

DSM-1

**DIGITAL SAMPLING SYNTHESIZER
OWNER'S MANUAL**

KORG[®]

Congratulations and thank you for choosing the KORG DSM-1 Digital Sampling Synthesizer Module. Please read this manual carefully to obtain optimum performance and help assure long term reliability.

BASIC PRECAUTIONS

ENVIRONMENT

Avoid using this unit in environments where it will be exposed to the following conditions:

- **Direct sunlight**
- **High temperature or humidity**
- **Dust or sand**
- **Excessive vibration**

POWER SUPPLY

Use this unit only with the rated AC voltage. If you intend to use this unit in areas where the voltage is different from the rated AC voltage, consult your KORG dealer about a suitable voltage transformer unit.

INTERFERENCE WITH OTHER APPLIANCES

This unit uses microprocessor circuitry that may cause interference with nearby radio or TV receivers. If problems occur, use at a greater distance from the radio or TV.

SAVING DATA

Data in the DSM-1's internal memory will be lost if its power is turned off. Therefore, ALWAYS save data to a disk before turning the power off.

HANDLE GENTLY

Although this unit is designed and constructed to KORG's high standards, the use of excessive force may cause damage to its keys and knobs.

TRANSPORT

To protect the disk drive while transporting this unit, ALWAYS insert the supplied head protection sheet before moving this unit.

CLEANING

Use only a soft, dry cloth to clean the exterior of this unit. Never use benzene, volatile cleaners or solvents, polish or cleaning compounds.

OWNER'S MANUAL

The DSM-1 is a sophisticated digital music device, with many functions. Therefore, we suggest that you keep this manual handy at all times, for reference.

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MAIN FEATURES

1. MEMORY CAPACITY

The DSM-1 features a powerful internal memory capable of storing 1 MWord. This memory is available in the form of four Banks, each capable of storing samples of up to 16 seconds in length (at a sampling rate of 16 kHz) for a total sampling time of 64 seconds.

2. SAMPLING VERSATILITY

The DMS-1 can sample at four frequencies (16, 24, 32 or 48 kHz). At the maximum sampling rate of 48 kHz incredibly accurate sampling, exceeding Compact Disc quality, can be executed.

3. VOICE POWER

The DSM-1 is 16-voice polyphonic, and compatible with all professional MIDI keyboards. Up to 64-point keyboard split is possible, using 16-point splits for each of four Timbres. Each of up to 16 sounds may be output separately via the Individual Outputs, and individually processed.

4. WAVEFORM CREATION

The DSM-1 combines Sampling with Harmonic Synthesis (the creation of a waveform by selecting and editing up to 128 harmonics) to enable the creation of incredibly complex waveforms. The envelope, filtering, and many other aspects of the waveforms can then be modified using Program Parameters. Up to 32 different Programs may be stored.

5. COMBINATIONS

Up to four Timbres (each consisting of a Multisound modified by a Program) may be played simultaneously as a Combination. A variety of split and layer modes is available. 32 Combinations may be memorized.

6. DISK LIBRARIES

A wide selection of sampled sounds on floppy disk libraries is available, including disks created for use with the KORG DSS-1 Digital Sampling Synthesizer.

7. MIDI/COMPUTER COMPATIBILITY

The DSM-1 is a powerful MIDI tool, which can form a vital part of any digital music system. It can receive and transmit an enormous variety of MIDI data, for full, state-of-the-art MIDI control. A unique feature is the setting of separate MIDI channels for each Timbre in a Combination.

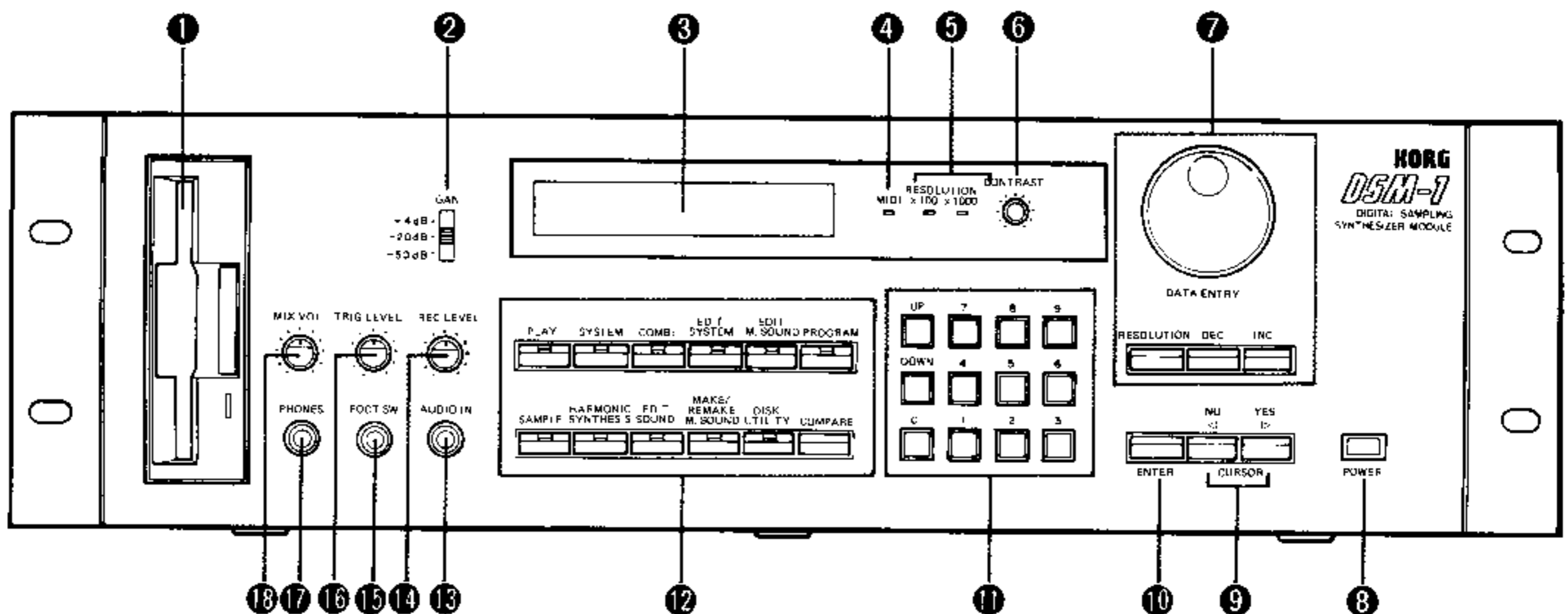
8. PLAYBACK OPTIONS

In addition to being played from any MIDI keyboard or sequencer, the DSM-1 has two other highly convenient playback options. A footswitch may be used to play a selected note (useful when editing a sound without the use of a keyboard). Also, the Audio Trigger function lets you trigger a selected note by inputting an audio signal such as a drum track.

HOW TO USE THIS MANUAL

- The **KORG DSM-1** is a complex and sophisticated digital music device that is remarkably easy to use, provided you follow the instructions in this manual. The manual has been structured so that it will guide you through the various operations easily and concisely, in the following manner:
- The **PRECAUTIONS** section should be studied carefully prior to using this unit.
- The **FRONT PANEL** and **REAR PANEL** sections give clear descriptions of all controls and terminals, for reference at any time while you are familiarizing yourself with the DSM-1.
- The **OPERATING FLOW** chapter offers a step-by-step introduction to the main functions of the DSM-1. It is recommended that even if you are an experienced user of samplers and digital equipment, you perform the operations exactly as described in this chapter, to gain a solid basic understanding of the DSM-1.
- The **SYSTEM STRUCTURE** chapter explains the functions of the DSM-1 using diagrams and detailed text, to give an overall view of its design and operating methods.
- The **MODES AND FUNCTIONS** section devotes a chapter to each of the DSM-1 operating modes. In this section, explanatory text is kept to a minimum -- rather, the emphasis is on concise, accurate descriptions of every operation and function available on this unit. You will probably use this section for reference as long as you own and use a DSM-1.
- The **SPECIFICATIONS** section provides full technical information on the DSM-1.
- The **MIDI IMPLEMENTATION** section details all MIDI specifications of the DSM-1, for users interested in advanced MIDI and computer applications of this unit.
- The **ERROR MESSAGES** section offers explanations of display messages that appear if a malfunction occurs, or if an operation is executed wrongly.
- The **TROUBLESHOOTING** section offers further explanation and assistance in situations where operating problems occur.
- The **GLOSSARY** provides a useful dictionary section with explanations of MIDI and digital music terms, particularly those referring specifically to the DSM-1.

FRONT PANEL



1 FLOPPY DISK DRIVE

For insertion of a 3.5" floppy disk. Use only high-density, double-sided, double-track disks, such as the KORG MF-2HD or the SONY MFD-2HD.

2 GAIN SWITCH

Sets the audio input to three different levels, to receive any type of input signal. Use this in conjunction with the REC LEVEL control.

3 LCD (LIQUID CRYSTAL DISPLAY)

Gives information regarding current mode, program, parameter values, etc.

4 MIDI LED

Lights only when a MIDI signal is received from an external MIDI device.

5 RESOL LED's

One of these LED's will light according to the data entry resolution setting (X100 or X1000). If the resolution is set to NORMAL, neither LED will light.

6 CONTRAST CONTROL

Allows adjustment of the LCD contrast to suit any lighting conditions.

7 DATA ENTRY CONTROLS

● DATA ENTRY WHEEL:

For entering data such as parameter values. Turn the wheel clockwise to increase the value, anticlockwise to decrease the value.

● DATA ENTRY KEYS:

Three keys for entering data such as parameter values. The DEC and INC keys decrease and increase data values, respectively. The RESOLUTION key sets the data entry resolution to one of three settings:

● NORMAL:

Data value is altered by one unit when the DEC or INC key is pressed.

● X100:

Data value is altered by 100 units when the DEC or INC key is pressed.

● X1000:

Data value is altered by 1000 units when the DEC or INC key is pressed.

8 POWER ON/OFF SWITCH

9 CURSOR (and YES/NO) KEYS

For movement of the cursor on the LCD, to the left or right according to the direction of the arrow marked on the key. Also for responding "yes" or "no" to display messages.

10 ENTER KEY

For entry of new data values into memory, or to execute or finalize functions.

11 NUMERIC KEY PAD

For selection of program numbers or functions within a mode. Keys marked with numerals are used to enter a number. The UP and DOWN keys are used to select the following or previous function, respectively.

12 MODE KEYS

For selection of operating modes. The COMPARE key enables comparison of a sound that is being edited with the original sound.

13 AUDIO IN

A 1/4" jack for input of an audio signal to be sampled.

14 REC LEVEL

Sets the recording level of the input for sampling, in conjunction with the GAIN SWITCH. Also sets the minimum level at which an audio input will trigger playback of a selected note.

15 FOOT SW

A 1/4" jack for connection of a foot switch for playback of a selected note without the use of a MIDI keyboard.

16 TRIG

Sets the minimum level at which an audio input will trigger sampling.

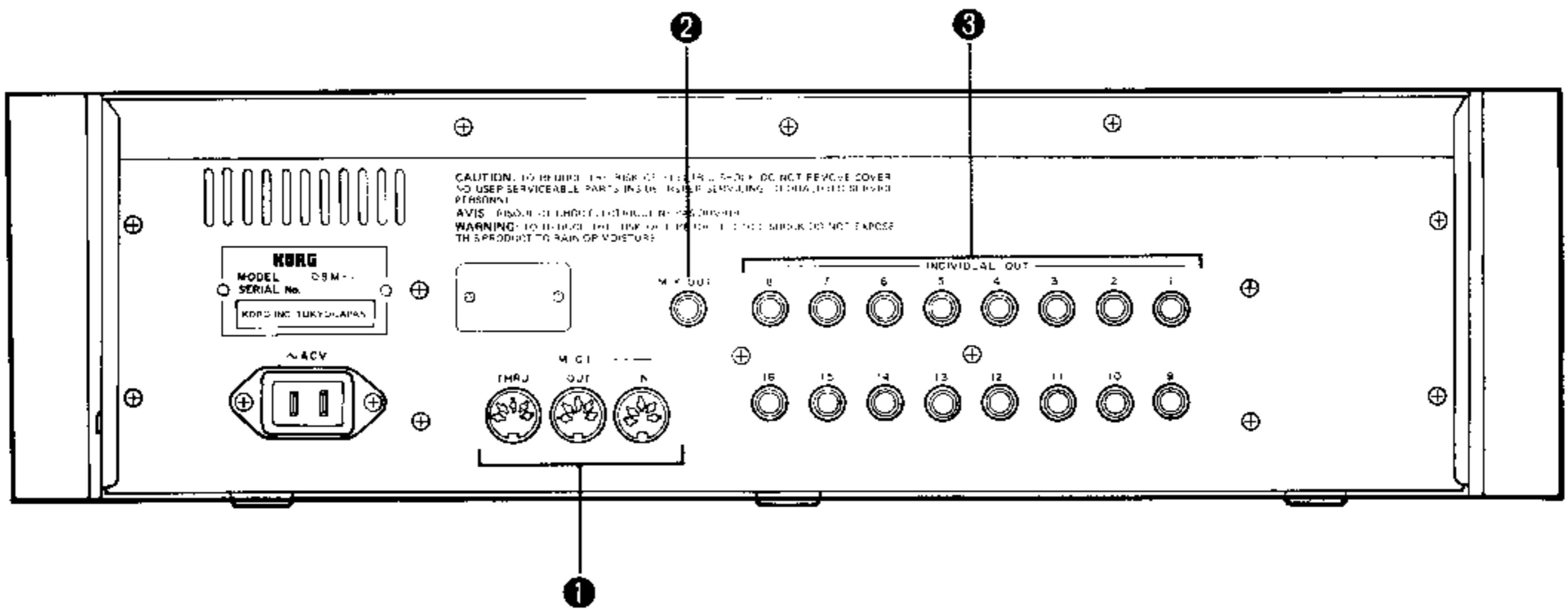
17 PHONES

A 1/4" jack for stereo headphone monitoring.

18 MIX VOL

Adjusts the volume of signals output via the MIX OUT jack.

REAR PANEL



- ❶ **MIDI IN/OUT/THRU JACKS**
For connection of external MIDI devices.
- ❷ **INDIVIDUAL OUTPUTS**
1/4" jacks for individual audio output of up to 16 sounds.
- ❸ **MIX OUT**
1/4" jack for a mono mix audio output of the DSM-1.

OPERATING FLOW

OVERVIEW

- In this chapter you will learn how to set up the DSM-1, load sounds from the factory disk and play those sounds. You'll also learn how to make your own sounds, save them to a disk, split them across the keyboard and/or layer them, and save those split/layer combinations.
- Each numbered section of this chapter will guide you step by step through a separate operation of the DSM-1. Only selected operations are covered here in order to get you using the DSM-1 as fast as possible. Where an operation might have several options, the easiest has been chosen. Where you can select parameters manually, or have them determined for you automatically, the automatic operation has been described.
- Before you start operating the DSM-1, however, we suggest that you read through the FRONT PANEL section. Familiarize yourself with the operation of the front panel, then come back to this chapter to begin playing and making sounds on the DSM-1.
- You'll find the OPERATING FLOW chapter helpful in gaining an overall idea of how to use the DSM-1. Work through the steps in this chapter carefully and then go on to the MODES AND FUNCTIONS section for more complete explanations of all operations.

1. SETTING UP

Before plugging in the AC cord, make sure that the power on the DSM-1 and all other equipment has been turned off. Connect the AC cord to an outlet and connect the DSM-1 to an amp or a mixing console by using the MIX OUT jack on the rear panel. The individual out jacks can be connected to the inputs of a mixer, but it is suggested that on this first attempt the MIX OUT jack be used. To control the DSM-1 connect the MIDI IN jack of the DSM-1 to the MIDI OUT jack of a MIDI keyboard controller or synthesizer, or connect a footswitch to the FOOT SW jack. The latter will trigger only one note on the DSM-1. Press the eject button on the DSM-1's disk drive and remove the plastic head protection card.

After you turn on the DSM-1, the following display will appear:

```
*** KORG DSM-1 ***  
** DIGITAL SAMPLING **
```

After several seconds it will change to:

```
F1 Get SYSTEM  
Set PERFORM Disk & ENTER
```

The DSM-1 is now in the SYSTEM MODE.

2. DISK PLAY

Before playing the DSM-1, it is necessary to load a system from a disk (use one of the Performance disks supplied.)

OPERATION

1. Insert a Performance disk into the drive.
2. Press **ENTER**. (Its LED will have been flashing.) The display will read "Now Loading..." followed by "Loading Completed."
3. Press **PLAY** to enter the PLAY MODE.
4. The cursor on the display will flash under "CMB01" (Combination #1) to indicate that a Combination can be selected. Use the **DATA ENTRY** wheel or the **INC** (increment) and **DEC** (decrement) keys to select the particular Combination you wish to play.
5. Use your MIDI keyboard to play the selected Combination. If using a footswitch, refer to SYSTEM MODE, Function #5 (PLAY BACK).

NOTE:

If, during the loading process, an unusual message appears, consult the Error Messages section or try repeating the preceding operation. Never attempt to remove a disk or turn the power off during loading or saving

3. DISK FORMAT

If you want to make your own sounds and use them in Combinations instead of using the factory disk, it is necessary first to format two blank disks. One disk you will format as a Work disk and will be used to store your sampled sounds, harmonics data, and the Multisounds you create. The other you will format as a Performance disk and will be used to put these Multisounds together in Programs and Combinations. In other words, the Work disk is used to store your sounds and the Performance disk is used to organize those sounds into groups for playing.

★ Use only 3.5-inch, high-density, double-sided, double-track disks. Recommended disks include KORG MF-2HD and SONY MFD-2HD.

OPERATION

1. Press **DISK UTILITY** to enter the DISK UTILITY MODE.
4. Press **YES** to begin formatting. The display will show "Now Formatting..." followed by:

```
** DISK UTILITY MODE **  
Select Function (0-9)
```

```
F0 Formatting Completed  
Select Function (0-9)
```

2. Insert the blank disk and press **0** on the numeric keypad.
5. Repeat steps #2 through #4 with a second blank disk, and select WORK in step #3.

```
F0 Format Disk:PERFORM  
Use DATA ENTRY & ENTER
```

```
F0 Format Disk:WORK  
Use DATA ENTRY & ENTER
```

3. Use the **DEC** and **INC** keys to select PERFORMANCE and press **ENTER**.

You are now ready to make your own sounds, Multisounds, Programs, and Combinations and save them to these disks.

```
F0 Format:PERFORMANCE  
Are You Sure ? (Y/N)
```

4. USING SAMPLING TO MAKE A MULTISOUND

The term 'Multisound' refers to the sound source as it is assigned to different sections of the keyboard in order to enable playing it over the entire keyboard range. The Multisound can be merely one sound distributed over the entire keyboard, or it can be as many as sixteen sounds, each of which is assigned to a particular portion of the keyboard.

Sampling is the process of recording a sound into digital memory. The sampled sound will be assigned to one selectable key on the keyboard (called the ORIGINAL KEY and abbreviated ORG), and keys played directly below the original key will play the sound back at a lower pitch and a slower speed. Likewise, the keys directly above the original key will have higher pitches and faster playback speeds.

Once you've sampled a sound, you can cut off a portion of the beginning or the end of the sound (truncating), choose a certain part of the sound to repeat itself over and over again to extend the sound length (looping), have the sound played backwards (reversing), or put two sounds together (linking). A more complete guide to sampling can be found in the MODES AND FUNCTIONS section of this manual. Here we'll try sampling four sounds and assign those sounds across the keyboard to make a Multisound.

As an example of sampling, we'll use a piano, miked up to provide the audio signal that the DSM-1 will record.

OPERATION

1. Set the **GAIN** switch on the front panel to the **+4 db** position and connect the microphone to the INPUT jack of the DSM-1. The audio signal from the microphone will be sent to the DSM-1's outputs (in step #4), so you can monitor the sound.
2. Press **SAMPLE** to enter the SAMPLE MODE.

```
***** SAMPLE MODE *****  
Select BANK No. = n
```

3. To perform any sample function, you must use one of the four Wave Memory Banks. Each bank is used to create and temporarily store up to sixteen sampled sounds in the form of a Multisound. Using the **DATA ENTRY** controls (see the FRONT PANEL section), select Bank number 1 and press **ENTER**.

```
**SAMPLE MODE in BANK1**  
Select Function (0-9)
```

5. In order to set the recording level, watch the peak-hold meter bar graph on the display, and adjust the **GAIN** and **REC LEVEL** controls so that the bar graph responds suitably to the piano sound.

★ *If the incoming signal is too loud and causing clipping, the bar graph will show it by dark blocks on the right of the screen. If the signal is constantly causing clipping (something you should definitely avoid), the dark blocks will stay on the screen.*

NOTE:

*When changing the **GAIN** setting, turn the **REC LEVEL** all the way down to avoid sudden surges in volume that could damage the equipment (or your ears!).*

6. Once the **REC LEVEL** is set, press **2** on the numeric keypad to call up the Auto Sampling function. Use of the Manual Sampling function is covered in the MODES AND FUNCTIONS section, but for now, in order to make the sampling process easier, use Auto Sampling.

```
F2 Sample AUTO Using Bn  
Are You Sure ? (Y/N)
```

4. Press **1** on the numeric keypad to monitor the audio signal.

```
F1 Monitor Pnn:pgm-name  
(((((((( (level meter)
```

7. Press **YES** to start the function.

```
F2 Select Sample Frq.  
[16 / 24 / 32 / 48]kHz
```

8. Now you can select the sampling frequency. The higher the frequency, the greater the clarity of the sampled sound. However, higher sampling frequencies also use up more memory space, reducing the sampling time available for each sample (see Sampling Time chart in the Sample Mode section). For this demonstration, select the 32-kHz sampling frequency and press **ENTER**.

```
F2 Select Mem.Division
[1 / 2 / 4 / 8 / 16]
```

9. Now you can select the memory division. This is the number of samples that you will make to fill up your Multisound. For your piano sound, select Memory Division number 4 and press **ENTER**.

```
F2 S01/08:01.0S 32k C 3
Select SOUND & ENTER
```

★ *The DSM-1 automatically sets a sampling time of 2 seconds for each sample. This is fairly short (for lower notes on the piano in particular) and you will probably want to make longer samples. In the MODES AND FUNCTIONS section you will learn how to sample in all four banks and use looping to achieve a more realistic piano sound.*

10. The display of the sound number should read "01;" if it doesn't, set it to "01." Press **ENTER**.

```
F2 S01/16:0.52S 32k C 3
Sample Start [Force/Trig]
```

You can now monitor the sound through your audio system or headphones.

11. For your piano sound use these four notes: C2 (the C below middle C), C3, C4, and C5. The first note you should sample is C2. To start sampling, set the Sample Start position to TRIG and turn the trigger dial (**TRIG**) up about a third of the way, or to the 10 o'clock position. This will keep extraneous noises from starting the recording. Just before playing C2, press **ENTER**.

```
F2 Ready to Sample
))))))
```

The moment you hit the piano note, sampling will begin.

You'll see:

```
F2 Now Sampling...
))))))
```

Followed by:

```
F3 Sampling Completed
ORG=nnnn TOP=nnnn TRNS
```

12. The ORIGINAL key will be set to C3 and the TOP key to F3. Press **ENTER** and play your first sampled sound.

```
F3 Sampling Completed
Continue ? (Y/N)
```

13. You can now continue to make the remaining sounds for your piano Multisound. Press **YES** when the display asks you if you want to continue.

14. The DSM-1 automatically moves to the next sound (in this case, sound number 2). Repeat steps #11 to #13 for the remaining sounds. When the ORIGINAL and TOP keys for the fourth and final sound have been entered, press **NO** in response to the "Continue?" display.

Now you can play your piano Multisound across the entire range of your keyboard.

15. Before leaving the SAMPLE MODE, you should name your new Multisound and save it to the Work disk you formatted in section 3. Press **9** on the numeric keypad.

```
F9 Save/Rename M.SOUND
Rename:msd-name ? (Y/N)
```

16. Press **YES**.

```
F9 Rename : msd-name
Use <,>,D.ENT & ENTER
```

17. Enter a name of up to eight characters, using the **CURSOR** and **DATA ENTRY** keys, and press **ENTER**.

```
F9 Save msd-name=111111
Are You Sure ? (Y/N)
```

18. You can now save this Multisound to your Work disk by setting the Work disk and pressing **YES**.

You'll see:

```
F9 Save msd-name=111111
Now Saving...
```

Followed by:

```
F9 Saving Completed
Select Function (0-9)
```

Your new Multisound is saved both in internal Wave Memory Bank number 1 and on your Work disk. You will call it up later for use with Program parameters and to make up part of a Combination.

NOTE:

Saving sounds to disk is very important since all data in Wave Memory is lost when you turn off the DSM-1's power.

5. CREATING WAVEFORMS TO MAKE MULTISOUNDS

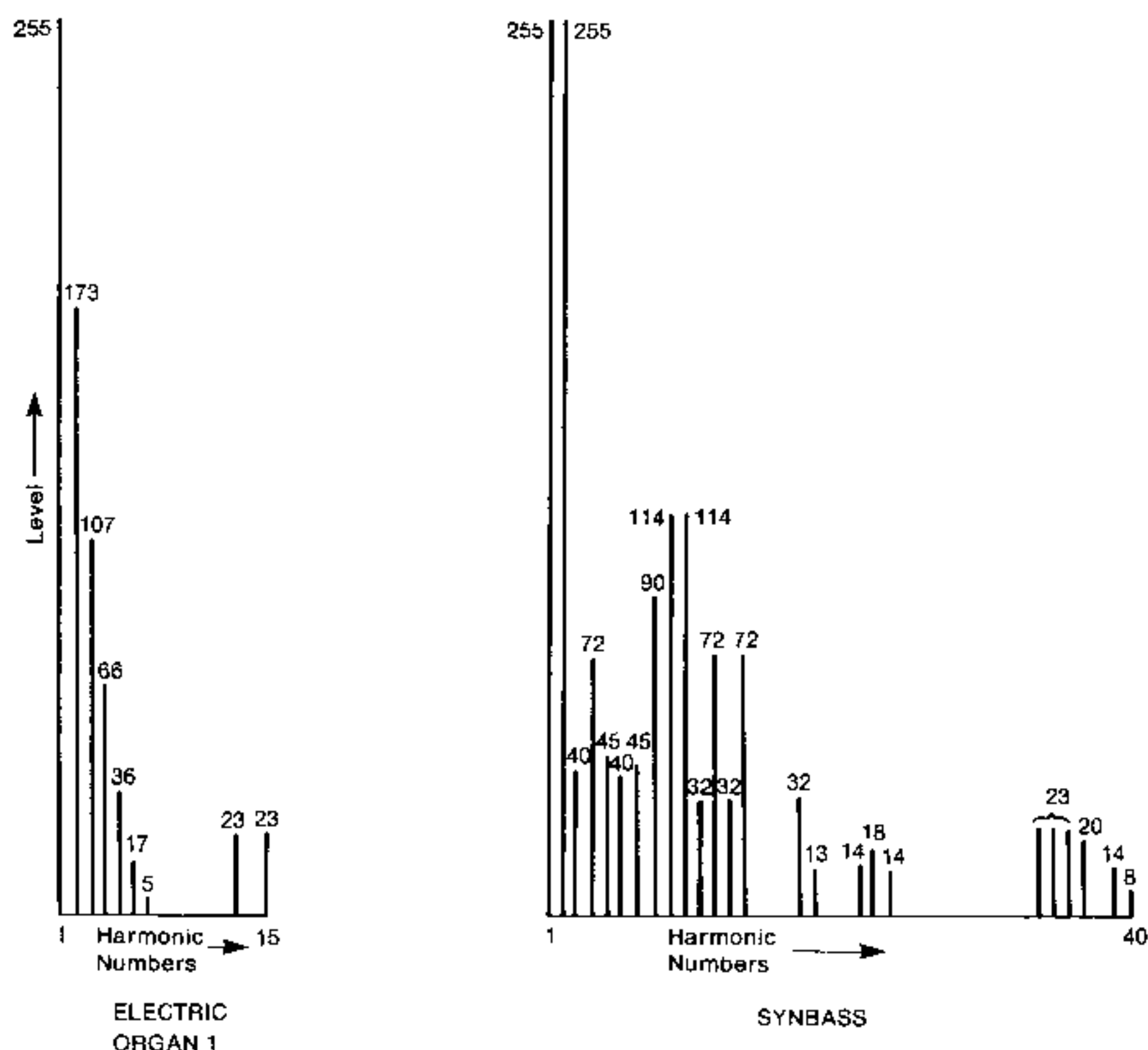
In addition to being able to use sampled sounds, you can select waveforms from 17 preset harmonics tables: BLANK, SAWTOOTH WAVE 1, SQUARE WAVE, ACOUSTIC PIANO, ELECTRIC PIANO 1, ELECTRIC PIANO 2, CLAVINET, ORGAN, BRASS, SAXOPHONE, SAWTOOTH WAVE 2, SAWTOOTH WAVE 3, ELECTRIC GUITAR, ELECTRIC BASS, SYNTHESIZER BASS, METAL (a metallic-toned wave), and SINE WAVE.

These preset waveforms are stored in the internal memory and are synthesized by mixing together sine waves of different frequencies and volumes. The frequencies are based on the harmonic series, which comprises the fundamental tone and multiples of the fundamental (called over-tones or harmonics). The fundamental tone (also called the first harmonic) gives the apparent pitch of the sound as a whole sound.

The mathematical relationship of the fundamental and its harmonics is best illustrated by example. If the the fundamental tone is 220 Hz, the second harmonic is twice that, or 440 Hz. The third harmonic, three times the first, is 660 Hz; the fourth, 880 Hz, and so on. Each successive doubling of the frequency (440 Hz, 880 Hz, 1760 Hz, etc.) creates octaves of the fundamental. So harmonics numbered 2, 4, 8, 16, and 32 correspond to octaves above the first harmonic.

The fundamental, a pure sine wave, is monotonous to listen to for longer than a few seconds. Most sounds, however, are more complex and have many additional harmonics, each at a different level. The harmonics table on the DSM-1 goes up to the 128th harmonic, and each harmonic's level can be adjusted.

Two Harmonics tables are displayed here in graph form:



Using the HARMONIC SYNTHESIS MODE, you'll make three different waveforms. Two of them will be synthesized from preset Harmonics Tables, and the third will be assembled by editing one harmonic at a time.

OPERATION

1. Press **HARMONIC SYNTHESIS** to enter the HARMONIC SYNTHESIS MODE.
2. Press **0** on the numeric keypad.

* HARMONIC SYNTH MODE *
Select Bank No. = n

F0 Select & Clear BANK2
Use D. ENTRY & ENTER

3. Select Bank number 2 and press **ENTER**.

```
F0  BNK2 Will Be Cleared
Are You Sure ?  (Y/N)
```

Followed by:

```
F3  HARM#001:LEVEL=255
Name:Bn-HMSxx  Created
```

4. Press YES to clear the bank.

```
F0  BNKn Is Cleared
Select Function (0-6)
```

7. Now that you've created a Harmonics Multisound in Wave Memory, you should save it to your Work disk. Press **6** on the numeric keypad.

```
F6  Save/Rename M.SOUND
Rename:Bn-HMSxx ? (Y/N)
```

5. Press **3** on the numeric keypad.

```
F3  Select HARM:Blank
Use D.ENTRY & ENTER
```

8. The display will ask you if you want to rename the Harmonics Multisound. Since you did no editing of the sound, press **NO**.

```
F6  Save msd-name=lllllll
Now Saving
```

6. Select one of the Harmonics tables by using the **DATA ENTRY** controls. There are 17 choices: **BLANK** (all harmonics are at zero volume), **SAW 1** (sawtooth wave), **SQUARE** (square wave), **ACOUSTIC PIANO**, **ELECTRIC PIANO 1**, **ELECTRIC PIANO 2**, **CLAV** (clavinet), **ORGAN**, **BRASS**, **SAXOPHONE**, **SAW 2**, **SAW 3**, **ELECTRIC GUITAR**, **ELECTRIC BASS**, **SYNTHESIZER BASS**, **METAL** (metallic tone), and **SINE** (sine wave). For now, avoid selecting **BLANK** or **SINE**. Press **ENTER**.

You'll see (example: SQUARE):

```
F3  Select HARM:Square
Now Synthesizing...
```

9. Now you can save the sound. Insert your Work disk and press **YES**.

```
F6  Save msd-name=lllllll
Are You Sure ?  (Y/N)
```

You have now saved your second Multisound. To select a new bank for creation of your third Multisound, press **0** then execute step #3 in this section, this time selecting and clearing Bank number 3. Now go through the same operation but select a different Harmonics Table, then save it to your Work disk.

After making your third Multisound and saving it to disk, create your fourth Multisound by editing one harmonic at a time on the **BLANK** preset Harmonics Table, as follows:

OPERATION

1. Execute steps #2 through #5 of the previous operation (in step #3, select Bank number 4).

2. Select the **BLANK** Harmonics table. Press **ENTER**.

3. Now you can edit each individual harmonic and make your own waveform. First, press **YES** to move the cursor to the LEVEL parameter, set the level to a value of your choice using the **DATA ENTRY** controls. Press **ENTER** after making the value change so that you can monitor the Harmonic Multisound you are editing. Press **NO** to move the cursor back to the Harmonic number parameter and continue editing other harmonics in the same fashion. Always press **ENTER** after you have set a new parameter value in order to change the sound and monitor it.

Ranges:

Harmonics number: #001 -- #128
Harmonics level: 0 -- 255

4. Once you are satisfied with the new waveform you have made, you can save it to your Work disk. Press **6** on the numeric keypad.

```
F6 Save/Rename M.SOUND
Rename: Bn-HMSxx ? (Y/N)
```

5. The display will ask you if you want to rename the Harmonics Multisound. Press **YES**, then name the sound using the **CURSOR** keys and the **DATA ENTRY** controls and press **ENTER**.

6. Now you can save the sound. Set your Work disk and press **YES**.

There should be four Multisounds in your Work disk at present. In the following sections you'll learn how to alter the character of the sounds by creating different Programs, and how to put the sounds together in a Combination.

6. CREATING PROGRAMS

Now you'll take the four Multisounds that you have made and create four different Programs.

There are a wide variety of Program functions that you can perform -- changing the tuning of a Multisound, editing the VCF and VCA envelopes, applying modulation, auto bend, after touch and velocity to the sounds. We'll explain a few of these parameters in this section. For more information, refer to the PROGRAM MODE chapter in the MODES AND FUNCTIONS section of this manual.

OPERATION

1. Press **PROGRAM** to enter the PROGRAM MODE.

```
*** PROGRAM MODE ***
Select Function (01-42)
```

2. Press **01**.

```
F01 Select Pnn:pgm-name
Select PGM with D.ENTRY
```

3. Select the Program number you will use. For the first Program, use "01."

4. Press **UP** to call up the Rename function.

```
F02 Rename :pgm-name
Use CURSOR & DATA ENTRY
```

5. Enter a name for the new Program using the **CURSOR** keys and **DATA ENTRY** controls. Call this Program "PIANO."

6. Press **11** to call up the Assign Multisound function.

```
F11 Assign MULTISOUND
Bn-Mm:msd-name L=111111
```

7. Use the **DATA ENTRY** controls to select one of the Multisounds (in this case, Multisound number 1 -- your sampled piano sound).

Now that you have performed the basic functions of identifying, your program and assigning a Multisound to it, you can get down to the business of programming.

Since you have probably become quite familiar with using the front panel's control keys by now, we'll just briefly explain some of the program functions you'll be using and give you a few parameter values to enter. Play the keyboard as you adjust the program parameters and hear how each one affects the sound. Experiment with them and change them as you like.

FUNCTION #13: OSCILLATOR MG (Modulation Generator) -- WAVEFORM, FREQUENCY, DELAY, INTENSITY

This lets you produce vibrato effects on a sound. Use it to add vibrato to your piano Multisound.

OPERATION

1. Press **13** on the numeric keypad to enter the function. Select the following parameter values for the Program:

- Frequency: 20
- Delay: 07
- Intensity: 10

2. You must also set the modulation waveform. Do this in Function #14. Press **14** and set the OSC MG WAVEFORM to SINE.

3. Press **03** to call up the Write Program function. This is necessary to save your newly edited Program 01 to Program memory.

```
F03 Write Pnn:pgm-name
Set No. with D.ENT&ENTER
```

4. Press **ENTER** to write the Program to memory.

FUNCTION #16: AUTO BEND -- POLARITY, TIME, INTENSITY

You can set a pitch bend to occur automatically when keys are played. Direction of the bend (up or down), time of the bend, and intensity are the parameters that can be set.

OPERATION

1. Repeat steps #2 through #7 (see the beginning of the CREATING PROGRAMS section) to give a number and name to your Program and assign another Multisound. For this function, number your Program "02" and assign to it the second Multisound you made.

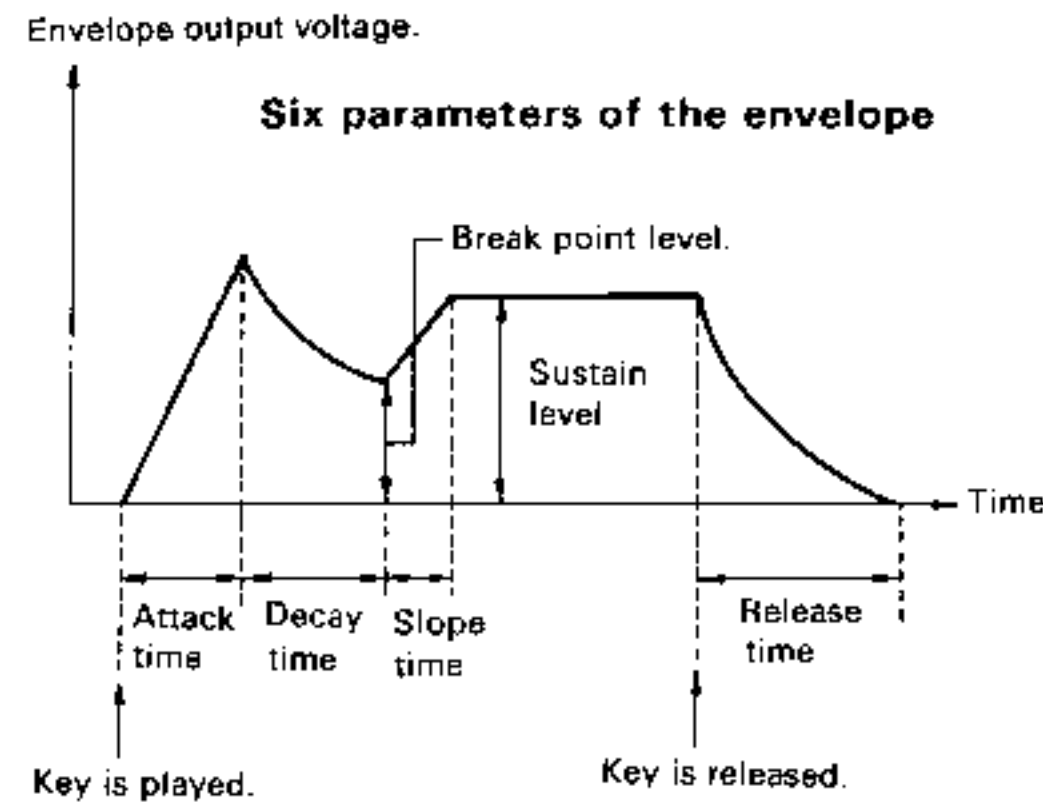
2. Press **16** on the numeric keypad to select the AUTO BEND function. Select the following parameter values for the Program:

- POLARITY: UP
- TIME: 08
- INTENSITY: 100

3. Press **03** to call up the Write Program function. Then press **ENTER** to write your newly edited Program 02 to memory.

FUNCTION #23: VCF EG -- ATTACK TIME, DECAY TIME, BREAK POINT LEVEL, SLOPE TIME, SUSTAIN LEVEL, RELEASE TIME

You can have a sound grow brighter or duller over time as the note is pressed and held. This function lets you set the envelope that controls this change in brightness. The envelope generator (EG) parameters are shown in this graph:



OPERATION

- Repeat steps #2 through #7 (see the beginning of the CREATING PROGRAMS section) to give a number and name to your Program and assign another Multisound. For this function, number your Program "03" and assign to it the third Multisound you made.
- Press **23** on the numeric keypad to enter the function. Select the following parameter values for the Program:
 - A: Attack time: **32**
 - D: Decay time: **43**
 - B: Break point level: **10**
 - S: Slope time: **34**
 - S: Sustain level: **06**
 - R: Release time: **00**
- For the program above to have any effect on the sound you must set three additional parameters: the VCF cutoff frequency (Function #21), the EG polarity and the EG intensity (Function #22).

Press **21** on the numeric keypad.

```
F21 VCF Control
CUTOFF=nnn KBD TRACK=nn
```

- Set the CUTOFF (Cutoff frequency) value to **90**. Ignore the other parameter.
- Press **22**.

```
F22 VCF Control
EG-POL=+ EG-INT=nn
```

- Set EG-POL (EG polarity) to **+**, and EG-INT (EG intensity) to **63**.
- Press **03** to call up the Write Program function. Then press **ENTER** to write your newly edited Program 03 to memory.

FUNCTION #32: VCA EG -- ATTACK TIME, DECAY TIME, BREAK POINT LEVEL, SLOPE TIME, SUSTAIN LEVEL, RELEASE TIME

You can have a sound grow louder or softer over time as the note is pressed and held. This function lets you set the envelope that controls this change in loudness. The VCA EG parameters are the same as in Function #23.

OPERATION

1. Repeat steps #2 through #7 (see the beginning of the CREATING PROGRAMS section) to give a number and name to your Program and assign another Multisound. For this function, number your program "04" and assign to it the fourth Multisound you made.
2. Press **32** on the numeric keypad to enter the function. Select the following parameter values for the Program:
 - A: Attack time: **00**
 - D: Decay time: **32**
 - B: Break point level: **18**
 - S: Slope time: **48**
 - S: Sustain level: **06**
 - R: Release time: **35**
3. Press **03** to call up the Write Program function. Then press **ENTER** to write your newly edited Program 04 to memory.

7. CREATING COMBINATIONS

Now that you've created your Multisounds and assigned them to Programs, you can put them into a Combination. The Combination is the final link in the DSM-1's sound chain and a valuable performance tool. With it you can make keyboard splits, layer sounds for simultaneous play, or have different sounds respond to how hard you play. Moreover, you can assign the sounds in various configurations to the 16 voices and outputs of the DSM-1.

The DSM-1 makes it very easy for you to use this feature since there are 7 preset Combination types to choose from. We'll use one of the presets to create a Combination with your new Programs. Later, in the MODES AND FUNCTIONS section, you'll see more of the almost unlimited options for creating Combinations on the DSM-1.

OPERATION

1. Press **COMBI** to enter the COMBINATION MODE.
3. Using the **DATA ENTRY** controls, select Combination preset SPLIT 4.

```
*** COMBINATION MODE ***
Select Function (00-16)
```

```
FOO SPLIT4:  A|B|C|D
Use D.ENTRY and ENTER
```

2. Press **00** to call up the Combination type select function.

Press **ENTER**.

```
FOO SINGLE:  A
Use D.ENTRY and ENTER
```

```
FOO SPLIT4:  A|B|C|D
A:P01 B:P02 C:P03 D:P04
```

- Now you can assign the Programs you created to the four Timbres displayed (**A, B, C, and D**). Assign them in any order you wish, but notice that the Timbres go in order from lowest section of the keyboard to highest, **A** corresponding to the lower register and **D** to the upper. Select the Program number for each Timbre and press **ENTER**.
- Select three key names (for example, C3, C4, C5) as the split points that will divide the four Timbres across the keyboard.

```
F00 SPLIT4: Key Split
<A>C 3<B>C 4<C>C 5<D>
```

Press **ENTER**.

- To set the number of voices that each Timbre will use, press **07** on the numeric keypad.
- There are 16 voices available for assignment, so for now, set 4 voices for each Timbre.

```
F07 NUMBER OF VOICE
A:04 B:04 C:04 D:04
```

Now that you have finished creating your first Combination, play it and hear how it sounds!

- Finally give the Combination a name and write it into Combination Memory.

To name your new Combination, press **01**.

```
F01 Rename : cmb-name
Use CURSOR & DATA ENTRY
```

- Enter the desired name using the **CURSOR** keys and **DATA ENTRY** controls, and press **ENTER**.
- To select the Write Combination function, press **02**.

```
F02 Write CMB02:cmb-name
Set CMB# with D.ENT&ENTR
```

- Select a memory number for the new Combination and press **ENTER**, to write your newly created Combination into memory.

8. SAVING AND LOADING A SYSTEM

One more step remains before you are finished with your Combination. You must save it to a Performance disk as you did with your sampled and Harmonic-synthesized Multisounds.

After you save the Combination, you'll reload it to make sure that everything works as it should and all your precious work has been preserved. You'll know then that you're the master of this machine and you can go on to bigger and better things in the **MODES AND FUNCTIONS** section!

OPERATION

1. Press **SYSTEM** to enter the SYSTEM MODE. Then select Function #2, SAVE SYSTEM, by pressing **2**.
3. While staying in the SYSTEM MODE, press **1** to call up the GET SYSTEM function.

```
F2 Save SYSTEM
Set PERFORM Disk & ENTER
```

```
F1 Get SYSTEM
Set PERFORM Disk & ENTER
```

2. Set a Performance disk in the drive and press **ENTER**. You'll see:
4. Check that your Performance disk is still set and press **ENTER**. You'll see:

```
F2 Save SYSTEM
Now Saving...
```

```
F1 Get SYSTEM
Now Loading...
```

Followed by:

Followed by:

```
F2 Saving Completed
Select Function (1-6)
```

```
F1 Loading Completed
Select Function (1-6)
```

Your Combination should now be saved, but let's check this by reloading it.

NOTE:

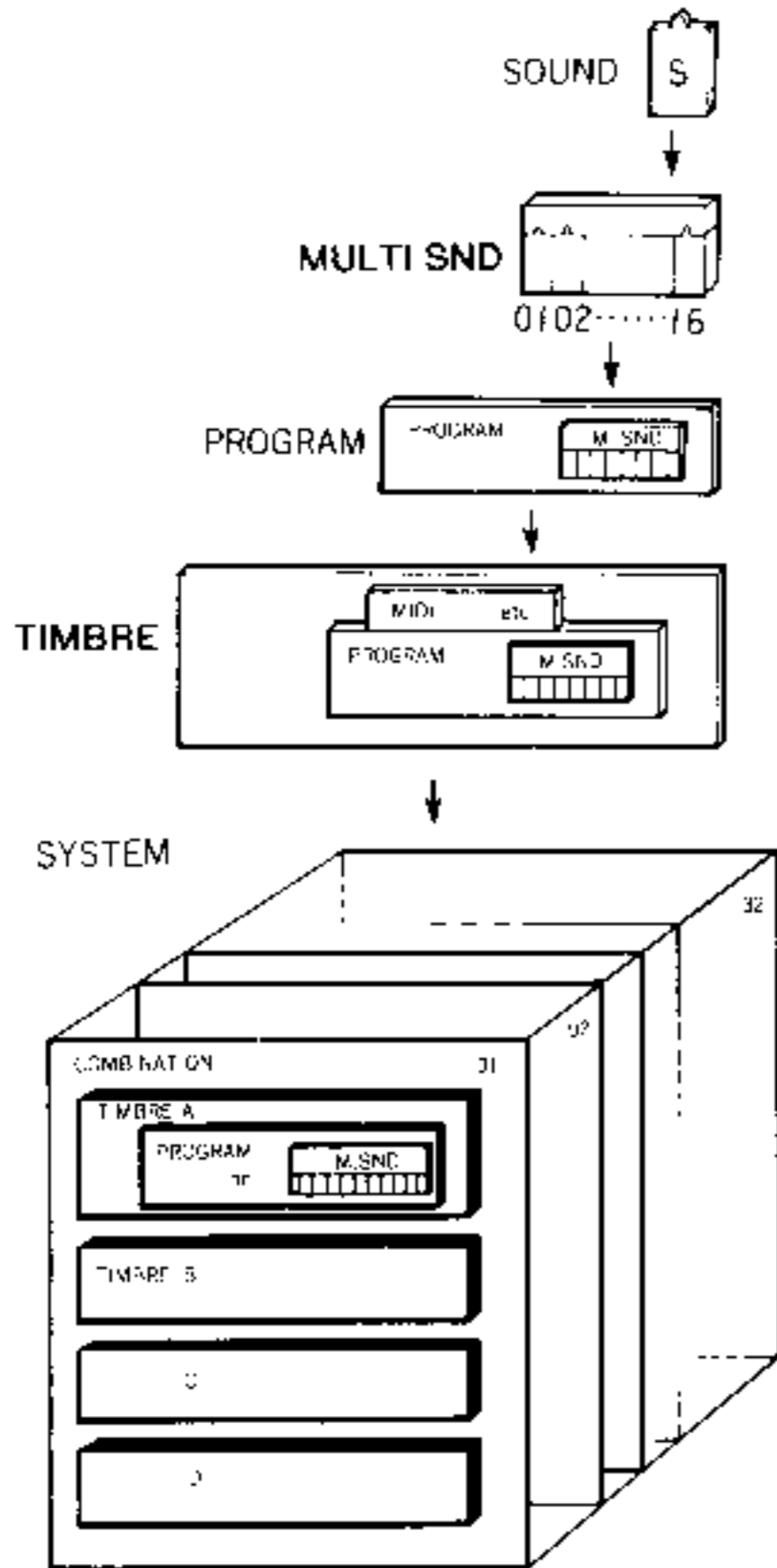
If, during the saving or loading processes, an unusual message appears, consult the Error Messages section or try repeating the preceding operation.

5. Go back to the PLAY MODE (press **PLAY**), select the Combination you created, and play it.

SYSTEM STRUCTURE

HOW SOUNDS ARE BUILT UP

The DSM-1 is a multi-timbre sampling unit capable of creating immensely rich sounds by combining up to 4 Timbres in each of 32 Combinations. The following illustration indicates how a complete system (32 Combinations) is assembled, from Sound to Multisound to Program to Timbre to Combination.

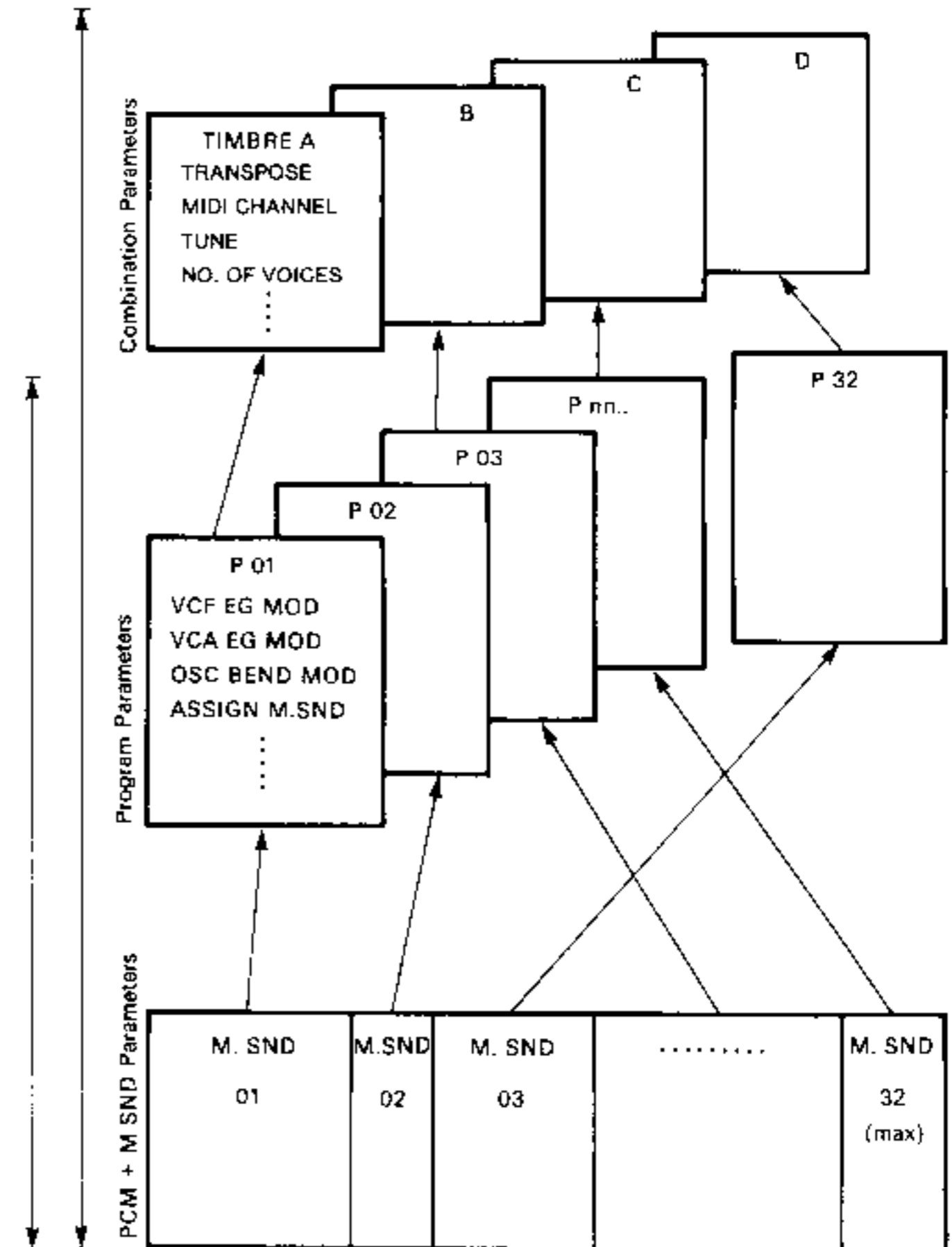


Starting with the final composite sound (a Combination) Timbres may be played in a variety of configurations: SPLIT indicates that each Timbre is assigned to a section of the keyboard (overlapping is also possible); LAYER indicates that Timbres are played simultaneously (they may be selected by the velocity with which the keyboard is played). Any combination of SPLIT and LAYER is also possible.

A Timbre is created by selecting a Program, to which is assigned a Multisound. The Program modifies the Multisound using conventional synthesizer functions such as VCA, VCF, etc. You can assign a separate MIDI channel to each Timbre, and select the number of voices which can be played by each Timbre. Timbres can also share voices.

A Multisound is created by assembling a number of Sounds, each of which is assigned to a different section of the keyboard. Sounds are originally created by sampling or by Harmonic synthesis, and may be reversed, linked or mixed.

The following diagram shows, in another format, how Multisounds (up to 32 may be stored) are assigned to Programs (up to 32) and thence to a Combination. A selection of Program parameters and Combination parameters is also shown. Note that the KORG DSS-1 Digital Sampling Synthesizer can also execute Multisounds and Program operations, but is not capable of creating Combinations.



DATA STORAGE

32 Combinations and 32 Programs may be stored in the internal memory or on a disk. The Wave memory stores Multisound data in four Banks. Each bank can contain up to eight Multisounds, totalling eight seconds of sampling time.

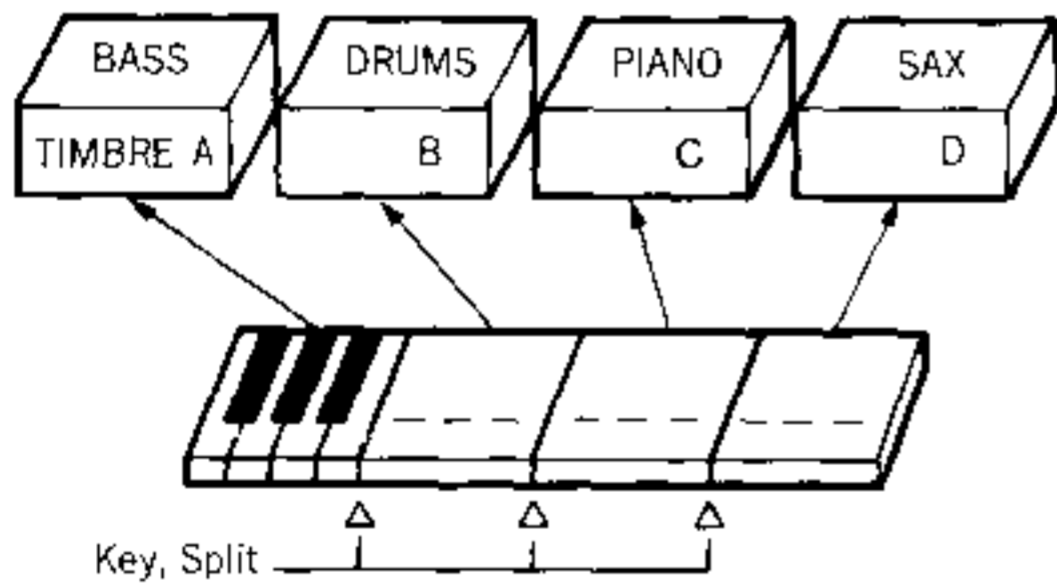
COMBINATION			
01	02	.....	32

PROGRAM			
01	02	.....	32

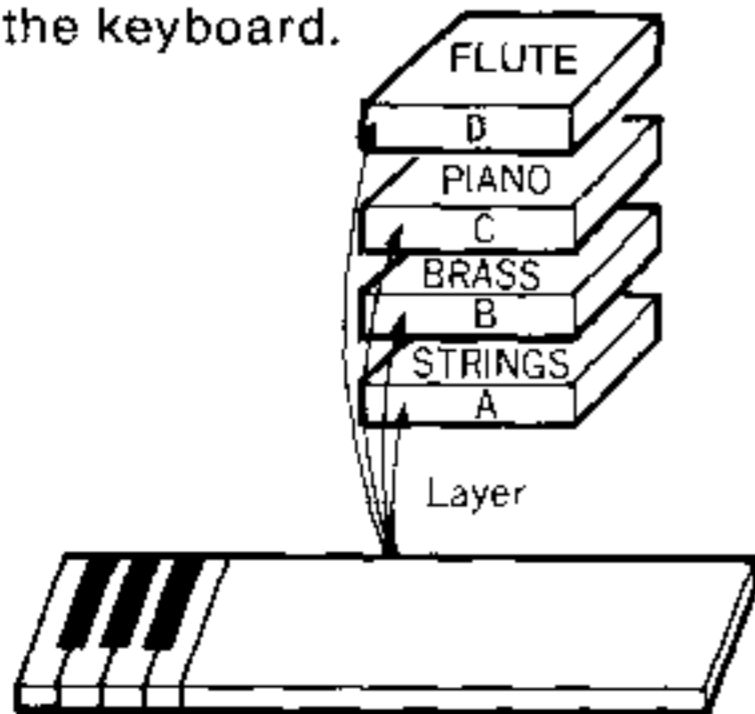
WAVE MEMORY											
BANK 1			BANK 2			BANK 3			BANK 4		
M.SND	M.SND	M.SND	M.SND	M.SND	M.SND	M.SND	M.SND	M.SND	M.SND	M.SND	M.SND
01	02	..... 08	01	02	..... 08	01	02	..... 08	01	02	..... 08
← 8sec Max (32KHz) →			← 8sec Max (32KHz) →			← 8sec Max (32KHz) →			← 8sec Max (32KHz) →		

COMBINATION TYPES

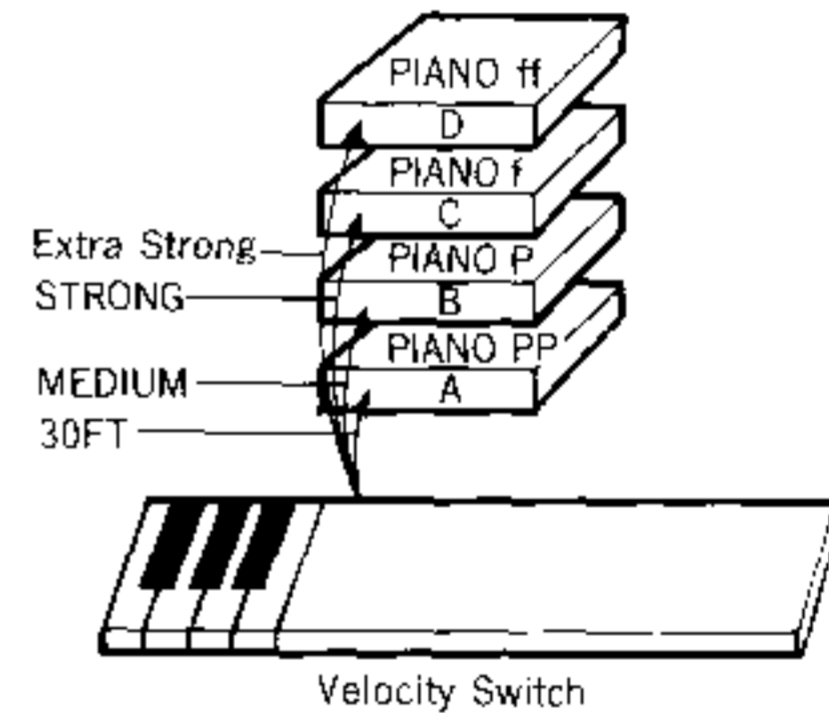
Here are examples of how four Timbres may be used in a Combination, to show four of the seven available preset Combination types:



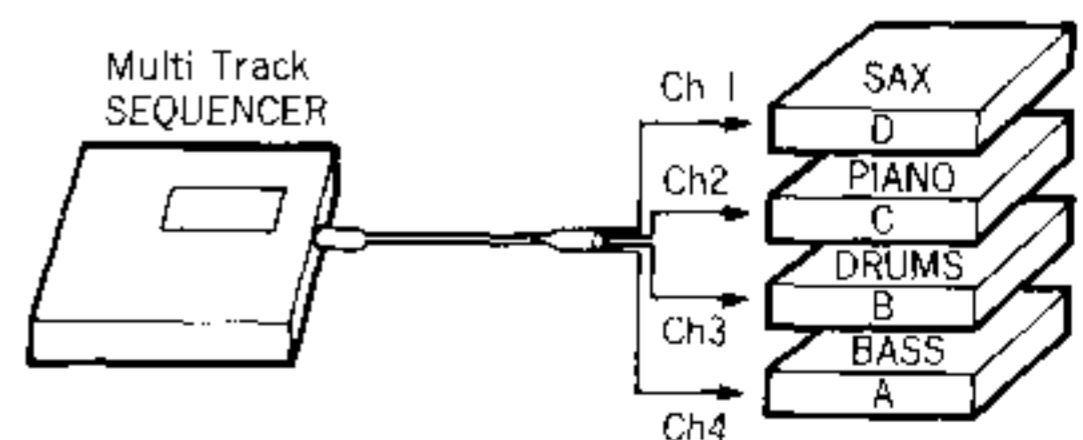
Using Function #00 in the Combination mode, Combination type SPLIT 4 assigns the four Timbres to four sections of the keyboard.



Combination type LAYER 4 enables the four Timbres to be played simultaneously.



In the LAYER 4 Combination type, a "velocity window" function allows each Timbre to be assigned to a different velocity range, so that Timbres may be changed just by the way the keys are played. At the softest touch, Timbre A will be heard. Increasing the key velocity allows play of Timbres B, C and D successively.



In the MULTI Combination type, the four Timbres are each set to receive MIDI data on a different MIDI channel, and can be played independently as four

"instruments" by MIDI data sent on separate MIDI channels from a sequencer. Note that if, for example, Timbre B is used to create a drum set, its sounds could be output via the DSM-1's 16 Individual Outputs, for independent panning and processing of each sound.

THE USE OF OUTPUTS

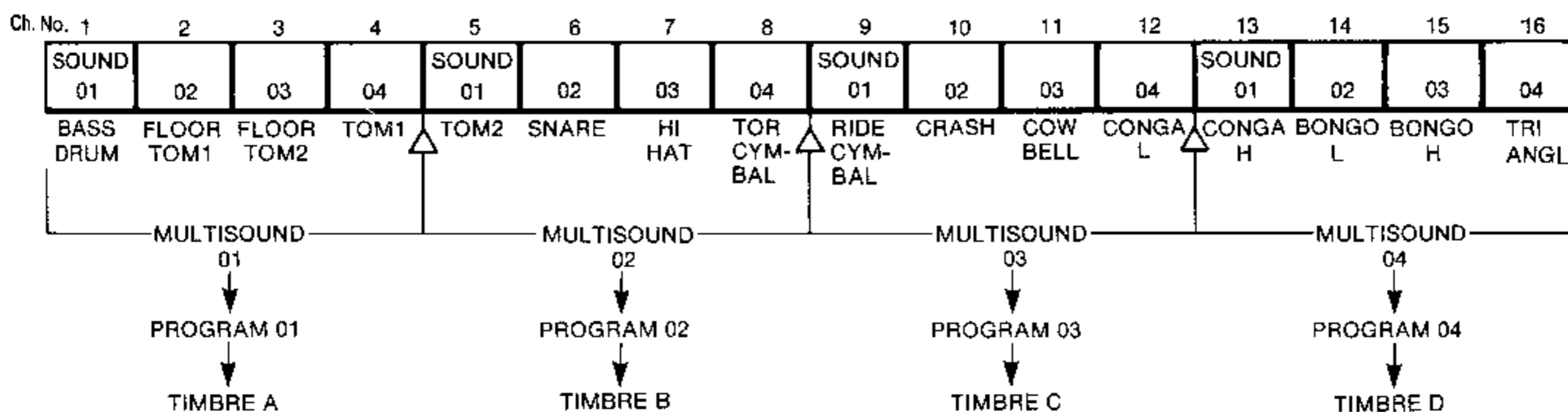
The DSM-1 has 16 Individual Outputs for sending sounds to independent channels on a mixing console. You can determine which sounds will be output via the Individual Outputs and which will be output via the mono MIX OUT jack.

To take advantage of this capability, three functions in the Combination Mode (Functions #07, #11, and #16) must be used.

The following diagram shows how 16 percussion sounds (grouped in 4 Multisounds) can be output via the 16 Individual Outputs. Create each Multisound by sampling four different percussion sounds. Assign the Multisounds first to Programs, then to Timbres, and determine the split points on the keyboard that will separate the four Timbres.

INDIVIDUAL OUT 16 PERCUSSIONS

- F07 F07 NUMBER OF VOICE
A:04 B:04 C:04 D:04
- F11 F11 Select VOICE ALLOC.
MODE 0: (A) (B) (C) (D)
- F16 F16 TIMBRE-A OUTPUT
TYPE=INDIVIDUAL SND OUT



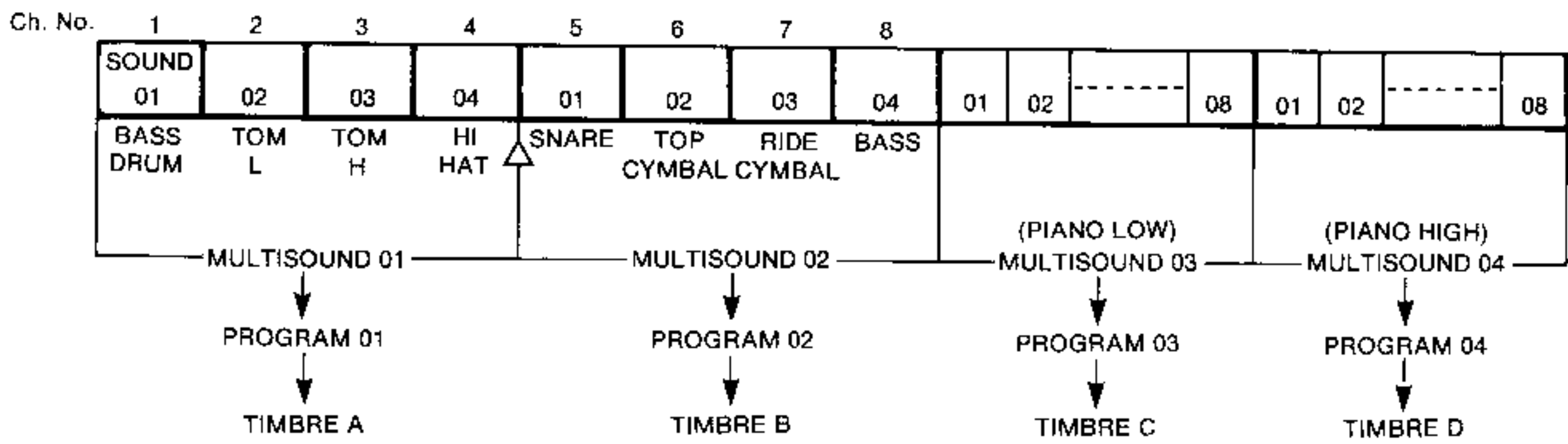
Seven percussion sounds and a bass sound can be sent via the Individual Outputs while an 8-voice piano sound can be simultaneously sent via the MIX OUT jack.

For this application, Combination Mode Functions are set as follows:

- F07 F07 NUMBER OF VOICE
A:04 B:04 C:04 D:04
- F11 F11 Select VOICE ALLOC.
MODE 1: (A) (B) (C + D)
- F16 F16 TIMBRE-A OUTPUT
TYPE=INDIVIDUAL SND OUT
- F16 F16 TIMBRE-C OUTPUT
TYPE=UNIVERSAL M.SND OUT

INDIVIDUAL OUT SEVEN PERCUSSIONS & BASS

MIX OUT PIANO

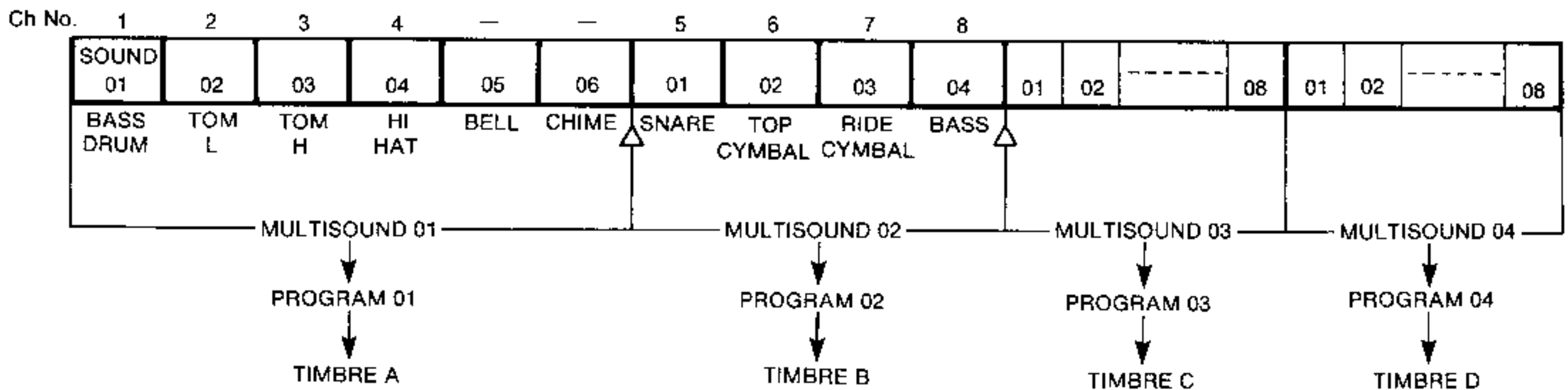


CONDITIONS WHERE SOME SOUNDS ARE NOT OUTPUT

In the following diagram, Multisound #01 consists of six sounds which have been set, in Function #16, to be output individually. If, in Function #07, its Timbre (Timbre A) is set to output four sounds, only sounds #01 - #04 will be output. Sounds #05 and #06 ("Bell" and "Chime") will not be output, neither to the Individual Outputs nor the MIX OUT jack.

INDIVIDUAL OUT

MIX OUT

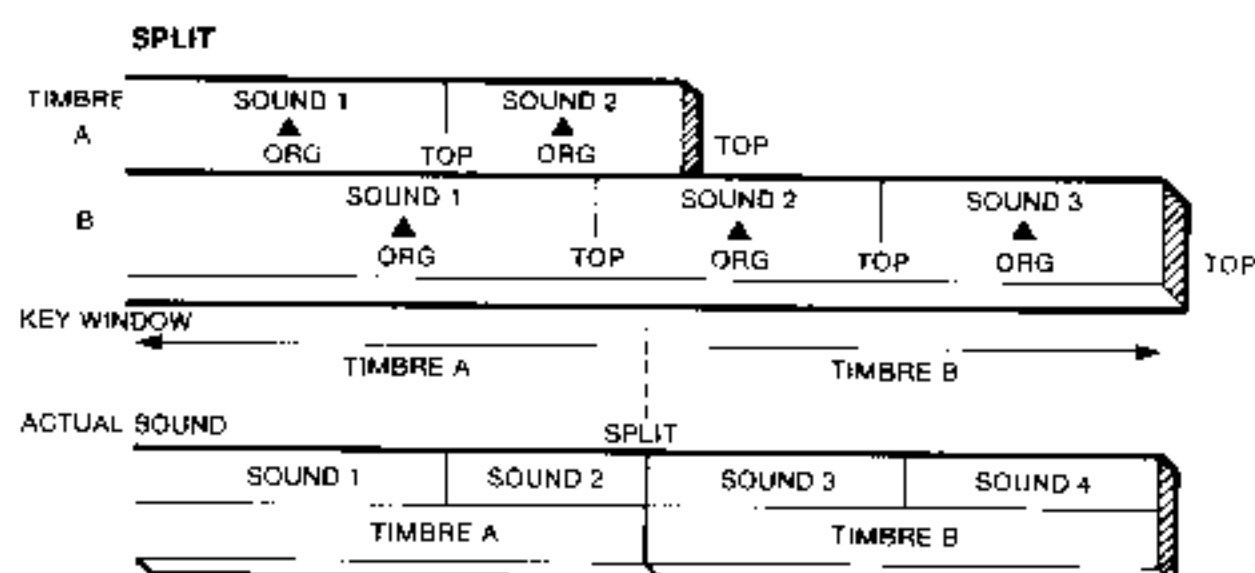


SOUND OUTPUT IN SPLIT MODES

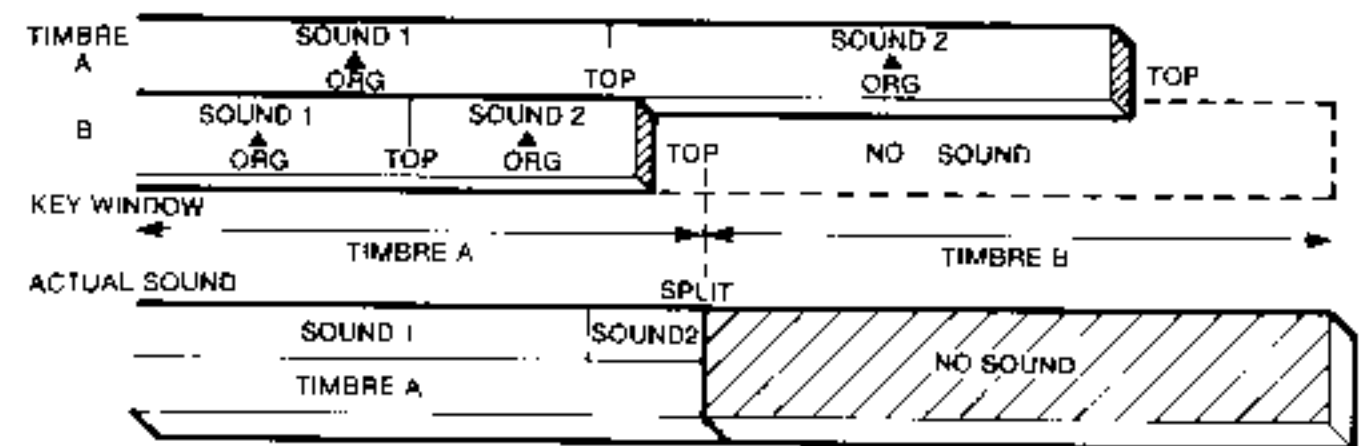
When using SPLIT type Combinations, Timbres may be assigned to different sections of the keyboard. With sampled sounds, there is an upper pitch limit to which samples can be transposed (see SAMPLE MODE Function #6) and this should be remembered when assigning the sound to the keyboard.

If, for example, a Multisound has no sounds in the higher keyboard register, and the key window has been assigned to a higher register, the Multisound will not be heard.

Here, both Timbres A and B can be heard:



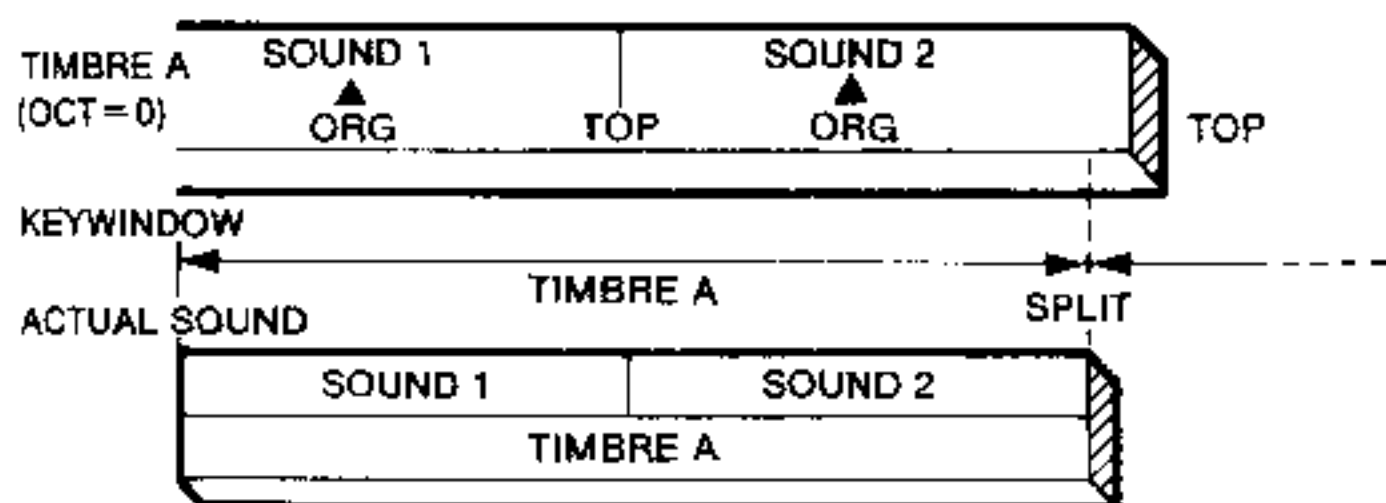
Here, only Timbre A (in the register below the split point) can be heard:



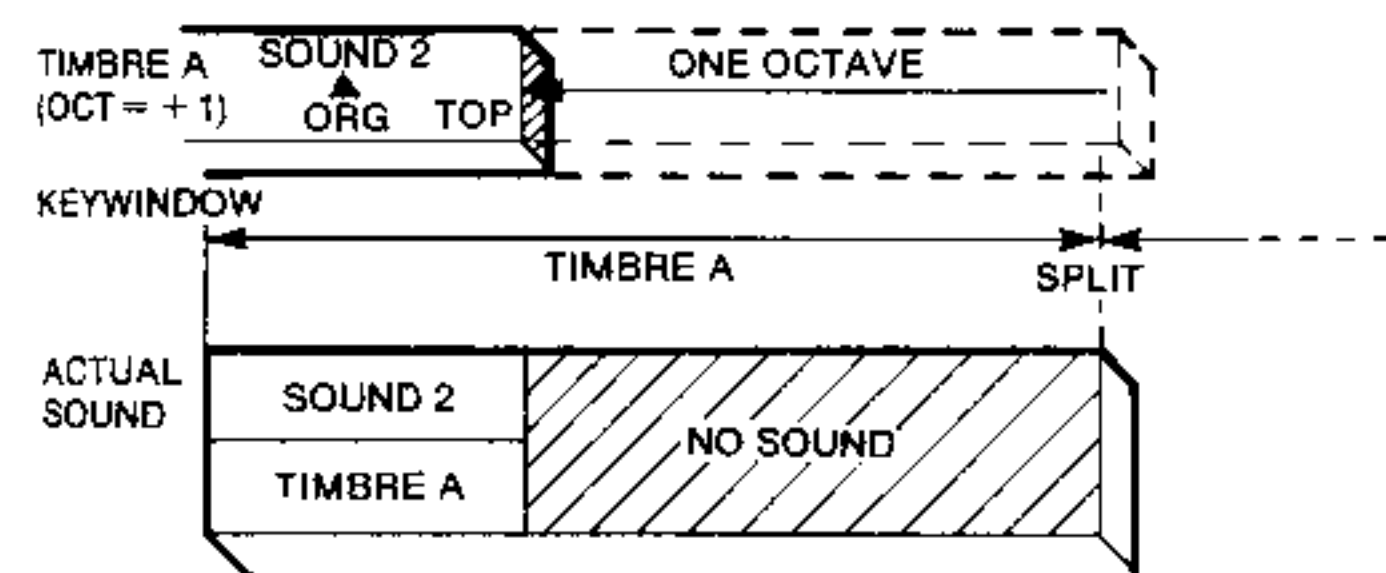
Timbre B CAN be heard if it is set one octave lower in Combination Mode Function #04.

However, care should also be taken when changing transposition settings.

In the diagram below, the sounds of Timbre A are output up to the split point.



If Timbre A is transposed down one octave, no sound will be heard between Timbre A's top key and the split point.



When creating Combinations such as these, sounds may not be output unless the following three parameters are taken into account:

1. The upper limit of the highest sound in the Multi-sound.
2. The transposition range of the Timbre as set in the Combination Mode, Function #04.
3. The key window of the Timbre.

PLAY MODE

OVERVIEW

In the Play Mode, you can:

- Select a Combination to be played, from the DSM-1's front panel or from an external MIDI instrument, and play it.
- Change the tuning of a Combination.
- Check the assigned Program numbers and MIDI channels for each Timbre in a Combination.

NOTE:

*If you are using a computer to edit data on the DSM-1 (in the MIDI EXCLUSIVE REMOTE EDIT MODE), you can press **PLAY** to exit the edit mode and enter the Play Mode.*

The MIDI EXCLUSIVE REMOTE EDIT MODE lets you communicate with a host computer via a MIDI or HSI connector (see the REAR PANEL section). The mode is entered automatically upon receiving the proper message from the host computer. In this mode, the DSM-1 accepts no real-time information via the MIDI or HSI Connectors, and only the PLAY key will function.

ENTERING AND OPERATING THE PLAY MODE

To enter the Play Mode, press **PLAY**. The following display will appear:

```
CMB01:cmb-name TUNE=+00  
A:P01 B:P02 C:P03 D:P04
```

Select a Combination. If the DSM-1's system-common MIDI channel (as selected in System Mode, Function #4) is the same as the MIDI transmit channel of the external MIDI instrument, you can select Combinations by selecting programs on the external MIDI instrument. You can now play the Combination.

Use the **DATA ENTRY** controls to change the tuning.

Check the Program and MIDI channel status of each Timbre by pressing **ENTER**. The **ENTER** key serves as a toggle switch between Program number and MIDI channel number.

To exit this mode, press any other mode key.

SYSTEM MODE

OVERVIEW

In the System Mode you can:

- Get a system from a Performance disk and load it into memory.
 - Save a system that is currently stored in Wave Memory onto a Performance disk.
 - Get a system from a disk made on the Korg DSS-1 Digital Sampling Synthesizer.
 - Set the system common MIDI channel.
 - Set the DSM-1 so that a footswitch or audio trigger can be used to play back a selected note.
-

THE FUNCTIONS

- Function #1: GET SYSTEM:**
Get a system from a disk and load it into Wave Memory.
- Function #2: SAVE SYSTEM:**
Take a system that has been created in Wave Memory and save it to disk.
- Function #3: GET DSS-1 SYSTEM:**
Load one of the four systems of a DSS-1 disk into Wave Memory.
- Function #4: SYSTEM COMMON MIDI CHANNEL:**
Change the MIDI receive channel for the DSM -1's system.
This function lets you determine the MIDI channel for combination changes so that it matches the channel on which the external keyboard sends program change messages.
- Function #5: PLAY BACK:**
Using either a positive or negative footswitch, play one selected note to monitor sounds during editing without the use of a MIDI keyboard.
- Function #6: AUDIO TRIGGER:**
Use an audio input to trigger (play) one selected note (the note is selected in Function #5).
-

ENTERING THE SYSTEM MODE

To enter the System Mode, press the **SYSTEM** key. You will be prompted to select a function (1-5). To exit this mode, either now or after completing one of the functions, press any other mode key.

FUNCTION #1: GET SYSTEM

FUNCTION

To get a system from a Performance disk and load it into Wave Memory.

OPERATION

1. Press **1** on the numeric keypad.

2. Set a Performance disk and press **ENTER**. The display will read "Now Loading..." followed by "Loading Completed."

F1 Get SYSTEM Set PERFORM Disk & ENTER

NOTE:

<i>If, during the loading process, an error message appears, consult the Error Messages section or try repeating the preceding operation.</i>

FUNCTION #2: SAVE SYSTEM

FUNCTION

To take a system that has been created in Wave Memory and save it to disk.

OPERATION

1. Press **2** on the numeric keypad.

F2 Save SYSTEM Set PERFORM Disk & ENTER
--

2. If a system currently occupies the disk, the display will show that.

3. Pressing **YES** will save the new system and overwrite the old system if one exists. The display will show "Now Saving..." followed by "Saving Completed" and prompt you to select a function (1-5). Pressing **NO** will abort the Save System function.

NOTE:

If, during the saving process, an error message appears, consult the Error Messages section. Never remove a disk or turn power off during loading or saving.

FUNCTION #3: GET DSS-1 SYSTEM

FUNCTION

To load one of the four systems of a DSS-1 disk into Wave Memory.

The DSS-1 can store four systems to a disk, named A, B, C, or D. Each system can hold up to 32 Programs, 32 Multisounds and sounds up to a total of 520,000 "words."

OPERATION

1. Press **3** on the numeric keypad.

F3 Get DSS-1 SYSTEM:A Select SYSTEM & ENTER
--

3. Select the desired system (A, B, C, or D) and press **ENTER**. The display will show "Now Loading..." followed by "Loading Completed."

NOTE:

If, during the loading process, an error message appears, consult the Error Messages section.

2. Set the DSS-1 disk and press **ENTER**.

FUNCTION #4: SYSTEM COMMON MIDI CHANNEL

FUNCTION

To change the MIDI receiving channel for the DSM-1's system.

OPERATION

1. Press **4** on the numeric keypad.

F4 SYSTEM COMMON MIDI Channel=nn

2. Select the MIDI channel desired.

Range: 1 ~ 16

FUNCTION #5: PLAY BACK

FUNCTION

Using either a positive or negative footswitch, to play one selected note to monitor sounds during editing without the use of a MIDI keyboard.

OPERATION

1. Press **5** on the numeric keypad.

F5 PLAY BACK: KEY=D# 3 Ch=nn Vel=nnn Sw-Type=n

2. Select the note for playback, the MIDI channel (to match the MIDI channel of the desired Timbre; see the COMBINATION MODE chapter, Function #12), the velocity sensitivity setting that the desired sound would normally be activated by (see the COMBINATION MODE chapter, Functions #00 and #14), and the switch type -- positive (1) or negative (0). See also the NOTE in the following function.

FUNCTION #6: AUDIO TRIGGER

FUNCTION

Using an audio signal sent to the DSM-1's AUDIO IN JACK, trigger (play) a selected note.

- Prior to using this function, use function #5 to select the note and its velocity setting. This function could be used to play a note on the DSM-1 from a drum, for example. Every time the drum is hit, the note will sound. The drum could be live, or pre-recorded. The microphone or tape deck should be connected to the DSM-1's AUDIO IN jack.

OPERATION

1. Press **6** on the numeric keypad.

F6 AUDIO TRIGGER Trig=DISABLE

3. Use the **REC LEVEL** control, **TRIG LEVEL** control and **GAIN SWITCH** to adjust the input level so that the selected sound is triggered. If no triggering occurs even at maximum gain, raise the level of the signal at its source.

NOTE:

Parameters set in Functions #5 and #6 may be saved to disk as system data, using Function #2 SAVE SYSTEM.

2. Use the **DATA ENTRY** controls to select "ENABLE". This allows you to use the Audio Trigger function. (When the DSM-1 power is turned on, this is always set to "DISABLE").

COMBINATION MODE

OVERVIEW

In the Combination Mode you can:

- Arrange Programs into a Combination by assigning them to Timbres.
- Select a Combination type (either a preset Combination type or a manually created Combination type) then name and write the Combination.
- Set each timbre to receive program changes, modulation data, and after touch data from an external MIDI device.
- Determine the level, transposition, tuning, and number of voices for each Timbre within a Combination.
- Determine the assignment of voices to the Individual outputs.
- Set MIDI receive channels for each Timbre.
- Create Combinations manually by setting key windows and key velocity windows for each Timbre.

THE FUNCTIONS

NOTE:

When a Preset type Combination is selected, only Functions #00 thru #09 may be used. When a Manual type Combination is selected, all the following functions may be used:

- Function #00:** SELECT COMBINATION TYPE: Select the combination type (one of seven presets or manual operation).
- Function #01:** RENAME COMBINATION: Give a name to a Combination.
- Function #02:** WRITE COMBINATION (to COMBINATION MEMORY): Take the Combination created in the output buffer and write it to a Combination memory number.
- Function #03:** MIDI RECEIVE FUNCTION (PROGRAM CHANGE, MODULATION, AFTER TOUCH): Determine whether or not each timbre will respond to program change, modulation, and after touch commands from a MIDI instrument.
- Function #04:** OCTAVE, SEMITONE TRANSPOSE: Select the transposition setting for each Timbre in a Combination.
- Function #05:** KEY ASSIGN MODE: Determine how the 16 voices of the DSM-1 will be assigned. (POLY 1 or POLY 2).
- Function #06:** PROGRAM NUMBER: Assign a Program to each Timbre.
- Function #07:** NUMBER OF VOICES: Determine the number of voices that will be assigned to each Timbre.
- Function #08:** TUNE: Set the amount of detuning that will be applied to each Timbre.
- Function #09:** LEVEL: Set the level of each Timbre.
- Function #11:** SELECT VOICE ALLOCATION MODE: Set the mode in which voices are "shared" among Timbres.
- Function #12:** MIDI CHANNEL: Set the MIDI receive channel for each Timbre.
- Function #13:** LEVEL-VELOCITY POLARITY: Determine whether the Timbres will respond normally or inversely to key velocity (as set in Function #14).
- Function #14:** VELOCITY WINDOW -- BOTTOM, TOP: Set the upper and lower key velocity settings between which each Timbre will sound.
- Function #15:** KEY WINDOW -- BOTTOM, TOP: Set the range of notes to which each Timbre will be assigned.
- Function #16:** SELECT OUTPUT TYPE: Select between sending sounds to the Individual Outputs or to the Mix Output.

ENTERING THE COMBINATION MODE

To enter the Combination Mode, press the **COMBINATION** key. You will be prompted to select a function: 00-16, if the current Combination is a manual type; 00-09, if the current Combination is a preset type. To exit this mode, either now or after completing one of the functions, press any other mode key.

FUNCTION #00: SELECT COMBINATION TYPE

FUNCTION

To select the combination type (one of seven presets or manual operation).

OPERATION

1. Press **00** on the numeric keypad.
2. Using the **DATA ENTRY** wheel or keys, select the combination type: SINGLE, SPLIT 2, LAYER 2, SPLIT 4, LAYER 4, SPLIT/LAYER (SP. LYR.), MULTI, or MANUAL. The Combination types are as follows:

SINGLE

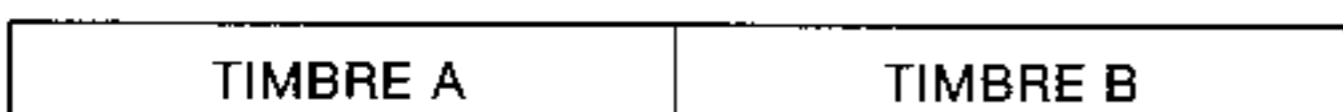


1. Press **ENTER**.

```
FOO SINGLE:  A
01:pgm-name
```

2. Timbre **A** is automatically selected as the only Timbre in this Combination; select the desired Program number to assign to Timbre **A** and press **ENTER**.
3. Select the output type desired: UNIVERSAL (sends all voices to the MIX OUT jack), or INDIVIDUAL (sends sound to the 16 individual outputs). (See Function #16 for more information on voice/output assigning).

SPLIT 2



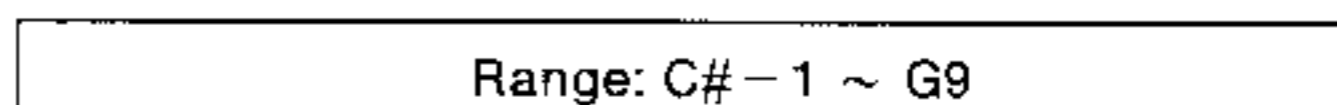
1. Press **ENTER**.

```
FOO SPLIT2:  A|B
01:pgm-name 02:pgm-name
```

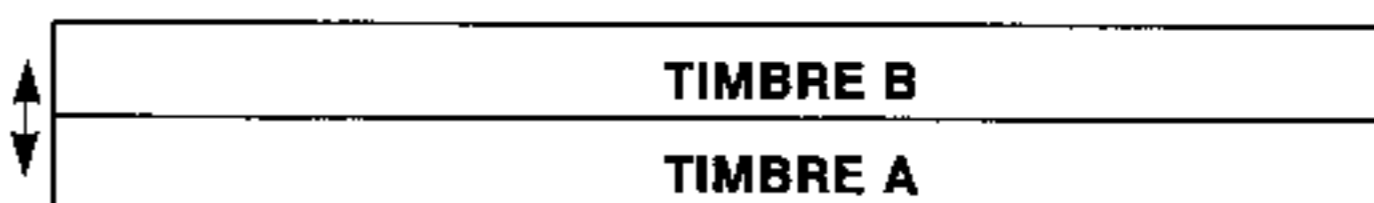
2. Timbres **A** and **B** are automatically selected as the two Timbres. Select the desired Program for each Timbre and press **ENTER**.

```
FOO SPLIT2 : A|B
Split Point = C 3
```

3. Set the split point and press **ENTER**.



LAYER 2



1. Press **ENTER**.

```
FOO LAYER2:  AB
01:pgm-name 02:pgm-name
```

2. Timbres **A** and **B** are automatically selected as the two Timbres. Select the desired Program for each Timbre and press **ENTER**.

```
FOO LAYER2:  AB
Velocity.Switch = OFF
```

3. Select the velocity switch value and press **ENTER**.

- Setting the velocity switch to OFF allows you to play both sounds simultaneously. Any other setting allows you to determine the point at which key velocity switches between the two sounds. Playing softly would sound the **A** Timbre, and playing hard would sound the **B** Timbre.

Velocity Switch Range: OFF/00 ~ 63

SPLIT 4



1. Press **ENTER**.

FOO SPLIT4: A|B|C|D
A:P01 B:P02 C:P03 D:P04

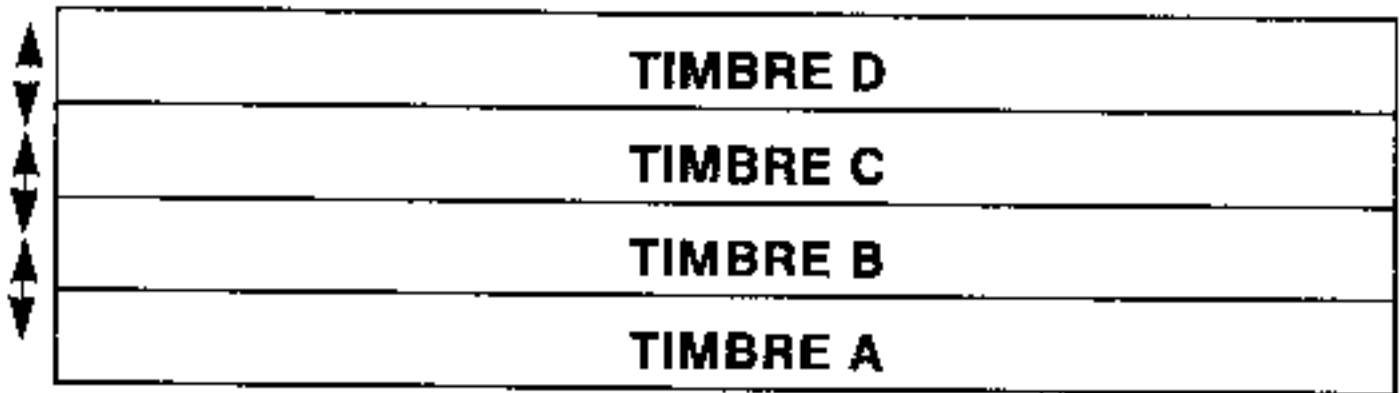
2. Select Program numbers for all four Timbres and press **ENTER**.

FOO SPLIT4: Key Split
<A>C 3C 4<C>C 5<D>

3. Select the three split points: 1> between **A** and **B**, 2> between **B** and **C**, and 3> between **C** and **D**. Press **ENTER**.

Range: C#-1 ~ G9

LAYER 4



1. Press **ENTER**.

FOO LAYER4: ABCD
A:P01 B:P02 C:P03 D:P04

2. Select Program numbers for all four Timbres and press **ENTER**.

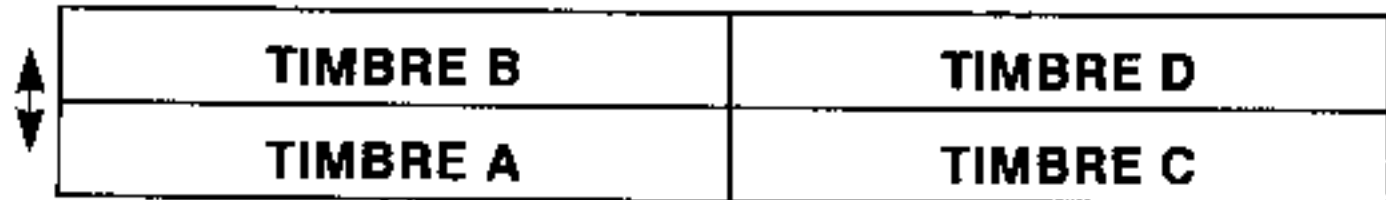
FOO LAYER4: Vel.Switch
<A> 10 30 <C> 43 <D>

3. Select OFF or the three velocity split points: 1> between **A** and **B**, 2> between **B** and **C**, and 3> between **C** and **D**. Press **ENTER**.

- Velocity sensitivity operates in alphabetical order of the letters: **A** will be sounded by the softest touch and **D** by the hardest. (See LAYER 2 above for more information.)

Velocity Switch Range: OFF/00 ~ 63

SPLIT/LAYER



1. Press **ENTER**.

FOO SP.LYR: AB|CD
A:P01 B:P02 C:P03 D:P04

2. Select Program numbers for all four Timbres and press **ENTER**.

FOO SP.LYR: AB|CD
SPLIT=C 4 Vel.Sw=OFF

3. Set the split point that will separate **A** and **B** from **C** and **D**. Select the velocity switch setting for the **A/C** and **B/D** layers. Press **ENTER**.

- When using the velocity switch, **A** and **C** will respond to a soft touch and **B** and **D** will respond to a hard touch. (See LAYER 2 above for more information.)

Split Point Range: C#-1 ~ G9

Velocity Switch Range: OFF/00 ~ 63

MULTI

TIMBRE D
TIMBRE C
TIMBRE B
TIMBRE A

1. Press **ENTER**.

```
FOO MULTI:  A, B, C, D
A:P01 B:P02 C:P03 D:P04
```

2. Select Programs for each Timbre and press **ENTER**.

```
FOO MULTI:  MIDI Ch
A:01 B:02 C:03 D:04
```

3. Determine the MIDI channel for each Timbre. Press **ENTER**.

- This preset allows you to have separate MIDI instruments play separate Timbres (on different MIDI channels), or play the four Timbres from four tracks of a sequencer (on different MIDI channels). You can also make Program changes for each Timbre.

To use this function, the Timbres' MIDI channels must be different from each other AND different from the system-common MIDI channel (set in the System Mode, Function #4). If the system-common MIDI channel and the MIDI channel for Timbre **A** are both the same, Combination change has priority and the whole Combination would change, not just Timbre **A**.

MANUAL

NOTE:

For Manual type Combinations ONLY, functions #11 thru #16 may be set in this mode. The Manual type offers more programming flexibility than the preset types, for complex overlapping key assigns, overlapping velocity switching, etc.

1. Press **ENTER**.

```
FOO MANUAL:
A:P01 B:P02 C:P03 D:P04
```

2. Select Program numbers for all four Timbres and press **ENTER**.

```
FOO MANUAL: MIDI ch
A:01 B:02 C:03 D:04
```

3. Determine the MIDI channel for each Timbre. Press **ENTER**.

FUNCTION #01: RENAME COMBINATION

FUNCTION

To give a name to a Combination.

OPERATION

1. Press **01** on the numeric keypad.

```
F01 Rename : cmb-name
Use CURSOR & DATA ENTRY
```

2. Select the desired name (up to eight characters) for the combination and press **ENTER**.

FUNCTION #02: WRITE COMBINATION (To COMBINATION MEMORY)

FUNCTION

To take the Combination created and write it to a selected Combination memory.

OPERATION

1. Press **02** on the numeric keypad.
2. Select a number for the combination and press **ENTER**.

```
F02 Write CMB02:cmb-name  
Set CMB# with D.ENT&ENTR
```

FUNCTION #03: MIDI RECEIVE FUNCTION (PROGRAM CHANGE, MODULATION, AFTER TOUCH)

FUNCTION

To determine whether or not each timbre will respond to Program change, modulation, and after-touch commands from an external MIDI device.

NOTE:

The Program change function will operate only when the Timbre's MIDI channel (as set in Function #00, MULTI or MANUAL Combination types, or Function #12) and the system-common MIDI channel (System Mode, Function #4) are different. (See the explanation in Function #00, the MULTI Combination type operation.)

OPERATION

1. Press **03** on the numeric keypad.
2. Select the desired Timbre (**A** through **D**) and the MIDI function settings (ON or OFF) for Program change, modulation, and after touch. Press **ENTER**.

```
F03 TIMBRE-A MIDI FUNC  
PGM=OFF MOD=OFF AFT=OFF
```

FUNCTION #04: OCTAVE, SEMITONE TRANSPOSE

FUNCTION

To determine the transposition setting for each Timbre in the Combination.

NOTE:

The range when transposing upward is reduced if there are sampled sounds in the Timbre. (See SAMPLE MODE, Function #6.)

OPERATION

1. Press **04** on the numeric keypad.
2. Set the Timbre desired and the parameters:

```
F04 TIMBRE-B TRANSPOSE  
OCTAVE=+2 SEMITONE=+11
```

```
Range: OCTAVE: -5 ~ +5
```

```
Range: SEMITONE: -11 ~ +11
```

FUNCTION #05: KEY ASSIGN MODE

FUNCTION

To determine how the 16 voices of the DSM-1 will be assigned when keys are played (POLY 1 or POLY 2).

POLY 1:

In this polyphonic setting, the sixteen voices are assigned sequentially to the keys as they are played. If the same note is played repeatedly, a new voice will be assigned to it each time it is played, allowing notes to overlap each other.

POLY 2:

In this polyphonic setting, the same voice will be used if the same key is played repeatedly, the voice's envelope being interrupted and started over again each time the key is played.

OPERATION

1. Press **05** on the numeric keypad.
2. Set the mode: POLY 1 or POLY 2.

F05 TIMBRE-B Key Assign MODE = POLY1

FUNCTION #06: PROGRAM NUMBER

FUNCTION

To select a Program for each Timbre.

OPERATION

1. Press **06** on the numeric keypad.
2. Set the program number (01-32) for each Timbre.

F06 PROGRAM A01:pgm-name A:P01 B:P02 C:P03 D:P04

FUNCTION #07: NUMBER OF VOICES

FUNCTION

To determine the number of voices that will be assigned to each Timbre.

- A total of 16 voices can be assigned to the four Timbres. If, for example, 8 voices are assigned to Timbre A, 8 voices would be divided up among the other 3 Timbres. When using a Manual type Combination, use this function with Functions #11 and #16 for output selection.

OPERATION

1. Press **07** on the numeric keypad.
2. Set the number of voices for each Timbre.

F07 NUMBER OF VOICE A:04 B:04 C:04 D:04
--

FUNCTION #08: TUNE

FUNCTION

To set the amount of detuning that will be applied to each Timbre.

OPERATION

1. Press **08** on the numeric keypad.

2. Set the parameter for each Timbre.

F08 TIMBRE TUNE A=+32 B=-12 C=+03 D= 00
--

Range: -32 ~ +32 (about +/- 1 semitone)

FUNCTION #09: LEVEL

FUNCTION

To set the volume of each Timbre.

OPERATION

1. Press **09** on the numeric keypad.

2. Set the parameter for each Timbre.

F09 TIMBRE LEVEL A= 62 B= 63 C= 59 D= 63

Range: 0 ~ 63

MANUAL SETTING FUNCTIONS

FUNCTION #11: SELECT VOICE ALLOCATION MODE

FUNCTION

To determine the polyphonic voice assignment among Timbres.

- Use this function in conjunction with Functions #7 and #16 for output selection.

NOTE:

This function may ONLY be used when a Manual type Combination is selected.
--

OPERATION

1. Press **11** on the numeric keypad.

2. Select the desired output mode (**0, 1, 2, 3, or 4**).

F11 Select VOICE ALLOC. MODE0: (A) (B) (C) (D)

F11 Select VOICE ALLOC MODE0: (A) (B) (C) (D)
--

In MODE 0, each Timbre has an exclusive number of voices (as set in Function #07) and none of the voices are shared between Timbres. For example, if Timbre A has 16 voices, none of the other Timbres would sound. The brackets around each Timbre letter indicates that each Timbre has separately assigned voices.

F11 Select VOICE ALLOC
MODE1: (A) (B) (C + D)

In MODE 1, Timbres A and B have exclusive voices, but Timbres C and D share voices. For example, if, in Function #7, Timbres C and D were assigned 4 voices each (or 5 and 3, or 7 and 1), 8 voices would be freely available for play between them (if Timbre C were not currently playing, because it was assigned to a different part of the keyboard, or a different velocity window, Timbre D could utilize all 8 voices). The plus sign indicates that voices are shared between these two timbres.

F11 Select VOICE ALLOC
MODE2: (A + B) (C + D)

In MODE 2, Timbres A and B are separate from C and D, and each pair share voices.

F11 Select VOICE ALLOC
MODE3: (A) (B + C + D)

In MODE 3, Timbre A is separate from the rest. Timbres B, C, and D share voices.

F11 Select VOICE ALLOC
MODE4: (A + B + C + D)

In MODE 4, all Timbres share all 16 voices.

FUNCTION #12: MIDI CHANNEL

FUNCTION

To set the MIDI receive channel for each Timbre.

NOTE:

This function may ONLY be used when a Manual type Combination is selected.

OPERATION

1. Press 12 on the numeric keypad.
2. Select a MIDI channel for each Timbre.

F12 MIDI CH
A:01 B:02 C:03 D:04

FUNCTION #13: LEVEL-VELOCITY POLARITY

FUNCTION

To determine whether the Timbres will respond normally or inversely to key velocity (as set in Function #14).

- A positive setting (+) corresponds to normal key velocity response (the harder you play, the louder the Timbre). With a negative setting, the harder you play, the softer the Timbre. This enables velocity cross-fades.

NOTE:

This function may ONLY be used when a Manual type Combination is selected.

OPERATION

1. Press **13** on the numeric keypad.
2. Select the polarity (positive or negative) for each Timbre and press **ENTER**.

F13 LEVEL-VELOCITY POL.
A:+ B:- C:+ D:+

FUNCTION #14: VELOCITY WINDOW

FUNCTION

To set the upper and lower key velocity settings between which each Timbre will sound.

This allows change of Timbres by key velocity. When key velocity reaches a preselected point (the BOTTOM parameter) the Timbre will sound. When the key velocity reaches a second, higher preselected point (the TOP parameter) the Timbre will cease to sound. In this way the four Timbres may be set to a variety of configurations, including overlapping of Timbres.

NOTE:

This function may ONLY be used when a Manual Combination is selected.

OPERATION

1. Press **14** on the numeric keypad.
2. Set the TOP and BOTTOM velocity window parameters for each Timbre.

F14 TIMBRE-A VEL.WINDOW
Bottom=00 Top=63

Range: 00 ~ 63

FUNCTION #15: KEY WINDOW

FUNCTION

To set the range of notes to which each Timbre will respond.

This allows the four Timbres to be assigned to any part of a keyboard, for a variety of keyboard split and overlapping configurations.

NOTE:

This function may ONLY be used when a Manual type Combination is selected.

OPERATION

1. Press **15** on the numeric keypad.

F15 TIMBRE-A KEY WINDOW Bottom=C -1 Top=G 9
--

2. Set the TOP and BOTTOM key window parameters for each Timbre.

Range: C#-1 ~ G9

FUNCTION #16: SELECT FIXED OUTPUT TYPE

FUNCTION

To select between sending sounds to the Individual Outputs or to the Mix Output.

- Use this function in conjunction with Functions #7 and #11 for output selection.

The principal purpose of this function is to allow up to 16 voices (four voices per Timbre) to be output individually via the Individual Outputs. For example when using drum samples, a "drum set" of 16 sampled drum sounds could be output, allowing external processing and level control of each sound.

When a Timbre is set to INDIVIDUAL SOUND OUT, all voices assigned to the a Timbre (up to a maximum of four) will be output via the Individual Outputs. If more than four voices are assigned to the Timbre, the extra voices will be output via the Mix Output.

When a Timbre is set to UNIVERSAL MULTISOUND OUT, it is output via the Mix Output ONLY.

One possible application of this would be to use two Timbres to create an 8-voice piano sound, which would be output via the Mix Output, and two other Timbres supplying eight separate orchestral voices output via the Individual Outputs. See THE USE OF OUTPUTS in the SYSTEM STRUCTURE chapter.

NOTE:

<i>This function may ONLY be used when a Manual type Combination is selected.</i>

OPERATION

1. Press **16** on the numeric keypad.

F16 TIMBRE-A OUTPUT TYPE=INDIVIDUAL SND OUT
--

2. Select the desired mode for each Timbre: INDIVIDUAL SOUND OUT or UNIVERSAL MULTISOUND OUT.

EDIT SYSTEM MODE

OVERVIEW

The Edit System Mode lets you:

- Load a selected Multisound or Program from disk into Wave Memory.
 - Perform basic filing operations for Multisounds on disk and in Wave Memory: erasing Multisounds from a Bank, clearing the entire contents of a Bank, copying Multisounds between Banks, checking a Bank's memory status, and calling up the Multisound directory of a disk.
-

THE FUNCTIONS

- Function #1:** GET PROGRAM (from Performance disk, with Multisound): Load a Program (with or without a Multisound) into a bank.
- Function #2:** MULTISOUND DIRECTORY: Call up the list of Multisounds and their lengths.
- Function #3:** FREE SPACE IN BANK: Check the amount of available space in word units in each bank's memory.
- Function #4:** ERASE MULTISOUND: Erase a specified Multisound from memory.
- Function #5:** GET MULTISOUND (from Work, Performance, and DSS-1 disks): Select Multisounds from disk and load them into a Wave Memory bank.
- Function #6:** COPY MULTISOUND: Copy a Multisound from one bank and load it into another bank.
- Function #7:** CLEAR BANK: Erase the contents of a bank.
-

ENTERING THE EDIT SYSTEM MODE

To enter the Edit System Mode, press the **EDIT SYSTEM** key. You will be prompted to select a function (1-7). To exit this mode, either now or after completing one of the functions, press any other mode key.

FUNCTION #1: GET PROGRAM (from Performance disk, with Multisound)

FUNCTION

To load a Program (with or without a Multisound) into a bank.

OPERATION

1. Press **1** on the numeric keypad.

F1 Get PROGRAM
Set PERFORM Disk & ENTER
2. Set a Performance disk and press **ENTER**.
3. Select the desired Program number and press **ENTER**. The display will show "Now Loading..." followed by:

F1 P01:pgm-name Loaded
Get MS:msd-name ? (Y/N)
4. If you want to load the accompanying Multisound into a bank, press **YES**. If you want to load only the Program at this time, press **NO**.
5. Pressing **NO** in step #4 will load only the Program.
6. If you pressed **YES** in step #4, now select a bank into which Program/Multisound will be loaded. Press **ENTER**.
7. If the same Multisound exists in the current bank, indicate whether you wish to overwrite that Multisound or not. Pressing **YES** will load the Program/Multisound into the bank. Pressing **NO** will load only the Program.

NOTE:

If, during the loading process, an error message appears, consult the Error Messages section.

Pressing **YES** again after an error message appears will restart the loading process and bring you back to the loading operation step that you were originally at (step #4 or #7). Pressing **NO** will exit this function.

FUNCTION #2: MULTISOUND DIRECTORY

FUNCTION

To call up the list of Multisounds and their lengths.

OPERATION

1. Press **2** on the numeric keypad.
2. Change the Multisound number to view each Multisound in Wave Memory.

```
F2 M.SOUND DIR in MEMORY
Bn-MSn:msndname L=nnnnnn
```

FUNCTION #3: FREE SPACE IN BANK

FUNCTION

To check the amount of available space in word units in each bank's memory.

OPERATION

1. Press **3** on the numeric keypad.
2. Select the bank you wish to examine.

```
F3 BANK=n FREE=nnnnnn
Select Bank with D.ENTRY
```

FUNCTION #4: ERASE MULTISOUND

FUNCTION

To erase a specified Multisound from memory.

When you erase a Multisound, all Multisounds above the erased sound in memory are shifted down to fill the address space left by the deleted Multisound. The numbers of these shifted Multisounds are also reduced by one.

OPERATION

1. Press **4** on the numeric keypad.
2. Select the Multisound you wish to erase and press **ENTER**.

```
F4 Erase M.SOUND in MEM.
Bn-MSn:msd-name L=nnnnnn
```

```
F4 msd-name Is Erased
Select Function (1-7)
```

FUNCTION #5: GET MULTISOUND (from Work, Performance, and DSS-1 disks)

FUNCTION

To select Multisounds from disk and load them into a Wave Memory bank.

OPERATION

1. Press **5** on the numeric keypad.

```
F5 Get MULTISOUND
Set Disk and Press ENTER
```

2. Insert the disk and press **ENTER**. The display will show "Now Searching..." followed by a prompt to select a Multisound:

```
F5 Get :msd-name
Select with D.ENT&ENTER
```

3. Select a Multisound and press **ENTER**.

4. Select the bank into which you will load the Multisound and press **ENTER**.

5. If the same Multisound exists in the current bank, indicate whether you wish to overwrite that Multisound. Pressing **YES** will execute the loading process and pressing **NO** will abort the process.

NOTE:

If, during the loading process, an error message appears, consult the Error Messages section.

Pressing **YES** again after an error message appears will restart the loading process; pressing **NO** will exit this function.

FUNCTION #6: COPY MULTISOUND

FUNCTION

To copy a Multisound from one bank and load it into another bank.

OPERATION

1. Press **6** on the numeric keypad.

```
F6 Copy M.SOUND
Bn-MSn:msd-name L=nnnnnn
```

2. Select the Multisound you wish to copy and press **ENTER**.

3. Select the destination bank number and press **ENTER** to initiate the function.

4. You can rename the Multisound in this step, if you wish to. Write the new name and press **ENTER**.

5. Once the copy function has been completed (or if the bank memory is full) the display will indicate this and prompt you to select a function (1-7).

FUNCTION #7: CLEAR BANK

FUNCTION

To erase the contents of a bank.

OPERATION

1. Press **7** on the numeric keypad.

```
F7 Select Clear BANK=n
Use D.ENTRY and ENTER
```

2. Select the bank to be cleared and press **ENTER**.

3. The display will show "Are you sure?" Press **YES** to clear the bank and **NO** to abort.

EDIT MULTISOUND MODE

OVERVIEW

In the Edit Multisound Mode, you can:

- Edit the following parameters of individual sounds within a Multisound: tuning, volume, filter cutoff frequency, original, top key, and transpose settings, sound start and sound end points, and loop length.
 - Recover additional memory space in wave memory by erasing the unused beginning and end portions of samples within a Multisound.
 - Select different Programs to modify a Multisound and monitor their effects.
 - Save and rename a Multisound to a Work disk.
-

FUNCTIONS

- Function #1:** SELECT MULTISOUND: Choose a Multisound from a Bank for editing.
- Function #2:** SELECT MONITOR PROGRAM: Determine which set of Program parameters will be used to modify the Multisound, for monitoring only.
- Function #3:** RELATIVE PARAMETERS: Adjust the tuning, volume, and filter cutoff frequency of individual sounds in the Multisound you are editing.
- Function #4:** ORIGINAL/TOP KEY: Change the key assignments for sounds within a Multisound.
- Function #5:** SOUND START, SOUND END, LOOP LENGTH: Alter the beginning and end points of a sample and set the length of a sound's loop.
- Function #6:** RECOVER MEMORY: Erase the unused beginning and end sections of all samples within a Multisound (that have been previously shortened by editing of the SOUND START and END values) in order to conserve space in Wave Memory.
- Function #7:** SAVE/RENAME MULTISOUND: Save a Multisound to a Work disk and/or rename it.
-

ENTERING THE EDIT MULTISOUND MODE

To enter the Edit Multisound Mode, press **EDIT M.SOUND**.

You will be prompted to select a function (1-7).

To exit this mode, either now or after completing one of the functions, press any other mode key.

- While editing a Multisound in Functions #3, #4, and #5, the **COMPARE** switch lets you examine (and hear) the difference between the new parameter values of an edited sound and its original or previous parameter values.
-

FUNCTION #1: SELECT MULTISOUND

FUNCTION

To choose a Multisound from a Bank for editing.

OPERATION

1. Press 1 on the numeric keypad.
2. Select the desired Bank number and Multisound number. The name of each Multisound appears on the display to facilitate selection.
3. Once you have selected a Multisound, you can go directly to any of the other functions in this mode to edit it.

F1 Select MULTISOUND Bn-MSn:msd-name L=111111
--

FUNCTION #2: SELECT MONITOR PROGRAM

FUNCTION

To determine which set of Program parameters will be used to modify the Multisound, for monitoring only.

Multisounds can be played exactly as they have been created. (This is how many sampled sounds might be used.) However, Multisounds can be altered by setting Program parameters. Since the Program parameters are stored separately from Multisounds, different Programs can be instantly 'grafted' onto a Multisound to hear which Program parameters sound best with a particular Multisound.

- Refer to the PROGRAM MODE chapter for more information on how the Program parameters are used to alter the character of a Multisound.

OPERATION

1. Press **2** on the numeric keypad.
2. Select the desired Program (01-32 or Initial Program).

F2 Monitor Pnn:pgm-name
Select PGM With D.ENTRY

FUNCTION #3: RELATIVE PARAMETERS (TUNE, LEVEL, Fc)

FUNCTION

To adjust the tuning, volume, and filter cutoff frequency settings of each sound within a Multisound.

Since a Multisound is often made up of several individual sounds, it is often desirable to modify the volume, brightness or tuning of each sound relative to the others to make a more consistent Multisound that doesn't change its tone abruptly at Memory Division points. Similar parameters can be changed in the Program Mode to globally affect a Multisound, but in this function you can alter each individual sound.

OPERATION

1. Press **3** on the numeric keypad.
3. Set parameter values for tuning (TUNE), level, and filter cutoff frequency (Fc). Use the COMPARE key to compare newly edited settings with the original ones.

F3 Bn-Mn:msd-name SNDnn
TUNE=+nn LEVEL=nn Fc=nn

TUNE: -63 ~ +63 (about +/- 1 semitone)

LEVEL: 01 ~ 64

2. Select the number of the sound that you want to edit.

Fc (Filter Cutoff Frequency): 01 ~ 64

FUNCTION #4: ORIGINAL / TOP KEY

FUNCTION

To change the key assignments for sounds within a Multisound.

This function can also be performed in the Sample Mode. Please refer to the SAMPLE MODE chapter for more information on key assignments.

OPERATION

1. Press **4** on the numeric keypad.

F4 Bn-Mm:msd-name SNDnn ORG=nnnn TOP=mmmm TRNS

2. Select the sound to be edited and adjust the sound's original key assignment (ORG), top key assignment (TOP), and transposition setting (TRNS) to the desired settings.

Key range (total): C-1 ~ G9

Transposition settings: TRNS/NTRN (transpose/no transpose)

FUNCTION #5: SOUND START, SOUND END, LOOP LENGTH

FUNCTION

To alter the beginning and end points of a sample and set the length of a sound's loop.

The Loop Length is measured from the start of the Loop to the end of the Sound.

OPERATION

1. Press **5** on the numeric keypad.

F5 S.ST S.END LP.LN Snn:nnnnnn mmmmm llllll
--

2. Select the sound number desired.

3. Press **ENTER** once to use the Auto Zero Cross Search function.

(The **ENTER** key serves as a toggle switch between AUTO and MANUAL.) Select the parameter that you want to change: Sound Start, Sound End, or Loop Length. Use the **DATA ENTRY** controls to alter the values. The AUTO function automatically finds the zero cross points/polarity changes of the wave form regardless of the Resolution setting; the MANUAL function lets you select values incrementally.

If the cursor is placed under the sound number when **ENTER** is pressed, the **AUTO** function is executed for all three parameters. To execute the **AUTO** function on a single parameter, move the cursor to that parameter, then press **ENTER**.

FUNCTION #6: RECOVER MEMORY

FUNCTION

To erase the unused beginning and end sections of all samples within a Multisound (that have been previously shortened by editing of the SOUND START and END values) in order to conserve space in Wave Memory.

NOTE:

<i>This function does not allow you to change the beginning and end points. Neither does it have any effect on sounds that have their original SOUND START and SOUND END values. It only erases the parts of a sound that have been left unused after you have changed the SOUND START and SOUND END points in Function #5 of this mode. You can also change these values in the Sample and Edit Sound modes.</i>

OPERATION

1. Press **6** on the numeric keypad.

```
F6  Bn-Mm:msd-name
ENTER to Recover Memory
```

2. Select the desired Multisound.
3. Press the **ENTER** key to execute the Recover Memory function.

FUNCTION #7: SAVE / RENAME MULTISOUND (TO WORK DISK)

FUNCTION

To save a Multisound to a Work disk and/or rename it.

Call up this function after you have edited a Multisound using the previous functions in this mode.

You may want to save the Multisound that you edited without deleting its original form. To do this, you can rename the newly edited Multisound in this function.

NOTE:

The edited Multisound can only be saved to a Work disk. Only then can it be assigned to a Timbre or Combination.

OPERATION

1. Press **7** on the numeric keypad.

```
F7  Save/Rename M.SOUND
Rename:msd-name ? (Y/N)
```

2. If you want to preserve the original Multisound as well as save the newly edited Multisound, press **YES**. If you don't want to save the original Multisound, press **NO**.

3. If you answered **YES** in step #2, the display will read "Rename" and show the original Multisound's name. Change the name.
4. Press **ENTER** to finalize the name change.
5. If you answered **NO** in step #2, or after you have entered the name change you made in step #3, the display will ask "Are You Sure?"
6. Pressing **YES** will start the save function and will be followed by "Saving Completed" on the display.
7. Pressing **NO** will abort the save function and show "Save M.SOUND Aborted" on the display.

PROGRAM MODE

OVERVIEW

In the Program Mode, you can:

- Select, rename, and write Programs.
 - Assign a Multisound to a Program and set the tuning.
 - Edit the modulation, auto bend, VCF, VCA, velocity, after touch, and pitch bend/VCF sweep controls.
-

THE FUNCTIONS

Function #01: SELECT PROGRAM (from PROGRAM MEMORY): Call up an existing Program (one of 32) from the DSM-1's memory.

Function #02: RENAME PROGRAM: Give a new name to an existing program.

Function #03: WRITE PROGRAM (to PROGRAM MEMORY): Take the program created in the output buffer and write it to a Program memory number of your choice.

DSC (Oscillator) Functions

Function #11: ASSIGN MULTISOUND: Assign a selected Multisound to the created Program/oscillator.

Function #12: TUNE: Set the tuning for the oscillator.

Function #13: OSCILLATOR MODULATION GENERATOR -- FREQUENCY, DELAY, INTENSITY: To set the speed of the signal that will modulate the oscillator (producing vibrato effects), the time it will take (from the point the key is pressed) for the modulation to reach its selected intensity, and how much effect the modulation will have on the oscillator.

Function #14: OSCILLATOR MODULATION GENERATOR -- WAVEFORM:
Select the waveform that will modulate the oscillator.

Function #15: OSCILLATOR MODULATION GENERATOR -- AFTER TOUCH:
Control the amount of modulation created by after touch.

AUTO BEND Functions

Function #16: AUTO BEND -- POLARITY, TIME, INTENSITY:

Set the pitch bend that will automatically occur when keys are played. Control the direction of the bend, the time it takes to reach normal key pitch, and the pitch bend range.

Function #17: AUTO BEND INTENSITY -- INITIAL TOUCH:

Control the amount by which pitch bend is affected by key velocity.

VCF Functions

Function #21: VCF CUTOFF, KEYBOARD TRACKING:

Set the cutoff frequency of the low pass filter, and the degree to which keyboard pitch affects the cutoff frequency.

Function #22: VCF EG POLARITY, INTENSITY:

Set the polarity of the envelope generator to positive or negative and control the amount by which the EG affects the cutoff frequency.

Function #23: VCF EG -- ATTACK TIME, DECAY TIME, BREAK POINT LEVEL, SLOPE TIME, SUSTAIN LEVEL, RELEASE TIME:

Set the EG parameters that affect the VCF's intensity.

Function #24: VCF MODULATION GENERATOR -- FREQUENCY, DELAY, INTENSITY:

Modulate the low pass cutoff frequency with a regular repeating variation. Control the frequency of the modulation, the time it takes (after pressing a key) for the modulation to reach its selected intensity, and the modulation intensity.

Function #25: VCF MODULATION GENERATOR -- WAVEFORM:

Determine the waveform type (triangle, square, or sine) of the VCF modulation generator.

Function #26: VCF CUTOFF, INITIAL TOUCH:

Set the degree to which key velocity affects the cutoff frequency.

Function #27: VCF EG INITIAL TOUCH -- ATTACK, DECAY, SLOPE:

Set the degree to which key velocity affects the VCF EG values.

Function #28: VCF CUTOFF/MODULATION GENERATOR INTENSITY AFTER TOUCH:

To set the amount by which the cutoff frequency and the intensity of the VCF modulation is affected by key pressure.

VCA Functions

Function #31: VCA TOTAL LEVEL: Set the overall level of the oscillator.

Function #32: VCA EG -- ATTACK TIME, DECAY TIME, BREAK POINT LEVEL, SLOPE TIME, SUSTAIN LEVEL, RELEASE TIME:

Set the EG parameters that affect the level of the oscillator.

Function #33: VCA DECAY KEYBOARD TRACKING:

Set the the degree to which keyboard pitch affects the VCA EG decay time.

Function #34: VCA RELEASE KEYBOARD TRACKING: Set the degree to which keyboard pitch affects the VCA release time.

Function #35: VCA INITIAL TOUCH -- TOTAL LEVEL:

Set the degree to which key velocity affects the volume of the oscillator.

Function #36: VCA EG INITIAL TOUCH -- ATTACK, DECAY, SLOPE:

Set the degree to which key velocity affects the the attack, decay, and slope times of the VCA EG.

Function #37: VCA AFTER TOUCH -- TOTAL LEVEL:

Set the degree to which after touch affects the volume.

BEND Functions

Function #41: BEND -- PITCH BEND RANGE:

Set the range of pitch change produced by moving a MIDI controller (usually a pitch bend wheel or joystick).

Function #42: BEND -- VCF SWEEP INTENSITY: Set the range of cutoff frequency change produced by moving a MIDI controller (usually a pitch bend wheel or joystick).

ENTERING THE PROGRAM MODE

To enter the Program Mode, press **PROGRAM**. You will be prompted to select a function (1-42). To exit this mode, either now or after setting one of the functions, press any other mode key.

FUNCTION #01: SELECT PROGRAM (from PROGRAM MEMORY)

FUNCTION

To call up an existing Program (one of 32) from the DSM-1's memory.

- There is, in addition to the 32 Programs, an Initial Program. It has initialized Program values (as do all 32 Programs before their parameters are set); most of the parameter values are at zero, or at settings that would allow any sound played to be heard with no coloring. For example, the VCF cutoff frequency is set at 127, letting all frequencies pass.

OPERATION

1. Press **01** on the numeric keypad.
2. Enter a Program number (01-32 or Initial Program). The Program name will be displayed along with the Program number.

F01 Select Pnn:pgm-name Select PGM with D.ENTRY
--

FUNCTION #02: RENAME PROGRAM

FUNCTION

To assign a new name to an existing program.

OPERATION

1. Press **02** on the numeric keypad.
2. Write the new name of the Program and press **ENTER**.

F02 Rename :pgm-name Use CURSOR & DATA ENTRY

FUNCTION #03: WRITE PROGRAM (to PROGRAM MEMORY)

FUNCTION

To write a program created in the output buffer to Program memory.

- Use this function **AFTER** you edit Program parameters to save your new Program to memory.

OPERATION

1. Press **03** on the numeric keypad.
2. Select the Program destination number and press **ENTER**.
3. The display will show that the Program has been written and will prompt you to choose a function (1-42).

F03 Write Pnn:pgm-name Set No. with D.ENT&ENTER
--

OSC (Oscillator) Functions

FUNCTION #11: ASSIGN MULTISOUND

FUNCTION

To assign a selected Multisound to the created Program.

OPERATION

1. Press **11** on the numeric keypad.
2. Use the **DATA ENTRY** controls to select the desired Multisound.

F11 Assign MULTISOUND Bn-Mm:msd-name L=111111
--

FUNCTION #12: TUNE

FUNCTION

To set the tuning for the oscillator.

OPERATION

1. Press **12** on the numeric keypad.
2. Select the desired tuning.

F12 TUNE Control =+nn Set Tune with D.ENTRY
--

Range: -32 ~ +32 (about 2 semitones)

FUNCTION #13: OSCILLATOR MODULATION GENERATOR -- FREQUENCY, DELAY, INTENSITY

FUNCTION

To set the oscillator modulation's waveform, frequency, intensity, and delay (time for it to reach its selected intensity).

OPERATION

1. Press **13** on the numeric keypad.
2. Set parameter values:

F13 OSC MG Control FRQ=nn DLY=nn INT=nn
--

FRQ: Modulation frequency

Range: 0 ~ 31

DLY: Modulation delay time

Range: 0 ~ 5

INT: Modulation intensity

Range: 0 ~ 31

FUNCTION #14: OSCILLATOR MODULATION GENERATOR -- WAVEFORM

FUNCTION

To set the oscillator's modulation signal's waveform.

OPERATION

1. Press **14** on the numeric keypad.

F14 OSC MG Control WAVEFORM = :Sine
--

2. Select the Waveform type.

Settings: triangle, square, sine

FUNCTION #15: OSC MODULATION GENERATOR INTENSITY -- AFTER TOUCH

FUNCTION

To control the amount of modulation created by after touch.

The degree of modulation applied to the oscillator can be controlled also by pressure on the keys of a keyboard. In this function you can determine how sensitive the modulation intensity will be to after-touch pressure. The higher the setting, the greater the response.

OPERATION

1. Press **15** on the numeric keypad.

F15 OSC AFTER TOUCH MG-INT=nn

2. Set parameter value:

MG-INT: Modulation generator intensity
--

Range: 0 ~ 15

AUTO BEND Functions

FUNCTION #16: AUTO BEND -- POLARITY, TIME, INTENSITY

FUNCTION

To program a key-triggered automatic pitch bend.

This function controls pitch bends produced automatically when keys are played. The pitch starts at a selectable point above or below the normal key pitch and reaches normal pitch at a programmable speed. Use of this function can approximate similar pitch bends that occur in the human voice and some brass instruments.

OPERATION

1. Press **16** on the numeric keypad.

F16 AUTO BEND Control POL=DOWN TIME=nn INT=nnn

2. Set parameter values:

POL: Polarity:

Settings: DOWN, UP

TIME: Time

Range: 0 ~ 31

INT: Intensity

Range: 0 ~ 127

NOTE:

If the intensity value is set too high in this function, the pitch may not change as desired, because the Auto-Bend function attempts to push the pitch bend starting point beyond the pitch transpose upper limit of the sound. For example, a sound played at 32 kHz has a pitch transpose upper limit of one octave above the original key. If the Auto-Bend function attempts to push beyond this upper limit, the Auto Bend will not function fully (see also SAMPLE MODE chapter, Function #6).

FUNCTION #17: AUTO BEND INTENSITY -- INITIAL TOUCH**FUNCTION**

To control the amount by which the intensity of the automatic pitch bend is affected by key velocity.

The higher the value set for this function, the greater the variation will be.

NOTE:

Even if the auto bend intensity (as set in Function #16) is zero, an auto bend effect can be obtained by raising the intensity value in Function #17.

OPERATION

1. Press 17 on the numeric keypad.

2. Set parameter value:

F17 AUTO BEND INIT TOUCH INTENSITY=nn
--

Intensity range: 0 ~ 63

VCF Functions**FUNCTION #21: VCF CUTOFF, KEYBOARD TRACKING****FUNCTION**

To set the VCF cutoff frequency and keyboard tracking.

OPERATION

1. Press 21 on the numeric keypad.

2. Set parameter values:

F21 VCF Control CUTOFF=nnn KBD TRACK=nn
--

CUTOFF: Cutoff frequency

Range: 0 ~ 127

KBDTRACK: Keyboard tracking

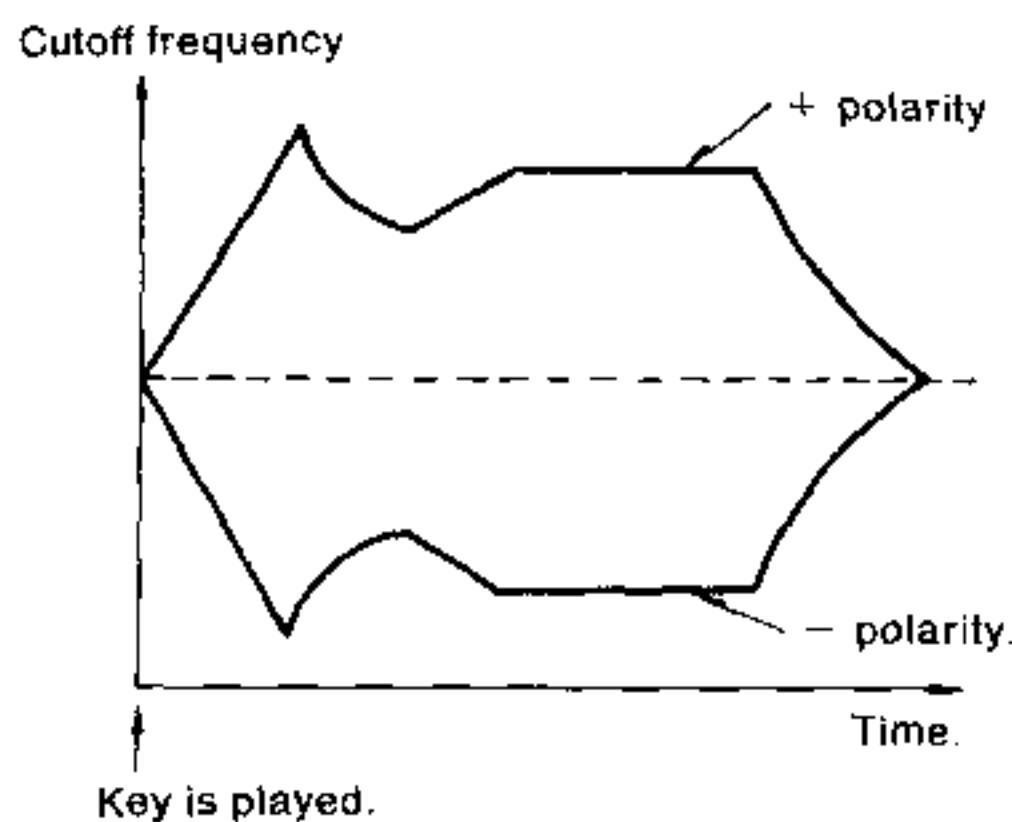
Range: 0 ~ 63

FUNCTION #22: VCF EG POLARITY, INTENSITY**FUNCTION**

To set the VCF envelope's polarity and intensity.

The VCF EG (set in Function #23) is used to control the cutoff frequency. In this way, a sound can become brighter (or duller) as the note is held down or sustained.

In this function, you can set the polarity of the EG to positive or negative. The positive setting is used for conventional effects where the sound becomes brighter during the attack. You can also set the intensity of the VCF EG's effect.



OPERATION

1. Press **22** on the numeric keypad.

2. Set parameter values:

F22 VCF Control
EG-POL=+ EG-INT=nn

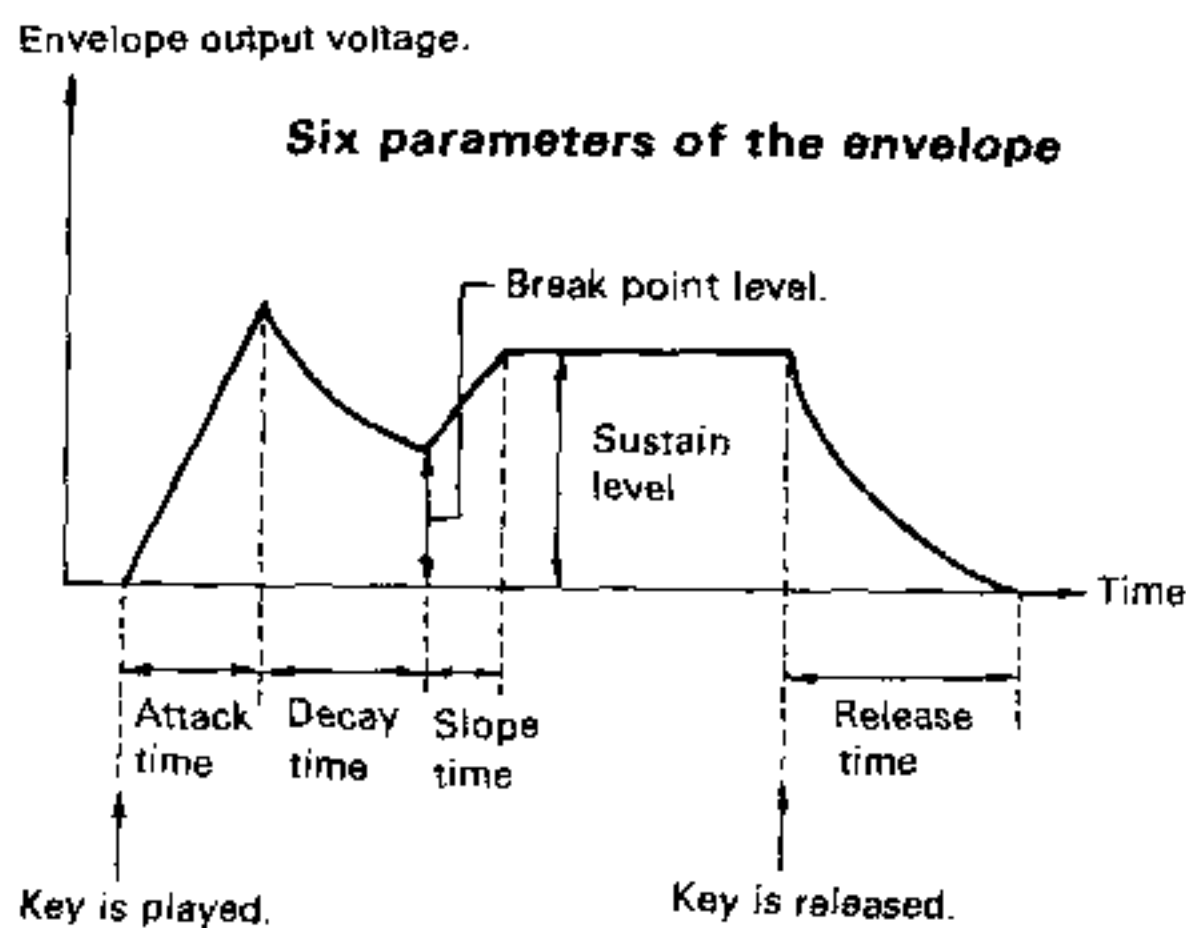
EG-POL: Envelope generator polarity
Settings: positive, negative
EG-INT: Envelope generator intensity
Range: 0 ~ 63

FUNCTION #23: VCF EG -- ATTACK TIME, DECAY TIME, BREAK POINT LEVEL, SLOPE TIME, SUSTAIN LEVEL, RELEASE TIME

FUNCTION

To set the VCF's envelope.

The VCF EG affects the VCF's intensity according to the following graph:



The attack time (indicated by **A** on the DSM-1's display) controls how long it takes the VCF to reach its initial maximum value after a key is played. The greater the attack time, the more gradual the tonal change is.

The decay time (indicated by **D**) is the time it takes for the VCF's intensity to reach the break point level.

The break point level (indicated by **B**) is the level at which the decay ends.

The slope time (indicated by **S**) is the time it takes the VCF's intensity to reach the sustain level.

The sustain level (also indicated by **S**) is the level at which the slope ends.

The release time (indicated by **R**) is how the time it takes for the VCF level to reach zero.

OPERATION

1. Press **23** on the numeric keypad.

F23	A	D	B	S	S	R
VCF-EG	nn	nn	nn	nn	nn	nn

2. Set parameter values:

A: Attack time
D: Decay time
B: Break point level
S: Slope time
S: Sustain level
R: Release time
Range (each parameter): 0 ~ 63

FUNCTION #24: VCF MODULATION GENERATOR -- FREQUENCY, DELAY, INTENSITY

FUNCTION

Set the VCF's modulation frequency, intensity, and delay.

This function utilizes a low frequency oscillator to vary the cutoff frequency, allowing creation of wah-wah effects. The waveform of this signal is set using Function #25.

OPERATION

1. Press **24** on the numeric keypad.

F24	VCF MG Control
FRQ=nn	DLY=nn INT=nn

2. Set parameter values:

FRQ: Modulation frequency
Range: 0 ~ 63
DLY: Modulation delay time
Range: 0 ~ 63
INT: Modulation intensity
Range: 0 ~ 63

FUNCTION #25: VCF MODULATION GENERATOR -- WAVEFORM

FUNCTION

Determine the waveform type (triangle, square, or sine) of the VCF modulation generator.

OPERATION

1. Press **25** on the numeric keypad.

F25	VCF MG Control
WAVEFORM =	:Sine

2. Set the waveform type: triangle, square, or sine.

FUNCTION #26: VCF CUTOFF, INITIAL TOUCH

FUNCTION

To set the degree to which key velocity affects the filter cutoff frequency.

Most acoustic instruments respond with a brighter tone when they are plucked, hit, or blown harder. This function lets you achieve the same effect by playing harder on the keyboard.

OPERATION

1. Press **26** on the numeric keypad.

F26 VCF INIT TOUCH CUTOFF=nn

2. Set parameter value:

Cutoff frequency
Range: 0 ~ 63

NOTE:

If the cutoff frequency has already been set at its highest possible value (in Function #21), this function will have no effect.

FUNCTION #27: VCF EG INITIAL TOUCH -- ATTACK, DECAY, SLOPE

FUNCTION

To set the degree to which key velocity affects the VCF's attack, decay, and slope times.

This function's parameters allow you to shorten the attack, decay, and slope times by playing harder, and lengthen them by playing softer.

OPERATION

1. Press **27** on the numeric keypad.

F27 VCF INIT TOUCH ATK=nn DCY=nn SLP=nn
--

2. Set parameter values:

ATK: Attack time
DCY: Decay time
SLP: Slope time
Range (for each parameter): 0 -- 63

FUNCTION #28: VCF CUTOFF/MODULATION GENERATOR INTENSITY -- AFTER TOUCH

FUNCTION

Set the degree to which key velocity affects the VCF EG values.

In this function you can set up a filter sweep (a gradual increase in brightness) that is controlled by after-touch pressure. After-touch can also be used to increase the intensity of VCF modulation set in Function #24.

NOTE:

Even if the VCF modulation intensity (as set in Function #24) is zero, after touch modulation can be utilized.

OPERATION

1. Press **28** on the numeric keypad.

F28 VCF AFTER TOUCH CUTOFF=nn MG-INT=**
--

2. Set parameter values:

CUTOFF: Cutoff frequency
Range: 0 -- 15
MG-INT: Modulation generator intensity
Range: 0 -- 15

VCA Functions

FUNCTION #31: VCA TOTAL LEVEL

FUNCTION

To set the overall level of an oscillator.

OPERATION

1. Press **31** on the numeric keypad.

2. Set parameter value:

F31 VCF Control
TOTAL LEVEL=nn

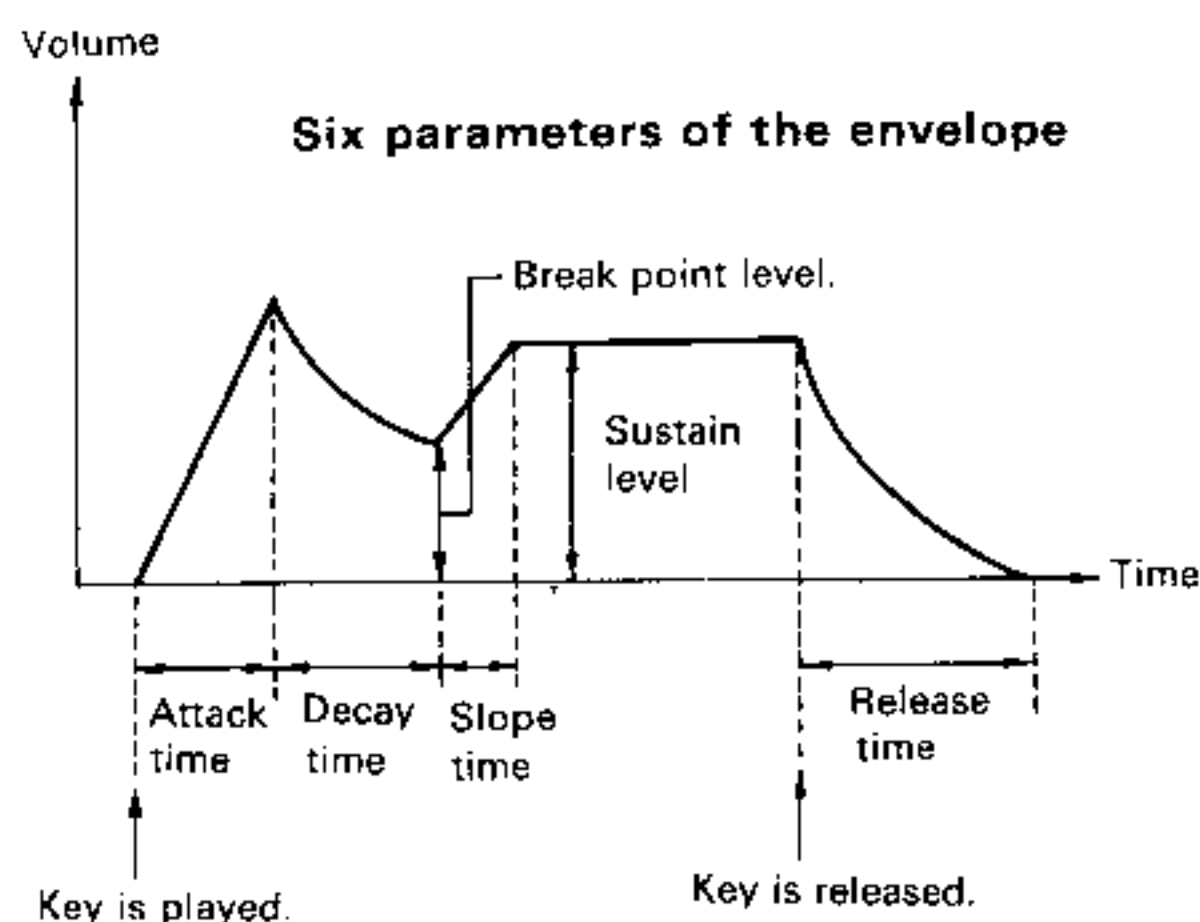
Total level
Range: 0 ~ 63

FUNCTION #32: VCA EG -- ATTACK TIME, DECAY TIME, BREAK POINT LEVEL, SLOPE TIME, SUSTAIN LEVEL, RELEASE TIME

FUNCTION

To set the VCA's envelope.

The VCA EG affects the oscillator level according to the following graph:



The attack time (indicated by **A** on the DSM-1's display) controls how long it takes the VCA to reach its initial maximum value after a key is played. The greater the attack time, the more gradual the volume change is.

The decay time (indicated by **D**) is the time it takes for the VCA's level to reach the break point level.

The break point level (indicated by **B**) is the level at which the decay ends.

The slope time (indicated by **S**) is the time it takes the VCA's level to reach the sustain level.

The sustain level (also indicated by **S**) is the level at which the slope ends.

The release time (indicated by **R**) is the time it takes for the VCA level to reach zero.

OPERATION

1. Press **32** on the numeric keypad.

F32	A	D	B	S	S	R
VCA-EG	nn	nn	nn	nn	nn	nn

2. Set parameter values:

A: Attack time
D: Decay time
B: Break point level
S: Slope time
S: Sustain level
R: Release time

Range (each parameter): 0 ~ 63

FUNCTION #33: VCA DECAY KEYBOARD TRACKING

FUNCTION

To make the VCA EG decay time become progressively longer or shorter in proportion to keyboard pitch.

With this function you can have the decay time of a sound decrease as you play higher notes and increase as you play lower notes. In this way you can imitate the characteristics of acoustic instruments, like the piano, where the decay is shorter for higher notes.

The effect can also be reversed (by setting a negative parameter value), making the decay times for higher notes become progressively longer.

OPERATION

1. Press **33** on the numeric keypad.

F33	VCA Control
DECAY KBD TRACK	=-64

2. Set parameter value:

Decay keyboard tracking level

Range: -64 ~ 63

FUNCTION #34: VCA RELEASE KEYBOARD TRACKING

FUNCTION

Set the degree to which keyboard pitch affects the VCA release time.

With this function you can have the release time of a sound decrease as you play higher notes and increase as you play lower notes. In this way you can imitate the characteristics of acoustic instruments, like the guitar, where the release is shorter for higher notes.

The effect can also be reversed (by setting a negative parameter value), making the release times for higher notes become progressively longer.

OPERATION

1. Press **34** on the numeric keypad.

F34	VCA Control
RELEASE KBD TRACK	=-64

2. Set parameter value:

Release keyboard tracking level

Range: -64 ~ 63

FUNCTION #35: VCA INITIAL TOUCH -- TOTAL LEVEL

FUNCTION

Set the degree to which key velocity affects the volume of the oscillator.

OPERATION

1. Press **35** on the numeric keypad.

2. Set parameter value:

F35 VCA INIT TOUCH ATK=nn DCY=nn SLP=nn
--

Total level
Range: 0 ~ 63

FUNCTION #36: VCA EG INITIAL TOUCH -- ATTACK, DECAY, SLOPE

FUNCTION

To set the degree to which key velocity affects the VCA's attack, decay, and slope times.

This function alters the values of the VCA EG's attack, decay, and slope times depending on how hard you play the keyboard. The harder you play, the shorter the EG will be; the softer you play, the longer it will be.

OPERATION

1. Press **36** on the numeric keypad.

2. Set parameter values:

F36 VCA INIT TOUCH TOTAL LEVEL=nn

ATK: Attack time DCY: Decay time SLP: Slope time
Range (for each parameter): 0 ~ 63

FUNCTION #37: VCA TOTAL LEVEL AFTER TOUCH

FUNCTION

To set the degree to which after touch affects the volume of the oscillator.

With this function, you can increase the volume by pressing down harder on the keys. Higher values for this function lower the total VCA volume. After touch then brings the volume back closer to its original setting (as programmed in Function #31).

OPERATION

1. Press **37** on the numeric keypad.

2. Set parameter value:

F37 VCA AFTER TOUCH TOTAL LEVEL=nn

Total level
Range: 0 ~ 15

BEND Functions

FUNCTION #41: BEND -- PITCH BEND RANGE

FUNCTION

To set the range of pitch change produced by moving a MIDI controller (usually a pitch bend wheel or joystick).

OPERATION

1. Press **41** on the numeric keypad.

2. Set parameter value:

F41 BEND Control PITCH BEND RANGE=nn

Pitch bend range: 0 -- 12 semitones

FUNCTION #42: BEND -- VCF SWEEP INTENSITY

FUNCTION

To set the range of cutoff frequency change (VCF Sweep) produced by moving a MIDI controller (usually a pitch bend wheel or joystick).

OPERATION

1. Press **42** on the numeric keypad.

2. Set parameter value:

F42 BEND Control VCF SWEEP=nn

VCF SWEEP Intensity
Range: 0 ~ 63

SAMPLE MODE

OVERVIEW

The Sample Mode lets you:

- Sample sounds and automatically or manually assign them to a Multisound.
 - Set the sample's start point, end point, loop length, volume, tuning, filter cutoff frequency, original key, and top key values.
 - Determine whether or not the sample will be transposed across its key range.
 - Recover memory space in wave memory by erasing the unused beginning and end portions of samples within a Multisound.
 - Save and/or rename the sampled Multisound to a Work disk.
 - Monitor a sample with a selected Program.
-

THE FUNCTIONS

Function #0: SELECT BANK (from 1-4):

Choose which one of the four banks of Wave Memory will be used to create and temporarily store the sampled sound or sounds.

Function #1: SELECT MONITOR PROGRAM AND VU MODE:

Determine which set of Program parameters will be used to listen to the sampled sound. Visually monitor the playback level of the sampled sound.

Function #2: SAMPLING -- AUTO:

Select a sampling frequency at which to sample a sound and have the sampling time set automatically. Select a memory division to automatically determine how many samples will be used and to what keys they will be assigned.

You can have the DSM-1 determine automatically the settings for sampling time, number of samples, and key assignment in this function. Creation of Multisounds from samples is much easier when these parameters are automatically set.

Function #3: SAMPLING -- MANUAL:

Sample sounds and determine manually how many samples will be recorded and assembled to form a Multisound, what the sampling times will be, and to what keys each sample will be assigned.

The manual sampling function also enables you to select how much time to use for each sample, so making optimum use of available memory.

Function #4: RESAMPLING:

Select an already sampled sound to erase and sample over, changing sampling frequency and key assignments, if desired.

Function #5: RELATIVE PARAMETERS (TUNE, LEVEL, Fc):

Adjust the tuning, volume, and filter cutoff frequency settings of each sample within a Multisound. The tune, level, and cutoff frequency parameters can be adjusted in this function in order to compensate for undesirable variations between the sounds in a Multisound.

Function #6: ORIGINAL/TOP KEY: Set the key to which the sample will be assigned, what key will be its upper limit, and whether or not the sample will be transposed across its key range.

When you assign a sound to the keyboard, you set the original key to the same pitch as the originally sampled sound, then set the top key to the highest note to which you want the sound's pitch transposed. However, there is a limit to how high the top key can be, depending on the sampling frequency selected. This chart shows the relationship between sampling frequency and top key limit:

::AA102

Function #7: SOUND START, SOUND END, LOOP LENGTH:

To alter the beginning and end points of a sample and set the length of the sample's loop.

- Interval from original key to upper pitch transpose limit.

Sampling frequency of sound.	Upper pitch transpose limit.	Example using C3 as original key, showing allowable range of top key settings.
16kHz	24 semitones up (64kHz)	C3 ~ C5
24kHz	17 semitones up (64kHz)	C3 ~ F4
32kHz	12 semitones up (64kHz)	C3 ~ C4
48kHz	5 semitones up (64kHz)	C3 ~ F3

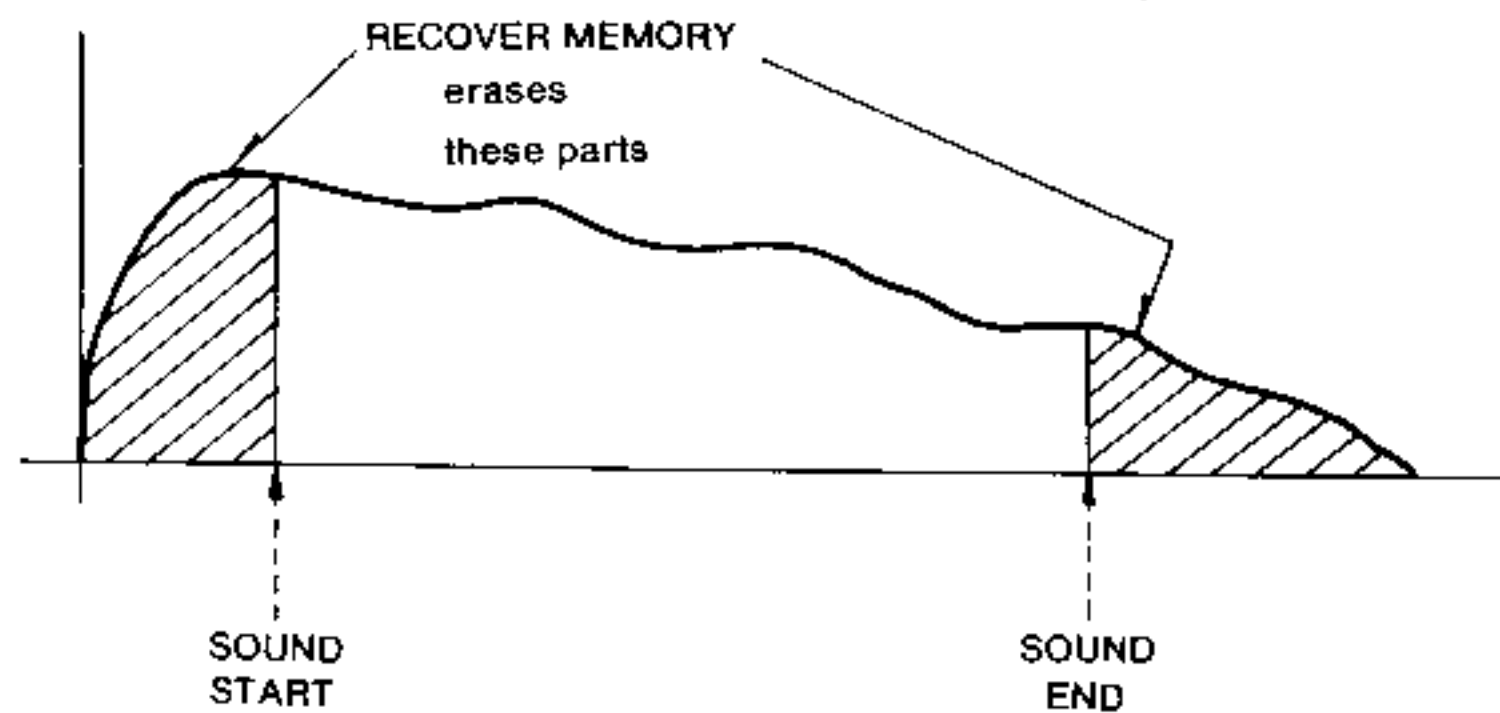
Function #7: SOUND START, SOUND END, LOOP LENGTH:

To alter the beginning and end points of a sample and set the length of the sample's loop.

Often it is useful to remove the beginning of a sampled sound, either to cut off noise that appears before the desired sound starts, or to eliminate the harshness of attack that some instruments and sounds have. Sampled sounds sometimes have beginning and end portions that need to be taken out to make the sounds usable.

Function #8: RECOVER MEMORY:

Erase the unused beginning and end sections of all sounds within a Multisound (that have been previously shortened by editing of the SOUND START and END values) in order to conserve space in Wave Memory.



Since sampling takes up a great deal of Wave Memory, only the required portion of the sound should be saved to disk, so as to conserve space in Wave Memory for further sampling.

This process is made easier by this function, which automatically erases from Wave Memory the truncated portions of all sounds in the Multisound.

Function #9: SAVE/RENAME MULTISOUND (to Work disk):

Save a Multisound to a Work disk and/or rename it.

ENTERING THE SAMPLE MODE

To enter the Sample Mode, press the SAMPLE key.

You can now select a function (0-9).

To exit this mode, either now or after setting one of the functions, press any other mode key.

```
***** SAMPLE MODE *****
Select BANK No. = 1
```

Select the Bank number and press ENTER.

```
**SAMPLE MODE in BANK 1**
Select Function (0-9)
```

FUNCTION #0: SELECT BANK (1-4)

FUNCTION

To choose which one of the four banks of Wave Memory will be used to create and temporarily store the sampled sound or sounds.

OPERATION

1. Press **0** on the numeric keypad.

2. Select the desired bank number (1-4) and press **ENTER**.

F0 Select BANK No.=n
Use D.ENTRY and ENTER

FUNCTION #1: SELECT MONITOR PROGRAM AND VU MODE

FUNCTION

To temporarily select a Program to monitor the playback of a sampled sound; to display the playback level of the sampled sound.

Use any of the 32 Programs in the DSM-1's internal memory to modify the sampled sound, for monitoring only.

■ Refer to the PROGRAM MODE chapter for more information on how Program parameters are used to alter the character of a sound.

OPERATION

1. Press **1** on the numeric keypad.

2. Select the desired Program number (01-32 or Initial Program)

3. While playing the sample, you can hear the effect of the selected Program, and monitor its level on the display.

F1 Monitor Pnn:pgm-name
(((((level meter)

FUNCTION #2: SAMPLING -- AUTO

FUNCTION

To select a sampling frequency and have the sampling time set automatically. To select a memory division so as to automatically determine how many samples will be used in a Multisound and to what keys they will be assigned.

OPERATION

1. Press **2** on the numeric keypad.

F2 Sample AUTO Using Bn
Are You Sure? (Y/N)

2. If you press **NO**, the auto sampling function will be aborted.

3. If you press **YES**, the display will prompt you to select one of four sampling frequencies (16, 24, 32, or 48 kHz). Select the desired frequency, then press **ENTER**.

4. The display will now prompt you to select the memory division (1, 2, 4, 8, or 16). This determines how many samples will be used to make up the Multisound. Select the desired memory division, then press **ENTER**. The DSM-1, upon selection of memory division, automatically determines the key assignment for each sound, as follows:

SAMPLE NO	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
01	ORG C3															
	TOP F3															
02	ORG C3	C5														
	TOP F3	F5														
04	ORG C3	C4	C5	C6												
	TOP F3	F4	F5	F6												
08	ORG C3	F#3	C4	F#4	C5	F#5	C6	F#6								
	TOP E3	A#3	E4	A#4	E5	A#5	F6	A#6								
16	ORG C3	D#3	F#3	A3	C4	D#4	F#4	A4	C5	D#5	F#5	A5	C6	D#6	F#6	A6
	TOP D3	F3	G#3	B3	D4	F4	G#4	B4	D5	F5	G#5	B5	D6	F6	G#6	B6

The total sampling time available (which depends on the sampling frequency) is divided equally among the sounds.

AVAILABLE SAMPLING TIME (seconds)

SAMPLING FREQUENCY	MEMORY DIVISION 1	MEMORY DIVISION 2	MEMORY DIVISION 4	MEMORY DIVISION 8	MEMORY DIVISION 16
16kHz	16.7	8.3	4.1	2.0	1.0
24kHz	10.9	5.4	2.7	1.3	0.6
32kHz	8.3	4.1	2.0	1.0	0.5
48kHz	5.4	2.7	1.3	0.6	0.3

5. Press **ENTER**.

6. The display will then show the current sample number, the memory division, the sampling time and frequency, and the current sample's original key assignment.

```
F2 S01/08:01.0S 32k C 3
Select SOUND & ENTER
```

7. Select the sound number you wish to sample and press **ENTER**.

8. You can now monitor the sound and select how you will start sampling. Using **TRIG**, sampling starts when the input signal level exceeds the selected trigger level. Using **FORCE**, sampling starts when you press **ENTER** or the footswitch. Select the desired sampling method.

9. If you selected **TRIG**, use the TRIG knob to adjust trigger level, then press **ENTER**.

```
F2 Ready to Sample
))))))
```

Now input the sound you wish to sample. A successful sampling will take you to step #11.

- The previous display will remain if the trigger level exceeds that of the sound, or if no sound has been input.

You can cancel the sampling process here by pressing **ENTER**. The following display will appear:

```
F2 Sampling Canceled
Continue ? (Y/N)
```

Pressing **YES** will return you to step #6. Reset the trigger level if you wish and continue sampling.

Pressing **NO** will abort the sampling function.

10. If you selected **FORCE** in step #8, sampling will start when you press **ENTER** or the footswitch.

NOTE:

```
Confirm that the footswitch being used is of the same
type that you set in System Mode Function #5. If it
is not, you will have to reset that function, or use
ENTER to start sampling.
```

11. During sampling, the display will show "Now Sampling" followed by "Sampling Completed." The automatically set values for original key, top key, and transposition will be displayed; change these settings if you wish to and press **ENTER**.

12. The display will then ask you if you want to continue sampling for the remaining sounds in the Multisound. Pressing **YES** will let you continue sampling by returning to step #6.

13. Press **NO** to exit the auto sampling function.

FUNCTION #3: SAMPLING -- MANUAL

FUNCTION

To sample sounds and determine manually how many samples will be recorded and assembled to form a Multisound, what the sampling times will be, and to what keys each sample will be assigned.

OPERATION

1. Press **3** on the numeric keypad.
This display will appear if no samples or Multisounds exist in the bank. (Go to step #7.)

This display will appear if samples or Multisounds exist in the bank:

```
F3 Select Sample Frq.
[16 / 24 / 32 / 48]kHz
```

```
F3 Sample MANUAL
Select [INIT / ADD]
```

2. Using the **CURSOR** keys, select **INIT** (initialize) if you want to begin making samples for a new Multisound. Select **ADD** if you want to add samples to an existing Multisound. Press **ENTER**. (If you selected **ADD**, this takes you to step #5).
3. Selecting **INIT** will prompt you to choose and clear a bank for sampling. Select the desired bank and press **YES** to clear the bank and take you to step #7.
4. Pressing **NO** in step #3 will cancel the Clear Bank function.
5. Select the Multisound number for which you wish to create samples and press **ENTER**.
6. Since all Multisounds in wave memory must be erased to accommodate memory needed for sampling, the display will ask you "Erase M.SNDs in BNKn Except msd-name?" to confirm erasure of all Multisounds except the one selected in step #5. Press **YES** to erase, or **NO** to abort.
7. If you pressed **YES** in the last step, the display will prompt you to select a sampling frequency (16, 24, 32, or 48 kHz), then press **ENTER**.
8. Select a sample time and press **ENTER**. The relationship between available sampling time and sampling frequency is as follows:

16 kHz ~ 16.7 seconds
24 kHz ~ 10.9 seconds
32 kHz ~ 8.3 seconds
48 kHz ~ 5.4 seconds

9. The display will now show the sample number, sampling time, and sampling frequency.

```
F3 S01:15.5Sec Sf=16kHz
Sample Start [Force/Trig]
```

10. Set the desired starting method (**TRIG** or **FORCE**).
11. If you selected **TRIG**, use the **TRIG** Knob to adjust trigger level, then press **ENTER**.

```
F3 Ready to Sample
))))))
```

Now input the sound you wish to sample. A successful sampling will take you to step #13.

- The previous display will remain if the trigger level exceeds that of the sound, or if no sound has been input.

You can cancel the sampling process here by pressing **ENTER**. The following display will appear:

```
F3 Sample Soundnn
Try Again? (Y/N)
```

Pressing **YES** will return you to step #9. Reset the trigger level if you wish and continue sampling.

Pressing **NO** will abort the function.

12. If you selected **FORCE** in step #10, sampling will start when you press **ENTER** or the footswitch.

NOTE:

*Confirm that the footswitch being used is of the same type that you set in System Mode Function #5. If it is not, you will have to reset that function, or use **ENTER** to start sampling.*

13. During sampling the display will show "Now Sampling" followed by "Sampling Completed." The values for original key, top key, and transposition will be displayed; change these settings if you wish to and press **ENTER**.
14. The display will then ask you if you want to sample the next sound for the Multisound. Pressing **YES** will let you keep this sample and continue with the next sample by returning you to step #7.
15. If you're not satisfied with the sample you just made, or if you wish to save the sample (in the next step) and exit from this function, press **NO**.
16. The display will ask you if you want to try sampling again. Press **YES** to return to step #7 and sample the same sound again. Press **NO** to save the sound and exit from the function.

NOTE:

In this function, samples should be created in ascending order - from lower to higher in terms of key assignment.

FUNCTION #4: RESAMPLING

FUNCTION

To select an already sampled sound to erase and sample over, changing key assignment if desired.

Use this function when you want to resample a specific sound within a Multisound and leave the other sounds intact.

OPERATION

1. Press **4** on the numeric keypad.

```
F4 Resample:Select M.SND
Bn-MSm:msd-name L=111111
```

2. Select the desired Multisound and press **ENTER**.

```
F4 S01/08: 5.2S 32k D# 4
Select SOUND to Sample
```

3. Select the sound number you wish to resample. The sampling frequency and sampling time are already fixed. Press **ENTER**.
4. Set the desired sample starting method (**TRIG** or **FORCE**).
5. If you selected **TRIG**, use the **TRIG** knob to adjust trigger level, then press **ENTER**.

```
F4 Ready to Sample
))))))
```

Now input the sound you wish to sample. A successful sampling will take you to step #7.

- The previous display will remain if the trigger level exceeds that of the sound, or if no sound has been input.

You can cancel the resampling process here by pressing **ENTER**. The following display will appear:

```
F4 Sampling Completed
Continue ? (Y/N)
```

Pressing **YES** will return you to step #2. Reset the trigger level if you wish and continue resampling.

Pressing **NO** will abort the function.

6. If you selected **FORCE** in step #4, sampling will start when you press **ENTER** or the footswitch.

NOTE:

*Confirm that the footswitch being used is of the same type that you set in System Mode Function #5. If it is not, you will have to reset that function, or use **ENTER** to start sampling.*

7. The display will show "Now Sampling" followed by "Sampling Completed."
8. The values for original key, top key, and transposition will be displayed; change these settings if you wish to and press **ENTER**.
9. The display will now ask if you want to continue resampling the remaining sounds in the Multisound. Pressing **YES** will return you to step #3. Press **NO** to complete resampling.

FUNCTION #5: RELATIVE PARAMETERS (TUNE, LEVEL, Fc)

FUNCTION

To adjust the tuning, volume, and filter cutoff frequency settings of each sample within a Multisound.

Since a Multisound is often made up of several individual sounds, it is often desirable to modify the volume, brightness or tuning of each sound relative to the others to make a more consistent Multisound that doesn't change its tone abruptly at Memory Division points. Similar parameters can be changed in the Program Mode to globally affect a Multisound, but in this function you can alter each individual sound.

OPERATION

1. Press 5 on the numeric keypad.

F5 Bn-Mm:msd-name SNDnn TUNE=+nn LEVEL=nn Fc=nn
--

2. Select the number of the sound that you want to edit.

3. Set parameter values for tuning (TUNE), level, and filter cutoff frequency (Fc). Use the COMPARE key to compare newly edited settings with the original ones.

TUNE : -63 ~ +63

LEVEL: 01 ~ 64

Fc (Filter Cutoff Frequency): 01 ~ 64

FUNCTION #6: ORIGINAL/TOP KEY

FUNCTION

To set the key to which the original sample will be assigned, its upper limit key, and whether or not the sample will be transposed across its key range.

OPERATION

1. Press 6 on the numeric keypad.

F6 Bn-Mm:msd-name SNDnn ORG=nnnn TOP=mmmm TRNS

2. Set parameter values:

ORG: Original key assignment

Range: C-1 ~ B9

TOP: Top key assignment

Range: C-1 ~ B9

TRNS: Transposition

Settings: transpose (TRNS)/ no transpose (NTRN)

FUNCTION #7: SOUND START, SOUND END, LOOP LENGTH

FUNCTION

To alter the beginning and end points of a sample and set the length of the sample's loop. The Loop Length is measured from the start of the Loop to the end of the Sound.

OPERATION

1. Press **7** on the numeric keypad.

F7	S.ST	S.END	LP.LN
Snn:nnnnnn	mmmmmm	llllll	

2. Select the sound number desired.

3. Press **ENTER** once to use the Auto Zero Cross Search function. (The **ENTER** key serves as a toggle switch between **AUTO** and **MANUAL**.) Select the parameter that you want to change: Sound Start, Sound End, or Loop Length. Use the **DATA ENTRY** controls to alter the values. The **AUTO** function automatically finds the zero cross points/polarity changes of the wave form regardless of the Resolution setting; the **MANUAL** function lets you select values incrementally.

If the cursor is placed under the sound number when **ENTER** is pressed, the **AUTO** function is executed for all three parameters. To execute the **AUTO** function for a single parameter, move the cursor to that parameter, then press **ENTER**.

FUNCTION #8: RECOVER MEMORY

FUNCTION

To erase the unused beginning and end sections of all samples within a Multisound (that have been previously shortened by editing of the **SOUND START** and **END** values) in order to conserve space in Wave Memory.

NOTE:

<p>This function does not allow you to change the beginning and end points. Neither does it have any effect on sounds that have their original SOUND START and SOUND END values. It only erases the parts of a sound that have been left unused after you have changed the SOUND START and SOUND END points in Function #7 of this mode. You can also change these values in the Edit Multisound and Edit Sound modes.</p>
--

OPERATION

1. Press **8** on the numeric keypad.

2. Select the desired Multisound and press the **ENTER** key to execute the Recover Memory function.

F8	Bn-Mn:msd-name
ENTER to Recover Memory	

FUNCTION #9: SAVE/RENAME MULTISOUND (to Work disk)

FUNCTION

To save a Multisound to a Work disk and/or rename it.

Use this function after you have edited a Multisound using previous functions in this mode.

You may want to preserve the original Multisound as well as save the Multisound that you have edited. To do this, you can rename the newly edited Multisound in this function.

NOTE:

The edited Multisound can only be saved to a Work disk. It can then be assigned to a Timbre or Combination.

OPERATION

1. Press **9** on the numeric keypad.

```
F9 Save/Rename M.SOUND
Rename:msd-name ? (Y/N)
```

2. If you want to preserve the original Multisound as well as save and rename the newly edited Multisound, press **YES**. If you don't want to save the original Multisound, press **NO**.
3. If you pressed **YES** in step #2, the display will read "Rename" and show the original Multisound's name. Change the name and press **ENTER**.
4. If you pressed **NO** in step #2, or after you have entered the name change you made in step #3, the display will read "Are You Sure?"
5. Pressing **YES** will execute the save function and will be followed by "Saving Completed" on the display.
6. Pressing **NO** will abort the save function.

HARMONIC SYNTHESIS MODE

OVERVIEW

In the Harmonic Synthesis Mode you can:

- Select one of 17 preset waveforms (stored as Harmonics Tables), edit it to create a new waveform, and save it to a Work disk for later recall.
-

THE FUNCTIONS

- Function #0:** SELECT AND CLEAR BANK:
Select and clear a bank in which Harmonic data will be entered and edited.
- Function #1:** SELECT MONITOR PROGRAM:
Temporarily select a Program to monitor the playback of a Harmonic synthesized Multisound.
- Function #2:** GET HARMONICS DATA (from WORK DISK):
Recall previously edited Harmonics Data from a Work disk.
- Function #3:** SELECT HARMONICS DATA (from HARMONICS TABLE):
Select one of 17 preset Harmonics Tables, and edit harmonics.
Some of the Harmonics Tables are standard synthesizer waveforms. Others are typical instrument sounds. These sounds are created by combining up to 128 harmonics, each of which is a sine wave which can be edited using this function.
- Function #4:** EDIT AND SYNTHESIZE:
Edit the Harmonics Table selected in Function #2 or #3.
- Function #5:** SAVE/RENAME HARMONICS DATA (to WORK DISK):
Save an edited Harmonics Table to a Work disk, and/or rename it.
- Function #6:** SAVE/RENAME HARMONIC MULTISOUND (to WORK DISK):
Save an edited Harmonics Multisound to a Work disk, and/or rename it.
-

ENTERING THE HARMONIC SYNTHESIS MODE

Entering this mode automatically clears a Bank so that you can create Harmonic data. To enter the Harmonic Synthesis Mode, press **HARMONIC SYNTHESIS**.

<p>* HARMONIC SYNTH MODE *</p> <p>Select BANK No. = n</p>

Select the Bank number and press **ENTER**. The display will show "Are you sure?" to confirm clearing of the bank. Press **NO** to return to the previous display and **YES** to clear the selected bank for Harmonic Synthesis. You can now select a function (0- 6).

To exit this mode, either now or after setting one of the functions, press any other mode key.

FUNCTION #0: SELECT AND CLEAR BANK

FUNCTION

To select and clear a bank on which Harmonic data will be entered and edited.

NOTE:

<p><i>It is unnecessary to use this function to select and clear a bank that has already been cleared by entering the Harmonic Synthesis mode. This function should be used, once you are in the mode, to select and clear banks other than the first one you cleared.</i></p>
--

OPERATION

1. Press **0** on the numeric keypad.

F0 Select & Clear BANKn
Use D:ENTRY and ENTER

3. When the display asks "**Are you sure?**", press **YES** to clear the bank.
4. If you pressed **NO** in step #3, the bank clear function will be aborted. The display will show the current bank number.

2. Select the bank to be cleared and press **ENTER**.

FUNCTION #1: MONITOR PROGRAM

FUNCTION

To temporarily select a Program to monitor the playback of a Harmonic-synthesized Multisound.

Use any of the 32 Programs in the DSM-1's internal memory to hear which Program sounds best with the sound.

- Refer to the PROGRAM MODE chapter for more information on how the Program parameters are used to alter the character of a Multisound.

OPERATION

1. Press **1** on the numeric keypad.

F1 Monitor Pnn:pgm-name
Select PGM with D:ENTRY

2. Select the desired Program number (01-32 or Initial Program).

FUNCTION #2: GET HARMONICS DATA (from WORK DISK)

FUNCTION

To recall previously edited Harmonics data from a Work disk.

OPERATION

1. Press **2** on the numeric keypad.

F2 Get HARMONICS DATA
Set WORK Disk & ENTER

3. The display will show "Now Searching" followed by a prompt to get the data name. Select a data name and press **ENTER**.

4. The display will show "Now Loading" followed by:

F2 dataname Loaded
Now Synthesizing...

2. Set the Work disk and press **ENTER**.

5. The Harmonic data is now loaded into the DSM-1, and may be edited.

FUNCTION #3: SELECT HARMONICS DATA (from HARMONICS TABLE)

FUNCTION

To select one of 17 preset Harmonics Tables, and edit harmonics.

OPERATION

1. Press **3** on the numeric keypad.

```
F3 Select HARM:Blank
Use D.ENTRY & ENTER
```

2. Select the desired Harmonics table. There are 17 choices: **BLANK** (all harmonics are at zero volume), **SAW 1** (sawtooth wave), **SQUARE** (square wave), **ACOUSTIC PIANO**, **ELECTRIC PIANO 1**, **ELECTRIC PIANO 2**, **CLAV** (clavinet), **ORGAN**, **BRASS**, **SAXOPHONE**, **SAW 2**, **SAW 3**, **ELECTRIC GUITAR**, **ELECTRIC BASS**, **SYNTHESIZER BASS**, **METAL** (metallic tone), and **SINE** (sine wave). Press **ENTER**.

3. The display will show "**Now Synthesizing...**," followed by the first harmonic and its current level setting. Example: SINE.

```
F3 HARM #001 : LEVEL=225
Name : SINE Created
```

4. Use the **CURSOR** keys and the **DATA ENTRY** controls to select Harmonics and edit their levels.

Ranges:

```
Harmonics number: #001 ~ #128
```

```
Harmonics level: 0 ~ 255
```

5. Press **ENTER** after editing. The display will show "**Now Synthesizing...**," followed by this display:

```
F3 HARM #002 : LEVEL=052
Name : SINE Created
```

NOTE:

To hear the Harmonic Multisound each time you edit one of the harmonics, merely repeat step #5 after each edit.

- If you want to keep your newly edited Harmonics data, go to Function #5 to save it to a Work disk.

FUNCTION #4: EDIT AND SYNTHESIZE

FUNCTION

To edit the Harmonics Table selected in Function #2 or #3.

OPERATION

1. Press **4** on the numeric keypad.

```
F4 HARM#001:LEVEL=023
Press ENTER to Synth
```

2. Use the **CURSOR** keys and the **DATA ENTRY** controls to select the Harmonics and edit their levels.

Ranges:

```
Harmonics number: #001 ~ #128
```

```
Harmonics level: 0 ~ 255
```

3. Press **ENTER** after editing. The display will show "Now Synthesizing..." followed by this display:

```
F4 HARM #001 : LEVEL=023
Name:Bn-HMSxx Created
```

4. You can now go on and edit other Harmonics in the same sound by repeating steps #2 and #3.

- If you want to keep your newly edited Harmonics data, go to Function #5 to save it to a Work disk.

FUNCTION #5: SAVE/RENAME HARMONICS DATA (to WORK DISK)

FUNCTION

To save an edited Harmonics Table to a Work disk, and/or rename it.

Use this function after you have edited the Harmonics data using previous functions in this mode.

You may want to preserve the original Harmonics data as well as saving the Harmonics data that you have edited. To do this, you can rename the newly edited Harmonics data in this function.

NOTE:

The edited Harmonics data can only be saved to a Work disk. It can then be assigned to a Timbre or Combination.

OPERATION

1. Press **5** on the numeric keypad.

```
F5 Save/Rename HARMONICS
Rename:dataname ? (Y/N)
```

2. The display will ask you if you want to rename the Harmonics data. If you want to preserve the original Harmonics data as well as save the newly edited Harmonics data, press **YES**. If you don't want to preserve the original Harmonics data, press **NO**.
3. If you pressed **YES** in step #2, the display will read "Rename" and show the original Harmonics data's name. Change the name and press **ENTER**.
4. If you pressed **NO** in step #2, or after you have entered the name change you made in step #3, the display will ask "Are You Sure?"
5. Pressing **YES** will execute the save function and will be followed by "Saving Completed" on the display.
6. Pressing **NO** will abort the save function and show "Saving Aborted" on the display.

FUNCTION #6: SAVE/RENAME HARMONIC MULTISOUND (to WORK DISK)

FUNCTION

To save an edited Harmonics Multisound to a Work disk, and/or rename it.

NOTE:

This function differs from Function #5 in that it saves newly edited Harmonic Multisounds as waveform data, making it impossible to re-edit individual harmonics.

OPERATION

1. Press **6** on the numeric keypad.

```
F6 Save/Rename M.SOUND
Rename:Bn-HMSxx ? (Y/N)
```

2. The display will ask you if you want to rename the Harmonic Multisound. If you want to preserve the original Harmonic Multisound as well as save the newly edited Harmonic Multisound press **YES**. If you don't want to preserve the original Harmonic Multisound press **NO**.

3. If you pressed **YES** in step #2, the display will read "Rename" and show the original Harmonic Multisound's name. Change the name and press **ENTER**.

4. If you pressed **NO** in step #2, or after you have entered the name change you made in step #3, the display will ask "Are You Sure?"

5. Pressing **YES** will execute the save function and will be followed by "Saving Completed" on the display.

6. Pressing **NO** will abort the save function and show "Saving Aborted" on the display.

EDIT SOUND MODE

OVERVIEW

The Edit Sound Mode allows you to:

- Select a sound, monitor it with a selected Program, alter its beginning and end points, reverse it, link it to or mix it with another sound, and edit individual address points of the sound.
 - Select the type of loop for a sound (back-and-forth or cross-fade), the loop's length and the sound's pitch.
-

THE FUNCTIONS

Function #01: SELECT MULTISOUND:

Select a sound (from a Multisound) for editing.

Function #02: SELECT MONITOR PROGRAM:

To temporarily select a Program to monitor the playback of a sound.

Function #11: SOUND START, SOUND END, LOOP LENGTH:

Alter the beginning and end points of a sound and set the length of the sound's loop.

Function #12: REVERSE SOUND:

Play a sound backward.

Function #13: LINK SOUNDS:

Join two sounds together in succession, either directly or by crossfading.

Function #14: MIX SOUNDS:

Mix a sound (selected in Function #01) with another sound. Adjust the relative volumes and detunings of the sounds.

Function #15: LOOP PROCESS -- BACK AND FORTH:

Use the first half of a loop and its reverse to be played alternately (back and forth) as a new loop.

Function #16: LOOP PROCESS -- CROSSFADE:

Automatically crossfade two portions of a looped sound to create a smooth loop.

Function #17: PITCH ADJUST:

Adjust the pitch of a sound to match that of its loop.

Function #18: VIEW AND EDIT SOUND DATA:

Edit the level of any address point in the waveform of a sound.

ENTERING THE EDIT SOUND MODE

To enter the Edit Sound Mode press **EDIT SOUND**. You will be prompted to select a function (01-02). Note that only AFTER using Function 01 to select a Sound for editing can you select Functions #11 through #18.

To exit this mode, either now or after completing one of the functions, press any other mode key.

FUNCTION #01: SELECT MULTISOUND

FUNCTION

To choose a sound (from a Multisound) for editing.

NOTE:

This function must be performed before you can select Functions #11 through #18.

OPERATION

1. Press **01** on the numeric keypad.

```
F01 Select MULTISOUND
Bn-MSm:msd-name L=111111
```

2. Select the desired Bank number and Multisound number. Press **ENTER**.

```
F01 Erase M.SNDs in BNKn
Except msd-name? (Y/N)
```

3. Press **YES** to erase all Multisounds in the bank except the one you have selected. Pressing **NO** will abort the function.

```
F01 Sxx:nk L111111 A#4
Select SOUND & ENTER
```

4. Select the sound you wish to edit then press **ENTER**. You can now go to any function (01-18) and edit the sound you have chosen.

FUNCTION #11: SOUND START, SOUND END, LOOP LENGTH

FUNCTION

To alter the beginning and end points of a sound and set the length of a sound's loop.

- The Loop Length is measured from the start of the Loop to the end of the Sound.
- Refer to the Program Mode for more information on how the Program parameters are used to alter the character of a sound.

OPERATION

1. Press **2** on the numeric keypad.
2. Select the desired Program number (01-32 or Initial Program).

```
F02 Monitor Pnn:pgm-name
Select PGM with D:ENTRY
```

FUNCTION #11: SOUND START, SOUND END, LOOP LENGTH

FUNCTION

To alter the beginning and end points of a sound and set the length of a sound's loop.

- The Loop Length is measured from the start of the Loop to the end of the Sound.

OPERATION

1. Press **11** on the numeric keypad.
2. Select the sound number desired.
3. Press **ENTER** once to use the Auto Zero Cross Search function. (The **ENTER** key serves as a toggle switch between **AUTO** and **MANUAL**.) Select the parameter that you want to change: Sound Start, Sound End, or Loop Length. Use the **DATA ENTRY** controls to alter the values. The **AUTO** function automatically finds the zero cross points/polarity changes of the wave form regardless of the Resolution setting; the **MANUAL** function lets you select values incrementally.
If the cursor is placed under the Sound number when **ENTER** is pressed, the **AUTO** function is executed for all three parameters. To execute the **AUTO** function for a single parameter, move the cursor to that parameter, then press **ENTER**.

```
F11 S.ST S.END LP.LN
Snn:nnnnnn mmmmm 111111
```

FUNCTION #12: REVERSE SOUND

FUNCTION

To play a sound backward.

The effect of this function is exactly the same as if the sound was recorded on tape and played backward. The sound data is reversed and stored from back to front.

OPERATION

1. Press **12** on the numeric keypad.

```
F12 Reverse SOUND
Press ENTER to Reverse
```

2. Press **ENTER** to reverse the sound.

NOTE:

```
If you wish to recall the original unreversed sound,
repeat the above steps.
```

FUNCTION #13: LINK SOUNDS

FUNCTION

To join two sounds together in succession, either directly or by crossfading.

This lets you take the end point of a sound that you selected in Function #01 and directly attach it to the beginning point of another sound. The two sounds may be of any origin -- sampled or Harmonic-synthesized. They may be linked together so that: 1 > the second sound begins exactly at the point the first one ends (NORMAL LINK), or 2 > the second sound's beginning point is automatically adjusted so that the two waveforms meet at the same level and make a smooth connection (NORMAL LINK with AUTO LEVEL ADJUST).

NORMAL LINK gives you an abrupt transition between the sounds. If you want a gradual change, use the CROSSFADE LINK function and determine the amount of time you want it to take for the sounds to overlap each other.

OPERATION

1. Press **13** on the numeric keypad.

```
F13 Bn-Mm:msd-name SNDnn
Select M.SND&SND to Link
```

4. If the sampling frequencies were the same, or if you pressed **YES** in step #3, then you will be prompted to select a bank to be erased for use as an edit work area. Select a bank and press **ENTER**.

```
F13 Link SNDs
LINK STnnnnnn XFLmmmmmm
```

2. Select the desired second sound for linking. You can choose from any Multisound in any bank. Select the sound number, then press **ENTER**. If the sounds were sampled at different frequencies, the display will show "Are you sure?" and the sampling frequencies of the two sounds (Sf 1 and Sf 2).

5. Setting the link start point (LINK ST) determines what address point in the second sound will be linked to the first sound's end point. If not specified, it is automatically set at the second sound's beginning point. Set the link start point using the **CURSOR** keys and the **DATA ENTRY** controls. Press **ENTER** (leaving the XFL setting at zero) to make a NORMAL LINK.

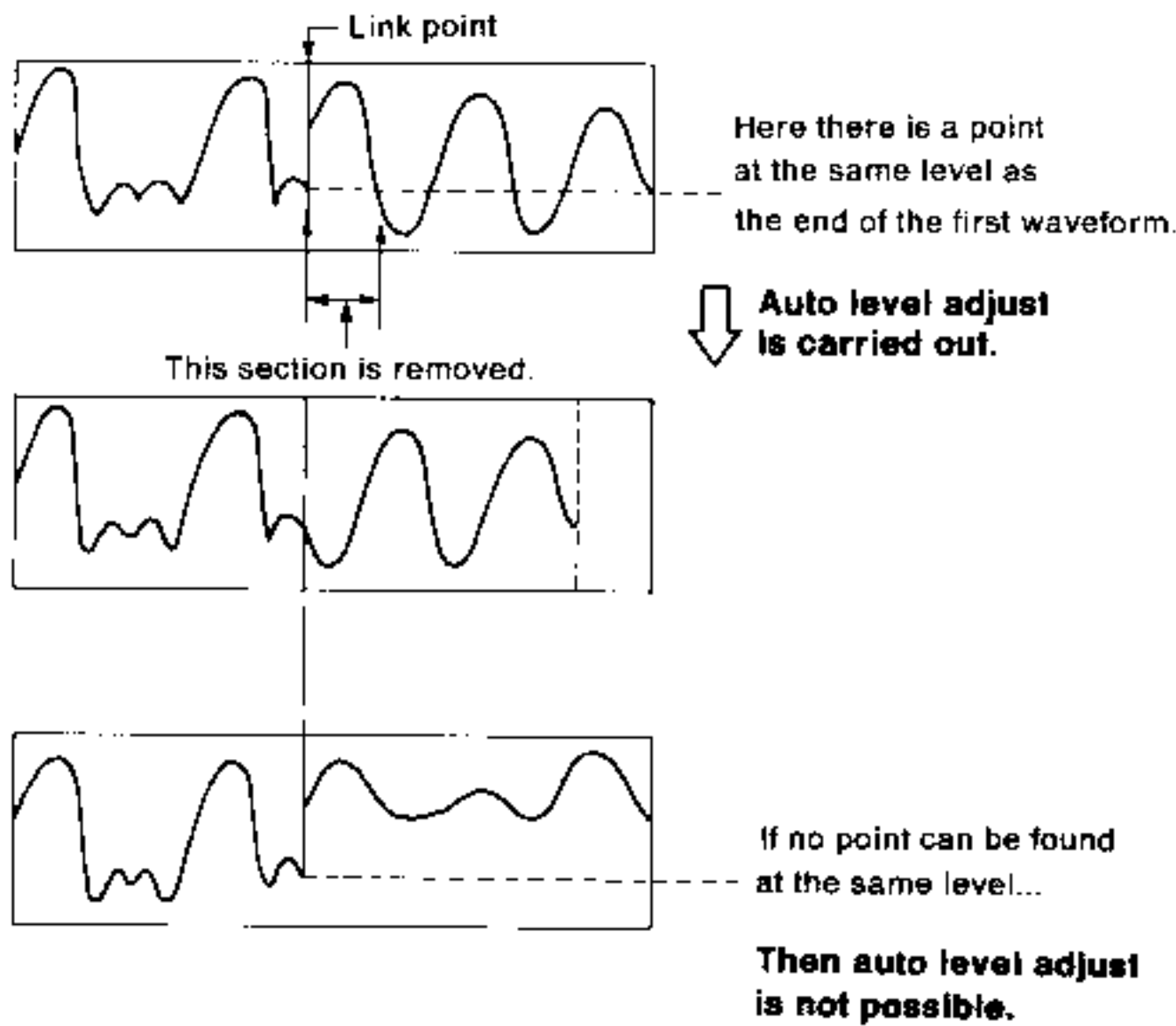
NOTE:

```
If the sampling frequencies of the two sounds were
not the same, the DSM-1 will automatically change
the sampling frequency of the second to match that
of the first. As a result, the sounds will have different
itches. For example, if the first sound was sampled
at 32 kHz and the second at 16 kHz, the second sound
is replayed at 32 kHz and becomes one octave
higher.
```

```
F13 Link SNDs ST=nnnnnn
Level Adjust ? (Y/N)
```

3. Press **YES** to continue linking; press **NO** to return you to step #2 and select a different sound.

6. Once the link has been made, you can select Auto Level Adjust to make sure that the connection between the two sounds is as smooth as possible. Auto Level Adjust automatically searches for the first point in the second sound's waveform that is at the same level as the end of the first sound's waveform.



7. Press **YES** to execute Auto Level Adjust.

F13 Link SNDs Completed
Retry to Link ? (Y/N)

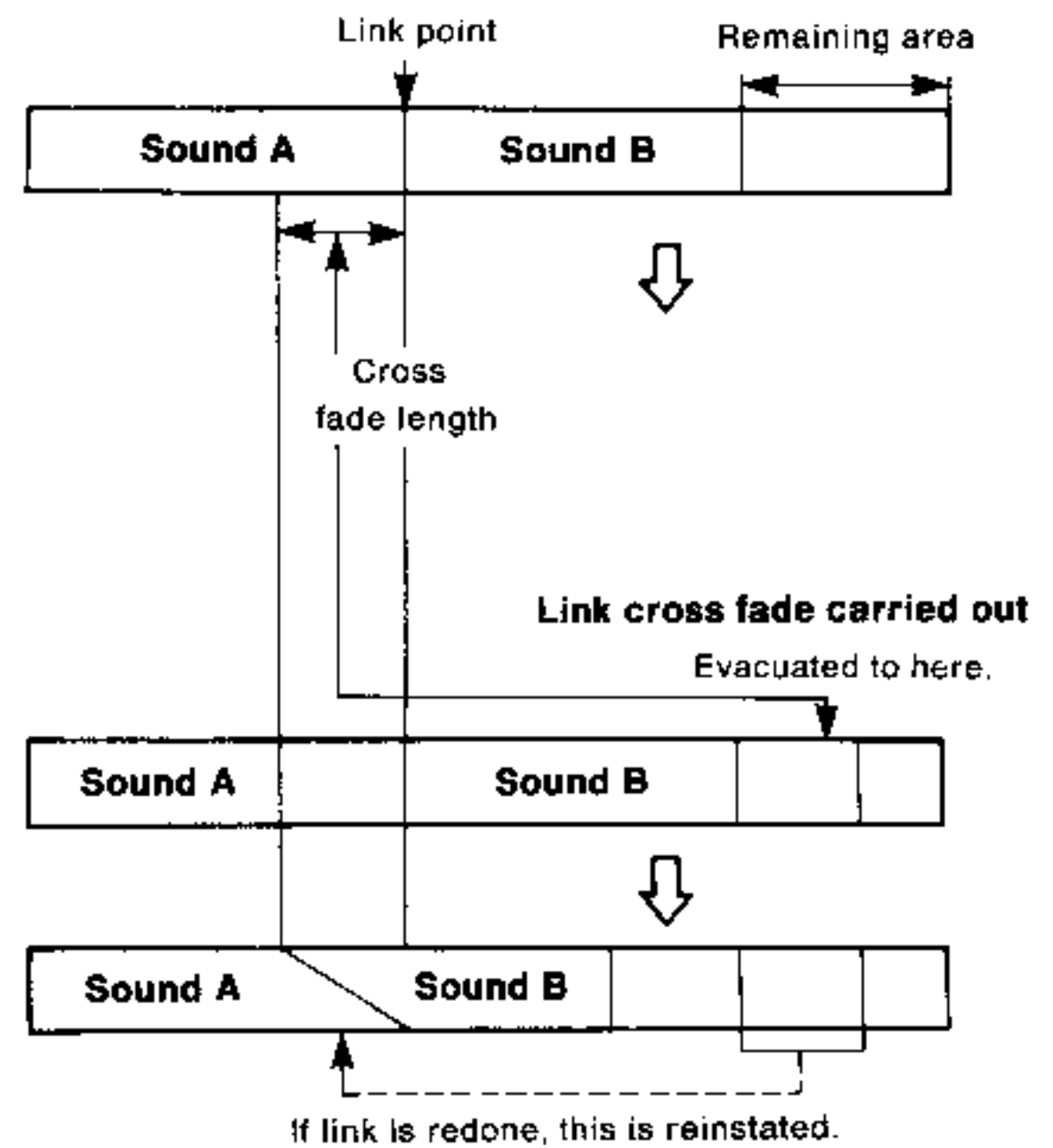
8. Press **YES** if you want to try linking the sounds again. This returns you to step #5.
9. Press **NO** if you are satisfied with the link. The display will show, "Do you want to make this permanent?" Press **YES** to complete the link or **NO** to abort the function.

CROSS FADE LINK

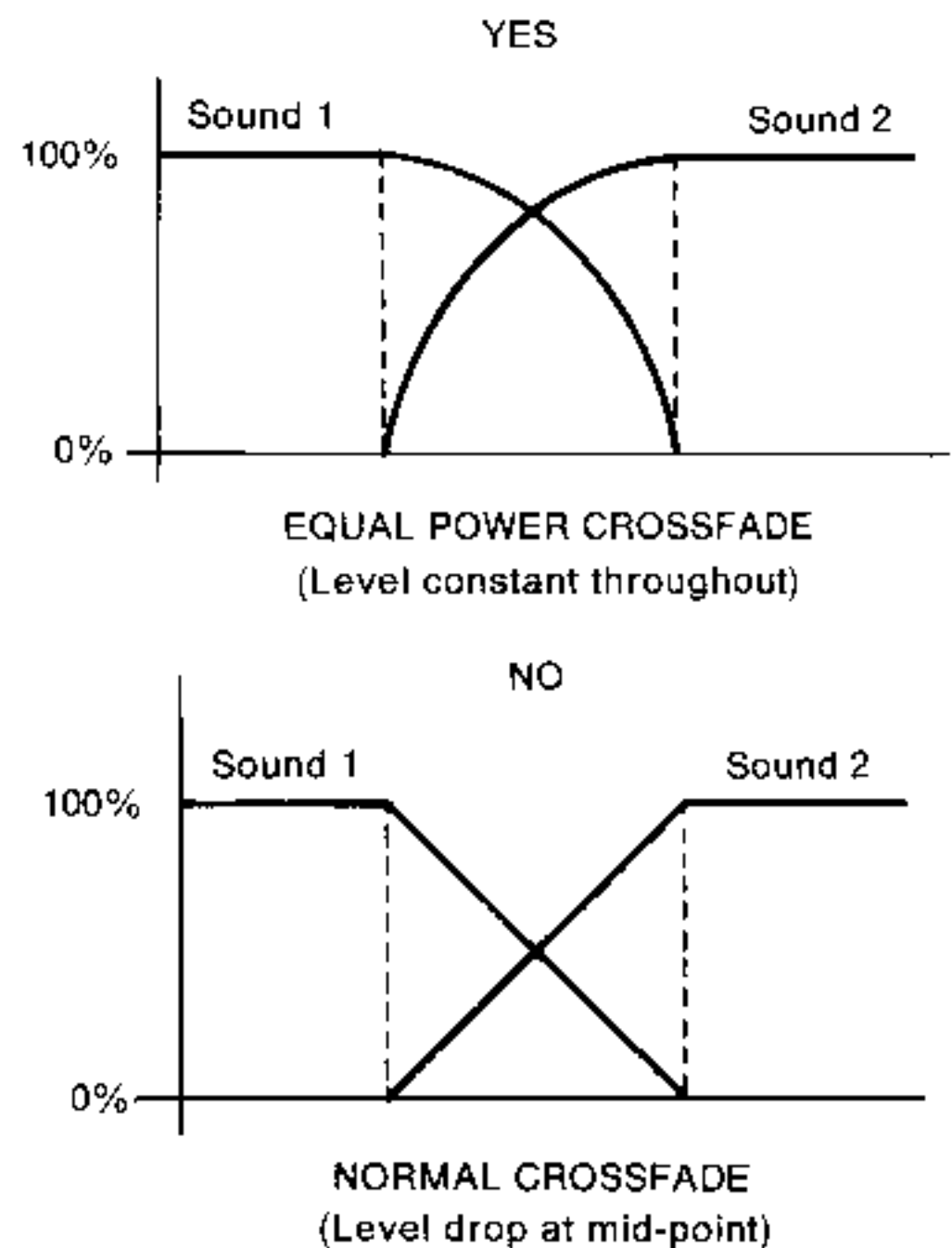
10. To make a Crossfade Link, set a value other than zero for the Crossfade Length (XFL) in step #5 and press **ENTER**. (A large XFL value will make a very gradual sound change and a small one will make an abrupt change)

NOTE:

The Crossfade Length cannot be set to 000000 (this becomes a NORMAL link) or to a value higher than the SOUND LENGTH of either of the sounds to be linked.



11. If you wish the linked sound to be at full volume throughout the duration of the Crossfade (EQUAL POWER), press **YES**. Pressing **NO** causes the sounds to fade in and out of each other with a slight drop in volume, as shown in the following diagram. Either selection completes the Crossfade link.



12. The display will show "Retry to Link?" Press **YES** to return to step #5. Press **NO** if the link is satisfactory.
13. The display will show "Do you want to make this permanent?" Press **YES** to complete the link or **NO** to abort.

FUNCTION #14: MIX SOUNDS

FUNCTION

To mix a sound (selected in Function #01) with another sound. To adjust the relative volumes and detunings of the sounds.

NOTE:

The resulting sound will only be as long as the first sound selected (in Function #01). If the second sound is longer, its duration past the first sound's end point will be cut off in the mix.

OPERATION

1. Press **14** on the numeric keypad.

```
F14 Bn-Mm:msd-name SNDnn
Select M.SND&SND to Mix
```

2. Select the desired second sound for mixing. You can choose from any Multisound in any bank. Select the sound number, then press **ENTER**. If the sounds were sampled at different frequencies, the display will show "Are you sure?" and the sampling frequencies of the two sounds (Sf 1 and Sf 2).

NOTE:

If the sampling frequencies of the two sounds were not the same, the DSM-1 will automatically change the sampling frequency of the second to match that of the first (see note in Function #13).

3. Press **YES** to continue mixing; press **NO** to abort.

4. If the sampling frequencies were the same, or if you pressed **YES** in step #3, then you will be prompted to select a bank to be erased for use as an edit work area. Select a bank and press **ENTER**.

```
F14 Mix SOUNDS
MIX RATIO=xx% TUNE=+nn
```

5. Adjust the volume of the second sound relative to the total volume by setting the MIX RATIO, which is expressed as a percentage. Adjust the detuning of the second sound by setting TUNE. Press **ENTER** when the mix is satisfactory.

6. The display will show "Retry to Mix?" Press **YES** to return to step #5. Press **NO** if the mix is satisfactory.

7. The display will show "Do you want to make this permanent?" Press **YES** to complete the mix or **NO** to abort.

MIX RATIO range: 1% ~ 99%

TUNE range: -50 ~ +50 (about +/- 1/2 semitone)

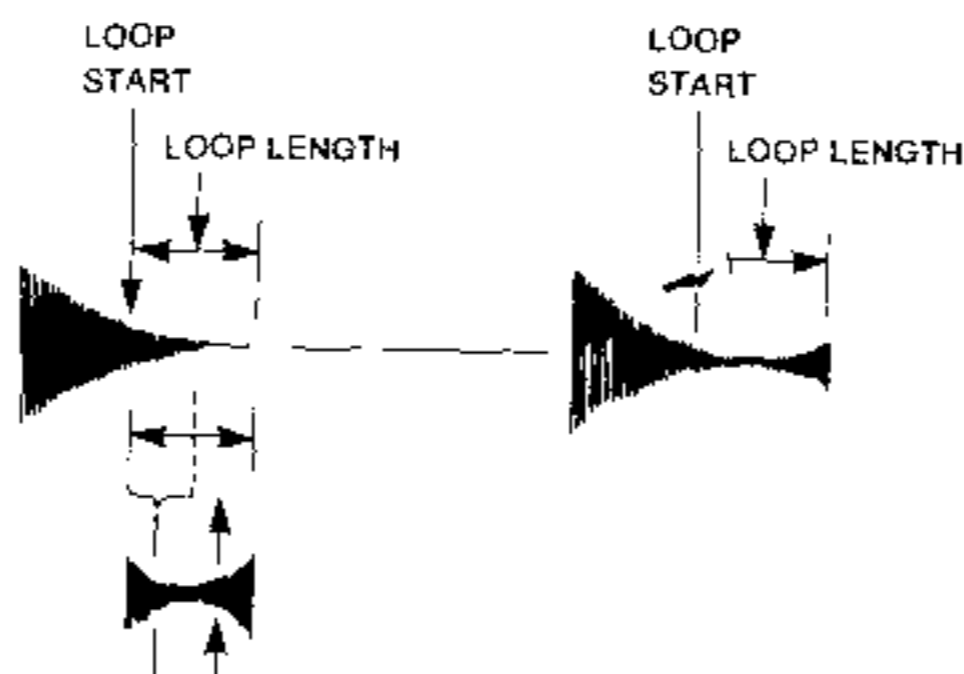
FUNCTION #15: LOOP PROCESS ~ BACK AND FORTH

FUNCTION

To use the first half of a loop and its reverse to be played alternately (back and forth) as a new loop.

■ This function can be used to make long loops sound smooth and seamless.

This takes the portion from the start of the loop address up to about half of the loop length, reverses the waveform and uses it to replace the remaining length of the end of the sound waveform. This also assumes that the loop start and length parameters have been specified (in Function #11 of this mode, or in the Sample or Edit Multisound modes).



OPERATION

1. Press **15** on the numeric keypad.

F15 BACK & FORTH LOOP
Select Working BANK=n

2. Select a bank to be cleared for use as an edit work area and press **ENTER**.

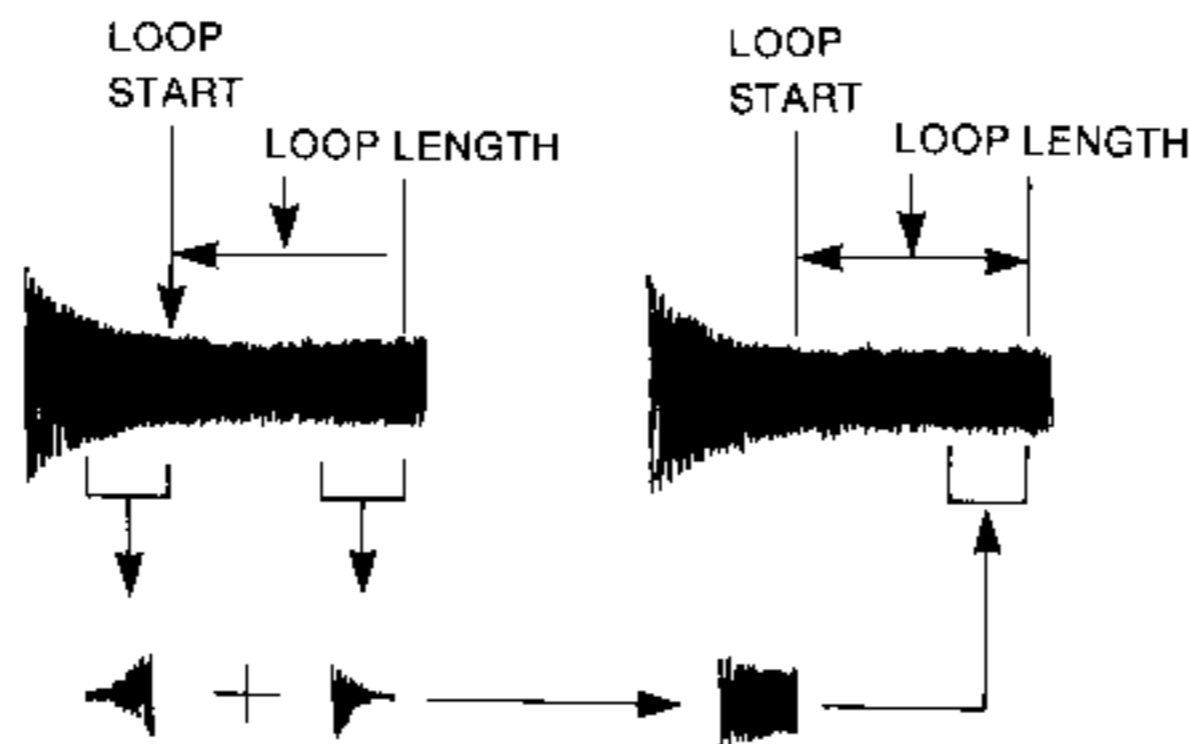
3. When the display reads "Are you sure?", press **NO** to abort the function, or press **YES** to clear the selected bank and execute the back-and-forth loop process.
4. The display will show "Now Processing..." followed by "Do you want to make this permanent?" Press **YES** to complete the new loop or **NO** to abort.

FUNCTION #16: LOOP PROCESS -- CROSSFADE

FUNCTION

To crossfade two portions of a looped sound to create a smooth loop.

Once you have used Function #11 to set the loop start and length parameters of a sound, you can use the Crossfade function to take a portion of the waveform of a selected length from in front of the start point and mix it with a portion the same length from in front of the end point.



OPERATION

1. Press **16** on the numeric keypad.

F16 Crossfade LOOP
Select Working BANK=n

2. Select a bank to be cleared for use as an edit work area and press **ENTER**.

3. The display will show "Are you sure?" Press **YES** to clear the bank and begin the Crossfade Loop process. Press **NO** to abort the function.

F16 Crossfade LN=nnnnnn
Use D.ENTRY and ENTER

4. Adjust the length of the crossfade and press **ENTER**.
5. If you wish to create an "Equal Power" type crossfade, press **YES**. If not, press **NO**. Either selection executes the Crossfade Loop. (Refer to Function #13 for an explanation of EQUAL POWER.)
6. The display will show "Now Processing..." followed by "Do you want to make this permanent?" Press **YES** to complete the Crossfade Loop or **NO** to abort.

FUNCTION #17: PITCH ADJUST

FUNCTION

To adjust the pitch of a sound to match that of its loop.

This function is used for short loops, with loop lengths of 1000 or less. A rapidly repeating loop will create its own pitch, regardless of the pitch of the original sample. For example, a loop of length 100 will, when played at 16 kHz, produce a note at $16.000 \div 100 = 160$ Hz. The loop length of a short loop will affect the reproduced pitch in the mathematical relationship shown below, assuming that you are playing the original key. A shorter length produces a higher pitch, while a longer length produces a lower pitch.

$$\text{Pitch at original key (in Hz)} = \frac{\text{Sampling frequency of sound (in Hz)}}{\text{Loop length}}$$

Using this function, the pitch of the original sound can be changed to match that of its loop.

- Because of the complexity of this function, the execution time on the DSM-1 will be relatively longer than with other functions.

OPERATION

1. Press **17** on the numeric keypad.
3. The display will show "Are you sure?" Press **YES** to clear the bank and begin the Pitch Adjust process, or press **NO** to abort.

```
F17 Pitch Adjust LOOP
Select Working BANK=n
```

```
F17 Pitch Adj TUNE=+nnnn
Use DATA ENTRY & ENTER
```

2. Select a bank to be cleared for use as an edit work area and press **ENTER**.
4. Adjust the tuning and press **ENTER** to execute the Pitch Adjust function.
5. The display will show "Now Processing..." followed by "Do you want to make this permanent?" Press **YES** to complete the Pitch Adjust function or **NO** to abort.

```
TUNE range: -1200 ~ +1200 (about +/- 1 octave)
```

FUNCTION #18: VIEW AND EDIT SOUND DATA

FUNCTION

To edit the level of any address point in the waveform of a sound.

OPERATION

1. Press **18** on the numeric keypad.
2. Set parameter values, for the address and the data value (level); the address can be incremented by one unit by pressing **ENTER**.

```
F18 View&Edit SOUND DATA
ADDR=nnnnnn DATA=+mmmm
```

```
ADDR: 000000 ~ 261,119
(dependent on the length of the sound)
```

```
DATA: -2048 ~ +2048
```


MAKE/REMAKE MULTISOUND MODE

OVERVIEW

In the Make/Remake Multisound Mode, you can:

- Get Multisounds from any disk or Bank, select sounds from them, and erase, insert, or replace those sounds.
 - Save your newly edited Multisound to a Work disk.
-

THE FUNCTIONS

- Function #01:** GET MULTISOUND (from Work, Performance, DSS-1 Disks):
Select a Multisound from disk and load it into a Wave Memory bank for editing (in Functions #11, #12, and #13).
- Function #02:** SELECT MULTISOUND (from BANK):
Choose a Multisound from a Bank for editing (in Functions #11, #12, and #13).
- Function #03:** NEW MULTISOUND:
Clear a Bank for creation of a new Multisound.
- Function #04:** SELECT MONITOR PROGRAM:
Temporarily select a Program to monitor the playback of a Harmonic-synthesized Multisound.
- Function #11:** INSERT SOUND:
Insert specified sounds (into the Multisound selected in Function #01 or #02).
- Function #12:** REPLACE SOUND:
Replace a sound in a Multisound (selected in Function #01 or #02) with another sound.
- Function #13:** ERASE SOUND:
Erase a specified sound from a Multisound (selected in Function #01 or #02).
- Function #14:** SAVE/RENAME MULTISOUND (to Work Disk):
Save a Multisound to a Work disk and/or rename it.

To edit a Multisound in this mode, you'll need to clear one Bank of Wave Memory. In Functions #01 and #02, call up one Multisound as a destination for the sounds that you will be inserting or replacing. You can also (in Function #03) initialize a Bank for creating a Multisound 'from scratch.'

- Performing Functions #13 (ERASE) and #11 (INSERT) in succession on the same sound achieves the same result as performing Function #12 (REPLACE).
-

ENTERING THE MAKE/REMAKE MULTISOUND MODE

To enter the Make/Remake Multisound Mode press **MAKE/REMAKE M. SOUND**. You will be prompted to select a function (01-04). Note that only AFTER using function #01, #02 or #03 to select a Multisound for editing can you select Functions #04 through #14.

To exit this mode, either now or after completing one of the functions, press any other mode key.

FUNCTION #01: GET MULTISOUND (from Work, Performance, DSS-1 Disks)

FUNCTION

To select a Multisound from disk and load it into a Wave Memory bank.

OPERATION

1. Press **01** on the numeric keypad.
2. Insert the disk and press **ENTER**. The display will show "Now Searching..." followed by a prompt to select a Multisound.
3. Select the desired Multisound and press **ENTER**.

F01 Get MULTISOUND Set Disk and Press ENTER
--

- Next you will be prompted to select a bank in which to load the Multisound. Select the bank number and press **ENTER**.

```
F01 Erase M.SND In BANKn
Except msd-name ? (Y/N)
```

- The display will show "Now Loading..." followed by "Loading Completed" and prompt you to select a function (04-14).

NOTE:

*If, during the loading process, an error message appears, consult the Error Messages section. Pressing **YES** after an error message appears will restart the loading process executed in step #5; pressing **NO** will exit the function and prompt you to select a function (01-04).*

- Press **YES** if you want to erase all Multisounds in the selected bank except for the one you chose in step #3 and begin loading. Pressing **NO** will abort the function.

FUNCTION #02: SELECT MULTISOUND (from BANK)

FUNCTION

To choose a Multisound from a Bank for editing.

- Use this function to select the Multisound that you will be using in which to insert, erase, or replace sounds. Later functions will select the sounds that you will insert in the Multisound selected in this function.

OPERATION

- Press **02** on the numeric keypad.
- Select the desired Multisound number and press **ENTER**.

```
F02 Select MULTISOUND
Bn-MSm:msd-name L=111111
```

```
F02 Erase M.SND in BANKn
Except msd-name ? (Y/N)
```

- Press **YES** to erase all Multisounds in the bank except the one chosen in step #2. The display will prompt you to select a function (01-14). Pressing **NO** will abort the function.

FUNCTION #03: NEW MULTISOUND

FUNCTION

To clear a Bank for creation of a new Multisound. This function lets you use Insert, Replace, and Erase functions to create a completely new Multisound.

OPERATION

- Press **03** on the numeric keypad.
- Select the Bank that you wish to use for creating the Multisound and press **ENTER**. The display will show "Are you sure?" Press **YES** to clear, or **NO** to abort.

```
F03 Make New M.SND in Bn
Select Bank & ENTER
```

FUNCTION #04: SELECT MONITOR PROGRAM

FUNCTION

To temporarily select a Program to monitor the playback of a Multisound.

Use any of the 32 Programs in the internal memory to hear which Program sounds best with the Multisound.

- Refer to the Program Mode for more information on how the Program parameters are used to alter the character of a Multisound.

OPERATION

1. Press **04** on the numeric keypad.
2. Select the desired Program number (01-32 or Initial Program).

F04 Monitor Pnn:pgm-name Select PGM with D.ENTRY

FUNCTION #11: INSERT SOUND

FUNCTION

To insert specified sounds (from any Multisound) into a Multisound. This takes a sound from any Multisound and inserts it at a selected sound number position within the Multisound that was selected in Function #01 or #02.

OPERATION

1. Press **11** on the numeric keypad.
3. Specify the Multisound desired and the sound that you wish to insert. Press **ENTER** to begin insertion. The display will show "Now Inserting..." followed by "Inserting Completed" and a prompt to continue. Press **YES** to continue inserting other sounds, or press **NO** to exit the function.

F11 Insert SOUND NO.=nn Select SOUND No. & ENTER

2. Select the sound number at which you wish to insert a sound and press **ENTER**.
- If the sound being inserted is too long to fit in the specified Bank space, the function will be aborted.

NOTE:

Inserting a sound will cause the Sound directly above it to be transposed upwards by one note. Use EDIT MULTISOUND Function #4 to alter the original/Top Key assignments of the newly-inserted Sound.

FUNCTION #12: REPLACE SOUND

FUNCTION

To replace a sound in a Multisound (selected in Function #01 or #02) with another sound.

This takes a sound from any Multisound and puts it in a selected sound number position within the Multisound that was selected in Function #01 or #02.

The length of the sound within the Multisound does not change. So if a shorter sound is used for replacement, there will be some left over memory space. If the replacement is longer, only a part of it equal in length to the original sound will be inserted.

OPERATION

1. Press **12** on the numeric keypad.

```
F12 Replace SOUND NO.=nn
Select SOUND No. & ENTER
```

3. Specify the Multisound desired and the sound that will replace the sound selected in Step 2. Press **ENTER** to begin replacing. The display will show "Now Replacing..." followed by "Replacing Completed" and a prompt to continue replacing other sounds in the Multisound. Press **YES** to continue replacing other sounds, or press **NO** to exit the function.

NOTE:

If the Multisound selected in Function #02 is empty, the display will show that and prompt you to select a function (01 ~ 14).

2. Select the sound that will be replaced, and press **ENTER**.

FUNCTION #13: ERASE SOUND

FUNCTION

To erase a specified sound from a Multisound (selected in Function #01 or #02).

OPERATION

1. Press **13** on the numeric keypad.

```
F13 Erase SOUND NO.=nn
Select SOUND No. & ENTER
```

3. The display will show "Now Erasing..." followed by "Erasing Completed".

NOTE:

Erasing a sound will cause the sound directly above it to be transposed downward to fill the gap left by erasure. The original key for the above sound will remain unchanged, however. If no sound exists above the erased sound, all keys previously assigned to that sound will be silent.

2. Select the sound you wish to erase and press **ENTER**.

FUNCTION #14: SAVE/RENAME MULTISOUND (to Work Disk)

FUNCTION

To save a Multisound to a Work disk and/or rename it.

Call up this function after you have edited a Multisound using the previous functions in this mode.

You may want to save the Multisound that you edited without deleting its original form. To do this, you can rename the newly edited Multisound in this function, thus saving it as a separate, new Multisound.

NOTE:

The edited Multisound can only be saved to a Work disk. It can then be assigned to a Timbre or Combination.

OPERATION

1. Press **14** on the numeric keypad.

```
F14 Save/Rename M.SOUND
Rename=msd-name ? (Y/N)
```

2. The display will ask you if you want to rename the Multisound. If you want to preserve the original Multisound as well as preserve the newly edited Multisound, press **YES**. If you don't want to save the original Multisound, press **NO**.

3. If you pressed **YES** in step #2, the display will read "Rename" and show the original Multisound's name. Change the name and press ENTER.

4. If you pressed **NO** in step #2, or after you have entered the name change you entered in step #3, the display will ask "Are You Sure?"

5. Pressing **YES** will start the save function and will be followed by "Saving Completed" on the display.

6. Pressing **NO** will abort the save function.

DISK UTILITY MODE

OVERVIEW

The Disk Utility Mode allows you to:

- Format blank disks for use in the DSM-1.
 - Call up directories of Programs, Harmonics data, Multisounds, and Combinations saved on Work, Performance, and DSS-1 disks.
 - Protect data stored on disks from being accidentally erased.
 - Delete unwanted Multisounds and Harmonics data from a Work disk.
-

THE FUNCTIONS

- Function #0:** FORMAT DISK (Performance or Work):
Format a Performance disk or Work disk for use in the DSM-1.
- Function #1:** DISK STATUS:
Confirm the type of disk being used and (with a Work disk) the amount of unused memory space remaining on the disk.
- Function #2:** PROTECT DISK (Set or Reset):
Protect data on a disk from accidental erasure or change.
- Function #3:** COMBINATION DIRECTORY (on Performance disk):
Call up the list of Combinations on a Performance disk
- Function #4:** PROGRAM DIRECTORY (on Performance disk):
Call up the list of Programs on a Performance disk.
- Function #5:** DSS-1 PROGRAM DIRECTORY:
Call up the list of Programs in each system (A, B, C, and D) on a DSS-1 disk.
- Function #6:** MULTISOUND DIRECTORY (on Work, Performance, DSS- 1 Disks):
Call up the list of Multisounds on a disk.
- Function #7:** HARMONICS DATA DIRECTORY (on Work disk):
Call up the list of Harmonics Data from a Work disk.
- Function #8:** DELETE MULTISOUND (on Work disk):
Delete selected Multisounds from a Work disk.
- Function #9:** DELETE HARMONICS DATA (on Work disk):
Delete selected Harmonics Data from a Work disk.
-

ENTERING THE DISK UTILITY MODE

To enter the Disk Utility Mode, press the **DISK UTILITY** key. You will be prompted to select a function (0-9). To exit this mode, either now or after completing one of the functions, press any other mode key.

FUNCTION #0: FORMAT DISK (Performance or Work)

FUNCTION

To format a Performance disk or Work disk for use in the DSM-1.

- The DSM-1 uses only 3.5-inch, high-density, double-sided, double-track disks. Suitable disks include: KORG MF-2HD and SONY MFD-2HD.
- Since the access time of a Work disk increases appreciably after saving on and loading from it many times, it is recommended that you periodically format Work disks for use. Performance disks are unaffected by repeated saving and loading.

NOTE:

Formatting a disk irretrievably erases ALL contents of that disk. Be very careful not to accidentally format a disk that contains sounds you wish to save. Protect your disks from accidental erasure by moving the WRITE PROTECT tab on the disk to the WRITE DISABLE position.

OPERATION

1. Press **0** on the numeric keypad.

```
F0 Format Disk:PERFORM
Use DATA ENTRY & ENTER
```

2. Select the disk type desired (Performance disk or Work disk).
3. The display will show "Are you sure?" Pressing **YES** will format the disk; "Now Formatting..." on the display will be followed by "Formatting Completed." Pressing **NO** will abort the function.

FUNCTION #1: DISK STATUS

FUNCTION

To confirm the type of disk being used and (with a Work disk) the amount of unused memory space remaining on the disk.

OPERATION

1. Press **1** on the numeric keypad.

```
F1 DISK STATUS
Set Disk and Press ENTER
```

```
F1 DSS-1 Format Disk
Select Function (0-9)
```

2. Set the disk and press **ENTER**. The display will read "Now Searching..." followed by one of the following displays, depending on the disk currently in the drive:

This display will be shown for DSS-1 disks only. It simply indicates the disk type.

NOTE:

If, during the searching process, an error message appears, consult the Error Messages section.

```
F1 PERFORMANCE DISK
No SYSTEM Present
```

This display, for Performance disks only, will read "No SYSTEM Present" or "SYSTEM Present," indicating whether or not the disk contains data. If the DSM-1's Protect Disk function is set to "SET", the display will show "PERFORMANCE: Protected".

```
F1 WORK Disk
Used:nnnnkb Free:mmmmkB
```

This display will be shown for Work disks only, and shows the used and free space on the disk. If the DSM-1's Protect Disk function is set to "SET", the display will show "WORK: Protected".

FUNCTION #2: PROTECT DISK

FUNCTION

To protect data on a disk from accidental erasure or change.

NOTE:

This function does NOT protect the disk contents from being erased in the FORMAT DISK Function (Function #0). Use the WRITE PROTECT tab on the disk itself to protect against accidental formatting.

OPERATION

1. Press **2** on the numeric keypad.

F2 DISK PROTECT :Set
Use DATA ENTRY & ENTER

2. Select "SET" to protect the disk, or "RESET" to allow erasure or change. Press **ENTER**. The display will show that the Protect function is being carried out. When it has been completed, the current status of the Protect function will be displayed and you will be prompted to select a function (0-9).

NOTE:

If, during this operation, an error message appears, consult the Error Messages section.

FUNCTION #3: COMBINATION DIRECTORY (on a Performance disk)

FUNCTION

To call up the list of Combinations on a Performance disk.

OPERATION

1. Press **3** on the numeric keypad.

F3 COMBINATION DIR
Set PERFORM Disk & ENTER

2. Set a Performance disk and press **ENTER**.

3. Use the **DATA ENTRY** controls to move through the Combination directory.

NOTE:

If, during this operation, an error message appears, consult the Error Messages section.

FUNCTION #4: PROGRAM DIRECTORY (on a Performance disk)

FUNCTION

To call up the list of Programs on a Performance disk.

OPERATION

1. Press **4** on the numeric keypad.

F4 PROGRAM DIR
Set PERFORM Disk & ENTER

3. Use the **DATA ENTRY** controls to move through the Program directory.

NOTE:

If, during this operation, an error message appears, consult the Error Messages section.

2. Set a Performance disk and press **ENTER**.

FUNCTION #5: DSS-1 PROGRAM DIRECTORY

FUNCTION

To call up the list of Programs in each system (A, B, C, and D) on a DSS-1 disk.

OPERATION

1. Press **5** on the numeric keypad.

F5 DSS-1 PGM DIR :SYS-B
Use DATA ENTRY & ENTER

3. Select the desired system (A, B, C, or D) and press **ENTER**.

4. Use the **DATA ENTRY** controls to move through the Program directory.

NOTE:

If, during this operation, an error message appears, consult the Error Messages section.

2. Set the DSS-1 disk and press **ENTER**.

FUNCTION #6: MULTISOUND DIRECTORY (on Work, Performance, DSS-1 Disks)

FUNCTION

To call up the list of Multisounds on a disk.

OPERATION

1. Press **6** on the numeric keypad.

F6 MULTISOUND DIR
Set Disk and Press ENTER

2. Set the disk (Performance, Work, or DSS-1) and press **ENTER**.

3. Use the **DATA ENTRY** controls to move through the Multisound directory.

NOTE:

If, during this operation, an error message appears, consult the Error Messages section.

FUNCTION #7: HARMONICS DATA DIRECTORY (on a Work disk)

FUNCTION

To call up the list of Harmonics Data stored on a Work disk.

OPERATION

1. Press **7** on the numeric keypad.

F7 HARMONICS DATA DIR
Set WORK Disk & ENTER

2. Set a Work disk and press **ENTER**.

3. Use the **DATA ENTRY** controls to move through the Harmonics Data directory.

NOTE:

If, during this operation, an error message appears, consult the Error Messages section.

FUNCTION #8: DELETE MULTISOUND (on a Work disk)

FUNCTION

To delete selected Multisounds from a Work disk.

OPERATION

1. Press **8** on the numeric keypad.

F8 Delete MULTISOUND Set WORK Disk & ENTER

3. Select the Multisound you wish to delete and press **ENTER**.

4. The display will show "Are you sure?" Press **YES** to delete and **NO** to abort.

NOTE:

<i>If, during the deletion process, an error message appears, consult the Error Messages section.</i>

2. Set a Work disk and press **ENTER**.

FUNCTION #9: DELETE HARMONICS DATA (on a Work disk)

FUNCTION

To delete selected Harmonics Data from a Work disk.

OPERATION

1. Press **9** on the numeric keypad.

F9 Delete HARMONICS DATA Set WORK Disk & ENTER

3. Select the Harmonics Data you wish to delete and press **ENTER**.

4. The display will show "Are you sure?" Press **YES** to delete and **NO** to abort.

NOTE:

<i>If, during the deletion process, an error message appears, consult the Error Messages section.</i>

2. Set a Work disk and press **ENTER**.

SPECIFICATIONS

- **CONFIGURATION :** 16 voices, 16 VCF modules, 16 VCA modules
- **SOUND SOURCES :** Oscillator waveforms created by sampling or by 128 Harmonic Synthesis
- **QUANTIZATION :** 12-BIT
- **SAMPLING TIMES & FREQUENCIES :** 16 sec x 4 Banks ~ 16 kHz,
11 sec x 4 Banks ~ 24kHz,
8 sec x 4 Banks ~ 32kHz,
5.5 sec x 4 Banks ~ 48 kHz
- **MAXIMUM NUMBER OF SPLIT POINTS :** 16 per Multisound, 64 per Combination (4 Timbres)
- **NUMBER OF MULTISOUNDS :** Up to 32 in internal memory
- **NUMBER OF COMBINATIONS :** 32
- **COMBINATION TYPES :** Single, Layer 2, Split 2, Layer 4, Split 4, Split/Layer, Multi, Manual.
- **NUMBER OF PROGRAMS :** 32
- **OUTPUTS :** 16 Individual Out, Mix Out, Stereo Headphones, MIDI OUT/THRU, HSI Terminal.
- **INPUTS :** Audio In Footswitch, MIDI IN
- **DISK DRIVE :** Takes 3.5 inch, Double-Sided, High Density, Double-Track (2HD Unformatted) Floppy Disks: PERFORMANCE DISKS (for storage of internal memory) WORK DISKS (for storage of Multisounds and Harmonic Data) and DSS-1 DISKS (for loading only of DSS-1 data)
- **SUPPLIED ACCESSORIES :** Floppy disks x 3,
MIDI Cable x 1,
AC Power Cord x 1
Rack Mount fittings,
- **DIMENSIONS (W x H x D) :** 433 x 134 x 430 mm (Without Rack Mount fittings)
- **WEIGHT :** 11 kg (without Rack Mount fittings)

★ Specifications subject to change without notice

MIDI IMPLEMENTATION

1. TRANSMITTED DATA

1. SYSTEM EXCLUSIVE MESSAGES

(1) DEVICE ID

BYTE	DESCRIPTION
1111 0000	Exclusive Status
0100 0010	KORG ID 42H
0011 nnnn	Format ID 3nH (n = ch)
0001 0101	DEVICE ID 15H
1111 0111	EOX

(2) DSM-1 SYSTEM EXCLUSIVE MESSAGES

BYTE	DESCRIPTION
1111 0000	Exclusive Status
0100 0010	KORG ID 42H
0011 nnnn	Format ID 3nH (n = ch)
0001 0101	DEVICE ID 15H
0fff ffff	Function ID (NOTE 1)
0ddd dddd	See 3.
0ddd dddd	
1111 0111	EOX

★ nnnn = 0 ~ 15: System Common MIDI ch - 1

NOTE 1: Function ID

- 42H (Mode Data)
- 45H (Multisound List)
- 44H (Multisound Parameter Dump)
- 43H (PCM Data Dump)
- 46H (Combination/Program List)
- 40H (Program Parameter Dump)
- 49H (Combination Parameter Dump)
- 21H (Write Completed)
- 22H (Write Error)
- 23H (Data Load Completed)
- 24H (Data Load Error)
- 25H (Data Processing Completed)

2. RECOGNIZED RECEIVE DATA

1. CHANNEL MESSAGES

STATUS	SECOND	THIRD	DESCRIPTION
1000 nnnn	0kkk kkkk	0xxx xxxx	Note Off Velocity will be ignored.
1001 nnnn	0kkk kkkk	0vvv vvvv	Note On vvv vvvv = 1-127 (7 bit resolution)
100f nnnn	0kkk kkkk	0000 0000	Note Off
1011 nnnn	0000 0001	0vvv vvvv	OSC Modulation vvv vvvv = 0-127 (7 bit resolution)
1011 nnnn	0000 0010	0vvv vvvv	VCF Modulation vvv vvvv = 0-127 (7 bit resolution)
1011 nnnn	0000 0111	0vvv vvvv	Volume vvv vvvv = 0-127 (7 bit resolution)
1011 nnnn	0100 0000	0vvv vvvv	Damper Off vvv vvvv = 0-63
1011 nnnn	0100 0000	0vvv vvvv	Damper On vvv vvvv = 64-127
1011 nnnn	0100 0010	0vvv vvvv	Sostenuto Off vvv vvvv = 0-63
1011 nnnn	0100 0010	0vvv vvvv	Sostenuto On vvv vvvv = 64-127
1011 nnnn	0111 1011	0xxx xxxx	All Notes Off
1011 nnnn	0111 11xx	0xxx xxxx	All Notes Off
1100 nnnn	0xpp pppp	-----	Program Change
1101 nnnn	0vvv vvvv	-----	Channel Pressure (After-Touch) vvv vvvv = 0-127 (7 bit resolution)
1110 nnnn	0xxx xxxx	0bbbbbbb	Pitch Bender Change LSB will be ignored.

★ 0kkk kkkk = 0 to 127: note number

★ 0xpp pppp = 0 to 31: program number/combination number

- Channel Message is received through the MIDI channel specified for each timbre in the Combination Mode. Program change can also be received through System Common Channel, and in this case, it functions as a Combination Change. (Prior to Program Change)
- Receiving range of Note On/Off, On/Off of Channel Pressure, Modulation, Program Change can be specified for each Timbre in the Combination Mode.
- All Notes Off is received by individual timbres, and functions only for the timbre which receives it.

2. SYSTEM REAL TIME MESSAGE

BYTE	DESCRIPTION
1111 1110	Active Sensing

3. SYSTEM EXCLUSIVE MESSAGES

(1) DEVICE ID REQUEST

BYTE	DESCRIPTION
1111 0000	Exclusive Status
0100 0010	KORG ID 42H
0100 nnnn	Format ID 4nH (n = ch)
1111 0111	EOX

(2) DSM-1 SYSTEM EXCLUSIVE MESSAGES

BYTE	DESCRIPTION
1111 0000	Exclusive Status
0100 0010	KORG ID 42H
0011 nnnn	Format ID 3nH (n = ch)
0001 0101	DEVICE ID 15H
0fff ffff	Function ID (NOTE 1)
0ddd dddd	See 3.
0ddd dddd	
1111 0111	EOX

★ nnnn = 0 ~ 15: System Common MIDI ch - 1

NOTE 1: Function ID

- 12H (ModeRequest)
- 42H (Mode Data)
- 16H (Multisound List Request)
- 45H (Multisound list)
- 15H (Multisound Parameter Request)
- 44H (Multisound Parameter Dump)
- 14H (PCM Data Request)
- 43H (PCM Data Dump)
- 17H (Combination/Program List Request)
- 10H (Program Parameter Request)
- 40H (Program Parameter Dump)
- 41H (Program Parameter Change)
- 11H (Program Write Request)
- 19H (Combination Parameter Request)
- 49H (Combination Parameter Dump)
- 1AH (Combination Write Request)
- 1EH (Data Processing Request)

3. DSM-1 SYSTEM EXCLUSIVE FORMAT

1. MODE REQUEST (FUNCTION ID = 12, RECEIVE ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 12 F7	Mode Request

2. MODE DATA (FUNCTION ID = 42, TRANSMIT AND RECEIVE)

FORMAT	DESCRIPTION
F0 42 3n 15 42	Mode Data Header
aa	Mode Data (NOTE 1)
bb	Combination No.-1. (NOTE 2)
cc	Editing Program No.-1 (NOTE 3)
dd	Modified flag. (NOTE 4)
F7	EOX

NOTE 1: MODE DATA

- 0 (PLAY MODE)
- 1 (SYSTEM MODE)
- 2 (COMBINATION MODE)
- 3 (EDIT SYSTEM MODE)
- 4 (EDIT MULTISOUND MODE)
- 5 (PROGRAM MODE)
- 6 (SAMPLE MODE)
- 7 (HARMONIC SYNTHESIS MODE)
- 8 (EDIT SOUND MODE)
- 9 (MAKE/REMAKE MULTISOUND MODE)
- A (DISK UTILITY MODE)
- B (REMOTE EDIT MODE)

- When sending: The current mode is indicated.
- When receiving: Receiving "0", the unit enters the Play mode. Receiving "B", it enters the Remote Edit mode. In this mode, all MIDI input (except for System Exclusive) and all front panel control input (except for the Play mode key) is ineffective.

NOTE 2: COMBINATION NO.

- When sending: The currently selected Combination No. is shown in order to monitor the Combination change from the front panel. (Actually the Combination depends on the contents of the output buffer, so it does not always correspond to this number.)
- When receiving: If this number is 0-31 when Play mode or Remote Edit mode is selected by MODE DATA, a Combination change is carried out. In any other case, this number is ignored.

NOTE 3: EDITING PROGRAM NO.

- When sending: The EDITING PROGRAM NO., specified when MONITOR PROGRAM is selected from the front panel and when MODE DATA is received, is shown.
- When receiving: if this number is 0-31 when Play mode or Remote Edit mode is selected by MODE DATA, EDITING PROGRAM NO. is specified, and the Program is called to the output buffer. In any other case, this number is ignored.
- To edit Program Parameters EDITING PROGRAM NO. must be specified here.
- On Program Editing
When the DSM-1 receives System exclusive data, and the Combination includes a Timbre whose Program No. corresponds to the Editing Program No., data in the Program Output buffer is used for the Timbre. (You can monitor the Program being edited.)
On the other hand, when a Combination is selected on the front panel, and a MIDI Program Change Message is received, data in the Program Memory is used regardless of the contents of the Editing Program No.. (Program data which is not written is not used.)

NOTE 4: MODIFIED FLAG

- bit 0 Combination Parameter, Coombination List
- bit 1 Program Parameter, Program List
- bit 2 Multisound Parameter, Multi Sound List
- bit 3 PCM Data

- When sending: The status of the Modified Flag is shown. When there is the possibility of change of parameters by editing from the front panel, the corresponding bit of this flag is set to 1.
- When receiving: If some bits are 1 when Play mode or Remote Edit mode is selected by MODE DATA, the corresponding flag is cleared. A bit which is 0 is not changed.

3. MULTISOUND LIST REQUEST (FUNCTION ID = 16, RECEIVE ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 16	Multisound List Request Header
aa	Bank No. -1
F7	EOX

4. MULTISOUND LIST (FUNCTION ID = 45, TRANSMIT AND RECEIVE)

FORMAT	DESCRIPTION
F0 42 3n 15 45	Multisound List Header
aa	Bank No. -1
bb	Number of Multisounds in the Bank
cc.....cc (14 bytes)	Multisound 1 Data (NOTE 1)
dd.....dd (14 bytes)	Last Multisound data
ss	Check sum
F7	EOX

NOTE 1: MULTISOUND DATA

FORMAT	DESCRIPTION
ee.....ee (8 bytes)	Multisound Name
ff.....ff (3 bytes)	Multisound Length
gg.....gg (3 bytes)	Multisound Base Address

- NOTE 2: The MULTISOUND LIST message must be followed by the MULTISOUND PARAMETER DUMP messages when receiving.

5. MULTISOUND PARAMETER REQUEST (FUNCTION ID = 15, RECEIVE ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 15	Multisound Parameter Request Header
aa (1 byte)	bit5 ~ 4 Bank No. -1 bit3 ~ 0 Multi sound No. -1
F7	EOX

6. MULTISOUND PARAMETER DUMP (FUNCTION ID = 44, TRANSMIT AND RECEIVE)

FORMAT	DESCRIPTION
F0 42 3n 15 4n	Multisound Parameter Dump Header
aa (1 byte)	bit5 ~ 4:Bank No. -1 bit3 ~ 0:Multisound No. -1
bb.....bb (8 bytes)	Multisound Name(see 4-(4))
cc.....cc (3 bytes)	Multisound Length
dd (1 byte)	Number of Sounds (lower 5 bits)
ee (1 byte)	Max interval (NOTE 1)
ff.....ff (18 bytes)	Sound 1 Parameter (NOTE 2)
gg.....gg (18 bytes)	Last Sound Parameter
ss (1 byte)	Check Sum (see 4-(3))
F7	EOX

NOTE 1: MAX INTERVAL

- Sets maximum value obtained with following formula. (The lower 7 bits of the two's complement.)
- (Top key) - (Org key) + -12(16kHz)
- 7(24kHz)
- 0(32kHz)
- 5(48kHz)

NOTE 2: SOUND PARAMETER

FORMAT	DESCRIPTION
hh (1 byte)	Top Key (MIDI Note No.)
ii (1 byte)	Original Key (MIDI Note No.)
jj (1 byte)	Relative Tune 1(-63) ~ 127 (+63)
kk (1 byte)	Relative Level (1 ~ 64)
ll (1 byte)	Relative Cutoff (1 ~ 64)
mm.....mm (3 bytes)	Sound Word Length
nn.....nn (3 bytes)	Sound Start Address (see 4-(5))
qq.....qq (3 bytes)	Loop Start Address (see 4-(5))
rr.....rr (3 bytes)	Loop Length
tt (1 byte)	bit7 ~ 6:00(Transpose), 01(Non Transpaose)
	bit5 ~ bit0: Sampling Frequency
	0(32KHz)
	1(24KHz)
	2(16KHz)
	3(48KHz)

7. PCM DATA REQUEST (FUNCTION ID = 14, RECEIVE ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 14	PCM Data Request Header
nn (1 byte)	Bank No. -1
aa.....aa (3 bytes)	Start Address(Absolute)
bb.....bb (3 bytes)	Last Address + 1(Absolute)
F7	EOX

8. PCM DATA DUMP (FUNCTION ID = 43, TRANSMIT AND RECEIVE)

FORMAT	DESCRIPTION
F0 42 3n 15 43	PCM Data Dump Header
nn (1 byte)	Bank No. -1
aa.....aa (3 bytes)	Start Address(Absolute)
bb.....bb (3 bytes)	Last Address + 1(Absolute)
cc.....cc (2 bytes)	PCM Data of Start Address (see 4-(2))
dd.....dd (2 bytes)	PCM Data of Last Address
ss	Check Sum (see 4-(3))
F7	EOX

9. COMBINATION/PROGRAM LIST REQUEST (FUNCTION ID = 17, RECEIVE ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 17	Combination/Program List Request Header
aa	Combination/Program (Note 1)
F7	EOX

NOTE 1: 1 (COMBINATION)
2 (PROGRAM)

10. COMBINATION/PROGRAM LIST (FUNCTION ID = 46, TRANSMIT ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 46	Combination/Program List Header
aa	Combination/Program (Note 1)
bb.....bb (8 bytes)	Combination/Program Name 1
cc.....cc (8 bytes)	Last Combination/Program Name
F7	EOX

NOTE 1: 1 (COMBINATION)
2 (PROGRAM)

11. PROGRAM PARAMETER REQUEST (FUNCTION ID = 10, RECEIVE ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 10 F7	Program Parameter Request

12. PROGRAM PARAMETER DUMP (FUNCTION ID = 40, TRANSMIT, RECEIVE)

FORMAT	DESCRIPTION
F0 42 3n 15 40	Program Parameter Dump Header
aa.....aa (8 bytes)	Program Name
bb.....bb (48 bytes)	Program Parameter (see 4-(6))
F7	EOX

13. PROGRAM PARAMETER CHANGE (FUNCTION ID = 41, RECEIVE ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 41	Program Parameter Change Header
aa (1 byte)	Parameter No.(0-47) (see 4-(6))
bb (1 byte)	Parameter Value
F7	EOX

14. PROGRAM WRITE REQUEST (FUNCTION ID = 11, RECEIVE ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 11	Program Write Request Header
aa	Parameter No.-1
bb.....bb (8 bytes)	Program Name (Optional) (NOTE 1)
F7	EOX

NOTE 1: If the program name is omitted, the name in the output buffer will be used.

15. COMBINATION PARAMETER REQUEST (FUNCTION ID = 19, RECEIVE ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 19 F7	Combination Parameter Request

16. COMBINATION PARAMETER DUMP (FUNCTION ID = 49, TRANSMIT AND RECEIVE)

FORMAT	DESCRIPTION
F0 42 3n 15 49	Combination Parameter Dump Header
aa.....aa (8 bytes)	Combination name
bb (1 byte)	Voice Combine Mode 0(OFF), 1 ~ 4 (MODE1 ~ MODE4)
cc (1 byte)	Combination Type 0(SINGLE) ~ 7(MANUAL)
dd.....dd (17 bytes)	Timbre A parameter (NOTE 1)
ee.....ee (17 bytes)	Timbre B parameter (NOTE 1)
ff.....ff (17 bytes)	Timbre C parameter (NOTE 1)
gg.....gg (17 bytes)	Timbre D parameter (NOTE 1)
F7	EOX

NOTE 1: TIMBRE PARAMETERS

OFFSET	TIMBRE PARAMETER	VALUE REPRESENTATION
0	MIDI RECEIVE CHANNEL	0 ~ 15 (1 ~ 16)
1	PROGRAM CHANGE ON/OFF	0(OFF) 1(ON)
2	MODULATION ON/OFF	0(OFF) 1(ON)
3	AFTER TOUCH ON/OFF	0(OFF) 1(ON)
4	OCTAVE	0 ~ 10 (-5 ~ +5)
5	SEMI-TONE TRANSPOSE	0 ~ 22 (-12 ~ +12)
6	RECEIVE KEY RANGE BOTTOM	0 ~ 127 (MIDI Note No.)
7	T.LEVEL-INIT TOUCH WINDOW BOTTOM	0 ~ 63
8	RECEIVE KEY RANGE TOP	0 ~ 127 (MIDI Note No.)
9	T.LEVEL-INIT TOUCH WINDOW TOP	0 ~ 63
10	NUMBER OF VOICE	0 ~ 8
11	KEYBOARD ASSIGN MODE	0 (POLY 1) 1 (POLY 2)
12	LEVEL	0 ~ 63
13	MULTISOUND MONO/POLY	0 (POLY) 1 (MONO)
14	T.LEVEL-INIT TOUCH DIRECTION	0 () 1 (+)
15	TUNE	0 ~ 64 (-32 ~ +32)
16	PROGRAM NO.	0 ~ 31

17. COMBINATION WRITE REQUEST (FUNCTION ID = 1A, RECEIVE ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 1A	Combination Write Request Header
aa	Combination No.-1
bb.....bb (8 bytes)	Combination Name (Optional) (NOTE 1)
F7	EOX

NOTE 1: If the combination name is omitted, the name in the output buffer will be used.

18. DATA PROCESSING REQUEST (FUNCTION ID = 1E, RECEIVE ONLY)

(1) MOVE PCM DATA

FORMAT	DESCRIPTION
F0 42 3n 15 1E	Data Processing Request Header
01	Move PCM Data
bb	Destination Bank No.-1
cc.....cc (3 bytes)	Destination Start Address
dd	Source Bank No. -1
ee.....ee (3 bytes)	Source Start Address
ff.....ff (3 bytes)	Word Count to Move
F7	EOX

(2) FILL PCM DATA MEMORY

FORMAT	DESCRIPTION
F0 42 3n 15 1E	Data Processing Request Header
02	Fill PCM Data Memory
bb	Destination Bank No.-1
cc.....cc (3 bytes)	Destination Start Address
dd.....dd (3 bytes)	Word Count to fill
ee.....ee (2 bytes)	PCM Data to fill with
F7	EOX

(3) REVERSE PCM DATA

FORMAT	DESCRIPTION
F0 42 3n 15 1E	Data Processing Request Header
03	Reverse PCM Data
bb	Bank No.-1
cc.....cc (3 bytes)	Start Address
dd.....dd (3 bytes)	Word Count to Reverse
F7	EOX

19. WRITE COMPLETED (FUNCTION ID = 21, SEND ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 21 F7	Write Completed

20. DATA LOAD COMPLETED (FUNCTION ID = 23, SEND ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 23 F7	Data Load Completed

21. DATA LOAD ERROR (FUNCTION ID = 24, SEND ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 24 F7	Data Load Error

22. DATA PROCESSING COMPLETED (FUNCTION ID = 25, TRANSMIT ONLY)

FORMAT	DESCRIPTION
F0 42 3n 15 25 F7	Data Processing Completed

4. DATA FORMAT REFERENCE

1. ADDRESS, LENGTH DATA FORMAT(8 Bytes)

1st Byte	0	a6	a5	a4	a3	a2	a1	a0
2nd	0	a13	a12	a11	a10	a9	a8	a7
3rd	0	0	0	a18	a17	a16	a15	a14

a0 = LSB, a18 = MSB0 ~ 261885 for address
1 ~ 261886 for length

2. PCM DATA FORMAT (2 Bytes)

1st Byte	0	b4	b3	b2	b1	b0	0	0
2nd Byte	0	b11	b10	b9	b8	b7	b6	b5

b0 = LSB b11 = MSB
0(-max) ~ 2048(0) ~ 4095(+max)

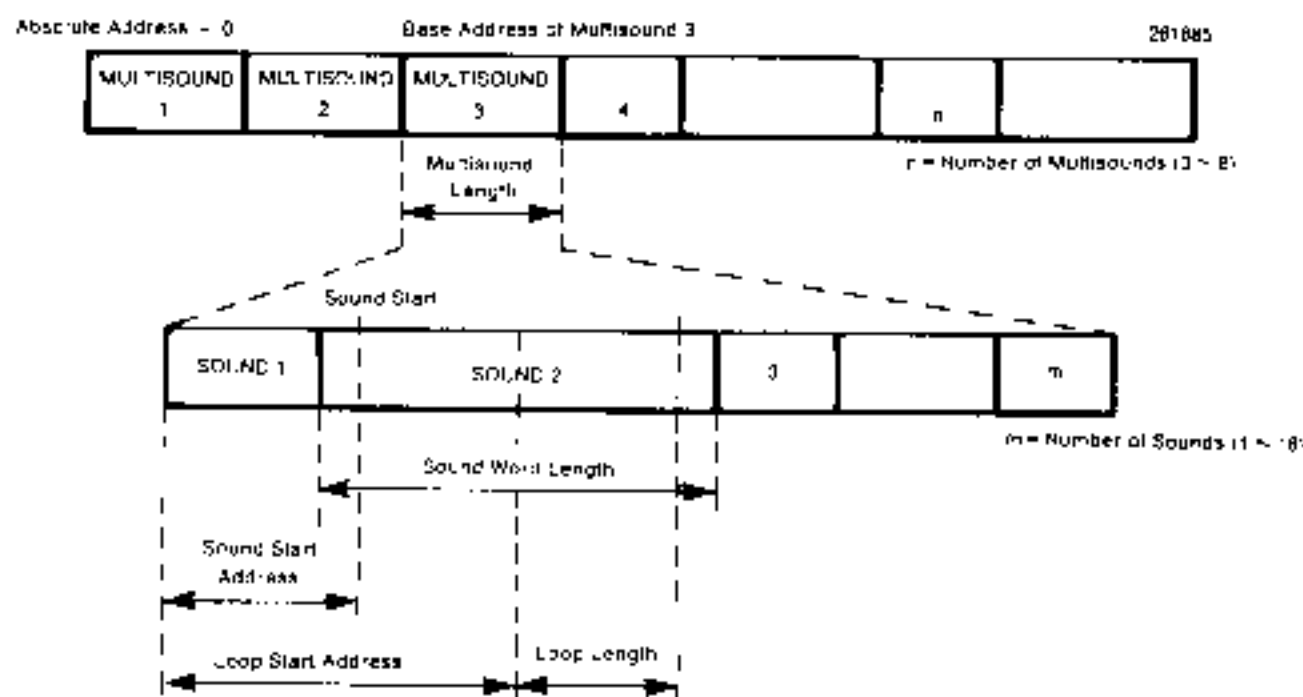
3. CHECK SUM(1 Byte)

Lower 7 bits of sum of data after function ID to before check sum.

4. NAME FORMAT(8 bytes)

1st byte = 1st character: 8th byte = 8th character. All characters must be 7-bit ASCII in the range of 20H to 7FH, excluding 22H, 2AH, and 3FH.

5. PCM DATA MEMORY MAP (for each bank)



- Absolute Addresses are used in PCM data dump and PCM data processing.
- Relative addresses from the Multisound Base Addresses are used in Multisound List and Multisound Parameter dump. The values displayed by the DSM-1 are different from these values, which are:

$$S.ST = \text{Sound Start Address} - SBA,$$

$$S.END = \text{Loop Start Address} + \text{Loop Length} - SBA,$$

where SBA is the sum of the Word Length's of all previous sounds in the multisound.

- The Multisound Base Address is equal to the sum of the Multisound Lengths of all previous Multisounds in the bank. The Multisound Name and Multisound Length parameters in the Multisound List and Multisound Parameter have the same values. These relations must be observed while sending messages to the DSM-1.

6. PROGRAM PARAMETER MAP

OFFSET	TIMBRE PARAMETER	VALUE REPRESENTATION
0	MULTISOUND NO.	bit 5 ~ 4: Bank No. -1 bit 3 ~ 0: Multisound No. -1 64(No Assign)
1	TUNE	0 ~ 64 (-32 ~ +32)
2	OSC MG FREQUENCY	0 ~ 31
3	OSC MG DELAY	0 ~ 15
4	OSC MG INT	0 ~ 63
5	OSC MG INT-AFTER TOUCH SENS.	0 ~ 15
6	AUTO BEND POLARITY	0(DOWN), 1(UP)
7	AUTO BEND TIME	0 ~ 31
8	AUTO BEND INT	0 ~ 127
9	AUTO BEND INT-INIT TOUCH SENS.	0 ~ 63
10	VCF CUTOFF	0 ~ 127
11	VCF KBDTRACK	0 ~ 63
12	VCF EG POLARITY	0(.), 1(+) 0 ~ 63
13	VCF EG INT	0 ~ 63
14	VCF EG ATTACK	0 ~ 63
15	VCF EG DECAY	0 ~ 63
16	VCF EG BREAK POINT	0 ~ 63
17	VCF EG SLOPE	0 ~ 63
18	VCF EG SUSTAIN	0 ~ 63
19	VCF EG RELEASE	0 ~ 63
20	VCF MG FREQUENCY	0 ~ 63
21	VCF MG DELAY	0 ~ 63
22	VCF MG INT	0 ~ 63
23	VCF CUTOFF-INIT TOUCH SENS.	0 ~ 63
24	VCF EG ATTACK-INIT TOUCH SENS.	0 ~ 63
25	VCF EG DECAY-INIT TOUCH SENS.	0 ~ 63
26	VCF EG SLOPE-INIT TOUCH SENS.	0 ~ 63
27	VCF AFTER TOUCH SELECT	0(CUTOFF), 1(MGINT)
28	VCF CUTOFF-AFTER TOUCH SENS.	0 ~ 15
29	VCF MG INT-AFTER TOUCH SENS.	0 ~ 15
30	TOTAL LEVEL	0 ~ 63
31	VCA EG ATTACK	0 ~ 63
32	VCA EG DECAY	0 ~ 63
33	VCA EG BREAK POINT	0 ~ 63
34	VCA EG SLOPE	0 ~ 63
35	VCA EG SUSTAIN	0 ~ 63
36	VCA EG RELEASE	0 ~ 63
37	VCA DECAY KEYBOARD TRACK	0 ~ 63, 64 ~ 127 (-64 ~ -1)
38	VCA EG ATTACK-INIT TOUCH SENS	0 ~ 63
39	VCA EG DECAY-INIT TOUCH SENS.	0 ~ 63
40	VCA EG SLOPE-INIT TOUCH SENS.	0 ~ 63
41	T.LEVEL-INITIAL TOUCH SENS.	0 ~ 63
42	VCA RELEASE KEYBOARD TRACK	0 ~ 63, 64 ~ 127 (-64 ~ -1)
43	VCF MG WAVE FORM	0(SINE), 1(TRI), 2(SQUARE)
44	TOTAL LEVEL -AFTER TOUCH SENS.	0 ~ 15
45	BENDER-VCF SWEEP INT	0 ~ 63
46	PITCH BEND RANGE	0 ~ 12
47	OSC MG WAVE FORM	0(SINE), 1(TRI), 2(SQUARE)

USING THE SYSTEM EXCLUSIVE MESSAGES

■ The DSM-1 handles the following information as system exclusive messages.

Data that can be transmitted and received.

The DSM-1 sends data upon receiving particular request messages. The DSM-1 also changes parameter settings upon receiving particular data.

- MODE DATA** : Information to indicate the current mode of the unit. This message is also used when designating combination or program to be edited. This data is sent when a **MODE REQUEST** is received.
- MULTISOUND LIST** : A list of multisounds in the DSM-1 system. Sent when a **SOUNDLIST REQUEST** message is received.
- MULTISOUND PARAMETER DUMP** : The parameter data for one multisound in the DSM-1 system. This is used, for instance, when computing PCM data addresses. Sent when a **MULTISOUND PARAMETER REQUEST** is received.
- PCM DATA DUMP** : Refer to PCM data within the specified area of DSM-1 PCM data memory. Sent when a **PCM DATA REQUEST** message is received.
- PROGRAM PARAMETER DUMP** : Refers to data for a single program parameter data contained in the output buffer. Sent when a **PROGRAM PARAMETER-DUMP REQUEST** is received. If the DSM-1 receives this data, it stores it in the program output buffer (not directly in program memory).
- COMBINATION PARAMETER DUMP** : Parameter data contained in the combination output buffer. This is sent when a **COMBINATION PARAMETER REQUEST** is received.

Data that is only transmitted.

This data is sent upon receiving particular system exclusive messages.

- DEVICE ID** : Name of device, sent when **DEVICE ID REQUEST** is received.
- MODE DATA** : Data indicating DSM-1 mode, sent when **MODE REQUEST** is received.
- COMBINATION/PROGRAM LIST** : List of program names or combination names in memory. This is sent when a **COMBINATION/PROGRAM LIST REQUEST** is received.
- PROGRAM NAME LIST** : The program name list from program memory, sent when a **PROGRAM NAME LIST REQUEST** is received.
- DATA LOAD COMPLETED** : Indicates successful reception of data. This is sent when "send/receive information" is received.
- DATA LOAD ERROR** : Indicates a problem with data reception. This is sent when there is a format error or check sum error, or when a message which is not acceptable in the current mode is received.
- WRITE COMPLETED** : Response to **PROGRAM WRITE REQUEST**, **COMBINATION WRITE REQUEST**.
- DATA PROCESSING COMPLETED** : Response to **DATA PROCESSING REQUEST**.

Data that is only received.

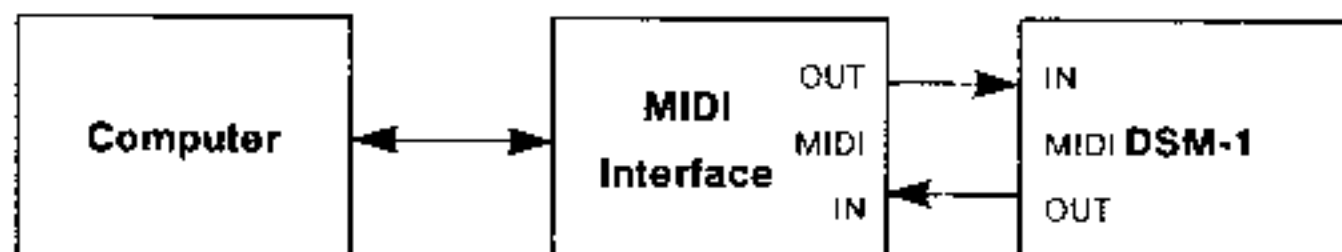
These are "request messages" which ask the DSM-1 for information or cause a change in some aspect of DSM-1 operation.

- DEVICE ID REQUEST** : A request for the **DEVICE ID** of the receiving device.
- PLAY MODE REQUEST** : Changes DSM-1 mode to the play mode.
- DEVICE ID REQUEST:** A request for **DEVICE ID**
- MODE REQUEST** : A request for **MODE DATA**.

- MULTISOUND LIST REQUEST** : A request for the multisoud list.
- MULTISOUND PARAMETER REQUEST** : A request for a multisound parameter dump.
- PCM DATA REQUEST** : A request for a PCM data dump.
- PROGRAM NAME LIST REQUEST** : A request for the program name list.
- COMBINATION/PROGRAM LIST REQUEST** : Information to request transmission of a **COMBINATION/PROGRAM LIST**.
- PROGRAM PARAMETER REQUEST** : A request for a program parameter dump.
- PROGRAM PARAMETER CHANGE** : Change parameter values in the program output buffer.
- PROGRAM WRITE REQUEST** : Information to write the data contained in the program output buffer into the program memory. After writing is completed, a **WRITE COMPLETED** message is sent.
- COMBINATION WRITE REQUEST** : information to write the data contained in the combination output buffer into the combination memory. After writing is completed, a **WRITE COMPLETED** message is sent.
- DATA PROCESSING REQUEST** : Information to transfer or to process data in the PCM data memory. After processing is completed, a **PROCESSING COMPLETED** message is sent.
- WRITE REQUEST** : A request to write data from the program output buffer to program memory. Depending on the program number received, the response will be **WRITE COMPLETED** or **WRITE ERROR**.

■ Using these system exclusive messages you can exchange data with a computer equipped with a MIDI interface and suitable software.

■ Connections are as shown here.



■ DSM-1 exclusive messages use the send/receive channel numbers determined by **SYSTEM** mode **SYSTEM MIDI CHANNEL**. These must match on the computer in order to send and receive system exclusive messages. Messages on the wrong channels are ignored. (They are not affected by the channel mode message **OMNI** mode.)

Important Note: : Unpredicable behavior may result if you send data to the DSM-1 that is outside the specified bounds. Check your data if strange things are happening. There could also be bugs in the software.

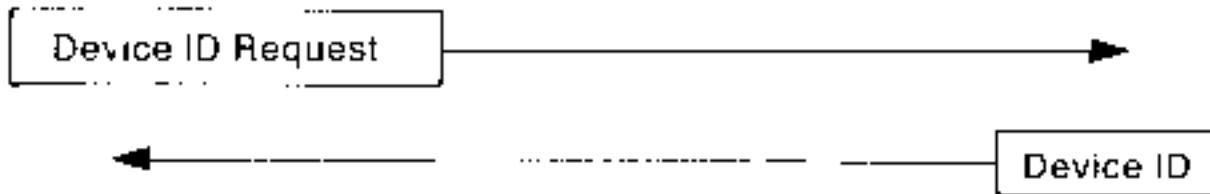
Messages	Playmode	Remote Edit Mode	Other Modes
DEVICE ID REQUEST, DEVICE ID	○	X	○
MODE REQUEST, MODE DATA	○	○	○
OTHER SYSTEM EXCUSIVE MESSAGES	○	○	X
MIDI MESSAGES OTHER THAN SYSTEM EXCLUSIVE	○	X	○

■ Typical applications:

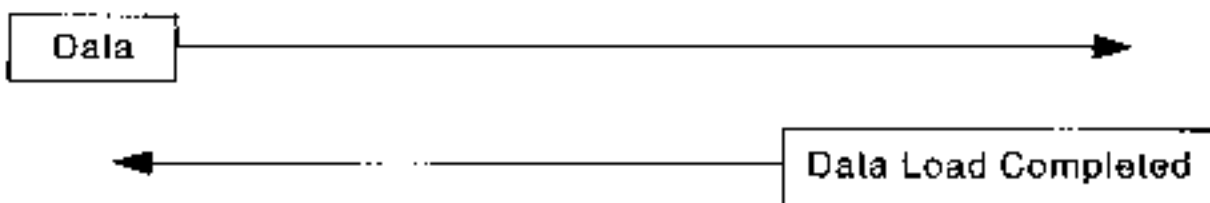
(1) To edit PCM data.



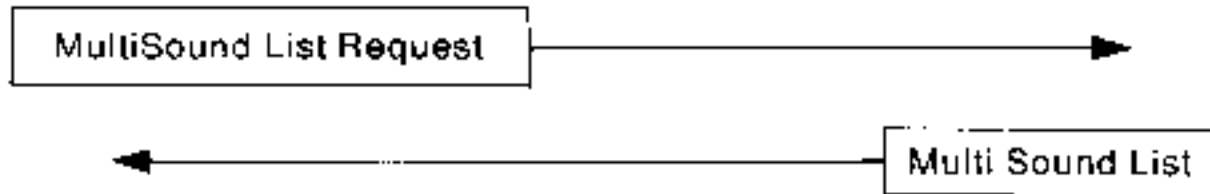
- Confirm proper connection from computer to DSM-1.



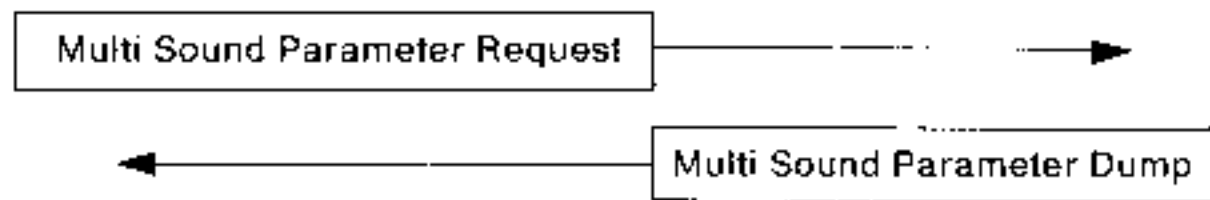
- Put the DSM-1 into the PLAY MODE.



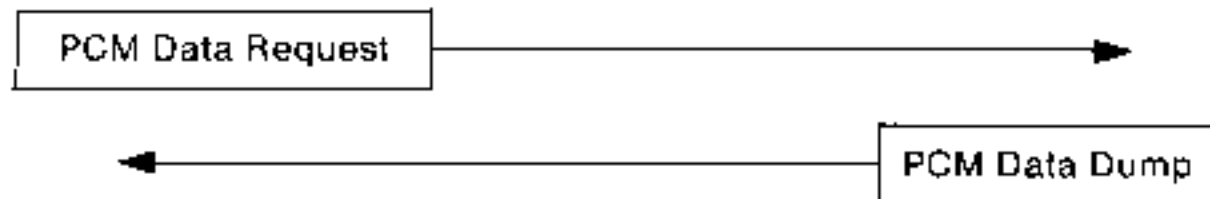
- Send a MULTISOUND LIST REQUEST to find out what multisounds are in DSM-1 memory.



- Send a MULTISOUND PARAMETER REQUEST to find the sounds in a multisound and their sampling frequencies, loop positions, and other data.

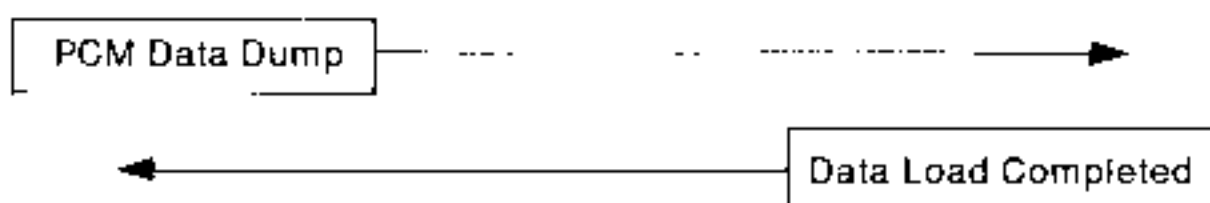


- Send a PCM DATA DUMP REQUEST to find the absolute address of a sound that you wish to edit.

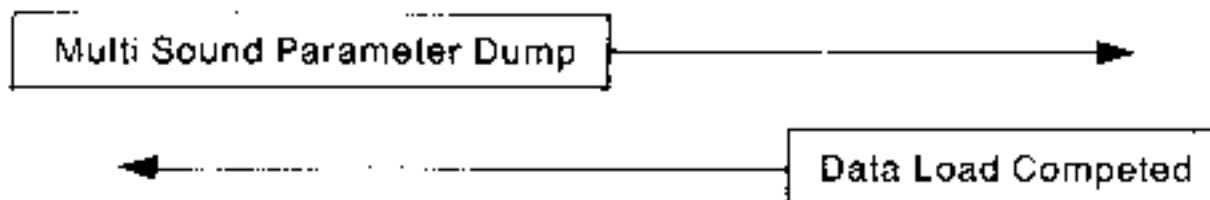


- Edit the PCM data, loop point, etc.

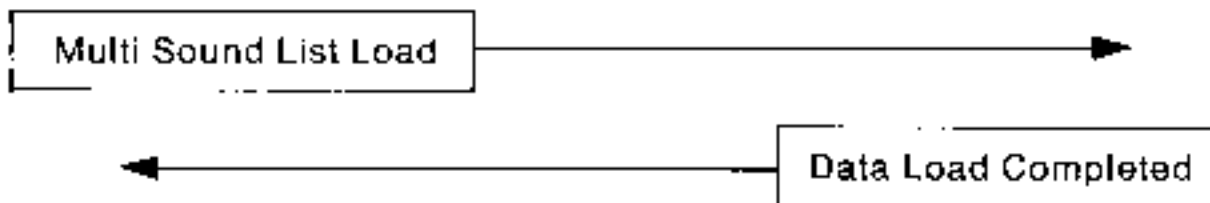
- Send the edited PCM data to the DSM-1.



- Send the edited Multisound Parameter to the DSM-1.



- Send a MULTISOUND LIST if the edit resulted in a change in the MULTISOUND LIST.

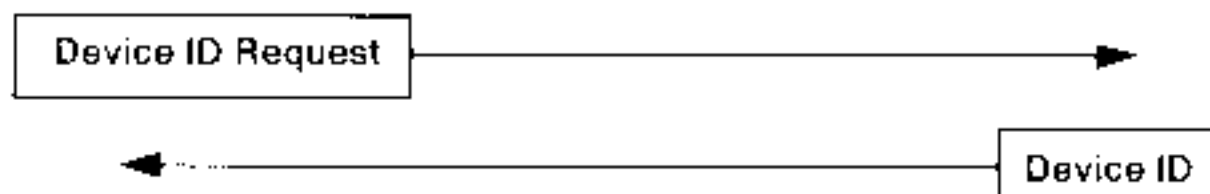


- END.

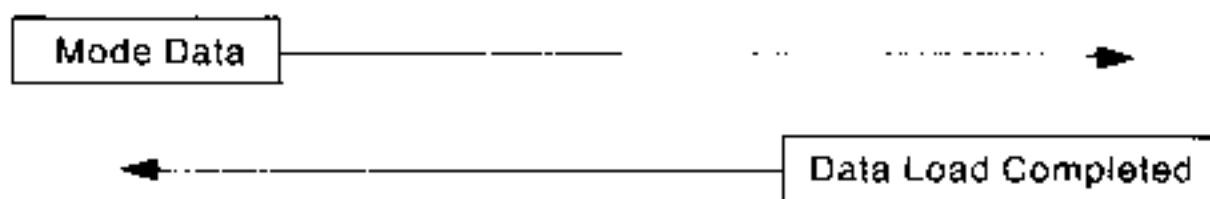
(2) To edit program parameters.



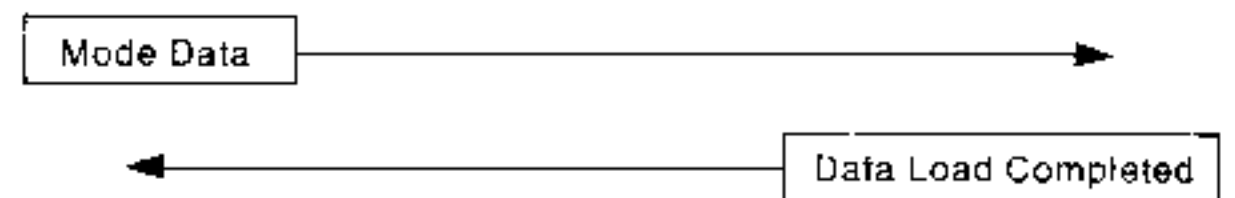
- Confirm proper connection from computer to DSM-1.



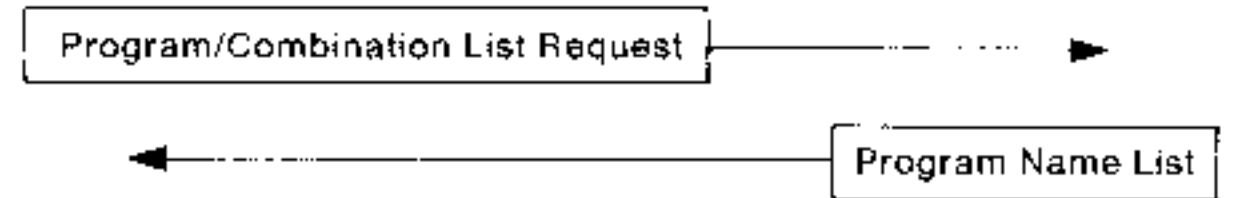
- Put the DSM-1 into the PLAY MODE.



- Select program to be edited, and call the program by MODE DATA.



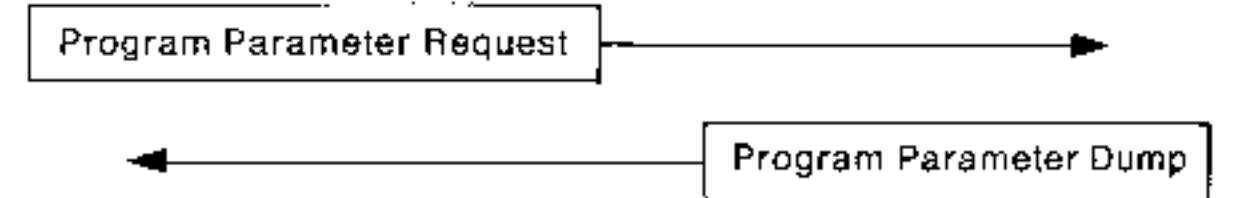
- Send a PROGRAM/COMBINATION LIST REQUEST to find out what program are in the DSM-1.



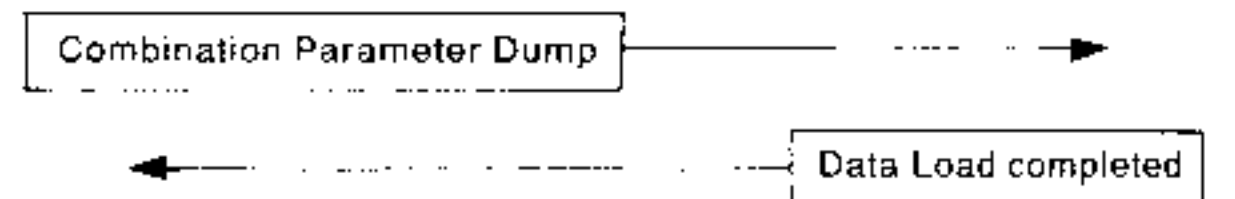
- Choose the program that you wish to edit and use the PROGRAM CHANGE message to change to that program.



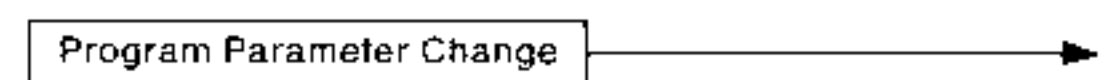
- Send a PROGRAM PARAMETER DUMP REQUEST to find out the program parameter values of the program that you wish to edit.



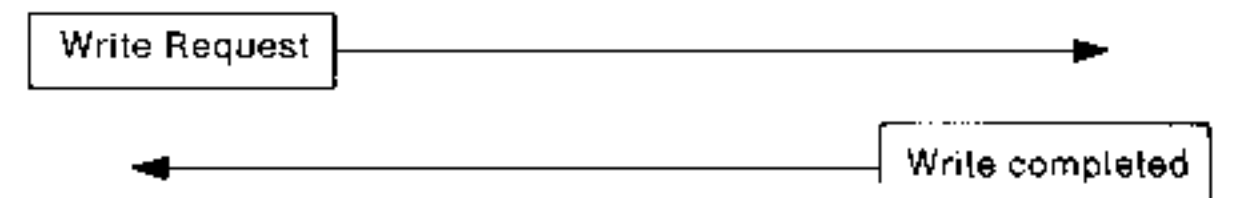
- In order to monitor the program being edited, select the combination which includes the program to be edited, and execute a COMBINATION PARAMETER DUMP.



- Edit the Parameter Values and transfer them.



- Finish the edit and write the program.



- END

ERROR MESSAGES

1. WHEN AN ERROR MESSAGE OCCURS WHILE READING DATA (LOADING) FROM THE DISK:

remove the disk, then re-insert it and retry the disk reading procedure. If the error persists, clean the heads using a dual-sided head cleaning disk, then perform a DIRECTORY operation (DISK UTILITY MODE Function #3, #4, #5, #6 or #7 as appropriate) until the error disappears.

2. WHEN AN ERROR MESSAGE OCCURS WHILE SAVING DATA TO A DISK:

there is a danger that other data on the disk may be adversely affected. Therefore, use a new disk to save the data; retain the old disk for reading data only.

MESSAGE	MEANING
Disk Not Ready set Disk or Press NO	There is no disk set in the drive. Set a disk in the drive or press NO key for 3~4 min. when disk is set.
Protect Tab Set	Format, save and delete functions can not be carried out because the disk's Protect Tab is open. Close the tab.
Protected Disk	Save and delete functions can not be carried out because the PROTECT DISK Function (DISK UTILITY MODE Function #2) is set to "SET". Using this function, select "RESET".
Disk Data Error	A data error has been caused by dirt on the disk or damage to the disk, or the disk drive heads are dirty.
No File Exists	The filename selected does not correspond to a file on the disk. Enter the correct filename or insert the correct disk.
Too Many Files	With a Work disk, you cannot save any more files because it already contains the maximum number of files. Use a new disk, or delete files on the disk to make space.
Disk Full	With a Work disk, you cannot save any more files because the files now on the disk occupy too much space. Use a new disk, or delete files on the disk to make space.
Disk Type Error	The type of disk (Performance, Work or DSS-1) in the disk drive differs from the disk type required for the current operation. Insert the correct type of disk.

TROUBLESHOOTING

If no sound is output:

- check that the DSM-1 is properly connected to headphones or an amplifier.
- ensure that the setting of the MIX VOLUME control on the front panel is above zero.
- check that data from a performance disk has been loaded, or that you have created a waveform in the internal memory, using harmonic synthesis or sampling.
- if playing the DSM-1 from an external MIDI device, check that the DSM-1's MIDI receive channel is the same as the MIDI transmit channel of the external device (see COMBINATION MODE Function #03).
- if the timbre you are playing is assigned to a specified range of the keyboard, check that you are playing keys within that range.
- when monitoring via an Individual Output, check that the Timbre you are playing is assigned to that output (see COMBINATION MODE Functions #11 and #16).
- when using a footswitch or audio trigger to play a sound, check that the footswitch or audio trigger is assigned to the correct note, MIDI channel and velocity for the Timbre you are playing, and the correct footswitch type has been selected (see SYSTEM MODE Function #5).

If you are unable to format a disk:

- check that the disk is properly inserted into the disk drive, and that the drive is locked.
- check that the Protect tab on the disk is closed.
- check that the appropriate type of disk is being used.

If you are unable to save data to a disk:

- check that the disk is properly inserted into the disk drive, and that the drive is locked.
- check that the Protect tab on the disk is closed.
- check that the disk has been correctly formatted for use with the DSM-1.
- check that the Protect Disk function is set to RESET (see DISK UTILITY MODE Function #2).
- check that the appropriate type of disk is being used.

If you cannot get (load) data from a disk:

- check that the disk is properly inserted into the disk drive, and the drive is locked.
- check that the appropriate type of disk is being used.

GLOSSARY

NOTE:

Cross-references are indicated by terms printed in capitals.

ABORT	: Stop (cancel) an operation or function.	COMBINATION	: A combination of up to 4 TIMBRES, which can be played simultaneously in a variety of configurations. Each TIMBRE can be assigned to a selected position on the keyboard, with its own velocity setting, MIDI channel and number of voices.
A/D CONVERSION	: Conversion of an analog signal into a digital signal.	DELETE	: Erase the contents of a disk, usually in order to use the disk to store new data.
A/D RESOLUTION	: The fineness by which A/D CONVERSION is carried out. The higher this value, the more accurate is the conversion.	DIR	: Display message indicating Directory (of multisounds, for example).
AUTO ZERO CROSS SEARCH	: Facility to automatically search for a ZERO CROSS POINT in a sound, for use as a LOOP point.	DISK STATUS	: The condition of a disk (its format type, and the amount of vacant memory space).
ADDRESS	: Indicates the position of a WORD in a sampled sound.	DSS-1 SYSTEM	: A SYSTEM of data created on a KORG DSS-1 Digital Sampling Synthesizer.
BANK	: A type of memory storage, with a capacity of 256,000 WORDS. The DSM-1 has four banks.	ERASE	: Empty the DSM-1's internal memory in order to make space for the creation of new waveforms, etc.
BACK AND FORTH	: A LOOP played alternately backwards and forwards, to create a smoother sound.	FORMAT	: Prepare a disk for use as a PERFORMANCE DISK or WORK DISK. This operation deletes all existing data on the disk.
CLEAR BANK	: Remove all data from a BANK, usually in order to use the empty BANK for synthesizing a new SOUND.	GET	: Load the contents of a disk into the internal memory.
CMB 01	: Display message indicating COMBINATION 01.	HARM	: Display message indicating HARMONICS.
C 01	: Display message indicating COMBINATION 01.		

HARMONICS	: The individual pure tones (sinewaves) which combine to make up a waveform. The first harmonic (fundamental) gives the basic frequency of the waveform.	RECOVER MEMORY	: Delete unused portions of a SOUND (after A TRUNCATE OPERATION) to conserve memory space.
HARMONICS DATA	: The frequency and level of all HARMONICS which make up a waveform synthesized on the DSM-1.	REL. PARAMS.	: Display message indicating Relative Parameters. These allow individual adjustment of the tuning, volume and cutoff frequency of SOUNDS within a MULTISOUND.
HARMONICS TABLE	: A preset group of HARMONICS which create a selected waveform (e.g., Sawtooth, Square, Metal) on the DSM-1.	REPLACE SOUND	: Replace a SOUND within a MULTISOUND by another SOUND.
KEY WINDOW	: A parameter indicating to which section of a keyboard each TIMBRE is assigned.	RESAMPLE	: Retry sampling of a SOUND within a MULTISOUND.
LINK	: To join two SOUNDS together, so that they are heard in succession when a key is played.	REVERSE	: Play a sound backwards, similar to reverse play on a tape recorder.
LOAD	: Transfer data from a disk into the internal memory. During loading, all other operations are impossible.	SAMPLE	: Digitally record an audio signal input via the DSM-1's Audio In, for use as a SOUND.
LOOP	: Continuous repeat play of a selected part of a waveform. The DSM-1's waveform memory limits the length of a sampled sound; with the use of a LOOP, a sound can be played to any length.	SAMPLING FREQUENCY	: The rate at which a sound is sampled, expressed in WORDS per second. The higher this value, the better the sound quality (more high frequencies may be preserved). However, at high sampling rates more wave memory is used, therefore the sampling time will be reduced.
MIX	: To blend two SOUNDS together, so that they are heard simultaneously when a key is played.	SAVE	: To transfer the contents of the internal memory onto a disk (actually the data is copied rather than transferred, and remains in the internal memory until it is erased).
MONITOR	: To temporarily use a program for modification of a waveform. This function is for listening purposes only, and is not memorized.	SEARCHING	: Display message indicating that the DSM-1 is in the process of locating a selected name or ZERO CROSS POINT.
MULTISOUND	: A completed sound source, comprising a group of up to 16 SOUNDS. The total length of these sounds must not exceed the memory capacity of a BANK.	SOUND	: A single sound, either sampled or synthesized; up to 16 sounds can be assigned to sections of the keyboard, to make up a MULTISOUND. The DSM-1 can REVERSE, LINK or MIX individual sounds.
ORIGINAL KEY	: A position on the keyboard to which a sampled SOUND is assigned, and can be played at its original pitch.	SYSTEM	A set of data comprising all the data needed to play the DSM-1, including MULTISOUNDS, PROGRAMS, COMBINATIONS and MIDI settings.
OUTPUT BUFFER	: A "working area" where programs and combinations are edited. Data in this area must be written into memory in order to be preserved and saved onto disk.	SYSTEM COMMON MIDI CHANNEL	: MIDI channel used for reception of COMBINATION change messages or System Exclusive messages.
OUTPUT MODE	: Indicates how the 16 Individual Outputs are used, in five modes. Each SOUND can be output separately. TIMBRES can share outputs in a variety of configurations.	TIMBRE	: On the DSM-1, this indicates a PROGRAM to which a MULTISOUND has been assigned. Four TIMBRES may be played together as a COMBINATION. In regular usage, timbre means the tone or color of a sound.
OVERWRITE	: Write new data upon existing data; the existing data will be erased by this process.	TOP KEY	: The upper limit to which a sample may be transposed above its original pitch. If a sample is played at the SAMPLING FREQUENCY at which it was recorded, it will be heard at its original pitch. A higher frequency of playback will raise the pitch of the sample. The DSM-1 has a maximum playback frequency of 64 kHz; therefore, this limits the pitch up to which a sample may be transposed.
PCM	: Pulse Code Modulation. The means by which waveform data is stored in the DSM-1.	TRIGGER	: Use an audio signal to 'play' a selected note. When the signal, sent to the DSM-1 input, reaches a selected level, the note is played.
PERMANENT	: Indicates that a new parameter setting has been stored, erasing the existing parameter setting.	TRNS/NTRS	: Transpose/Non-transpose. Selects whether a sound will be affected by the pitch of the keys (TRNS) or will be playable at its original pitch only, regardless of the key pressed (NTRS).
PERFORMANCE DISK	: Disk into/from which the entire internal memory of the DSM-1 is transferred.	TRUNCATE	: Shorten a sample by setting its Start and End points. The unused data will still be present in the memory, unless the RECOVER MEMORY operation is executed.
PLAYBACK	: Use a footswitch to play a note at a selected pitch (as if it were functioning as a selected key on a keyboard).	VOICE ASSIGN	: Select how many voices of the 16 available may be played by each TIMBRE.
PROGRAM	: A set of data relating to parameters such as VCF, VCA, MULTISOUND Assign, etc. This data is used to modify a MULTISOUND.	VOICE COMBINE	: Enables voices to be "shared" by two or more TIMBRES.
PROTECT	: A function which prevents data stored on a disk from being altered or deleted. "Soft Protect" in which the FORMAT operation may still be executed, is done in the DSM-1's Disk Utility mode. "Hard Protect", in which the FORMAT operation may not be executed, is done by using the protect tab on the disk itself.		
P 01	: Display message indicating PROGRAM 01.		

VELOCITY	: The speed at which a key is played. Also known as Initial Touch. Volume, cutoff frequency, envelope length and auto-bend may be affected by velocity.
VELOCITY WINDOW	: Allows setting of the upper and lower VELOCITY limits between which a TIMBRE will sound.
VIEW AND EDIT	: Select, view (on the LCD) and edit data existing at each address.
WAVE MEMORY	: Internal memory used for storing sound source waveforms such as SOUNDS or MULTISOUNDS. The size of unused wave memory decides the available sampling time.
WORK DISK	Disk used only for the storage of "raw material" such as SOUNDS, MULTISOUNDS or HARMONICS DATA. This data may be used for the creation of TIMBRES and COMBINATIONS.
WORKING BANK	: BANK to be used for creation and editing of a SOUND or MULTISOUND. This BANK should first be cleared of all data.
WORD	: The basic single unit of sampled data. For example, at a SAMPLING FREQUENCY of 32 kHz, 32,000 words are recorded per second.
XFL	: Display message indicating Cross Fade Length (the length of crossfade at each end of a LOOP).
ZERO CROSS POINT	: The point at which the level of the waveform is zero; a waveform graph would show this as the point at which the waveform crosses the horizontal axis. This makes an ideal LOOP point, and may be selected automatically using AUTO ZERO CROSS SEARCH.

Function		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1 1-16	1 1-16	
Mode	Default Messages Altered	X XXXXXXXXXXXXXXXX	3 X	
Note Number	True voice	XXXXXXXXXXXXXXXX	0 - 127 0 - 127	(NOTE 1,2)
Velocity	Note ON Note OFF	X X	○ V = 1 - 127 X	
After Touch	Keys Channels	X X	X ○	(NOTE 1,2)
Pitch Bender		X	○ 0 - 12 semi	(NOTE 1)
Control Change	1 2 7 64 66	X X X X X	○ ○ ○ ○ ○	OSC Modulation VCF Modulation Volume Damper pedal switch Sostenuto pedal switch (NOTE 1,2)
Prog Change	: True #	X XXXXXXXXXXXXXXXX	○ 0 - 127 ○ 0 - 31	(NOTE 1,2)
System Exclusive		○	○	
System Common	: Song Pos : Song Sel : Tune	X X X	X X X	
System Real Time	: Clock : Commands	X X	X X	
Aux Messages	: Local ON/OFF : All Notes OFF : Active Sense : Reset	X X X X	X ○ 123 - 127 ○ X	(NOTE 1)
Notes	1. Channel Message is received through the MIDI channel specified for each timbre. Program change can also be received through System Common Channel, and functions as a Combination Change. 2. Receiving range of Note On/Off, On/Off of Channel Pressure, Modulation, Program Change can be specified for each Timbre in the Combination Mode.			

Mode 1 : OMNI ON, POLY
 Mode 3 : OMNI OFF, POLY

Mode 2 : OMNI ON, MONO
 Mode 4 : OMNI OFF, MONO

○ : YES
 X : NO

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N O T I C E

Korg products are manufactured under strict specifications and voltages required by each country. These products are warranted by the Korg distributor only in each country. Any Korg product not sold with a warranty card or carrying a serial number disqualifies the product sold from the manufacturer's/distributor's warranty and liability. This requirement is for your own protection and safety.

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