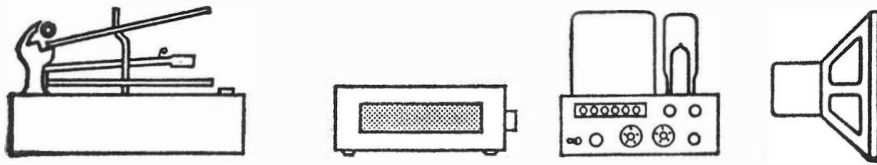


# EQUIPMENT



# PROFILE

## MARANTZ MODEL 10B FM-STEREO TUNER

Every serious audiofan was excited some three years ago with the announcement that there was about to be a Marantz FM-Stereo tuner. The reputation of the company was so good that had Marantz decided to bring out a new automobile, hundreds of fans would have been standing in line with checkbook in hand to be one of the first to own one. Then a long time passed, during which the dedicated Marantz fans were occasionally treated to a glimpse of some prototype models at the various hi fi shows, and what they saw intrigued them still further.

Finally the coveted Model 10B arrived at our "lab." And this is what we saw:

A handsome brushed pale-gold-finish panel 5½-in. high by 15½-in. wide with a large window (2¼ by 11¼ in.) solid black in appearance when off, but showing a full 10-inch dial scale which is perfectly linear from 88 to 108 mc—one inch for 2 megacycles—the even numbers in white lettering and the divisions in soft green, all traversed by a fluorescent red cursor. At the left, centered over 91.7 mc, is an inverted T scale in red, serving as the indicator in front of a 2-in. cathode ray tube with a deep green filter over it. At the right, centered above 104.8 on the scale is the word STEREO illuminated in red in the presence of a stereo signal, solid black when listening to a mono station. MARANTZ and FM TUNER appear in white

on the rear glass plate, and "Stereo" in green script on the back of the front glass plate give a three-dimensional effect. MODEL 10B in red completes the identification—a strikingly handsome appearance.

There are seven knobs on the front panel—a large one in the center for tuning, two smaller ones at the left control the type of indication on the scope and the manual control of stereo switching, and two more at the right to control power and dial illumination intensity on one, muting on the other. Tiny ¼-in. knobs at each end of the dial window are vertical and horizontal positioning controls for the CR-tube spot in the tuning display, of which more later. The chassis extends 15½-in. behind the front panel, and is almost all black—the exceptions are the balun transformer box, the chassis plate for the front end, which is brushed chrome, the discriminator transformer can, and three electrolytic capacitor cans. All external connections are made on the top of the chassis—there are none on the rear apron, not even the power cord. Four adjustable controls for the CR tube functions, stereo-threshold and muting-threshold controls, and the output level-set controls are also on the chassis top. Phono jacks are provided for detector output, right and left main outputs, and external scope input. A test jack is also furnished for service use. The antenna input terminals are on top of the balun housing.

If we are unduly detailed in describing the physical aspects of the 10B, it is only

because we can not give a detailed circuit rundown as is our custom—there are too many unique circuit arrangements in the 10B, and the manufacturer understandably wants to keep quiet about them for a bit longer. Maybe next year . . .

### Design Features

While we cannot give details, we can provide the reader with considerable "semi-technical" data about the Marantz 10B. The antenna is connected to a balun, making it possible to maintain complete balance of the antenna line and eliminate any longitudinal noise appearing in the lead-in. This indicates that the search for minimum noise begins even before the signal enters the tuner. The tuned circuits in the front end are interesting from the design standpoint because of the difference in the L/C ratios in the various circuits. One usually expects a gang capacitor to be of the same value in each section, which indicates that the coils are all approximately the same. However, in the 10B the sections are not identical. Each coil is chosen to work at the correct impedance in the circuit in which it is employed—for example, the coil feeding a grounded-grid stage is comparatively small, indicating a large capacitor section, and so on. The main tuning capacitor is a four-gang unit, with each section having a split stator. The coils are found of heavy wire (about #14) and supported on polystyrene rods for stability. For exact trimming, all of the front-end circuits are provided with trimmers, the inductances are adjustable, and temperature compensating fixed capacitors are employed where necessary. The entire front end consists of two low-noise triodes (EC88/6DL4's) and a 6DZ4 oscillator, a type designed for uhf TV oscillator service. The output is fed to a balanced-bridge modulator using instrument-type silicon diodes, and thence to the first i.f. stage, employing a 6JK6 pentode. The i.f. amplifier is unusual in several respects. Basically, the entire i.f. section consists of tubes providing "packages" of amplification, with passive filter networks between them. Each of these networks consists of three precision cup-cored coils, with the required fixed and variable capacitors for tuning them. These filters are modified Butterworth types, with flatter tops and steeper skirts than are usually obtainable with two-winding i.f. transformers. One further difference between conventional i.f. amplifier design is that every one of the amplifier tubes also serves as a limiter, due to back-to-back diodes in its input circuit. In addition, the 10.7-mc amplifier is followed by three more 6JK6's as limiters immediately preceding the discriminator coil—an air-core winding of extreme stability. We are now up to 12 tubes, with only ten more to go for the total of 22. A 12AX7, two 12AU7's, and a 6U8 serve as the multiplex decoder circuit, and another 12AX7 is the output stage, with separate gain controls on each channel. A 12AU7 serves as the muting control.

The cathode-ray tube is an interesting addition to an FM tuner, and since this is the only one we know of so far in which a CR tube is built into the tuner itself

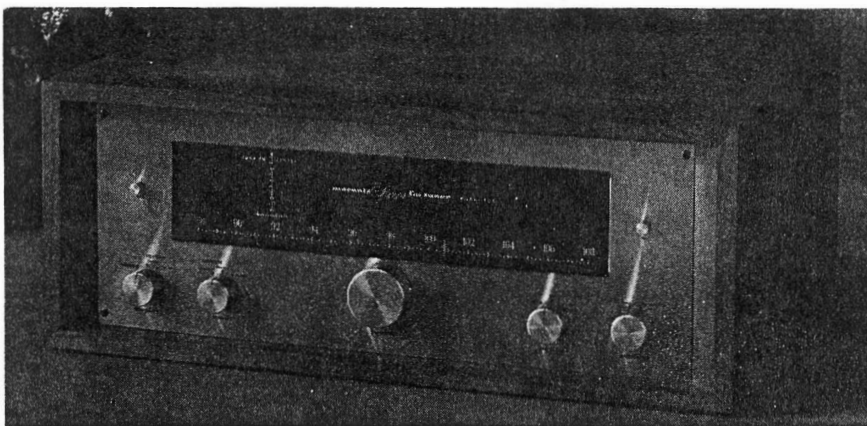


Fig. 1. The Marantz Model 10B FM-Stereo Tuner.

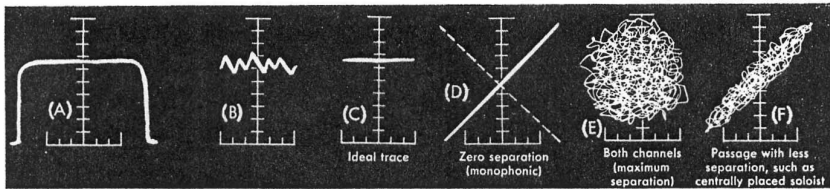


Fig. 2. Patterns on the tuning indicator.

to serve as a tuning indicator as well as multipath distortion indicator, and additionally to monitor the output signal visually. In the TUNING position of the "display" control, the spot traverses the face of the tube as shown at "A" in Fig. 2, showing approximately the curve of the i.f. amplifier as the tuning control is turned. When properly tuned in, the spot is centered on the vertical red line of the reticule, deviating to right and left in accordance with the modulation. With no signal, the spot rests on the bottom of the reticule in a fuzzy haze caused by the noise. The height of the spot on the scale gives an indication of the signal strength, and when the spot is near the top of the scale the signal is approximately 100,000 microvolts. The range is logarithmic, so that small differences at lower signal strengths can be observed. When there is any multipath distortion, the spot's travel with modulation is likely to be a wavy line, rather than a straight one which it follows when there are no reflections to cause multipath distortion in the reception. These different patterns are shown at "B" and "C" in Fig. 2. When the wavy line is encountered, it is the sign that the antenna should be rotated to a position where the line is least wavy, and a minimum of multipath distortion is then present.

In the OUTPUT position of the "display" control, a totally different pattern is shown on the screen—one in which the vertical movement of the spot represents the left signal, and the horizontal represents the right signal. "D" in Fig. 2 shows the appearance of an in-phase monophonic signal, which is one in which right and left signals are equal to each other. Referring to this slope as positive, we get a negative slope (shown as a dotted line) on out-of-phase monophonic signals, which are occasionally encountered during the first few weeks of broadcasting by a new stereo station, possibly—at least we have seen some in that category. This same signal will indicate when an announcer is being broadcast monophonically even though the station is on stereo—that is, his microphone is fed to both channels equally. If he is on only the left channel, the pattern will be a vertical line; if he is on only the right channel, it will be a horizontal line. On stereo programs, the pattern is a mish-mash such as that in "E" Fig. 2. If this pattern appears to be a narrow ellipse, as at "F," it is an indication that there is not the full amount of separation between the channels—full separation will give a pattern which essentially fills a full circle, at least part of the time. The third position of the "display" switch is EXTERNAL, which accepts a signal from the external jacks on the chassis, so the user

can connect the output of his preamp to these jacks, so as to observe the stereo content of records or tapes, if he wishes, with, we might add, occasional surprises as to phasing.

To provide the functions of the CR tube, three more tubes are required, a 12AX7 for the stereo signals, and two more 12AX7's for horizontal and vertical deflection. These, with the CR tube itself, make the total of 22.

The "mode" switch also has three positions—two for automatic stereo switching and one for mono. One of the automatic positions is marked NORMAL, and provides normal separation with good reception conditions; the other is marked HI-BLEND, and reduces separation on the high frequencies so as to overcome the effects of multipath distortion or weak signal strength. Switching to stereo is automatic, unless prevented by placing the mode switch in the MONO position. The switching is controlled by the one transistor in the tuner, and a threshold control is provided. Stereo switching and muting are both accomplished by light actuated cadmium-sulphide cells.

One other unusual feature that particularly intrigued this observer is the dial indicator adjustment. This takes the form of a screw at the right side of the chassis just back of the front panel, and permits the user to set the pointer accurately to a station of known frequency. Once this is done, every station within the range of the set will come in *exactly* at its indicated frequency. As a matter of fact, Marantz engineers claim that this tuner is more accurate than most laboratory signal generators, which are usually guaranteed to be within 1 per cent. The 10B is within 25 kc, which is about  $\frac{1}{4}$  of 1 per cent. This is greater accuracy than we have ever encountered in any FM tuner heretofore, and the linear scale is most unusual. If nothing else, it betokens a very careful design of the tuning capacitor, which looks as though it might have been a component of a top-quality "Mil. Spec." space receiver—solid construction, silver plated, with ceramic insulation, and such indications of accuracy and stability.

#### Performance

In our listening location some 20 miles east of New York City, we were able to log 53 stations—more than ever before on any tuner. Not all were of entertainment quality, we must admit, and some three pairs of them were on the same frequency at different times. Four of the stations received, however, were in Philadelphia, and two of those were of entertainment quality. Philadelphia is approximately 103 miles by air line from our location. For a "practical" test we used an antenna which was a simple dipole,

such as is furnished with most FM tuners. We mounted it on a 5-ft. strip of wood on top of a photographic lamp stand so we could rotate it. We were able to receive Philadelphia with this setup *inside* our building.

We are, naturally, accustomed to excellent equipment in our normal listening, and when someone makes a product which is *very* good, we may not be able to "rave" about it. But we can say that it is in that rare category of amongst the best. (We maintain that when we are continually comparing different equipment and claiming that high-quality components are 95 per cent perfect, it becomes most difficult to assign some unit as being 96 per cent—or even possibly 100 per cent.) There is no question that the 10B does show up as having better separation than the average FM tuner, and this is easily observable on the 'scope. Also, there is no question that the 10B would satisfy the most particular FM listener. It is beautiful in appearance, obviously well designed, and extremely stable. We are thoroughly impressed by the quiet performance—the unit is said to reach 50 db of quieting at a signal of only 6 microvolts, which is an extremely sharp quieting curve. We are equally impressed by its selectivity, which permits receiving stations in adjacent channels in many instances where many another tuner won't, and almost invariably in alternate channels. We also must admit that the indicator with its two modes of display is a useful tool—every FM station should have a 10B as a monitor. This is undoubtedly the Rolls Royce of the tuners. With a price tag of \$650 in the East, it isn't cheap, nor even inexpensive, but one look at its underside will show why the cost is what it is. It is a tuner the most critical would be proud to own and more than happy to listen to.

Circle 220 on Reader Service Card

### CLARIFICATION OF DUAL 1010 REPORT

Once upon a time, when life was much simpler in audio (and at AUDIO), one could speak of "manual play" and "automatic play" and be clearly understood to really mean "single play" and "changer" respectively. But today one must be more specific. Unfortunately, this didn't dawn on us until after we had reviewed Dual's new 1010 automatic turntable in February.

In that otherwise favorable review, we had somehow described the 1010's "manual" and "automatic" operation in terms of "problems" and "nuisance," whereas it really is quite simple and flexible. So, let us now proceed to describe how the 1010 actually *does* operate with its interchangeable spindles. (All Duals operate the same way.)

For single play (not necessarily manual), the short spindle is dropped in. For automatic start, the operating slide switch is moved to the right, past "stop" to "start." For manual start, the tonearm can be placed anywhere on the motionless record, and the same switch moved to the left to "manual." If a manual start on a rotating record is desired, the switch

(Continued on page 66)