

Scott's Digital FM Tuner



The Equipment: Scott 433, a stereo-FM digital tuner. Dimensions (in integral three-sided wood case): 17½ by 6 by 15 inches. Price: \$549.90. Manufacturer: H. H. Scott, Inc., 111 Powder Mill Rd., Maynard, Mass. 01754.

Comment: Automated, foolproof tuning—and the new front-panel look associated with it—is featured in this new model from Scott. In place of the familiar multigang tuning capacitor, dial cord, knob, and station dial, we find in the Scott 433 a digital frequency synthesizer, which can be described as a small computer made of integrated circuits. The set receives stations by synthesizing a particular FM-channel frequency (the action is regulated by a quartz crystal reference standard). It then tunes automatically to the exact center of the channel, and "reads out" the frequency selected on an illuminated digital indicator.

In tuning the Model 433 you have four options. One is via a set of keyed program cards, of which one hundred and five (covering the one hundred FM-channel allocations, plus five spares to use in making replacements should any become damaged) are supplied with the set. Insert a card into the slot on the front panel, and the set will lock to that channel and hold it whether the channel is being used by a station or not, and regardless of the quality of the signal. The cards, incidentally, are marked for channel frequencies, with space for you to fill in the station call letters used in your locale.

You also can tune the 433 by any of three scan methods (with no card inserted in the slot). Note the bar-and buttons-grouping in the center of the front panel. The bar at the left is marked "scan." The three buttons next

to it are labeled as a group "scan mode selector," and individually as "channel," "stereo," and "station." Above this group is a slide control marked "channel scan speed" with "slow" and "fast" indicated at its two ends.

With the "channel" button pushed in, you can press the "scan" bar and the tuner will run through the entire FM band. The speed with which it does so is regulated by the slide-control above it. The frequencies being scanned show on the digital readout indicator. When you release the scan bar the set will remain locked in on the last frequency reached. With the speed control on "slow," you actually can use the scan bar to pick your way carefully through the band, with enough time to release the bar and check the program content of any station that strikes your fancy.

With the "station" button pressed, the set will scan the FM band automatically until it hits an acceptable FM signal (i.e., a broadcast strong enough to turn off the muting circuit and switch on the "station" indicator light). The scanning then stops and the set remains on that station. To move from this particular station to the next "acceptable" station, simply press the scan bar, and the scanning action will continue. The scanning also will resume if the incoming signal drops below minimal strength due to FM transmission vagaries. To prevent this, simply press the "channel" button after the scanning has brought in a station you want to hear.

With the "stereo" button pressed, a similar scanning action occurs, but this time the set will stop scanning only when it reaches a station strong enough to trip the automatic stereo switching circuit and cause both the

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"station" and the "FM stereo" lights to come on. Again, you can resume scanning by pressing the scan bar, or look the set to the station by pressing the "channel" button.

Regardless of what mode of automatic scan has been selected, and regardless of what channel any of those modes has pulled in, the insertion in the slot of a keyed program card overrides it all and returns the set to the channel keyed on that card. The "station" and "FM stereo" indicator lights, as well as the two meters (one for signal strength, the other showing multipath distortion) all operate in any mode of tuning used.

We found this tuning system somewhat complex at first, but also fascinating—and foolproof insofar as accurate, on-the-nose channel selection with minimal drift and perfect frequency calibration are concerned. Its drawback of course is that the sequence of channels runs only one way (from the higher-frequency channels down); you cannot tune in the opposite direction as you would with a conventional tuning dial. Let's say you want to go back to 91.5 MHz after having tuned in 91.3 MHz. You must either fish out the 91.5 MHz card or let the tuner scan downward from 91.3 MHz, return to the top of the band, and continue downward until it comes to 91.5 MHz. This is best done, by the way, with the "channel" button pressed and the speed control on "fast"—but watch your digital readout and go to "slow" scan as needed or you'll zip right past the channel you want.

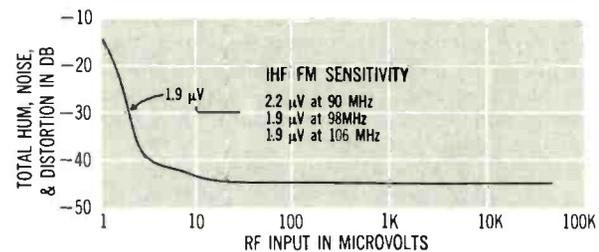
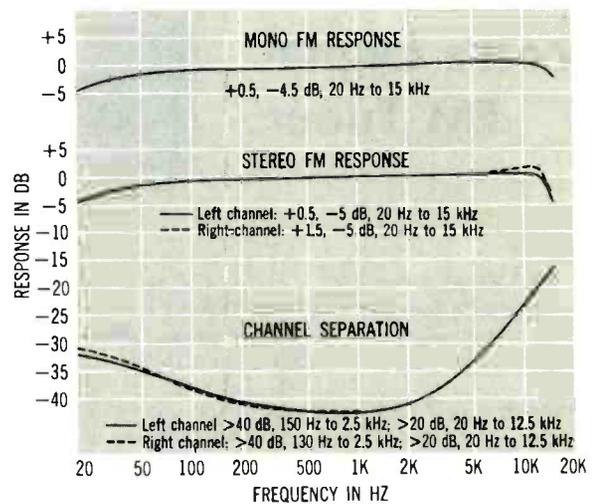
In addition to the features described, the front panel contains button switches for power off/on; muting off/on (when "on," this control will mute stations not strong enough to activate the "station" light); mono/stereo mode; and a high-frequency filter. There's also a "tape out" jack for convenient patching-in of a tape recorder; we found that this jack also will serve as a make-do stereo headphone jack for private listening, although the obvious impedance mismatch does result in fairly low volume. A second slot, under the card-insertion slot, will hold up to eight program cards (presumably those for the stations most often tuned in), although we prefer to keep these cards in numerical order in the box they came in.

The rear of the Scott 433 contains three stereo pairs of signal output jacks, all controlled by a pair of left- and right-channel level adjustments. Thus, any combination of up to three external stereo amplifiers and/or tape recorders can be driven at once. There's also a stereo output for driving an oscilloscope indicator, and another jack for feeding a composite multiplex signal from the 433's IF strip to a four-channel broadcast decoder, should one ever be needed. Even if this jack is used, by the way, the normal two-channel stereo audio is still available at the signal-output jacks. A special test jack also is provided for professional use. Antenna options include terminals for regular 300-ohm twin-lead, plus a grounding screw for use with shielded twin-lead. There's also a receptacle for a 75-ohm input jack, and a switch that selects between 300 ohms and 75 ohms for the antenna input impedance. A fuse holder, an unswitched AC convenience outlet, and the set's power cord complete the rear picture.

Its novel tuning arrangement aside, the Scott 433 offers excellent FM performance. Sensitivity was measured at CBS Labs as 2.1 microvolts. The FM sensitivity curve descends steeply and reaches maximum quieting of 48 dB for 100 microvolts of input signal, with no signs of front-end overload at higher input signals. In our cable-FM test we logged 52 stations of which 40 were judged suitable for critical listening or off-the-air

taping. Our tests also indicate that this set has exceptionally good selectivity (which prevents strong signals from swamping their weaker neighbors), and this characteristic permits stations to come in more clearly than they otherwise would on an FM set (even one with higher numerical sensitivity) that had poorer selectivity. The tuner's capture ratio at 2 dB is excellent, as is its signal-to-noise figure of 62.5 dB. Multiplex carrier suppression (see data) is exceptionally good; IM and harmonic distortion, very low. Audio response, in mono and stereo, is linear within the normal broadcast audio spectrum of 50 to 15,000 Hz; channel separation for stereo signals is outstanding. The sound of the Scott 433 is eminently clean and honest. For the perfectionist who can afford it, the Scott 433 offers FM performance of top quality combined with state-of-the-art operational options.

CIRCLE 143 ON READER-SERVICE CARD



Scott 433 Tuner Additional Data

Capture ratio	2 dB		
S/N ratio	62.5 dB		
IM distortion	0.30%		
THD	Mono	L ch	R ch
80 Hz	0.38%	0.80%	0.82%
1 kHz	0.39%	0.54%	0.58%
10 kHz	0.40%	1.60%	1.40%
19-kHz pilot	-66 dB		
38-kHz subcarrier	-68 dB		