

Technics SA-700

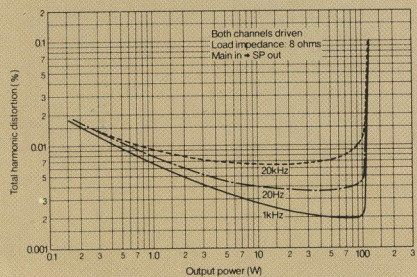
FM/AM Stereo Receiver



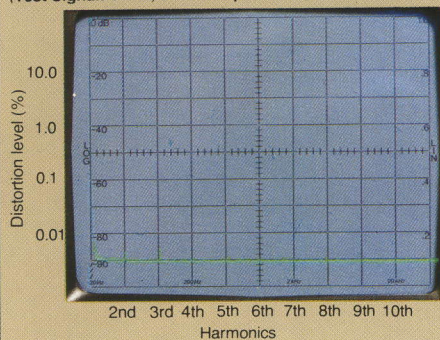
SA-700 FM/AM Stereo Receiver

The sound and performance of the SA-700 are just as spectacular as its specifications suggest. It also incorporates a very generous array of features, including Technics' new Acoustic Control, two-way tape dubbing, and peak-power LED's. And with this superb combination of performance and features, it is offered at a reasonable price. The SA-700 is both an audiophile-class component and an incredible value.

Output Power vs Total Harmonic Distortion



Power Output Distortion Spectrum
(Test Signal: 1 kHz, 0 dB = Output Voltage at Rated Power)



100 watts per Channel

The SA-700 is capable of generating 100 watts per channel, minimum continuous power into 8 ohms, from 20–20,000 Hz, with no more than 0.04% total harmonic distortion. On a short-term (rather than continuous) basis, it can put out more than its rated power without clipping, enabling it to faithfully render high-amplitude musical peaks.

0.04% Total Harmonic Distortion

In the past, 0.04% total harmonic distortion at full power was found usually only in the best separate power amplifiers. But now, thanks to increasingly advanced technology, Technics has brought this level of performance to receivers. Naturally, this required very careful design of every stage affecting the power amplifier's performance.

Large, well-regulated power supply

Use of a large, low-impedance power transformer contributes to the SA-700's excellent stability under highly dynamic conditions. Two 15,000 µF electrolytic capacitors are employed, one on each side of the power supply, to maintain regulation and provide reserve power for handling high-intensity musical peaks and deep-bass signals.

Current-mirror loaded differential stage

In the differential stage, current-mirror loading doubles signal gain without increasing noise and distortion. A single-packaged transistor pair is employed because of its precise thermal tracking under changing ambient temperature conditions.

Parallel push-pull, pure complementary output stage

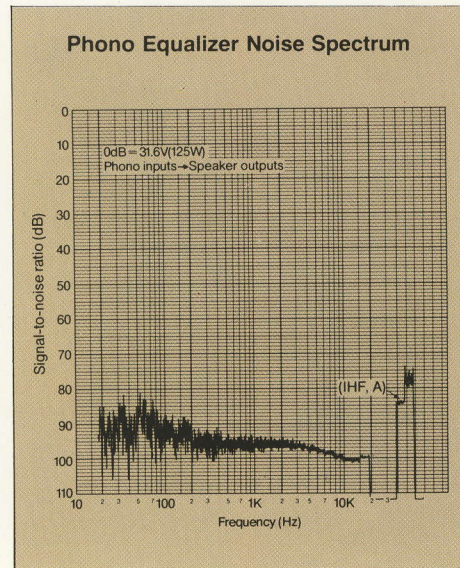
Four high-power transistors are used in each channel in a parallel push-pull, pure-complementary configuration. The output stage is of course OCL (output capacitor-less) which helps to achieve tight, low-distortion deep bass response.

Quality control and circuit techniques

Large-scale, intensive analysis is continually conducted in Technics' labs to discover the best and most efficient circuit configurations, whether in discrete or IC formats. And when electronic elements of specific values and tolerances are needed, Technics can design them to exact standards and maintain strict quality control in their manufacture. To a very large extent, such extensive research and sophisticated manufacturing facilities make it possible for us to design and produce a superb power amp like the SA-700's, while maintaining a reasonable cost to the consumer.

Phono Equalizer Stage—Accuracy Combined with Very Wide Dynamic Range 83 dB S/N Ratio

With a reference signal of 2.5 mV, the phono signal-to-noise ratio is an extraordinary 83 dB (IHF, A). Which means that for all practical purposes, the circuit is silent. It is made possible largely by the use of a Technics developed low-noise transistor (M47LP), which has the noise-reduction properties of several conventional transistors connected in parallel. Maximum input at 1 kHz, RMS is 200 mV. This voltage-handling capacity is aided by use of a separate positive/negative power supply for the phono stage. It is unlikely that even the most sensitive magnetic cartridges will overload the



phono section. Finally, RIAA equalization is kept within a tolerance of ± 0.2 dB, thanks to use of 1% tolerance metal-film resistors and 2% tolerance polypropylene capacitors.

Acoustic Control

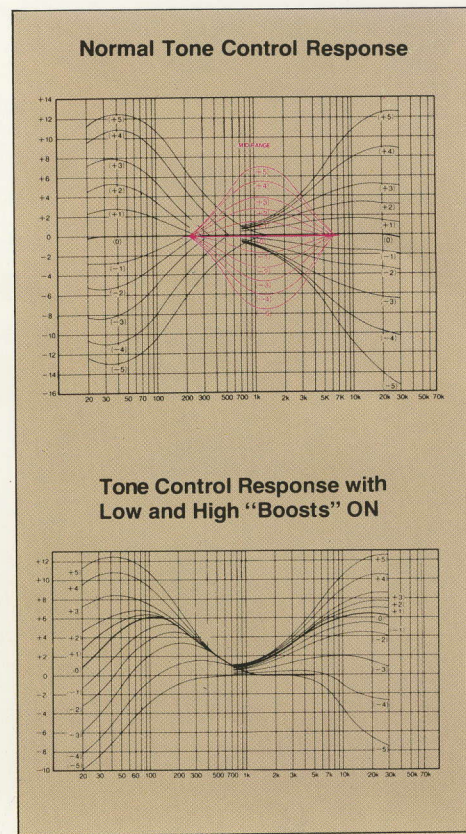
The SA-700's Acoustic Control combines the functions of low-distortion Baxandall-type bass, midrange and treble controls with "Boost/Filter" switches for the bass and treble ranges. Together, these controls give much greater flexibility in tone-tailoring than is possible with conventional tone controls:

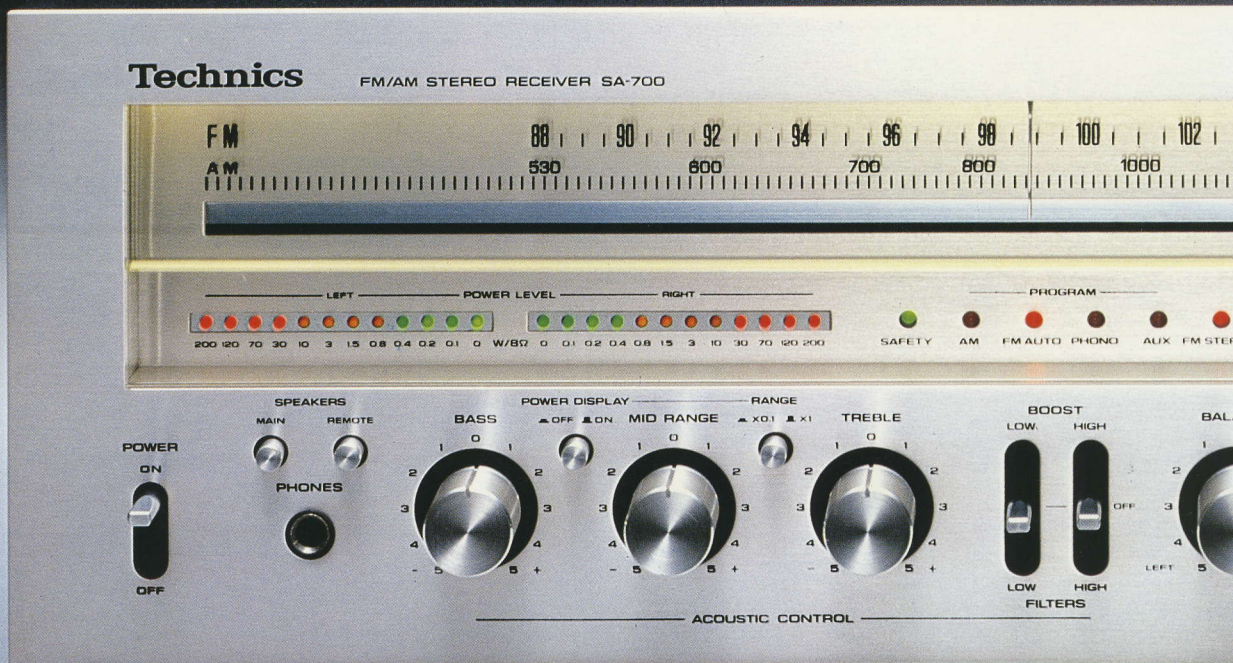
Low and High Boost/Filter Switches

With the bass control left "flat", the "low boost" switch injects a peak at about 100 Hz which accentuates drums and bass instruments. Then, if you adjust the bass control, the location and amplitude of the peak changes. You can therefore get a very wide range of bass tonalities. The "high boost" creates a shelved response in the upper midrange and treble, which brightens the overtones of voices and instruments. Again, adjustment of the regular treble control will further change tone balance in this range. In the filter positions, 6 dB/oct roll-offs are created, beginning respectively at 100 Hz and 7 kHz. You would use these to suppress subsonic signals from warped records, or high-frequency noise in the program material.

Combinations

You can use any of these controls independently, or none at all if you wish. But very often, you'll find that you can achieve subjectively better sound with combinations of settings—e.g. high "boost" in, regular treble control decreased. The chart below will give you an idea of the possibilities.





LED Peak-Power Indicators

A string of 24 LED's, 12 per stereo channel, light up to indicate peak power output being generated by the receiver. LED's were used instead of mechanical power meters because they are faster-acting, and can therefore give a more accurate indication of power peaks. For higher power levels, orange and red lights are used. When the red lights are flashing, this indicates that you are approaching clipping levels, so care should be taken with any further increase in volume. By using the range switch, you can cause the LED's to read ten times the level actually being generated. At this more sensitive setting, channel balance and separation can be readily checked. And even when you're not using the LED's for a specific purpose, you can still enjoy their beautiful visual effect.

Protection Circuitry

If DC voltage should appear at the speaker terminals, relays isolate the speakers from the circuit and a green LED goes out on the front panel. Fuse protection is provided against damage from dangerously low speaker impedance or short-circuits in the speaker connections.

Amp/Preamp Convenience and Operating Features

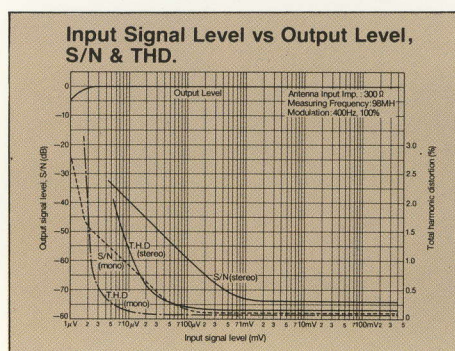
• Two tape monitors with two-way dubbing. You can connect two tape decks to the SA-700, or add external processors such as an

equalizer. When two decks are connected, you can record from either deck to the other. And you can listen to another sound source (such as a record or the tuner) while dubbing is in progress.

- Pre-Out/Main-In terminals. Permits separate use of preamplifier or power amplifier sections. External processors can be placed here to avoid using up a tape monitor.
- Main and remote speaker connections.
- Stereo/mono mode switch.
- Loudness switch.
- Front-panel program-source indicators.
- Click-stop volume, balance and tone controls.
- "Pop-Noise Muting" eliminates pops or thumps in speakers when power is turned on or off.

TUNER SECTION

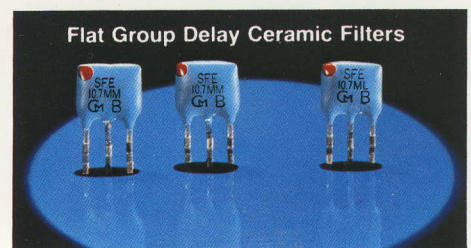
MOS FET FM Front End

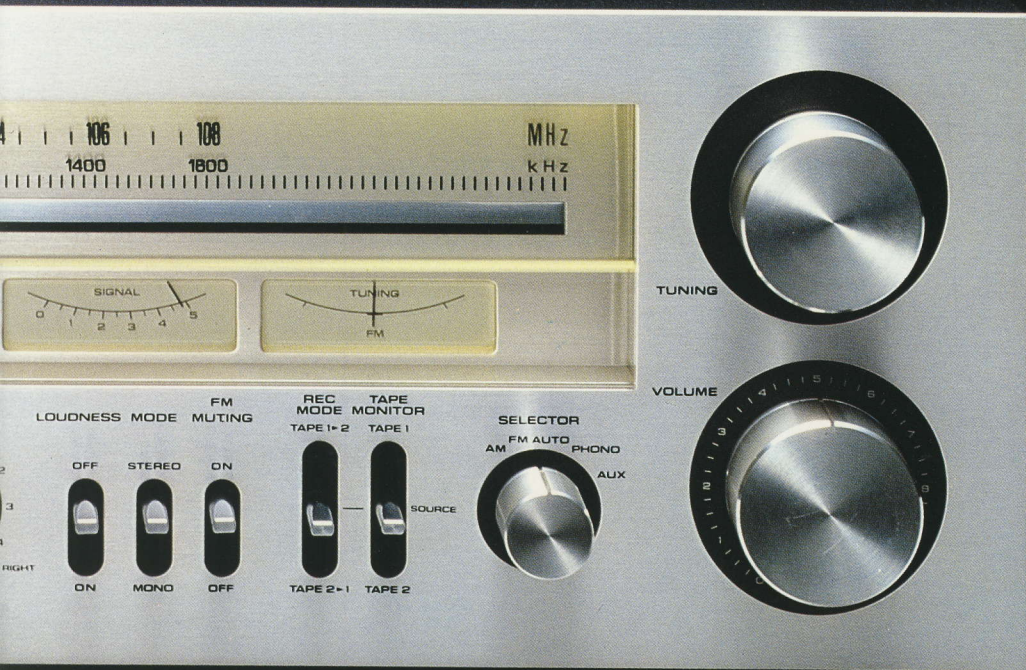


A 4-pole dual-gate MOS FET is used for RF amplification. Not only does this MOS FET exhibit the usual qualities of high sensitivity and high tolerance to strong signals; it is extremely low-noise as well (noise figure of less than 4.5 dB) with low internal capacitance (less than 0.05 pF). A junction FET is used as a buffer amp between the mixer and local oscillator to prevent mutual interference between them. The FM front end elements are contained in a 4-gang linearly variable tuning capacitor which achieves superb sensitivity, selectivity, quieting and interference rejection.

IF Stage Employing "Flat Group Delay" Ceramic Filters

The five-stage IF section includes three 2-element "Flat Group Delay" ceramic filters. These filters contribute significantly to the tuner's 80 dB selectivity. At the same time, they exhibit excellent phase characteristics, which is important for audio quality, particularly in the high frequencies. Differential amplifiers, incorporated into high-linearity IC's, provide uniform gain and excellent AM suppression.





High-Linearity Quadrature Detector

A high-linearity quadrature detector with broad peak-to-peak range plays a key role in obtaining wideband, linear frequency response and low distortion. It can easily handle excessively modulated broadcast signals without significant distortion or loss of high frequencies. This wide tolerance assures linear operation with virtually any signal you're likely to receive.

Phase-Locked-Loop (PLL) Multiplex Stage

A PLL IC keeps the switching signals generated by the tuner in precise phase with the pilot and subcarrier signals generated by the broadcast station. The result is very stable FM stereo performance, with wide separation maintained well into the high audio frequencies for a very striking stereo image. The PLL helps maintain low distortion as well, and its performance will not deteriorate with changing ambient temperature and humidity conditions. Use of an IC removes the need for periodic realignment of the MPX stage.

FM Frequency Response: 20-15,000 Hz, +0.2-0.8dB

Painstaking attention to circuit design enables the SA-700's FM tuner to achieve a very wide, flat frequency response—nearly ruler-flat over

the standard FM audio frequency bandwidth. Its excellent high-frequency extension is partially attributable to use of a Chebyshev-type low-pass filter which suppresses the 19 kHz pilot signal by 65 dB, yet has a very minimal effect in the highest audio frequencies. At 15 kHz, response is down only 0.8 dB, and time-delay is an insignificant 5.5 microseconds at this point.

Quality AM Section with IC

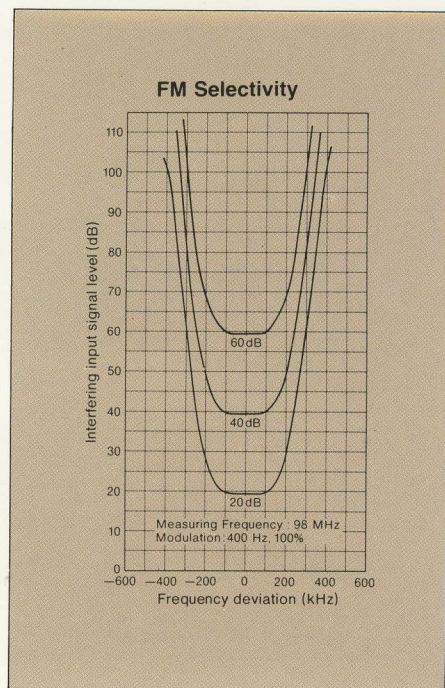
Although you will probably prefer FM for serious listening, you can also expect good AM performance from the SA-700. Most of the important circuitry is incorporated into a reliable IC. Triple-tuned coils in the IF section provide good selectivity. While AM won't match FM in terms of clarity and frequency response, the SA-700's AM section will nonetheless provide very good performance.

Tuner Convenience and Operating Features

- Mirror-reflection FM/AM tuning scale and smoothly operating flywheel dial facilitate pinpoint tuning.
- Two tuning meters: signal-strength for FM and AM, center-of-channel for FM. Unlike many signal-strength meters, the SA-700's shows maximum readings only with very strong (65 dBf) signals. This makes it an excellent aid for orienting your antenna.
- FM muting. Double-muting action, applied both in the IF stage and after the MPX stage,

provides smooth transition between mute and non-mute conditions, without the loud thumps often heard in muting circuits.

- Jacks for adding future FM quad and AM stereo adaptors.
- Terminals for 75 and 300 ohm FM antennas. AM bar antenna.



0.2%

±0.8 dB, IHF)

±1.5 dB, IHF)
80 dB
1.0 dB
85 dB
100 dB
100 dB
60 dB

45 dB
35 dB

±1.5 dB, IHF)

±1.5 dB, IHF)
1.2 μV

180 kHz
300 kHz
(lanced),
(lanced)

305 kHz
0 μV/m
35 dB
50 dB
45 dB

850 W
0/240 V
3/60 Hz
390 mm
11/32")
35.5 lb)



made in Japan

Massive Power, with the Subtleties that Define Sonic Excellence

The SA-700 is a very powerful receiver, and it delivers its power with astonishing cleanness. On the basis of power alone, it will appeal to the serious audiophile, because it can deliver dynamic range that lesser-powered receivers aren't capable of.

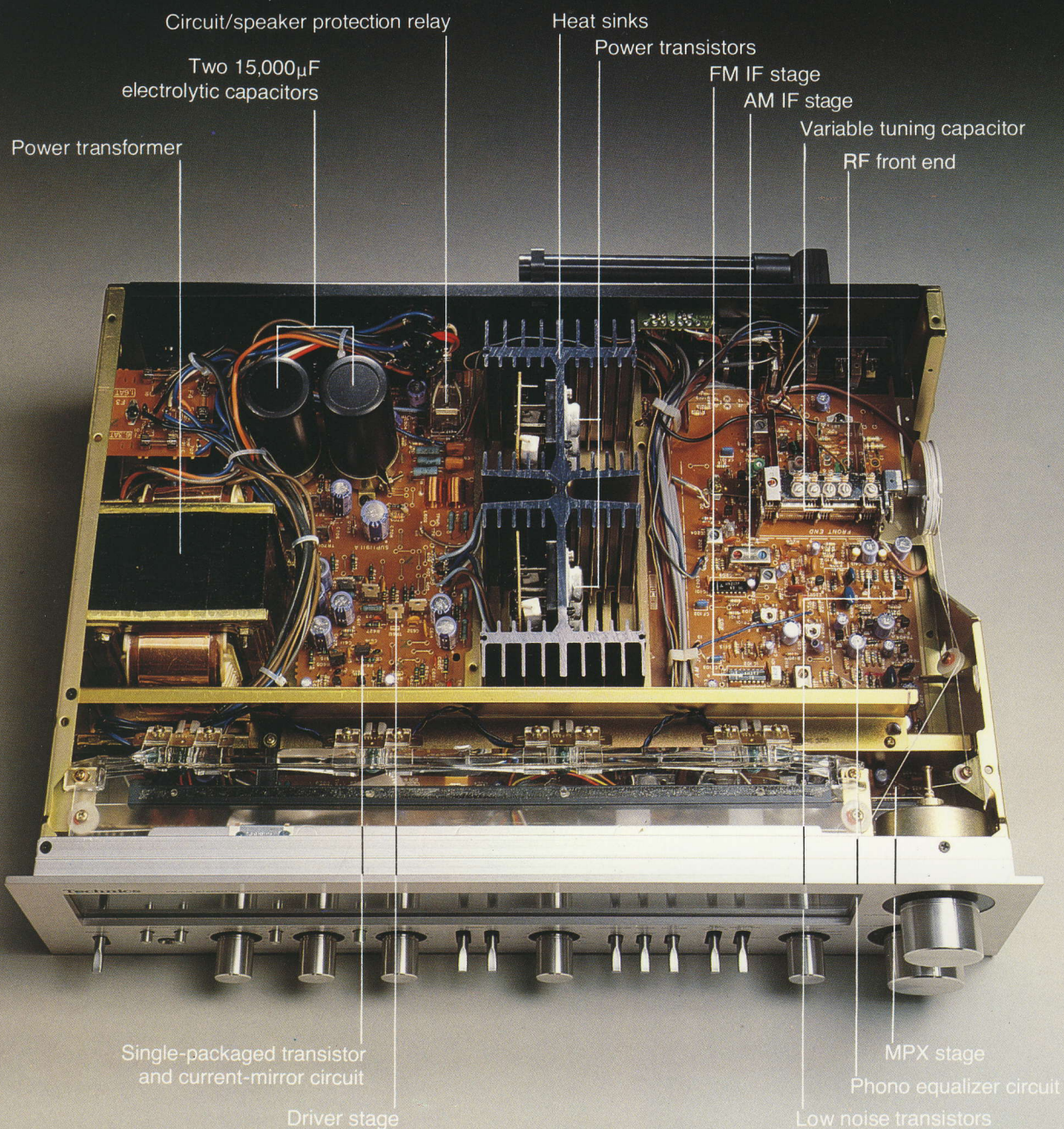
But the SA-700's sonic excellence goes beyond the clarity and dynamic range that high power can provide. For example, the phono equalizer stage is extremely accurate and quiet, as demonstrated by its ± 0.2 dB RIAA equalization and its 83 dB signal-to-noise ratio.

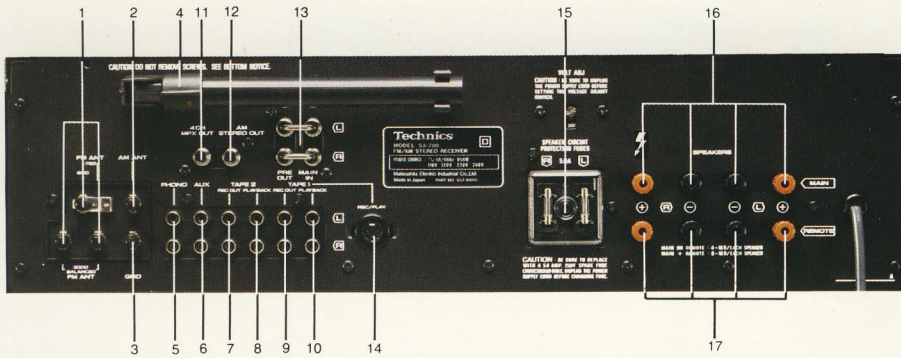
The tuner section's specifications are just as

impressive. But more important, it exhibits excellent waveform fidelity. This is made possible by careful overall design and by use of "flat group delay" ceramic filters in the IF section.

The Acoustic Control gives you possibilities for sound tailoring that conventional tone controls don't provide. And such features as two-way tape dubbing, an LED power display and others give you considerable flexibility.

Tremendous, clean power. Meticulous overall design. And a generous complement of features. The SA-700 combines all of these in one package, at a surprisingly manageable price.





1. FM antenna terminals (75Ω, 300Ω)
2. AM antenna terminal
3. Ground terminal
4. AM ferrite bar antenna
5. Phono inputs
6. AUX inputs
7. Tape deck 2 REC outputs
8. Tape deck 2 PLAY inputs
9. Tape deck 1 REC outputs
10. Tape deck 1 PLAY inputs
11. 4ch MPX output
12. AM stereo output terminal
13. Pre-out/main-in terminals
14. Tape deck 1 REC/PLAY terminal
15. Speaker/circuit protection fuses
16. Speaker terminals (main)
17. Speaker terminals (remote)

Technical Specifications (DIN 45 500)

AMPLIFIER SECTION

20 Hz~20 kHz continuous power output both channels driven	110 W×2 (4 Ω) 100 W×2 (8 Ω)
40 Hz~16 kHz continuous power output both channels driven	110 W×2 (4 Ω) 100 W×2 (8 Ω)
1 kHz continuous power output both channels driven	120 W×2 (4 Ω) 110 W×2 (8 Ω)
Total harmonic distortion rated power	
at 1 kHz	0.04% (4 Ω, 8 Ω)
at 40 Hz~16 kHz	0.04% (4 Ω, 8 Ω)
at 20 Hz~20 kHz	0.04% (4 Ω, 8 Ω)
half power	
at 20 Hz~20 kHz	0.025% (4 Ω) 0.015% (8 Ω)
at 1 kHz	0.005% (4 Ω, 8 Ω)
-26 dB power	
at 1 kHz	0.04% (4 Ω)
50 mW power at 1 kHz	0.2% (4 Ω)
Intermodulation distortion rated power	
at 250 Hz:8 kHz = 4:1, 4 Ω	0.04%
at 60 Hz:7 kHz = 4:1, SMPTE, 8 Ω	0.04%
Power bandwidth both channels driven, -3 dB	10 Hz~40 kHz (4 Ω)
Damping factor	25 (4 Ω), 50 (8 Ω)
Headphones output level & impedance	500 mV/330 Ω
Input sensitivity & impedance	
PHONO	2.5 mV/47 kΩ
AUX	150 mV/47 kΩ
TAPE 1, REC/PLAY	180 mV/47 kΩ
TAPE 2	150 mV/47 kΩ
MAIN in	1 V/100 kΩ
Phono maximum input voltage at 1 kHz, RMS	200 mV
S/N	
rated power (4 Ω)	PHONO 75 dB
(83 dB at 2.5 mV, 95 dB at 10 mV, IHF A)	AUX 88 dB (95 dB, IHF A)

-26 dB power (4 Ω)	PHONO 65 dB
	AUX 70 dB
50 mW power (4 Ω)	PHONO 55 dB
	AUX 55 dB
Frequency response	
PHONO	RIAA standard curve ±0.2 dB (30 Hz~15 kHz)
AUX	10 Hz~40 kHz (-1 dB) +0~-0.3 dB (20 Hz~20 kHz)
Tone controls	
BASS	50 Hz, +12 dB~-12 dB
TREBLE	20 kHz, +12 dB~-12 dB
MID	1 kHz, +7 dB~-7 dB
Acoustic controls (at "0" positions)	
LOW BOOST	100 Hz, +6 dB
HIGH BOOST	10 kHz, +6 dB
Low filter	100 Hz, -6 dB/oct
High filter	7 kHz, -6 dB/oct
Loudness control (volume at -30 dB)	50 Hz, +9 dB
Output voltage & impedance	
PRE OUT	1 V/4.7 kΩ
REC OUT	150 mV
REC/PLAY	30 mV/80 kΩ
Channel balance	
AUX, 250 Hz~6300 Hz	±1.0 dB
Channel separation	
AUX, 1 kHz	63 dB
Load impedance	
MAIN or REMOTE	4 Ω~16 Ω
MAIN and REMOTE	8 Ω~16 Ω
FM TUNER SECTION	
Frequency range	88~108 MHz
Sensitivity (±40 kHz deviation)	
S/N 30 dB	1.8 μV (300 Ω), 1.3 μV (75 Ω)
S/N 26 dB	1.6 μV (300 Ω), 1.2 μV (75 Ω)
S/N 20 dB	1.5 μV (300 Ω), 0.9 μV (75 Ω)
IHF usable sensitivity	1.8 μV (IHF '58)
IHF S/N 46 dB stereo quieting sensitivity	18 μV (75 Ω)
Total harmonic distortion	
MONO	0.1%

STEREO	0.2%
S/N (±40 kHz deviation)	
MONO	60 dB (77 dB, IHF)
STEREO	58 dB (73 dB, IHF)
Frequency response	
20 Hz~15 kHz, +0.2 dB, -0.8 dB	
20 Hz~15 kHz, ±1.5 dB	
Alternate channel selectivity	80 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	85 dB
IF rejection at 98 MHz	100 dB
Spurious response rejection at 98 MHz	100 dB
AM suppression	60 dB
Stereo separation	
1 kHz	45 dB
10 kHz	35 dB
Carrier leak	
19 kHz	-60 dB (-65 dB, IHF)
38 kHz	-65 dB (-70 dB, IHF)
Channel balance	
250 Hz~6300 Hz	±1.5 dB
Limiting point	1.2 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	300 Ω (balanced), 75 Ω (unbalanced)

AM TUNER SECTION

Frequency range	525~1605 kHz
Sensitivity S/N 20 dB	30 μV, 250 μV/m
Selectivity	35 dB
Image rejection at 1000 kHz	50 dB
IF rejection at 1000 kHz	45 dB

GENERAL

Power consumption	850 W
Power supply	AC 110/120/220/240 V 50/60 Hz
Dimensions (W×H×D)	510×160×390 mm (20-3/32"×6-5/16"×15-11/32")
Weight	16.1 kg (35.5 lb)

Technics
Matsushita Electric