Technics SU-9600/SE-9600

High Fidelity
Stereo Control Center

High Fidelity
Stereo Control Amplifier

SU-9600/SE-9600

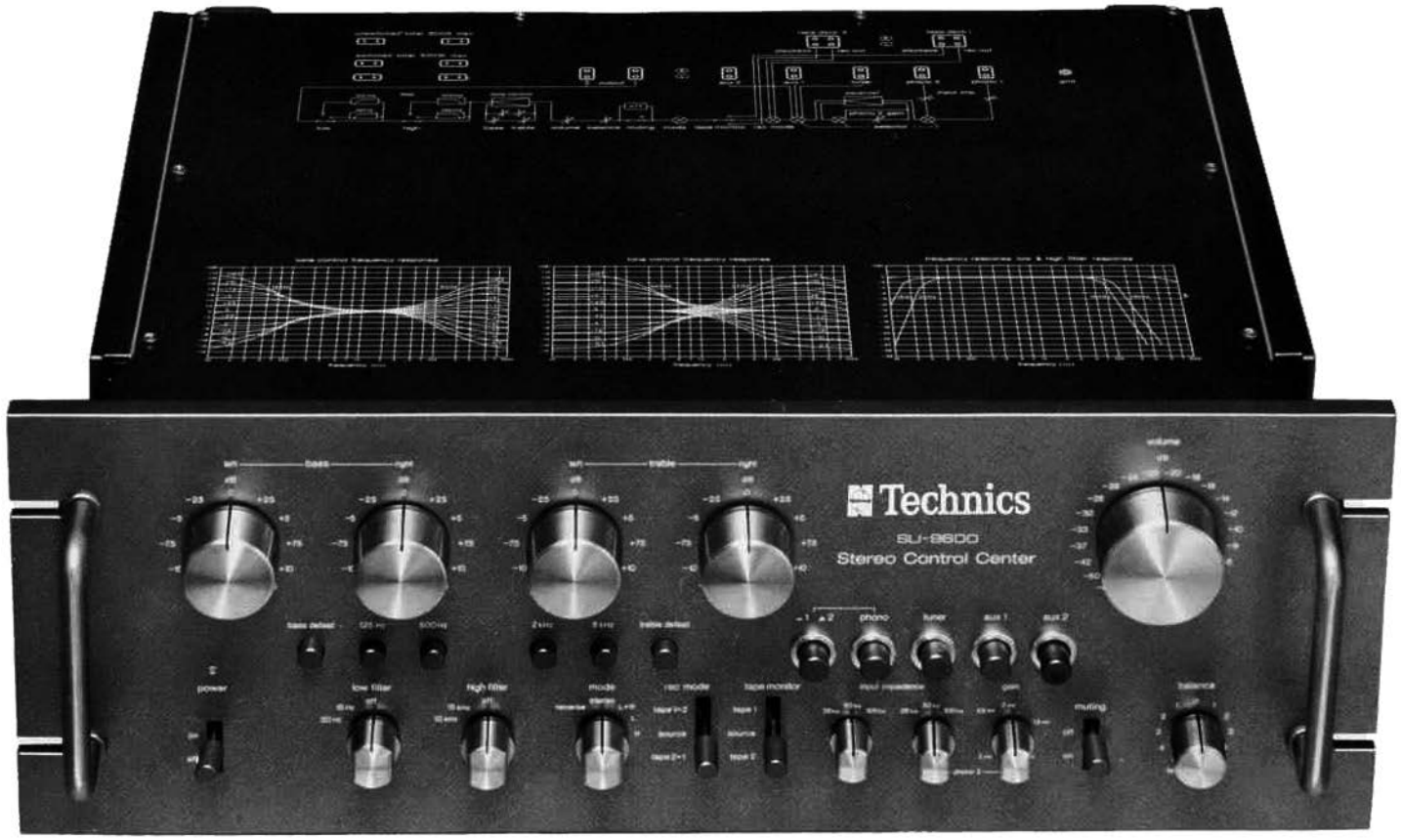
High Fidelity Stereo Control Center &
Stereo Power Amplifier

A New Standard of Excellence in Pre-Amplifier and Power Amplifier Performance

The new SU-9600 Control Center (pre-amplifier) and SE-9600 Power Amplifier offer an entirely new standard of excellence against which audio performance should be measured.

With their functional, masculine styling, these units speak of a professional approach to audio engineering. With unparalleled flexibility and a host of features (not gimmicks), some of them available for the first time on generally distributed production models, this combination control center and power amplifier is the proud achievement of Technics audio engineering. The breath-taking performance specifications and electrifying sound, the incredibly low distortion and the constant-voltage, constant-current power supplies that make music power equal RMS power —these are the signposts to the way ahead for the rest of the audio industry.

Available now from your Technics dealer.



SU-9600

New Evaluation of Transient Behavior Leads to Total Fidelity

We believe, and can prove, that amplifier performance is totally open to scientific investigation and planning—provided, of course, that valid methods and precise instruments are available. That is why Technics engineers have devised several new kinds of measurements which permit almost total evaluation of all factors in amplifier performance.

One such method is the "transient IM distortion" measurement. Conventional measurements of an amplifier's intermodulation distortion, being performed with continuous sine wave input signals, permit no conclusions to be drawn about the amp's behavior under transient conditions, in particular the behavior of its power supply. In our method, we supply a continuous 5 kHz sine wave input signal plus a series of high-level 100 Hz tone bursts. From the output signal we then extract the 5 kHz component in a high pass filter, then observe, measure and analyze it. Ideally, it should remain completely unaffected by the tone bursts; any distortions found provide valuable information about power supply stability and amp behavior under conditions of actual music reproduction.

Another example of exclusive Technics procedures is our "transient crosstalk distortion" measurement in which tone bursts are applied to one input channel of a stereo amplifier while no signal is fed to the other channel. Output from the idle channel, ideally zero, shows up any crosstalk caused by transient leak through the power supply unit.

SE-9600

SU-9600

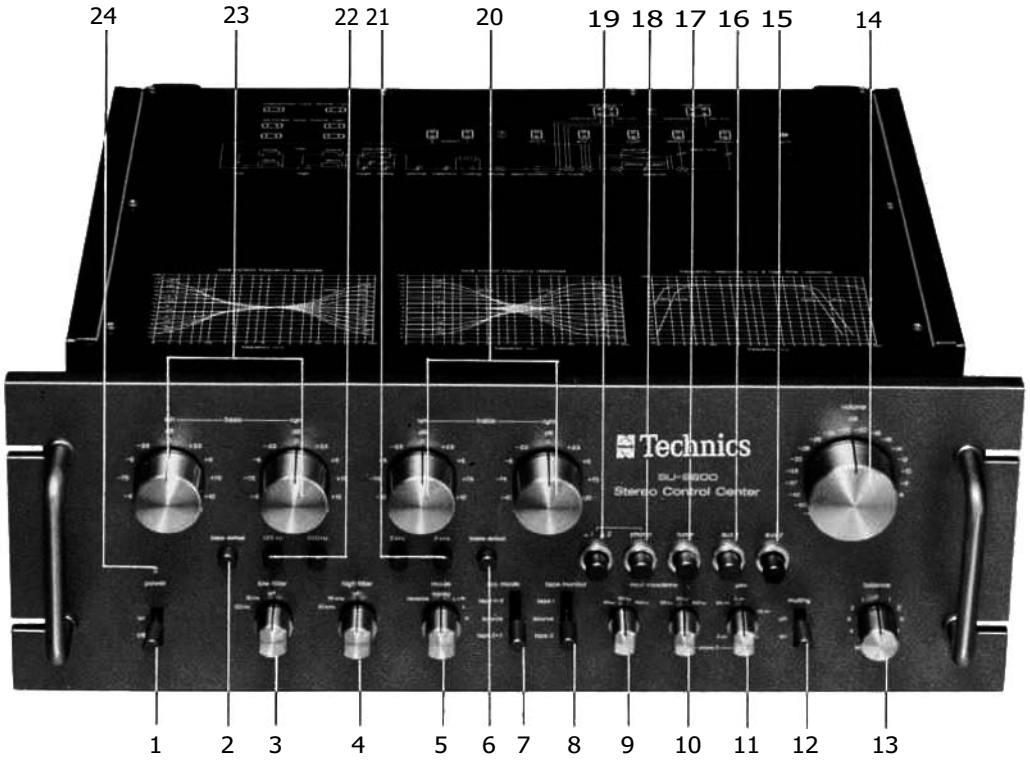
A New Performance Standard

The SU-9600 stereo control center has been designed to give professional and advanced amateur users a higher level of performance than has been available before, with lower distortion, high signal-to-noise ratio, the convenience of frontal control, and a design in which every control variable and function have been selected for optimum convenience. Technics has directed special efforts at improving the dynamic characteristics by a combination of advanced theoretical analysis and exhaustive experimental tests. Everything has had the one aim; to secure the finest possible quality of sound reproduction, from the finest nuance of expression, to the rich fabric or orchestral enserrible, and the loudest climaxes. With fingertip control over every function and program source, the SU-9600 is truly worthy of the name coined for it: the Stereo Control Center.

Features at a Glance

- Fixed (phono 1) and variable (phono 2) input sensitivity
- Switchable input impedance (phono 1&2)
- Separate L and R channel bass controls —2.5dB steps
- Separate L and R channel treble controls— 2.5 dB steps
- Switchable bass turnover frequency at 125/500 Hz
- Switchable treble turnover frequency at 2/8 kHz
- Separate bass and treble tone control defeat buttons
- Dubbing 1→2 or 2→1 between tape decks
- 1350 mV RMS max imUm input at 3mV sensitivity (phono 2)
- All controls on front panel
- Block diagram, filter and tone control characteristics given on the top panel

Front Panel Facilities



1. Power on/off switch
2. Bass defeat button
3. Low-cut filter (15 Hz/30 Hz/off)
4. High-cut filter (10 kHz/15 kHz/off)
5. Stereo mode (normal stereo, reverse, L+R, L, R)
6. Treble defeat button
7. Recording mode (source/1→2/2→1 dubbing)
8. Tape monitor (source or tape 1/2)
9. Variable input impedance control for phono 1 input
10. Variable input impedance control for phono 2 input
11. Variable gain control for phono 2 input
12. Muting switch (0/-20dB)
13. Balance control
14. Calibrated attenuator-type volume control (22 steps, 0 to -∞)
15. Aux 2 selector button
16. Aux 1 selector button
17. Tuner selector button
18. Phono selector button
19. Phono 1/2 selector button
20. Click-stop calibrated treble controls
21. Treble control turnover frequency selection at 2/8 kHz
22. Bass control turnover frequency selection at 125/500 Hz
23. Click-stop calibrated bass controls
24. Power indicator light

Design and Performance Features

High Input Level Tolerance
With 3mV sensitivity setting (phono 2) the maximum permissible input is an amazing 1350 mV RMS at 1 kHz. The secret of this superb performance is in the 7-transistor equalizer, a 4-stage direct-coupled circuit (3-stage differential amplifier plus emitter follower). With many of today's high performance cartridges with their wide dynamic range, the actual output can greatly exceed the rated output. This factor can be further aggravated by high level record cutting, etc. The SU-9600 features an extremely high maximum input before overloading, so that overload distortion will never be a practical problem.

High Voltage Supply to Final Equalizer Stage
The power supply to the final stage is a high 160 V, another factor in the very high maximum permissible input levels. The result is a tremendous improvement in the dynamic characteristics at high input levels and a dramatic drop in distortion with extremely stable operation.

Triple Phono Impedance Settings
Both phono 1 and phono 2 have switchable impedances of 25 kΩ, 50 kΩ and 100Ω. As well as ensuring the optimum matching with a given cartridge, these settings can also be used to give a further fine control of tone "coloration" not otherwise available: the 100 kΩ setting will tend to enhance high frequency response, and with the 25 kΩ setting it will be correspondingly reduced.

Fixed (phono 1) and Variable (phono 2) Sensitivity
Phono 1 gives a fixed sensitivity of 2mV with maximum non-overloading input levet of 900 mV RMS at 1 kHz. Phono 2 can be varied continuously over the range 1 mV (450 mV RMS maximum) to 3 mV (1350 mV RMS). Any cartridge can be accommodated with the sensitivity that's best for it, and two cartridges can be matched to give the same loudness level.

Excellent S/N Ratio & Low Distortion
Use of ultra low noise PNP transistors in the first stage gives excellent signal-to-noise ratios: 76 dB with phono 2 sensitivity set at 3 mV. Total harmonic distortion rating of the SU-9600 is exceptionally low at 0.02%.

Tone Controls with Selectable Turnover Frequency
The 3-stage negative feedback type tone control (2-stage differential amplification plus emitter follower) ensures the absolute minimum of distortion. Both bass and treble controls operate in 2.5 dB steps, giving a maximum range of ±12.5 dB. With turnover frequencies of 125 and 500 Hz (bass) and 2 and 8 kHz (treble), and independent defeat buttons for treble and bass, the optimum settings for any environment or program source can soon be found.

High and Low Frequency Filters
Low frequency filters (-18 dB/oct) can be switched in at 15 and 30 Hz. The excellent low-frequency response of the SU-9600 means that if any unacceptable degree of rumble is present it will be faithfully amplified and may even, in severe cases, overload the speaker systems. High frequency filters can be switched in at 10 and 15 kHz to eliminate undesired high frequency signal components such as tape or FM hiss, record noise, etc.

Advanced Attenuator-Type Volume Control
The click-stop volume control is calibrated in dB (maximum output = 0 dB). The 22 position switch runs from zero through -60 dB and -∞. An even greater range of variation is obtainable in combination with the muting switch which gives a further 20 dB of attenuation. The volume control is completely free of annoying drifts in balance at low listening volumes which can affect conventional controls.

Full Tape-to-Tape Dubbing and Monitoring
Two tape decks can be connected, with recording from a source or tape-to-tape dubbing in either direction, and full monitoring of all recordings is possible.

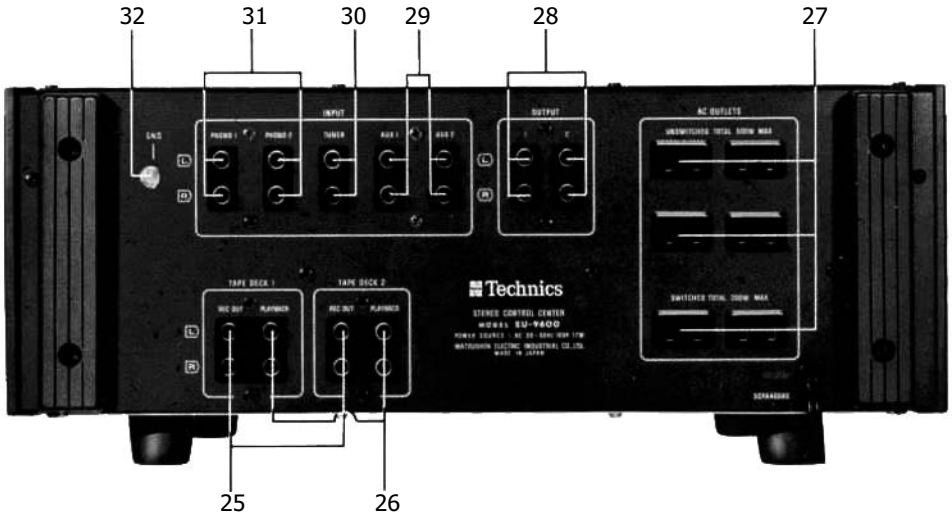
Front-Panel Controls
All the operational controls are brought out onto the front panel. Click-stop calibrated controls and instant button selection of source and characteristic make it easy to use despite its comprehensive control features.

Highly Stable Power Supply
For complete independence of the performance of the two channels it is essential that power supplies be absolutely stable. This is assured, in the SU-9600, by special voltage stabilization circuits, completely eliminating "pull-down" of supply voltage at maximum output, and giving stable performance at all times and under all conditions.

On/Off Switch Anti-Shock Circuit
Switching transients from the main power switch are eliminated by a special circuit which protects all components from potential damage.

Rear Panel Facilities

25. Tape Outputs 1, *2*
26. Tape Inputs 1, 2
27. AC Outlets
28. Output Terminals 1, 2
29. Aux Inputs 1, 2
30. Tuner Inputs
31. Phono Inputs 1, 2
32. Ground Terminal



SE-9600

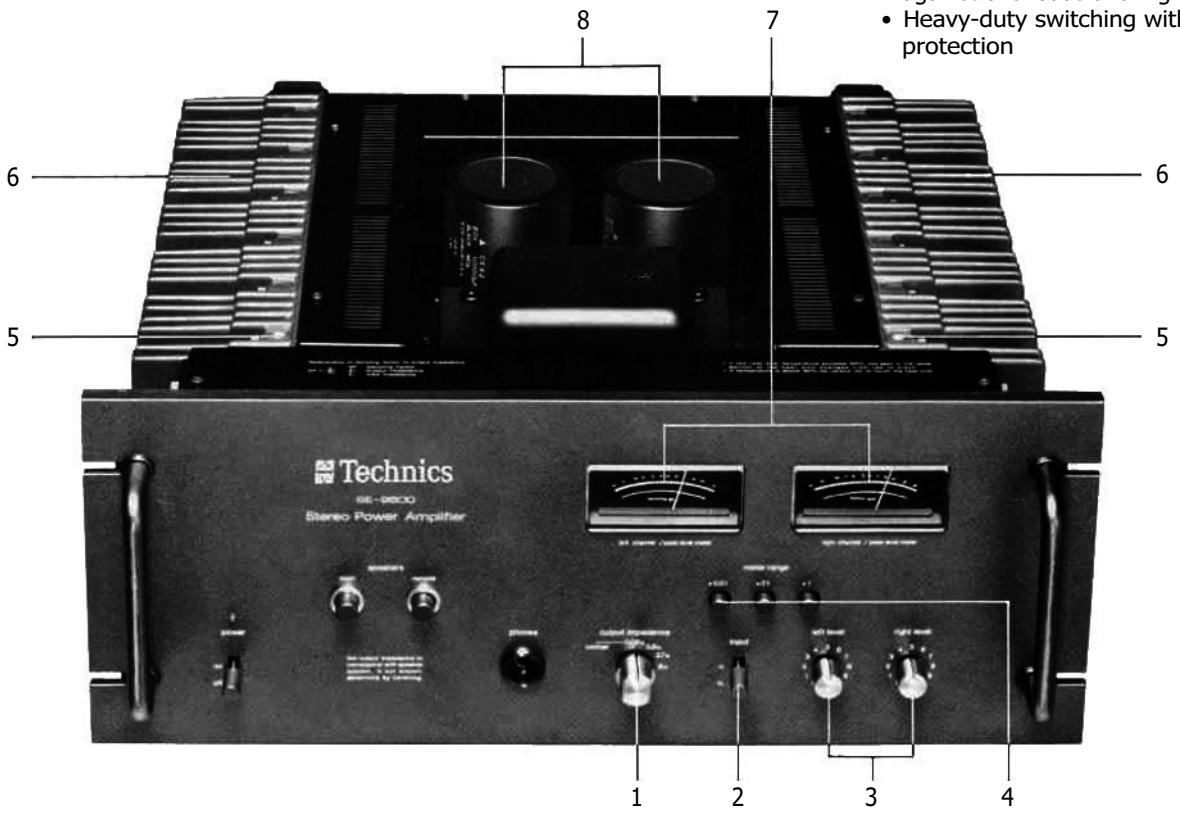
A New Measure of Audio Excellence

With tne incredibly low distortion, at maximum output and at normal, lower listening levels, and with the ultra-stable power supply circuit, the SE-9600 opens up the possibility of enjoying the highest performance available to a wide circle of professionals and advanced amateurs. There is no respect in which the SE-9600 is not outstanding: in its 2 x 110W output (RMS, either or both channels driven into 8Ω), power bandwidth, in harmonic and intermodulation distortion, and in a remarkable series of user-oriented features like the fast-response peak level meters and the switchable output impedance. All of these features are described in detail below, but it is not the features, nor the specifications—unparalleled as they are—that will encourage the enthusiast to buy the SE-9600. All Technics resources have been directed at producing a power amplifier which will convince, stunningly and instantly, that no higher quality sound reproduction is currently available anywhere in the world, at any price.

Features at a Glance

- Full 2 x 110W RMS output (both channels, into 8Ω)
- Ultra-stable constant current, constant voltage supply circuit with high capacity smoothing capacitors
- Switchable output impedance (variable damping factor)
- Fast-response peak level power output meters (switched ranges)
- Output connections for two sets of speakers
- Independent adjustment of R and L channel input levels
- Diecast aluminum heat-dissipating fins
- Thermo-sensitive labels painted on the fins (warning of 50°C or 122°F temperatures)
- Paired transistors in differential amplifier with emitter follower, OCL circuitry
- Ample negative feedback for stable operation
- Full protection of amplifier and speakers against overloads and high temperatures
- Heavy-duty switching with anti-shock protection

Front Panel Facilities



1. 4-stage output impedance selection: The 0.08Ω (normal), 0.8Ω, 2.7Ω and 8/2 settings give respective damping factors of 100, 10, 3 and 1 with 8Ω speakers.
2. Input on/off switch: With all circuits still operative, the input alone can be isolated for safety in changing program sources.
3. Level controls: Variable input level controls are fitted independently for both L and R channels.
4. Switched 3-range meter sensitivity: With x0.01, x0.1 and x1 ranges, the meters can be used at all outputs from the lowest to full power.
5. Thermo-sensitive labels: Serve as visible warning of temperatures too hot to touch, for added safety.
6. Diecast aluminum fins: Beautifully finished, these fins assure efficient dissipation of heat developed by output transistors.
7. Peak-level power output meters: With extremely fast response and slower fall-back, they give readily visible indication of maximum power.
8. Large smoothing capacitors: The combination of these large capacitors with the special smoothing circuits for electrical power supply give extremely stable operation and even greater effective capacity.

Design and Performance Features

Highly-Stable, High-Output, Low-Distortion Circuitry

Conventional technology carried to an unconventional extreme could describe the SE-9600. Basically, it uses the well-established all-stage direct-coupled, fully complementary, output-capacitorless (OCL) circuitry. Differential amplification is used wherever feasible. However, the specially paired transistors used in the differential amplifier are linked to the following stage by emitter follower, decreasing the operating impedance of the next stage and reducing the load on the amplifier stage. The transistorized current stabilization, Darlington-connected fully-complementary output stage, and the use of transistors with specially matched characteristics in parallel for the final stage, both eliminate crossover distortion and give stable, reliable performance. The absence of boot-strap capacitors greatly improves the open loop characteristics of the transistors, which results in fuller low range response; this construction permits the voltage amplification stage to operate in constant current mode. The high NFB margin and unique Technics knowhow make the 2 x 110W (8Ω) harmonic distortion a mere 0.02% (i.e. at 1 kHz full output), and correspondingly low at all lower listening levels.

High Capacity Voltage-Stabilized Power Supplies

In order to eliminate the transient non-linearities and distortions due to voltage "pull-down" at high outputs, stable power supplies to all stages including the final output stage are essential. The complete stability of SE-9600 supplies eliminates transient non-linearities and transient crosstalk du'e to high-level low-frequency components of music signals. There are those who prefer to judge the stability of power supplies by the capacity of electrolytic capacitors used: stated in these terms, the SE-9600 has the stability equivalent to that which would be obtained with a capacity of several million pF

Wide Power Bandwidth

At only 3 dB below rated output, the power bandwidth is from 5 Hz to 60 kHz (both channels driven, into 8Ω, T.H.D. at 0.08%).

4-Way Switching of Output Impedance

The SE-9600 features four different output impedances, giving damping factors of x100, x10, x3 and x1 with 8Ω speakers. This feature, pioneered by Technics in the days of tube amplifiers, means that the damping factor best suited to the speaker systems in use can be selected. The difference is truly dramatic, and can make or mar speaker performance. The smaller bookshelf types usually function best with high damping factors (low output impedance), and the massive "system" speakers often sound better with lower damping factors. Particular care has been taken to ensure that modification of the damping factor does not in any way affect the sound quality or distortion, A bridge circuit is used, with a combination of current and voltage negative feedback,

Peak Level Meters with Switched Ranges

The peak level meters fitted have extremely fast responses and give an accurate indication of output level both in terms of power (watts) and decibels. Meter performance closely simulates that of truly professional meters such as used by the BBC. With three-fold range switching (x0.01, x0.1 and x1). outputs at all levels can be accurately monitored.

Comprehensive Protective Device

The SE-9600 is provided with three-fold protection: of the speakers against excessive current flow (particularly DC), of the output transistors against short circuiting of the speaker terminals, and against excessive overheating. Speaker protection is by means of a relay which is not a part of the signal-bearing circuit, and which therefore can have no effect upon sound quality. Output circuit protection is by means of a current-limiter circuit which comes into operation automatically. The power supply is also isolated whenever the output transistor operating temperature exceeds 90°C (194°F). Resetting is either automatic, as with the current-limiter circuit, or is effected by switching the amplifier off and on again.

Zener Diode Circuit Protects against Switching Transients

With such high power outputs, on/off switching can produce potentially dangerous shocks within the system.. These are eliminated in the SE-9600 by a special Zener diode circuit.

Main/Remote Speaker Systems

One or both of two speaker systems may be selected by buttons on the front panel.

Front Panel Controls for Easy Operation

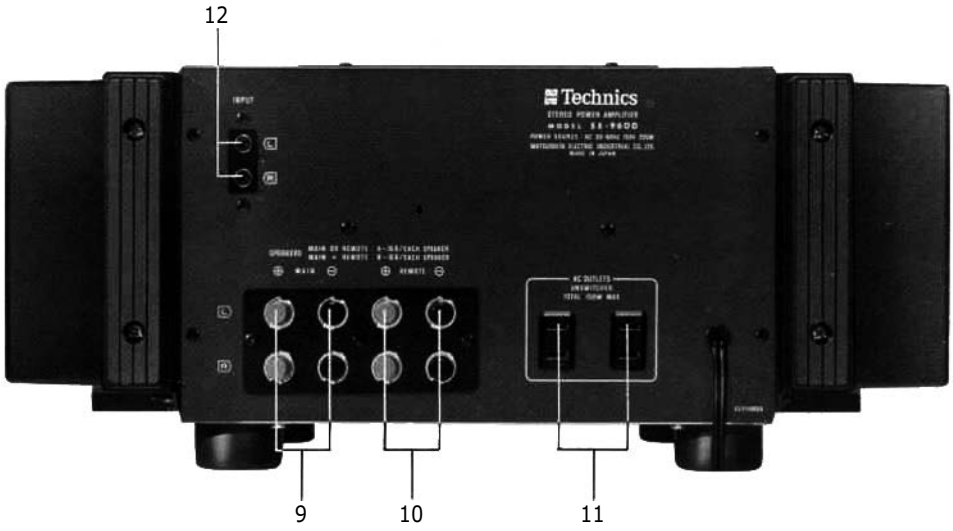
As with the SU-9600, all controls have been brought out to the front panel for ease i n operation.

Diecast Aluminum Fins with Heat Warning

The solid, professional design, with well-located controls, features functional aluminum cooling fins which efficiently dissipate the heat generated by the output transistors. The heat-sensitive paint on the upper surfaces gives a clear indication of when the fins are too hot to touch, turning from yellow to orange at temperatures above 50°C (122°F). The amplifier can continue to operate safely at this temperature: the visible warning is a useroriented feature.

Rear Panel Facilities

9. Speaker Terminals (MAIN)
10. Speaker Terminals (REMOTE)
11. AC Outlets
12. Input Terminals



Technical Specifications

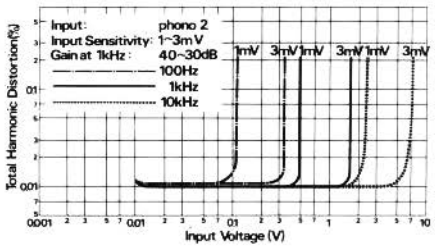
SU-9600 Stereo Control Center

Output Voltage & Impedance:	
rated	1V/600Ω
max.	12V/600Ω
Input Sensitivity & Impedance:	
PHONO 1	2mV/25k, 50k, 100kΩ
PHONO 2	1~3mV/25k, 50k, 100kΩ
TUNER	100mV/50kΩ
AUX 1,2	100mV/50kΩ
Phono Max. Input Voltage:	
at 2mV	900mV (1kHz, RMS)
at 1~3mV	450~1350mV (1kHz, RMS)
Total Harmonic Distortion:	0.02%
Intermodulation Distortion:	0.02%
S/N Ratio (rated power):	
PHONO 1	73dB
PHONO 2	69~76dB
TUNER	95dB
AUX	95dB
Frequency Response:	
PHONO 1,2	RIAA Standard Curve ±0.3dB
AUX	2Hz~100kHz, +0 -3dB
Tape Monitor 1, 2:	
PLAYBACK	100mV/50kΩ
REC OUT	100mV/600Ω
Tone Control:	
BASS	50Hz, ±12.5dB (2.5dB step)
TREBLE	20kHz, ±12.5dB (2.5dB step)
Turnover Frequency:	
BASS	125Hz, 500Hz
TREBLE	2kHz, 8kHz
Low Filter:	15Hz, 30Hz (-18dB/oct)
High Filter:	10kHz, 15kHz (-18dB/oct)
Muting:	-20dB
Power Consumption:	17W
Power Supply:	AC 110/120/220/240V 50/60Hz
Dimensions (W x H x D)	450 x 173 x 375mm (17 23/32" x 6 3/16" x 13 3/4")
Weight:	10.5kg (23.2 Ib.)

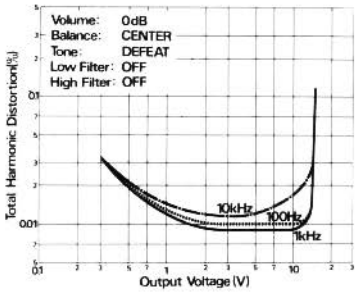
SE-9600 Stereo Power Amplifier

1kHz RMS (Continuous) Power:	
each ch, driven	2 x 165W (4Ω)
	2 x 110W (8Ω)
both ch. driven	2 x 165W (4Ω)
	2 x 110W (8Ω)
20Hz~20kHz RMS (Continuous) Power:	
both ch. driven	2 x 165W (4Ω)
	2 x 110W (8Ω)
Total Harmonic Distortion: (5Hz~60kHz)	0.08%
Intermodulation Distortion: (60Hz : 7kHz = 4 : 1, SMPTE)	0.08%
Power Bandwidth: (both ch. driven, 8Ω)	5Hz~60kHz, -3dB
Frequency Response:	5Hz~150kHz, +0 -3dB
S/N Ratio (rated power):	110dB
Residual Hum & Noise:	0.3mV
Damping Factor:	50, 5, 1.5, 0.5 (4Ω)
	100, 10, 3, 1 (8Ω)
Load Impedance:	
MAIN or REMOTE	4~16Ω
MAIN plus REMOTE	8~16Ω
Input Sensitivity & Impedance:	1 V/40kΩ
Power Consumption:	295W
Power Supply:	AC 110/120/220/240V 50/60Hz
Dimensions (W x H x D):	450 x 193 x 426mm (17 23/32" x 7 19/32" x 16 25/32")
Weight:	23.6kg (52 Ib.)

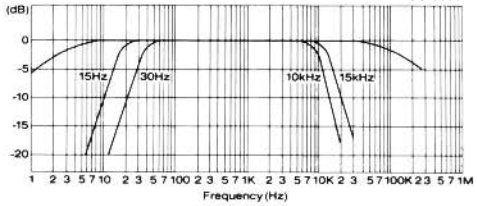
TOTAL HARMONIC DISTORTION vs PHONO 2-REC OUTPUT VOLTAGE SU-9600



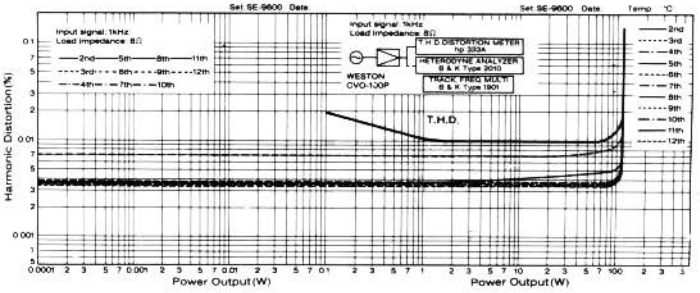
TOTAL HARMONIC DISTORTION vs AUX-OUTPUT VOLTAGE SU-9600



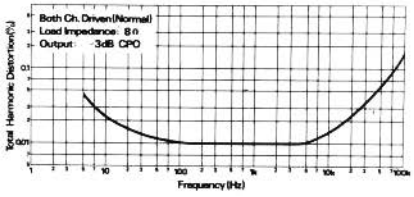
FREQUENCY CHARACTERISTICS OF HIGH/LOW FILTERS SU-9600



HARMONIC DISTORTION vs POWER OUTPUT



POWER BANDWIDTH SE-9600



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