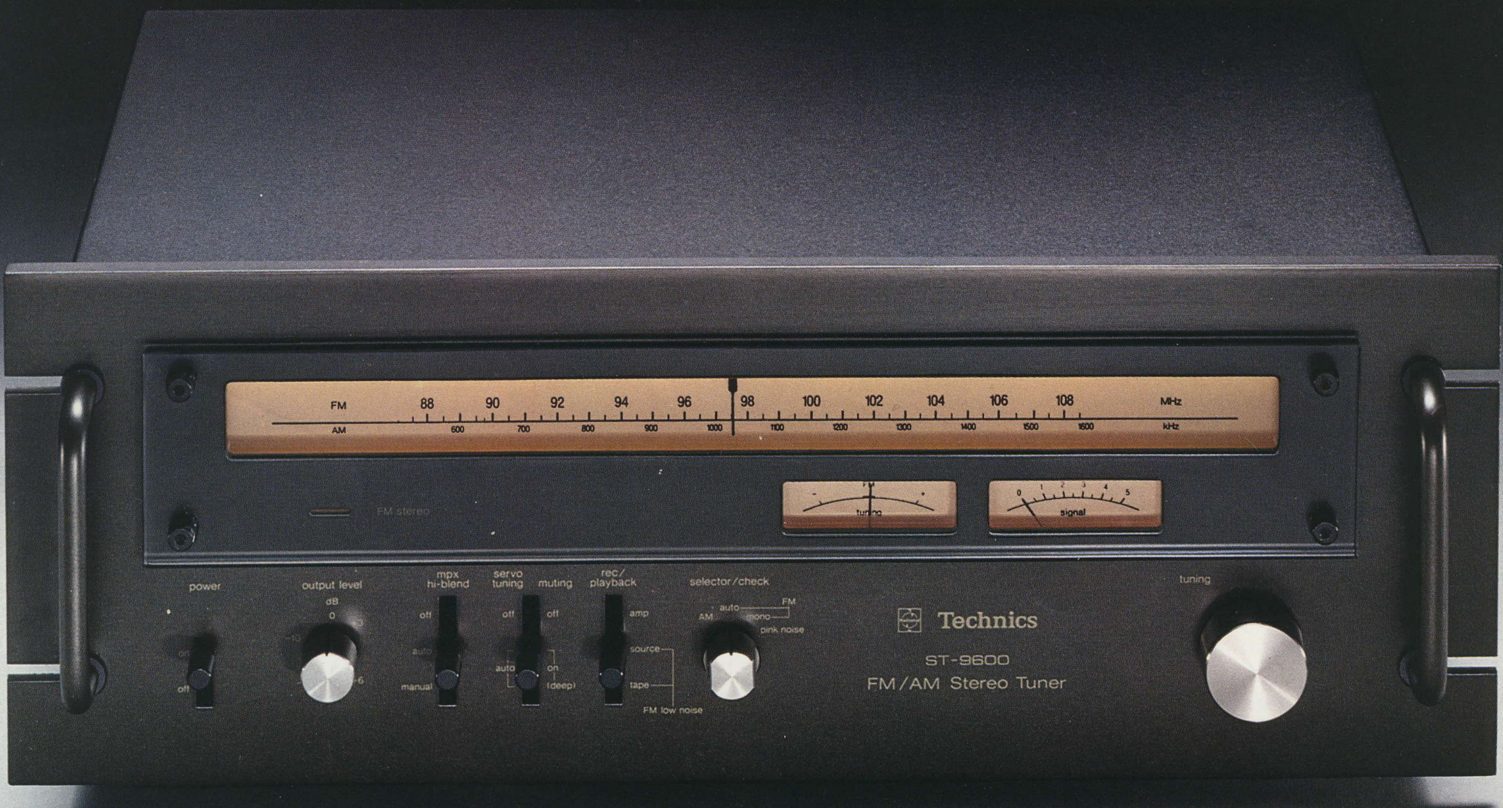
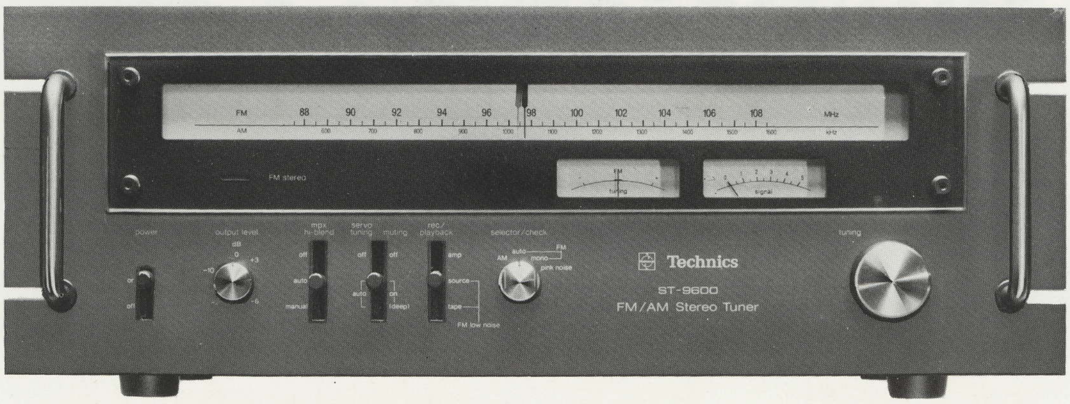
Technics ST-9600
FM/AM Stereo Tuner



ST-9600 FM/AM Stereo Tuner



Frequency response 20 Hz～18 kHz, +0.2 dB, −0.8 dB, alternate channel selectivity 85 dB, sensitivity at ±40 kHz deviation 0.9 μV (S/N 30 dB, 75 Ω).

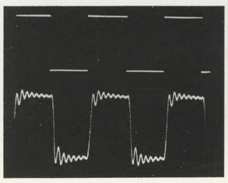
The Specifications Are Impressive. What They All Add up to Is Waveform Fidelity.

Although it shouldn't seem new, the exceptional "clean sound" from Technics ST-9600 stereo tuner certainly sounds new. The guiding principle behind the design of Technics latest series of high fidelity components has been "true-to-the-original," and certainly no stone was left unturned in an all out effort to eradicate all sources of noise from FM reception. Any further improvements will have to be made by the broadcasting stations themselves.

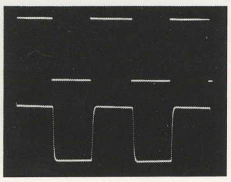
A Technics exclusive 19 kHz pilot filter extends the flat frequency response right up past the 18 kHz barrier, while ceramic "Flat Group Delay" filters have ironed out the noise inducing time delay kinks. And Technics true-to-the-original line of thinking has also been applied to tape recording, resulting in direct FM-to-deck recording facilities for almost perfect recording and servo tuning for accurate, drift-free FM reception.

Whichever way you listen, the full tonal beauty and richness of FM broadcasts is kept true to the original by Technics latest pride, the ST-9600 stereo tuner.

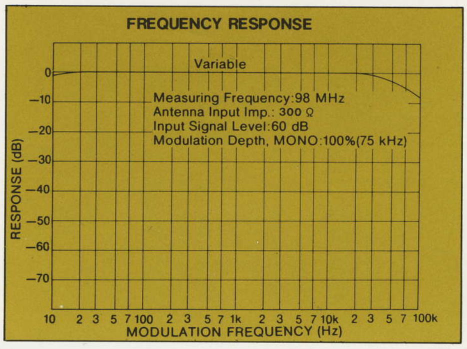
Conventional



ST-9600



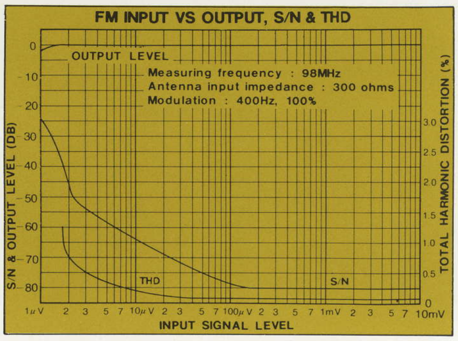
Flat Frequency Response Extended to 18 kHz
Technics new exclusive 19 kHz pilot cancel circuit cuts out the FM 19 kHz pilot with almost razor sharp precision. The result: a flat frequency response right up into the 18 kHz range—a feat simply not possible with the regular run of "fine" filters which inevitably resulted in loss of some of the high frequency signals of the actual FM program. This breakthrough by Technics engineers has not resulted in any loss of response linearity, either (+0.2～−0.8 dB for full 20 Hz～18 kHz range). Nor is there any increase in carrier leak (held down to the remarkably low figure of −65 dB at 19 kHz).



Flat Group Delay Filters Eliminate Another Problem Area
Another major reason why Technics engineers have been able to present true-to-the-original, clean sound lies in their success in eliminating time delay differences in the IF stage. Conventional tuners never really properly fulfiled the two basic, but conflicting condition for "clean sound" in the IF stage. The IF stage must select with optimum sharpness, and then amplify the group of frequencies constituting the signal broadcast from the FM station. But it must do this without introducing any distortion, cross-modulation or any other undesirable signal components. The very sharp selectivity attained by regular ceramic filters unfortunately introduces a time lag at this stage. This would not matter if all components of the signal group were delayed by the same amount, because the original time relation would be maintained. And this is exactly what the Flat Group Delay ceramic filters produced by Technics engineers have been designed to do.

The precise dimensioning of these filters gives a selectivity rating of an astounding 85 dB, while the excellent limiting effect of the IF amplification is instrumental in providing an equally impressive signal-to-noise ratio of 80 dB (IHF). Distortion in stereo mode is an inaudible 0.25%. These data amply corroborate the claim that the ST-9600 is one of the cleanest sounding tuners today.

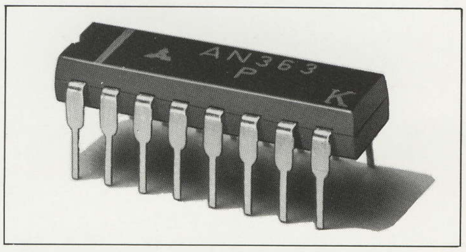
New Type Tuning Capacitor
The front end of a tuner largely determines its performance as a receiving instrument, especially in such factors as reception sensitivity and rejection of such unwanted components as image, IF, and spurious signals. This newly developed 8-ganged tuning capacitor (5-ganged for FM and 3-ganged for AM) with extremely good temperature and aging stability, plus the 4-pole MOS FET equipped RF amplification stage are combined in a tuning circuit with spectacular results.



0.9 μV (S/N 30 dB, 75 Ω) sensitivity, IF rejection of 105 dB and a spurious rejection of 100 dB—figures which give you excellent freedom from noise and cross-modulation as well as extremely high sensitivity and overload resistance.

Similar care has been taken with the oscillator and mixer stages to remove even the slightest hint of noise, producing a degree of reception performance unmatched by any other tuner—even with the faintest of station signals. Inputs for 300 Ω antenna feeder line are also provided.

PLL FM Stereo Decoder
The 38 kHz time switching signal for decoding the two channels of FM MPX (stereo) broadcasts is supplied by the most advanced, stable method known: PLL or Phase Locked Loop. A "phase comparator and feedback" technique, PLL assures invariable, rigidly locked coincidence of input and output phase to give clear-cut channel separation at all frequencies and regardless of temperature changes.



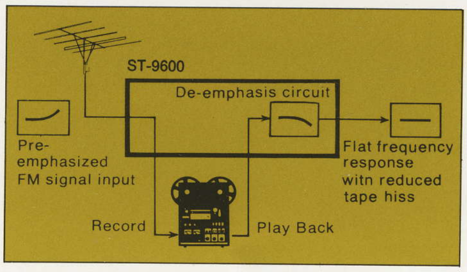
FM stereo separation and distortion are largely affected by the performance of FM MPX stereo demodulator. Technics incorporates PLL circuitry which supplies stable switching signal and double-differential switching circuit into an IC. This assures excellent FM stereo separation (45 dB at 1 kHz, 35 dB at 10 kHz).

Elaborate IF Control Circuit
In pursuit of waveform fidelity, control signal path and the main signal path are separately installed to prevent mutual interference. The muting signal comes out of the AND circuit installed after narrow and wide band double tuning circuits.

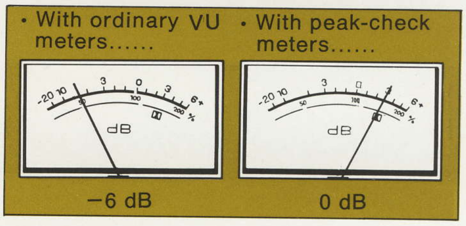
A reed relay, which acts quickly, quietly, reliably and with minimum switch bounce, provides positive activation of the muting function to suppress inter-station tuning noise. Application of this action to the audio-frequency stage, instead of preceding circuitry, reduces still further the possibility of a transitional noise pulse in changes between the muted and non-muted conditions. A separate circuit for muting avoids loading of the main signal path, thus avoiding the chance of introducing distortion.

Two-Step Muting Coupled with Servo-Tuning Circuit
Servo-tuning is a unique technique that assures completely drift-free, stable tuning to an FM station. Unlike the AFC circuit found on tuners in the past, the servo-tuning circuit employs a switching and charge/discharge cicuit, dealing with any DC components in the detector digitally. This contributes to drift-free servo-tuning without distortion problems. On/off switching of the servo-tuning functions is combined with the FM muting switch. Two muting positions provide a choice of two different threshold levels—at "muting deep," only strong, clean, "stereo-worthy" stations are received.

Low Noise FM to Tape Recording and Rec Level Adjustments
Technics engineers have also come up with a means of eradicating a lot of noise from tape recording. In this method, the ST-9600 is connected directly to the tape recorder, bypassing the amplifier. This means that the FM signal, pre-emphasized by the broadcasting station, is recorded with its high frequency portion still boosted. Playback and tape monitor signals are then channeled back to the tuner and through its de-emphasis circuit to recover the original flat frequency response. The result is greatly reduced tape hiss, since the de-emphasis circuit reduces the tape's inherent noise as well.



When taping FM programs, accurate level adjustments can be quite a problem. But not with the ST-9600. The built-in pink noise generator provides automatic and accurate level adjustments. Simply switch over to the tuner pink noise position, and then set the tape deck's recording level to −6 dB (or +3 dB for tape decks with peak check meters). Pink noise can also be used in speaker coloration checks and phasing checks.

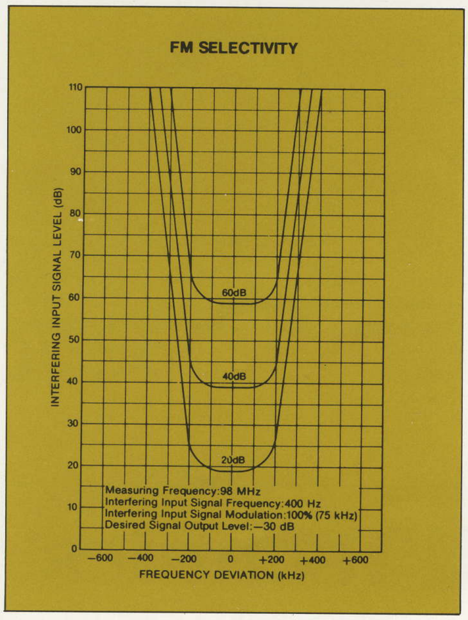


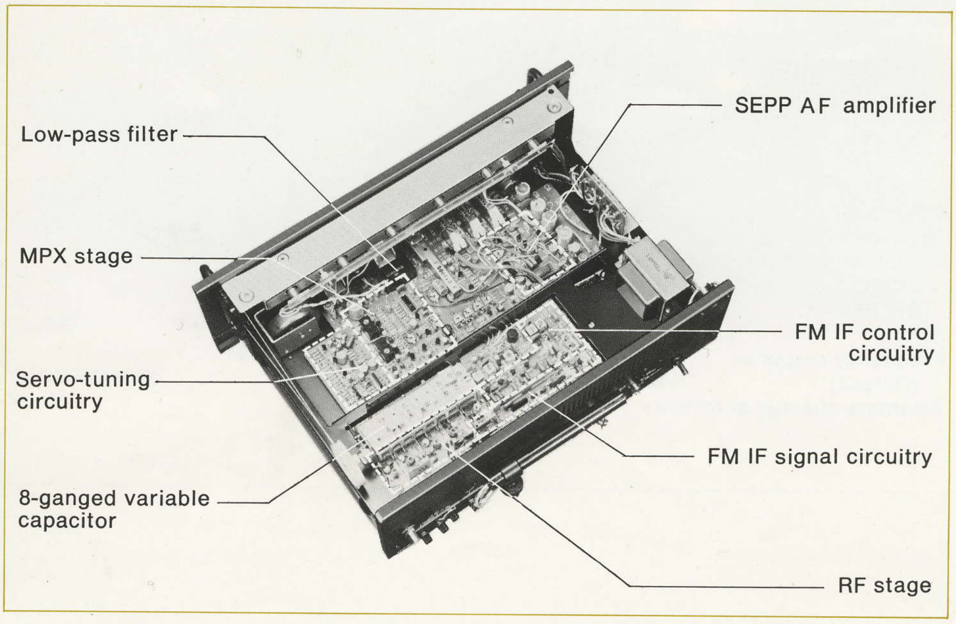
Two Tuning Meter, Linear Indication of Actual Signal Strength
Conventional signal strength meter often reaches peak deflection while the signal is relatively weak. In the ST-9600, the meter features an extremely wide range of linearity, giving a precise indication of how strong the radio signal really is. A great help in optimizing antenna position and direction. A zero-center meter indicates precise center-of-channel tuning on FM.

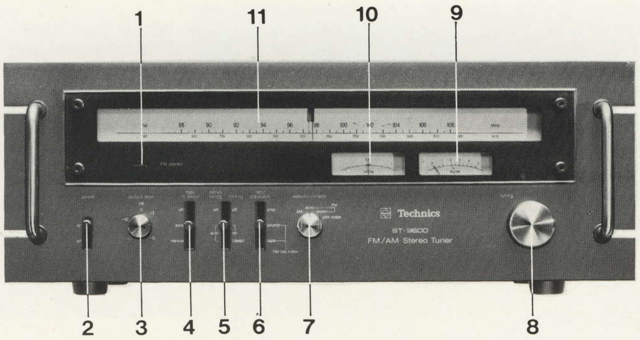
Automatic Hi-Blend
With weak stereo stations, it's sometimes better to sacrifice a little stereo separation in high frequency range and get better signal-to-noise ratio. The Hi-Blend circuit accomplishes this. The circuit is activated automatically in accordance with signal strength or manually.

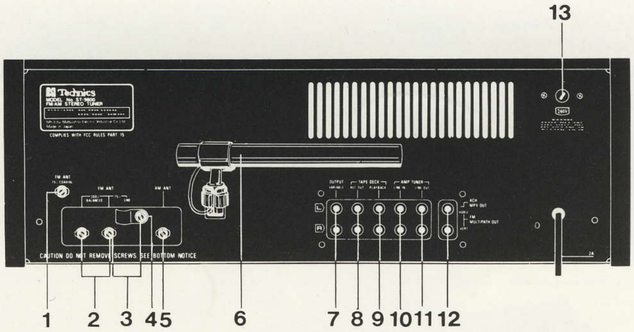
High Grade Audio Amplifier with Balanced Power Supply
No skimping in the audio amplifier section (where other tuners often cut corners). The ST-9600 features a true audio amplifier with balanced positive/negative power supply for greatest stability and true SEPP (single ended push-pull) output stage, like an elaborate preamplifier.

Variable Output Level, up to +6 dB
There are two pairs of output jacks: fixed and variable. The voltage of the variable outputs can be freely adjusted within 0.077–1.55 volts. You can precision-match the tuner output to that of other system components, obtaining the same listening level from all.









1. FM stereo indicator
2. Power on/off switch
3. Output level control
4. MPX hi-blend switch
5. Servo tuning/Muting switch
6. Rec/playback switch (FM low noise)
7. Selector/check switch
8. Tuning control
9. Signal-strength meter
10. FM center-tuning meter
11. FM/AM tuning dial

1. Terminal for FM antenna 75Ω coaxial cable
2. FM antenna terminals (300Ω)
3. FM antenna terminals (75Ω)
4. Ground terminal
5. AM antenna terminal
6. AM ferrite bar antenna
7. Variable level outputs
8. Tape deck REC outputs
9. Tape deck PLAY inputs
10. Line inputs (AMP to TUNER)
11. Line outputs (TUNER to AMP)
12. 4-channel MPX output & FM multipath outputs
13. Voltage adjuster

Technical Specifications

DIN 45 500

FM TUNER SECTION	
Frequency range	88～108 MHz
Antenna terminals	300 Ω (balanced)
	75 Ω (unbalanced)
Sensitivity at ±40 kHz deviation	
	1.8 μV, S/N 30 dB, 300 Ω
	1.4 μV, S/N 20 dB, 300 Ω
	0.9 μV, S/N 30 dB, 75 Ω
	0.7 μV, S/N 20 dB, 75 Ω
Total harmonic distortion (400 Hz, 100% modulation)	
MONO	0.15%
STEREO	0.25%
S/N at ±40 kHz deviation	
MONO	75 dB
Frequency response (Output)	20 Hz～18 kHz, +0.2 dB, −0.8 dB
Alternate channel selectivity	85 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	95 dB
IF rejection at 98 MHz	105 dB
Spurious response rejection at 98 MHz	100 dB
AM suppression	55 dB
Stereo separation 1 kHz	45 dB
10 kHz	35 dB
Leak carrier 19 kHz	−65 dB
Limiting point	1.2 μV
Bandwidth	
IF amplifier	250 kHz
FM demodulator	820 kHz
AM TUNER SECTION	
Frequency range	525～1605 kHz
Sensitivity	30 μV
Selectivity	25 dB
Image rejection at 1,000 kHz	80 dB
IF rejection at 1,000 kHz	85 dB
GENERAL	
Output voltage	
Variable	0.077～1.55 V
Fixed	0.6 V
Power supply	110 V/120 V/220 V/240 V
Power consumption	25 W
Dimensions (W × H × D)	450 × 173 × 362 mm ($17\frac{23}{32}$" × $6\frac{13}{16}$" × $14\frac{1}{4}$")
Weight	8.7 kg (19.2 lb.)

IHF

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National Technics
Matsushita Electric

Specifications are subject to change without notice for further improvement. Printed in Japan