
EM61000 MIDI

Application Notes



義隆電子股份有限公司
ELAN MICROELECTRONICS CORP.

March 2002

No. AP-EM61-0010E-v1



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Printed in Taiwan, ROC, 03/2002

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ELAN MICROELECTRONICS CORPORATION

Headquarters:

No. 12, Innovation Road 1,
Science-based Industrial Park,
Hsinchu, Taiwan, R.O.C.

Tel: +886 3 5639977

Fax: +886 3 5639966

<http://www.emc.com.tw>

Hong Kong Office:

Rm. 1005B, 10/F Empire Centre
68 Mody Road, Tsimshatsui
Kowloon, HONG KONG

Tel: +852 2838-8715

Fax: +852 2838-0497

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1.0 Compatible MIDI File Format

MIDI files must be compatible with the General Midi (GM) specification and saved as “MIDI Format 1” type files.



The above example is from “CakeWalk”

2.0 MIDI Duration

2.1 Acceptable Minimum Beat

1/16 beat (64th – note; 64th – rest)

1/12 beat (32nd Triplet – note; 32nd Triplet – rest)

Acceptable length should be a multiple of the above beats.

2.2 Quantization and Resolution

Use the quantization feature to adjust notes position and apply the shortest beat (see Section 2.1) as the resolution value.



The above example is from “CakeWalk”

2.3 Timebase

It is recommended that the Timebase of your editing software is set at *1 beat = 48 ticks* in order to facilitate debugging.

3.0 Frequency

2.1 Note

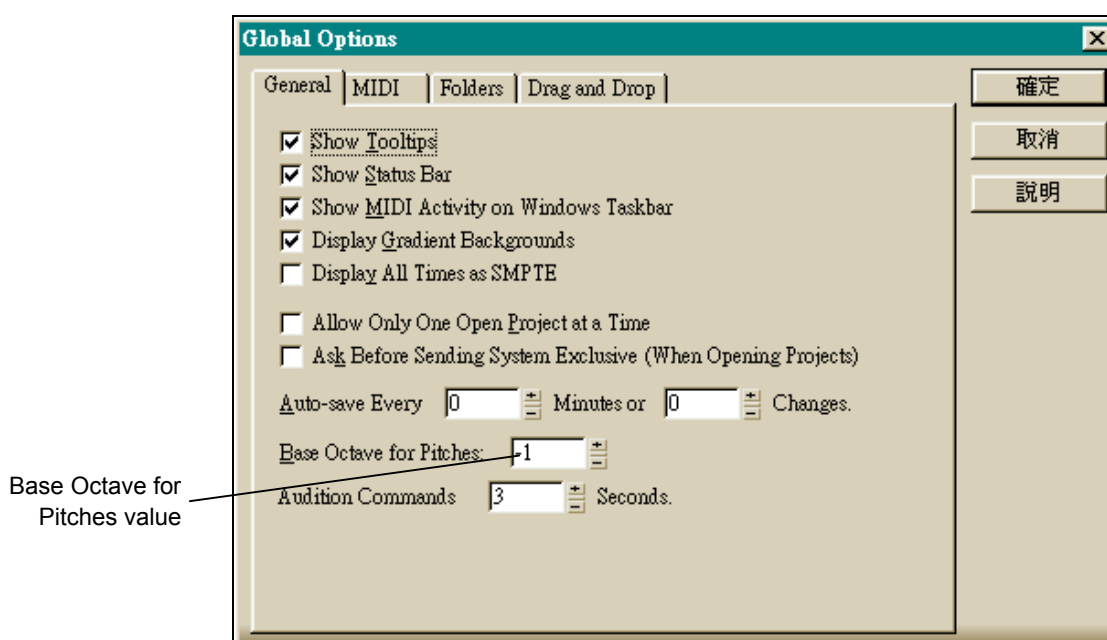
Each Note in the MIDI is numbered from 0 to 127 with C = 60 as the Mid-Note. The ability of the current version of EM61000 in recognizing pitch is unstable. Refer to *61_tonelib.doc* for further details.

2.2 Base Octave

It is recommended that the setting for Base Octave for pitches is set at C4 = 60 to facilitate debugging.

(Under Cakewalk, when Base Octave for Pitches is -1, C4 = 60)

(Under Cakewalk, when Base Octave for Pitches is 0, C5 = 60)



The above example is from "Cakewalk"

4.0 Patch and Channel in EM61000

4.1 EM61000 Capabilities

The General MIDI (GM) is specified to directly access up to 128 patches of musical instruments (numbered 0 ~ 127), 47 patches of drum and percussion parts (numbered 35 ~ 81), and 16 channels (numbered 1 ~ 16). The current version of EM61000 IDE software supports the GM requirements except for the patches of musical instrument. Presently, the EM61000 Tone Library (*INSLIB*) only supports 66 patches. User needs to modify the MIDI file in order to fill the missing instrument patches to make it compatible with EM61000.

4.2 Maximum Tones in Channel and Looping

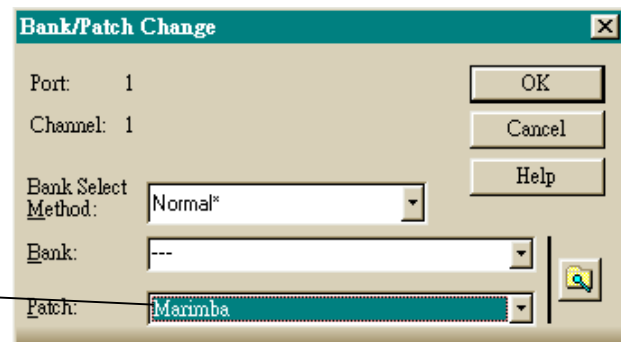
The maximum number of tones that can be played at a given moment with EM61000 channel is 8.

EM61000 can only accept 4 channels of long loop tones when each loop exceed 128 bytes.

4.3 Patch Change

EM61000 supports multiple patch changes in a channel.

An example of a patch change setup in a channel



Tik	HMSF	MBT	Ch	Kind	Data
1	00:00:01:00	1:03:000	1	Note	D 5 98 60
1	00:00:01:15	1:04:000	1	Note	F 4 88 60
1	00:00:01:23	1:04:060	1	Note	Bb4 107 60
1	00:00:02:00	2:01:060	1	Patch	Normal --- Electric Grand Piano
1	00:00:02:08	2:01:060	1	Note	F 4 94 60
1	00:00:02:15	2:02:000	1	Note	E 4 112 60
1	00:00:02:23	2:02:060	1	Note	Eb4 105 60
1	00:00:03:00	2:03:000	1	Note	D 4 103 60
1	00:00:03:08	2:03:060	1	Note	Db4 110 60
1	00:00:03:15	2:04:000	1	Note	Bb3 94 60
1	00:00:03:23	2:04:060	1	Note	B 3 116 60
1	00:00:04:00	3:01:000	1	Note	C 4 102 60
1	00:00:04:08	3:01:060	1	Note	C 4 102 60
1	00:00:04:15	3:02:000	1	Note	Eb4 103 60
1	00:00:04:23	3:02:060	1	Note	Eb4 112 60
1	00:00:05:00	3:03:000	1	Note	G 4 102 1:000
1	00:00:05:15	3:04:000	1	Note	C 5 106 4:000
1	00:00:08:00	5:01:000	1	Patch	Normal --- Marimba
1	00:00:08:00	5:01:000	1	Note	C 5 106 90
1	00:00:08:11	5:01:090	1	Note	Eb5 109 60
1	00:00:08:19	5:02:030	1	Note	C 5 112 90
1	00:00:09:00	5:03:000	1	Note	A 4 86 90
1	00:00:09:11	5:03:090	1	Note	C 5 111 60
1	00:00:09:19	5:04:030	1	Note	A 4 99 90
1	00:00:10:00	6:01:000	1	Note	F 4 75 90

The above examples is from "CakeWalk"

4.4 General MIDI vs. EM61000 Patches

The following table shows patches where EM61000 complies with the 128 preset MIDI specified instruments. Note that Patches Number 115, 116, and 117 are unique to EM61000 and do not conform to MIDI specified instruments.

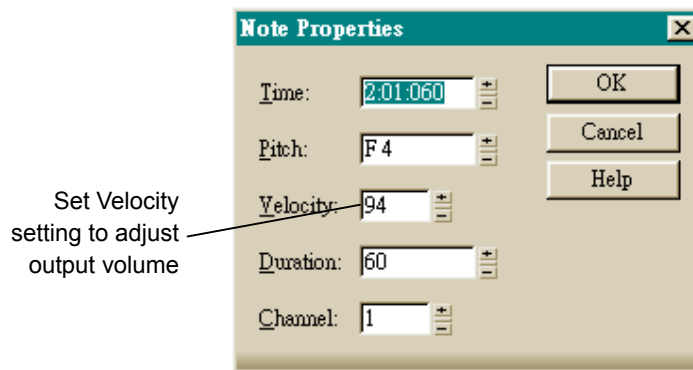
Patch No.	General MIDI Instrument Name	EM61000	Patch No.	General MIDI Instrument Name	EM61000	Patch No.	General MIDI Instrument Name	EM61000
000	Acoustic Grand Piano	Comply	043	Contrabass	Comply	086	Lead 7 (Brit Saw Wave)	–
001	Bright Acoustic Piano	Comply	044	Tremolo Strings	Comply	087	Lead 8 (Brass + Lead)	–
002	Electric Grand Piano	–	045	Pizzicato Strings	Comply	088	Pad 1 (Fantasia)	Comply
003	Honky-Tonk Piano	Comply	046	Orchestral Harp	Comply	089	Pad 2 (Warm)	–
004	Rhodes Piano	Comply	047	Timpani	–	090	Pad 3 (Polysynth)	–
005	Chorused Piano	Comply	048	String Ensemble 1	–	091	Pad 4 (Choir)	Comply
006	Harpichord	Comply	049	String Ensemble 2	–	092	Pad 5 (Bowed Glass)	–
007	Clavinet	Comply	050	Synth Strings 1	–	093	Pad 6 (Metallic)	–
008	Celesta	Comply	051	Synth Strings 2	–	094	Pad 7 (Halo)	–
009	Glockenspiel	–	052	Choir Aahs	–	095	Pad 8 (Sweep)	–
010	Music Box	Comply	053	Voice Oohs	–	096	SFX 1 (Ice Rain)	–
011	Vibraphone	Comply	054	Synth Voice	–	097	SFX 2 (Sound Track)	–
012	Marimba	Comply	055	Orchestra Hit	–	098	SFX 3 (Crystal)	–
013	Xylophone	Comply	056	Trumpet	Comply	099	SFX 4 (Atmosphere)	–
014	Tubular Bells	Comply	057	Trombone	Comply	100	SFX 5 (Brightness)	–
015	Dulcimer	Comply	058	Tuba	Comply	101	SFX 6 (Goblins)	–
016	Hammond Organ	–	059	Muted Trumpet	Comply	102	SFX 7 (Echo Drops)	–
017	Percussive Organ	Comply	060	French Horn	Comply	103	SFX 8 (Sci- Fiction)	–
018	Rock Organ	Comply	061	Brass Section	–	104	Sitar	–
019	Church Organ	Comply	062	Synth Brass 1	–	105	Banjo	Comply
020	Reed Organ	–	063	Synth Brass 2	–	106	Shamisen	–
021	Accordion	Comply	064	Soprano Sax	Comply	107	Koto	–
022	Harmonica	Comply	065	Alto Sax	–	108	Kalimba	–
023	Tango Accordion	Comply	066	Tenor Sax	Comply	109	Bagpipe	–
024	Acoustic Nylon Guitar	Comply	067	Baritone Sax	Comply	110	Fiddle	–
025	Acoustic Steel Guitar	Comply	068	Oboe	Comply	111	Shanai	–
026	Electric Jazz Guitar	Comply	069	English Horn	Comply	112	Timkie Bell	–
027	Electric Clean Guitar	Comply	070	Bassoon	Comply	113	Agogo	–
028	Electric Muted Guitar	Comply	071	Clarinet	Comply	114	Steel Drum	Comply
029	Overdriven Guitar	Comply	072	Piccolo	Comply	115	Woodblock	* Major Triad
030	Distortion Guitar	Comply	073	Flute	Comply	116	Taiko Drum	* Minor Triad
031	Guitar Harmonics	Comply	074	Recorder	Comply	117	Melodic Tone	* Mandolin
032	Acoustic Bass	Comply	075	Pan Flute	Comply	118	Synth Drum	–
033	Electric Bass Fingered	Comply	076	Bottle Blow	Comply	119	Reverse Cymbal	–
034	Electric Bass Picked	Comply	077	Shakuhachi	Comply	120	Guitar Fret Noise	–
035	Fretless Bass	–	078	Whistle	–	121	Breath Noise	–
036	Slap Bass1	Comply	079	Ocarina	–	122	Seashore	–
037	Slap Bass2	Comply	080	Lead 1 (Square Wave)	–	123	Bird Tweet	–
038	Synth Bass1	Comply	081	Lead 2 (Saw Tooth)	–	124	Telephone Ring	–
039	Synth Bass2	Comply	082	Lead 3 (Caliopo)	–	125	Helicopter	–
040	Violin	Comply	083	Lead 4 (Chiff)	–	126	Applause	–
041	Viola	Comply	084	Lead 5 (Charang)	–	127	Gunshot	–
042	Cello	Comply	085	Lead 6 (Solo Voice)	–			

* 115, 116 & 117 are EM61000 unique instruments

5.0 Volume

5.1 EM61000 Playing Volume

Modifying the volume and velocity in the MIDI file will change the EM61000 overall playing volume.



The above example is from "CakeWalk"

5.2 Volume Range

The acceptable volume range for EM61000 is 0 ~ 127.

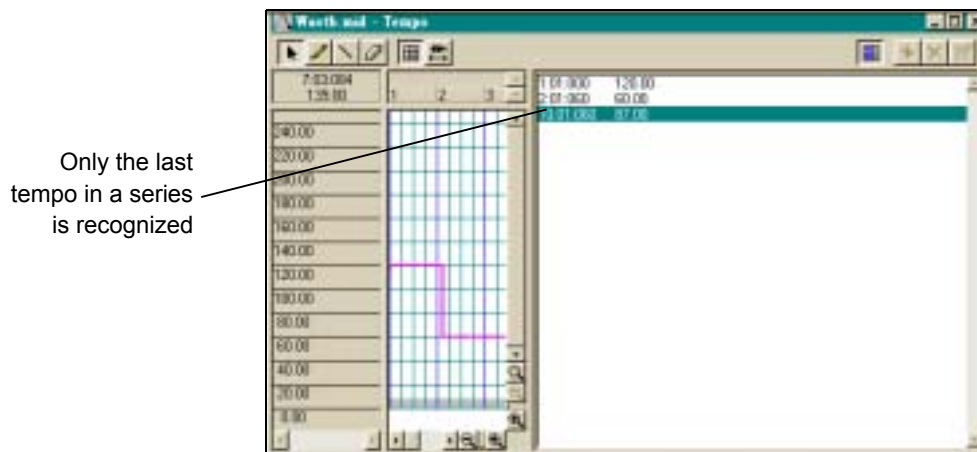
6.0 Tempo

6.1 Tempo Range

The acceptable tempo range for EM61000 is 40 ~ 240.

6.2 Tempo Limitation

EM61000 Voice Translator can only accept one tempo for each MIDI. If several tempos are available, only the last tempo is accepted.



The above example is from "CakeWalk"

6.3 Multiple Tempos

EM61000 can only accept one tempo in a MIDI. If more than one tempo is required, chunk the tempo into several parts and place each part into a separate MIDI file. Then program them to play continuously.

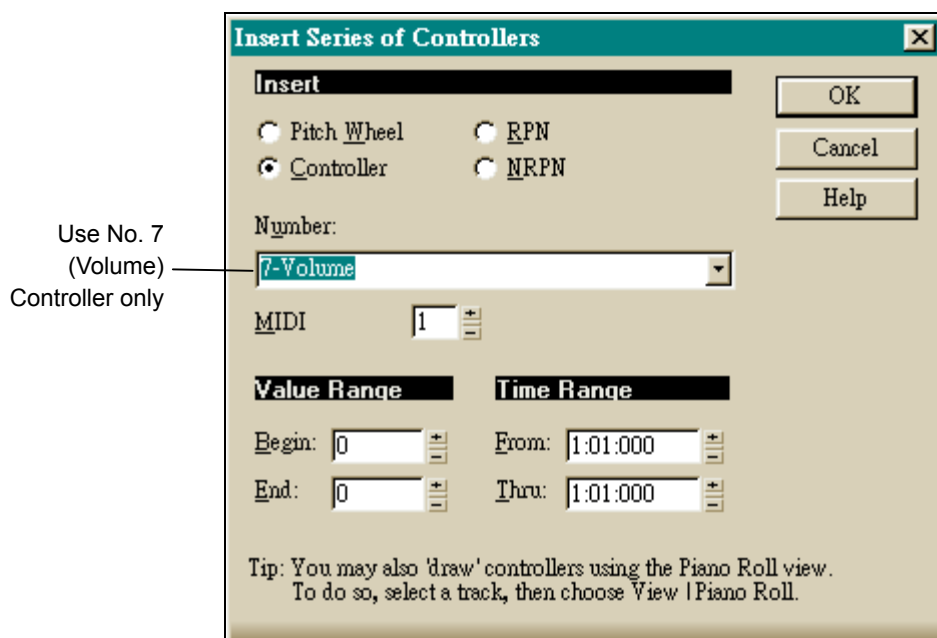
7.0 Meter

7.1 Limitations

- EM61000 only accepts one meter within a MIDI. If a song contains several meters, only the last meter will be recognized as the MIDI's meter. The last meter is then utilized as the applicable meter for the whole song.
- Furthermore, only a meter of n/4 is acceptable.

8.0 Controller

Of all the available MIDI Controllers, EM61000 can only interpret the No. 7-Volume. Avoid using the other controller numbers, as they will only be ignored.



The above example is from "CakeWalk"