Oberheim Prommer

MIDI Sampler/
PROM programmer

USER'S GUIDE

Oberheim Prommer

User's Guide

By Paul J. White

Preliminary Edition, June 1986

CAUTION:
To prevent fire or shock hazard, do not expose this appliance to rain or moisture. Do not remove cover. No user servicable parts inside. Refer servicing to qualified service personnel.

WARNING:
This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

TABLE OF CONTENTS PAGE

1. Introduction 7

2. Getting started 9

3. Blocks 13
A. Select block
B. Block address
C. Block length
D. Protect

4. Sampling 17
A. Sample rate
B. Sample time display
C. Record trigger threshold
D. How to record a sound

5. Playback modes 21
A. Play mode
B. Loop points
C. Looping guidelines
D. Transpose
E. Fine tune
F. Filter frequency
G. External trigger
H. Retrigger delay
I. Emphasis
J. Idle bypass

6. EPROMs 25
A. Cautions
B. Select PROM type
C. PROM offset
D. Check erasure function
E. Erasing EPROMs
F. Compare data function
G. Program PROM function
H. In case of an error...
I. Program linear function
J. Program setup function
K. Load data function
L. Load linear function
M. Load setup function
N. Run program function
O. Example1: Programming EPROM with block of equal size
P. Example 2: Programming multiple EPROMs with one sound
Q. Example 3: Programming multiple sounds on one EPROM

7. Block functions 35
- A. Copy block function
- B. Swap block function
- C. Erase block function
- D. Erase all function
- E. Reverse block function
- F. Bit manipulation function
- G. Examine memory function

8. Sound modifications 39
- A. Envelope function
- B. Envelope decay time
- C. Envelope start point
- D. Mix block function
- E. Mix ratio
- F. Ring modulate function
- G. Stretch function
- H. Squash function

9. MIDI 43
- A. Channel select
- B. Keyboard pitch enable
- C. Echo
- D. Modes
- E. Zones
- F. Zone limits
- G. Pitch bend range
- H. Velocity
- I. Pressure
- J. Program change enable
- K. System exclusive - dump one block
- L. System exclusive - dump all blocks
- M. Universal sample dump
- N. Universal sample dump request
- O. Receive data
- P. Transmit data
- Q. Receive / Transmit example

10. Miscellaneous Information 51
- A. Software Version
- B. Battery backup system
- C. Test programs
- D. Bytes & Samples

11. Function Summary 55

Appendix 1. Application examples
A. EPROMs and Drum Machines 59
B. Using MIDI Zones 67

Appendix 2. PROM cross reference 71

Appendix 3. Prommer MIDI specification 77

Appendix 4. Warranty 85

Chapter 1 - INTRODUCTION

This guide is intended to describe the operation and general use of the Oberheim Prommer, a powerful and versatile tool for the modern musician. The first chapters will describe the basic operation of all functions and the appendices will provide information on some specific applications.

Although the Prommer was designed to be very versatile and easy to use, it is still a complex instrument and will require some learning on the user's part in order to use it properly. Please read this manual carefully and keep it with the Prommer for future reference.

WHAT DOES IT DO ?

SAMPLES SOUNDS

The Prommer is a digital audio sampling device, that will convert an audio signal into digital form and store the digitized signal in its memory. The Prommer will record at a rate of up to 32,000 samples per second and has a maximum memory capacity of 65,536 samples. This means that you can record a sound that is about two seconds long at the fastest sampling rate. Longer sounds may be sampled by using a slower sampling rate at a reduced audio bandwidth.

One primary application of the Prommer is sampling drum sounds and other percussive sound effects.

There is an input for line level signals (with switchable sensitivity of +4 dB or -10 dB), and a balanced input for a low impedance microphone. A peak reading LED meter allows monitoring the level of the input signal in order to set the correct recording level.

BURNS PROMS

The Prommer is also a PROM programmer. It can program ("burn") most popular types of EPROMS, PROMS and EEPROMS. This means that you can make your own custom sound chips to use in your Oberheim DMX or DX digital drum machine. The Prommer will also program chips for other brands of drum machines, that is any drum machine that uses individual sound chips with eight bit companded or linear data format.

PLAYS BACK SOUNDS

The Prommer can play back sounds in memory over a twelve octave pitch range when used with a MIDI controller, with control over transposition and fine tuning. Sounds may be looped to add sustain, with adjustable loop points. An external trigger may be used to play a sound, and a low pass filter at the output will track the playback rate or can be set to a selected frequency.

UNDERSTANDS MIDI

MIDI note-on commands can be used to play sounds at different pitches with velocity and pressure controlling loudness and/or filter frequency. MIDI pitch wheel information can also control pitch to allow 'bending' notes. The Prommer can transmit sound data over MIDI to another Prommer or to another machine that uses a proposed standard MIDI sample dump. The Prommer can also record received MIDI data directly into memory and retransmit it on command. This feature is useful for saving synthesizer patches, drum machine sequences, etc.

STORES MULTIPLE SOUNDS

The memory of the Prommer may be divided into 16 blocks. Each block may be defined to cover any portion of memory and may even overlap other blocks. All operations (Record, Play, Program PROM, etc.) take place only within the currently selected block. When you record a sound, for example, sound is recorded only into that part of memory defined by the current block. This means that you can have as many as 16 different sounds in memory at one time.

Non-volatile (battery powered) memory is used so all your sounds will be retained in memory even with the power off.

MANIPULATES SOUND DATA

Sounds may be modified in several ways including reversing, mixing, stretching, squashing, and enveloping. These Sound Mod functions don't take place in real time but actually change the data in memory so that the change is permanent and the modified sound can be burned onto a PROM. Data in memory may also be examined and modified numerically one byte at a time.

AND MORE !

The Prommer has an almost endless variety of possible applications including (but not limited to) - sampling sounds for drum machines, copying EPROMs, transferring multiple EPROM sounds to a single EPROM, drum machine sound editing, transferring sounds from linear format drum machines to companded format machines and vice-versa, playing sounds with a keyboard, and MIDI data storage.

Chapter 2 - GETTING STARTED

This chapter is designed to be a step by step tutorial look at the Prommer for the new user. It is not intended to cover all the features of the Prommer, but rather to familiarize the user with the basic controls and the process of recording and playing back a sound.

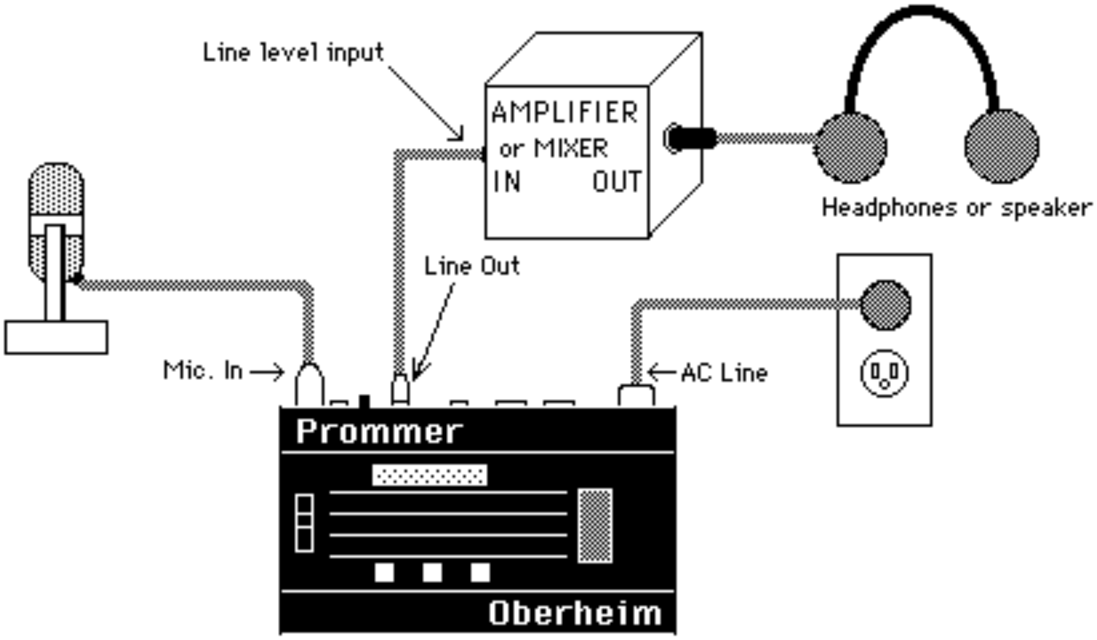


Figure 1 - Basic setup

ABOUT THE SWITCHES

The switches that control the Prommer are arranged in three main groups; the function switches which are arranged in a rectangular pattern in the center of the front panel, the number pad and data entry switches on the right side of the panel, and the three raised pushbuttons on the lower part of the front panel - PLAY, RECORD and EXECUTE.

Most of the function buttons have more than one function and in this manual these switches will be referred to mainly by their topmost label. Function switches are grouped by function type into horizontal rows. The top row of buttons deal with MIDI control of the Prommer. The next row contains EPROM functions, the row beneath that has Sound Modification functions, and the bottom row contains sampling, playback and other miscellaneous controls.

Please notice the button just beneath the right side of the function buttons. This is the PARAMETERS button and is also marked with a plus sign "+". Also notice that some of the function buttons have labels preceded by a plus sign. This indicates that this is a Parameter of the Function listed above it and to access the Parameter, you must first press the desired function button, and then press the PARAMETERS button.

MAKING YOUR OWN SOUNDS

The following is a step by step explanation of how to get the Prommer to record and play back a sound and some exercises in using some of the simple functions.

CONNECTING THE PROMMER (See figure 1).

a) Connect the AC cable and plug it in to a suitable source of power. Turn the Prommer power switch ON and set the input level control all the way down.

b) Connect an amplifier to the Prommer's line output. If you will be using a microphone, the amplifier output should go to headphones or speakers physically distant from the microphone in order to reduce the possibility of audio feedback.

c) Connect a low impedance microphone to the MIC. INPUT of the Prommer using a standard microphone cable and set the input level switch on the back panel to +4.

RECORDING A SOUND

1. Set the record level.

Speak into the microphone and say "Hello" a few times. Watch the LED meter on the Prommer and raise the INPUT LEVEL control until the yellow LED lights while you speak.

2. Get ready to record.

a) Press the "SELECT BLOCK" button.

b) Press "1" to select block number 1.

c) Press the "PARAMETERS" button to see the address of block 1.

d) Press "0" to set the address of block 1 to zero.

e) Press the PARAMETERS button again to see the length of block 1.

f) Press "3" and then press "2" to set the length of block 1 to 32k.

g) Press the "SAMPLE RATE" button.

h) Press "CLEAR" to set the sample rate to 32kHz.

i) Press the "SAMPLE RATE" button again to set the record threshold.

j) Press "CLEAR" to set the threshold to -18db.

3. Record a sound.

a) Be quiet.

b) Press and HOLD the "RECORD" button. Display will read
"PRESS PLAY. . .".

c) Press the "PLAY" button and then release both buttons. The display should read: "RECORDING. . ."

d) Speak into the microphone - "Hello". The display will read
"RECORDING. . .NOW" for about one second.

PLAYING BACK A SOUND

1. Play the sound normally.

a) Press the "PLAY" button and listen through the headphones. You should be able to hear the sound you just recorded.

2. Try changing some playback parameters.

a) Press the "SAMPLE RATE" button until the sample rate is displayed. Press the "<" button and see that the rate changes to 24kHz.

b) Press "PLAY" and hear how the sound has changed. Press the "<" button again to change the sample rate to 16khz and 12kHz. Press "PLAY" at each sample rate and listen to how the pitch changes.

c) Set the sample rate back to 32kHz.

d) Press the "TRANSPOSE" button. The display should read
"1 TRANSPOSE= +0".

e) Use the number pad to enter a number between 1 and 48. Press "PLAY". Use the "+/-" button to change the sign of the transpose value displayed. Press "PLAY" again. Try entering different values and listening to how the sound changes each time.

f) Set the transpose back to zero.

MODIFY THE SOUND

a) Press the "REVERSE" button. The display will read "1 REVERSE *".

b) Press the "EXECUTE" button. The display will read "BUSY. . ." for a moment.

c) Press "PLAY". Hear how the sound plays backwards. Press "EXECUTE" again. Press "PLAY" and notice that the sound has returned to normal.

PLAYING SOUNDS FROM THE OBERHEIM STOCK EPROM

An EPROM containing some sample sounds and a demonstration program comes packaged with the Prommer. Before handling the EPROM, please skip ahead and read the warnings at the beginning of Chapter 6 (EPROMs).

a) Insert the Oberheim EPROM in the socket on the front panel. Be sure to raise the lever first, orient the EPROM with its notch toward the rear of the Prommer, align all the pins correctly and press the lever down to secure it.

b) Select the correct EPROM type.
Press the button labelled PROM SELECT and use the right arrow button (>) to step through the choices of EPROMs until the display reads:
PROM = 27256, 32K

c) Load setup parameters from the EPROM.
Press the LOAD DATA button (three times) until the display reads:
LOAD SETUP *

d) Press EXECUTE to load a new set of block parameters from the chip.

e) Press the LOAD button again until the display reads:
x LOAD DATA * (where x is any number)

f) Use the number pad to enter the number sixteen (Press [1] and then press [6]). This selects block number sixteen.

g) Press EXECUTE. The EPROM data will be loaded into memory.

h) Play some sounds. Select blocks 1, 2, 3, or 4 and play the sounds. These sounds are included to demonstrated some of the possible uses of the Prommer.

i) Run the demo program. Select block 10. Press the button labelled "RUN PROGRAM". Now, press and hold the PARAMETERS button and then press the EXECUTE button. The program loaded from the Oberheim demonstration EPROM which is now residing in block 10 is now running. You should see a message scrolling across the display. Be sure you use the RUN PROGRAM function ONLY when a block containing a valid PROGRAM is selected.

THIS IS JUST A SAMPLE

There are lots of other things you can do with the Prommer. Feel free to experiment - and have fun! Read the rest of this guide for complete details on how all the functions work and please read the warnings at the beginning of the section on EPROMs before handling any EPROMs.

Chapter 3 - BLOCKS

A block is a continuous section of memory which may be located in any part of the Prommer's available memory. There are sixteen blocks, each of which is user definable. The currently selected block is the section of memory used for recording, playback, and all other Prommer functions.

SELECTING A BLOCK

The SELECT BLOCK function is used to select the current block. The sixteen blocks are numbered 1 through 16. Press the SELECT BLOCK button and the display will show the current block like this:

1--SELECT BLOCK

You may use the number pad or the arrows to change the current block number at this time.

DEFINING A BLOCK

To define a block you must specify it's address and length.

The Prommer contains 65,536 bytes of sound storage memory numbered 0 through 65535. For convenience, we usually describe addresses and length in 1K units (one K is equal to 1024), so we say the Prommer has a maximum memory capacity of 64K (64 x 1024 = 65536). The reason for using a strange number like 1024 is that the capacities of computer memory chips (like EPROMs) are multiples of 1024, a result of the binary numbering system used by most computers. So, to make a sound fit exactly on an EPROM, its block length needs to be an exact multiple of 1024 and 2, 4, 8, etc.

BLOCK ADDRESS

The address of a block is a number describing where the block starts in memory. To define the address of a block, press the PARAMETERS button (from the SELECT BLOCK display). The display should now show something like :

1 ADDRESS = 16K

The number on the left of the display is the current block number and the number on the right is the currently selected starting address for the block shown in multiples of 1024 (indicated by the letter "K"). The range of addresses is from 0 to 63k or 0 to 65535.
By using the number pad or the arrows, you can change the block address.

Note that the address changes in increments of 1k. If you want to define the address with high resolution, press the [#] button:

1 ADDRESS = 16384

The display will now show the address in whole number form and you can use the number pad or arrows to change it. Press the [#] button again and you will go back to viewing the address in 1k form. Notice that if you have entered an address that is not an exact multiple of 1024, a dot will show on the display between the number and the "K" symbol to remind you.

BLOCK LENGTH

The <u>length</u> of a block is the number of bytes (samples) in that block. To define the length of the current block, press the PARAMETERS button again and the display will show you the length.

1 LENGTH = 8K

You can change the block length by using the number pad or the arrows. As with the block address, you can also define the length in high resolution mode, by pressing the [#] button:

1 LENGTH = 8192

Pressing the [#] button again will take you back to the 1k increment length display.

Block lengths are limited by the end of the Prommer's memory. For example, a block at address 62k would have a maximum length of 2k. There is also a minimum block length of 16 bytes for recording and playing back sounds. For any other purpose, the minimum block length is 1.

If you wish to have two blocks be consecutive in memory, just add the length of the first block to its address to get the address of the second block. Example: to have two consecutive 8k blocks, where block #1 starts at address 16k, block #2 should start at address 24k.

See figure 2 on the next page for more information about blocks.

BLOCK PROTECT

Press the PARAMETERS button one more time (from the Block Length display) and the display will show the <u>protect</u> status of the current block:

1 UNPROTECTED

By pressing the +/- button, you can toggle the protect status between PROTECTED and UNPROTECTED.

(The number pad and arrows can be used at this point to change the current block number, which is displayed at the left. This enables you to quickly check the status of all blocks.)

When a block is protected, the data in it normally cannot be changed or recorded over. <u>However</u>, if one block overlaps another, changing the data in one will overwrite the data in the other whether it is protected or not. For this reason it is important to understand the concept and be aware of all overlapping blocks.

figure 2 - PICTURE: Block examples goes here. . .

Chapter 4 - SAMPLING

SAMPLE RATE

The SAMPLE RATE function sets the basic sampling rate for recording and playing a sound. Ther Prommer has four possible recording sample rates - 32kHz, 24kHz, 16kHz, and 12kHz. Each block is assigned its own sample rate. To set the sample rate for the current block, press the SAMPLE RATE button:

1 RATE = 32KHZ

The number on the left is the current block and the sample rate is shown on the right. The sample rate may now be changed by using the arrow buttons.

The sample rate determines two things about a sample - the audio bandwidth and the speed at which memory is filled during recording. A high sample rate will give you a higher quality recording than a low sample rate, but it will also use up memory faster. For example, you can record about five and a half seconds in 64k of memory at the lowest sample rate of 12kHz, but increasing the sample rate to 32kHz gives you only about two seconds of record time for the same amount of memory.

Sample rate/		Block length			
bandwidth	4k	8k	16k	32k	64k
12kHz / 4.8kHz	0.34	0.68	1.36	2.73	5.46
16kHz / 6.4kHz	0.25	0.51	1.02	2.04	4.09
24kHz / 9.6kHz	0.17	0.34	0.68	1.36	2.73
32kHz / 12.8kHz	0.13	0.25	0.51	1.02	2.04

Table 1 - Recording time (in seconds)

The sample rate may be important when you record sounds for drum chips - when choosing a sample rate, consider the fact that most Oberheim DMX and DX drum voices are designed for sounds originally sampled at 20kHz to 40kHz. For example, a sound recorded at 12kHz will not play back on a DMX Snare drum voice at the proper rate (due to limited tuning range). Refer to appendix 1 for approximate sample rates for various Oberheim drum voices.

RECORDING TIME DISPLAY

If you want to see just how much time is available for recording at the current block size and selected sample rate, press the PARAMETERS button (from the Sample Rate display):

16 TIME = 2047 MS

This is the recording time displayed in milliseconds. A millisecond is one thousandth of a second (2047 milliseconds = 2.047 seconds). To return to the Sample Rate display, press PARAMETERS again.

RECORD TRIGGER THRESHOLD

The record trigger threshold is the input amplitude level that is required to start the process of recording a sound. To set the record trigger threshold level, press the SAMPLE RATE button again.
The display will show:

RECORD AT -18 DB

Use the number pad or the arrows to set the threshold level to any value between 0 and -45db. The number displayed corresponds approximately with the level you see on the LED meter.

When the Prommer is in a "ready to record" condition, the recording will start when the input signal level exceeds the record trigger threshold. The Prommer uses a pre-record buffer so that the leading edge of the audio cycle that triggers it will not be lost. This allows recording data starting with the first zero level crossing before the trigger point to eliminate any clicks or thumps that may be caused by starting a sound at the wrong phase of a cycle.

If you want to be able to record immediately without waiting for the input signal to trigger, just set the threshold level to its minimum value of -45. Recording will then start as soon as record mode is entered (see below).

Pressing the SAMPLE RATE button again will take you back to the SAMPLE RATE display.

RECORDING A SOUND

To record a sound, press and hold the RECORD button. If the current block length is greater than 15 bytes and the block is not protected, the display will read:

PRESS PLAY. . .

Still holding the RECORD button, now press the PLAY button. The display will now read:

RECORDING. . .

Now the Prommer will wait for the input signal to reach the record trigger threshold. (You may now release both buttons.)

When the input signal becomes loud enough to cross the threshold, the Prommer will start recording into the current block and the display will read:

RECORDING. . . NOW

Recording will continue until the current block is full.

After you record a sound you can play it back by pressing PLAY. You can re-record a sound if you want to - just press RECORD and PLAY again.

Note: Once the Prommer is in record-ready mode (when the display reads - "RECORDING. . .") there is no way to leave this mode without recording a sound unless you turn the power off and then on again. For example, if you forget to plug in a microphone and you press RECORD and PLAY, the Prommer will ignore all buttons on the front panel including STOP until a sound has been recorded. Also, if you accidentally start to record over an unprotected block you wanted to save, the first part of the block may be erased, even if you do turn the power off before recording starts. This is because the current block is used as a pre-record buffer and the first part of it will contain new samples even though the input signal was less than the record threshold (possibly only a few bytes may be lost).

SETTING THE RECORD LEVEL TO MINIMIZE DISTORTION

Due to the nature of digital recording, you will get the best signal to noise ratio at the highest recording level possible but when the level is increased beyond a certain point, the signal will be clipped (distorted) suddenly. This is different from recording on magnetic audio tape where you have a certain amount of "headroom" and overload distortion happens gradually. For this reason, it is important to monitor the record level carefully before and during the recording process.

A good recording level should be around 0db on the LED peak meter. Anything higher than about +3db will begin to overload the analog-to-digital converter and the signal will distort. Sometimes this distortion may be just the thing to give a drum sound some extra "punch", but usually it is undesirable.

Before recording, check the level by producing the sound you are going to record a few times and watching the meter. Adjust the input level control until the meter reads about 0db or +3db at the loudest point. If the level is too high, the sound will be distorted by clipping, and if too low, the background noise may become more noticeable.

Although setting the record level with the meter is a good starting point, the most reliable way to detect overload distortion is by listening to the output of the Prommer with Idle Bypass mode OFF. The sound you will then hear is the same as that which will be recorded, that is, the signal that has been converted from analog to digital and then back to analog again.

If the sound coming out of the Prommer is distorted even at low levels, the problem may be that the output level of the Prommer is too high for your amplifier. Be sure that the Prommer is connected to a Line Level input (+4 dBm).
Another possible cause of distortion is in the input section. If the level of the device connected to the input of the Prommer is too high, the input amplifiers may be overloaded. Also, be sure the input sensitivity switch on the rear panel is set for the proper range of input levels (+4 or -10) and if necessary, reduce the level of the input device.

Chapter 5 - PLAYBACK MODES

The Prommer is able to play back sounds that have been recorded into it monophonically (one block at a time). The audio output should be connected to an amplifier with a volume control or to a line level input of an audio mixing board.

You can play back sounds in three different ways; with the PLAY button on the front panel, with an external trigger or with a MIDI keyboard or other MIDI controller.

There are four basic modes for playing back sounds - normal, gated, loop, and gated / loop. The play mode may be set differently for each individual block. To show the play mode for the current block, press the PLAY MODE button:

1 MODE = NORMAL

You can use the arrows to select the mode now. The number on the left of the display is the current block.

NORMAL MODE

In normal mode, when you trigger a sound, the current block will play through to its end unless it is retriggered, or the STOP button is pressed.

GATED MODE

In gated mode, the sound will only play as long as the PLAY button or MIDI key is depressed. Releasing the key will stop the playback immediately.

LOOP MODE

Loop mode will play a sound repeatedly after it is triggered and will only stop when the STOP button or another key is pressed.

GATED / LOOP MODE

Gated / loop mode is similar to loop mode except that the looping happens only as long as the PLAY button or MIDI key is depressed. When the key is released, the loop will finish playing, and then the remaining part of the sound will play.

LOOP POINTS

You may set the loop points for a block so that looping occurs only in a selected section of the sound.

The section that will repeat is defined by the loop start point and the loop end point. To access the loop start point, press PARAMETERS (from the Playback Mode display):

1 LOOP ST.= 0

The CLEAR button will set the loop start point to the start of the block.

Press the PARAMETERS button again to set the loop end point:

1 LP. END = 8191

The CLEAR button will set the loop end point to the end of the current block. As always, the number on the left of the display is the current block. You can use the number pad to change the start and end points, or you may use the arrows.

Loop points are specified as an offset from the beginning of the current block. So, no matter where the current block is located in memory, a loop start point of zero always indicates the beginning of the sound.

AUTOMATIC ZERO-CROSSING DETECTION

You may notice that when you use the arrows to change loop points, the numbers will move in apparently random size steps. What happens is that the data in memory is scanned until the loop address reaches the next audio zero crossing, that is the point where the audio signal in memory changes from positive to negative or from negative to positive. This is done to make it easier to set smooth sounding loop points.

Note: If the current block is empty, and there are no zero crossings, when you use the arrows the loop point will jump to the maximum or the minimum address offset for the block.

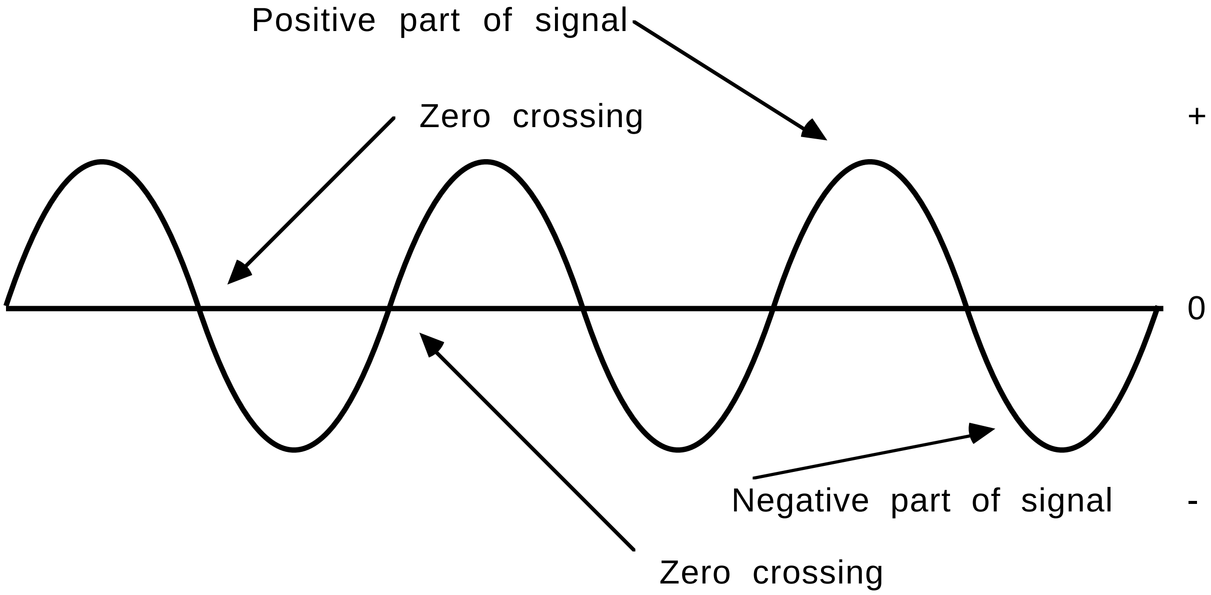


Figure 3 - Zero Crossings

GUIDELINES FOR SETTING LOOP POINTS

It will probably take some practice and patience (and a good sample) in order to get a good sounding loop. With some sounds it is just not possible to find any good loop points. For example, a sound that continually increases or decreases in pitch or volume will not loop smoothly. As the playback switches from the end point of the loop back to the beginning you will hear a sudden change in the pitch or loudness. However, a sound with even a small amount of sustained timbre can be looped successfully if you find the right location for the loop points.

If you want a sound that will stop quickly after releasing the PLAY button, set both the loop start and end points near the end of the block. If you want a sound to have a long release, set the loop points near the beginning or middle of the block.

Setting the loop points is usually just a matter of trial and error. Use the number pad to set the loop points to approximately where you want them, and then use the arrows to move each loop point to its nearest zero crossing. Now listen to the sound and alternately try changing the loop start point and then the loop end point until the loop sounds OK. Notice that if you move a loop point one step (zero crossing) at a time, every other step will make a bad sounding loop. This is because at these points, the phase of the signal changes abruptly when the sound loops back.

PLAYBACK TRANSPOSITION

The apparent pitch of sounds may be changed by transposing the sample rate for playback. Press the TRANSPOSE button to view the current transpose value:

1 TRANSPOSE = + 0

Use the number pad or the arrows to set the transpose amount for the current block in musical semitones. (Example: +12 = transpose up one octave, -5 = transpose down five semitones, etc.). The transposition is based on the currently selected sample rate, so playing a sound at a sample rate of 32kHz, transposed down by -12 will give the same result as playing the sound at a sample rate of 16kHz with zero transposition.

The range of transposition from the front panel is plus or minus 48, which is a range of eight octaves. There is more range available if you use a MIDI controller to play the sound. MIDI note number 60 (Middle C) corresponds to the normal playback rate for the current block including the set transposition. Higher or lower MIDI notes will play the sound at a chromatically higher or lower pitch respectively.

Note: The Prommer can't actually play data at sample rates faster than 32kHz but appears to do so by sampling at a lower rate and playing only every other byte of the sound (or every fourth byte or eighth byte, etc.). This may cause an unusual change in the timbre of some sounds - especially sounds with large amounts of high frequency (such as cymbals).

FINE TUNING PLAYBACK

You can also make fine tuning adjustments in the playback of a sound. Press the TRANSPOSE button again:

FINE TUNE = +0

There is a fine tune value associated with each block, but the current block number is not shown in the Fine Tune display. The range of fine tune values is from -127 to +127. This range covers approximately two semitones, so a fine tune value of +127 is equivalent to one semitone of up-transposition. Use the number pad or the arrows to set the fine tune.

OUTPUT FILTER CONTROL

____________________The Prommer has a voltage controlled low pass filter in its playback output stage, and the frequency of the filter normally tracks the playback rate to reduce sampling noise, but for special effects, you can set the filter frequency to a fixed point.

Press the TRANSPOSE button again:

1 FILTER = TRACK

By using the arrows or the number pad, you can enter a value between 1 and 255 for the filter frequency for the current block, with 255 being "wide open" and 1 being the lowest filter cutoff frequency. These numbers are not calibrated to the actual cutoff frequency and should just be used for reference.

1 FILTER = 123

You can set the filter back to tracking mode by entering a value of zero or by pressing the CLEAR button. The filter is also controllable by MIDI pressure and/or velocity. MIDI control will override the filter setting shown here. See the section about MIDI for more information.

EXTERNAL TRIGGERING

As mentioned earlier, the playback of sounds may be triggered with an external trigger through the quarter-inch phone jack on the back panel. This trigger may be a logic signal such as the "click" output of a drum machine, a high level percussive audio signal, a drum pad output, or a momentary footswitch. To enable the external trigger, press the EXT. TRIGGER button:

EXT. TRIGGER OFF

Use the +/- button or the arrows to enable the trigger. Use the CLEAR button to disable the trigger. The trigger polarity may be set to positive or negative (**ON+** or **ON-**). If an audio trigger is used you will probably need to set the retrigger delay. Press the PARAMETERS button now:

RETRIG. DLY.= 0

Use the number pad or arrows to set the retrigger delay. The arrows will increment or decrement the delay value by 128. The retrigger delay is the number of bytes that will play after a sound is triggered before a new external trigger will be recognized. For example, at a playback rate of 32kHz, a retrigger delay of 3200 will correspond to an actual delay of 1/10 second. If a very percussive audio signal or a click is used for the trigger, the delay may be set fairly short and you can retrigger a sound quickly. If a more complex waveform is used, its level may have to be decreased or a longer delay set to avoid multiple false triggers.
Note: The external trigger will not work in GATED playback mode.

PRE-EMPHASIS / DE-EMPHASIS

Each block may be recorded with or without EMPHASIS. This is an equalization circuit in the Prommer that boosts midrange and high frequencies during recording (pre-emphasis), and cuts midrange and high frequencies upon playback (de-emphasis) Press the EXT. TRIGGER button again to see the EMPHASIS display:

1 EMPHASIS OFF

You can toggle the emphasis mode with the +/- button. Emphasis ON acts as a sort of noise reduction when used on both input and output. When recording sounds for drum machines, remember that a sound recorded with pre-emphasis will not neccessarily sound natural on a drum voice without de-emphasis, but you can add brightness to a sound by recording it with emphasis ON and playing it back with emphasis OFF.

IDLE BYPASS MODE

There is a function called IDLE BYPASS which bypasses the analog-to-digital converter circuitry in the Prommer whenever a sound is not being played or recorded. This will eliminate the sampling noise you will normally hear when monitoring the input with no signal coming in. If you are recording sounds, you should set the idle bypass mode OFF. This will enable you to hear any clipping distortion as it happens and make the neccessary adjustments in the input level. To turn the IDLE BYPASS on or off, press the EXT.TRIGGER button one more time:

IDLE BYPASS OFF

Use the +/- button or the arrows to toggle the idle bypass mode.

Chapter 6 - EPROMs

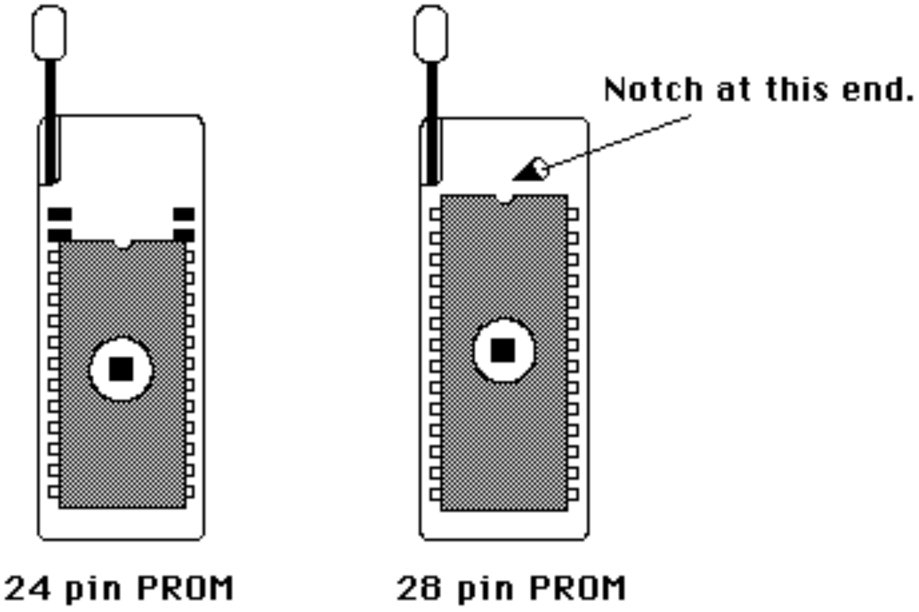
The Prommer is able to program or "burn" several different types of PROMs (Programmable Read Only Memories), EPROMs (Eraseable PROMs) and EEPROMs (Electrically Eraseable PROMs). See appendix 2 for a full listing of compatible types.
An EPROM is an integrated circuit chip that can be used for permanent or semi-permanent data storage. The terms PROM and EPROM will be used interchangeably throughout this manual - the only difference between them are the part numbers and the fact that PROMs cannot be erased, while EPROMs may be erased by exposure to ultraviolet light and then re-programmed. EEPROMs are a special type of PROM that can be re-programmed without having to be erased.

You can use EPROMs to permanently store the sounds you have sampled with the Prommer. Once you have a sound on an EPROM it may be reloaded into the Prommer at any time or used in a drum machine such as the Oberheim DMX.

All EPROM functions operate only on the currently selected block of memory.

All EPROM operations require a chip installed in the socket on the front panel according to the diagram in Figure 4 - to install an EPROM, first lift the socket handle, insert the EPROM (make sure all the pins are straight) and then push the handle down to secure it. Notice that 24 pin EPROMs must be placed only in the lower holes of the socket.

Note: DO NOT remove or insert an EPROM while any EPROM operation is in progress!



24 pin PROM

28 pin PROM

Figure 4 - PROM Orientation

CAUTIONS !

1. EPROMs are very sensitive to damage and you should always use great care and caution in handling them. A major cause of permanent EPROM failure is static electricity damage. You should always keep your EPROMs in static protective foam or tubes when they are not in use. Do not touch an EPROM after walking across a carpet on a dry day without grounding yourself first to dissipate any electrical charge.

2. Try not to bend the leads on an EPROM as they are delicate and will break easily.

3. EPROMs must always be oriented properly in their sockets with the notch in the end facing the correct way.

VERY IMPORTANT NOTE !

Each type of EPROM requires a different programming algorithm and some types use different pins for different functions. The Prommer must be configured differently for each type so you must always specify what type of EPROM you are using.

SELECTING THE EPROM TYPE

To specify an EPROM, press the PROM SELECT button and the display will show the currently selected PROM type:

PROM= 2764, 8K

Use the arrows to select the type you will be using.

The display example shown here indicates the part number of the EPROM (2764) and the size of the EPROM in bytes (8K). The EPROM size is not printed on the EPROM itself - it is just shown here for reference in comparing block sizes to EPROM sizes.

Please read the part number of your EPROM carefully and be aware that there may be differences even in similar part numbers - for example, a 2732 is not the same as a 2732A and a Toshiba TMM27256D is not the same as an Intel 27256. Permanent damage may occur if you try to program an EPROM when the wrong type is selected.

Some EPROM part numbers are followed by a dash and a number (Example: MBM2764-30). The number following the dash (30) indicates the access time of the EPROM and can be ignored for most drum machine type applications. Note that some chips may also be marked with a date code such as 8523 - indicating that the chip was manufactured in 1985 during the 23rd week of the year. Don't let this confuse you. The actual part number is usually fairly obvious.

EPROM ADDRESS OFFSET

Normal program and read operations start at the first address location of the EPROM and count upward, but you can set a PROM offset address if, for example, you want to program only the second half of an EPROM. While the display is showing the PROM type, press the PARAMETERS button to display the PROM offset:

PROM OFFSET= 4K

Use the number pad or the arrows to set the offset in 1k increments. Be sure to reset the offset to zero for normal operation. Note: the PROM offset is always reset to zero when the AC power is turned off.

BLANK EPROM VERIFICATION

You can test an EPROM to verify the fact that is blank. Press the CHECK ERASURE button:

CHECK ERASURE *

This function will test the EPROM in the socket on the front panel to see if all bits are equal to 1 (ready to be programmed). Press the EXECUTE button to check erasure. If the EPROM is blank, the display will read **OK** after a moment. If the EPROM is not blank, the display will show the address of the first non-blank location:

ERROR AT 1009

ERASING EPROMS

EPROMs may be erased by exposing them to a source of ultraviolet light. If you use EPROMs with your Prommer, you will most likely need an EPROM eraser. Most EPROMs can be erased with 5 to 30 minutes of exposure in an EPROM eraser. Be sure to follow the manufacturer's instructions when using an eraser and DO NOT expose your eyes to ultraviolet light.

It is also possible to erase an EPROM by exposing it to sunlight, since the sun produces ultraviolet light. It may be necessary to leave an EPROM out in the sun for a day or more, depending on the weather, to completely erase it.

Remember to put an opaque label over the window of any EPROM that you plan to save to avoid accidental erasure.

WHAT IS BLANK ?

As far as digital audio is concerned, a blank EPROM is not the same as a silent one. When a PROM or EPROM is new or erased, each byte of memory is set to all ones (11111111). If you were to play a blank EPROM in a drum machine you would hear a loud thump. If for some reason, you want to program a part of an EPROM with a section of silence, you should program that part with zeros, -- don't just leave it blank.

COMPARING EPROMS WITH MEMORY

Data on an EPROM may be compared with the data in the current block. Press the CHECK ERASURE button again:

1 COMPARE DATA *

Press EXECUTE to compare. If the data in the current block doesn't match the data in the EPROM exactly, an error message will be displayed.

PROGRAMMING EPROMS

To program an EPROM, press the PROGRAM PROM button and the display will read:

1 PROGRAM PROM *

The number at the left shows the current block number which is the block that will be programmed onto the EPROM when you press EXECUTE. The current block may be changed at this point by using the number pad or the arrows.

After having selected the correct EPROM type, and the correct block, be sure that your EPROM is secured correctly in the socket on the front panel and then press the EXECUTE button.

The EPROM is checked for erasure at this time and if it is blank, programming will begin and the display will read:

PROGRAMMING. 31

The number in the display is a count-down number provided to indicate the time remaining before the programming process is complete. The number will start at different values depending on what size EPROM you are using.

To avoid accidental destruction of data on a previously programmed EPROM, if the EPROM is <u>not</u> blank at the time programming starts, the display will read:

ARE YOU SURE. . .

If you wish to continue, press EXECUTE a second time. If not, press the STOP button to cancel the program command.

After all the data has been programmed, it will be verified one more time, and if all the data has been programmed correctly, the display will read **OK.**

You can press the STOP button at any time to interrupt the programming process, but if you want to restart, you must do so from the beginning.

BLOCK / EPROM LIMITS

If the current block is not equal in size to the EPROM being used, the programming process will stop as soon as either one reaches its limit. For example - if you program a 4k block onto an 8k EPROM, the programming process will stop after the first 4k bytes have been programmed, leaving the second half of the EPROM blank or unchanged. Or if you program a 16k block onto an 8k EPROM, only the first half of the block will be programmed.

IN CASE OF A PROGRAMMING ERROR . . .

If an error occurs during the programming process, an error message will show on the display. You should double check the EPROM type that is selected against the part number printed on the EPROM. If the EPROM type is correct, you can try programming the EPROM a second time, in case the error was transient. If the error happens again, as a last resort, try erasing the EPROM and program it again.

Assuming there is no problem when programming other EPROMs of the same type, if the error still happens, the EPROM is defective and should be discarded. If the same error happens when using other EPROMs, the Prommer may have a hardware problem. If you suspect a hardware problem, contact your nearest Oberheim Authorized Service Center and do not attempt to program any more EPROMs.

If you have a problem re-programming an EEPROM (Electrically Eraseable PROM), you may need to erase it before re-programming. To erase an EEPROM, first select an unused block of memory the same size as the EEPROM (8k for a 9864 or 2864). Then, using the Prommer's bit function, set up the following pattern: 11111111. Press EXECUTE and all the data in the block will be set to ones (the same as an erased EPROM). Now, use the PROGRAM PROM function to program the EEPROM with this new block. If the programming operation is successful, the chip should now be blank. Now, try programming the desired block onto the EEPROM.

LABEL YOUR EPROMS!

To avoid almost certain confusion, you should always put a label on an EPROM immediately after it has been programmed and give it a descriptive name such as "SNARE 31", "STANDUP BASS MID. C", etc. If the sound on the EPROM is used in the Prommer with looping or emphasis it would be good to write that data on the label also. If there is not room to write all the necessary information on the label, you might consider keeping a logbook of all your EPROMs and keep track of them by name or by an index number and write all the information in the book.

COMPANDED DATA VS. LINEAR DATA

Sounds are recorded and played in the Prommer in a digital format called eight-bit companded. Oberheim and many other drum machines also use this format. The other eight bit format used in the industry is known as linear. Linear format is the simplest and most inexpensive to use but has a lower dynamic range than companded. Companded format is better suited for reproducing audio signals. The Prommer has the ability to convert data from one format to the other.

PROGRAMMING LINEAR EPROMS

If you want to program an EPROM for use in a linear drum machine, you can use the program linear function. Press the PROGRAM PROM button again and you will see the display:

1 PROG. LINEAR *

This function works the same as PROGRAM PROM except that just before programming each byte, the data is converted from companded to linear format. The data in the Prommer's memory is not changed by the process, only the data on the EPROM is converted.

Note: If you use the COMPARE DATA function on a chip that has been programmed as linear, the data will not compare correctly, since the data on the chip was converted to linear but the data in memory is still companded. However, immediately after programming, the data is automatically compared in the proper format, so you can be assured that if the display reads OK after linear programming, the chip has actually been programmed correctly.

SAVING A PROMMER SETUP

If you have spent some time setting your Prommer to play several different sounds from a keyboard with blocks assigned to different zones, and various transposes for each block, for example, you may want to save these set-up parameters for later use. You can do this by using the Program Setup Data function. Press the PROGRAM PROM button again:

PROGRAM SETUP *

If you press EXECUTE now, all block and global parameters currently set in the Prommer will be programmed onto the EPROM in the socket.

The Program Parameters function does <u>not</u> check erasure before programming, so use it with care.

All parameters are saved including block addresses and lengths, loop points, MIDI zone limits, MIDI channel, and all other mode and status information. A special code is saved at the beginning of the data to identify it as Prommer Setup Data. All the data fits in less than 1k bytes, so you can save several Prommer set-ups on one EPROM by using the PROM offset function. You can save up to eight sets of parameters in an 8k EPROM or 32 sets in a 32k EPROM.

You may also save setup and sound data on one chip; for example, you can program the Prommer setup data onto a 27256 EPROM at a zero PROM offset, and then program a 31K block containing one or more sounds onto the same EPROM by setting the PROM offset to 1k. (This is how the Oberheim Prommer Factory Stock sound chip was made.)

LOADING DATA FROM EPROMS

Data that is already on an EPROM may be loaded into the current block. Press the LOAD DATA button again to get the display:

1 LOAD DATA *

You can change the current block number (displayed at the left) with the number pad or the arrows at this point. When you press EXECUTE, the data in the EPROM in the socket will be copied into the current block (if the block is not protected). If the block size is smaller than the EPROM, only the first part of the EPROM data will be loaded. If the block size is larger than the EPROM, the EPROM data will be loaded into the beginning of the block leaving the remaining portion undisturbed.

LOADING LINEAR EPROMS

You can also load linear format data from EPROMs into the Prommer. Press the LOAD DATA button again:

1 LOAD LINEAR *

This is the same as the load data function except that the data is converted from linear format to companded before storing it in the current block.

LOADING SETUP DATA FROM EPROMS

To retrieve set-up parameters from an EPROM that were saved using the Program Setup function, press the LOAD DATA button again:

LOAD SETUP *

When you press EXECUTE, if the data on the EPROM in the socket has the correct identification code at its beginning, the parameters will be loaded into memory. Note that this function doesn't affect the sound data at all, just the settings such as block addresses, zone limits, etc.

FOR SERIOUS PROGRAMMERS ONLY

An advanced feature of the Prommer is the ability to load a program written in 6809 machine language into memory and run it. For more information please refer to the Prommer Service Manual. When you press the RUN PROGRAM button the run program display will appear:

1 RUN PROGRAM*

If you have loaded a valid 6809 program into the current block, you can start execution of the program from the first address of the current block, by pressing and holding the PARAMETERS button and then pressing EXECUTE. If the data in the current block is not specifically a 6809 program DO NOT TRY TO RUN IT ! Unpredictable results will occur including possible loss of data in memory and probable "lock-up" of the machine.

INTERNAL EXPANSION EPROM

There is additional memory space available inside the Prommer for possible future program enhancements. If your Prommer was shipped from the factory with an EPROM installed in this socket, you can access the programs it contains by pressing the RUN PROGRAM button and then pressing EXECUTE. If no EPROM is installed here, pressing EXECUTE will have no effect.

EXAMPLES - Programming EPROMs with Blocks of different sizes

A reminder about block and EPROM sizes

To see the length of the current block, press the SELECT BLOCK button and then press PARAMETERS until the Length display appears.

To find the size of an EPROM, press the PROM SELECT button and look at the EPROM size displayed at the far right. If the PROM size is not displayed, refer to the EPROM cross reference in appendix 2, or use the part number of the chip as a reference. PROM manufacturers often refer to the size of PROMs in the device part number - with the last digits indicating the number of kilobits of storage (a kilobit is 1024 bits). To find the number of kilobytes available, divide this number by eight. For example a 27256 contains 32k of data (256k divided by 8 = 32k). So, we can say that the size of a 27256 EPROM is 32k.

All references to block length and PROM size in this manual and in Prommer displays are in bytes.

EXAMPLE 1 - EPROM SIZE = BLOCK LENGTH

The simplest way to program a sound onto an EPROM is to start out with a sound in a block that is the same size (length) as the selected EPROM type. For example, if you have a 2764 (8k) EPROM, and an 8k block, simply program the EPROM directly from the block that contains your sound.

EXAMPLE 2 - MULTI-EPROM SOUNDS

Suppose you have a sound that uses 32k of memory in the Prommer and you want to put it in a DMX Cymbal 3 voice card which requires four 8k (2764) EPROMs for a total of 32k. To program your 32k sound onto four 2764s, you need to set up four other blocks that cover the same portion of memory containing your sound.

Let's say the sound in block #1 is a 32k block starting at address 0. You can define four other blocks, each with a length of 8k:

Block #2 - Address 0, Length 8k
Block #3 - Address 8k, Length 8k
Block #4 - Address 16k, Length 8k
Block #5 - Address 24k, Length 8k

Now all you need to do is program your four EPROMs from blocks #2, #3, #4, and #5 (see figure 5 on the next page).

(Remember to label your EPROMs immediately after programming so they don't get mixed up.)

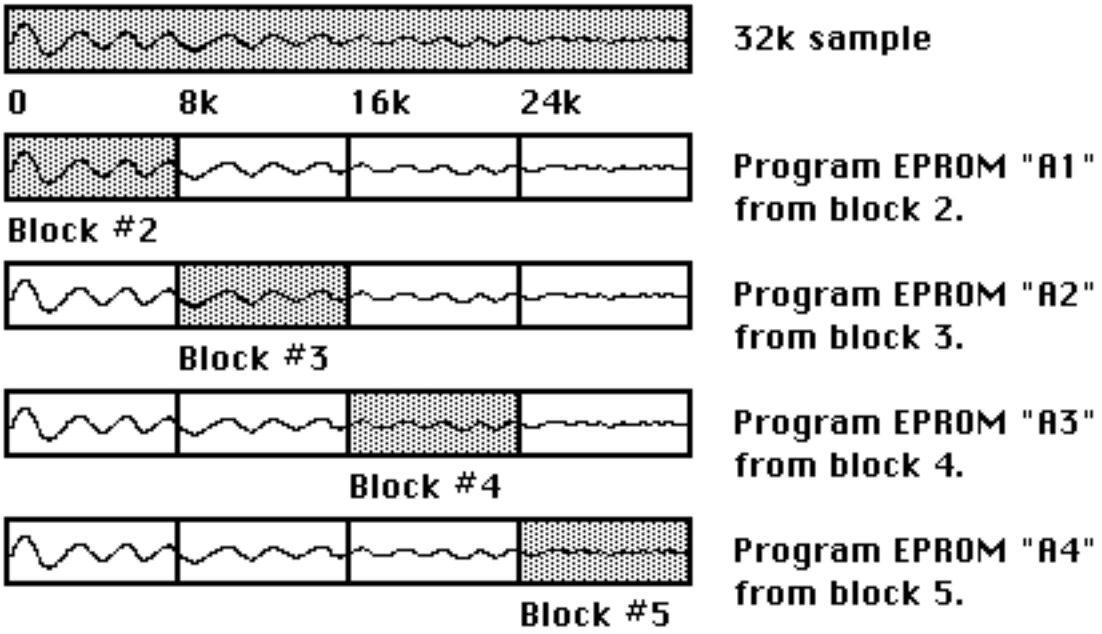

32k sample
0
8k
16k
24k
Program EPROM "A1" from block 2.
Block #2
Program EPROM "A2" from block 3.
Block #3
Program EPROM "A3" from block 4.
Block #4
Program EPROM "A4" from block 5.
Block #5

Figure 5 - One Sound on Four Chips

EXAMPLE 3 - MULTIPLE SOUNDS ON ONE EPROM

If you want to put two sounds on one chip for the PERC position in your DX (two 4k sounds on one 8k chip), there are at least two ways to do it. One way is to record the separate sounds into the Prommer in two sequential blocks, and then define a block that covers both of these and program the EPROM from this third block as shown in figure 6.

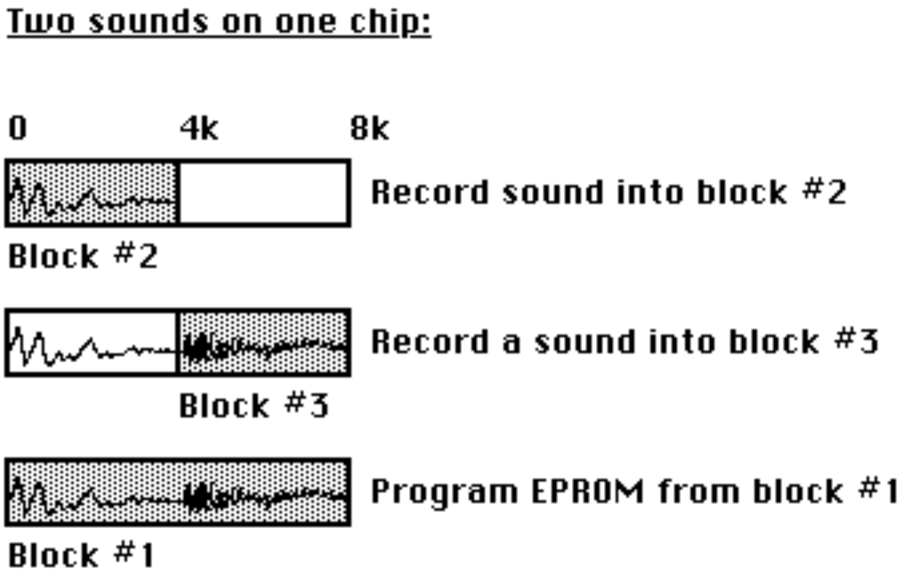

Two sounds on one chip:
0
4k
8k
Record sound into block #2
Block #2
Record a sound into block #3
Block #3
Program EPROM from block #1
Block #1

Figure 6 - Two Sounds on One Chip

Another way to do this is to program the block that will be the first of the two sounds into your EPROM, and then set the PROM offset and program the second sound into the second half of the EPROM. For example, let's say you have two 4k sounds that you want to put on an 8k EPROM. Program the first sound normally onto a 2764 with the PROM offset equal to zero. Since the current block is only 4k in length, the programming process will only program the first half of the EPROM, leaving the second half blank. Now, set the PROM offset to 4k and program the second block into the same 2764.
(Don't forget to reset the PROM offset back to zero after you finish!)

PICTURE HERE : two sounds in one EPROM

Chapter 7 - BLOCK FUNCTIONS

There are several functions available to manipulate blocks of memory in the Prommer. The functions operate in the following way. Press the appropriate function button until the display shows the desired function. Next, select the correct parameters for the function to operate with, and then press EXECUTE. Please notice that in all Prommer displays, whenever you see an asterisk (*), it means that you must press the EXECUTE button in order to perform the indicated function.

COPYING BLOCKS

The contents of blocks may be copied from one place to another in memory. Press the COPY BLOCK button:

1 COPY TO 2 *

The number on the left is the current block (source), and the number on the right is the destination block for the copy operation. You can change the destination block number with the number pad or the arrows. (To change the source block, you will have to go to the SELECT BLOCK display and change the current block and then come back to the COPY BLOCK display.)

This function will copy the data in the currrent block into the destination block when you press EXECUTE (if the destination block is not protected). Only the sound data is copied - all parameters such as loop points, transpose, etc. are unchanged in the destination block. The two blocks must be equal in length - you will get an error message if you try to copy to a block that is not the same size as the source:

NOT EQUAL SIZE.

If the two blocks involved in the copy operation overlap, the overlapped part of the source block will be changed by the data that is copied into the secondary block.

EXCHANGING BLOCKS

There is also a function that will exchange the contents of two blocks of memory. If you press the COPY BLOCK button again, the display will read:

1 SWAP WITH 2 *

The number on the right (the secondary block) may be changed with the number pad or the arrows.

This swap function will exchange the contents of two blocks of equal length (blocks 1 and 2 in this example). As with copy, the swap function only exchanges sound data - all other block parameters are unchanged. In addition to being equal in length, the blocks must not overlap. If you try to swap overlapping blocks you will see the error message:

BLOCKS OVERLAP.

When an error message appears, press any key to return to normal operation.

ERASING A BLOCK

You can erase the sound data in a block with the erase block function. Press the COPY BLOCK button again:

1 ERASE BLOCK *

At this point you may change the current block with the number pad or the arrows. Press EXECUTE to erase the sound data memory in the current block (all bytes equal to 0). Block parameters remain unchanged.

ERASING EVERYTHING

You can erase all memory including all blocks, and reset all parameters to their default values - press COPY BLOCK again:

ERASE ALL *

If you are sure you want to erase everything, press EXECUTE now.

REVERSING SOUNDS

You can make a sound play backwards by reversing it. To access the reverse function press the REVERSE button:

2 REVERSE *

Pressing the EXECUTE button now will reverse the data in the current block (displayed at the left). You can return the sound to normal by reversing it once more.

NUMBER CRUNCHING

Notice that when the Prommer is executing a function the display reads:

BUSY. . . .

This means that it is busy making the calculations required to make the change in the data. Since some of these functions require a considerable amount of "number crunching" (calculation), they may take from a few seconds to more than a minute to execute, depending on the function and the amount of data involved. You can stop a function before it is finished with the STOP button, but there is no way to start again at the point where you stopped, so you would have to start from the beginning if you wanted to continue.

WARNING

NOTE: Before using any of the following functions, it is advised that you make a copy of your sound in another part of memory, if possible, since the effects of some of these functions are not reversible.

BIT FUNCTION

The bit function can be used for special effects or other purposes. Press the REVERSE button again to see the bit display:

2 BIT - - - - - - - - *

The number on the left is the current block. The asterisk on the right indicates that this is a function that requires you to press the EXECUTE button before any action will be taken. The eight dashes correspond to the eight bits in a data byte, with the most significant bit on the left. A blinking cursor showing the position of the currently selected bit can be moved left and right with the arrow buttons.

The bit function, when executed, will modify every byte of data in the current block according to the image displayed in the following manner; If there is a dash ("-") displayed (select with CLEAR button), there will be no change to the bits at that position. If an "X" is displayed (+/- button) the data at that position will be logically inverted. If a "1" or "0" is displayed (select with 1 or 0 buttons), the bit at that position will set to one or to zero, respectively. (See the table below).

Bit display	Select with:	Result after EXECUTE
-	CLEAR	No Change
X	+/-	Invert bit
1	1	Set bit to 1
0	0	Set bit to 0

One application of this function is to introduce distortions to a sound by setting certain bits to one or zero, or by inverting bits.

2 BIT - X -1- - 01 *

Another application is phase inversion; by inverting only the most significant bit (the sign bit) you can invert the polarity of a sound.

2 BIT X - - - - - - - *

If you have modified a sound with a bit pattern containing only "X"s and "-"s you can return the sound to normal by applying the same pattern a second time. If you have applied a pattern containing any zeros or ones, there is no way to return to the original data unless you made a copy of the block before starting.

DISPLAYING MEMORY

The Prommer will allow you to examine and modify memory one byte at a time. Press the REVERSE button again and the examine memory display will appear:

1, 4321 = 129.

The number on the far left is the current block. The number just to the right of the comma is an absolute memory address, and the data byte located at that address is displayed at the far right. The arrows are used to increment or decrement the address. The CLEAR button will reset the address to the start of the current block.

The address is always displayed in decimal and may also be entered numerically by pressing the [#] button. The data will blank out, and you can now use the number pad to enter a different address.

Press the [#] button again to return to examining data.

DATA DISPLAY FORMAT

The data may be displayed in one of three different formats - absolute value, hexadecimal, or sign & magnitude.

To select the display format, press the PARAMETERS button:

DISPLAY ABS. VAL.

Use the arrows or the +/- button to rotate between the three formats. Absolute value format (identified by a decimal point after the data) shows the decimal value of the eight bit data in memory. Sign & magnitude format interprets the lower seven bits of data as a decimal number and the eighth bit as a sign (0=positive, 1=negative). This mode is useful for examining sound data. Hexadecimal mode (number base 16) is handy for examining MIDI data and is identified by the letter **H** to the right of the data.

Press PARAMETERS again to return to examining memory.

MODIFYING MEMORY

In the absolute value and sign & magnitude display modes, you may modify the data that is currently displayed by using the number pad and the +/- button to enter a new value directly.

Note: The protect status of a block is NOT checked before data is modified with this function.

Chapter 8 - SOUND MODIFICATIONS

The Prommer has several sound modification features which change the data stored in memory.

ENVELOPING A SOUND

One of these is the envelope function which will modulate the current block with a decay envelope. Suppose you have recorded a drum sound and there is a sudden cut-off of the sound at the end of the block. You can use the envelope function to make the cut-off more gradual. Press the ENVELOPE button to see the display:

2 ENVELOPE *

Pressing the EXECUTE button now will modify the currrent block. However, you will probably want to set the envelope parameters before you go on.

ENVELOPE DECAY PARAMETERS

Press the PARAMETERS button now to set the decay time:

DECAY TIME= 33

Pressing the PARAMETERS button one more time will display the decay start point:

START PT.= 0/100

The number pad and arrows may be used to change the envelope parameters. Press the ENVELOPE button again to go back to the envelope display.

The decay of the envelope can be described as a linear decay from the specified start point to the end of the current block. The start point is specified as a fraction of the length of the current block - 0/100 means that the envelope will start at the beginning of the sound, 99/100 means that it will start almost at the end of the sound.

A low value for the decay time will give a fast cutoff, and a high value will provide a long gradual envelope.

Applying an envelope to a block two or more times increases the effect and makes the decay exponential rather than linear.

See Figure 8 for some examples of the effects of envelopes on sounds.

HOW TO GET AN ATTACK ENVELOPE

In addition to a decay envelope, you can get the effect of an attack envelope in the following way: First reverse the block, then apply a decay envelope, and then reverse the block a second time.

TECHNICAL NOTE ABOUT DECAY TIME

For the technically inclined reader, the decay time can be defined as follows; D=decay time, X starts at 255. The current address is set to the start point and is incremented by one until it reaches the end of the block, while the linear equivalent value of the sound data at the current address is multiplied by X/256, and every D bytes, X is decremented by one (until it reaches zero).

PICTURE HERE : Figure 8 - Envelope example

MIXING SOUNDS IN MEMORY

The sounds in two blocks may be mixed together into one block. Press the MIX BLOCKS button:

1 MIX WITH 2*

The current block is displayed at the left and the secondary block is shown at the right. You can change the secondary block with the number pad or the arrows. Pressing EXECUTE now will mix the current block with the secondary block at the currently set mix ratio (see below) and store the result in the current block.

MIX RATIO

The two blocks can be mixed in equal parts, or a different mix ratio may be set. Press PARAMETERS to display the current mixing ratio:

MIX RATIO= 3/4

Use the number pad or the arrows to change the ratio numerator. The numerator of the fraction (3 in this example) refers to the amount of the CURRENT block to mix and the denominator (4 in this example) refers to the amount of the SECONDARY block to mix. Notice that the denominator always equals four. The numerator may range from zero to sixteen. If you mix two blocks at a mix ratio of 0/4, the secondary block will be copied into the current block at half its original volume level. A mix ratio of 4/4 will mix equal parts of both blocks.

RING MODULATION

Press the MIX BLOCKS button again until you see the RING MOD. display:

1 RING MOD. 2

The ring modulate function is like the MIX function except instead of summing two blocks together, the blocks are multiplied together and then scaled down, causing an effect known as Ring Modulation. If you press EXECUTE now, the current block will be multiplied together with the secondary block and the result stored in the current block.

The current mix ratio also applies to blocks being ring modulated and can be set by pressing the PARAMETERS button as described above.

STRETCHING AND SQUASHING

You can double the length of the current block with the stretch function. Press the STRETCH button:

2 STRETCH *

When you press EXECUTE, this function will stretch the current block to twice its original length. The block length parameter is doubled automatically. Bytes from the original block are spread out to occupy every other address of the new block and the spaces between are filled with the average value of the data on either side.
WARNING: The protect status of the memory following the current block is NOT checked before the stretch function is executed.

Press STRETCH again to access the squash function:

2 SQUASH *

This function is the opposite of stretch - it will shorten the current block to half it's original length, copying every other byte of the original block to the new block. The new block is located at the same start address as the original block and the leftover part of the original block is not disturbed.
Press EXECUTE to perform the function.

When you play back a block that has been stretched, you will hear that the pitch is an octave lower. Squashing a block will raise the apparent pitch by one octave.
You should understand that when you squash a block you will lose half of the information contained in the original block, and that stretching it out again will only fill in the gaps with approximated data. Squashing and then stretching a block will act as a sort of low pass filter.

Chapter 9 - MIDI

MIDI is a standardized digital communication interface common to many electronic musical instruments. MIDI commands and messages are transmitted serially over a cable between MIDI transmitters and receivers. The commands include such functions as Note-On, Note-Off, Pitch Bend, Program Change, etc.
The Prommer is capable of receiving and transmitting several types of MIDI information. Note-On commands received by the Prommer from a keyboard, for example, can play back sounds at a pitch relative to the note played. For a complete description of how the Prommer implements MIDI, see appendix 3.

BASIC CHANNEL

The Prommer may be set to receive voice messages on any one of sixteen MIDI channels. To select the channel for the Prommer, press the MIDI CHANNEL button. The display will show the current MIDI receive channel:

MIDI CHAN. = OMNI

OMNI means that the Prommer will recognize MIDI data on all sixteen channels. To select a single channel, use the number pad to enter a number from 1 to 16:

MIDI CHAN. = 12

If a single channel number is set, the Prommer will only recognize data that is received on that channel. Enter zero or press CLEAR to reset to OMNI mode.

MIDI PITCH CONTROL

Press the MIDI CHANNEL button again to see the next parameter:

3 KEY. PITCH ON

The keyboard control of playback pitch may be toggled **ON** or **OFF** with the +/- button. The current block is displayed on the left and may be changed at this time with the number pad or the arrows.

The keyboard pitch enable option is provided so that each block may be set to allow the MIDI controller (keyboard) to trigger the sound and control the playback pitch, or to trigger the sound with the pitch control "turned off" so the sound will always play at it's normal pitch regardless of which key is played. When the keyboard pitch is enabled, middle C (MIDI note number 60) will play the sound in the current block at its normal pitch (which is determined by the basic sample rate, transpose, and fine tune values for the current block), and notes above or below middle C will play the sound at a correspondingly higher or lower pitch.

MIDI ECHO

Press the MIDI CHANNEL button again to set the echo mode:

MIDI ECHO OFF

Use the +/- button to select one of three echo modes - **ON**, **OFF**, or **SPL x**.

MIDI echo ON will take everything that is received at the MIDI IN connector and echo (retransmit) it through the MIDI OUT connector.

Echo OFF will not echo anything.

SPL is used as an abbreviation for spillover. Use the number pad or arrows to change the spillover number.

Spillover echo will retransmit all information except note-on messages. A note-on message is only retransmitted (spilled over) if a block is currently in the process of being played. This feature will allow you to connect two or more Prommers in series and play them polyphonically from a MIDI keyboard. To do this, you need to set the spillover number for each unit in the chain to the number of units remaining "down the chain" from it. The spillover number is used to determine how many note-ons to echo while a note is playing before "robbing" the Prommer of its note and retriggering it with the latest note-on number. See figure 9 for an example of using spillover echo.

EXAMPLE OF USING MULTIPLE PROMMER UNITS TOGETHER POLYPHONICALLY

By using spillover echo mode, many Prommers may be linked together to play sounds polyphonically. Using MIDI cables as shown, connect the units together. Set all units to the same MIDI channel, and set the spillover echo number for each unit to the number of Prommers to the right of the selected one (as shown in the picture). The last unit in the chain should have "ECHO OFF". Load the sound(s) that will be played into the first unit in the chain and then execute a MIDI "DUMP ALL" command to copy the sounds into the other units.

PICTURE HERE: Figure 9 - Spillover example

MIDI BLOCK SELECT MODES

There are three basic MIDI modes of operation for the Prommer. Press the MIDI MODE button to see the currently selected mode.
One of the following three messages will be displayed. The mode may be changed by using the +/- button or the arrows.

MIDI ZONE MODE

MIDI zone mode is the most commonly used mode and can be used to allocate different sections of the keyboard to different blocks (sounds). In this mode if a MIDI note is received that is outside of the zone limits for the current block, the limits of each other block are tested until a block is found that the note will fit in. This new block becomes the current block and is played.
This mode may be used to assign different blocks to different areas of the keyboard or even to single MIDI note numbers.

BLOCK=CHAN. MODE

Block-equals-channel mode uses the received MIDI channel number to select the current block. The basic MIDI channel should be set to OMNI in order to use this mode.

VELO. ZONE MODE

Velocity zone mode is similar to MIDI zone mode, except the zone limits are tested against the note-on velocity rather than the note-on number, so the block is changed according to the velocity of a note.

ZONES

Each block may be assigned to a particular range of note numbers or velocity values. This range is called a zone, and is defined by its upper and lower limits. To view the zone limits for the current block, press the PARAMETERS button now:

1 LOWER LIM.= 0

Continue pressing the PARAMETERS button to switch between upper and lower limits:

1 UPPER LIM.=127

The arrows may be used to change the current block (displayed at the left). The number pad may be used to set the limit value. The CLEAR button will reset the limit to a default value (0 for lower limits, 127 for upper limits). Press the MIDI MODE button again to get back to the mode display.

The limits may also be set with an external MIDI keyboard connected to the Prommer. Press and hold the PARAMETERS button so that the display shows the limit you want to set and then press a key on the keyboard. The limit will now be set to the value of the key just pressed. The range of limits is 0 to 127 which is also the range of MIDI notes.

If you want a block not to play by MIDI, set both the upper and lower limits for that block to zero.

To set normal operation, select MIDI zone mode and set the lower limits for all blocks to zero, and set all upper limits to 127. This will enable all blocks to play via MIDI and the current block will not be changed by MIDI notes. See appendix 1 for a few examples of the many ways to use MIDI zones.

PITCH BENDING

The pitch bender on a MIDI controller can be used to control the playback pitch of a block. Press the BEND RANGE button :

BEND RANGE = 0

To enable the pitch lever (pitch wheel), use the arrows or number pad to enter a non-zero value for the bend range. Bend range is specified in semitones, so a value of 12 will give one octave of bend (up or down). The maximum bend range is 36 (three octaves).

MIDI VELOCITY AND PRESSURE ROUTING

MIDI note-on velocity may be used to control the loudness level or the filter frequency during playback. To select a destination for MIDI velocity, press the BEND RANGE button again:

VELOCITY VCF

Use the arrows or the +/- button to select velocity **OFF**, **VCA** (Voltage Controlled Amplifier), or **VCF** (Voltage Controlled Filter). Increasing velocity will increase the volume level or raise the output filter frequency.

MIDI pressure (after-touch) information may also be used to control volume level or filter frequency. Press the BEND RANGE button one more time:

PRESSURE OFF

Use the arrows or the +/- button to select the pressure destination (**OFF**, **VCA**, or **VCF**).
Both Channel Pressure and Polyphonic Key Pressure are recognized, and if both are transmitted by the controller, the Prommer will try to respond to both types. If possible, enable only one type of pressure at a time on the transmitter.

REMOTE BLOCK SELECTION

The program (patch) selection controls on a MIDI controller may be used to select the current block of the Prommer. Press the BEND RANGE button again:

PROG. CHANGE OFF

Use the arrows or the +/- button to turn the program change enable ON or OFF. When program change is <u>on</u>, selecting a program number on the controller will select the block with the same number on the Prommer. Numbers higher than sixteen will set the block by modulo 16 (program #17 selects block #1, program #18 selects block #2, etc.).

MIDI DATA TRANSFER

MIDI may be used in various ways to transfer sound data between machines using MIDI's system exclusive feature. The Prommer supports two different system exclusive formats used for transferring sounds. The first is used only for transferring sounds between two Oberheim Prommers and transfers all parameters and sound data associated with a block. The other format is a "universal" type of sample dump based on a proposed standard that transfers sound data in linear format and includes only the following parameters: sample number, sample rate, sample length, loop start address, loop end address, and loop type.

PROMMER SOUND DUMP

The Prommer sound transfer uses a single MIDI cable in an "open loop" system. To transfer a sound from one Prommer to another, connect the MIDI cable from MIDI Out of the sending unit to MIDI In of the receiving unit. Press the BLOCK DUMP button:

1 SYSTEMX DUMP*

The number on the left is the current block which is the block that will be transmitted in Prommer system exclusive format when you press EXECUTE. The dump will transfer all data associated with the current block including sound data, block number, block start address and length, loop start and end points, zone limits, sample rate, playback mode, transpose, fine tune, filter frequency, and protect, emphasis, and MIDI pitch disable status.

Press EXECUTE to start the transmission. The display should read:

STOP TO CANCEL. . .

Pressing the STOP button will interrupt the data transfer. The receiving Prommer will automatically accept the data as it comes in unless the current block is protected, or a recording is in progress. There is no interruption in regular operation while the data is being received, except that if a sound is playing, you will hear it slow down considerably during reception.

You can transmit all 16 blocks in Prommer System Exclusive format. Press the BLOCK DUMP button again:

SYSX DUMP ALL *

System exclusive Dump All will transfer all blocks and block parameters over MIDI. Notice that if there are overlapping blocks defined, some data will be transmitted more than once. Since it takes several seconds to transmit sound data, a system exclusive dump-all may take several minutes if there is much overlapping data.
After all blocks have been transmitted, global parameters - MIDI mode, Bend Range, Program Change Enable, MIDI Channel, Velocity and Pressure Destinations, and External Trigger parameters - are also transferred.

Press EXECUTE to start the transfer:

STOP TO CANCEL. 1

The number displayed on the right is the current block and you will see it automatically incremented as blocks are transmitted one at a time.

UNIVERSAL SAMPLE DUMP

The Universal sample dump system is designed to use MIDI In and MIDI Out on each machine to provide "handshaking" between the two machines involved in the transfer (see figure 10). Although both connections are not absolutely necessary, for improved speed and error correction this "closed loop" system may be used. If a single connection is used ("open loop") the cable should be connected from the sender's MIDI Out to the receiver's MIDI In.

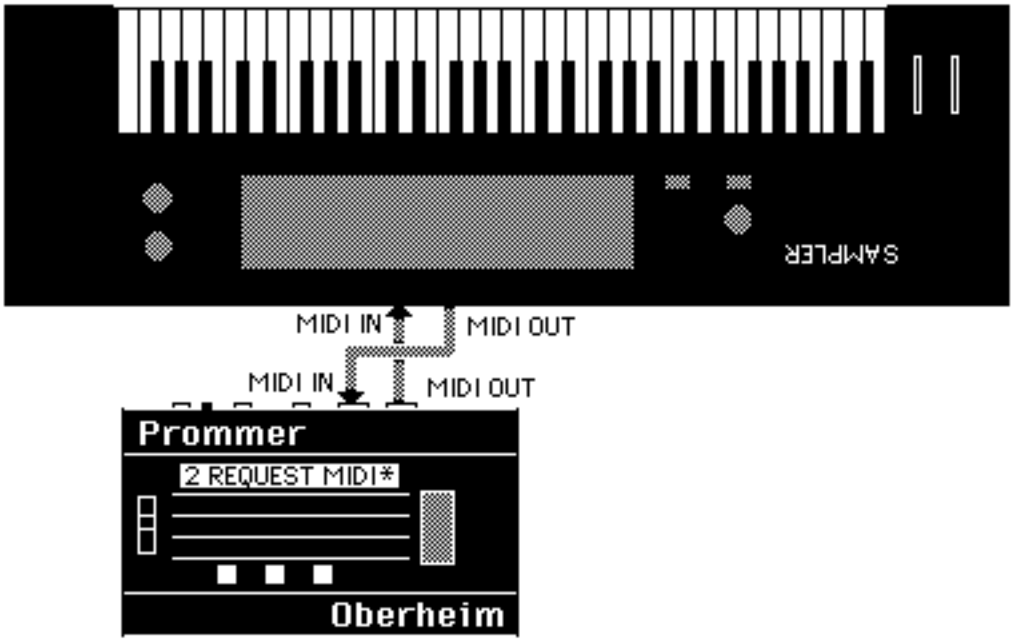


Figure 10 - Closed Loop Communication

To prepare to transmit a sample in universal format, press the SOUND DUMP button again:

2 MIDI DUMP *

Press EXECUTE to start transmission of the current block. If a closed loop system is used and the receiving machine is not ready to accept data, it may send a CANCEL command and the Prommer will stop transmitting. Otherwise, the Prommer will continue sending until the transmission is complete.

To <u>receive</u> Universal MIDI data, the Prommer must be prepared to accept the data. Press the BLOCK DUMP button one more time:

2 REQUEST MIDI*

After you press EXECUTE, the Prommer will turn MIDI Echo <u>off</u> and transmit a "Dump Request" command, requesting the sample with the same number as the current block. The Prommer will then wait for incoming data. If a closed loop system is being used and the other machine is not ready to transmit, it may send a

CANCEL command over MIDI and the Prommer will stop waiting and return to normal operation, restoring whatever echo mode was previously set.
The Prommer will also quit if the current block is protected or if you press the STOP key. If an open loop system is used, after pressing EXECUTE to start the REQUEST MIDI function, you must start transmission on the other machine by pressing the proper switches. The sample number transmitted by the other machine is ignored and the incoming data is stored in the current block.

MIDI DATA STORAGE

Another feature of the Prommer is the ability to store MIDI data in memory exactly as it is received. This is useful for storing synthesizer patches that are transmitted in their own MIDI system exclusive format. Press the RECEIVE DATA button to prepare to receive MIDI data in the current block:

3 RECEIVE DATA*

Be sure the current block is long enough to receive the expected amount of data. When you press EXECUTE to start receiving, you have about five seconds to start transmitting from your synthesizer. Any time during reception, if five seconds pass with no data received over MIDI, the Prommer will automatically cancel the receive data mode. You may also cancel receive mode by pressing the STOP button. The display will then show the number of bytes that were received:

OK- 1234 BYTES.

This number is stored as two bytes in the first two memory locations of the current block. The actual data received starts at the third location.

MIDI DATA TRANSMISSION

To retransmit this kind of MIDI data do not use the system exclusive dump - use the transmit data function. Press the RECEIVE DATA button again:

1 TRANS DATA *

Warning - do not try to transmit data that was not originally received using the RECEIVE DATA function ! Sending non-MIDI data out over MIDI may have unpredictable results on any units connected to the Prommer's MIDI Out connector.
When you are ready to transmit, press the EXECUTE button and the first two bytes of the current block will be read to determine the number of bytes to transmit. The data will now be transmitted starting with the data at the third address of the current block. After transmission is complete, the display will indicate the number of bytes that were transmitted.

RECEIVE / TRANSMIT DATA EXAMPLE

The Prommer may be used with any synthesizer or drum machine that can transmit and receive program (patch) data on MIDI to save and recall patches on EPROMs. Each type of machine will vary slightly, but the procedure is basically the same as described here with the Oberheim Matrix-12 synthesizer as an example.
The amount of data transmitted in a "Patch Dump" will vary from machine to machine, so before starting, make sure there will be enough room in the current block to receive all the data - set block #1 to address=0 and length=64k.

With MIDI Out of the Matrix-12 connected to MIDI In of the Prommer, select the RECEIVE DATA function on the Prommer. When the synthesizer has been prepared to transmit its patches (Master page / MIDI / SEND ALL), press EXECUTE on the Prommer. You now have five seconds to start transmission of the Matrix-12 patches by pressing the START button. Now, just wait until the synthesizer has completed its transmission, and then when no MIDI data is received after five seconds, the Prommer will cancel the Receive mode automatically.
Note: If your synthesizer sends active sensing status or controller data continuously on MIDI, the Prommer won't stop receiving until the current block is full, unless you press STOP after the patch dump is complete. If possible, turn off active sensing and controllers before starting a patch dump to the Prommer.

When the dump is complete, or the current block is full, the display will show the number of bytes received. Add two to this number to get the total number of bytes you need to save on EPROM(s). In the case of the Matrix-12, the display read:

OK - 64207 BYTES.

Add 2 to get 64209, and divide this number by 1024 to see how many "k" of EPROM space will be needed. This amount of data (62.7k) will require a single 64k EPROM (27512), two 32k EPROMs (27256) or four 16k EPROMs (27128), etc.

Let's assume that you have two blank 27256's handy, and will use them to store your Matrix-12 patches. Set up two more blocks in the Prommer; Block #2 starting at address 0 with length = 32k, and Block #3 starting at address 32k with length = 32k.
Set the EPROM type to 27256 and program block #2 into one of the EPROMs and label it "Matrix-12 patches part 1 of 2". This EPROM now contains the first half of the patch data and the total number of bytes in the patch dump coded into its first two bytes. Now, program block #3 into the other EPROM and label it "Matrix-12 patches part 2 of 2". This EPROM contains the final part of the patch data.

To load the patches back into the synthesizer, the process is basically reversed. Set up three blocks in the Prommer; Block #1 at address 0 with length = 64k, block #2 at address 0 with length = 32k, and block #3 at address 32k with length = 32k.
Select block #2 and load the data from the EPROM labelled "part 1 of 2". Select block #3 and load "part 2 of 2".
Connect the Prommer MIDI Out to the Matrix-12 MIDI In. Make sure the synthesizer is ready to receive system exclusive patch data and then select block #1 as the current block on the Prommer. Select the TRANSMIT DATA function and press EXECUTE. The Prommer then will read the first two bytes of the current block to find out how many bytes of data to transmit, and then will transmit the data over MIDI to the synthesizer exactly as it was originally received.

Note: The Prommer does not save any timing information with received data, and will retransmit it as fast as possible. To avoid some of the problems this might cause in other machines, a 20 millisecond pause is inserted after every EOX (F7H) byte that is encountered during transmission. This gives the receiving machine time to do any necessary computations between multiple system exclusive messages.

Chapter 10 - MISCELLANEOUS INFORMATION

SOFTWARE REVISION NUMBER

To display the current version of software that is installed in your Prommer, immediately after turning on the power, press and hold the 3, 5 and 7 buttons.

BATTERY BACKUP MEMORY

The random access memory (RAM) in the Prommer is powered by a lithium battery when the AC power is off. So, whatever sounds were in the Prommer when you last turned off the power will still be there when you turn the power on again. The battery should last more than a year before it starts to run down, but when the battery does eventually fail, the Prommer will lose data when the power is turned off and the next time the power is turned back on, the display will read:

CHECK BATTERY

The CHECK BATTERY message will appear immediately after turning on the AC power if there has been a major loss of memory. When this message appears, contact your local Oberheim Authorized Service Center to get a replacement battery installed.

IN CASE OF A PROBLEM

On rare occasions computer based products like the Prommer will unexpectedly "lock up" or cease functioning. This can be caused by surges in the AC power line or static electricity shocks (especially static shocks caused when touching the EPROM socket). If the Prommer locks up, it can usually be restarted without any loss of memory by simply turning the power off and then on again. If the unit remains locked up, there is a failsafe method of restarting it - hold the CLEAR button down while turning on the power. ALL data in memory will be erased and all parameters will be set to default values. Since this erases all sounds in memory, it is recommended that you save your important sounds and other data on EPROMs or some other permanent storage device soon after recording them.
If the Prommer seems to behave in an otherwise unexpected manner, be sure to check all parameters that could be related to the problem before assuming that it is broken. If there is an obvious problem, contact your nearest Oberheim Authorized Service Center.

TEST PROGRAMS

There are some functions not normally available in the Prommer that are accessed in the following way:

1. Turn off the AC power.
2. Hold down both the PLAY and RECORD buttons.
3. Turn the power on again.

As long as the PLAY and RECORD buttons are held down the display will read:

TEST PROGRAMS. . .

After releasing all switches, the first of eight test progams used to verify operation of the Prommer will be displayed. Most of these are of interest only to the service technician, however the first one may be used to set the brightness of the vacuum fluorescent display:

DISPLAY INTENS.

Press the arrows to increase or decrease the intensity of the display. When the intensity is at an acceptable level, press STOP. The Prommer will remember this value and use it to set the brightness of the display in the future (until you change the value again).

You may press EXECUTE to start any of the tests, or just keep pressing STOP until the display reads:

OBERHEIM PROMMER

At this point, normal operation is resumed.

Important note: Be sure that the PROM socket on the front panel is empty before executing any of the test programs.
For more information regarding these test programs, please refer to the Prommer Service Manual.

ABOUT BYTES AND SAMPLES

The term byte is used frequently in this guide and should be explained for those unfamiliar with computer teminology. A byte is defined as a group of eight bits of information. A bit is a binary digit that has only two possible values - zero or one. A byte has 256 (2 to the 8th power) possible values, or combinations of ones and zeros.

Memory in the Prommer is arranged in bytes. Each byte of memory can be located by a unique 16 bit address. The range of addresses is from zero to 65535 (2 to the 16th power possible addresses).
When a sound is sampled by the Prommer, each sample (one byte per sample) is stored at a new memory address. Each sample is coded into eight bits, and the number stored as a byte represents an instantaneous voltage level corresponding to the input signal at the time the sample was taken. Upon playback, these numbers are read back out of memory, and converted back into a voltage, one at a time at a steady sample rate.

If you could look directly into a memory location at random you might see the following group of eight bits :

10011100

This binary number could be interpreted in several different ways. The decimal equivalent to this number is 152, in sign & magnitude form it is -28, and in Hexadecimal it is equal to 9C. All three interpretations are equally valid.

COMPANDED DATA

The Prommer stores samples in a sort of Sign/Magnitude format known as companded. The most significant bit is the sign and the other bits represent the magnitude of the sample in two parts - the chord and the step values.

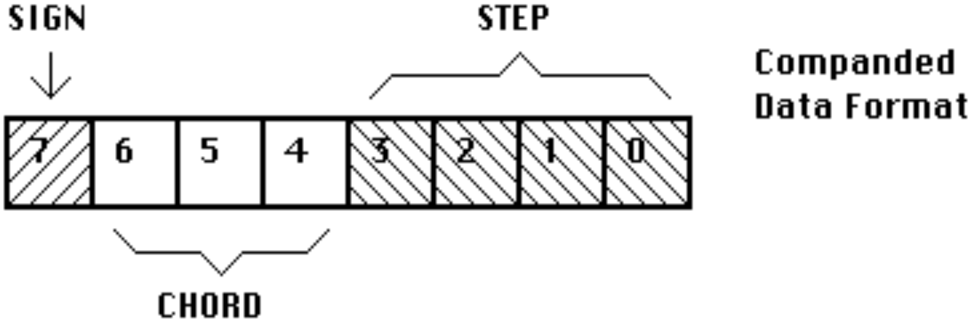


Figure 11 - Companded Data Format

Briefly, the chord value represents one of eight possible ranges of output levels, each range being twice as large as the next lowest. The step value represents one of 16 equal divisions within the selected chord.

Oberheim Prommer - Summary of Functions

SELECT BLOCK

Select the current block number (1 - 16).
-parameters-
BLOCK ADDRESS - Select the beginning memory address for the current block.
BLOCK LENGTH - Select the length of the current block.
BLOCK PROTECT - Select protect status for the current block.

SAMPLE RATE

Select the sample rate for recording (12kHz, 16kHz, 24kHz, 32kHz).
-parameters-
RECORD TIME - Display the recording time available in the current block at the selected sample rate.

RECORD TRIGGER THRESHOLD

Select the level of sound that will trigger recording (-45 - 0 dB).

TRANSPOSE

Select the playback transpose amount for the current block (-48 - +48 semitones).

FINE TUNE

Select the playback fine tune amount for the current block (-127 - +127).

SET FILTER

Select tracking filter or fixed filter for playback. For fixed filter select filter value (1 - 255).

PLAY MODE

Select playback mode (Normal, Gated, Loop, Gated/Loop).
-parameters-
LOOP START POINT - Select address offset for beginning of playback loop.
LOOP END POINT - Select address offset for end of playback loop.

EXTERNAL TRIGGER

Select external trigger (On/positive trigger, On/negative trigger, Off).

EMPHASIS

Select Record and Playback emphasis (On, Off).

IDLE BYPASS

Select Idle Bypass mode (On, Off).

COPY BLOCK

Select destination block for copy operation. Press [EXECUTE] to copy.

SWAP BLOCKS

Select secondary block for swap operation. Press [EXECUTE] to swap.

ERASE BLOCK

Press [EXECUTE] to set all bytes of the current block to zero.

ERASE ALL

Press [EXECUTE] to clear ALL of the memory in the Prommer and reset default parameters.

REVERSE

Press [EXECUTE] to reverse the order of the current block.

BIT - - - - - - - - *

Use arrows to move cursor. Use [0], [1], [CLEAR], [+/-] keys to select pattern for each bit. Press [EXECUTE] to mask memory with displayed pattern (current block only).

EXAMINE MEMORY

Display memory. Address shown is absolute memory address. Use number pad to modify data (except in HEX display mode). Use arrows to change address or press [#] and enter address directly.
-parameters-
DISPLAY MODE - Select data display mode for examine function (Hexadecimal, Sign & magnitude, Absolute).

ENVELOPE

Press [EXECUTE] to calculate an envelope for the current block.
-parameters-
DECAY TIME - Select decay time for envelope operation (0 - 99).
START POINT - Select envelope start point (0/100 - 99/100).

MIX BLOCKS

Select secondary block to mix with the current block. Press [EXECUTE] to add blocks together in the current block.
-parameters-
MIX RATIO - Select the mix ratio between the blocks to be mixed :
Current Block / Secondary Block (0/4 - 16/4).

RING MODULATE BLOCKS

Select secondary block to modulate with the current block. Press [EXECUTE] to multiply blocks together with the scaled result in the current block.
-parameters-
MIX RATIO - Same as for mixing blocks.

STRETCH BLOCK

Press [EXECUTE] to stretch the current block to double its original size, averaging data to fill in new bytes.

SQUASH BLOCK

Press [EXECUTE] to squash the current block to half its original size, discarding every other byte.

SELECT PROM

Use arrows to select appropriate EPROM or PROM type.
-parameters-
PROM OFFSET - Select EPROM address offset in 1K increments.

CHECK ERASURE

Press [EXECUTE] to test EPROM for erasure.

COMPARE DATA

Press [EXECUTE] to compare EPROM data with data in current block.

PROGRAM PROM

Press [EXECUTE] to program EPROM with data from the current block.

PROGRAM LINEAR

Press [EXECUTE] to program EPROM in linear format with data from the current block.

PROGRAM SETUP

Press [EXECUTE] to program EPROM with all block and playback parameters for entire unit. Data requires less than 1k of storage on EPROM.

LOAD DATA

Press [EXECUTE] to load data from EPROM into current block.

LOAD LINEAR

Press [EXECUTE] to load linear data from EPROM and convert to companded in the current block.

LOAD SETUP

Press [EXECUTE] to load block parameters, etc. for entire unit from EPROM.

RUN PROGRAM

Hold PARAMETERS button and press [EXECUTE] to run 6809 program starting at the first address of current block. Press [EXECUTE] only to run program out of expansion EPROM (internal).

MIDI CHANNEL

Select basic MIDI channel for reception (OMNI, 1-16).

KEY PITCH ENABLE

Select MIDI pitch control of playback (On, Off) for current block.

MIDI ECHO

Select echo of incoming MIDI over MIDI OUT (On, Off, Spillover N [$1 \leq N \leq 99$]).

MIDI MODE

Select MIDI playback mode (Keyboard zone, Velocity zone, Block=Channel).
-parameters-
ZONE UPPER LIMIT - Select upper MIDI zone limit for current block.
ZONE LOWER LIMIT - Select lower MIDI zone limit for current block.

BEND RANGE

Select the bend range for MIDI pitch wheel controller (0 - 36 semitones up/down).

VELOCITY

Select destination for MIDI Note On velocity (Off, VCA, VCF).

PRESSURE

Select the destination for MIDI pressure (Off, VCA, VCF).

PROGRAM CHANGE

Select MIDI program change control of current Block number (On, Off).

SYSTEM EXCLUSIVE DUMP

Press [EXECUTE] to dump all sound data and parameters in the current block over MIDI in Prommer system exclusive format.

SYSTEM EXCLUSIVE DUMP ALL

Press [EXECUTE] to dump all blocks and parameters over MIDI in Prommer system exclusive format.

MIDI DUMP

Press [EXECUTE] to transmit the current block in "universal" MIDI linear sample format.

REQUEST MIDI

Press [EXECUTE] to transmit a "dump request" and wait for incoming "universal" MIDI sample data.

RECEIVE DATA

Press [EXECUTE] to enable transfer of MIDI data directly into the current block. Function will time out after five seconds of inactivity. First two bytes of block will contain the number of bytes received.

TRANSMIT DATA

Press [EXECUTE] to transfer data in the current block directly out over MIDI. First two bytes of block must contain the number of bytes to transmit.

RECORD

Press RECORD and PLAY to record sound into the current block.

PLAY

Press PLAY to play the sound in the current block.

STOP

Press STOP to halt sound playback, or any operation in progress.

Prommer Application Examples

APPENDIX 1 - PART A

DRUM MACHINES AND EPROMS

One of the primary reasons for Oberheim's introduction of the Prommer was the demand by DMX and DX owners for a way to create new sounds for their drum machines. This section of the User's Guide will try to explain how the Prommer can help you do that.

Basically, the process of creating a new drum machine sound is very simple; sample a sound with the Prommer, burn an EPROM, and put the EPROM in the drum machine. However, there are some complications to this process.

You may want to modify the sound before burning an EPROM, or you may want to put two sounds on one EPROM. You may want to tailor the sound for a particular type of drum machine voice circuit, or you might even need to modify the drum machine voice configuration to match the desired drum sound.

If you own a drum machine other than an Oberheim, you need to find out whether or not it uses individually replaceable sound chips, what sort of data format is used, and what the capacities of the sound chips are. If your machine does not use individual sound chips that are pin-compatible with any of the PROMs listed in appendix 2, you will not be able to use the Prommer to make new sound chips. The Prommer is also limited to programming only 8-bit data formats (companded or linear). If your machine uses 8-bit linear format, see the chapter on EPROMs for information on how to burn a chip in linear format. All Oberheim drum machines use companded format data.

If you own a DX or DMX, see the tables in this section for information on suggested sample rates and EPROM capacities for different drum voices.

1. Sampling a sound

If you are going to record a live sound with a microphone, find a quiet place to work, (with as little background noise as possible) and connect the microphone to the Mic. Input of the Prommer. If you are recording from tape or disk, you can use the Line Input. After selecting the appropriate sample rate, monitor the output of the Prommer with the Idle Bypass off and set the record level.

Select a block and set its length to match the capacity of the drum voice you intend to use for your new sound.

Now, record the sound and play it back. If neccessary, record the sound again until it sounds right. If the sound is slightly too long for the block, you may use the envelope function to reduce any sudden cutoff, use a slower sample rate, or you may have to consider using a different type of drum voice with a greater capacity.

2. Burning an EPROM

Once you have a sample that you are satisfied with, you can program it into an EPROM (or multiple EPROMs). Handle EPROMs with care and be certain to set the Prommer for the same type of EPROM that you will be using. (If you have a linear format drum machine, don't forget to use the Program Linear function.)

Another consideration when making sound chips is that some DX and DMX voices have a hardware circuit that creates an envelope. This will affect the sound in such a way that the sound you heard on the Prommer will not neccessarily be the same on the drum machine. The best type of drum voice for playing Prommer sounds is one without any enveloping, and with a wide tuning range.

DX and DMX standard EPROM types

DX Note: DX voices have a wider tuning range than most DMX voices.

Voice	EPROM	Capacity	Sample rate	Comments
DX Bass	2764	8k	24kHz	3 volume levels, envelope
DX Snare	2764	8k	32kHz	3 volume levels
DX Hi-hat	2764	8k	24kHz	Envelope on 1 & 2
DX Tom	2764	8k	12kHz-32kHz	3 Pitches
DX Cymbal (DX serial #D4441 & lower)	2764 (x4)	32k	24kHz	Uses 4 EPROMS for 32k total 3 volume levels
DX Cymbal (DX serial #H45001 & higher)	27256 (x2)	64k	24kHz	Uses two 32k ROMs - 2 sounds 1 & 2 - two volume levels
DX Perc	2764	8k	24kHz	2 sounds on 1 EPROM (4k each)

DMX

DMX Bass	2732	4k	24kHz	3 volume levels, envelope
DMX Snare	2732	4k	32kHz	3 volume levels
DMX Hi-hat	2732	4k	24kHz	Envelope on 1 & 2
DMX Toms (old type)	2732	4k	12kHz	3 Pitches, envelope
DMX Toms MK II Voice	2764	8k	12kHz	Envelope, jumpers select one or two EPROMS, 2732 or 2764
DMX Cymbal #2	2732 (x8)	32k	24kHz	8 EPROMs for two16k sounds
DMX Cymbal #3	2764 (x8)	64k	24kHz	8 EPROMs for two 32k sounds
DMX Perc1	2732	4k	24kHz	2 sounds on one EPROM (2k each)
DMX Perc2	2732	4k	16kHz	2 sounds on one EPROM (2k each)

Note: Voices with a hardware envelope are not suitable for most sounds sampled with the Prommer. The envelope will cut off about half of the sound, making only very percussive sounds usable.

Linn 9000

Note: All Linn 9000 sound chips are 8k (2764 type) EPROMs. All voices have a wide tuning range, sample rates of 24kHz or 32kHz should be OK.

Voice board name	Individual outputs	Sound Length	# of chips	Notes
BASS / SNARE	Sidestick	8k	1	
	Snare	8k	1	
	Bass	8k	1	
HI-HAT	Hi-hat	16k	2	Adjustable decay envelope
TOM-TOMS	Tom 4	8k	2	2 identical chips used for
	Tom 3	...	...	alternating playback,
	Tom 2	...	...	Filter envelope, 4 pitches.
	Tom 1	...	...	
CYMBALS	Ride 2	32k	4	
	Ride 1	32k	4	
CYMBALS	Crash 2	48k	6	2 pitches
	Crash 1	...	...	
CONGAS	Conga 2	8k	2	2 ident. chips, 2 pitches,
	Conga 1	...	...	Filter Envelope
PERCUSSION	Claps	8k	1	
	Cowbell	8k	1	
	Cabasa	8k	1	
	Tamborine	8k	1	

Linn Drum

Note: All Linn Drum sound chips are 4k (2732 type) EPROMs. The basic sample rate is approximately 24kHz and not individually tunable per voice with the exception of the Snare, Toms, and Congas

No. of EPROMs / Block size		Drum Voice	Location	Comments
1	4k	Bass drum	BASS	2 volume levels
1	4k	Cabasa	CBSA	2 volume levels
1	4k	Claps	CLPS	
2	8k	Conga	CGA1-2	2 tunable pitch levels
1	4k	Cowbell	CWBL	
8	32k	Crash Cymbal	CRS1-8	
4	16k	Hi-hat	HAT1-4	3 levels - 1 "open" (no envelope), 2
8	32k	Ride Cymbal	RID1-8	2 volume levels
1	4k	Side stick	SSTK	
1	4k	Snare	SNAR	3 volume levels (Side stick and Snare are tunable together)
1	4k	Tamborine	TAMB	2 volume levels
2	8k	Tom	TOM1-2	2 tunable pitch levels

Sequential Circuits, Inc. Drumtraks

With the exception of the Bass drum chip which is a 2732 type, all EPROMs in the Drumtraks are 2764 types.

Channel	Standard Voice	EPROMs	Tuning Range	Notes
1	Bass	2732	7.7kHz-18kHz	Single 4k sound.
2	Snare/ Rimshot	1/2 2764 1/2 2764	8.6kHz-22kHz 12kHz-22kHz	Two sounds on one 8k chip - First 4k is Snare, second 4k is Rimshot.
3	Tom 1 Tom 2	2764	2.6kHz-13kHz 2.3kHz-13kHz	Same 8k chip plays at two different pitches.
4	Crash cymbal Ride cymbal	4 x 2764 4 x 2764	4kHz-25kHz 5.5kHz-25kHz	One 32k sound on four 8k chips. One 32k sound on four 8k chips.
5	Closed Hi-Hat Open Hi-Hat	2764	8.3kHz-16kHz	Closed Hi-Hat is open Hi-hat with envelope.
6	Claps/ Tamborine	1/2 2764 1/2 2764	4kHz-14kHz 4kHz-14kHz	Two sounds on one 8k chip - First 4k is Claps, second 4k is Tamborine.
	Cowbell/ Cabasa	1/2 2764 1/2 2764	5kHz-25kHz 4kHz-14kHz	Two sounds on one 8k chip - FIrst 4k is Cowbell, second 4k is Cabasa.

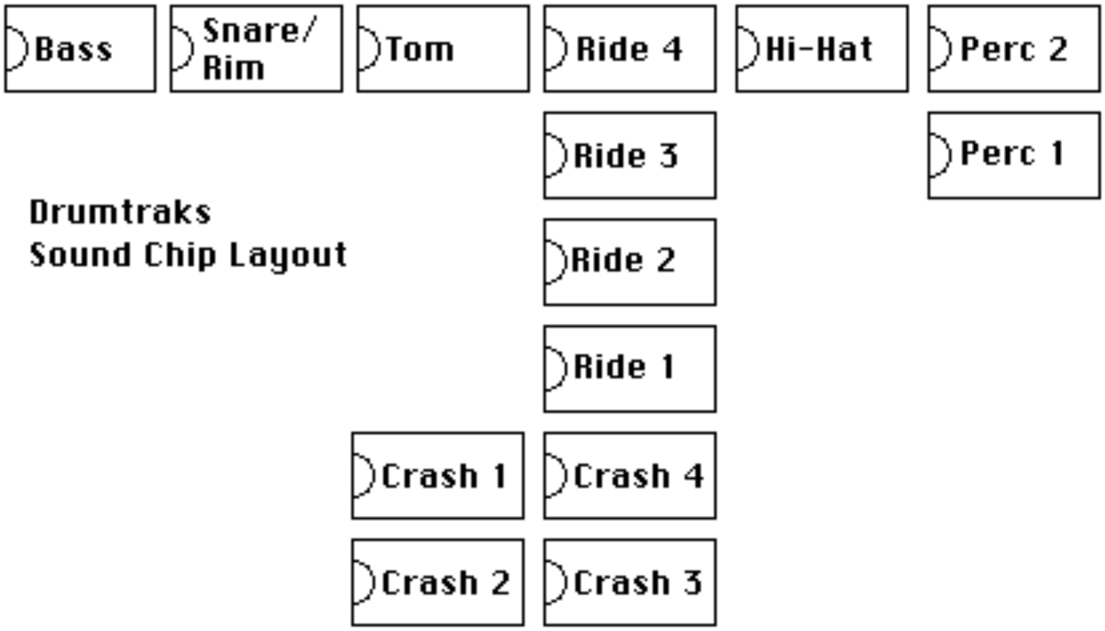


Figure 12 - S.C.I. Drumtraks

SIMMONS DRUM MACHINES

All Simmons drums that use digital drum sounds (EPROMs) use 8 Bit Linear data format. At the date of this writing, the following Simmons machines have actually been tested at Oberheim for compatibility with the Prommer.

SIMMONS SDS-1

The SDS-1 is a drum pad with an EPROM sound generating circuit built into it. A switch selects either an 8k sound or a 16k sound (2764 or 27128). As with all Simmons machines, the data format is linear and several controls are available for changing the playback parameters of pitch, envelope, etc.

SIMMONS SDS-9

The SDS-9 has provisions for three digital sound chips (Linear Format) played with the Snare, Rim A and Rim B controls. The chips may be 2764 or 27128 types (8k or 16k) and several controls are available for modifying the playback parameters of the sounds.

APPENDIX 1 - PART B

USING MIDI ZONES

The creative possibilities for using the Prommer with a MIDI keyboard are almost limitless. An understanding of zones is an important key to acheiving these capabilities. This section will discuss ways of playing notes on a keyboard to trigger sounds in the Prommer and also change blocks (sounds).

REQUIREMENTS

To begin with, it will be assumed that you have a keyboard or other controller capable of transmitting MIDI information including velocity and pressure. Velocity and pressure are not necessary for playing sounds, but can add dynamic control of sounds by modulating the VCF and VCA. Velocity also has another use, as will be discussed later.

Connect the MIDI Output of the keyboard to the MIDI Input of the Prommer.

MIDI ZONE MODE

With the MIDI Mode on the Prommer to MIDI ZONE MODE, playing a note on the keyboard will play the sound in the current block at a pitch relative to the note played based on the current sample rate, transpose and fine tune settings of the block.

By carefully setting the zone limits for each block, you can select a different block when a note is played that falls outside the zone limits for the current block.

For example, suppose you have three sounds in the Prommer in blocks 1, 3 and 5 and you want to play each of these sounds in a different range depending on what part of the keyboard you play (see the picture below).

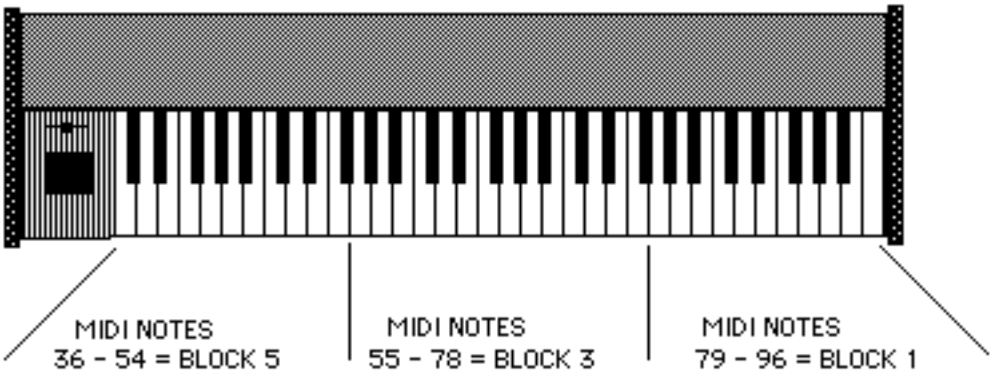


Figure 13 - MIDI Zone Example

To do this, you must set the zone limits for each of the blocks involved, and also in order to keep the other blocks from playing, you must set the upper and lower limits of all unused blocks to zero.

For Block 1, set the lower limit to 79 and the upper limit to 127. For Block 3, set the lower limit to 55 and the upper limit to 78, and for Block 5, set the lower limit to 0 and the upper limit to 54.

Now, select Block 1 and press middle C on the keyboard (MIDI note 60). Notice that the block number on the display changes to 3 and you hear Block 3 play.

Press keys in other parts of the keyboard and see what happens - notes on the lower part of the keyboard play Block 5, notes in the middle play Block 3, and higher notes play Block 1.

Here is what was actually happening when you first pressed middle C: The current block was Block 1, and the note played (60) was outside of the zone limits for the block (79-127). Since the note didn't fit within the limits for Block 1, the limits for the next block, Block 2, were checked against note number 60. Block 2 had both limits set to zero, so again, the note didn't fit within the limits of the block, and the next block was checked. Block 3 had its limits set to 55 and 78 and since 60 does fit within this range, Block 3 became the current block and was played. This checking process happens every time a new MIDI note is played.

Three blocks were used just as an example here, but if you like, you can control as many as sixteen blocks from the keyboard, each in its own zone.

SIMULATING A MIDI DRUM MACHINE

Here is one example of using several drum sounds in the Prommer to simulate a MIDI drum machine. A typical MIDI controlled drum machine uses MIDI notes in a specific range to play its drums, with each MIDI note in that range assigned to a different sound. Let's assume that the Prommer has 12 different sounds in blocks 1 through 12 that you want to play from the range of MIDI notes 36 through 47. Start by setting the zone limits for each of the blocks to its respective MIDI note - both upper and lower limits should be the same.

Next set both zone limits for unused blocks 13 through 16 to zero, and finally, set the Key Pitch Enable for all blocks OFF, so all drum sounds will play at their normal pitches.

Now, playing any key below MIDI note 36 or above 47 will have no effect, and every key between 36 and 47 will play a different block.

OVERLAPPING ZONES

Zones may overlap also. Suppose you have two sounds in the Prommer that you want to play from the keyboard and the limits for one are set to 37 - 96 and the other to 36 - 95. With all other block zone limits set to zero, playing a note anywhere on the keyboard between notes 37 and 95 will play whichever of the two blocks is currently selected. You can then switch from one block to the other by playing the highest key (96) or the lowest key (36). Playing note 36 while in the block with the [37 - 96] limits will switch to the next available block, in this case, the one with [36 - 95] limits. Playing note 96 then will select the other block.

UNDEFINED ZONES

If there are any "holes" in the arrangement of zones (that is a place on the keyboard that has no blocks assigned to it) , and you play a note in this range, the Prommer will not play any block.

MIDI VELOCITY ZONE MODE

When the MIDI mode is changed to "VELO. ZONE MODE", all the zone limits that were set for ranges of the keyboard now will apply to ranges of MIDI Note-On velocities. The permissible range of MIDI velocities is the same as for MIDI notes; 0 - 127. If you were to use the setup shown in the picture above, with Velocity Zone mode selected, blocks 1, 3 or 5 would play depending on how fast you strike the key on the keyboard. A light touch would play Block number 5, a moderate stroke would play Block 3, and a fast depression would play Block 1.

You may also divide the ranges of keyboard velocities among up to sixteen different blocks, but it is difficult to have precise control over velocity, so it is best to limit the number of blocks controlled by velocity to a maximum of about four. Also be aware that some types of keyboards are not capable of sending every possible value of velocity over MIDI.

An example of using Velocity Zone mode might be the case where you have three samples of the same note from an electric bass guitar. The first sample is a note that was played softly, the second sample was played a little louder and the third sample was "popped", or played with great emphasis. Assuming these samples are in blocks 1, 2 and 3 respectively, you can set the zone limits as follows: Block #1 limits = 0 - 45, Block #2 limits = 46 - 75, Block #3 limits = 76 - 127, and blocks #4 through #16 limits = 0 - 0.

Now, you can play the bass from the keyboard with dynamic control. A way to further enhance the control of this sound is to set the MIDI Velocity destination to VCF, so the velocity also controls the brightness of the sound as well as the actual sample played.

Oberheim Prommer
EPROM Cross Reference

EPROM COMPATIBILITY

2K EPROMs (2716)

Programming of 2716 types is not supported by the Prommer, however, 2716s may be loaded into memory by setting the Prommer for a 2732 or 2732A PROM type. Select a 2k length block and use the LOAD DATA or LOAD LINEAR function.

4K EPROMS (2732)

4K EPROMs are used in the:

Oberheim DMX
Linn Drum
S.C.I. Drumtraks

8K EPROMS (2764)_

8K EPROMs are used in:

Oberheim DMX
Oberheim DX
Oberheim Stretch
Linn 9000
S.C.I Drumtraks
Simmons SDS-1 (Linear format data)
Simmons SDS-9 (Linear format data)

16K EPROMS (27128)

16K EPROMs are used in:

Simmons SDS-1 (Linear format data)
Simmons SDS-9 (Linear format data)

32K EPROMS (27256)

32K EPROMs are used in:

Oberheim DX cymbal (serial #H45001 and later)
Oberheim Stretch cymbal

EPROM PROGRAMMING INFORMATION

EPROM type	Capacity	Program Voltage	Algorithm
2732	4k	25	Slow
2732A	4k	21	Slow
2764	8k	21	Fast
2764A	8k	12.5	Fast
27128	16k	21	Fast
27128A	16k	12.5	Fast
27256	32k	12.5	Fast
27256D	32k	21	Fast
27512	64k	12.5	Fast
Am9864	8k	5	Fast
2864A	8k	5	Slow

4k PROMS

Manufacturer	Part #	Type	Select PROM type

AMD	AM2732	*	EPROM	2732
	AM2732A	*	EPROM	2732A
Fujitsu	MBM2732A	*	EPROM	2732A
	MBM27C32A		EPROM	2732A
	MBM2732	*	EPROM	2732
Hitachi	HN27C32		EPROM	2732
	HN27C32A		EPROM	2732A
	HN462732	*	EPROM	2732
	HN482732A	*	EPROM	2732A
Intel	2732		EPROM	2732
	2732A	*	EPROM	2732A
	P2732A		PROM	2732A
Mitsubishi	M5L2732K		EPROM	2732
	M5L2732A		EPROM	2732A
National	NMC2732		EPROM	2732
	NMC27C32		EPROM	2732
NEC	D2732D	*	EPROM	2732
	D2732A	*	EPROM	2732A
SGS	M2732A	*	EPROM	2732A
Texas Inst.	TMS 2732JL	*	EPROM	2732
	TMS 2732A		EPROM	2732A
Toshiba	TMM2732D	*	EPROM	2732
	TMM2732A		EPROM	2732A

* These types of PROMs have been tested at Oberheim and are known to work with the Prommer.

8K PROMS

Manufacturer	Part #		Type	Select PROM type
AMD	AM2764		EPROM	2764
	AM2764A		EPROM	2764A
	AM2864BDC	*	EEPROM	AM9864
	AM9864DC	*	EEPROM	AM9864
Fujitsu	MBM2764	*	EPROM	2764
	MBM27C64		EPROM	2764
Hitachi	HN27C64G		EPROM	2764
	HN482764G	*	EPROM	2764
	HN482764P		PROM	2764
Intel	2764		EPROM	2764
	2764A		EPROM	2764A
	P2764		PROM	2764
	P2764A		PROM	2764A
Mitsubishi	M5L2764K		EPROM	2764
NEC	D2764		EPROM	2764
SEEQ	DQ5133	*	EPROM	2764
	DQ5133H		EPROM	2764
SGS	2764		EPROM	2764
S-MOS	SPM2864C	*	EEPROM	2864C
Texas Inst.	TMS 2764	*	EPROM	2764
Toshiba	TMM2764D		EPROM	2764

* These types of PROMs have been tested at Oberheim and are known to work with the Prommer.

16K PROMS

Manufacturer	Part #		Type	Select PROM type
AMD	AM27128		EPROM	27128
	AM27128A		EPROM	27128A
Fujitsu	MBM27128	*	EPROM	27128
Hitachi	HN27C128		EPROM	27128
	HN4827128		EPROM	27128
Intel	27128		EPROM	27128
	D27128A	*	EPROM	27128A
Mitsubishi	M5L 27128K	*	EPROM	27128
NEC	D27128		EPROM	27128
SEEQ	5143		EPROM	27128
S-MOS	SPM 27128H		EPROM	27128
	SPM 27128C		PROM	27128
Texas Inst.	TMS 27128		EPROM	27128
Toshiba	TMM 27128D		EPROM	27128
	TMM 24128P		PROM	27128

* These types of PROMs have been tested at Oberheim and are known to work with the Prommer.

32K PROMS

Manufacturer	Part #		Type	Select PROM type
AMD	AM27256DC	*	EPROM	27256
Fujitsu	MBM27256		EPROM	27256
	MBM27C256		EPROM	27256
General Inst.	27256		EPROM	27256
Hitachi	HN27C256G		EPROM	27256
	HN27256G	*	EPROM	27256
	HN4827256		EPROM	27256
Intel	D27256	*	EPROM	27256
Mitsubishi	M5L27256	*	EPROM	27256
NEC	D27256		EPROM	27256
	D27C256D	*	EPROM	27256D
Oki	27256		EPROM	27256
Toshiba	TMM27256D	*	EPROM	27256D
	TMM24256P		PROM	27256D

64K PROMS

Manufacturer	Part #		Type	Select PROM type
AMD	AM27512	*	EPROM	27512
Intel	27512		EPROM	27512

* These types of PROMs have been tested at Oberheim and are known to work with the Prommer.

Prommer MIDI Specification

PROMMER MIDI IMPLEMENTATION

TRANSMITTED DATA - CHANNEL VOICE MESSAGES

-None-

RECEIVED DATA - CHANNEL VOICE MESSAGES

Status byte	Data bytes	(See notes 1-7)	
1000nnnn	0kkkkkkk	Note Off event	
	0xxxxxxx	Note Off velocity	-Ignored-
1001nnnn	0kkkkkkk	Note On Event	
	0vvvvvvv	Note On velocity	(vvvvvvv = 0 : Note Off)
1010nnnn	0kkkkkkk	Polyphonic Key Pressure	
	0vvvvvvv	Pressure value	
1011nnnn	0ccccccc	Control change (see Channel Mode msgs. below)	
	0xxxxxxx	Control value (ignored)	
1100nnnn	0xxxpppp	Program Change pppp = Block number - 1	
1101nnnn	0vvvvvvv	Channel Pressure vvvvvvv = Pressure value	
1110nnnn	0vvvvvvv	Pitch Bend Change LSB	
	0vvvvvvv	Pitch Bend Change MSB	

RECOGNIZED RECEIVE DATA - CHANNEL MODE MESSAGES

1011nnnn	01111011	All Notes Off command
	00000000	
1011nnnn	01111100	OMNI mode off - Basic channel reverts to last s
	00000000	(All Notes Off)
1011nnnn	01111101	OMNI mode on
	00000000	(All notes off)

SYSTEM EXCLUSIVE MESSAGES

PROMMER SYSTEM EXCLUSIVE SOUND DUMP REQUEST FORMAT (Received)

MIDI Data:	Description:
11110000	System exclusive status byte
00010000	Oberheim ID number
00000101	Prommer ID number
00000000	Command byte 1 : block dump request
0000pppp	Command byte 2 : requested block number - 1
11110111	EOX (End system exclusive data)

PROMMER SOUND DUMP FORMAT (transmitted and received)

11110000	System exclusive status byte
00010000	Oberheim ID number
00000101	Prommer ID number
00000001	Single block sound transfer code
0000pppp	Transmitted block number - 1 (0 - 15)

Note:
Data bytes are sent as four bit nybbles, most significant nybble sent first (MSN also identified by bit 6 = 1).

(Block Parameters)

0100dddd , 0000dddd	Start address MSB
0100dddd , 0000dddd	Start address LSB
0100dddd , 0000dddd	Block length MSB
0100dddd , 0000dddd	Block length LSB
0100dddd , 0000dddd	Loop start point address offset MSB
0100dddd , 0000dddd	Loop start point address offset LSB
0100dddd , 0000dddd	Loop end point address offset MSB
0100dddd , 0000dddd	Loop end point address offset LSB
0100dddd , 0000dddd	Zone upper limit
0100dddd , 0000dddd	Zone lower limit
0100dddd , 0000dddd	Miscellaneous status: Bit 7 = Data protected (1) / unprotected (0) Bit 6 = Pre-emphasis on (1) / off (0) Bit 5-2 = undefined Bit 1,0 = 00 sample rate 32kHz 01 sample rate 24kHz 10 sample rate 16kHz 11 sample rate 12kHz
0100dddd , 0000dddd	Playback mode

Bit 7 =	Gated play mode
Bit 6 =	Loop play mode
Bit 5 =	MIDI pitch disable
Bit 4 - 0 =	undefined

0100dddd , 0000dddd	Playback pitch transpose amount Range = +/- 48 semitones
0100dddd , 0000dddd	Playback pitch fine tune value Range = -127 to +127
0100dddd , 0000dddd	Playback filter frequency control 0 = Tracking filter 1 - 255 = fixed frequency
0100dddd , 0000dddd	(Future expansion)
0100dddd , 0000dddd	(Future expansion)
0100dddd , 0000dddd	(Future expansion)
0100dddd , 0000dddd	(Future expansion)
0100dddd , 0000dddd	(Future expansion)

(Sound data)

0100dddd , 0000dddd	Sound data starts here
…	…
0100dddd , 0000dddd	Last byte of sound data
11110111	End system exclusive status byte

PROMMER GLOBAL PARAMETER DUMP (Transmitted and received)

The global parameter dump is transmitted automatically after a "System Exclusive Dump ALL" command.

11110000	System exclusive status byte
00010000	Oberheim ID number
00000101	Prommer ID number
00000011	Parameter Dump code
0100xxxx, 0000xxdd	MIDI mode: 0= keyboard zone, 1=Block/Channel mode, 2=velocity zone
010000dd, 0000dddd	Bend Range [0≤d≤36]
0100xxxx, 0000xxxd	Program Change Enable: 1=Enabled
0100mxxx , 0000dddd	MIDI Channel (d): 0-15, OMNI mode (m): 1=on
0100xxxx , 0000xxdd	MIDI Velocity destination:0=off, 1=VCA, 2=VCF
0100xxxx , 0000xxdd	MIDI Pressure destination:0=off, 1=VCA, 2=VCF
0100xxxx , 0000xxxd	Idle Bypass Mode: 0=off, 1=on
0100pxxx, 0000xxxd	Ext. trigger enable(d): 1=enabled, 0=disabled Ext. trigger polarity (p): 1=positive, 0=negative
0100dddd , 0000dddd	Ext. trigger delay MSB
0100dddd , 0000dddd	Ext. trigger delay LSB
11110111	EOX (End system exclusive data)

UNIVERSAL SAMPLE DUMP SYSTEM MESSAGES

DUMP REQUEST: (transmitted and received)

11110000	F0H	System exclusive status byte
01111110	7EH	Universal ID number
0ddddddd	--	Channel number - currently set to Basic channel
on		transmission and ignored on reception.
00000000	03H	Dump Request command byte
0ddddddd	--	Sample Number (LSB) (Block number)
0ddddddd	--	Sample Number (MSB) (zero transmitted,
ignored on		reception)
11110111	F7H	EOX

ACKNOWLEDGE (ACK): (transmitted and received)

Acknowledge is used for handshaking in a closed loop system to signal acceptance of the header or a packet of information.

11110000	F0H	System exclusive status byte
01111110	7EH	Universal ID number
0ddddddd	--	Channel number
01111111	7FH	ACK command byte
0ddddddd	--	Packet number - Packet number that is being acknowle
11110111	F7H	EOX

NOT ACKNOWLEDGED (NAK): (transmitted and received)

NAK is used to signal an that an error in reception has occured and that the indicated packet should be retransmitted.

11110000	F0H	System exclusive status byte
01111110	7EH	Universal ID number
0ddddddd	--	Channel number
01111110	7EH	NAK command byte
0ddddddd	--	Packet number
11110111	F7H	EOX

CANCEL (CAN): (transmitted and received)

Cancels a transmission in progress.

11110000	F0H	System exclusive status byte
01111110	7EH	Universal ID number
0ddddddd	--	Channel number
01111101	7DH	Cancel command byte
0ddddddd	--	Packet number
11110111	F7H	EOX

WAIT: (Received)

Causes the Prommer to suspend transmission until an ACK is received.

11110000	F0H	System exclusive status byte
01111110	7EH	Universal ID number
0ddddddd	--	Channel number
01111100	7CH	Wait command byte
0ddddddd	--	Packet number
11110111	F7H	EOX

SAMPLE DUMP HEADER: (transmitted and received)

Precedes an actual sample dump.

11110000	F0H	System exclusive status byte
01111110	7EH	Universal ID number
0ddddddd	--	Channel number - Currently set to Basic Channel
on		transmission, ignored on reception.
00000001	01H	Sample Dump Header command byte
0ddddddd	--	Sample Number (LSB)
0ddddddd	--	Sample Number (MSB)
000ddddd	--	Sample Format (Number of significant bits; 8 -
28)		
0ddddddd	--	Sample period in nanoseconds (LSB)
0ddddddd	--	sample period
0ddddddd	--	sample period (MSB)
0ddddddd	--	Sample length in words (LSB)
0ddddddd	--	sample length
0ddddddd		sample length (MSB)
0ddddddd	--	Sustain Loop Start Point word number (LSB)
0ddddddd	--	sustain loop start point
0ddddddd	--	sustain loop start point (MSB)
0ddddddd	--	Sustain Loop End Point word number (LSB)
0ddddddd	--	sustain loop end point
0ddddddd	--	sustain loop end point (MSB)
0000000d	0 or 1	Loop Type (0= forward only, 1=
backward/forward)		
11110111	F7H	EOX

DATA PACKET: (transmitted and received)

As many packets as are necessary to send the entire sample are transmitted. Packet numbers start at zero and increment by one. After packet numbers reach 7FH, they start again at zero. The checksum is the exclusive-OR of all bytes in the packet with the exception of the F0H sytem exclusive status byte, the EOX status byte and the checksum itself. Each packet contains exactly 120 data bytes - any unused bytes in the last packet are filled with zeros. Each word of data is transmitted in two's complement linear format - left justified in 2, 3, or 4 bytes - 7 bits per byte. The number of bytes per word depends on the Sample Format described in the Sample Header.

11110000	F0H	System exclusive status byte
01111110	7EH	Universal ID number
0ddddddd	--	Channel number
00000010	02H	Packet command byte
0ddddddd	--	Running packet count (current packet number)
0ddddddd	(120 data bytes)	
0ddddddd	--	Checksum of previous 124 bytes
11110111	F7H	EOX

PROMMER REMOTE KEY SYSTEM EXCLUSIVE FORMAT (received)

11110000	System exclusive status byte	
00010000	Oberheim ID number	
00000101	Prommer ID number	
00000010	Command byte : Key stroke(s) follow	
0ddddddd	1-15 Data bytes : Key codes (see note 8)	
. . . .		Allow time for Prommer to empty key queue
0ddddddd		before sending more key code data bytes.
11110111	F7H	EOX (End system exclusive data)

Note 1: nnnn = Basic Channel -1 (0000 = Channel 1, 0001 = Channel 2, etc.)
Note 2: kkkkkkk = Note number
Note 3: xxxx = Don't care
Note 4: ccccccc = Controller number
Note 5: vvvvvvv = Value
Note 6: dddd = Data
Note 7: pppp = Program or block number -1

Note 8: Table of key codes

00H	0	01H	1
02H	2	03H	3
04H	4	05H	5
06H	6	07H	7
08H	8	09H	9
0AH	#	0BH	+/-
0CH	Left Arrow [<]	0DH	CLEAR
0EH	Right Arrow [>]	0FH	PLAY
10H	External Trigger display	11H	Play Mode display
12H	Transpose display	13H	Sample Rate display
14H	Select Block display	15H	EXECUTE
16H	PARAMETERS	17H	RECORD
18H	Stretch display	19H	Mix Blocks display
1AH	Envelope display	1BH	Reverse display
1CH	Copy Block display	1DH	MIDI Mode display
1EH	MIDI Bend Range display	1FH	STOP
20H	Run Program display	21H	Load Data display
22H	Program PROM display	23H	Verify Erasure display
24H	Select PROM display	25H	MIDI Channel display
26H	MIDI Block Dump display	27H	Receive MIDI display
28H	Null	29H	Compare Data display
2AH	PROM Offset display	2BH	Program Linear display
2CH	Transmit Data display	2DH	Filter Frequency display
2EH	Erase Block display	2FH	Erase All display
30H	Examine RAM display	31H	Program Setup display
32H	MIDI Velocity display	33H	Idle Bypass display
34H	Emphasis display	35H	Loop Start display
36H	Loop End display	37H	Ring Modulation display
38H	Mix Ratio display	39H	Swap Blocks display
3AH	Bit Manipulation display	3BH	Record Trigger Threshold
3CH	Envelope Decay Rate	3DH	Envelope Decay Start Point
3EH	Data Display Mode	3FH	Memory Protect display
40H	MIDI Program Change	41H	Display Sample Time
42H	Fine Tune display	43H	MIDI Echo display
44H	Block Address display	45H	Block Length display
46H	Zone Lower Limit display	47H	Zone Upper Limit display
48H	Load Setup display	49H	External Trigger Holdoff
4AH	MIDI Pressure display	4BH	Load Linear Data display
4CH	Universal MIDI Dump	4DH	Squash Block display
4EH	Block Address whole num.	4FH	Block Length whole num.
50H	MIDI Pitch enable display	51H	MIDI Dump All Blocks disp.
52H	Request Universal Dump		
7FH	Immediate EXECUTE (for RUN PROGRAM)		

IF YOU HAVE A PROBLEM

WARRANTY

The staff at E.C.C. / Oberheim wish to thank you for purchasing an Oberheim product and hope that you will remain a long-time Oberheim player. We are confident that your instrument will provide you with years of excellent service as each unit is thoroughly tested and inspected before it leaves the factory. The Owner's Manual was written to be logical and comprehensive so that you will be able to get the most out of your Oberheim.

Although we have taken great care in manufacturing your Oberheim instrument and preparing thorough documentation in the manual, products at this level of technology may require servicing. The following Warranty Policy outlines your rights and responsibilities, and also lists several limitations of coverage and important exclusions. We strongly recommend that you read the following policy statements carefully and refer to the procedure at the end in obtaining service for your Oberheim product should it ever be needed.

OBERHEIM LIMITED CUSTOMER WARRANTY (Non-Transferable)

Oberheim, a Division of E.C.C. Development Corporation, warrants its products, when purchased in the United States of America from an Authorized Oberheim Dealer, to be free from defects in materials or workmanship for a period of 12 months from the date of purchase. Warranty service is effective and available to the original purchaser **ONLY**, and only upon completion and return of the Oberheim Warranty Registration card within 14 days of the date of purchase.

Warranty coverage is valid for Factory-Authorized updates to Oberheim products when their installation is performed by an ECC / Oberheim Authorized Service Center and a properly completed Warranty Certificate is returned to the factory within 14 days of installation.

To obtain service under this Warranty, the product must, upon discovery of the defect, be properly packed and shipped to the nearest Oberheim Authorized Service Center. The party requesting Warranty service must provide proof of original ownership and date of purchase of the product, or date of installation of the update, by supplying to the Oberheim Authorized Service Center either the Warranty Registration Sticker applied to the unit itself, or the sales receipt / installation receipt. In the event that both have been lost or misplaced, the Service Center shall, at the Service Center's or owner's expense, contact Oberheim to verify the Warranty status of the product.

If the Warranty has been verified, Oberheim will, without charge for parts or labor, either repair or replace the defective part(s). If the Warranty cannot be verified, the entire cost of the repair in parts and labor is the responsibility of the product's owner.

PRICES AND SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

WHAT IS COVERED

ECC / Oberheim warrants that it will make all necessary adjustments, repairs or replacements at no cost to the original owner within the first 12 months from the purchase date if:

1. The product fails to perform its specified functions due to failure of one or more of its components.

2. The product fails to perform its specified functions due to defects in workmanship.

3. The product is maintained and operated by the owner in strict accordance with the written instuctions for proper maintenance and use as specified in the Owner's Manual.

WHAT IS NOT COVERED

Before purchasing and using, the owner shall determine the suitability of the product for his/her intended use, and the owner assumes all risk and liability whatsoever in connection therewith. Oberheim shall not be liable for any injury, loss or damage, direct or consequential, arising out of the use or inability to use the product.

The Warranty provides only the benefits specified and does not cover defects or repairs needed as a result of acts beyond the control of Oberheim including but not limited to:

1. Damage caused by abuse, accident or negligence.

Oberheim will not cover under warranty any EPROM, Sound Chip or Voice Card damaged or destroyed as a result of the owner's mis-handling, or the improper removal and installation into the Prommer or DMX, DX or Stretch Digital Drum Machines.

2. Any tampering, alteration or modification of the product's mechanical or electronic components.

3. Failure to operate the product in strict accordance with the procedures written in the Owner's Manual.

4. Repairs performed by unauthorized persons.

5. Damage caused by fire, smoke, falling objects, water or liquids etc. or natural events such as rain, earthquakes, floods, lightning, tornadoes, storms, etc.

6. Damage caused by operation on improper voltages.

IMPORTANT NOTICE: **The warranty is VOID if the product is electronically or mechanically modified, altered or tampered with in any way.**

Oberheim shall not be liable for costs involved in packing or preparing the product for shipping with regards to time, labor or materials, shipping and freight costs, or time and expenses involved in transporting the product to and from an Oberheim Authorized Service Center, an Oberheim Authorized Dealer or the Oberheim

Factory. If a suitable shipping container is unavailable, a replacement carton may be purchased from Oberheim.

Oberheim will not cover under Warranty an apparent malfunction that is determined to be in fact user error, or the owner's inability to use the product.

Oberheim will not cover under Warranty an apparent malfunction that is inaccurately or inadequately described by the owner to the Service Center at the time of repair.

THE DURATION OF ANY OTHER WARRANTIES, WHETHER IMPLIED OR EXPRESS, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY OF MERCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN.

Oberheim hereby excludes incidental and consequential damages, including but not limited to:

1. Loss of time
2. Inconvenience
3. Delay in performance of the Warranty
4. The loss of use of the product
5. Commercial loss
6. Breach of any express or implied warranty, including the Implied Warranty of Merchantability, applicable to this product.

Oberheim shall not be liable for damage or loss resulting from the negligent or intentional acts of the shipper or his contract affiliates. The owner of the product should contact the shipper for proper claims procedures in the event of damage or loss resulting from shipment.

HOW TO OBTAIN WARRANTY SERVICE

If you have reason to believe that your Oberheim product is malfunctioning or otherwise not operating properly, do the following:

STEP 1: **CONTACT YOUR NEAREST ECC / OBERHEIM SERVICE CENTER**
Telephone them as soon as the problem is discovered. Be prepared to discuss the problem as completely and accurately as possible. A current roster of Authorized Service Centers is included with the Owner's Manual.

The Service Center will let you know when the repair can be scheduled, the approximate number of days it will take to complete the repair and if the required parts are in stock or if they need to be ordered.
Take the failed unit to the Service Center along with the sales receipt as the Service Center will need to verify the Warranty. If you have returned your Warranty Card, the Warranty Verification Sticker affixed to the bottom panel of your unit is sufficient to prove warranty status.

The Service Center will then inspect the product and take the necessary steps to complete the repair.
If the product continues to malfunction or another problem different from the original problem occurs, contact the service center IMMEDIATELY so that the problem can be resolved without delay or futher complications.

STEP 2. **CONTACT YOUR ECC / OBERHEIM DEALER**

If you feel that your problem has not been resolved, contact the Oberheim Dealer where the product was purchased. It will be most expedient if you discuss the matter personally with the salesperson who sold you the instrument. By making the salesperson aware of your situation, they will be in a better position to assist you in getting the problem resolved.

STEP 3: **CALL OR WRITE TO THE OBERHEIM FACTORY**

If you believe that the problem is still unresolved after you have contacted the Service Center and Dealer, contact the Oberheim factory. In an attempt to resolve your problem, we will work with your local Service Center or Dealer to review and verify the information and facts. Based on these facts, we will advise or consult with the Service Center or Dealer as appropriate.

Written correspondence should be addressed to:

OBERHEIM
Division of E.C.C. Development Corporation
Customer Services Department
11650 Olympic Boulevard
Los Angeles, CA 90064

Every attempt will be made to respond to your letter as quickly as possible.

If you would prefer to contact the Oberheim factory by telephone, a Service Representative will be available to assist you. Our telephone hours are from 1:00 PM to 4:00 PM West Coast Time, Monday through Friday **only.** The Customer Services Department can be reached at 213-479-4851. Collect calls cannot be accepted.

When calling the ECC / Oberheim offices:

√ Have your instrument and amplifier turned on and in front of you when you are on the phone. You should also have your Owner's Manual with you.

√ Tell the receptionist that you are having a problem with your Oberheim product and ask to speak to a Service Representative.

√ Be prepared to provide the following information:

1. Your name.
2. The model of the product.
3. The product's Serial Number.
4. The name of the Dealer from where it was purchased.
5. The exact date of purchase.
6. A complete description of the problem.

When writing to Oberheim, please also include your full address, telephone number and the best time to call should it be necessary to call you rather than answer your letter.

OBERHEIM PROMMER SPECIFICATIONS

Inputs

Microphone input: balanced low impedance XLR connector
Line input: unbalanced high impedance - 1/4 phone jack
Input sensitivity switch selectable:
  Line input : +4dB / -10dB
  Mic. input : -46dB / -60dB (Ref. 0dB = .775vrms)
External Trigger: AC coupled
  Sensitivity: 200mv rms at 1kHz
  Trigger response time: 3 milliseconds
MIDI Input: 5 pin DIN socket

Meter

Peak reading LED meter graduated in 3 db steps
Clipping level = +3

Outputs

Unbalanced output - 1/4 inch phone jack
  Output level = +3dB (4vp-p) for 0db meter reading
MIDI Output: 5 pin DIN socket

Signal to noise ratio

Bypass mode on: 58db

Display

16 Character Alphanumeric Vacuum Fluorescent

Memory capacity

65536 (64K) bytes in16 User definable Blocks

Sampling Rates

12kHz, 16kHz, 24kHz, 32kHz

Maximum Recording time

5.46 seconds

Sampling Format

8 Bit Companding

Power requirements

115vac 18 watts

Prommer EPROM Log

EPROM NAME: EPROM type:

Block size: Data offset:

Description of sound or data:

Performance data

Sample rate: Transpose: Fine tune:

Filter setting: Emphasis:

Loop mode: Loop start: Loop end:

Notes:

Programmer's name: Creation date:

Prommer EPROM Log

EPROM NAME: EPROM type:

Block size: Data offset:

Description of sound or data:

Performance data

Sample rate: Transpose: Fine tune:

Filter setting: Emphasis:

Loop mode: Loop start: Loop end:

Notes:

Programmer's name: Creation date: