



Guitar Teacher

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If you have installed "Large Fonts" you may encounter display problems in *Guitar Teacher*.

A **chord** is a combination of three or more notes sounded simultaneously. The term **interval** is used when only two notes are sounded.

[abbreviation: **Hz**] In acoustics, a measure of frequency equal to one cycle per second and named after German physicist Heinrich R. Hertz (1857-94).

The relationship between two notes. The interval from **C** to **G** is called a "fifth". See the **C** major scale in the Major Scales window by choosing **Help, Major Scales** from *Guitar Teacher's* menu.

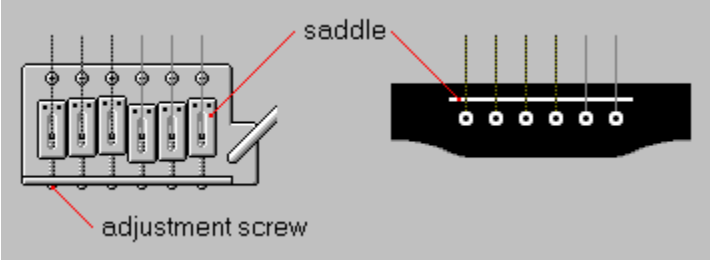
Oct means eight. On the music staff, the distance from a given note to the next note of the same name is eight lines and spaces. The higher of the two vibrates at exactly two times the number of cycles per second (Hertz or Hz) of the lower.

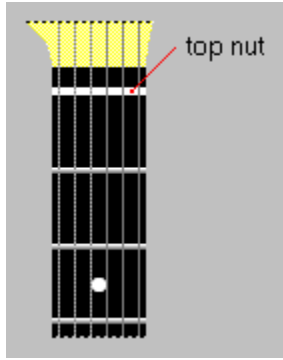
The distance between one note and the next immediately adjacent note. The distance from **C** to **C#** is a semitone, as is the distance from **E** to **F**. A distance of one semitone is covered when the cycles per second (Hertz or Hz) value of one note is multiplied or divided by 1.0594630943592952.

The following is a list of the considerations for proper setup:

1. The neck must be straight.
2. The frets must all be the same height.
3. The depth of the grooves in the **top nut** must be at the same level as the frets.
4. The bridge **saddles** must be set at the correct distance from the top nut. These are usually not adjustable on acoustic (non-electric) guitars.

Note: Adjustments must be made in the order listed.





Overview

Guitar Teacher is a system for studying guitar **chords**. It was designed to be a reference tool comparable to a dictionary. When you come across an unfamiliar chord in a piece of music, use *Guitar Teacher* to look up the chord just as you would look up a word in a dictionary. This approach is appropriate for playing music already written.

However, if you wish to compose your own music, "wandering" through *Guitar Teacher* can give you lots of ideas for chords to use, and will increase your chord "vocabulary", just as studying a dictionary would increase your knowledge of words (although studying guitar chords is more fun).

Some might wonder how one can ever remember all those chords. The answer is, "You probably can't". There are literally thousands of useful chords. Still, many guitarists seem to use a tremendous number. How do they do it? Here's the key: They understand **chord structure**.

Simply trying to remember chord diagrams will get you only so far. Knowing how chords are constructed gives meaning to them and connects one chord to another. Every chord displayed by *Guitar Teacher* supplies complete information on its structure.

Help provides valuable instruction on tuning and chord structure.

Menu Commands

- **File**
- **Options**
- **Window**
- **Help**

View/Print Order Form

Runs **ORDERFRM.EXE**. An order form for a registered copy of *Guitar Teacher* may be viewed on the screen and then printed if you choose.

Exit

Closes *Guitar Teacher*. Options you have set during your session will be saved for the next session.

Arrange Icons

Arranges all icons.

The Window List

As windows are opened within *Guitar Teacher*, a list is built on the **Window** menu. Using the window list to find the window you want is often much easier than searching for it on the screen.

Options Menu

- Display
- Opening Fanfare
- Closing Fanfare
- Colors

Options, Display, Right-/Left-handed

Guitar Teacher's display can be set for either right- or left-handed guitarists. The setting is saved for future sessions.

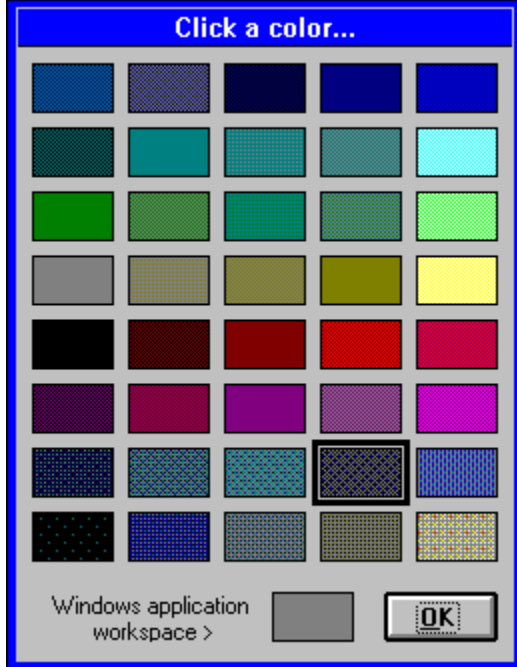
Options, Opening Fanfare, Activate/Test

This option appears only if an audio card such as *Sound Blaster* is installed on the system. *Guitar Teacher* can be set to play a short sequence of chords as a session begins. If the **Activate** option is preceded by a check mark, the fanfare is activated and will play every time you run *Guitar Teacher*. Click the option to deactivate the fanfare and remove the check mark. The **Test** option allows you to play the fanfare at any time during a *Guitar Teacher* session.

Options, Closing Fanfare, Activate/Test




This option appears only if an audio card such as *Sound Blaster* is installed on the system. *Guitar Teacher* can be set to play a short sequence of chords as a session ends. If the **Activate** option is preceded by a check mark, the fanfare is activated and will play every time you exit *Guitar Teacher*. Click the option to deactivate the fanfare and remove the check mark. The **Test** option allows you to play the fanfare at any time during a *Guitar Teacher* session.

Options, Colors...



The **Chord Viewer's** background color can be changed. The setting is saved for future sessions.

Help Menu

-  [Contents](#)
-  [Major Scales](#)
-  [About Guitar Teacher](#)

Help, Contents

Displays **Help** beginning at the table of contents.

Help, About Guitar Teacher

Displays version and copyright information.

Help, Major Scales

Displays a window listing the 12 major scales.

Major Scales													
8	A	Bb	B	C	Db	D	Eb	E	F	Gb	G	Ab	8
7	G#	A	A#	B	C	C#	D	D#	E	F	F#	G	7
6	F#	G	G#	A	Bb	B	C	C#	D	Eb	E	F	6
5	E	F	F#	G	Ab	A	Bb	B	C	Db	D	Eb	5
4	D	Eb	E	F	Gb	G	Ab	A	Bb	Cb	C	Db	4
3	C#	D	D#	E	F	F#	G	G#	A	Bb	B	C	3
2	B	C	C#	D	Eb	E	F	F#	G	Ab	A	Bb	2
1	A	Bb	B	C	Db	D	Eb	E	F	Gb	G	Ab	1

The Chord Viewer

Click on a button for an explanation of its function...



Related topics...

Chord Structure

Inversions

Roman Numerals

Displays the chord menu.

Moves down the neck displaying the previous alternative for the current chord.
Keyboard alternative: **Down arrow**

Displays the first alternative for the current chord.
Keyboard alternative: **Home**

Moves up the neck displaying the next alternative for the current chord.
Keyboard alternative: **Up arrow**

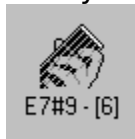
Displays the last alternative for the current chord.
Keyboard alternative: **End**

Plays the current chord.
Keyboard alternatives: **Enter** or **Space bar**

Some notes have two names. The alternative name for a given note is called its "enharmonic". Example: **A#** is the enharmonic of **Bb**. Others: **C#/Db**; **D#/Eb**; **F#/Gb**; **G#/Ab**. This button swaps sharp/flat roots for their enharmonics. If for instance the root of the chord being displayed is **Bb**, clicking the button changes the root to **A#**.

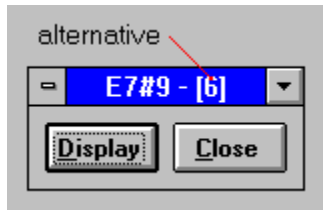
Stores the displayed chord in an icon which can later be quickly recalled. The icon's caption shows the name of the chord, and in square brackets, the alternative.

Keyboard alternative: **Insert**

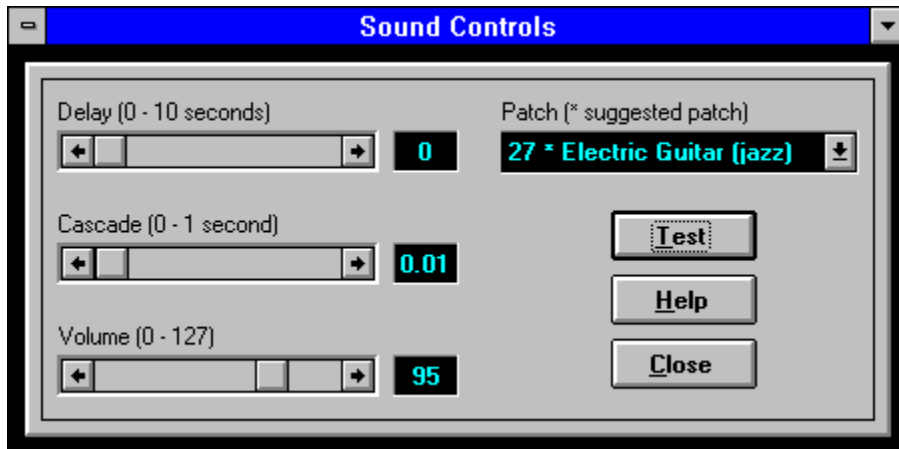


Displays the **Sound Controls** window.

Displays the **Tuner** window.



The Sound Controls Window



Delay is the period from the time the **play button** is pressed to the time the chord actually begins to sound. If you wish to play along with your computer, setting a delay gives you a chance to pick up your pick and get ready.

Cascade refers to speed at which the chord is "strummed" by the computer. If no sound card such as *Sound Blaster* is installed on your system, the caption on this control will appear slightly different from the one shown above.

Volume sets *Guitar Teacher's* volume if a sound card is installed.

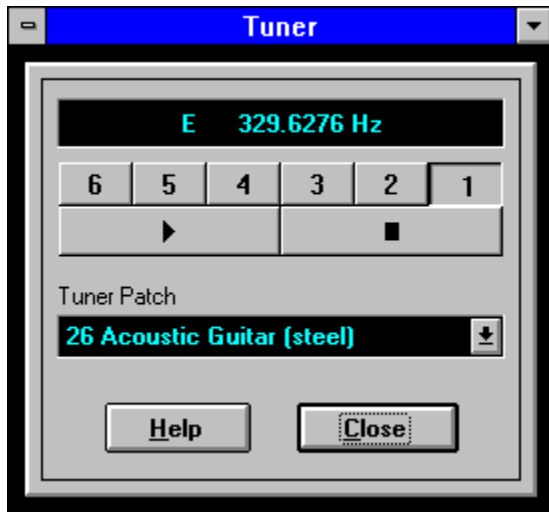
A **MIDI**-instrument setting is called a **patch**. The MIDI standard offers 128 patches the quality of which is governed by your sound card. *Guitar Teacher* was developed using a *Sound Blaster 16* which resulted in certain patches being selected as more appropriate. The suggested patches (preceded by an asterisk) incorporate the proper decay to simulate the sound of a guitar string.

Use the **Test** button to hear how chords will sound when played from the **Chord Viewer** window.



Musical Instrument Digital Interface

The Tuner Window



Each numbered button represents a guitar string. When the **Tuner** is first displayed the button representing the first string is depressed. Press the **start button** to start the sound. Selecting any other string starts the sound for that string automatically. Click on a button below for an explanation of its function...



The **Tuner Patch** option is disabled if no audio card such as *Sound Blaster* is installed. Since the sound quality of different audio cards varies widely, *Guitar Teacher* allows you to choose the tone (patch) the **Tuner** will use. The best instrument is one where the tone does not decay such as an organ for instance. However, some of these instruments may include vibrato or overtones that cause oscillation making it difficult to tune accurately. *Guitar Teacher* was developed using a *Sound Blaster 16*. It was determined that number **23 Harmonica** provided the best solid, even tone. If you have another brand of audio card, it may be necessary to experiment a little.

Related topic...

How To Tune



Starts the sound for the string button that is currently pressed. If there is no sound card installed on your system, the sound will stop after 60 seconds if the **Tuner** is left untouched. It can be restarted by simply pressing the button again.

Stops the sound.

Chords

- Chord Structure
- Inversions
- Roman Numerals

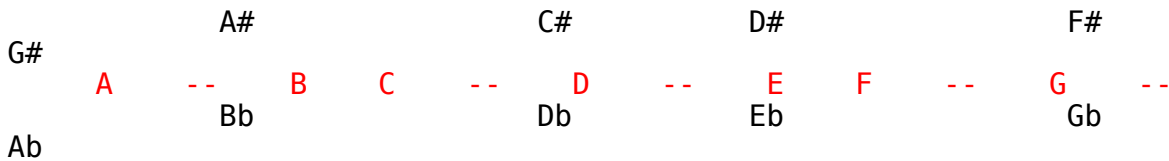
Chord Structure

Chords are often a great mystery to musicians and of special interest to guitarists because eventually, every guitarist ends up playing a lot of them, whereas a trumpet player, for instance, never plays one. A chord is simply a combination of single notes often called a **formula**. There is no end of formulas one could come up with, so naming them all with descriptive names would be quite a task.

However, over the centuries, attempts have been made to categorize different formulas and give them names. The names for chord formulas that have come to be accepted are only barely descriptive. Besides that, most teaching on the subject of intervals and chord structure is confusing, and different "authorities" disagree on the spacing of some intervals. The explanation below should take you a long way.

A little encouragement at this point. The following may seem a little boring at first glance, but it's crucial and becomes quite interesting when you understand it. There's really not much to it, and without it you will never understand music to any reasonable degree. With it, music will become like a whole new subject. From here to the end of this **Help** topic, is some of the most enlightening music theory you will ever learn.

First, keep in mind that the notes are spaced as follows:



The note after **A** can be called "**A sharp**" (**A#**) or "**B flat**" (**Bb**).

To understand the formula for each chord name, one must consider the major scale, i.e. Do, Re, Mi, Fa, So, La, Ti, Do.

To play the major scale starting on any note, it must be played with the following intervals:

Do * Re * Mi Fa * So * La * Ti Do

or

1 * 2 * 3 4 * 5 * 6 * 7 8

Each number or asterisk represents a fret on the guitar. What this means is that you must skip a fret between certain notes, but not others. Forget about "Do, Re, Mi" now and just consider the numbers. From 1 to 2 is called an **interval**. From 1 to 2 is a distance of two **semitones** (there is a fret between 1 and 2). Notice that 3 and 4 are right next to each other and likewise 7 and 8. The rest have frets between them. Therefore, it is a greater distance from 1 to 2 than it is from 3 to 4.

Try playing a major scale starting with the second string, (next to the thinnest

string) pressing the first fret. This note is a **C**. Call this note number 1. Next, play the second note of the scale in the third fret, and then continue following the number pattern above until you reach the end of the scale. You should end up at the 13th fret which is the next **C** and exactly one **octave** from the note you started with. You have just played a **C** major scale.

So, what does this have to do with chords? It's simple really. The different chord formulas are simply different number combinations based on the major scale. The most basic chord for instance is a major chord (major triad) which is any combination of the first, third and fifth notes of the major scale. So, a **C** major chord is made up of any combination of **C**, **E** and **G** (1, 3 and 5 from the **C** major scale). You might want to stop at this point and minimize **Help** so you can examine the **Major Scales** window. Choose **Help, Major Scales** from *Guitar Teacher's* menu.

If you display a **C** major chord, you'll find that every alternative is a different combination of these three notes. Notice that the formula for each chord is listed to the right of the fingerboard diagram and the "voicing" for each alternative is displayed just below it. The first note in the scale is also referred to as the **root** of the chord. Now display an **E** major chord. From the **E** major scale on the side of the **Chord Viewer** window we see that the root is **E**, 3 is **G#**, and 5 is **B**.

The formulas themselves are more descriptive than their names. For instance, calling a chord a **C7** doesn't reveal a lot about its structure, but knowing the formula is 1 3 5 b7, starting with **C**, is much more useful. (You need to know the names though.)

If you study the structure of every chord you play, you'll gradually begin to see how useful this knowledge is.

Inversions

A chord is said to be "inverted" if a note other than the root is on the bottom of the chord, i.e. the lowest sounding note in the chord.

Consider the following chord:

C major: G (5th)
E (3rd)
C (Root)

This chord is in "root position" because the root is on the bottom. If the root were to be placed on the top and the 3rd was left on the bottom, then we would say the chord has been inverted once and therefore called the "first inversion":

C major:
(1st inversion) G C (Root)
E (3rd)

If now the 3rd were to be placed on the top and the 5th left on the bottom, we would say the chord has been inverted twice, so we have a second inversion:

C major:
(2nd inversion) C E (3rd)
G (5th)

As with many of the terms used in music, the word "inverted" is not ideal. The chord was not really inverted by the usual definition of the word, i.e. the chord was not turned upside down. Also, keep in mind that the example given demonstrates the strictest definition of the term "inversion" as used in music. It is generally used in reference to the bottom note only--the rest of the notes above can be in any order. The following two chords would both be called **C** major, 2nd inversion:

E (3rd) C (Root)
C (Root) E (3rd)
G (5th) G (5th)

One might wonder if this is important. Actually, it is very useful. Consider the following sequence of chords:

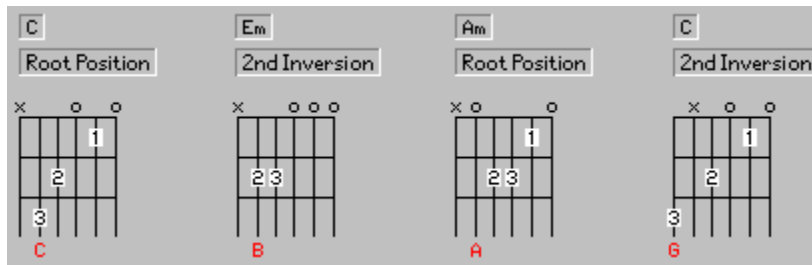
C Em Am C

If each of these chords is played in root position, the bottom note of each chord produces the following bass line:

C E A C

It sounds pleasant enough, but is nothing special. However, playing the same chords making use of inversions can produce a more melodic bass line.

Using the following produces a descending scale (C B A G) which sounds much more interesting.



The formulas for the preceding chords are:

C		Em		Am	
5	G	5	B	5	E
3	E	b3	G	b3	C
1	C	1	E	1	A

Roman Numerals

On some diagrams, there will be a Roman numeral beside the first fret. This means that it is actually not the first fret, but the fret corresponding to the numeral. This is standard notation for guitar music--Roman numerals refer to fret numbers or "position" numbers. Being in the **first** (I) position means that your first finger is in the **first** fret. Being in the **second** (II) position means that your first finger is in the **second** fret.

I	=	1
II	=	2
III	=	3
IV	=	4
V	=	5
VI	=	6
VII	=	7
VIII	=	8
IX	=	9
X	=	10
XI	=	11
XII	=	12
XIII	=	13
XIV	=	14
XV	=	15

How To Tune

If you have trouble tuning your guitar, you're in good company. Most people including many professionals have a love/hate relationship with their guitars because of tuning problems. In most cases, it's because the guitar was not **set up** properly and is actually impossible to tune accurately. However, even if everyone was given a perfectly adjusted instrument, it's doubtful that one in a great number could properly explain how to tune it. Many know various ways of getting the instrument tuned to a point they can accept, but most methods are faulty.

The most common method of tuning is actually a very poor one. Most guitarists learn early that the first string open (**E**, the thinnest string) is the same pitch as the second string at the fifth fret. One starts by hoping that the first string is close to being in tune, and then if the second string, fifth fret can be tuned to sound the same as the first string open, then, it is reasoned, the second string must be in tune as well. Next, the third string is compared to the second, and so on until all of the strings are in tune.

There are at least two problems with this method. First of all, most guitars, especially acoustics, don't have their bridge saddles set at the right distance from the top nut, so when the second string was played at the fifth fret, it probably wasn't perfectly in tune and therefore not a good reference.

Secondly, our hearing is not perfect and even when we think two notes are perfectly in tune, there is still a certain amount of error. As you move across the neck toward the sixth string, your error is compounded. How many times have you used this tuning method, thinking you did a good job, and then when you played a chord it sounded terrible? That's because when you tuned the second string to the first, you were just a little out of tune, but by the time you got to the sixth string, you were a long way out.

It's best if you tune every string to the same note instead of several different notes that get gradually more and more out of tune. This can be a little tricky and demands considerably more knowledge. However, with the *Guitar Teacher Tuner* you don't have to worry about the problems of tuning to inaccurate notes. Also, you're not tuning fretted notes--you use open strings.

So, how does one know when the string is actually in tune with the tone from the computer? Most people can tune it so it's close, but there's a way to be very precise. When two notes are close to the same pitch, but not quite, you should hear a faint pulsating sound or "oscillation". As the notes get closer to being the same pitch, the oscillation slows down. The goal is to make it stop completely. When it stops, the two notes are vibrating at the same number of cycles per second (**Hertz**). Oscillation is sometimes more audible when using harmonics.

If you find that later, a string seems to have gone out of tune, go back to the **Tuner**. Tuning to another string which itself might be a little out is where you begin getting all out of tune again. If your tuning still seems inaccurate, it may be that your bridge saddle(s) and/or top nut are not adjusted properly (this is a common problem). You might consider taking your guitar to a repair shop for an opinion. Take it to a large, reputable music store that serves professionals. Many small music shops have people on staff who may think they are qualified, but are not.

SPEAKER.DRV

If your system does not have an audio card such as *Sound Blaster* installed, *Guitar Teacher* uses the standard PC speaker for output. If the output from the speaker produces only short "clicking" sounds, the cause may be a file called SPEAKER.DRV. This "driver" is installed on some systems to allow .WAV files to be played through the PC speaker. Unfortunately, it interferes with the normal operation of the speaker and must be removed.

The following solution applies to Windows 3.1 and Windows for Workgroups 3.11:

To prevent SPEAKER.DRV from being installed when you start a Windows session, you must edit your SYSTEM.INI file.

- ▣ To solve the problem, do the following:

- Run *Notepad*.



- Open the file called SYSTEM.INI found in your WINDOWS directory. Below is an example of some typical SYSTEM.INI entries. The offending lines are shown in red:

```
[mci]
WaveAudio=mciwave.drv
Sequencer=mciseq.drv
CDAudio=mcicda.drv

[drivers]
timer=timer.drv
midmapper=midimap.drv
Wave=speaker.drv

[CLVGA]
cursor=0
videomode=92
dpi=96

[LogiMouse]
Release=2.23
LockSetting=No
Type=PS/2
ConnectedModel=2_ButtonMouse
DragLock=None

[speaker.drv]
CPU Speed=42
Volume=500
Version=774
Enhanced=1
Max seconds=3
Leave interrupts enabled=0
```

Use *Notepad's* **Search** option to find lines that relate to SPEAKER.DRV and add a semi-colon (;) to the beginning of the line.

For example, the line:

```
Wave=speaker.drv
```

should be changed to:

```
;Wave=speaker.drv
```

The next time you start Windows, these lines will be ignored. After editing, save the new version of SYSTEM.INI and exit *Notepad*.

- Close and re-start Windows.

Technical Support

Technical support is available to registered users of *Guitar Teacher* for one year beginning from the date stamp on your registered copy of **GT.EXE**.

If you need help with this application, please write to **Celista Software**. If reporting an apparent bug, explain in detail the circumstances under which the problem occurs. It will be most helpful if you list, step by step, the actions that led to the occurrence.

- ▣ To request help, please provide the following:
 - your *Guitar Teacher* registration number
 - the version of DOS you're running
 - the version of Windows you're running
 - any other software running at the time the problem occurred
 - processor (example: 486 DX2 66 MHz)
 - amount of memory (RAM) installed (example: 8 MB)
 - hard disk size (example: 500 MB)
 - amount of unused disk space available
 - monitor type (examples: EGA, VGA, SVGA)
 - screen resolution in use at the time a problem occurred (example: 800 x 600)
 - your name, address, area code and telephone number

**Celista Software
P. O. Box 1678
Salmon Arm BC
V1E 4P7
CANADA**

Greetings from British Columbia, Canada!

Guitar Teacher contains a lot of valuable information, and considering the cost of guitar lessons, I think you'll find it's worth the price.

Music theory is extremely confusing to most people, but I've tried to organize *Guitar Teacher* so that you can make sense out of it.

Once you start, you can press **F1** at any time for **Help** with the currently active window.

Thanks for trying *Guitar Teacher*. I've enjoyed working on it--I hope you enjoy using it.

Michael Fenimore

P.S. Don't forget to use **F1** for **Help**.

Exit

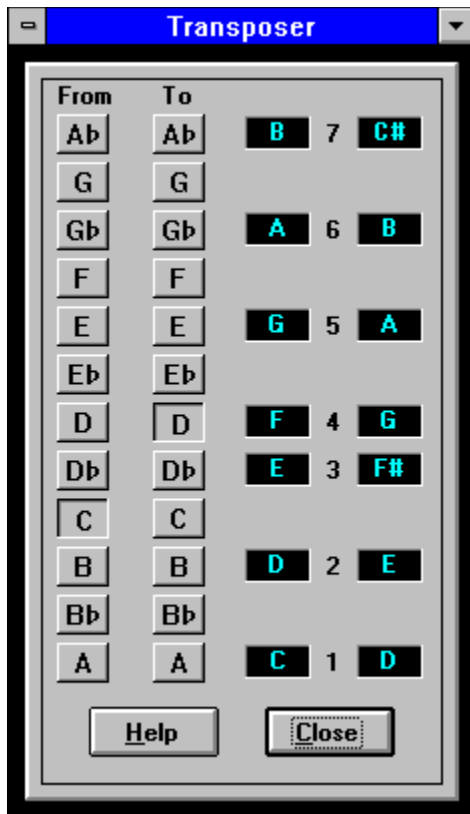


Guitar Pro

Guitar Pro offers features to meet the needs of the serious guitarist. Nineteen chord formulas are provided with up to 15 alternatives for each chord. This adds up to a maximum database size of 3,420 chord diagrams providing coverage of the entire neck.

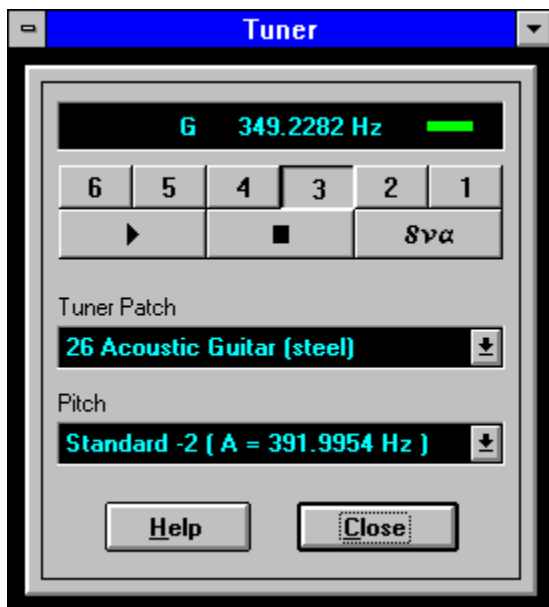
Select root and formula...											
A	A#/Bb	B	C	C#/Db	D	D#/Eb	E	F	F#/Gb	G	G#/Ab
Major							7 augmented 9	R 3 5 b7 #9			
major		R 3 5					7 suspended 4	R 4 5 b7			
major 6		R 3 5 6					9	R 3 5 b7 9			
major 6 add 9		R 3 5 6 9					9 suspended 4	R 4 5 b7 9			
major 7		R 3 5 7					11	R 3 5 b7 9 11			
major 9		R 3 5 7 9					13	R 3 5 b7 9 11 13			
Minor							Miscellaneous				
minor		R b3 5					augmented	R 3 #5			
minor 6		R b3 5 6					diminished 7	R b3 b5 bb7			
minor 7		R b3 5 b7					suspended 4	R 4 5			
Dominant											
7		R 3 5 b7									
7 augmented 5		R 3 #5 b7									

When a song is not in the right key for a singer's voice, it must be "transposed" to a different key. The *Guitar Pro* transposer teaches you how to do it.



Learn to tune using harmonics with *Guitar Pro's* **octave button**. The same feature can be used to tune 12-string guitars.

The "Pitch" feature allows 12-string guitarists to tune one or two **semitones** below standard pitch decreasing tension on the bridge and top of the guitar.



One can never really understand tuning without knowing something about the mathematics behind it. *Guitar Pro* provides an enlightening study of the subject.

Half-step Multiplier: 1.0594630943592952

Key #		Hertz	Hertz
1	A	27.500000000000	27.5000
2	A#/Bb	29.13523509488	29.1352
3	B	30.86770632851	30.8677
4	C	32.70319566257	32.7032
5	C#/Db	34.64782887211	34.6478
6	D	36.70809598968	36.7081
7	D#/Eb	38.89087296526	38.8909
8	E	41.20344461411	41.2034
9	F	43.65352892913	43.6535
10	F#/Gb	46.24930283895	46.2493
11	G	48.99942949772	48.9994
12	G#/Ab	51.91308719749	51.9131
13	A	55.000000000000	55.0000
14	A#/Bb	58.27047018976	58.2705
15	B	61.73541265702	61.7354
16	C	65.40639132515	65.4064
17	C#/Db	69.29565774422	69.2957
18	D	73.41619197935	73.4162
19	D#/Eb	77.78174593052	77.7817
20	E	82.40688922822	82.4069
21	F	87.30705785825	87.3071
22	F#/Gb	92.49860567791	92.4986

Help Close

Guitar Pro allows you to add a personal touch to the tuner.



Options are available for a 12-string display.

Chord Viewer - A13 (5 of 13)

13 F#
E
11 D
C#
9 B
A
7 G#
6 F#
5 E
4 D
3 C#
2 B
R A

Name: A13
Root position

Formula:
13 F#
11 D
9 B
b7 G
5 E
3 C#
R A

Pitch: -2

Help is provided for the added features.

Summary		Guitar Teacher	Guitar Pro
Formulas (major, minor etc.)	7	19	
Maximum alternatives per selected chord	6	15	
Maximum chords in database	504	3,420	
Transpose	No	Yes	
Tune using harmonics	No	Yes	
Tune 12-string guitar	No	Yes	
Tune below standard pitch	No	Yes	
In-depth study of tuning	No	Yes	
Tuner icons	1	14	
Optional 12-string display	No	Yes	



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