MMA Technical Standards Board/ AMEI MIDI Committee
Confirmation of Approval of New MIDI Message

Date of issue: 11/5/98 (rev 8/24/99 & 12/01/00)   **Originated by:** MMA

Reference: TSBB Item #: 137   Volume #: 22 (revised)

Title: Sample Dump Size, Rate and Name Extensions
CA#: 019

Related item(s): System Exclusive Messages; Sample Dump Standard

Abstract:

This CA adds an Extended Dump Header, capable of handling sample object sizes up to 32 GB (Gigabytes) with greater precision in calling out the sample rate; a new Extended Loop Point message for longer loops; and a Sample Name Transmission / Request pair, all implemented under the Sample Dump Extensions command tree. The additional object size in the Extended Dump Header is contained in an additional two sample length data bytes.

Background:

The advent of 128 MB Sample RAM samplers combined with the possibility of higher speed MIDI transport mechanisms provides a rationale for enhancing certain aspects of the MIDI Sample Dump Standard. There are three shortcomings within the MIDI Sample Dump Specification that are addressed within this proposal. They are:

  (1) A 2MB sample limit; and
  (2) The inability to name samples; and
  (3) Precision in describing the sample rate

Details:

The MIDI command structure, implemented under the Sample Dump Extensions command tree, is as follows:

SAMPLE DUMP STANDARD

EXTENDED DUMP HEADER - (Sub Command 05)

```
F0                 Start of Exclusive
7E                 Non Real-time
<device ID>        ID of target device (7F = all devices)
05                 Sample Dump Extensions Command (sub-ID#1)
```

```
    05                    Extended Dump Header Sub Command (sub-ID#2)
    ss ss                 Sample Number ( 0 - 16383 )
    ee                    Sample Format (# of significant Bits from 8 - 28)
    ff ff ff ff           Sample rate integer portion in Hertz (LSB first)
    gg gg gg gg           Sample rate fractional portion in Hertz (LSB first)
    hh hh hh hh hh        Sample length in words (0 - 32 GB)  (LSB first)
    ii ii ii ii ii        Sustain Loop start point word number (LSB first)
    jj jj jj jj jj        Sustain Loop end point word number (LSB first)
    kk                    Loop type
    ll                    Number of channels
    F7                    End of Exclusive (EOX)
```

Notes:

ff ff ff ff   Allows fixed point eight byte representation of the sample rate.

gg gg gg gg   Specified are 28 bits for the integer part and 28 bits for the fractional part,
                     which allow sampling rates up to $((2^{28})-1) + ((2^{28})-1)/2^{28}$,
                     or 268435455.9999999962747 Hz to be represented. This is a change from
                     the original Sample Dump Header, which presented the sample period.

jj jj jj jj   Sustain loop end point is the last sample played.

kk   Note: In the descriptions below, the direction of "forward" refers to playing
                     samples in order from lower memory addresses to higher memory addresses.
                     "Backward" playback refers to playing samples in order from higher memory
                     addresses to lower memory addresses.

                     Typically, sample pointers appear in the following order:
                     Sample start-->Loop start-->Loop end-->Sample end.

          Value 00 = Forward playback with unidirectional loop. Sample plays from sample start to loop
                     end, jumps to loop start, and continues in this fashion until voice playback stops.

          Value 01 = Forward playback with bi-directional loop. Sample plays from sample start to loop
                     end, plays backwards to loop start, plays forwards to loop end, and continues in
                     this fashion until voice playback stops.

          Value 02 = Forward playback with unidirectional loop and release. Sample plays from sample
                     start to loop end, jumps to loop start, plays forwards to loop end, and continues in
                     this fashion until key up. When the key is released, continue playing the sample
                     to the end of the programmed loop, and then play the remaining portion of the
                     sample after the programmed loop.

          Value 03 = Forward playback with bi-directional loop and release. Sample plays from sample
                     start to loop end, plays backwards to loop start, plays forwards to loop end, and
                     continues in this fashion until key up. When the key is released, continue playing
                     the sample to the end of the programmed loop, and then play the remaining
                     portion of the sample after the programmed loop.

          Value 40 = Backward playback with unidirectional loop. Sample plays from sample end to
                     loop start, jumps to loop end, and continues in this fashion until voice playback
                     stops.

          Value 41 = Backward playback with bi-directional loop. Sample plays from sample end to
                     loop start, plays backwards to loop end, plays forwards to loop start, and
                     continues in this fashion until voice playback stops.

Value 42 =   Backward playback with unidirectional loop and release. Sample plays backwards from sample end to loop start, jumps to loop end, plays backwards to loop start, and continues in this fashion until key up. When the key is released, continue playing the sample to the end of the programmed loop, and then play the remaining portion of the sample, after the programmed loop, backwards.

.Value 43 =   Backward playback with bi-directional loop and release. Sample plays backwards from sample end to loop start, plays forwards to loop end, plays backwards to loop start, and continues in this fashion until key up. When the key is released, continue playing the sample to the end of the programmed loop, and then play the remaining portion of the sample, after the programmed loop, backwards.

Value 7E =   Backward one-shot playback, no looping.

Value 7F =   Forward one-shot playback, no looping.

ll   Number of audio channels (0 - 127) of the current sample. The total number of samples within the Sample Dump is the number of channels times the sample size. If the number of audio channels within the header is defined as 0 (ll = 0) this should be considered an error condition. Commonly expected values are ll = 1 and ll = 2. Samples for audio channels are interleaved. For stereo samples, ch1=left and ch2=right. If there are 3 audio channels (ll = 3), then the samples are interleaved as follows (where c1=channel 1, c2=channel 2, and c3 =channel 3): c1c2c3 c1c2c3.

EXTENDED LOOP POINT Transmission (Sub Command 06)

```
F0                Start of Exclusive (SOX)
7E                Non Realtime
<device ID>       ID of target device (7F = all devices)
05                Sample Dump Extensions Command
06                Sample Extended Loop Point Transmission Sub Command
ss ss             Sample Number ( 0 - 16383 )
bb bb             Loop Number (LSB First: 7F 7F delete all loops)
cc                Loop Type (same as in Extended Dump Header)
dd dd dd dd dd    Loop Start Address
ee ee ee ee ee    Loop End Address
F7                End of Exclusive (EOX)
```

EXTENDED LOOP POINT Request (Sub Command 07)

```
F0                Start of Exclusive (SOX)
7E                Non Realtime
<device ID>       ID of target device (7F = all devices)
05                Sample Dump Extensions Command
07                Sample Extended Loop Point Transmission Sub Command
ss ss             Sample Number ( 0 - 16383 )
bb bb             Loop Number (LSB First: 7F 7F request all loops)
F7                End of Exclusive (EOX)
```

A Sample Name Transmission / Request pair is also implemented under the Sample Dump Extensions command tree.

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SAMPLE NAME TRANSMISSION (Sub Command 03)

```
F0                Start of Exclusive (SOX)
7E                Non Real-time
<device ID>       ID of target device (7F = all devices)
05                Sample Dump Extensions Command (sub-ID#1)
03                Sample Name Transmission Sub Command (sub-ID#2)
ss ss             Sample Number ( 0 - 16383 )
tt                Sample Name Language Tag Length (default: 00)
<TAG>             Sample Language Tag Data
                    (Data byte string of length tt)
nn                Sample Name Length (up to 127 characters)
<NAME>            Sample Name Data bytes (string of length nn)
F7                End of Exclusive (EOX)
```

SAMPLE NAME REQUEST (Sub Command 04)

```
F0                Start of Exclusive (SOX)
7E                Non Real-time
<device ID>       ID of target device (7F = all devices)
05                Sample Dump Extensions Command (sub-ID#1)
04                Sample Name Request Sub Command (sub-ID#2)
ss ss             Sample Number ( 0 - 16383 )
F7                End of Exclusive (EOX)
```

Comments:

The Sample Name Language Tag is presented to provide future specification of International Text functionality. The default setting is zero (0x00), which defaults to English. In this case, the Name Data field is transmitted as standard ASCII bytes.

Examples:

A Sample Name Request/Transmit transaction from host computer to sampler:

```
SAMPLE NAME Request (from Computer):

   F0 7E 01 05 04 00 01 F7  - Requests name of sample #1

SAMPLE NAME Transmit (from Sampler) - "Test Sample":

   F0 7E 01 05 03 00 01 00 0B 54 65 73 74 20 53 61 6D 70 6C 65 F7

SAMPLE NAME Transmit (from Computer) - "Renamed Sample"

   F0 7E 01 05 03 00 01 00 0E 52 65 6E 61 6D 65 64 20 53 61 6D 70 6C 65 F7
```

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