

A "Separate-Looking" Receiver from Toshiba

The Equipment: Toshiba SA-420 stereo FM/AM receiver in wood case. Dimensions: 19¾ by 6¼ inches (front panel); 14 inches deep plus clearance for controls and connections. Price: \$250. Warranty: "limited," two years parts and labor. Manufacturer: Tokyo Shibaura Electric Co., Ltd., Japan; U.S. distributor: Toshiba America, Inc., 280 Park Ave., New York, N.Y. 10017.

Comment: The Toshiba SA-420 gives the appearance of a low-profile FM tuner perched comfortably atop an integrated amplifier of similar dimensions, the two sharing a brushed-gold styling of sophisticated luxury. But a quick peek through the vent in the top of the case dispels the vision: Inside is a receiver of fairly standard construction. In providing such a showy exterior for a relatively low-priced receiver, Toshiba has added a decided plus. Is too much performance traded away to achieve it? As the lab data show, some compromises have been made, and your appreciation of the total package will depend to some extent on how excited you can get over a pretty face.

Toshiba recently revised the power rating of the SA-420 upward from 13 to 14 dBW (20 to 25 watts). The data supplied to the CBS Technology Center gave the lower rating, which therefore was used as the basis for testing. Total harmonic distortion data taken 1 dB below the new "full output" plus the intermodulation data suggest jointly that this receiver will indeed produce its rated power without excess distortion.

The damping factor of 27, which is somewhat low, is equivalent to an output impedance of 0.3 ohm at 1 kHz with an 8-ohm load. Speaker designers usually assume that amplifiers have negligible output impedance, and this value, while small, is enough to affect the behavior of at least some woofers. The most accurate results will probably be had by using the Toshiba to drive a somewhat overdamped speaker system to which it is connected by heavy-gauge wire—though the screw-type speaker terminals on the back panel appear to be engineered with lighter-gauge wire in mind. (Similar terminals are used for antenna connections: 300-ohm and 75-ohm FM, long-wire AM. The single back-panel AC outlet is not switched by the POWER/SPEAKERS knob.)

With a signal-to-noise ratio equivalent to 79½ dB re a nominal 10-millivolt input, the phono section displays performance that is unusually good in a receiver of this class.

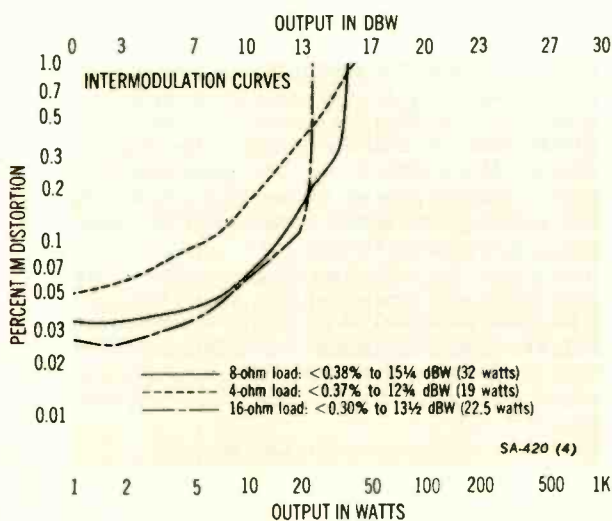
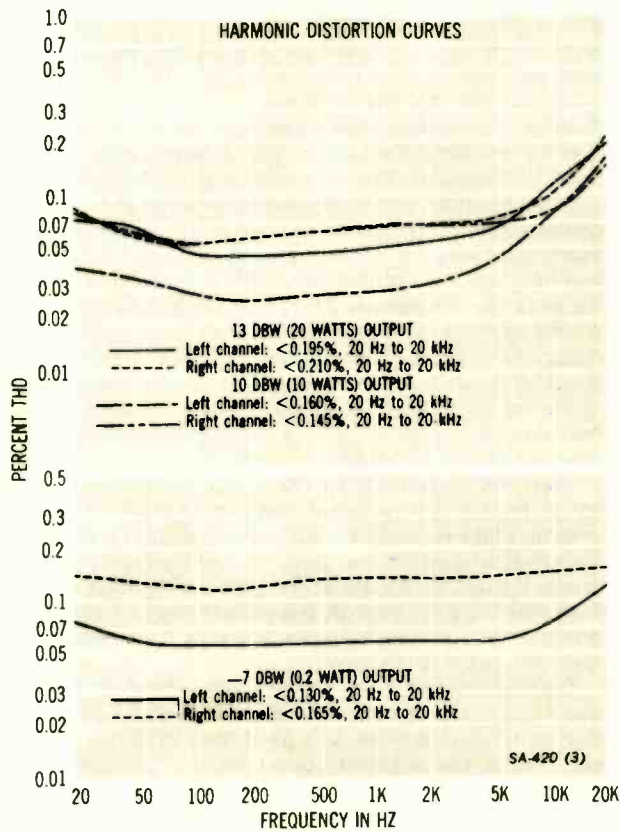
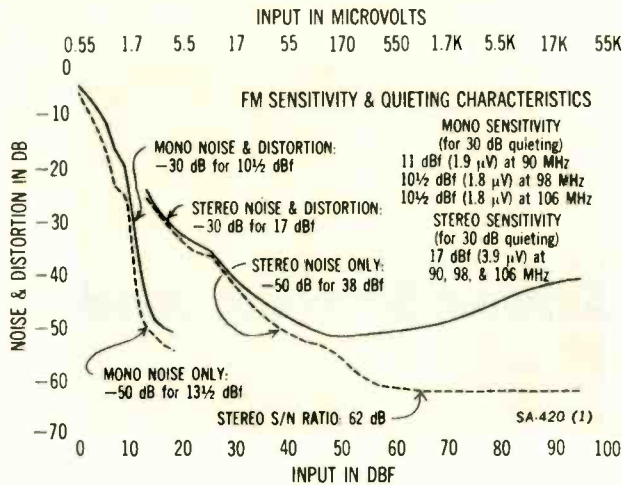
The overload point, 150 millivolts at 1 kHz, is perfectly adequate. The RIAA equalization departs from flat by 1 to 1½ dB in our test sample, which does seem to color the sound a bit, although some of the slightly tubby midbass (roughly 100 to 700 Hz) that we heard in our listening tests probably can be attributed to the low damping factor interacting with our speakers.

The control section sports a solid array of features, including dual tape monitors with dubbing capability in one direction. The characteristics of the tone controls seem quite reasonable, and the maximum treble boost seems intentionally limited to avoid stability problems at high and ultrasonic frequencies. (Oddly, Toshiba has seen fit to mount the balance control next to the tone controls rather than near the VOLUME, where it would seem to belong.) Filter slopes (at 6 dB per octave) are not as steep as some, but they are modestly effective. The loudness response seems well judged. The POWER switch is forced to share a knob with the speaker selector, which means that the "A" output terminals (to which most users would connect their main speakers) are on line as soon as the unit is turned on—of no consequence unless the switch is flipped on, then off, then on again. That sequence will sock the speakers with an appreciable pulse of energy.

The tuner section is, in its design and manufacture, complementary to the other functional blocks. As with most FM sections these days, its 30-dB quieting point is within a few dB of the theoretical minimum. The curves slope impressively from there, reaching 50 dB of noise quieting at just beyond 13 dBf in mono and at 38 dBf in stereo. At levels of 65 dBf and above, there is evidence of rising distortion, suggesting that the front end might benefit from the use of an antenna attenuator in really strong-signal areas.

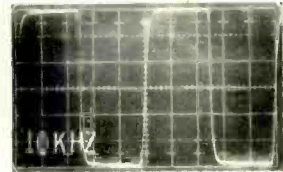
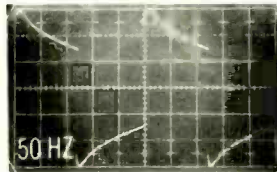
Of the remaining tuner specifications, capture ratio and total harmonic distortion can be characterized as excellent; alternate-channel selectivity is adequate for most signal environments. Suppression of the 19-kHz stereo pilot (and 38-kHz subcarrier) is not a strong point, so the filter provided in Dolby-equipped cassette decks should be used when recording off the air. The frequency response has obvious departures from flat, resulting in a sound that is quite acceptable but not particularly accurate. Separation is adequate or better all across the band.

Though the styling makes a promise the electronics do



not quite redeem, this is not at all a bad receiver. It represents far better value than most of what is available on the compact market, for example. It is not as good as it might have been, given the resourcefulness of Toshiba's engineers—but that is judging by what they have accomplished on an obviously limited budget.

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Toshiba SA-420 Receiver Additional Data

Tuner Section

Capture ratio	1.1 dB		
Alternate-channel selectivity	61 dB		
S/N ratio (mono, for 65 dBf)	70 dB		
THD	Mono	L ch	R ch
80 Hz	0.30%	0.41%	0.41%
1 kHz	0.22%	0.38%	0.40%
10 kHz	0.24%	0.44%	0.46%
IM distortion	0.27%		
19-kHz pilot	-40 1/2 dB		
38-kHz subcarrier	-30 dB		
Frequency response	mono +2 1/2, -1 1/2 dB, 20 Hz to 15 kHz		
L ch	+2 1/2, -1 1/2 dB, 20 Hz to 15 kHz		
R ch	+2, -2 1/2 dB, 20 Hz to 15 kHz		
Channel separation	>35 dB, 230 Hz to 5 kHz		
	>25 dB, 25 Hz to 15 kHz		

Amplifier Section

Power output at clipping (channels driven simultaneously)	L ch 15 dBW (31 watts) for 0.60% THD		
	R ch 15 dBW (32 watts) for 0.65% THD		
Frequency response	± 1/2 dB, 30 Hz to 20 kHz		
	± 1 1/4 dB, 10 Hz to 50 kHz		
RIAA equalization	+1 1/2, -2 dB, 20 Hz to 20 kHz		
	± 1 dB, 30 Hz to 15 kHz		
Input characteristics (for 20 watts at full gain)	Sensitivity	Noise	S/N ratio
phono	2.8 mV	-55 dBW	68 dB
aux	160 mV	-69 dBW	82 dB
tape 1, 2	160 mV	-69 dBW	82 dB

Phono overload (clipping point) 150 mV at 1 kHz

Damping factor at 1 kHz 27

High filter -3 dB at 7 kHz; 6 dB/oct.

Low filter -3 dB at 75 Hz; 6 dB/oct.