USER'S GUIDE TO THE UPGRADED DSS-1 SAMPLING SYNTHESIZER

Preliminary Version

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INTRODUCTION

The DSS-1 Upgrade includes two main features: more internal memory and a hard disk SCSI interface. Other benefits include a faster floppy disk drive, increased data capacity on floppies and revised operating software,

You can use all your existing performance disks while you familiarize yourself with the new features. Gradually you'll want to re-configure your sound library to take advantage of the upgrade. Take your time, there are lots of exciting possibilities to plan for.

While it's exciting to operate the upgraded DSS-1 from the built-in Floppy Disk drive with its increased storage and faster speeds, you shouldn't overlook the enormous advantages of a Hard Disk

drive: Mass storage and very fast data exchange. Once you'll have a Hard Disk, you'll wonder how you ever managed without it.

This User's Guide works for both the experienced and new DSS-1 owner. Experienced DSS-1 users may want to start with the Concise Summary and the Concise Hard Disk Guide where they'll find most of the information they need.

First-time DSS-1 users should also read the Detailed Explanations where a necessary background on the operation and structure of the DSS-1 is given, together with step-by-step suggestions for the best use of the upgrade.

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PART 1

DSS-1 UPGRADE CONCISE SUMMARY

1. The standard DSS-1 has 262,144 words (commonly known as 256k) of internal memory (RAM) capacity. This original memory becomes Bank 1 on the upgraded DSS-1.

2. The upgrade expands the internal memory (RAM) by Banks of 262,144 words each. The minimum installation is one Expansion Bank (Bank 2) for a total of 524,288 RAM. The maximum installation possible is seven Expansion Banks (Banks 2-8) for a total of 8 x 262,144 = 2,097,152 words (two mega-words) of RAM.

3. Use System Mode F7 Multi Sound Directory / Free Space to check on available Banks and vacant memory in RAM. This works even while no Multi Sounds are in RAM (i.e. on power up).

4. The upgrade also includes an SCSI port for the connection of one or several external Hard Disk drives of your choice. Separate information on compatible makes and models is available from KORG USA. Up to eight Hard Disk drives, each with a maximum storage capacity of 120 megabytes, can be chained together and accessed by the DSS-1 in a matter of seconds for saving and loading of up to 512 Multi Sounds and 99 Systems per Hard Disk drive, plus Sound (Sample/Waveform), Program, and MIDI parameter data. The new data compression scheme of the upgrade stores about 20 megawords (about 30megaBytes) on a 20meg Hard Disk.

5. The upgrade contains new software to deal with the additional RAM and with the Hard Disk interface, with the Hard Disk interface, and with some other modifications to the operating system. A new turbo feature doubles the speed of the on-board Floppy Disk drive. No further software update will be needed if you decide to add more Expansion Banks or Hard Disk drives at a later date.

6. The following has not changed: A System contains all the data that are in RAM at any one time, including up to 16 Multi Sounds (which can each be built from up to 16 Sounds), 32 Programs, MIDI parameters. This still means that there is one System in RAM at one time.

7. The capacity of the Floppy Disk has been increased by 50% (approx.). The 773 blocks (see Disk Utility Mode F7 Disk Status) were previously the equivalent of 773 kBytes, or 525,640 words (commonly known as 512k). Due to the new data compression this is now the equivalent of 1meg (approx.), or in excess of 700,000 words.

8. If your DSS-1 has the most basic upgrade (1 Expansion Bank) and you decide to wait with the purchase of a Hard Disk drive, then your newly-configured Systems will still fit onto Floppy Disks. But you'll miss out on the extra speed and convenience of the Hard Disk. If you have from two to seven Expansion Banks, you'll need a Hard Disk drive before you can make the most of your

upgrade, unless you're prepared to restrict the size of Multi Sounds to the capacity of a single Floppy Disk, for the following reasons.

9.   Sounds can be up to 1 Bank in size (261,886 words).

10. Multi Sounds can contain Sounds from one or several Banks. In the extreme, one Multi Sound can contain up to 16 Sounds that can fill the entire expanded memory. If each Sound is the size of an entire Bank, then the Multi Sound can contain as many Sounds as your DSS-1 has Banks, and that Multi Sound takes up the whole RAM and therefore an entire expanded System.

11. Multi Sounds must be saved to Floppy Disks in one packet, they can't be broken up and spread over several Floppies. This means that any Multi Sounds that fill substantially more than two Banks in expanded RAM must be saved to a Hard Disk.

12. Systems as large as 2meg can be broken up and spread over several Floppy Disks, as long as they contain no Multi Sounds larger than a Floppy Disks's storage capacity. As soon as the first disk is full, a prompt invites you to "swap disks", i.e. to insert the next blank, formatted disk.

13. Audio-input Samples can be as long as 261,886 words, which fills all of Bank 1. The LCD readout MemDiv (Memory Division) 01, when selected in connection with a chosen maximum amount of seconds at a given Sampling Frequency, refers to the entirety of Bank 1 and not to the entire upgraded memory. Save each Sample immediately after recording (Sample Mode F5) and after editing (Edit Sample Mode F8) if the second of two consecutive Samples would exceed the combined size of the available sampling RAM in

Bank 1 (261,886 words). These are the maximum time durations at the available Sampling Frequencies if a Sample is of maximum length (261,886 words):
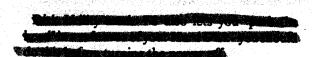
16 sec @ 16kHz
11 sec @ 24kHz
8 sec @ 32kHz

14. When you load Sounds into RAM while building a Multi Sound (Multi Sound Mode F0 and F8), and when you load Multi Sounds into RAM while building a System (System Mode F9), the incoming data get distributed across the available Banks, starting with Bank 1. While you don't need to concern yourself with "what goes where", it pays to add up the sizes of Multi Sounds before building a System. With a bit of planning you should be able to fit most of your favorite Multi Sounds and Programs into one or two expanded Systems for live performance.

15. Many former courtesy displays of data lenghts and Are You Sure? no longer appear in the LCD. This speeds up your work. To check on the lengths of your existing Multi Sounds that you want to re-configure into new, larger Systems, use copies of the blank chart in this manual for future reference. On power up, use System Mode F9 to load - one by one - all the Multi Sounds of a DSS-1 disk. They'll fill, at most, two Banks. System Mode F7, after you use the right-arrow cursor to access the Multi Sounds in the LCD, shows their lengths as you scroll through them with the Data Entry tabs or sliders. Write the lengths down. Turn the power off and back on to clear the RAM before you proceed with your next disk.

PART 2

CONCISE HARD DISK GUIDE

Two new functions have been added to the Disk Utility Mode - they don't appear on the front panel.

- F8 lets you assign an ID number to your Hard Disk drive(s), from 0 through 7. Check the owner's manual of your Hard Disk drive(s) for DIP switch settings to match the ID number. Set the switches with the drive's power off, or follow the drive's manual.

- F9 lets you format the Hard Disk(s) after you set the ID number(s) with F8. Formatting a Hard Disk erases all previous data and prepares the disk for action. Do this only the very first time you install the drive.

~~Disk Utility mode .... lets you ......~~

As you use System F9 to assemble Multi Sounds from the Hard Disk into the DSS-1 for a System of your own planning, load the larger Multi Sounds first. This helps the DSS-1 to assign the incoming data to its memory Banks in the most efficient manner.

To access Systems (System F1, F2, F4, F5, F6,) on the Hard Disk that you defined with Disk Utility Mode F8, use any Data Entry tabs or sliders to scroll past A/B/C/D where you get access to System numbers from 01-99.

PART 3

DETAILED EXPLANATIONS

If you've had your DSS-1 before the upgrade you'll see only one external change, the SCSI port on the rear panel (SCSI stands for Small Computer System's Interface, pronounced as "scuzzy").

The LCD (the readout screen) now displays these messages upon power up: *KORG USA DSS-1 PRO SAMPLING SYNTHESIZER*, followed by *Upgrade (C) 1987 by SOUND LOGIC, Inc.*

This is followed by the readout *** *SYSTEM MODE* *** *Select (1-9).*

REVIEW OF DSS-1 TERMS

Sample, Waveform, Sound, Multi Sound, Program, System, Bank.

SAMPLE
The word SAMPLE has many uses among musicians. If somebody talks about a "great piano sample" he or she probably refers to a collection of actual samples that were brought together to make a good-sounding keyboard setup: Recordings of several piano strings of different pitches. KORG uses the word in the strict sense: A single digital recording.

SAMPLE is one of three names for the smallest unit of sound that the DSS-1 treats as a file that you can name, save to disk, and load from disk.

The other two names for this kind of sound file are WAVEFORM and SOUND (see below).

It's only called SAMPLE while you're working in two modes: SAMPLE Mode where you do the actual audio-input recording, and EDIT SAMPLE Mode where you can make changes to an individual recorded sample, either right after recording it, or later when you bring it back from a disk on which you saved it after the recording.

As soon as you save a SAMPLE to disk, and anytime you work with a SAMPLE in the context of a MULTI SOUND, the DSS-1 calls it a SOUND. When looking for your individual samples on a disk, use DISK UTILITY Mode F4 SOUND DIRECTOR, and delete samples from disk with DISK UTILITY Mode F5 DELETE SOUND. You'll use MULTI SOUND Mode F0 GET SOUNDS when you assemble your SAMPLES into a keyboard set-up (a MULTI SOUND) that can be played as part of a SYSTEM.

In the upgraded DSS-1 a SAMPLE can be up to 261,886 digital "words" long. This fills one of the Banks in the memory of your upgraded DSS-1. Here are the maximum time durations at the available sampling frequencies if a SAMPLE is of maximum length.

16 sec @ 16kHz.
11 sec @ 24kHz.
8 sec @ 32kHz.
5.5 sec @ 48kHz.

WAVEFORM

The word WAVEFORM also has many uses among musicians. On the DSS-1, like on most synthesizers, you can call up pre-configured waveforms, but you can also build your own waveforms. All this happens in CREATE WAVEFORM Mode. It produces eight "samples" of the chosen waveform that are automatically assigned across the range of the keyboard. If you want to save the whole keyboard set-up, you save it as a MULTI SOUND (MULTI SOUND Mode F9). But you can extract any of the eight waveform samples and save them individually. They'll be saved as WAVEFORMS, and from then on listed as SOUNDS, similar to your recorded audio-input samples.

A "created" waveform is 1020 words long. It breaks down into the eight waveform samples that are of these lengths, from lowest pitch to highest: 512, 256, 128, 64, 32, 16, 08, 04.

SOUND

On the DSS-1 this word has a very specific meaning. It is the smallest unit that can be named, saved and re-loaded as its own type of file. A SOUND starts out as either a SAMPLE or as a WAVEFORM. Once you've named and saved it, the DSS-1 calls it a SOUND. In most cases a SOUND gets combined with other SOUNDS into the next-higher file type, a MULTI SOUND. Only MULTI SOUNDS are recognized by the PROGRAMS that you call up during performance as part of a SYSTEM.

If you go looking for a SOUND on a disk, you won't find it unless that SOUND was saved by using one of these three functions:

1.   SAMPLE Mode F5 SAVE SAMPLE

2.   EDIT   SAMPLE   Mode   F8 SAVE/RENAME SAMPLE.

3.   CREATE WAVEFORM Mode F3 SAVE WAVEFORM.

Once SOUNDS have been combined into a MULTI SOUND, and only the MULTI SOUND has been saved to a disk, then the individual SOUNDS are not listed in DISK UTILITY Mode F4 SOUND DIRECTORY. This means that you can't load them individually from that disk. But you can load the whole MULTI SOUND and extract individual SOUNDS with EDIT SAMPLE Mode F1. You'll be doing a lot of that as you reorganize your sound library to take advantage of the DSS-1 upgrade.

The maximum length for a SOUND is 261,886 words, which fills one Bank of the DSS-1 expanded memory.

MULTI SOUND

To play your samples and waveforms as part of a performance SYSTEM you need to organize them into MULTI SOUNDS. Up to 16 SOUNDS can be assembled into a MULTI SOUND. Normally these SOUNDS are spread across the keyboard. Each SOUND can be as long as 261,886 words (see above under SAMPLE for the time durations), and a MULTI SOUND can be as large as the memory of your upgraded DSS-1 allows.

MULTI SOUNDS can contain SOUNDS from one or several Banks. In the extreme, one MULTI SOUND can contain up to 16 SOUNDS that can fill the entire expanded memory. If each SOUND is the size of an entire Bank (261,886 words), then the MULTI SOUND can contain as many SOUNDS as your DSS-1 has Banks, and that MULTI SOUND takes up the whole RAM (onboard memory) and therefore an entire expanded SYSTEM.

It is a good idea to keep track of the lengths of your MULTI SOUNDS when planning to reconfigure your sound library for the upgraded DSS-1. Make a list or a cardfile - anything that works for you. You'll want to pack as many SOUNDS into MULTI SOUNDS and MULTI SOUNDS into SYSTEMS as possible. This requires good housekeeping so that you know what you're working with.

Whenever you make a change to a Multi Sound in Multi Sound Mode, be sure to rename it before saving. All Systems on a disk can access the Multi Sound, so if you change one with just one System

in mind, all other Systems will also play the new version if you don't rename the new edit.

If you plan to use the DSS-1 without the Hard Disk drive, make sure that no Multi Sounds in your Systems exceed the Floppy Disk's storage capacity, as Multi Sounds can't be broken up and spread over several floppies in the same way as Systems can.

PROGRAM

These are the "presets" or "patches" that you call up during performance. PROGRAMS organize the MULTI SOUNDS in a SYSTEM by assigning the same or two different MULTI SOUNDS to the two oscillators that produce the actual sound output (PROGRAM PARAMETER Mode F12 and F13). PROGRAMS also refine the MULTI SOUNDS with a lot of synthesizer parameters, including the two digital delays and a lot of fingertip control from velocity, aftertouch etc.

There are 32 PROGRAMS in every SYSTEM. PROGRAM data is very memory efficient, since it doesn't contain the sound data itself. PROGRAM data can be saved as a separate file.

SYSTEM

This is the highest level of organization on the DSS-1. Before and during performances you call up one SYSTEM from among the four SYSTEMS that a floppy disk can hold, or from among the 99 SYSTEMS that each Hard Disk drive can hold. Then you select from among the 32 PROGRAMS that each SYSTEM contains. A SYSTEM takes up the whole expanded memory of the DSS-1, so there can only be one SYSTEM in memory at one time.

SYSTEMS are put together by loading up to 16 MULTI SOUNDS from disk into the DSS-1

memory, preferably with the larger Multi Sounds first for more efficient use of the expanded memory. Then you use the PROGRAM PARAMETER Mode to assign the MULTI SOUNDS to the 32 PROGRAM numbers, and to refine the MULTI SOUNDS as described under PROGRAM. You also set the desired MIDI parameters, and you save the entire SYSTEM to disk for future recall.

The maximum size of a SYSTEM depends on your version of the memory upgrade (number of expansion Banks). Hard Disks can store Systems of any size, up to the possible maximum of 2meg if your DSS-1 has eight Banks of expanded memory. Floppy Disks can break up large Systems and spread them over up to four floppies, as long as no Multi Sounds in the System are larger than a single Disk's capacity.

BANK

The original DSS-1 had 262,144 words of on-board memory (RAM) before the upgrade. This becomes BANK 1 after the upgrade, when more BANKS are added. How many? Up to seven Expansion BANKS, which brings the possible maximum of on-board memory to eight BANKS, for a total of $8 \times 262,144 = 2,097,152$ words (two megawords) of RAM.

If you want to verify the number of BANKS on your DSS-1, press SYSTEM Mode and F7 (press 7 on the numerical tabs). Then use any of the Data Entry tabs or sliders to read through the BANKS. Multiply the highest BANK number by 262,144 to get an idea of the capacity for MULTI SOUNDS. It's actually a little less, because PROGRAM and MIDI data are also part of a SYSTEM.

PART 4

HOW TO USE THE EXPANDED MEMORY

What you'll do with the extra memory will depend on your main use of the DSS-1: live performances or studio work. You have basically two options, although you'll often combine them in your planning. One option is to pack more SOUNDS into MULTI SOUNDS, and more MULTI SOUNDS into SYSTEMS. The other option is to include longer SOUNDS in your MULTI SOUNDS and SYSTEMS. Let's discuss these options, to help you plan for your own needs.

MORE SOUNDS PER MULTI SOUND

The factory sound disk KSDU-001R (it was initially released as KSD-001) contains a MULTI SOUND called A.PF (Acoustic PianoForte) that is 254,790 words long. It used to fill almost the entire RAM (262,144 words) before the upgrade. It covers the entire five octaves and, when played via MIDI, it can produce some pitches from beyond the range of the DSS-1 keyboard. Yet it is made up from just five recorded samples. Here's how you can break it down for closer inspection.

1. Clear the RAM by turning the power off and back on.

2. Press SYSTEM, then 9 Get Multi Sound. Insert Disk KSDU-001R into the floppy drive, leave the cursor under the word "Floppy" and press Enter. If you have already stored this MULTI SOUND on the Hard Disk, move the cursor to SCSI and press Enter.

3. When the LCD displays Select M.SOUND use any of the Data Entry tabs or sliders until you find A.PF, then press Enter. This loads the sound data.

4. To discover the length of each SOUND within this MULTI SOUND, press EDIT SAMPLE, and 1 on the numerical tabs. Leave the cursor under MEMORY since the sound data are already in internal memory. Press Enter.

5. Now the MULTI SOUND is displayed, with its total length of 254,790. Press Enter.

6. Now the individual SOUNDS (samples) are accessible, with SOUND 01 up. Press Enter. This asks you to confirm (Yes/No) that you want to get SOUND 01 isolated from the others for editing. But all you want right now is a readout of its length. Make a note of L = 064,104, then press the left cursor tab for NO (negative). Now the message is Aborted - Select (1-2).

7. Press 1. This takes you back to step 4 above. Continue as before, but when SOUND 01 is displayed, use the Data Entry tabs to change it to 02. Repeat this cycle until you have made a note of each SOUND length.

8. Now it's time to find out what recorded piano notes these SOUNDS represent. Press MULTI SOUND and 1.

9. When SOUND 01 is up, press 3. This shows the ORG (original) pitch as A2, and the TOP (top key for transposition of this sample) as D4. TR means that the transposition function is active. Make a note of these pitches.

10. Press 1, then tap the Data Entry tabs to select SOUND 02.

11. Press 3 and make a note of the ORG and TOP pitches.

12. Keep cycling through these steps until you come up with a list of the following information:

Rec. pitch & assign key		Top key	Length
SOUND 01	A2	D3	64,104
SOUND 02	A3	D4	63,095
SOUND 03	A4	D5	64,663
SOUND 04	G5	D6	30,976
SOUND 05	G#6	G#7	31,952
			254,790

This means that all notes except A2, A3, A4, G5, and G#6 are transposed by the DSS-1 when you play the keyboard. What if you had access to samples of other piano pitches - could you enlarge this MULTI SOUND by sticking some intermediate pitches in there? Sure you can.

The factory disk KSDU-008 contains a MULTI SOUND called A.Piano that is 257,917 words long. Use the above method to analyze it. Here it is.

Rec. pitch & assign key		Top key	Length
SOUND 01	C#-1	C#-1	00,001
SOUND 02	C3	E3	65,528
SOUND 03	C4	E4	65,522
SOUND 04	A4	C5	47,290
SOUND 05	G5	G5	31,916
SOUND 06	C6	F6	31,977
SOUND 07	G6	G7	15,682
SOUND 08	G#7	G#7	00,001
			257,917

SOUNDS 02, 03, and 06 with their recorded pitches of C3, C4, and C6 look like welcome additions to the previous MULTI SOUND, as long as your ears tell you that they came from a similar sounding Grand Piano so that they'll blend in.

Here's how the finished MULTI SOUND could look:

Rec. pitch & assign key		Top key	Length
SOUND 01 A2 (#01 from disk 001)		A2	64,104
SOUND 02 C3 (#02 from disk 008)		E3	65,528
SOUND 03 A3 (#02 from disk 001)		A3	63,095
SOUND 04 C4 (#03 from disk 008)		E4	65,522
SOUND 05 A4 (#04 from disk 008)		D5	47,290
SOUND 06 G5 (#04 from disk 001)		A5	30.976
SOUND 07 C6 (#06 from disk 008)		E6	31,977
SOUND 08 G#6 (#05 from disk 001)		G#7	31,952
			400,444

No SOUND would have to be transposed up or down by more than five semitones except for the lowest and the highest SOUNDS. In the midrange this would be as little as two semitones between A and C.

Before you can mix'n-match these SOUNDS into the new MULTI SOUND you need to save them individually. Here's how it all works.

With the MULTI SOUND A.Piano still in RAM, go back to EDIT SAMPLE Mode, select SOUND 02 (you don't need SOUND 01 - it makes no sound) and use F8 to name and save it. Write down what name you give it - something like APianoC3 (eight characters maximum). Then do the same with SOUNDS 03 and 06.

Turn the power off and on and load the MULTI SOUND A.PF from disk KSDU- 001R or from Hard Disk (SYSTEM F9). Go to EDIT SAMPLE

Mode and save SOUNDS 01, 02, 04, and 05 with F8. In MULTI SOUND Mode (F8) replace SOUND 02 with the saved sample of the pitch C3. Replace (F8) and load (F0 "get") the SOUNDS as listed above.

From then on it's a matter of editing your MULTI SOUND as usual. And you already know the length of it, so that you can plan further towards a SYSTEM that uses however many Banks you have in your upgraded DSS-1. The new SOUNDS needn't be borrowed from other disks. Sample your own, save them with SAMPLE Mode F5 or EDIT SAMPLE Mode F8, and they're ready for inclusion into any MULTI SOUND, as long as you don't exceed the overall memory capacity of your upgraded DSS-1.

MORE MULTI SOUNDS PER SYSTEM

Once you've done your homework on the numbers you can plan to include as many MULTI SOUNDS as your upgraded memoy will hold, up to 16 per SYSTEM. Let's say your DSS-1 has eight Banks, and the above example of the new piano MULTI SOUND should be joined by your favorite string ensemble, some brass, a few basses, and others for instant access during live performances where even a few seconds of waiting for the Hard Disk would be too long. No problem.

Add the lengths, you have two million words of SYSTEM memory at your disposal! And don't forget the economical synthesizer

WAVEFORMS (just 1,020 words long) that can produce great sounds, by themselves or when blended in with "real" samples (PROGRAM PARAMETER Mode F12 & F13). But remember that SYSTEMS over 525,640 won't fit onto floppies, they'll have to go onto the Hard Disk.

LONGER SOUNDS IN MULTI SOUNDS

Many types of sounds are either very hard to loop, or they lose a lot of realism when they're looped. Decaying sounds that change color a lot while they fade are the worst offenders. Now, with more memory, you can afford to put the loop very late into the event, or maybe you don't have to loop them at all. At 32kHz Sampling Frequency you have eight seconds per SAMPLE/SOUND, and a MULTI SOUND can contain up to 16 SOUNDS.

In the above example of the piano MULTI SOUND you could replace the lowest pitches with long samples of your own that you would loop after about seven seconds, by which time the typical changes in color have come to an end. Let your ears be your guides, together with a stopwatch. The PROGRAM PARAMETER Mode has features like F33 and F37 Keyboard Track that adjust the timing of the decay in relation to the pitchrange. This adds a lot of realism to sounds that, in nature, have faster decays in higher pitches. Explore!

PART 5

Building An Expanded System

Start by making a list of

- which Multi Sounds the System should contain
- how long these Multi Sounds are
- where these Multi Sounds are currently stored

Since the Multi Sounds will need to be called up and refined by Program Parameters, you should also write down for each Multi Sound

- which existing System on which disk uses your selected Multi Sounds with a suitable Program that you might be able to borrow
- what changes come to mind that you'll have to remember to program if the existing Program isn't entirely suitable

Why all this preparation?

You don't have to do it all, but you'll soon find that you'll have more fun when you're well organized. Programming can be time consuming - why not use what you've already got, as long as you know where to get it from...You can always change things later, but first you want to complete a System so that you can save it and listen to it.

Add up the lengths of the selected Multi Sounds, to get an idea of how big your System will be. Check to see that it fits into your version of the expanded memory. If you're planning on using the System with Floppy Disks, make sure no Multi Sound exceeds a single Floppy's capacity.

1. Clear the RAM - turn the DSS-1 off and back on.

2. When the LCD reads System Mode Select (1-9), press 9 on the numerical tabs.

3. Check your list for your longest Multi Sound and its current location, then set the cursor accordingly to Floppy or SCSI. The default number for SCSI (Hard DISK) is 0. Use any of the Data Entry tabs or sliders to set the desired number to match the number that your Hard Disk drive is set to.

4. Press Enter. The LCD displays M.SND#01: and the name of the first Multi Sound in the selected location (Floppy or Hard Disk). The #01 doesn't refer to the number of the Multi Sound in its present location. What #01 means is this: Whatever Multi Sound you're about to select will become #01 in the System you're about to assemble.

5. Use any of the Data Entry tabs or sliders to scroll through the list of Multi Sounds. When you find the first one for your System, press Enter.

6. When the LCD reads Loaded, press 9 again, consult your list for the next-longest Multi Sound and repeat the above steps to load it. It'll automatically become #02.

7. Repeat the above steps until all your Multi Sounds are in the RAM of the DSS-1 (up to 16 Multi Sounds), by loading the shortest ones last. Now it's time to get to the Programs.

8. Check your notes. Let's say you like Program 05 in an existing System B on a certain Floppy Disk, and it should become Program 07 in your new System.

9. While still in System Mode, press 4 on the numerical tabs. When the LCD reads Get Program, System:... Program:..., insert the Floppy Disk, make sure that the cursor points to System and use any of the Data Entry tabs or sliders to set it to System: B. Then move the cursor to Program and set it to 05. Press Enter.

10. When the Program has been loaded, the Program name appears, and the LCD asks Write into Memory? (Y/N). Memory means the RAM of the DSS-1, where the Program will become part of the System you're building. Press YES.

11. Use any of the Data Entry tabs or sliders to set it to Program #07. Press Enter.

12. Press Program Parameter Mode and the numbers 1 and 2 on the numerical tabs. Is the Program you just wrote into memory calling up the desired Multi Sound for Oscillator 1? If not, use only the tab or slider of Data Entry B to select a Multi Sound.

13. Do the same for Oscillator 2, after pressing 1 and 3 on the numerical tabs.

14. Do you want to rename this new Program 01 in your new System? If so, press 0 and 1 and press Yes. Use only the tab or slider of Data Entry B to select characters and numbers, and use the cursor to shift position. Although it isn't good housekeeping, you can have two or more Programs in a System that have the same names.

15. Press Enter when your new name is complete. To write the new version into memory, thereby replacing the previous Program 07, press Enter. If you change your mind about what Program number this should become, simply change it before pressing Enter. If you're using the Program Up footswitch on a job and your Programs need to be arranged in the strict sequence of the changes during a certain perfor-

mance, you can write the same Program into several numbers.

16. If there is a Multi Sound in your new System that you couldn't find a Program for anywhere else in your existing library, or if you want to reset an existing Program in RAM to default values, press 00 and go about the business of programming, using as many Program Parameters as you need. Then use F01 to rename and write it into memory as described above.

17. Complete the remainder of the 32 Programs in the above manner.

18. Set the MIDI Parameters according to your needs.

19. As long as your System doesn't include any Multi Sound that exceeds the Floppy's capacity, you can save the System to one or several disks. Use System Mode F2 and follow the prompts. When the first disk is full (message: Disk Full - Swap Disk or Cancel), insert a new, blank and formatted disk. Systems on Floppies are those from A through B. If you keep pressing the Data Entry tabs or sliders, you come to the numbers 01-99 that are automatically sent to the Hard Disk.

20. When saving a System you'll often get a message that lists the name of a Multi Sound and asks Delete Old? (Y/N). There can only be one Multi Sound file of a given name on a disk, but all the Systems on the same disk can use that Multi Sound when a Program calls it up. When you used System Mode F9 to load the Multi Sounds into the DSS-1, only a copy of these Multi Sounds was loaded, the files still exist where you got the copies from. So now that you're saving the same Multi Sounds as part of your finished System, the DSS-1 is telling you that they alrady exist in the files on the disk. If you made no changes to the Multi Sounds in Multi Sound Mode since you loaded them, then they don't need to be replaced - press NO (negative). If you did make some changes to the currently displayed Multi Sound, in Multi Sound Mode while building your System, press YES. But realise that this wipes out the old version of that Multi Sound. All other Systems that use this Multi Sound will now also play the new

version. Hopefully you renamed and saved the
edited Multi Sound at the time you worked on it,
with Multi Sound Mode F9.

PART 6

HINTS ABOUT HARD DISK DRIVES

The first time you install and connect your Hard Disk drive, follow the suggestions in the drive's manual. Usually there is some device, such as a row of DIP switches, that allows you to set an ID number on the drive. The manufacturers may have preset a number already. If it is your first drive you'll want it to be #0, simply because this saves you from having to reset the number on the DSS-1 where it always comes up as 0 when you switch the power on. If you make a change to DIP switches, do it while the drive is turned off. On power-up the new setting will be read, and communications should be established.

If 0 isn't the number you want to use for a particular Hard Disk (remember that you can chain up to eight Hard Disks, each with a maximum capacity of 120meg!), press Disk Utility Mode, and press 8 on the numerical tabs. Use any Data Entry tabs or sliders to set a number from 0-7.

You need to format (initialize) the Hard Disk before the DSS-1 can exchange any data. Press Disk Utility Mode, then press 9 on the numerical tabs. Formatting erases any data that might already be on the Hard Disk.

On power-up, the Hard Disk drive needs a few seconds to get up to speed, during which time you'll get Data Error messages if you attempt any data exchange. Wait a few seconds before repeating the command.

Before you turn the power off you must "park the head" of the Hard Disk drive in a safe area of the drive. Press Disk Utility and press 8 on the numerical tabs. Check the drive ID number, adjust it if necessary, and press Enter. This prevents the "head" from settling on the area that contains data where it could wreak havoc with your files. This isn't necessary on certain Hard Disk drives where the heads get "parked" automatically while inactive. Take no chances, read your owner's manual carefully. Follow all instructions to the letter, Hard Disk drives are sensitive devices.

We wish you many enjoyable hours of working with your expanded DSS-1.