

Technics

SA-200

FM/AM Stereo Receiver



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With the SA-200, Technics continues its tradition of offering outstanding receivers in the budget price range. Note that its 0.04% total harmonic distortion is about 1/10th the amount usually found in comparably-priced receivers. It is an excellent choice for a component system where high power is not required.

Clean Power

The SA-200 puts out 25 watts per channel, continuous "RMS" power into 8 ohms, from 20–20,000 Hz, with no more than 0.04% total harmonic distortion. At half power, total harmonic distortion is a scant 0.025%, measured from 20–20,000 Hz.

Low-Distortion Power Amplifier Design

A current-mirror loaded differential amplifier in the first stage, which employs a single-packaged, low-noise transistor pair, contributes to stability with high gain and low distortion. And like all Technics receivers ever made, the output stage is direct-coupled OCL (output capacitor-less), which contributes to tight, solid bass response right down to the very low frequencies.

Generous Power Supply

An amplifier's power supply can have a considerable effect on its sound quality. To satisfy the high-current demands sometimes created by dynamic music, the SA-200 uses a sizeable power transformer, with a bridged rectifier for stability. Two 6,800 μ F filter capacitors are used to keep hum and noise low, and to provide reserve power for handling sudden musical peaks. This receiver can briefly exceed its rated "RMS" power to faithfully render such musical peaks.

78dB Phono S/N Ratio at 2.5 mV

This 3-stage, direct-coupled phono equalizer achieves a signal-to-noise ratio of 90 dB (IHF, A) referenced to 10 mV, 78 dB (IHF, A) referenced to 2.5 mV. These are very good figures for an

expensive separate preamplifier—astonishing ones for a receiver! In practical terms, it means that circuit noise will not spoil your enjoyment of records, even during soft musical passages. The phono stage will handle up to 130 mV (at 1 kHz) without overload, and adheres to the standard RIAA curve within ± 0.5 dB.

MOS FET FM Front End

The SA-200's FM "front end" achieves excellent sensitivity, quieting and interference rejection with a dual-gate MOS FET and a 3-gang linearly variable tuning capacitor. "46 dB quieting sensitivity" is achieved with 22 μ V (75 Ω) signal-strength in stereo—an excellent figure. With stronger signals, tuner S/N ratios will reach 75 dB in mono and 70 dB in stereo (IHF).

FM IF Stage with "Flat Group Delay" Ceramic Filters

The IF stage plays an important role in determining the tuner's selectivity—its ability to isolate the desired broadcast signal from unwanted, nearby signals. In the SA-200, a five-stage IF section is used, with two "flat group delay" ceramic filters. These filters help achieve 70 dB selectivity, but without creating sound-degrading phase non-linearities (a problem with past tuner designs). Use of these "FGD" filters contributes to the very clean sound of the SA-200's tuner section.

Quadrature Detector

After passing through the IF stage, the FM signal must be demodulated into an audio signal. At this point, the SA-200 uses a high-linearity quadrature detector, which contributes to flat frequency response and low distortion. If the broadcast station has transmitted an "overmodulated" signal, it could potentially cause problems at this point. But the quadrature detector is designed to tolerate highly overmodulated signals without causing significant distortion or loss of high frequencies.

Phase Locked Loop FM Stereo Decoding

Stereo FM signals are separated into left and right channels by a "multiplex" stage. For this function, the SA-200 employs phase-locked-loop circuitry, incorporated into an IC chip. The PLL circuit maintains precise phasing between pilot and subcarrier signals, thus achieving excellent separation throughout the audible range of frequencies. Even at 10 kHz, separation between channels is 35 dB, which helps maintain a distinct stereo image. And because the PLL circuit is all contained in an IC, it will not need adjustment as would be the case if discrete parts were used.

Quality AM Section with IC

Although we expect most listeners will prefer FM for serious listening, we have also included a well-designed AM section in the SA-200. Most of the important circuitry is incorporated into a reliable IC. And in the IF strip, Jaumann-type ceramic filters are used to achieve good selectivity. While AM doesn't match FM in terms of clarity and frequency extension, the SA-200's AM section will nonetheless provide very good performance.

Convenience and Operational Features

- 41-step click-stop volume control.
- Low-distortion bass and treble controls.
- Loudness compensation switch.
- Connections for "main" and "remote" speaker pairs. Switches select either or both pairs.
- Tape monitor switch with record out/playback jacks for adding a tape deck or external processor.
- Auxiliary input jacks.
- Dual-function tuning meter. Reads center-of-channel on FM, signal-strength on AM.
- FM muting/mode selector. Muting is engaged in "stereo" position, out in "mono" position.
- Fuse protection for both amplifier and connected speakers.

Technical Specifications (DIN 45 500)

AMPLIFIER SECTION

20 Hz ~ 20 kHz continuous power output both channels driven	25 W \times 2 (8 Ω)
40 Hz ~ 16 kHz continuous power output both channels driven	27 W \times 2 (4 Ω) 25 W \times 2 (8 Ω)
1 kHz continuous power output both channels driven	30 W \times 2 (4 Ω) 27 W \times 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% (8 Ω)
half power	
at 20 Hz ~ 20 kHz	0.025% (8 Ω)
at 1 kHz	0.009% (8 Ω)
-26 dB power at 1 kHz	0.06% (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 ~ 25 kHz (4 Ω)
Residual hum & noise	0.6 mV
Damping factor	16 (4 Ω), 32 (8 Ω)
Headphones output level & impedance	330 mV/330 Ω

Input sensitivity & impedance

PHONO	2.5 mV/47 k Ω
AUX	150 mV/33 k Ω
TAPE 1, REC/PLAY	180 mV/39 k Ω
Phono maximum input voltage at 1 kHz, RMS	130 mV
S/N	
PHONO 70 dB (78 dB at 2.5 mV, 90 dB at 10 mV, IHF A)	
AUX 88 dB (95 dB, IHF A)	
PHONO 68 dB	
AUX 77 dB	
PHONO 64 dB	
AUX 65 dB	
50 mW power (4 Ω)	
Frequency response	
PHONO RIAA standard curve ± 0.5 dB (30 Hz ~ 15 kHz)	
AUX 10 Hz ~ 30 kHz (-1 dB) ± 0.5 dB (20 Hz ~ 20 kHz)	
Tone controls	
BASS 50 Hz, +10 dB ~ -10 dB	
TREBLE 10 kHz, +10 dB ~ -10 dB	
Loudness control (volume at -30 dB)	50 Hz, +9 dB
Output voltage & impedance	
REC OUT	150 mV
REC/PLAY	30 mV/80 k Ω
Channel balance	
AUX, 250 Hz ~ 6300 Hz	± 1.0 dB

Channel separation

AUX, 1 kHz	55 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	1.9 μ V (300 Ω), 1.3 μ V (75 Ω)
S/N 26 dB	1.7 μ V (300 Ω), 1.2 μ V (75 Ω)
S/N 20 dB	1.5 μ V (300 Ω), 0.9 μ V (75 Ω)
IHF usable sensitivity	1.9 μ V (IHF '58)
IHF S/N 46 dB Stereo quieting sensitivity	22 μ V (75 Ω)
Total harmonic distortion	
MONO	0.15%
STEREO	0.3%
S/N (± 40 kHz deviation)	
MONO	60 dB (75 dB, IHF)
STEREO	58 dB (70 dB, IHF)
Frequency response	20 Hz ~ 15 kHz, +1 dB, -2 dB 20 Hz ~ 14 kHz, ± 1.5 dB
Alternate channel selectivity	70 dB
Capture ratio	1.2 dB
Image rejection at 98 MHz	70 dB
IF rejection at 98 MHz	90 dB
Spurious response rejection at 98 MHz	80 dB

AM suppression

Stereo separation	55 dB
1 kHz	45 dB
10 kHz	35 dB
Carrier leak	
19 kHz	-33 dB (-40 dB, IHF)
38 kHz	-48 dB (-50 dB, IHF)

Channel balance

250 Hz ~ 6300 Hz	± 1.5 dB
Limiting point	1.2 μ V
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 μ V, 300 μ V/m
Selectivity	30 dB
Image rejection at 1000 kHz	45 dB
IF rejection at 1000 kHz	40 dB

GENERAL

Power consumption	300 W
Power supply	AC 110/120/220/240 V 50/60 Hz
Dimensions (W \times H \times D)	430 \times 142 \times 300 mm (16-15/32" \times 5-19/32" \times 11-13/16")
Weight	7.2 kg (15.9 lb)

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