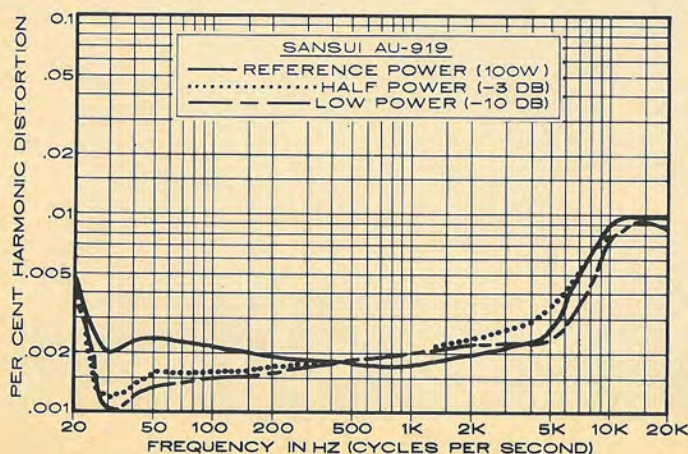
The volume control is a large knob that is detented at intervals of from 1 to 6 dB over its range of 70 dB. A small center-detented balance knob is located below it. The tape-recording and monitoring facilities of the AU-919 are unusual in being divided into recording and playback functions. There are three TAPE PLAY buttons, only one of which can be engaged at a time. When the SOURCE button is pressed, the selected program is heard through the amplifier. The TAPE 1 and TAPE 2 buttons connect the playback outputs of either of two tape decks to the amplifier. Working in conjunction with the TAPE PLAY buttons is a separate COPY knob, with positions marked TUNER, OFF, SOURCE, and two dubbing positions that connect the two tape decks for copying a tape from either one to the other.

In its SOURCE position, the COPY switch supplies the selected program to the recording inputs of both tape decks. In TUNER, the tuner program is delivered to both decks regardless of the setting of the input selector (which determines what is heard through the speakers). Regardless of what is being recorded at any time, the output of either tape deck can be heard by pressing the appropriate TAPE PLAY button. The OFF position of the COPY switch disconnects the tape-recording outputs of the amplifier from all signals.

The remaining front-panel features of the AU-919 are the SPEAKERS switch, with positions for connecting either, both, or neither of two pairs of speakers to the amplifier; the phones jack; the power switch; and the pilot light (marked PROTECTOR). On the rear apron in addition to the various signal-input and output jacks, there are preamplifier-output and power-amplifier-input jacks normally joined by a slide switch. Insulated spring connectors are used for the speaker terminals. One of the three a.c. outlets is switched. The Sansui AU-919 is a moderately large and surprisingly heavy amplifier. It is 17 inches wide, 16 inches deep, and 6 1/2 inches high, and weighs about 47 pounds. It is finished entirely in black and is furnished with accessory rack-mounting adapters and handles. Price: \$800.

● **Laboratory Measurements.** The one-hour preconditioning period left the top of the Sansui AU-919 moderately warm over the power transistors (which are aligned from front to rear within the cabinet). The outputs clipped

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at 119 watts per channel into 8 ohms for an IHF clipping-headroom rating of 0.76 dB (the 4- and 16-ohm clipping outputs were 177 watts and 70 watts per channel, respectively). The IHF dynamic headroom was 1.02 dB, corresponding to a short-term clipping output of 126 watts.

The distortion of the AU-919 was literally unmeasurable over much of its operating range. Using our new H-P 239A low-distortion audio oscillator, whose inherent distortion is less than 0.0018 per cent, we measured a total harmonic distortion of 0.002 per cent or less at 1,000 Hz from about 0.1 watt to well over 100 watts output, and it was only 0.007 per cent at the clipping point of about 120 watts. For reasons that are not clear (they are probably related to the ground paths that existed in our test setup), the intermodulation distortion (IM) was slightly higher than Sansui's 0.008 per cent rating, although an IM level of 0.01 to 0.02 per cent over the rated power range of the amplifier can hardly be considered a serious fault!

At its rated power output and at lower power levels, the harmonic distortion (THD) of the AU-919 was typically about 0.002 per cent between 25 and 5,000 Hz. It rose slightly to almost 0.005 per cent at 20 Hz, and it reached its maximum of 0.01 per cent in the 10,000- to 20,000-Hz range. The minute discrepancy between our reading and Sansui's 0.008 per cent rating is again probably due to a combination of test-setup factors we are currently investigating. In any case, exact duplication of distortion measurements in this very low range is difficult even with the same instruments—and in a totally different test setup the difficulty is compounded.

The Sansui AU-919 reached a reference output of 1 watt with an input at the high-level

jacks of 15 millivolts, or a phono input (MM) of 0.215 millivolt. The corresponding signal-to-noise-ratio measurements, with A weighting, were 81.8 and 79.5 dB referred to a 1-watt output. The phono preamplifier overloaded at an extraordinary 460-millivolt input. Its input impedance was 47,000 ohms in parallel with 220 picofarads.

Although there are no universally accepted standards for measuring slew rate, we attempted to verify Sansui's 200-volt-per-microsecond rating. We didn't quite achieve that figure, but the 120-volt-per-microsecond measurement we did record would have to be considered quite remarkable for an amplifier with a 100-watt output rating. The IHF slew factor was in excess of 25, which is our measurement limit.

The phono equalization was within +1, -0 dB of the extended RIAA characteristic from 20 to 20,000 Hz, referred to the 1,000-Hz level. Measuring it through the inductance of a phono cartridge, we found the response up slightly less than 1 dB in the 10,000- to 15,000-Hz range, which would probably tend to flatten out the total response (subjectively) for those few people who can hear such a minute effect.

The tone controls had the specified characteristics, although the differences between the families of bass-control curves using the 150- and 300-Hz turnover frequencies were so slight as to be hardly measurable. As might be expected from a total control range of  $\pm 5$  to  $\pm 6$  dB, these controls are very subtle in their effect. They *can* be heard, however, and no doubt will appeal to those people who prefer to make only very slight adjustments to tonal balance. There is no possibility of creating any serious sonic unbalance with these tone controls, and even at their extreme settings

the sound quality was never unnatural.

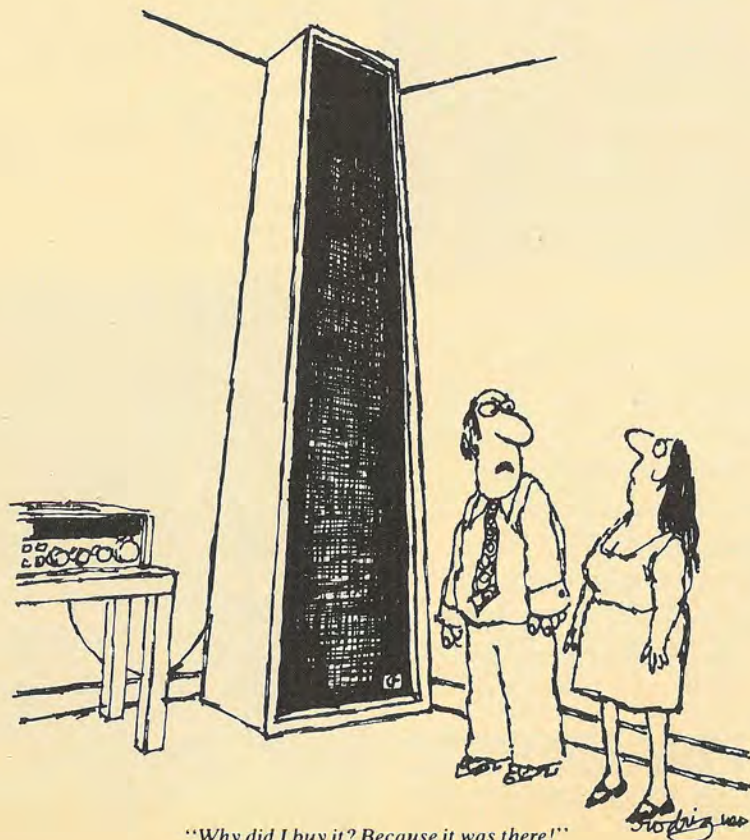
● **Comment.** Sansui has obviously chosen to follow their own careful path in the design of the AU-919. No matter how similar most integrated amplifiers may be (and most are more alike than different), the AU-919 provides a distinct alternative to the general run of amplifiers. Those who rarely, if ever, use tone controls probably will not care one way or the other about Sansui's choice of tone-control curves. However, these controls are more likely to enhance the total sound quality than to degrade it, which is more than can be said about most tone controls we have seen (and heard).

To us, the most unusual thing about the AU-919, in view of its position as the leading integrated amplifier of a high-quality component line, is its conceptual approach to various features. Take filters, for example. Sansui chose to leave them out entirely, perhaps because filters are not a part of their design philosophy (the "subsonic" filter does not fall into this category, being an inherently inaudible filter that serves merely to prevent grossly improper operation of the amplifier or speakers with certain program inputs). We also note that the AU-919 does not have a control for paralleling the channels to form a mono signal (or to cancel vertical rumble when playing mono records).

On the other hand, the tape-recording and monitoring facilities of the AU-919 are certainly among the most versatile we have seen from the standpoint of giving the user complete control over his listening and recording activities. And the inclusion of a moving-coil-cartridge head amplifier must not be overlooked in light of the current and apparently growing popularity of that type of cartridge. (Expensive as it is, the cost of a moving-coil cartridge is usually more than doubled by the addition of an external transformer or head amplifier, and it makes good sense both technically and economically to build the necessary gain into the system amplifier.) We listened to both Ortofon and Nagatron low-output cartridges through the AU-919 head amplifier with perfectly fine results. At any reasonable listening level, one can lift the pickup from the record and experience total silence from the speakers, even at close range.

In regard to the "JUMP" feature of the AU-919, inasmuch as our minuscule distortion readings were obtained through the complete amplifier we cannot imagine how any improvement can result from bypassing the 16-dB gain stage and tone-control circuits (which are readily bypassed with the DEFEAT switch). We could not hear any effect from the JUMP switch other than the gain change.

To summarize, the Sansui AU-919 is an amplifier with exceptionally robust construction, more than ample power for most listeners, fantastically low distortion (quite literally unmeasurable under any realistic use conditions), extremely fast response at all power levels, inaudible noise levels, and a built-in head amplifier for moving-coil cartridges. Clearly, this is a superb amplifier meant to be used with the finest ancillary equipment to bring out the best in top-quality sound sources. For that purpose, it could hardly be surpassed, and its fairly high price is well justified.



"Why did I buy it? Because it was there!"

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