



K U R Z W E I L

Music Systems



K2500 Operating System Version 2.5x (KB3 Mode) Release Notes

What's New in Version 2.5?

The primary new features of Version 2.5 are in KB3 Mode, which is fully described in this document, beginning on page 3. Additional enhancements to V2.5 include:

Faster SCSI Operations.

Sample loading is now up to three times faster than in previous versions of the operating system. These operations are now performed at approximately 1 Meg per second. Sample saving is over twice as fast (Now approximately $\frac{2}{3}$ Meg per second). Copy and backup are similarly improved.

Faster Sample Memory Deletion/Compaction.

Sample memory deletion and compaction have been speeded up considerably in V2.5. The K2500 stores all sample data contiguously in sample RAM (as opposed to storing on a disk, where a file may be fragmented), so deleting selected samples from memory requires the K2500 to arrange all remaining samples contiguously; this keeps the remaining memory in one "chunk". While the amount of time needed still depends on how much is being deleted and how much is currently in memory, this process is now much faster than it was previously.

Faster Object Memory Delete/Save.

Previously, with many hundred objects in memory, deleting or saving an object could take a long time. Now it is much faster, typically under a second. However, dependent object computation can still take a while.

Multi-Velocity Keymaps

Five multi-velocity keymap templates have been added to ROM (IDs 34-39). Previously only two- and three-level keymaps were available. Use the Chan/Bank buttons to navigate through the various levels while in the Keymap editor. Switch points are not user editable.

New Control Setup

Control Setup (ID 97) has been changed to include KB3 functionality:

- EditSetup: COMMON page Mutes parameter defaults to KB3 Control.
- PanelSwitch2 now sends MIDI 29.
- FootSwitch4 now sends MIDI 68 (LegatoSwitch-Leslie Fast/Slow for KB3 programs).

© 1997, All Rights Reserved. Kurzweil is a product line of Young Chang Co. Kurzweil, K2500, and V.A.S.T. are trademarks of Young Chang Co. Voce is a trademark of Voce, Inc. Hammond and Leslie are trademarks of Hammond Suzuki USA. All other trademarks and registered trademarks are the property of their respective owners. Product features and specifications are subject to change without notice.

Installing Version 2.5

Note: Back up your RAM objects before performing this installation. All RAM will be erased by the Hard Reset at the end of the installation.

The complete procedure for installing the operating system and objects is included in Chapter 2 of the *K2500 Performance Guide*. For your convenience, here's a summary of the procedure:

1. Start the K2500
2. Press and release the Exit key while the "Please wait..." message is displayed. This brings up the K2500 Boot Loader.
3. Load the operating system floppy, then use "Install System" from the K2500 Boot Loader to install the new operating system.
4. Replace the operating system disk (after you've installed it) with the factory objects disk, then use the Boot Loader's "Install Objects" option to install the correct objects for your configuration.

Object file versions and K2500 ROM configurations for V2.5 are as follows:

OBJ300.K25	for Base ROM
OBJP310.K25	for Base + Piano option
OBJO320.K25	for Base + Piano + Orchestral option
OBJC330.K25	for Base + Piano + Contemporary option
OBJF340.K25	for Base + Piano + Orchestral + Contemporary option

The Object files that accompany Version 2.5 software add ten KB3 organ programs, three effects, and one Quick Access Bank to the 700's bank of your K2500.

5. When the installation is finished, choose "Hard Reset" followed by "Run System" from the Boot Loader. While you won't normally need to reinstall the operating system or objects, you should still put the disks in a safe place, just in case you may need them again.

Introducing KB3 Mode

KB3 Mode is a ground-breaking upgrade for the K2500. You can now create and play organ programs that offer superb realism and unprecedented flexibility. If you are using a keyboard model of the K2500, you'll also be able to use your instrument's mod wheel and sliders to emulate the nine drawbars found on traditional tone wheel organs. Similarly, if you're running a K2500R, you'll be able to respond to external drawbar commands from MIDI (e.g., a MIDI drawbar device).

Although KB3 Mode is an extension of the V.A.S.T. operating system, its programs work a little differently than other K2500 programs. You'll want to read through these release notes to make sure you take full use of all these new capabilities.

First Some History

Countless blues, jazz, and rock recordings have centered around the distinctive sound created by classic tone wheel organs (such as the Hammond™ B-3) played through rotating speaker systems like the Leslie™. Not only is the sound great, but it's supremely versatile, since the player can control timbre in real-time by adjusting drawbars that add or remove harmonics from the fundamental tone. Other cool sound-shaping tools include a percussive emphasis that can be added to each note and the capability to change speaker rotation speed. Many people, in fact, feel that the tone wheel organ was the first popular synthesizer. And although these organs haven't been made for years, they are still sought after, restored, and lugged about by legions of dedicated keyboard players. This despite archaic electronics, inscrutable wiring, and an unwieldy heft that tops 400 pounds.

Duplicating the sound and flexibility of these organs – without the nasty side effects – is the goal of KB3 Mode.

A Little Science

In creating KB3 Mode, we've done extensive testing, measurement, and analysis on several tone wheel organs. From there we've done our own physical modeling to emulate these organs, taking into account even such esoteric matters as the way older organs sound different (and arguably better) as their capacitors begin to leak. (Of course we let you decide if you want your K2500 to sound like an old or new organ.) We've also recruited the best organ players we could find to try out these programs, and have used their feedback to make sure that all of KB3 Mode's real-time controls are as convenient as they were on the organs of yore.

To make it all work, we've created a new type of program – the KB3 program – that is built around a totally new model. In a nutshell, KB3 programs use up to 96 oscillators simultaneously, each oscillator having its own pitch and amplitude. The K2500 has 48 voices, and KB3 Mode provides two oscillators per voice, for a total of 96. To get the voices it needs, KB3 Mode employs these oscillator pairs independently of each other. Furthermore, all voices start up – albeit silently – when you select a KB3 Mode program. In a regular K2500 program, on the other hand, voices only start when you play a note. You can see this if you go to the Voices display (Master mode Util page) while a regular K2500 or KB3 program is selected. While a KB3 program is selected, you'll see that a number of the K2500's voices are active, even when no notes are being played. And since these voices are always active, KB3 Mode can rely on tone wheel sharing, as opposed to note stealing, to maximize usable polyphony.

One more thing. When you create your own KB3 Mode programs, you can use any samples you want for the upper tone wheels and a variety of waveforms for the lower tonewheels. Not only that, but you can swap the upper and lower tone wheel groups. The creative possibilities are limited only by your imagination.

Before Starting KB3 Mode

After you've loaded the new operating system and KB3 programs, we know you'll want to get jamming right away. Before you start, however, take a minute to check the settings of your Drum Channel and Control Setup.

Drum Channel

To get started with KB3 Mode, first make sure that the current MIDI channel is the one designated as the Drum Channel on the Master page. None of the other channels (including other drum channels) will work with KB3 Mode. If the names of all the KB3 programs are in parentheses, it means that your K2500 is not transmitting on the Drum Channel; the box at the left of the Program display will indicate the channel you must select.

An important note for PC88 Users: Do not use channel 1 as the Drum Channel on your K2500 if you will be controlling it from a PC88. This is because the PC88 sends controller 90 for VGM FX selection on channel 1, while the K2500 uses controller 90 for leakage level.

Control Setup

The current Control Setup, which you set on the MIDI Transmit Page, will affect how MIDI controllers – such as drawbars – function within KB3 Mode. For predictable results, we suggest you start with "97 Control Setup". If you create a Setup with a KB3 program, we suggest you either start with "97 Control Setup" as your editing template, or use the Import Zone function to import the parameters from "97 Control Setup" into the zone you intend to use for your KB3 program.

For K2500R Owners

See the section "MIDI Control of KB3", near the end of this document.

Get Playing

Once you've checked your Drum Channel and Control Setup, all you have to do to get going is select one of the KB3 programs and start playing.

Drawbars

The drawbars on a tone wheel organ emulate pipes of different lengths on a pipe organ. In either case, they are controlled by changing the positions of a number of "stops". As the organist pulls out or pushes in these stops, he adds or reduces harmonics. Whether it's pipes or drawbars, though, the stops work like this: pull one out to add more of an overtone; push it in to reduce the volume of the overtone.

The stops on the most popular tone wheel organs are: 16', 5¹/₃', 8', 4', 2²/₃', 2', 1³/₅', 1¹/₃', and 1'. Note that they are still measured in feet, a carryover from pipe organ days. The 16' and 5¹/₃' stops are considered the subharmonic group, while the third stop, 8', produces the fundamental of a tone, and stops 4-9 produce harmonics above the fundamental. By making use of different combinations of these harmonics, a rich sort of additive synthesis is possible. Best of all, you can make radical changes to the tone dynamically as you play.

On a K2500 keyboard, check out the eight sliders and the mod wheel; together they emulate the nine drawbars you may be familiar with. To be as close to an actual tone wheel organ as possible, we've programmed sliders A-H to serve as drawbars 1-8; sliding one of these sliders up "pushes in" a drawbar. Conversely, "pulling out" a drawbar involves sliding a slider down.

The mod wheel works a little differently. Since it functions as drawbar 9, often unused by organists, we've made it work more like a conventional mod wheel: roll the mod wheel away from you to pull out the drawbar; roll it towards you to push the drawbar in. In other words, if you normally keep the mod wheel down all the way, then this drawbar will normally be in.

KB3 Mode buttons

The eight buttons above the sliders on K2500 keyboards have special capabilities in KB3 Mode. These include changing the speed of the rotary speaker emulation, turning vibrato or chorus on and off, and various percussion features. The buttons control both the K2500's internal effects, by the way, and also any external MIDI devices to which you may be connected (see "MIDI Control of KB3", near the end of this document, for a listing of the controller values transmitted).

Attach the "Assignable Controllers / KB3 Mode" label above the eight buttons on your K2500 keyboard. For your convenience, a full size copy of this label is included on the last page of this document. These buttons normally perform zone muting in Setup mode, so to use them as KB3 Mode buttons you must set the Mutes parameter on the Setup Mode COMMON page (new in Version 2.5 software) to "KB3 Control". These buttons will still do zone muting, however, unless there is an active KB3 program.

<i>Assignable Controllers / KB3 Mode</i>							
<i>Rotary</i>	<i>Vibrato</i>	<i>Percussion</i>					
<i>Fast/Slow</i>	<i>On/Off</i>	<i>Select</i>	<i>Depth</i>	<i>On/Off</i>	<i>Volume</i>	<i>Decay</i>	<i>Pitch</i>
		<i>Chorus/Vibrato</i>	<i>1/2/3</i>		<i>Loud/Soft</i>	<i>Fast/Slow</i>	<i>High/Low</i>

Editing a KB3 Program

You can edit a wide assortment of any KB3 program's parameters. You can also create your own KB3 programs, though you must start with an existing KB3 program to do this. A regular K2500 program cannot be turned into a KB3 program. If you're not sure whether the current program is a KB3 program, check the information box on the left side of the program display; it will indicate "KB3 Program" if that's what the program is.

Enter the KB3 program editor by pressing the Edit button while a KB3 program is selected in program mode. You'll quickly see that the KB3 editor differs from the standard V.A.S.T. program editor.

KB3 Program Editor–TONEWL Page

By default, KB3 Mode uses DSP generated waveforms for the lower half of its tonewheels and samples for the upper half of its tonewheels. Using the parameters on the TONEWL page, you can specify the waveforms and samples you wish to use, the number of tonewheels (which will affect how many other voices are available to you), and other related settings. You can even switch the tonewheels, so that samples are used for the lower tonewheels and waveforms are used for the upper ones.

```

EditProg: TONEWL
UpperToneWheels: 163 Sine Wave
LowerToneWheels: SINE2 LowerXpose: 0ST
UpperVolAdjust: -2dB UpperXpose: 0ST
NumToneWheels: 79 LowestPitch: C 2
Upper/LowerSwap: Off
WheelVolumeMap: Bright OrganMap: Peck's
<more> TONEWL DRAWBS SetDBS PITCH <more>

```

Upper Tone Wheels

Use this parameter to indicate the keymap (and thereby the samples) to use for the upper tone wheels. You can use any ROM or RAM based keymap, though you must specify a keymap that uses looped samples for KB3 Mode to work correctly. This keymap's name will be displayed in the information box on the left side of the program display whenever this KB3 program is selected.

Lower Tone Wheels

Here you can specify the waveform to use for the lower half of the tonewheels. Choose from SINE, SINE2, SAW, and SQUARE. SINE2 is an improved version of SINE, with less distortion.

Upper Volume Adjust

Since sample volumes can vary, while the volume of DSP-generated waveforms will remain consistent, you may find it necessary to adjust the level of the sample-based tone wheels. This parameter lets you adjust the amplitude of the upper (sample-based) tone wheels relative to amplitude of the wave-form generated tone wheels.

Number of Tone Wheels

This parameter lets you specify the number of tone wheels used by a KB3 program. The classic tone wheel organs used 91 tone wheels, though the lowest 12 were for the pedals only. Therefore, you may find 79 a good number of tone wheels to specify for realistic organ emulations. This would leave you eight voices for other programs. You can specify up to 95 tone wheels.

Here's how to do the math to calculate polyphony: the number of K2500 voices used by a KB3 program is $(\text{number of tone wheels} + 1) / 2$, rounded to the next highest whole number if the result is a fraction. So, for example, with 79 tone wheels specified you would use 40 voices. Keep in mind that these voices are permanently allocated and running while the KB3 program is selected, and cannot be stolen. The additional voice used by KB3 programs, by the way, is for keyclick.

Upper/Lower Swap

Use this parameter to swap the upper and lower tone wheel groups (i.e., to use sample-based tone wheels for the lower positions and waveform-generated tone wheels in the upper positions).

Wheel Volume Map

We've provided several tone wheel volume maps here, based on measurements we've taken on different organs. Choose from Bright, Equal, Mellow, or Junky.

Organ Map

This is the place to adjust the relative amplitude of each key, per drawbar. Like the tone wheel volume maps, these maps are based on measurements we've made on actual organs. The choices are: Bob's, Peck's, Eric's, and Equal.

Lower Transpose / Upper Transpose

These two parameters let you transpose the upper and/or lower tone wheels in semitone steps away from their default tunings.

Lowest Pitch

Here you can specify the pitch of the lowest tone wheel, which is typically set to C2. The rest of the tone wheels – as many as you have specified in the NumToneWheels parameter – will be tuned in semitone steps above this pitch.

KB3 Program Editor–DRAWBR Page

Press the **Drawbr** soft button to access the KB3 Program Editor's Drawbar Page. This page lets you edit KB3's drawbars. Remember that your K2500's sliders function as drawbars 1-8, while the mod wheel is drawbar 9.

```

EditProg: DRAWBR
Mode: Preset Steps: 0-8
Vol : 0   0   0   0   0   0   0   0   8
Tune: -12 7   0   12  19  24  28  31  36
<more TONEWL DRAWBR SetDBR PITCH more>
  
```

Mode

When you set Mode to "Preset," the preset drawbar settings on this page will be installed at program selection. The drawbar values will immediately change, however, as soon as you move the drawbar. Set Mode to "Live" if you want the drawbar volume settings at program selection to be determined only by the position of the MIDI drawbar controllers (e.g., mod wheel and sliders). With either setting – Preset or Live – the MIDI drawbar controllers will affect drawbar volumes subsequent to program selection.

Steps

This parameter lets you specify the increments by which drawbar volumes will change. Choose either "0-8", to approximate the drawbar settings on actual organs, or choose "0-127" for a finer degree of resolution.

Volume

This parameter only appears if you've set Mode (see above) to "Preset". Use the Volume parameter to set the preset volume of each of the nine drawbars. The available values will be 0-8 or 0-127, depending on the setting of the Steps parameter, also on this page.

Tune

This parameter lets you tune each of the nine drawbars in semitone steps up or down.

SetDBR Soft Button

Press the **SetDBR** soft button to capture the current position of the drawbars into the "Preset" volumes on the DRAWBR page.

EditProg:PERC

Percussion is a characteristic feature of tone wheel organs. It's especially useful while soloing, since percussion adds an extra plink (actually an extra tone at a defined harmonic) to the attack of individual notes. When you play more than one note simultaneously, only the first note you play will trigger the envelope of the percussion tone, though notes played shortly afterwards will also be affected by this envelope. When you play chords, all of the notes played simultaneously will get the percussive effect. (provided percussion hasn't already been triggered.) You can reach the KB3 Program Editor's percussion parameters by pressing the **Perc** and **Perc2** soft buttons.

Percussion

This is where you turn the percussion effect on or off. Percussion is created by a decaying envelope applied to one of the nine drawbars. The percussion effect is "single-triggered", which means that once it's triggered, it won't trigger again until all keys go up. You can also turn percussion on or off by pressing button 5 on the front panel of a K2500 keyboard.

Volume

This parameter switches between loud and soft percussion settings. The actual amplitude is set on the PERC2 page. You can also set volume soft or loud by pressing button 6 on the front panel of a K2500 keyboard.

Decay

This parameter switches between fast and slow percussion settings. The actual decay rate is set on the PERC2 page. You can also set decay fast or slow by pressing button 7 on the front panel of a K2500 keyboard.

Harmonic

This parameter switches between high and low harmonic percussion settings. The actual pitch is controlled by the LowHarm and HighHarm parameters. You can also toggle between high or low harmonics by pressing button 8 on the front panel of a K2500 keyboard.

VelTrack

Here is where you specify the degree to which key velocity controls percussion volume. A value of zero corresponds to no velocity tracking, which is like a real tone wheel organ. Other values add velocity tracking, so that increased velocity results in louder percussion.

LowHarm

Controls which drawbar is used as the basis for the percussion when Harmonic is set to "Low". On an actual tone wheel organ, this is drawbar 4 (2nd harmonic). The actual pitch obtained depends on the drawbar tuning.

HighHarm

Controls which drawbar is used as the basis for the percussion when Harmonic is set to "High". On an actual tone wheel organ, this is drawbar 5 (3rd harmonic). The actual pitch obtained depends on the drawbar tuning.

StealBar

Controls which drawbar is disabled (if any) when the percussion effect is turned on. On an unmodified tone wheel organ, the ninth drawbar is the one disabled. Any drawbar can be selected, including "None".

EditProg:PERC2**PercLevel, DecayTime, OrgLevel**

These parameters let you control the amplitude and decay rate of the percussion effect for all combinations of the Loud/Soft and Fast/Slow parameters. Additionally a compensating organ level is provided for each combination, to allow for accurate modeling of classic organs.

EditProg:KEYCLK

The Key Click feature adds a decaying burst of pitched noise to the attack of notes. Unlike the percussion, the key click is "multi-triggered", which means that every new note will trigger it. The parameters on this page primarily control the decay, volume, and pitch of the key click.

KeyClick

This is where you turn Key Click on or off.

Volume

This parameter sets the level of the keyclick; the noise decays from the level you set here. This level is scaled by the drawbar levels, as well as the expression pedal level.

Decay

Sets the basic decay time of the noise envelope. Smaller values produce a shorter burst.

Pitch

Sets the basic pitch of the key click noise, relative to the highest tone wheel's pitch. The pitch is actually controlled by a steep lowpass filter applied to white noise.

VelTrk

Controls the degree to which key velocity affects the key click volume. A value of zero means that the key velocity has no effect on the key click volume. Other values add volume as the velocity increases.

Random

Controls the degree to which a random amount of amplitude variation is added to the key click.

ReTrigThresh

This parameter lets you set the volume level below which key click must decay before it will be retriggered.

Note Attack Normal/Hard

Controls the attack characteristic of notes. "Normal" provides a smoothed attack, while a setting of "Hard" has an instant attack and will produce an audible click, in addition to any amount of key click programmed here. "PercHard" sets a hard attack level for percussion only; all other notes will use a normal attack.

Note Release Normal/Hard

Controls the release characteristic of notes. A setting of "Normal" has a smoothed release, while a setting of Hard has an instant release. "Hard" will produce an audible click.

EditProg:MISC

PreampResp

Set this parameter "On" or "Off" to enable or disable the preamp+expression pedal part of the KB3 model. Turning this "On" (the default) makes KB3 programs function like stock organs. The expression pedal in this case is more than a volume pedal; it actually functions like a "loudness control", varying the frequency response to compensate for the ear's sensitivity at different volumes. In addition, the preamp provides a de-emphasis curve to compensate for the built-in tone wheel volume pre-emphasis. Turning preamp response "Off" emulates organs that have been modified to have a direct out (before the preamp and expression pedal).

Leakage

Controls the level of the simulated crosstalk and signal "bleed" of adjacent tone wheels in the model. This is provided to help "dirty up" the sound to make it a bit more realistic. A setting of -96 dB gives the purest tones; other values add more simulated leakage. This level is scaled by the drawbar levels, as well as the expression pedal level.

LeakMode

Selects between different leakage models, determining which leakage harmonics are emphasized. "TypeA" provides an overall tone wheel leakage, with all tone wheels leaking a small amount. "TypeX", "TypeY", and "TypeZ" emulate different degrees of drawbar leakage, where the leakage components correspond to the nine drawbars, instead of all the tone wheels.

SpeedCtl

Select either "Fast" or "Slow" to choose the speed of the rotary speaker emulation. KB3 Mode does not directly provide a rotating speaker simulation; by default it uses the internal K2500 effects processor. (The KDFX option will provide comprehensive effects capabilities.) The SpeedCtl parameter allows control of either an external or K2500-generated rotating speaker simulation. On selection of a KB3 program, the value of this parameter is used to generate a MIDI control (locally and to external MIDI) which can be patched to perform the desired effect. The control values used are 0 = Slow, and 127 = Fast. The controller number used for this feature is 68. You can toggle between fast and slow speed using button 1 on the front panel of K2500 keyboards.

VibChorCtl

Choose "On" or "Off" to turn on or off either vibrato or chorus (as selected in the VibChorSel parameter, also on this page). KB3 Mode does not directly provide a chorus/vibrato simulation; by default it uses the internal K2500 effects processor. (The KDFX option will provide comprehensive effects capabilities.) The VibChorCtl parameter allows control of either an external or K2500-generated chorus/vibrato simulation. On selection of a KB3 program, the value of this parameter is used to generate a MIDI control (locally and to external MIDI) which can be patched to perform the desired effect. The control values used are 0 = Off, and 127 = On. The controller number used for this feature is 95. Use button 2 on the front panel of K2500 keyboards to toggle between on and off.

VibChorSel

Choose the vibrato or chorus program (there are three of each) you wish to use with this KB3 program. Note that you must set VibChorCtl (also on the MISC page) to "On" to hear the effect. On selection of a KB3 program, the value of this parameter is used to generate a MIDI control (locally and to external MIDI) which can be patched to perform the desired vibrato or chorus effect. The control values used are 0 = Vib1, 36 = Vib2, 58 = Vib3, 79 = Chor1, 100 = Chor2, 122 = Chor3. The controller number used for this feature is 93. Buttons 3 and 4 on the front panel of K2500 keyboards also lets you select the chorus or vibrato program you want.

VolAdjust

Provides an overall volume adjust for the KB3 model. Use this parameter to "normalize" KB3 programs with other programs.

BendRange

Controls the pitch bend range of this KB3 program.

Sustain

Set "On" or "Off" to enable or disable response to MIDI sustain (CC#64).

Sostenuto

Set "On" or "Off" to enable or disable response to MIDI sostenuto (CC#66).

EditProg:EQ

When you press the **EQ** soft button, you'll see a page that at first glance looks quite similar to a regular K2500 Program's algorithm page. The four boxes on this page, however, represent two shelving bands of equalization and two parametric bands. The KB3 EQ offered here, though, is not implemented as a true EQ section, instead it adjusts the volume of the tone wheels based on frequency. If the tone wheels are based on sine waves, then this acts a lot like a real EQ.

Each EQ section has Gain (G), Frequency (F), and Width (W) controls. Frequency controls the center frequency of the band. Width controls the bandwidth. Gain controls the amount of boost or cut.

Programming Tips

This section provides some starting points for creating your own KB3 programs. Remember that you'll have to start with one of the existing KB3 programs.

As described below, the most prominent difference between organ vintages is the number of tone wheels used. Keep in mind, however, that the sound of an actual tone wheel organ will depend not only on its age, but also on how well it has been maintained.

"Octave folding", where an octave (or part of an octave) is repeated at the top or bottom of the keyboard, will be handled automatically by KB3 Mode, and will emulate the folding done on actual tone wheel organs.

Early Tone Wheel Organs. Instruments of this period had 91 tone wheels. To get this sound, go to the TONEWL page, select 91 tone wheels, and set lowest pitch to C 1. Start with the "Junky" Wheel Volume Map and "Bob's" Organ Map. You may also want to increase the Key Click level, since this tends to become louder on older organs.

Middle Period Organs. To model one of these instruments, set 82 tone wheels and a low note of A 1. Use the "Mellow" Wheel Volume Map and "Eric's" Organ Map. Set Key Click to a moderate level.

The Classic B-3. For this sound, choose 79 tone wheels and set the low note to be C 2. The best settings here are the "Bright" Wheel Volume Map and "Peck's" Organ Map. You may also want to reduce the Key Click level.

Using a KB3 Program in a Setup

When using a KB3 Program in Setup Mode, you must first set a few parameters on the Effects Mode page. This is necessary so that the K2500's internal effects (non-KDFX) rotary speaker simulator will work properly. Set FX Mode to "Program" and FX Chan to the current drum channel.

Emulating a Two-Manual Organ

You can use Setup Mode to emulate a two-manual keyboard. However, you can only use a KB3 program in one zone of the setup. (Use a regular K2500 organ program in the other zone.) Also, you will have limited polyphony on the non-KB3 channel. The actual number of voices that will be available on the non-KB3 channel depends on the number of tone wheels used by the KB3 program. (You may be able to reduce the number of tone wheels used, depending on the note range of the zone.)

Programs Using 2PARAM SHAPER

If you are running a KB3 program, then you will not be able to simultaneously play K2500 programs that use the 2PARAM SHAPER DSP function on another channel. (Actually, the program will still play, but the 2PARAM SHAPER DSP function will be bypassed.)

Shaper AMP (!AMP)

Although the !AMP DSP function is not part of the KB3 editor, we have used the !AMP to help "dirty-up" several programs. This allows us to re-create the tube distortion characteristics of classic drawbar organ pre-amps.

Using the K2500 Program Editor on a KB3 Program

KB3 Mode lets you access some K2500 program editor parameters - such as the !AMP DSP function mentioned above - that are not found within the KB3 editor. There's a "back door" that lets you access these non-KB3 parameters, since a program editing page that has been MARKed (with the Master / Mark button) from within a normal VAST program can be JUMPed to when in the KB3 editor (with the Song /Jump).

We recommend, however, that you DO NOT edit parameters not normally found in the pages of the KB3 program editor. Nonetheless, we realize that some power users (you know who you are!) will want to hear the results. Before you touch these parameters, please be aware of the following:

- **Turn your volume down!!** In KB3 mode, most resources are being used in much different ways than in a typical V.A.S.T. program; the results of editing "JUMPed-to" parameters can be extremely unpredictable.
- Most changes made to these parameters will not be heard until the program has been saved and re-selected.
- You cannot import a KB3 program layer into a regular V.A.S.T. program.

Live Drawbars

The Live Drawbars program has been included for use as a programming template. It is intended for use with an external rotary speaker cabinet or emulator. This program uses Mode=Live on the Drawbar page, as opposed to Mode=Preset. This means that current value of the corresponding MIDI controllers will produce the drawbar settings when this program is selected. Also, the Live Drawbars program uses effect ID 708 Chorus, and has a closer approximation of the Vibrato/Chorus circuit found on classic tone wheel organs.

MIDI Control of KB3

KB3 programs use a fixed MIDI control model, so that certain MIDI controller numbers will always control certain KB3 functions. In general, this requires that any remapping be done at the MIDI transmit level. The MIDI controller mappings to KB3 functions are documented below, and are chosen to work with the Control Setup 97. Furthermore, KB3 programs will automatically respond correctly to the controller numbers shown in parentheses; these values are used by the Voce MIDI Drawbar controller made by Voce, Inc.

Kurzweil Controller #	(Voce™ Controller #)	Function
6	(12)	Drawbar1
22	(13)	Drawbar2
23	(14)	Drawbar3
24	(15)	Drawbar4
25	(16)	Drawbar5
26	(17)	Drawbar6
27	(18)	Drawbar7
28	(19)	Drawbar8
1	(20)	Drawbar9
4	(8)	Expression Pedal
73	N.A.	Percussion On/Off
72	(72)	Percussion High/Low
71	(71)	Percussion Loud/Soft
70	(70)	Percussion Fast/Slow
68	(68)	Rotating Speaker Slow/Fast
95	(95)	Vibrato/Chorus On/Off
93	(93)	Vibrato/Chorus Selector
89	(89)	Key Click Level
90	(90)	Leakage Level

KB3 ROM Objects

Version 2.5 adds ten KB3 organ programs, three effects, and one Quick Access Bank to the 700's bank of your K2500.

Programs

- 760 Testify
- 761 Prog Rock Organ
- 762 Rock Organ
- 763 Dirty Syn B
- 764 Full Drawbars
- 765 Loungin'
- 766 Jazz Set
- 767 WarmDriveBallad
- 768 Gospel Drawbars
- 769 Live Drawbars

KB3 Effects

- 706 Rotary Club
- 707 Rotary Hall
- 708 Chorus

KB3 Quick Access Bank

- 700 KB3 Organs

KB3 Mode Front Panel Label

Assignable Controllers / KB3 Mode					
Rotary	Vibrato	Select	Depth	Percussion	
Fast/Slow	On/Off	Chorus/Vibrato	1/2/3	On/Off	
				Volume	
				Loud/Soft	
				Decay	
				Fast/Slow	
				Pitch	
				High/Low	