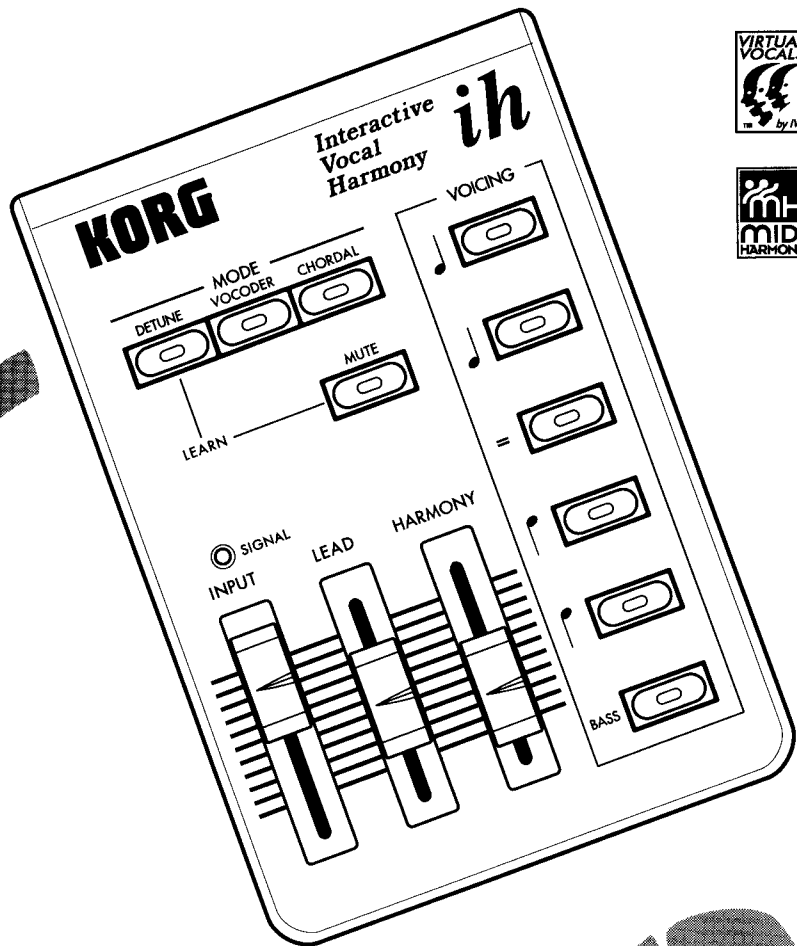


KORG *Interactive Vocal Harmony ih*



USER'S MANUAL

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Introduction

Welcome

Thank you for purchasing the Korg *ih* Interactive Vocal Harmony processor. The *ih* was specifically developed to provide solo musicians a way of adding incredibly realistic-sounding vocal harmonies to their performance. This product can also be used in a musical group allowing one musician to sing all of the backup parts while another sings lead.

Using the *ih* does not require any special knowledge of musical theory. Your only requirement is the ability to play chords on a MIDI keyboard; the intelligence of the *ih* will do the rest.

The “intelligence” of the *ih* is used in two areas: first, to provide a natural vocal sound when pitch shifting the human voice and second, to provide harmonies that are musically correct over the changing chords in a composition.

We are sure you will be satisfied with your purchase of the Korg *ih*. Now let's get set up and make some music!

Precautions

Location

Using the unit in the following locations can result in a malfunction:

- In direct sunlight
- Locations of extreme temperature or humidity
- Excessively dusty or dirty locations
- Locations of excessive vibration

Power supply

Please connect the supplied AC adaptor to an AC outlet of the correct voltage. Do not connect it to an AC outlet of voltage other than that for which your unit is intended.

Interference with other electrical devices

This product contains a microcomputer. Radios and televisions placed nearby may experience reception interference. Operate this unit at a suitable distance from radios and televisions.

Handling

To avoid breakage, do not apply excessive force to the switches or controls.

Care

If the exterior becomes dirty, wipe it with a clean, dry cloth. Do not use liquid cleaners such as benzene or thinner, or cleaning compounds or flammable polishes.

Keep this manual

After reading this manual, please keep it for later reference.

Keeping foreign matter out of your equipment:

- Never set any container with liquid in it near this equipment. If liquid gets into the equipment, it could cause a breakdown, fire, or electrical shock.
- Be careful not to let metal objects get into the equipment. If something does slip into the equipment, unplug the AC adaptor from the wall outlet. Then contact your nearest Korg dealer or the store where the equipment was purchased.

The Control Panel

The controls of the *ih* are arranged in three groups to help you understand them easily.

1. The Mode group allows you to select which harmony mode you would like to use or to Mute the harmonies.
2. The Voicing group allows further control of the Chordal and Detune harmony modes.
3. The Volume Control group allows you to vary the relative balance of the harmony and lead voices and to set the microphone input gain.

CHORDAL Mode:

Automatically selects the correct harmony intervals by recognizing the chords you play on a MIDI keyboard.

VOCODER Mode: Allows you to transpose your voice by up to four notes you play on a MIDI keyboard.

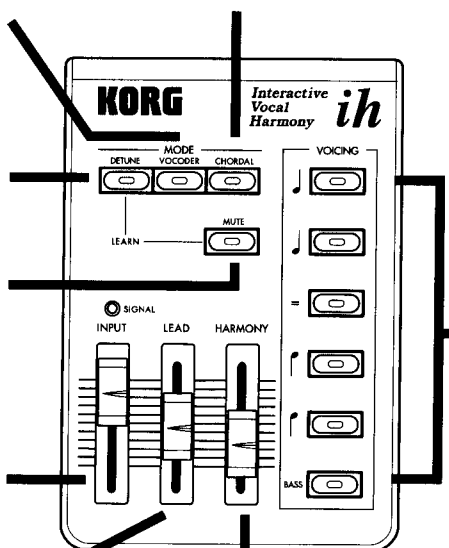
DETUNE Mode: Makes your voice sound like a group of singers all singing a single note.

MUTE Button: When this button is lit, the harmony voices are turned off and only your voice is audible.

INPUT Volume: Set this so the SIGNAL LED turns red only when you sing your loudest note.

LEAD Voice Volume: This varies the volume of your voice. Set it so that your amplifier is not distorting at a comfortable listening level.

HARMONY Voices Volume: This sets the volume of the harmony voices in relation to your voice.



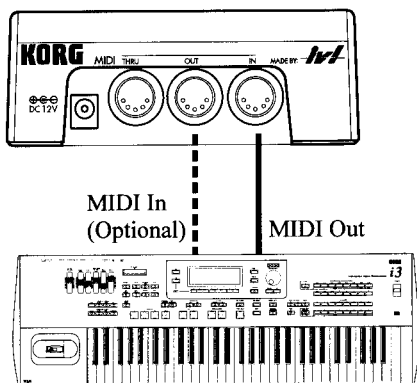
VOICING:

With Chordal mode selected, these buttons allow you to choose your harmony intervals.

In Detune mode, they allow selection of detuned voices.

MIDI Connections

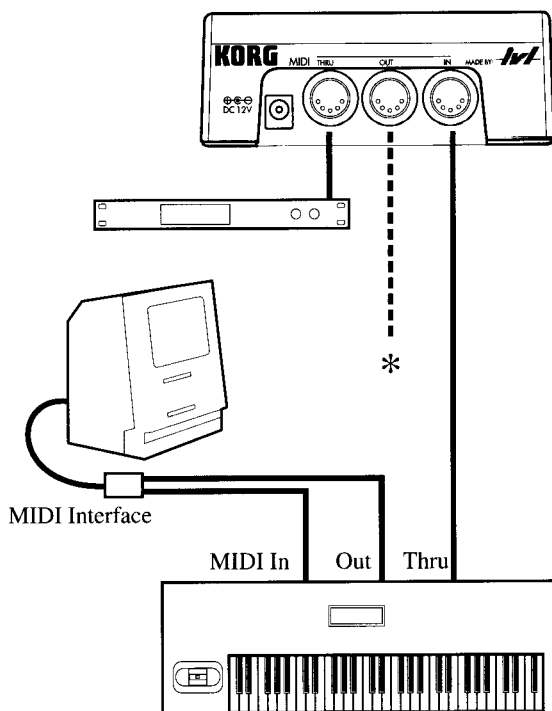
Basic MIDI Setup



The graphic at left shows the simplest MIDI connection setup. You could use either a Korg *i series* workstation or any MIDI controller keyboard with it. The essential connection is between the MIDI output of your controller and the MIDI input on the *ih*. This connection transmits the notes and chords you play on your keyboard to the *ih* to control your harmonies.

If you are using an *i series* or other workstation, you have the option of connecting the MIDI output of the *ih* to the input of the workstation. This will allow you to record the button presses you make to change the *ih*'s harmony mode, voicing and mute in the workstation's sequencer. This connection will also allow communication between the two machines for added features.

Advanced MIDI Setup



The graphic at left shows how you would connect the *ih* for recording or playback in a MIDI component system.

The MIDI output of the keyboard is connected to the input of the sequencer. The sequencer will pass the keyboard messages from your playing through to the *ih* during recording and playback.

When you press Play on your sequencer, the messages are transmitted from its MIDI output to the keyboard first and then through the keyboard's MIDI Thru to the *ih*. If you have more sound modules, you can connect them to the Thru connector on the *ih*.

* If you want to record the *ih* button presses as described in the Basic MIDI Setup, you will need to connect the *ih*'s output to the input of the sequencer. This will require a MIDI Merge device or a MIDI patchbay.

MIDI Control

The *ih* can accept MIDI notes, Pitch Bend and Control Change messages from your keyboard or sequencer. It uses MIDI notes and Control Changes to control harmonies while in Vocoder and Chordal modes. Pitch Bend applies to Vocoder mode only.

The *ih* can also transmit information. It does so when you press the front panel buttons to select harmony modes, the mute function and voicings. This allows you to record and play back these button presses along with your keyboard performance with a sequencer.

Once you have made your MIDI connections, you must tell the *ih* which channel it is to receive and transmit MIDI control information on. There are sixteen channels of information for transmission on a MIDI cable and the *ih* can only respond to or transmit on one at a time.

Learn mode

Learn mode is an intelligent mode in which you can set the following parameters:

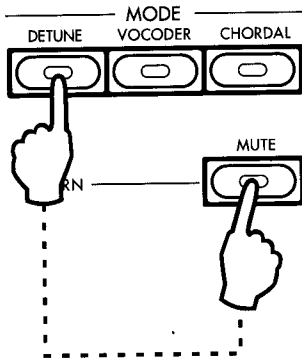
1. MIDI channel for transmit and receive
2. Keyboard note that defines the split point and zone
3. Power-up settings for the harmony modes and voicing.

The intelligence in Learn Mode allows it to recognize notes you play on your keyboard and configure the MIDI channel and split point parameters automatically. If you prefer, you can enter the MIDI channel manually.

The split point is a note that divides your controller keyboard into two zones. You can choose the zone to the left or right of the split point to control the *ih*. The split point feature only works with the Chordal harmony mode.

The power-up settings allow you to specify which settings you prefer every time you turn the unit on. You can set the default Detune and Chordal voicing and initial harmony mode regardless of how they were set when the *ih* was last turned off.

Setting the MIDI channel and split point from a keyboard:

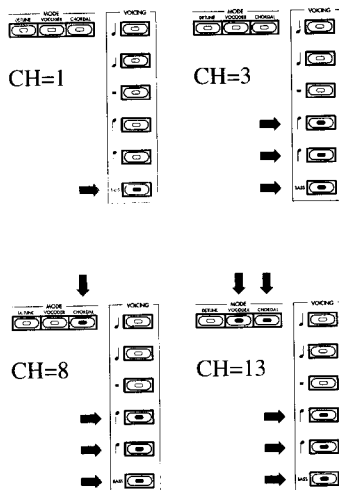


1. Make your MIDI connections as shown previously.
2. Press and hold the Detune and Mute buttons until the LEDs in these buttons flash to indicate Learn Mode.
3. If you do not want to set a split point, press and release any note on your keyboard and proceed to step #4. The MIDI channel of the note played is displayed on the *ih* front panel. (See below)

If you want to set a split point, press *and hold* the note that will be your split point. While holding this note, press any note to the left or right of it to choose which zone is to control the *ih*.

4. Press the Detune and Mute buttons at the same time as before. The *ih* will exit from Learn Mode.

Setting the MIDI channel from the *ih* front panel:



You can set the MIDI channel separately using the following method. No split point is possible when you set the MIDI channel in this way.

1. Make your MIDI connections as shown previously.
2. Press and hold the Detune and Mute buttons until the LEDs in these buttons flash to indicate Learn Mode.
3. The lower five Voicing buttons are used to enter numbers one through five. The Chordal and Vocoder buttons add five and ten, respectively, to the number chosen with the Voicing buttons. The top Voicing button is used to set channel 16. (See examples at left)
4. Press the Detune and Mute buttons at the same time as before. The *ih* will exit Learn Mode. Your MIDI channel is now set.

To define the power-up settings:

1. Set the Detune amount and Chordal Voicing according to instructions in the Harmony Modes chapter. No Voicings are required for Vocoder mode.
2. Switch to the harmony mode you want the *ih* to power up in.
3. Press and hold the Detune and Mute buttons for a half second to enter Learn mode. Your settings are programmed when you enter and then exit Learn mode.
4. Press the Detune and Mute buttons at the same time to exit Learn Mode.

Control Changes

This is a name given to a type of MIDI message that allows you to introduce expression into your performance. The *ih* can respond to the following control change messages:

MIDI Volume (CC#7)

Modulation (CC#1)

General purpose controllers 1 - 4 (CC#16, 17, 18, 19)

Damper Pedal (CC#64)

Note: Pitch Bend, though not a true Control Change message, may be used to modulate pitch with the *ih*. Pitch Bend is recognized only in Vocoder mode and the range of bend is set to plus or minus two semitones.

The MIDI Volume message tells the *ih* to increase or decrease the volume level of the harmonies. If you do not send it a volume message, the *ih* will always default to full volume (value 127). If you do change the volume, it will stay at the same value for all modes until you turn the power off and then on or until the *ih* receives another volume message. See the manual for your MIDI keyboard to see how to transmit MIDI Volume messages.

Modulation, usually transmitted by a keyboard's joystick or mod wheel, varies the amount of vibrato in the harmony voices. There is a small amount of vibrato present by default but you can override this using Modulation.

The Control Changes numbered 16 through 19 control mode changes and allow additional harmony options not controllable from the *ih*'s front panel. See the MIDI appendix at the end of this manual for more details. Damper Pedal will sustain the harmony voices in Vocoder mode only.

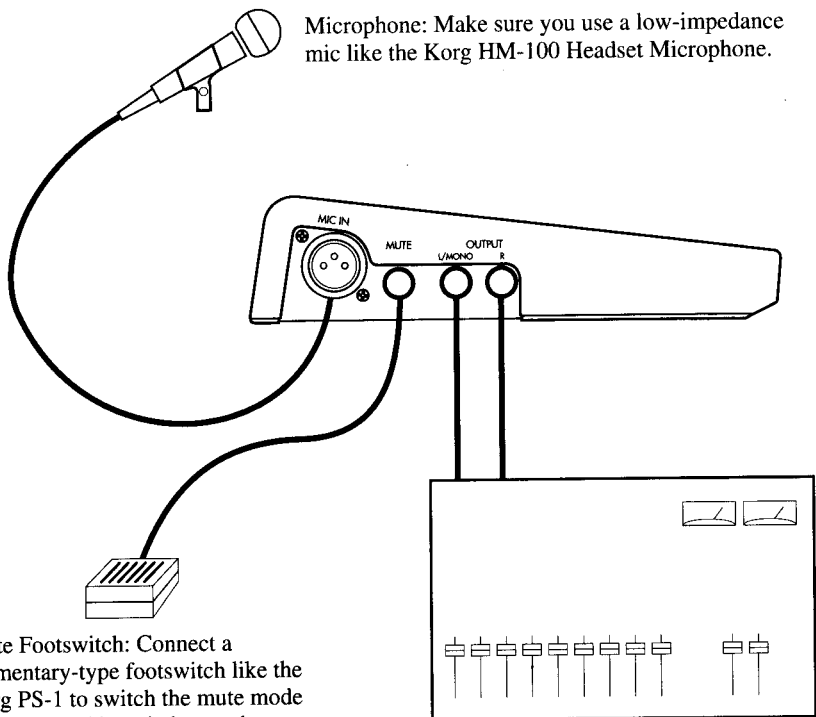
Microphone and Audio Connections

The minimum amount of audio equipment you will need is:

1. A low impedance dynamic microphone with an XLR connector on the output end of its cable
2. An amplifier with at least one input for the *ih*

For best results you can add the following:

1. A stereo mixer/amplifier
2. A footswitch



Microphone: Make sure you use a low-impedance mic like the Korg HM-100 Headset Microphone.

Mute Footswitch: Connect a momentary-type footswitch like the Korg PS-1 to switch the mute mode on and off. This switch must be a normally open type. Latching or normally closed footswitches will not work.

Mixer/amplifier: Connect the Left and Right *ih* outputs to two inputs on your stereo mixer. If you prefer to use mono, connect only the L/Mono output.

Setting the Input level

It is important for you to set the input level properly. If this level is set too high, this will cause both the lead and harmony voices to distort. If set too low, the *ih*'s output will produce unacceptable levels of hiss or not produce harmonies at all.

Sing into the microphone and push the Input control up slowly until the loudest notes you sing cause only brief peaks to turn the Signal LED to red. The Signal LED is a two color LED that will turn red when the input signal is close to distortion and will show green when the input level is sufficient for pitch recognition.

Note: The *ih* generates a pop noise when you turn it on and off. Set the volume of your amplifier or mixer to zero first and then turn the *ih* on. Before you turn the power off, set the amplifier or mixer volume to zero.

Getting a good vocal signal:

It is important that you perform as close as possible to the microphone in order to reduce unwanted harmonization of background noise. In a quiet home or studio environment this is less critical but on a loud stage, the singer's voice must be considerably louder at the microphone than any other sounds.

Sing with the microphone as close to your mouth as possible.

Try not to have speakers facing into the front of the mic.

Use cardioid microphones only and avoid Omni-directional mics. A Cardioid mic has a pickup pattern primarily at the front of the mic. Omni-directional mics pick up sounds from the front and back equally and will capture unwanted sounds from speakers and other instruments.

Harmony voice stereo panning:

If you use the stereo capability of the *ih*, you will notice that each harmony voice has its own location in the stereo field. Each harmony mode has a slightly different voice pan assignment although your lead voice will always be produced in the center at equal volume from both the left and right speakers.

Read the descriptions of each harmony mode in the next chapter for specific information on harmony voice panning.

The Harmony modes

Now that you have everything set up, it's time to explore the three harmony modes: Detune, Vocoder and Chordal.

Detune mode

The Detune mode is actually more of a lightly pitch shifted unison than an actual harmony. The harmony voices in the *ih* will sing exactly the same note as you but only a few cents (hundredths of a semitone) above or below your pitch. This produces a thickening or chorusing effect that adds to your vocal performance.

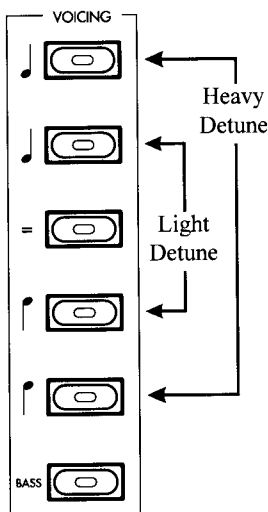
You have a choice of three different Detune modes:

1. Light Detune (two voices at +/- 7 cents)
2. Heavy Detune (two voices at +/- 12 cents)
3. Light and Heavy Detune combined (four voices)

The Detune mode can be used without any MIDI keyboard or sequencer input. There is no need for harmony intelligence or chord recognition because the *ih* is singing the same note as you, no matter what you sing.

To enter Detune mode:

1. Connect the microphone and set your levels as described previously. A MIDI keyboard is not required.
2. Press the Detune button from the mode group. The LED in the button will light up.
3. Select the amount of detuning you prefer with the Voicing buttons. To select light detuning, press either of the buttons immediately above and below the "=" button. To select heavy detuning, press either the top or bottom interval buttons. You can select both for a more dramatic effect. The Bass and "=" buttons do not operate in Detune mode.
4. Sing!



Stereo voice panning in Detune mode

The Light and Heavy Detune modes each use two of the four harmony voices available in the *ih*. One voice will be panned fully to the left speaker and the other will be panned fully to the right. When you select both the Light and Heavy modes at the same time, the *ih* will use all four voices with two in the left speaker and two in the right.

If you prefer the voices to be panned more to the center, adjust the panning controls on your mixer.

Vocoder mode

Vocoder mode is named after a completely different technology that functions in a similar way. It allows you to play any notes you want (to a maximum of four) on your keyboard and have the *ih* pitch-shift your voice to these exact notes. Vocoder mode is the most flexible mode because it allows you to create specific harmony lines on your keyboard that can also be recorded, edited and played back from a sequencer.

Vocoder mode is excellent when using MIDI backing tracks for live performance and Karaoke because of its flexibility.

Velocity sensitivity and voice transposition are additional features available through MIDI. See the MIDI appendix for details.

To enter Vocoder mode:

1. Make your MIDI and audio connections as described previously. Ensure that the *ih* and the keyboard or sequencer are set to the same MIDI channel.
2. Press the Vocoder button on the top of the *ih*. The LED in the button will light up.
3. Play chords and single notes on your keyboard while you sing.

You will notice that the harmonies are more noticeable when you sing sustained notes. If you sing while holding down notes on your keyboard, the harmonies will stay on those notes even though you are singing a changing melody line.

You can even create the effect of having your background voices singing a different rhythm from you. While you sing long sustained notes, play a series of short duration chords on beats 2 and 4 of a simple rhythm, for example. As you get used to this effect, you can try more complex rhythms and create interesting harmony parts.

You can also try moving the pitch bender (if you have one) on your keyboard while singing and playing chords. This makes the harmonies bend up and down two semitones from the center pitch. An effective technique is to move the bender to below pitch, then hold a chord and sing while moving the bender towards the center.

Stereo voice panning in Vocoder mode

The Vocoder voice panning depends on the number of notes held down on your keyboard and their arrangement in pitch from low to high. The following table shows the stereo positioning:

1 Note	Center
2 Notes	Low voice = Right, High voice = Left
3 Notes	Low + High voices = Right, Mid voice = Left
4 Notes	Low + Med High voices = Right, Med Low + High voices = Left

If you want less spread between left and right, adjust your mixer panning controls more to the center.

When you hold down more than four notes, the limit of the number of voices the *ih* has, it will have to make a decision on which notes to keep sounding. In this case, the rule is simple: the first note that was played is the first one to be turned off.

Chordal mode

Chordal mode is the “automatic” harmony mode in the *ih*. It has musical intelligence that recognizes the chords you play and determines which harmony intervals would be most appropriate with your singing. Even if you sing a melody that ranges over

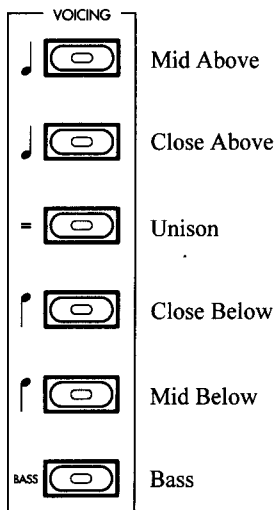
wide intervals, the automatic harmony intervals in Chordal mode will remain musically correct with the chords you play.

Voicing

Voicing refers to the arrangement of harmony voice pitches above and below your input note. This distance between your note and a harmony note is called an “interval”.

Depending on the song, you may want to have a single harmony voice staying close to your input melody or a group of voices over a wider interval range.

The front panel of the *ih* allows you to select up to four harmony intervals at once to vary the harmony sound to your liking. (See the diagram at left)



The Close and Mid voicings produce the intelligent harmonies. These harmonies shift intervals to stay musically correct relative to the MIDI input chords and the pitch of your voice. They generally stay on the nearest 1st, 3rd, 5th and 7th of the chord you are playing. In certain cases, they will produce a 2nd, 4th or 6th.

The Unison voicing produces the same note as your input note and can be used for doubling effects. The doubled voice can be used alone or in conjunction with other harmony voices.

The Bass voicing is unique. Unlike the Mid and Close voicings, the Bass voice stays fixed on the root of the chord or an alternate note that you can specify. When used in conjunction with the Mid and Close voices, the low voice can be sustained, while the upper voices move to produce an interesting effect. The static Bass voicing also allows you to produce harmony inversions such as a V chord over the I (e.g. G over C), VII over I (e.g. Bb over C) and similar chords.

To enter Chordal mode:

1. Make your MIDI and audio connections as described previously. Ensure that the *ih* and the keyboard or sequencer are set to the same MIDI channel.
2. Press the Chordal button from the Mode button group. The LED in the button will light up.

3. Select from one to four voice intervals using the Voicing button group.
4. Play chords on your keyboard while you sing.

Chordal mode chord recognition

In Chordal mode, the *ih* analyzes your playing by comparing the incoming chords to known chord types. Its internal comparison table has a broad selection of chords used in most popular types of music. The following list shows what chord types the *ih* can recognize in any key:

Major, Major 6, Major 7, Major 7b5, Major 7 Suspended 4

Minor, Minor 6, Minor 7, Minor 7b5, Minor Major 7

7b5, 7 Suspended 4

Diminished, Diminished Major 7,

Augmented, Augmented 7, Augmented Major 7

Suspended 4, Suspended 2

Dominant 7

If you play a chord the *ih* does not recognize, it will make an “educated guess” and select the closest chord it knows.

Chord scanning with a split point

If you set a split point in Learn mode, you should be aware of the way the *ih* “looks” at the chords you play to control harmonies in Chordal mode. There are 3 scanning modes:

1. Lower scanning
2. Upper scanning
3. Full scanning

Lower scanning takes effect when you have selected the keyboard zone below the split point. Lower scanning can produce harmonies with less notes than the other two modes. If you play

one note only, the *ih* will trigger a major chord. Playing two notes or more will trigger the other chord types.

Upper scanning is in effect when you have selected the keyboard zone above the split point. This mode requires a minimum of three notes occurring simultaneously to trigger a chord. This makes it easier for you to use your keyboard to play accompaniment and control harmonies at the same time. You can play a chord to provide harmonies and then play melody lines, which will not change the chord that the *ih* used to create the harmonies.

Full scanning occurs when no split point has been set. As with upper scanning, three simultaneous notes are required to change chords.

If you are using an *i series* workstation with the *ih*, you will find more information about chord scanning in the Korg manual.

Stereo voice panning in Chordal mode

The stereo panning of voices in this mode depends on how many voices you have chosen with the Voicing buttons. This is the same arrangement as in Vocoder mode.

1 Voice	Center
2 Voice	Low voice = Right, High voice = Left
3 Voice	Low + High voices = Right, Mid voice = Left
4 Voice	Low + Med High voices = Right, Med Low + High voices = Left

If you want less spread between left and right, adjust your mixer panning controls more to the center.

Special Korg i series features

There are advantages to using the **ih** with the Korg **i series** workstations. The advantages are:

1. Automatic MIDI channel selection in the **ih**
2. Synchronized chord recognition for the **ih** in Chordal mode

For these features to work correctly, the System Exclusive parameter in the **i series**' Global MIDI Filter menu must be set to Enable.

Auto MIDI channel

This feature automatically sets the **ih**'s MIDI receive channel depending on the current operating mode of the **i series**.

i series operating mode	ih Auto channel
Arrangement Play	i series global
Program	i series global
Backing Sequence	ih "learned" channel
Song (i1 / i2 / i3)	ih "learned" channel
Song Play (i1 , i4s)	ih "learned" channel

To control harmonies in Backing Sequence and Song modes, you will have to manually put the **ih** into Learn mode and set it to receive on the desired channel.

Synchronized chord recognition

When you use Chordal mode in the **ih**, it uses chord recognition to analyze the chords you play and to produce the correct harmonies. When you use an **i series** keyboard, the Arrangement Play or Backing Sequence modes offer chords that the **ih** uses to create harmonies.

The **ih** automatically recognizes when MIDI signals are being transmitted from an **i series** keyboard and which mode it is currently in. When you change to Arrangement Play or Backing Sequence modes, the **ih** turns off its own chord recognition as

soon as it receives a chord from the *i series*. When you switch back to Program or Song modes, the *ih* reverts to its own chord recognition.

Both the automatic MIDI channel selection and synchronized chord recognition features are made possible because the two products undergo a MIDI dialog when they power up and during operation. If the *ih* is powered up after the *i series*, its MIDI out should be connected to the *i series*' MIDI in. If you have not made this connection, you should change modes in the *i series* after the *ih* is powered up.

Note: Synchronized chord recognition is not available below system ROM 58 with the Korg *i2* and *i3*. In this case, the *ih* will perform its own chord recognition.

To check your ROM version on the *i2* and *i3*, hold the Edit Style button during power up. The system ROM version will flash briefly at the bottom left corner of the screen. Contact your dealer if you wish to upgrade to a newer ROM. Synchronized chord recognition is always available with Korg *i1* and *i4s* workstations.

MIDI Implementation Chart

Korg *ih*

Version: 1.00

Function		Transmitted	Recognised	Remarks
Basic Channel	Default	1	1	memorized
	Changed	1-16	1 - 16	
Mode	Default	X	Mode 3	
	Messages Altered	X *****	X	
Note Number		X	0-127	Chord Recognition or
	True Voice	*****	24-96	Vocoder Mode Vocoder Mode
Velocity	Note On	X	O	Vocoder Mode with Velocity Sensitivity On
	Note Off	X	X	
After Touch	Polyphonic(Key's)	X	X	
	Monophonic (Channel)	X	X	
Pitch Bend		X	O	+/- 2 Semitones
Control Change	1	X	O	Vibrato Depth Mod.
	7	X	O	Volume Mod.
	16	O	O	Mute Switch
	17	O	O	Vocoder Mode Select
	18	O	O	Chordal Mode Select
	19	O	O	Detune Mode Select
	64	X	O	Damper Pedal
Program Change		X	X	
	True Number	*****		
System Exclusive		O	O	See details on following pages
System Common	Song Position	X	X	
	Song Select	X	X	
	Tune Request	X	X	
System Real Time	Clock	X	X	
	Commands	X	X	
Aux Messages	Local On/Off	X	X	
	All Notes Off	X	O	
	Active Sensing	X	X	
	System Reset	X	X	
Notes	Control Change details on following pages			

Mode 1: OMNI ON, POLY
Mode 3: OMNI OFF, POLY

Mode 2 : OMNI ON, MONO
Mode 4 : OMNI OFF, MONO

O : YES
X : NO

Control Change Implementation Chart

Mute Switch Control:

Cntrl#	Cntrl Name	Cntrl Value
16	Mute Switch	Standard MIDI Switch: 0-63 Mute Off 64-127 Mute On

Mutes the Harmony output.

Vocoder Mode Control:

Cntrl#	Cntrl Name	Cntrl Value
17	Vocoder Mode	Value=Velocity Setting + Transpose Setting 0 Velocity Sensitivity On 8 Velocity Sensitivity Off Transpose Settings: 0 No Transpose 1 Auto Transpose 2 -3 Octave 3 -2 Octave 4 -1 Octave 5 +1 Octave 6 +2 Octave 7 +3 Octave Value transmitted by ih = 8 Velocity Sensitivity Off (8) + No Transpose (0) = 8

Selects the Vocoder mode with a velocity setting and a transpose setting. Auto Transpose transposes the MIDI notes to the octave nearest to the sung vocal note.

Chordal Harmony Mode Control:

Cntrl#	Cntrl Name	Cntrl Value
18	Chordal Harmony Mode	Value=Add setting values for individual voices together Maximum of 4 voices allowed Voice Settings: 1 Far Above On (~7th or 8th) 2 Mid Above On (~5th) 4 Close Above On (~3rd) 8 Unison On 16 Close Below On (~5th) 32 Mid Below On (~3rd) 64 Bass On Value Transmitted by ih = current voicing (Far Above On is never transmitted - there is no Voicing button for it) Examples: Close Above(4) + Unison(8) + Close Below(16) = 28 Mid Above(2) + Close Above(4) + Close Below(16) + Bass(64) = 86

Selects the Chordal Harmony mode with a voicing. The voicing sets the number of voices and position of each voice relative to the sung vocal note. If more than 4 voice settings are contained in a message, the message is ignored.

Detune Mode Control:

Cntrl#	Cntrl Name	Cntrl Value
19	Detune Mode	Value=Number of Voices + Detune Amount Number of Voices Settings: 0 2 Voice 4 4 Voice Detune Amount Settings: 0 Low 1 Medium-Low 2 Medium-High 3 High Value Transmitted by ih = current voicing Examples: 2 Voice(0) + Low(0) = 0 (Light) 2 Voice(0) + Med-Low(1) = 1 (Heavy) 4 Voice(4) + Med-Low(1) = 5 (Light + Heavy)

Selects the Detune mode with the number of voices (2 or 4) and the detune amount. Low and medium-low detune depths are useful in all musical situations. They correspond to the Light and Heavy Detune Voicings available from the front panel. Medium-high and high are more for special effects.

System Exclusive Message Details

System Exclusive Message Details:

Transmitted Messages:

1. *Universal System Exclusive Message* (non-realtime) Device Inquiry Reply - sends KORG ih identity with software version number and currently Learned MIDI channel.

Byte	(hex)	Description
1111 0000	(F0)	exclusive status
0111 1110	(7E)	non realtime message
0000 gggg	(0g)	MIDI learned channel
0000 0110	(06)	inquiry message
0000 0010	(02)	identity reply
0100 0010	(42)	KORG ID
0100 0000	(40)	ih ID (family code (LSB))
0000 0000	(00)	(family code (MSB))
0000 0000	(00)	(member code (LSB))
0000 0000	(00)	(member code (MSB))
0nnn nnnn	(nn)	ROM number (minor ver. (LSB))
0000 0000	(00)	(minor ver. (MSB))
0nnn nnnn	(nn)	software version (major ver. (LSB))
0000 0000	(00)	(major ver. (MSB))
1111 0111	(F7)	end of exclusive

2. *Universal System Exclusive Message* (non-realtime) Device Inquiry - this message is sent on powerup from ih to determine if connected to an i-series, and if so, the global channel of the i-series so that a Mode Request message can be sent.

Byte	(hex)	Description
1111 0000	(F0)	exclusive status
0111 1110	(7E)	non realtime message
0111 1111	(7F)	any channel
0000 0110	(06)	inquiry message request (sub ID 1)
0000 0001	(01)	inquiry message request (sub ID 2)
1111 0111	(F7)	end of exclusive

3. *i-series Mode Request message* - this message is sent after receiving a Universal System Exclusive Message Device Inquiry Reply from an i-series, to determine what mode the connected i-series is currently in.

Byte	Description
F0, 42, 3g, 39	i-series exclusive header
0001 0010 (12)	mode request
1111 0111 (F7)	end of exclusive

Received Messages:

1. Universal System Exclusive Message (non-realtime) Device Inquiry Reply- responds with Message 3 above.

Byte	(hex)	Description
1111 0000	(F0)	exclusive status
0111 1110	(7E)	non realtime message
0000 gggg	(0g)	MIDI global channel
0000 0110	(06)	inquiry message
0000 0010	(02)	identity reply
0100 0010	(42)	KORG ID
0011 1001	(39)	i-series
0000 0000	(00)	(family code (LSB))
0000 0000	(00)	(family code (MSB))
0000 000n	(0n)	(member code (LSB))
0000 0000	(00)	(member code (MSB))
0nnn nnnn	(nn)	ROM number
0000 0000	(00)	(minor ver. (LSB))
0000 0000	(00)	(minor ver. (MSB))
0nnn nnnn	(nn)	software version
0000 0000	(00)	(major ver. (LSB))
0000 0000	(00)	(major ver. (MSB))
1111 0111	(F7)	end of exclusive

2. Universal System Exclusive Message (non-realtime) Device Inquiry. Reception of this message triggers transmission of the Device Inquiry Reply message (see note with Transmitted Message 1 above).

Byte	(hex)	Description
1111 0000	(F0)	exclusive status
0111 1110	(7E)	non realtime message
0ggg gggg	(gg)	MIDI channel *1
0000 0110	(06)	inquiry message request (sub ID 1)
0000 0001	(01)	inquiry message request (sub ID 2)
1111 0111	(F7)	end of exclusive

*1: gg = 0..F received if learned channel
gg = 7F received on any channel

3. i-series Mode Data message. The value of i-series mode data determines the ih MIDI channel (learned or global MIDI channel). The global MIDI channel is contained in byte 3 (3g) of the message.

Byte	Description
F0, 42, 3g, 39	i-series exclusive header
0001 0010 (42)	mode data
0000 mmmm (0m)	i-series mode data
0000 00vv (0v)	card status
1111 0111 (F7)	end of exclusive

4. i-series Mode Change message . The value of i-series mode data determines the ih MIDI channel (learned or global MIDI channel). The global MIDI channel is contained in byte 3 (3g) of the message.

Byte	Description
F0, 42, 3g, 39	i-series exclusive header
0001 1110 (4E)	mode change
0000 mmmm (0m)	i-series mode data
1111 0111 (F7)	end of exclusive

5. i-series Chord message. For those i-series modes of operation that recognize chords, internal ih chord recognition is disabled and i-series chord messages are used for harmonizing.

Byte	Description
F0, 42, 3g, 39	i-series exclusive header
0110 0111 (67)	chord
0000 rrrr (0r)	root (C=0)
0000 bbbb (0b)	bass (C=0)
0ccc cccc (cc)	chord type (sub ID 1)
0ccc cccc (cc)	chord type (sub ID 2)
0ttt tttt (tt)	tension note (s)
000t tttt (tt)	tension note(s)
1111 0111 (F7)	end of exclusive

For more details on i-series system exclusive messages, consult an i-series Reference Guide.

Specifications and Options

System:	IVL Virtual Vocals
Number of Voices:	4
Input Note Range:	C2 through C6 (C4 = Middle C = 261.6 Hz)
Modes:	Detune, Vocoder, Chordal
Controls:	Mute, Mode and Voicing buttons; Input, Lead and Harmony Level sliders
Indicators:	Mute, Mode, Voicing, Signal Clip/Lock LEDs
Inputs:	Microphone - balanced XLR Impedance: 2 k-ohms Sensitivity: -43 dBu to -3 dBu Mute - unbalanced phone jack Switch Type: Normally open momentary contact
Outputs:	Left/Mono, Right - unbalanced phone jacks Impedance: 1.5 k-ohms Maximum Level: +8 dBu
Effect THD+N:	<0.01% @ 1 KHz A-weighted
Effect Frequency Response:	30 Hz to 11.5 KHz +.5 / -3 dB
Effect Dynamic Range:	90 dB
Effect Sampling:	16 bit @ 31.25 KHz
MIDI:	In, Out, Thru
Power Supply:	DC 12V AC adapter
Power Consumption:	300 mA
Dimensions:	174mm × 118 mm × 43 mm (6.85" × 4.65" × 1.69")
Weight:	.5 kg (1 lb)
Optional Accessories:	PS-1 Pedal Switch, MIDI cable, Korg Headset Microphone HM-100
Included items:	User's Manual, AC adaptor

Specifications subject to change without notice