

Mobile Musical Interface Specification

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Association of Musical Electronics Industry
Active Ringtone Working Group

MOBILE MUSICAL INSTRUMENT SPECIFICATION

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History

Version	Date	Revisions
1.0.0	Jan. 9th 2007	First Edition
1.0.1	Jan. 12 th 2007	2.2.2 “→: Octave up each time the directional key is pressed . The new octave is then held.” is hanged to “→: Octave up while pressing the directional key.” “←: Octave down each time the directional key is pressed . The new octave is then held.” is changed to “←: Octave down while pressing the directional key.” In figure 13, “Held” is eliminated.
1.0.2	July 10, 2007	Remove “Blue Note” from 3.1.5 Change “Five” to “Six” in 2.1.1 Remove extraneous text and markings

1 Background

The evolution of mobile phone functionality in recent years is quite remarkable. One example is the approach to music, with FM tone generators used for playing ringtones appearing in mobile phones around 1999. Since then, mobile phone tone generators have continued to evolve, reaching sound quality equivalent to that of PC-produced digital recordings

Using the number key pad for text messaging, mobile phone users—particularly younger users—are able to communicate easily and with great agility. As using the mobile phone keypad as a musical instrument spreads, it is not unimaginable that users could become as virtuosic as on any other musical instrument.

However, if each mobile phone maker independently implements the way the number keypad is used to play music, this could mean that a user would have to re-learn a new interface for each mobile phone. This document provides a suggestion for standardizing the user interface specification for using the mobile phone as a musical instrument.

2 User interface for mobile phone as musical instrument

2.1 Standard keypad key assignment

The standard mobile phone has twelve keys in the number keypad, as shown in Figure 1.

This specification defines standard assignment of these keys for melodic instruments and drum sets.



Figure 1 Standard keypad key placement (Reference)

2.1.1 Standard keypad key assignment for melodic instruments

The following tables illustrate standard keypad key assignments for melodic instruments. They define pitch names corresponding to each keypad key number. Six melodic instrument keypad key assignments are defined: Default, Option 1, Option 2, Option 3, Option 4, and Option 5. All pitches are based on the major scale.

2.1.1.1 Melodic Instrument: Default

Key number	Pitch name
1	Root
2	2nd
3	3rd
4	4th
5	5th
6	6th
7	7th
8	8th
9	9th
*	10th
0	11th
#	12th



Figure 2 Keypad key assignment for Melodic Instrument: Default

2.1.1.2 Melodic instrument: Option 1

Key number	Pitch name
1	4th(Oct Down)
2	5th(Oct Down)
3	6th(Oct Down)
4	7th(Oct Down)
5	Root
6	2nd
7	3rd
8	4th
9	5th
*	6th
0	7th
#	8th



Figure 3 Key assignment for Melodic Instrument: Option 1

2.1.1.3 Melodic instrument: Option 2

Key number	Pitch name
1	Root
2	2nd
3	3rd
4	4th
5	b2nd(#1st)
6	b3rd(#2nd)
7	5th
8	6th
9	7th
*	b5th(#4th)
0	b6th(#5th)
#	b7th(#6th)



Figure 4 Key assignment for Melodic Instrument: Option 2

2.1.1.4 Melodic instrument: Option 3

Key number	Pitch name
1	10th
2	11th
3	12th
4	7th
5	8th
6	9th
7	4th
8	5th
9	6th
*	Root
0	2nd
#	3rd



Figure 5 Key assignment for Melodic Instrument: Option 3

2.1.1.5 Melodic instrument: Option 4

Key number	Pitch name
1	6th
2	7th
3	8th
4	3rd
5	4th
6	5th
7	7th(Oct Down)
8	Root
9	2nd
*	4th(Oct Down)
0	5th(Oct Down)
#	6th(Oct Down)



Figure 6 Key assignment for Melodic Instrument: Option 4

2.1.1.6 Melodic instrument: Option 5

Key number	Pitch name
1	b5th(#4th)
2	b6th(#5th)
3	b7th(#6th)
4	5th
5	6th
6	7th
7	4th
8	b2nd(#1st)
9	b3rd(#2nd)
*	Root
0	2nd
#	3rd



Figure 7 Key assignment for Melodic Instrument: Option 5

2.1.2 Standard number key assignment for drum sets

The following tables illustrate standard number key assignment for drum sets. They define drum instruments corresponding to each keypad key number. By defining four drum sets, each using the standard twelve keypad keys, all forty-seven instruments of the GM1 drum set are covered. Four drum set keypad key assignments are defined: Drum Set 1, Drum Set 2, Percussion Set 1 and Percussion Set 2.

2.1.2.1 Drum Set 1

Key number	Instrument name
1	Crash Cymbal 1
2	Splash Cymbal
3	Ride Cymbal 1
4	Hi Tom
5	Low Mid Tom
6	High Floor Tom
7	Acoustic Snare
8	Cowbell
9	Open Hi-Hat
*	Bass Drum 1
0	Side Stick
#	Closed Hi-Hat



Figure 8 Key assignment for Drum Set 1

2.1.2.2 Drum Set 2

Key number	Instrument name
1	Crash Cymbal 2
2	Chinese Cymbal
3	Ride Bell
4	Hi Mid Tom
5	Low Tom
6	Low Floor Tom
7	Electric Snare
8	Hand Clap
9	Ride Cymbal 2
*	Acoustic Bass Drum
0	(Reserved)
#	Pedal Hi-Hat



Figure 9 Key assignment for Drum Set 2

2.1.2.3 Percussion Set 1

Key number	Instrument name
1	Claves
2	Cabasa
3	VibraSlap
4	Tambourine
5	Low Timbale
6	High Timbale
7	Maracas
8	Hi Bongo
9	Low Bongo
*	Mute Hi Conga
0	Open Hi Conga
#	Low Conga



Figure 10 Key assignment for Percussion Set 1

2.1.2.4 Percussion Set 2

Key number	Instrument name
1	Short Guiro
2	Short Whistle
3	High Agogo
4	Long Guiro
5	Long Whistle
6	Low Agogo
7	Mute Cuica
8	Hi Wood Block
9	Mute Triangle
*	Open Cuica
0	Low Wood Block
#	Open Triangle



Figure 11 Key assignment for Percussion Set 2

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The following table illustrates the division of the forty-seven GM1 drum set instruments between the number key assignment for drum sets.

Key#	Instrument	Drum1	Drum2	Perc.1	Perc.2
35	Acoustic Bass Drum		*		
36	Bass Drum 1	*			
37	Side Stick	0			
38	Acoustic Snare	7			
39	Hand Clap		8		
40	Electric snare		7		
41	Low Floor Tom		6		
42	Closed Hi-Hat	#			
43	High Floor Tom	6			
44	Pedal Hi-Hat		#		
45	Low Tom		5		
46	Open Hi-Hat	9			
47	Low Mid Tom	5			
48	Hi Mid Tom		4		
49	Crash Cymbal 1	1			
50	High Tom	4			
51	Ride Cymbal 1	3			
52	Chinese Cymbal		2		
53	Ride Bell		3		
54	Tambouline			4	
55	Splash Cymbal	2			
56	Cowbell	8			
57	Crash Cymbal 2		1		
58	Vibraslap			3	
59	Ride Cymbal 2		9		
60	Hi Bongo			8	
61	Low Bongo			9	
62	Mute Hi Conga			*	
63	Open Hi Conga			0	
64	Low Conga			□	
65	High Timbale			6	
66	Low Timbale			5	
67	High Agogo				3
68	Low Agogo				6
69	Cabasa			2	
70	Maracas			7	
71	Short Whistle				2
72	Long Whistle				5
73	Short Guiro				1
74	Long Guiro				4
75	Claves			1	
76	Hi Wood Block				8
77	Low Wood Block				0
78	Mute Cuica				7
79	Open Cuica				*
80	Mute Triangle				9
81	Open Triangle				#

2.2 Directional pad assignment

Pitch ranges greater than one octave can be achieved using the directional pad on the cellular phone.

This specification assumes the directional pad to have four arrows: "↑", "↓", "→", and "←". Three directional pad assignments are defined: Melodic Instrument 1, Melodic Instrument 2, and Drum Set.

2.2.1 Directional pad assignment for Melodic Instrument 1

This describes the directional pad assignments for the melodic instrument keypad key assignments Default, Option 1, Option 3, and Option 4 detailed in Section 2.1.1.

- ↑: Halftone up (sharp; #) by pressing the number key while pressing the directional key.
- ↓: Halftone down (flat; b) by pressing the number key while pressing the directional key.
- →: Octave up each time the directional key is pressed . The new octave is then held
- ←: Octave down each time the directional key is pressed . The new octave is then held.

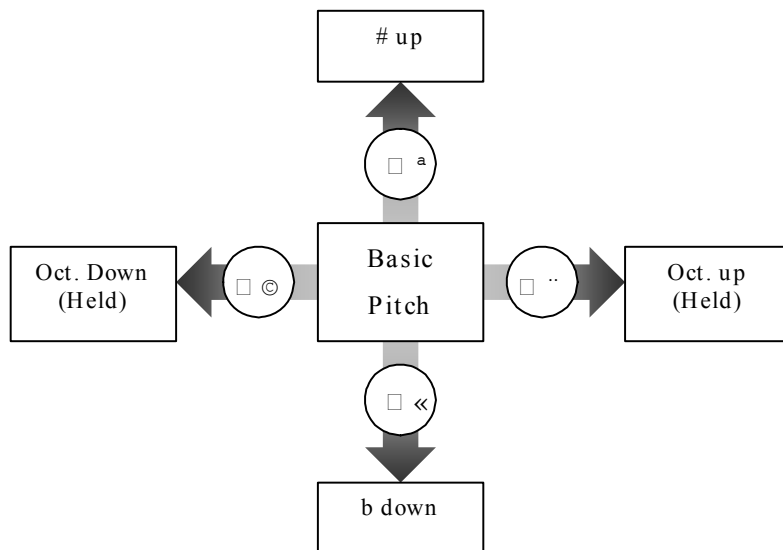


Figure 12 Directional pad assignment for Melodic Instrument 1

2.2.2 Directional pad assignment for Melodic Instrument 2

This describes the directional pad assignments for the melodic instrument keypad key assignments Option 2 and Option 5 detailed in Section 2.1.1.

- ↑: Pitch bend up by pressing the number key while pressing the directional key.
- ↓: Pitch bend down by pressing the number key while pressing the directional key.
- →: Octave up while pressing the directional key.
- ←: Octave down while pressing the directional key.

[Note]

Default pitchbend behavior is as follows:

- 2 halftones (200 cents) up/down after the number key has been held for 150ms.
- The tuning resolution is linear cents.

A system can be implemented such that the above values can be changed.

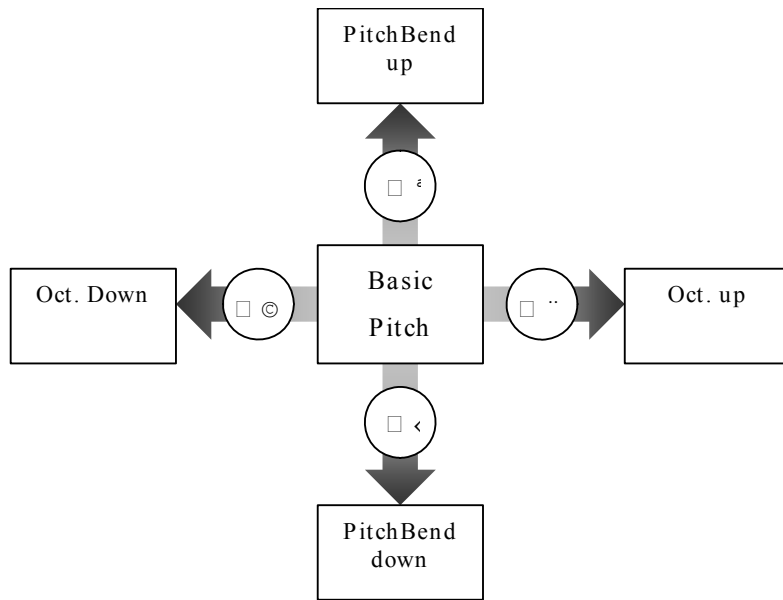


Figure 13 Directional pad assignment for Melodic Instrument 2.

2.2.3 Directional pad assignment for Drum Set

This describes the directional pad assignment for the drum set keypad key assignments detailed in Section 2.1.2.

- ↑: Volume accent by pressing the number key while pressing the directional key.
- ↓: Change drum set by pressing the number key while pressing the directional key.
 - When Drum Set 1, change to Drum Set 2.
 - When Drum Set 2, change to Drum Set 1.
 - When Percussion Set 1, change to Percussion Set 2.
 - When Percussion Set 2, change to Percussion Set 1.
- →: Reserved.
- ←: Reserved.

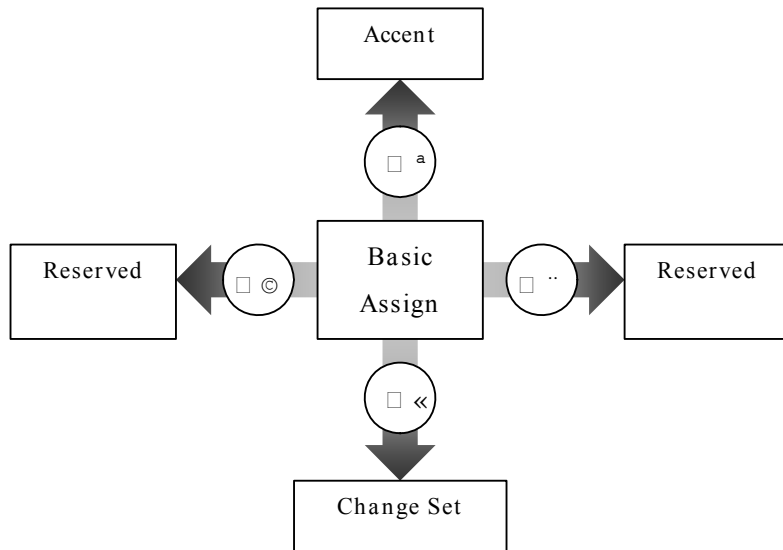


Figure 14 Directional pad assignment for Drum Set

[Note]

The default volume and accent volume depends on implementation in the mobile phone.

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2.3 Center octave

Center octave is defined for each melodic instrument.

Considering the standard octave provided for in the GM specification to be 0, the table below illustrates the center octave value relative to the GM octave number for each instrument.

□ 1 Center Octave

PC#	Instrument	Center Oct.	PC#	Instrument	Center Oct.
0	Acoustic Grand Piano	0	32	Acoustic Bass	-2
1	Bright Grand Piano	0	33	Electric Bass (finger)	-2
2	Electric Grand Piano	0	34	Electric Bass (pick)	-2
3	Hnky-Tonk Piano	0	35	Fretless Bass	-2
4	Electric Piano 1	0	36	Slap Bass 1	-2
5	Electric Piano 2	0	37	Slap Bass 2	-2
6	Harpsichord	0	38	Synth Bass 1	-2
7	Clavi	0	39	Synth Bass 2	-2
8	Celesta	+2	40	Violin	+1
9	Glockenspiel	+2	41	Viola	0
10	Music Box	+1	42	Cello	-1
11	Vibraphone	0	43	Contrabass	-2
12	Marimba	+1	44	Tremolo Strings	0
13	Xylophone	+2	45	Pizzicato Strings	0
14	Tubular Bells	0	46	Orchestral Harp	0
15	Dulcimer	0	47	Timpani	-1
16	Drawbar Organ	0	48	String Ensemble 1	0
17	Percussive Organ	0	49	String Ensemble 2	0
18	Rock Organ	0	50	SynthStrings 1	0
19	Church Organ	0	51	SynthStrings 2	0
20	Reed Organ	0	52	Choir Aahs	0
21	Accordion	0	53	Voice Oohs	0
22	Harmonica	0	54	Synth Voice	0
23	Tango Accordion	0	55	Orchestra Hit	0
24	Acoustic Guitar (nylon)	0	56	Trumpet	0
25	Acoustic Guitar (steel)	0	57	Trombone	-1
26	Electric Guitar (jazz)	0	58	Tuba	-2
27	Electric Guitar (clean)	0	59	Muted Trumpet	0
28	Electric Guitar (muted)	0	60	French Horn	0
29	Overdriven Guitar	0	61	Brass Section	0
30	Distortion Guitar	0	62	Synth Brass 1	0
31	Guitar Harmonics	0	63	Synth Brass 2	0

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PC#	Instrument	Center Oct.	PC#	Instrument	Center Oct.
64	Soprano Sax	+1	96	FX 1 (Ice Rain)	0
65	Alto Sax	0	97	FX 2 (Soundtrack)	0
66	Tenor Sax	-1	98	FX 3 (Crystal)	+2
67	Baritone Sax	-2	99	FX 4 (Atmosphere)	+1
68	Oboe	+1	100	FX 5 (Brightness)	+1
69	English Horn	0	101	FX 6 (Goblins)	0
70	Bassoon	-1	102	FX 7 (Echoes)	0
71	Clarinet	0	103	FX 8 (Sci-Fi)	0
72	Piccolo	+2	104	Sitar	0
73	Flute	+1	105	Banjo	0
74	Recorder	+1	106	Shamisen	0
75	Pan Flute	+1	107	Koto	0
76	Blown Bottle	0	108	Kalimba	+1
77	Shakuhachi	0	109	Bag pipe	+1
78	Whistle	+2	110	Fiddle	+1
79	Ocarina	+1	111	Shanai	+1
80	Lead 1 (Square)	+1	112	Tinkle Bell	+2
81	Lead 2 (Sawtooth)	+1	113	Agogo	0
82	Lead 3 (Calliope)	+1	114	Steel Drums	0
83	Lead 4 (Chiff)	+1	115	Woodblock	0
84	Lead 5 (Charang)	+1	116	Taiko Drum	0
85	Lead 6 (Voice)	+1	117	Melodic Tom	0
86	Lead 7 (Fifths)	+1	118	Synth Drum	0
87	Lead 8 (Bass+Lead)	+1	119	Reverse Cymbal	0
88	Pad 1 (New Age)	0	120	Guitar Fret Noise	0
89	Pad 2 (Warm)	0	121	Breath Noise	0
90	Pad 3 (PolySynth)	0	122	Seashore	0
91	Pad 4 (Choir)	0	123	Bird Tweet	0
92	Pad 5 (Bowed)	0	124	Telephone Ring	0
93	Pad 6 (Metallic)	0	125	Helicopter	0
94	Pad 7 (Halo)	0	126	Applause	0
95	Pad 8 (Sweep)	0	127	Gunshot	0

3 Guidelines for mobile phone as a musical instrument settings

3.1 Recommended settings

The following items are the recommended standard settings for mobile phone as a musical instrument.

3.1.1 Instrument type

Sets the performed type of instrument. Any settings regarding the type of instrument being used provided by content should take priority in determining the type of instrument performed.

Range: Melodic, Drum1, Drum2, Percussion1, Percussion2 (Default: Melodic)

3.1.2 Keypad key assignment

Sets the performed keypad key assignment. Any settings regarding the keypad key assignment provided by content should take priority in determining the keypad key assignment. This setting is only effective when a melodic instrument has been assigned.

Range: Default, Option1, Option2, Option3, Option4, Option5 (Default: Default)

3.1.3 Root key

Sets the performed root key. Any settings regarding the root key provided by content should take priority in determining the performed root key.

Range: -6□0□+6 (Default: 0)

3.1.4 Octave

Sets the performed octave. Any settings regarding the octave provided by content should take priority in determining the performed octave.

Range: -5□0□+5 (Default: 0)

3.1.5 Scale

Sets the performed scale type. Any settings regarding the scale type provided by content should take priority in determining the performed scale type.

Range: Major, Natural Minor, Dorian (Default: Major)

3.1.6 Program Number

Set the performed channel's program number. Any settings regarding the program number provided by content should take priority in determining the performed program number.

Range: 0□127 (Default: 0)

3.1.7 Volume

Set the performed channel's volume value. Any settings regarding the volume provided by content should take priority in determining the performed volume.

Range: 0-127 (Default: Depends on implementation in the mobile phone.)