

 BUILT FOR POWERCORE



# HARMONY4

NATURAL, INTELLIGENT VOCAL HARMONY

**TC-HELICON**  
VOCAL TECHNOLOGIES

DISTRIBUTED BY

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ULTIMATE SOUND MANUFACTURER

Manual version 1.1



# Harmony4 User's Manual

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# Chapter 1: Introduction

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Thank you for purchasing the Harmony4 plug in from TC-Helicon. This product is a landmark plug-in. It is the first time our harmony technology has been made available as a software plug-in. The arrival of faster, more capable computer platforms, and secure hardware such as TC Electronic's PowerCore has allowed us to offer you our harmony capabilities previously available only in our dedicated hardware products. As a DAW user, you have the extra convenience to make fine adjustments over time that increase realism.

Now you can add vocal sparkle, and depth to your songs, advertising jingles, spoken word content, video games, and more from within a compatible digital audio host program. All you need is a nicely recorded vocal track to send to Harmony4. The four Hybrid Shifting™ algorithms can be thought of as well trained singers that you can manipulate in order to create vocal magic.

We hope you become as entranced by the possibilities of Harmony4 as we are excited to bring it to you.

The TC-Helicon Team  
August 2006

## Main Features

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- ◆ up to 4 harmony voices
- ◆ Humanization styles offer enhanced realism and special FX
- ◆ Tabbed interface simplifies and speeds editing
- ◆ Range of musical inputs possible: Notes or Chords from MIDI keyboard or Key, and Scale
- ◆ Multiple instances can produce more harmony voices and thicker vocals
- ◆ All settings easily automatable for superior results

# Support Information

The TC Support Interactive website [www.tcsupport.tc](http://www.tcsupport.tc) is designed as an online support, and information center. At the site you can find answers to specific questions regarding TC-Helicon software, and hardware. All known issues are stored in a database searchable by product, category, keywords, or phrases. Under the section "My Stuff" you can login to check the status of your questions, download materials such as product manuals, software updates, and new presets. This site has been specifically designed to meet the needs of our users. We constantly update the database, and you will find the site to be a huge resource of information. Browse through Q&A's, and discover new aspects of your TC-Helicon product. If you can't find an answer online, you have the option of submitting a question to our technical support staff who will then reply to you by e-mail. The TC Support Team is on constant alert to help you in any way they can.

The screenshot shows the TC Support Interactive website interface. At the top, there are logos for "t.c. electronic", "TCHELICON", and "dynaudioacoustics". Below the logos is the "TC SUPPORT INTERACTIVE" logo. The navigation menu includes "Support Home", "Answers", "Contact Support", "My Stuff", "Login", and "Help". The search section has filters for "Product Line" (TC Helicon - Vocal Products), "Category" (All), and "Access Level" (Any). The search text is "Harmony4" and the search by method is "Phrases". Below the search filters, it shows "162 Answers Found" and a pagination control "Page: 1 of 9". A table of search results is displayed with columns for "Summary" and "Product".

	Summary	Product
1	New - Resetting the Quintet to default factory settings	Quintet (discontinued)
2	Latest VoiceDoublers software	VoiceDoublers
3	Avoiding feedback with VoiceSolo	multiple

## Contact Details

Alternatively, you may contact the TC Electronic distributor in your area, or write to:

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USA  
[www.tc-helicon.com](http://www.tc-helicon.com)

# System Requirements

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## WINDOWS

- PowerCore running version 2.0.2 or higher
- Desktop or laptop computer that meets Powercore system requirements
- VST compatible host application
- System must meet requirements of the host application

## MAC OS X

- Macintosh system OS X 10.4
- PowerCore running version 2.0.2 or higher
- Desktop, iBook or PowerBook computer that meets Power system requirements
- VST or AudioUnits compatible host application
- System must meet requirements of the host application

# Parameter Inputs

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## Mouse Click/Drag

Clicking in any text edit field, and dragging vertically is supported.

## Scroll Wheel Support

All parameters support scrolling on both Windows XP, and Mac OS X. Simply place the mouse over a parameter value field, and use the Scroll Wheel to increment/decrement the associated parameter value.

## Direct Input

Double clicking in any edit field allows you to type in an exact number. In a text field, you need only type in the first few characters, and press enter.

## Key Commands

Most host applications support keyboard commands for certain functions. The following key commands are available for all Plug-In parameters:

### Key Commands In Windows

Fine Adjust = Alt + Scroll Wheel (in some hosts)

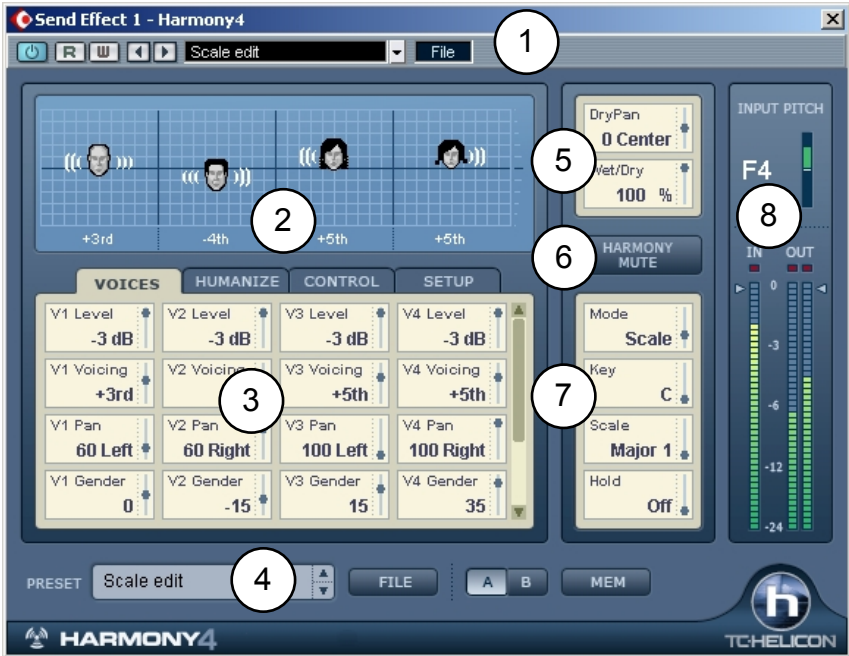
### Key Commands in Mac OS

Fine Adjust = Apple + Scroll Wheel (in some hosts)

# Chapter 2: Descriptions

## The Main Interface

Here we discuss getting around the GUI. More detail on parameters follows later in the manual.

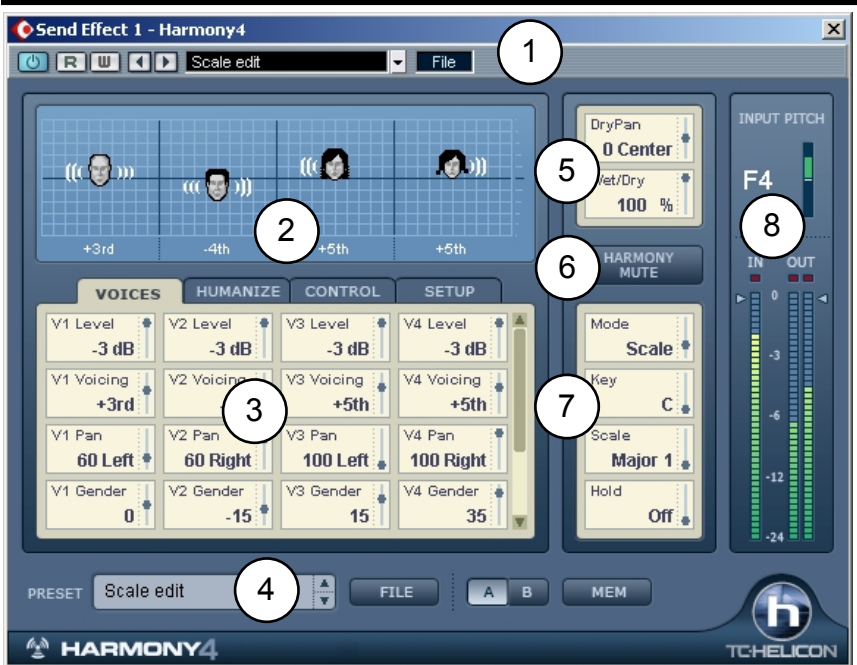


**1. Host Area** - This will be displayed differently for each host program. In this case, the host area of Cubase SX is shown.

**2. Visualization Area** - Here you can see at a glance information about the current preset. Each head represents an enabled voice. Click on a head, and you can drag the mouse to change the harmony interval of each voice (although not in Notes and Notes 4CH modes because harmony intervals in these modes are determined by incoming MIDI note messages). Gender is represented by the apparent male, or female characteristic of each voice. The soundwaves emanating from the heads show both level, and pan position. The lower part shows text representing each harmony interval, or MIDI note depending on the current harmony mode.

**3. Tab Editing Area** - This is composed of 4 tabs containing parameters that are grouped by function. Generally, each voice has its own vertical column of settings. The slider on the right side of this window can be used to reveal more parameters if they exist.

# The Main Interface (cont.)



**4. Preset Area** - This drop down menu displays the included factory presets. This menu is provided in case the host application does not have a preset menu of its own.

**5. Wet/Dry Mix, and Pan** - There is an optional dry path through the plug in for times when you use Harmony4 as a channel insert. Note that when used as a stereo insert plugin, only the left channel of the audio track will be as input to Harmony4.

**6. Harmony Mute** - Pressing this button will quickly turn the harmony voices off.

**7. Musical Info/Various** - Each harmony mode has different requirements in order to make the voices produce musical sounding harmonies. See the “Control Tab” section later in this manual for each harmony mode’s requirements. The parameters in this area will differ depending on which mode is selected. You can tell at a glance the harmony mode of the loaded preset, and which type of musical input you need to provide.

**8. Meters, and In/Out Levels**- The upper meter shows the current pitch recognized from the input voice. The pitch meter shows note, octave information as well as the meter that shows whether the input note is sharp, or flat. This meter shows +/- 50 cents. The lower meters display in/out levels. You can make adjustments by clicking, and dragging the arrows.



# The Voices Tab

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The Voices Tab allows editing of settings you need most for each harmony voice. The number of parameters differs depending on the harmony mode.

## Level

Here you can mix the relative levels of each of the four voices. There is also an "Off" value which will disable any voice. Note that turning all four voices on at 0dB (full) may produce overload. If this occurs, you can either reduce the input level with the IN slider, or reduce the level of each voice.

## Voicing (editable in Shift, Scale, and Chord Modes)

The Voicing parameter allows you to arrange the intervals of your four singers above, and below the lead singer. Voicing works slightly differently in each harmony mode.

In **Shift** Mode, the Voicing values range from -24 semitones to +24 semitones in a fixed, non-diatonic interval relative to the input melody.

In **Scale** Mode, the Voicing parameter specifies a diatonic interval relative to the input. The range is -2 octaves to +2 octaves. For example, a setting of +3rd will result in a harmony voice a third above the input voice, which could be major, or minor depending on the current Key, and Scale settings.

In **Chord** Mode, Voicing determines a more general relation of the harmony note to the input note. The harmony intervals always relate to the chord of the incoming MIDI notes. A setting of "Up1" generally places the harmony voice a third above the input voice.

In **Notes**, and **Notes 4CH** modes, the Voicing parameter is not shown, or editable because intervals are the same as the incoming MIDI notes.

## Pan

Each harmony voice can have its own stereo pan position. Spreading the harmony voices within the stereo field can help de-couple the harmony voices from the input voice, resulting in more natural sounding harmonies. Left = "-", Right = "+"

## Gender

This parameter shifts the formants (often called the gender) of the harmony voices. Use it to alter the character of the voice ranging from -50 (a big person with a deep, resonant voice) to 0 (no change) to +50 (mice/alien sound).

## Note Source, and Input Note (Only available in Scale Mode)

These parameters help you to create custom scales for times when the lead voice melody, the harmony voice(s), and the musical accompaniment don't sound correct on certain notes. You can edit the individual harmony notes of all four voices (if they are all enabled) for each input note.

When Note Source is set to "Manual", you can select the Input Note with your mouse. When Note Source is set to "Sung", the Input Note is determined by the pitch of the singer.

### **Output Note**

Each of the 4 harmony voices can produce a different harmony note for every given input (sung note). Use these parameters to set the desired output note for each enabled voice.

## **The Humanize Tab**

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TC-Helicon's Humanize settings make the harmony voices sound more natural, or even wildly effected if you prefer. You can select a pre-programmed Humanize style, or start with the Off style, and experiment with each parameter.

### **Style**

This parameter contains preset values for all the parameters in the Humanize block. It provides quick access to different qualities of performance.

### **Portamento**

Portamento sets the time in milliseconds to reach a target note when a harmony voice changes pitch.

### **Smoothing**

This is most effective in Scale mode. At Smoothing settings near zero, the harmony voices will sound in tune even if your lead voice is a little out of tune. In this case, the pitches of the harmony voices are pitch-corrected to a chromatic semitone scale. Settings near 100 allow the lead singer to float between pitches with the harmony voices following closely.

### **Detune**

With the Detune Parameter, a tiny, fixed amount of pitch shift is applied uniquely to each of the harmony voices. This creates a thicker, chorus-like effect when applied to harmony voices set to similar pitches.

### **Pitch Randomize**

Small amounts of this parameter apply a unique, moving pitch shift to each voice that is derived from the study of human singing. It is used to remove the sometimes mechanical sound of perfectly in-tune harmonies.

### **Time Randomize**

No group of singers is able to start their harmony notes at the exact same time. Lower values of this parameter create slight timing differences to the onset, and sustained portions of each harmony note. This feature greatly increases realism when the harmony voices are panned in stereo. Also note that sometimes breathy consonants in the lead voice can create a slight flange effect when mixed with the harmony voices. Adding Time Randomize can help reduce this.

## **Vibrato Style & Amount**

A unique modeled vibrato based on the analysis of human singers can be added to each harmony voice using a combination of these two parameters. When Style, and Amount are chosen, vibrato occurs when the pitch of the lead voice has settled momentarily. This more closely simulates human singing. Vibrato may not occur if the lead voice melody is changing quickly.

The styles are randomized so that they sound slightly different on each voice even when the same style is chosen for all. Mixing different styles can create a very realistic sounding vocal group.

## **Scoop Style & Amount**

The Scoop parameter adds a brief pitch envelope to the onsets of the harmony notes, further disconnecting the harmonies from the lead. Select a style, then use the Amount control to determine the shift range of the scoop

# **The Control Tab**

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The Control Tab is used to configure parameters that relate to the different harmony modes. Depending on the mode, different parameters are available. A brief description of each harmony mode follows here with more detailed discussion following in Chapter 3.

### **Mode: Shift**

Shift Mode is best used for doubling, and special FX. Shift is the most basic mode of operation for the Harmony Block. The harmony voices can be shifted away from the input note in semi-tones.

### **Mode: Scale**

In Scale Mode, harmonies use key, and scale information to create musically correct, diatonic harmonies. Scale Mode harmonies are more parallel than Chord Mode harmonies. To overcome situations where the harmony interval is incorrect for one, or two sung notes, the custom scale editing parameters may be used. Refer to Appendix: Scale Types, and Voicings Table

### **Mode: Chord**

In Chord Mode, musically correct harmonies are produced by chords recognized from the incoming MIDI notes.

### **Mode: Notes & Notes 4CH**

In this Mode, incoming MIDI notes determine the pitches of up to four harmony voices. When "Notes" is selected, a single MIDI channel controls the 4 harmony voices. When Notes 4CH, or "Notes Four Channel" is selected, each harmony voice is assigned a unique MIDI channel in the Setup tab which has many benefits including:

1. the ability to use unique pitch bends on each channel
2. full stability of panning, and gender assignments for each voice.

To take full advantage of this mode, you will need to have 4 tracks of MIDI data on separate channels driving Harmony4.

### **Key & Scale (available only in Scale Mode)**

Use these parameters to set the key, and scale type. The scale defines the map for how the harmony voices will react to the input pitch. Available scales are Major/Minor 1,2, and 3. Custom scales can be created for situations where the predefined scales don't produce the desired results. Refer to Appendix: Scale Types, and Voicings Table

### **Attack and Release**

Available only in Chord, and Notes Modes, these parameters set the envelope attack, and release times for harmony voices. Using these parameters can make entrances, and exits of the harmony notes softer, or harder. This function works when Latch is "Off", and MIDI notes are being received.

### **Latch (available only in Chord, and Notes Modes)**

When enabled, the last chord remains active after the notes have been released. When disabled, harmony output stops when MIDI notes are released. In notes mode, the number of notes played must equal the number of harmony voices enabled for any voices to be triggered.

### **Bend Range**

You can define how far the harmony pitches are shifted when you move the pitch wheel on your MIDI keyboard. The values go from 0 to +/- 24 semitones.

### **Tuning**

There are three micro tuning options for all modes except Notes, and Notes 4CH.

**Equal** Tuning uses approximations for the tuning of each note, allowing you to easily alter the key of your music without re-tuning your instruments. This is the same way synthesizers are tuned. Most non-digital instruments are tuned this way.

**Just** Tuning maintains the exact relative ratios between pitches, creating perfect harmonies. Just Tuning will sound natural the majority of the time.

**Barbershop** Tuning differs from Just Tuning only in Chord Mode, and is best used for a cappella applications.

### **Hold**

This control engages the Harmony Hold feature. When set to "On", Harmony Hold freezes the harmony voices while allowing the lead voice to ad lib over top. When a preset is stored, the parameter will always be saved as "Off". The signal will not be held until a stable pitch is recognized.

### **Hold Release**

Sets a fade-out time for the hold feature when returned to the "Off" value.

### **Root, and Chord (available only in Chord Mode)**

Use these parameters to set the chord root (e.g. C), and chord type (e.g. major 7). The chord defines the allowable notes for the harmony voices.

## **The Setup Tab**

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When using the two modes that require MIDI input, Notes, and Chords, it is essential to match the MIDI settings of Harmony4 to those of your DAW's MIDI track for controlling harmony.

### **Harmony V1(All) Channel**

The MIDI channel for notes, and sustain pedal information must match the channel of the transmitting keyboard controller, or sequencer MIDI track. Chord, and Notes modes (but not Notes 4CH) require only the Harmony V1(All) Channel be set to match your controller.

The other three channel assignments only apply when using Notes 4CH mode where each voice has its own channel assignment. The "Vn" nomenclature denotes each edit field as the channel setting for Voice 1 through 4.

### **Harmony V2/ V2 / V3 / V4 Channel**

In Notes 4CH mode only, these settings determine which channel controls each single voice.

### **Notes Transpose**

In Notes mode only, this setting works in tandem with the Split Zone, and Split Note settings to allow you to play high harmony notes on the lower section of your keyboard, and vice versa.

### **Split Zone & Split Note**

You can use these settings to isolate which section of your MIDI keyboard will control Harmony4. This is mostly used when playing live with keyboard sounds triggered from one side of the keyboard, and harmonies triggered from the other.

### **Tuning Reference**

If the vocal track that drives Harmony4 was recorded with a non-440Hz instrument reference, you can use this setting to bring the harmonies into tune.

### **Bend Range**

See the Control Tab description previous.

# Chapter 3 - Producing Harmony

## Harmony Modes Background

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A quick description of why the harmony modes are required is that they help Harmony4 “sing the right notes”. Each harmony mode requires different input from you and is capable of producing different harmony sounds. We will use a little allegory to explain.

When you and a fellow musician get together to play and sing, typically some musical information is passed from one to the other before commencing the song. You do this in order to make sure the music sounds pleasant and not discordant. The information can be as simple as the name of a song you both know, a musical key, or even pointing out the chords on your instrument. In this respect, Harmony4 is similar. You will need to share some musical information in order for it to do its job properly. The ways in which you communicate this information to Harmony4 are through the “harmony modes”.

Like your friend in our analogy, Harmony4 has intelligence that can contribute to making good music. You can choose to use this intelligence, or not depending on the chord structure of your song and the harmony lines you have in mind. You make this choice when choosing presets to produce harmony in your song.

The factory presets are organized on the basis of the four harmony modes:

- ◆ **Scale**
- ◆ **Chords**
- ◆ **Notes**
- ◆ **Shift.**

The “intelligent” harmony modes, **Scale** and **Chords**, calculate a harmony map with the following inputs from you:

1. The note the lead vocal is singing at any given moment;
2. Either the key and scale you’ve set at the beginning of your song (Scale mode);
3. or the chord root and type interpreted by Harmony4 from incoming MIDI track (Chords mode).

The map has an output note associated with every input note. This creates a harmony melody that moves with your lead melody while generally sounding harmonically correct with your accompaniment.

The non-intelligent modes, **Notes** and **Shift**, each have unique requirements so we will deal with them individually:

The **Notes** harmony mode requires a MIDI keyboard, or other MIDI source to

dictate to Harmony4 what harmony notes you'd like to hear. Once a harmony note, or notes are held down on your MIDI keyboard, or MIDI track, this is where they will stay regardless of your changing vocal melody.

**Shift** mode shifts the pitch of the lead melody by a fixed interval. This is most useful for doubling, special effects, or Gothic-sounding 5ths.

## A Comparison of the Harmony Modes

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The following table gives an overview of the plusses and minuses of each harmony mode.

Harmony Mode	Input Action	Benefits	Challenges
Shift	Set shift amount with the Voicing parameter	Easiest to use	Fixed interval less useful for musical harmony
Scale	Set Key and Scale of song	Most natural sounding with minimal input. Can be the fastest.	Diatonic harmony doesn't work with all chord accompaniments.
Chord	Play chords on a MIDI keyboard	Works for nearly every chord change accompaniment.	Limited harmonic movement not always realistic sounding
Notes	Perform harmony melodies on MIDI keyboard or MIDI track	Any harmony melody can be created for each voice.	Requires keyboard skills. Wide-panned voices may swap sides due to voice allocation.
Notes 4 Channel	Perform harmony melodies on four MIDI channels/tracks using a MIDI keyboard and/or sequencer	Any harmony melody can be created for each voice. Unique pitch bends on each channel add realism. Pan and Gender assignments locked to voice	More time required to input melodies. Sequencing knowledge required.

## Getting Set Up

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1. Prepare your DAW and PowerCore hardware for a new session. Turn on your computer, run the host program and ensure that any external PowerCore unit(s) are powered on.
2. Connect a MIDI keyboard to your computer and set your host program to route the MIDI to Harmony4, or create a MIDI track in your host application.
3. Import an audio file containing a dry vocal performance into your session.

### *Notes concerning input files:*

- ◆ The vocal track driving Harmony4 can be mono, or stereo. In the case of it being stereo, only the left channel send is sent to Harmony4. See the *Insert, or Auxiliary Send?* note below for more information on mono/stereo.
- ◆ There should be as little as possible pitched instrument, or other vocal leakage onto the main vocal track. Increasing leakage compromises the harmony quality.

◆ Any equalization of the send to Harmony4 should be removed. You can add EQ after the plug-in, if required.

◆ While Harmony4 has excellent pitch detection, it may have trouble finding a pitch in growled, or extremely raspy voices.

4. Create a send bus from the audio track to Harmony4. This will be handled differently in the various DAW programs so consult the manual that came with your DAW if you haven't done this before. You can confirm that audio is reaching H4 and is being processed by checking the Input and Output meters.

#### *Insert, or Auxillary Send?*

◆ While you can run Harmony4 as either an insert, or auxiliary send plug-in, typically, it's best to run it as an auxillary send effect. This allows you to process the lead and the harmony voices separately. Also, you will be able to use the track faders in your DAW to control return levels of lead and harmony independently. When using this method, ensure that no other tracks are inadvertently sending to Harmony4 on its assigned aux send bus.

◆ You can use H4 as an insert if you do not have enough aux sends available in your DAW to drive Harmony4, or if you don't need to return the dry portion of the vocal track to the mix. It is not advisable to insert Harmony4 in a stereo track because the dry return to the mixer will be heard on the left channel. Note that using Harmony4 as an insert requires that you control wet/dry mix within the plug-in as opposed to the track fader controls in your DAWs mixer.

5. You can confirm that Harmony4 is receiving MIDI note information by loading a Notes mode preset e.g. Notes In Stereo and observing note names in the visualization area as you play your keyboard, or playback a MIDI track.

## **Checking Out The Harmony Presets**

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Now that you're setup, you can start producing harmony! If you are familiar with TC-Helicon harmony products you can proceed directly to the presets dedicated to the harmony mode of your choice and experience the results.

1. If this is your first time creating virtual harmonies, start by loading the first preset in the factory preset list. The first group of presets are based on the **Chords** harmony mode so get ready to play chords on your MIDI keyboard, or playback a MIDI track in time with the song's chord changes.

2. Press Play and confirm all of your audio paths are correctly set. You should hear a mix of the lead voice and the harmony voices and see metering indications in your track meters. Until you play the keyboard, or MIDI track, the harmonies won't follow the song but this is OK while you're making sure the audio paths are correct.



*You may want to record a scratch MIDI chord track in your host sequencer in the song sections where harmony is required so you can try the different Chords presets without having to play at the same time.*

**3.** You can now listen to how the different Chord presets sound as the song plays. At this point you can also start learning about editing. A good place to start is with parameters in the Voices Tab. Here you can move the Voicing up and down and hear the effect of different Gender settings on each voice.

**4.** Once you've experimented with the Chords mode presets, you can check out the presets built on **Notes** mode. You'll need your MIDI keyboard, or MIDI track again but this time, instead of simply playing chords, you also have the option of playing melody lines, or holding static notes.

*Again, it will help if you create a scratch MIDI track with some harmony lines so you can sample the different Notes presets.*

One of the Notes mode presets is called MIDI 4 Channel. To hear this preset correctly, you will need to record up to four MIDI tracks on different MIDI channels each with a mono melody line. The four MIDI channel assignments of the tracks must match the assignments set in the Setup tab of Harmony4. It sounds like a lot of work but this is arguably the most flexible and powerful harmony mode so it is worth the extra effort to hear it. Be sure to try different pitch bends on each channel.

**5.** Auditioning the **Scale** mode presets with your lead vocal track is much easier. All you have to do is determine which Key and Scale matches your song, or song section, and enter it when you load each preset. If the song chord structure is fairly simple, one setting of Key, and Scale will sound wonderful. What may happen though is that the harmony part will sound great for most of the song, or section but when the accompaniment goes to a particular chord, and the singer sings a particular note, the harmony at that moment doesn't sound musically correct.

When Scale harmony needs help, the beauty of DAW automation comes to the rescue! Take note of where the harmony needs to be adjusted. Then loop this section, and find a Key, or Scale combination that works for that moment. Now automate a Key, or Scale edit just before that note, or phrase. Return to the original Key, and Scale settings for the rest. You may have to do this at a couple of places in your song but the often breathtaking reality of Scale mode harmonies will make it worth the effort.

A table outlining the differences between the three Major, and three Minor scales is in the Appendix. These scale modifications have been developed by performing musicians to make Scale harmonies work for more songs.

**6. Shift** is the last harmony mode group in the factory presets. These are least likely to produce what we call harmony but they can be useful for doubling, and special FX. No input on these presets is required beyond loading the preset. Editing the voicing parameters though will give you a good idea of what is possible with this harmony mode.

If you've stayed with this text up to this point, you've received a good overview of what Harmony4 has to offer. From this point onwards you can work with presets in the harmony modes that suit your workflow best.

# Chapter 4: Appendix

## Troubleshooting

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For the more extensive and up to date troubleshooting information please visit [www.tcsupport.tc](http://www.tcsupport.tc)

### **I don't hear any harmony voices, but the input meter to Harmony4 shows input level - nothing on the output?**

There are several common reasons harmonies are not being produced when the plug-in shows input level:

1. Harmony Mute is enabled: disable it to hear harmonies
2. A Notes or Chord preset is selected: make sure there is MIDI being sent through the correct path in the DAW program
3. If MIDI is being sent, but there are still no harmonies: confirm that:
  - a) the MIDI channel for Harmony4 is matched to your track with MIDI information. or;
  - b) the split point settings are allowing MIDI notes through

### **Why do my meters only show activity on the left channel?**

If Harmony4 is inserted on a mono channel only the left side of Harmony4 is used. For both meters to function, use Harmony4 on a stereo channel.

### **Sometimes I hear excessive sibilance when using Harmony4?**

The harmony voices are pitch shifted and humanized versions of the input voice. If there is sibilance on the original recording, that effect becomes more noticeable with each harmony voice added. Try using Time Randomize = 10. Additionally, consider using a de-esser plug-in.

# Scale Types and Voicings Table

	Lead Voice	C	C#	D	E <sub>b</sub>	E	F	F#	G	G#	A	B <sub>b</sub>	B
<b>MAJ1</b>	3rd Above	E	nc	F	nc	G	A	nc	B	nc	C	D	D
	5th Above	G	nc	A	nc	B	C	nc	D	nc	E	F	F
<b>MAJ2</b>	3rd above	E	nc	F	nc	G	A	nc	C	nc	C	D	D
	5th above	G	nc	A	nc	C	C	nc	E	nc	E	F	F
<b>MAJ3</b>	3rd above	E	nc	F	nc	G	A	nc	B <sub>b</sub>	nc	C	D	D
	5th above	G	nc	A	nc	B <sub>b</sub>	C	nc	D	nc	E	F	F
<b>MIN1</b>	3rd above	E <sub>b</sub>	nc	F	G	nc	A <sub>b</sub>	nc	E <sub>b</sub>	C	nc	D	nc
	5th above	G	nc	F <sub>b</sub>	B <sub>b</sub>	nc	C	nc	D	E <sub>b</sub>	nc	F	nc
<b>MIN2</b>	3rd above	E <sub>b</sub>	nc	F	G	nc	A	nc	B <sub>b</sub>	C	nc	D	nc
	5th above	G	nc	A	B <sub>b</sub>	nc	C	nc	D	E <sub>b</sub>	nc	F	nc
<b>MIN3</b>	3rd above	E <sub>b</sub>	nc	F	G	nc	A <sub>b</sub>	nc	B	C	nc	D	nc
	5th above	G	nc	A	B <sub>b</sub>	nc	C	nc	D	E <sub>b</sub>	nc	F	nc

The table at left illustrates the how the six scale types differ. It shows the third and fifth intervals for input notes in the key of C.

The bold line of notes at the top represent the sung, or input note.

The symbol "nc" means no change, in that the harmony voice will simply stay on the previous note until the lead voice changes to a non "nc" note.

**The following table shows the range of harmony voicings available in Scale mode.**

+2 Octaves

++7

++6

++5

++4

++3

++2

+1

+7

+6

+5

+4

+3

+2

Unison

-2

-3

-4

-5

-6

-7

-1 Octaves

--2

--3

--4

--5

--6

--7

-2 Octaves

# Chord Types and Voicings Table

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The following gives additional detail on Chords mode. It shows the range of chords recognized by Harmony4 based on a chord root of C in the left column. To the right in the table is the combination of notes that are required to be played in order for Harmony4 to recognize each chord type.

## Recognized Chord Types with Root of C

Type	Required Notes			
Maj	C	E	G	
Maj6	C	E	G	A
Maj7	C	E	G	B
Maj7sus4	C	F	G	B
Min	C	E <sub>b</sub>	G	
Min6	C	E <sub>b</sub>	G	A
Min7	C	E <sub>b</sub>	G	B <sub>b</sub>
Min7b5	C	E <sub>b</sub>	G <sub>b</sub>	B <sub>b</sub>
Dim	C	E <sub>b</sub>	G <sub>b</sub>	
Dim7	C	E <sub>b</sub>	G <sub>b</sub>	B <sub>bb</sub> (equiv. to A)
Dom7	C	E	G	B <sub>b</sub>
Dom7b5	C	E	G <sub>b</sub>	B <sub>b</sub>
Aug	C	E	G <sub>#</sub>	
Aug7	C	E	G <sub>#</sub>	B <sub>b</sub>
Sus	C	F	G	
Sus2	C	D	G	
Sus7	C	F	G	B <sub>b</sub>

## Voicing intervals in Chord Mode Presets

- +2 Octaves
- +1 Octave
- Up 6
- Up 5
- Up 4
- Up 3
- Up 2
- Up 1
- Unison
- Down 1
- Down 2
- Down 3
- Down 4
- Down 5
- 1 Octave
- 2 Octaves
- Bass 2
- Bass 1
- Root 2
- Root 1