



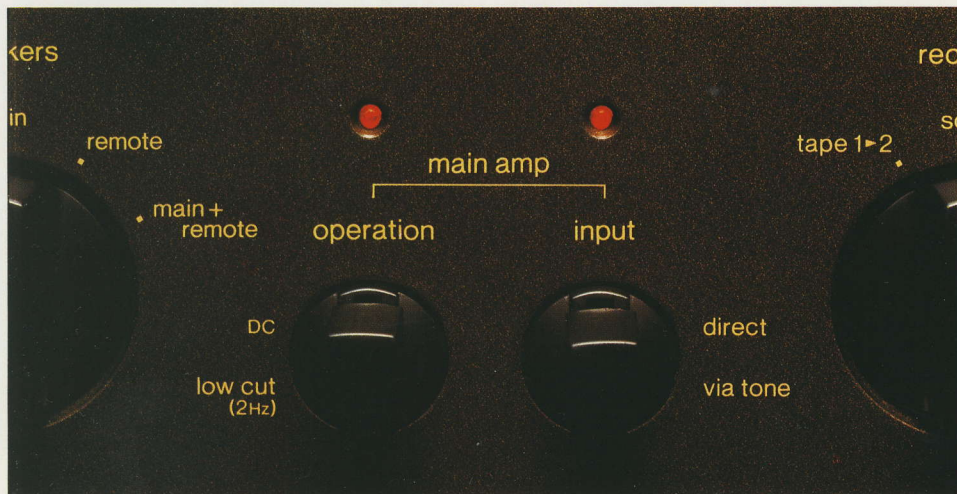
Technics

SU-8080

Stereo Integrated DC Amplifier



SU-8080 Stereo Integrated DC Amplifier



A fact which is often lost sight of in these days of proliferating audio products is that the first and foremost purpose of an amplifier is to amplify. To amplify the program source as accurately as possible, neither adding to nor subtracting from the natural beauty of your music. Technics terms this Waveform Fidelity, and it's what we continuously strive to achieve in all our fine components. In the SU-8080, our audio engineers have gone all out in their quest for absolute Waveform

Fidelity. Major features include our newly-designed Integrated DC Amplifier, totally separate power supplies for each channel, a fantastically quiet equalizer circuit, direct high level input to the DC power amplifier, and dozens of other innovations. Read the following specifications and then listen to this amplifier perform. We're confident that you'll want to hear a whole lot more from the SU-8080.

New Integrated DC Amplifier for Maximum Waveform Fidelity

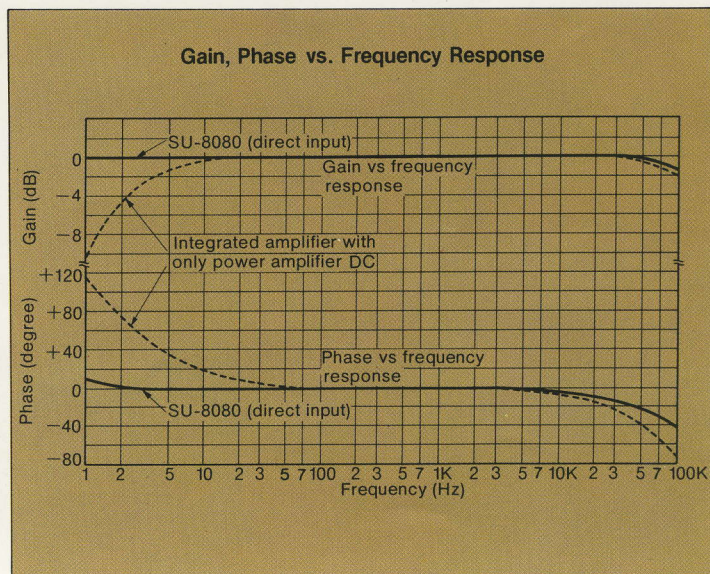
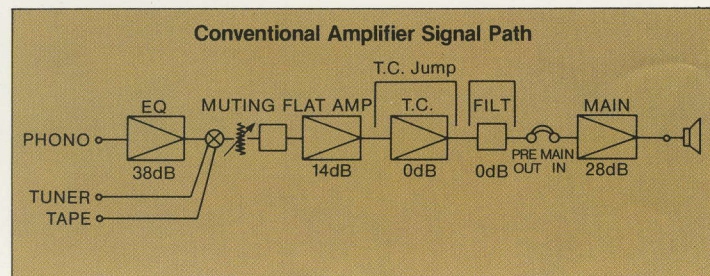
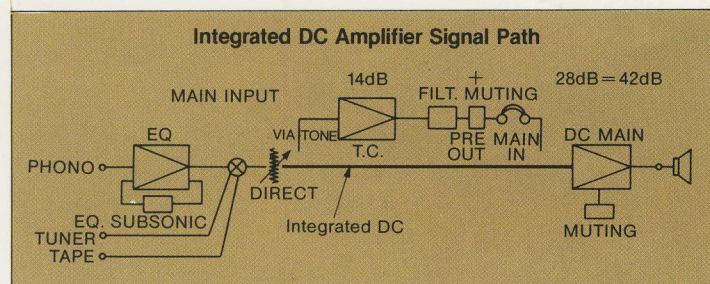
The power amplifier of the SU-8080 is a newly-designed DC amplifier to ensure the maximum in Waveform Fidelity. It features a first stage differential amplifier, a purely resistive loaded voltage amplifier, an emitter follower and a two-stage Darlington-connected fully complementary output stage.

For complete low frequency reproduction all the way down to 0 Hz, all coupling capacitors have been totally eliminated from the SU-8080 circuits. No capacitors will be found anywhere in the signal path: in the output stage, between stages, or in the NFB loop. Since capacitors cannot pass DC or any

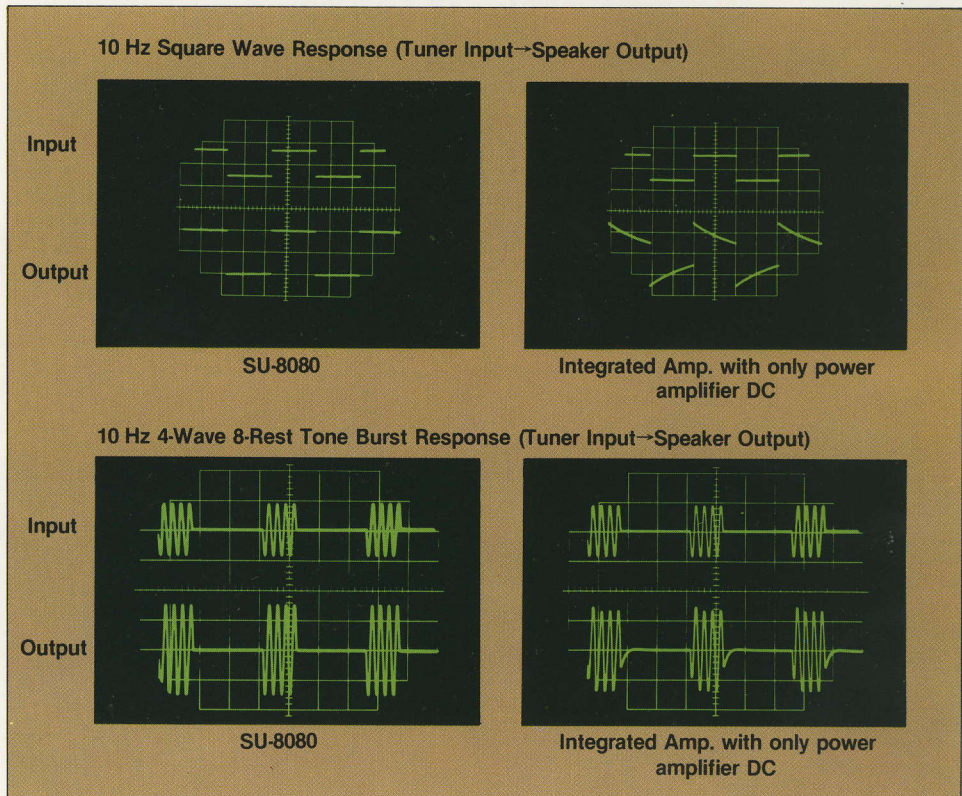
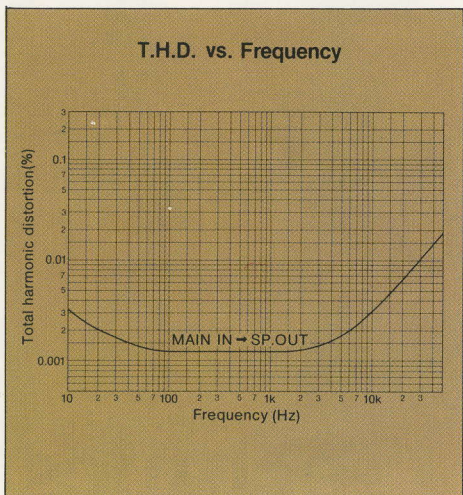
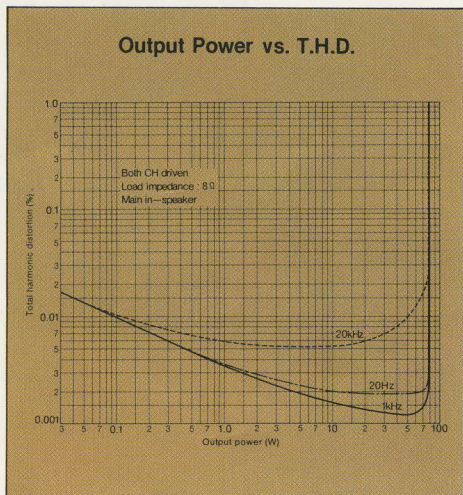
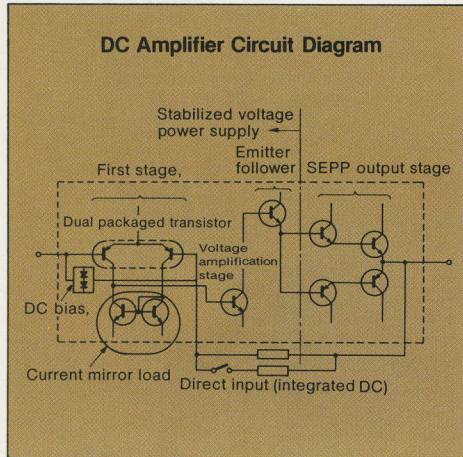
frequencies close to it, their use—and they are used in nearly all other amplifiers—places a distinct limit on lower range frequency response. Another advantage of the DC circuitry is the correction of another problem found in conventional amplifiers: phase dislocation of bass frequencies. Overall, then, the DC amplifier simply performs better and permits much more accurate reproduction of the input signal and therefore better Waveform Fidelity. And that, we repeat, is the name of the game.

To obtain the best from a DC amplifier, one should avoid using it with a non-DC preamplifier. That's why the SU-8080 is designed so that high level inputs from Tape, Tuner, Aux etc., can be routed directly to the power amplifier without passing through any other circuits. That's what we mean by an "integrated" DC amplifier. When operated in this fashion, the DC power amplifier has a gain of 42 dB (above 0.02Hz). And compared to a conventional amplifier, the SU-8080 delivers a considerably lower level of distortion as measured between the high level input terminals and the speaker terminals. When necessary, tone controls and/or filters can be switched in from the front panel, in which case the power amplifier gain is 28dB. The amplifier produces 72 watts per channel, minimum RMS, into 8Ω from 20Hz to 20,000Hz, with a phenomenally low THD (Total Harmonic Distortion) of less than 0.02% at full rated power. When power drops down to 36 watts, the maximum level at which it would normally be used in most home applications, THD is an incredibly small 0.0015% (1kHz).

In the first stage differential amplifier, the SU-8080 employs current mirror loading and Technics' unique dual packaged transistors which are well matched for thermal stability. Current mirror circuit construction means that only the initial stage has any bearing on the amp's DC balance. In order to always keep the DC base potential strictly at zero, a DC bias has been provided for proper operation. Whenever there is a danger of pure DC leaking into the DC amplifier—an undesirable



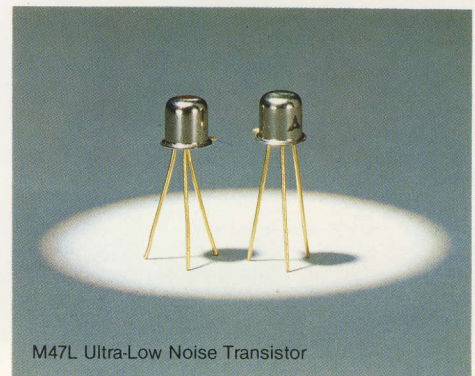
situation from the standpoint of speaker protection—you need only switch in the Low Cut Filter. This effectively cuts off all signals below 2Hz and eliminates any possibility of problems. In addition, should more than $\pm 2.5V$ of direct current appear at the output terminals of the power amplifier, the speakers are electronically disconnected from the amplifier to prevent speaker damage.



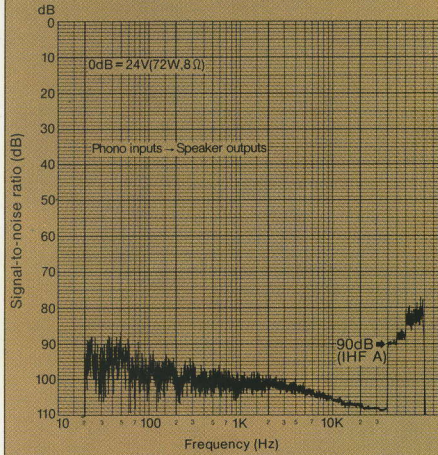
Super Silent Phono Equalizer: 88dB S/N Ratio

To accompany this superb power amplifier, Technics audio engineers were not content to include a conventional phono equalizer in the SU-8080, and a major effort was launched to find ways to achieve the same kind of superior performance in the equalizer that the DC amplifier affords. Efforts centered on the elimination of noise from the equalizer circuits, the kind of noise that you can hear in a conventional amplifier by placing the input selector switch to Phono and turning up the volume. It was found that to reduce noise (i.e. increase the S/N ratio) both circuit noise and transistor internal noise would have to be tackled. Conventional low noise transistors were found to be lacking, and still produced noise after circuit noise had been reduced. Thus, a transistor newly-developed by Technics was employed. This was the M47L, which is beyond compare in its low noise characteristics. It is used in the first stage differential amplifier operated with a current mirror load to produce an extremely low noise operating current. The result is an unprecedentedly high phono S/N ratio in the SU-8080 of 88dB at a sensitivity of 2.5mV (IHF-A). You will notice the difference with a regular high impedance cartridge, but the difference is really impressive when using a low impedance MM cartridge at high volumes. Other important steps in achieving superb phono equalizer performance include the use of Metallized polyester film capacitors as the coupling capacitors for the input and output stages (to ensure that no distortion is present even in

the inaudible range), and the use of precision components throughout the equalizer circuitry. Metallized film resistors with a tolerance of only $\pm 1\%$, and polypropylene capacitors with a tolerance of $\pm 2\%$ are used exclusively. This permits the achievement of extremely accurate frequency response throughout the entire audio range. Variation from the standard RIAA curve is no more than $\pm 0.2dB$. The following graph shows the relationship between input voltage and total harmonic distortion of the SU-8080 phono equalizer amplifier. Total harmonic distortion remains extremely low even in the low frequency range where the effect of NFB is small. High input levels up to 280mV can be handled without causing distortion or other quality degradations, so that even high output cartridges tracking discs of high cutting levels will be accommodated without the slightest problem.



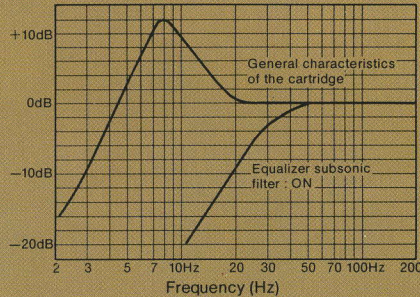
Phono Equalizer Noise Spectrum



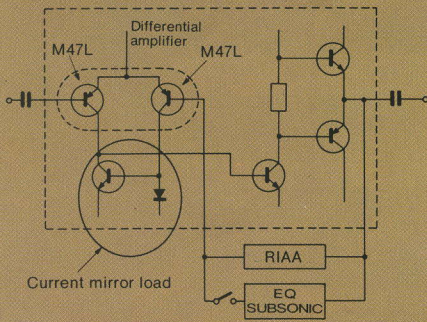
Equalizer Subsonic Filter

A sharp subsonic filter built into the equalizer circuit permits the operator to cut off all sounds below 30Hz (12dB/oct) at the flick of a switch. This eliminates low frequency vibrations picked up by the cartridge from warped records, etc., and prevents these sounds from muddying the low frequency range of your music.

Equalizer Subsonic Filter Effect



Phono Equalizer Circuit Diagram

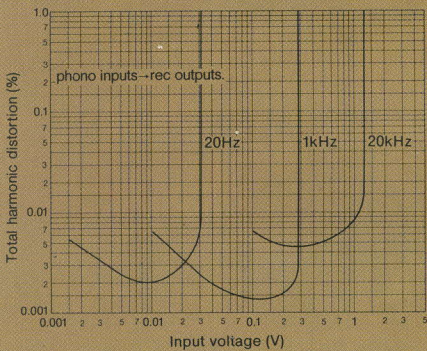


Switchable Input Resistance/Capacitance Settings

The impedance of the phono input has a subtle but important effect on the quality of sound produced. In the SU-8080, the input resistance is switchable between 27kΩ and 47kΩ, while the capacitance may be switched between high and low. This gives a total of four possible combinations, thus allowing the SU-8080 to accommodate the whole range of cartridges available on the market today. (For low output MC cartridges a separate preamp or step-up transformer will be needed.)



Phono Equalizer Input Voltage vs. Total Harmonic Distortion



Additional Features of the SU-8080

Completely Independent Power Supplies for Each Channel

The test of a quality amplifier is how it responds to music transients, those sharp, loud, sudden sounds that occur so frequently in many kinds of music. A poor amplifier cannot handle these transients and distorts the music in a very noticeable manner. The cause is insufficient power supply capacity for both channels, and often the transients occurring on one channel will end up distorting the music on the other channel

because too much current is drawn away from the one channel to be used in the other. This is known as transient crosstalk. The most elegant way to eliminate this problem is to utilize separate, independent power supplies for each channel. This is exactly what Technics' engineers have built into the SU-8080. It utilizes two hefty power transformers and four oversized 10,000 μF electrolytic capacitors along with two separate rectifier circuits for total separation of the two supplies. This completely solves the problem of transient crosstalk. In addition, the power supply for the voltage amplifier stage in both the power amp and the preamp are of the constant voltage type which means that both transient distortion in each channel and self-transient distortion are greatly suppressed, producing an amplifier with excellent dynamic characteristic. The two transformers are arranged on the chassis in such a way that they largely cancel out each other's leakage flux, thus contributing to the excellent S/N ratio.

New Type Tone Controls

When the selector switch on the front panel of the power amp is switched to the "via tone" position, the tone controls are placed in operation and adjustments to the sound may be made. But the tone controls of the SU-8080 have a unique difference, for when they are in their center positions, the tone control circuit components (resistors and capacitors) are removed from the circuit and the frequency response is totally flat.

Dynamic Range Unaffected by Muting Circuit

Audio muting is accomplished by altering the power amplifier's NFB by 14dB. This differs from the conventional method which is to introduce resistance after the volume control. The virtue of this new approach is that the dynamic range is not altered, although the noise is decreased in volume. It also means that the audio muting takes place after the tone amplifier when the selector switch is in the via tone position.

Precise, Error-Free Volume Control

The volume control is a precision-crafted continuously variable device to permit accurate adjustment of playing volume level. The circuit utilizes 1% tolerance metal film resistors in the NFB loop of each channel's amplifier and maintains gain difference within 0.5dB, so that the left-right balance between the channels does not vary when the volume is adjusted up or down.

Versatile Controls

The SU-8080 has facilities to accommodate two tape decks, and dubbing in either direction is possible. The rec mode and tape monitor switches are independent, so you may play records or listen to the FM tuner while dubbing tape-to-tape. This convenient feature permits great flexibility and allows maximum enjoyment of your equipment.

High Filter

An effective high filter engaged from the front panel eliminates irritating high frequency noises such as record scratches and tape hiss.

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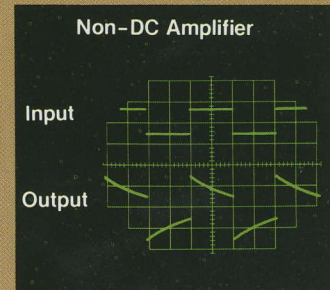
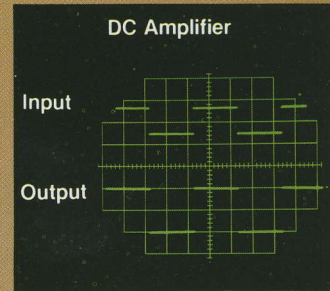
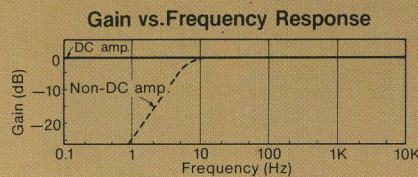
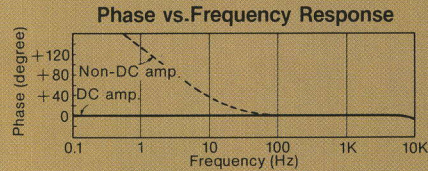
Why a DC Amplifier?

In conventional amplifiers, extremely low frequency sounds are not amplified because as 0Hz is approached, intra- and inter stage capacitors block the signals and fail to let them travel through the circuit. This not only harms low frequency gain but also has adverse effects on phase response. In the DC amplifier, those lows all the way down to 0Hz are amplified, thus ensuring the most accurate possible reproduction of the incoming signal and guaranteeing maximum Waveform Fidelity.

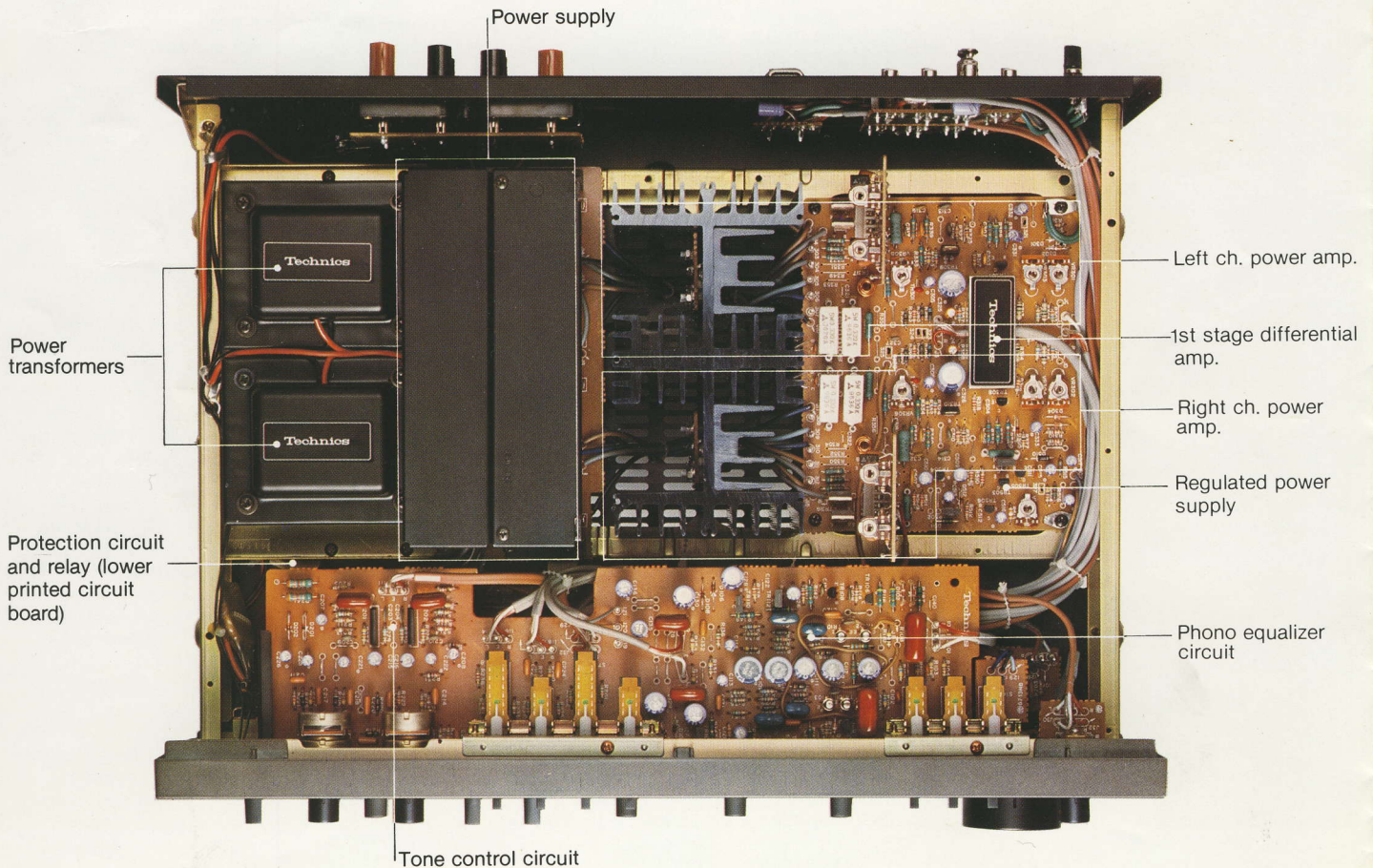
This is accomplished by totally eliminating capacitors from the signal path stages and connections between them. By their very nature, capacitors block the flow of direct current, and as a consequence the very low frequency sounds fail to ever reach the amplifier circuits. In a very real sense, the recent history of audio amplifiers has been the history of the elimination of capacitors from amplifier circuits. First they were eliminated from the output stage in the OCL (output capacitorless) amplifiers and from between the stages in the direct coupled amplifier. Now they have been eliminated from the NFB loop as well, permitting total, complete DC amplification.

Naturally, the process is much more complicated than merely removing the capacitors. The elimination of coupling capacitors is not

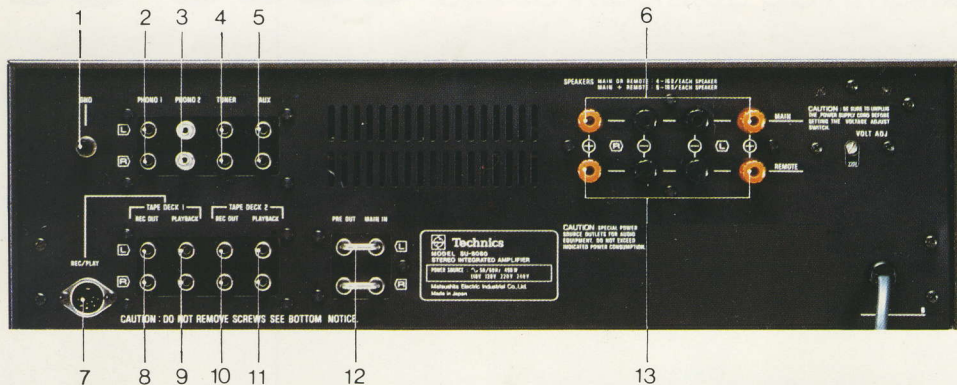
a simple task, and Technics engineers had many problems to solve to achieve this. Actually to ensure complete DC and temperature stability in the power amplifier stage, a complete redesign and upgrade of the circuitry was required. A great deal of design attention was given to making circuits as exact as possible, and only the most precise, narrow tolerance components could be utilized so as to keep all sources of DC from getting into the circuits, for even a single trace of direct current is amplified by the DC amplifier and appears at the output.



10 Hz Square Wave Response



Rear Panel Facilities



- 1. Ground terminal
- 2. Phono 1 inputs
- 3. Phono 2 inputs
- 4. Tuner inputs
- 5. Aux inputs
- 6. Speaker terminals (main)
- 7. REC/PLAY terminal (Tape deck 1)
- 8. Tape deck 1 REC outputs
- 9. Tape deck 1 PLAY inputs
- 10. Tape deck 2 REC outputs
- 11. Tape deck 2 PLAY inputs
- 12. Pre-out/Power-amp-in terminals
- 13. Speaker terminals (remote)



The ST-8080 is just the right companion for your SU-8080. With the same bold, attractive styling and outstanding performance standards, it perfectly complements the SU-8080 Integrated DC Amplifier.

Technical Specifications (DIN 45 500)

POWER AMPLIFIER SECTION

1 kHz continuous power both channels driven	2×92 W (4 Ω) 2×74 W (8 Ω)
40 Hz~16 kHz continuous power both channels driven	2×90 W (4 Ω) 2×72 W (8 Ω)
20 Hz~20 kHz continuous power both channels driven	2×90 W (4 Ω) 2×72 W (8 Ω)
Total harmonic distortion	
rated power at 1 kHz	0.02% (4 Ω, 8 Ω)
rated power at 40 Hz~16 kHz	0.05% (4 Ω) 0.02% (8 Ω)
rated power at 20 Hz~20 kHz	0.05% (4 Ω) 0.02% (8 Ω)
half power at 1 kHz	0.0015% (4 Ω, 8 Ω)
-26 dB power at 1 kHz	0.08% (4 Ω)
50 mW power at 1 kHz	0.15% (4 Ω)
Power bandwidth	
both channels driven at 4 Ω	5 Hz~40 kHz, -3 dB
both channels driven at 8 Ω	5 Hz~40 kHz, -3 dB
Frequency response	20 Hz~20 kHz, +0 dB, -0.1 dB DC~100 kHz, +0 dB, -3 dB

S/N (IHF, A)	115 dB
Residual hum & noise	100 μV
Damping factor	35 (4 Ω), 70 (8 Ω)
Input sensitivity and impedance	1 V/47 kΩ
Headphones level and output impedance	550 mV/330 Ω
Load impedance	
MAIN or REMOTE	4~16 Ω
MAIN+REMOTE	8~16 Ω

PREAMPLIFIER SECTION

Input sensitivity and impedance	
PHONO 1, 2	2.5 mV/47 kΩ, 27 kΩ
TUNER, AUX	200 mV/35 kΩ
PLAYBACK, REC/PLAY	200 mV/35 kΩ
Phono maximum input voltage (1 kHz, RMS)	280 mV
Total harmonic distortion	0.01%
S/N	
rated power PHONO 1, 2	70 dB (IHF, A: 88 dB)
TUNER, AUX	92 dB (IHF, A: 100 dB, via tone) (IHF, A: 106 dB, direct)
-26 dB power PHONO 1, 2	65 dB
TUNER, AUX	67 dB
50 mW power PHONO 1, 2	60 dB
TUNER, AUX	62 dB
Frequency response	
PHONO 1, 2	RIAA standard curve ±0.2 dB
TUNER, AUX	20 Hz~20 kHz, +0 dB, -0.1 dB
Tone controls	
BASS	50 Hz, +7.5 dB~-7.5 dB
TREBLE	20 kHz, +7.5 dB~-7.5 dB
Equalizer subsonic filter	30 Hz, -12 dB/oct.
High filter	10 kHz, -6 dB/oct
Loudness control (volume at -30 dB)	100 Hz, +8 dB
Muting	-14 dB
Output voltage	
PRE OUT (rated)	1 V
(max.)	9 V
REC OUT	200 mV
REC/PLAY	30 mV
Channel balance (250 Hz~6300 Hz)	±1.0 dB
GENERAL	
Power consumption	490 W
Power supply (50 Hz/60 Hz)	110 V/120 V/220 V/240 V
Dimensions (W×H×D)	450×140×371 mm (17-23/32"×5-1/2" ×14-19/32")
Weight	14 kg (30.9 lb.)

 **Technics**
Matsushita Electric