

AdrenaLinn II MIDI Implementation

Version 2.1 Software

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Introduction

The original version 2.0 software that shipped with the AdrenaLinn II contained a limited System Exclusive implementation, as well as some bugs. Specifically, it was not possible to request the preset/drumbeat edit buffers or the Main/MIDI parameters, as well as some other limitations. Version 2.1 software corrects the bugs and provides an improved System Exclusive implementation. We recommend that when writing a MIDI editor for AdrenaLinn II, you use the newer version 2.1 implementation, requesting the AdrenaLinn II's software version at startup and if the version is less than 2.1, informing the user of the need to upgrade at our web site.

Front panel MIDI parameters

Channel selects the MIDI channel (1-16 or ALL) over which the AdrenaLinn receives MIDI Channel Voice messages (MIDI note, velocity, bend, controller, pressure and program change). The default setting is ALL (Omni mode).

Clock In selects whether or not the AdrenaLinn responds to incoming MIDI Clock synchronization messages. If on, the AdrenaLinn also responds to song position pointer messages, so no matter where your external audio sequencer starts, the AdrenaLinn will start at the appropriate point within its 2-measure drumbeat and sequence. Note: the AdrenaLinn always outputs MIDI Clock messages.

Prog Chng selects whether or not the AdrenaLinn responds to incoming MIDI Program Change commands. The options are On and Off. If On, incoming MIDI Program Change messages are used to select user presets U 0 though U99. Incoming Program Change messages specifying programs above 99 are ignored.

Dump selects which of three types of MIDI dumps will be performed when the Bypass footswitch is pressed:

Display	Option
PST	(Preset) Sends the currently selected preset when BYPASS is pressed
DBT	(Drumbeat) Sends the currently selected drumbeat when BYPASS is pressed
ALL	Sends all user presets, drumbeats & Main/MIDI data when BYPASS is pressed

While this parameter is selected, the Bypass LED blinks to indicate that pressing the Bypass footswitch will initiate the MIDI dump.

Note: The AdrenaLinn is always ready to receive an external MIDI data dump:

1. Receiving an "ALL" dump replaces all user presets and drumbeats as well as all MAIN/MIDI parameters.
2. Receiving a "PST" dump will overwrite the selected user preset. (If a factory preset is selected, then the incoming preset dump is ignored.)
3. Receiving a "DBT" dump will overwrite the selected user drumbeat. (If a factory drumbeat is selected, then the incoming drumbeat dump is ignored.)

Channel Mode, System Common and System Real Time Messages

Channel Mode messages

The following messages are recognized.

Status	Second	Third	Description
1001 nnnn	0kkkkkkk	0vvvvvvv	Note On message; nnnn = channel, kkkkkkk = note number and vvvvvvv = velocity. If Effect = Arpeggiator Sequence, note number is used to transpose the sequence down or up. Number 60 = no transposition. If Effect = MIDI and: If Variation = 1, 2, 8 or 9, this message triggers the envelope generator and velocity scales the envelope amplitude. If Variation = 3 or 10, velocity adds to Frequency/Key parameter to alter filter frequency. 60 = no change; other velocity settings decrease or increase filter frequency. If Variation = 4 or 11, note number adds to Frequency/Key parameter to alter filter frequency. 60 = no change; other note number settings decrease or increase filter frequency. Note: If velocity = 0, this message has the same effect as MIDI Note Off message.
1000 nnnn	0kkkkkkk	0vvvvvvv	Note Off message; nnnn = channel, kkkkkkk = note number and vvvvvvv = velocity. This is used to terminate a MIDI Note On. This is only used if Effect = MIDI and Variation = 1, 2, 8 or 9.
1011 nnnn	0ccccccc	0vvvvvvv	Control Change; nnnn = channel, ccccccc = control number, vvvvvvv= value. If control number = 0 (bank select) and value = 0, Factory Preset bank is selected; if value = 1, user preset bank is selected. (User bank is automatically selected at power-up.) If Effect = MIDI and Variation = 6 or 13, then the data value of control number 1, 11, 16, 70 or 74 modulate filter frequency.
1100 nnnn	0ppppppp		Program change; ppppppp = new program number. Used to select presets F0-F99 or U0-U99, depending on last received "bank select" controller message. If ppppppp is greater than 99, message is ignored.
1101 nnnn	0vvvvvvv		Channel Pressure; vvvvvvv = value. If Effect = MIDI and Variation = 7 or 14, value modulates filter frequency.
1110 nnnn	0vvvvvvv	0vvvvvvv	Pitch Bend; byte 2 is LS Byte and byte 3 is MS Byte. If Effect = MIDI and Variation = 5 or 12, MS byte modulates filter frequency; LS byte is ignored.

No channel mode messages are sent.

System Common messages

Status	Second	Third	Description
1111 0010	0vvvvvv	0vvvvvv	Song Position Pointer – LS Byte then MS Byte. Used to remotely set the starting position within the AdrenaLinn II's filter and drumbeat sequences. Because the sequences are only 2 measures, incoming positions above 2 measures are reduced to give the correct position within the 2 measure sequences. For example, if the received number gives a position of bar 55, beat 2 and tick 3, it is automatically changed to bar 1, beat 2 and tick 3.
1111 0011	0sss ssss	None	Song Select. Used to select user drumbeats U0-U99. Note that this message is not assigned to a specific MIDI channel as Program Change messages are.

System Real Time Messages

Status	Description
1111 1000	Timing Clock. When received while Clock In = ON, replaces the internal tempo clock. Sent at all times at the internal tempo rate.
1111 1010	Start. When received, starts the sequencer from the beginning. Sent when sequencer started.
1111 1011	Continue. When received, starts the sequencer from the current step. This message is not sent.
1111 1100	Stop. When received, stops the sequencer. Sent when sequencer is started.

Universal System Exclusive Messages

Only two Universal Sysex messages are supported: Identity Request and Identity Reply. These are used primarily to

Identity Request

When AdrenaLinn II v2.1 receives this message, it responds by sending an "Identity reply" message. Note: This message was added in version 2.1.

Status	Description
1111 0000	System Exclusive (SysEx)
0111 1110	Non-realtime message
0vvv vvvv	If MIDI channel is set to 1-16, 0vvvvvvv must match (unless MIDI Channel = ALL); AdrenaLinn II always responds if 0vvvvvvv = 0000 0000.
0000 0110	ID for Inquiry Message
0000 0001	ID for Inquiry Request
1111 0111	End of Exclusive (EOX)

Note: This message was added in version 2.1. If no response is returned and you are sure that the AdrenaLinn II is otherwise responding correctly, the unit has the original 2.0 software version. In this case, you should inform the user to go to www.rogerlinndesign.com to update his unit to version 2.1.

Identity Reply

Note: This message was added in version 2.1.

Status	Description
1111 0000	System Exclusive (SysEx)
0111 1110	Non-realtime message
0vvv vvvv	If MIDI Channel parameter= ALL (0), vvvvvvvv = 000 0000. Otherwise vvvvvvvv = Channel Number 1-16.
0000 0110	ID for Inquiry Message
0000 0010	ID for Inquiry Reply
0000 0000	Roger Linn Design ID byte 1
0000 0001	Roger Linn Design ID byte 2
0011 0111	Roger Linn Design ID byte 3
0010 0001	AdrenaLinn family ID LSB
0000 0000	AdrenaLinn family ID MSB
0000 0010	AdrenaLinn II family member ID LSB
0000 0000	AdrenaLinn II family member ID MSB
0vvv vvvv	Software version 1 st digit (ASCII character)
0000 0000	Software version 2 nd digit (ASCII character)
0vvv vvvv	Software version 3 rd digit (ASCII character)
0000 0000	Always 0
1111 0111	End of Exclusive (EOX)

System Exclusive Messages

The supported system exclusive messages are listed below in order of their message ID numbers.

Transmit single parameter (message ID 1)

The external device sends this message to AdrenaLinn II in order to change a single parameter within the preset edit buffer, drumbeat edit buffer or Main/MIDI parameters data structure. The AdrenaLinn II does not send this message.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 0001	Message ID for 'Receive single parameter into preset/drumbeat edit buffers or Main/MIDI parameters'
0000 00vv	If vv=00, parameter within preset edit buffer If vv=01, parameter within drumbeat edit buffer If vv=10, parameter within Main/MIDI parameters (added in v2.1)
00vv vvvv	Address of parameter within preset, drumbeat or Main/MIDI data structures. See "Data structures" below.
0000 vvvv	LS 4 bits of datum
0000 vvvv	MS 4 bits of datum
1111 0111	End of Exclusive (EOX)

Transmit user preset (message ID 2)

This message is sent either by the front panel "Dump active preset" message or in response to a "request user preset" message.

If this message is sent from an external device to the AdrenaLinn II while a user preset is selected, the preset is stored to the selected user preset location. If this message is sent from an external device to the AdrenaLinn while a factory preset is selected, the message is ignored.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 0010	Message ID for 'Send or receive stored user preset'
0vvv vvvv	Preset data: 64 bytes coded into 74 bytes of 7-bit MIDI data (see "Data packing" below.)
1111 0111	End of Exclusive (EOX)

NOTE: The AdrenaLinn II requires nearly a full second to save the received user preset to its slow flash memory. Any messages received while AdrenaLinn II is still saving the received user preset will be ignored. After the external device sends this message, it should either wait a full second or wait until a "Preset or drumbeat save complete" message is returned before sending any further messages.

NOTE 2: A bug existed in v2.0 that read the user sequence data of received preset dumps incorrectly, though they were saved correctly. That bug was fixed in v2.1.

Transmit user drumbeat (message ID 3)

This message is sent by AdrenaLinn II either by the front panel “Dump active drumbeat” message or in response to a “request user drumbeat” message.

If this message is sent from an external device to the AdrenaLinn II while a user drumbeat is selected, the preset is stored to the selected user preset location. If this message is sent from an external device to the AdrenaLinn while a factory preset is selected, the message is ignored.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 0011	Message ID for ‘Send or receive stored user drumbeat’
0vvv vvvv	Preset data: 44 bytes coded into 51 bytes of 7-bit MIDI data (see “Data packing” below.)
1111 0111	End of Exclusive (EOX)

NOTE: The AdrenaLinn II requires nearly a full second to save the received user drumbeat to its slow flash memory. Any messages received while AdrenaLinn II is still saving the received user drumbeat will be ignored. After the external device sends this message, it should either wait a full second or wait until a “Preset or drumbeat save complete” message is returned before sending any further messages.

Request user preset (message ID 5)

When AdrenaLinn II receives this request, it responds by sending the requested user preset as a “Transmit user preset” message.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 0101	Message ID for ‘Request stored user preset’
0vvv vvvv	Requested preset number, 0 (user 0) to 99 (user 99)
1111 0111	End of Exclusive (EOX)

Request user drumbeat (message ID 6)

When AdrenaLinn II receives this request, it responds by sending the requested user drumbeat as a “Transmit user drumbeat” message.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 0110	Message ID for 'Request stored user drumbeat'
0vvv vvvv	Requested drumbeat number, 0 (user 0) to 99 (user 99)
1111 0111	End of Exclusive (EOX)

Select user drumbeat (message ID 8)

When AdrenaLinn II receives this request, it responds by making the requested user drumbeat number active.

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 1000	Message ID for 'Select drumbeat'
0vvv vvvv	Requested user drumbeat number, 0 (user 0) to 99 (user 99)
1111 0111	End of Exclusive (EOX)

Select user preset (message ID 9)

When AdrenaLinn II v2.1 receives this request, it responds by making the requested user preset number active. This has the same effect as a MIDI Program Change message, except that this message ignores the AdrenaLinn II's front panel MIDI Channel setting. Note: This message was added in version 2.1

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 1001	Message ID for 'Select user preset'
0vvv vvvv	Requested user preset number, 0 (user 0) to 99 (user 99)
1111 0111	End of Exclusive (EOX)

Request preset edit buffer (message ID 10)

When AdrenaLinn II v2.1 receives this request, it responds by sending the requested user preset as a "Transmit preset edit buffer" message. Note: This message was added in version 2.1

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 1010	Message ID for 'Request preset edit buffer'
1111 0111	End of Exclusive (EOX)

Transmit preset edit buffer (message ID 11)

This message is sent by the AdrenaLinn II in response to a "Request preset edit buffer" message. It is also received by the AdrenaLinn II, allowing an external editor to overwrite the AdrenaLinn II's preset edit buffer. Note: This message was added in version 2.1

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 1011	Message ID for 'Send or receive stored user preset'
0vvv vvvv	Preset data: 64 bytes coded into 74 bytes of 7-bit MIDI data (see "Data packing" below.)
1111 0111	End of Exclusive (EOX)

Request drumbeat edit buffer (message ID 12)

When AdrenaLinn II v2.1 receives this request, it responds by sending the requested user preset as a "Transmit preset edit buffer" message. Note: This message was added in version 2.1

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 1100	Message ID for 'Request drumbeat edit buffer'
1111 0111	End of Exclusive (EOX)

Transmit drumbeat edit buffer (message ID 13)

This message is sent by the AdrenaLinn II in response to a "Request preset edit buffer" message. It is also received by the AdrenaLinn II, allowing an external editor to overwrite the AdrenaLinn II's drumbeat edit buffer. Note: This message was added in version 2.1

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 1101	Message ID for "Transmit drumbeat edit buffer"
0vvv vvvv	Drumbeat data: 44 bytes coded into 51 bytes of 7-bit MIDI data (see "Data packing" below.)
1111 0111	End of Exclusive (EOX)

Request Main/MIDI parameters (message ID 14)

When AdrenaLinn II v2.1 receives this request, it responds by sending a "Transmit Main/MIDI parameters" message. Note: This message was added in version 2.1

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 1110	Message ID for 'Request Main/MIDI parameters'
1111 0111	End of Exclusive (EOX)

Transmit Main/MIDI parameters (message ID 15)

This message is sent by the AdrenaLinn II in response to a "Request Main/MIDI parameters" message. It is also received by the AdrenaLinn II, allowing an external editor to overwrite the AdrenaLinn II's settings. Note: This message was added in version 2.1

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0000 0001	File Version
0000 1111	Message ID for "Transmit Main/MIDI parameters"
0vvv vvvv	Main/MIDI parameters: 14 bytes coded into 16 bytes of 7-bit MIDI data (see "Data packing" below.)
1111 0111	End of Exclusive (EOX)

Preset or drumbeat save complete (message ID 17)

After AdrenaLinn II receives either a "transfer user preset" message (ID 2) or "transfer user drumbeat" message (ID 3) and the transferred data has been successfully saved to flash, AdrenaLinn II sends this message. Until it is sent, the AdrenaLinn will ignore any subsequently received messages. The external

device should wait for this message before sending another message, or the external device should wait one full second before sending another message. Note: This message was added in version 2.1

Status	Description
1111 0000	System Exclusive (SysEx) ID
0000 0000	Roger Linn Design manufacturer ID byte 1
0000 0001	Roger Linn Design manufacturer ID byte 2
0011 0111	Roger Linn Design manufacturer ID byte 3
0000 0010	AdrenaLinn II product ID
0001 0001	Message ID for "Preset or drumbeat save complete"
1111 0111	End of Exclusive (EOX)

Data Structures

See description of each parameter in manual for more detail.

Preset Data Structure

Byte	Parameter	Range/Description
0	Effect	0-13 (TRE, FTR, FCH, ROT, VIB, RFI, RFL, TSE, FSE, ARP, AFI, TAL, VOL, MID).
1	Variation	0-x, hi limit dependent on selected Effect type. A data value of '0' = variation 1.
2	Effect-Dry Mix	0-99 (0 = dry, 99 = full effect)
3	Off/On/Ster	0 (effect off), 1 (effect on mono) or 2 (effect on stereo)
4	Speed	If Effect = TRE, FTR, FCH, ROT, VIB, RFI or RFL, this controls LFO speed: 0-99 (fixed speeds) plus 100-115 (16 tempo-synched rates) If Effect = TSE, FSE, ARP, AFI, TAL, VOL or MID, this controls envelope attack and decay time: 0-99 (left decimal digit is attack time 0-9; right is decay time 0-9)
5	Depth	0-198 (-99 to 0 to 99 in display)
6	Frequency/Key	0-99
7	Resonance	0-99
8	Amp	0-23 (AM1, AM2, AM3, AM4, BR1, BR2, BR3, HIW, BCA, BSM, CAB, MCA, JAZ, SST, REC, HIG, RTH, RBL, RDE, RBR, RRE, FUZ, OCT, CLE)
9	Amp-Fx Order	0 (Effect before amp) or 1 (amp before effect)
10	Amp Volume	0-99 (output level of amp models)
11	Amp Off/On	0 (amp modeling is bypassed) or 1 (amp modeling is on)
12	Amp Drive	0-99
13	Amp Bass	0-99
14	Amp Mid	0-99
15	Amp Tre	0-99
16	Delay Vol	0-99
17	Delay Time	0-99 (fixed rates) followed by 100-118 (19 tempo-synched rates: 2M, 2Mt, 1Md, 1M, 1Mt, 2d, 2n, 2t, 4d, 4n, 4t, 8d, 8n, 8t, 16d, 16n, 16t, 32n, 32t).
18	Delay Feedback	0-99
19	Delay Off/On/Ster	0 (no delay), 1 (delay on in mono) or 2 (delay on in stereo)
20	Mod Source	0-16 (SEQ, EG, LFO, AUD, HOL, NOT, VEL, BEN, CON, PRE, E-L, E-H, E-V, L-S, L-C, L-P, S-N). Note: This is one of the 4 "hidden parameters"; see the manual.
21	LFO Wave	0-4 (SIN, TRI, PUL, SAT, RAN) Note: This is one of the 4 "hidden parameters"; see the manual.
22	Filter type	For filter effects: 1-5 (LP2, LP4, BNP, NOT, HIP) only; For flanger effects: 6 (FLA) or 7 (FLI) only; For pitch effects: 8 (VIB) only For volume effects: 9 (VOL) only. Setting 0 is not used. Note: This is one of the 4 "hidden parameters"; see the manual.
23	Effect Volume	0-99 (output volume of modulation effect) Note: This is one of the 4 "hidden parameters"; see the manual.
24	Linked drumbeat	0-199 (drumbeat linked to preset, F0-99 followed by U0-99)
25-31	Unused	(unused—reserved for future expansion)
32-63	Sequence steps	Data for 32-step user sequence, 1 byte per step: LS 7 bits contain sequence level of 0-99; MS bit sets envelope generator off (0) or on (1) for that step.

Note: The Effect and Variation parameters are master parameters that work in the following way inside the AdrenaLinn II: When Effect is changed, Variation 1 is internally selected. Also when Variation is changed (either directly or when set to variation 1 as a result of Effect being changed), the following parameters are loaded with initial values appropriate to the selected variation: Effect-dry mix, Off/On/Ster, Speed, Depth, Frequency/Key, Resonance, Mod source, LFO Wave, Filter Type and Effect Volume. (These parameters may subsequently be edited to taste by the user.) To insure that an external editor always has correct values for these parameters, if it remotely changes the Effect or Variation parameters, it should subsequently read

the preset edit buffer to get the new values of the above-mentioned slave parameters. Also note that when a "Transmit user preset" or "Transmit edit buffer" message is received by an external editor from the AdrenaLinn II, the individual values of the slave parameters should override the initial values used by the master Variation parameter.

Drumbeat Data Structure

<u>Byte</u>	<u>Parameter</u>	<u>Range/Description</u>
0	Volume	0-99
1	To Delay/Filter	0-99 (to delay) followed by 100-199 (0-99, to input of preset signal chain)
2	Not used	This byte is not used and any value sent to it will be ignored.
3	Timebase	0-4 (8n, 8t, 16n, 16h, 16s)
4	Bass sound-vol	10-99 (BCD: MS nibble is sound select 1-9, 2 nd decimal digit is mix volume 0-9)
5	Snare sound-vol	10-99 (BCD: MS nibble is sound select 1-9, 2 nd decimal digit is mix volume 0-9)
6	Hihat sound-vol	10-99 (BCD: MS nibble is sound select 1-9, 2 nd decimal digit is mix volume 0-9)
7	Perc sound-vol	10-99 (BCD: MS nibble is sound select 1-9, 2 nd decimal digit is mix volume 0-9)
8	Tempo	30-250 (drumbeat's assigned tempo)
9-11	Unused	For future expansion
12-43	Drumbeat steps	Data for 32-step user drumbeat; 1 byte per step: Bits 0-1 = bass; 0 (off), 1 (soft), 2 (medium) or 3 (loud) Bits 2-3 = snare; 0 (off), 1 (soft), 2 (medium) or 3 (loud) Bits 4-5 = hihat; 0 (off), 1 (soft), 2 (medium) or 3 (loud) Bits 6-7 = percussion; 0 (off), 1 (perc1), 2 (perc2) or 3 (perc3)

Main/MIDI Parameters Data Structure

<u>Byte</u>	<u>Parameter</u>	<u>Range/Description</u>
0	Active Preset	00-99 (factory presets F00-F99), followed by 100-199 (user presets U00-U99)
1	Active Drumbeat	00-99 (factory presets F00-F99), followed by 100-199 (user presets U00-U99)
2	Global tempo	30-250
3	Master volume	0 (very quiet) – 99 (maximum)
4	Bypass Mode	0-8 (bypass, EFT, AMP, DLY, EA-, E-D, -AD, LST, OFF)
5	Preset Sets Dmbt	0 (Off) or 1 (On)
6	Noise Gate	0 (off) or 1-9 (9 gate thresholds)
7	Balance/SEP	0 (P50) to 50 (EQU) to 100 (D50), plus 101 (SEP)
8	Use Drmbt tempo	0 (drumbeat's tempo setting is ignored; always use master tempo) or 1 (load drumbeat's tempo setting when drumbeat selected)
9	Direct/Amp	0 (EQ for flat response sound system) or 1 (EQ for guitar amp)
10	MIDI channel	0 (receive on all channels) or 1-16 (receive on single channel)
11	MIDI clock in	0 (ignore incoming MIDI clock) or 1 (accept incoming MIDI clock)
12	MIDI progrm chng	0 (ignore incoming program change messages) or 1 (accept them)
13	MIDI dump mode	0 (dump active preset), 1 (dump active drumbeat) or 2 (dump all). Note: this parameter is useless to external devices.

7-Bit Data Packing

The general data packing scheme for preset and drumbeat data dumps groups 7 bytes of data, stripping off the MS bit of each, and packing these MS bits into an additional byte. 7 bytes of internal memory yields 8 bytes of MIDI data.

Assuming 7 bytes of memory data are:

```
0:   AAAAaaaa   Memory byte 0
1:   BBBBbbbb   Memory byte 1
2:   CCCCcccc   Memory byte 2
3:   DDDDdddd   Memory byte 3
4:   EEEEeeee   Memory byte 4
5:   FFFFffff   Memory byte 5
6:   GGGGgggg   Memory byte 6
```

Then it is sent over MIDI with the MS bits first as follows:

```
0:   0GFEDCBA   Packed MS bits
1:   0AAAAaaa   MIDI Data Bytes
2:   0BBBBbbb
3:   0CCCCccc
4:   0DDDDddd
5:   0EEEEeee
6:   0FFFFfff
7:   0GGGGggg
```

Note that fewer than 7 bytes can be sent, and the unused MS bits will be set to zero. For example, if two bytes are sent:

Assuming 2 bytes of memory data are:

```
0:   AAAAaaaa   Memory byte 0
1:   BBBBbbbb   Memory byte 1
```

Then it is sent over MIDI as a three byte sequence, with the MS bits first as follows:

```
0:   000000BA   Packed MS bits
1:   0AAAAaaa   MIDI Data Bytes
2:   0BBBBbbb
```