

The Silver Anniversary Sherwoods



25 years of design and engineering excellence.

Basic design simplicity: In a world of increasing technological complexity it is becoming an increasingly rare and valued virtue—and perhaps the highest form of technological sophistication as well.

Of importance is not innovation merely for innovation's sake, but innovation for practical, reliable and audible improvements.

Sherwood's engineering approach is distinctive in several ways.

Number one, all design related functions—from concept to creation of the prototype—are performed under the direction of Sherwood Laboratories in Chicago. Assembly of many important components also takes place here under the supervision of the designers.

Secondly, Sherwood's specialized product line permits its engineering staff to focus on critical details and exercise greater control throughout the entire creative process.

Incompatible as this might seem with the operations of a large scale manufacturer, it has been the formula of success for Sherwood.

Sherwood's value has been recognized in the Best Buy ratings of leading consumer electronics magazines, in favorable reviews by independent consumer testing organizations, and, most importantly, by knowledgeable audiophiles themselves.

Sherwood was one of the first commercial manufacturers of quality audio equipment in America. In fact, Sherwood equipment was used in the first commercial FM stereo broadcast.

Today, much of the research work of the Sherwood engineers involves the re-working and perfecting of current circuit configurations—not only

for better performance but also for improvement of servicing capabilities.

One recent development of this nature is the "mother board": a multi-circuit-bearing p.c. board that interconnects all inputs and outputs and replaces more elaborate wiring configurations. By eliminating conventional "sandwiching" of printed circuits, it is no longer necessary to remove non-defective components to get at a defective part. The result? Greatly reduced servicing costs and easier servicing when required.

Certified Performance: A genuine advance in value to the customer.

One of the inevitable by-products of mass production has always been the variation of individual units from the "target" level of performance.

As a result, the specs in product literature can normally only be viewed as a general guideline to performance.

Test reports and lab evaluations, of course, reveal specific performance data. But only for the unit under test.

Which has meant that most units on dealer shelves must be considered "unknowns" as far as exact performance figures are concerned. (Very few hi-fi dealers are able to help because of the cost of high accuracy testing equipment.)

Now Sherwood has eliminated the uncertainty with its line of Certified Performers.

Certified Performance: You'll know what you're getting. You'll see it in writing.

Attached to the carton of every Sherwood product is a notarized certificate which describes the actual performance of that unit. Each Sherwood has undergone extensive tests and measurements in our factory under the direction of the same engineers who designed it. The performance

of every Sherwood has been optimized by our technicians. This actual maximized performance has been recorded on a "Certified Performance" certificate. This document, keyed to the serial number of the product, signed by the technician who performed the work, and notarized, is your assurance that your Sherwood works as well as it can when it leaves our factory, and that it will continue to deliver maximum pleasure and performance for many years.

What is on the Certificate?

The Certified Performance certificate that comes with every Sherwood begins with the model and serial number of the tested unit. Included for receivers and amplifiers is the rated power specification using the FTC standard.

Receivers, of course, are actually combinations of three separate components, and the C.P. certificate gives essential information about the performance of all three: the power amplifier, pre-amplifier, and tuner of every receiver.

Our Obligations.

High fidelity manufacturers commonly look for engineering achievements which are "promotable." Some of these "breakthroughs" are significant. Others, of course, are not. At Sherwood we believe that audio manufacturers must avoid meaningless races for highest power, lowest distortion, and most-knobs-per-dollar, and must, instead, design products for musical reproduction. Manufacturers also have an obligation to supply rational standards and state which specifications are important, and why.

Power and Distortion.

The amount of power an amplifier can deliver has been stressed by every manufacturer of audio equipment, yet few have ever attempted to describe what limits useful power. The maximum

usable power output is limited by the introduction of audible distortion.

Experts acknowledge that there is a threshold for the audibility of distortion—that there must be a point, beyond which further reduction in the amount of harmonic distortion is a technological tour de force but not a listening benefit. The question is "at what point does harmonic distortion become audible?" It is audible at .01%, or .05%, or .2% or 10%?

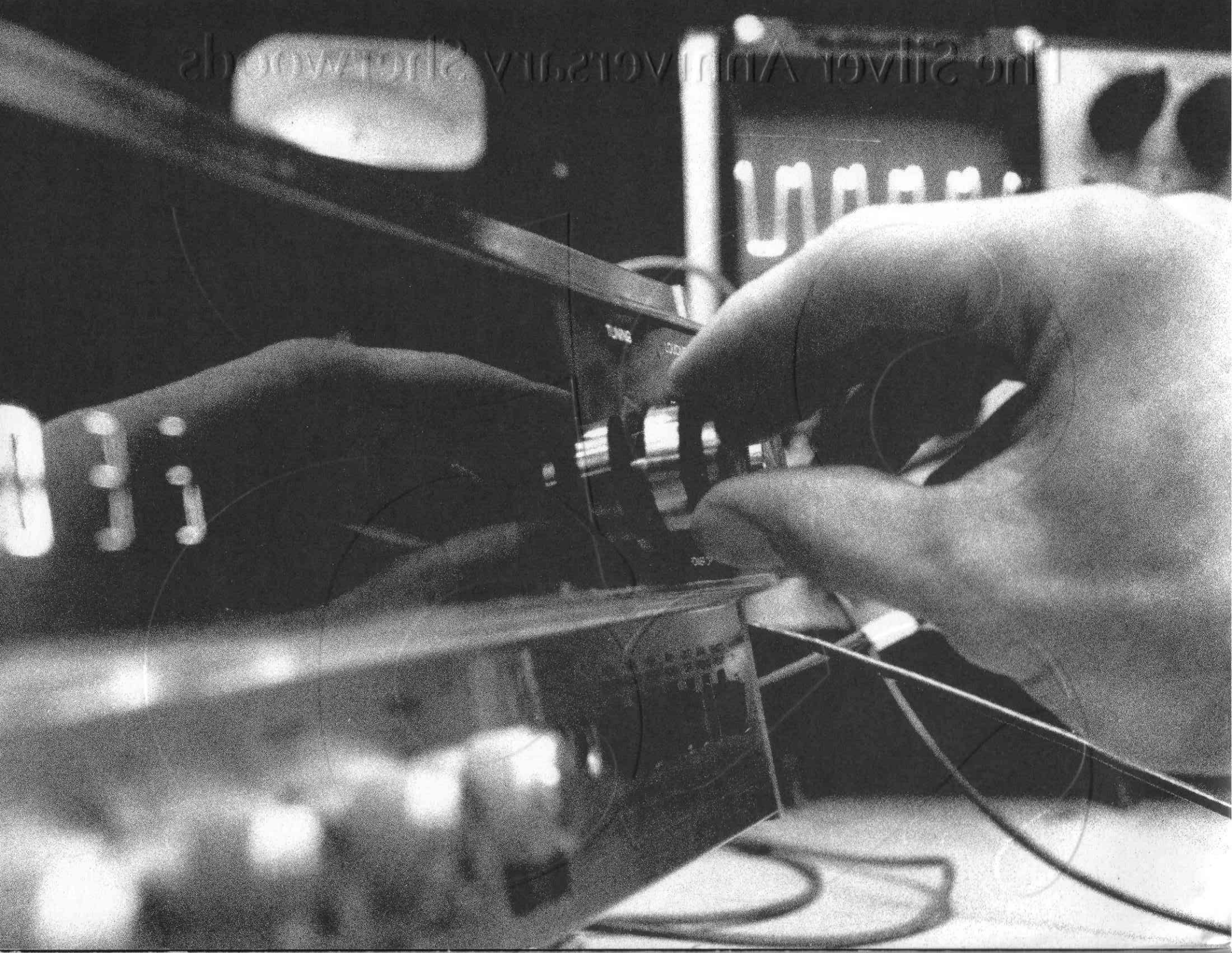
Psychoacousticians, who deal with such matters, agree that distortion of about .35% to 1% becomes audible on certain program material.¹¹ Therefore, we at Sherwood conservatively rate all our amplifiers and receivers at .2% total harmonic distortion. Since this is below the audible threshold for musical reproduction, we must, therefore, conclude that with respect to harmonic distortion, all amplifiers and receivers, whether rated at .001%, or .05%, or .2% are audible equivalents.

For those who are curious about the actual distortion levels of their Sherwood, however inaudible the distortion might be, the CP certificate does show the measured distortion at rated output at 20Hz (the lowest tone considered audible), 1000 Hz, and 20,000 Hz (the highest audible tone). Often these are up to 10 times better than the "rated" figure.


Are FTC power specs sufficient?

Unfortunately, knowing the rated power of an amplifier and that its distortion is .2% or less, is incomplete information. The reality is that when actually playing music, some amplifiers, sound louder than other amplifiers, even when they have the same FTC power ratings.

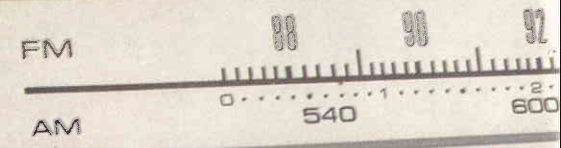
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 SHERWOOD

S-7850 CP ST



POWER

PHONES

SPEAKERS

ON

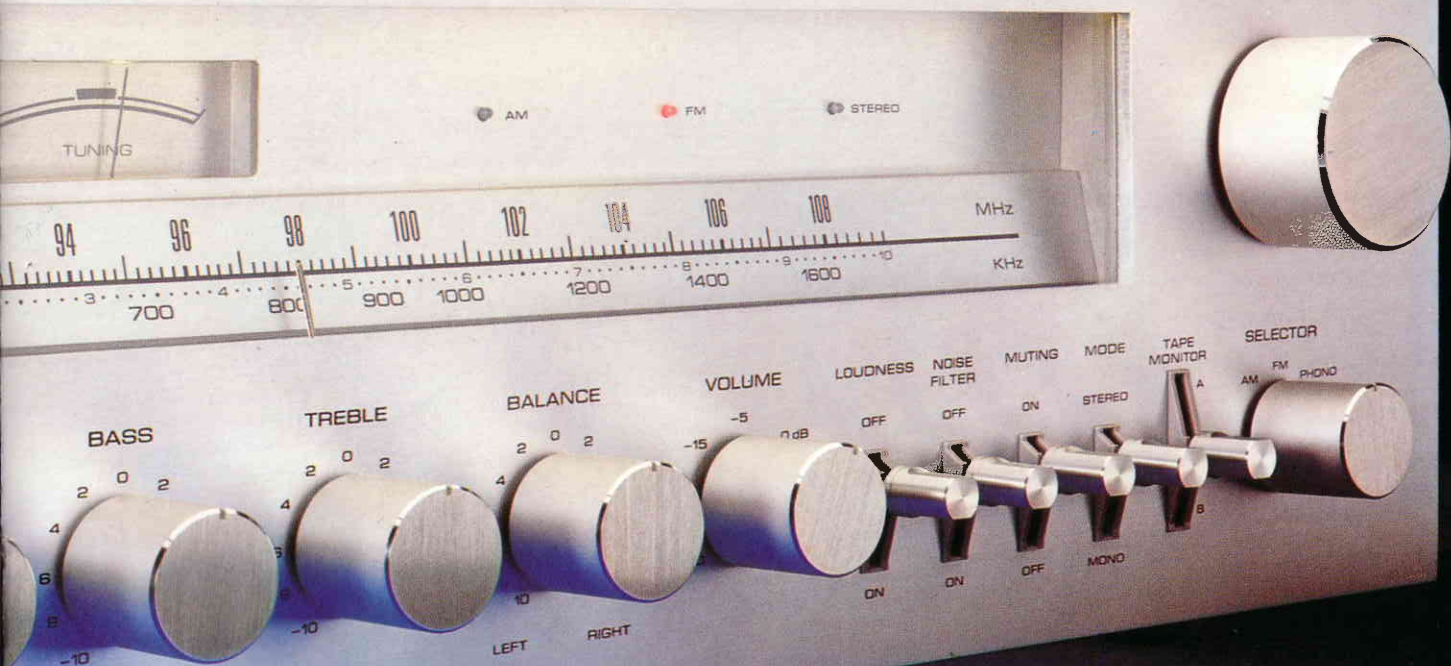


OFF





STEREO RECEIVER



S-7650 CP

45 watts per channel, minimum RMS, at 8 ohms from 20-20,000 Hz, with no more than 0.2% Total Harmonic Distortion

Four section FM tuning capacitor with dual gate MOS FET for superior sensitivity

Phase linear FM IF filters and PLL multiplex for high selectivity and wide separation

Differential amplifier in phono pre-amplifier gives 92 dB signal-to-noise ratio with minimal interaction

Built-in subsonic filter to eliminate phono overload from record warps

Noise filter with very sharp 12 dB per octave slope to minimize high frequency noise

S-7250 CP

20 watts per channel, minimum RMS, at 8 ohms from 20-20,000 Hz, with no more than 0.2% Total Harmonic Distortion

Three section FM tuning capacitor with Phase Linear FM IF filters and PLL multiplex for superior FM

Center channel tuning meter

Phono preamp with 92 dB signal-to-noise ratio and minimal interaction

Built-in subsonic filter to eliminate phono overload from record warps

Noise filter with very sharp 12 dB per octave slope to minimize high frequency noise

Detented tone and balance controls for repeatability and ease of use



SHERWOOD

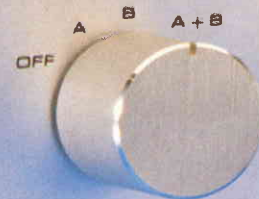
S-7250 CP STEREO



POWER

PHONES

SPEAKERS



D RECEIVER

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BASS

TREBLE

BALANCE

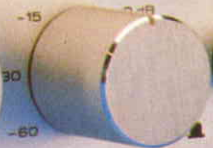
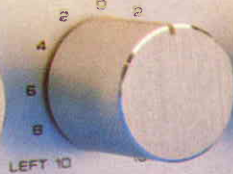
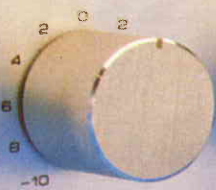
VOLUME

LOUDNESS NOISE FILTER


MUTING

TAPE

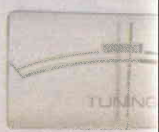
SELECTOR





 SHERWOOD

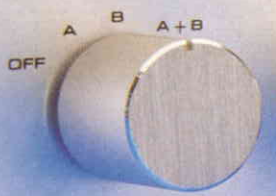
S-7450 CP STEREO RECEIVER



POWER

PHONES

SPEAKERS



BASS





S-7450 CP

30 watts per channel, minimum RMS, at 8 ohms from 20-20,000 Hz, with no more than 0.2% Total Harmonic Distortion

Three section FM tuning capacitor with Phase Linear FM IF filters and PLL multiplex for superior FM

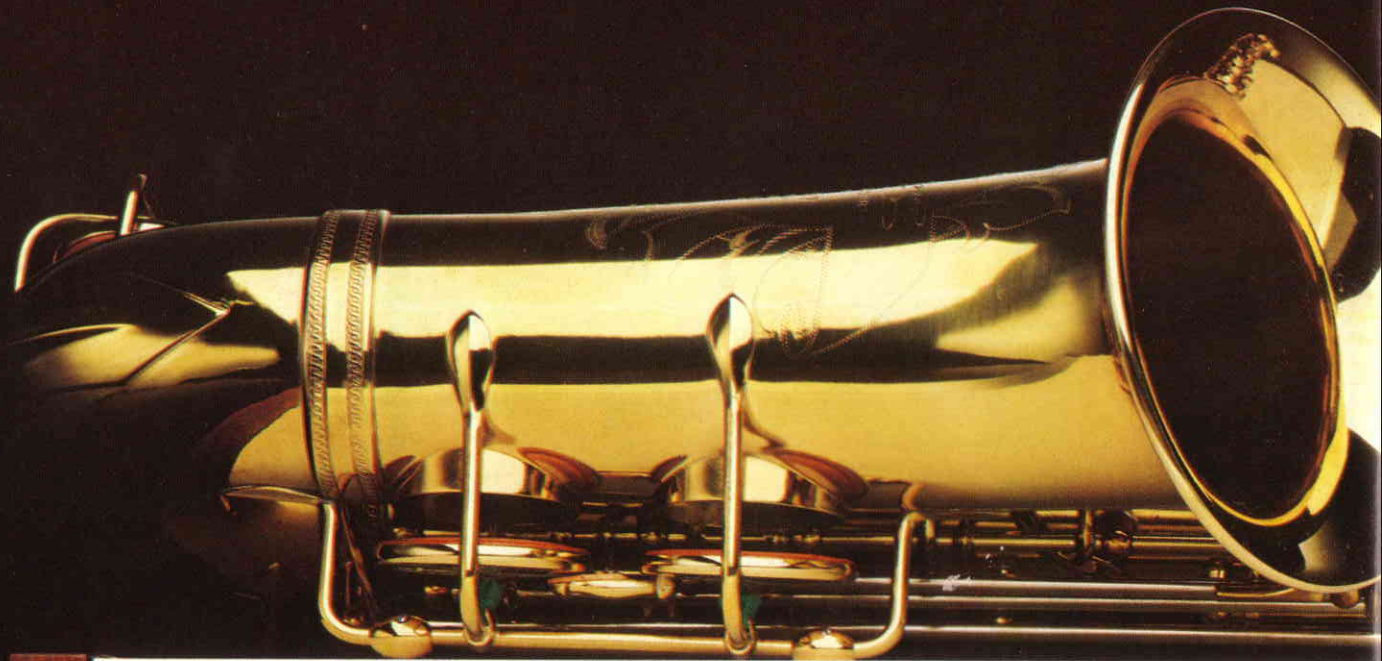
Center channel and signal strength meters for ease of tuning


Phono preamp with 92 dB signal-to-noise ratio and minimal interaction

Built-in subsonic filter to eliminate phono overload from record warps

Noise filter with very sharp 12 dB per octave slope to minimize high frequency noise

Detented tone and balance controls for repeatability and ease of use



 SHERWOOD

STEREO RECEIVER MODEL S-110CP

Two analog meters: **SIGNAL** (0-5 scale) and **TUNING** (centered needle). To the right is a frequency scale with **FM** (88-96) and **AM** (540-700) markings. A red vertical bar indicates the current frequency, currently at 92.5 FM. Below the scale are three buttons: **FM DEEMPHASIS** (25 and 75 NORM), **FM STEREO ONLY**, and **FM MUTING**.

TAPE 2

IN
OUT

MONITOR DUBBING

1 1-2
SOURCE 2 2-1

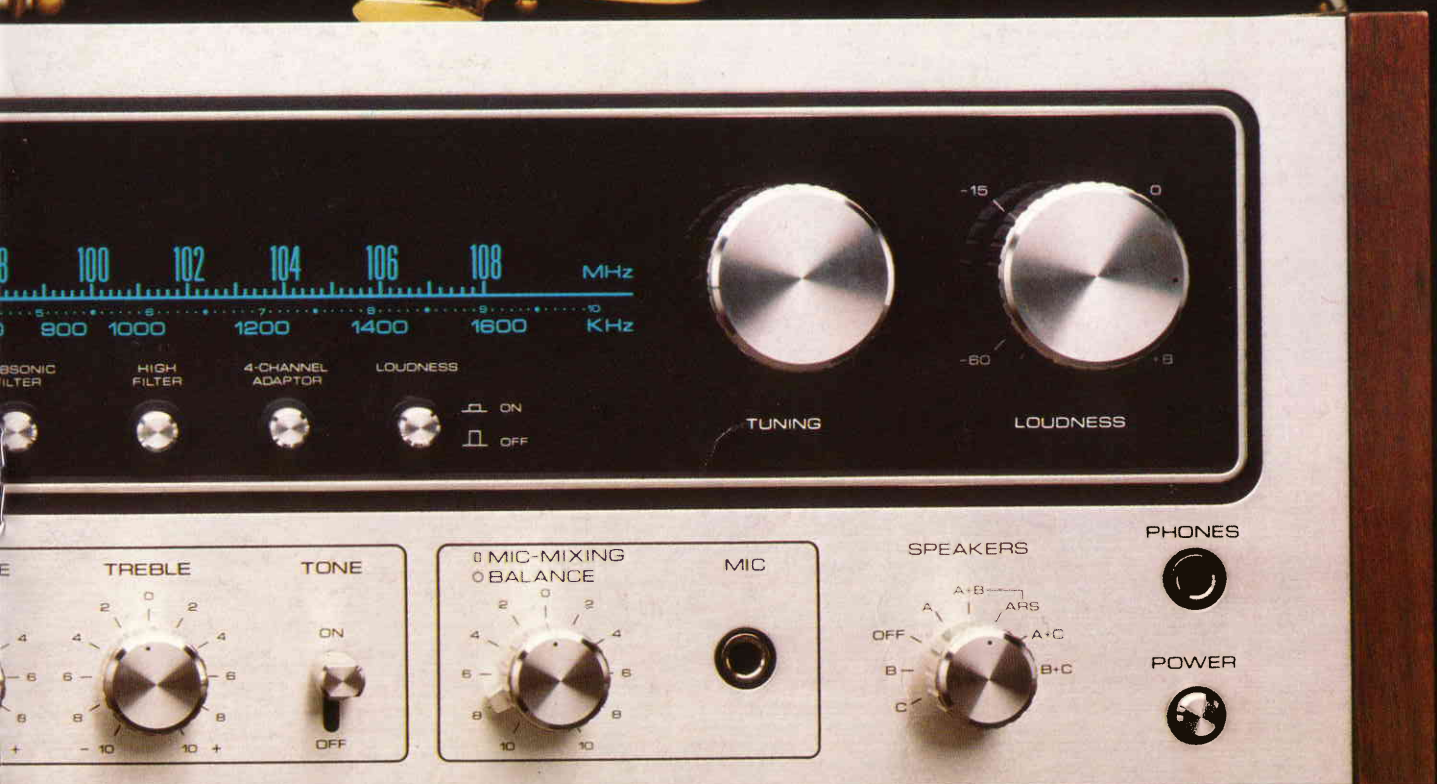
SELECTOR MODE

PH1 FM AM PH2
AUX1 -AUX2

R STEREO L REV MONO

BASS MIDRA

2 0 2 2 0
4 4 4 4 0
6 6 6 6 0
8 8 8 8 0
-10 10 + -10



S-110 CP

100 watts per channel, minimum RMS, at 8 ohms from 20-20,000 Hz, with no more than 0.2% Total Harmonic Distortion

4 section FM with 2 dual gate MOS FETs for extraordinary sensitivity and almost complete immunity to overload and spurious responses

Tuner includes IF Phase Linear Ceramic Filters, Phase Lock Loop (PLL) multiplex; and IC digital detector for superior FM and ease of service

Differential amplifier in phono pre-amplifier gives 94 dB signal-to-noise ratio with minimal interaction

Tone controls add no distortion and may be bypassed

Direct coupled power amplifier with plug-in driver boards for high power and serviceability

Relay speaker protection automatically disconnects speakers to avoid catastrophes

Built-in 4 channel synthesizer (ARS)

Built-in mic mixing

Relay switching of 3 pair of speakers maintains very high damping factor



S-75 CP

70 watts per channel, minimum RMS, at 8 ohms from 20-20,000 Hz, with no more than 0.2% Total Harmonic Distortion

4 section FM with 2 dual gate MOS FETs for extraordinary sensitivity and almost complete immunity to overload and spurious responses

Tuner includes IF Phase Linear Ceramic Filters, Phase Lock Loop (PLL) multiplex; and IC digital detector for superior FM and ease of service

Differential amplifier in phono pre-amplifier gives 94 dB signal-to-noise ratio with minimal interaction

Tone controls add no distortion and may be bypassed

Direct coupled power amplifier with plug-in driver boards for high power and serviceability

Relay speaker protection automatically disconnects speakers to avoid catastrophes

Built-in 4 channel synthesizer (ARS)





HP 1000 CP

60 watts per channel, minimum RMS, at 8 ohms from 20-20,000 Hz, with no more than 0.2% Total Harmonic Distortion

"Mother board" construction and glass reinforced circuit boards for long life and easy of serviceability

Accommodates two turntables, two tape decks, a tuner, two auxiliary components plus an external processor loop

Variable loudness compensation for exact tonal balance at low listening levels

Power amp with localized feedback for low TIM distortion

Front panel power meters

Five separate circuits for protection of amplifier and speakers

Built-in four channel synthesizer (ARS)



HP-5500 CP

1.6 μ V IHF FM sensitivity

Five section FM tuning capacitor with 3 dual gate MOS FETs in the front end for extraordinary sensitivity and almost complete immunity to overload and spurious responses

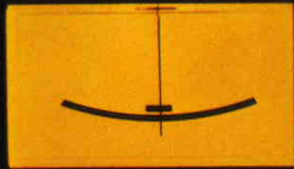
Four pairs of matched phase linear ceramic filters with four integrated circuits used as gain blocks for wide selectivity and low distortion

Digital FM detector for recovered audio as distortionless as the signal itself

Cross-coupled PLL stereo multiplex integrated circuit for uniform stereo separation

Exclusive "Touch Lock AFC" assures non-critical tuning.

Especially designed IC for superior AM performance



HP 2000 CP

120 watts per channel, minimum RMS, at 8 ohms from 20-20,000 Hz, with no more than 0.2% Total Harmonic Distortion

"Mother board" construction and glass reinforced circuit boards for long life and ease of serviceability

Accommodates two turntables, two tape decks, a tuner, two auxiliary components plus an external processor loop

Variable loudness compensation for exact tonal balance at low listening levels

Power amp with localized feedback for low TIM distortion

Front panel power meters and LED clipping indicator

Five separate circuits for protection of amplifier and speakers

Built-in four channel synthesizer (ARS)

Built-in mic preamp and mixer



MICRO/CPU 100

1.6 uV IHF FM sensitivity

Computer controlled design for state-of-the-art performance

Station call letter and frequency display

Unprecedented tuning accuracy of .0024%

Six section varactor front end for the most sensitive tuner ever

"Our reaction to the Sherwood Micro CPU 100 is that, as of now, it is the best available FM tuner." STEREO REVIEW, January 1978

"We have just measured what is probably the world's greatest FM tuner." AUDIO MAGAZINE, November 1977

STEREO

MHz

96 98 100 102 104 106 108



102.7





SHERWOOD

The reasons for this are attributable to various factors. We know that some amplifiers overload more gracefully than others causing less distortion and less irritation, and some amplifiers have greater "head room," the ability to deliver extra power when playing music, than others. These are both factors.

Also important is that distortion is not equally audible at all frequencies. To take the most obvious example, distortion in very high pitched tones might not be audible. The first harmonic of a 15,000 Hz tone will be 30,000 Hz, well outside the audible range. Very low bass distortion is also less audible, partially because the human ear is relatively insensitive at these frequencies, and because loudspeakers and headphones greatly increase distortion below 100 Hz.

Sherwood engineers utilize a test which they have determined has the highest correlation with the perceived loudness of amplifiers and receivers. The test is the amount of power the amp can deliver before intermodulation distortion (the most audible kind) reaches .2% (the audible threshold.) This amount of available power, measured in watts, appears on every C.P. certificate.

Pre-Amplifier

Most consumers rely too heavily on the power amplifier specifications of power and distortion and pay little, if any, attention to the preamplifier. This section, which processes the signals from the phonograph cartridge and provides all the control functions for the amplifier or receiver, is actually the first link in the reproduction chain. Any noise or distortion introduced here will simply be amplified by the power section. It is, therefore, of critical importance that the preamplifier be designed with utmost care.

Manufacturers often use a single I.C. for the preamplifier of their integrated amps and receivers. Although these devices are cost efficient, they have not been proven in the most exacting audio applications. Sherwood builds the preamplifier of all its receivers with more costly, but better sounding discrete transistor circuitry.

The first preamp specification listed on the C.P. certificate is harmonic distortion of the phono section, rated at 100 millivolts input. This signal level was selected because it is representative of the maximum signal typically processed by this section.

The next specification on the certificate goes one step beyond the IHF standards. The IHF specifies that phono overload (the maximum signal that can be processed) is measured at 1,000 Hz. Unfortunately this specification alone is not enough to describe this parameter.

Although older high output cartridges could only produce outputs of 100 mV at 1,000 Hz while tracing groove modulations, mistracking and new high energy magnets may increase output up to 30%. Therefore, 140 mV phono overload capability is necessary to insure total freedom from overload at 1,000 Hz. However, high frequencies on records are boosted above the 1 KHz level. Cartridge trackability follows this boost up to 10 KHz and then drops quickly due to stylus resonance. To avoid overload at 10,000 Hz, input capability must be 4.87 times the 1 KHz value or approximately 680 mV (millivolts). This 10,000 Hz overload capability is measured and certified on each Sherwood receiver.

Transient Distortion.

Research has recently identified a form of distortion that does not appear during normal testing. This transient distortion is the result of poor power

amp design where slow impulse response overloads the amplifier on musical material. Sherwood engineers worked to eliminate these power amplifier distortions, and they have also identified a phenomenon we call phono transient overload distortion. This distortion can occur in phono sections whenever the 10,000 Hz phono overload is insufficient. Under these conditions, the charging current requirement of the capacitors in the RIAA equalization network is so great that the phono section may interact and overload on musical inputs.

To be free of phono transient overload distortion, preamplifiers must have both 10,000 Hz overload capability greater than 680 mV and at least 4.87 times the 1 KHz value.

All Sherwood receivers have been designed to minimize this source of overload and interaction.

FM Tuner.

Sherwood has always been famous for its FM technology. Our Micro CPU 100 has been named by many experts in the audio industry as the finest ever built. This magnificent, computer controlled tuner is indicative of the care, attention to detail, and expertise we bring to all our tuner designs.

The Certified Performance certificate lists two FM parameters. The first, signal necessary for 50 dB of quieting in stereo was cited by Julian Hirsch in the June, 1978, STEREO REVIEW as "probably the most important single specification of an FM tuner..." (The lower the number the better.)

We also list stereo separation at 1,000 Hz. Wide separation enhances the imaging of the audio signal and adds to its enjoyment, and this specification is closely related to the tuner's theoretical limits and to the exactitude of alignment of that particular unit. (The higher the

number the better.)

How can Sherwood certify performance when no one else does?

Theoretically, any manufacturer should be able to measure and certify significant performance parameters of each piece of equipment produced.

But to put that theory into practice requires major changes in both the manufacturing process and the manufacturer's philosophy.

Clearly, if the individual specs of every unit are to be determined and certified, each unit must be built to the most exacting manufacturing tolerances. What's more, certification procedures demand the time of experienced engineers.

These are two commitments Sherwood has been willing to make.

Admittedly, certification adds to the cost of each receiver, tuner or amplifier. But at Sherwood we are convinced that its impact on product value is greater than anything which could be done at comparable cost.

Our confidence in our Certified Performance procedure is the reason we have extended the limited warranty period on CP products from two years to three.

In use the difference that certification makes should be apparent the first time you turn on your Sherwood unit. A "supertuned" CP unit will probably outperform even its higher priced competition.

It's all a question of value.

With the Sherwood Certified Performers there's no longer any doubt.

1 George Tlamsa, STEREO REVIEW, May, 1978

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