TC Electronic D-Two MIDI specification

Document revision history:

V1.00	2000-01-26	D-Two release 1.01

General message format:

0xF0	MIDI System Exclusive message start
0x00	3 byte manufacturer ID for TC Electronic
0x20	..
0x1F	..
<Device ID>	System Exclusive device ID (User parameter)
0x45	D-Two model ID
<Message type>	D-Two message type
<Data>	Data depends on message type
..	..
..	..
0xF7	MIDI System Exclusive message terminator

Preset numbers

Preset numbers are represented in the SysEx messages as 2 bytes (14-bit value). The first byte is the 7 most significant bits and the second byte is the 7 least significant bits.

Preset numbers are mapped accordingly:

0x01 (1) to 0x32 (50)	Factory bank
0x33 (51) to 0x96 (150)	User bank

Preset number 0 is used to access the edit buffer. When recalling presets with program changes, sending a controller 0 or controller 32 change first can be used to indicate bank number (when sending other than zero selects user-bank as opposed to factory-bank).

Binary data

Messages containing binary data dumps consists of a set of 14-bit values as 2-byte pairs The most significant byte is sent in the first byte and the least significant in the second. The dump is terminated with a 14-bit checksum value which is the negative sum of all bytes in the dump truncated to 14 bits. ie. (-sum(all data bytes)) & 0x3FFF.

Communication precautions
When linking together two D-Two devices for transfer of data, make sure that the receiving device is set to receive only SysEx.
During MIDI operation the D-Two may present the following messages:

"> Preset Received <"
"> Preset Dumped <"
"> Rhythm Received <"
"> Rhythm Dumped <"
"> Checksum Error <"
">MIDI Error Occured<"
"> Event Unknown <"
"> Preset Stored <"
">Kernel Par Changed<"
"> Bulk In Progress <"

D-Two message types:

SYXTYPE_PRESETREQUEST	0x45
SYXTYPE_PRESETDATA	0x20
SYXTYPE_RHYTHMREQUEST	0x46
SYXTYPE_RHYTHMDATA	0x21
SYXTYPE_PARAMREQUEST	0x47
SYXTYPE_PARAMDATA	0x22

Preset Request

0xF0	SysEx
0x00	TC Electronic
0x20	..
0x1F	..
<Device ID>	Device ID
0x45	D-Two
0x45	SYXTYPE_PRESETREQUEST
<Preset MSB>	Preset number
<Preset LSB>	..
0xF7	EOX

Preset Data

0xF0	SysEx	
0x00	TC Electronic	
0x20	..	
0x1F	..	
<Device ID>	Device ID	
0x45	D-Two	
0x20	SYXTYPE_PRESETDATA	
<Preset MSB>	Preset number	
<Preset LSB>	..	
<Data>	22 x 14-bit data	
	1 x 14-bit	Preset number
	20 x 14-bit	Presetname (characters in LSB)
	1 x 14-bit	Algorithm-modifiers (in LSBs)
	32 x 14-bit data	
	10 x 14-bit	Rhythm-pattern
	10 x 14-bit	Rhythm-gains
	14-bit checksum	
0xF7	EOX	

Rhythm Request

0xF0	SysEx
0x00	TC Electronic
0x20	..
0x1F	..
<Device ID>	Device ID
0x45	D-Two
0x46	SYXTYPE_RHYTHMREQUEST
0xF7	EOX

Rhythm Data

0xF0	SysEx	
0x00	TC Electronic	
0x20	..	
0x1F	..	
<Device ID>	Device ID	
0x45	D-Two	
0x21	SYXTYPE_RHYTHMDATA	
<Data>	22 x 14-bit data	
	1 x 14-bit	Base tempo
	1 x 14-bit	Rhythm-scale-base*
	10 x 14-bit	Rhythm-taps
	10 x 14-bit	Rhythm-gains
0xF7	EOX	

** Note that this value is created at the time when the rhythm is tap'ed and is used for time-scaling relative to base-tempo. When a rhythm is tap'ed the Rhythm-scale-base equals Base-tempo.*

Parameter Data Request

0xF0	SysEx
0x00	TC Electronic
0x20	..
0x1F	..
<Device ID>	Device ID
0x45	D-Two
0x47	SYXTYPE_PARAMREQUEST
[0x00 | 0x01]	7-bit value specifying system- (1) or algo- (0) parameter.
<Param ID>	7-bit parameter identifier
0xF7	EOX

Parameter Data

0xF0	SysEx
0x00	TC Electronic
0x20	..
0x1F	..
<Device ID>	Device ID
0x45	D-Two
0x22	SYXTYPE_PARAMDATA
[0x00 | 0x01]	7-bit value specifying system- (1) or algo- (0) parameter.
<Param ID>	7-bit Parameter identifier
<Data>	Byte pair yielding signed 14-bit parameter values (MSB first)
0xF7	EOX

See below for a list of parameter identifiers. If a Parameter Data Request message requests a parameter range extending across any undefined parameter identifiers, the corresponding parameter values in the Parameter Data message should be ignored.

Parameters
Parameters can be changed by the System Data SysEx message (for system-parameters) or hard-wired controller change messages (for the algorithm-parameters). Parameters are always set as absolute 14-bit values.
The CC's used for algorithm-parameters are as follows (ID's are given below):

System: Ctrl 16 + <ID>
Effect parameter : Ctrl 48 + <ID>

The System-parameter ID's are used with SysEx-Cmd's and the **CC-Id**'s are used as controller parameters !

System parameter name	**ID**	**CC-Id**	**Min value**	**Max value**
MIDI_INPUT	0		0	1
MIDI_OUTRANGE	1		0	3
MIDI_CLOCK	2		0	2
MIDI_INRANGE	3		0	1
MIDI_DITHER	4		0	3
MIDI_OUTLEVEL **(CC)**	5	**(2)**	-100	0
MIDI_DIGINLEVEL **(CC)**	6	**(1)**	-100	6
MIDI_INLEVEL **(CC)**	7	**(0)**	-5	7
MIDI_MIXLEVEL **(CC)**	8	**(3)**	0	100
MIDI_BYPASS **(CC)**	9	**(4)**	0	1
MIDI_DELAYUNIT	10		0	17
MIDI_MIDIPRGBANK	11		0	2
MIDI_MIDICHNL	12		0	17
MIDI_MIDICC	13		0	1
MIDI_MIDISYSEX	14		0	127
MIDI_MIDISYNC	15		0	1
MIDI_VIEWANGLE	16		0	2
MIDI_BYPASSMODE	17		0	2
MIDI_PEDALMODE	18		0	2
MIDI_CURPRESET	19		1	150
MIDI_ALGO	20		0	127
MIDI_STATUSBITS	21		0	1
MIDI_DELAYMODE	22		0	1
MIDI_REVERSEOFFSET **(CC)**	23	**(5)**	0	1
MIDI_ALGO_SPATIAL **Only CC**		**(6)**	0	1
MIDI_ALGO_FILTER **Only CC**		**(7)**	0	1
MIDI_ALGO_CHORUS **Only CC**		**(8)**	0	1
MIDI_ALGO_REVERSE **Only CC**		**(9)**	0	1
MIDI_ALGO_DYNAMIC **Only CC**		**(10)**	0	1
MIDI_ALGO_P-PONG **Only CC**		**(11)**	0	1
MIDI_ALGO_RHYTHM **Only CC**		**(12)**	0	1

Algorithm parameter name	ID	Min value	Max value
MIDI_DELAY	0	0	10000 ***(5000)***
MIDI_DELAYRYTHM*	1	0	10000 ***(5000)***
MIDI_FBLEVEL	2	0	100
MIDI_FBREPEATS	3	0	10
MIDI_FBSTYLE	4	0	1
MIDI_SUBDIV	5	0	12
MIDI_SHUFFLE	6	0	100
MIDI_TRACKTAP	7	0	1
MIDI_QUANTIZE	8	0	1
MIDI_FXLEVEL	9	0	100
MIDI_SPATIAL_OFFSET	10	0	400
MIDI_SPATIAL_PHASEREV	11	0	3
MIDI_FBHICUT	12	0	60
MIDI_FBLOCUT	13	0	60
MIDI_HICUT	14	0	60
MIDI_LOCUT	15	0	60
MIDI_CHOSPEED	16	0	208
MIDI_CHODEPTH	17	0	100
MIDI_CHOAMOUNT	18	0	100
MIDI_CHOFEEDBACK	19	-100	100
MIDI_CHOTIME	20	0	500
MIDI_CHOGOLDENRATIO	21	0	1
MIDI_CHOPHAREVERSE	22	0	1
MIDI_CHOLFOCURVE	23	0	1
MIDI_CHOLFOPHASE	24	0	2
MIDI_PINGSTYLE	25	0	2
MIDI_THRESHOLD	26	-60	0
MIDI_RELEASE	27	11	26
MIDI_DAMPING	28	-60	0
MIDI_REVERSETHRESHOLD	29	0	5
MIDI_REVERSESTYLE	30	0	10
MIDI_RHYTHM_1-10	32-41	0	10000 ***(5000)***
MIDI_ACCATT_1-10	42-51	0	6

** Note that this value is created at the time when the rhythm is tap'ed and is used for time-scaling relative to base-tempo. When a rhythm is tap'ed the Rhythm-scale-base equals Base-tempo. Therefore this parameter is ONLY directly available through SysEx-control of Rhythms and should NOT be updated via Midi-CC.*