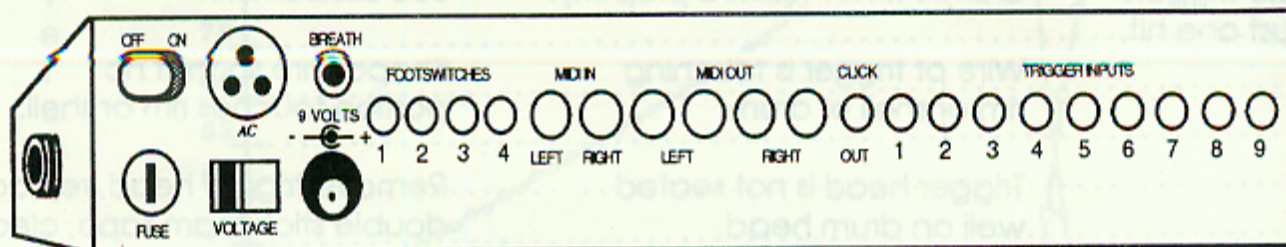


# APPENDIX I:

## drumKAT 3.0 Guide



### INTRODUCTION 3.0

Hello! Welcome to the **drumKAT 3.0**. The **drumKAT 3.0** is a product of evolution. What started as **drumKAT 1.0** in 1988 has involved into an industry standard.

The **drumKAT** has changed physically. The playing surface has evolved in feel and structure. The chassis has been modified to accommodate a FootControl input (for realistic HiHat playing with a **hatKAT**), a breath control input (you can even play notes with your mouth!), locking power cord and backup AC Adaptor input.

The software capabilities have expanded greatly. The power of the triggering section has expanded with the inclusion of an "Interaction Matrix" and further improvements on **KAT**'s Envelope Training Software that makes the **drumKAT 3.0** the interface for acoustic triggering. The Multiple, Alternating, and Velocity Shift modes have grown from 3 Notes to 4 notes per pad. Special Alternate 8 and Random 8 Modes have been added. New HiHat software lets you play 4 HiHat notes with a Footswitch and up to 9 HiHat notes with a **hatKAT**. A Link Mode allows pads to be linked to create wonderful effects and patterns.

All of these changes have been made available as upgrades to everyone who ever bought a **drumKAT** (even in 1988). We tell you this so that you'll know that as the **drumKAT** evolves even further in the years to come - our future innovations will be made available to you too! We won't forget you!

(By the way, we've also included a two page "Screen Map" that shows you what all the Kit Edit Screens and the Global Screens are, etc. at the end of this Guide. This will make it easier to see what all is in your **drumKAT 3.0** and where it is!)



## Version 3.0 - Installation

First, *before* you install 3.0 you should Save your drumKAT 2.5 memory to a data disk or a computer by doing an "ALL MEM" dump from the drumKAT.

3.0 is so significantly different than the 2.5 software that the formatting of your memory is different. When you install 3.0 all of your present Kits and other settings will be "trashed". The complexity of 3.0 required that the number of Kits be dropped from 32 to 30 to provide room for the 4 notes per pad, HiHat modes, linking, etc. This means that Kits 31 and 32 will no longer exist on your 3.0 drumKAT. So, before you dump your 2.5 Kits make sure that 31 and 32 are not your two favorite Kits! (If they *are*, simply do a KitCopy to some less needed Kit.)

After you have installed 3.0 you can receive this 2.5 dump back into your drumKAT and the drumKAT will automatically reformat this information to conform to the 3.0 system.

-----

**Tools Needed To Change Software:** 1 small & 1 medium flat screwdriver.

- 1) First, remove the power cord from the back of the drumKAT!
- 2) Find a smooth, clean, flat surface and place your drumKAT upside down on it, the jacks facing away from you.
- 3) Remove back cover of the drumKAT (10 screws).
- 4) When the drumKAT is opened, you will see one large circuit board. On the front right of the printed circuit board is a large chip with a white paper label that says something like "drumKAT 2.5". This chip is next to a chip that says "DALLAS". The chip with the white label is your Software Chip, the code that runs your drumKAT - its Operating System.
- 5) To remove an old chip you will use your small flat screwdriver. You will want to pry the chip out of its socket. **DO NOT** pry out either of the two sockets underneath the Software Chip. They both remain attached to the printed circuit board. Look at the Upgrade chip you received and you will be able to tell what is the chip and what is the socket. You want to insert the screwdriver *between* the chip and the *top* of the two sockets so as to pry up the chip but not the sockets. You also should take turns prying a little bit at a time on each



side of the chip. If you pry a LOT on one side, you will excessively bend the small legs on the other side as the chip pivots on them.

Don't be scared - just pry a little more on each side alternately until the chip is out. Take your time, don't be in a hurry.

Make sure you insert the small screwdriver *between* the chip and the socket before you start to pry each time. (**Instead of between the socket and the circuit board or between the two sockets.**)

- 6) After you have the chip out, place the new chip in its socket. Take a little care to align the legs of the chip into the holes in the pins of the socket. Then push down evenly on the chip. It should push down snugly into the socket. Visually check to see that none of the legs got squished and are **smashed under the chip**.
- 7) Replace the back cover of your drumKAT and reinsert the 10 screws.
- 8) Turn your drumKAT back over, and reinsert the power cord. Now turn your drumKAT back on. If the display is working, you are OK.

If the display is not working then:

- a) Remove the power cord again.
  - b) Turn the drumKAT back over again and remove the 10 screws.
  - c) Take the back cover off again.
  - d) Try reinserting the chip (pry it out again to make sure that the legs didn't get bent under the chip).
  - e) Put the back cover on, turn the drumKAT back over, reinsert the power cord, and turn the power back on.
  - f) If this still fails, put your OLD software back in and give us a call. (413-594-7466)
- 10) After you have had the new software in and used it for several days, please send the old chip back to us. They are reusable.

To properly **initialize** your new unit either:

A. Dump in an "ALL MEM" or "ALL KITS" that was saved from a 2.5 or 3.0 drumKAT previously.

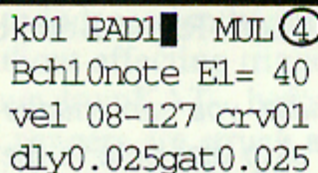
B. Manually retrain triggers (do trigger train twice on an uninitialized drumKAT) and pads, adjust thresholds, and adjust the Global settings.



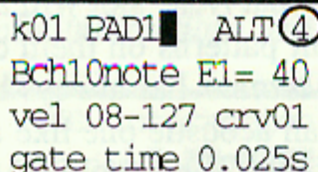
## I. 4 Note Multiple, Alternate, and Velocity Shift.

You can now do the *Multiple*, *Alternate* and *Velocity Shift* modes with Four Notes instead of the previous Three Notes. This new fourth note is completely independent of the other 3. Now you can stack 4 Notes to make a super-thick sound or play 4 note chords, alternate in 4 note patterns, or totally control the blend of 4 separate sounds with velocity.

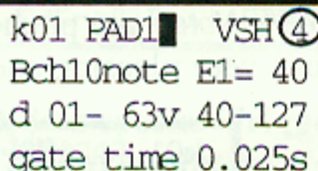
All you need to do is advance the *Sound #* on the right hand end of the first line (in *Multiple*, *Alternate*, or *Velocity Shift* modes) past 3 to 4! Now define the new 4th Note and have fun!



```
k01 PAD1■ MUL ④  
Bch10note E1= 40  
vel 08-127 crv01  
dly0.025gat0.025
```



```
k01 PAD1■ ALT ④  
Bch10note E1= 40  
vel 08-127 crv01  
gate time 0.025s
```



```
k01 PAD1■ VSH ④  
Bch10note E1= 40  
d 01- 63v 40-127  
gate time 0.025s
```

Note also that the action of the HEAR SOUND Pad has changed somewhat. Now, when you are in these modes and hit the HEAR SOUND Pad in Edit you hear ONLY the part of the sound you are looking at. This makes it much easier to tell which sound you are currently editing.



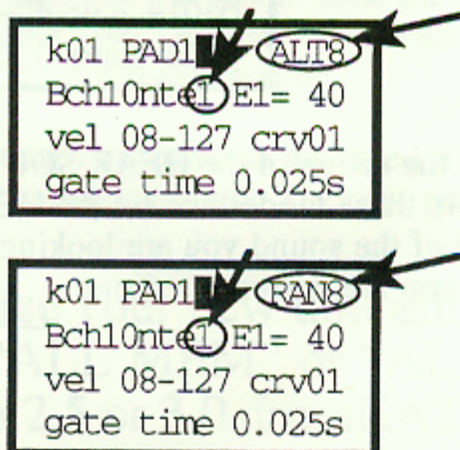
## II. Special 8 Note Alternate and Random Modes.

We've added 2 modes that allow you to cycle through **8** sounds. This allows you to get interesting pattern combinations on Linked pads (see IV.) or mix up a lot of similar samples of a snare drum to give you more of a natural sound when playing.

If all 8 notes were totally definable the KIT size would grow considerably and allow even fewer KITs to be stored (note that as it is, we have had to reduce kits to 30 from 32 to accommodate the new additions). A compromise was made to avoid making the KIT size become too large. The compromise is that these two modes don't allow independent control of all settings. Each *Note* can be on a separate *Channel* but they all share the same *Velocity* and *Gate Time* settings and the same *Sides* setting (Left, Right, Both, or Neither).

In the **8 Note Alternate** you can choose to define **8** or less notes. If you set the note to "OFF" you will skip that note in the pattern, allowing you to alternate in 6, or 5, or 3, etc. If you set the *Channel* of a *Note* to a Channel that no Sound Source is set to respond to, that *Note* slot will act as a rest in the pattern! Several different pads with different patterns on them can result in fabulous grooves.

One of the uses of *Alternate* has always been to mix up several similar samples of a sound (often an acoustic one like a snare drum or a piano) to give the sound a more natural feel. The **8 Note RANDOM** mode expands this approach and makes it even more alive. In this mode the 8 *Notes* are chosen randomly as you play. If the 8 *Notes* are pitched and in a scale relationship, the **8 Note RANDOM** can produce very pleasing and surprising results.



Notice that the "note" has been changed to "nte1". The "1" here changes to allow you to select each of the 8 notes (the "8" of "ALT8" and "RAN8" doesn't change because "ALT8" is the actual name of the mode).



### III. Improved Triggering and Trigger Interaction Matrix.

When we designed the **midikIT1** (after the **drumKAT**) we developed even better methods of handling complex acoustic drum signals. This resulted in the **midikIT1** becoming the professional choice for acoustic drum triggering. Which was great! But this made us feel sorry for you loyal **drumKAT** owners! So to eliminate our guilt we have now added all those advances to your **drumKAT 3.0** - and developed some even better signal processing methods for the **drumKAT 3.0** in the process.

Most of the changes are hidden to you - hidden in the *processing* of your *trigger signals*. The most noticeable change is the **Trigger Interaction Matrix**. This feature allows you to independently eliminate the *interaction* between two or more triggers without affecting triggers that are not involved. On other interfaces (including your **drumKAT** - before today!) this often results in missed hits when two or more triggers are struck at once. The *Trigger Interaction Matrix* allows you to group only the triggers that are physically affecting each other. You tell the **drumKAT** which triggers cause which other triggers to misfire and those specific *interactions* are suppressed independently and by a *selectable* amount.

TRG1 interaction  
matrix: ■2■■5■■■■  
amt= 25%    20mS  
set->hit T1 hard

To help you utilize this mode a special **Trigger Interaction Auto-Train** has been added. When at the *Trigger Interaction* screen, hitting the selected trigger will cause a reading of all triggers and the amount of interaction present on the other triggers generated by this hit will be calculated. All the triggers that interact will show their trigger # as a member of the matrix on this screen. All triggers that do not interact from a certain trigger are seen as black rectangles to indicate they are not physically involved. The amount of *interaction* is calculated for you. The calculated amounts and membership in the interaction matrix are easily edited manually same as all of the other **drumKAT** settings.

On the screen shown above triggers 2 and 5 interact (false-trigger) when 1 is hit. The size of the interaction signal present on 2 and 5 is about 1/4 (25%) the size of the actual hit on TRG1. The time that this interaction is present for is about 20mS (milli-seconds).

If you know that trigger 6 sometimes interacts also and you want to include it in the matrix, simply tap trigger 6 and it will join the matrix on the screen.



Likewise, a trigger that you don't care about interacting (a cymbal pad for example, that when played softly is inaudible) can be *removed* from the matrix by tapping that Pad.

Back in PLAY MODE, *after* the training is done, when TRG1 is hit light hits on Trigs 2 and 5 are ignored for 20mS after the hit of Trig 1, unless they are greater than 25% of Trig 1 (in this example, based on the screen settings).



## IV. Link Mode.

The new **LINK MODE** allows you to combine any two modes by *LINKing* any pad or trigger to another. When a pad is linked to another it will cause the other trigger to be played whenever the first is played. If two pads or triggers are both *Multiple* you will get an *8 Note Multiple* when you *LINK* them. *LINKing* two *Alternating* pads will cause the two patterns to be played on top of each other. Any two modes may be *linked* together in this manner.

The result is always the same as hitting both pads simultaneously. A simple mode - but with powerful, fun, and surprising results.

To set up a **LINK**, look for a screen that looks like the following:


```
k01    PAD1  
  
link to ■
```

Get the ■ blinking. Use Value Advance to change it to "PAD3".

```
k01    PAD1  
  
link to PAD3
```

Now any hit on Pad1 will cause Pad3 to *also* play.

On the usual Pad Definition screen a new parameter has been added to allow you to see if a Pad is linked or not - right here! If a Pad is Linked to some other Pad an "L" will appear here, otherwise a ■ will appear to indicate the Pad is not Linked to another Pad. Note, you can not select or change the Link here, only see it.



```
k01 PAD1 L SIMPL  
ch10 note E1= 40  
vel 08-127 crv01  
gate time 0.025s
```



## Link Examples:

Linking two Alternating pads (say 7 and 8) will result in the *two* patterns being played *on top of each other* as you play pad 7. If you then hit pad 8 once (assuming it is not linked back to 7 as well) and then play on pad 7 again the two patterns will play on top of each other - *but* shifted by one note. Another hit on pad 8 alone will cause hits of 7 to play both patterns offset from each other by two notes, Etc.! (Home base can reset them to back in sync of course - and that Home base could itself be linked to another pad so that resyncing can even fit into your playing!).

By linking a velocity shift pad with a multiple pad that has several delayed notes gives an incredible combination of control by *both* how hard and how *fast* you play on the controlling pad.

Linking a Sequence Start and a Simple mode pad will enable you to get a snare sound (or a clave, etc.) when you start an external sequence.

Linking a motif slicing pad with a velocity shift pad can result in complex patterns readily controllable by your dynamics.

Link the Breath Controller to a Pad or Trigger and you can play notes with the Breath Control - 5 limb coordination!

Link two Random 8 pads and even we can't tell you what you will get !



## V. KIT ADVANCE / BACKUP - from pads and triggers

This is another feature that we put in to the design of the **midIKIT1**, to the delight of **midIKIT1** owners. This allowed them to select a new kit while playing without having to move their feet off of the bass and hihat. But **drumKAT** owners said, "Hey, What about us?" Okay, okay now we've done it for the **drumKAT 3.0** too.

A new Control screen has been added for the pads and triggers so any pads or triggers can be selected as **Kit Advance** or **Kit Backup**. (Naturally it can be linked to another pad to make the sound of a snare or cymbal at the same time.) If you have **Song Mode** turned **On**, the pad will step you forward or backward through the **Steps** of the Song.

k01 PAD1	CNTRL
KIT ADVANCE	

k01 PAD1	CNTRL
KIT REVERSE	

To use this, simply select the pad or trigger you want to use. Then put it in **CNTRL Mode**. Next, select the Control Type (left side of 2nd line) and Value **Advance** until you see these choices.

Note, if you Link this Pad or Trigger to another Pad or Trigger that is making an appropriate Sound you can change Kits without even missing a beat!



## VI. Foot Control Input and New High Hat Software.

As part of the hardware upgrade to your drumKAT to make it into a 2.5 drumKAT, an insulated 1/4" phone jack was added to the right side of your drumKAT. This is for use with an expression pedal.

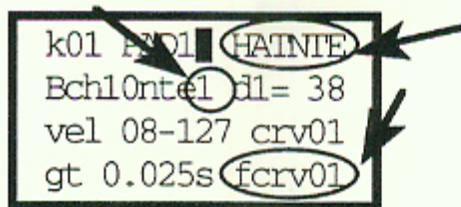
KAT now sells a "hatKAT" (with control pedal out, trigger out and footswitch all built into one) specifically for this purpose. Combined with new software in the 3.0 drumKAT this pedal can give very realistic hihat playing. As you depress the pedal more and more, the sound of playing on the hihat pad can get *more and more* closed. Even the "chick" sound is dynamic.

### HOOKING UP YOUR hatKAT

Using the hatKAT as a hi hat with the 3.0 drumKAT.

- 1) Connect the **CTRL** out of the hatKAT to the hatKAT/KF1 input. (In HATNTE mode, the pedal will allow you to select between the 8 different note numbers that you can assign; In HATGTE mode, the duration of the note number assigned is lengthened or shortened depending on the position of the pedal)
- 2) Connect the **TRIG** out of the hatKAT to a trigger input on the drumKAT. (This will give you a velocity-sensitive foot closed sound)
- 3) **FTSW** out of hatKAT not used.

The new hihat software allows you to select one of two new methods of advanced hihat control.

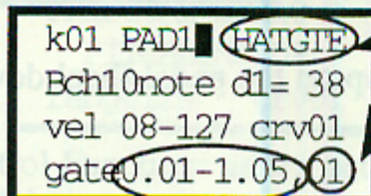


In "HATNOTE" mode you can select up to 8 notes that will be played on the pad, based upon position of the pedal when the hihat pad is struck. Where the 8 (or fewer) sounds are selected by position of pedal is controlled by the "fcrv" -



FootCuRve. Like Alternate 8 and Random 8 these 8 notes can be on different MIDI Channels, but share Velocity and Gate Time settings. By selecting the 8 (or fewer) sounds to be in succeeding amounts of “closedness” playing the hihat pad while closing the pedal will give realistic hat play.

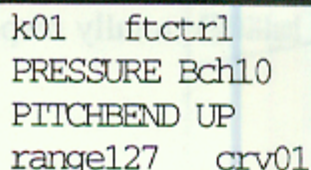
If your drum machine doesn't have multiple hihat sounds to take advantage of the **HATNOTE** mode you have a second option:



```
k01 PAD1 HATGTE
Bch10note d1= 38
vel 08-127 crv01
gate0.01-1.05,01
```

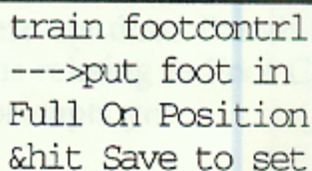
In “**HATGATE**” mode you can select a range of gate times for the hihat pad that will be controlled by the position of the pedal when the pad is hit. The correlation of pedal position to actual gate time is controlled by the foot curve selection at the far right of the bottom line of display. If the hihat pad is assigned to play an open sound - depressing the pedal can result in shortening the open sound gradually to a short closed sound on full depression of the pedal. Your drum machine must be set up to respond to **Note Off** commands so that the drumKAT can control the length of sound heard.

On a separate new Kit Edit screen the pedal can instead be assigned to do the same **Pressure Control Functions** as the pads. Most typical uses are pitchbend, modulation, and stereo panning.



```
k01 ftctrl
PRESSURE Bch10
PITCHBEND UP
range127 crv01
```

The actual *training* of the **halKAT** pedal is done in a new set of screens located under pad 0. The first screen prompts you to “put foot in Full On position” and hit the the Save Pad (7) the lock in the reading:



```
train footctrl
--->put foot in
Full On Position
&hit Save to set
```

So, push your toe down all the way on the pedal (closed) and hit Pad 7, while you keep your toe down.



Then you are prompted to "put foot in Full Off position" and hit the Save pad to lock in that reading:

```
train footcontrl  
-> put foot in  
Full OffPosition  
shit Save to set
```

So, raise your toe up on the pedal (heel down) (or open) and hit Pad 7, *while the pedal is up*.

These readings instruct the drumKAT on the range and type of action of your expression pedal - enabling the drumKAT to work with virtually all expression pedals.

Hit Screen Advance and:

```
foot range  
154-245
```

This screen shows you the actual values of your Foot Control High Dynamic and Low Dynamic. There is no good readings or bad readings. The drumKAT reads the pedal and then uses these readings to make your Foot Control device (hopefully a **hatKAT**) totally responsive.



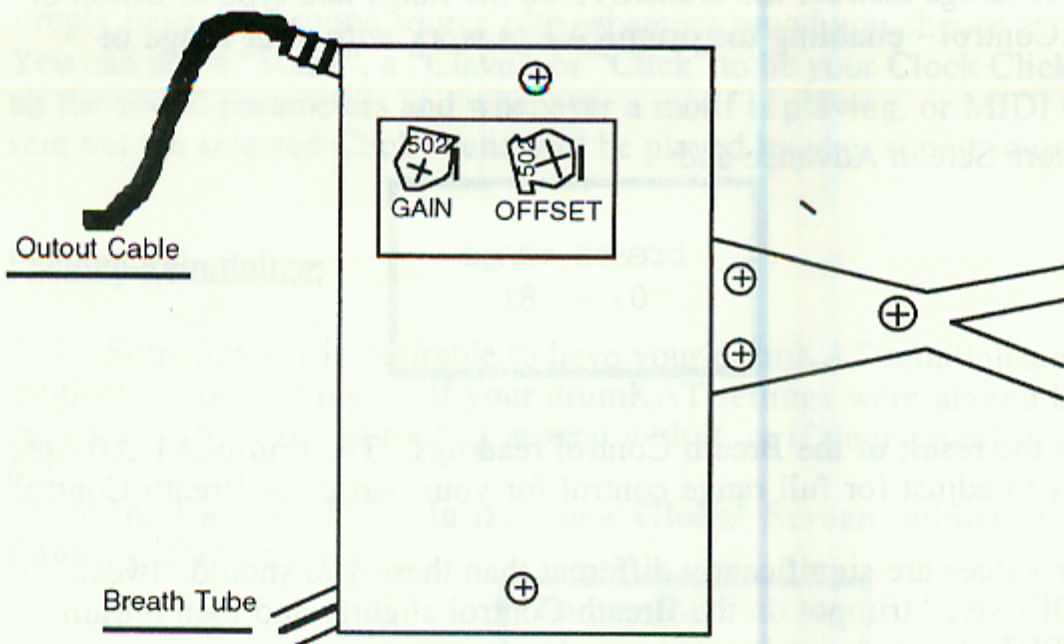
## VII. Breath Control Input.

The **BreathControl** input accepts a signal from the Yamaha BC2 Breath Controller. A new 3.0 screen in the Kit Edit Screens allows **Pressure Control** to be selected for the **Breath Controller**:

```
k01  brctrl  
PRESSURE Bch10  
PITCHBEND UP  
range128  crv01
```

The same **Pressure Control** Functions as the pads are possible. Most typical uses are pitchbend, modulation, and stereo panning.

To actually use a Breath Control you should first adjust the two trimpots in the headset to match the following diagram, then train it. First match these settings:



The actual **training** of the **breath controller** is done in a new set of screens located under pad 0. There are three Breath Control training screens immediately after the three screens relating to Foot Control (see VI.). The first Breath Control Screen prompts you:



```
train breathctrl  
--->Breathe with  
Maximum Pressure  
&hit Save to set
```

So, breathe with full Pressure and the hit Pad 7, *while you are still breathing full.*

Then the screen prompts:

```
train breathctrl  
->Don't breathe  
into BreathCtrl  
&hit Save to set
```

So, *while you are not breathing into the Breath Control*, hit Pad7.

These readings instruct the drumKAT on the range and type of action of your Breath Control - enabling the drumKAT to work with your range of expression.

One more Screen Advance and:

```
breath range  
03 - 81
```

This is the result of the Breath Control readings. The drumKAT 3.0 uses these settings to adjust for full range control for your particular Breath Control.

If your values are significantly different than these you should “tweak” or adjust the “OFFSET” trimpot on the Breath Control slightly and then retrain. Several OFFSET changes may be necessary to get optimum settings. It is not necessary to get *exactly* these settings. The drumKAT will do its best to adjust to whatever readings you get. If your readings are within 03-15 for the low number and 60-83 for the high reading you are OK.



## VIII. Miscellaneous - MIDI Note for Click, Factory Re-initialize, Lock Mode, Convert 2.0 Dumps.

### **MIDI Click:**

A new Global screen allows you to select that a MIDI note be sent for the click of the drumKAT's MIDI Clock.

```
CLICK= MIDI NOTE  
Bch10note E1= 40  
velocity = 00  
gate time 0.025s
```

Instead of plugging the audio Click Out of the drumKAT into your mixer, simply have your sound source play whatever sound you choose as your click! You can use a "Snare", a "Clave", or "Click" to be your Clock Click! Simply set up the sound parameters and whenever a motif is playing, or MIDI Clock is being sent out the selected Click sound will be played by your sound source.

### **Factory-Reinitialize:**

Sometimes it is desirable to have your drumKAT reinitialized to the original factory settings. (If your drumKAT settings were altered beyond recognition by a friend fooling around with it, or if your drumKAT got "spiked out".)

To do the **Factory-Reinitialize** a new **Global Screen** allows you to select **Factory Reinitialize:**

```
to re-initialize  
your drumKAT  
hit pad 8
```

This will cause *all* settings in the drumKAT to return to factory default settings.



## Lock Mode:

At times it is desirable to leave a drumKAT in a "locked" condition. When a drumKAT is **locked**, no settings may be edited or changed. Settings may be examined, but not altered. Kits can be stepped through but the contents of the kits can not be changed.

Reasons to lock a drumKAT include: at a wedding gig where rowdy members of the audience may decide to sit in a your kit while you are on break; in a studio when you decide to leave your gear over-night, in a store when a drumKAT is left on display to be tried out (but not cannibalized!)

To Lock, or Unlock, a drumKAT 3.0 find the following new Global Screen:

your drumKAT is  
UNLOCKED CHANGES  
CAN be made  
to your settings

Value Advance, will toggle you in and out of LOCK

## Convert 2.0 Dumps:

Internally, the data in your drumKAT 3.0 is organized in a much different manner than drumKAT 2.0 and 2.5. To start with the kits are much bigger to accommodate 4 note modes. This results in there being two *fewer* kits - a maximum of **30** as opposed to 32. Also there are many totally *new* modes that need separate amounts of memory to be used. This causes the new **Data Dumps** to contain different *amounts* of data that is organized in a different *manner*. Normally this means that the new software version is *incompatible* with the old and old stored dumps from the previous version just won't be accepted. Well, we had mercy on those of you desiring your old kits to remain workable. We took the time to put in software to automatically convert 2.0 and 2.5 dumps into 3.0 compatible information as it is received. This means your old dumps are converted to work in the new 3.0 configuration as they are received into the drumKAT.

3.0 dumps themselves are stored with different configurations to reflect the changes in memory organization and allocation.

All of this occurs in the background and is taken care of automatically. In other words whether your drumKAT3.0 receives 3.0 Kit dumps or 2.0 Kit dumps, the drumKAT 3.0 will accept both and convert if necessary.