peterson

VS-1 Virtual Strobe™ Tuner Instruction Manual

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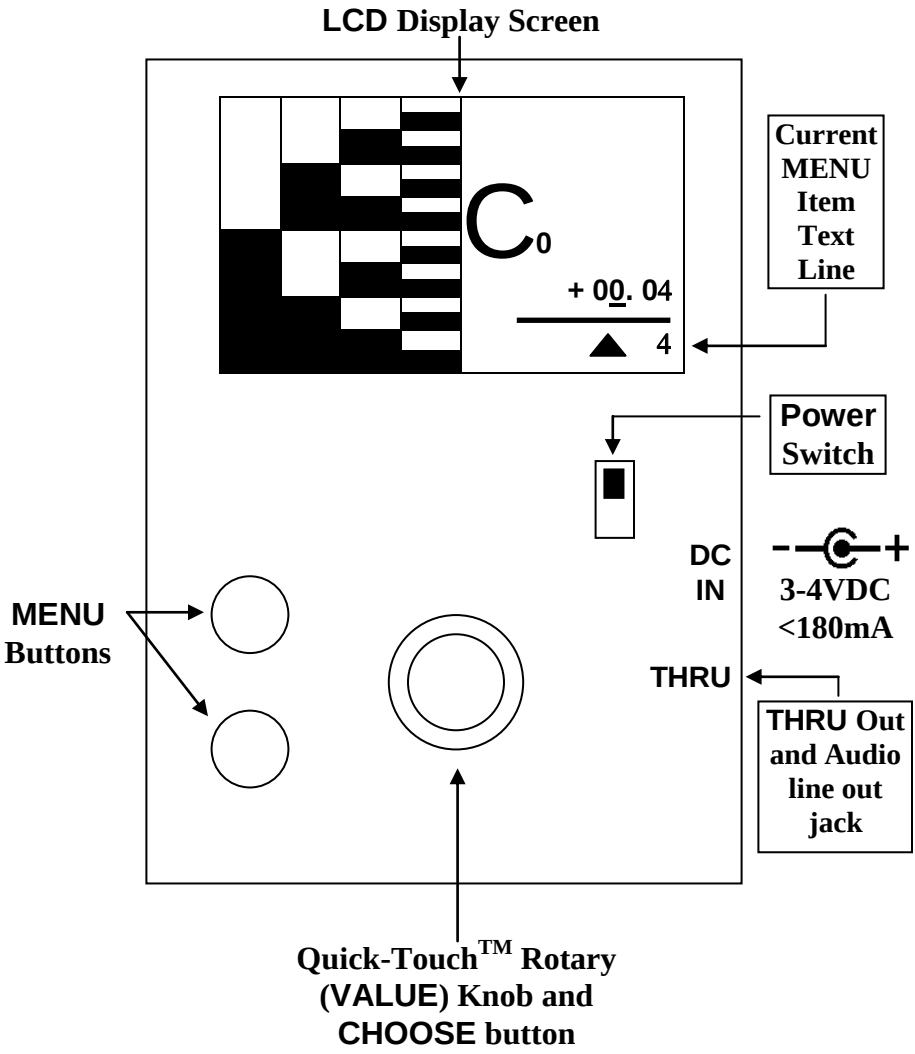
VS-1 Virtual Strobe™ Tuner Instruction Manual

Congratulations on your purchase of the finest all-electronic tuning device ever made! As the first product utilizing visionary (patent pending) Virtual Strobe Technology℠ recently developed at peterson, the concept behind this tuner is a true marriage of peterson's unsurpassed Digital Rotating Strobe-Disc Tuning technology with the latest advances in analog, digital, and display technologies available today.

Getting Started



Your VS-1 tuner may be powered from either 3 AA-cell batteries or a *regulated* DC voltage from an AC wall transformer. Depending upon your location, an appropriate wall transformer may have been provided with the purchase of your tuner. In any case, the wall transformer should provide a 3.0V to 4.0V *regulated* DC voltage from the AC line voltage *you are using* and accommodate at least 180mA of current (500mW of power). The DC IN jack requires a standard 2.1mm / 5.5mm plug with the positive (+) terminal as the inner plug:

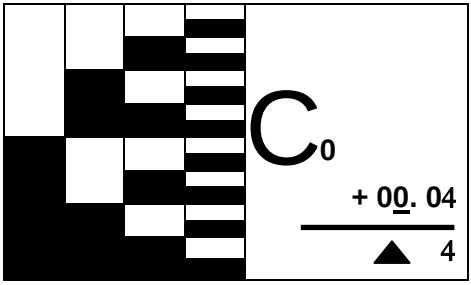
USING A WALL TRANSFORMER WITH THE WRONG ORIENTATION OR VOLTAGE MAY CAUSE PERMANENT DAMAGE TO THE WALL TRANSFORMER, THE TUNER, OR BOTH!!

The batteries are automatically electrically disconnected from the power circuit when the appropriate plug is inserted into the DC IN jack. Any standard carbon or alkaline AA batteries may be used as a portable source of power. NiCad or NiMH rechargeable batteries may also be used but will *not* be recharged from this product! **Always use identical types of cells at any one time.** Battery life will vary greatly depending upon the type of battery cell used, the amount of product use with the LCD backlight turned on, and the length of continuous use at each session. One fully charged set of low-capacity NiCad batteries may power the tuner with intermittent use and backlight always on for 6-7 hours. A new set of (non-rechargeable) alkaline batteries used intermittently with backlight always off may last as long as 50 hours! Expect battery life to generally fall between these extremes.

It is recommended that batteries be removed if the product will not be powered with them for more than 1 month to avoid undetected corrosion or other battery failures. Batteries are inserted or removed by first removing the VS-1 from its protective rubber boot. The Battery Cover at the back of the tuner enclosure slides down and out with simple finger pressure.

BE CAREFUL TO INSTALL BATTERIES IN THE INDICATED ORIENTATIONS. FAILURE TO DO SO MAY CAUSE PERMANENT DAMAGE TO THE BATTERIES, THE TUNER, OR BOTH!

To turn the tuner on, a convenient slide switch has been mounted on the face of the tuner. **NOTE:** If the bottom MENU button (▽) is pressed during power-on, the resulting **Bass Shift**—indicated by a bass clef near the octave number—permits visual tuning down to C_0 (16 Hz) and beyond. In any case, after a brief appearance of an initialization screen showing product identification and software version, a "RUN" screen will appear.



This first RUN screen always includes a four-band strobe display at the left, a large scale-note indication (which may appear to fluctuate randomly when no clear input signal is present due to automatic note detection), a "cents" indication initialized to 00.0 cents offset, and a "current MENU item" of "cents" in the bottom text line under the horizontal rule (separation line). **This bottom line of text is *always* reserved for the indication of the current MENU item, that is, the parameter—selected by either of the MENU buttons—which will currently be affected by the Quick-Touch℘ rotary VALUE knob and CHOOSE button.**

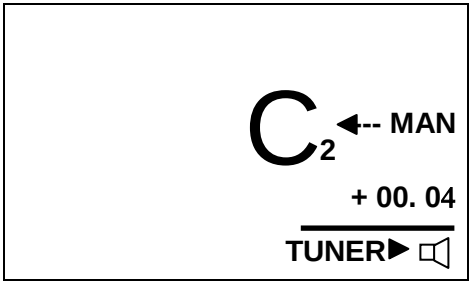
The VS-1 will respond to any electrical signal (approximately ±10mV to 5V) presented to the EXT IN ¼" jack on the side of the enclosure including hand-held microphones, electric guitars, or line-level audio sources. The built-in microphone will be automatically activated for response to direct sound whenever the EXT IN jack is empty. Generally, visual tuning is very simple. When the note indicator is at the nearest scale note to the sound source to be tuned, the strobe bands will appear to roll upward smoothly if the sound is sharp or down if it is flat. When the image appears stationary, tuning is exact. The greater the apparent speed of movement, the farther the source pitch is from the reference scale note. (See the **Visual Tuning** section below for more details and special cases.)

MENU Item Parameters

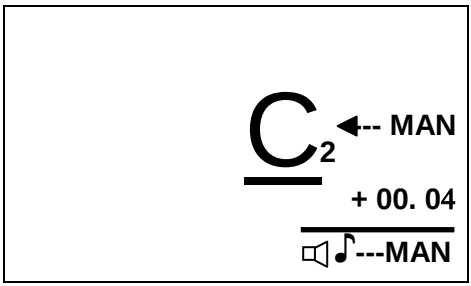
The two circular buttons at the bottom left of the tuner (labeled MENU with up and down arrows) allow the selection of various tuning parameters and modes of operation which will be of interest to most users. Because certain combinations of parameters will be changed frequently in some applications, the pair of MENU buttons allows the user to a) quickly alternate between any two adjacent MENU items and b) reduce the number of required button presses to traverse from one MENU item to any other. The following is a table describing the effect and range of each MENU item in order from ¢ ("cents") at power-on to *AUTO/MAN that the user would see by repeatedly pressing the up arrow MENU button. Also shown is the effect, if any, of pressing the CHOOSE button built into the Quick-Touch℘ rotary knob:

MENU ITEM	DESCRIPTION	↻ VALUE RANGE / DEFAULT VALUE	CHOOSE ▽ BUTTON
¢ (cents)	1 cent = 1/100 semitone offset ($^{1200}/_{2}$)	-50.0 to +50.0 / 00.0¢	1¢ / 0.1¢ steps Hold: 0 reset
KEY	Transposition of the displayed note based on any of 12 scale notes	B♭ to A / C -2 to +9 / +0	Letter / Fret # scale
A4	Concert A tuning reference adjustment for the tuner in 0.5 Hz increments	433.0 to 447.0 / 440.0	—
TMPR	EQUAL or one of eight non-equal temperaments (note to note intervals) with note C as the scale root and note A set to 0 4 offset.	EQU Equal PYT Pythagorean JST Just Major MNT 1/4 Meantone KRN Kirnberger WRK Werkmeister YNG Young KLN Kellner GTR Guitar 5ths	—
LIGHT	LCD backlight full ON or dim	ON / OFF (dim)	ON / OFF
SAVE	MENU item values which can be stored in memory as new power-on values	LIGHT TMPR A4 KEY } SURE ?? confirm	1st: SURE ?? 2nd:SAVED ✓
🔊/▤	TUNER mode	Audio (line) / Visual (strobe)	Visual /Audio
♪ AUTO MAN	Note selection	C_1 to G_8: ▤ / AUTO C_0 to B_5: Bass Shift C_0 to B_8: Audio / MAN	AUTO / MAN

The VS-1 can be operated in any of three modes: Visual Tuning (strobe display), Audio Tuning (line-level signal out of THRU 1/4" connector), or SAVE mode (saving MENU item selections to non-volatile memory). By pressing the bottom (▽ MENU button during power-on, the resulting **Bass Shift** (shown by a bass clef near the octave number) permits visual tuning down to C_0 (16Hz) and beyond. When switching from Visual tuner mode (▤) to the Audio (♪ 🔊) tuner mode, the Note Select option is forced to MANual because it is the only valid note selection method in the Audio (line out) tuner mode. This is indicated with a "MAN" status display when the TUNER MENU item is switched to 🔊:



(Also note that the strobe bands are cleared since they are meaningless in this mode.) If the *AUTO/MAN MENU item is made current when in AUDIO tuner mode, an added " " icon is drawn in the current MENU item line as a reminder of the current tuner mode, and the usual "select arrow" is replaced to indicate that AUTO cannot be selected with the CHOOSE button while in this tuner mode. In other words, notes must be *manually* selected when in the AUDIO tuner mode:



When switching from AUDIO tuner mode to VISUAL (strobe) mode, the strobe bands are once again made visible and the note selection is forced to AUTO.

The RUN Screen In More Depth

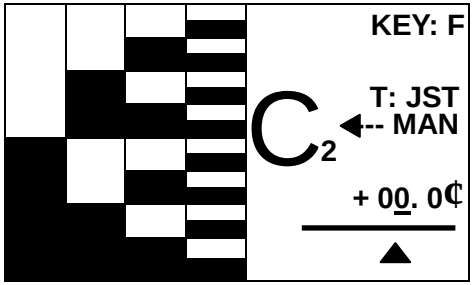
The initial RUN screen may include additional indications at the top right of the screen if one or more savable MENU item values have been saved to non-factory-default values in any previous operation of the tuner. The *savable* MENU item values are:

SAVABLE MENU ITEMS	DESCRIPTION	DEFAULT VALUE
KEY	Transposition of the displayed note	C
A4	Concert A tuning	440.0
TMPR	EQUAL or non-equal temperaments	EQU
LIGHT	LCD backlight full ON or dim	(ON)

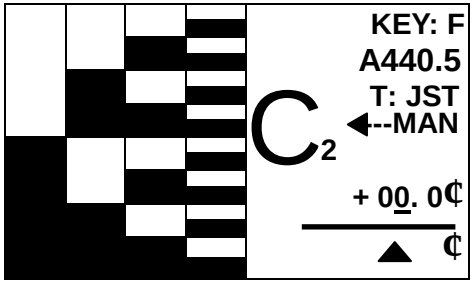
To simplify the appearance of the display, the additional "status display" of KEY, A4, or TMPR is made visible ONLY when a non-default value for the given MENU item has been selected. Once altered to a non-default value, a "status display" for an item will appear immediately whether the new value is saved or not. *No* status display is ever given for the LIGHT MENU item since its setting is visually obvious.

As noted in the previous section of these instructions, an additional status display indicating MANual note selection (not a "savable" MENU item) is made visible when active as a reminder that the note selection and indicator will NOT change to the nearest note detected in the incoming audio signal as it would with AUTO note selection (which is always the power-on default).

Thus, for example, if KEY had been previously saved to F, A4 had been saved to 440.0 (the default), TMPR had been saved to JST (Just Major temperament), and the tuner had last been set to MANual note selection, the LCD display screen might look like this:



If the A4 MENU item is then changed to a non-default value (even if it is not saved) by pressing one of the MENU buttons to make A4 the "current MENU item" in the bottom text line and turning the VALUE rotary knob to display a value of, say, 440.5, then the non-default status of A4 will appear in its given position (second text line). These non-default status displays will persist even when a new "current MENU item" is selected:



Tuning With The Virtual Strobe

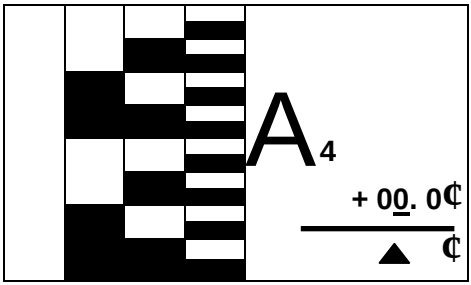
The simplest and most common use of this tuner will be visual tuning with AUTO note detection/selection. This is accomplished through the following grueling sequence of steps:

- Turn the tuner ON.

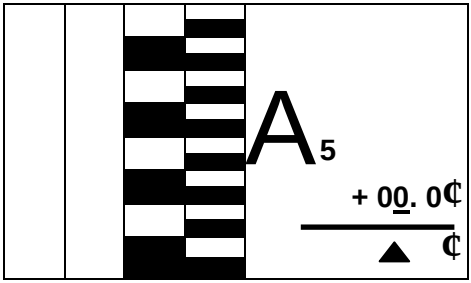
Yes, that's it! The tuner always powers up in Visual (strobe) tuning mode with AUTO note selection. Unlike traditional strobe devices, the VS-1 will *not* respond to harmonics or high-frequency "partials" of an incoming sound. The four strobe bands are provided only to extend the useful visual response to more octaves of musical pitch. Generally, the "lowest" band that is visible (a leftmost, larger-striped band corresponding to one of the lower OCTAVE numbers listed beneath it) is the truest, most accurate band to "read".

Tuning At Higher Octaves—Special Considerations

At higher pitches (from Octave 4 and up), the lower bands do not convey useful indications of tuning. If shown, they would appear to move randomly while the higher bands show true relative tuning motion for the incoming sound. To avoid unnecessary distraction, these lower bands are successively "blanked out" when higher octave pitches are detected. For example, if one hums an A440 pitch and it is AUTO-detected by the VS-1 tuner, the screen will change to the following:

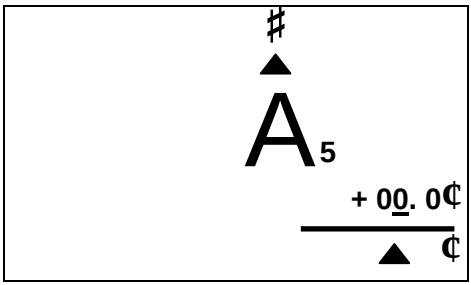


If 880Hz (A5) is sounded and detected:



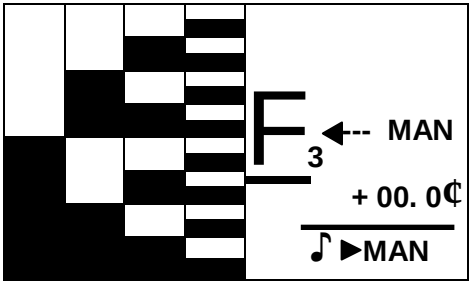
If a low pitch is then sounded (Octave 1-3), all four strobe bands will return.

There is another nuance of visual tuning with the VS-1 when reading tunings for high octave sounds. Normally, AUTO note selection will adjust the tuner to the nearest scale note frequency to that of the incoming sound. Usually, this means that the incoming sound can vary by ±504 (±1/2 semitone) before the reference scale note indication is adjusted. As the incoming sound goes flatter (lower frequency) compared to the AUTO-note frequency, the strobe image will appear to move downward at an increasing rate. Conversely, as the incoming sound goes sharper relative to the scale note, the image appears to move upward at an increasing rate. Normally, this movement is easy to see over the entire ±504 range. However, for notes at higher octaves, the rate of movement when approaching the 504 offset extremes becomes difficult to see with the eye. (It's not unlike the effect of "seeing" hubcap spokes on a moving car *apparently* turning backwards from their actual motion.) In these cases, the VS-1 eliminates the strobe bands altogether and produces either an appropriate < or = symbol above or below the note indication. The pitch range over which the strobe bands remain for visual tuning gets narrower at higher frequencies, but even at Octave 8, the strobe bands will be available for fine-tuning to match the scale note. Think of the alternate ♯ and ♭ indicators as quick and easy-to-read "*way* out of tune" signals. Below is an example of the display screen when a sound that is 40¢ sharp of A5 is detected by the tuner:



Manual Note Selection

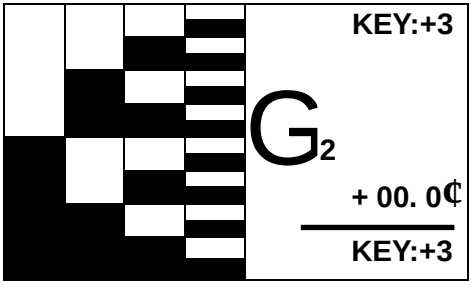
When tuning under unusual circumstances—tuning extremely high-pitched notes or low volume sounds in noisy environments—it may be necessary to manually select the note to which you would like to tune. Press one of the MENU buttons until ♪AUTO/MAN becomes the "current MENU item". At this point, pressing the CHOOSE button built into the Quick-Touch rotary knob will select between AUTO and MAN note selection methods. Alternatively, you can simply begin turning the Quick-Touch knob (VALUE) to select the desired note (and octave) which, in turn, forces the tuner into MANual note selection.



KEY Transposition—Explanation And Usage

The MENU item, KEY, provides a simple means of transposing note names for instruments built around something other than Concert C pitch (for example, a B= clarinet or E= saxophone). In addition, with this tuner, peterson introduces a Fret Transposition Scale (FTS) which provides a clearer, more meaningful transposing system for fretted instruments than the standard alphabetical note name keys.

For example, when a guitar is in its standard tuning, we commonly call the open string notes: E, A, D, G, B, and E. These are the Concert C key signature note names for those sound frequencies. However, guitarists commonly think of this tuning as standard E tuning because of the preponderance of Key of E notes. Obviously, this can get confusing. Our Fret Transposition Scale (evoked by using the Quick-Touch **CHOOSE button** while the current MENU item is KEY):



provides an optional numbering system for key transposition which corresponds to the equivalent fret "stop" of the strings. For example, if you apply a capo (on a standard-tuned guitar) on the 3rd fret, the new "open string" notes without key transposition would be: G, C, F, A#, D, and G. If you would like to tune these new "open string" notes without having to mentally transpose note names, you would simply select an FTS key value of "+3" which corresponds to the 3rd fret in this example. In this case, the open string notes will once again be displayed as E, A, D, G, B, and E on the tuner.

To carry the analogy further, the open strings without a capo (the normal case of the nut stopping the strings) is equivalent to the 0th fret and so "+0" under FTS yields the standard note names for the open strings. Further, if you detune the strings *down* as in "½-step drop" (or "flat") tuning, this would be equivalent to having an "extra fret" as the stop in the opposite direction. Hence, the FTS key to use would be "-1". Our FTS system, in fact, permits transposition from –2 to +9 which corresponds to B♭ to A in standard key transposition.

One more subtlety: for advanced users employing non-equal temperaments (under the TMPR MENU item), key transposition still affects *only* the note *names* for use with non-Concert C instruments. The tonic or root frequency of the temperament remains at Concert C pitch.

Saving MENU Values As New Power-On Defaults

Your VS-1 Virtual Strobe Tuner is initialized at the factory with MENU item values which are generally considered to be standard and will not need to be changed by a great many users. These are:

- Display backlight ON
- EQUAL Temperament
- Concert A at 440.0Hz
- KEY transposition at C (standard "concert" pitch)

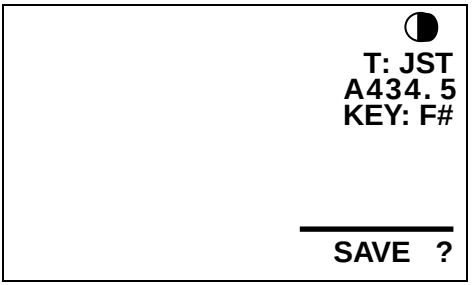
These values can be changed at any time when in either the Visual or Audio tuning operational modes (as can all other MENU item values except attempting

to choose AUTO note selection during Audio " 🔊 " tuning). In addition, these four MENU item values may be changed and saved by the user as new power-on defaults.

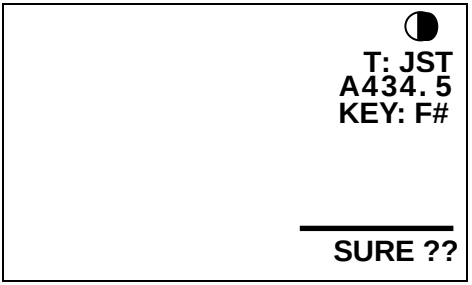
Before entering the SAVE sequence, the values of *all four* of these MENU items should be at the desired values. For this example, let us assume that:

- LIGHT is off (dim)
- TMPR is Just major: JST
- A4 is 434.5 Hz
- KEY is F#

Press either the up " △ " or down "▽" MENU buttons until SAVE becomes the current MENU item:

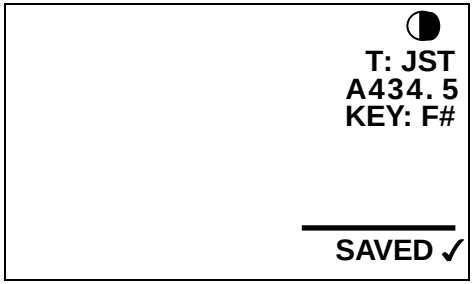


At this point, the current values of the four MENU items are displayed so that you can review the values you will be saving. Pressing either MENU button at this point will cause a new MENU item to become current and no saving operation will have occurred. By either turning the VALUE knob or pressing the **CHOOSE button** once, however, a "confirmation" screen will appear:



The question "SURE ?? " now appears on the current MENU item line. Once again, pressing either MENU button will cause a new current MENU item to appear and the SAVE procedure will have been aborted with *no* change to the saved values. Similarly, turning the VALUE knob by one "click" will step back

to the first "SAVE ?" screen. However, if the **CHOOSE button** is pressed while the "confirmation" screen is active, the SAVE procedure will have been completed as indicated by the final screen:



The VS-1 tuner would now power-on with these MENU item values until a new SAVE procedure is completed. The last entered tuning mode will resume when one of the MENU buttons is pressed to create a new "current MENU item" and exit SAVE mode.

APPENDIX A — Temperament Settings

NOTE: GTR is a proprietary setting geared toward "sweetening" the 4th and 5th intervals on a standard tuned guitar (or ½-step down tuning).

TMP	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
EQU	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0
PYT	-5.9	+7.8	-2.0	-11.8	+2.0	-7.8	+5.9	-3.9	+9.8	+0.0	-9.8	+3.9
JST	+15.6	-13.7	+19.6	+31.3	+2.0	+13.7	-15.6	+17.6	-11.7	+0.0	+33.2	+3.9
MNT	+10.4	-13.3	+3.6	+20.7	-3.3	+13.6	-9.7	+7.0	-17.0	+0.0	+17.6	-6.4
KRN	+11.7	+1.9	+3.9	+5.8	-2.0	+9.8	+2.0	+7.8	+3.9	+0.0	+7.8	+0.0
WRK	+10.3	+0.5	+3.4	+4.4	+2.0	+8.3	-1.5	+6.8	+2.4	+0.0	+6.3	+3.9
YNG	+5.8	-4.0	+2.0	-0.1	-1.8	+3.9	-6.1	+3.9	-2.0	+0.0	+1.9	-3.7
KLN	+8.2	-1.6	+2.7	+2.3	-2.7	+6.3	-3.5	+5.5	+0.4	+0.0	+4.3	-0.8
GTR	PROPRIETARY											

WARRANTY

We warrant this product to be free of defects in materials or workmanship for a period of ONE year after delivery to the original purchaser. Our obligation under this warranty is limited to the replacement or repair of any part or parts which prove upon our examination to be defective.

This warranty does not apply to damage resulting from transportation, misuse, abuse, or alteration. The complete unit must be returned to our factory, transportation charges prepaid. In order to speed the return of the unit to you, it is recommended that for all

repairs, other than those required as a result of shipping damage, you deal directly with our factory. In case of damage in shipment, a claim should be filed with the carrier. Be sure to include a brief description of the difficulty you are experiencing and your return address.

The above warranty is contingent upon the attached registration card being filled in and returned to the factory within 10 days of the date of receipt of the product by the original purchaser. The warranty conveys specific legal rights to the purchaser, other rights vary from state to state and internationally.

TROUBLE-SHOOTING

IF:	IT COULD MEAN:
I cannot switch from MANual note detection to AUTO under ♪AUTO/MAN	If the current MENU item includes the symbol " 🔊 in it, the device is in the AUDIO tuner mode which does not allow AUTO note detection. Either change the note manually (by turning the VALUE knob) or change the current MENU item to TUNER and change to the STROBE tuning mode first.
Lower octave strobe band(s) appear random while upper ones seem to respond to input	Under MANual note detection: the selected octave is probably lower than the input signal octave. Under AUTO note: the analyzed octave is probably lower than that of the actual signal, often due to a weak (low-level) input.
The four strobe bands will not appear in the LCD screen	Either the tuner is in AUDIO mode or the signal frequency is too distant from the reference note/octave (look for a ♯ or ♭ above or below the scale note display). If in MANual note detection, check that the selected octave is appropriate.
At power-up, display appears but then fades away	Batteries are old or discharged.
KEY indication is numerical instead of a letter scale note	Tuner is using the Fret Transposition Scale for KEY. Hit the CHOOSE button when KEY is the current MENU item to change it.
When using the AUDIO tuner mode, I'm getting feedback in my audio playback system.	The THRU jack pre-mixes the audio tone out with the input signal (which can be useful when using headphones). One alternative is to plug into the EXT IN jack instead of the THRU jack to get the tuner's audio output tone. This will cutoff the internal MIC and will boost the output level by about 10dB.