SANSUI S-X1130 AUDIO/VIDEO RECEIVER

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SANSUI'S S-X1130 is possibly the most versatile receiver currently available for the audio/video enthusiast. The moderately large and heavy component contains a stereo/mono FM tuner, a stereo/mono AM tuner, a preamplifier that has a phono input suitable for either a moving-magnet (MM) or a moving-coil (MC) cartridge as well as the usual tuner, tape, and high-level signal inputs, and a husky stereo power amplifier. The power-amp section is rated to deliver at least 130 watts per channel into 8-ohm loads from 20 to 20,000 Hz with no more than 0.005 percent total harmonic distortion. All these audio features alone—especially the ability to decode automatically AM-stereo broadcasts in any of the four approved systems—would make the S-X1130 noteworthy, but there's more.

The S-X1130 can also operate with several video components, including a television set or video monitor, a video-disc player, and one or two VCR's. Front-panel pushbuttons select the program source—which can be audio only (as from a turntable or CD player) or combine audio with video (as from a VCR)—and interconnect the appropriate components for dubbing audio or video programs.

One of the two VCR's that the S-X1130 can accommodate plugs into front-panel jacks and can be used for playback only. The other connects to jacks on the rear apron of the receiver, and its audio and video outputs can be processed within the S-X1130 before going to an external TV receiver or video monitor and speakers. The primary reason for this arrangement is to make use of the unique audio/video control features of the S-X1130, which are especially useful for dubbing video tapes.

A small knob on the receiver's front panel fades audio and video levels simultaneously, and another allows replacement of the audio portion of a video program with another audio source. A third control adjusts the sharpness of the video image, which is useful for maintaining video quality during dubbing. Small pushbuttons select stereo or mono from video sources and turn on a noise filter to reduce high-frequency hiss in a video soundtrack. Pressing the MULTIDIMENSION button can increase the channel spread of some stereo programs, and it can provide a pseudo-stereo effect from a mono program by means of frequency contouring and interchannel phase shifting. When these control functions are applied to a video program from a VCR or video-disc player, the modified program can be recorded or supplied to the antenna input of an external TV receiver (on Channels 3 or 4) by using the S-X1130's built-in modulator.

Most of the other features and controls of the Sansui S-X1130 are typical of fine stereo receivers and need not be described in detail. The multicolored information display on the front panel shows the radio band, tuned frequency, and signal strength, the selected program source, the status of such front-panel control buttons as SUBSONIC (filter) and LOUDNESS, the power output from each channel, and whether a stereo transmission (AM or FM) is being received. Most controls are light-touch buttons or plates, and the only full-sized knob is the volume control. The tone controls (bass, midrange, treble) and the balance control are small horizontal sliders.

The Sansui S-X1130 is 17 inches wide, 16⅝ inches deep, and 6⅜ inches high. It is finished in black with gold front-panel markings, and it weighs 36 pounds. Price: $950. Sansui Electronics Corp., Dept. SR, 1250 Valley Brook Ave., Lyndhurst, NJ 07071.

Lab Tests

The Sansui S-X1130 has no external heat sinks, and during our one-hour one-third-power preconditioning period its top plate became very hot—uncomfortable to the touch, though not dangerous. During normal operation it never became more than mildly warm.

The receiver's measured 8-ohm dynamic headroom of 3.1 dB is unusually good. Apparently the amplifier's distortion rating of 0.005 percent applies only to the power-amplifier section, which can be operated separately from the preamplifier by removing a pair of jumper links on the rear panel. It is our policy, however, to measure the distortion levels of integrated amplifiers and receivers through a high-level preamplifier input, which is their normal mode of operation. This difference in measurement procedure perhaps explains our higher than rated distortion figures, but in any case the distortion was quite inaudible. The measured rise to 0.045 percent at 1 watt reflects the contribution of noise at lower-power outputs. The distortion characteristics were quite similar with lower-impedance loads.

The receiver has a SPEAKER IMPEDANCE selector switch on its rear apron that can be set for either 8- to 16-ohm or 4- to 8-ohm speakers. Though it is apparently intended to prevent overheating or other damage from extended high-power output operation into low load impedances, we could find no difference between the two settings in either clipping-power output, dynamic-power output, or distortion. The 8/16-OHM setting was therefore used for all amplifier measurements.

The S-X1130 was stable with reactive simulated speaker loads. We found that the power-level display was grossly inaccurate over much of its range (at an indicated 100 watts, the actual output was only 12 watts!), but this has no bearing on the actual performance of the receiver. A pushbutton switch increases the display's sensitivity by a factor of ten; the error noted was measured at the "normal" sensitivity setting.

The tone controls had conventional response characteristics, and the loudness control boosted both low and high frequencies as the volume was reduced (the response modification came on abruptly at a volume-control setting of about −20 dB and remained unchanged as the volume was reduced further). The SUBSONIC filter began to roll off the response at about 100 Hz, and it was down 10 dB at 20 Hz. RIAA phono equalization was unusually accurate.

We measured the response of the MULTIDIMENSION circuit by driving only one channel and measuring the frequency response at the output of both channels as well as the phase difference between them. The output of the undriven channel had a reasonably uniform response over the audio range; it was at the same average level as the driven channel. The driven channel, however, had a reduced output between 60 and 600 Hz, reaching a minimum of −20 dB at 200 Hz, and a fairly flat but elevated (+6- to +7-dB) output between 2,000 and 20,000 Hz. The phase difference between the two channels changed with frequency, typically being between 90 and 180 degrees; the channels were in phase only at 140 Hz.

The FM tuner of our test sample of the S-X1130 was slightly misaligned. As a result, minimum distortion occurred when the signal frequency was set about 30 kHz higher than the frequency display indicated. Although the change in distortion from this procedure was not great, it had an appreciable effect on the usable-sensitivity measurement and on the measured tuner distortion with a 65-dBf input. With a digital synthesis tuner like this, an ordinary user cannot detune to achieve minimum distortion, nor could this be done by ear even if it were possible, since the distortion is audibly insignificant in any case. Therefore, we made all our tuner measurements as though the misalignment did not exist.

As sometimes happens, the maximum stereo quieting, a very low −80.7 dB, was not attained until the input signal was increased to 85

FEATURES

- ☐ Digital-synthesis AM/FM stereo receiver
- ☐ Automatic decoding of all approved AM-stereo transmission systems; switchable to mono
- ☐ Electronic pushbutton tuning with seek and scan functions
- ☐ Memories for eight FM and eight AM stations
- ☐ Connections and switching for two pairs of speakers, two audio tape decks, two VCR's, and a video-disc player, including dubbing functions
- ☐ Video and audio outputs to TV set or video monitor
- ☐ Video/audio fading control and audio mixing control
- ☐ Noise filter for video-component audio channels
- ☐ "Multidimension" pseudo-stereo circuit for video or audio program sources
- ☐ Sharpness control for improved picture quality when dubbing video signals
- ☐ Stereo/mono button for video sources
- ☐ Stereo headphone jack (¼-inch phone) on front panel
- ☐ Mono microphone-input phone jack and level control on front panel
- ☐ Input connections for one VCR on front panel
- ☐ Pushbutton source selector for phono, FM, AM, auxiliary/CD player, one tape deck
- ☐ Monitor/playback button for second tape deck
- ☐ Pushbuttons select MM or MC phono inputs, "subsonic" filter, loudness compensation
- ☐ Horizontal sliders for tone controls and balance
- ☐ Display panel shows radio band, tuned frequency, correct tuning, signal strength, stereo reception, selected program source, other control settings, audio power output for left and right channels (calibrated from 0.01 to 200 watts)
- ☐ Pushbutton selects tenfold increase in power-display sensitivity
- ☐ Wide/narrow FM i.f.-bandwidth selector button
- ☐ Rear apron contains audio and video input and output jacks, preamplifier-output/main-amplifier-input jacks (joined by removable jumpers), VHF antenna input and output jacks ("F" connectors), connectors for an AM loop antenna and a 300-ohm FM antenna, 75-ohm FM "F" type coaxial connector, insulated speaker binding posts, speaker-impedance selector switch, and three a.c. outlets (one switched)

dBf (10,000 μV). The capture ratio and AM rejection were excellent, as was the 75-db image rejection. The alternate- and adjacent-channel selectivity measurements were both very good, using either the wide or narrow i.f. bandwidth. In view of the modestly reduced distortion using the wide bandwidth, without any significant reduction in selectivity, we would recommend using the wide setting at all times (in the absence of a specific interference problem). The 19-kHz pilot-carrier leakage into the audio was very low, and power-line hum was exceptionally low.

The AM tuner section's frequency response was somewhat broader than in most tuners we have tested. No measurements could be made on the stereo performance of the AM tuner, although we did listen to a number of stereo broadcasts.

Comments

It is unfortunate that the FM tuner of the Sansui S-X1130 receiver we tested was misaligned, since almost all our criticism of its performance derives from that flaw. Luckily, it was misaligned by only 30 kHz. A larger error would have prevented the TUNED indicator from coming on and would have kept the receiver constantly muted unless it were switched to mono, which is the only way to disable the muting circuit. On the other hand, a larger misalignment might well have prevented the receiver from leaving the factory in the first place, and we would never have encountered the problem!

Still, we are happy to report our very positive impressions of this unusual and versatile product. Despite the misalignment of our sample, its FM tuner is one of the better ones we have seen recently, with good to excellent measured performance in practically every category. The noise level, in particular, was lower than we generally measure from either a receiver or a separate tuner. Even the AM tuner is a cut above the norm in sound quality (though still far from "hi-fi").

For the first time, we had the opportunity to listen at length to stereo AM transmissions from a number of stations. Our impression of the sound was that, while it was unquestionably stereo, it was still AM, with all the traditional limitations of that medium. Most of the time, setting the AM mode button to mono produced a quieter and more listenable sound. At our location, AM reception is usually noisy and unsatisfactory, so we could expect no more from this or any receiver. If you can get reasonably quiet AM reception in mono, there is a good chance that the S-X1130 will give perfectly satisfactory stereo AM as well. Certainly its automatic decoding of the different AM stereo modulation systems is a major advantage—actually a necessity in many reception areas.

The S-X1130 performed the other r.f. and audio functions flawlessly. Indeed, for all its versatility and apparent front- and rear-panel complexity, it is a very easy receiver to use. Its sound, as might be expected, was superb from all sorts of sources, including FM, CD, and phono (with both MM and MC cartridges). The loudness compensation, like most we have used, made the sound bass heavy at typical listening levels. Although we made little use of the S-X1130's video functions, we could appreciate the flexibility offered by its fading and mixing capabilities. The value of the MULTIDIMENSION feature is something you will have to judge for yourself. We rarely find such pseudo-stereo circuits worthwhile, even if (as in this case) they do pretty much what they are claimed to do.

The Sansui S-X1130 is a lot of receiver. It does so many things so well that its purchase may be justified even if you don't require its video facilities right now. Video and audio will be sharing the home-entertainment market from now on, and this well-powered, well-performing receiver is unlikely to become obsolete for a long time.

Circle 143 on reader service card

HIRSCH-HOUCK LAB MEASUREMENTS

☐ **FM Tuner Section** (wide i.f. bandwidth unless specified)

Usable sensitivity (mono): 16.5 dBf (3.7 μV)
50-dB quieting sensitivity: mono, 13 dBf (2.5 μV); stereo, 37 dBf (39 μV)
Signal-to-noise ratio at 65 dBf: mono, 82.5 dB; stereo, 76 dB (80.7 dB at 85 dBf)
THD + noise at 65 dBf: mono, 0.27% (narrow bandwidth, 0.41%); stereo, 0.17%
Capture ratio at 65 dBf: 1.2 dB
AM rejection at 65 dBf: 75 dB
Image rejection: 75 dB
Alternate-channel selectivity: wide i.f. bandwidth, 64 dB; narrow bandwidth, 80 dB
Adjacent-channel selectivity: wide i.f. bandwidth, 4 dB; narrow bandwidth, 8 dB
Stereo threshold: 30 dBf (17.4 μV)
19-kHz leakage: −75 dB
Hum: −82 dB
Stereo channel separation: at 100 Hz, 42.5 dB (wide i.f.), 38 dB (narrow i.f.); at 1,000 Hz, 46 dB (wide), 38.5 dB (narrow); at 10,000 Hz, 36.5 dB (wide), 33.5 dB (narrow)
AM frequency response: −6 dB at 23 and 3,500 Hz; 30 to 9,000 Hz +0, −1 dB; −4 dB at 15,000 Hz
FM frequency response: 30 to 15,000 Hz (+0, −3.5 db at 15,000 Hz)

☐ **Audio Amplifier**

1,000-Hz output power at clipping: 171 watts into 8 ohms; 150 watts into 4 ohms; 76 watts into 2 ohms
Clipping headroom (relative to rated output): 1.2 dB (8 ohms)
Dynamic power output: 264 watts into 8 ohms; 200 watts into 4 ohms; 100 watts into 2 ohms
Dynamic headroom: 3.1 dB (8 ohms)
Harmonic distortion (THD + noise) at 1,000 Hz into 8 ohms: 1 watt, 0.045%; 10 to 50 watts, 0.015%; 130 watts, 0.025%
Maximum distortion from 20 to 20,000 Hz into 8 ohms: 0.13% at 20,000 Hz (130 watts)
Slew factor: greater than 25
Sensitivity for a 1-watt output (into 8 ohms): MM phono, 0.56 mV; aux, 14 mV; microphone, 0.054 mV (at maximum gain)
Phono-input overload (MM): 78 to 80 mV
Microphone overload: about 10 mV
A-weighted noise (referred to a 1-watt output): MM phono, −71.5 dB; aux, −77 dB
Phono-input impedance: 50,000 ohms and 110 picofarads (MM); 100 ohms (MC)
RIAA phono equalization error: ±0.4 dB from 20 to 20,000 Hz
Tone-control range: +9.5, −10 dB at 100 Hz; +8, −8.5 dB at 1,000 Hz; +8.5, −9.5 dB at 10 kHz