

Sherwood Model S-32CP Stereo FM/AM Tuner



Manufacturer's Specifications

FM Tuner Section

IHF Usable Sensitivity: Mono, 9.84 dBf (1.7 μ V).

50-dB Quieting Sensitivity: Mono, 14.17 dBf (2.8 μ V); stereo, see note.

S/N at 65 dBf: Mono, 74 dB; stereo, 68 dB.

Capture Ratio: 1.0 dB.

Selectivity: 70 dB.

I.f. Rejection: 60 dB.

Image Rejection: 60 dB.

AM Suppression: 65 dB.

Spurious Rejection: 85 dB.

THD: Mono, 0.1 percent at 100 Hz and 1 kHz, 0.15 percent at 6 kHz; stereo, 0.2 percent at 100 Hz and 1 kHz, 0.25 percent at 6 kHz.

Stereo Separation: 45 dB at 100 Hz, 35 dB at 10 kHz; 1 kHz, see note.

Frequency Response: 20 Hz to 15 kHz, +1.0, -2.0 dB.

Stereo and Muting Threshold: 17.23 dBf (4.0 μ V).

Output Voltage: 0 to 1.0 V variable and 600 mV fixed.

AM Tuner Section

IHF Sensitivity: 15 μ V.

Selectivity: 25 dB.

Frequency Response: -6 dB at 4 kHz.

Image Rejection: 45 dB.

Spurious Rejection: 40 dB.

Output Voltage: 0 to 300 mV variable, 180 mV fixed; both for 30 percent modulation.

General Specifications

Power Requirements: 120 V, 50/60 Hz, 10 watts.

Dimensions: 17 in. (43.18 cm) W x 5 1/4 in. (13.35 cm) H x 12 3/4 in. (32.4 cm) D.

Weight: 14 1/2 lbs. (6.6 kg).

Price: \$250.00.

Note: The two specifications called out above are named "Certified Specifications" by Sherwood, and the exact performance of each unit in each area is measured and listed on a "notarized" certificate packed with each unit purchased.

The Sherwood Model S-32CP FM/AM tuner is a low-cost unit with relatively few convenience features or frills, but one that offers exceedingly good fundamental performance for its price. For most FM listeners, it should prove to be a more-than-just-adequate tuner component, especially when you consider the quality level of most of what is currently being broadcast over FM in this country.

The few controls along the lower portion of the front panel of this tuner include a *Power On/Off* lever switch, a rotary *Output Level* control, a program *Selector* switch with settings for mono FM, auto stereo FM, and AM, a large tuning knob coupled to a flywheel dial-pointer arrangement, an MPX "blend" filter lever switch, and an *FM Muting* switch. It is interesting that Sherwood is able to supply *separate* mono/stereo switching and muting switching, while makers of some tuners and receivers costing much more insist upon combin-

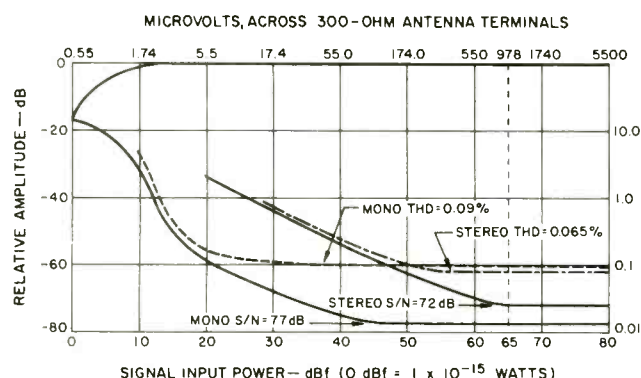
ing these functions on one switch, thereby limiting the listener to strong-signal stereo reception even if that listener wants to listen to weaker signals in stereo.

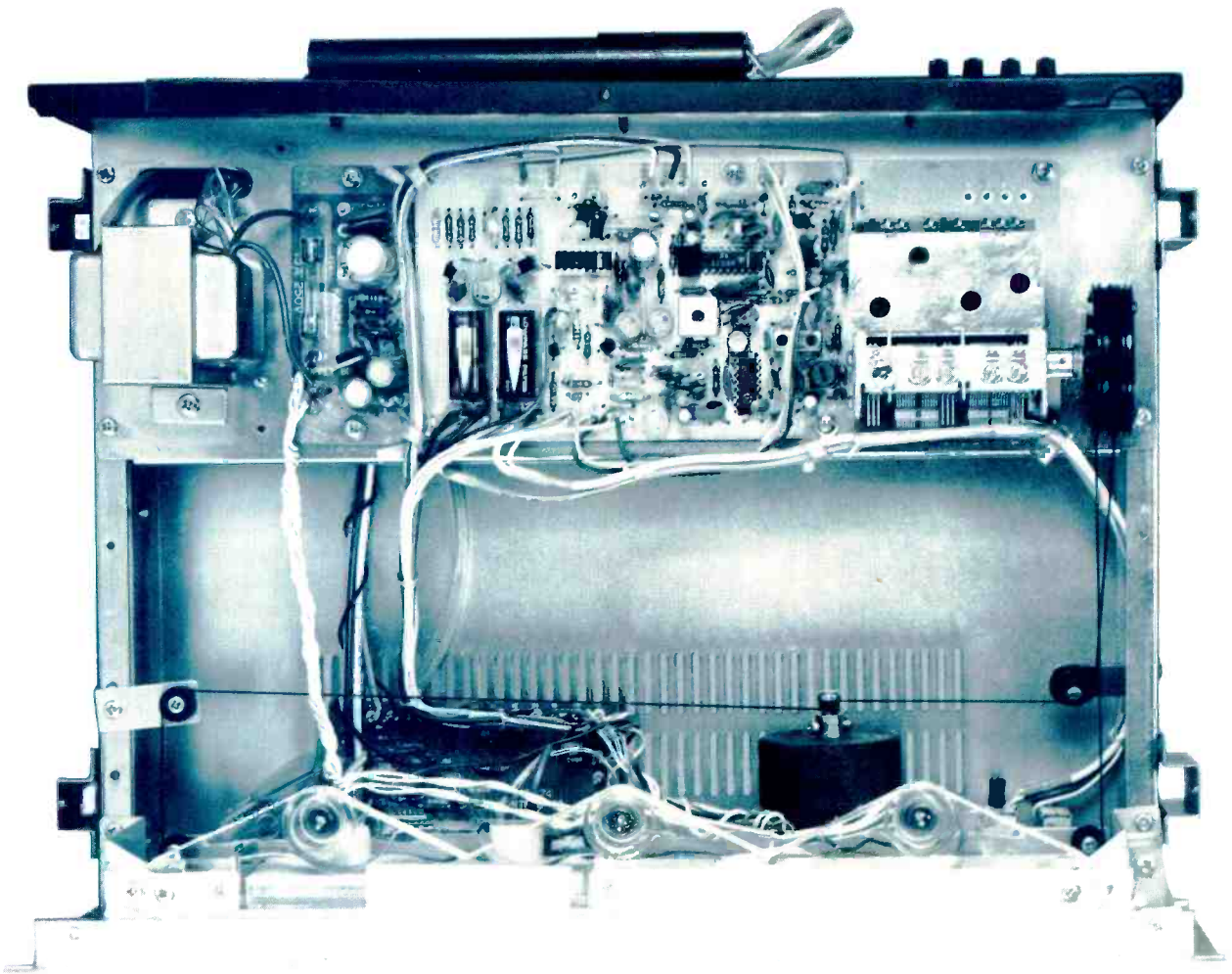
The upper portion of the dial area, at the top of the front panel, contains two meters, one for signal strength indications, the other for center-of-channel tuning on FM. Finding two meters on a tuner in this price category is, in itself, rare, but finding a center-of-channel meter that correlates perfectly with true lowest-distortion tuning across the FM band is even rarer—at any price level. (Such correlation turned out to be excellent in the case of the S-32CP.) To the right of the meters are three indicator lights for stereo FM and AM or FM program indications. Just below are a long, linearly calibrated FM frequency scale with markings at every 200 kHz and a similarly expanded AM frequency scale.

The rear panel of this Sherwood tuner is equipped with two pairs of output jacks—one providing fixed levels, the other controlled by the level control on the front panel. This double output arrangement not only frees up a record-out pair of jacks on any associated preamplifier or integrated amplifier (and with all the new sound processing add-ons available, most of us can use every tape monitor circuit we've got—and more), but permits the user to vary listening levels of AM or FM program sources by means of the front-panel level control without altering recording levels being fed to a connected tape deck.

Screw-type terminals are provided for 75-ohm or 300-ohm FM antenna transmission lines and for an external AM antenna, should one be required. A pivotable AM ferrite-bar antenna is also located on the rear panel. A three-position slide switch is located near the output jacks and has settings for 75-, 50- or 25-microsecond de-emphasis.

Fig. 1—Mono and stereo quieting and distortion characteristics, FM section, Sherwood S-32CP.





FM Performance Measurements

Usable monophonic sensitivity measured 10.3 dBf (1.8 μ V), while mono 50-dB quieting was obtained with signal strengths of 14.1 dBf (2.8 μ V) as claimed. Stereo sensitivity is one of the specifications which is supplied by Sherwood on a separate "certified performance" sheet, along with stereo separation at 1000 Hz. Unfortunately, there was no such individual sheet in our sample, so we could not verify the "certification." (Editor's Note: The "Certified Performance" sheet was apparently lost in transit; however, results were more than adequate.) In any event, our sample had a measured stereo sensitivity of 17.2 dBf (4.0 μ V), governed more by the stereo threshold point than by actual quieting or distortion figures. The 50-dB quieting point was obtained for stereo with input signals of 39 μ V (37.0 dBf) as against 34.7 dBf claimed.

Distortion levels were extremely low for a tuner in this price category, measuring a mere 0.09 percent in mono and an even lower 0.065 percent in stereo. Quieting and distortion characteristics as a function of signal strength are shown in the graphs of Fig. 1 (for a 1-kHz modulating signal). Fre-

quency response was down 2.0 dB at 15 kHz, as shown in Fig. 2. Also plotted in the 'scope photo of Fig. 2 are the separation characteristics without the MPX blend circuit (lower trace) and with that circuit activated. We measured 50 dB of separation at 1 kHz, 53 dB at 100 Hz, and 38 dB at 10 kHz without using the blend switch. When the blend switch is used, separation decreases to 16 dB at mid-frequencies and to around 10 dB at 10 kHz. The switch should only be used when listening to stereo FM signals that are otherwise too noisy to enjoy.

Crosstalk components appearing in the unmodulated channel output when a 5-kHz signal is used to modulate the desired channel fully are depicted in the spectrum analyzer photo of Fig. 4. The large signal at the left is the 5-kHz "desired" signal (sweep is linear and at a rate of 5 kHz per division, with vertical sensitivity equal to 10 dB per division), and superimposed upon it is the actual 5-kHz signal detected in the unmodulated channel output. That signal is some 48 dB lower than the desired signal. To the right are distortion components at 10 kHz and 15 kHz, as well as a residual 19-kHz pilot signal component, all of which are approximately 60 or more dB below the reference desired signal level.

Fig. 2—Frequency response and stereo FM separation.

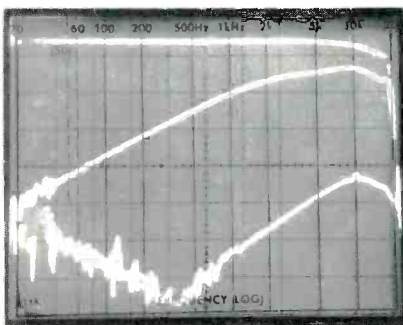


Fig. 3—Crosstalk components for a 5-kHz modulating signal.

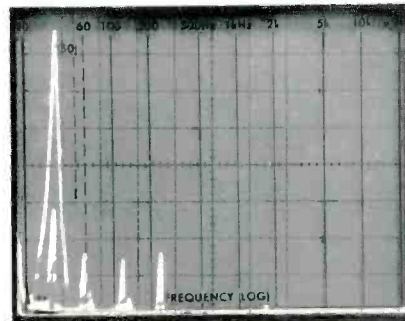


Figure 4 is a graph showing distortion versus modulating frequency for both mono and stereo FM reception. THD in mono at the frequency extremes of 100 Hz and 6 kHz measured 0.075 and 0.13 percent, while for stereo, we obtained readings of 0.12 and 0.16 percent. AM suppression measured 63 dB, while capture ratio measured exactly 1.0 dB as claimed. Image, i.f., and spurious rejection were all better than claimed, with readings of 65, 63, and 90 dB respectively. Stereo switching threshold was set at $4.0 \mu\text{V}$ (17.2 dBf), while muting threshold was set somewhat higher, at $7.0 \mu\text{V}$ (22.1 dBf).

AM frequency response, depicted in Fig. 5 (here the sweep is logarithmic again, so that frequency notations at the top of the 'scope face do apply), was surprisingly flat within the pass band which extended from around 40 Hz to 4 kHz for the -6 dB end points. While this hardly represents "high fidelity" performance, it is actually somewhat better than what we usually encounter in typical AM tuner circuits for products costing considerably more than this Sherwood tuner.

Fig. 4—Distortion vs. frequency.

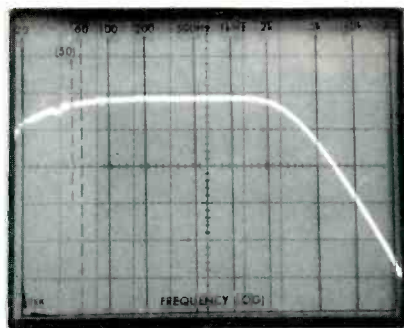
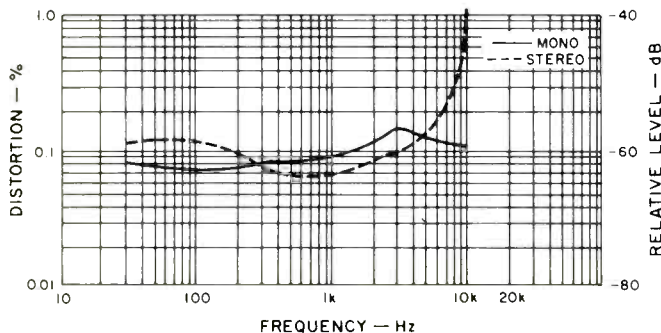


Fig. 5—AM frequency response.

Listening and Use Tests

It is only reasonable that in a tuner of such low cost a few performance areas have to be compromised to some extent. In the case of the S-32CP, such secondary specifications as image, i.f. and spurious rejection are not as high as they are on the most expensive models. However, in most listening situations, such deficiencies seldom cause serious problems. With a good outdoor antenna, properly oriented for best reception and lowest multipath interference, we could not tell any difference between the quality of received mono and stereo FM broadcasts heard on the Sherwood S-32CP and those heard, for comparison purposes, on a tuner costing fully twice as much. With a simple indoor dipole antenna, some differences were noted when the same comparisons were made, with the Sherwood tuner producing a bit more noise on weaker stereo stations. Still, when you consider the fact that a decent outdoor antenna can be had for \$25,000 or so (and is not too difficult to install yourself), the money you save on a no-frills tuner such as the S-32CP will represent a very considerable amount. Considering the present state of most FM broadcasting, such apportioning of your hi-fi component budget makes a lot of sense.

Leonard Feldman