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STROBE TUNERS

The Sound of Precision.

Steel Guitar Tuning

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Strobe Tuners for Pedal Steel, Lap Steel and Resophonic Guitar

STEEL GUITAR TUNING

What is sweetened tuning?

Up to now, the word temperament has been used mainly in conjunction with keyboard instruments and is defined as a way of placing the 12 notes of the chromatic scale at varying degrees of pitch from one another. We at Peterson Tuners thought it was high time a name was coined which described altering the pitch of some or all of those notes. We came up with the name "Sweetener" which means any variation from Equal temperament when tuning an instrument.

Choices when tuning

The old argument about whether one should tune to Equal Temperament or Just Intonation misses the point that a musician should view tuning as an **effect** - not a *right* way or *wrong* way to voice an instrument. There are ways to design a tuning to take advantage of a particular instrument's attributes or compensate for an instrument's flaws, but to do that, we need to know the difference between tuning one way as opposed to another.

Intervals

Two pitches sounded together create an interval. The most common intervals are
The fifth = two tones separated by 6 semitones in a chromatic scale (example C4 and G4 played together)

The fourth = two tones separated by 4 semitones in a chromatic scale (example C4 and F4 played together)

The major third = two tones separated by 3 semitones in a chromatic scale (example C4 and E4 played together)

The minor third = two tones separated by 2 semitones in a chromatic scale (example C4 and D# played together)

Consonance & Dissonance

The terms consonance & dissonance describe the degree of harmony of an interval. The closer the interval is to being beatless, the more consonant it is said to be, the farther away from that point the more dissonant it is said to be.

Perfect Intervals

Perfect intervals are those that are at their highest degree of harmony, the only perfect interval in Equal Temperament is the octave. Just Intonation offers perfect octaves & thirds and Pythagorean offers perfect octaves, fourths & fifths. Not all perfect intervals share the same degree of consonance, the octave and fifth are considered to be consonant, but the fourth and major & minor third, though also consonant, are said to be imperfectly consonant.

What makes an interval perfect?

When two pitches are sounded in a perfect interval, a third sound called the *resultant tone* is produced, this is half the difference in Hz between the other two pitches and will reinforce the harmonious quality of the interval by being perfectly consonant with the partials or overtones of one or both notes. In an equally tempered interval, this effect does not occur.

What is a Partial?

Every sound is made up of partials. Partial is the DNA of a note or the audio equivalent of mixing colors together to get another color (RGB), many refer to them as overtones. The first partial is the fundamental note, the second partial is one octave above that, the third partial is a fifth above the fundamental and so on, each partial being a division of the one before it in the harmonic series of a sound.

Difference between Equal Tempered and Perfect intervals

Equally tempered fifths are 1.9 cents flat of being perfect

Equally tempered fourths are 2.0 cents sharp of being perfect

Equally tempered major thirds are 13.7 cents sharp of being perfect

Equally tempered minor thirds are 15.6 cents flat of being perfect

Does 1.9 cents make a difference?

Take an instrument like the violin or fiddle, tune it to Equal temperament and let a fiddler play it. The chances are that he/she will stop and retune immediately. When you're used to hearing perfect intervals, which is traditionally how violins are tuned (perfect fifths), the difference is very obvious when those intervals become Equally tempered imperfect intervals.

If I sweeten the tuning on my steel, won't I be out of tune with everyone else?

Other instruments use different tuning methods too! An orchestra comprises of stringed instruments tuned to perfect fifth intervals, horns in Just intonation and tuned percussion instruments which are often 8 cents sharper than the other instruments, last but not least the concert grand piano is stretch tuned to the tune of 20 cents flat in the lower octaves to 25 cents sharp in the upper octaves. The regular guitarist rarely has these things on his mind onstage, and many can only recognize an out of tune octave interval.

The steel guitarist is almost like a horn player, having much more freedom and the harmonious interval is one of the reasons why, like a good horn section, a good steel guitar sound stands out from the band.

If perfect intervals are so good, why doesn't everyone use them?

Not all chromatic instruments can produce more than a few perfect intervals, very few stringed & fretted instruments can because the relationship between the notes changes when the root of a chord changes. This would involve retuning before every chord change, which is only possible on steel if we consider the fact that pedals & levers "retune" the guitar as does the bar.

If I can't make all intervals perfect, is there a point to trying at all?

Yes! The most important tools a musician has at his or her disposal are phrasing and voicing, the voicing of a less than perfect interval builds tension and fills the listener full of expectation and longing for a resolving perfect interval, to balance the dissonance of the preceding interval or chord. If you avoid the perfect interval by using strictly Equal temperament, you will be giving away this chance to play with the emotions of the listener and your sound will be bland & lifeless in comparison.

What about playing single note runs?

Many say that single note melody lines can be all over the place in terms of tuning, but most are trying to emulate the human voice, which is incapable of imperfect intervals and will always strive to be consonant by nature as the last note lingers in the mind. So although it's not as apparent, melody needs to be harmonious too!

What about cabinet drop?

Cabinet drop is something we all have to live with, to a more or lesser extent, depending on the degree. **However, one more variable does not mean that we shouldn't strive for better tuning, to make our playing more eloquent.**

How does using a Peterson Tuner make my playing sound better?

All Peterson tuners contain "Sweeteners" which take into account the particular characteristics of the instrument, in this case the presets SE9, 0E9, SC6, U12, EM9, EM6 and their pedal and lever equivalents take the guesswork out of tuning your steel, likewise the DBO and DBH Sweeteners make your reso sound more harmonically pleasing as do the LA6 and LC6 lap steel settings. The Peterson "knows" when to show that a string, pedal or lever is in-tune, and that can be according to Jeff Newman's system, the Emmons system or your very own system!

To tune using the Newman or Emmons settings, just dial them in under "Sweetener" on the tuner. To program your own settings, do as follows:

Preparation

1. Ensure that the strings are fresh and not old, dirty or damaged.
2. Operate pedals & levers a few times before tuning to check for smooth travel make sure nothing is snagging and that the strings are stretched sufficiently.

Interpreting the screen of a Peterson tuner

The image on the screen drifts clockwise to indicate a sharp note, and counter-clockwise indicating a flat note. The note name is displayed in the center of the screen, accompanied by the octave in which that note is located in the form of a number.

How to measure a sweetened or favored tuning's offsets

As all temperaments or sweeteners are shown as offsets of Equal temperament, to measure a tuning you have arrived at by experimentation, the tuner needs to be set to the EQU preset. Then track your strings by using the cent control to immobilize the strobe image. The cent offset will be displayed on the screen.

Write these offsets down one after another with the relevant note name until all have been measured. Don't forget to take note of whether you measured your tuning with pedals down or not.

How to program your own offsets into your Peterson StrobePlus Tuner

Use the PetersonConnect site to enter the values on your computer. *Don't forget, the StrobePlus is the first tuner to be able to program different cent values for the same note in the same or different octave within the same preset.* When you're done, connect the tuner to your computer and upload the settings into your tuner. It's as simple as that!

Optional Accessories:

For the StrobePlus HD tuner, the following optional accessories are available from the Peterson Online Store or your local Peterson dealer:

StrobePlus Pitch Holder pedal steel mounting bracket

StrobePlus adapter mount for StrobeFlip Pitch Holder

StrobePlus AC Power Adapter

Additional Rechargeable Lithium Ion Battery

Existing Sweetened Tunings

Pedal Steel Guitar

Here are some sweeteners for Pedal Steel.

Offsets for pedals/levers are shown if they differ from open string offsets.

SE9 is the *newer* tuning devised by Jeff Newman OE9 is an *older* tuning devised by Jeff Newman

Jeff Newman's **SE9 Offsets**
(E's at 09.8 cents)

Note	Cent Offset
F#	+05.9
D#	-03.9
G#	0-3.9
E	+09.8
B	+07.9
G#	-03.9
F#	+05.9
E	+09.8
D	+05.9
B	+07.9

Jeff Newman's **OE9 Offsets**
(E's at +00.0 cents)

Note	Cent Offset
F#	-03.9
D#	-13.7
G#	-13.7
E	+00.0
B	-01.9
G#	-13.7
F#	-03.9
E	+00.0
D	-03.9
B	-01.9

* Raises/Lowers for pedals & Levers
SE9

Note	Cent Offset
A	+03.9
C#	-05.9
F	-17.8
G	+05.9

* Raises/ Lowers for pedals & Levers
OE9

Note	Cent Offset
A	-05.9
C#	-15.7.
F	-15.7
G	-03.9

* These settings are also preset in the SE9 & OE9 Sweeteners

Jeff Newman's C6 Offsets

Note	Cent Offset
G	+07.9
E	-03.9
C	+09.8
A	-05.9
G	+07.9
E	-03.9
C	+09.8
A	-5.9
F	+5.9
C	+9.8

* Raises/Lowers for pedals & Levers C6

Note	Cent Offset
B	-05.9
C#	-17.8
D	-05.9
D#	+09.8
F#	-13.8
G#	+09.8
A#	+00.0

Emmons E9 Offsets

Note	Cent Offset
F#	+4
D#	-10
G#	-11
E	+0
B	+0
G#	-11
F#	-15
E	+0
D	+0
B	+0

Raises/Lowers for Emmons E9

Note	Cent Offset
A	-7
A#	-10
C#	-17
D	-20
F	-26
F#	+4/-22/-26
G	-15

* These settings are also preset in the SC6 and EM9 Sweeteners

Randy Beavers' StroboStomp

E9 Offsets

Note	Cent Offset
F#	-02.2
D#	-15.0
G#	-10.4
E^	+02.0
B	+03.4
G#	+00.0
F#	+00.0
E	+04.6
D	-01.4
B	+00.0

Randy Beavers' StroboStomp

C6 Offsets

Note	Cent Offset
D	-03.0
E^	-10.0
C	+00.0
A	-12.0
G	+03.7
E	-08.0
C	+00.0
A	+00.0
F	+03.0
C	00.0

Sneaky Pete Kleinow's B-6 Tuning

Note	Cent Offset
B	+0.00
C	-27.6
C#	-15.7
D	+00.0
E	-03.9
F	-23.6
F#	-01.9
G	+00.0
G#	-15.7
A	-09.8
A#	-15.7

Robert Randolph's E7 Offsets

Note _____ **Cent Offset**

F#	_____	+4
D#	_____	-4
G#	_____	-4
E	_____	+8
D	_____	+4
B	_____	+8
G#	_____	-4
E	_____	+8
E	_____	+8
B	_____	+8

Robert Randolph's E7 Offsets – Pedals

Robert Randolph's E7 Offsets – Knee

Levers

LKL

6th String B to A# _____ -12

10th String B to A# _____ -12

LKV

5th String D to D# _____ -04

LKR

5th String D to C# _____ -8

9th String E to D# _____ +4

RKL

4th String E to F _____ -24

8th String E to F _____ -18

9th String E to F _____ -18

RKR

4th String E to F# _____ +4

8th String E to F# _____ +4

Pedal #1

3rd String G# to G _____ +4

7th String G# to A# _____ -12

11th String G# to A# _____ -12

12th String E to F# _____ +4

Pedal #2

6th String B to C# _____ -8

10th String B to C# _____ -8

Pedal #3

3rd String G# to A _____ +4

7th String G# to A _____ +4

11th String G# to A _____ +4

Pedal #4

9th String E to D _____ +4

Pedal #5

3rd String G# to G _____ +4

7th String G# to G _____ +4

11th String G# to G _____ +4

Lap Steel

Here are some suggested tunings for lap steel*:

C6 - Six string lap steel-

Note **Cent Offset**

C +09.8

E -03.9

G +07.9

A -05.9

C +09.8

E -03.9

C6 - Six string lap steel- with Equally tempered root

Note **Cent Offset**

C +00.0

E -13.7 (if you modulate a lot, tune this to 6.8)

G -01.9

A -15.7

C +00.0

E -13.7

A6* - Six string lap steel

Note **Cent Offset**

A +09.8

C# -03.9

F# -05.9

A +09.8

C# -03.9

E +07.9

A6 - Six string lap steel - with Equally tempered root

Note **Cent Offset**

A +00.0

C# -13.7

F# -15.6

A +00.0

C# -13.7

E -01.9

C13 - Six string lap steel

Note **Cent Offset**

Bb +00.0

E -03.9

G +07.9

A -05.9

C +09.8

E -03.9

C13 - Six string lap steel - with Equally tempered root

Note **Cent Offset**

Bb -9.8

E -13.7

G -01.9

A -03.9

C +00.0

E -13.7

E6 - Six string lap steel

Note **Cent Offset**

E +17.8

B +07.9

E +17.8

G# -03.9

C# -05.9

E +17.8

E6 - Six string lap steel with Equally tempered root

Note **Cent Offset**

E +00.0

B -09.9

E +00.0

G# -13.9

C# -23.7

E +00.0

*C6 and A6 are preset as the LA6 and LC6 Sweeteners

C 13- Eight string lap steel**Note** ____ **Cent Offset**

C ____ +09.8
 Bb ____ +00.0
 C ____ +09.8
 E ____ -03.9
 G ____ +07.9
 A ____ -05.9
 C ____ +09.8
 E ____ -03.9

C13- Eight string lap steel-with Equally tempered root**Note** ____ **Cent Offset**

C ____ +00.0
 Bb ____ -09.8
 C ____ +00.0
 E ____ -13.7
 G ____ -01.9
 A ____ -15.7
 C ____ +00.0
 E ____ -13.7

B11 - Eight string lap steel**Note** ____ **Cent Offset**

B ____ +09.8
 F# ____ +07.9
 B ____ +09.8
 D# ____ -03.9
 F# ____ +07.9
 A ____ +00.0
 C# ____ -05.9
 E ____ +05.9

B11 - Eight string lap steel - with Equally tempered root**Note** ____ **Cent Offset**

B ____ +00.0
 F# ____ -01.9
 B ____ +00.0
 D# ____ -13.7
 F# ____ -01.9
 A ____ -09.8
 C# ____ -15.7
 E ____ -03.9

E13 - Eight string lap steel**Note** ____ **Cent Offset**

E ____ +09.8
 G# ____ -03.9
 B ____ +07.9
 D ____ -00.0
 F# ____ -05.9
 G# ____ -03.9
 C# ____ -05.9
 E ____ +09.8

E13 - Eight string lap steel - with Equally Tempered Root**Note** ____ **Cent Offset**

E ____ +00.0
 G# ____ -13.7
 B ____ -15.7
 D ____ -05.9
 F# ____ -15.7
 G# ____ -13.7
 C# ____ -15.7
 E ____ +00.0

Resonator Guitar/Dobro

Here are some suggested tempered tunings for Resonator/Dobro:

Open A Tuning		
Note		Cent Offset
A		00.0
C#		-6.8
E		+1.9
A		00.0
C#		-6.8
E		+1.9

Open G Tuning		
Note		Cent Offset
G		00.0
B		-6.8
D		+1.9
G		00.0
B		-6.8
D		+1.9

Open D Tuning		
Note		Cent Offset
D		00.0
A		-6.8
D		00.0
F#		+1.9
A		-6.8
D		00.0

* Acoustic Guitar

Here are some suggested tempered tunings for acoustic guitar:

Regular Tuning		
Note		Cent Offset
E		-12.0
A		-10.0
D		-08.0
G		-05.0
B		-07.0
E		-03.0

DADGAD Tuning		
Note		Cent Offset
D		+1.9
A		00.0
D		+1.9
G		00.0
A		00.0
D		+1.9

* Above tunings are available as presets in StrobePlus, StrobeClip, Stomp Classic, StrobeRack and StrobeSoft tuners.

Conclusions

Looking at the above, it is remarkable how few 00.0 cent values there are listed, it just goes to show how different settings can effect a tuning, and why there is good reason to explore their affect on an instrument.

A recent survey among Steel players revealed that over 80% use a non-Equal temperament to tune their guitars, Peterson tuners are the only tuners that give you all the tools you need to consistently and accurately tune your Steel.

Equal Temperament and all of these variants are always at your fingertips with a Peterson Strobe Tuner.

Peterson Tuners for Pedal Steel, Lap Steel and Reso

Peterson StroboPlus

Super Accurate Strobe Tuner for Pedal Steel, Dobro and regular guitar. Built-in Sweetened Tunings for E9, C6, Universal 12 String, Lap steel and Dobro. Newman and Emmons Presets. Rechargeable Battery.



SC-1 StroboClip

Clip-On Tuner with 0.1 cent accuracy, comes with two Dobro and two lap steel Sweeteners. Robust, metal and carbon fiber construction.



VSS-C Stomp Classic

Super Accurate Strobe Tuner/DI combination for Pedal Steel, Dobro and regular guitar. Built-in Sweetened Tunings for E9, C6, Universal 12 String. Newman settings included.



Peterson StroboRack

19" programmable rack tuner, ideal for pro steel players with rack systems, includes E9, C6, U12, LA6, LC6, DBO & DBH presets, all metal construction, smart power, and programmable marquee.



StroboSoft Tuning Software

StroboSoft™ with its included E9th and C6th tuning presets can be used to tune your Pedal or Lap Steel Guitar. User Programmable to 0.1 cent

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Since 1948