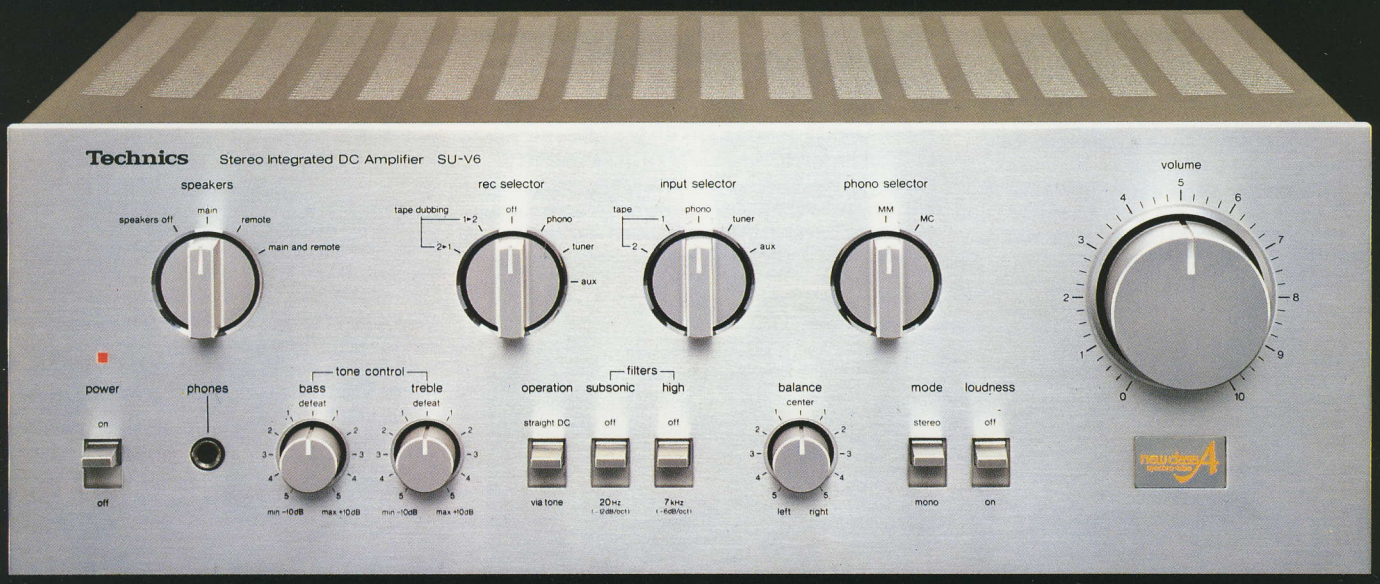
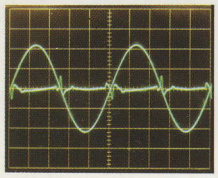
Technics SU-V6

Stereo Integrated DC Amplifier

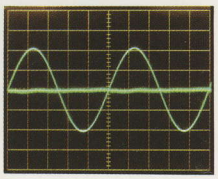


new class A synchro-bias

With this amplifier, you can obtain the best of both worlds. Technics' "New Class A" amplifier circuit combines class A output with stable load condition on all stages. Also, the undistorted sound quality of class A and the efficient, high-output power of class B are available within a single amplifier. You don't have to trade efficiency and price for sound quality, or switching distortion for high output.
The SU-V6's facts and figures support these claims: 70 watts per channel, both channels driven into 8 ohms, from 20 Hz to 20 kHz with no more than 0.007% total harmonic distortion. The most important fact, though, is that this integrated amplifier's faithfully reproduced sound exhibits the effortless smoothness of true class A amplification. And yet all this is available at a fraction of a conventional class A amplifier's cost.



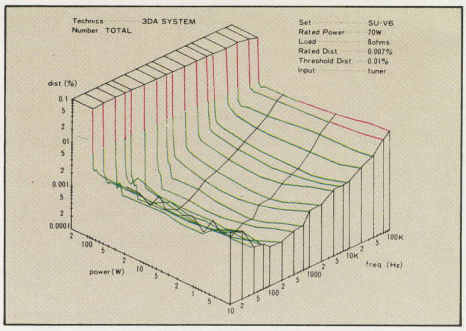
Class B amplifier output waveform and distortion waveform (at 20 kHz)



New class A amplifier output waveform and distortion waveform (at 20 kHz)

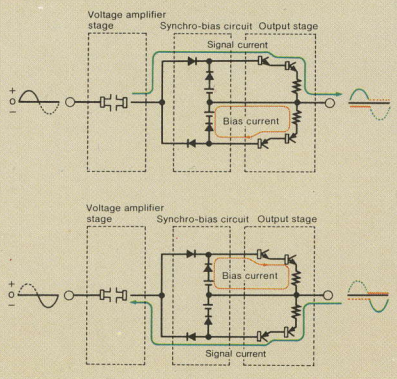
New Class A and Straight DC Provide Both Quality and Quantity

Quality of reproduced sound and quantity of output power are the two general aims we were striving to develop in the advanced circuitry incorporated in the SU-V6.
To test the success of our circuit designs, we have employed a new method of analysis called 3DA (first used in the development of the SU-8099 integrated amp), which stands for "3-Dimensional Analysis." With the aid of a computer, this system enables us to test performance at 4,000 points and express the results in 3-dimensional graphic form. From our extensive research using 3DA, we have found that performance requirements within the audio spectrum are best satisfied by building amplifiers that exhibit good performance characteristics

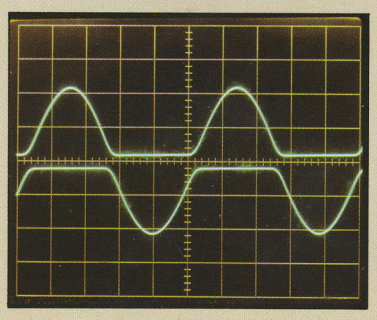


from 0 Hz (DC) at the bottom of the frequency range, all the way up to nearly 100 kHz in the ultra-high range (it's undesirable to go much higher than this point, given currently available circuit components).
To achieve performance within these considerations, we have used a number of advanced circuit configurations, the two most important of which are "New Class A" and "Straight DC."

New Class A Operation



Output Transistor Current Waveform



New Class A with Synchro Bias for Better High Frequency Response

Transistor switching is a major cause of high-frequency distortion in class B and class AB amplifier designs. In class B designs, two output transistors are used for each channel. The "upper" transistor handles the positive half of the waveform and the "lower" transistor handles the negative half. But problems occur when the signal crosses the zero point; one transistor turns off and the other turns on. During this crossover, "switching distortion" is generated. This takes the form of brief pulses with very sharp peaks, which produce high-order harmonic distortion. NFB (negative feedback) does not cope with switching distortion effectively, despite its usefulness in combating ordinary forms of distortion. This switching distortion can also result in intermodulation distortion which muddies reproduced sound to a greater degree

than might be expected from a simple examination of an oscilloscope trace. In class A, the same transistor handles the entire waveform, but a large idling current is required to operate the transistor even when there is no audio input signal. Although this prevents any form of switching distortion, it also results in very low efficiency. Large heat sinks must be provided to dissipate the substantial amount of excess heat that is created. Price is correspondingly high.
In our New Class A circuitry, the output transistor bias current is synchronized with the positive and negative swings of the input signal so that the output transistors are always in an active state. With this remarkable circuitry, switching distortion is eliminated since the transistors are never allowed to switch off. Because of this synchronized operation, we call this "synchro bias." Besides preventing switching distortion in the output waveform, it also presents linear load conditions to the voltage amplification stage. Predriver load fluctuation is also minimized. The result is the virtual elimination of "crossover distortion."

"Straight DC" Configuration for Direct Coupling Between DC Power Amp Section and High Level Input Signals

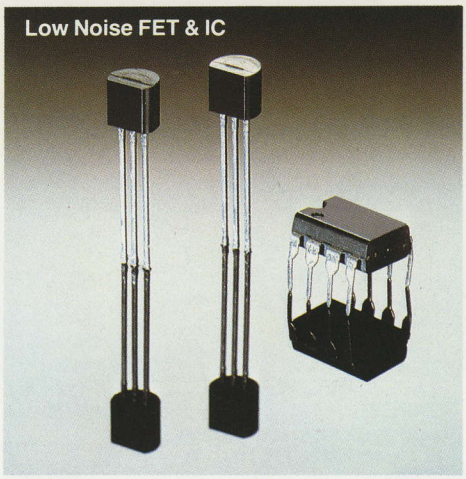
The SU-V6's design takes full advantage of the excellent low-range frequency response, phase-linearity, and low distortion inherent in our refined DC power amp design. By increasing the gain of the power amp section, we have made it possible to directly couple high level inputs, such as tuner, tape, and AUX sources, to the power amp input. The resulting improvement in low range fidelity is a good example of what can be achieved with an innovative, yet uncomplicated, approach to integrated amp design. In fact, you could view this configuration as simply a phono equalizer and a DC power amp.
While this characterizes the "simple is best" philosophy, some additional innovations were necessary to obtain the desired performance goals. First of all, a high-gain amp is required to raise typical "high level" inputs of 150 mV~200 mV to output levels of 70 W~100 W. Furthermore, any tendency toward temperature dependent DC drift must be avoided since the amp's gain extends all the way down to DC in the low range.
To obtain high gain, Technics' SU-V6 amp employs a linear cascode, 3-stage Darlington configuration which provides excellent open-loop performance. As a result, only 45 dB NFB is required to achieve the 0.007% THD rating at 70 W output.
To combat DC drift, 1-chip dual FET's are used for the first stage differential amplifier. Since this prevents mutual temperature differences, DC drift is reduced to a mere ±10 mV from −10°C to +50°C.

Concentrated Power Block (CPB) Prevents Distortion from Electromagnetic Induction

With the strikingly clean high range response obtained from our New Class A synchro bias circuitry, we made sure that nothing would interfere with proper performance under practical signal handling conditions.
Our concentrated power block was developed to prevent electromagnetic induction between those portions of the circuitry which handle large amounts of current and those which handle smaller signals. The power supply and output stage were concentrated in one integrated unit to create the shortest possible connections. With the addition of low impedance laminated bus lines, the power supply loop was minimized. Another advantage of CPB is that it virtually eliminates significant differences in performance between individual units. Consequently, you can expect a maximum 0.007% THD for any individual SU-V6 amp.

ICL Phono EQ Circuit Employing Ultra-Low Noise FETs Permits Direct MC Cartridge Connection

The first stage of the phono equalizer is a differential amplifier with ultra-low noise dual FETs. As a result, no input capacitors are necessary. A mere increase in equalizer gain, rather than an additional pre-preamp or step-up transformer, is all that is needed for MC cartridge compatibility. When the amp is in the straight DC mode, the only capacitor in the entire amp circuit, whether the input is MC or MM, is the EQ output capacitor.



Heavy Duty Power Supplies

In an audio amplifier, the power supply must be able to meet the changes in impedance presented by the speaker systems. Depending on the frequency, this figure can range from below 4 ohms up to as high as 30 ohms for a speaker system rated at 8 ohms.
In the SU-V6, independent rectifier and ripple filter circuits are provided for the left and right channels to assure truly stable DC power. Furthermore, the power transformer coils float in a special resin within shielded cases to prevent power supply hum.

Independent Recording Selector with 2-Way Dubbing

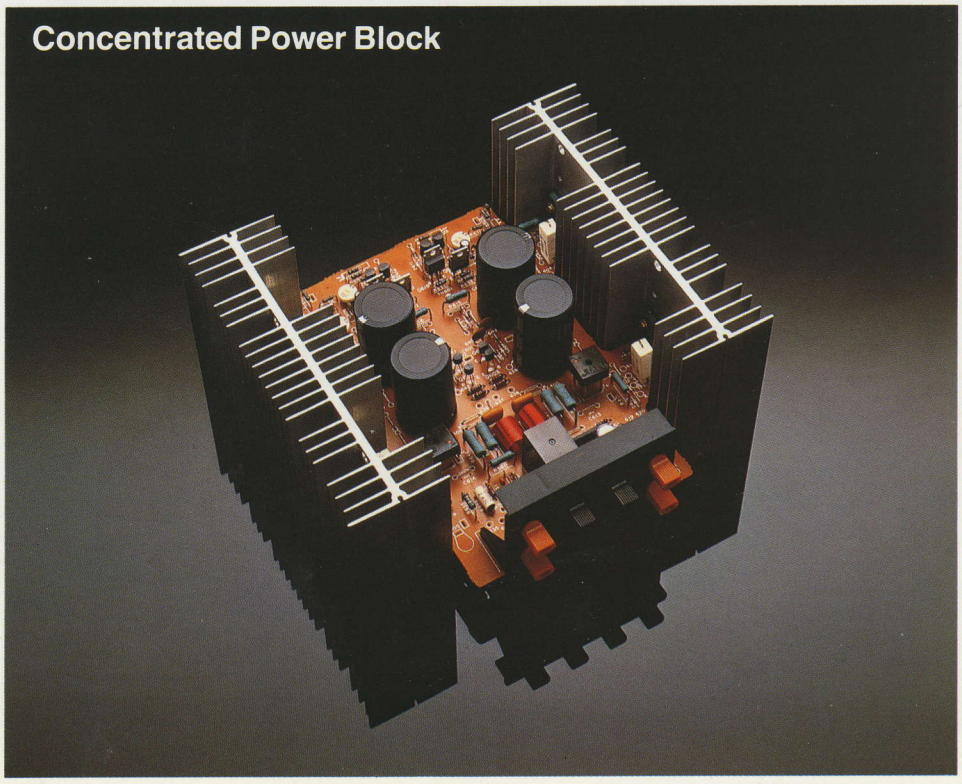
With this versatile arrangement you can record from one source while listening to another since the input and recording selectors are separate. Tape inputs are positioned on both the input selector and the recording selector so that you can record while listening to another source (such as a disc), if you wish.

Remote Action Switches Eliminate Excess Wiring

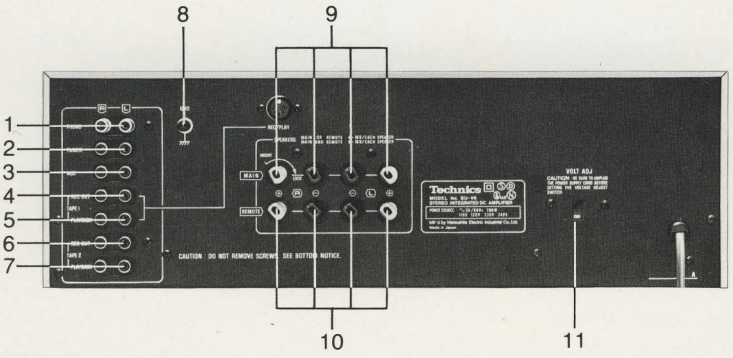
Remote action switches are employed on the input selector, recording selector, and phono selector. Therefore, switching takes place at the ideal location within the circuitry.
This contributes to sound quality by minimizing the chances of signal degradation due to extensive wiring.

Other Features

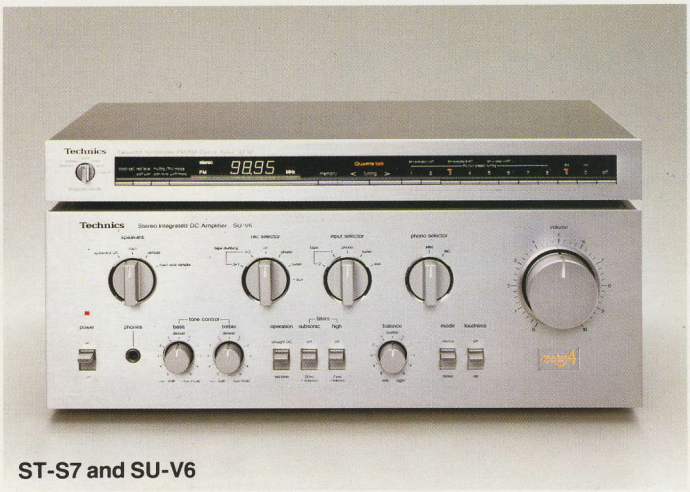
- High filter to cut out high frequency noise such as record scratches and tape hiss.
- Front-panel speaker selector lets you select either of two pairs of speaker systems (A or B) or both at once (A+B).
- Tone controls defeated at center position setting.



Rear Panel Facilities



1. PHONO inputs
2. TUNER inputs
3. AUX inputs
4. TAPE DECK 1 Recording outputs
5. TAPE DECK 1 Playback inputs
6. TAPE DECK 2 Recording outputs
7. TAPE DECK 2 Playback inputs
8. Ground terminal
9. Speaker terminals (main)
10. Speaker terminals (remote)
11. Voltage adjuster



ST-S7 and SU-V6

The ST-S7 Quartz Synthesizer FM/AM Stereo Tuner is just the right companion for your SU-V6. With the same clean, attractive styling and outstanding performance standards, it perfectly complements the SU-V6 Integrated DC Amplifier.

Technical Specifications (DIN 45 500)

20 Hz~20 kHz continuous power output	
both channels driven	80W×2 (4Ω)
	70W×2 (8Ω)
40 Hz~16 kHz continuous power output	
both channels driven	80W×2 (4Ω)
	70W×2 (8Ω)
1 kHz continuous power output	
both channels driven	90W×2 (4Ω)
	74W×2 (8Ω)
Total harmonic distortion	
rated power	
at 20 Hz~20 kHz	0.02% (4Ω)
	0.007% (8Ω)
at 40 Hz~16 kHz	0.02% (4Ω)
	0.007% (8Ω)
at 1 kHz	0.01% (4Ω)
	0.007% (8Ω)
half power	
at 20 Hz~20 kHz	0.007% (8Ω)
at 1 kHz	0.003% (8Ω)
−26 dB power at 1 kHz	0.05% (4Ω)
50 mW power at 1 kHz	0.08% (4Ω)
Intermodulation distortion	
rated power	
at 250 Hz:8 kHz=4:1, 4Ω	0.02%
at 60 Hz:7 kHz=4:1, SMPTE, 8Ω	0.007%
Power bandwidth both channels driven, −3 dB	
	THD. 0.03%, 5 Hz~60 kHz (4Ω)
	THD. 0.02%, 5 Hz~60 kHz (8Ω)
Residual hum & noise (Straight DC)	0.3 mV
Damping factor	30 (4Ω), 60 (8Ω)

Headphones output level & impedance	
	560 mV/330Ω
Load impedance	
MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω
Input sensitivity & impedance	
PHONO MM	2.5 mV/47 kΩ
MC	170 μV/47Ω
TUNER, AUX	150 mV/36 kΩ
TAPE 1, REC/PLAY	170 mV/39 kΩ
TAPE 2	150 mV/36 kΩ
Phono maximum input voltage	
at 1 kHz, RMS, THD 0.01%	
MM	150 mV
MC	10 mV
S/N	
rated power 4Ω	
PHONO MM	78 dB (86 dB, IHF A)
MC	68 dB (68 dB, IHF A, 250 μV input)
TUNER, AUX	92 dB (106 dB, IHF A)
−26 dB power 4Ω	
PHONO MM	67 dB
MC	65 dB
TUNER, AUX	68 dB
50 mW power 4Ω	
PHONO MM	64 dB
MC	62 dB
TUNER, AUX	65 dB

Frequency response	
PHONO	RIAA standard curve ±0.5 dB (30 Hz~15 kHz)
TUNER, AUX, TAPE (Straight DC)	DC~150 kHz (−3 dB) +0, −0.3 dB (20 Hz~20 kHz)
Tone controls	
BASS	50 Hz, +10 dB~−10 dB
TREBLE	20 kHz, +10 dB~−10 dB
High-cut filter	7 kHz, −6 dB/oct
Subsonic filter	20 Hz, −12 dB/oct
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Output voltage & impedance	
REC OUT	150 mV
REC/PLAY	30 mV/82 kΩ
Channel balance	
AUX, 250 Hz~6300 Hz	±1.0 dB
Channel separation	
AUX, 1 kHz	55 dB

GENERAL

Power consumption	760 W
Power supply	AC 110/120/220/240 V, 50/60 Hz
Dimensions (W×H×D)	430×153×351 mm (16-15/16"×6-1/32"×13-13/16")
Weight	12.5 kg (27.6 lb)

Note: Total harmonic distortion is measured by the digital spectrum analyzer (HP 3045 system).

Technics
Matsushita Electric

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