

ALESIS

HA-16[®] HIGH SAMPLE RATE / 16 BIT DRUM MACHINE

MMT-8[®] MULTI TRACK MIDI RECORDER

HA-16[®] HIGH SAMPLE RATE / 16 BIT DRUM MACHINE

Instruction Manual

Dear Alesis Customer:

You have just purchased a powerful music production/comprehensive electronic percussion system. Please take a moment to glance through this manual to gain a better understanding of the operation of the HR-16, the MMT-8, and the HR-16:B.

The operating systems of the Alesis HR-16 and the HR-16:B are identical with a few exceptions. All instructions and descriptions of HR-16 functions in this manual will apply to the operation of the HR-16:B except for those exceptions which are noted throughout the manual. When using the HR-16 and the HR-16:B together as one unit, please refer to the instruction manual insert, "Using the HR-16 with the HR-16:B", or to the insert instruction card located inside the flip-up instruction lid. Both of these instructions are included with your HR-16:B.

PLEASE READ THIS

Concerning the backup memory of the HR-16 and MMT-8.

The backup memories in the HR-16 and the MMT-8 are non-volatile. They are protected by a lithium cell battery with an expected life of 10 years. This means you can turn power off on both machines and your work will be retained in memory.

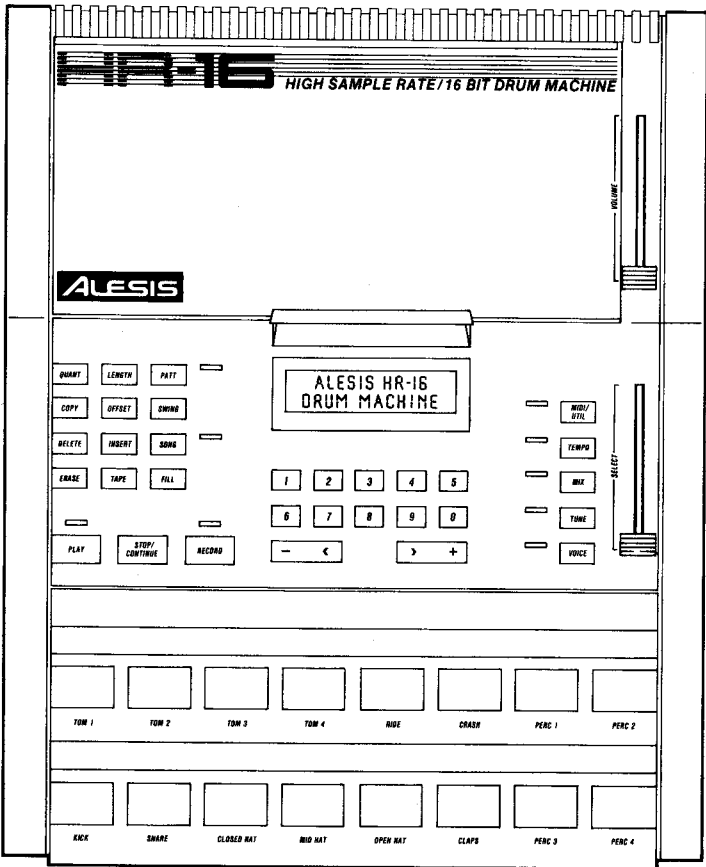
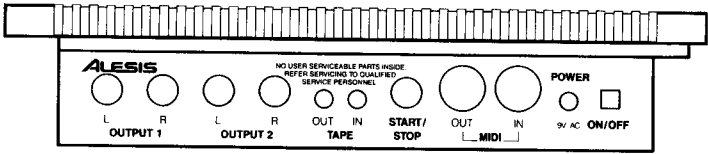
However, please be aware that any computer based device with memory backup can be subject to losing its memory at any time for the following reasons:

- 1) If power is interrupted, even briefly, during RECORD, ERASE, or LENGTH CHANGE, you may lose all memory or some minute portion of memory. This is possible because the MMT-8 and HR-16's internal computers are moving information around in memory during these operations. A power surge, or power interruption could cause an unfortunate memory loss during these vulnerable operations.
- 2) Static electricity can also cause a full or partial memory loss.

Therefore, it is recommended that you frequently backup any important work you are involved in. It is a simple operation. Please make it a habitual part of your use of the HR-16 and MMT-8, so that your enjoyment and musical progress won't be interrupted. See the sections on TAPE in this Instruction Manual.

ALESIS HR-16 HIGH SAMPLE RATE 16 BIT DIGITAL DRUM MACHINE

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INTRODUCTION

The Alesis HR-16 (High sample Rate / 16 bit drum machine) is a user friendly, yet extremely powerful MIDI drum sequencer / sound generator. The sound generation capabilities of the HR-16 include 16 independent drum "voices", each of which can be assigned to any one of 49 digital samples (47 in the HR-16:B), and can be routed with a 7 position pan to one of two sets of stereo outputs. Each voice can also be tuned independently in 32 increments over an octave and a half.

The sequencing of the drums is accomplished by entering record, and then playing on the touch-sensitive drum buttons on the front panel, which is then stored into a "pattern." There can be up to 100 patterns in the HR-16's memory (00-99). These patterns can be anywhere from 1 to 682 beats long. The patterns can be combined into lists of patterns, which are called "songs." There can be up to 100 songs in the HR-16's memory(00-99), and each can contain a list of patterns up to 255 steps long.

The 16 drum pads at the front of the HR-16 are velocity-sensitive. How hard the pad is hit determines the volume of the drum on 8 levels. 12 of the pads (all pads except Closed Hat, Mid Hat, Open Hat, and Crash) are each directly assigned to a voice. This means that playing a pad repeatedly will retrigger the same voice, and no other pad will effect that voice.

Any sounds assigned to the three Hi Hat pads will all be assigned to the same voice. This is so that playing the Closed Hat will cut off the Open or Mid Hat, for a more realistic hi hat sound. The Crash pad is assigned to two voices that alternate. This means that repeatedly hitting the crash pad results in two independent crashes (of the same sound) that can overlap as they decay.

More sounds can be made to overlap by assigning the same sound to two different pads and alternating which pad is pressed each time the sound is to be played. Only 15 voices have been used (12 normal pads, 1 voice for Hi Hats, 2 for Crash). The 16th voice is used for the Click, which can also be assigned to be any of the available sounds.

PLEASE NOTE THESE FEATURES

PROGRAM CHANGE THROUGH MIDI

This allows MIDI program selection of patterns to work while a part is playing. If a new program number is received over MIDI, this program number will be selected to be the NEXT pattern number to play when the current pattern is finished. This functions exactly as if the new pattern number had been selected with the keypad. If a song is playing, MIDI program commands will be ignored.

SONG CHANGE THROUGH MIDI

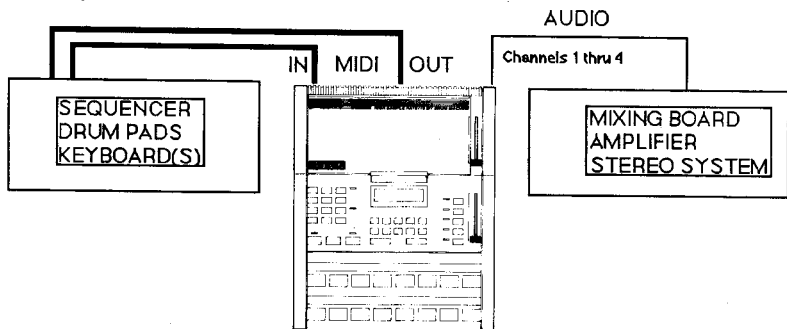
MIDI program changes will select songs if the HR-16 is in Song mode, and not playing.

SPOT ERASING

This allows spot erasing while in record mode when Quantize is OFF. The erase button and a drum button can be held down while recording with quantize off in order to erase all drum events (quantized or not) that occur during the time that the buttons are held down.

HR-16 QUICK BASIC SETUP

1. Connect output 1 (either left, right or both) to a suitable monitoring system. If output 2 is connected, the desired drum pads must be assigned to output 2 using the **MIX** button. (See MIX.)
2. Connect the MIDI IN jack of the HR-16 to the MIDI OUT jack of a sequencer, an external drum pad controller, or a keyboard.
3. Connect the MIDI OUT jack of the HR-16 to other MIDI sound sources when daisy chaining MIDI devices or to an external drum source. The MIDI OUT jack also doubles as a MIDI THRU jack and both MIDI IN data and data produced on the HR-16 are present at the MIDI OUT jack if desired.



For stand alone operation the MIDI jacks need not be connected.

MIDI allows rhythm triggering and programming of the HR-16 from external MIDI devices, such as keyboards or drum pads that are equipped with MIDI. Also, MIDI can be used to sync different devices to the HR-16, save and recall the memory using an external disk drive via MIDI system exclusive data dump, and receive program change commands which will call up patterns.

The program change command is useful for accessing different sets of sounds when triggering sounds from drum pads or sequencers.

If a new program change command is received while the HR-16 is in PLAY mode, the program number will select the next pattern to play after the current pattern is finished.

The HR-16 has two stereo outputs (four individual outputs). The volume slider is active on only the first stereo output (output 1). In addition, if only one side of an output is connected, the stereo mix assigned on that stereo output becomes a mono mix on that single output. This saves having to reconstruct a mono mix from a stereo mix, when only a single output is being used.

Using Four outputs, assign the kick to output 2 panned hard left and the snare to output 2 panned hard right. This leaves all other drums on output 1 panned in stereo as desired and the kick and snare assigned to their own output.

For more information on setting up drum machines and sequencers, see MMT-8 BASIC SET UP in the MMT-8 Instruction Manual.

PATTERN MODE

When power is first turned on, the HR-16 will be in SONG or PATT mode (SONG or PATT LED lit), depending on the mode that was selected before power was turned off. The song or pattern number will also be the same as when power was turned off.

PATT (pattern) Button

Press the PATT button to enter pattern mode. PATT LED will light. Now, the display reads:

SELECT PATT 00

Selecting a PATTERN

The 00 is underlined to indicate that it will be changed if a new number is selected with the keypad or the +/- arrow buttons. Pressing the +/- arrow buttons immediately selects the next pattern number, with the numbers looping past 99 to 00 and looping down from 00 to 99. If a single digit on the keypad is pressed (3, for example), the display will change to:

SELECT PATT 3_

The display is now indicating that the second digit of the pattern should be entered. After entering the second digit, the new pattern is selected. If the second digit is not entered within 2 seconds, the display will revert back to the previous pattern number, and no new pattern will have been selected. This type of keypad entry is consistent with all entries made with the keypad described in this manual. Pressing PLAY will start playing the selected pattern from its beginning, and the PLAY LED will light. The display will read, for example:

PLAYING PATT 00
BEAT 001

The display is now showing the current beat number and the pattern number that is being played. As each beat occurs, the display will advance the beat count. While the pattern is playing, the keypad and +/- arrow buttons can be used to select a new pattern number. The display will read:

PATT 00 NEXT 01
BEAT 001

Selecting new PATTERNS in PLAY

At the end of the current pattern, the newly selected pattern number will play, with the beat count starting again at 001. The NEXT pattern to play can be changed up until the end of the current pattern is reached, after which the new pattern will begin playing, and the display will revert back to PLAYING PATT.

STOP/CONTINUE Buttons

Pressing STOP/CONTINUE will stop playing a pattern, and the display will return to the select pattern display. Pressing STOP/CONTINUE again will begin playing a pattern from the beginning of the beat it was on when it was stopped. Pressing PLAY will always start a pattern from the beginning. When a pattern reaches its end, it will loop back and continue playing from the beginning.

RECORDING A PATTERN (Also see LENGTH and QUANTIZE)

To record on a pattern, press and hold the RECORD button, and then press the PLAY button. The HR-16 will immediately begin playing back any existing drums in the currently selected pattern from the beginning, and will add any new drums played on the buttons or via MIDI to the pattern. The PLAY and RECORD LEDs will be lit, and the display will read:

RECORDING PATT 00
BEAT 001

The pattern number is not underlined, indicating that a new pattern cannot be selected while recording. When a drum button is pressed, it is recorded along with its dynamics on eight levels. The drums are always recorded quantized to the nearest currently selected quantize beat. Pressing STOP exits record mode, and both the RECORD and PLAY LEDs will turn off. If PLAY is pressed while in RECORD, the RECORD LED will turn off, and the pattern will immediately begin playing from the start.

LENGTH

When recording for the first time on an empty pattern, the length will default to 8 beats, unless it was set previously with the LENGTH button.

The LENGTH button is used to set the length of a pattern to a specified number of beats. While holding the LENGTH button, the display will show the current length of the current pattern. If it is an empty pattern, the display will read:

PATT 00
LENGTH 008 BEATS

8 beats is the default length of an empty pattern. If it is desired to change the length, the +/- arrow buttons can be used to move the length up or down in single beat increments (001 minimum, 682 maximum), or a three digit number can be entered with the keypad. In either case, the new length is not entered into the pattern until the RECORD button is pressed. When RECORD is pressed the display changes to:

PATT 00
LENGTH CHANGED

This display remains until RECORD is released. If LENGTH is released before RECORD is pressed, no change to the length will be made, regardless of what was pressed on the keypad. If RECORD is pressed after entering a partial length (1 or 2 digits), nothing will happen. When entering in digits, the first digit entered (1, for example) results in the following display:

PATT 00
LENGTH 1_ BEATS

The display is now waiting for the entry of the second digit. If the second digit is not entered within 2 seconds, the display will revert to its previous value. If RECORD is pressed after entering an incomplete length (1 or 2 digits), the display will revert to its previous value.

When a new length is entered (RECORD), any drum events that were beyond the new set length will be erased. If the new length is longer than the previous one, the additional length will be filled with silence. If it is desired to remove or add length to the beginning of a pattern, first set the desired length (as described above), and then press and release the PATT button. The display will change to:

CHANGES PATT TOP
LENGTH 008 BEATS

Pressing the PATT button again will toggle back to the original display. If RECORD is pressed with the above display showing, any additional beats will be placed at the beginning of the pattern, and any beats removed will be removed from the pattern top. Drum events that were stored in the removed beats will be removed from the pattern.

The LENGTH button has no effect in song mode, or while a song or pattern is playing.

QUANTIZE

The QUANTIZE button is used to select the resolution at which drum events are to be recorded. While holding down the QUANTIZE button in pattern mode, the display will read:

QUANTIZE RECORD
TO 1/16

The 10 quantize choices are 1/4, 1/6, 1/8, 1/12, 1/16, 1/24, 1/32, 1/48, 1/64, and OFF. The +/- arrow buttons of the keypad can be used to scroll through the choices. The keypad buttons 1-0 can also be used to select the quantize value directly, with 1 = 1/4 and 0 = OFF.

Quantize will only affect newly recorded events, and will not change any events already recorded. Whenever a new quantize value is selected, the swing amount will be reset to 50%. Also, the quantize value determines the step amount to be used when in pattern step mode (PATT+RECORD). If quantize is set to OFF, the steps will be in 384th notes.

ERASE

The erase button is used to erase a single drum, a pattern, or a song. When in PATT mode, pressing and holding the ERASE button causes the following display:

ERASE PATT 01

The number 01 would actually be the currently selected pattern number. To erase the selected pattern, press RECORD. The display will change to:

ERASE PATT 01
PATT ERASED

The display will remain this way until the RECORD button is released, after which the display will return to its previous state. To erase a single drum, press and hold the ERASE button, and select the desired drum button. If, for example, TOM 1 is pressed, the display will read:

ERASE PATT 01
TOM 1 ERASED

TOM 1 is now completely erased from pattern 1. When erasing a single drum, it is not necessary to press RECORD.

In SONG mode, holding the ERASE button will cause the following display:

ERASE SONG 01

Pressing the RECORD button will erase the currently selected song number.

When erasing a pattern or song, the erase is not executed until RECORD is pressed, and will be aborted if ERASE is released before pressing RECORD. When erasing a drum, the erase occurs as soon as the drum button is pressed. The ERASE button has no effect while a song or pattern is playing.

Erasing individual drums in RECORD mode (selected beats)

While recording in a pattern, individual drums can be erased by holding the ERASE button while playing the drum on the desired beat to be erased. If the drum was hit within a quantize window in which that same drum had been previously recorded, it will be erased. Holding the drum button down will continue to erase any of the same drum events that may occur.

This means that a drum button can be held down with ERASE throughout a part of a pattern while in record in order to erase all of that drum's events that occur within the current quantize step. If eighth notes existed on a snare for example, and erase and snare were held down in record while in quarter note quantize, only the snare events on quarter notes would be erased.

Erasing an entire drum button's rhythm (all beats) or erasing and entire PATTERN

While not playing or recording a pattern, the ERASE button can be used to erase all of a drum's events (regardless of quantize mode) from the entire pattern by holding erase and hitting the drum. It can also be used to erase the entire pattern by holding ERASE and hitting RECORD.

STEP EDIT MODE

How to enter STEP EDIT mode

To enter step record / step edit, press and hold PATTERN, and then press RECORD, then release both buttons. The RECORD LED will light, but the PLAY LED will not, indicating that you are in step mode. The display will look as follows:

STEP 001 + 00/96
PERC 1 VOLUME:8

The first line of the display shows the current beat number, followed by the sub-beat shown as a fraction of 96ths of a beat. The + arrow button is used to move forwards in

single steps of the current quantize value (you cannot move backwards). If quantize is set to 1/16, each step will equal 24/96 (If swing is set to 50%).

If a drum existed on a step in between the current quantize value, it will play as it is stepped past, but the display will not stop on that drum. The lower display shows the drum that was triggered followed by the volume of that drum. Since only one drum can be displayed at a time, if more than one drum occurred on the same beat, the + arrow button will advance through each drum one at a time before advancing to the next step. If a quantize step does not have any drum recorded on it, the display will read EMPTY in place of the drum name. The 16 possible drums are displayed with 7 characters each as follows:

TOM 1	TOM 2	TOM 3	TOM 4	RIDE	CRASH	PERC 3	PERC 4
KICK	SNARE	CLS HAT	MID HAT	OPN HAT	CLAPS	PERC 1	PERC 2

These same displays appear elsewhere in this manual when the drum buttons are displayed. The volume is shown as one of eight possible volumes. To add a new drum to a beat, just press a drum button. That drum, along with its volume (how hard the pad was hit), will be recorded onto the displayed step.

If there were other drums already recorded on that beat, they are not effected. If the drum played already existed on the current beat, it will be replaced with the new volume played.

Erasing a drum from a step

To erase a drum from a step, hold ERASE, and press RECORD, the drum that was being displayed will be erased. To edit the volume of a drum, the 1-8 buttons on the keypad are used, or the displayed drum is replayed. Step mode is exited by pressing STOP or PATTERN. If PLAY is pressed, step mode will be exited, and the pattern will begin playing from the beginning. If swing is on, STEP mode will step in "swinged" increments.

SONG MODE

Selecting and Playing a SONG / SONG Button

Press the SONG button to enter song mode. The display will read as follows, with the last song entered being indicated in the number portion of the display.

```
SELECT SONG 00
STEP 01 PATT 27
```

Selecting a SONG

A SONG is a list of patterns in a specific order, with each entry into the list being a STEP which contains a pattern number. The 00 is underlined to indicate that it will be changed if a new number is selected with the keypad. If a single digit on the keypad is pressed (2, for example), the display will change to:

```
SELECT SONG 2
STEP 01 PATT 27
```

The display is now indicating that the second digit of the song should be entered. After entering the second digit, the new song is selected. If the second digit is not entered within 2 seconds, the display will revert back to the previous song number, and no new song will have been selected. The +/- arrow buttons are used to scroll forwards and backwards through the steps within a song. Pressing PLAY will start playing the selected song from its beginning, and the PLAY LED will light. The display will read, for example:

SONG 00 BEAT 001
STEP 01 PATT 27

The first line of the display is now showing the current song number being played, and the current beat number of the pattern being played. The second line of the display is showing the step number and the pattern assigned to the step that is playing at the moment. When the song advances to the next step, the display will show the pattern for step 2, etc. Pressing STOP/CONTINUE will stop playing the song, and the display will return to the select song display. Pressing STOP/CONTINUE again will begin playing the song from the point at which it was stopped. Pressing PLAY will always start the song from the beginning of the first step. When a song reaches its end, it will stop and the PLAY LED will turn off, unless SONG LOOP (see MIDI/UTIL) is on, which will cause the song to loop back to step one and continue playing.

SONG EDIT

A song is edited by using the DELETE, INSERT, and OFFSET buttons, along with the +/- arrow buttons. The arrow buttons are used to move forward and backward through the list of steps in a song. If a song is empty, the display will read:

SELECT SONG 00
STEP 01 END

Inserting a Step / INSERT Button

To insert a step into a song at the currently displayed step, press and hold INSERT. The display will read:

INSERT INTO
STEP 01 PATT 00

While holding the INSERT button, the keypad or +/- buttons can be used to change the pattern number displayed. To complete the insertion, the RECORD button must be pressed while still holding the INSERT button. The display will read:

INSERT COMPLETED
STEP 01 PATT 00

This display will remain until RECORD is released, after which the display will revert to the first INSERT display. If it is desired to insert the same pattern many times, the RECORD button can be pressed repeatedly while holding the INSERT button. Each time a pattern is inserted, the previous pattern at the displayed step is moved to step +1, and all other steps after it are also stepped +1. If a tempo change is desired, pressing TEMPO while holding INSERT causes the following display:

INSERT INTO
STEP 01 TEM 120

The keypad can now be used to change the desired tempo to be inserted into the song. Again, pressing RECORD completes the insertion. Pressing the TEMPO button again will change the display to PATT again. The programmable tempo range of a step in a song is from 46 to 200 beats per minute.

Deleting a step / DELETE Button

To delete a step from a song, press and hold the DELETE button, and the display will read:

DELETE STEP
STEP 01 PATT 27

To complete the deletion, the RECORD button must be pressed while still holding the DELETE button. This shifts all patterns after the displayed step down one step. After all steps have been deleted, the display will show step 1 being END (empty song). The END step cannot be deleted (RECORD will be ignored).

Replacing a step / OFFSET Button

The OFFSET button is used to replace the currently displayed step's pattern or tempo with another pattern or tempo. It is provided as a convenience, and essentially does the same thing as DELETE followed by INSERT. Pressing and holding the OFFSET button causes the following display:

REPLACE STEP
STEP 01 PATT 00

While holding the OFFSET button, the keypad can be used to change the pattern number displayed. To complete the replacement, the RECORD button must be pressed while still holding the OFFSET button. The display will read:

STEP REPLACED
STEP 01 PATT 00

This display will remain until RECORD is released, after which the display will revert to the first REPLACEMENT display. If the step being replaced contained a tempo, the display will read TEM instead of PATT. Whether replacing a pattern or a tempo, the TEMPO button can be turned on or off so as to change what the replacement will be. When replacing a step, all other steps remain unchanged, since the number of steps does not change.

Erasing an entire SONG

To erase an entire song, press and hold the ERASE button. The display will read:

ERASE SONG 00

While holding the ERASE button, if RECORD is pressed, the song will be erased, and the display will read:

ERASE SONG 00
SONG ERASED

This display will remain until RECORD is released. In all of the above editing examples, no changes to the song will occur until RECORD is pressed.

COPY

Copying a PATTERN to itself

The copy button is used to append a pattern or song to another pattern or song. It only functions while the COPY button is held down. If the COPY button is released (either before or after the copy is executed), the previous mode will show up on the display, and copy mode is exited. When in PATT mode, and COPY is pressed and held:

FOR THE HR-16 - Pressing RECORD completes the operation and the display reads COPY COMPLETE.

FOR THE HR-16:B - At this point you may either enter the pattern's two-digit number with the keypad or press the + or - key to set the copy assignment to the same pattern number. Pressing RECORD completes the operation and the display reads COPY COMPLETE.

This display remains until the RECORD button is released, which then returns the display to its previous state. The above example demonstrated copying a pattern to itself, which will double the length of that pattern.

Copying a PATTERN to another PATTERN

To copy a pattern to another pattern, press and hold COPY, then enter the two digit pattern number with the keypad. The display will show the selected pattern number. Pressing RECORD initiates the copy, and appends the source pattern (the current pattern before COPY was pressed) to the destination pattern (the pattern entered with the keypad). If the destination pattern was empty, then the destination now contains an exact copy of the source pattern.

If the destination was not empty, then the destination's length is increased by the length of the source pattern, and the source pattern is appended to the end of the destination pattern. All voice, mix, and tuning assignments made on the source pattern will be overridden by the destination pattern's assignments. If the length of the destination pattern would result in more than 682 beats after copying, the copy will not be executed, and the display will read:

TOO MANY BEATS
IN PATTERN

Copying a single drum pad's rhythm to another drum pad

Single drum pads can also be copied to other pads. If a drum pad (CLOSED HAT, for example) is pressed while holding the COPY button, the display will read:

COPY FROM PATT
CLS HAT > 2

Both displayed pattern numbers will actually display the current pattern number (00-99).

The display is now waiting for a second drum pad to be pressed (pressing RECORD at this point will do nothing). If for example, TOM 1 was pressed, the display would read:

COPY FROM PATT
CLS HAT > IOM 1

The display of the second pad pressed remains underlined, indicating that it can still be changed by selecting another drum pad. As in copying patterns, once RECORD is pressed, the copy will be complete, and the display will read "COPY COMPLETE."

The length of the rhythm of the destination pad will not be changed, and the source drum rhythm will be merged with the destination drum rhythm. The destination drum will remain assigned to its previous voice, mix, and tuning. A drum from one pattern can be copied to a drum of another pattern if the destination pattern is selected before selecting the source and destination drum buttons.

Copying a SONG to itself

In SONG mode, pressing and holding the COPY button will result in the following display:

COPY FROM SONG
01 TO SONG 01

The 01 display will actually show the currently selected song number. Like in PATT mode, pressing RECORD will append the current song to itself, making it twice as long.

Copying a SONG to another SONG

If a new song number is selected, the display will show the newly selected song number, and pressing RECORD will append the source song number (the number selected before pressing COPY), to the destination song number (the number selected while holding COPY).

This mode is very useful, since a verse consisting of more than one pattern could be entered into a song, and then appended into another song when needed without having to re-enter the patterns for the verse. If the destination song would result in more than 255 steps after copying, the copy will not be executed, and the display will read:

TOO MANY STEPS
IN SONG

In all cases, the copy is not executed until RECORD is pressed, and will be aborted if COPY is released before pressing RECORD. The COPY button has no effect while a song or pattern is playing.

OFFSET

The OFFSET button is used to add or subtract a number of clock pulses (384th notes) to a drum or pattern. If OFFSET is held down, the display will show:

OFFSET 00/384th

The keypad can be used to enter a two-digit number (00-99), or the +/- arrow buttons can be used to increment or decrement the amount. The range of the offset is ± 99 . Entering a value with the keypad will remain the current display sign (+ or -). To change the sign, the +/- buttons must be used to "pass through" zero. Pressing the RECORD button executes the offset command for all drums in a pattern, resulting in the following display:

OFFSET 03/384th
PATT OFFSET

This display remains until RECORD is released. The offset function moves drum events ahead (+) or behind (-) the beat in 384th note steps. This is used to change the "feel" of the pattern. If an event is moved past the end of a pattern, it is put at the beginning. Likewise, if an event is moved to before the beginning, it is put at the end. Like the ERASE function, individual drums can be offset as well. If, for example, TOM 1 is pressed, the display will read:

OFFSET 03/384th
TOM1 OFFSET

TOM 1 is now offset ahead of its previous location by 3 384th notes. Unlike quantize, this feature modifies the already existing drum events in a pattern, and does not effect any newly recorded events in the pattern. Because of this, it is suggested that a copy of a pattern be made before changing the offset so that the original will be easily retrievable if the results are undesirable.

The OFFSET button does not function while playing a pattern, or while in song mode.

SWING

The SWING button is used to change the ratio between two equal rhythmic values (such as 1/16th notes) in order to achieve a shuffle feel. If SWING is held down, the display will show:

SWING IN RECORD
00=50.0%

The display above shows the current swing value. The +/- arrow buttons can be used to increment or decrement the swing number, with the percentage of swing

shown beside it. 0 swing = 50% = no swing. The range of the swing is determined by the current quantize value. The swing amount will only effect newly recorded drum events, like in quantize. The swing amounts are shown below:

<u>QUANT</u>	<u>SWING</u>	<u>PERCENTAGE</u>
1/4	00	50.0 %
1/6	00 - 24	50.0 - 68.8 %
1/8	00 - 16	50.0 - 66.7 %
1/12	00 - 12	50.0 - 68.8 %
1/16	00 - 08	50.0 - 66.7 %
1/24	00 - 06	50.0 - 68.8 %
1/32	00 - 04	50.0 - 66.7 %
1/48	00 - 02	50.0 - 62.5 %
1/64	00 - 01	50.0 - 58.3 %
OFF	00	50.0 %

The SWING button does not function while playing a pattern, or while in song mode.

FILL

The FILL button is used to allow repeated entries of drums into a pattern without having to repeatedly press the drum buttons. While FILL is held down, pressing and holding any drum button will cause that drum to repeat at the current quantize rate until either the FILL button or the drum button is released. The volume of the repeats will be determined by how hard the drum button is first hit. Fill will only work while playing or recording.

MODE / DATA ENTRY BUTTONS

All MODE buttons function as on/off switches. This means that they are pressed once to enter the mode, and pressed again to exit the mode. When any of the modes have been entered, the associated LED will be lit. For simplicity, any time PATTERN or SONG is pressed, any previously selected mode will be turned off.

The VOICE, TUNE, and MIX settings can be stored with each pattern by holding the RECORD button and pressing VOICE, TUNE, or MIX, respectively. Any changes made to these parameters without storing them are temporary edits that will be lost if a new pattern is selected. Copying a pattern to an empty pattern will also copy these settings. Copying a pattern to a not empty pattern will not copy these settings, but will instead retain the settings of the pattern being copied to. An empty pattern defaults to a standard voice assignment with no pitch shift, and nominal mix levels.

IMPORTANT NOTE: VOICE, TUNE, AND MIX ASSIGNMENTS CANNOT BE STORED IN AN EMPTY PATTERN UNLESS THE LENGTH HAS BEEN CHANGED TO A LENGTH OTHER THAN 8 BEATS.

VOICE

Selecting a VOICE

To change the sound of any of the drum pads, the desired pad is pressed. If KICK is pressed, for example, the display will show:

KICK PAD = 01 24" POWER KICK

The slider, keypad, or +/- arrow buttons can be used to change the selected sound, and the lower display will show the name of the currently selected sound. There are a total of 49 sounds to choose from. Any changes made to any of the drum pads are temporary until stored and will be lost as soon as a new pattern is selected, or the current pattern is reselected (unless Manual Voice/Tune/Mix is off, see below) .

Storing VOICE settings

To store the VOICE settings, press and hold RECORD, and then press VOICE. When this is done, the voice settings will be permanently stored with the current pattern.

IMPORTANT NOTE: VOICE, TUNE, AND MIX ASSIGNMENTS CANNOT BE STORED IN AN EMPTY PATTERN UNLESS THE LENGTH HAS BEEN CHANGED TO A LENGTH OTHER THAN 8 BEATS.

TUNE

The TUNE mode is used to select the desired pitch for each drum pad, and the click. When it is pressed, its LED will light, and the display will read:

CLICK
PITCH = 0

This display appears when TUNE is first pressed, and the display was not previously in MIX or VOICE mode for a drum pad. It is used to select the pitch of the click (metronome). The pitch amount can be changed with the slider, or the +/- arrow buttons. The range is from -16 to +15. As with the voice mode, pressing a drum pad will select that drum for pitch editing. Also like in voice mode, changes made to drum pads are temporary until stored by holding RECORD and pressing TUNE. **See IMPORTANT NOTE under storing voice settings.**

MIX

The MIX button is used to change the volume, panning, and output assignment of each drum button. When MIX is pressed its LED lights, and the display reads:

CLICK OUTPUT 1
VOL: 65 PAN: . .

This display appears when MIX is first pressed, and the display was not previously in VOICE or TUNE mode for a drum pad. It is used to select the output, the volume, and the panning of the click (metronome). The output is selected with the 1 and 2 buttons of the keypad to select stereo outputs 1 or 2, respectively. The volume control is adjusted with the slider (00 to 99), and the panning is adjusted with the +/- arrow buttons. The panning is seven position, and the display will show <3, <2, <1, <, 1>, 2>, or 3>. As with the voice mode, pressing a drum pad will select that drum for mix editing. Also like in voice mode, changes made to drum pads are temporary until stored by holding RECORD and pressing MIX. **See IMPORTANT NOTE under storing voice settings.**

NOTE: The Volume slider on the front controls output 1 only.

TEMPO

The TEMPO button is used to change the tempo of a pattern or song. The tempo can be stored with a song, but not with a pattern. While in pattern mode, the tempo remains at its previous setting until changed. While in song mode, the tempo changes to the programmed tempo each time a tempo step is encountered within a song. While in pattern mode, pressing the TEMPO button causes the TEMPO LED to light, and results in the following display:

TEMPO = 120
BEATS PER MINUTE

The +/- arrows and the SELECT slider can be used to select a new tempo, or a tempo can be entered directly with three digits on the keypad. Tempo changes are effective as soon as they are entered, and the RECORD button does not have to be pressed.

In SONG mode, the tempo is displayed as a relative amount of change from the pre-programmed song tempo. The display reads:

```
SONG TEMPO 100%  
TEMPO = 120
```

The current tempo (the one most recently recalled within a song) will be displayed in the lower display, and the upper display shows the percentage of programmed tempos to be used. The keypad can be used to enter a three-digit number, or the +/- arrow buttons can be used to increment or decrement the amount. The range of the shift is 50% (half tempo) to 200% (double tempo). This change is shown as a percentage so that any tempo changes that occur in the song will keep their time ratios constant.

MIDI / UTIL

The MIDI / UTIL button is used to access a number of miscellaneous functions that usually do not need to be accessed very often. The functions are scrolled through with the SELECT slider, with the display showing the current function, and each function being numbered for easy reference. The keypad and +/- arrow buttons are used to change the parameters. All of these parameters are global parameters, e.g., they are set once for the entire machine and are not programmable for each pattern or song. The pages are as follows:

MIDI CHANNEL

The first MIDI UTIL page is MIDI CHANNEL. The display looks like this:

```
01 SET MIDI  
CHANNEL: 01
```

The keypad and +/- buttons can be used to change the MIDI channel from 01 to 16. This sets the MIDI channel that the HR-16 will transmit and receive on. If 00 is selected, the display will read OMNI. In OMNI mode, the HR-16 will transmit on channel 1, and will receive on all channels. The default is OMNI.

RECEIVE MIDI DRUMS

The RECEIVE MIDI DRUMS function is used to determine whether or not incoming MIDI notes from a sequencer, keyboard, or MIDI drum pad controller should trigger the drums. The display looks like this:

shown beside it. 0 swing = 50% = no swing. The range of the swing is determined by the current quantize value. The swing amount will only effect newly recorded drum events, like in quantize. The swing amounts are shown below:

<u>QUANT</u>	<u>SWING</u>	<u>PERCENTAGE</u>
1/4	00	50.0 %
1/6	00 - 24	50.0 - 68.8 %
1/8	00 - 16	50.0 - 66.7 %
1/12	00 - 12	50.0 - 68.8 %
1/16	00 - 08	50.0 - 66.7 %
1/24	00 - 06	50.0 - 68.8 %
1/32	00 - 04	50.0 - 66.7 %
1/48	00 - 02	50.0 - 62.5 %
1/64	00 - 01	50.0 - 58.3 %
OFF	00	50.0 %

The SWING button does not function while playing a pattern, or while in song mode.

FILL

The FILL button is used to allow repeated entries of drums into a pattern without having to repeatedly press the drum buttons. While FILL is held down, pressing and holding any drum button will cause that drum to repeat at the current quantize rate until either the FILL button or the drum button is released. The volume of the repeats will be determined by how hard the drum button is first hit. Fill will only work while playing or recording.

MODE / DATA ENTRY BUTTONS

All MODE buttons function as on/off switches. This means that they are pressed once to enter the mode, and pressed again to exit the mode. When any of the modes have been entered, the associated LED will be lit. For simplicity, any time PATTERN or SONG is pressed, any previously selected mode will be turned off.

The VOICE, TUNE, and MIX settings can be stored with each pattern by holding the RECORD button and pressing VOICE, TUNE, or MIX, respectively. Any changes made to these parameters without storing them are temporary edits that will be lost if a new pattern is selected. Copying a pattern to an empty pattern will also copy these settings. Copying a pattern to a not empty pattern will not copy these settings, but will instead retain the settings of the pattern being copied to. An empty pattern defaults to a standard voice assignment with no pitch shift, and nominal mix levels.

IMPORTANT NOTE: VOICE, TUNE, AND MIX ASSIGNMENTS CANNOT BE STORED IN AN EMPTY PATTERN UNLESS THE LENGTH HAS BEEN CHANGED TO A LENGTH OTHER THAN 8 BEATS.

VOICE

Selecting a VOICE

To change the sound of any of the drum pads, the desired pad is pressed. If KICK is pressed, for example, the display will show:

KICK PAD = Q1 24" POWER KICK

The slider, keypad, or +/- arrow buttons can be used to change the selected sound, and the lower display will show the name of the currently selected sound. There are a total of 49 sounds to choose from. Any changes made to any of the drum pads are temporary until stored and will be lost as soon as a new pattern is selected, or the current pattern is reselected (unless Manual Voice/Tune/Mix is off, see below).

Storing VOICE settings

To store the VOICE settings, press and hold RECORD, and then press VOICE. When this is done, the voice settings will be permanently stored with the current pattern.

IMPORTANT NOTE: VOICE, TUNE, AND MIX ASSIGNMENTS CANNOT BE STORED IN AN EMPTY PATTERN UNLESS THE LENGTH HAS BEEN CHANGED TO A LENGTH OTHER THAN 8 BEATS.

TUNE

The TUNE mode is used to select the desired pitch for each drum pad, and the click. When it is pressed, its LED will light, and the display will read:

```
CLICK
PITCH = 0
```

This display appears when TUNE is first pressed, and the display was not previously in MIX or VOICE mode for a drum pad. It is used to select the pitch of the click (metronome). The pitch amount can be changed with the slider, or the +/- arrow buttons. The range is from -16 to +15. As with the voice mode, pressing a drum pad will select that drum for pitch editing. Also like in voice mode, changes made to drum pads are temporary until stored by holding RECORD and pressing TUNE. **See IMPORTANT NOTE under storing voice settings.**

MIX

The MIX button is used to change the volume, panning, and output assignment of each drum button. When MIX is pressed its LED lights, and the display reads:

```
CLICK OUTPUT 1
VOL: 65 PAN: . .
```

This display appears when MIX is first pressed, and the display was not previously in VOICE or TUNE mode for a drum pad. It is used to select the output, the volume, and the panning of the click (metronome). The output is selected with the 1 and 2 buttons of the keypad to select stereo outputs 1 or 2, respectively. The volume control is adjusted with the slider (00 to 99), and the panning is adjusted with the +/- arrow buttons. The panning is seven position, and the display will show <3, <2, <1, <0, 1>, 2>, or 3>. As with the voice mode, pressing a drum pad will select that drum for mix editing. Also like in voice mode, changes made to drum pads are temporary until stored by holding RECORD and pressing MIX. **See IMPORTANT NOTE under storing voice settings.**

NOTE: The Volume slider on the front controls output 1 only.

TEMPO

The TEMPO button is used to change the tempo of a pattern or song. The tempo can be stored with a song, but not with a pattern. While in pattern mode, the tempo remains at its previous setting until changed. While in song mode, the tempo changes to the programmed tempo each time a tempo step is encountered within a song. While in pattern mode, pressing the TEMPO button causes the TEMPO LED to light, and results in the following display:

```
TEMPO = 120
BEATS PER MINUTE
```

The +/- arrows and the SELECT slider can be used to select a new tempo, or a tempo can be entered directly with three digits on the keypad. Tempo changes are effective as soon as they are entered, and the RECORD button does not have to be pressed.

In SONG mode, the tempo is displayed as a relative amount of change from the pre-programmed song tempo. The display reads:

```
SONG TEMPO 100%  
TEMPO = 120
```

The current tempo (the one most recently recalled within a song) will be displayed in the lower display, and the upper display shows the percentage of programmed tempos to be used. The keypad can be used to enter a three-digit number, or the +/- arrow buttons can be used to increment or decrement the amount. The range of the shift is 50% (half tempo) to 200% (double tempo). This change is shown as a percentage so that any tempo changes that occur in the song will keep their time ratios constant.

MIDI / UTIL

The MIDI / UTIL button is used to access a number of miscellaneous functions that usually do not need to be accessed very often. The functions are scrolled through with the SELECT slider, with the display showing the current function, and each function being numbered for easy reference. The keypad and +/- arrow buttons are used to change the parameters. All of these parameters are global parameters, e.g., they are set once for the entire machine and are not programmable for each pattern or song. The pages are as follows:

MIDI CHANNEL

The first MIDI UTIL page is MIDI CHANNEL. The display looks like this:

```
01 SET MIDI  
CHANNEL: 01
```

The keypad and +/- buttons can be used to change the MIDI channel from 01 to 16. This sets the MIDI channel that the HR-16 will transmit and receive on. If 00 is selected, the display will read OMNI. In OMNI mode, the HR-16 will transmit on channel 1, and will receive on all channels. The default is OMNI.

RECEIVE MIDI DRUMS

The RECEIVE MIDI DRUMS function is used to determine whether or not incoming MIDI notes from a sequencer, keyboard, or MIDI drum pad controller should trigger the drums. The display looks like this:

02 RECEIVE MIDI
DRUMNOTES:OFF

The +/- buttons are used to turn this function on or off. The default is OFF.

TRANSMIT MIDI DRUMS

The TRANSMIT MIDI DRUMS function is used to determine whether or not the HR-16 drum events should be transmitted out MIDI. The display looks like this:

03 TRANSMIT MIDI
DRUMNOTES:OFF

The +/- arrow buttons are used to turn this function on or off. The default is OFF.

MIDI NOTE ASSIGNMENT

The MIDI NOTE ASSIGNMENT function is used to assign a specific MIDI note to each drum button. The display looks like this

04 SET MIDI NOTE
KICK = 061 C#4

The lower display shows the currently selected drum pad name, and the MIDI note number and key assigned to it. The drum pads can be used to select another drum to assign, and the keypad and +/- arrow buttons can be used to select the desired note.

LISTING OF MIDI NOTE ASSIGNMENT DEFAULTS

<u>DRUM</u>	<u>MIDINOTE</u>	<u>KEY VALUE</u>
CLICK	034	A#0
KICK	035	B0
SNARE	038	D1
CLS HAT	042	F#1
MID HAT	044	G#1
OPN HAT	046	A#1
CLAPS	039	D#1
PERC3	037	G3
PERC4	038	G#3
TOM1	048	C2
TOM2	045	A1
TOM3	041	F1
TOM4	063	D#3
RIDE	051	D#2
CRASH	049	C#2
PERC1	065	F3
PERC2	062	D3

MIDI ECHO

The MIDI ECHO function is used to echo any MIDI information that is received at the MIDI input to the MIDI output. The display looks like this:

05 ECHO MIDI IN
TO MIDI OUT: ON

The +/- arrow buttons are used to turn this function on or off. The default is ON. The HR-16 will not echo system exclusive data.

MIDI PROGRAM CHANGE

The MIDI PROGRAM CHANGE function is used to allow MIDI program change commands to select pattern numbers. MIDI programs 00 through 99 will select patterns 00-99, and MIDI programs 100-127 will select patterns 00 through 27. The display looks like this:

06 MIDI PROGRAM
PATT SELECT: OFF

The +/- arrow buttons are used to turn this function on or off. The default is OFF. When ON, incoming MIDI program change commands will select patterns. Program changes will be ignored while a pattern or song is playing.

CLOCK SOURCE

The clock source function is used to select what clock will drive the HR-16. The display will show one of the three following choices:

07 CLOCK SOURCE:
MIDI & INTERNAL

07 CLOCK SOURCE:
INTERNAL ONLY

07 CLOCK SOURCE:
TAPE SYNC IN

By using the keypad or +/- arrow buttons, one of the three clocking sources can be selected. The default setting is MIDI & INTERNAL (1), with the other choices being INTERNAL ONLY (2), and TAPE SYNC IN (3).

MIDI CLOCK OUT

The MIDI CLOCK OUT function is used to turn on or off the transmission of MIDI clocks. The display is as follows:

08 MIDI CLOCK
OUT ENABLE: ON

The +/- arrow buttons are used to turn this function on or off. The default is ON.

AUTO START

The AUTO START function is used to turn on or off the capability of starting a pattern or song automatically if a MIDI start or tape sync signal occurs. The display is as follows:

09 AUTO START
ENABLE: ON

The +/- arrow buttons are used to turn this function on or off. The default is ON.

The HR-16 does not need to turn on or off its internal clock, since it intelligently determines what clock to use when necessary. A functional description of the clocking possibilities are shown in the table below:

CLOCK SOURCE	AUTO START	PRESS PLAY	RECEIVE MIDI START	RECEIVE TAPE SYNC
MIDI & INTERNAL	OFF	2	6	1
MIDI & INTERNAL	ON	2	6	1
INTERNAL ONLY	OFF	2	1	1
INTERNAL ONLY	ON	2	2	1
TAPE SYNC	OFF	3	1	4
TAPE SYNC	ON	3	1	5

1. Do nothing.
2. Start playing from beginning with internal clock.
3. Enter play mode, but don't start playing until tape sync clock occurs.
4. If in play mode, start playing, otherwise ignore sync.
5. Start playing from beginning with tape sync clock.
6. Start playing from beginning with MIDI clock.

If tape sync and auto start are on and a pattern or song is playing, it will stop playing automatically if the tape sync signal is interrupted for more than 1 second. If auto start is not on, the HR-16 will wait in play for more sync pulses.

CLICK VALUE

The click value function is used to set the metric value of the click (metronome). The display looks like this:

10 CLICK VALUE:
1/8

The possible values are the same as in quantize: 1/4, 1/6, 1/8, 1/12, 1/16, 1/24, 1/32, 1/48, 1/64, and OFF. The keypad and +/- arrow buttons are used to change the value. The default is 1/8. If the CLICK value is set to OFF, it will not click in either RECORD or PLAY.

CLICK IN PLAY

The CLICK IN PLAY function is used to turn on or off the click while playing a pattern or song. It does not effect the click in record. The display looks like this:

11 CLICK IN PLAY
ENABLE:ON

The +/- arrow buttons are used to turn this function on or off. The default is ON.

Manual Voice/Tune/Mix

In the "on" position, the currently selected assignments will be applied globally (to all Patterns and Songs). In order to have individual Voice/Tune/Mix assignments per Pattern, this Midi utility must be turned "off".

12 MANUAL VOICE/
TUNE/MIX: OFF

The +/- arrow buttons are used to turn this function on or off. The default is OFF, so that the programmed settings can be used.

BUTTON DYNAMICS

The BUTTON DYNAMICS function is used to select the response of the drum pads. The display will look like this:

13 PAD DYNAMICS
LOUD RESPONSE

The +/- arrow buttons are used to select the pad dynamics choices. The choices are LOUD, MEDIUM, SOFT, and FIXED 1 through FIXED 8. The first three choices are 3 different loudness curves. In the FIXED 1 through 8 settings, the pads will always play the same dynamics (1 through 8), regardless of how hard they are

hit. These curves will also effect MIDI input triggering of the drums. In addition, MIDI input velocity sensitivity allows 32 steps of volume control per drum when used with external controllers such as drum pads or sequencers. Note, however, that recording MIDI input information on the HR-16 will only store 8 steps of velocity inside the HR-16's internal record memory.

SONG LOOP

The SONG LOOP function turns on or off song looping. The display is as follows:

14 SONG LOOP
ENABLE: OFF

The +/- arrow buttons are used to turn this function on or off. The default is OFF. When ON, a song that reaches its end will loop back to the beginning of that song.

TAPE

The TAPE button is used to access the tape interface features of the HR-16. This allows the user to save and retrieve sequence data with an ordinary cassette recorder. Pressing and holding the TAPE button results in the following display:

SAVE ALL PATTS &
SONGS TO TAPE

Pressing the RECORD button initiates the save to tape. Both buttons can now be released, since this operation may take over two minutes, during which the display will read:

SAVING TO TAPE..
PATT: 00

The display shows the current pattern or song being output. This display will advance until all data is output. Pressing the STOP button will abort the operation. Before pressing RECORD, the +/- arrow buttons can be used to access the other five tape pages. They are as follows:

CHECK TAPE DATA
FOR ERRORS

LOAD ALL PATTS &
SONGS FROM TAPE

LOAD ONE PATT
FROM TAPE: 00

LOAD ONE SONG
FROM TAPE: 00

SEND ALL PATTS &
SONGS OUT MIDI

In all five of these pages, pressing RECORD initiates the operation. The verify function is used to insure that the data just recorded to tape is good. Load from tape loads the entire memory with the data on tape. Load patt and load song allow a single pattern or song to be loaded from a tape. The keypad can be used to select the desired number. After pressing RECORD, the display will change to the following (depending on the page shown when it was pressed):

VERIFYING TAPE..
PATT: 00

LOADING TAPE..
PATT: 00

LOADING PATT 27
PATT: 00

LOADING SONG 56
SONG: 00

SENDING OUT DATA
TO MIDI

Again, the RECORD and TAPE buttons can be released, and the display will continue until the operation is complete, with the currently loading or verifying pattern or song number being shown in the display. When loading one pattern or song, the display will continue to show the selected pattern or song number in the upper display. When sending out MIDI data, the display shown above will remain until the data has been sent out. After completion of the tape functions, the display will return to its previous state (select pattern or select song). If an error is encountered while loading a tape, the display will show ERROR as soon as it occurs, for example,

LOADING TAPE..
PATT: 36 ERROR

The tape will attempt to continue to load, but it is possible that the data will be corrupted and therefore unusable.

During any of the tape operations (but not the send MIDI function), the STOP/CONTINUE button can be used to abort the operation. When loading in all patterns and songs, aborting the tape may leave unusable data in memory. When loading one pattern or song, aborting after the selected pattern or song has passed will not cause any problems.

STORING TO DISK USING MIDI SYSTEM EXCLUSIVE BULK DATA DUMP

The HR-16 send to MIDI function is provided so that the data can be stored on a computer, a Yamaha MDF-1 (MIDI Filer) or a Yamaha DX-7IIFD. The data is sent out as one block of system exclusive data, with the length being determined by the amount of memory being used. No more than 50% of memory should be full when saving to a DX-7IIFD or its buffer will be filled. The HR-16 will automatically receive MIDI system exclusive sequence data from any of these devices without having to select a specific page. If the system exclusive data starts to come in, the display will read:

RECEIVING DATA
FROM MIDI.....

This display will remain until the data has been completely loaded, after which the HR-16 will return to song 99. Note that any time the HR-16 receives sequence data from MIDI, any data previously in memory will be lost.

SYNCING THE HR-16 TO TAPE

It is possible to sync the HR-16 to a tape recorder with the help of the TAPE SYNC mode. In this mode, the HR-16 reads a master clock pulse from a track of a tape recorder, which keeps all of the sequencers/drum machines perfectly in time with the recorded information on the tape machine. This method has the advantage of eliminating the need to print drum machine or synthesizer parts on tape, since you can use the master clock recorded on tape (or "sync track") to trigger the drum machine and synthesizers via the sequencer.

RECORDING THE SYNC TONE

Before recording any audio information on the tape machine, you must lay a "Sync Tone" down on one track of the tape machine. This is usually done on an outside track (track 1 or 8 on an eight track machine; track 1 or 16 on a sixteen track machine; etc.) to keep the crosstalk to a minimum.

- 1) Connect the TAPE OUT jack of the HR-16 to the input of the desired track of the tape machine.
- 2) Press PLAY on the HR-16, then adjust the level of the track so that it reads approximately "0VU".
- 3) *You must select a tempo for the song on the HR-16 at this time as it cannot be changed later.*
- 4) Begin recording on the tape machine.
- 5) Press PLAY on the HR-16. Allow the HR-16 to play through its entire song before stopping the recording. When the song has ended, stop the recording and rewind the tape machine. You are now ready to trigger the HR-16 from the sync tone that you just recorded.

NOTES:

- A) *There is no TAPE SYNC OUT switch as this is always active.*

B) Keep the Sync signal at about 0VU in order to avoid dropouts. If the HR-16 does not see the sync tone for 1/2 second, it will assume that the sync tone has ended and will go into STOP mode.

C) If possible, do not use any noise reduction, EQ, or signal processing on the sync tone.

D) Avoid recording high energy, high-frequency tracks next to the sync track.

TO CLOCK THE HR-16 FROM TAPE SYNC

1) Connect the output of the track of the tape machine that has the sync tone to the TAPE IN jack of the HR-16.

2) Press and hold the CLOCK button. The display will read:

CLOCK SOURCE
MIDI & INTERNAL

3) Use the keypad or + and - buttons to select TAPE SYNC IN. The display will read:

CLOCK SOURCE
TAPE SYNC IN

4) Put the tape machine into PLAY. The HR-16 will automatically start as soon as it receives the sync tone, causing any other sequencers connected to it to play. *Be careful to return to the beginning of the sync tone since the HR-16 will automatically begin playing any time that it receives the sync tone.*

USING THE HR-16 AS A SOUND SOURCE

It is possible to trigger the HR-16 from an external controller such as a sequencer, keyboard, or drum pad controller through MIDI. The HR-16 built in sequencer remains idle while the external controller triggers the voices. Be sure to activate MIDI / UTIL #2 RECEIVE MIDI DRUMS ON. If this is set to OFF, it will not be possible to trigger any voices on the HR-16 from the controller.

MIDI program change commands sent to the HR-16 can access patterns. MIDI / UTIL #6 MIDI PROGRAM PATT SELECT must be set to ON to activate this function. This feature was designed to give external MIDI controllers access to different sound set ups stored in any of the 100 available patterns.

IMPORTANT NOTE: VOICE, TUNE, AND MIX ASSIGNMENTS CANNOT BE STORED IN AN EMPTY PATTERN UNLESS THE LENGTH HAS BEEN CHANGED TO A LENGTH OTHER THAN 8 BEATS.

START/STOP FOOTSWITCH

The START/STOP footswitch jack is provided for a momentary normally open footswitch that connects the jack's tip to its sleeve (ground). While in stop, the footswitch will function like the play button and start a pattern or song from the beginning. While in play, the footswitch acts like the stop button, and stops playing.

REMAINING MEMORY

Holding RECORD and pressing LENGTH causes the following display:

REMAINING MEMORY 100 PERCENT

This shows the amount of memory that has not been used. Note that some operations may not be possible even though it seems that there is still a small amount of memory available. This is due to the fact that the HR-16 requires enough memory to duplicate a pattern before it can be recorded on, or length changed, or offset, etc. If a large pattern is attempted to be altered when there is not enough memory to complete the operation, the display will indicate that there is not enough memory available to complete the operation.

CLEARING MEMORY

To clear all of the HR-16's memory and reinitialize all of its variables, turn power off, press and hold ERASE, DELETE, and RECORD, and turn on the power while holding these buttons down for 3 seconds.

HR-16 MIDI IMPLEMENTATION CHART

Function	Transmitted	Recognized	Remarks
CHANNEL Default	1-16	1-16	Memorized
Changed	1-16	1-16	
MODE Default Messages Altered	Mode 3	Mode 1	Honors modes 1,3
NOTE NUMBER True Voice	00-127	00-127	see note 1
VELOCITY Note on	O	O	
Note Off	X	X	
TOUCH Keys	X	X	
Chan's	X	X	
PITCH BENDER	X	X	
CONTROL CHANGE	X	X	
PROGRAM CHANGE True #	X	O 00-99	Program change commands select pattern numbers
SYSTEM EXCLUSIVE	O	O	
SYSTEM COMMON Song Pos	O	O	
Song Sel	X	X	
Tune	X	X	
SYSTEM REAL TIME Clock Messages	O O	O O	
AUX Local Control	X	X	
All Notes Off	X	X	
Active Sense	X	X	
Reset	X	X	
NOTES: Note 1: Transmitted and recognized note numbers can be assigned by panel operation.			

Mode 1: OMNION, POLY
Mode 3: OMNI OFF, POLY

Mode 2: OMNION, MONO
Mode 4: OMNI OFF, MONO

O: YES
X: NO

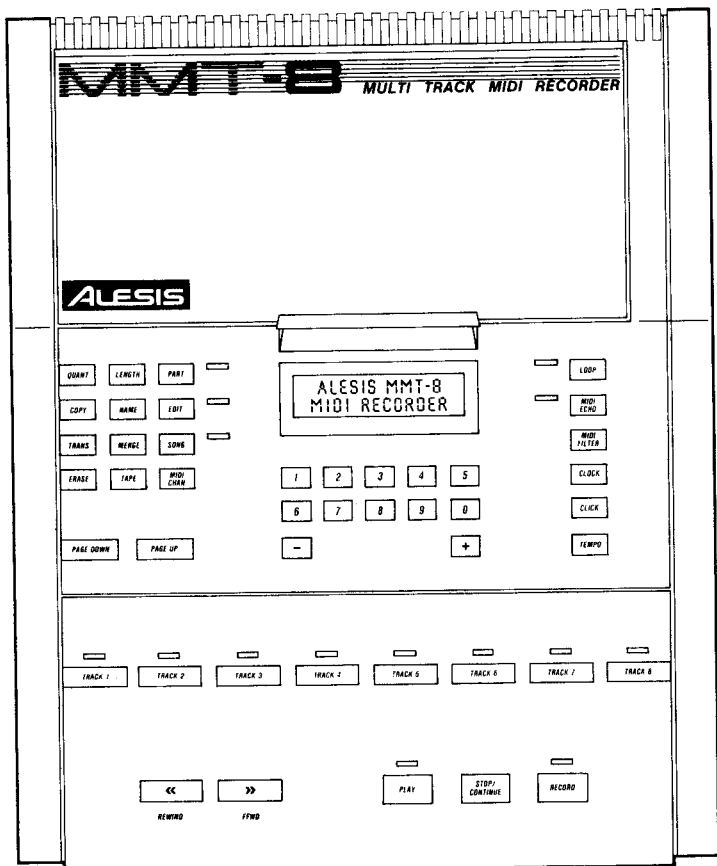
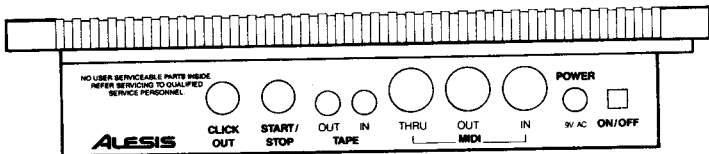
HR-16 TROUBLESHOOTING CHART

SYMPTOM	WHAT 'S PROBABLY WRONG	WHAT TO DO
No power.	Power supply not properly connected. Power switch not turned on. Power supply malfunction.	Check power supply connection. Push in power switch. Check with dealer to test the power supply on a different unit.
No sound.	Audio cable shorted. Output selection. Volume slider down. Wrong output connected.	Check cable. Check MIX parameter. Raise volume slider. Connect proper output.
One or more pads not functioning	MIX setting	Check MIX parameters for proper output selection and volume.
Seems to miss recording some beats	Quantize value	Select proper quantize value.
Not working from external controllers.	Receive MIDI notes is OFF. MIDI channels aren't matched.	Set receive MIDI notes to ON . Select the MIDI channel on the HR-16 that is being output by the controller.
Not memorizing voice, tune, and mix assignments.	Trying to store in a pattern that is empty.	Select a length other than 8 beats.
Not recalling the sound set up when the pattern is selected.	Never memorized . Manual voice/tune/mix is ON.	Never stored (see above). Turn Manual voice, tune, mix OFF.
Won't save or load to tape.	Bad connections. Bad tape. Level of sync tone is too high or low. Errors in data.	Check wiring. Use a certified data tape. Try a higher or lower level to tape. Re-save the data.
Won't sync to tape.	Bad connections. Level on tape.	Check wiring. Set level at or near 0 vu, Turn off noise reduction if possible.

If problems aren't solved after troubleshooting and referring to the manual, consult your Alesis dealer for assistance.

ALESIS MMT-8 MULTI TRACK MIDI RECORDER

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INTRODUCTION

The Alesis MMT-8 Multi Track MIDI Recorder is a user friendly, yet extremely powerful MIDI sequencer. It is able to record any information received at its MIDI INPUT jack (except poly-pressure and note off velocity), and store it into non-volatile memory for later retrieval. This information can include notes, controllers, pitch bend, after touch, program changes, and system exclusive data.

The MMT-8 can play back 8 tracks simultaneously and it functions in many ways like an 8 track tape recorder. The MMT-8's memory capacity is approximately 9,000 to 11,000 notes. Variable MIDI controllers like aftertouch, pitch bend, mod wheel, etc. will take up more memory, so the actual amount of note storage capacity will vary depending on how much these controllers are used. Each set of 8 tracks is called a 'part'. There can be up to 100 parts in the MMT-8's memory (00-99). These parts can be combined into lists of parts, which are called 'songs'. There can be up to 100 songs in the MMT-8's memory, and each can contain a list of parts up to 255 steps long.

By constructing songs in this fashion, the MMT-8 makes it very easy to arrange songs by recording one verse into one part, and a chorus into another, and a bridge into another, and then making a list of the parts into a song with as many verses, choruses, and bridges as desired.

The MMT-8 has many editing capabilities, which allow the user to alter any data after recording it. Notes can be transposed, timing corrected, copied, and erased. MIDI channels can be reassigned, controllers can be modified, etc. Also, the MMT-8 has an Autolocate feature which will allow you to jump to any desired beat number within a part or song. See Page 29 Despite this flexibility, the MMT-8 is very easy to use, since these features do not get in the way of the more basic operations, like recording and playing back.

MMT-8 QUICK BASIC SETUP

1. Connect the MIDI OUT of the keyboard to the MIDI IN of the MMT-8.
2. Connect the MIDI IN of the keyboard to the MIDI OUT of the MMT-8.
3. Connect the audio output of the keyboard to the audio input of a suitable monitoring system (amplifier, mixer, stereo system).

These are three basic setups. A single keyboard is connected to the MMT-8. In fig. 2 and 3 the MMT-8 and HR-16 are setup with a single keyboard and the MMT-8 is providing the master timing signal. Make sure that the MIDI OUT or THRU is connected to the MIDI IN properly in every MIDI connection. Also, turn on MIDI ECHO (Red LED lit) so that MIDI information will pass thru the MMT-8. Add more keyboards / sound generators by connecting the MIDI THRU from either the keyboard or the HR-16 to the MIDI IN on the keyboard / sound generator, etc.

FIG. 1

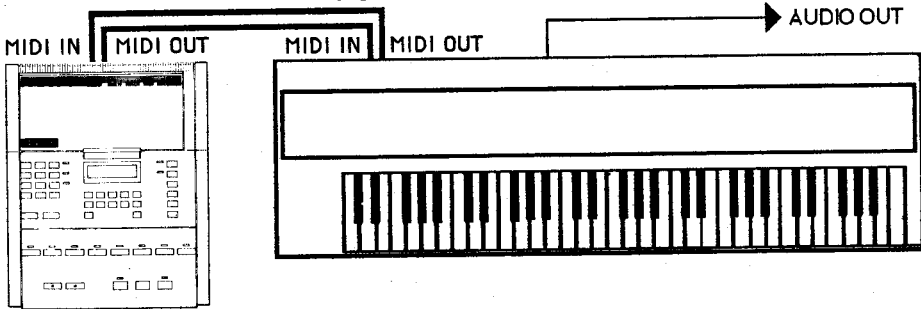


FIG. 2

MIDI OUT to other MIDI Instruments

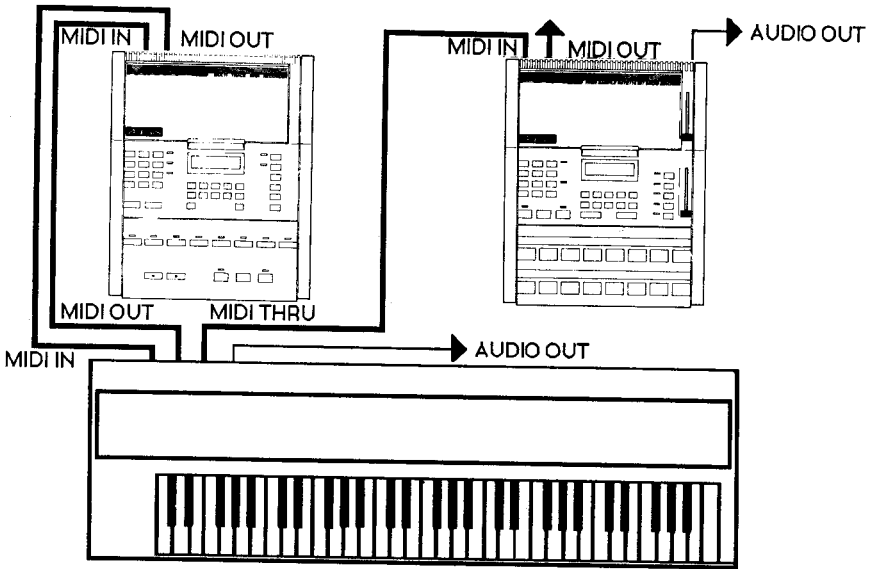
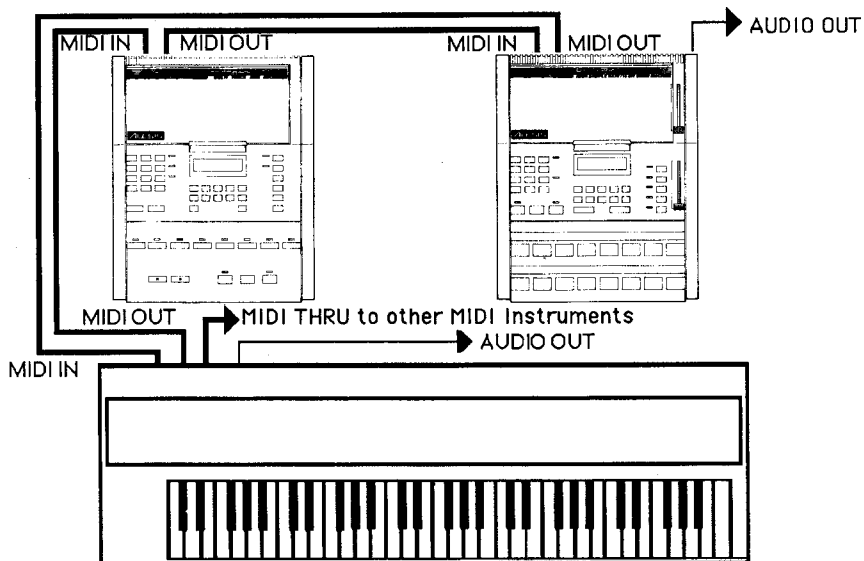


FIG. 3



PART MODE

Selecting and Playing a PART

When power is first turned on, the sequencer will be in SONG or PART mode (SONG or PART LED lit), depending on the mode that was selected before power was turned off. The song or part number will also be the same as when power was turned off.

PART Button

Press the PART button to enter PART mode if the sequencer is not currently in this mode. The LED next to the PART button will light and the display will read:

```
SELECT PART 00
" PART TITLE "
```

Selecting a PART

The 00 is underlined to indicate that it will be changed if a new number is selected with the keypad or the +/- buttons. The second line of the display shows the name of the part. If a part is empty, the display reads EMPTY PART. Pressing the +/- buttons immediately selects the next part number, with the numbers looping past 99 to 00 and looping down from 00 to 99. If a single digit on the keypad is pressed (3, for example), the display will change to:

```
SELECT PART 3_
" PART TITLE "
```

The display is now indicating that the second digit of the part should be entered. After entering the second digit, the new part is selected, and its name is displayed. If the second digit is not entered within 2 seconds, the display will revert back to the previous part number, and no new part will have been selected. This type of keypad entry is consistent with all entries made with the keypad described in this manual. The page up and page down buttons have no function when selecting parts or songs.

Selecting TRACKS for playback

While in PART mode, the eight TRACK SELECT LEDs will display the tracks that are turned on (not muted) on the selected part. These buttons can be turned on or off to change the selected tracks to be played. Whenever a part is playing, the eight track select LEDs will show which tracks are playing. When a new part is selected, all eight tracks are turned on. At any time, the track selection can be changed with the track select buttons. Pressing PLAY will start playing the selected part from its beginning, and the PLAY LED will light. The display will read, for example:

```
PLAYING PART 00
BEAT 001
```

The display is now showing the current beat number and the part number that is being played. As each beat (quarter note) occurs, the display will advance the beat count. While the part is playing, the keypad and +/- buttons can be used to select a new part number, which will then be displayed in the display as follows:

```
PART 00 NEXT 01
BEAT 001
```

At the end of the current part, the newly selected part number will play, with the beat count starting again at 001. The NEXT part to play can be changed up until the end of the current

part is reached, after which the new part will begin playing, and the display will revert back to PLAYING PART.

Pressing STOP/CONTINUE will stop playing a part, and the display will return to the select part display. Any notes that were sustaining will turn off. Pressing STOP/CONTINUE again will begin playing a part from the beginning of the beat it was on when it was stopped, replaying all previously sustaining notes. Pressing PLAY will always start a part from the beginning. When a part reaches its end, the PLAY LED will turn off and the part will stop, unless LOOP is on, which will cause the part to continue playing from the beginning.

FAST FORWARD

The « and » buttons (rewind and fast forward) can be used to advance or retreat through the beats of a part. If a part is playing, pressing the fast forward button will cause sustaining notes to stop, and the display to advance quickly one beat at a time until the fast forward button is released, after which the part continues playing from the beginning of the displayed beat.

REWIND

The rewind button works similarly, but in reverse. In either direction, if the end or beginning of a part is reached, the display remains on the last beat, unless loop is on, which results in the beat "wrapping around." When a part is not playing, these buttons can be used for the same function, and by pressing STOP/CONTINUE the song will continue from the last displayed beat. The fast forward and rewind button can be held down simultaneously to "freeze" the display on the current beat.

It is also possible to Autolocate with the fast-forward and rewind buttons.

This function allows you to go directly to any desired beat. See page 29

Recording a PART

Selecting the RECORD TRACK

To record on a part, press the RECORD button. The RECORD LED will light. The track to be recorded always defaults to the lowest numbered empty track. For an empty part, track 1 will be selected. If a part has all eight tracks used, no track will be selected, and the RECORD LED will not light.

Every time a track is recorded onto, the next empty track will automatically be selected the next time RECORD is pressed. If a track other than the selected one is desired, pressing another track select button while holding down the RECORD button will select the new track to be recorded on. Like on a tape recorder, if a track with something on it is recorded over, the old information is erased.

Once the user has selected a track manually, the automatic track selection of the next empty track is turned off. This way, if the user wants to redo a track many times, he can select it once, and that track will remain selected until he selects another track. When a new part is selected, the automatic track selection is turned back on. If the track that is selected is reselected, it will stop flashing (and return to its previous state, flashing or off), and no track will be selected for record (causing the RECORD LED to turn off when the RECORD button is released). While the RECORD button is held down, the display reads:

SELECT THE TRACK
TO RECORD ON

While holding RECORD, the track that is lit indicates the currently selected track to be recorded on. Any tracks that are flashing are currently empty, and any tracks that are not lit currently have something recorded in them. Any track (flashing, on, or off) can be selected to be recorded onto.

Entering RECORD

After releasing RECORD, the RECORD LED will remain lit to indicate that it is ready to record if PLAY is pressed, unless no track was selected (no track LED lit solid), which would cause the RECORD LED to turn off after releasing the RECORD button. If STOP/CONTINUE is pressed while the RECORD LED is on, the RECORD LED will turn off, indicating that record is disabled, but the selected record track will be remembered. To begin recording, press PLAY. If a track had been selected (RECORD LED on), then the RECORD and PLAY LEDs will be lit, and the selected track will begin recording from the beginning of the part, after counting down four beats (the countdown can be changed; see CLICK), during which time the display will read:

RECORDING PART 00
COUNT DOWN-- 4

With each beat past, the display will change to 3, then 2, then 1, after which the display will change to:

RECORDING PART 00
BEAT 001

The part number is not underlined, indicating that a new part cannot be selected while recording. While recording, the eight tracks can still be turned on or off. Pressing the RECORD button effectively "punches out" the record track, the RECORD LED turns off, and the part continues to play from where it was. Pressing the PLAY button is also the same as punching out, except that the part will immediately start playing from the beginning. The rewind and fast forward buttons will also punch out. Pressing STOP/CONTINUE also punches out, but stops the part from playing as well.

When recording for the first time on an empty part, the track will continue recording until STOP, FAST FORWARD, REWIND, or PLAY is pressed. When one is pressed, this determines the length of the part, rounded to the nearest beat. When recording on any other track, the part will automatically stop when the end of the part (as determined by the first record track) is reached. If LOOP is on, the RECORD LED will turn off ("punch out"), and the part will begin playing from the start. It is possible to set the length before recording the first track, or to change the length after recording the first track (see LENGTH below).

While holding the RECORD button, pressing and holding the LENGTH button will show on the display the percentage of memory still available for recording.

LENGTH

The LENGTH button is used to set the length of a part to a specified number of beats. While holding the LENGTH button, the display will show the current length of the current part. If it is an empty part, the display will read:

PART 00
LENGTH 000 BEATS

This indicates that no length has yet been set. If RECORD mode is entered without setting this length, the length of the part will be determined by the number of beats recorded before pressing STOP/CONTINUE, RECORD, or PLAY. If it is desired to set the length before recording, the +/- buttons can be used to move the length up or down in single beat increments (000 minimum, 682 maximum), or a three digit number can be entered

with the keypad. In either case, the new length is not entered into the part until the RECORD button is pressed. When RECORD is pressed the display changes to:

LENGTH CHANGED

This display remains until RECORD is released. If LENGTH is released before RECORD is pressed, no change to the length will be made, regardless of what was pressed on the keypad. If RECORD is pressed after entering a partial length (1 or 2 digits), nothing will happen. When entering in digits, the first digit entered (1, for example) results in the following display:

PART 00
LENGTH 1_ BEATS

The display is now waiting for the entry of the second digit. If the second digit is not entered within 2 seconds, the display will revert to its previous value. If RECORD is pressed after entering an incomplete length (1 or 2 digits), the display will revert to its previous value.

When a new length is entered (RECORD), any information on any track of the selected part that was beyond the new set length will be erased. Any notes sustaining beyond the new end will automatically be given a new duration. If the new length is longer than the previous one, the additional length will be filled with silence. If it is desired to remove or add length to the beginning of a part, first set the desired length (as described above), and then press either page up or page down. The display will change to:

CHANGES PART TOP
LENGTH 000 BEATS

Pressing either page up or page down again will toggle back to the original display. If RECORD is pressed with the above display showing, any additional beats will be placed at the beginning of the part, and any beats removed will be removed from the part top. Notes that were stored in the removed beats will be removed regardless of their duration.

The LENGTH button has no effect in song mode, or while a song or part is playing.

ERASE

Erasing a PART

The erase button is used to erase a single track, part, or song. When in PART mode, pressing and holding the ERASE button causes the following display:

ERASE PART 01

The number 01 would actually be the currently selected part number. All 8 track LEDs will be lit. To erase the selected part, press RECORD. The display will change to:

PART ERASED

The display will remain this way until the RECORD button is released, after which the display will return to its previous state.

Erasing a single TRACK

To erase a single track, press and hold the ERASE button (all track LEDs will light), and select the desired track number. The selected track's LED will remain lit, and the other track LEDs will turn off. Additional tracks can be selected, and their LEDs will come on. Pressing RECORD will erase any selected tracks.

Erasing selected information (notes, pitchbend, individual MIDI channel, etc.)

When erasing a track or part, it is possible to erase only selected data from a part or track. While holding the ERASE button, the page up and page down buttons below the LCD display can be used to select specific functions. If the arrow buttons are used, they will scroll through the following choices backwards or forwards depending on which button is pressed:

ERASE PART 01
ERASE ONLY NOTES

ERASE PART 01
ERASE PITCHBEND

ERASE PART 01
ERASE AFTERTOUCH

ERASE PART 01
ERASE CONTROLLERS

ERASE PART 01
ERASE PROG CHNGE

ERASE PART 01
ERASE SYSTEM EX.

ERASE PART 01
ERASE MIDI CH. 1

ERASE PART 01
ERASE MIDI CH. 2

|
thru channel 16

This feature makes it possible to erase specific data, such as the after touch on one track, without affecting the other data on that track or part. If erase after touch was selected and RECORD was pressed without selecting a track, all after touch on all eight tracks of the selected part would be erased.

Erasing a SONG

In SONG mode, holding the ERASE button will cause the following display:

ERASE SONG 01

Pressing the RECORD button will erase the currently selected song number. The eight track buttons are inactive when erasing songs. The page up and page down buttons are also inactive when erasing songs.

In all cases, the erase is not executed until RECORD is pressed, and will be aborted if ERASE is released before pressing RECORD. The ERASE button has no effect while a song or part is playing.

COPY

The copy button is used to copy or append a track, part, or song, to another track, part, or song. It only functions while the COPY button is held down. If the COPY button is released (either before or after the copy is executed), the previous mode will show up on the display, and copy mode is exited.

Copying a PART to Itself

When in PART mode, and COPY is pressed and held, all 8 track LEDs will light, and the display will read:

COPY FROM PART
01 TO PART 01

Both displayed part numbers will actually display the current part number (00-99). Pressing RECORD completes the operation, and the display reads:

COPY COMPLETE

This display remains until the RECORD button is released, which then returns the sequencer to the previous copy display (unless COPY is released as well). The above example demonstrated copying a part (all 8 tracks) to itself, which will double the length of that part.

Copying a PART to another PART

To copy a part to another part, press and hold COPY, then enter the two digit part number with the keypad. The display will show the selected part number. Pressing RECORD initiates the copy, and appends the source part (the current part before COPY was pressed) to the destination part (the part entered with the keypad). Again, all 8 track LEDs are lit, so all 8 tracks are copied.

If the destination part was empty, then the destination now contains an exact copy of the source part. If the destination was not empty, then the destination's length is increased by the length of the source part, and the source part is appended to the end of the destination part. Any MIDI assignments made on the source part's tracks will be overridden by the destination part's MIDI assignments.

Copying a TRACK to Itself

To copy a single track to itself (useful for erasing all but one type of MIDI information, see below), press and hold the COPY button, select the desired track (its LED will remain lit and the others will turn off), then press RECORD.

Copying a TRACK to another TRACK of the same PART

To copy a single track to another track of the same part number, press and hold COPY, and select the source track. The selected track's LED will remain lit, and all the other track LEDs will turn off. Now select the destination track. This track's LED will now flash, indicating that it is the track to be copied to. Pressing the RECORD button initiates the copy, and copies the source track to the destination track. If any information existed in the destination track, it is erased.

Copying a TRACK to another TRACK of a different PART

To copy a single track of one part to a single track of another, press and hold COPY, select the source track, select the destination part number, select the destination track, then press RECORD. If the destination track is the same number as the source track, the destination track button does not have to be selected before pressing RECORD.

Copying selected information (notes, pitchbend, individual MIDI channel, etc.)

In all of the above copy modes, the entire contents of a track or part are copied to the destination. It is possible to copy selected information from one track or part to another by using the page up and page down buttons to select the desired data while holding the COPY button. These buttons can be selected any time during the copy selection before RECORD is pressed. They will scroll backwards and forwards through 22 choices with the following displays:

COPY ONLY NOTES
FROM 01 TO 01

COPY PITCHBEND
FROM 01 TO 01

COPY AFTERTOUCH
FROM 01 TO 01

COPY CONTROLS
FROM 01 TO 01

COPY PROG CHNGE
FROM 01 TO 01

COPY SYSTEM EX.
FROM 01 TO 01

COPY MIDI CH. 1
FROM 01 TO 01

COPY MIDI CH. 2
FROM 01 TO 01

|
thru channel 16

By scrolling through the list, any selected data can be copied from one track or part to another. For example, if a track contained notes on many MIDI channels that had been previously combined together, copying only one MIDI channel to a new track would allow the parts to be separated out again. Also, copying NOTES ONLY from a track to itself will effectively erase all pitchbend, controller, program change, after touch, and system exclusive data from that track.

Copying a SONG to itself

In SONG mode, pressing and holding the COPY button will result in the following display:

```
COPY FROM SONG
01 TO SONG 01
```

The 01 display will actually show the currently selected song number. Like in PART mode, pressing RECORD will append the current song to itself, making it twice as long.

Copying a SONG to another SONG

If a new song number is selected, the display will show the newly selected song number, and pressing RECORD will append the source song number (the number selected before pressing COPY), to the destination song number (the number selected while holding COPY). This mode is very useful, since a verse consisting of more than one part could be entered into a song, and then appended into another song when needed without having to re-enter the parts for the verse. None of the eight track buttons will have any effect when copying songs. The page up and page down buttons also have no effect when copying songs.

In all cases, the copy is not executed until RECORD is pressed, and will be aborted if COPY is released before pressing RECORD. The COPY button has no effect while a song or part is playing.

EDIT

The EDIT button is an on/off switch with an associated LED. All operations as discussed so far assume that EDIT is off. When edit is on, individual note editing can be achieved in part mode, and the list of parts in a song can be edited in song mode. To exit EDIT mode, press EDIT again (the LED will turn off), or select PART or SONG, which automatically turns EDIT off.

Editing a PART

When EDIT is pressed while in PART mode (PART LED lit), individual MIDI events can be edited. The eight track buttons are used to select which track is being edited. Only one track can be edited at a time (only one track is lit at a time). The display now shows the MIDI information of the selected track as follows:

```
001/00: C#-2 064
002/00 CHAN 01
```

The first three digits are the beat number, followed by the sub-beat count (00-95), followed by the note value, followed by the note velocity (01-127), followed by the note's duration (in beats and sub-beats), followed by the note's MIDI channel (1-16). The cursor is under

the beat number, indicating that it can be changed with the keypad or the +/- buttons. To access the other parameters, the page up and page down buttons are used. They move the cursor as shown in the following displays:

```
001/00: C#-2 064
002/00 CHAN 01
```

```
001/00: C#-2 064
002/00 CHAN 01
```

```
001/00: C#-2 064
002/00 CHAN 01
```

```
001/00: C#-2 064
002/00 CHAN 01
```

```
001/00: C#-2 064
002/00 CHAN 01
```

```
001/00: C#-2 064
002/00 CHAN 01
```

The cursor moves to the next parameter, and will "loop around" past the last parameter back to the first. The MIDI channel is the channel that the note is output on if the track's MIDI channel is assigned to UNCHANGED. If the track is assigned to a specific channel, the original channel number will be shown in parenthesis. The note's MIDI channel can still be changed, but no effect will be heard unless the track's MIDI channel is assigned to UNCHANGED. (See MIDI Channel, page 20.)

Other MIDI information is displayed as follows. This information will only be displayed if it has been entered into the sequence beforehand. See page 16, Adding an Event. For pitch bend, the display includes the beat, the sub-beat, MIDI channel, and pitch bend amount. The pitch bend range is from -4096 to +4095. The page up and page down displays scroll as follows:

```
001/00: PCH BEND
4095 CHAN 01
```

```
001/00: PCH BEND
4095 CHAN 01
```

```
001/00: PCH BEND
4095 CHAN 01
```

```
001/00: PCH BEND
4095 CHAN 01
```

Pitch bend amounts can be entered with the keypad, but the only way to achieve negative numbers is to use the - button until negative numbers are reached, after which any keypad entry will be negative.

For after touch, the display includes the beat, sub-beat, MIDI channel, and after touch amount. The after touch range is from 0 to 127. The page up and page down displays scroll as follows:

001/00: AF TOUCH
127 CHAN 01

001/00: AF TOUCH
127 CHAN 01

001/00: AF TOUCH
127 CHAN 01

001/00: AF TOUCH
127 CHAN 01

For controllers, the display shows the beat, sub-beat, controller number, controller amount, and MIDI channel. The controller range is from 0 to 121. The controller amount range is from 0 to 127. The page up and page down displays scroll as follows:

001/00: CONTRLER
121:127 CHAN 01

001/00: CONTRLER
121:127 CHAN 01

001/00: CONTRLER
121:127 CHAN 01

001/00: CONTRLER
121:127 CHAN 01

001/00: CONTRLER
121:127 CHAN 01

For program changes, the display includes the beat, sub-beat, program change number, and MIDI channel. The program range is from 0 to 127. The page up and page down displays scroll as follows:

001/00: PRG CHNG
127 CHAN 01

001/00: PRG CHNG
127 CHAN 01

001/00: PRG CHNG
127 CHAN 01

001/00: PRG CHNG
127 CHAN 01

For system exclusive information, the number of parameters could be any value. Since this could contain a large amount of information, the page up and page down buttons continue

to scroll the data through the display until the end is reached. The display includes the beat, sub-beat, and any system exclusive data, as follows:

001/00: SYS EXCL
126 125 124>

001/00: SYS EXCL
126 125 124>

001/00: SYS EXCL
126 125 124>

001/00: SYS EXCL
126 125 124>

001/00: SYS EXCL
126 125 124>

001/00: SYS EXCL
< 123 122 121>

001/00: SYS EXCL
< 123 122 121>

etc.

Erasing an event

Any event being displayed can be erased by holding ERASE and pressing RECORD. Erasing an event removes it from the track, but does not alter the timing of the track. For example, removing a quarter note at the beginning of a track does not move everything else forward a quarter note.

Adding an event

An event can be added by using the COPY button. Pressing and holding COPY causes the following display:

INSERT NOTE
AT 001/00

Pressing the RECORD button will insert a note at the current beat location with a note value of C3, a velocity of 64, and a duration of 1 beat. This note can then be edited as described above to any desired value. If something other than a note is desired to be inserted, the page up and page down buttons can be used to scroll through the other choices before pressing RECORD:

INSERT PCH BEND
AT 001/00

INSERT AFT TOUCH
AT 001/00

INSERT CONTROLER
AT 001/00

By scrolling through the list, any selected data can be copied from one track or part to another. For example, if a track contained notes on many MIDI channels that had been previously combined together, copying only one MIDI channel to a new track would allow the parts to be separated out again. Also, copying NOTES ONLY from a track to itself will effectively erase all pitchbend, controller, program change, after touch, and system exclusive data from that track.

Copying a SONG to itself

In SONG mode, pressing and holding the COPY button will result in the following display:

COPY FROM SONG 01 TO SONG 01

The 01 display will actually show the currently selected song number. Like in PART mode, pressing RECORD will append the current song to itself, making it twice as long.

Copying a SONG to another SONG

If a new song number is selected, the display will show the newly selected song number, and pressing RECORD will append the source song number (the number selected before pressing COPY), to the destination song number (the number selected while holding COPY). This mode is very useful, since a verse consisting of more than one part could be entered into a song, and then appended into another song when needed without having to re-enter the parts for the verse. None of the eight track buttons will have any effect when copying songs. The page up and page down buttons also have no effect when copying songs.

In all cases, the copy is not executed until RECORD is pressed, and will be aborted if COPY is released before pressing RECORD. The COPY button has no effect while a song or part is playing.

EDIT

The EDIT button is an on/off switch with an associated LED. All operations as discussed so far assume that EDIT is off. When edit is on, individual note editing can be achieved in part mode, and the list of parts in a song can be edited in song mode. To exit EDIT mode, press EDIT again (the LED will turn off), or select PART or SONG, which automatically turns EDIT off.

Editing a PART

When EDIT is pressed while in PART mode (PART LED lit), individual MIDI events can be edited. The eight track buttons are used to select which track is being edited. Only one track can be edited at a time (only one track is lit at a time). The display now shows the MIDI information of the selected track as follows:

001/00: C#-2 064
002/00 CHAN 01

The first three digits are the beat number, followed by the sub-beat count (00-95), followed by the note value, followed by the note velocity (01-127), followed by the note's duration (in beats and sub-beats), followed by the note's MIDI channel (1-16). The cursor is under

the beat number, indicating that it can be changed with the keypad or the +/- buttons. To access the other parameters, the page up and page down buttons are used. They move the cursor as shown in the following displays:

```
001/Q0: C#-2 064
002/00 CHAN 01
```

```
001/00: C#-2 064
002/00 CHAN 01
```

```
001/00: C#-2 Q6 4
002/00 CHAN 01
```

```
001/00: C#-2 064
Q02/00 CHAN 01
```

```
001/00: C#-2 064
002/Q0 CHAN 01
```

```
001/00: C#-2 064
002/00 CHAN Q1
```

The cursor moves to the next parameter, and will "loop around" past the last parameter back to the first. The MIDI channel is the channel that the note is output on if the track's MIDI channel is assigned to UNCHANGED. If the track is assigned to a specific channel, the original channel number will be shown in parenthesis. The note's MIDI channel can still be changed, but no effect will be heard unless the track's MIDI channel is assigned to UNCHANGED. (See MIDI Channel, page 20.)

Other MIDI information is displayed as follows. **This information will only be displayed if it has been entered into the sequence beforehand. See page 16, Adding an Event.** For pitch bend, the display includes the beat, the sub-beat, MIDI channel, and pitch bend amount. The pitch bend range is from -4096 to +4095. The page up and page down displays scroll as follows:

```
001/00: PCH BEND
4095 CHAN 01
```

```
001/Q0: PCH BEND
4095 CHAN 01
```

```
001/00: PCH BEND
Q095 CHAN 01
```

```
001/00: PCH BEND
4095 CHAN Q1
```

Pitch bend amounts can be entered with the keypad, but the only way to achieve negative numbers is to use the - button until negative numbers are reached, after which any keypad entry will be negative.

For after touch, the display includes the beat, sub-beat, MIDI channel, and after touch amount. The after touch range is from 0 to 127. The page up and page down displays scroll as follows:

001/00: AF TOUCH
127 CHAN 01

001/00: AF TOUCH
127 CHAN 01

001/00: AF TOUCH
127 CHAN 01

001/00: AF TOUCH
127 CHAN 01

For controllers, the display shows the beat, sub-beat, controller number, controller amount, and MIDI channel. The controller range is from 0 to 121. The controller amount range is from 0 to 127. The page up and page down displays scroll as follows:

001/00: CONTRLER
121:127 CHAN 01

001/00: CONTRLER
121:127 CHAN 01

001/00: CONTRLER
121:127 CHAN 01

001/00: CONTRLER
121:127 CHAN 01

001/00: CONTRLER
121:127 CHAN 01

For program changes, the display includes the beat, sub-beat, program change number, and MIDI channel. The program range is from 0 to 127. The page up and page down displays scroll as follows:

001/00: PRG CHNG
127 CHAN 01

001/00: PRG CHNG
127 CHAN 01

001/00: PRG CHNG
127 CHAN 01

001/00: PRG CHNG
127 CHAN 01

For system exclusive information, the number of parameters could be any value. Since this could contain a large amount of information, the page up and page down buttons continue

to scroll the data through the display until the end is reached. The display includes the beat, sub-beat, and any system exclusive data, as follows:

Q01/00: SYS EXCL
126 125 124>

001/Q0: SYS EXCL
126 125 124>

001/00: SYS EXCL
126 125 124>

001/00: SYS EXCL
126 125 124>

001/00: SYS EXCL
126 125 124>

001/00: SYS EXCL
< 123 122 121>

001/00: SYS EXCL
< 123 122 121>

etc.

Erasing an event

Any event being displayed can be erased by holding ERASE and pressing RECORD. Erasing an event removes it from the track, but does not alter the timing of the track. For example, removing a quarter note at the beginning of a track does not move everything else forward a quarter note.

Adding an event

An event can be added by using the COPY button. Pressing and holding COPY causes the following display:

INSERT NOTE
AT 001/00

Pressing the RECORD button will insert a note at the current beat location with a note value of C3, a velocity of 64, and a duration of 1 beat. This note can then be edited as described above to any desired value. If something other than a note is desired to be inserted, the page up and page down buttons can be used to scroll through the other choices before pressing RECORD:

INSERT PCH BEND
AT 001/00

INSERT AFT TOUCH
AT 001/00

INSERT CONTROLER
AT 001/00

INSERT PROG CHNG
AT 001/00

In the above choices, pressing RECORD will insert the displayed event at the current beat and with values of 0.

While in part EDIT, the fast forward and rewind buttons are used to advance and retreat, respectively, through the list of MIDI events on the selected track. When the end of a track is reached, or if a track is empty, the display will read END OF TRACK. Playing a part while in part edit will play the part while continuing to display the events as they happen on the display.

Editing and Creating a SONG

When in SONG mode, the EDIT button is used to enter the song edit mode. This mode is used for creating or editing a song, which is a list of parts. The display appears as follows:

EDIT SONG 00
STEP 001 PART 27

The step number can be moved forwards or backwards with the fast forward and rewind buttons. The part number is underlined indicating that it can be changed with the keypad or +/- buttons. If a song is empty, the first step's part will be blank. The step past the last part of a song will also display a blank part. To change a part, simply type in a new part number. To erase a step, hold ERASE and press RECORD. The displayed step will be erased, and all parts from the steps past the erased step will shift down one step. To insert a part, press and hold COPY. The display will read:

EDIT SONG 00
INSERT PART 27

The keypad or +/- buttons can be used to change the part number. Pressing RECORD inserts the part at the displayed step, and moves the previously displayed step and all subsequent steps one step back. When the buttons are released, the display reverts back to the song edit display.

Automatic TRACK selection and muting at each step of a SONG

You can select which tracks will playback at each step of a song by turning off the tracks you don't want to hear (LED's off) and leaving on the tracks you wish to hear (LED's on). The MMT-8 will store in memory which tracks were selected for playback at each step.

SONG MODE

Selecting and Playing a SONG

SONG Button

Press the SONG button to enter song mode. The display will read as follows, with the last song entered being indicated in the number portion of the display.

SELECT SONG 00
" SONG TITLE "

Selecting a SONG

The 00 is underlined to indicate that it will be changed if a new number is selected with the keypad or the +/- buttons. The second line of the display shows the name of the currently selected song (up to 14 characters). If the current song number is empty, the second line will read EMPTY SONG. Pressing the +/- buttons immediately selects the next song number, with the numbers looping past 99 to 00 and looping down from 00 to 99. If a single digit on the keypad is pressed (2, for example), the display will change to:

```
SELECT SONG 2_
" SONG TITLE "
```

The display is now indicating that the second digit of the song should be entered. After entering the second digit, the new song is selected, and its name will appear. If the second digit is not entered within 2 seconds, the display will revert back to the previous song number, and no new song will have been selected. The page up and page down buttons have no function when selecting parts or songs.

A SONG is a list of parts (sequences) in a specific order, with each entry into the list being a STEP which contains a part number. Each step also contains which of the eight tracks should be on for that step.

Manual TRACK selection and muting in SONG mode

While in SONG mode, the eight TRACK SELECT LEDs will display the tracks that are turned on on the first part of the selected song. These buttons can be turned on or off to change the selected tracks to be played, although these changes will be temporary and not stored with the song. Pressing PLAY will start playing the selected song from its beginning, and the PLAY LED will light. The display will read, for example:

```
SONG 00 STEP 001
PART 27 BEAT 001
```

The first line of the display is now showing the current song number being played, and the current beat number of the part being played. The second line of the display is showing the step number and the part assigned to the step that is playing at the moment. When the song advances to the next step, the display will show the part for step 2, etc. The track select LEDs will change to show which tracks are turned on for the current part. Again, the track selection can be changed by turning on or off the track buttons.

Pressing STOP/CONTINUE will stop playing the song, and the display will return to the select song display. Pressing STOP/CONTINUE again will begin playing the song from the beat at which it was stopped. Pressing PLAY will always start the song from the beginning of the first step. When a song reaches its end, it will stop and the PLAY LED will turn off, unless LOOP is on, which will cause the song to loop back to step one and continue playing.

The « and » buttons (rewind and fast forward) can be used to advance or retreat through the beats and steps of a song. If the song is playing, pressing the fast forward will cause sustaining notes to stop, and the beat display to advance at a gradually increasing rate (up to the maximum possible tempo) until the fast forward button is released, after which the song continues playing from the beginning of the displayed beat. If the end of the current step is reached, the next step is started.

The rewind button works similarly, but in reverse. In either direction, if the end or beginning of a song is reached, the display remains on that step, unless loop is on, which results in the step "wrapping around". When a song is not playing, these buttons can be used for the same function, and by pressing STOP/CONTINUE the song will continue from

the last displayed beat. The fast forward and rewind button can be held down simultaneously to "freeze" the display on the current beat.

LOOP

The LOOP button is a simple on/off switch with an LED indicator. When LOOP is on, a part or song will loop back to its beginning when it has reached its end and continue playing indefinitely. If LOOP is off, a part or song will stop when it reaches its end.

MIDI ECHO

The MIDI ECHO button is an on/off switch with an LED indicator. When MIDI ECHO is on, whatever information is present at the MIDI INPUT jack will be sent to the MIDI OUTPUT jack. When not in RECORD or RECORD READY (RECORD LED lit), the MIDI data is transmitted out unchanged.

When in RECORD or RECORD READY, and the track selected has been assigned to a specific MIDI channel (see MIDI CHANNEL below), then all MIDI information received will be transmitted out on the selected MIDI channel. This feature allows the user to hear a part playing on the desired synthesizer while it is being recorded. System exclusive information and polyphonic pressure are not echoed, and MIDI clocking information will be echoed only if MIDI clock is being used for clocking the MMT-8.

NAME

The NAME button is used to change the name of a part or song. The name of a part or song is 14 characters long. An empty part or song will always have the name "EMPTY PART" or "EMPTY SONG", and cannot be changed. When a part or song is first used, its name is changed from "EMPTY PART" or "EMPTY SONG" to "NO PART NAME" or "NO SONG NAME." To change the name of a part or song, press and hold the NAME button. The display will read:

```
SELECT PART 00
" _NO PART NAME "
```

The cursor is now under the first character of the part or song name. Using the + and - buttons, any alphanumeric character can be selected, and the keypad can be used to enter numbers directly. The page up and page down buttons are used to move the cursor left and right on the display. When the desired name has been entered, pressing RECORD stores the name for that part or song. If RECORD is not pressed before releasing the NAME button, any changes to the name will not be saved.

MERGE

The MERGE mode is provided so that two tracks can be merged together (overlapped) onto one track. In part mode, when MERGE is held down, the display reads:

```
SELECT 2 TRACKS
TO BE MERGED
```

The eight track LEDs will be off. Press the first desired track (it will light solid), followed by the destination track (it will flash), followed by RECORD. The display will read:

TRACKS MERGED TO
SECOND TRACK

This display remains until the RECORD button is released. The first track and the second track are now combined in the second track's location. The first track remains unchanged. The MERGE button has no effect in song mode, or while a part is playing. NOTE: When two tracks are merged, their MIDI channel assignments (see MIDI CHANNEL) are permanently assigned to the data of each track, and the new track's MIDI channel is assigned to UNCHANGED. This way, tracks assigned to different channels retain their channel independence on the same track.

MIDI CHANNEL

Like the COPY and ERASE buttons, the MIDI CHANNEL button is only active while it is held down. It is used to select the MIDI channel of a track of a part (it has no function in SONG mode). When held down, track one's LED will light, and the display will show the MIDI channel selected for that track:

SET MIDI CHANNEL
UNCHANGED

The keypad or +/- buttons can be used to change the selected track's MIDI channel, and other tracks can be displayed or changed by selecting the desired track button (only one track is lit at a time). The selection of the channel can be 0 (UNCHANGED), or 1 through 16. A given track always retains its recorded MIDI channel information, so that if a track contains notes from more than one channel, it can be played back as recorded. In this case it is desired to assign the track to UNCHANGED, which means that it will output on the same MIDI channels as are recorded. Whenever a new track is recorded it defaults to UNCHANGED. If a specific MIDI channel is selected (1-16), then the selected track's notes will all be output on the selected channel. However the actual track information remains unchanged, so that returning a track to UNCHANGED will cause the separate MIDI channels to play back as before.

NOTES: An empty track can be assigned to a MIDI channel before recording onto it, which will cause that channel to be output while recording if MIDI ECHO is on. Also, if a track is copied to an empty track, its MIDI channel setting will be copied as well. If a track or part is erased, its MIDI channel assignment is left as it was.

QUANTIZE

The QUANTIZE button is used to correct the timing of notes to any desired beat value. QUANTIZE only moves note events, and does not alter controllers, pitch bend, after touch, program change, and system exclusive information. While holding down the QUANTIZE button in part mode, the most recently recorded track will be lit, and the display will read:

QUANTIZE TO 1/16
NOTE START

The 10 quantize choices are 1/2, 1/4, 1/6, 1/8, 1/12, 1/16, 1/24, 1/32, 1/48, 1/64. The +/- buttons of the keypad can be used to scroll through the choices. The keypad buttons 0-9 can also be used to select the quantize value directly, with 0=1/2 and 9=1/64. The track select buttons can be used to select the desired track(s) to be quantized. When quantize is first pressed, all eight track LEDs will be lit, indicating that all tracks will be quantized if RECORD is pressed. If a track button is pressed, all other tracks will turn off, and only that track will be selected. From that point on, each track select button will turn on or off its associated LED, so that any combination of tracks can be selected to be quantized. Pressing the RECORD button initiates the quantizing, and changes the display to:

QUANTIZE DONE

This display remains until the RECORD button is released, which then returns the sequencer to its previous quantize display. The quantization process changes the start point of each note to the nearest quantize beat, but leaves the note release point where it was, which changes the actual note duration. Other quantizing options can be selected by using the page up and page down buttons. Pressing the page up button scrolls through the following choices:

QUANTIZE TO 1/16
NOTE START & END

QUANTIZE TO 1/16
NOTE END

QUANTIZE TO 1/16
KEEP DURATION

If RECORD is pressed with QUANTIZE NOTE START & END being displayed, the release times of the notes will also be quantized to the selected quantize beat. IF NOTE END is selected, only the release times of the notes will be quantized. If KEEP DURATION is selected, a note's duration will remain constant, i.e., if the start of a note is moved 1/16 note ahead, the release will also move 1/16 ahead.

In SONG mode, the QUANTIZE button is used to select an amount of clock offset for each track in a song. These offsets are global settings used by all songs, and do not affect the individual parts directly. The purpose for this feature is to allow the user to compensate for MIDI delays, and sound devices with slow attack times. While holding the QUANTIZE button in song mode, the first track LED will light, all others will be off, and the display will read as follows:

SHIFT TRACK TIME
00/384th NOTES

The value can be set from -48 to +48 384th notes ($\pm 1/2$ note) by using the keypad or the +/- buttons. Positive values represent a shift forward in time, and negative values represent a shift backward in time. When entering a value with the keypad, the sign remains unchanged (except when entering 00, which is always positive). To change the sign, the +/- keys must be used to "pass through" zero to the other side. Each track can be selected and set independently. Of course, the first beat of the first part of a song cannot be advanced (it can't read minds..).

TRANPOSE

The TRANPOSE function allows for a track or part to be transposed by a user specified number of semitones. When TRANPOSE is held down in part mode, the display reads:

TRANPOSE UP
00 SEMITONES

The keypad can be used to enter a two-digit number of semitones to transpose up from the original pitch (00-99), or the +/- buttons can be used to increment or decrement the amount. Like in ERASE mode, all eight track select LEDs are lit, indicating that the transposition will effect all tracks. If a track select button is pressed, all other track LEDs will turn off, and only the selected track will be lit. Additional tracks can be selected by pressing the select track buttons, which will toggle the LEDs on or off for each track. Pressing the page up or page down button will change the display to:

TRANPOSE DOWN
00 SEMITONES

Now the number entered from the keypad selects the number of semitones to transpose down. For either transpose up or down, pressing the RECORD button executes the transpose command, resulting in the following display:

TRANPOSE DONE

This display remains until RECORD is released. If a track that is transposed results in an underflow (notes below 0) or an overflow (notes above 127), the track will automatically readjust the pitch in octave increments until it is back in legal range.

The TRANPOSE button does not function while playing a part or song.

TEMPO

The TEMPO button is used to change the tempo of a part or song. The tempo is stored with a song, and not with a part. While in part mode, the tempo remains at its previous setting until changed. While in song mode, the tempo changes to the programmed tempo each time a different song is selected. While in either part or song mode, pressing the tempo button results in the following display:

TEMPO = 120
BEATS PER MINUTE

While holding the TEMPO button, the +/- buttons can be used to select a new tempo, or a tempo can be entered directly with three digits on the keypad. Tempo changes are effective as soon as they are entered, and the RECORD button does not have to be pressed. In part mode, the RECORD button has no function for TEMPO. In song mode (while not playing), pressing RECORD stores the selected tempo into the current song. Otherwise, it is a temporary tempo change that will be forgotten once a different song is selected. If RECORD is pressed, the display changes to:

SONG TEMPO SAVED

This remains until the RECORD button is released. In both song and part mode, the tempo can be changed while playing.

MIDI FILTER

The MIDI FILTER button is used to select what type of MIDI information will be recorded by the MMT-8. While holding down the MIDI FILTER button, the page up and page down buttons can be used to scroll through the possible choices, while the + and - buttons can be used to turn each function on or off. The possible displays that can be scrolled through are as follows:

RECORD MIDI
NOTES: ON

RECORD MIDI
PITCH BEND: ON

RECORD MIDI
AFTER TOUCH: OFF

RECORD MIDI
CONTROLLERS: ON

RECORD MIDI
PROG CHANGE: ON

RECORD MIDI
SYSTEM EXCL: OFF

RECORD ON MIDI
CHANNEL: ALL

Pressing the + button changes the display to ON, pressing the - button changes the display to OFF. If a function is off, it will not be recorded into the MMT-8, and will not be echoed out the MIDI OUT jack if MIDI ECHO is on. The last page selects which MIDI channel the MMT-8 will record. Normally, it is set to ALL, which means that it will record on all MIDI channels. It can also be set to 1 through 16, which will cause the MMT-8 to ignore all channels but the selected one while recording. Selecting 00 on the keypad will display ALL, and the individual channels can be selected as 01 through 16. The default settings are as shown above, with all functions on except after touch and system exclusive.

CLOCK

The CLOCK button is used to set the clock input and output functions of the MMT-8. Pressing and holding the CLOCK button allows access to the CLOCK pages. The first page is used to select the clocking source, and will display one of the following choices:

CLOCK SOURCE:
MIDI & INTERNAL

CLOCK SOURCE:
INTERNAL ONLY

CLOCK SOURCE:
TAPE SYNC

By using the keypad or +/- buttons, one of the three clocking sources can be selected. The default setting is MIDI & INTERNAL (1), with the other choices being INTERNAL ONLY (2), and TAPE SYNC (3). The page up and page down buttons can be used to scroll through the next two clock pages:

MIDI CLOCK OUT
ENABLE: ON

AUTO START
ENABLE: ON

The + and - buttons can be used to turn each function on or off, respectively. The default setting is MIDI & INTERNAL clock source, MIDI CLOCK OUT ON, and AUTO START ON. There is no TAPE SYNC out switch, since this function is always active. The MMT-8 does not need to turn on or off its internal clock, since it intelligently determines what clock to use when necessary. A functional description of the clocking possibilities are shown in the table below:

CLOCK SOURCE	AUTO START	PRESS PLAY	RECEIVE MIDI START	RECEIVE TAPE SYNC
MIDI & INTERNAL	OFF	2	6	1
MIDI & INTERNAL	ON	2	6	1
INTERNAL ONLY	OFF	2	1	1
INTERNAL ONLY	ON	2	2	1
TAPE SYNC	OFF	3	1	4
TAPE SYNC	ON	3	1	5

1. Do nothing.
2. Start playing from beginning with internal clock.
3. Enter play mode, but don't start playing until tape sync clock occurs.
4. If in play mode, start playing, otherwise ignore sync.
5. Start playing from beginning with tape sync clock.
6. Start playing from beginning with MIDI clock.

If tape sync and auto start are on and a part or song is playing, it will stop playing automatically if the tape sync signal is interrupted for more than 1 second. If auto start is not on, the MMT-8 will wait in play for more sync pulses.

CLICK

The CLICK button is used to set the rhythmic value that the metronome will have. Holding the CLICK button results in the following display:

CLICK VALUE 1/16
RECORD CLICK ON

The 10 click value choices are 1/2, 1/4, 1/6, 1/8, 1/12, 1/16, 1/24, 1/32, 1/48, 1/64. The +/- buttons of the keypad can be used to scroll through the choices. The keypad buttons 0-9 can also be used to select the click value directly, with 0=1/2 and 9=1/64. Additional click pages can be accessed with the page up and page down buttons. Pressing the page up button once moves the cursor to the RECORD CLICK function, as follows:

CLICK VALUE 1/16
RECORD CLICK ON

This function determines whether or not the metronome will click while in record mode. The default setting is ON, but it can be changed with the + and - buttons. The next page has two more click parameters which are accessed with the page up and page down buttons. They display as follows:

PLAY CLICK OFF
COUNT DOWN: 04

The top function determines whether or not the metronome will click while in PLAY modes. The + and - buttons can be used to change the function on or off, respectively. The default setting is PLAY CLICK OFF. The last function determines the number of clicks that will be counted down when entering record. It can be set from 0 (OFF) to 99. The default is 4.

TAPE

The TAPE button is used to access the tape interface features of the MMT-8. This allows the user to save and retrieve sequence data with an ordinary cassette recorder. Pressing and holding the TAPE button results in the following display:

SAVE ALL PARTS &
SONGS TO TAPE

Pressing the RECORD button initiates the save to tape. Both buttons can now be released, since this operation may take over two minutes, during which the display will read:

SAVING TO TAPE..
PART: 00

The display shows the current part or song being output. This display will advance until all data is output. Pressing the STOP button will abort the operation. Before pressing RECORD, the page up and page down buttons can be used to access the other five tape pages. They are as follows:

CHECK TAPE DATA
FOR ERRORS

LOAD ALL PARTS &
SONGS FROM TAPE

LOAD ONE PART
FROM TAPE: 00

LOAD ONE SONG
FROM TAPE: 00

SEND ALL PARTS &
SONGS OUT MIDI

In all five of these pages, pressing RECORD initiates the operation. The verify function is used to insure that the data just recorded to tape is good. Load from tape loads the entire sequence memory with the data on tape. Load part and load song allow a single part or song to be loaded from a tape. The keypad can be used to select the desired number. After pressing RECORD, the display will change to the following (depending on the page shown when it was pressed):

VERIFYING TAPE..
PART: 00

LOADING TAPE..
PART: 00

LOADING PART 27
PART: 00

LOADING SONG 56
SONG: 00

SENDING OUT DATA TO
MIDI.....

Again, the RECORD and TAPE buttons can be released, and the display will continue until the operation is complete, with the currently loading or verifying part or song number being shown in the display. When loading one part or song, the display will continue to show the selected part or song number in the upper display. When sending out MIDI data, the display shown above will remain until the data has been sent out. After completion of the tape functions, the display will return to its previous state (select part or select song). If an error is encountered while loading a tape, the display will show ERROR as soon as it occurs, for example,

LOADING TAPE..
PART: 36 ERROR

The tape will attempt to continue to load, but it is possible that the data will be corrupted and therefore unusable.

During any of the tape operations (but not the send MIDI function), the STOP/CONTINUE button can be used to abort the operation. When loading in all parts and songs, aborting the tape may leave unusable data in memory. When loading one part or song, aborting after the selected part or song has passed will not cause any problems.

STORING TO DISK USING MIDI SYSTEM EXCLUSIVE DATA DUMP

The MMT-8 send to MIDI function is provided so that the data can be stored on a computer, a Yamaha MDF-1 (MIDI Filer) or a Yamaha DX-7IIDF. The data is sent out as one block of system exclusive data, with the length being determined by the amount of memory being used. If using the MIDI Filer, no more than 85% of the memory should be full or else the

data will be too large for the MIDI filer's buffer. No more than 25% of memory should be full when saving to a DX-7IIFD or its buffer will be filled as well. The MMT-8 will automatically receive MIDI system exclusive sequence data from any of these devices without having to select a specific page. If the system exclusive data starts to come in, the display will read:

RECEIVING DATA FROM
MIDI.....

This display will remain until the data has been completely loaded, after which the MMT-8 will return to song 99. Note that any time the MMT-8 receives sequence data from MIDI, any data previously in memory will be lost.

SYNCING THE MMT-8 TO TAPE

It is possible to sync the MMT-8 to a tape recorder with the help of the TAPE SYNC mode. In this mode, the MMT-8 reads a master clock pulse from a track of a tape recorder, which keeps all of the sequencers/drum machines perfectly in time with the recorded information on the tape machine. This method has the advantage of eliminating the need to print drum machine or synthesizer parts on tape, since you can use the master clock recorded on tape (or "sync track") to trigger the drum machine and synthesizers via the sequencer.

RECORDING THE SYNC TONE

Before recording any audio information on the tape machine, you must lay a "Sync Tone" down on one track of the tape machine. This is usually done on an outside track (track 1 or 8 on an eight track machine; track 1 or 16 on a sixteen track machine; etc.) to keep the crosstalk to a minimum.

- 1) Connect the TAPE OUT jack of the MMT-8 to the input of the desired track of the tape machine.
- 2) Press PLAY on the MMT-8, then adjust the level of the track so that it reads approximately "0VU".
- 3) *You must select a tempo for the song on the MMT-8 at this time as it cannot be changed later.*
- 4) Begin recording on the tape machine.
- 5) Press PLAY on the MMT-8. Allow the MMT-8 to play through its entire song before stopping the recording. When the song has ended, stop the recording and rewind the tape machine. You are now ready to trigger the MMT-8 from the sync tone that you just recorded.

NOTES:

- A) There is no TAPE SYNC OUT switch as this is always active.
- B) Keep the Sync signal at about 0VU in order to avoid dropouts. If the MMT-8 does not see the sync tone for 1/2 second, it will assume that the sync tone has ended and will go into STOP mode.
- C) If possible, do not use any noise reduction, EQ, or signal processing on the sync tone.
- D) Avoid recording high energy, high-frequency tracks next to the sync track.

TO CLOCK THE MMT-8 FROM TAPE SYNC

- 1) Connect the output of the track of the tape machine that has the sync tone to the TAPE IN jack of the MMT-8.

2) Press and hold the CLOCK button. The display will read:

CLOCK SOURCE
MIDI & INTERNAL

3) Use the keypad or + and - buttons to select TAPE SYNC IN. The display will read:

CLOCK SOURCE
TAPE SYNC IN

4) Put the tape machine into PLAY. The MMT-8 will automatically start as soon as it receives the sync tone, causing any other sequencers connected to it to play. *Be careful to return to the beginning of the sync tone since the MMT-8 will automatically begin playing any time that it receives the sync tone.*

START / STOP FOOTSWITCH

The START/STOP footswitch jack is provided for a momentary normally open footswitch that connects the jack's tip to its sleeve (ground). While in stop, the footswitch will function like the play button and start a part or song from the beginning. While in play, the footswitch acts like the stop button, and stops playing.

REMAINING MEMORY

Holding RECORD and pressing LENGTH causes the following display:

REMAINING MEMORY
100 PERCENT

This shows the amount of memory that has not been used. Note that some operations may not be possible even though it seems that there is still a small amount of memory available. This is due to the fact that the MMT-8 requires enough memory to duplicate a part before it can be recorded on, or length changed, or offset, etc. If a large part is attempted to be altered when there is not enough memory to complete the operation, the display will indicate that there is not enough memory available to complete the operation.

CLEARING MEMORY







To clear all of the MMT-8's memory and reinitialize all of its variables, turn power off, press and hold ERASE, PAGE UP, and PAGE DOWN, and turn on the power while holding these buttons down for 3 seconds.

AUTO LOCATE







The MMT-8 has Auto Locate ability which allows you to go directly to a specific beat of a part without playing through the beats prior to the desired beat number.

PART MODE:

A. When the MMT-8 is in PLAY -

1. Press and hold either the Fast-Forward  or Rewind  button.
2. Enter the number of the desired beat (3 digits) using the keypad buttons  through  .
3. Release the Fast-Forward  or Rewind  button.
4. The Part will continue playing from the selected beat number.

B. When the MMT-8 is in STOP -

1. Press and hold either the Fast-Forward  or Rewind  button.
2. Enter the number of the desired beat (3 digits) using the keypad buttons  through  .
3. Release the Fast-Forward  or Rewind  button.
4. Press the STOP/CONTINUE button to begin playing from the selected beat.

SONG MODE:

1. Follow instructions for PART mode. The MMT-8 will Auto Locate to the desired beat in the current step (Part) of the song.

MMT-8 MIDI IMPLEMENTATION CHART

Function	Transmitted	Recognized	Remarks
CHANNEL Default	1-16	1-16	Userchangeable
Changed	1-16	1-16	
MODE Default Messages Altered	X	X	
NOTE NUMBER True Voice	00-127	00-127	
VELOCITY Note on	O	O	
Note Off	X	X	
TOUCH Key's	X	X	
Chan's	O	O	
PITCH BENDER	O	O	
CONTROL 0-63	O	O	
CHANGE 64-122	O	O	
124-127	X	X	
PROGRAM CHANGE True #	0-127	0-127	
SYSTEM EXCLUSIVE	O	O	
SYSTEM COMMON Song Pos	O	O	
Song Sel	X	X	
Tune	X	X	
SYSTEM REAL TIME Clock	O	O	
Messages	O	O	
AUX Local Control	X	X	
All Notes Off	X	X	
Active Sense	X	X	
Reset	X	X	

Mode 1: OMNI ON, POLY
Mode 3: OMNI OFF, POLY

Mode 2: OMNI ON, MONO
Mode 4: OMNI OFF, MONO

O: YES
X: NO

MMT-8 TROUBLESHOOTING CHART

SYMPTOM	WHAT 'S PROBABLY WRONG	WHAT TO DO
No sound during playback of recorded parts.	Didn't record. MIDI channels not properly corresponding with sound sources. Tracks are muted	Check MIDI connection. Check MIDI channel assignments. Check track mute selection.
Won't record after touch or system exclusive data.	MIDI filters for after touch and system exclusive are enabled.	In MIDI filters mode, set after touch and sys ex record to on.
Won't save or load to tape	Bad connections. Bad tape. Level of sync tone is too high or low. Errors in data.	Check wiring. Use a certified data tape. Try a higher or lower level to tape. Re-save the data.
Won't sync to tape.	Bad connections. Level on tape	Check cables. Set level at or near 0 vu. Turn off noise reduction if possible.

If problems aren't solved after troubleshooting and referring to the manual, consult your Alesis dealer for assistance.

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