

EMAX HARD DISK SUPPLEMENT

BACKGROUND: WHY HARD DISKS?

The standard Emax comes with a single floppy disk drive for saving and loading bank information. Adding a hard disk drive offers two big advantages:

- Greater storage. The hard disk holds up to 36 banks, the floppy - 1 bank.
- Faster access time. A bank can be saved from the Emax to the hard disk in 8 seconds (as opposed to 1 minute for saving to a floppy), or loaded from the hard disk to the Emax in 4 seconds (as opposed to approximately 26 seconds from a floppy).

What this means is that you can have a large library of banks stored in the hard disk, and that any of these banks can be loaded almost instantly.

THE HARD DISK PERSONALITY

In most cases, you can treat the hard disk just like a super-floppy; transferring data to and from the Emax is straightforward.

Any new hard disk will come with an error log that contains a list of all known errors; this information along with operating system software necessary to format the hard disk, is stored on the Emax hard disk software diskette (supplied with the hard disk unit or retrofit).

Like a floppy disk, the hard disk must be formatted initially to accept data. However, a hard disk may also be formatted if the hard disk “crashes”.

Over time the hard disk can develop errors (particularly if system abuse occurs). When an error is detected, the location of the error is added to the “Error Log” automatically. The error is like a disk read error on a floppy, in which case the bank read is discarded and the display reads “Hard Disk Error”. All of the errors can be “mapped out” when the hard disk is scanned or re-formatted, thus enabling the user to rejuvenate a hard disk that exhibits disk read errors.

This supplement will cover hard disk basics, then discuss the hard disk functions that are accessed via the Master module. These functions cover almost all of your day-to-day use of the hard disk.

POWER-ON WITH HARD DISK SYSTEMS

When you first turn on power, the Emax will test the floppy drive, If there is no floppy in the drive, the Emax will boot (load its operating system software) from the hard disk. This is the preferred mode of operation, as referring to the hard disk for the operating system software greatly speeds up overall Emax operation (i.e. there is virtually no delay when switching from module to module).

The hard disk takes a few seconds to “Spin-up” whenever it is turned on. Upon turn-on the display will read “Diagnostics”, then “Loading Software”, then “Loading Bank” after which the display should be reading the current preset.

If there is a floppy disk in the drive, the Emax will boot from the floppy. This allows you to easily boot the machine if the hard disk is malfunctioning for any reason. Example: Suppose the system “crashes”. System crash may occur after shipment where severe shock to the hard disk has been inflicted. You could re-boot from the hard disk software floppy, thus loading software with which you can reformat the hard disk.

LOADING A BANK FROM THE HARD DISK

Press the **LOAD BANK** button; the display says: Load Bank, and shows the name and number of the Current Bank. Use the data slider to scroll through the available Hard Disk banks (Select 00 to load a bank from the floppy disk). Stop when you find an interesting bank, then press **ENTER**.

An alternate method of loading a Hard Disk bank is to press **LOAD BANK**, then simply type in the number of the bank using the numeric keypad.

After the bank has loaded, the display will show the Current Preset number and name (the cursor will flash underneath the first digit).

SAVING A BANK TO THE HARD DISK

1. Activate **PRESET MANAGEMENT 2**. The display says:

Save To Bank: XX
XX Name of Bank

...where "XX" is the bank number and "Name of Bank" is the name of the bank.

Note: The "Name of Bank" is simply the name of the current preset at the time that the bank was saved to disk.

2. Use the data slider or the increment/decrement buttons to select the destination bank (either hard disk or floppy), and then press **ENTER** to save the bank to disk. Before saving, the display will caution you with the message.

Save To Bank: XX
Overwrites! OK?

Press **YES** to overwrite, **NO** to return to the module identifier. When the save is complete, Emax will return to the Module Identifier.

OTHER HARD DISK RELATED FUNCTIONS

Module: MASTER 8

Function: BACK UP

This module allows you to backup a portion or the entire contents of the hard disk onto floppy diskettes. This function makes backup so easy that you will have no excuse for not backing up all your hard disk banks! Remember, if you would hate to lose it, **BACK IT UP**.

1. **Activate MASTER 8.** The display says:

Backup Bank
Erases Memory! OK?

2. If you don't want to lose what you have in the Bank, save it to disk first (see **PRESET MANAGEMENT 2**). Otherwise, press **YES**.
3. The display now says:

Backup Banks:
all banks

4. Moving the data slider changes the display to:

Backup Banks:
Updated banks

5. Select "All banks" if you want to backup the entire hard disk. Select "Updated banks" if you wish to backup only the banks that have been changed since the last back up.
6. If you select "All banks", the display will prompt you to:

Get XX Formatted
Disks. Ready? Y/N

7. Where "XX" is the number of floppy disks needed.
8. If you select "Updated banks", the display will prompt you to get the number of formatted disks ready that have changed since the last back-up After pressing **ENTER**, you may scroll through the banks that have been changed with the data slider and update your backup disks as desired Any bank may be skipped during backup Press **MASTER** to exit the function.

Hint: It's a good idea to keep your backup copies in order and labeled so that backup and restore can be performed quickly and easily.

Module: MASTER 9

Function: RESTORE

This module allows you to easily restore a portion or the entire contents of the hard disk from your floppy backup diskettes.

1. Activate **MASTER 9**. The display says:

Restore Bank:
Erases memory! OK?

If you don't want to lose what you have in the Bank, save it to disk first (see **PRESET MANAGEMENT 2**). Otherwise, press **YES**.

The display now instructs you to "Insert the Floppy".

Insert the floppy disk with the bank that you wish to restore and press **ENTER** to begin.

2. The display says: **Loading Bank...** and loads the floppy bank. After the disk has been loaded, the display shows the name of the bank just loaded and allows you to select the destination hard disk bank with the slider.

For example, in restoring the Arco Strings bank, the display says:

Arco Strings To
01 Arco Strings

Bank loaded from floppy
Destination bank selected with slider

Any bank may be skipped during restore. Press **MASTER** to exit the function.

Module: MASTER 0

Function: SPECIAL

This module holds some seldom used, but extremely useful, functions.

1. Activate **MASTER 0**. The display says:

Special (1-8)/Slider

2. Select the desired special function. More functions may be added in the future, but here is what is currently available:

1 Copy Software

The E-max operating system deals with such tasks as disk transfers, memory management, and so on. Occasionally E-mu enhances the operating system. Each version of the operating system is numbered, as indicated when you move the data slider all the way to the top while in Special. As newer versions are introduced, use this function to copy the new software on to disks containing the old software. Everything else on the old disk - Samples, Presets, Sequences, and so on remain unchanged.

1. Upon selecting Copy Software, the display says:

Copy Software
Erases memory! OK?

If it's not okay to erase memory, press **NO** and copy the Bank contents to disk. Otherwise, press **YES**. The display now says:

Copy Software
From: harddisk

2. Moving the data slider changes the display to:

Copy Software
From: floppy

Insert the Source disk (the one with the new software) in the drive if you are copying from floppy.

3. Press **ENTER** to select the source drive. This clears the Bank and loads the operating system software into E-max. The display will say: Loading software.
4. If Hard disk is selected then the destination is automatically selected to be the floppy disk. The display will read:

Copy Software
To Floppy – Ready?

Insert the destination diskette and press **YES** to copy the software.

5. If Diskette is selected, the display says:

Copy Software
To: harddisk

6. Moving the data slider changes the display to:

Copy Software
To: floppy

Insert the destination floppy disk (if applicable) and press **ENTER** to initiate the transfer. After copying the software to a floppy, you have the option of copying the software onto another disk (insert the disk then press **YES**) or exit back to the Module Identifier (press **NO**).

2 MIDI Overflow

With MIDI Overflow on, if you play more than eight notes on Emax, the extra notes will appear at the MIDI Out port. Thus, by connecting the MIDI Out to the MIDI In on another Emax “slave” (rack style or keyboard), you will end up with essentially a 16 note polyphonic Emax. Make sure that the “slave” Emax is set to MIDI Overflow Off, otherwise the 17th note will not be played.

3 Disable Channel

If an Emax channel should fail, activate **MASTER 8** and select **SPECIAL 2**. Press the number(s) that correspond to the channel(s) to be disabled. The display will confirm your choice. After finding the bad channel, press **ENTER** to disable the channel and return to the Module Identifier.

4 Recalibrate

With this function you can select minimum and maximum values for the left wheel, right wheel, keyboard pressure, foot pedal, data slider, and volume slider. You can also select a center value for the left wheel. With **SPECIAL 4** selected, select the controller to be re calibrated with the data slider.

With the exception of the left wheel and the footswitch, you will first set the minimum value and press **ENTER**, then the maximum value and press **ENTER**. For the left wheel, you can also set the center value. After making your choices, the display will ask if you want to save results. If so, press **YES**; otherwise, press **NO**.

The recalibrate footswitch function allows EMAX to use either of two types of footswitches (normally open or normally closed), If your footswitch seems to work backwards, try changing the setting of the footswitch select from Footswitch on = Closed to Footswitch on = Open.

5 Audition Note

This function was included for use on the EMAX rack where there might be times when a MIDI keyboard was not connected. This function allows you to play EMAX without a keyboard. Select Special 5 and the display says:

Audition Note: C3
(0-9)/Slider

Moving the slider will select which note is played and buttons 0-9 play the sound.

6 MIDI Analyzer

The MIDI Analyzer is a useful function designed to help you solve MIDI interconnection problems. Select Special 6 and the display says:

MIDI Data In
Use Data Slider

Moving the Data Slider changes the analyzer from analyzing MIDI IN to analyzing MIDI OUT. Press **ENTER** to select. The display now says:

Waiting For
MIDI Data

When MIDI data is received (or sent), the data will be displayed. The analyzer recognizes most MIDI messages, but does not display System Exclusive or Active Sensing messages.

7 Format HD

Just as a floppy disk must be formatted in order to receive Emax data, so must the hard disk. Formatting, which erases any existing hard disk data, occurs for one of two reasons:

- The hard disk has never been used previously and must be prepared for operation. However, *NEVER* format a hard disk before first checking whether or not there are existing banks on the hard disk that should be saved to floppy.
- The hard disk has developed one or more “Disk Read Errors” making one or more banks unavailable. The error scan has been performed but has either failed to restore the banks or has resulted in slow response time from the hard disk or other problems.

Formatting will re-initialize the hard disk and erase any existing banks. Hard disk crashes are not frequent occurrences, which may lull you into a false sense of security. However, Murphy’s Law dictates that a crash will occur when you have sampled fantastic, unique new sounds that aren’t backed up, so *ALWAYS* maintain floppy disk backups of any Banks stored on the hard disk.

1. With a formatted disk already in the drive, activate **MASTER 5**. The display says:

Format Floppy
Erases Memory! OK?

If you don’t want to lose what you have in the Bank, save it to disk first (see **PRESET MANAGEMENT 2**). Otherwise, press **YES**.

2. The display says:

Get Software
From: harddisk

Moving the data slider changes the display to:

Get Software
From: floppy

3. If you choose floppy, the display says:

Please Insert
Source Disk

Check that a formatted Emax disk with the latest software is in the drive. If not, insert one. To prevent any embarrassing errors write-protect the disk (**GENERAL INSTRUCTIONS 4**)

Press **ENTER**. There will be a short wait while Emax loads the formatting software. If you choose hard disk, Emax loads the formatting software from the hard disk.

4. The display now says:

Pls Insert Disk
To Be Formatted

Remove the source disk and insert the disk to be formatted, then press **ENTER**. The display will say:

Formatting
Floppy...

Formatting takes just enough time that you can get a drink of water or do a couple of sit-ups. After formatting is complete, the display asks:

Format Another
Floppy? Y/N

To format another disk, remove the newly formatted disk from the drive, insert the next disk to be formatted in the drive, then press **YES**. Otherwise, press **NO**, whereupon the display returns to the Module Identifier.

8 Scan HD

The hard disk scan is used when the hard disk has developed one or more “Disk Read Errors” making one or more banks unavailable, or making the operating system unavailable resulting in failure to boot from the hard disk.

To run a HD error scan:

1. Everything should already be backed up on floppy disk. What!? You haven't backed it up? Well you had better do it now (if it's not too late).

Select Special 8 and the display says:

Scan Hard Disk
Erases Memory! OK?

(The memory in question is the Emax's internal RAM, not the HD.)

2. Press **YES** to begin scan or **NO** to return to the **MASTER** module.

If you press **YES**, the display says:

Scanning HD...

3. The hard disk scans itself for defects. This takes a few minutes and if all is well after the scan, the display will read:

No Defects
Were Found

4. Press **ENTER** to return to the module identifier
If one or more hard disk defects were found, the display will read:

Defects Were Found
In XX Bankname

where "XX Bankname" is the name and number of the damaged hard disk bank.

5. Press **ENTER** to get more information, and one of the following messages will be displayed.

Bank is Unusable!
Keep Scanning? Y/N

This display indicates serious defects The hard disk may need to be reformatted

Bank is Corrupted!
Keep Scanning? Y/N

This display indicates less serious defects. The bank has been made usable, but the data may be Bad.

Note: If the bank is corrupted, there will probably be a glitch in one or more of the sounds. Other sounds in the bank may be entirely unaffected. Or, who knows? They might all be OK.

Bank is Corrected!
Keep Scanning? Y/N

This display indicates minor defects. The errors have been corrected.

Press **YES** to continue scanning for defects, **NO** to return to the **MASTER** module.

LOADING A BANK VIA MIDI

Your Emax HD can be instructed via MIDI to load a bank either from the hard disk or from the floppy disk. Since a standard for loading hard disk banks has not yet been adopted by the International MIDI Association, we have included this function as a system exclusive MIDI command.

The Emax system exclusive command to load a bank is:

F0 18 02 10 "BANK# in Hex Code" F7

Bank# in Decimal	=	Bank# in Hex Code		Bank# in Decimal	=	Bank# in Hex Code
Floppy	=	00		19	=	13
1	=	01		20	=	14
2	=	02		21	=	15
3	=	03		22	=	16
4	=	04		23	=	17
5	=	05		24	=	18
6	=	06		25	=	19
7	=	07		26	=	1A
8	=	08		27	=	1B
9	=	09		28	=	1C
10	=	0A		29	=	1D
11	=	0B		30	=	1E
12	=	00		31	=	1F
13	=	0D		32	=	20
14	=	0E		33	=	21
15	=	0F		34	=	22
16	=	10		35	=	23
17	=	11		36	=	24
18	=	12				

For Example:

To load hard disk bank number 10, your master keyboard or sequencer must send Emax these numbers via MIDI:

F0 18 02 10 0A F7