

peterson

CHROMATIC TUNER MODEL 320

OPERATING INSTRUCTIONS

APPLICATION

The **PETERSON CHROMATIC TUNER, MODEL 320**, is a precision instrument for supplying tones of the equi-tempered musical scale to a very high degree of accuracy (to within one-hundredth of a semitone). The instrument has been designed specifically for tuning musical instruments, but it may also be used for a laboratory frequency standard or wherever a source of a wide range of highly accurate audio frequencies is required.

POWER REQUIREMENTS

The instrument is designed to operate on a power line supplying 105 to 125 Volts, 50 to 60 Hz (cycles/second) A.C. (Export models 220/240 Volts). **CAUTION: *Serious damage will result if this instrument is plugged into a D.C. power source.***

DESCRIPTION OF CONTROLS

Two rotary switches and two potentiometers control all functions of the instrument. To turn on the instrument, turn the control marked **VOLUME** clockwise until a click is heard. A tone will be heard. Adjust the volume to a suitable level. The knob marked **NOTE** is for the purpose of selecting the desired semitone of the musical scale. The knob to the left of the **NOTE** switch is marked **OCTAVE**. The position of this switch determines which octave will be sounded. If this switch is set to number 1, turning the **NOTE** switch will produce a series of tones that corresponds to the pitches produced by the lowest manual octave of a pipe organ when an 8' stop is drawn. If the **OCTAVE** switch is set to 2, tones an octave higher will be produced and so on through octave seven, which is one octave above the highest octave produced by a 4' stop.

The **VERNIER** control is for the purpose of transposing the range of the instrument above or below the standard pitch of A=440 Hz. If it is desired to tune to standard pitch, simply set the **VERNIER** control at A=440.

It is sometimes desirable to tune to a pitch other than the standard pitch of A=440. With the **PETERSON CHROMATIC TUNER, MODEL 320**, it is possible to shift the pitch of all tones up to one half semitone sharp or flat, while still maintaining the exactly correct inter-relationship or "temperament" of the scale. To tune to a pitch that is sharp of A=440, rotate the control clockwise. You will notice a stiffness in turning this control. This has been incorporated to keep the control at any desired setting, and to make it less sensitive to accidental movement.

The calibration marks are hundredths of a semitone (commonly called "cents"). This control is accurately calibrated and may be used to measure frequency by zero-beating the unknown to the tone produced by the instrument by adjusting the **Vernier** control and then reading the calibration marks. A "**Frequency to Cents**" conversion chart is available at no charge by sending a self addressed, **stamped #10** (Business size) envelope to the address on page 3.

To tune older musical instruments that were built and tuned to A=435 Hz or other frequencies, set the vernier control to a position twenty hundredths of a semitone "flat" of A=440. Frequently it is necessary to tune a pipe organ at a temperature slightly above or below the normal temperature, in which case the **Vernier** control can be used to compensate for this difference. Most organ pipes change pitch about two one-hundredths of a semitone per degree Fahrenheit, in a positive direction. That is, an increase in temperature causes an increase in pitch.

EXTRA SPEAKER JACK

The jack in the lower left of the panel is for the purpose of connecting the tuner to either an oscilloscope or to an extension speaker. An extension speaker is particularly useful when tuning pipe organs, since the tuner can be operated by the person at the console, leaving the person in the chamber free to use both hands for tuning.

Use a 16 ohm permanent magnet dynamic speaker and connect to an ordinary phone plug using lamp cord type wire. You may use up to about 100 feet without any appreciable loss of volume.

ACCURACY

The exceptional accuracy of the **PETERSON CHROMATIC TUNER, MODEL 320** is due to the fact that all of the pitches are controlled by a single oscillator circuit of unusual design (patented) using components of the highest stability. The pitch is not affected by changes in power line voltage and experience has shown that these instruments will maintain their accuracy over a period of many years, there being practically no aging characteristics to the tuning constants. If at any time you want to check calibration you can return the instrument to the factory and we will check the calibration and make adjustments if necessary for a nominal fee. *Do not rely on tuning forks to check calibration. Most tuning forks, regardless of cost, vary considerably with temperature and thus will produce erroneous indications.* The most reliable source for **A=440** is the U.S. Government, National Bureau of Standards, Radio Station WWV which broadcasts at radio frequencies 2, 5, 10, 15, or 20 Megahertz (Megacycles/per second).

WARM-UP

Since there are no heat producing parts in the "solid state" circuitry of the Model 320 tuner, no warm up is needed. The effect of ambient temperature is almost immeasurable, and can be neglected except in extreme cases. Where an instrument has been exposed to freezing temperatures, or has been stored in the trunk of a car on a hot day, it is a good idea to wait 5 or 10 minutes to allow the tuner to attain room temperature before beginning tuning.

WARRANTY

All Peterson tuners are warranted for a period of one year from date of purchase. Any tuner that is returned to the factory prepaid within this period will be repaired free of charge if, in our opinion, it is defective in material or workmanship. Instruments that require repairs due to accidental damage, abuse or operation on power sources other than those specified, will be repaired and charged for at current rates.

REPAIR SERVICE

Should your instrument ever require any repairs, either in warranty or out of warranty, please send it postpaid, **directly to the factory**. If you return the instrument to your dealer it will only result in unnecessary delay. We recommend you ship via **United Parcel Service** if possible; otherwise, use **Parcel Post Special Handling, Insured**. We almost always complete repairs the same day we receive the tuner. Address the package as follows:

PETERSON ELECTRO-MUSICAL PRODUCTS, INC.
REPAIR DEPARTMENT
11601 South Mayfield Avenue
Alsip, IL 60803-6007

Be sure to have at least 2" of packing material (crumpled newspaper, etc) surrounding the entire instrument. Include a note **describing the difficulty** you are experiencing and **also your name, return address, and a daytime phone number where you may be reached if we have any questions**. If you have any questions our phone number is 1(708) 388-3311 and our FAX number is 1(708) 388-3341.