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## Testing and Adjusting Intonation

### *Tips for Using Tuning Devices to Test Intonation*

Step 1: Before using the tuning device, be sure it is properly calibrated (follow the manufacturer's directions).

Step 2: Install new strings (see page 76). As strings get old they become corroded, filled or covered with body oils and dented by the frets. All of these factors inhibit normal vibration of the string and cause false readings.

Step 3: Lower the pickups away from the strings to avoid excess magnetic pull. Magnetic pull can cause erratic string vibration, making it impossible to achieve proper intonation.

Step 4: Pre-tune the guitar to concert pitch (A=440). This step is important for two reasons. First, it is necessary to have full tension on the neck when making adjustments since tension affects action and therefore intonation. Second, a string that is not tuned to correct pitch may produce a false reading on the tuner. Some tuning devices pick up and register harmonic overtones. For example, if the tuner is set to "E," a string tuned accidentally to "A" could produce a stable pattern on the indicator because "A" is a natural overtone of "E." By pre-tuning the guitar, you ensure that the indicator is registering the proper note.

#### NOTE

*With tuners that have auto-seek, one need only be concerned with tuning to the proper octave.*

Step 5: Hold the guitar in normal playing position when testing intonation. Holding the guitar adds slight stresses to the neck and body and these stresses affect intonation. Testing in this way ensures adjustments that compensate for playing conditions.

Step 6: For electric guitars and basses, use a standard patch cord to plug directly into the tuning device. Set the pickup selector switch to the neck position and volume and tone controls to the full position. This will ensure maximum signal. For acoustic guitars, you can use the tuner's internal microphone.

Step 7: Use the 12th fret harmonic instead of the open string when tuning with the device. The harmonic creates more vibrations per second, causing a more continuous signal and therefore a clearer signal.