Evolution Synthesis
EVS-1

MIDI Implemetation

The EVS-1 hasn't been produced since about 1990. Nevertheless, I spent a while preparing this document in the vain hope that someone might write a better editor for it. I can dream…

Jonathan Watters
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evs@heaven.fetch.co.uk
www.fetch.net/~heaven/evs.htm

EVS-1 System Exclusive Messages

The following format is used for all exclusive messages

Byte		Description
11110000	f0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0tttnnnn		t=Command Type, n=System Channel
0000mmmm		m = Command Mode
(Body)		Main data
11110111	F7h	End of Exclusive

MIDI Status : F0h, F7h

An exclusive message must have these two bytes at the start and end. The manufacturers ID must follow the Foh.

Manufacturers ID

The manufacturers ID identifies the manufacturer of a MIDI instrument that triggers an exclusive message. Value 00h, 20h, 08h is the code for Evolution Synthesis.

Product ID

This contains a value which uniquely identifies the EVS-1 as an Evolution Synthesis product.

System Channel

The System channel contains the currently specified System Channel on the EVS-1. This enables the exclusive message to be directed at a specific unit, if several EVS-1's are connected.

Command Type

The command type breaks the exclusive messages into 5 main categories, which are:

0 Parameter Change
1 Bulk Dump
2 Bulk Request
3 Remote Buttons
4 Error Messages

Command Mode

The command Mode accesses the various modes available to each of the 5 main categories.

Main Data

The data sent here will vary depending on the Command Type and the Command Mode.

System Exclusive Communication

Parameter Change Message [Receive only]

This message is used to change individual parameters within the EVS-1 memory. There are 5 different types of parameter change;
Sound Name
Sound Data
Bank Data
Group Name
Recall Group

Byte		**Description**
11110000	f0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0000nnnn		Command Type 0 (Parameter Change) n=System Channel
00pppppp		Parameter number (see table below)
0ooooooo		Offset into selected parameter
0000hhhh		High 4 bits of data
0000llll		Low 4 bits of data
11110111	F7h	End of Exclusive

Parameter		Offset Values
0-19	Change character in sound name 0-19	0-9
20-39	Change parameter in sound data 0-19	0-127
40-47	Change bank parameter 1-8	0-8
48	Change character in group name	0-9
50	Recall group	0

Bulk Data Messages [Receive and Transmit]

The EVS-1 has 8 types of bulk data messages, as follows:
One Sound
All Sounds
One Group
All Groups
Prog Change
Utility
LEDs
Group

Since some of the data sent as part of a bulk dump uses 8 bits, all bulk data bytes are sent as pairs of 4 bits, with the upper 4 bits first.

One Sound

Rx: Stores data into any on of the 20 internal sounds
Tx: Can transmit both internal and preset sounds

Byte		**Description**
11110000	f0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0001nnnn		Command Type 1 (bulk data) n=System Channel
00000000		Dump One Sound
00000010	02h	Upper 7 bits of single sound size
00010100	14h	Lower 7 bits of single sound size
0sssssss		Sound number, rx:0-19, tx:0-99
(Sound)		Sound data, 138 bytes sent as 0000hhhh, 0000llll
0ccccccc		Checksum - Lowest 7 bits of the total of data bytes
11110111	F7h	End of Exclusive

All Sounds

Rx: Changes all internal sounds in one go
Tx: Sends all internal sound data

Byte		**Description**
11110000	f0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0001nnnn		Command Type 1 (bulk data) n=System Channel
00000001		Dump All Sounds
00101011	2Bh	Upper 7 bits of all sound data size
00010000	10h	Lower 7 bits of all sound data size
Sound 0		Sound data, 138 bytes sent as 0000hhhh, 0000llll
…		
Sound 19		Sound data, 138 bytes sent as 0000hhhh, 0000llll
0ccccccc		Checksum - Lowest 7 bits of the total of data bytes
11110111	F7h	End of Exclusive

One Group

Rx: Stores data into any one of the 20 groups
Tx: Sends single stored group

Byte		**Description**
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0001nnnn		Command Type 1 (bulk data) n=System Channel
00000010	02h	Dump one group
00000001	01h	Upper 7 bits of single group size
00100100	24h	Lower 7 bits of single group size
000ggggg		Group number 0-19
(Group)		Group data, 82 bytes sent as 0000hhhh, 0000llll
0ccccccc		Checksum - Lowest 7 bits of the total of data bytes
11110111	F7h	End of Exclusive

All Groups

Rx: Stores new set of groups
Tx: Sends all stored group data

Byte		**Description**
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0001nnnn		Command Type 1 (bulk data) n=System Channel
00000011	03h	Dump all groups
00000001	01h	Upper 7 bits of all group data size
00100100	24h	Lower 7 bits of all group data size
Group 0		Group data, 82 bytes sent as 0000hhhh, 0000llll
...		
Group 19		Group data, 82 bytes sent as 0000hhhh, 0000llll
0ccccccc		Checksum - Lowest 7 bits of the total of data bytes
11110111	F7h	End of Exclusive

Program Change Table

Rx: Stores new program change table
Tx: Sends contents of program change table

Byte		**Description**
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0001nnnn		Command Type 1 (bulk data) n=System Channel
00000100	04h	Dump program change table
00000010	02h	Upper 7 bits of program change table size
00000000	00h	Lower 7 bits of program change table size
(Prog Change)		Program change table data, 256 bytes sent as 0000hhhh, 0000llll
…		
Group 19		Group data, 82 bytes sent as 0000hhhh, 0000llll
0ccccccc		Checksum - Lowest 7 bits of the total of data bytes
11110111	F7h	End of Exclusive

Utility

Rx: Stores new utility parameters
Tx: Sends current utility parameter settings

Byte		**Description**
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0001nnnn		Command Type 1 (bulk data) n=System Channel
00000101	05h	Dump utility data
00000000	00h	Upper 7 bits of utility data size
00001110	0Eh	Lower 7 bits of utility data size
(Utility)		Utility data, 7 bytes sent as 0000hhhh, 0000llll
0ccccccc		Checksum - Lowest 7 bits of the total of data bytes
11110111	F7h	End of Exclusive

LEDs

Rx: N/A
Tx: Sends current LED display

Byte		Description
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0001nnnn		Command Type 1 (bulk data) n=System Channel
00000110	06h	Dump LED display data
00000000	00h	Upper 7 bits of utility data size
00001110	08h	Lower 7 bits of utility data size
(LED)		LED data, 4 (8? JW) bytes sent as 0000hhhh, 0000llll
0ccccccc		Checksum - Lowest 7 bits of the total of data bytes
11110111	F7h	End of Exclusive

Group

Rx: N/A
Tx: Sends the current group parameter settings, which may be different from what has been stored.

Byte		Description
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0001nnnn		Command Type 1 (bulk data) n=System Channel
00000111	07h	Dump current group settings
00000001	01h	Upper 7 bits of group data size
00100100	24h	Lower 7 bits of group data size
(Group parameters)		Group parameter data, 82 bytes sent as 0000hhhh, 0000llll
0ccccccc		Checksum - Lowest 7 bits of the total of data bytes
11110111	F7h	End of Exclusive

Dump request messages [Receive only]

When the EVS-1 receives one of these messages, it will transmit the requested data as described above in the Buld Data Messages

One Sound

Byte		**Description**
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0010nnnn		Command Type 2 (Bulk request) n=System Channel
00000000	00h	Request single sound
0sssssss		Sound number to dump (0-99)
11110111	F7h	End of Exclusive

All Sounds

Byte		**Description**
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0010nnnn		Command Type 2 (Bulk request) n=System Channel
00000001	01h	Request all sounds
11110111	F7h	End of Exclusive

One Group

Byte		Description
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0010nnnn		Command Type 2 (Bulk request) n=System Channel
00000010	02h	Request one group
000ggggg		Group number to dump (0-19)
11110111	F7h	End of Exclusive

All Groups

Byte		Description
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0010nnnn		Command Type 2 (Bulk request) n=System Channel
00000011	03h	Request all groups
11110111	F7h	End of Exclusive

Program Change Table

Byte		Description
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0010nnnn		Command Type 2 (Bulk request) n=System Channel
00000100	04h	Request program change table
11110111	F7h	End of Exclusive

Utility

Byte		Description
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0010nnnn		Command Type 2 (Bulk request) n=System Channel
00000101	05h	Request utility data
11110111	F7h	End of Exclusive

Group

Byte		Description
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0010nnnn		Command Type 2 (Bulk request) n=System Channel
00000111	07h	Request current group settings
11110111	F7h	End of Exclusive

Remote Buttons [Receive only]

When the EVS-1 receives one of these messages it gives the same effect as pressing one ofthe buttons on the front panel.

Byte		**Description**
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0011nnnn		Command Type 3 (Remote Buttons) n=System Channel
0000bbbb		Remote button value (0-10)
11110111	F7h	End of Exclusive

Button	**Action**
00h	Reset
01h	Bank/Util
02h	Cursor Left
03h	Cursor Right
04h	+100
05h	-100
06h	+10
07h	-10
08h	+1
09h	-1
0Ah	Enter

MIDI Errors

Memory Protect On/Checksum Mismatch

Byte		Description
11110000	F0h	Exclusive
00000000	00h	Manufacturers ID (EVOLUTION Synthesis)
00100000	20h	Ditto
00001000	08h	Ditto
00000001	01h	Product ID
0100nnnn		Command Type 4 (Error Message) n=System Channel
0000000e		Error type (see below)
11110111	F7h	End of Exclusive

Error Number	Error Type	Reason
0	Memory Protect On (Write Error)	This is sent after a bulk dump message is received that finds Memory Protect is set to ON.
1	Checksum Mismatch	This is sent after a bulk dump message is received which finds that the low 7 bits of the total of the bytes sent does not match its given checksum

Parameter Descriptions

This section gives a more in depth look at the types of data sent as part of bulk data transfers.

Sound Parameters

This details the format of a single sound sent as part of a bulk dump. It is also valid for parameter change messages, although note that the sound name is accessed with a different parameter.

Offset		Parameter	Value
00h	srrrrrrr	s=Sustain r=Rate	1=Sustain at this stage? 0-127
01h	elllllll	e=End l=Level	1=End envelope at this stage? 0-127
02-0Bh		Rate/Level pairs 2-6 as 00h, 01h	
0Ch	0000nnnn	Env1 Node1	0-9 Vary based on Alg 10-12 LFO1Spd, LFO1Dep, LFO2Spd 13-14 LFO2Dep, E.G. Rate
0Dh	0lllllll	Env1 Depth1	0-127
0Eh	0000nnnn	Env1 Node2	0-15
0Fh	0lllllll	Env1 Depth2	0-127
10-1Fh		Envelope 2	
20-2Fh		Envelope 3	
30-3Fh		Envelope 4	
40h	0000wwww	LF01 Wave	0-3 Sine, Triang, Square, Saw Up 4-6 Saw Dn, TrillU, Trill5 7-8 Rand1, Rand2
41h	0ddddddd	LFO1 Delay	0-127
42h	0rrrrrrr	LFO1 Rate	0-127
43h	0000nnnn	LFO1 Node1	0-15
44h	0ddddddd	LFO1 Depth1	0-127
45h	0000nnnn	LFO1 Node2	0-15
46h	0ddddddd	LFO1 Depth2	0-127
47-4Dh		LFO2	
4E-51h	0000nnnn	Dest Node	0-15
52-55h	bbbbbbbb	Key Break	24-102, 232-154 (C0-F#6=>, <=C0-F#6)
56-59h	ddddddddd	Key Depth	129-0-127 (-127 - 0 - +127)
5A-5Dh	vvvvvvvv	Velocity Depth	129-0-127 (-127 - 0 - +127)
5E-61h	aaaaaaaa	Aftertouch	129-0-127 (-127 - 0 - +127)
62-65h	cccccccc	Controller	129-0-127 (-127 - 0 - +127)
66-69h	mmmmmmmm	Mod Wheel	129-0-127 (-127 - 0 - +127)
6Ah	00aaaaaa	Algorithm	0-27
6Bh	ttttttt	Transpose	232-23 (-24 - + 24)
6C-7Fh		Node Parameters	10 pairs, see below - not well defined - JW
80-89h	0xxxxxxx	Sound name 10 chars	32-127 (ASCII)

Format for Node parameters

0	ddddddddd	Detune	192-64 (-64 - +64)
1	fDDDDDDD	f=Fixed Freq D=Detone	0 Off, 1 On 1-127 (-63 - +63) Centre=64
0	000000000	Level	No value specified at this point
1	000000000		
0	000wwwww	Wave	0-31
1	00000000		

Group Parameters

This details the format of a single group sent as part of a bulk dump. The parametr change message accesses values based on bank number and offset into that particular bank 0-8.

Offset		**Parameter**	**Value**
00-07h	0sssssss	Sound Number	0-99
08-0Fh	0000nnnn	MIDI Channel number	0-16, 0= OMNI
10-17h	0vvvvvvv	Volume	0-99
18-1Fh	pppppppp	Pan	249-7 (-7 - +7)
20-27h	00LbAMCV	Mod Control: V Velocity C Controller M Mod wheel A Aftertouch b Pitch Bend L LFO	Each bit may be 0 or 1, Off or O
28-2Fh	ttttttt	Transpose	244-12 (-12 - +12)
30-37h	ddddddd	Detune	237 - 19 (-19 - +19)
38-3Fh	0lllllll	Low Split point	24-102
40-47h	0hhhhhhh	High Split point	24-102
48-51h	0xxxxxxx	Group name, 10 chars	32-127 (ASCII)

Utility Parameters

This details the format of the utility data sent as a bulk dump.

Offset		**Parameter**	**Value**
00h	0ccccccc	Controller Change	2-121
01h	0000nnnn	System Channel	0-16, 0=OMNI
02h	xxxxxxxx	Memory Protect	0= Off, 255=On
03h	00SbACPV	MIDI Filter	Each bit may be 0 or 1, Off or On
		V Velocity	
		P Program Change	
		C Controller	
		A Aftertouch	
		b PitchBend	
		S System Exclusive	
04h	ttttttt	Master Tune	237 - 19 (-19 - +19)
05h	0000bbbb	Pitch Bend range	0-12, 0 = Off
06h	00000kkk	Key Mode	0-5 Ln1, Ln2, Fn1, Fn2, CAS

Program Change Table Parameters

This details the format of the program change table sent as a bulk dump.

Offset		Parameter	Value
00h	fxxxxxxx	f=Sound/Group	0=Sound, 1=Group
		x=Number	0-99 (Sounds), 0-19 (Groups)
01-7Fh		Prog Change 1-127	

LED Parameters

This details the format of the LED data sent as a bulk dump.

Offset		Parameter	Value
00h	000fxxxx	f=Bank/Util	0=Bank, 1=Util
		x=Position	0-9 (JW?)
01h	hgfedcba	Left digit	Bits 0=Off, 1=On
02h	hgfedcba	Centre digit	Bits 0=Off, 1=On
03h	hgfedcba	Right digit	Bits 0=Off, 1=On

Position of segments on LED:

```
----a----

|       |

f       b

|       |

|---g---|

|       |

e       c

|       |

----d----  *h
```

MIDI Implemetation Chart

Function	Transmitted	Recognized	Remarks
Basic Channel	1-16	1-16 0=Omni	Separate Channel for each bank possible
Note Number	24-102	24-102	
Velocity Note ON	*	*	Vel=0=Note OFF
Velocity Note Off	X	X	
After touch Keys	X	X	
After touch Channels	*	*	
Pitch Bender	*	*	Range 0-12 semitones 7 bit resolution
Control Change 1	*	*	Mod Wheel
Control Change 7	o	o	Volume
Control Change 10	o	o	Pan
Control Change 64	o	o	Sustain Pedal
Control Change 2-121	*	*	Assignable Controller
Program Change	* 0-127	* 0-127	Can be reassigned using
True #	********	0-147	program change table
System Exclusive	*	*	Voice/Group Parameters
System Common			
Song Pos	x	x	
Song Sel	x	x	
Tune	x	x	
System RealTime			
Clock	x	x	
Commands	x	x	
Aux Messages			
Local On/Off	x	x	
All Notes Off	x	x	
Active Sense	x	x	
Reset	x	x	
Notes	o Yes x No * Can be set to o/x and memorised		