

ONKYO®**FM/AM STEREO TUNER**model **433**

A FM/AM Stereo Tuner that pulls in, detects and converts signals and keeps them faithful to the original broadcast.

Onkyo's Model 433 is specially designed to bring real high fidelity sound to your home. Finely developed technology was employed for Model 433 because it was Onkyo's aim to create a unit that would pull in the desired signals, detect them and convert them into an audio output that is exactly the same as the signal originally broadcast. This was no easy task but by using the latest transistor circuit technology and selected materials Onkyo has come up with this amazing unit, Model 433. A few of the specially designed features are a 4 gang capacitor, a FET in the front end, 6 IF stages, 4 differential amplifiers and 3 pairs of mechanical filters. These were all incorporated into this unit for your greater listening pleasure.

A ratio detector that is ahead of it's time is used to obtain

linearity over a wider bandwidth. Model 433 can produce a perfectly flat response from 20-15,000 Hz because of the delicate adjustment of the de-emphasis characteristic and complete filtering of the 19 KHz and 38 KHz carrier waves. The distortion-null tuning meter that doubles as a signal-strength meter and a center-tuning meter enables fast and easy pinpointing of any station. A linear scale dial with a black-out dial face that lights up when the power is turned on and smooth dial movement all combine to enhance Model 433's amazing performance. Extensive listening tests, the most advanced technology and more than 20 years of experience enabled Onkyo to create this quality Hi-Fi tuner, Model 433. Onkyo means artistry in sound.

Artistry in sound **ONKYO®**

ONKYO®

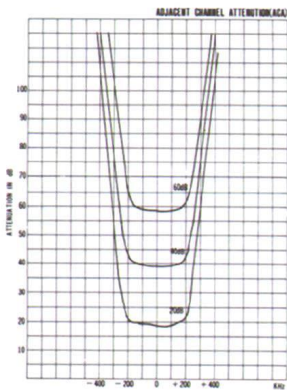
model 433

FM/AM STEREO TUNER



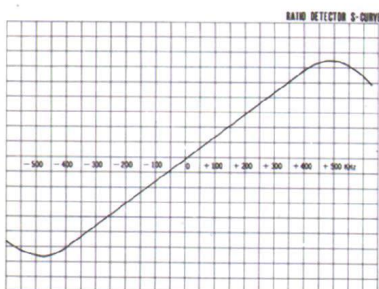
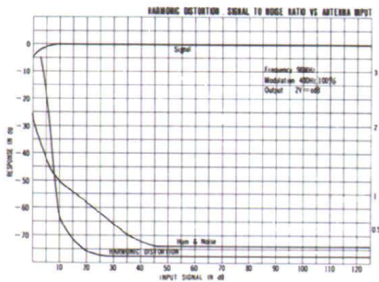
Front End

Model 433 utilizes a 4 gang variable capacitor and a 2 stage RF amplifier with FET (Field Effect Transistor) for reception of FM signals. These units boost sensitivity and are capable of rejecting any interference to the desired signal. Model 433 has an image rejection ratio of better than 90 dB. Thus it easily rejects stations at frequencies two or three times higher than the desired station. Rejection of spurious noise is over 100 dB. With this advanced front end circuitry Model 433 gives sharp and clear reception of any frequency while it rejects almost all interference.



IF Stage

The IF stages are extremely important because they are crucial in determining the distortion ratio of the whole tuner. That is why Model 433 uses as many as 6 IF stages to provide the needed gain and to minimize distortion. In addition, Model 433 employs the highly advanced ceramic filter in the tuning circuit instead of the ordinary filters with coil and capacitor. Three stages (each with two elements) of ceramic filters assure sharp selectivity and a broad bandwidth. FM has by its very nature a stronger resistance to interference than other signals. However, undesired atmospheric and ignition noise can creep in if nothing is done to prevent it. Among the 6 IF stages 5 of them (including 4 stages of differential amplifiers) work as effective limiters and eliminate unwanted interference. Model 433 achieves AM suppression of more than 55 dB and a capture ratio of below 1.2 dB. Adjacent channel separation is better than 75 dB.



Ratio Detector

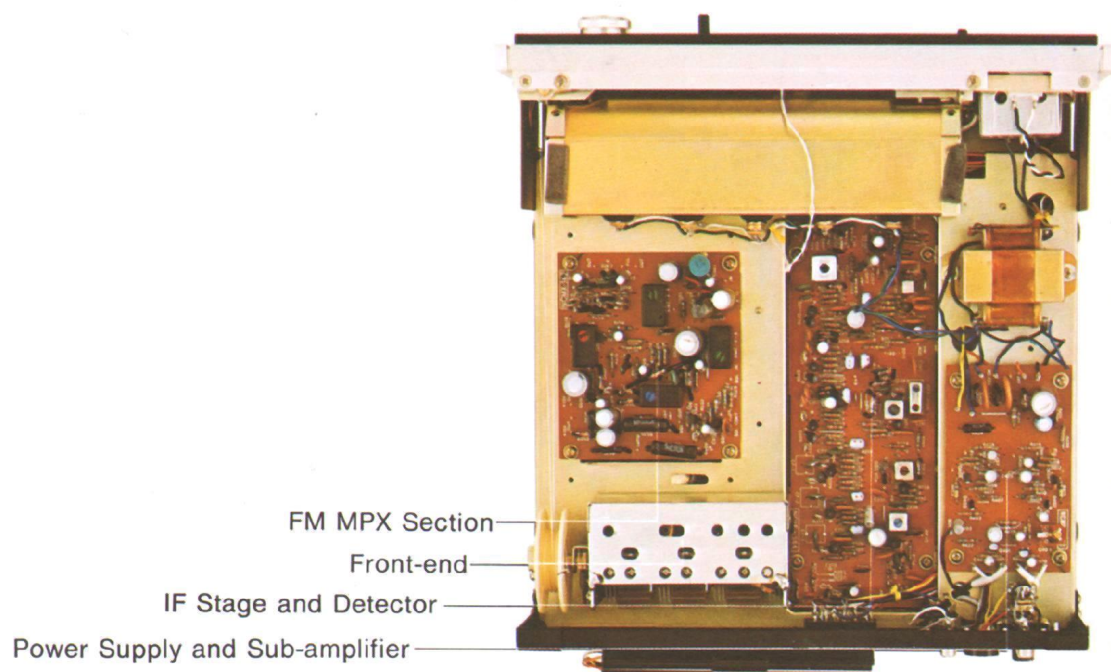
A very advanced ratio detector is used in Model 433 to convert the FM signal into an audio signal. As shown in the "S curve of the ratio detector", Model 433's ratio detector gives an unusually broad bandwidth of 900 KHz, peak to peak, with perfect linearity. Combined with the elaborate front end and IF stages this gives Model 433 a distortion of less than 0.2% (mono) and 0.5% (stereo).

Muting Circuit

Model 433 is a very sensitive tuner. However, the higher the sensitivity the louder the interstation noise. To counteract this Onkyo has incorporated a SQL (Squelch) switch into the front panel of Model 433. This switch activates the muting circuit and eliminates irritating interstation noise and assures that you receive your station without interference from other signals. To receive a very remote and weak station turn the SQL switch off so that the muting circuit does not eliminate the desired station.

Automatic FM MPX Section

Most tuners change automatically from FM stereo to mono and vice versa. Model 433's FM stereo/mono automatic switching circuit is different and better. While an ordinary circuit only detects the 19 KHz pilot carrier to activate the stereo circuit, Model 433's circuit measures the strength of the wave. If the wave is not strong enough for FM stereo reception it remains in monoaural automatically. While another tuner would torture your ears with noisy, distorted stereo Model 433 comes through clearly in monoaural.



Noise Filter

The Noise Filter switch is installed so that you can cut out the higher noises that are very annoying when conditions for FM stereo reception are not ideal. Push this switch down and unpleasant noises are cut out. Then you can enjoy clear and sharp stereo reception. Good channel separation is maintained and all undesirable noises are suppressed. The high frequency range is not affected by the Noise Filter.

De-Emphasis Circuit and Low Pass Filter

The De-Emphasis circuit is, in a sense, the equalizer in the tuner. It is delicately adjusted with the same exactness that is used in adjusting the equalizer of an amplifier. Combined with the Low Pass Filter which completely eliminates the 19 KHz and 38 KHz carriers Model 433 has a frequency response of 20 Hz to 15 KHz within $+0\text{dB}$, -1dB . The carrier leak from the 19 KHz pilot signal and the beat interference are suppressed by two stages of double tuned circuits. There is no interference to the bias frequency of a tape deck because of this minimization of the beat frequency.

Distortion-null Tuning Meter

In Model 433 a single Distortion-null tuning meter takes the place of the usual signal strength meter and center tuning meter. This method makes it much easier to tune in a station because the Distortion-null meter indicates the point of least distortion and the point of the strongest signal at the same time.

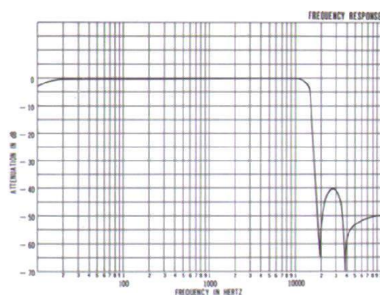
AM Section

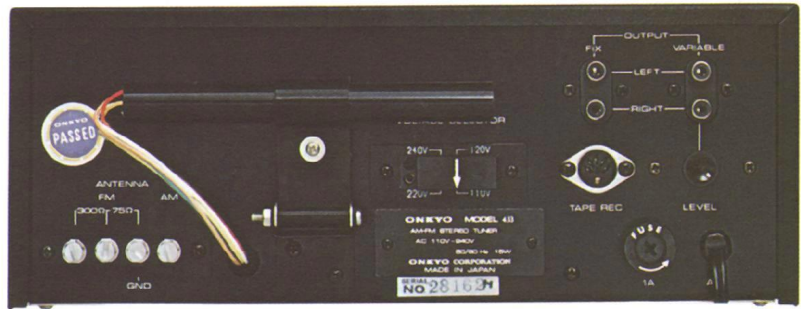
Onkyo uses the latest circuit technology in the

AM section. High sensitivity and selectivity are achieved by employing a three gang variable capacitor, ceramic filters and a sensitive built-in ferrite bar antenna. Model 433 brings quality listening that you never expected from AM broadcasting.

Variable/Fixed Output Level

The output level of Model 433 is variable from 0-2V (FM) so that you can match any amplifier's input. A fixed 0.75V (FM) output terminal is also provided and this can be conveniently used as a recording output.





Specifications

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| Tuning Range | FM 88~108 MHz AM 530~1,605 KHz |
| IHF Sensitivity | FM 1.7 μ V AM 15 μ V, 120 μ V/m (Bar Antenna) |
| Image Rejection Ratio | FM 90 dB (98 MHz) AM 70 dB (1 MHz) |
| IF Rejection Ratio | FM 100 dB (98 MHz) AM 70 dB (1 MHz) |
| Signal to Noise Ratio | FM 10 dB (IHF) AM 45 dB (Input 30% 9 mV) |
| Spurious Response | FM Better than 100 dB |
| Adjacent Channel Attenuation | FM 75 dB |
| AM Suppression Ratio | FM better than 55 dB |
| Capture Ratio | FM Less than 1.2 dB |
| Harmonic Distortion...FM MONO less than 0.2% | FM ST less than 0.5% |
| | AM Less than 0.8% |
| Frequency Response | FM 20~15,000 Hz (+0 -0.5 dB) |
| FM Antenna Input Terminal | FM 300 Ω , 75 Ω |
| Output... FM 0.75V Fix, 0~2V•Var(400Hz 100%) | AM 0.2V Fix, 0~0.6V•Var (400Hz 30%) |

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| Output Impedance..... | 7K Ω (Fix) 1K Ω (Max. Variable) |
| Carrier Leak | -70 dB |
| Stereo Separation..... | Better than 40 dB (400Hz), Better than 35 dB (100~10,000Hz) |
| Transistor | Transistor 34 (1 FET) Diode 31 |
| Power Supply...110/120/220/240V 50/60Hz 15W | |
| Dimensions | 312(W) x 345(D) x 136(H)mm |
| Weight | 8 kg |
| Attachment Circuits | |
| | ● FM Monaural/Stereo Automatic Selector ● LPF (Low-pass Filter) ● FM Squelch (Muting) ● SCA Filter ● Noise Filter ● Fix-Variable 2-System Output Terminal ● Tape Recorder Terminal (DIN) ● Minimum Distortion Tuning Indicator ● AM Bar Antenna ● FM 300 Ω , 75 Ω Input Terminal ● MPX AGC Circuit |

Specifications are subject to change according to improvements without notice.

ONKYO CORPORATION