

HAMMOND



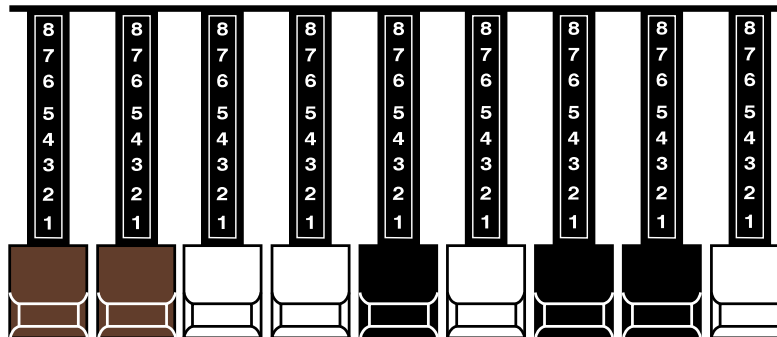
Sk **PRO**

**ORGAN
VOICE
SECTION**

ORGAN VOICE SECTION

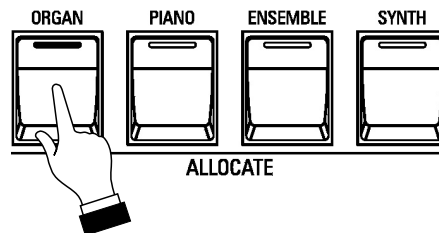
The tones produced by the ORGAN Voice Section are controlled by a set of nine Drawbars.

Drawbars, sometimes called Tonebars, are the heart and basis of the renowned Hammond Sound and have been used since the first Hammond Organ Model A introduced in 1935. An explanation of how to use these Drawbars is given later in this chapter of the Guide.

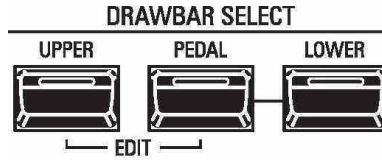


The ORGAN Voice Section can produce three different types of tones. Tone Wheel Organ replicates the performance of a vintage Hammond Organ, Transistor Organ replicates the sounds of various combo organs using solid-state technology, and Pipe Organ, which produces authentic pipe organ stops. This will be explained later in this chapter of the Guide.

To hear the ORGAN Voice Section, Press the ORGAN button in the ALLOCATE button section. The LED will light.



◆ DRAWBAR SELECT buttons



These buttons allow you to use the Drawbars to control sounds for UPPER, LOWER and PEDAL Parts. If an LED above a button is lit, the Drawbars will control the tones represented by that button.

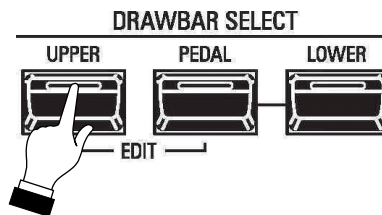
◆ Using the DRAWBAR SELECT buttons

The following examples are designed to acquaint you with the DRAWBAR SELECT buttons.

IMPORTANT NOTE: Before doing the following examples, make sure only the ORGAN ALLOCATE button is “ON” (LED lit).

TRY THIS:

1. Press the UPPER button in the DRAWBAR SELECT button section to turn it “ON” (red LED lit).

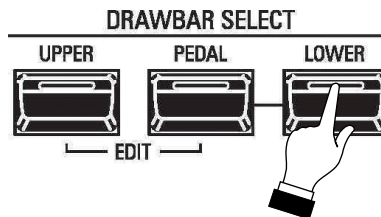


2. Create a Drawbar registration - for example, 88 8800 008. You can confirm the registration by consulting the Information Center Display.
3. Play some notes on the manual. You will hear the notes play with the Drawbar registration you just set up.

Now, we will add a Drawbar registration to the LOWER Part.

TRY THIS:

1. If the 3PART ORGAN button is not “ON,” press it to turn it “ON.” An orange LED will light and the SPLIT button will also turn “ON.” This is necessary in order to hear the LOWER Registration.
2. Press the LOWER button in the DRAWBAR SELECT button section to turn it “ON” (LED lit).

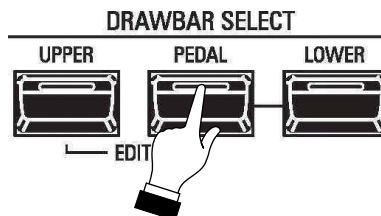


3. Create a Drawbar registration - for example, 00 8400 000. You can confirm the registration by consulting the Information Center Display.
4. Play some notes on the lower portion of the keyboard. You will hear the notes play with the Drawbar registration you just set up.

Finally, here is how to add a Pedal or Bass registration.

TRY THIS:

1. Press the PEDAL button in the DRAWBAR SELECT button section to turn it “ON” (red LED lit).



2. Create a Pedal Drawbar registration - for example, 60 0000 000. You can confirm the registration by consulting the Information Center Display.

NOTE: The Pedal tones are created by using ONLY the first **brown** Drawbar and the first **white** Drawbar. This is explained in more detail on page 170.

3. Press the PEDAL TO LOWER button to transfer the Pedal tones to the manual and play some notes on the left end of the manual. You will now hear the notes play with Pedal tones added.

◆ Please Read

On the SK PRO, Drawbar Parameter changes for the PEDAL Part (“P”) will not be heard unless both the 3 PART ORGAN, Split and PEDAL TO LOWER buttons are “ON” or a MIDI Pedal clavier is connected.

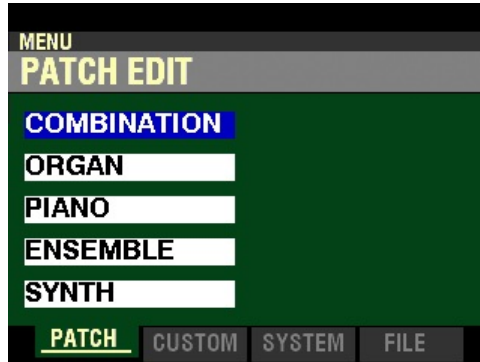
Notice that only two (2) Drawbar settings are shown for the Pedals in the Information Center Display. On most Hammond Organs with two manuals and pedals, there are two Drawbars for controlling the Pedal tones - one at “16” pitch and the other at “8” pitch. The SK PRO recreates this by using the Sub-Fundamental Drawbar (marked “16”) and the Fundamental Drawbar (marked “8”) to control the Pedal sounds. For more information consult page 170.

◆ **PATCH EDIT - ORGAN**

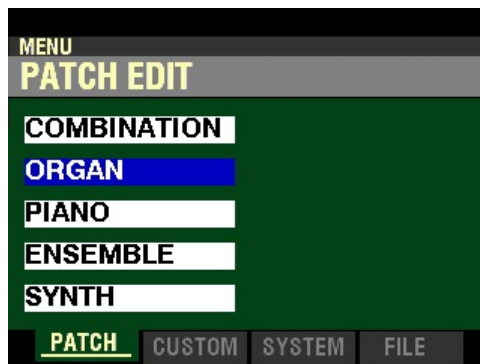
This FUNCTION Mode Menu allows you to make various changes to the characteristics of the ORGAN Voice Section.

◆ **Accessing the PATCH EDIT - ORGAN FUNCTION Mode using the MENU/EXIT button:**

1. From any of the PLAY Mode screens, press the MENU/EXIT button to see the PATCH EDIT screen. The COMBINATION box will be highlighted.



2. Press the DIRECTION “▼” button to highlight ORGAN.

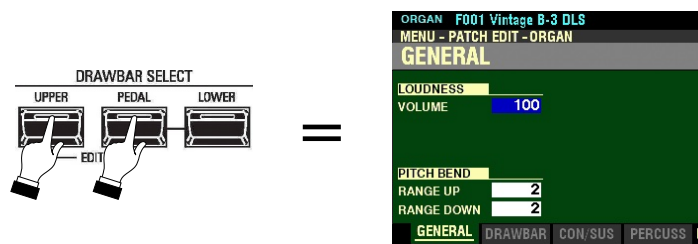


3. Press the ENTER button.




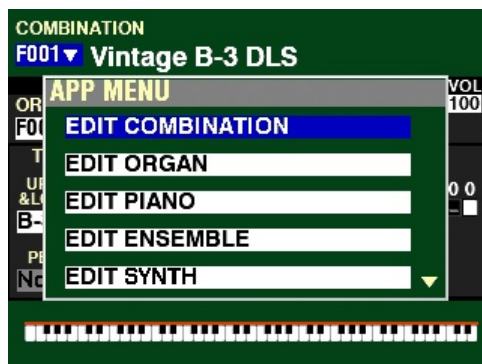
◆ Accessing the PATCH EDIT - ORGAN FUNCTION Mode using a Shortcut:

Press the UPPER and PEDAL DRAWBAR buttons together.




◆ Accessing the PATCH EDIT - ORGAN FUNCTION Mode via the APP MENU:

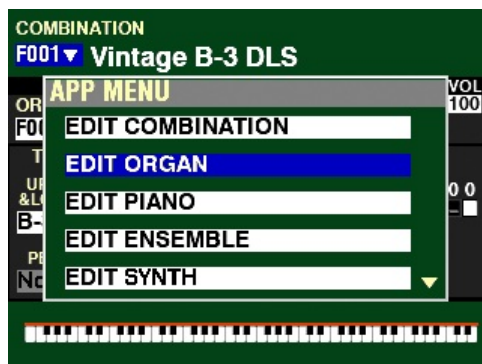
1. From any of the PLAY Mode screens, Press and Hold the MANUAL “” button. The Information Center Display should now look like this:



The box “EDIT COMBINATION” should be highlighted.

NOTE: The APP MENU may not display all Voice Sections, depending on which Voice Sections are active for the selected Combination.

2. Press the DIRECTION “”ENTER button once. The box “EDIT ORGAN” should be highlighted.



3. Press the ENTER button. The Information Center Display should now look like this:



You are now in the PATCH EDIT - ORGAN FUNCTION Mode. You may now use the DIRECTION and PAGE buttons in conjunction with the VALUE knob to make various changes to the characteristics of the Drawbars. These changes are explained starting below.

◆ GENERAL Parameters

If you followed the instructions shown above, the Information Center Display should look like this. The box to the right of "VOLUME" should be highlighted.



This FUNCTION Mode Page allows you to:

1. Adjust the overall Loudness or volume of the selected ORGAN Patch,
2. Adjust the Upper limit of the Pitch Bend Wheel,
3. Adjust the Lower limit of the Pitch Bend Wheel.

LOUDNESS



This Parameter allows you to adjust the maximum level of the selected ORGAN Patch.

Turn the VALUE knob to the right to increase the overall volume of the ORGAN Patch.

Turn the VALUE knob to the left to decrease the overall volume of the ORGAN Patch.

NOTE: The **Loudness** Parameter serves to set the maximum volume of the selected ORGAN Patch and works independently of the ORGAN VOLUME knob. The overall volume of the ORGAN Voice Section is controlled by the ORGAN VOLUME knob. The MASTER VOLUME knob and/or a connected Expression Pedal will control the volume of the entire instrument.

NOTE: This Parameter works independently of the ORGAN VOLUME Rotary Control.

From the above screen, press the DIRECTION “▼” button.



The box to the right of “RANGE UP” should be highlighted.

PITCH BEND - PLUS DEPTH

This Parameter allows you to set the amount by which the pitch will bend up using the Pitch Bend Wheel for the ORGAN Voice Section. The lowest setting is 0 (no change), while the highest setting is 12 (twelve half-steps, or one full octave up). The default setting is 2.

Turn the VALUE knob to the right to increase the Plus Depth.

Turn the VALUE knob to the left to decrease the Plus Depth.

PITCH BEND - MINUS DEPTH

From the screen shown at the bottom of the previous page, press the DIRECTION “▼” button. The Information Center Display should now look like this:



The box to the right of “RANGE DOWN” should be highlighted.

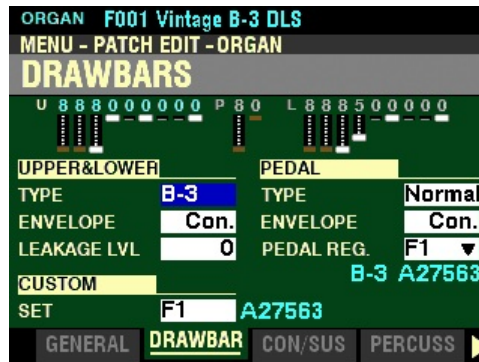
This Parameter allows you to set the amount by which the pitch will bend down using the Pitch Bend Wheel for the ORGAN Voice Section. The lowest setting is 0 (no change), while the highest setting is 12 (twelve half-steps, or one full octave down). The default setting is 2.

Turn the VALUE knob to the right to increase the Minus Depth.

Turn the VALUE knob to the left to decrease the Minus Depth.

◆ DRAWBARS Parameters

From the screen shown on the previous page, press the PAGE “▶” button. The Information Center Display should now look like this:

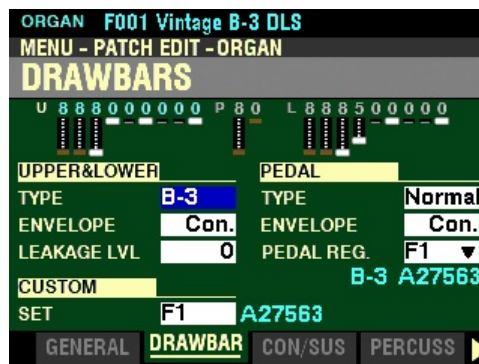


This FUNCTION Mode Page allows you to:

1. See the current Drawbar registration for the currently selected ORGAN Patch.
2. Select the Organ Type for the UPPER and LOWER Parts.
3. Select the Organ Type for the PEDAL Part.
4. Select the Attack and Release Envelopes for the [UPPER] and LOWER Parts.
5. Select the Attack and Release Envelope for the PEDAL Part.
6. Select the amount of Leakage for the [UPPER] and LOWER Parts.
7. Select the registration for the Pedal Drawbars.
8. Select the Custom Set for the ORGAN Voice Section..

DRAWBAR REGISTRATION

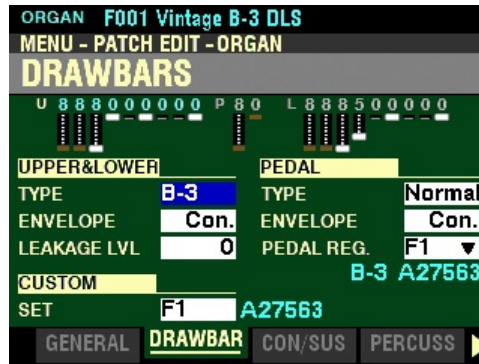
You will see the Drawbar registration for the currently selected ORGAN Patch at the top of the display.



NOTE: The Drawbar registration shown will be the one programmed in the currently selected ORGAN Patch. Therefore, it may not correspond with the physical Drawbar positions. However, if you move any of the Drawbars, the display will show the position or positions of the Drawbar or Drawbars you moved.

NOTE: Pressing the MANUAL button “ON” (LED lit) will cause the Drawbar registration in the screen to correspond to the physical Drawbar setting.

UPPER & LOWER Organ Type



This Parameter allows you to change the sound of the Drawbars for the UPPER and LOWER Parts. The data chart below shows the options you may select.

UPPER & LOWER Organ Type	
Description	Function
A-100, B-3, C-3	Reproduces the sounds of various Tone-Wheel™ generators from vintage Hammond Organs.
Mellow	Produces very pure sine-wave tones similar to all-electronic Hammond Organs such as the Concorde, Grandee, Monarch, etc.
Vx	Reproduces a vintage British combo organ.
Farf	Reproduces a vintage Italian combo organ.
Ace	Reproduces a vintage Japanese combo organ.
Pipe	Produces authentic Classic and Theatre pipe organ tones.

Turn the VALUE knob to the right to go forward through the choices.

Turn the VALUE knob to the left to go backward through the choices.

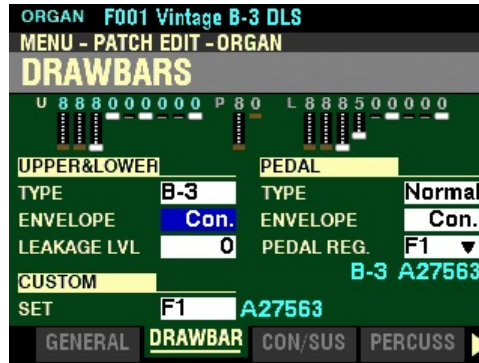
NOTE: The **A-100**, **B-3** and **C-3** Organ Types are traditional Tone-Wheel™ settings modeled from vintage Hammond Organs. You can customize each one of these Organ Types to your liking. This is explained in the **CUSTOM TONE WHEEL** section of this chapter of the Guide.

NOTE: The **Vx.**, **Farf.** and **Ace.** Organ Types change the operation of the Drawbars from the traditional Hammond Harmonic Drawbar functions. This is explained starting on page 171 of this chapter of the Guide.

NOTE: The **Pipe** Organ Type changes the operation of the Drawbars to function similar to drawstops or stop tablets on a pipe organ. This is explained in the **CUSTOM PIPE** section of this chapter of the Guide.

UPPER & LOWER ATTACK & RELEASE ENVELOPE

From the screen shown on the previous page, press the DIRECTION “▼” button.



The box to the right of “ENVELOPE” should be highlighted.

This Parameter allows you to adjust the rate of Attack (when a key is depressed) and Release (when the key is released). The data chart below shows the options you may select.

ATTACK & RELEASE ENVELOPE	
Parameter	Description
Con	This is the envelope of the key-click(s) generated with the Virtual Multi-Contacts.
1 ~ 15	This is the rate of Attack without the Virtual Multi-Contacts. The greater the value, the slower the Attack (the speed at the which the Drawbar registration sounds when a key is depressed).
R1 ~ R15	This changes the Release rate. The Attack rate is that provided by the Virtual Multi-Contacts. This means that the onset of the tone will be instantaneous while the Release rate is regulated by the numerical setting.
AR1 ~ AR15	This Parameter disables the Virtual Multi-Contacts and allows you to change both the Attack and Release rate. At higher numerical settings the Attack and Release will be slow, similar to that of a pipe organ.

WHAT IS “KEY CLICK?”

On a tone-wheel Hammond Organ, each time a key is depressed with an active Drawbar registration, a Key Click (or Key Pop) is heard just before the note sounds. This is because, unlike other electrical or electronic musical instruments, the sound is always present at the key contacts. Therefore, Pressing a playing key will likely intercept the sound wave at some point along its excursion, creating a “spike” or attack transient. This transient is heard as “Key Click.” Since the generated sound is interrupted when a key is both pressed and released, there is a Release Key Click as well as an Attack Key Click.

The ENVELOPE Parameters on your SK PRO allow you to replicate this characteristic of vintage tone-wheel organs.

UPPER & LOWER LEAKAGE LEVEL

From the screen shown on the previous page, press the DIRECTION “▼” button.



The box to the right of “LEAKAGE LVL” should be highlighted.

This Parameter allows you to adjust the total volume of the Leakage tone.

WHAT IS “LEAKAGE?”

In a vintage Hammond Organ, each tone-wheel rotates next to a magnet. These are mounted in separate bins to isolate them from each other and prevent the magnets from intercepting frequencies from neighboring wheels; however, a small amount of current may still “leak” through, producing a phenomenon called Leakage. Leakage is usually heard as a “hash” type sound consisting of many frequencies sounding at once. A properly calibrated organ will have a minimum of this effect; however, an instrument which has been subjected to hard use over a period of time may exhibit more leakage noise.

CUSTOM ORGAN SET

From the above screen, press the DIRECTION “▼” button.



The box to the right of “SET” should be highlighted.

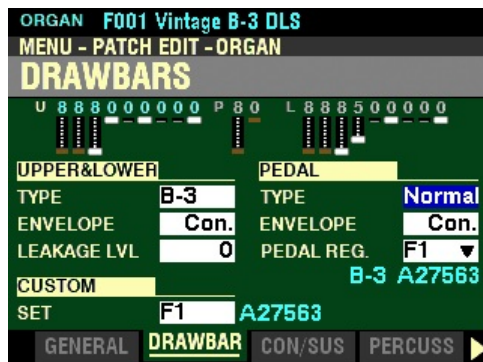
This Parameter allows you to select a customized set for each Tone Wheel Organ and Pipe Organ. There are three Factory (“F”) Custom Sets - “F1,” “F2,” and “F3” - for each of the Tone Wheel Organs and Pipe Organ. You can select any of these, or if you have created and saved your own Custom Organ Set(s), you can select them as well. These will be identified by a number preceded by a “U” for “User.” You can save up to three (3) Custom Organ Sets for each Tone Wheel Organ and Pipe Organ.

NOTE: This Parameter is not available for the Transistor Organ Types (**Vx**, **Farf** and **Ace**).

NOTE: See the **CUSTOM SETS** chapter of this Guide for information about how to create and Record your own Custom Organ Sets.

PEDAL TYPE

From the screen at the bottom of the previous page, use the PAGE “▶” and DIRECTION buttons to move the cursor to the right side of the display so the Information Center Display looks like this:



The box to the right of “TYPE” should be highlighted.

This Parameter allows you to select the Organ Type for the PEDAL Part. The data chart below shows the options you may select.

PEDAL TYPE	
Parameter	Description
Normal	Produces the traditional tone-wheel registration of the B-3 / C-3 / A-100.
Muted	Produces very mellow analog-type pedal tones

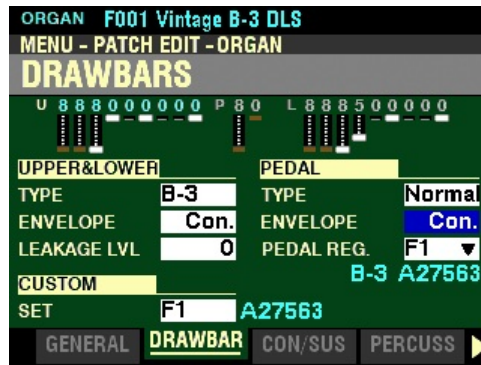
Turn the VALUE knob to make your selection.

NOTE: When one of the Transistor Organs (**Vx.**, **Farf.** or **Ace.**) is selected for the [UPPER & LOWER], **Muted** is automatically selected for the PEDAL Part.

NOTE: When the **Pipe** Organ Type is selected, the Pedal tones automatically become Pipe Organ tones and this Parameter is disabled.

PEDAL ATTACK & RELEASE ENVELOPE

From the screen shown on the previous page, press the DIRECTION “▼” button.



The box to the right of “ENVELOPE” should be highlighted.

This Parameter allows you to adjust the rate of Attack (when a pedal is depressed) and Release (when the pedal is released). The data chart below shows the options you may select.

PEDAL ATTACK & RELEASE ENVELOPE	
Parameter	Description
Con	This is the envelope of the key-click(s) generated with the Virtual Multi-Contacts.
1 ~ 15	This is the rate of Attack without the Virtual Multi-Contacts. A higher value will result in a slower Attack (the speed at the which the Drawbar registration sounds when a pedal is depressed).
R1 ~ R15	This Parameter changes the Release rate. The Attack rate is that provided by the Virtual Multi-Contacts. This means that the onset of the tone will be instantaneous while the Release rate is regulated by the numerical setting.
AR1 ~ AR15	This Parameter disables the Virtual Multi-Contacts and allows you to change both the Attack and Release rate. At higher numerical settings the Attack and Release will be slow, similar to that of a pipe organ.

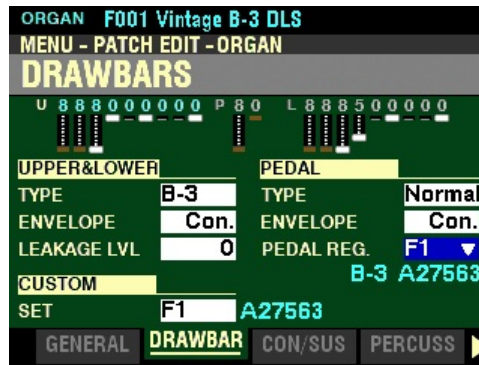
Turn the VALUE knob to make your selection.

NOTE: This Parameter is NOT available on the Transistor or Pipe Organ Types.

NOTE: In addition to the above Parameters, the PEDAL Part can also receive **Pedal Sustain**, a popular effect for organ bass which adds a smooth decay reminiscent of a string bass. This feature is described in the **COMBINATIONS / PATCHES / BUNDLES / FAVORITES** chapter of this Guide.

PEDAL REGISTRATION

From the screen shown on the previous page, press the DIRECTION “▼” button.



The box to the right of “PEDAL REG.” should be highlighted.

This Parameter allows you to select the Custom Pedal Registration that you prefer. There are three Factory (“F”) registrations - F1, F2 and F3. You can select any of these, or if you have created and saved your own Custom Pedal Registration(s), you can select them as well. These will be identified by a number preceded by a “U” for “User.” You can save up to three (3) Custom Pedal Registrations.

Turn the VALUE knob to make your selection.

NOTE: See the CUSTOM PEDAL REGISTRATION chapter of this chapter of the Guide for information about how to create and Record your own Custom Pedal Registrations.

◆ CONTACTS OF A TONE-WHEEL ORGAN & VIRTUAL MULTI-CONTACTS

As explained in the CUSTOM SETS chapter of this Guide, the basis for the “Hammond Sound” is the tone- or phonic-wheel generator.

When a key is pressed on a tone-wheel Hammond Organ, it closes 9 small electrical switch contacts. These 9 contacts represent the 9 pitches provided by the Drawbars - the fundamental tone plus eight harmonics. The contacts are closed and opened by means of 9 horizontal flat springs which press 9 busbars. When a flat spring presses a busbar, electrical contact is made and the harmonic is permitted to sound. Since the 9 busbars are physically separated, the harmonics do not all sound simultaneously, but in succession. This can be heard most clearly by selecting one of the four Manual Drawbar sets of a tone-wheel organ (for example, Upper Manual “B”), pulling all of the Drawbars in the selected set out to their maximum volume setting and slowly pressing a playing key. Each of the harmonics will add in a sequence from highest to lowest until all 9 frequencies will be heard when the key is at the bottom of its travel. The “Key-Click” on tone-wheel Hammond Organs is due in part to these physical characteristics.

The SK PRO utilizes a new specially-designed “VMC™ (Virtual Multi-Contact) system which reproduces the effect of 9 contacts per note by means of special software.

◆ CONTACT / SUSTAIN Parameters

From the screen shown on the previous page, press the PAGE “▶” button. The Information Center Display should now look like this:



The box to the right of “OFFSET TIME” should be highlighted.

This FUNCTION MODE Page allows you to adjust the Parameters affecting the Virtual Multi-Contacts and the Sustain effect for the UPPER and LOWER Parts.

OFFSET TIME



This Parameter allows you to control the amount of time the Virtual Multi-Contacts will take to make full contact after a key is depressed. You can select from -64 to +63 as well as 0. A higher value causes a longer Attack time and a shorter Release time.

Turn the VALUE knob to the right to increase the Offset Time.

Turn the VALUE knob to the left to decrease the Offset Time.

From the above screen, press the DIRECTION “▼” button once.



The box to the right of “DAMPING” should be highlighted.

DAMPING

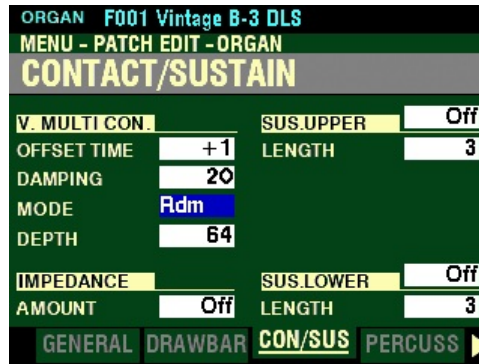
This Parameter allows you to control the amount of damping applied to the Virtual Multi-Contacts. You can select from 0 to 31. The higher the value, the more pronounced the Key Click.

Turn the VALUE knob to the right to make the Key Click brighter.

Turn the VALUE knob to the left to make the Key Click mellower.

NOTE: This Parameter can be used as a “tone-control” for the Key Click. If the Key Click is too bright or “noisy,” adjust this Parameter to “smooth” the waveform and make the Key Click more mellow.

From the screen shown at the bottom of the previous page, press the DIRECTION “▼” button once.



The box to the right of “MODE” should be highlighted.

MODE

This Parameter allows you to select how the VMC’s (Virtual Multi Contacts) will sound when keys are depressed. The data chart below shows the options you may select.

VMC MODE	
Parameter	Description
Random	When a key is depressed, each contact of the VMC’s will connect in a random order at the shallow point, and all the contacts are fully made when the key reaches the bottom of its travel.
Velocity	When a key is depressed to the bottom of its travel, each contact of the VMC’s is made by a time difference depending on the velocity. The contacts are made sequentially from high to low as on a tone-wheel organ.

Turn the VALUE knob to make your selection.

From the above screen, press the DIRECTION “▼” button once.



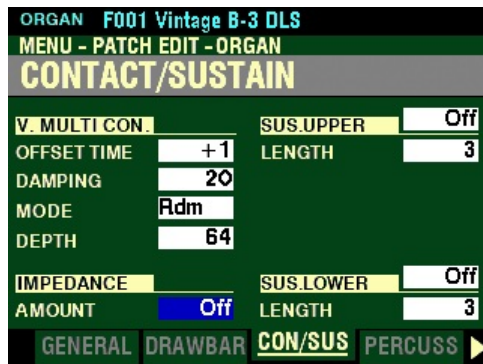
The box to the right of “DEPTH” should be highlighted.

DEPTH

This Parameter allows you to adjust the amount of time for each VMC to sound when a key is depressed. You can select from 0 to 127. At 0 all the VMC’s sound simultaneously. A higher value will result in a longer time interval between contacts.

Turn the VALUE knob to make your selection.

From the screen shown at the bottom of the previous page, press the DIRECTION “▼” button once.



The box to the right of “AMOUNT” should be highlighted.

IMPEDANCE AMOUNT

This Parameter allows you to adjust the output impedance of the Tone Wheel Organ TypeS.

WHAT IS “IMPEDANCE?”

Impedance here refers to the AC load on a tone-wheel generator. When a note is played, it is “loaded down” by the circuits related to the contacts under the key being depressed. When more keys calling for the same tone wheels are pressed and held, the tone-wheel is loaded down further, causing a slight volume drop on those related notes. This characteristic can be highly variable from one vintage Hammond Organ to another, and the effect can be different on different organs built during different time periods and using components of slightly different values. These Parameter settings allow you to replicate the idiosyncrasies of different instruments.

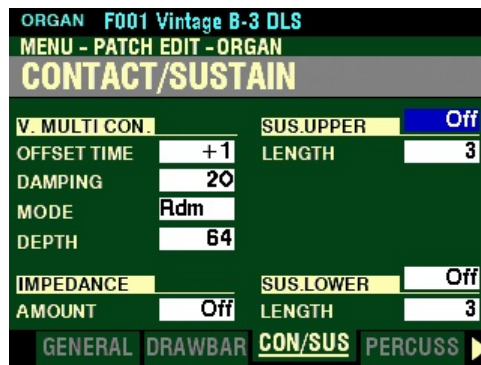
The data chart below shows the options you may select.

IMPEDANCE AMOUNT	
Parameter	Description
Off	No change in volume when keys are depressed and held and other keys are depressed.
Half	When keys are depressed and held and other notes are played, the volume of the notes being held is reduced by a small amount.
Full	When keys are depressed and held and other notes are played, the volume of the notes being held is reduced by the full amount.

Turn the VALUE knob to make your selection.

NOTE: The Half setting is designed to replicate the performance of a vintage Hammond Organ such as B-3, C-3, etc.

From the screen shown on the previous page, use the PAGE “▶” and DIRECTION buttons to move the cursor to the right side of the display so the Information Center Display looks like this:



The box to the right of “SUS UPPER” should be highlighted.

SUSTAIN UPPER ON / OFF

This Parameter allows you to turn Sustain “ON” or “OFF” on the UPPER Part.

Turn the VALUE knob to turn UPPER Sustain “ON” or “OFF.”.

From the above screen, press the DIRECTION “▼” button once.



The box to the right of “LENGTH” should be highlighted.

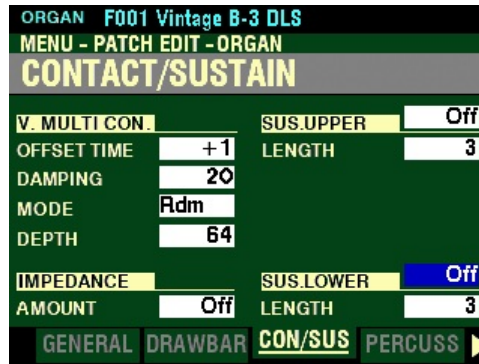
SUSTAIN UPPER LENGTH

This Parameter allows you to adjust the length of the Sustain effect for the UPPER Part. You can select from 1 (shortest amount) to 5 (longest amount) as well as 0. At 0 there is no Sustain.

Turn the VALUE knob to the right to increase the UPPER Sustain Length.

Turn the VALUE knob to the left to decrease the UPPER Sustain Length.

From the screen shown at the bottom of the previous page, press the DIRECTION “▼” button once.



The box to the right of “SUS LOWER” should be highlighted.

SUSTAIN LOWER ON / OFF

This Parameter allows you to turn Sustain “ON” or “OFF” on the LOWER Part.

Turn the VALUE knob to turn LOWER Sustain “ON” or “OFF.”.

From the above screen, Press the DIRECTION “▼” button once.



The box to the right of “LENGTH” should be highlighted.

SUSTAIN LOWER LENGTH

This Parameter allows you to adjust the length of the Sustain effect for the LOWER Part. You can select from 1 (shortest amount) to 5 (longest amount) as well as 0. At 0 there is no Sustain.

Turn the VALUE knob to the right to increase the Lower Sustain Length.

Turn the VALUE knob to the left to decrease the Lower Sustain Length.

◆ Vibrato & Chorus

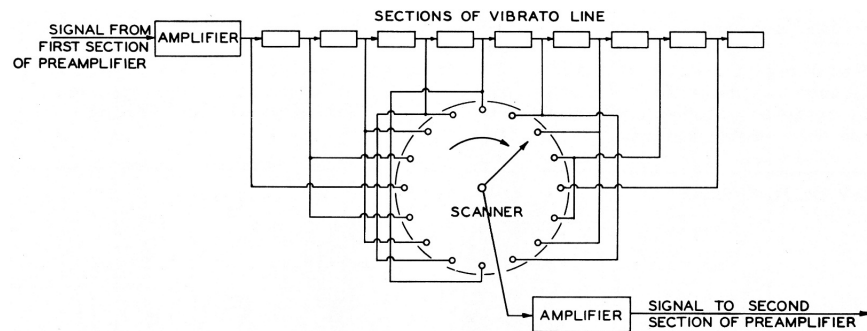
The Hammond Vibrato & Chorus is a hallmark of the “Hammond Sound.”

“Vibrato” is created by a periodic raising and lowering of pitch, comparable to the effect produced when a violinist moves his finger back and forth on a string while playing, varying the frequency while maintaining constant volume.

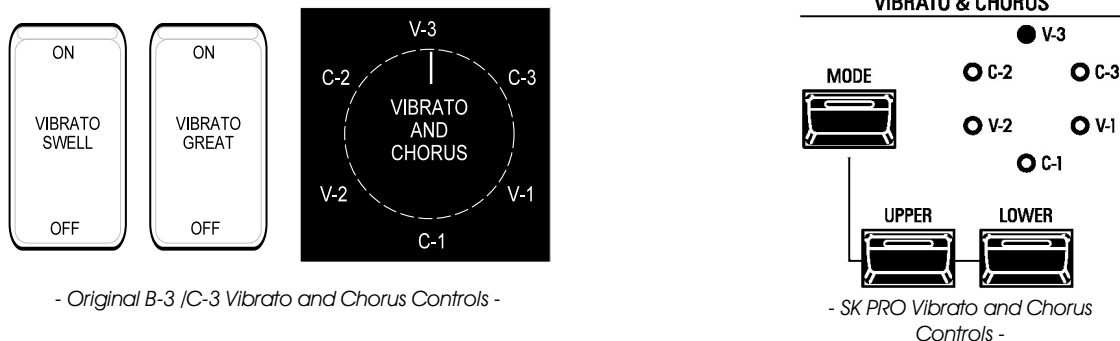
On a tone-wheel Hammond Organ equipped with Vibrato & Chorus, the vibrato circuitry consists of a series of plural coils or low-pass filter sections called a “delay line” or “line box” and a motor-driven “scanner” which, as the name implies, scans the delay line and progressively retards the phase, creating the Vibrato effect.

“Vibrato Chorus,” an effect similar to the effect of two or three slightly out-of-tune frequencies mixed together, is obtained when the vibrato output signal is mixed with a portion of signal without vibrato.

The diagram below shows the vibrato equipment of a typical tone-wheel Hammond Organ such as a B-3.



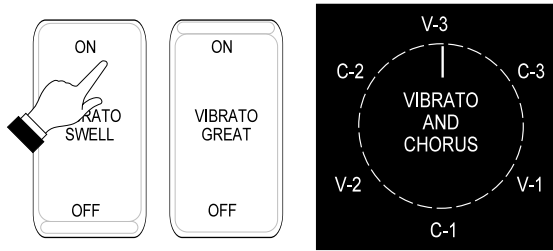
◆ The Vibrato and Chorus Controls



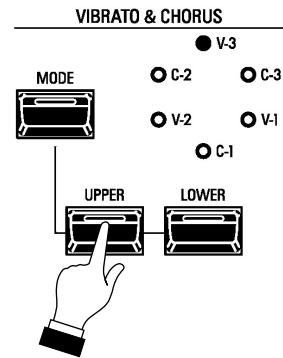
- Original B-3 /C-3 Vibrato and Chorus Controls -

- SK PRO Vibrato and Chorus Controls -

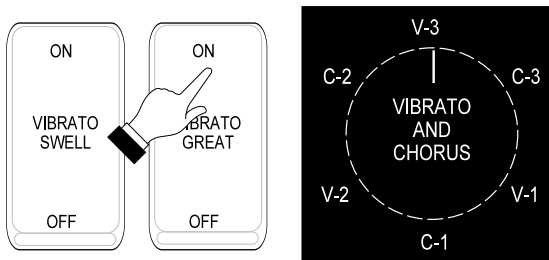
The Vibrato and Chorus controls on vintage Hammond console organs with either a “2” or a “3” as part of their model designation (B-2, B-3, etc.) consist of two tilt tablets and a six-position rotary Rotary Control to the left of the Drawbars. The SK PRO uses a similar arrangement, except that it uses buttons instead of tilting tablets, and instead of a rotary Rotary Control there is a MODE button which accesses the same six degrees of Vibrato and Chorus.



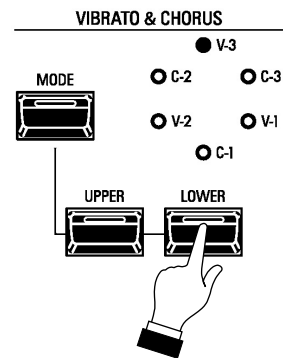
To turn the Vibrato or Chorus effect "ON" for the Swell Manual of a vintage B-3 / C-3, press the top of the VIBRATO SWELL tilt tab.



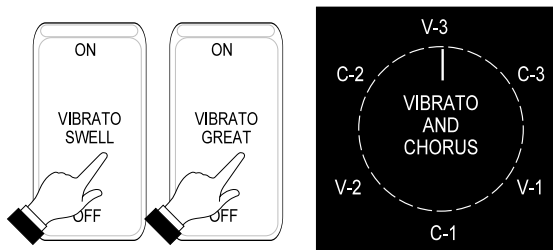
To turn the Vibrato or Chorus effect "ON" on the UPPER Part of the SK PRO, press the UPPER button "ON" (LED lit).



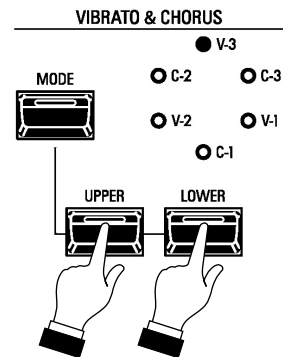
To turn the Vibrato or Chorus effect "ON" for the Great Manual of a vintage B-3 / C-3, press the top of the VIBRATO GREAT tilt tab.



To turn the Vibrato or Chorus effect "ON" for the LOWER Part of the SK PRO, press the LOWER button "ON" (LED lit).



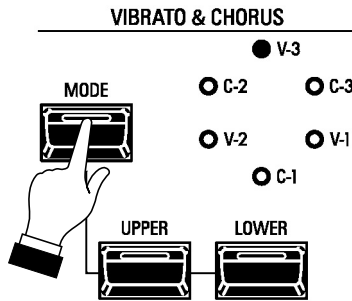
To turn the Vibrato or Chorus effect "OFF" for the Swell or Great Manuals of a vintage B-3 / C-3, press the tilt tabs at the bottom.



To turn the Vibrato or Chorus effect "OFF" for the UPPER or LOWER Parts of the SK PRO, press the buttons "OFF" (LED's not lit).

◆ Amount of Vibrato and Chorus

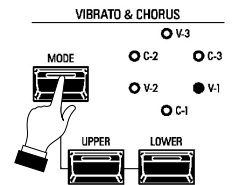
To select the amount of Vibrato or Chorus, press the MODE button repeatedly until the orange LED next to the desired effect and amount lights. Each successive button press will rotate the LED's clockwise.



Vibrato

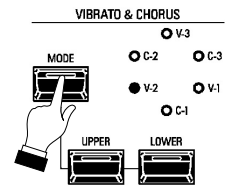
V-1 (Small Vibrato)

To select vibrato depth V-1, press the MODE button orange LED next to the legend, "V-1" will light. This is the lightest depth and produces the vibrato equivalent of most orchestral solo instruments.



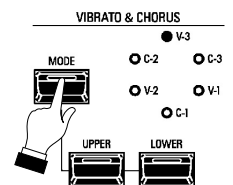
V-2 (Wide Vibrato)

To select vibrato depth V-2, press the MODE button so that the orange LED next to the legend, "V-2" will light. This is the standard depth vibrato used with the Drawbars to produce the effect of a theater organ.



V-3 (Full Vibrato)

To select vibrato depth V-3, press the MODE button so that the orange LED next to the legend, "V-3" will light. This is the fullest amount and adds much warmth and enhances your music.



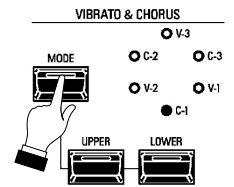
Remember, either one or both of the UPPER or LOWER buttons must be "ON" (orange LED lit) to allow you to hear the selected Vibrato effect for each Part. In addition, the SPLIT button must be "ON" in order to hear the Vibrato effect for the LOWER Part.

Chorus

When the CHORUS effect is used, half of the tone is heard without Vibrato, and half of the tone is heard with Vibrato.

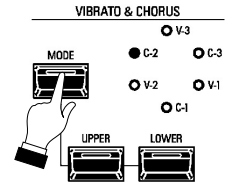
C-1 (Small Chorus)

To select chorus depth C-1, press the MODE button so that the orange LED next to the legend, "C-1" will light. This is the lightest depth, and produces the light chorus effect.



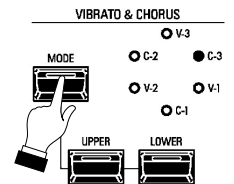
C-2 (Wide Chorus)

To select chorus depth C-2, press the MODE button so that the orange LED next to the legend, "C-2" will light. This is the standard depth of the chorus effect.



C-3 (Full Chorus)

To select chorus depth C-3, press the MODE button so that the orange LED next to the legend, "C-3" will light. This is the fullest amount.



Remember, either one or both of the UPPER or LOWER buttons must be "ON" (orange LED lit) to allow you to hear the selected Vibrato effect for each Part. In addition, the SPLIT button must be "ON" in order to hear the Vibrato effect for the LOWER Part.

◆ SPECIAL NOTE - Vx, Farf., Ace and Pipe ORGAN Types

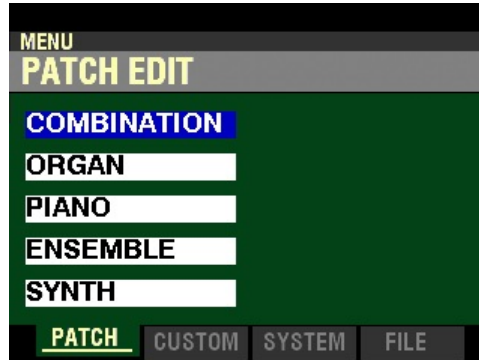
Instead of three degrees of Vibrato and three degrees of Chorus, the VIBRATO & CHORUS Controls will provide 6 degrees of Vibrato for the Vx, Farf. and Ace ORGAN Types and 6 degrees of Tremulant for the Pipe ORGAN Types. V-1 provides the smallest amount while C-3 gives the largest amount of Vibrato or Tremulant. The other modes provide various degrees between these two settings.

◆ VIBRATO & CHORUS FUNCTION Mode Page

You can adjust the Vibrato & Chorus of the Tone Wheel Organs, Vibrato for the Transistor Organs, and Tremulant for the Pipe Organ from the VIBRATO & CHORUS FUNCTION MODE Page.

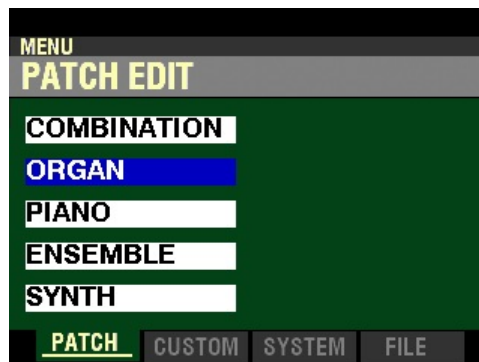
Accessing the VIBRATO & CHORUS FUNCTION Mode Page using the MENU/EXIT button:

1. From any of the PLAY Mode screens, press the MENU/EXIT button once. The Information Center Display should now look like this:



The “COMBINATION” box should be highlighted.

2. Press the DIRECTION “▼” button once. The “ORGAN” box should be highlighted.

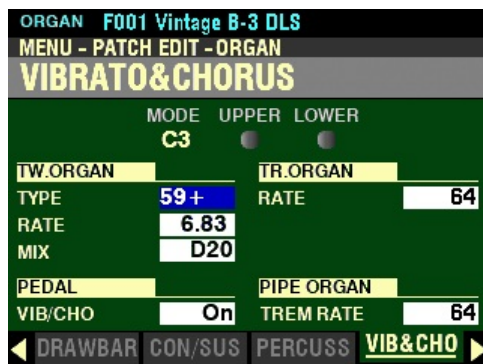


3. Press the ENTER button. The Information Center Display should now look like this:



The PATCH EDIT - ORGAN FUNCTION Mode should now display.

4. Press the PAGE “▶” button four times. The Information Center Display should now look like this:

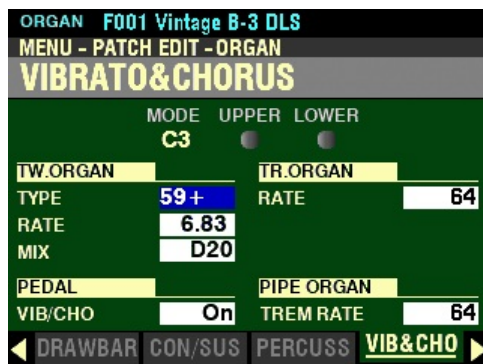


Accessing the VIBRATO & CHORUS FUNCTION MODE Page using the Shortcut:

Press and hold any of the three VIBRATO & CHORUS buttons (UPPER, LOWER or MODE). After approximately 1 second, you will see the screen shown above.

You are now in the VIBRATO & CHORUS FUNCTION Mode Page. You may now use the DIRECTION buttons in conjunction with the VALUE knob to make various changes to the Vibrato and Chorus. These changes are explained starting below.

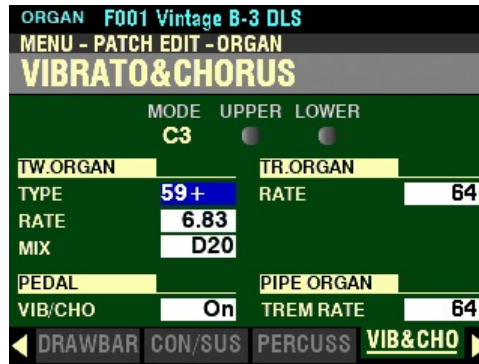
If you followed the instructions on the previous pages, you should now see the VIBRATO & CHORUS FUNCTION MODE Page. The box to the right of “TYPE” should be highlighted.



VIBRATO & CHORUS MODE, UPPER / LOWER ON / OFF

Notice the two small icons at the top of the display for UPPER and LOWER as well as the MODE setting. These correspond to the VIBRATO & CHORUS controls on the Control Panel. When either the UPPER or LOWER buttons are “ON” (LED lit), the corresponding icon will light. Also, the MODE shown will correspond to the Mode setting on the Control Panel.

In this screen, the box to the right of “TYPE” should be highlighted.

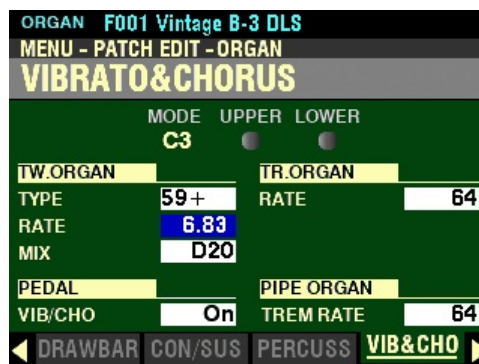


TYPE

Hammond tone-wheel organs with Vibrato & Chorus were manufactured from 1949 through 1975. During that time, several different types of vibrato circuits were employed, particularly line boxes of different construction. This Parameter creates the effect of different types of Vibrato delay lines. You can select from 55-57 (Metal Box 1955 - 1957), 57-59 (Big Silver Box 1957 - 1959) or 59+ (Small Silver Box 1959 or later).

Turn the VALUE knob to make your selection.

From the above screen, press the DIRECTION “▼” button once.



The box to the right of “RATE” should be highlighted.

RATE

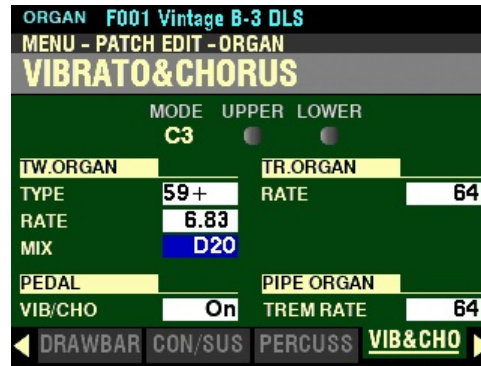
This Advanced Feature allows you to select the Vibrato/Chorus Rate that you prefer. You can select from “5.78Hz” to “7.90Hz.” The default setting is “6.83Hz.”

Turn the VALUE knob to the right to make the Vibrato Rate faster.

Turn the VALUE knob to the left to make the Vibrato rate slower.

NOTE: “Hz” is an abbreviation for “Hertz,” which refers to the number of cycles per second.

From the screen shown at the bottom of the previous page, press the DIRECTION “▼” button once.



The box to the right of “MIX” should be highlighted.

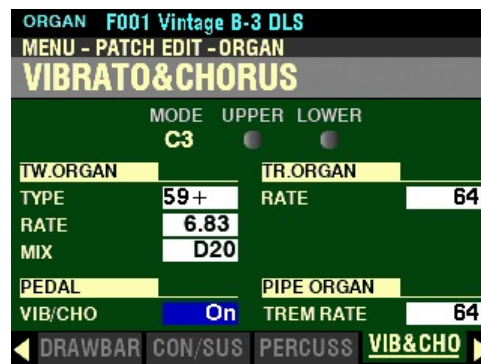
MIX

The Chorus effect is produced by mixing two audio signals together - one containing Vibrato and a “dry” signal with no Vibrato. The amount of Vibrato versus non-Vibrato signal can vary when comparing vintage organs. This Parameter allows you to control the amount of Vibrato signal versus the amount of “dry” or non-Vibrato signal. You can select from D64 (only the dry signal with no Vibrato) through 63V (only the Vibrato signal, with no dry signal). The middle or EVEN setting will mix the Vibrato and non-Vibrato signals together in equal amounts.

Turn the VALUE knob to the right to increase the amount of Vibrato signal.

Turn the VALUE knob to the left to decrease the amount of Vibrato signal.

From the above screen, press the DIRECTION “▼” button once.



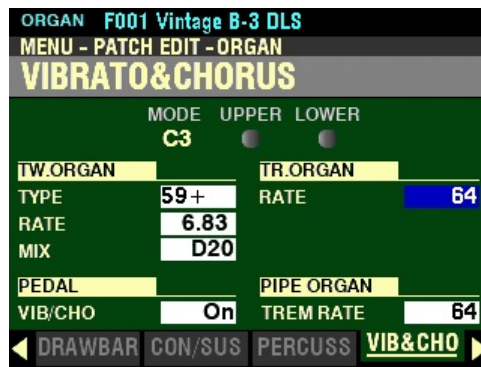
The box to the right of “VIB/CHO” should be highlighted.

Vibrato On Pedal (PEDAL)

This Parameter allows you to select whether you want Vibrato to also affect the Pedal Drawbar tones when the VIBRATO LOWER Press Tab is “ON.” This replicates the Vibrato function on a vintage Hammond Organ.

Turn the VALUE knob to turn Vibrato On or Off for the Pedal Drawbar tones.

From the screen shown at the bottom of the previous page, use the **DIRECTION** buttons to move the cursor to the right side of the display so the Information Center Display looks like this:



The box to the right of “RATE” should be highlighted.

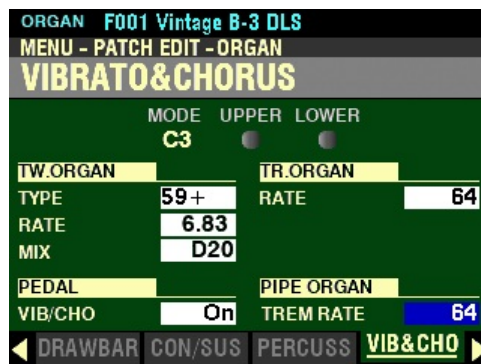
TR.ORGAN (Transistor Organ) RATE

This Parameter allows you to adjust the Vibrato Rate for the Transistor Organs (Farf, Vx and Ace). You can select from 0 (no Vibrato) to 127 (fastest Vibrato Rate).

Turn the VALUE knob to the right to increase the Vibrato Rate.

Turn the VALUE knob to the left to decrease the Vibrato Rate.

From the above screen, press the **DIRECTION** “▼” button once.



The box to the right of “TREM RATE” should be highlighted.

Pipe Organ Tremulant RATE

This Parameter allows you to adjust the Tremulant Rate for the Pipe Organ.

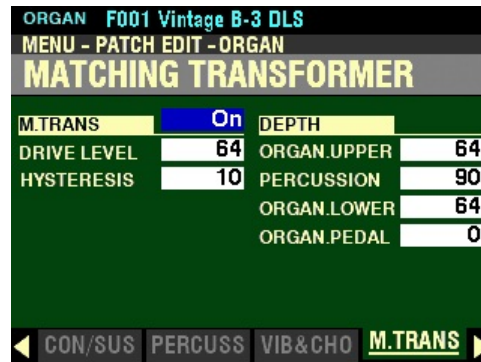
Turn the VALUE knob to the right to make the Tremulant Rate faster.

Turn the VALUE knob to the left to make the Tremulant rate slower.

NOTE: More information about Pipe Voices can be found starting on page 177.

◆ MATCHING TRANSFORMER Parameters

From the screen shown at the bottom of the previous page, press the PAGE “▶” button. The Information Center Display should now look like this:

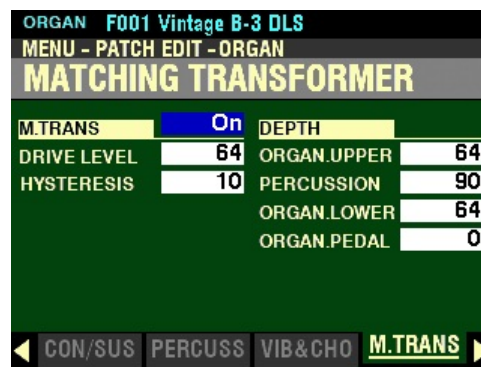


◆ WHAT IS A “MATCHING TRANSFORMER?”

The primary purpose of the Matching Transformer in a Hammond tone-wheel organ is to “match” the low Impedance of the generator and key circuits to the high impedance amplifier input. However, in the B-3/C-3/A-100 family of Hammond Organs it performs the additional function of combining the individual tones from each Drawbar into one complex musical tone. It serves also, through taps on its primary winding, to establish a series of intensity levels for the Drawbars. Doing this imparts some unique characteristics to the sound which are part of the tonal characteristics of a Hammond tone-wheel organ such as the B-3. This feature reproduces these characteristics digitally.

SWITCH

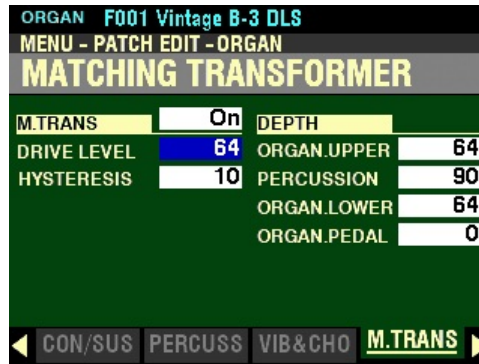
If you followed the instructions shown above, you should now see the MATCHING TRANSFORMER FUNCTION MODE Page. The box to the right of “M.TRANS” should be highlighted.



This Parameter allows you to turn the Matching Transformer effect “ON” or “OFF”

Turn the VALUE knob to make your selection.

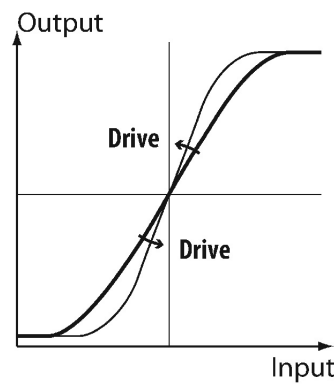
From the screen shown at the bottom of the previous page, press the DIRECTION “▼” button once.



The box to the right of “DRIVE LEVEL” should be highlighted.

DRIVE LEVEL

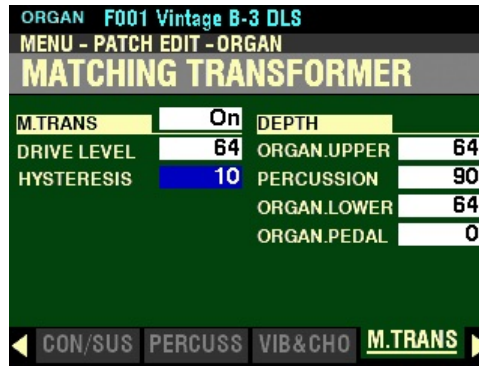
This Parameter allows you to set the saturation level of the Matching Transformer. You can select from 0 to 127. A higher value will result in more saturation at low volume levels (see the illustration below).



Turn the VALUE knob to the right to increase the amount of Saturation.

Turn the VALUE knob to the left to decrease the amount of Saturation.

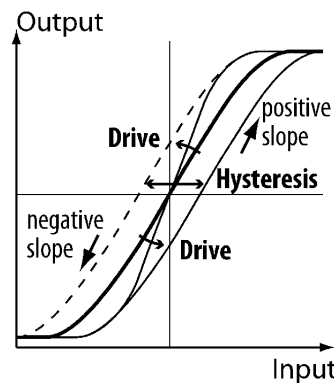
From the above screen, press the DIRECTION “▼” button once.



The box to the right of “HYSTERESIS” should be highlighted.

HYSTERESIS

Hysteresis refers to the fact that all of the values of a given event can change at different rates (see the illustration below).

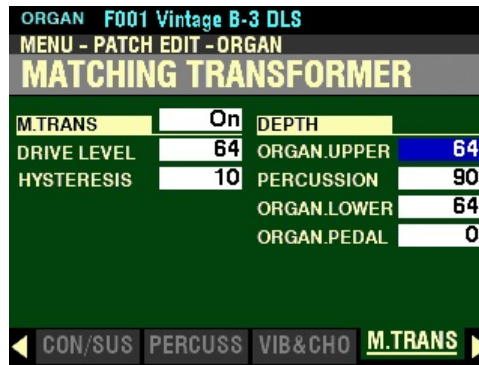


In the case of a Hammond Organ, as discussed previously, each Drawbar has 8 degrees of volume. When a Drawbar is moved, not only the volume but the sound quality changes because of the artifacts introduced by the Matching Transformer. This Parameter allows you to replicate this characteristic of a tone-wheel Hammond Organ by setting the strength of the Hysteresis characteristic. You can select from 0 to 127. The higher the value, the more “asymmetrical” the sound.

Turn the VALUE knob to the right to increase the strength.

Turn the VALUE knob to the left to decrease the strength.

From the screen shown at the bottom of the previous page, use the PAGE “▶” and DIRECTION buttons to move the cursor to the right side of the display so the Information Center Display looks like this:

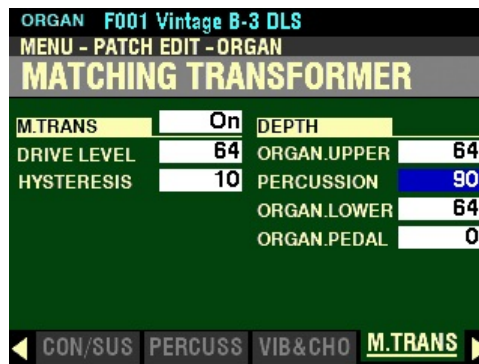


The box to the right of “ORGAN.UPPER” should be highlighted.

DEPTH - ORGAN UPPER

This Parameter allows you to set the amount of the Matching Transformer modeling for the UPPER ORGAN Part. You can select from “0” to “127.” A higher value creates a deeper effect.

From the above screen, press the DIRECTION “▼” button once.

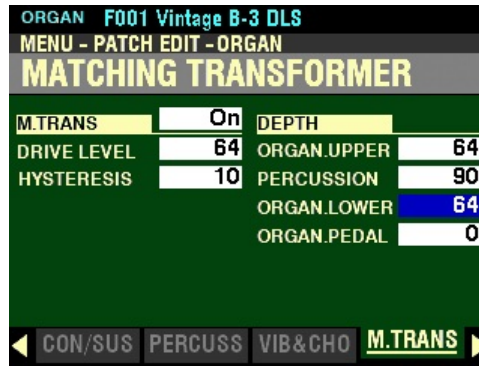


The box to the right of “PERCUSSION” should be highlighted.

DEPTH - PERCUSSION

This Parameter allows you to set the amount of the Matching Transformer modeling for the PERCUSSION. You can select from “0” to “127.” A higher value creates a deeper effect.

From the screen shown at the bottom of the previous page, press the DIRECTION “▼” button once.

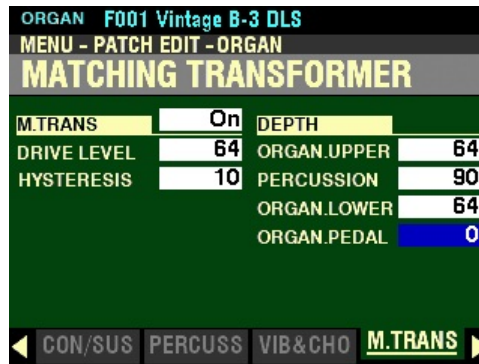


The box to the right of “ORGAN.LOWER” should be highlighted.

DEPTH - ORGAN LOWER

This Parameter allows you to set the amount of the Matching Transformer modeling for the UPPER ORGAN Part. You can select from “0” to “127.” A higher value creates a deeper effect.

From the screen above, press the DIRECTION “▼” button once.



The box to the right of “ORGAN.PEDAL” should be highlighted.

DEPTH - ORGAN PEDAL

This Parameter allows you to set the amount of the Matching Transformer modeling for the PEDAL tones. You can select from “0” to “127.” A higher value creates a deeper effect.

◆ LESLIE®

Your Hammond SK PRO has a built-in digital Leslie effect that replicates the sound of a twin-rotor Leslie Speaker cabinet. In addition, the SK PRO can also be used with a variety of different Leslie Speaker cabinets. There is a full explanation of how to use the SK PRO with a Leslie Speaker cabinet starting on page 20.

◆ What Is A “Leslie Speaker?”

When the Hammond Organ was first introduced in the mid 30's, it was not “self-contained” - in other words, the sound-producing apparatus was not contained within the console. In order to hear the sounds produced by the organ's tone generators, a separate “tone cabinet” containing an amplifier and speaker system had to be connected to the organ console via a special cable. The Hammond Organ Company for many years manufactured many different models of tone cabinets specifically for use with Hammond Organs. The best known of these is probably the PR-40 model, which used a 40-watt tube amplifier to drive a set of speakers.



Hammond PR-40 Tone Cabinet



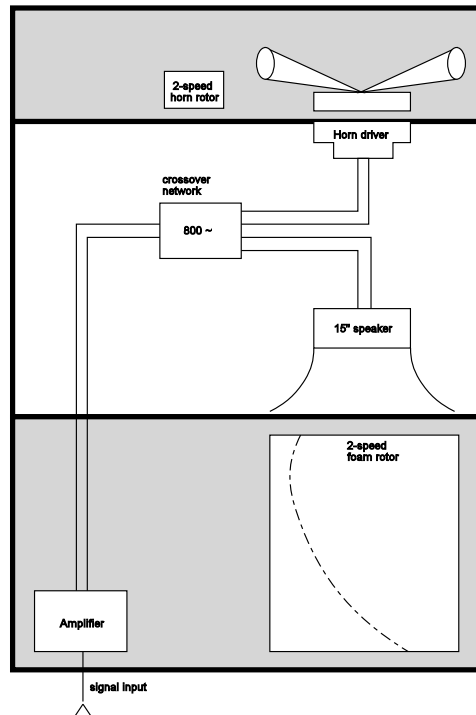
A typical Leslie Speaker cabinet.

The Hammond engineers had very definite ideas about what a Hammond Organ should sound like and the Hammond speakers were designed to deliver that sound. In the late 30's, however, an independent engineer and organ enthusiast named Donald J. Leslie wanted a sound from a Hammond Organ more nearly approximating the sound of a theatre organ, particularly a realistic theatre organ tremulant. He found that rotating a baffle in front of a stationary speaker created the effect of a tremulant (the well-known “Doppler effect”) and called the subsequent speaker the “Vibratone.” (The “Vibratone” designation was eventually dropped and subsequent models would be known simply as Leslie Speakers.) Over a hundred models of Leslie Speakers have been made over the years; probably the best known being the models 122, 142, 145 and 147, all of which have 40-watt vacuum-tube amplifiers. The 122 and 147 are both 41" tall (see above photo), while the 142 and 145 are 33" tall. The 122 and 142 have the same electronics, as do the 145 and 147.

Although the 122 and 147, as well as the 142 and 145, share identical cabinet designs, they are electrically dissimilar - the 122/142 is designed specifically for use with a Hammond Organ whose preamplifier has “GG” terminals (a “balanced” signal output), whereas the 147/145 has an “unbalanced” input more suitable for use with self-contained organs - other brands as well as Hammond. Additionally, the 122 and 147 have different high-frequency responses - the 122 rolls off the treble at 6K to reduce key click, while the 147 does so at 8K, resulting in a slightly brighter overall sound.

◆ What Are “Horn” and “Bass?”

The basic Leslie Speaker design, as represented by the 122 and 147 families of cabinets, divides the sound between “treble” (above 800Hz) and “bass” (below 800Hz). The treble frequencies are routed to a treble speaker or “driver,” while the bass tones sound through a bass speaker (typically 15”). In the classic design, the speakers themselves do not move - a baffle is rotated in front of each speaker to produce animation. The shape of the baffle for the high frequencies is similar to the bell of a horn, hence the popular designation “horn.” The figure below illustrates this.



The Leslie cabinet type shown above connects to the organ console by means of a special connector kit which allows proper routing of both the audio signal and the electrical voltage necessary to operate the rotors.

The first Leslie speakers used two motors to rotate the baffles at a speed suitable for recreating theatre-organ-type tremulant which were controlled by a toggle switch on the side of the speaker cabinet. In the mid-60's an additional motor was added to both Horn and Bass which spun the rotors much more slowly to suggest the sound of a “celeste,” or a compound organ stop with two or more ranks slightly detuned. Also added were switches which could be mounted to the front of an organ console to allow the organist to control the rotor speeds, and therefore the sound, while playing- “Chorale” described the effect produced by the Slow motors, while “Tremolo” was the designation used when the Fast motors were engaged. The picture below shows a typical Leslie switch of this kind.

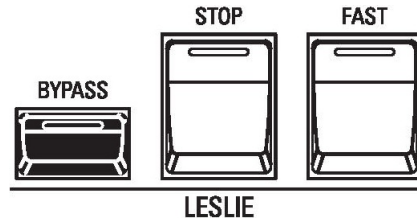


In more recent years there have been two important additions to the classic Leslie design:

1. The introduction of an 11-pin interface to allow a Leslie Speaker to handle more than one audio channel, as well as to isolate line voltage from the audio signal path.
2. The replacement of separate Fast and Slow motors with variable speed motors for both Horn and Bass. The newer motor design reduces the total number of motors from four to two, and also allows for “Brake” mode, or the ability to shut the rotors completely off (previously a special “brake kit” had to be added to the cabinet to permit this feature).

New digital technology has now made it possible to recreate the Doppler effect without using moving parts. This technology has been incorporated into the SK PRO. The following pages explain how the internal digital Leslie of your Hammond SK PRO works.

◆ LESLIE buttons



These three button controls allow you to control either the internal digital Leslie or the rotors of a connected Leslie Speaker cabinet.

LESLIE BYPASS

When this Press Tab is "OFF" (LED not lit), the Drawbars will sound through the internal Leslie channel. Pressing the BYPASS Press Tab "ON" (LED lit) will change the sounds produced by the Drawbars from the Leslie channel to the stationary channel. The effect is similar to the sound produced by a vintage Hammond Organ being played through a Hammond speaker cabinet.

LESLIE STOP

When this Press Tab is "OFF" (LED not lit), the Leslie effect is that of an acoustic Leslie Speaker cabinet with the rotors turning either slowly (Chorale) or Fast (Tremolo). Pressing the LESLIE STOP Press Tab "ON" (LED lit) will cause the Leslie rotors to stop turning.

LESLIE FAST

The speed of the rotors of either the internal digital Leslie or a connected Leslie Speaker depends upon the position of the LESLIE FAST Press Tab.

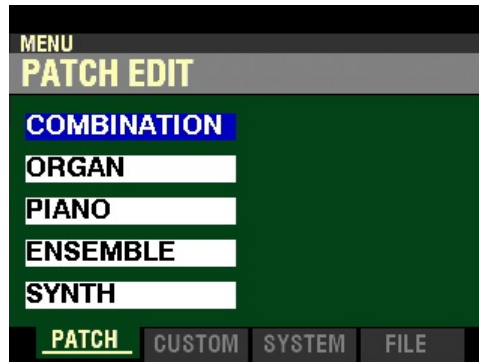
When this Press Tab is "OFF" (LED not lit), the Leslie effect is that of an acoustic Leslie Speaker cabinet with the rotors turning slowly (Chorale). Pressing the LESLIE FAST Press Tab "ON" (LED lit) will cause the Leslie effect to speed up and rotate fast (Tremolo) to produce a rich, full sound.

◆ LESLIE Parameters

You can select the LESLIE Parameters for the ORGAN Voice Section from the LESLIE FUNCTION MODE Page.

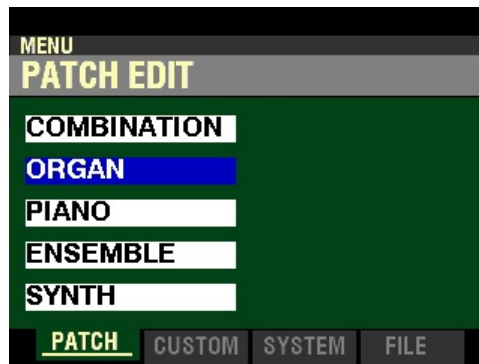
Accessing the LESLIE FUNCTION Mode Page using the MENU/EXIT button:

1. From any of the PLAY Mode screens, press the MENU/EXIT button once. The Information Center Display should now look like this:



The “COMBINATION” box should be highlighted.

2. Press the DIRECTION “▼” button once. The “ORGAN” box should be highlighted.



3. Press the ENTER button. The Information Center Display should now look like this:



The PATCH EDIT - ORGAN FUNCTION Mode should now display.

4. Press the PAGE “▶” button six times. The Information Center Display should now look like this:



Accessing the LESLIE FUNCTION MODE Page using the Shortcut:

Press and hold any of the three LESLIE buttons (BYPASS, STOP or FAST). After approximately 1 second, you will see the screen shown above.

You are now in the LESLIE FUNCTION Mode Page. You may now use the DIRECTION buttons in conjunction with the VALUE knob to make various changes to the Vibrato and Chorus. These changes are explained starting below.

If you followed the instructions on the previous pages, you should now see the LESLIE FUNCTION MODE Page. Notice the four small icons at the top of the display for BYPASS, SLOW, STOP and FAST.



LESLIE BYPASS & ROTOR SETTING

The four small icons at the top of the display correspond to the LESLIE buttons to the left of the keyboard. When any of the LESLIE buttons is “ON” (LED lit), the corresponding icon will light. If none of the LESLIE buttons is “ON,” the SLOW icon will light.

In this screen, the box to the right of “LESLIE ON REV” should be highlighted.



LESLIE ON REVERB

When an audio signal containing Reverb is sent to a Leslie Cabinet, the Reverb is modulated along with the main signal. This characteristic can be replicated using this Parameter.

The data chart below shows the options you may select.

LESLIE ON REVERB	
Parameter	Description
Off	The effect is that of a Leslie Cabinet speaking into an auditorium or a large live room, or a Leslie Cabinet having a separate Reverb amplifier and speakers such as a vintage 122RV - the Organ tones are affected by the Leslie rotors but not the Reverb.
On	The effect is that of an audio signal containing both Organ tones and Reverb being fed into a single-channel Leslie - the rotors will modulate the Reverb as well as the basic Organ tones.

Turn the VALUE knob to make your selection.

NOTE: This Parameter DOES NOT affect a connected Leslie Speaker Cabinet.

From the screen shown on the previous page, press the DIRECTION “▼” button once.



The box to the right of “CABINET” should be highlighted.

CUSTOM CABINET

This allows you to select a Custom Leslie Cabinet.

Turn the VALUE knob to make your selection.

NOTE: Please consult the **CUSTOM SETS** chapter of this Guide for complete information about Custom Leslie Cabinets.

SPECIAL NOTE: All of the ORGAN Parameters affect the Tone Wheel Organs; however, some of the ORGAN Parameters do not affect the Transistor or Pipe Organs - for example, Leakage Level, Pedal Type and Custom Tone Wheels. If a particular Parameter does not affect the selected Organ Type, it will be “greyed out” or darkened in the display (see the example below). However, the value of a disabled Parameter can still be adjusted using the VALUE knob.

NOTE: All of the Organ Types except **Pipe** can be played either with the built-in digital Leslie or through a connected Leslie Speaker Cabinet.

◆ MULTI EFFECT 1&2, OVERDRIVE and EQUALIZER

From the screen shown on the previous page, you can use the PAGE “◀” and “▶” buttons to move back and forth among the four remaining ORGAN FUNCTION Mode Pages.

IMPORTANT NOTE: These FUNCTION Mode Pages are covered in the **MULTI EFFECT / OVERDRIVE / EQUALIZER** chapter of this Guide since each Voice Section has these Parameters. However, the MULTI EFFECT / OVERDRIVE / EQUALIZER Parameters are controlled separately - adjusting one of these Parameters for one Voice Section will affect that Voice Section **only**.

The image displays four sequential screenshots of the ORGAN F001 Vintage B-3 DLS patch editor, showing different effect settings. Each screen has a dark green background with white and yellow text.

Screen 1: MULTI EFFECT 1
 SWITCH: Off
 TYPE: Tremolo
 WAVE: Triangle
 TRIGGER: Free
 RATE: 67
 DEPTH: 90
 Navigation: MFX 1 (selected), O.DRIVE, MFX 2, EQUALIZ

Screen 2: OVERDRIVE
 SWITCH: Off
 TYPE: Tube
 DRIVE: 20 EXP. CTRL: Exp.-OD
 X.OVER[Hz]: 3.36k
 BLEND: 100
 Navigation: MFX 1, O.DRIVE (selected), MFX 2, EQUALIZ

Screen 3: MULTI EFFECT 2
 SWITCH: Off
 TYPE: AutoPan
 WAVE: Dull Sqr
 RATE: 36
 DEPTH: 80
 Navigation: MFX 1, O.DRIVE, MFX 2 (selected), EQUALIZ

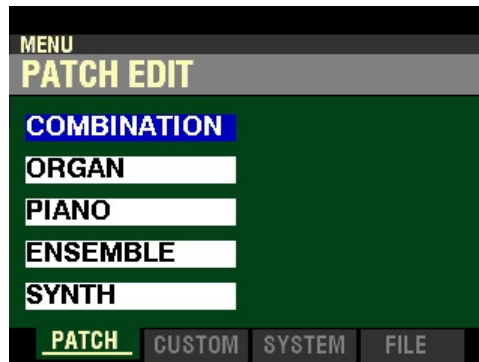
Screen 4: EQUALIZER
 EQ
 BASS: 104, MID: 250, TREB: 4.2k
 GAIN: 0, 0, 0
 TONE CONTROL
 GAIN: 0
 Navigation: MFX 1, O.DRIVE, MFX 2, EQUALIZ (selected)

◆ ORGAN TYPES

In addition to traditional Hammond Drawbar tones, the Drawbars on the SK PRO can control a number of models of Combo Organs as well as different types of Pipe Organs. This Parameter allows you to select which type of organ sounds you want the Drawbars to control.

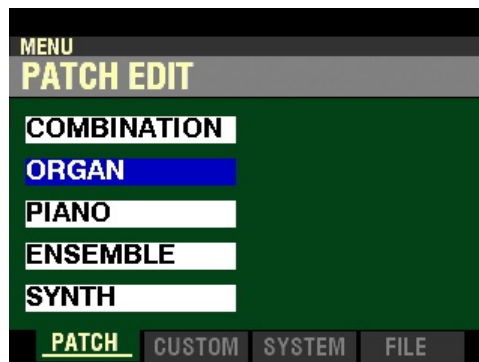
TRY THIS:

1. From any of the PLAY Mode screens, press the MENU/EXIT button once. The Information Center Display should now look like this:



The “COMBINATION” box should be highlighted.

2. Press the DIRECTION “▼” button once. The “ORGAN” box should be highlighted.

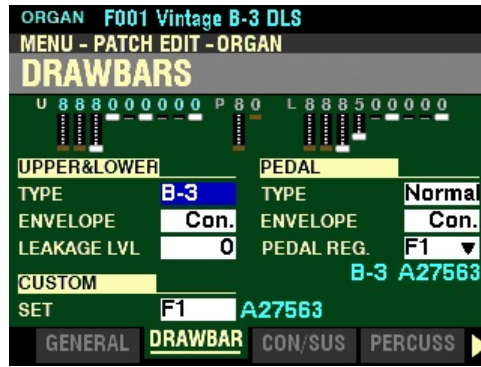


3. Press the ENTER button. The Information Center Display should now look like this:



The PATCH EDIT - ORGAN FUNCTION Mode should now display.

- Press the PAGE "▶" button once. The Information Center Display should now look like this:

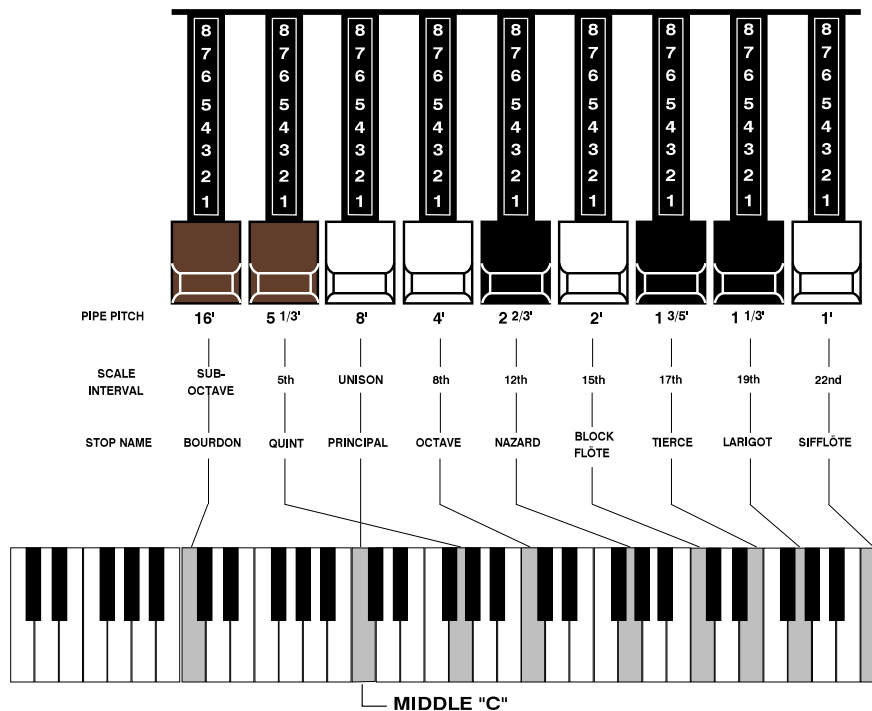


The box to the right of "TYPE" should be highlighted.

You can now use the VALUE knob to select what type of organ sound will be associated with the Drawbars. The first four Drawbar Organ Types are traditional vintage Hammond settings. However, the last four Organ Types allow you to use the Drawbars to register other types of organ sounds. The Organ Types are explained starting below.

◆ Organ Types - "A-100," "B-3," "C-3," "Mellow"

There are approximately 253,000,000 possible sound combinations that can be produced by these Drawbars. Each Drawbar consists of sine waves of different pitches. The illustration below shows how each Drawbar relates to the keyboard when middle "C" is depressed.



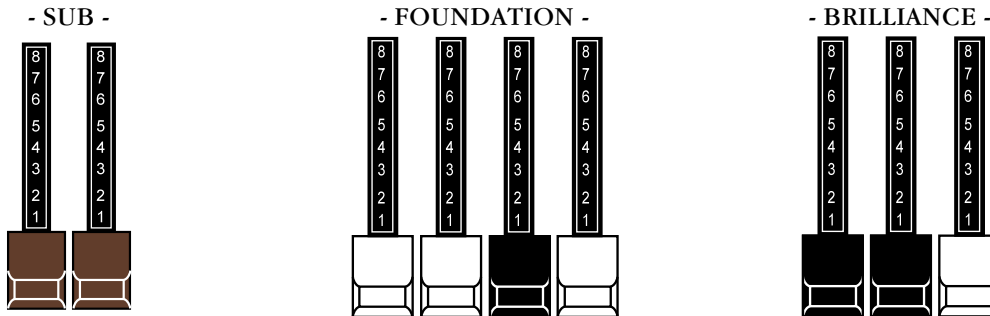
Each Drawbar is marked with a number followed by a footage mark. For example, the first white Drawbar is marked "8'". This is pipe organ terminology indicating that the pipe used to produce the lowest note on the keyboard on a pipe organ is actually eight feet long. The numbers from "1" to "8" on each Drawbar represent degrees of loudness - number 1 being the softest, and number 8 being the loudest.

The following pages explain characteristics of the Drawbars which are common to traditional uses of Drawbars in vintage Hammond Organs which have Drawbars.

Drawbars are divided into 3 groups of sound as well as 3 groups of color. We will first look at the 3 sound groups.

◆ Sound Groups

You may think of these sound groups in terms of the three levels - The Sub being the deep pitches, the Foundation being the mid range of pitches and the Brilliance being the high pitches.



TRY THIS:

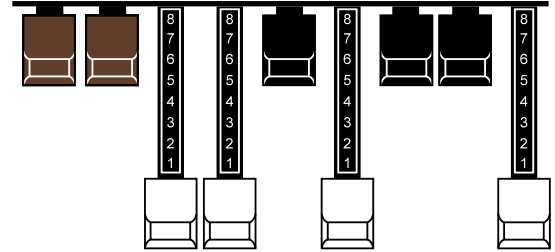
1. Make sure all Drawbars are "IN" (off).
2. Make sure the ORGAN ALLOCATE button is "ON" (LED lit).
3. Hold down a "C" chord, starting with "E" above middle "C", ("E", "G" & "C" notes) with your right hand on the manual (or the UPPER Manual of the SK-2).
4. Starting with the first white Drawbar, pull out and push in each of the Foundation Drawbars one group at a time until you have a sound that you like.
5. While still holding the "C" chord down, pull each of the brown Sub Drawbars out until you like the sound.
6. Now do the same with the Brilliance Drawbars.

It's that easy to create your own custom Drawbar settings.

◆ Color Groups

White Drawbars

The first white Drawbar represents the “fundamental” or “8’ base” tone. All of the other white Drawbars are octave intervals or harmonics of the fundamental tone. The tonal brilliance is greatly increased by adding white Drawbars, but the harmonics added are always in “consonance” or harmony.



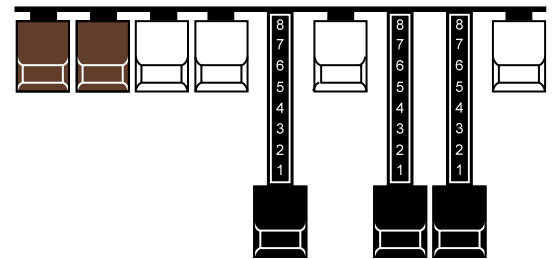
TRY THIS:

1. Make sure all Drawbars are “IN” (off).
2. Make sure the ORGAN ALLOCATE button is “ON” (LED lit).
3. Hold down middle “C” on the keyboard.
4. Pull the first white Drawbar all the way out.
5. Now, one by one, pull the other white Drawbars out in sequence.

As you add each Drawbar, you will hear the addition of the same note an octave higher in each case.

Black Drawbars

The Black Drawbars on the Hammond Organ represent the dissonant (discordant) harmonics which are also necessary in building rich tone colors. The mellowness of a horn, the pungency of strings, and the brilliance of reed voices owe much of their character to the presence of these harmonics in different degrees.



TRY THIS:

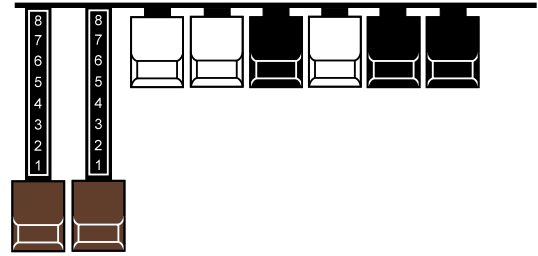
1. Make sure all Drawbars are “IN” (off).
2. Make sure the ORGAN ALLOCATE button is “ON” (LED lit).
3. Hold down middle “C” on the keyboard.
4. Pull the first white Drawbar in the second group of Drawbars for the Swell Manual, marked 8’, all the way out.
5. Now pull the 3 Black Drawbars in the second group of Drawbars for the Swell Manual all the way out.

The sound produced by the Drawbars is that of a clarinet.



Brown Drawbars

In addition to the white and black Drawbars, there are two brown Drawbars in the group. These two Drawbars produce “sub-octave” effects. The first brown Drawbar is the sub-octave of the fundamental Drawbar. It is “one octave” lower in sound.



TRY THIS:

1. Make sure all Drawbars are “IN” (off).
2. Make sure the ORGAN ALLOCATE button is “ON” (LED lit).
3. Hold down middle “C” on the keyboard.
4. Pull the first white Drawbar all the way out.
5. While continuing to hold middle “C” down, pull the first brown Drawbar all the way out.

You will now hear the sound of “C” one octave lower being added.

The second brown Drawbar is the “sub-octave” of the third harmonic. Both of these Drawbars are used to add depth and richness to many combinations. They also increase the range of the manual by one octave since a solo registration of the “8 foot,” or normal pitch, can be set up using the first brown Drawbar as the fundamental and played one octave higher.

TRY THIS:

1. Make sure all Drawbars are “IN” (off).
2. Make sure the ORGAN ALLOCATE button is “ON” (LED lit).
3. Hold down middle “C” on the keyboard.
4. Pull the first white Drawbar all the way out.
5. While continuing to hold middle “C” down, pull the first brown Drawbar all the way out. You will now hear the sound of “C” one octave lower being added.
6. Now pull the second brown Drawbar in the same group out, and you will hear it add a richness to the sound of the “C” note that you are holding down.

◆ Tone Families By Shape

Regardless of the size of a pipe organ or its number of stops, all of its voices are related to four basic families of tone. The four basic families - Flute, Reed, String and Diapason - can be quickly set up on the Drawbars by relating a pattern or shape to each family.

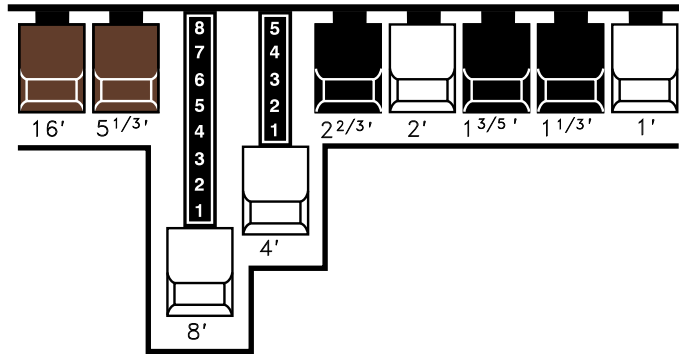
These are the generalities which apply to the tonal resources of the organ, and in themselves produce pleasant and usable effects. However, real beauty of tone is secured in two ways. The first way is to use registrations which have been devised by organists. The second way, and eventually the one that best expresses your own feeling for the music, is to create your own tonal effects, experimenting with and perfecting tones which you use to play your favorite selections.

The Hammond Organ Drawbars allow you not only to set up any tonal effect you want, but also to make many fine variations of the tone. Only with the Hammond Drawbars can you play exactly the shade of tone you want for every selection and, perhaps even more important, for every size and type of room in which you play.

With the Hammond Organ Drawbars, a Press of a finger is all that is needed to make the tone quality softer or more brilliant, richer in one harmonic or another.

Typical Drawbar Registration Patterns For The Four Families Of Organ Sound

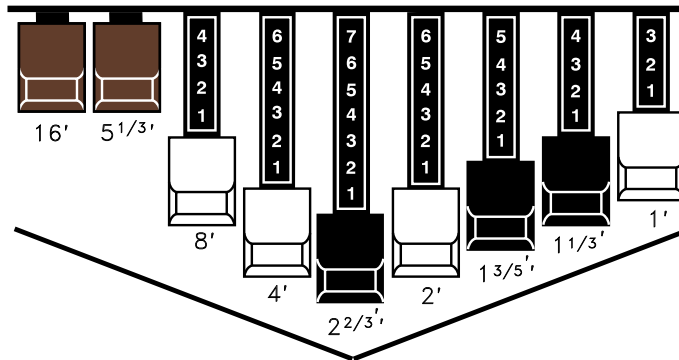
Flute family (2 step pattern)



Flute Tones

Accompaniment Flute 8' I	00 8460 000
Accompaniment Flute 8' II	00 3220 000
Accompaniment Flute 8' III	00 8600 000
Chorus of Flutes 16'	80 8605 002
Orchestral Flute 8'	00 3831 000
Piccolo 2'	00 0006 003
Stopped Flute 8'	00 5020 000
Tibia 8'	00 7030 000
Tibia 4'	00 0700 030
Tibia (Theater) 16'	80 8605 004
Wooden Open Flute 8'	00 8840 000

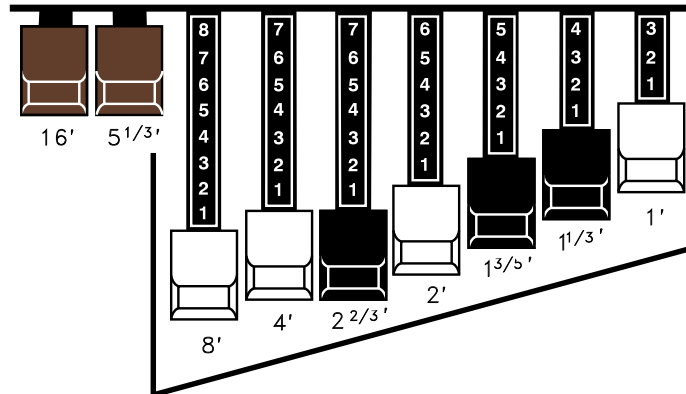
Reed family (triangle pattern)



Reed Tones

Bassoon 16'	44 7000 000
Clarinet 8'	00 6070 540
English Horn 8'	00 3682 210
Flugel Horn 8'	00 5777 530
French Horn	00 7654 321
Kinura 8'	00 0172 786
Oboe 8"	00 4764 210
Trombone 8'	01 8777 530
Trumpet 8'	00 6788 650
Tuba Sonora 8'	02 7788 640
Vox Humana 8'	00 4720 123

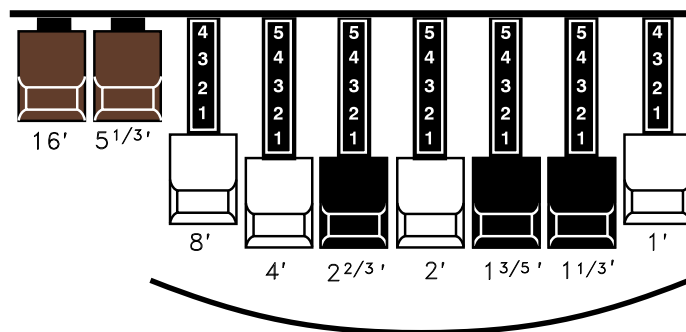
Diapason family (check mark pattern)



Diapason Tones

Accompaniment Diapason 8'	00 8874 210
Chorus Diapason 8'	00 8686 310
Diapason 8'	00 7785 321
Echo Diapason 8'	00 4434 210
Harmonic Diapason 16'	85 8524 100
Harmonic Diapason 8'	00 8877 760
Harmonic Diapason 4'	00 0606 045
Horn Diapason 8'	00 8887 480
Open Diapason 8'	01 8866 430
Solo Diapason	01 8855 331
Wood Diapason 8'	00 7754 321

String family (bow pattern)



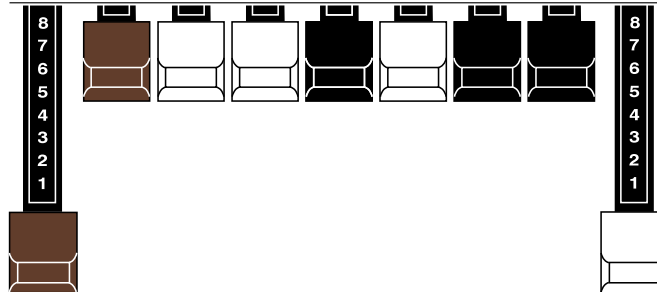
String Tones

Cello 8'	00 3564 534
Dulciana 8'	00 7770 000
Gamba 8' I	00 3484 443
Gemshorn 8'	00 4741 321
Orchestral String 8'	00 1464 321
Salicional 8'	00 2453 321
Solo Viola 8'	00 2474 341
Solo Violin 8'	00 3654 324
Viola da Gamba 8'	00 2465 432
Violina 4'	00 0103 064
Violone 16	26 3431 000

Jazz and Pop Drawbar Registrations

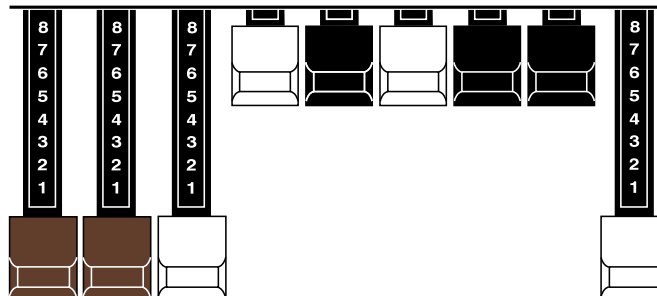
With Hammond Drawbars, any harmonic may be emphasized individually or eliminated completely. Even the fundamental may be eliminated. Because of this fact, many unusual and striking effects can be developed.

A POP ORGAN TONE - 80 0000 008



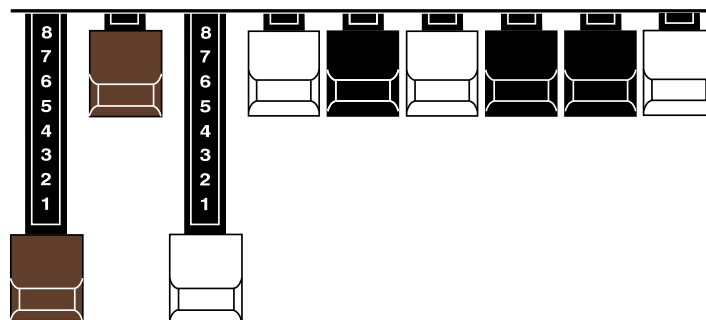
The above is an example of what can be done using the Drawbars to create new sounds. This is a very popular combination used by many pop organists. The effect of two harmonics five octaves apart gives a beautiful tone color for playing slower songs or ballads.

A JAZZ ORGAN TONE - 88 8000 008



There are many Drawbar combinations which are not imitative of any instrument, but which are immediately recognized as "Hammond Sounds." The basic Hammond Organ jazz sound is obtained with the first three Drawbars, such as 88 8000 000. When the last white Drawbar is used along with the first three Drawbars, a very pleasing effect is created. For playing slower songs, you may wish to try a little less of the last white Drawbar - for example, 88 8000 005. The 8th harmonic will still be heard, but will not be as prominent.

◆ Pedal Drawbars



The first brown Drawbar and the first white Drawbar control the sounds produced by the PEDAL Part. The first brown Drawbar produces a tone at 16' pitch for a deep foundation bass, while the first white Drawbar produces a tone at 8' pitch, or one octave higher.

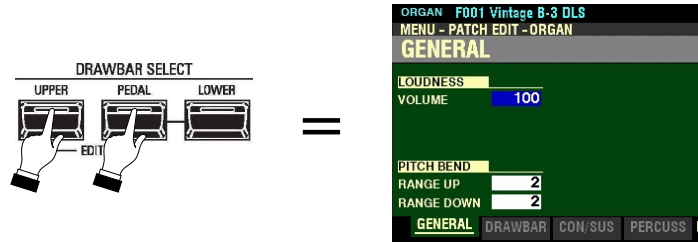
NOTE: The PEDAL DRAWBAR SELECT button must be "ON" in order to adjust the Pedal Drawbar tones. For more information consult page 122.

◆ Organ Type - Vx

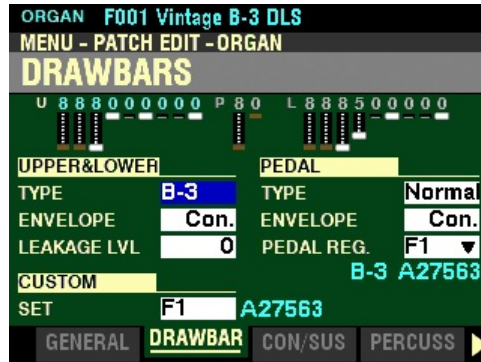
The Vx Drawbar Organ Type allows you to use the Drawbars to register the sound of a vintage British combo organ.

TRY THIS:

1. If you have not already done so, access the PATCH EDIT - ORGAN FUNCTION Mode. The quickest way to do this is to use the Shortcut shown below:

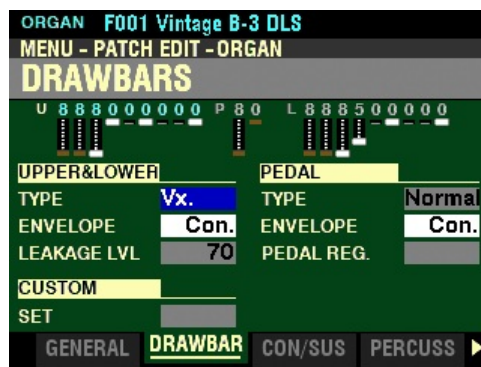


2. Press the PAGE “▶” button once. The Information Center Display should now look like this:



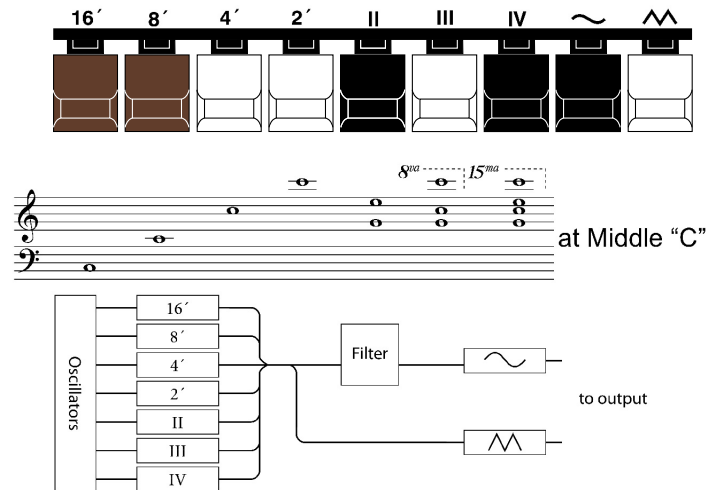
The box to the right of “TYPE” should be highlighted.

3. Turn the VALUE knob so the Information Center Display shows the following:



You may now use the Drawbars to control vintage British combo organ tones.

The figure below shows how the Drawbars are allocated in Vx mode.



The type of combo organ replicated by “Vx” mode had drawbar-type controls, but they functioned differently from Hammond Harmonic Drawbars. The first four Drawbars control individual pitches, while the next three are “Mixture” Drawbars which cause multiple pitches to sound. “II,” “III” and “IV” refer to the number of pitches represented by that Drawbar.

The last two Drawbars control the type of tone produced by the first seven Drawbars. The eighth Drawbar causes pure tones to sound while the last Drawbar causes brighter and more harmonically complex tones to sound.

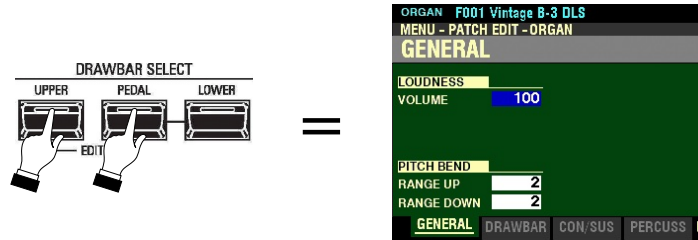
NOTE: The first seven Drawbars WILL NOT sound unless one or both of the last two Drawbars are also “out.” These two Drawbars regulate the overall volume as well as timbre of the total Drawbar registration, and can be used separately or together.

◆ Organ Type - Farf

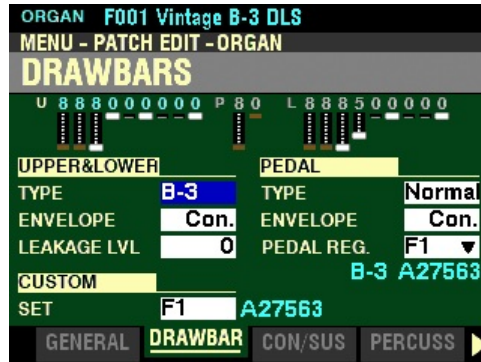
The Farf Drawbar Organ Type allows you to use the Drawbars to register the sound of a vintage Italian combo organ.

TRY THIS:

1. If you have not already done so, access the PATCH EDIT - ORGAN FUNCTION Mode. The quickest way to do this is to use the Shortcut shown below:

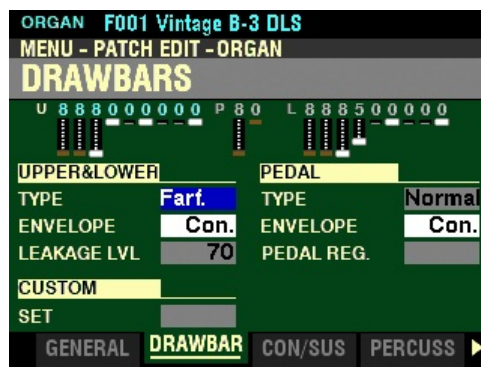


2. Press the PAGE “▶” button once. The Information Center Display should now look like this:



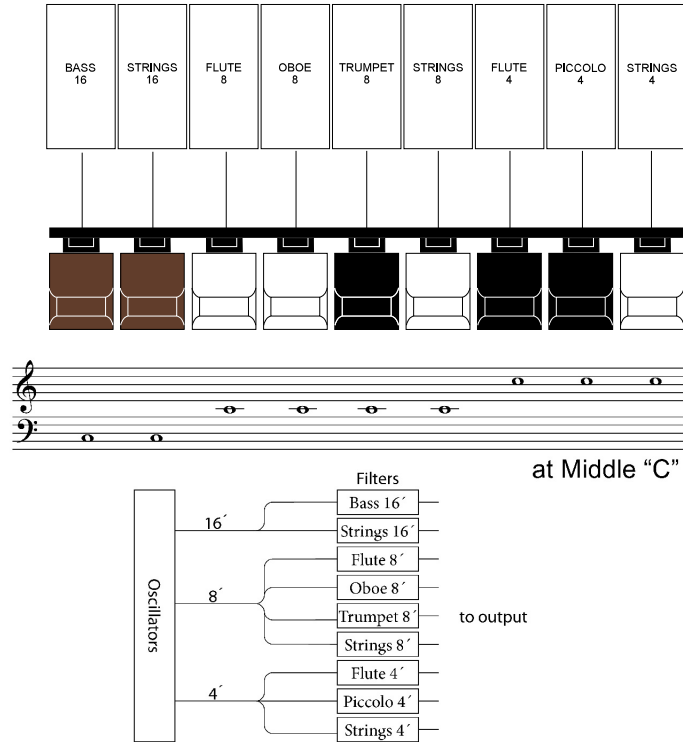
The box to the right of “TYPE” should be highlighted.

3. Turn the VALUE knob so the Information Center Display shows the following:



You may now use the Drawbars to control vintage Italian combo organ tones.

The figure below shows how the Drawbars are allocated in Farf mode.



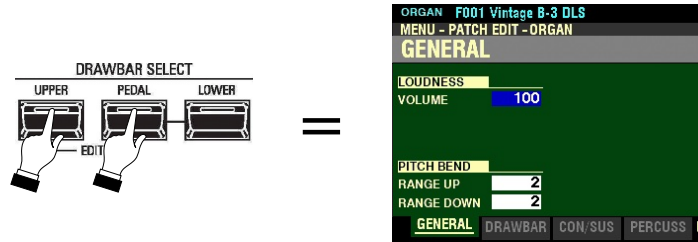
The above configuration follows the layout of the “Combo Compact” series of combo organ, which used rocker-type tilt tablets rather than Drawbars to turn voices “on” and “off.” On the SK PRO, the Drawbars are used to control the same sounds. To replicate the effect of tablets, simply pull the Drawbar(s) representing the tone(s) you want “out” all the way. Or, you can create shadings of tones by using the Drawbars in the more traditional fashion.

◆ Organ Type - Ace

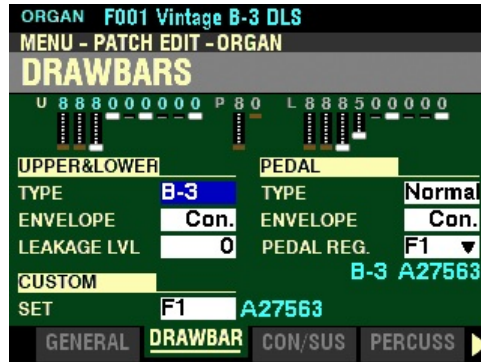
The Ace Drawbar Organ Type allows you to use the Drawbars to register the sound of a vintage Japanese combo organ.

TRY THIS:

1. If you have not already done so, access the PATCH EDIT - ORGAN FUNCTION Mode. The quickest way to do this is to use the Shortcut shown below:

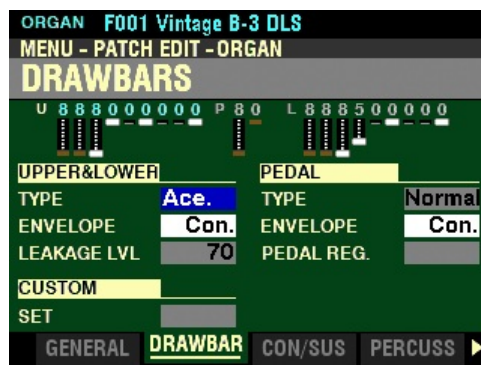


2. Press the PAGE “▶” button once. The Information Center Display should now look like this:



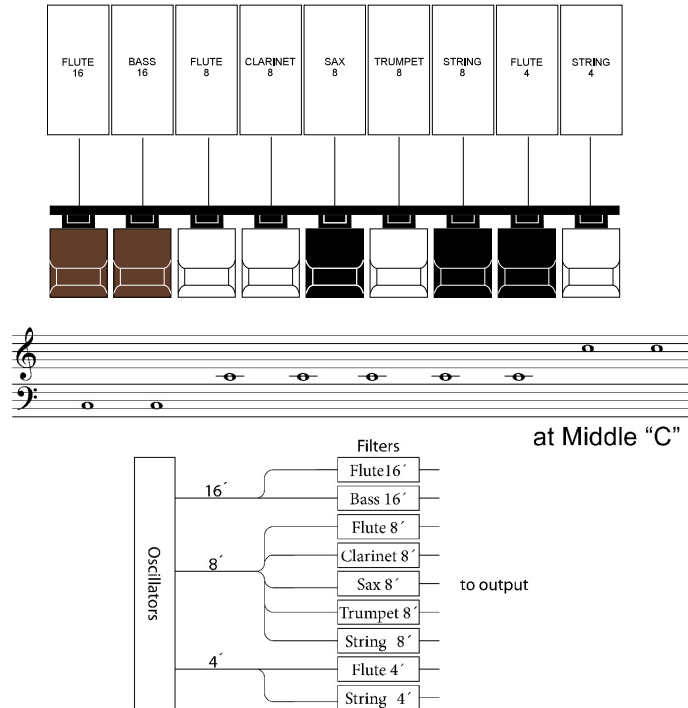
The box to the right of “TYPE” should be highlighted.

3. Turn the VALUE knob so the Information Center Display shows the following:



You may now use the Drawbars to control vintage Japanese combo organ tones.

The figure below shows how the Drawbars are allocated in Ace mode.



The above configuration follows the layout of the "TOP7" combo organ, which used rocker-type tilt tablets rather than Drawbars to turn voices "on" and "off." On the SK PRO, the Drawbars are used to control the same sounds. To replicate the effect of tablets, simply pull the Drawbar(s) representing the tone(s) you want "out" all the way. Or, you can create shadings of tones by using the Drawbars in the more traditional fashion.

◆ Organ Type - Pipe

The Pipe Drawbar Organ Type allows you to use the Drawbars to register authentic classical pipe organ tones.

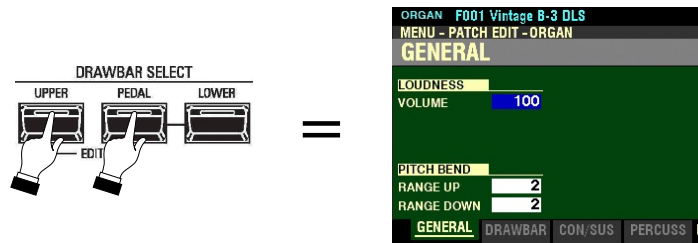
The Pipe Organ Type contains three (3) Custom Sets - Classic, Theatre 1 and Theatre 2. The following pages show how the Pipe Voices are allocated to the Drawbars for each Custom Set.

NOTE: Classic and Theatre denote different kinds of Pipe Organs. Classic organs are designed to play classical and liturgical music, while Theatre organs are better suited to semi-classical and popular music as well as orchestral transcriptions.

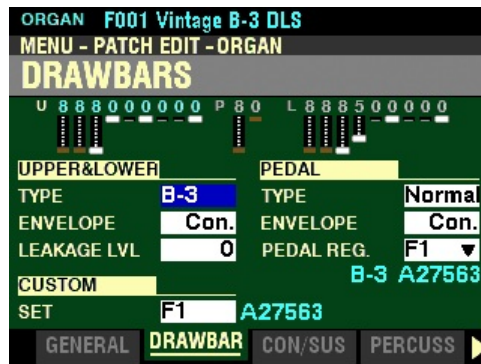
Organ Type - “Pipe” (classical)

TRY THIS:

1. If you have not already done so, access the PATCH EDIT - ORGAN FUNCTION Mode. The quickest way to do this is to use the Shortcut shown below:

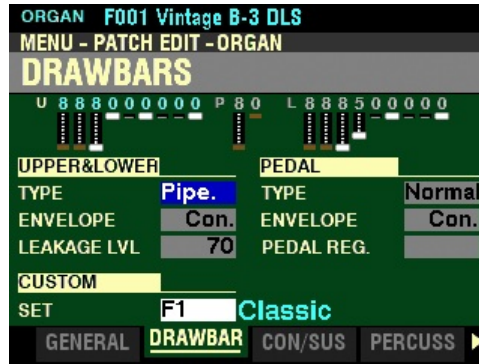


2. Press the PAGE “▶” button once. The Information Center Display should now look like this:



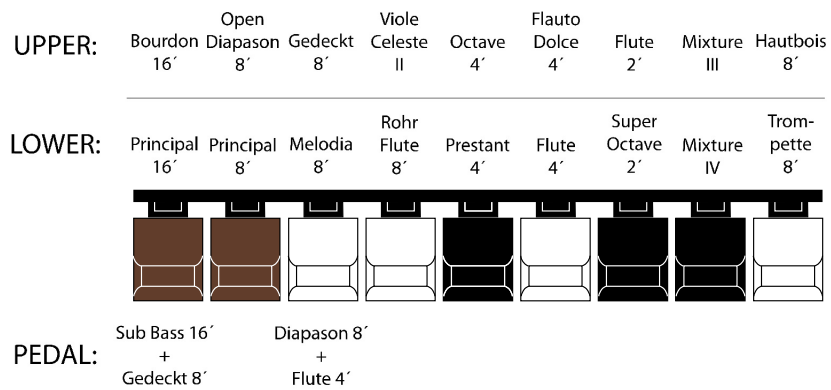
The box to the right of “TYPE” should be highlighted.

- Turn the VALUE knob so the Information Center Display shows the following:



You may now use the Drawbars to control the voices of a classical pipe organ. The figure below shows how the Drawbars are allocated in this mode.

F1 - Classic:



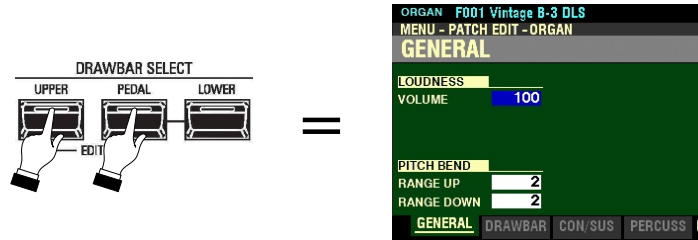
IMPORTANT NOTE: When “Pipe” mode is activated, the Drawbars will function similar to drawstops on a traditional pipe organ - pulling a Drawbar “out” will turn the associated Pipe Voice “ON” while pushing the Drawbar “in” will turn the Pipe Voice “OFF.” The Pipe Voices **do not** have gradations of volume - they are either “ON” or “OFF.”

◆ Organ Type - “Pipe” (Theatre)

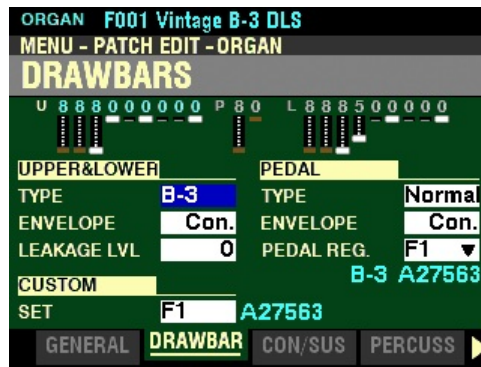
This Organ Type allows you to use the Drawbars to register authentic theatre pipe organ tones.

TRY THIS:

1. If you have not already done so, access the PATCH EDIT - ORGAN FUNCTION Mode. The quickest way to do this is to use the Shortcut shown below:

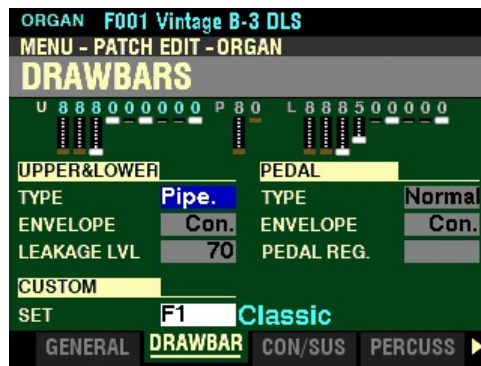


2. Press the PAGE “▶” button once. The Information Center Display should now look like this:

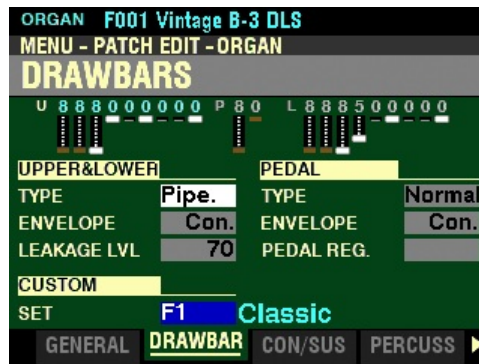


The box to the right of “TYPE” should be highlighted.

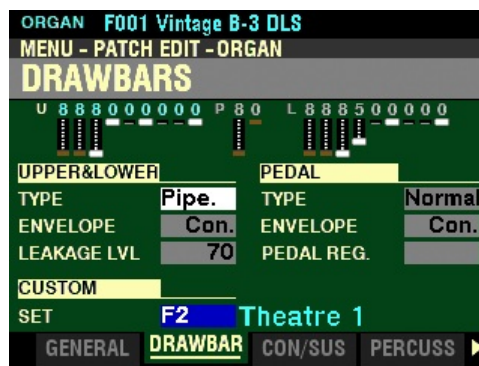
3. Turn the VALUE knob so the Information Center Display shows the following:



4. Press the DIRECTION “▼” button three times. The box to the right of “SET” should be highlighted.



5. Turn the VALUE knob so that “F2” displays in the box to the right of “SET.”



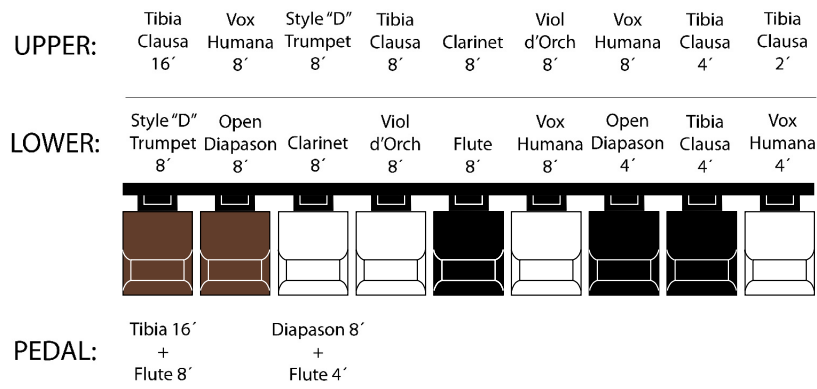
You may now use the Drawbars to control the voices of a theatre or “cinema” pipe organ.

Use the VALUE knob to select F2 Theatre 1 or F3 Theatre 2.

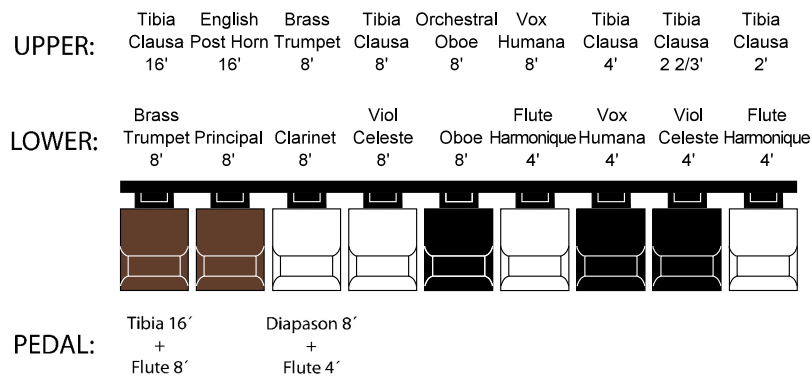
Theatre 1 is a stop complement similar to a Wurlitzer “Style 210” while Theatre 2 is derived from the stops from a Wurlitzer “Style 260 Special” including English Post Horn.

The figures on the next page show how the Drawbars are allocated in this mode.

F2 - Theatre 1:



F3 - Theatre 2:



IMPORTANT NOTE: When "Pipe" mode is activated, the Drawbars will function similar to the stop tablets on a theatre pipe organ - pulling a Drawbar "out" will turn the associated Pipe Voice "ON" while pushing the Drawbar "in" will turn the Pipe Voice "OFF." The Pipe Voices do not have gradations of volume - they are either "ON" or "OFF."

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