The DPM® 2
Performance Sequencer

Upgrade
To The DPM 2 Synthesizer
Owner's Manual

Contents

Introduction

Congratulations and thank you for purchasing the DPM 2 Performance Sequencer Upgrade. This software upgrade will transform your DPM 2 synthesizer into a powerful composition center capable of recording, editing, and playing fully orchestrated compositions or arrangements.

Features

- 80,000 event capacity
- 10 songs, 50 sequences
- 16 tracks
- 96 ppqn
- Separate loop lengths for each track
- Multi-channel record
- Automated mix down and record
- User selectable metronome sound
- Up to 64th note triplet quantization
- Step edit mode
- Song building (drum machine style)
- Track editing: transpose, scale, velocities, quantize, merge, insert measure, delete measure, slide, copy, and erase
- Microscope editing
- Keyboard data entry
- Time marking
- Track muting and soloing

DPM 2 Upgrades (in addition to Sequencer upgrade)

Keyboard Data Entry

The DPM 2 now supports keyboard data entry. This means that the DPM 2 accepts data changes for notes and velocity from the keyboard. *For example:* You are going to edit a note parameter. Instead of using the *+/inc* or *-/dec* buttons or the *data slider* to input the new value, you could strike the note on the keyboard. The DPM 2 will take that note message and place it into the note field being edited.

This feature is available everywhere note or velocity values may be edited.

Note: The *+/inc* and *-/dec* buttons as well as the *data slider* may still be used for entering note and velocity data if desired.

Programs

The DPM 2 now allows you to have more than 600 programs. Programs 0 - 299 are factory presets stored in ROM and cannot be altered. However, they may be edited and saved to any of the user program locations in RAM or to a RAM cartridge. Programs 300 - 599 are user programs stored in RAM and may be edited and altered. Programs 600 and above are those plugged into the cartridge slot on the DPM 2.

Note: Each time the DPM 2 is reinitialized the 300 programs stored in ROM are copied and placed into the 300 user programs in RAM. You must save your programs before reinitializing if you want to keep them.

Copy Changes

The *Copy* menu now has a page to copy ALL SEQS, this lets you copy all sequences, via MIDI, to a MIDI device capable of accepting sequence data.

You can no longer copy ROM programs. The Copy PROGRAMS page has been changed to allow you to copy the RAM programs in banks. There are three banks of 100. Bank 0 will copy programs 0 - 99, bank 1 copies programs 100 - 199, and bank 2 copies programs 200 - 299.

9.1 Contents

The DPM 2 Performance Sequencer software upgrade consists of:

- Installation instructions
- Two EPROMs (labeled Hi and Lo)
  These will replace the existing EPROMs
- Two Memory ICs
  These will occupy the sockets located to the right of the EPROMs when viewed with the DPM 2 upside down and the access hatch open
- DPM 2 Performance Sequencer Owner's Manual addendum
- Front panel template

The front panel template for the *Program Select* buttons looks like this:
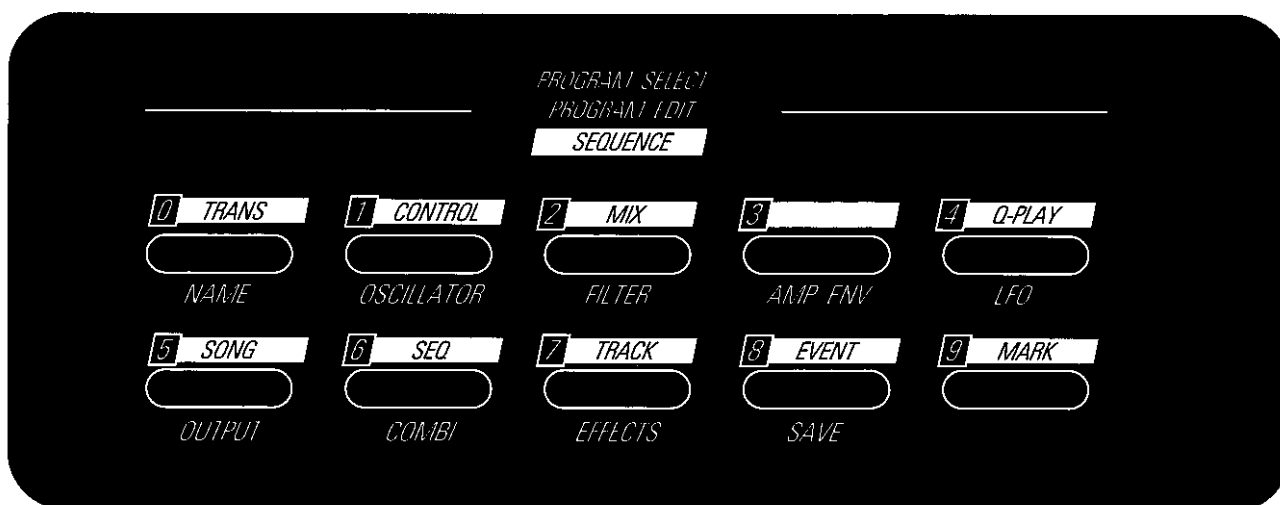
9.2 Basic Operation

What is a sequencer?

By now, you should be familiar with the vast array of sounds the DPM 2 can create. If a person could layer several performances using various sounds, they could simulate a performance or recording by an entire band of musicians. This facility is provided by the DPM 2 Performance Sequencer.

A sequencer is similar to a multi-track tape recorder. For example, we can record a drum track by playing one of the DPM 2 drum programs after putting the sequencer into record mode. Now, if we put the sequencer into play mode, we will hear the DPM 2 repeat the drum track we just recorded. Next we layer an acoustic bass over the existing drums. To do this, we record to a different track while the drums are playing back. After recording track number three, piano, we can sit back and listen to our jazz trio recording.

There are two major differences between a multi-track tape recorder and a sequencer.

1. Instead of recording audio information, the sequencer records MIDI information. Since this format is disjoint from the sounds, we can easily replace the acoustic bass and piano with different instruments such as electric bass and organ.
2. While the tape recorder saves the information on tape, the sequencer uses random access digital memory chips. The DPM 2 can quickly manipulate this data in several ways, making it easy to fix performance errors

and experiment with your music. Also, tracks can be re-recorded as many times as you like without any sound degradation.

What is sequencer memory?

Sequencer memory is similar to tape length. If you were using a multi-track tape recorder, you would know exactly how many minutes of tape you had to record on. You would also know that the length of time was independent of the amount of music (information) being recorded. With sequencer memory you know exactly how much data (control information) can be recorded (total number of events available); this total is independent of the amount of time it takes to record your data. Understanding this difference will help you to manage sequencer memory.

For example, holding down a single key for one minute uses much less memory than a slow pitch bend. Key up and key down data is small while pitch bend and mod wheel information can become very large. This is because the key press and depress only uses two MIDI messages or control gestures, while the pitch bend uses several. (One for each new position of the bend!)

The DPM 2 Performance Sequencer is a 16-track sequencer designed for efficient composing. Each track can play back multiple voices through its own internal sound, send multiple voice MIDI data out to other instruments, or both.

Storage - The sequencer memory stores up to 10 songs, 50 sequences; however, the total number of events cannot exceed approximately 80,000.

Sequence Structures - An individual sequence can be treated as a complete composition. This approach is called *linear* recording since events are recorded "in a line" from beginning to end. The DPM 2 also allows for *modular* (or *drum-machine* style) sequencing; this allows combining of individual sequences into a song.

Example: One sequence could be a verse, another a chorus, a third an instrumental break, and so on; a song would play back each sequence consecutively, in the desired order. Up to ten songs can be stored that use any of the sequences in memory.

Resolution - The resolution is 96 clocks per quarter note, as good as many computer based software sequencers, and sufficiently accurate to reproduce your "feel."

Editing Options - Operations can affect entire tracks, portions of tracks, specific range of note, or even a single event.

Tracks - There are sixteen tracks numbered 0 - 15.

Looping - The sequencer also allows for looping, where any track can play continuously by jumping back to the beginning after reaching the end. However, since each track can have a separate length, loops can be independent (loop four bars of drums, eight bars of bass, etc.)

9.2a   Overview of Sequencer Menus

In order to access the following sequencer functions, press the *Sequence* button. To exit the sequencer, enter a different **System** menu, or press the *Exit* button until you reach the **Program Select** screen.

- **Transport** - Basic operation is similar to using a tape recorder, with familiar Play, Stop, Rewind, Fast Forward, and Pause controls.
- **Control** - This indicates general system parameters: clock source, tempo, whether loop is on or off, free memory, metronome setup, etc.
- **Mix** - This accesses the parameters for track number, program, configuration, MIDI channel, and volume.
- **Q-Play** - This allows a song or sequence to be put in a queue.
- **Song** - This accesses all song level actions.
- **Seq** - This accesses all sequence level actions.
- **Track** - This allows access to track edit functions such as: statistics, copy, merge, insert, delete, erase, transpose, scale, slide, and quantize.
- **Event** - The functions accessed through the Event button are similar to the Track functions; the difference is that this allows you to edit at the event, or note, level.
- **Mark** - This allows you to mark a time within a sequence and later load it into a field being edited.

9.3   Sequencer Menu Functions

9.3a   CONTROL

The *CONTROL* menu allows you to change the general system settings on the following five pages:

- Synchronization
- Metronome
- Recording
- Event Processing
- Memory

After pressing the *CONTROL* button to enter the control pages, the *+/inc* and *-/dec* buttons will move through the five pages.

The *SYNC* page allows you to change the loop, clock, XSysR, and tempo settings.

```
SYNC          Loop    Clock    XSysR    Tempo
              OFF     INT      OFF      127
```

Loop   -   When the current sequence or song ends, it will start again.
Clock   -   Choose between INT (the DPM responds to its own clock at the specified tempo) or EXT (the DPM follows an external MIDI timing source if such signals are present at the DPM MIDI in).
XSysR -   If Clock= Int and XSysR= On, the DPM 2 will respond to MIDI stop, start, and continue commands present at the MIDI in port, but follows its internal clock. If Clock= Ext and XSysR= On, the DPM 2 will respond to the previous commands *and* external MIDI timing clocks. If XSysR= Off, the DPM 2 will not respond to stop, start, or continue commands, but if Clock= Ext, the DPM 2 will respond to MIDI timing clocks.
Tempo -   This sets the default tempo for sequence recording. This parameter is saved with a sequence or song. If the clock is set to EXT, the tempo comes from the external MIDI clock source, not the internal tempo value.

The *METRO* page allows you to change the resonance, volume, oscillator wave, pitch, and decay of the metronome.

Note: The DPM 2 Performance Sequencer uses a software metronome. This allows the user to select any of the percussive waves as the sound source for the metronome.

```
Metro   Res    Vol   Osc Wave   Pitch   Decay
ON      1/4    89    SSTICK     C3      10
```
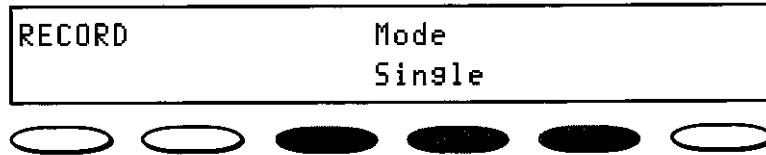
METRO   -   This turns the metronome ON or OFF.
Res   -   This sets the resolution (rhythmic value) of the metronome to 1/4, 1/8, or 1/16.
Vol   -   This sets the volume of the metronome.
Osc Wave   -   This allows you to select any percussive wave of the DPM 2 as the metronome sound.

Pitch   -   This allows you to select the key (within the range of the keyboard) that the metronome
                   will play.

Reminder: Keyboard data entry may be used to edit the Pitch parameter.

Decay   -   This selects the decay of the metronome.

The *RECORD* page allows you to set the record mode to either single or multi-channel recording.

```
┌─────────────────────────────────────────────┐
│ RECORD              Mode                     │
│                     Single                   │
└─────────────────────────────────────────────┘
```

◯ ◯ ⬤ ⬤ ⬤ ◯

The *EVENT* page allows the user to determine the event types used in Event Search mode. The
possible event types are:

- All   - All events
- Notes   - Note events only
- Controls   - Controllers only (any of the following)
- Pitch Bend   - Pitch bend only
- Aftertouch   - Aftertouch only
- Prg Change   - Program changes only
- Mod Wheel   - Modulation wheel (control #1)
- Vol Change   - Volume changes (control #7)
- Sustain   - Damper pedal (control #64)

```
┌─────────────────────────────────────────────┐
│ EVENT               Filter                   │
│                     ALL                      │
└─────────────────────────────────────────────┘
```

◯ ◯ ⬤ ⬤ ⬤ ◯

9.3b   SEQ

Use the sequence menu to create, select, build, rename, copy, and delete a sequence, or to set its effect type.

The *+/inc* and *-/dec* buttons and the *data slider* allow you to choose a sequence to operate on. Sequences range from 0 to 49.

On entering the screen, the format for each sequence may be different depending on whether the sequence has been created or not. If the sequence has not been created, the only function available is create.

```
        10:Empty          T.Sig  Bars [ENTER]
Create  [<-]    [->]     04/4    001
```

T.Sig   -   This allows you to select a time signature between 1/4 and 32/4.
Bars   -   Select the number of bars for the sequence.

If a sequence has been created, pressing soft key 1 allows you to choose Select, Rename, Copy, Delete, or Effect.

Select   -   a sequence must be selected to be able to control it from the transport or track/event edit screen. If a sequence is selected, an *S* will be shown to the left of its name. Once selected, a copy of the sequence is loaded into an edit buffer allowing you to make any changes desired without affecting the original sequence. If you return to the Sequence display window and press the ENTER button to select the sequence that is already selected, you will be asked if you want to save the changes made to the first copy of the sequence in a different location. Then, the DPM 2 will load another copy of the original sequence into the edit buffer.

Note: Only one song or sequence can be selected at a time.

```
 *S* 00:SequenceName                 [ENTER]
Select
```

Rename   -   change the name of the sequence. (See section 5.2b: Program Name)

```
 *S* 00:SequenceName
Rename          [<-]    [->]
```
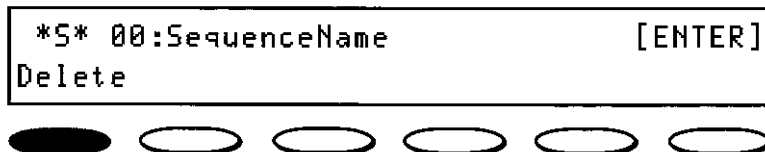
Copy   -   copies the sequence from one location to another. If the destination sequence exists, you will be asked to confirm overwriting that sequence.

```
 *S* 00:SequenceName                 [ENTER]
Copy     --> 10:Empty
```

Delete   - resets the sequence name to *Empty* and un-created it.

```
┌─────────────────────────────────────────────┐
│ *S* 00:SequenceName              [ENTER] │
│ Delete                                      │
└─────────────────────────────────────────────┘
```
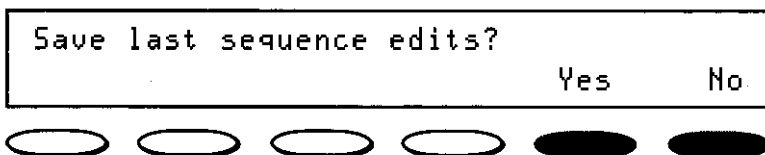
⬤   ◯   ◯   ◯   ◯   ◯

Effect   - sets the effect to use while sequence is playing. Each DPM 2 program has its own associated signal processing parameters. A sequence will use one of these effect setups *on all* tracks. If a cartridge is inserted, you may select the effect setup from a cartridge program.

```
┌─────────────────────────────────────────────┐
│ *S* 00:SequenceName              [ENTER] │
│ Effect      000:Tech Kit                    │
└─────────────────────────────────────────────┘
```

⬤   ⬤   ⬤   ⬤   ◯   ◯

Saving your sequence:

The edited version of the selected sequence is stored in the sequence edit buffer. This information remains intact after the DPM 2 is powered down.

There are several operations which destroy the sequence edit buffer information: creating a sequence, selecting a sequence, selecting a song, and entering the Q-Play menu. Any time you perform an operation that would otherwise destroy new data, before that operation is executed the SAVE pages will be visited to allow you to save your changes.

```
┌─────────────────────────────────────────────┐
│ Save last sequence edits?                   │
│                          Yes      No        │
└─────────────────────────────────────────────┘
```

◯   ◯   ◯   ◯   ⬤   ⬤

Pressing the NO soft button will continue the operation without saving the last sequence edits. Pressing the YES soft button will take you to the second SAVE page. If you are not sure if you made any important sequence changes, the safest route is to press YES.

```
┌─────────────────────────────────────────────┐
│      10:SequenceName             [ENTER] │
│ Update...                                   │
└─────────────────────────────────────────────┘
```

⬤   ◯   ◯   ◯   ◯   ◯

The function in the bottom left corner may show Update..., Save to..., Overwrite..., or Reserved. Use the +/inc and -/dec buttons or the data slider to choose a sequencer number at which to store the edited sequence, and watch this function change.

Update...   - stores the sequence back to the location from which it originated.
Save To...   - stores the sequence to a different, empty location.
Overwrite...   - destroys a different sequence, and replaces it with the edited sequence.

Reserved...   -   this indicates that you cannot store to this location. Pressing the *Enter* button will not do anything.

Press the Enter button to store the edited sequence and execute the original operation.

Note: You never have to be concerned about saving changes until the DPM 2 shows you the save page.

9.3c   MIX

The MIX setup menu allows the user to change the parameter settings for each Trk (track), Program, Cnfg (configuration), MIDI, and Vol (volume).

```
┌─────────────────────────────────────────────────┐
│ Trk00    Program: 000    Cnfg   Midi   Vol       │
│ *M*      Tech Kit         INT    01    127        │
└─────────────────────────────────────────────────┘
```

When no fields are being edited, the +/inc and -/dec buttons or the data slider will change the track number. This also chooses the currently selected track for recording and track/event editing. Make sure the correct track is selected before exiting this menu.

The only other way to change the currently selected track is through the Track menu explained later.

Program - This selects the program used for this track. The program can be chosen from cartridge as well as DPM 2 memory (ROM and RAM).

Cnfg - The configuration determines whether a track will: play the assigned internal programs only (INT); transmit track data to MIDI out but not play the internal program (EXT); or play the assigned internal programs and transmit data to MIDI out (ALL).

Midi - This selects the MIDI channel (channels 1-16) over which MIDI data will be received when Cnfg is set to EXT or ALL.

Vol - This sets the value of volume data transmitted over MIDI and the relative mix of the internal programs.

Note: The *M* in the bottom left corner of the display window indicates that MIDI data has been recorded on this track.

Mute/Solo

You can also set tracks to be muted or solo by repeatedly pressing the Vol button until either MUTE or SOLO is displayed. When MUTE is selected, the track that is muted will no longer be heard. When SOLO is selected, only that track will be heard, all other tracks will become muted. When SOLO is removed from a track, the original settings of all the tracks are remembered.

Automated Mixdown

For automated mixdown, adjust the volume while the track is recording. Your fader movements will be recorded into the sequence.

9.3d TRANS

The Sequencer Transport menu contains only one page, the Transport page. Most of your sequencer time will be spent on this page and several functions can be performed from here. These functions can be broken into four groups: Transport Control, Recording, Tempo Control, Step Editing.

Unless recording, the top left of the screen displays the current sequence name. The remainder of the display information will be explained under the group heading to which it relates.

```
SequenceName 001/01 of 001 *STOP* T=127
SAFE     REW      PLAY      FF      STOP    PAUSE
```

Transport Control

The transport control soft keys simulate a standard tape transport, allowing you to play and stop songs and sequences, and change position within a sequence. They include soft keys 2 through 6, labeled REW, PLAY, FF, STOP, and PAUSE.

REW   -   This is the Rewind function. Press once to back up one measure, or press and hold to back up one measure at a time as long as the button is held down. The sequencer mutes during rewind. This soft key also leads to the Goto function which is explained later.

PLAY   -   Puts the transport in motion for playing back recorded data and/or recording new data. It also functions as the STEP key in the Step Edit mode. See Step Editing.

FF   -   This is the Fast Forward function. Press once to go forward one measure, or press and hold to go forward one measure at a time for as long as the button is held down. The sequencer is muted during Fast Forward. This soft key also leads to the Goto function which is explained later.

STOP   -   Stops the sequencer.

PAUSE -   Pauses the sequencer at the current sequence position or time. You must press PAUSE again to exit the paused state. Pause is also used in Step Editing.

The transport will always be in one of six states. The current state is displayed on the top line of the transport page, bordered by asterisks.

STOP   -   The transport is stopped at the beginning of the currently loaded sequence.

PLAY   -   The transport is moving forward at normal speed. Both sequence playing and recording use this transport state.

PAUSE   -   The transport is paused at the beginning of the currently loaded sequence. This state is entered preparing for the *STEP* state.

STEP   -   The transport is paused, but not necessarily at the beginning of the loaded sequence!
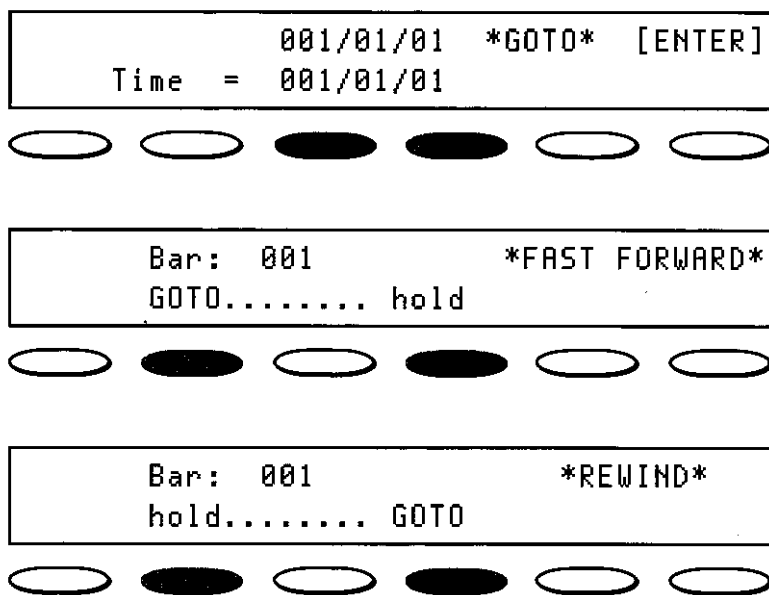
REWIND - The transport is backing up through the measures of the sequence. The sequence is muted.

FAST FORWARD - The transport is advancing through the measures of the sequence at fast speed. The sequence is muted.

GOTO - The transport is paused waiting for you to select a time at which to position the transport.

The Transport page also shows the current time or position within the sequence. In most transport states this is shown as <bar#>/<beat#> of <bars in sequence>. In the *STEP* state, it shows <bar#>/<beat#>/<clock#>. The range of the fields are:

bar # - 1.. bars per sequence.
beat # - 1.. beats per bar, dependent on time signature.
clock # - 1.. 96.

Goto

Pressing REW and FF at the same time brings us to the Goto page. The GOTO function allows you to jump to a new time or position in the current sequence. This makes it easy to change to the GOTO function while waiting for an everlasting fast forward or rewind to finish! The GOTO, Fast Forward, and Rewind screen look like this:

```
        001/01/01   *GOTO*   [ENTER]
Time  =  001/01/01
```

```
Bar:  001              *FAST FORWARD*
GOTO........ hold
```

```
Bar:  001                *REWIND*
hold........ GOTO
```

The bar, beats, and clocks of the GOTO point can be edited. To edit one of these fields, press one of the two soft keys under the three fields. These soft keys will rotate through the 3 fields. Soft key number 3 will rotate to the left while soft key number 4 rotates to the right through the fields. Once a field is flashing, change the value using the +/inc and -/dec buttons or the data slider. The first value displayed in this field is the last GOTO point used, making it easy to return to the same spot several times. To execute a GOTO, set the desired GOTO time and press the Enter button. The transport will return to the state in effect before issuing the GOTO, i.e. *STOP* or *PLAY*.

Recording

There are seven states related to recording functions. The current record state is displayed over soft key 1, which, along with the PLAY and STOP keys, controls this record state.

During all record states except SAFE, the current sequence name, in the upper left of the transport page, is replaced with the recording track. All record functions, except multi-track recording, affect only the recording track.

```
┌─────────────────────────────────────────────────────┐
│--Track 00-- 001/01 of 016 *STOP*  T=127 │
│ODRDY   REW     PLAY     FF     STOP    PAUSE│
└─────────────────────────────────────────────────────┘
```

SAFE   - The sequencer is not recording, nor ready to record. This is the record state during normal playback.

ODUB   - This is the overdub state, or sound-on-sound. The sequencer is recording new data without erasing any existing data.

ODRDY - The sequencer is ready for overdub.

RECRD - This is the record state, similar to a home tape recorder. The sequencer is recording new data while erasing any existing data in the recording track.

RCRDY - The sequencer is ready for RECRD.

ERASE - The sequencer is erasing data from the recording track. Any new data is ignored.

ERRDY - The sequencer is ready to ERASE.

Setting the record state must be initiated while the transport is in *STOP* or *PAUSE*. By repeatedly pressing soft key 1, the record state written over the soft key will toggle through the three ready record states (ODRDY, RCRDY, ERRDY) and SAFE.

Pressing PLAY will put the transport into *PLAY* or *STEP*, depending on whether it was in *STOP* or *PAUSE*, respectively. At this point, soft key 1 toggles between the ready record state and the active record state. In other words, ODRDY, RCRDY, and ERRDY will toggle with ODUB, RECRD, and ERASE respectively. This allows us to punch in and out of the active record state. For example, punching in and out of ERASE allows us to do "spot erasures."

In order to simplify basic recording, pressing PLAY while in the ODRDY record state automatically changes it to ODUB. This does not occur with RCRDY and ERRDY since RECRD and ERASE are destructive. Also, the STOP soft key always resets the record state to SAFE.

To record:

1. Press the **TRANS** button.

```
┌─────────────────────────────────────────────────┐
│ SequenceName  001/01  of  001  *STOP*   T=127   │
│ SAFE    REW     PLAY     FF     STOP    PAUSE    │
└─────────────────────────────────────────────────┘
```

2. Press the soft key under SAFE. The following display should appear:

```
┌─────────────────────────────────────────────────┐
│   Record Track is empty.         [ENTER]        │
│   Enter length = 016 bars                       │
└─────────────────────────────────────────────────┘
```

3. Press the **ENTER** button. This takes you back to the transport page.

```
┌─────────────────────────────────────────────────┐
│ --Track 00--  001/01  of  016  *STOP*   T=127   │
│ ODRDY   REW     PLAY     FF     STOP    PAUSE    │
└─────────────────────────────────────────────────┘
```

4. Press the soft key under *ODRDY* (overdub ready) until you reach *RCRDY* (record ready).
5. Press the soft key under *Play*, then the soft key under *RECORD* and begin playing.
6. When you have finished recording, the display will look similar to this:

```
┌─────────────────────────────────────────────────┐
│ SequenceName  001/01  of  016  *STOP*   T=127   │
│ SAFE    .REW    PLAY     FF     STOP    PAUSE    │
└─────────────────────────────────────────────────┘
```

7. To hear what you have just recorded, press the *Play* soft key.

Tempo Control

The tempo is displayed in the upper right corner of the Transport page. It shows the rate at which the sequence is played in beats per minute. The tempo can range from 40 to 250 beats per minute. Since there is only one page under the TRANS menu, the *+/inc* button, *-/dec* button and the *data slider* are used to adjust the sequencer tempo. When using the slider, the current tempo must be grabbed before it can be adjusted. This avoids quick jumps in tempo.

This parameter is saved with a sequence or song. Any changes to the tempo while the transport is in *PLAY* or *STEP* are temporary, and do not change the original tempo for the sequence or song.

When the transport is in the *STEP* state, the upper right corner of the transport page is changed to

display the step size, and this parameter is now edited by the +/inc button, -/dec button and the data slider.

Step Size Table

Display	Note Value	# of Clocks
1/4	quarter note	96
1/4T	quarter note triplet	64
1/8	eighth note	48
1/8T	eighth note triplet	32
1/16	sixteenth note	24
1/16T	sixteenth note triplet	16
1/32	thirty-second note	12
1/32T	thirty-second note triplet	8
1/64	sixty-fourth note	6
1/64T	sixty-fourth note triplet	4
1 Clk	1/384th note	1

When you execute a step, the sequencer plays from one step to the next at the tempo rate. Therefore, the tempo parameter can also be adjusted via the Sequencer Control menu (CONTROL).

Step Editing

Step - Pressing PLAY and PAUSE or vice versa enters the *STEP* mode. Once in this mode, the PLAY soft key is re-labeled STEP. Each press of STEP advances the time by the step size, now displayed in the upper right of the page. During this process you can punch in or punch out to add or delete notes.

Step Edit Operations

To enter step mode from normal playback:

1. Start normal playback.
2. Press the Pause soft button.
3. Select the desired step size (this appears instead of the tempo in the upper right of the display). Use the +/inc or -/dec buttons or the data slider to change the step.
4. Press the Step soft button (this is the Play soft button renamed) to step through the sequence at the selected step size. The bar/beat/clock counter will replace the Transport bar/beat counter in the display. This will increment each time the Step soft button is pressed.

To step from start of sequence:

1. Press the Transport button, then the Stop soft button.
2. Press the Pause button.
2. Press the Play button to tell the sequencer you want to start playback.
3. Press the +/inc or -/dec button to select the step size.
4. Press the Step button to position the sequencer at the first clock of the current bar.
5. Press the Step button again to step through the sequence at the selected step size. The bar/beat/clock counter will increment to show where you are in the sequence.

Rewinding and fast forwarding in step edit mode:

1. To rewind or fast forward, press the rewind or fast forward soft button, respectively.
2. The display will briefly flash to the *GOTO* display while rewinding or fast forwarding.
3. The sequencer status is now equivalent to entering step mode from normal playback. Release *Pause* button to start normal playback.

To record in step edit mode:

Note: To record in the Step mode it is necessary to press and hold the note desired, step to a new bar/beat/clock, then release the note. If the note was pressed and released without stepping the time, the note may not sound as expected.

1. Choose the record condition, either RCRDY or ODRDY, by pressing the SAFE soft button.
2. Press the *Pause* soft button.
3. Press the *Play* soft button.
4. If RCRDY was selected, press the *RCRDY* soft button to place the sequencer in the RECRD mode. If ODRDY was selected, the sequencer automatically switches to ODUB when the Play button is pressed.
5. Use the Step or Goto functions to position the sequence at the desired bar/beat/clock.
6. When you reach the bar/beat/clock where you want to record, play the note(s) to be recorded.

To erase in step edit mode:

1. Press the SAFE soft button until ERRDY is displayed.
2. Press the *Pause* soft button.
3. Press the *Play* soft button.
4. Select the step size.
5. Press the *Step* soft button to step to the location where erasing should begin.
6. Press the *ERRDY* soft button. It should now read ERASE. You are now ready to Step erase.
7. Press the *Step* soft button to step through the sequence until you reach the last step where erasing is to occur.
8. Press the *Erase* soft button to exit the Erase mode and return to *ERRDY.*

Once you become familiar with step edit options, you'll find it's easy to bounce back and forth between normal recording and step edit modes. Remember, you can enter step edit at any time during normal sequencer operation by pressing the Pause soft button, then pressing the transport controls as appropriate (see above). To exit step edit mode at any time, simply release pause.

Multi-Channel Record

This is used to record sequences from another sequencer into the DPM 2. Perform multi-channel recording as follows:

- On the DPM 2 MIDI page, set the mode to OMNI. This allows MIDI data coming in on all sixteen MIDI channels to be recorded.
- Toggle the CONTROL Record page to the Multi mode.
- Create a new sequence with the correct time signature and enough bars (use the default of 999 bars if you are not sure).

- Set the sync as desired. If the source sequencer sends MIDI Start/Stop/Continue, we suggest setting **XSysR = On**. If the source sequencer sends timing clocks, set **Clock = EXT**.
- Press RECORD on the transport page. If the sequence has track data, you must confirm destroying all tracks. In MULTI mode there are only two record options: SAFE and RECORD.
- The above will force tracks 0 -15 to MIDI channels 1-16.
- In the external clock mode, press PLAY on the DPM 2 to prepare for recording; then start the source sequencer. This will start the DPM 2 recording. In internal clock mode, press PLAY on the DPM 2 to start recording; then immediately start the source sequencer.
- Press stop when the recording is complete. Don't wait for 999 bars to play.

Note: Multi will discard the unused bars. These are the bars not used between the time the stop button is pressed and the 999 bars maximum.
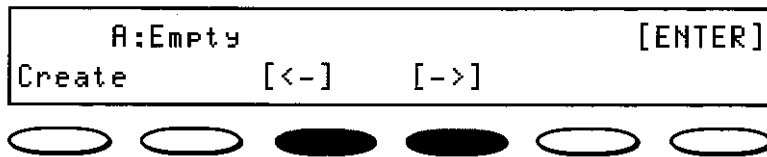
9.3e SONG

A DPM song is a play list of sequences resident in the DPM 2. This play list specifies which sequences will play, their order, and how many times individual sequences repeat before the next sequence in the play list begins playback.

The +/inc and -/dec buttons and the *data slider* allow you to choose a sequence to operate on. Songs range from A to J.

Note: To play a song, all of the sequences that make up that song must be in memory.

On entering the Song screen, the format for each song may be different depending on whether the song has been created or not. If a song has not been created, the Create screen will be displayed.

```
┌─────────────────────────────────────────┐
│     A:Empty                    [ENTER]   │
│ Create         [<-]      [->]            │
└─────────────────────────────────────────┘
```
◯   ◯   ⬤   ⬤   ◯   ◯

If created, pressing soft key 1 allows you to choose Select, Build, Copy, Delete, Effect, or Rename.

Select - Songs must be selected to be able to control them from the transport screen. If a song is selected, an *S* will be shown to the left of its name. To select a song, press the ENTER button when the song desired is shown in the display.

Note: Only one song or sequence can be selected at a time.

```
┌─────────────────────────────────────────┐
│  *S* A:Shuffle                 [ENTER]   │
│ SELECT                                   │
└─────────────────────────────────────────┘
```
⬤   ◯   ◯   ◯   ◯   ◯

Build - insert and delete sequences to and from a song. A song step can be given a repeat count, so that a sequence will repeat up to 999 times. A repeat count of 0 means that a sequence will play once without repeating. Pressing *Ins* will duplicate the current sequence. The user can then change it to the desired sequence and set the repeats.

```
┌─────────────────────────────────────────────┐
│  *S* A:Shuffle      Step     Seq:00    Rep   │
│ Build    Ins    Del   01    SequenceName 000 │
└─────────────────────────────────────────────┘
```
⬤   ⬤   ⬤   ⬤   ⬤   ⬤

Ins - Inserts a sequence to a song.

To Insert a sequence into a song:

1. Press the soft button under **Step.**
2. Press the +/inc or -/dec button until you reach the point where you want to insert a new step.
3. Press the **Ins** soft button. This will insert the sequence after the step shown.

4. Press the soft button under the Sequence name.
5. Using the +/inc or -/dec button, change to the desired sequence.

    Del - Deletes a sequence from a song.

To Delete a sequence from a song:

1. Press the soft button under **Step**.
2. Press the +/inc or -/dec button until you reach the point where you want to delete a step. This will delete the sequence occupying the step shown.
3. Press the **Del** soft button.

    Step - This is the current song step.
    Seq - Name of the sequence.
    Rep - Number of times the sequence will repeat.

Copy - copies the song from one location to another.

```
*S* A:Shuffle                [ENTER]
COPY      to B:Big B!
```

Delete - resets the song name to *Empty* and un-creates it.

```
*S* A:Shuffle                [ENTER]
Delete
```

Effect - sets the effect to use while song is playing.

```
*S* A:Shuffle                [ENTER]
Effect    000:Tech Kit
```

Rename - changes the name of the song.

```
*S* A:Shuffle
Rename         [<-]     [->]
```

About Effects

The effects that can be used while in the sequencer mode can be set in three places – selecting programs, **SEQ** page, and the **SONG** page.

A new sequence is created with its effect set to *UNDEFINED*. As a user changes programs (through the MIX page program field or changing tracks) before doing any recording, the effect will change to the one associated with that program. To disable this feature, set the sequence effect to something other than *UNDEFINED*, and re-enable by setting it back to *UNDEFINED*.

When the first track is recorded, the effect for the track program becomes the sequence effect. This is done because the sequencer can play sixteen different sounds, but can use only one effect setup. Each sound may have a different effect setup associated with it.

This effect can be changed later through the **SEQ Effect** page. Once recorded, the effect can no longer be set to *UNDEFINED*. All sequencer sounds are played through this effect setup.

As you start assembling songs, you can assign an effect to the song or use the effects set by each of the sequences. When creating a song, its effect is set to effect 000. The user can change the effect for the song, or set it to *UNDEFINED*. The latter means that the song will use the effects set by each of the individual sequences.

9.3f   TRACK

Once a track has been recorded, there are multiple edit functions. These can affect an entire track, only certain portions of a track, only notes that fall within a certain pitch range, etc.

Track edit functions are:

- Statistics
- Copy
- Merge data from one track to another
- Insert data into a track
- Delete all data in a particular range of measures
- Erase specified data
- Transpose pitch
- Scale note velocities
- Slide data forward or backward in time
- Quantize (correct note timing to the nearest specified rhythmic value)

When the track exists, all functions except Copy are available. When the track doesn't exist, only Stats (statistics) and Copy are available.

To move from one track edit function to the next, press the soft button under the name of the track edit function displayed. It should start flashing. Then use the +/inc or -/dec or data slider buttons to access each of the other track edit functions.

Statistics
On this page you can view the number of bars a track has and the number of bytes (amount of memory) that track occupies. This page is information only and cannot be edited.

```
Trk00              Bars        Bytes
Stats              008         000988
```

1. From inside the sequencer, press the Track menu button. This will be the first page displayed if this is the first time in the Track menu since power up. Otherwise, press soft button 1 and decrement until you see the Stats page.

Copy
This function copies track note data to the selected track from the same, or a different, sequence. This function is only available if the selected track is empty.

1. Make sure the track into which you want to copy data is selected, then select the Copy function by pressing the track edit function soft button and using the +/inc or -/dec button.

```
Trk05                   Sequence        Track
Copy      From      00:SequenceName       00
```

2. On the **Copy** page, the soft button under **From** is used to select the copy options: **Notes** and **Limits**.
3. Select the *sequence* and *track number* from which the data is to be copied.
4. Press soft button 2 (under From) to go to the **Notes** page.
5. Select the **Option** desired. Possible Options are: ALL, and RANGE. If ALL is selected, the Low to High Range is ignored and all notes on the track are erased. If RANGE is selected, only the notes that are within the Low and High notes specified are erased from the track.
6. Press soft button 2 (under Notes) to go to the **Limits** page.
7. On this page you can set a starting and ending bar to copy data that meets the specified data.
8. When the parameters selected are correct, press soft button 2 until the **Copy Do it!** page is displayed.
9. Press the *Enter* button to confirm, or any other non-soft button to exit.

Merge

This function mixes all data from a specified track to the currently selected track. *Example:* Record several different solos on one track. Delete all but the best sections of each track, then merge all the tracks into one final, combined solo track.

```
Trk00          From Track         [ENTER]
Merge              00
```

1. Make sure the track into which you want to merge data is selected, then select Merge function by pressing the track edit function soft button and using the *+/inc* or *-/dec* button.
2. Select the **From Track**. This is the track from which you are getting the information to merge onto the current track.
3. Press the *Enter* button to confirm, or any other non-soft button to exit.

Insert

This function inserts note data from part of a track into the same track, starting at a designated measure. The track is extended by the length of the inserted section. *Example:* Assume four measures, A, B, C, D. Inserting D before C creates a track that goes A, B, D, C, D.

```
Trk00    From Bar   Thru   Before [ENTER]
Insert        001    002    004
```

1. Select the **From Bar**. This is the bar that you will start the insert with.
2. Select the **Thru** bar. This is the bar that you will end the insert with.
3. Select the **Before** bar. This will take the bar range specified and place it (them) before the bar indicated.
4. Press the *Enter* button to confirm, or any other non-soft button to exit.

Delete

Deletes all or some measures of a track.

```
┌─────────────────────────────────────────────┐
│ Trk00    From Bar    Thru          [ENTER]   │
│ Delete        001    002                     │
└─────────────────────────────────────────────┘
```

● ○ ● ● ○ ○

1. Select the **From Bar**. This is the bar that you will start the delete with.
2. Select the **Thru** bar. This is the bar that you will end the delete with.
3. Press the *Enter* button to confirm, or any other non-soft button to exit.
4. If you delete the range of an entire track, it is returned to its unused and undefined state.

Erase

This function erases all or some note and/or controller data.

```
┌─────────────────────────────────────────────┐
│ Trk00               Option   Low    High     │
│ Erase   Notes         ALL    C-1    G9       │
└─────────────────────────────────────────────┘
```

● ● ○ ● ● ●

To Erase:

1. On the **Erase** page, the soft button under **Notes** is used to select all of the erase options: **Notes**, **Controls**, and **Limits**.
2. Select the **Erase Notes** page.
3. Select the **Option** desired. Possible Options are: ALL, NONE, and RANGE. If ALL is selected, the Low to High Range is ignored and all notes on the track are erased. If NONE is selected, the Low and High Range is ignored and no notes are erased from the track. If RANGE is selected, only the notes that are within the Low and High notes specified are erased from the track.
4. Press soft button 2 and select the **Cntrl** page.
5. Select the controller data to be erased. Select ALL to erase all controllers, NONE to erase no controllers, or a specific controller to be erased: Pitch Bend, Aftertouch, Program Change, Mod Wheel, or Volume.
6. Press soft button 2 and select the **Limits** page.
7. Select the **Erase Limits** page.
8. The top bar/beat/clock selects where the bar/beat/clock erasure begins, the bottom bar/beat/clock selects where the bar/beat/clock erasure ends.
9. Press the *Enter* button to confirm, or any other non-soft button to exit.

Note: It is possible to erase both **Note** and **Controller** data. *Example:* If **Notes** are set to ALL and **Controls** are set to ALL, pressing the *Enter* button on the **Erase Do It!** page will erase *all* notes and controllers.

Transpose

This function transposes note data in semitone steps over a range of ±2 octaves.

```
┌─────────────────────────────────────────────┐
│Trk00               Option   Low     High│
│Tpose   Notes          ALL    C-1     G9 │
└─────────────────────────────────────────────┘
```
● ● ○ ● ● ●

To Transpose notes:

1. On the **Transpose** page, the soft button under **Notes** is used to select all of the transpose options: **Notes**, **Limits**, and **Steps**.
2. Select the **Transpose Notes** page.
3. Select the **Option** desired. Possible Options are: ALL and RANGE. If ALL is selected, the Low to High Range is ignored and all notes on the track are transposed. If RANGE is selected, only the notes that are within the Low and High notes specified are transposed.
4. When the parameters selected are correct, press soft button 2 until the **Limits** page is displayed.
5. The top bar/beat/clock selects where the bar/beat/clock erasure begins, the bottom bar/beat/clock selects where the bar/beat/clock erasure ends.
6. Select the **Transpose Steps** page.
7. Select the step amount, in semitones, up to ±2 octaves.
8. Press the *Enter* button to confirm, or any other non-soft button to exit.

Scale

This function multiplies velocity values by 0% to 255%.

```
┌─────────────────────────────────────────────┐
│Trk00               Option   Low     High│
│Scale   Notes          ALL    C-1     G9 │
└─────────────────────────────────────────────┘
```
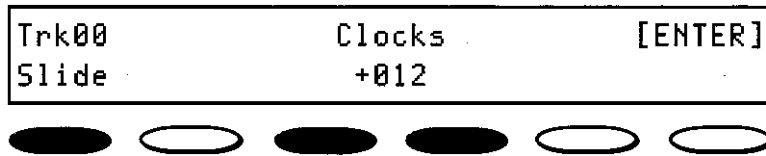● ● ○ ● ● ●

To Scale notes:

1. On the **Scale** page, the soft button under **Notes** is used to select all of the scale options: **Notes**, **Limits**, and **Amount**
2. Select the **Scale Notes** page.
3. Select the **Option** desired. Possible Options are: ALL and RANGE. If ALL is selected, the Low to High Range is ignored and all notes on the track are scaled. If RANGE is selected, only the notes that are within the Low and High notes specified are scaled.
4. Select the **Scale Limits** page.
5. The top bar/beat/clock selects where the bar/beat/clock erasure begins, the bottom bar/beat/clock selects where the bar/beat/clock erasure ends.
6. When the parameters selected are correct, press soft button 2 until the **Amount** page is displayed.
7. Select the scale amount, from 1% to 255%.
8. Press the *Enter* button to confirm, or any other non-soft button to exit.

Slide

This function slides all data (notes and controllers) forward or backward in time, by a specified number of clock pulses (up to ±384 clock pulses).
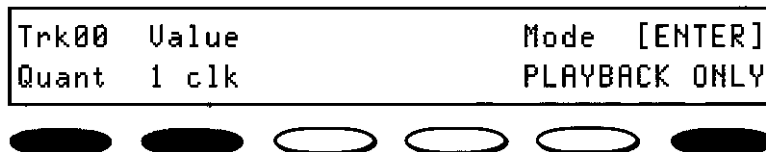
```
┌─────────────────────────────────────────────────────┐
│ Trk00              Clocks            [ENTER]         │
│ Slide               +012                             │
└─────────────────────────────────────────────────────┘
```

⬭ ⬭ ⬭ ⬭ ⬭ ⬭

1. Make sure the track into which you want to shift is selected, then select Slide function by pressing soft button 1 and using the +/*inc* or-/*dec* button.
2. Select the shift in clock pulses. Negative values move events earlier in time; positive values move events later in time.
3. Press the *Enter* button to confirm, or any other non-soft button to exit.

Quantize

This function shifts notes to the nearest specified rhythmic value. *Example:* If you quantize to 16th notes, the start of each quantized note will be shifted to the nearest 16th note. The DPM 2 offers two quantization modes: permanent (the quantize operation cannot be undone) and playback only. In playback only:

- The track is quantized only during playback but otherwise remains unedited, so you can audition the quantized part before committing to permanent quantization. It is recommended that you use the quantize playback only mode when first recording a part. This will allow you to experiment with different quantization values to discover the sound desired. Once this sound is achieved, committing the part to permanent quantization will assure the same sound.
- The quantization value affects only that track.

```
┌─────────────────────────────────────────────────────┐
│ Trk00   Value              Mode    [ENTER]          │
│ Quant   1 clk              PLAYBACK ONLY            │
└─────────────────────────────────────────────────────┘
```

⬭ ⬭ ⬭ ⬭ ⬭ ⬭

1. Select the desired mode (permanent or playback only).
2. If **Playback Only**, select the quantization rhythmic value: 1/4, 1/4 triplet, 1/8, 1/8 triplet, 1/16, 1/16 triplet, 1/32, 1/32 triplet, 1/64, 1/64 triplet, and 1 clock (quantization off).
   If **Permanent**, select the quantization rhythmic value and the starting and ending bars.
3. Press the *Enter* button to confirm, or any other non-soft button to exit.

9.3g EVENT (Microscope Edit)

The **Microscope Event Editing** pages, accessed through the *Event* button, allow you to locate, add, change, or delete a single event within the current track. Use this menu to perform such actions as:

- fix a bad note
- insert a program change in a track
- thin out pitch bend information

You cannot change the currently selected track from here! This is done in the **MIX** or **TRACK** editors where you can see more details such as the track program. Thus, you must make sure the track you want to microscope edit is selected before entering the *Event* menu. You cannot enter **Microscope Event Editing** if there is no MIDI data in the current track or sequence.

Pressing the *Event* button puts you in Event Search mode. The sequencer transport is put in the *STEP* state at the current time. If the track has an event or events at the current time, the first one will be displayed, along with its event number within the track. If not, the display will show something like "<:12345", instead of "#:12345". Event to event movements are performed using the *+/inc* or *-/dec* buttons or the *data slider*. The events shown depend on the setting of the CONTROL menu Event parameter.

The event types are:

• All	-	All events
• Notes	-	Note events only
• Controls	-	Controllers only (any of the following)
• Pitch Bend	-	Pitch bend only
• Aftertouch	-	Aftertouch only
• Prg Change	-	Program changes
• Mod Wheel	-	Modulation wheel (control #1)
• Vol Change	-	Volume changes (control #7)
• Sustain	-	Damper pedal (control #64)

To move to the next quarter note, next clock, or a specific time, use the transport page. Both pages have the current bar/beat/clock shown at the same screen position, so reading the pages while flipping back and forth can be done quickly. Once you have located the event in question, you can add a duplicate event, delete the event, or enter Event Change mode to alter all or some of the event attributes.

Here are some examples of Event Editing (using **Type:** Note):

Note Event

```
C#3    U:107   001/01/01                    #00001
Dur: 000/01   001/01/02   ADD    DEL    CHG
```

⬭ ⬭ ⬭ ⬬ ⬬ ⬬

1. Pressing the **ADD** soft button duplicates the event. You can then use the Event Change function (**CHG**) to edit the event.

29

2. Pressing the **DEL** soft button deletes the event displayed.
3. Pressing the **CHG** soft button will enter the Event Change mode. The following page is displayed:

Note Event *after* pressing the CHG soft button

```
                                    [ENTER]

TYPE              NOTE
```

● ◯ ● ● ◯ ◯

Type - The *Type* can be changed to Note, Pitch Bend, Aftertouch, PRG Change, Mod Wheel, Vol Change, or Sustain.

4. Select the **Type** to edit by pressing either soft button 3 or 4, then use the *+/inc* or *-/dec* buttons or the *data slider* to select the type to edit.
5. Once selected, press the soft button under **Type**. For type Note the following page would be displayed:

Note Event *after* pressing the TYPE soft button

```
            Pitch       Velocity    [ENTER]

Value       C2            112
```

● ● ● ● ● ◯

Value - Set the value or values for the event data bytes. The parameters to be edited will depend on the event type. For example, a note has a pitch and velocity, whereas a sustain value is set to on or off.

6. Select the **Pitch** and **Velocity** values to edit. These values can be selected using keyboard data entry or with the use of the *+/inc* and *-/dec* buttons or the *data slider*.
7. Once the type is selected, press the soft button under **Value**. The following page should be displayed:

Note Event *after* pressing the VALUE soft button

```
          Duration    On:  001/01/01   [ENTER]

TIME      000/13      Off: 001/01/14
```

● ● ● ● ● ◯

Time - The event may be moved to a new time within the sequence. For all events except note, simply edit the bar, beat, and clock parameters. For a note event, the note on time, note off time, and note duration can all be changed. Soft keys 2 and 3 edit the note duration's beats and clocks respectively. Notice that the note off time will change with the note duration. Soft keys 4 and 5 will rotate the edited parameter left and right around the note on and note off parameters. Edit the bar, beat, and clock parameters as desired. Notice that the note duration will change with the note off time.

8. The *ENTER* button can be pressed at any time, whether editing Type, Value, or Time parameters, to commit the changes and return to the Event Search page.

9.3h MARK

The *Mark* button is a convenience feature which remembers important times within a sequence for you and simplifies editing time fields.

The *Mark* button does one of three operations, depending on what page is showing and whether you are editing a time parameter.

1. Pressing the *Mark* button while on the transport page or the Event Search page will store the current sequence time into one of two bar/beat/clock registers. This stored, or marked, time is referred to as a mark. Each following press will mark the current time in the opposite register.

Note: Nothing is displayed on the screen to indicate the time has been marked.

2. While editing a time field, pressing the *Mark* button will load one of the two marks into that field. Pressing the button repeatedly will load the opposite mark. The first press always loads the mark that makes the most sense. For example, if you are loading a **From Bar** parameter, the mark with the earliest time will be loaded. When loading a mark into a bar only field, such as **From Bar**, the mark is rounded to the nearest bar. Time fields where you can load a mark are found in the Track menu, the Event Change mode, and the GOTO page. Note that on the GOTO page, you don't have to edit to goto time to load the mark.

3. For all other pages within the sequencer, the *Mark* button has no function.

Here is an example of how the *Mark* button simplifies transposing part of track 3 in the current sequence:

1. Play the sequence.
2. Press the *Mark* button immediately before the notes to transpose.
3. Press the *Mark* button immediately after the notes to transpose.
4. Press the *Stop* soft button to stop the sequencer.
5. Press the *Track* button, select track 3, if necessary.
6. Go to the TPOSE function page.
7. Set the **Notes** page parameters. For this example use ALL.
8. Go to the **Limits** page.
9. Edit any bar/beat/clock field in the top bar/beat/clock field.
10. Press the *Mark* button to load the 1st mark.
11. Edit any bar/beat/clock field in the bottom bar/beat/clock field.
12. Press the *Mark* button to load the 2nd mark.
13. Go to the **Steps** page, set the step.
14. Press the *Enter* button.

9.3i   Q-PLAY

The purpose of this screen is to queue up a new sequence or song to play once the current sequence or song has finished. If there is no sequence or song playing, the chosen selection will start immediately, making it a quick way to start up a song. The most common use is to experiment with a series of sequences not yet ordered into a song.

```
Q-PLAY          Seq 05             [ENTER]
              SequenceName
```
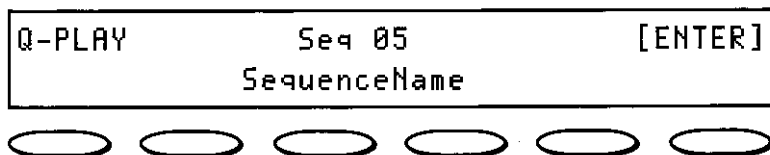
To queue a sequence or song, use the +/inc and -/dec buttons and data slider to display the desired sequence or song, then press Enter. The choices are ordered sequences 0 - 49 and songs A - J. A *Q* will appear beside the selection waiting to play. This will disappear once the selection starts playing.

Note: Touching the +/inc or -/dec buttons or the data slider will de-queue any queued sequence or song.

Features and specifications subject to change without notice.