AU-D11|D9 TU-S9

Sansui Super-Feedforward DD/DC Integrated Amplifiers & Quartz PLL Synthesizer Tuner

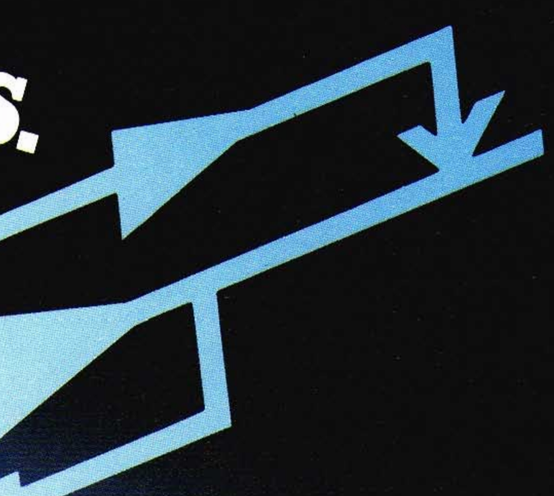
Sansui

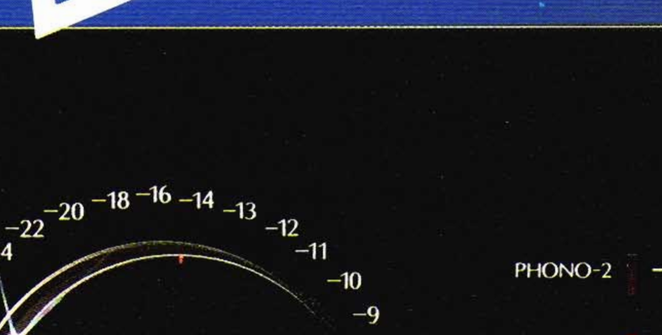
THE END OF DISTORTION DISPUTES.

Super FF

Sansui

INTEGRATED AMPLIFIER
AU-D11
SUPER FEEDFORWARD & DD/DC





SANSUI SUPER FEEDFORWARD SYSTEM (Pat. Pend.†)

Sansui is making distortion figures an anachronism. If the new Super Feedforward amps are any indication of what's in store for hi-fi in the years to come—and Sansui assures you they are—from now on all kinds of music-marring distortion are going to be at levels so low they won't be worth your time to check. Now you'll concentrate on what's been most important to you all along—how an amp *sounds*. If it's a Super Feedforward amp, the sound you hear will be music and only music, as pure and intact as it's ever been.

The Super Feedforward amplifiers are the revolutionary Sansui developments that are going to end distortion disputes once and for all. Check out its distortion rate—just for old times' sake.

THE END OF DISTORTION DISPUTES.

Super FF

The Sansui Super Feedforward System – The end of distortion disputes, once and for all.

Sansui Super Feedforward: The end of distortion disputes

For years arguments over the causes and even the significance of distortion have been raging the world over. Is a Class-A amp the only alternative to distortion, even if it is costly and inefficient? Is an altered, quasi-Class-A power amp design the answer to the struggle of the Classes A and B? Is TIM a legitimate, *audible* threat to musical accuracy, more harmful than intermodulation distortion or even harmonic distortion? Do high-speed devices completely eliminate switching distortion?

Now Sansui has ended the disputes once and for all with a research and development policy that goes straight to the heart of the very nature of music.

Music, Sansui has realized for years now, is an eloquent pattern of pulses and silences—*never* an unvarying test signal. That's why Sansui engineers have dedicated their research efforts to improving the *transient* response of electronic equipment. To preserve and enhance all the dynamism and subtle nuances of the original performance.

This philosophy led to the DC design and the Sansui-exclusive DD/DC circuit, developments that improved transient response so dramatically that TIM and envelope distortion were practically eliminated.

But this was not enough: Sansui engineers refused to rest until they had broken through all the remaining stumbling blocks in the way of 100% accuracy in audio reproduction.

Now Sansui moves on to conquer *all* types of distortion with the new Super Feedforward configuration. With this new advance, all the disputes over distortion have finally reached their end; now all that remains to discuss is music, pure and complex.

The Super Feedforward System: Background

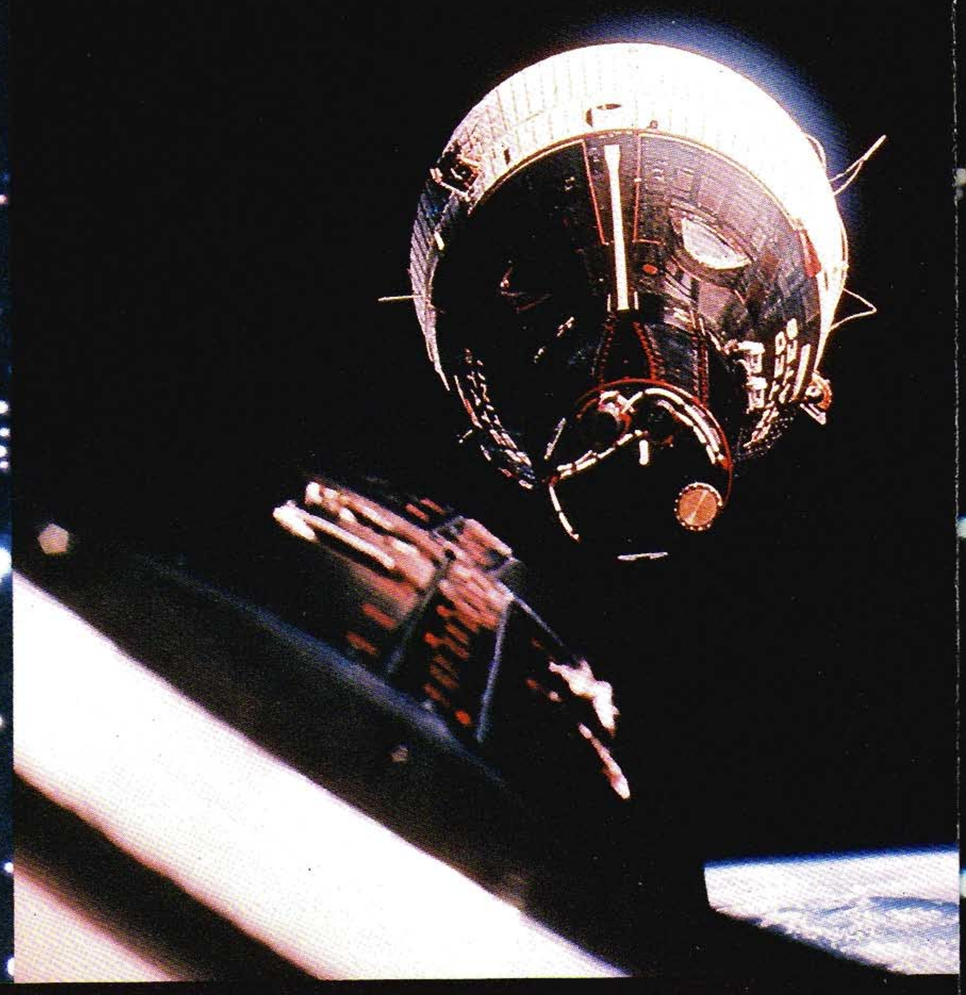
The history of audio now spans over a century, but it wasn't until 1947 that hi-fi was born. That milestone year marks the appearance of the Williamson amp, the first amp to put NFB (Negative Feedback) technology to a practical audio use. This was the amp that the audiophile of the late 40s wanted: the first amp to reduce noise and distortion, and expand frequency response, to a level worthy to be called "high fidelity."

Today NFB has become so solidly entrenched in audio engineering that it's difficult to imagine a popular amp without it. In some ways, the last thirty years of audio history have been little more than variations on the NFB theme.

But NFB—even in its many variations—hasn't solved all the ills that beset the audio amp. The improvements it has brought to hi-fi have been dramatic and effective, but NFB also has built-in limitations. At Sansui, audio engineers have long sought another breakthrough that would overcome these limitations and take amp technology to unprecedented heights of fidelity.

That breakthrough is here. Sansui calls it the *Super Feedforward System.* You'll find it in Sansui's newest, best integrated amplifiers.

The feedforward (FF) technique isn't new; it actually predates NFB by nine years. Since as far back as 1928, when H.S. Black of Bell Laboratories discovered it, audio engineers have been trying to find a practical audio application for it. Sansui, after many years of research, has now developed an extraordinary amplifier circuit we call the Super Feedforward System that combines the feedforward technique, made possible by means of an "error correction amp," with NFB. This unique circuit is now available for the first time in the AU-D11 and AU-D9.

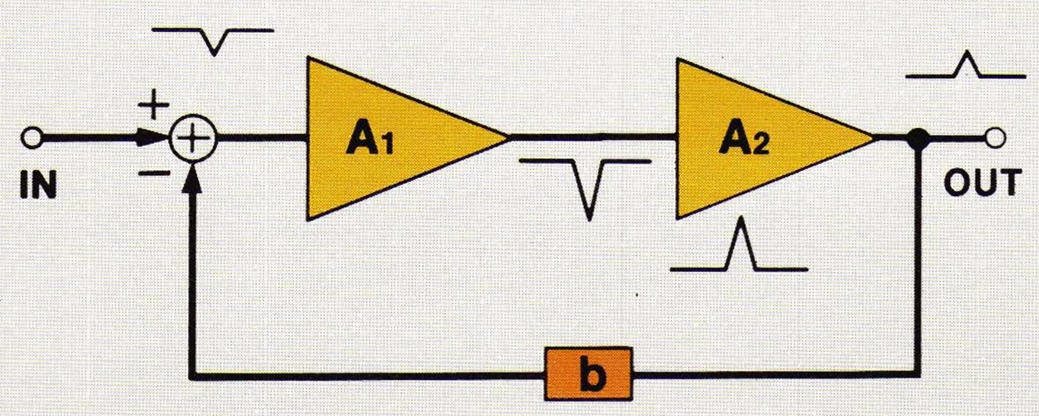


NFB: Pros and Cons

An NFB amp is one that has a negative feedback loop. Fig. 1 shows a representative design. Distortion, generated by power amp stage A_2, is returned (fed back) to the input through the NFB loop and added, in reverse phase, to amp stage A_1. Reverse-phase distortion is amplified by A_1 and added to A_2, thus cancelling distortion at A_2. NFB is effective against distortion and also results in large-scale improvements in frequency response, in/output impedance, signal-to-noise ratio, etc.

The problem, however, is that NFB makes amps more prone to oscillation and instability, especially in the high frequencies where it presents such a hazard that its application must be greatly reduced. And, when applied excessively, NFB causes TIM (Transient Intermodulation) and other kinds of transient distortion. It is also ineffective against high-frequency switching distortion, the type of distortion most common in power amps using the popular class-B configuration. These three drawbacks have kept NFB amps from complete fidelity to the original signal.

Fig. 1 Basic NFB Circuit



Feedforward: Pros and Pros

Fig 2 shows a theoretical circuit diagram for Feedforward. The output from A_1 is multiplied by $1/A_1$ (amplitude degree) and then put out of phase. Then it is compared with the original signal at the input of A_2. The difference, representing distortion components, is then amplified same amplitude level of A_1 and added to the output of A_1 thereby nullifying distortion. Feedforward technique eliminates distortion without a loop in the circuitry: free of oscillation, it can be used with stability at *any* frequency.

Fig. 2 Theoretical Feedforward Circuit

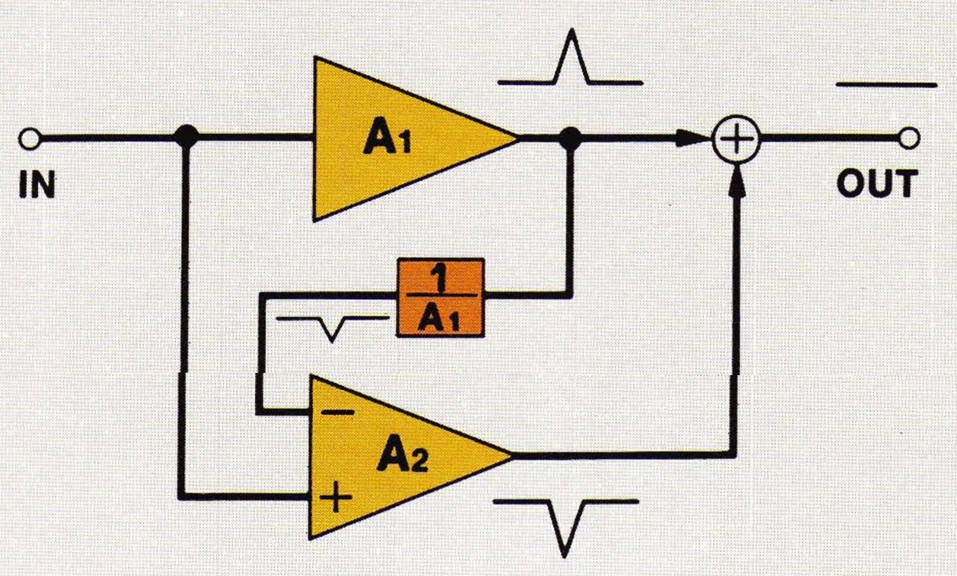
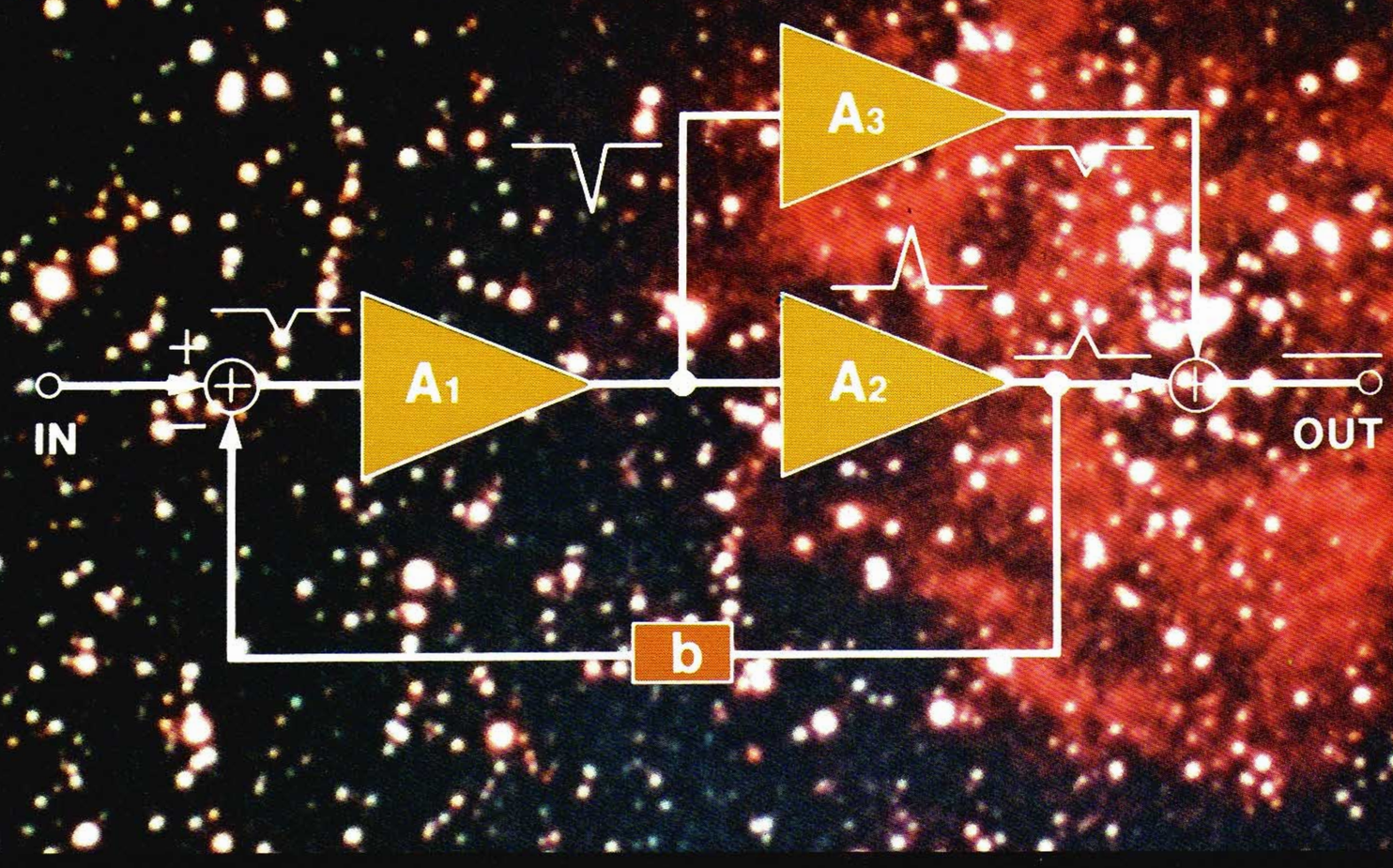


Fig. 3 Sansui Super Feedforward System



Sansui Super Feedforward: Working Principle

The Sansui Super Feedforward System is an ingenious synthesis of the advantages of the traditionally used NFB and the rediscovered FF techniques. It reduces *all* kinds of distortion at *all* frequencies. Not, like NFB used alone, only certain types of distortion at certain frequencies. Operation is stable across the entire frequency range.

Fig. 3 represents the circuit diagram of the Sansui Super Feedforward system. Distortion, generated in A_2, is returned to the input in reverse phase, where it is added to A_1. The reverse-phase signal is then amplified by A_1 and sent to A_2. Thus distortion is reduced at the output of A_2. This is the working principle of NFB.

In the Super Feedforward system, a reverse-phase signal at the output of A_1 is also sent to an error correction amp A_3, where it is amplified and then sent on to the output (rather than the input) of A_2. In this way the feedforward circuit eliminates what little distortion NFB fails to discard.

Fig. 4 shows the "domain of effectiveness" in terms of frequencies of NFB and FF. Note that NFB is most effective in the low frequencies; FF is used best in the high frequencies. Combined, the two keep distortion inaudibly low from the infrasonics *to the supersonics. With ideal stability across the entire range.*

Let's sum up the advantages of the Super Feedforward System:

1. Steady-state distortion, such as harmonic distortion and intermodulation, and switching and crossover distortion (inherent in conventional class-B amps) are all eliminated.
2. Transient distortion, such as Transient Intermodulation (TIM), is, with assistance from the DD/DC driver (discussed later), ousted completely.
3. Distortion due to thermal buildup or to fluctuations in the power-line voltage is cancelled the moment it's generated. The Super Feedforward System is so effective, in fact, that even harmonic distortion in the supersonic frequency range (100kHz) disappears (see Photo 4)

Finally, almost miraculously, *all* types of distortion have met their master. The struggle of the classes A and B and all distortion disputes are now resolved once and for all. With Sansui's Super Feedforward System, it's music—and music alone—that counts.

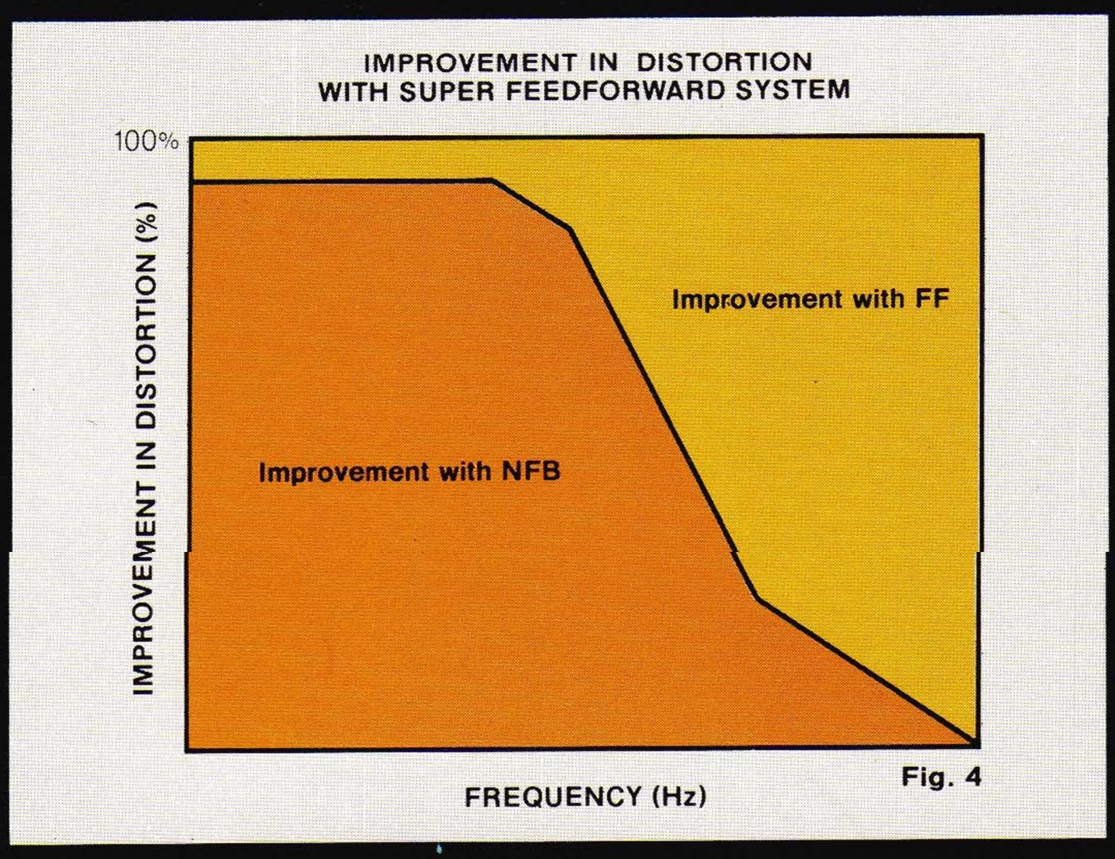


Fig. 4

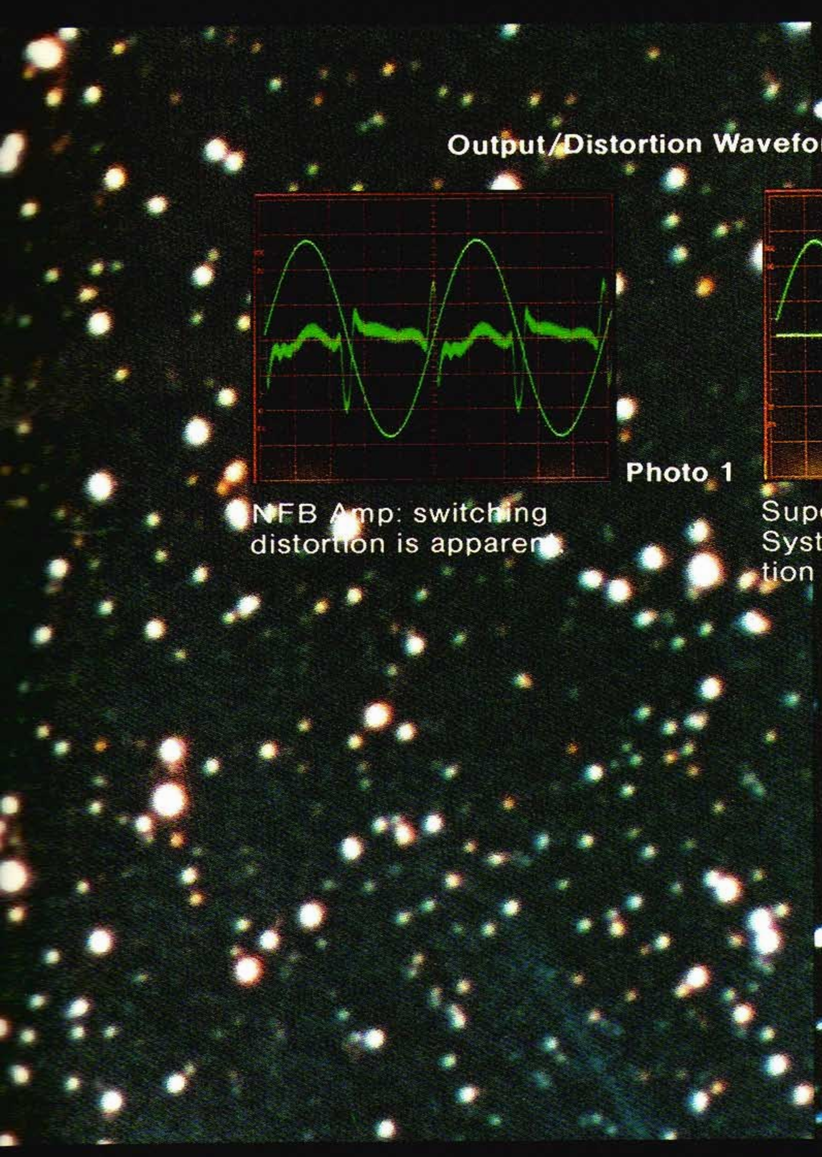

Output/Distortion Waveforms

Photo 1

NFB Amp: switching distortion is apparent.

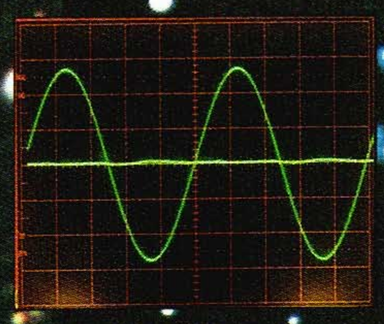


Photo 2

Super Feedforward System: switching distortion is hardly visible.

100kHz Output/Distortion Waveforms


Photo 3

NFB Amp: Harmonic distortion in response to a 100kHz signal.

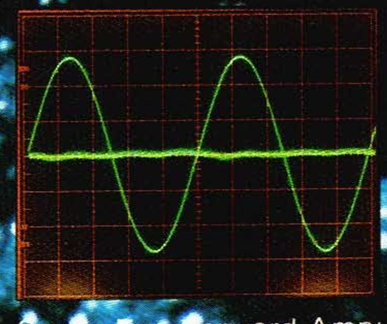


Photo 4

Super Feedforward Amp: No perceivable distortion is seen at the output. It indicates input and output waveforms are symmetrical.

Now that distortion is practically non-existent, amps sou than ever before to "live".

Super Feedforward System and DD/DC (Pat. Pend.†)

You learned all about the remarkable low-distortion performance achieved by the Super Feedforward System on the preceding pages. In the Sansui Integrated Amplifiers, the AU-D11 and AU-D9, this new technique is joined by an equally innovative Sansui development: Diamond Differential DC or "DD/DC."

DD/DC boosts the driver current capability to a record high for an exceptional slew rate of ±350V/μs in the D11 (±300V/μs in the D9) and an ultra-fast rise time of 0.8μs in the D11 and D9). Together, these mean that the power amps in both models cannot fall victim to TIM (Transient Intermodulation) distortion, a kind of distortion almost completely overlooked by most audio manufacturers until Sansui developed a way of measuring it practically and, as a result, combatting it effectively.

The driver and power output configurations are state-of-the-art examples of modern circuit design. In the driver, a pair of differential circuits in a symmetrical design are connected to each other as dual-complementary differentials. The power output features a differential input, fed with constant current, formed of a low-noise, high-current Dual FET. Stability is incomparably high.

Linear Servo Power Regulators: Ideal power regulation

For near-perfect power regulation, low-ripple output and low flux radiation, the AU-D11 uses a newly-developed power transformer featuring a "CI" core.

Furthermore, special constant-voltage circuits, called "Linear Servo Regulators," are used for the voltage-amplifying circuits. One each is employed in: the power-amp predriver, the phono equalizer in the preamp section. Sufficient current is always available—no matter how suddenly it is called for or how much is demanded.

In the AU-D9, one "Linear Servo Regulator" provides the necessary current for both the phono equalizer and the MC pre-preamp.

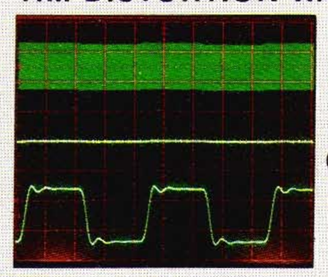
In both models, low-impedance capacitors, fast-recovery diodes and other select components have been used in the power supply to ensure a low-impedance power feed across the entire frequency range.

High-Gain DC-Servo Equalizer: Stable down to the infrasonics

Good news for audio purists: Besides the pre-preamp for MC cartridges, there are basically only two amps—the phono equalizer and the power amp—inside both the AU-D11 and the D9. The output of the equalizer goes directly to the power amp and then to the connected speaker system without encountering a single capacitor. That means reproduction stays as clean and intact as possible.

The equalizer is of the high-gain DC-Servo construction to prevent quasi-DC components (warp-caused infrasonics, arm/cartridge resonance, etc.) from causing instability. Like the power amp, the cartridge phono equalizer is highly sophisticated: In the AU-D11 it has a differential input, formed of a Dual FET, followed by a highly capable DD/DC circuit and a true complementary SEPP output; in the AU-D9, the equalizer begins with a dual differential input with a Dual FET, and finishes up with a true complementary push-pull SEPP with a current mirror and current differential circuits.

TIM DISTORTION WAVEFORM

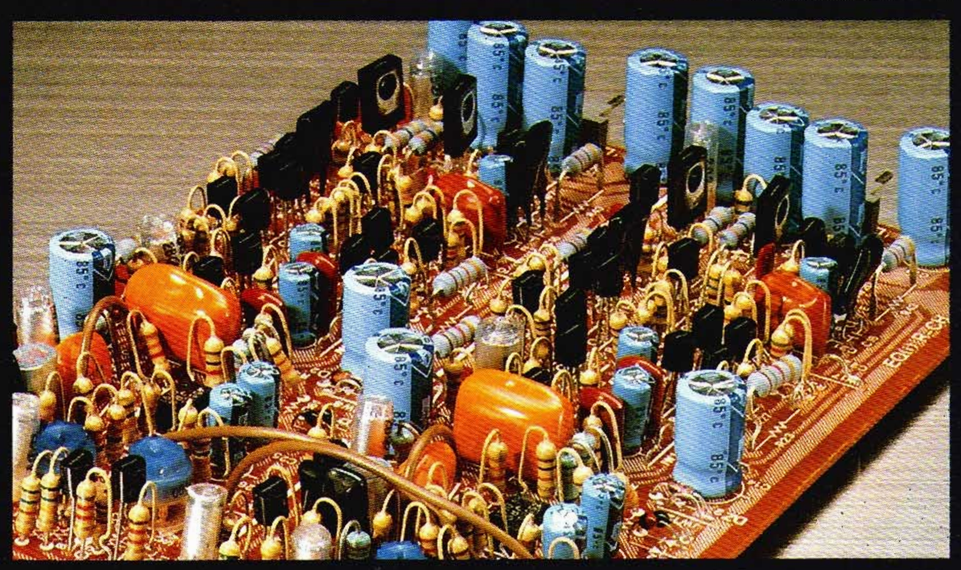


Input Waveform

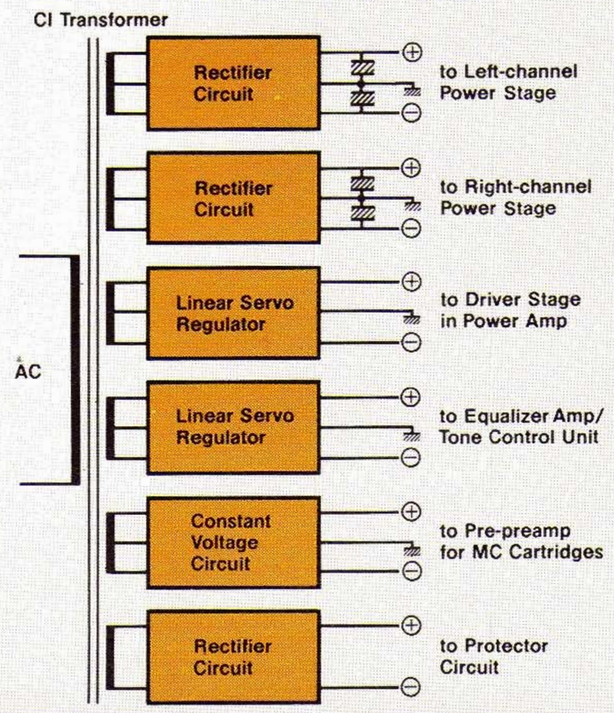
Output Waveform (Super Feedforward Amp)

Output Waveform (Conventional Amp)

*Plateau-like rectangular output indicates that audible frequencies not contained in the original input are generated inside the amp: TIM distortion is the cause.



AU-D11 Power Supply System



ıd closer

High S/N Pre-Preamp for MC Cartridges: Selectable gain
If you're one of the growing number of audiophiles who think MC (Moving Coil) cartridges are indispensable to high fidelity, you'll be pleased that Sansui has built a sophisticated MC pre-preamp into both amp models. The AU-D11 uses one featuring an array of FETs in push-pull configuration; the AU-D9 a symmetrical construction with two differential stages. Both models use only the most select components in the pre-preamp for quality on a par with expensive separate pre-preamp units. The specs bear this out: signal-to-noise ratio is a high 74dB.

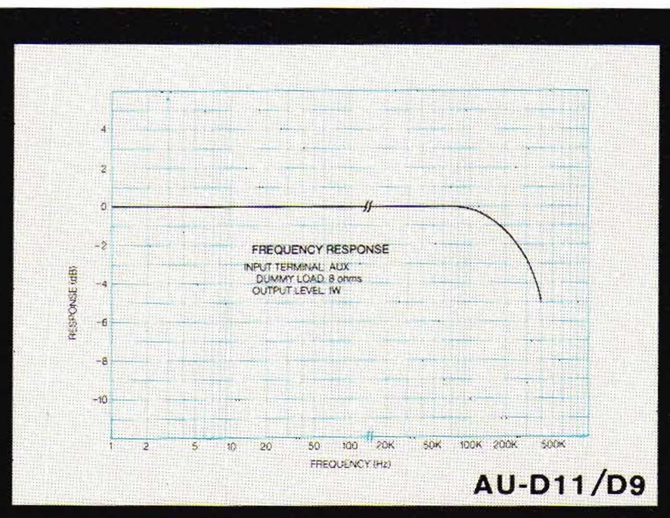
A selector with two positions "HIGH" and "LOW" gives the option of using various cartridges: "HIGH" for cartridges with 0.1mV and "LOW" for those with 0.2mV (AU-D11) or 0.25mV (AU-D9) output. Thus the pre-preamp amplifies to a proper level no matter what output your cartridge delivers.

Logical Chassis Layout: Shorter wires, simple construction
In the AU-D11 and D9, the chassis layout has been made simpler —and sound quality better—by trimming all wires used to the shortest possible length.

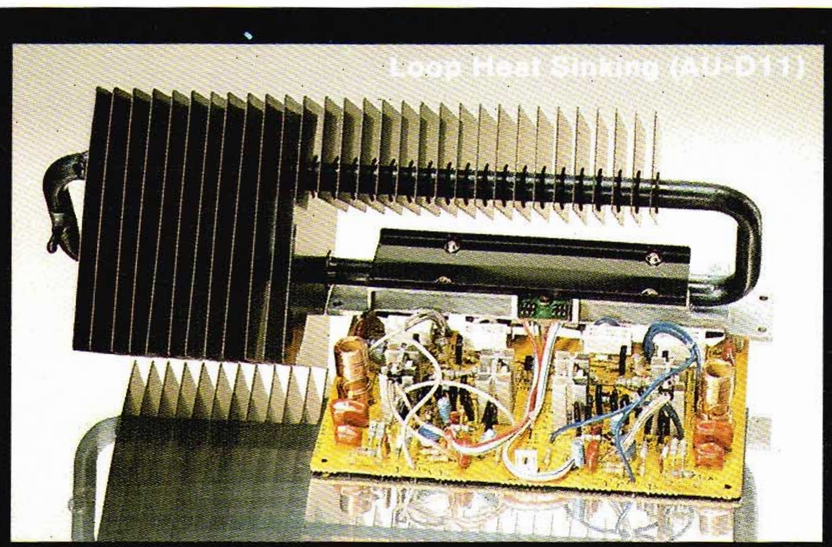
Another contribution to simplicity in chassis layout is the loop heat sinking used in the AU-D11, and tubular heat sinking in the AU-D9. They are flexible and efficient enough to allow placement almost anywhere on the chassis. This permits the power-output stage to be integrated with the driver stage, thus eliminating the wires that usually connect these two stages. The flux that would otherwise develop around the output transistors is prevented, protecting the critical preamp and pre-preamp stages from the intrusion of noise. And, since speaker switching is performed by a relay located at the rear of the chassis, the wires that would otherwise run from back to front and then back are also no more. This removes another source of magnetic flux.

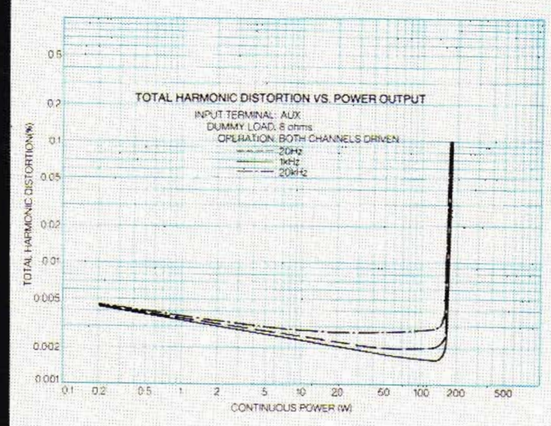
Since the minute audio signals can be severely affected by undesirable magnetic influence, the AU-D11 and D9 feature generous use of non-magnetic materials. In the D11, in fact, Sansui has actually copper-plated the chassis, rear-panel and screws. Similar attention to every detail of amp design in every part of the AU-D11 and D9 has paid off in exceptionally clean, transparent reproduction.

Other Deluxe Features
- *Tone Control:* Two turnover frequencies are provided for each of the two controls: 300Hz and 150Hz for BASS and 3kHz and 6kHz for TREBLE. There is also a TONE DEFEAT switch to enable you to bypass the circuit entirely for a flat response.
- *Tape Play & Rec Selectors:* Up to two tape decks can be connected, with dubbing possible from one to the other. You can also dub tapes or record off a connected tuner while listening to another source.
- *Speaker Switch (OFF, A, B, A+B):* Four options for driving (or not driving) connected speaker systems are provided. Connection and disconnection is performed via a relay located just behind the rear panel.
- *Supersonic/Subsonic Filters:* Noise is eliminated effectively and musical content left intact with two filters, with 16Hz and 20kHz cut-off frequencies respectively.
- *Two Phono inputs for MM/MC Cartridge:* Switching is via front panel controls.
- *−20dB Audio Muting Switch*
- *Extra-Durable Binding Posts for Speaker Terminals*

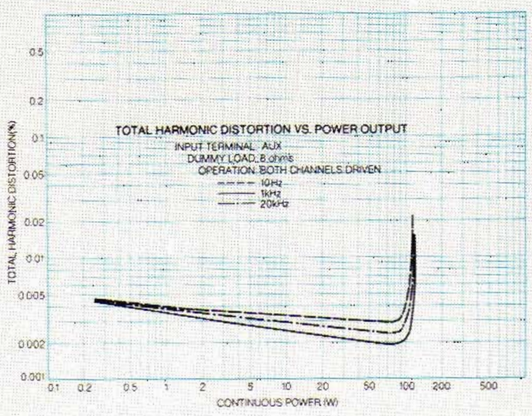


AU-D11/D9

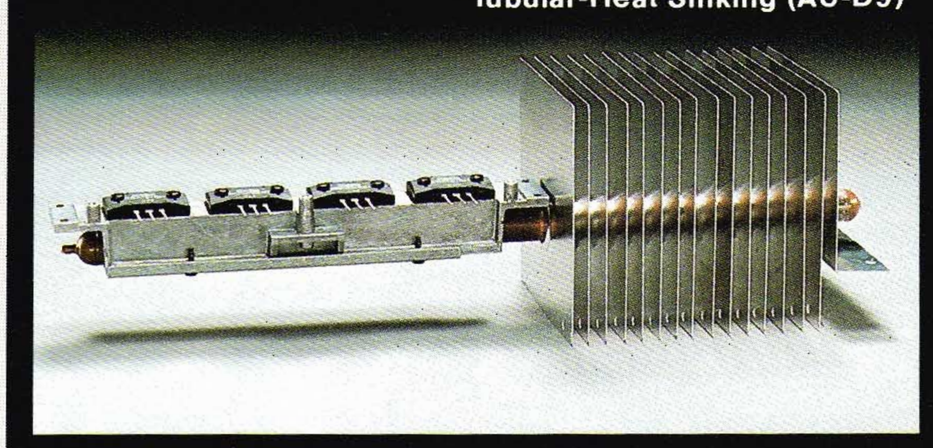


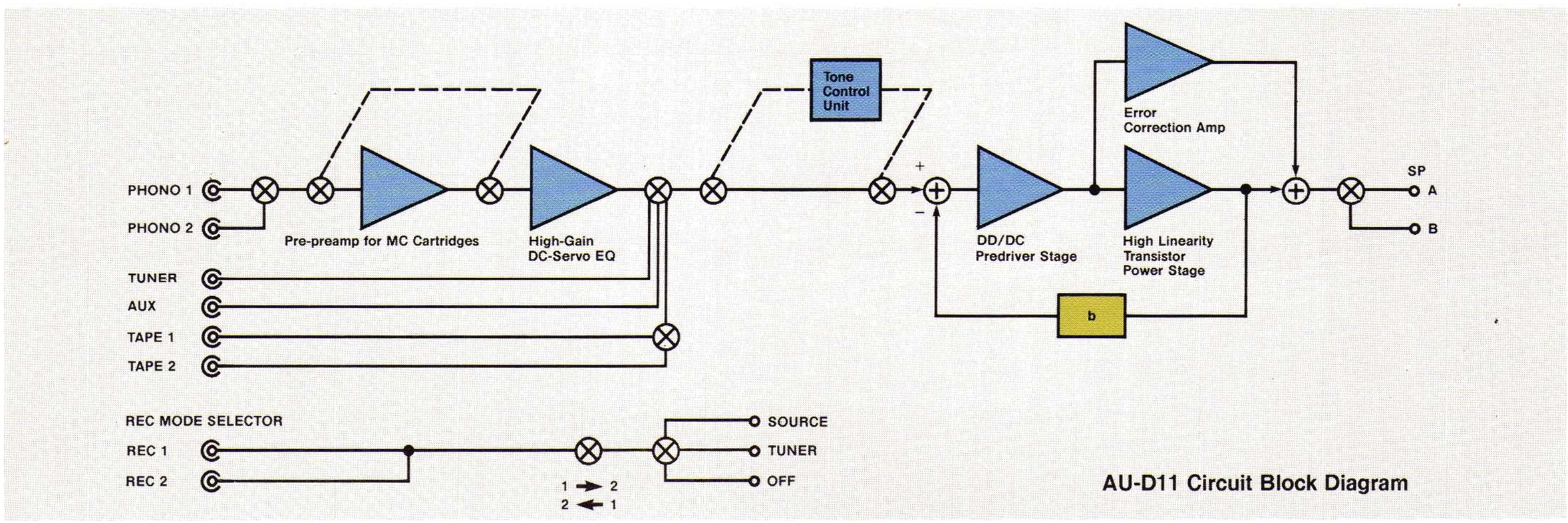


AU-D11

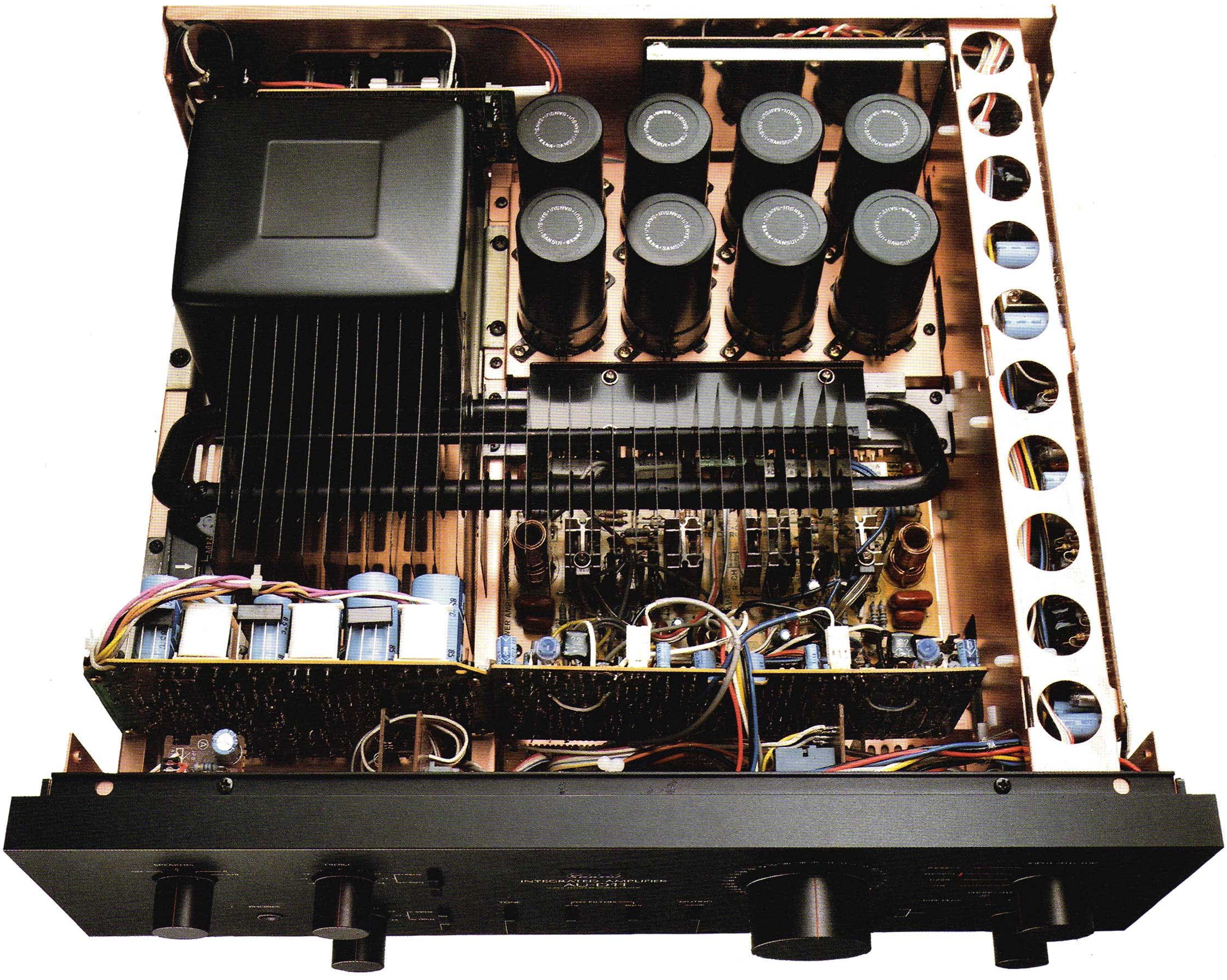


AU-D9





AU-D11 Circuit Block Diagram



The End of the Distortion Dispute—The Beginning of a New Era in Amplifier Engineering.

The Sansui Quartz-PLL Synthesizer Tuner—Quality Made Compatible with Convenience.

You'll wonder how you ever put up with conventional tuners after you experience the accuracy of Quartz and the convenience of presetting.

Quartz-PLL Synthesizer Tuning: Accurate, precise and stable

All tuners promise precision and stability, but few deliver them like the Quartz-PLL Synthesizer in the Sansui TU-S9. Station frequencies are electronically tuned and locked in for hours or even days of driftless, error-free reception supervised by an unerring microprocessor.

This precise tuning system uses a team of variable-capacitance diodes to change capacitance according to the control voltages. The control voltages are in turn derived from phase comparison of the tuned frequency and a reference signal obtained from a steady quartz crystal. The two signals are applied to the front end thousands of times every second to keep phase locked at all times. For higher reliability, the entire Quartz-PLL Synthesizer has been contained in a single LSI, for the most precise, stable tuning available today, completely unaffected by ambient temperature or humidity.

10 FM/AM Preset Stations: Instant and accurate recall

Combining a quartz-PLL Synthesizer with variable-capacitance diodes has resulted in another electronic bonus: preset tuning capability for up to 10 AM/FM stations. You can assign any of *the ten Preset Station buttons to any frequency simply by touch*ing the appropriate button and the "MEMORY" button. Any combination of AM and FM stations is possible, with instant, accurate recall available at the touch of a button. For extra convenience, a plastic strip has been provided above the Station Recall buttons to allow you to write or letter in (with provided paste-up sheets) the stations' call signs.

Direct Set Function: The simplest tuning ever

If you know the frequency of the station you want to receive, all you have to do is push the appropriate three or four digital keys, pocket calculator style (1-0-3-7 for 103.7MHz, for example), after touching the DIRECT SET button. Should you want to preset the station, you simply touch the MEMORY button and one of the station buttons which double as digital keys. A fluorescent digital display confirms accurate tuning of any station. During DIRECT SET tuning, muting circuitry eliminates annoying inter-station noise before the desired station is tuned in.

Auto/Manual Tuning: Double convenience

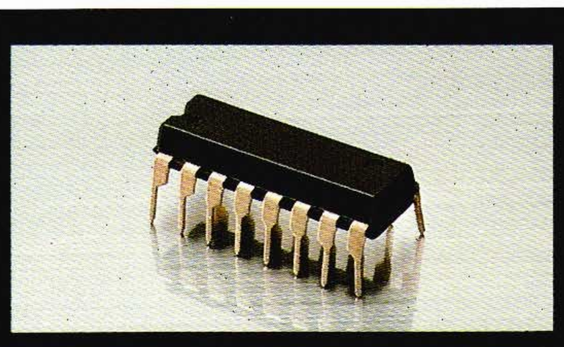
The light-touch UP/DOWN Tuning buttons allow you to tune stations in automatically or, if you prefer, manually.

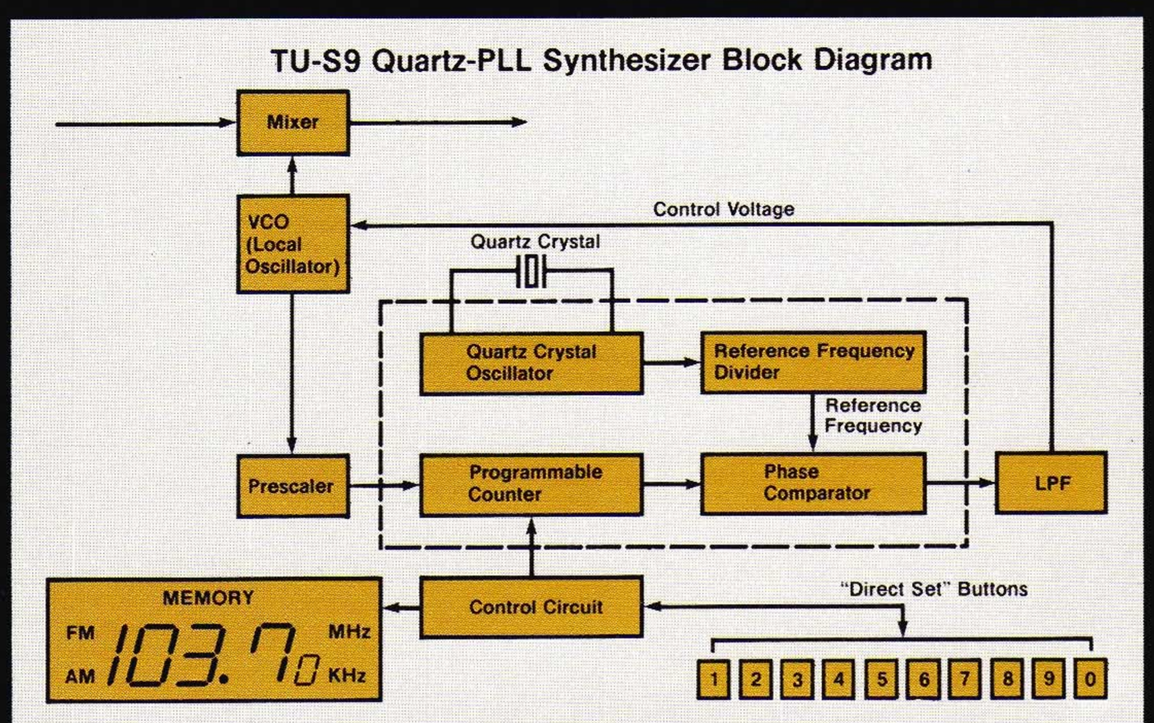
Automatic Tuning: A firm push of either the UP or DOWN button sets the tuner to scanning the tuning range (AM or FM) until it locates the nearest strong-signal station. If a strong-signal station is not found by the time scanning reaches one end of the tuning band, the tuner "backs up" and begins scanning in the reverse direction.

Manual Tuning: A light touch of either button activates tuner scanning in predetermined steps (1kHz for AM and 100kHz or, in some areas, 50kHz for FM). A somewhat more sustained light *touch speeds scanning up, so that you can move from one* portion of the tuning band to another quickly. Any station you tune in, automatically *or* manually, can be preset.

"Last One" Memory and Memory Back-Up: Bonus features

The station you listen to last before switching the tuner off will be tuned in again—automatically and accurately—upon repowering.





This is called the "Last One" feature. It's a valuable bonus if you're interested in making unattended, timer-controlled recordings off the air.

"Memory Back-Up" refers to a circuit contained in the TU-S9 which feeds on two penlight AA batteries to keep the preset station frequencies viable while the tuner is shut off or even unplugged. When the leftmost Signal Indicator LED stops to glowing, you know it's time to replace the run-down batteries with new ones.

FM Front End: Sensitive, low in noise

Some people think that synthesizer tuners, though convenient and easy to operate, have the disadvantage of an inferior signal-to-noise ratio. Sansui has eliminated this cause for concern in the TU-S9 with a front end featuring: (1) high-Q variable-capacitance diodes of the back-to-back type, (2) a high-speed regulated power supply using fast-recovery diodes and (3) a DC active LPF (Low Pass Filter) for the PLL circuit. The high signal-to-noise ratio that has resulted—85dB for mono, 80dB for stereo—is unprecedented in a synthesizer tuner. The high 10.5dBf sensitivity rating is another indication of the sophisticated accuracy the TU-S9 has achieved. In fact, the variable-capacitance diodes are every bit as sensitive and as effective in interference rejection as a conventional 4-ganged tuning capacitor.

Post-IF Stages: DC Audio Amp, PLL Multiplex

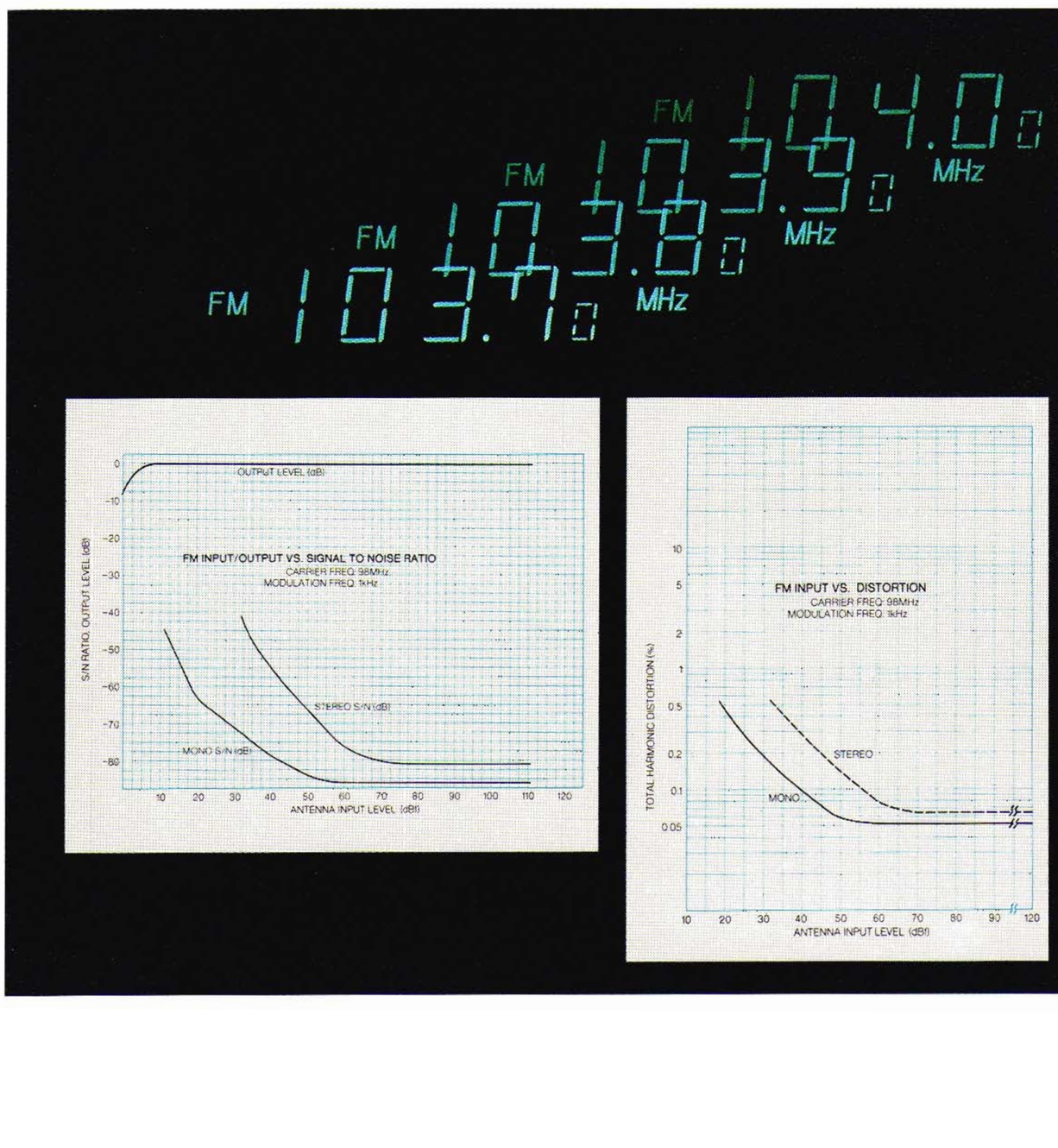
The FM IF section features a group of ceramic filters with a flat group delay response, for both high selectivity and low distortion. The detector is of the double-tuned quadrature type contained in an IC for a high signal-to-noise ratio. The multiplex demodulator employs a PLL system for steady separation and low distortion. Switching pilot signals are removed completely once their mission is completed, so that there is no possiblity of their mingling with program signals and marring reproduction. Last but hardly least, the audio amp is of DC configuration and specifically designed for a high slew rate for the purest amplification possible.

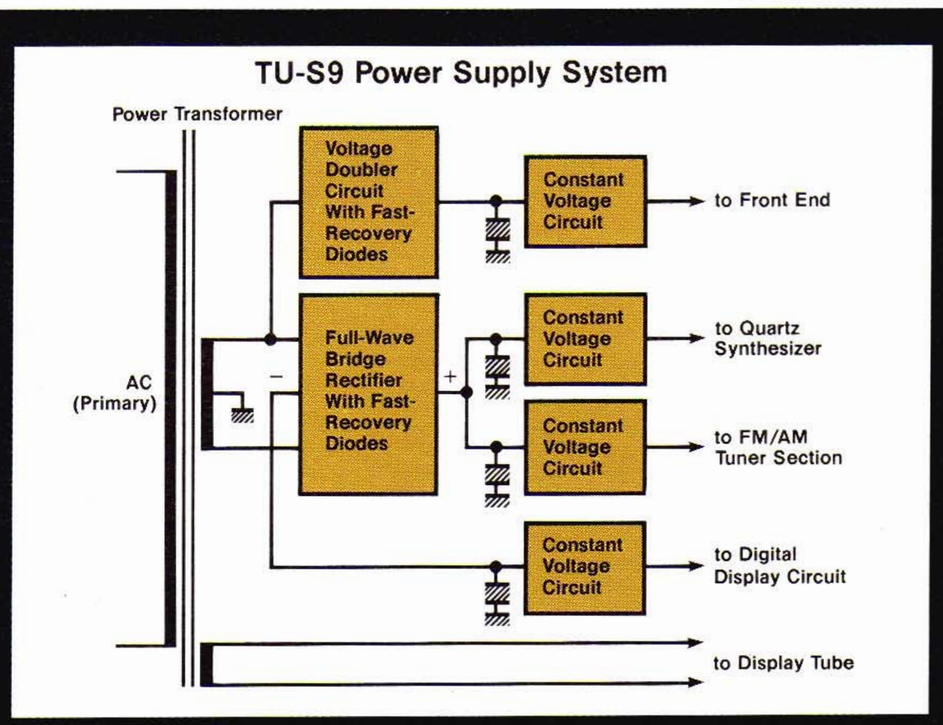
AM Loop Antenna: Shuts noise out

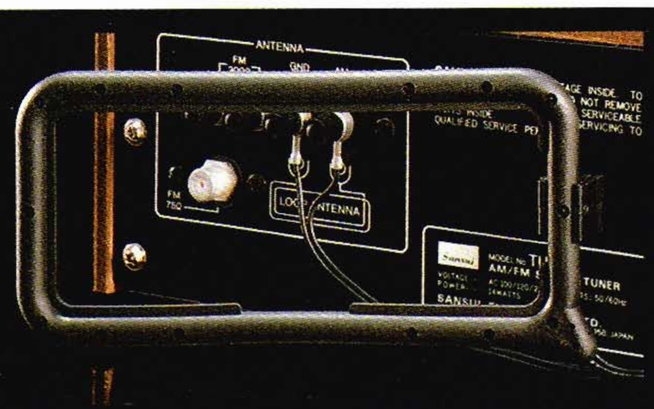
The TU-S9 includes a loop antenna for AM reception. Unlike conventional bar antennas, the loop antenna is immune to noise generated by TV receivers, refrigerators and cars. It's so sensitive that reception will be strong and clear even in concrete buildings. The detachable antenna comes with a lead-in cable (80cm/2.6 feet). You can install it anywhere and be assured of noise-free AM reception.

Other Extra-Special Sansui Features

- *LED Signal/Multipath Meter:* When switched to SIGNAL, this meter shows the signal strength of a received AM or FM station. In the MULTIPATH position, it indicates the amount of multipath reflection to enable you to orient your FM antenna precisely in the direction where noise and distortion are least.
- *Noise Canceller:* High-frequency noise is cut with this circuit for better reception quality.
- *Calibration Tone Switch:* Recording levels on a connected tape recorder can be adjusted with the 400Hz test signal this switch provides at the tuner's output.
- *FM Muting/Mode Switch:* In the stereo mode, irritating interstation noise is eliminated by a built-in muting circuit. Muting is off when this switch is set to the mono mode, allowing you to tune in weak-signal stations.







Specifications

AU-D11

POWER OUTPUT*
Min. RMS, both channels driven, from 10 to 20,000Hz, with no more than 0.005% total harmonic distortion
120 watts per channel into 8 ohms

LOAD IMPEDANCE* 8 ohms

TOTAL HARMONIC DISTORTION*
OVERALL (from AUX) less than 0.005% at or below rated min. RMS power output

INTERMODULATION DISTORTION (60Hz:7,000Hz=4:1 SMPTE method)
less than 0.005% at or below rated min. RMS power output

DAMPING FACTOR (at 1,000Hz both channels driven)
150 into 8 ohms

SLEW RATE ±350V/μSec. (INSIDE)

RISE TIME 0.8μSec.

FREQUENCY RESPONSE (at 1 watt)
OVERALL (from AUX) DC to 300,000Hz +0dB, −3dB

RIAA CURVE DEVIATION (20 to 20,000Hz)
+0.2dB, −0.2dB

INPUT SENSITIVITY AND IMPEDANCE (at 1,000Hz)

PHONO 1, 2 (MM)	2.5mV, 47k ohms
PHONO 1, 2 (MC)	0.1mV and 0.2mV, 100 ohms
AUX	250mV, 27k ohms

MAXIMUM INPUT CAPABILITY (at 1,000Hz 0.01% T.H.D.)
PHONO 1, 2 200mV (MM) 16mV (MC)

OUTPUT VOLTAGE AND IMPEDANCE (at 1,000Hz)
TAPE REC (PIN) 250mV into 47k ohm load

HUM AND NOISE

PHONO 1, 2	90dB (MM) 74dB (MC)
AUX	110dB

CHANNEL SEPARATION (at 1,000Hz)

PHONO 1, 2 (MM)	60dB
AUX	80dB

CONTROLS

BASS	+8dB, −8dB at 50Hz (Turnover Frq. at 300Hz)
TREBLE	+8dB, −8dB at 15kHz (Turnover Frq. at 3kHz)

AC OUTLETS switched max. 100 watts
unswitched total. 250 watts

POWER REQUIREMENTS

POWER VOLTAGE	110, 120, 220, 240V 50/60Hz
POWER CONSUMPTION	600 watts

SEMICONDUCTORS 159 Transistors; 43 Diodes; 16 Zener Diodes; 11 LEDs; 28 FETs; 3 ICs

DIMENSIONS 445mm (17 9/16")W
155mm (6 1/32")H
443mm (17 1/2")D

WEIGHT 17.5kg (38.5 lbs.) Net
18.8kg (41.4 lbs.) Packed

FINISH Simulated rosewood grain

AU-D9

POWER OUTPUT*
Min. RMS, both channels driven, from 10 to 20,000Hz, with no more than 0.005% total harmonic distortion
95 watts per channel into 8 ohms

LOAD IMPEDANCE* 8 ohms

TOTAL HARMONIC DISTORTION*
OVERALL (from AUX) less than 0.005% at or below rated min. RMS power output

INTERMODULATION DISTORTION (60Hz:7,000Hz=4:1 SMPTE method)
less than 0.005% at or below rated min. RMS power output

DAMPING FACTOR (at 1,000Hz both channels driven)
150 into 8 ohms

SLEW RATE ±300V/μSec. (INSIDE)

RISE TIME 0.8μSec.

FREQUENCY RESPONSE (at 1 watt)
OVERALL (from AUX) DC to 300,000Hz +0dB, −3dB

RIAA CURVE DEVIATION (20 to 20,000Hz)
+0.2dB, −0.2dB

INPUT SENSITIVITY AND IMPEDANCE (at 1,000Hz)

PHONO 1, 2 (MM)	2.5mV, 47k ohms
PHONO 1, 2 (MC)	0.1mV and 0.25mV, 100 ohms
AUX	250mV, 27k ohms

MAXIMUM INPUT CAPABILITY (at 1,000Hz 0.01% T.H.D.)
PHONO 1, 2 200mV (MM) 20mV (MC)

OUTPUT VOLTAGE AND IMPEDANCE (at 1,000Hz)
TAPE REC (PIN) 250mV into 47k ohm load

HUM AND NOISE

PHONO 1, 2	90dB (MM) 74dB (MC)
AUX	110dB

CHANNEL SEPARATION (at 1,000Hz)

PHONO 1, 2	50dB
AUX	80dB

CONTROLS

BASS	+8dB, −8dB at 50Hz (Turnover Frq. at 300Hz)
TREBLE	+8dB, −6dB at 15kHz (Turnover Frq. at 3kHz)

AC OUTLETS switched max. 100 watts
unswitched total. 250 watts

POWER REQUIREMENTS

POWER VOLTAGE	100,120, 220, 240V 50/60Hz
POWER CONSUMPTION	500 watts

SEMICONDUCTORS 92 Transistors; 37 Diodes; 9 Zener Diodes; 11 LEDs; 4 FETS; 2 ICs

DIMENSIONS 445mm (17 9/16")W
155mm (6 1/32")H
403mm (15 7/8")D

WEIGHT 13.7kg (30.2 lbs.) Net
15.4kg (34.0 lbs.) Packed

FINISH Simulated rosewood grain

TU-S9

FM SECTION

TUNING RANGE 87.5 to 108MHz

50dB QUIETING SENSITIVITY

MONO	14.5dBf
STEREO	36dBf

SENSITIVITY
MONO (IHF) 10.5dBf (1.8μV IHF T-100)

SIGNAL TO NOISE RATIO

MONO	85dB (at 65dBf)
STEREO	80dB (at 80dBf)

FREQUENCY RESPONSE
STEREO 30 to 18,000Hz +0.3dB, −0.8dB

TOTAL HARMONIC DISTORTION

MONO	less than 0.06% at 100Hz
	less than 0.06% at 1,000Hz
	less than 0.06% at 6,000Hz
STEREO	less than 0.07% at 100Hz
	less than 0.07% at 1,000Hz
	less than 0.07% at 6,000Hz

CAPTURE RATIO 1.0dB

ALTERNATE CHANNEL SELECTIVITY 60dB at 400kHz

SPURIOUS RESPONSE RATIO 80dB

IMAGE RESPONSE RATIO 70dB

IF RESPONSE RATIO 80dB (Balanced)

RF INTERMODULATION 65dB

AM SUPPRESSION RATIO 55dB

STEREO SEPARATION 40dB at 100Hz
52dB at 1,000Hz
42dB at 10,000Hz

ANTENNA INPUT IMPEDANCE 300 ohms balanced
75 ohms unbalanced

OUTPUT VOLTAGE AND IMPEDANCE
Fixed 0.5V, 2.2k ohms

AM SECTION

TUNING RANGE 525 to 1,605kHz

SENSITIVITY (Loop Antenna) 55dB/m (562μV/m)

SELECTIVITY (±10kHz) 34dB

SIGNAL TO NOISE RATIO 46dB

TOTAL HARMONIC DISTORTION less than 0.6% at 30% Mod. 80dB/m

IMAGE RESPONSE RATIO 45dB at 1,000Hz

GENERAL

POWER REQUIREMENTS

POWER VOLTAGE	120, 220, 240V 50/60Hz
POWER CONSUMPTION	14 watts

SEMICONDUCTORS 54 Transistors; 45 Diodes; 18 LEDs; 11 ICs; 2 Zener Diodes; 2 FETs

DIMENSIONS 445mm (17 9/16")W
102mm (4 1/16")H
310mm (12 1/4")D

WEIGHT 4.2kg (9.3 lbs.) Net
5.2kg (11.5 lbs.) Packed

FINISH Simulated rosewood grain

*Power specifications measured pursuant to U.S. Federal Trade Commission trade regulation on power output claims for amplifiers.
*The FM performance of this model is measured pursuant to the new Institute of High Fidelity standard, IHF-T-200, except specifications given with the legend IHF-T-100.
*Design and specifications subject to change without notice for improvements.
†Patents pending for Super Feedforward System and DD/DC circuitry in Japan, U.S.A., Great Britain and West Germany.

Sansui

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