TU-919

Sansui Patented Digitally Quartz-Locked FM/AM Stereo Tuner with Impeccable Drift-Free Tuning Accuracy.

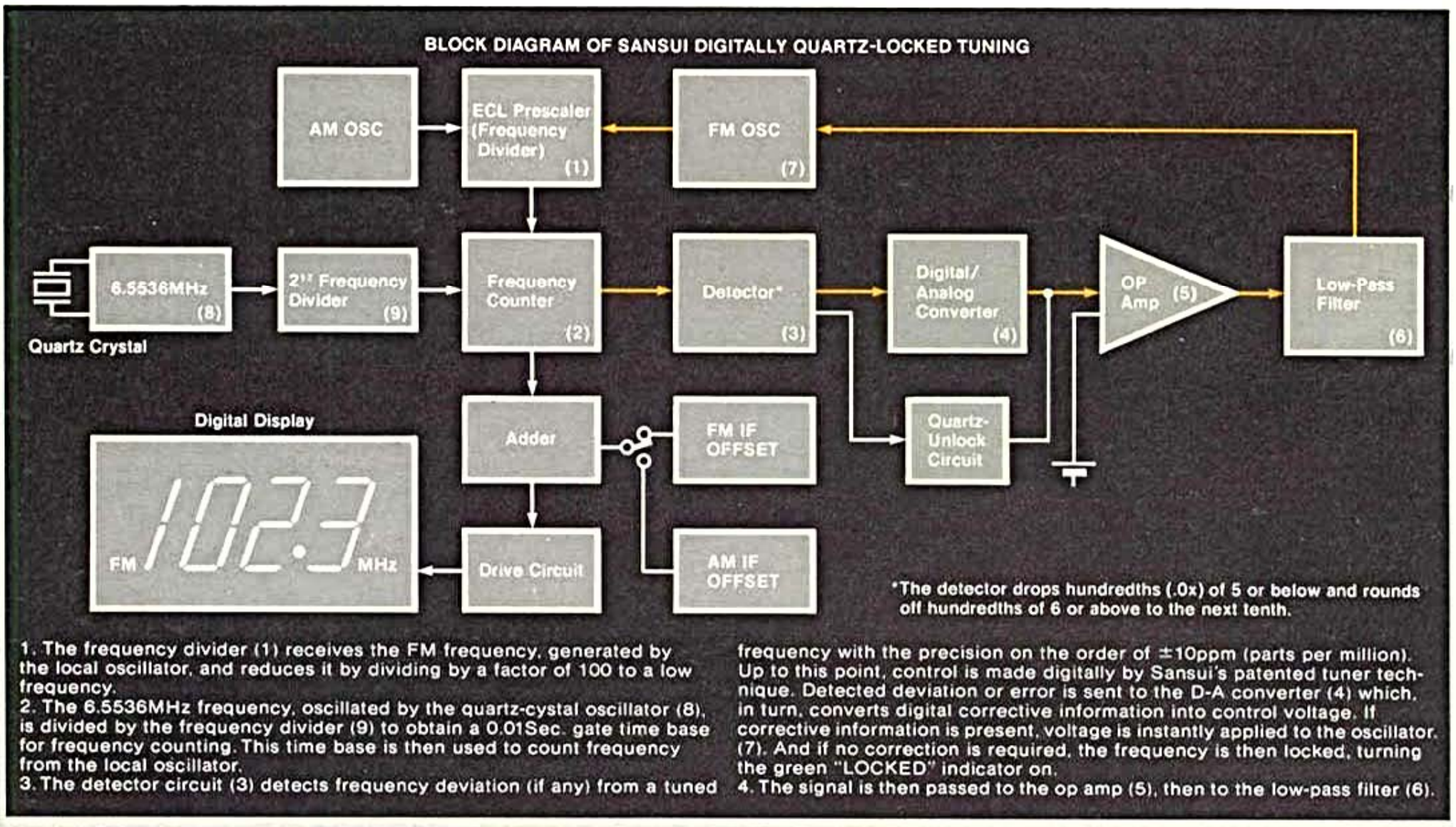
Sansui Only hi-fi, everything hi-fi.

DRIFT NO MORE

When you build a tuner as fine as the top-of-the-line Sansui TU-919, the last thing you can afford is to let tuning drift endanger performance. This is why every single precaution necessary to improve this tuner's accuracy is built in, and why we've eliminated drift entirely with a Digitally Quartz-Locked system that was perfected—and then some—in Sansui laboratories.

Quartz, as you know, is nothing new. What *is* new is the way Sansui continues to use it for dependability. Since a sliver of quartz crystal (similar to that used in fine timepieces and turntables, etc.) can be energized to emit a reference frequency of extremely high regularity, there's nothing quite like it for tuning accuracy. In the TU-919, the Sansui engineers have combined it with digital control for more than tuning convenience and cosmetics. Once you quartz-tune your station, the backup circuitry we've employed for the digital frequency control keeps it locked.

This unique and highly effective Sansui system is just one of the reasons why the TU-919 is a desirable and dependable precision instrument. Included is a Darlington-connected differential IC in the IF, selectable bandwidth circuitry, and other key developments which ensure both better tuning accuracy and faithful audio reproduction than any comparably-priced tuner. At Sansui, where it's *all* hi-fi, the TU-919 continues the superlative tradition of high performance.



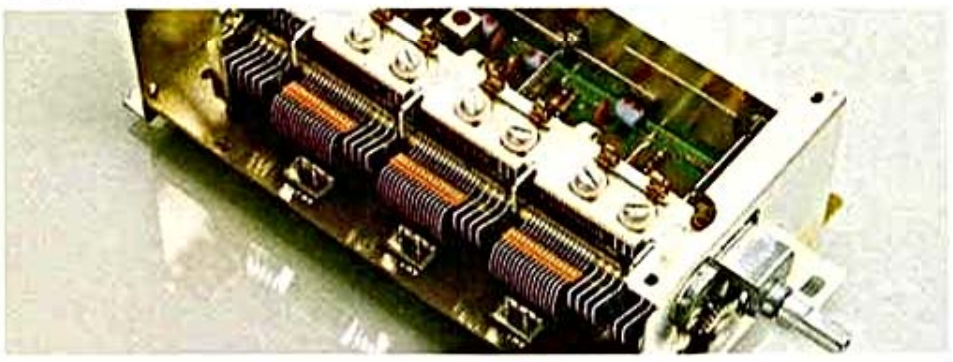
1. The frequency divider (1) receives the FM frequency, generated by the local oscillator, and reduces it by dividing by a factor of 100 to a low frequency.
2. The 6.5536MHz frequency, oscillated by the quartz-cystal oscillator (8), is divided by the frequency divider (9) to obtain a 0.01Sec. gate time base for frequency counting. This time base is then used to count frequency from the local oscillator.
3. The detector circuit (3) detects frequency deviation (if any) from a tuned frequency with the precision on the order of ±10ppm (parts per million). Up to this point, control is made digitally by Sansui's patented tuner technique. Detected deviation or error is sent to the D-A converter (4) which, in turn, converts digital corrective information into control voltage. If corrective information is present, voltage is instantly applied to the oscillator. (7). And if no correction is required, the frequency is then locked, turning the green "LOCKED" indicator on.
4. The signal is then passed to the op amp (5), then to the low-pass filter (6).

The TU-919: Tuner Section Has Authentic Fidelity.

Strictly Hi-Fi Performance in FM/AM

FM Frontend Sensitivity: Enhanced by low-noise Dual-Gate MOS FET and 5-gang Tuning capacitor.

The extraordinary tonal quality of the Sansui TU-919 begins here. Crossmodulation and interference are avoided in the FM frontend using a low-noise Dual-Gate MOS FET RF amp and a wide-gap, frequency-linear 5-gang variable capacitor of high precision. The 50dB Quieting Sensitivity is an excellent 13.5dBf for mono, 35.5dBf for stereo.



FM IF Selectivity: Very low group delay means much-improved sound.

Tonal quality is further enhanced by flattening transient group delay and phase distortion to achieve higher selectivity with lower distortion in the FM IF section. The real test of our IF circuitry comes when inputs from your antenna vary upredictably in level.

Actual field tests show the effectiveness of the ten differential IF stages, contained in one Darlington-connected differential IC, and the linear-phase ceramic filters found here. Changes in signal level have hardly any effect on selectivity.

Patented Variable Group-Delay Equalizer: Distortion is further reduced.

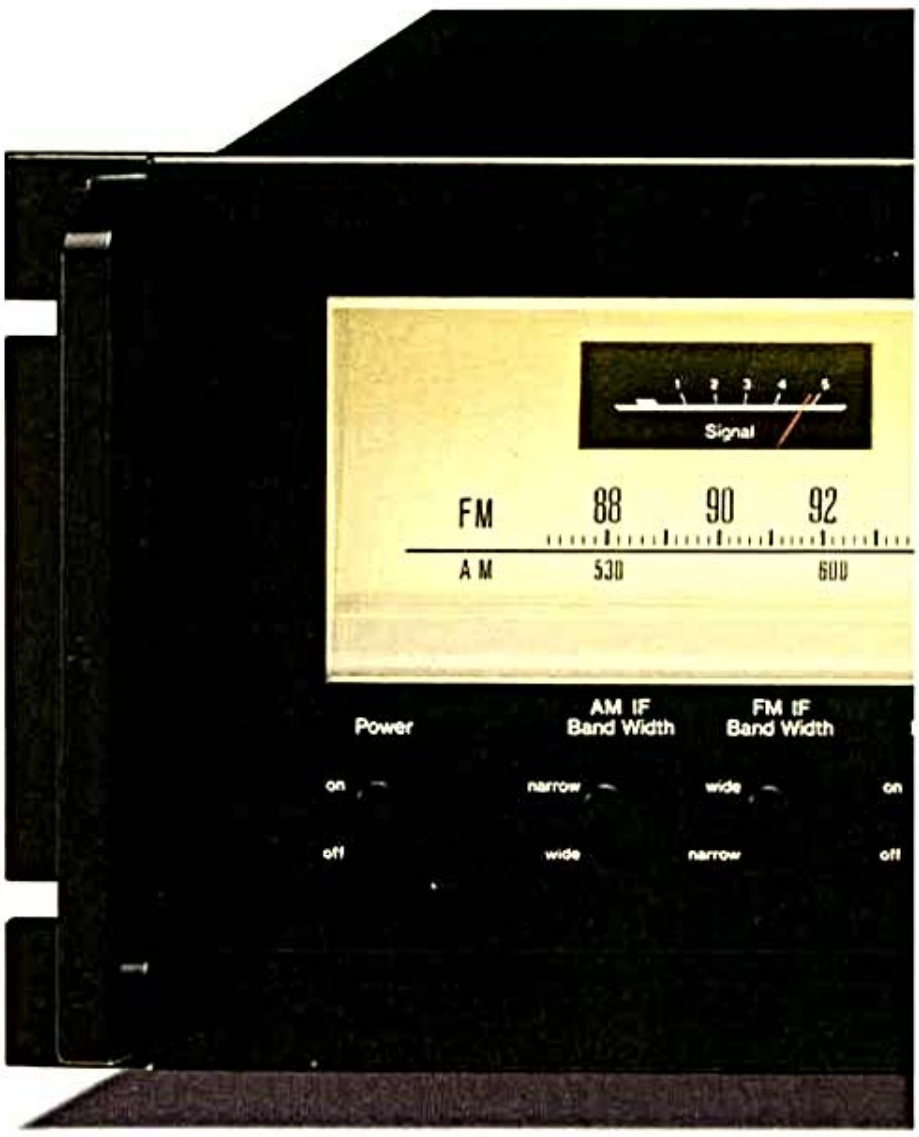
This is a unique device that permits the independent adjustment of the equivalent amount of frequency response of the IF signal within the bandwidth. This, in turn, helps eliminate any deviation, however minute, in group-delay response within the bandwidth. Higher signal-to-noise ratio and lower distortion are also achieved.

FM Stereo Sound: Wider separation and purer fidelity from PLL.

Stereo FM broadcasts are multiplexed with a "pilot" signal to trigger receiving tuners into the stereo mode and enable them to "decode" the composite signal into left and right channels. Once its job is done, that "pilot" (a 19kHz signal) must be *entirely* removed from the audio signal. The conventional filter used for this can cause more problems than it prevents.

Such 19kHz filters are usually positioned at the output of the stereo demodulator. Together with the "pilot," they also often filter out the upper end of the frequency response and cause phase distortion as well. Sansui avoids such filters in the TU-919 for a more musical sound.

Our stereo demodulator is a PLL (Phase-Locked Loop) type with a special "pilot" cancelling circuit (not a filter)



included in its IC. It eliminates the 19kHz signal *before* it enters the switching or demodulation stage. Output of the demodulator amp is pure audio.

Wide-Range DC Configuration: More guarantees of cleaner sound.

As in the highly advanced Sansui AU amplifiers and our best Pure Power receivers, the DC amplifier configuration in the TU-919 offers cleaner audio reproduction in both AM and FM. Main advantages are: Wider dynamic range; Lower TIM (Transient Intermodulation) distortion; and Superb frequency response all are vital to hi-fi.

These parameters are made still more dependable by our reduction of the internal power-supply impedance across the widest possible frequency range. Reproduction is always well balanced.

Power Supply: Attention given to better sound localization.

An error-correction/amplification constant-voltage circuit of an entirely new type is found in the power supply of the TU-919. It provides unfailing power regulation for constantly high performance quality. With impedance low throughout, musical textures remain crystal clear and sound-image localization in the reproduced sound field is the sharpest possible.

High-Power Drive Ratio Detector: S/N and linearity are improved.

A newly-developed, wide-range, high-power drive ratio detector, driven by a triple-base Darlington-connected IC, is used in the FM discriminator. It contributes to improved linearity and S/N. For more stability and still less noise we've housed the discriminator in a shielded casing, separate from the IF circuit.

Selectable IF Band for AM: WIDE/NARROW improves reception.

By broadening the signal-passing bandwidth in the AM tuner section, frequency range is dramatically improved.

For this reason, you'll want to use the WIDE position on the IF bandwidth selector. When the station to which you have tuned is strong enough, the results in improved high frequency response are impressive.

On the other hand, weak or distant AM stations are received more clearly when you use the NARROW position; the interference caused by stronger stations broadcasting on adjacent frequencies is dramatically lowered.

Sansui Tuning Conveniences.

●FM WIDE/NARROW BANDWIDTH SELECTOR.
In normal operation you'll use the WIDE mode to maximize potential sound quality in FM broadcasts which can be received without excessive interference. But when reception difficulties threaten to destroy musical quality entirely, switch to NARROW. In the latter case, the station you want is pulled through the interference, with rejection and suppression ratios high, by special circuitry in the IF section.

●FM ADJACENT CHANNEL FILTER.
FM stations in urban areas are usually "crowded" on the dial with as little as 400kHz between them. The special phase-linear Adjacent Channel Filter, plus a phase equalizer, at the detector output of the TU-919 ends the "birdie" noise (beat noise) often heard in tuners with conventional IF filters.

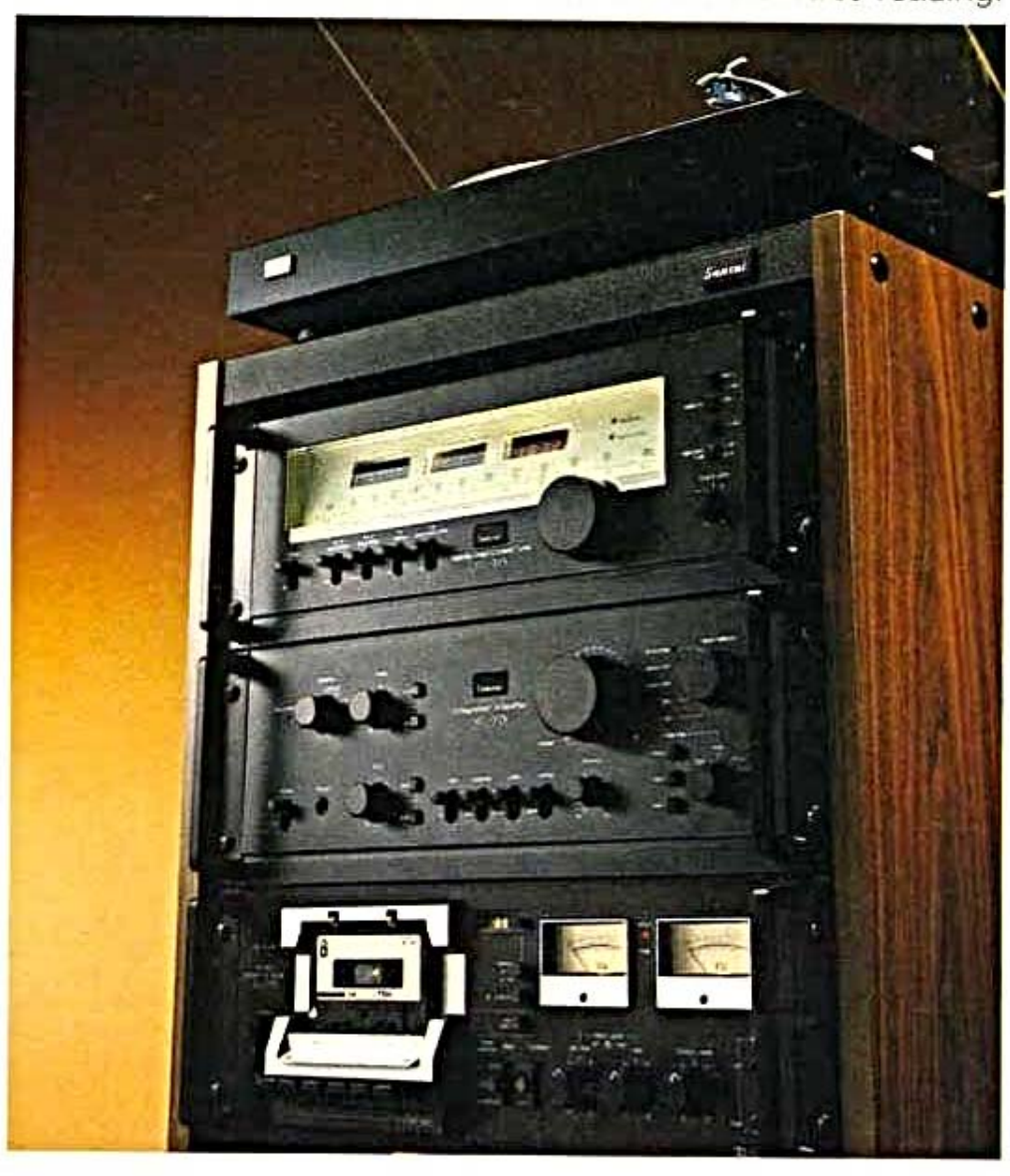
●FM MUTING.
Switch in the muting to end annoying inter-station noise as you tune. Lo-fi signals are eliminated.

●CALIBRATION TONE.
This switch sends a 400Hz "test signal" to the tuner's output to permit you to adjust recording levels on connected decks, etc.

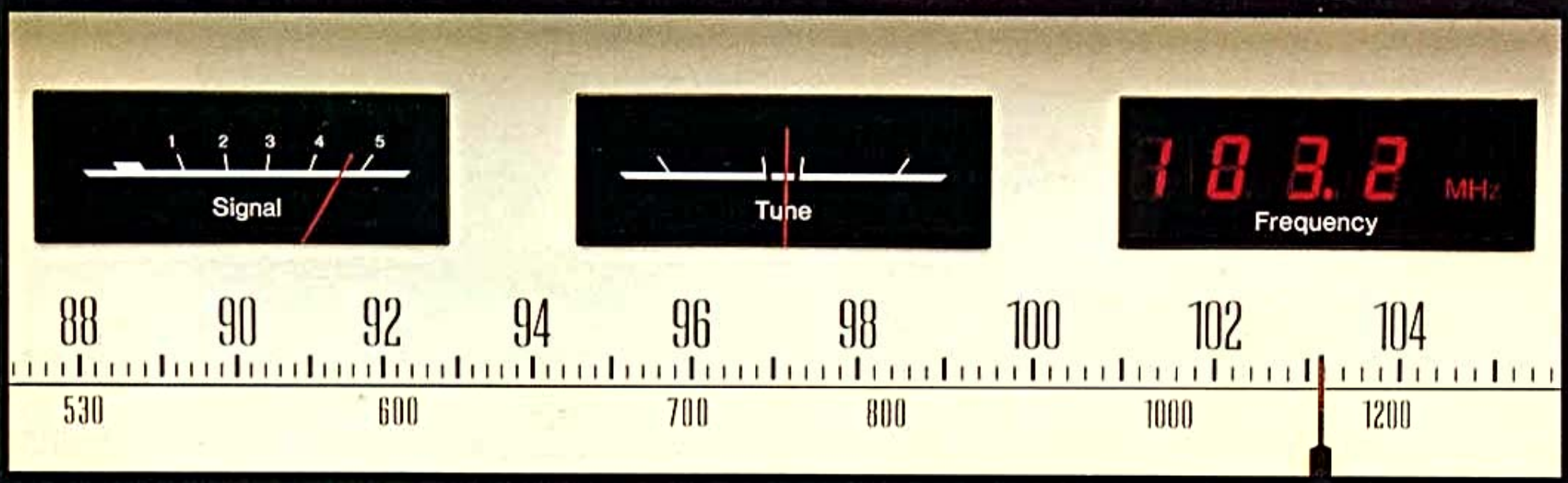
●FM AUTO NOISE FILTER (Pat. Pend.)
FM signals too weak for respectable hi-fi reproduction in stereo are processed for more listenable quality when you use this switch.

●STUDIO-INSPIRED DESIGN—Rack-mountable sizing (brackets for EIA-standards 19-inch rack included) and distinctive Sansui matte-black finish.

●TWIN SIGNAL/TUNE METERS.
Responsive and useful, hard to saturate to indicate false reading.



Patented Digitally Quartz-Locked Tuning.

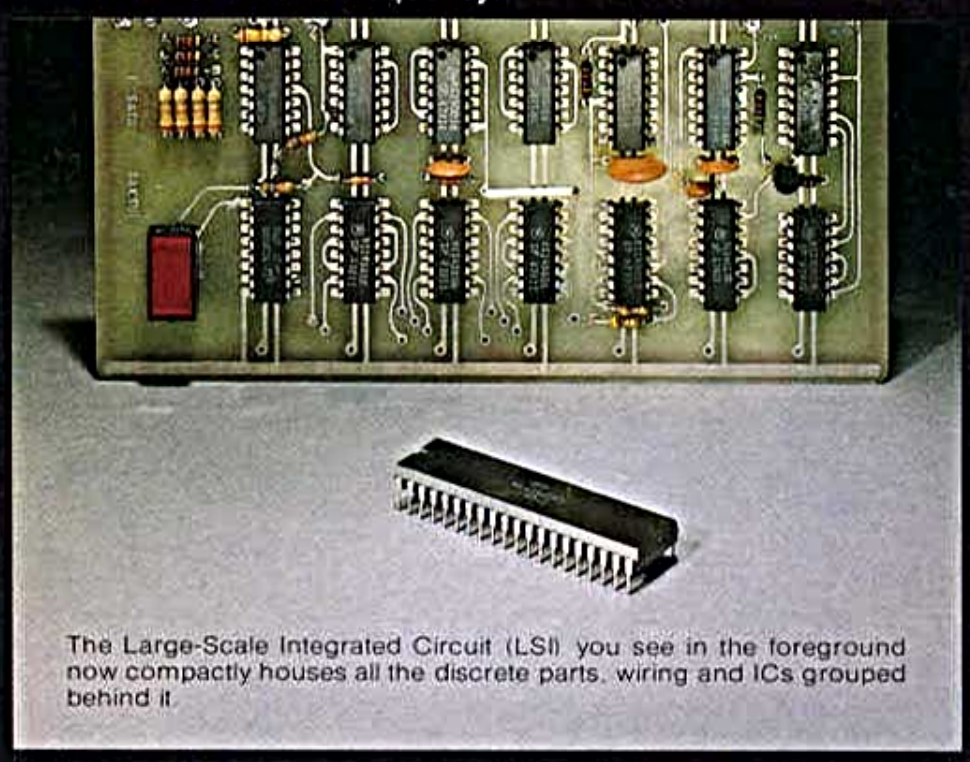


Sansui Exclusive FM Digitally Quartz-Locked System: Contained in a single LSI.

We've combined a quartz crystal, providing a rock-steady reference base, with an error-free digital control in the TU-919. This Sansui-exclusive system detects any tuning error caused by temperature, voltage and humidity changes and compensates for it instantly. Drift is now a thing of the past.

Most other quartz tuners use analog phase reference controls that compare phase of two frequencies between the local oscillators and quartz crystals, in order to check and correct errors (drift). But our TU-919 doesn't; instead it has a digital control system.

With it the frequency counter samples the local oscillator's frequency constantly, once every 0.01 seconds, timed by the accurate quartz. When there's an error, it's converted to digital units, which are then converted to voltage to control the local oscillator. When there's no error, the tuned frequency is locked to the station's frequency.



The Large-Scale Integrated Circuit (LSI) you see in the foreground now compactly houses all the discrete parts, wiring and ICs grouped behind it.

Sansui's digital processing doesn't use the kind of reference signal containing infinite harmonics; therefore, we've eliminated drift without compromising spurious response ratio, signal-to-noise ratio, sensitivity or other important specifications.

Three more features make the Sansui system still easier to use. One, you need not remove your hand from the knob to make sure the station is surely quartz-locked. Two, locking range is wide, even rough tuning locks in the desired station and keeps it locked for hours. Three, should you turn off the tuner, a built-in Re-Lock system memorizes your station for instant recall when you switch it on again.

Sansui has received patents on our Quartz/Digital-Lock System. And to ensure long-term reliability of its operation we've packaged it all in a single LSI (Large-Scale Integrated Circuit) with circuits equivalent to thousands of discrete transistors, resistors and diodes. It can never fail.

Digital Readout: Tuned FM and AM stations are precisely displayed.

If station tuning in the FM frontend of any tuner is off by even the thinnest hair, no following circuitry can restore the hi-fi quality mistuning damages. In the fully state-of-the-art TU-919 we've used the best backup circuitry yet developed to ensure top tonal quality; the new Quartz/Digital-Lock makes sure that backup circuitry gets the chance to prove its worth.

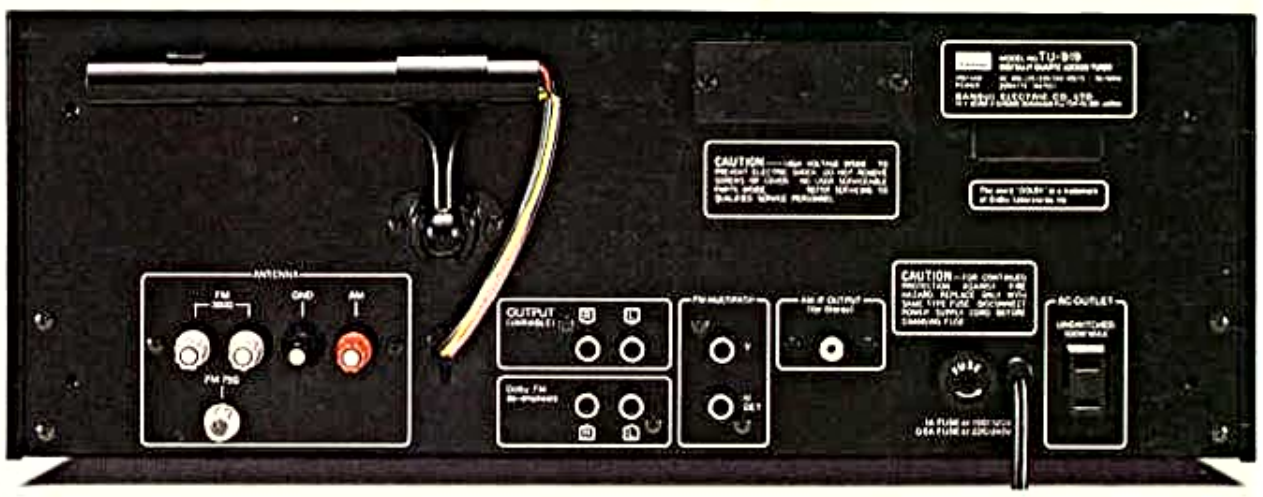
Because digital circuitry can be put to many uses at once, some of the same precision elements in the frequency control system double to provide a digital frequency readout on the front panel of the TU-919. The display has easy-to-read numbers to confirm the selection you've made on the conventional analog scale, as you see from its dial plate.

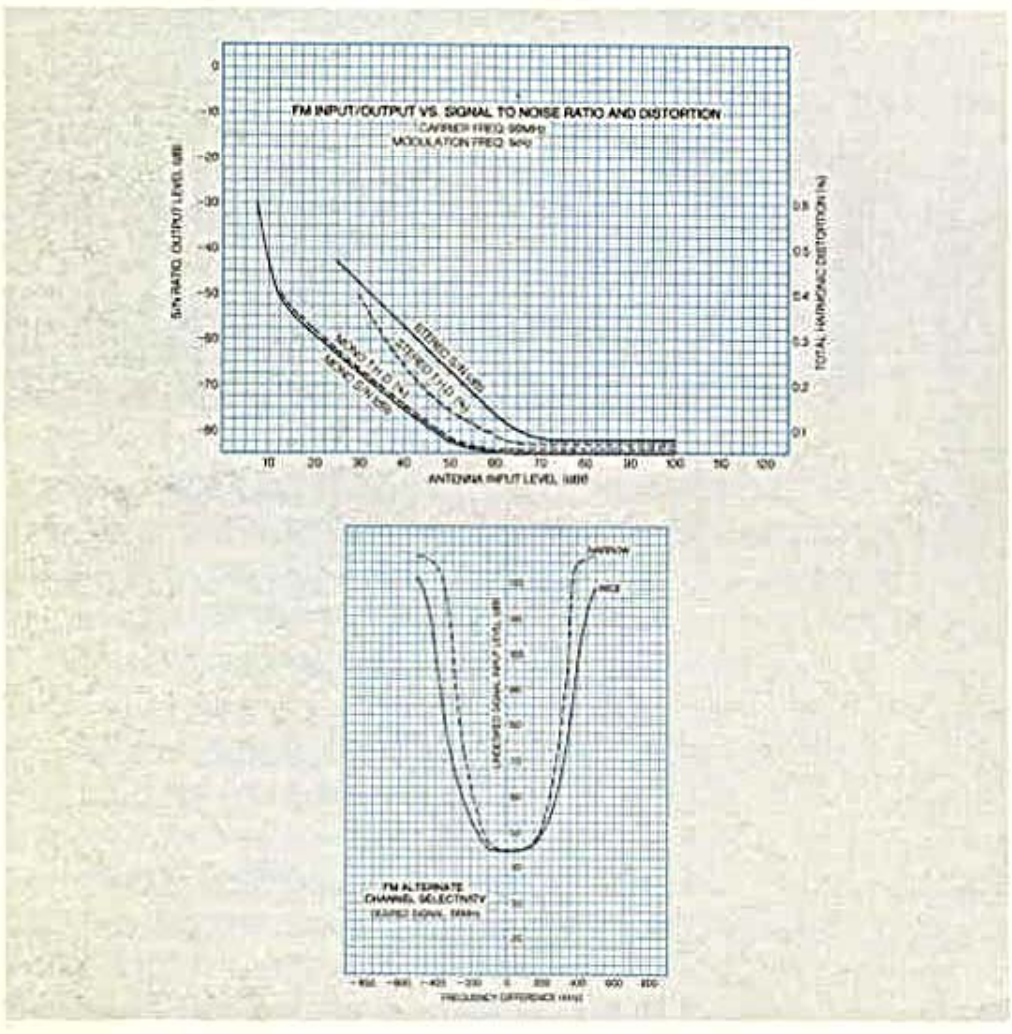
Quartz Locked

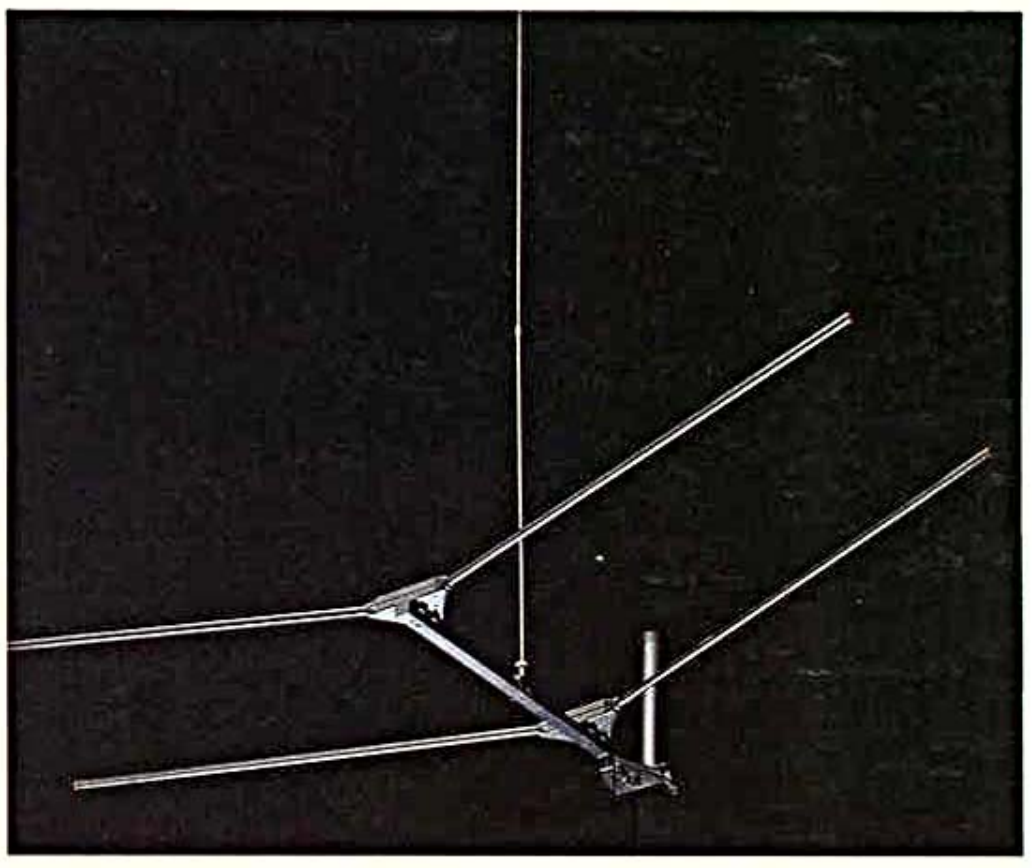
Specifications

FM SECTION	
TUNING RANGE	88 to 108MHz
50dB QUIETING SENSITIVITY	
MONO	12.5dBf
STEREO	34.0dBf
SENSITIVITY	
MONO (IHF)	9.0dBf (1.54μV T-100)
(DIN)	0.95μV
STEREO	15dBf
SIGNAL TO NOISE RATIO	
MONO	83dB (at 80dBf)
	82dB (at 65dBf)
STEREO	80dB (at 80dBf)
	76dB (at 65dBf)
FREQUENCY RESPONSE	
MONO	30 to 15,000Hz +0.2dB, −0.5dB
STEREO	30 to 15,000Hz +0.2dB, −0.5dB
TOTAL HARMONIC DISTORTION	
MONO	less than 0.06% at 100Hz
	less than 0.04% at 1,000Hz
	less than 0.08% at 6,000Hz
STEREO	less than 0.09% at 100Hz
	less than 0.06% at 1,000Hz
	less than 0.15% at 6,000Hz
CAPTURE RATIO	0.9dB
ADJACENT CHANNEL SELECTIVITY	
WIDE	5dB at 200kHz
NARROW	18dB at 200kHz
ALTERNATE CHANNEL SELECTIVITY	
WIDE	50dB at 400kHz
NARROW	80dB at 400kHz
SPURIOUS RESPONSE RATIO	
	110dB at 98MHz
IMAGE RESPONSE RATIO	110dB at 98MHz
IF RESPONSE RATIO	
Balanced	110dB at 98MHz
RF INTERMODULATION	75dB at 98MHz
AM SUPPRESSION RATIO	60dB at 98MHz
STEREO SEPARATION	40dB at 100Hz
	50dB at 1,000Hz
	35dB at 10,000Hz
	30dB from 30 to 15,000Hz
ANTENNA INPUT IMPEDANCE	
	300 ohms balanced
	75 ohms unbalanced
OUTPUT VOLTAGE AND IMPEDANCE	
Variable	1V, 2.5k ohms
Dolby FM	200mV, 9k ohms
AM SECTION	
TUNING RANGE	530 to 1,600kHz
SENSITIVITY (Bar Antenna)	47dB/m at 1,000kHz (220μV/m)
SELECTIVITY	35dB at 1,000kHz
SIGNAL TO NOISE RATIO	50dB
TOTAL HARMONIC DISTORTION	
	less than 0.35% at 30% Mod. 80dB/m
IMAGE RESPONSE RATIO	70dB at 1,000kHz
IF RESPONSE RATIO	70dB at 1,000kHz
GENERAL	
AC OUTLETS	unswitched total 100 watts
POWER REQUIREMENTS	
POWER VOLTAGE	100, 120, 220, 240V 50/60Hz
POWER CONSUMPTION	22 watts
SEMICONDUCTORS	73 Transistors; 57 Diodes; 6 FETs; 16 ICs
DIMENSIONS	430mm (16 9/16")W
	168mm (6⅝")H
	402mm (15⅞")D
with Rack-mounting Adaptors	
	482mm (19")W
	168mm (6⅝")H
	419mm (16½")D
WEIGHT	9.6kg (21.2lbs.) Net
with Rack-mounting Adaptors	
	9.8kg (21.6lbs.) Net
	11.6kg (25.6lbs.) Packed

- The FM performance of this model is measured pursuant to the new Institute of High Fidelity standard, IHF-T-200, except specifications with the legend IHF-T-100.
- Digitally Quartz-Locked System: U.S. Pat. No. 3991382.
- For European models, some specifications might change to comply with local safety regulations and standards.
- Design and specifications subject to change without notice for improvements.







FA-7 FM/AM Compatible Antenna System by Sansui
World's first FM/AM compatible antenna system (Pat. Pend):
Both FM and AM reception is possible with one antenna and one cable, connected to receiver/tuner's FM/AM terminals.

Sansui

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Printed in Japan (A9003K)