MIDI MANUFACTURERS ASSOCIATION AMEI Association of Musical Electronics Industry

MMA Technical Standards Board/ AMEI MIDI Committee

Confirmation of Approval of New MIDI Message

Date of issue: 2/28/99 Originated by: MMA
Reference TSBB Item #: 148 Volume #: 22 (revised)
Title: Controller Destination Setting
CA# 22

Related item(s): Universal Real Time System Exclusive, General MIDI 2, Controllers

Abstract:

This proposal enables selecting the destination for Control Change messages, plus Channel Pressure and Polyphonic Key Pressure, using Universal Real Time System Exclusive messages. When coupled with specific recommended practices for response to these controllers, these messages will provide common controller response among a variety of playback devices. See General MIDI 2 Recommended Practice for examples of how the response can be standardized.

Background:

There are now a large number of electronic musical instruments available in the market from different manufacturers, with a great variety of design concepts, making controlling various parameters of these sound generators cumbersome because of the lack of a standardized interface. Some parameters, such as Volume and Pan, are controlled in essentially the same manner in most sound generators, but Channel Pressure, Polyphonic Key Pressure, Breath Controller, and Foot Controller responses are not defined in any common manner. Also, it is now popular for many sound generators to have several assignable controllers, and the method to set these controllers is very different among those devices.

Creators of Standard MIDI Files are unable to use most continuous controllers and reliably predict how the controller data will be interpreted by the playback devices. Rather than attempt to dictate a specific design, this proposal allows the composer of the SMF to determine the connection between performance controls and the sound parameters on each device. It will then be possible to include performance controllers in MIDI files and expect common playback without limiting the flexibility of individual designs.

Details:

[UNIVERSAL REAL TIME SYSTEM EXCLUSIVE]
CONTROLLER DESTINATION SETTING

Controller Destination Setting message is defined as Universal Real Time System Exclusive message (sub-ID#1=09). The control source is defined in sub-ID#2 as follows.

```
sub-ID#2        control source
-----------------------------------------------------
      01        Channel Pressure (Aftertouch)
      02        Polyphonic Key Pressure (Aftertouch)
      03        Control Change message
```

The complete message assigns the control source to one or more sound parameters/destinations. The message includes both the destination and a range, defining the magnitude of the response. For instance, the range may be a number of semitones or cents for pitch bend, hertz for filter cutoff control, etc. See the example below.

The Controller Destination Setting message can include multiple sets of parameter/range pairs in a single message, so the length of the message is variable.

Destinations and ranges for a particular controller source which have previously been set will be cleared upon receiving new destinations and ranges on a channel by channel basis.

Channel Pressure/Polyphonic Key Pressure:

```
F0 7F <device ID> 09 01/02 0n [pp rr] ... F7

      F0 7F             Universal Real Time SysEx header
      <device ID>       ID of target device (7F = all devices)
      09                sub-ID#1 = “Controller Destination Setting”
      01/02             sub-ID#2 = Control Source:
                              Channel Pressure/Polyphonic Key Pressure
      0n                MIDI channel (00 - 0F)
     [pp rr]            controlled parameter and range
       :
      F7                EOX
```

Control Change:

The only difference in this message is the presence of the "controller number" field which is identical to the actual Control Change number. Only controller (Control Change) numbers 01H to 1FH and 40H to 5FH are allowed. Any other controller number must be ignored by the receiver.

```
F0 7F <device ID> 09 03 0n cc [pp rr] ... F7

     F0 7F              Universal Real Time SysEx header
     <device ID>        ID of target device (7F = all devices)
     09                 sub-ID#1 = “Controller Destination Setting”
     03                 sub-ID#2 = Control Source: Control Change Message
     0n                 MIDI channel (00 - 0F)
     cc                 Control Number (01 - 1F, 40 - 5F)
```

```
    [pp rr]             controlled parameter and range
      :
     F7                 EOX
```

Controlled Parameters and Ranges:

The following controlled parameters are defined for use with the Controller Destination Setting message.

```
controlled parameter (pp)       range (rr)
-------------------------------------------------
 00   Pitch Control                 defined by R/P
 01   Filter Cutoff Control         defined by R/P
 02   Amplitude Control             defined by R/P
 03   LFO Pitch Depth               defined by R/P
 04   LFO Filter Depth              defined by R/P
 05   LFO Amplitude Depth           defined by R/P
 06 – 7f are reserved for future definition by the MMA/AMEI.
```

Additional controlled parameters will be defined MMA/AMEI.

Manufacturers must refrain from adding proprietary parameters to the table.

Response to these messages is defined independently in specific recommended practices.

Example:

This example follows the GM 2 Recommended Practice.

```
F0 7F      Universal Real Time SysEx header
7F         device ID   (7F = all devices)
09         sub-ID#1  "Controller Destination Setting"
01         sub-ID#2    Control Source:    (01 =Channel Pressure)
06         Channel:    06
00         Destination#:   00 (Pitch Control)
42         Range:          42 (+2 semitones)
01         Destination#:   01 (Filter Cutoff Control)
60         Range:          60 (+4800 cents)
05         Destination#:   05 (LFO Amplitude Depth)
20         Range:          20 (25%)
F7         EOX
```