

# Appendix A: Using TUN Files

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## About Microtuning

Microtuning, or "microtonality" are methods for tuning musical instruments whereby musicians may explore and compose with ethnic, historical and contemporary tuning-systems. Microtuning musical instruments allows one to use scales which may have pitches lying between the notes of our familiar Western 12 tone scale. These pitches which are found in the 'cracks' of 12 Tone Equal Temperament are one of the things that give musics of Bali, India, Africa, Thailand, Turkey and the Middle East (to name but a few) a special intonational flavor, but is something that is of immeasurable value to the contemporary acoustic and electronic composer, who may require a more broad palette of musical pitches for their music.

The quest for creating beautiful and musically useful tuning-systems has been an unending process of discovery and debate amongst musical theorists, mathematicians, physicists and musicians going back to early history. Quite often the reasons for microtuning instruments may involve improving the consonant intervals of a tuning-system for sweeter sounding harmonies, as well as offering wider variety of choices for melody. "Microtuning" an instrument can sometimes mean there may be less or more than 12 tones in an octave, or even that the octave itself may be stretched or compressed. Microtuning is a vast topic, rich with lore, music and an infinity of musical possibilities for the sonic explorer.

## Creating TUN microtuning files with SCALA

Scala is a freeware utility developed by Manuel Op de Coul in the Netherlands, which can be used for the creation and analysis of historical, ethnic and contemporary microtunings. A powerful capability of Scala is that it enables the user to create the proprietary tuning data required for microtuning a wide range of hardware and software synthesizers and samplers.

Scala may be used to create the TUN format microtuning-files needed to explore microtunings with this VSTi. What follows is a brief instruction guide on how to use the Scala application to create these files.

The Scala home page is

<http://www.xs4all.nl/~huygensf/scala/>

## Installing SCALA

1. Firstly, go to the below Scala download page, and download the version of the Scala application for your computer platform, as well as the Scale Archive:

<http://www.xs4all.nl/~huygensf/scala/downloads.html>

Note: The Scala Scale Archive is a vast collection of over 2,900 historical, ethnic and contemporary microtunings in the Scala SCL format. Here is a page which shows brief descriptions of these microtunings:

<http://www.xs4all.nl/~huygensf/doc/scalesdir.txt>

2. Install Scala.
3. Create a new-folder inside the Scala program folder, labeling it "SCL".
4. Extract the contents of the Scala Scale Archive to the "SCL" folder.
5. Create an additional folder and label it as "TUN". This will be used as the location for saving the TUN files as they are created.

## How to create a TUN microtuning file from the SCALA archive

The microtuning files in the Scala Scale Archive are saved in the Scala SCL format. The below procedure will enable the user to convert the SCL format into the TUN format, using the command-line and menus in Scala.

1. Run the Scala program from either the desktop icon or by double-clicking its EXE file.
2. Type into the command-line "cd tun", then hit the Enter key on the keyboard. Scala is now focused inside this folder and will save files to this location.
3. Click the File Menu (located at the top left of the Scala application window), and chose Open Scale. Navigate to the SCL folder and find the file labeled "indian\_12.scl". Double-click this file, which will load the microtuning into Scala.
4. Type "show" in the command-line, then Enter. Now one will see information and values for this microtuning in the field above the command-line.

5. Type "set synth" in the command-line, then Enter. Next, one is prompted to specify the synth for which the proprietary microtuning data is to be created. Type "112" in the command-line, then Enter. One will now see that the TUN format has been selected.

6. Type "send/file", then Enter. Type the file name "indian\_12.tun", then Enter.

7. The TUN file has now been created and saved in the TUN folder, and is ready to be used with the soft-synth! Load the TUN file just created into the soft-synth plug-in from its UI.

## Specifying the Reference Frequency of a Microtuning

One of the powerful capabilities of the TUN file format and Scala, is the ability to specify the pitch and midi note which will be the reference pitch for the microtuning in use. This becomes a very important consideration when one is using a number of different synthesizers and wishes to keep them in tune with a given base frequency. It is very common for one to specify a chosen concert pitch such as A440 Hz or C261.6256 Hz as a reference for a microtuning, however, the flexibility of the TUN format and Scala enables one to specify this frequency arbitrarily. In Scala this reference is called Map Frequency.

As well as being able to specify the Map Frequency, one can also specify a central midi-note, which will become the starting point for the microtuning in use. Being able to specify a particular midi-note on the controller, provides a way to map a microtuning beginning on any desired midi key, making it easier to navigate the keyboard when there may be more or less than 12 tones per octave, or where one may desire to have the notes of a tuning fall on certain physical keys.

## How to specify the Map Frequency

1. Firstly, to see what the default settings are, type "show map", then Enter. One can see that the default pitch "Reference" is set to "261.6256 Hertz at note 60.C". Let's change this to A440, midi-note 69.

2. Type "SET MAP\_FREQ 440.0 69", then Enter.

3. Type "show map", then Enter. One can see that now the Reference is 440.0000 Hertz at note 69.A.

## How to specify the Middle Key for degree 0 of the microtuning

1. Type "set middle 69" to specify midi-note A69 as degree 0 of the microtuning, then Enter.
2. Type "show map" to see the results of the change. One can now see that the beginning note for degree 0 is 69.A.
3. Follow steps 5-6 above to save a TUN file with these new mapping properties.

### Important Note

When one uses a TUN microtuning-file in the CronoX VSTi, the above specified mapping properties will override the Master Tuning reference. Normally when one is using the default 12 Tone Equal Tempered Scale, the Master Tuning will be used to make fine pitch adjustments around the standard concert pitch of A440 Hz, but when one has specified another pitch base for a microtuning when the TUN file is created in Scala, such as C261.6256 Hz, the data in the TUN microtuning-file will provide a new pitch reference.