2600 A/V MIDI Event Sequencer

The MIDI Event List

Starting with Version 4.10, the 2600 A/V can be used as a powerful MIDI event sequencer. Although not intended to replace specialized high-end music sequencers, it can perform, in conjunction with samplers, many audio-for-video MIDI tasks, such as editing and recording sound effects.

The hardware for the MIDI ports resides on the same board as the C:SOUND coprocessor. MIDI-IN and MIDI-OUT ports are provided for the receiving and transmitting of the MIDI data. The timing reference for the MIDI data is obtained by configuring the Adams-Smith longitudinal timecode generator (LG) module to jam-sync to the master through the System Configuration dialog, and then connecting the timecode output of the generator to one of the four C:SOUND timecode channels. The C:SOUND channel can be defined either through the C:SOUND Channel Assignments dialog, or through the Set MIDI Operating Modes dialog from the MIDI Menu (see "The MIDI Menu" below).

To accommodate the MIDI event sequencer, a new list type has been created, called the MIDI List. This list operates in a manner similar to the Working EDL, Reference EDL, and Memo Lists. Its display area is the same as the other lists, and can be brought up in a number of ways: (1) It can be chosen through Display Management Menu item 2 "Select List to Display"; (2) It can be toggled to by pressing SHIFT-LISTMGMT until it appears; or (3) The MIDI list can be assigned to a specific machine with Display Management Menu item 3, "Assign Lists to Machines". Like other lists, the MIDI List is scrolled up and down with the UP and DOWN ARROW keys. The list may contain up to 1000 entries.

The columns in the MIDI list are used as follows:

NUM	Each list entry is assigned an event number, which can be used in the list management routines to identify the entry. The highest valid MIDI number is 1000.
EDIT	When a record-edit is made with entries in the MIDI List, any MIDI entry whose edit number is blank (zero) will be assigned the current edit number. Once a MIDI entry has a non-zero edit number, it will only trigger on edits (including re-edits and auto-assemblies) which have the same edit number. An exception to this rule is that MIDI entries with edit number 9999 will trigger no matter what the current edit number is.
TRACK	Each entry in the MIDI list has a track number of 1 to 8. This number can be used for muting purposes or for list management operations. Generally, related MIDI events should be given the same track number, and unrelated MIDI events should have different track numbers.
NOTE	This column corresponds to the MIDI note number, assigned as a number between 0 and 127 or in musical notation. A special notation of "PC" indicates a MIDI Program Change rather than a MIDI Note.
CHANNEL	This column corresponds to the MIDI channel number, and can have the values 1 to 16. Each MIDI receiving device can be set up to either respond to a specific channel number or to all channels ("omni" mode).
VELOCITY	This column is the note-on velocity, and can have the values 1 to 127. Many MIDI devices ignore this number. For Program Change events, this is the program number.
ON-TIME	This is the time (relative to the master's timecode) at which the MIDI Note-On message will be sent.
OFF-TIME	This is the time at which the MIDI Note-Off message will be sent. It is also possible to display DURATION in this column, which represents OFF-TIME minus ON-TIME.

The MIDI Menu

Pressing the MIDI key (the QWERTY-section "9" key) will now bring up a menu for controlling various options of the MIDI event sequencer. The menu has the following items:

Set MIDI Operating Modes -- This dialog window controls the behavior of the MIDI event sequencer. Items in this dialog are:

> **Enable MIDI Events (Y/N)** -- This is the "master switch" for the MIDI event sequencer. Setting this field to NO will turn off all MIDI event input and output.
>
> **Enable MIDI Function Keys (Y/N)** -- Setting this field to YES will allow playing of MIDI notes through the use of function keys F1 through F10 (see below). When the mode is enabled, the message "FUNCTION KEYS = MIDI NOTES" will be displayed in yellow below the mark table.
>
> **Enable MIDI Event Record (Y/N)** -- Setting this field to YES will allow MIDI input (either MIDI function keys or notes received through the MIDI in port) to be recorded into the MIDI event list (see "MIDI Record and Playback").
>
> **Echo MIDI Input to Output (Y/N)** -- Setting this field to YES will cause all data received from the MIDI in port to be echoed to the MIDI out port.

MIDI Note Assignments -- This dialog window controls the assignments of function keys F1 through F10 to MIDI notes. The main purpose of this capability is to allow easy entry of MIDI notes for sound effects work, without the need to hook up an external MIDI keyboard. Each function key can be used to play a specified MIDI note. If MIDI event record is enabled, the note will also be recorded to the MIDI event list, with the note-on and note-off times set to the master's timecode at which the function key was pressed and released. Each key can be individually set for MIDI or left as a learn key, and the mode can be completely disabled by answering NO to the Enable MIDI Function Keys question. The mode can also be toggled on/off by pressing SHIFT-MIDI.

Set MIDI Record Track -- This dialog window controls the assignment of the MIDI track for new entries recorded into the MIDI event list. Also, it allows events with specified tracks to be muted (not played). The mute tracks can be given as a standard track range, such as "2,4-6".

MIDI Record and Playback

Notes and program changes can be recorded into the MIDI event list either while the master is playing or is stopped. If the master is stopped, the timecode used will be an estimate of the actual timecode based on control-track updating (unless VITC is used, in which case it should always be correct). MIDI notes received through the MIDI-IN port are "time-stamped" to the nearest one-tenth of a frame, and are thus extremely precise when entered with the master in play. Notes entered with the MIDI function keys are not as precise, and may be more appropriate for working with a stopped master.

MIDI events will play (be sent to the MIDI-OUT port) whenever the master passes the event's ON-TIME at play speed. Additional requirements for an event to be played are:

The event's ON-TIME must fall within the master's IN and OUT times.

The track must not be muted in the Set MIDI Record Track dialog.

The edit number of the event must be zero (blank), 9999, or equal to the current edit number.

Valid play-speed master timecode must be received by the C:SOUND coprocessor, and the appropriate timecode channel must be configured in the Set MIDI Operating Modes dialog.

At the completion of a RECORD-EDIT, any entry in the list that was played during the edit and whose edit number is zero will be given the current edit number. Thus, these entries will not play again unless a re-edit or auto-assembly is performed for that edit, or the edit number of the list entry is changed to 9999.

Display Options

A new item 8 has been added to the Display Management Menu, "Set MIDI List Options". Items in this dialog are:

Sort Sequence -- The MIDI list can be sorted in any of the following sequences: (1) Sort off (no sorting takes place); (2) Sort by MIDI number; (3) Sort by Note-On time; (4) Sort by Track, Note-On (sorted by track number first, and then by note-on time for entries with the same track number); or (5) Sort by Edit, Note-On (sorted by edit number first, and then by note-on time for entries with the same edit number).

Note-Off/Duration Display -- This controls whether the note-off time or the note duration is displayed in the last column of the list.

Display blank line between entries -- Answering YES to this question will cause a blank line to be displayed between each entry in the MIDI list.

Display MIDI notes in musical notation -- Answering YES to this question will cause MIDI notes in the MIDI list and in dialog screens to be displayed in musical notation. Answering NO will cause the notes to be displayed as a number between 0 and 127.

Enable auto-scroll -- If this question is answered YES, and the list is sorted by note-on time, then any change in the master timecode will cause the MIDI list to automatically scroll to the entry in the list whose note-on time most closely matches the master's timecode.

MIDI List Management

Whenever the MIDI list is being displayed, the LIST MGMT key can be used to perform list management on the MIDI list. The following operations are provided:

Create/Edit MIDI Events -- This dialog provides an alternate way to create new entries, or to modify existing entries.

Delete MIDI Events -- This dialog provides a way to delete a range of MIDI entries. The range of entries to delete is first entered. Qualifications on which entries to delete can be entered by entered by filling in values for any of the MIDI parameter fields. For example, to delete all MIDI events with a track number of 2, type "A" (for ALL) for the From MIDI number, and type "2" for the track number.

Renumber MIDI Events -- This dialog provides a way to reassign the numbers associated with the MIDI list entries.

Move MIDI Events -- This dialog provides a way to manually reorganize the entries in the list. It is only valid if "Sort off" has been specified for the sort sequence.

Change MIDI Times -- This dialog provides a way to change the note-on and note-off times for a range of entries in the list.

Change MIDI Parameters -- This dialog can be used on a range of entries to change any MIDI note parameter. Any combination of parameters can be specified. Besides specifying the range, an optional set of parameters can be entered to only affect entries with a note-on time between a given starting and ending time. Press A (for ALL) for any "from" parameter to match all entries within the range.

When entering note numbers in dialogs, either numeric or musical notation forms can be used to specify the note (regardless of which form is currently selected for display). In addition, MIDI program change commands can be specified in place of MIDI notes by entering "PC" for the note number, and the program number for the velocity.

MIDI Note Number Table

The following table can be used to translate MIDI notes between numeric and musical notation forms. This table follows the MIDI specification in defining middle C as C4 and as note number 60. It should be noted that not all manufacturers follow this standard, so if you are working with a MIDI device that uses musical notation, check to make sure that it uses the same standard.

MIDI Note	Musical Notation	MIDI Note	Musical Notation	MIDI Note	Musical Notation
9	A0	45	A3	81	A6
10	A#0	46	A#3	82	A#6
11	B0	47	B3	83	B6
12	C0	48	C3	84	C6
13	C#0	49	C#3	85	C#6
14	D0	50	D3	86	D6
15	D#0	51	D#3	87	D#6
16	E0	52	E3	88	E6
17	F0	53	F3	89	F6
18	F#0	54	F#3	90	F#6
19	G0	55	G3	91	G6
20	G#0	56	G#3	92	G#6
21	A1	57	A4	93	A7
22	A#1	58	A#4	94	A#7
23	B1	59	B4	95	B7
24	C1	60	C4	96	C7
25	C#1	61	C#4	97	C#7
26	D1	62	D4	98	D7
27	D#1	63	D#4	99	D#7
28	E1	64	E4	100	E7
29	F1	65	F4	101	F7
30	F#1	66	F#4	102	F#7
31	G1	67	G4	103	G7
32	G#1	68	G#4	104	G#7
33	A2	69	A5		
34	A#2	70	A#5		
35	B2	71	B5		
36	C2	72	C5		
37	C#2	73	C#5		
38	D2	74	D5		
39	D#2	75	D#5		
40	E2	76	E5		
41	F2	77	F5		
42	F#2	78	F#5		
43	G2	79	G5		
44	G#2	80	G#5		