

PROGRAMMABLE POLYPHONIC SYNTHESIZER

**KIWITECHNICS UPGRADE** 



© Roland names and logos are owned by Roland The Kiwitechnics Kiwi-8P Upgrade has not been authorised or endorsed by Roland



Table of Contents	
Kiwi-8P Features	6
Kiwi 8P Flow Chart	7
Kiwi 8P Front Panel	8
Front Panel Description	9
RED BUTTONS	0
WRITE BUTTON	9
	9 Q
	9 Q
GREY EDIT BUTTONS	10
MASTER TUNE BUTTON	10
MIDI BUTTON	10
NAME BUTTON	10
PARAMETER BUTTON	
CONTROL BUTTONS	11
HOLD BUTTON	
ARP BUTTON	
SEQ BUTTON	11
KEY MODE BUTTON	11
CHORD BUTTON	12
GLOBAL TEMPO BUTTON	12
KEY TRANSPOSE	12
TAP TIMER	12
SYSEX DUMP	13
QUICK EDIT BUTTON	13
NAME EDIT LEFT	13
NAME EDIT RIGHT	13
GREEN BUTTONS	14
GROUP 1-8	14
BLUE BUTTONS	15
BANK 1	15
BANK 2	15
BANK 3	15
BANK 4	15
BANK 5	
BANK /	16

BANK 8	16
RED BUTTONS	17
TONE 1-8	
PG-800 Support	
PG-800	
Performance Control Section	
Pitch Bender Range	
LFO Trigger	19
Portamento	
Aftertouch	19
JX-8P Upgrade Notes	
Digital Oscillators	
Front Panel Buttons	20
Tuning	
Display	
Factory Presets	21
Midi Received	21
Midi Panic	21
Note Hold	21
Edit Buffer Compare	21
LFO Generators	
Envelopes	
Sequencer	23
Sequencer Writing / Editing	24
C) Playing	
Arpeggiator	27
Chord Mode	
Parameter Editing	
DCO Parameters	
VCF Parameters	
LFO Parameters	
Modulation Matrix	
VCA Level	
VCA LFO Level	33
VCA LFO Select	
VCA ENV Select	33
VCA Dynamics	33

Chorus	33
Voice Assign Mode	34
Voice Mode Steal	34
Voice Mode Staccato	34
Detune	34
Analogue Feel	34
Patch Clock	35
ARP Step Timing	35
SEQ Step Timing	35
ENV ADSR	35
ENV KEY	
Quick Edit Assign	
Mod Wheel Destination	
Mod Wheel Level	
GLOBAL PARAMETERS	
Master Clock Source.	
Mad Wheel Level	
Aftertauch Level Multiplier	
Not Lood	، د
Hold Podal Modo	
Cart Import	
Factory Reset	
Catting up with External Daviaga	
Setting up with External Devices	
Importing/Exporting Tones	39
Importing Tones	39
Exporting Tones	39
Firmware Updates	40
Test Mode	41
Upgrade install	42
Adjustments for the JX-8P	51
Midi Data	53
Continuous Controllers	<u>دم</u>
Real Time Commands	

Midi Sysex Support	59
Midi Sysex Data	60

## Kiwi-8P Features

- 512 Tones can be stored and edited. It is also possible to temporarily edit any Tone
- Tones are stored in Flash memory so no battery is required.
- MidiCC & Sysex support for all parameters and Midi Sysex support for Tone Dump & Load
- PG-800 Support for Control of Parameters
- Key Assign Modes are Poly Single, Poly Dual, Poly Triple, Unison & Solo
- Each Key Assign mode can have Rotate/Reassign, Staccato/Legato, Steal/No Steal with five steal modes (Highest, Lowest, Oldest, Newest, Quietest)
- Portamento in all modes
- DCO Key Assign Detune available in all key modes except Solo. In addition there is a 'Analog Feel' parameter that
  add an adjustable small random frequency to each note. Detune is best used with Poly Dual, Poly Triple or Unison
  keying modes for greatest effect
- Three independent envelope generators. These are traditional ADSR type and are modeled on the Original JX-8P.
   Each ENV Mod can select from ENV 1 3 and has an Inverted or Normal modes. These are faster than the traditional JX-8P envelopes
- Three independent Low Frequency Oscillators with 6 waveforms each. Each LFO Mod can select from LFO 1-3. LFOs can be plus and minus base note or plus base note only.
- Aftertouch scaling option to help with the failing 8P aftertouch strip.
- Key transpose allows transposition to any key with a range of plus 2 or minus 1 octaves. Sequencer key can be shifted while playing
- Internal Master Clock with the range 5-299 BPM.
- Full Matrix mod system that can channel any mod source to any destination. The matrix mod control parameter can itself be modified from various sources making the matrix very powerful
- A quality Front Panel Overlay is provided with the Kiwi-8P upgrade

#### **CHORD MODE**

• Any chord with up to 6 notes can be set and played from any key

#### ARPEGGIATOR

- The Arpeggiator is clocked from the Master Clock and can be independently divided to Half Note, Quarter Note, 1/8 Note, 1/8 Note Half Swing, 1/8 Note Full Swing, 1/8 Note Triplets, 1/16 Note, 1/16 Note Half Swing, 1/16 Note Full Swing, 1/16 Note Triplets, 1/32 Note, 1/32 Note Triplets, 1/64 Note.
- Arp modes are Up, Down, Up and Down, Random, As Played, 1, 2, 3 or 4 octaves
- Arp can be Started, Stopped & Continued using Midi Commands
- Appeggiator will Output Midi Data

#### SEQUENCER

- 8 separate 124 Max step Polyphonic sequences can be created and stored
- Sequences can be edited
- The Sequencer is clocked from the Master Clock and can be independently divided to Half Note, Quarter Note, 1/8 Note, 1/8 Note Half Swing, 1/8 Note Full Swing, 1/8 Note Triplets, 1/16 Note, 1/16 Note Half Swing, 1/16 Note Full Swing, 1/16 Note Triplets, 1/32 Note, 1/32 Note Triplets, 1/64 Note.
- Sequencer will Output Midi Data



### Kiwi 8P Front Panel



## **Front Panel Description**

The Kiwi-8P front panel differs from the original 8P in a number of ways and the Kiwi-8P Upgrade redefines most of the buttons on the Roland JX-8P. Many of the buttons have been assigned new functions and others now operate differently. An overlay label is supplied with the upgrade that fits over the existing JX-8P front panel label. This has the additional benefit of fixing the very common label cracking that occurs on the jx-8p front panel

The new layout can be seen on the front panel layout on the previous page.

Because of the number of parameters in the Kiwi-8P the parameter editing system has also been altered. Each parameter has a three button addressing system that looks like G1 B1 T1. These refer to the Group buttons 1-8, Bank buttons 1-3 & Tone buttons 1-8.

Most of the other buttons have also changed use and function and are described here in more detail.

RED BUTTONS		
WRITE BUTTON	<ul> <li>The WRITE button has different operation depending on the mode the Kiwi-8P is currently in.</li> <li>For writing a Tone to permanent memory in normal play mode simply press WRITE followed by the Group (1-8), Bank (1-8) and Tone (1-8). The actual write is done when the Tone button is pressed and the Group and Bank buttons are optional. If the Tone you wish to save is in the same Group or Bank you can skip selecting these again.</li> <li>A Tone can be easily copied from one location to another by selecting a different Group and/or Bank before pressing the Tone button.</li> </ul>	If you are editing a sequence then the editing can be finished by pressing the Write if you wish to save the seq to permanent memory. To save a sequence press WRITE followed by Tone 1-8. The Group and Bank are not used for Sequences. If the memory is protected then an error message will display when a write is attempted.
MIDI PANIC BUTTON	The MIDI PANIC will stop all sound from the Kiwi-8P. This button is also used to put the Kiwi-8P into update mode. This is done by holding down this button during power on.	To perform a FACTORY RESET which will clear all memory hold WRITE and MIDI PANIC down as you power on the Kiwi-8P. Warning – this will clear all memory in the synth and there will be no confirmation.
CANCEL BUTTON	The CANCEL button will exit most operations. The Arp & Seq Step Timing button edits will need to be exited via the same Step Timing button.	This button is also used to put the Kiwi-8P into test mode. This is done by holding down this button during power on.

GREY EDIT BUTTONS		
MASTER TUNE BUTTON	The MASTER TUNE button allows the synth global fine tune to be set. The Tune is changed by moving the EDIT slider.	The Master Tune can be set from A395 to A485. Press Master Tune Again or CANCEL to exit master tune mode.
MIDI BUTTON	<ul> <li>The MIDI button allows the synth global midi options to be set. These will be memorised and retained when the power is turned off.</li> <li>The button will cycle though the seven global midi parameters and the value is changed using the Edit Slider</li> <li>1) Midi In – This can be 1-16 or Omni If omni is set any midi channel is recognised by the Kiwi-8P</li> <li>2) Midi Out - This can be 1-16</li> <li>3) Seq Midi Out - This can be 1-16</li> <li>3) Seq Midi Out - This can be 1-16</li> <li>4) Soft Through – There are four possible options.</li> <li>Stop All – No incoming midi is sent out the Midi Out</li> <li>Pass All – All incoming midi is sent out the Midi Out</li> <li>Pass Only Non CC – All Midi except CC is passed to Midi Out</li> <li>Stop Used CC – All Midi is passed to Midi Out except CC commands that are recognised and used by the Kiwi-8P</li> </ul>	<ul> <li>5) Program Change Enable – There are four possible options.</li> <li>Off – No program change is sent or received</li> <li>In Only – Program Change commands are received but not sent</li> <li>Out Only – Program Change commands are sent but not received</li> <li>Both In &amp; Out – All Program</li> <li>Commands are both sent &amp; received</li> <li>6) CC Enable – There are four possible options.</li> <li>Off – No MidiCC is sent or received In Only – MidiCC are received but not sent</li> <li>Out Only – MidiCC are sent but not received</li> <li>Both In &amp; Out – All MidiCC are both not received</li> <li>F – No MidiCC are sent but not received</li> <li>Out Only – MidiCC are sent but not received</li> <li>Both In &amp; Out – All MidiCC are both sent &amp; received</li> <li>7) Sysex Enable – There are two options</li> <li>Off – No sysex is recognised by the Kiwi-8P</li> <li>On – Sysex with correct header information will be recognised</li> </ul>
NAME BUTTON	The NAME button allows the Name of the currently selected Tone to be edited. Name editing is temporary until the Tone is changed and will only be retained if the Tone is written to memory. Editing is done by selecting the letter to change using the Left & Right Arrow buttons and using either the Edit Slider or any button with a letter on it. E.g. The Bank 1 button can be used for the letter 'G'.	Once editing is finished control can be returned to normal mode by any of the following methods. 1) CANCEL is pressed 2) WRITE is pressed to save the Tone 3) NAME is pressed

PARAMETER BUTTON	<ul> <li>The PARAMETER button allows editing of all the parameters for a Tone as well as some of the Global Parameters. A parameter is made up of three sections.</li> <li>1) a 'G' number. These are selected using the Group buttons 1-8.</li> <li>2) a 'B' number. This number is selected from the Bank buttons 1-3</li> <li>3) a 'T' number. This number is selected using the Tone buttons 1-8.</li> </ul>	Every parameter will have an ID. For example the VCF cutoff looks like 212 (G2B1T2). To get to this parameter for editing press Parameter, Group button 2, Bank button 1, Tone button 2 in that order. The value of the cutoff can now be changed using the EDIT SLIDER. If edits are made using the PG-800 the parameter being edited will be identified on the display using the same numbering system. Also see the Quick Edit Button.

CONTROL BUTTONS		
HOLD BUTTON	The HOLD button will toggle HOLD mode. The LED will be on when	During Name Editing this button will select the letter W
Edit Letter "W"	HOLD is on.	
ARP BUTTON	This button will toggle the ARP On and Off. The LED will be on when	During Name Editing this button will select the letter X
Edit Letter "X"	the ARP is playing.	
SEQ BUTTON	This button will toggle the SEQ On and Off. The LED will be on when	During Name Editing this button will select the letter Y
Edit Letter "Y"	the Sequence is playing.	
KEY MODE BUTTON	The KEY MODE button will rotate around 5 Key Mode types.	<b>SOLO</b> – Only the last note played will select 1 sounding voices.
Edit Letter "*"	<b>POLY SINGLE</b> – Each note played will select a single sounding voice. Voice assign parameters 421 – 423 will effect how notes are assigned.	During Name Editing this button will select the symbol '*'
	<b>POLY DUAL</b> – Each note played will select two sounding voices.	
	<b>POLY TRIPLE</b> – Each note played will select three sounding voices.	
	<b>UNISON</b> – Only the last note played will select 6 sounding voices.	

CONTROL BUTTONS		
CHORD BUTTON Edit Letter "-"	The CHORD button allows Chords to be set or cleared. To set a chord play the chord near middle C & press and release the CHORD button while the keys are being held. The Chord Light will be lit when a chord is set.	Each note played with the chord set will be used as the base note for the chord. Keying will behave the same as Unison or Solo and some keying mode parameters will not have any effect. To clear a chord press and release the Chord Button with no keys pressed. The Chord light will turn off. During Name Editing this button will select the letter - (Minus)
GLOBAL TEMPO BUTTON Edit Letter ","	The GLOBAL TEMPO BUTTON is used to set the master internal clock rate. This is done by pressing the GLOBAL TEMPO button and setting the speed using the EDIT SLIDER. The speed range can be set from 5 BPM to 299 BPM. Press the GLOBAL TEMPO Button again to return to the previous mode.	The Master Clock source can be selected from one of 2 sources using Global parameter edit G6B1T2. 1) Internal clock 2) Midi During Name Editing this button will select the letter , (Comma)
KEY TRANSPOSE Edit Letter "Z"	The Kiwi-8P Key Transpose can be changed using this button. While the Key Transpose Button is pressed, press the note you wish to transpose to on the keyboard. Then release the Key Transpose button. The current transpose will show on the display while the button is pressed. It is also possible to step the transpose up and down using the left & right arrow buttons while the Key Transpose button is pressed	During Name Editing this button will select the letter Z
TAP TIMER Edit Letter "/"	The internal clock rate can be set by using this button. Tapping this button in time with the beat will set the internal clock to this rate. The first tap will display "TIMING TAP" and the second tap will display the actual BPM that was measured.	During Name Editing this button will select the letter / (forward slash)

CONTROL BUTTONS		
SYSEX DUMP Edit Letter "\"	The Kiwi-8P can output a number of different sysex dumps and this button is used to start the dump process. The button sequence to send a sysex dump out the midi out is press SYSEX DUMP, then select the DUMP type using the Yellow SEQ buttons then followed by the WRITE button. The dump will only start when the WRITE is pressed. A Dump can be canceled before it starts by pressing the CANCEL button. Note - Write Protect must be off to Load Dumps into the Kiwi-8P Note – The Kiwi-8P may become unresponsive during a large sysex dump	<ul> <li>Seq Select – Dump Current Tone The currently selected tone will be dumped</li> <li>Seq Edit – Dump Current Sequence. The currently selected Sequence will be dumped</li> <li>Seq Step Timing – Dump All 64 Tones from currently selected Group.</li> <li>Warning – Large file size</li> <li>Seq Length – Dump All Sequences Warning – Large file size</li> <li>Seq New – Dump Global Data</li> <li>During Name Editing this button will select the letter \ (back slash)</li> </ul>
QUICK EDIT BUTTON Edit Letter " "	This button can be set up with a Edit Parameter ID as a short cut into Parameter Editing. To assign an edit parameter to this button use parameter edit 531	During Name Editing this button will select a space
NAME EDIT LEFT Move Edit Position Left NAME EDIT RIGHT	This button will move the Name letter being edited to the Left if possible. Note – The Kiwi-8P tone name is 20 characters. Due to display size on the 8P only the first 12 characters are displayed This button will move the Name	During Name Editing this button will move the selected letter one position to the left if possible. During Name Editing this button will
Move Edit Position Right	letter being edited to the Right if possible.	move the selected letter one position to the right if possible.

GREEN BUTTONS		
GROUP 1-8	These buttons will select Group 1 to Group 8 Tones under normal play	During Parameter Editing these buttons will select the G1 to G6 parts
Edit Letters "1-8"	mode. The Tone will immediately load.	of the parameter number.
	When writing a Tone these buttons will select the Group 1-8 that the Tone will be stored under. The Tone is not written to memory until the Tone Button is pressed. This allows a tone to be written (or moved) to any position in memory. Each Group has 64 Tones (8 Banks x 8 Tones) and there are 8 Groups making a total of 512 Tones in total.	During Name Editing these buttons will select the numbers 1-8

BLUE BUTTONS		
BANK 1 Edit Letter "G"	This button will select Bank 1 Tones under normal play mode. The Tone will immediately load. Each Bank has 8 Tones which are selected using the TONE buttons	During Seq Editing this button will change the editing step to the first step. This is explained in more detail in the Sequencer description
	When writing a Tone these buttons will select the Bank that the Tone will be stored under. The Tone is not written to memory until the Tone Button is pressed. This allows a tone to be written (or moved) to any position in memory.	During Name Editing this button will select the number G
BANK 2 Edit Letter "H"	This button will select Bank 2 Tones under normal play mode. The Tone will immediately load. Each Bank has 8 Tones which are selected using the TONE buttons	During Seq Editing this button will insert a Rest. This is explained in more detail in the Sequencer description
		During Name Editing this button will select the number H
BANK 3	This button will select Bank 3 Tones under normal play mode. The Tone	During Seq Editing this button will insert a Tie. This is explained in more
Edit Letter "I"	8 Tones which are selected using the TONE buttons	During Name Editing this button will select the number I
BANK 4	This button will select Bank 4 Tones under normal play mode. The Tone	During Seq Editing this button will step the editing position forward one
Edit Letter "J"	8 Tones which are selected using the TONE buttons	in more detail in the Sequencer description
		During Name Editing this button will select the number J
BANK 5	This button will select Bank 5 Tones under normal play mode. The Tone	During Seq Editing this button will step the editing position backward
Edit Letter "K"	8 Tones which are selected using the TONE buttons	explained in more detail in the Sequencer description
		During Name Editing this button will select the number K

BLUE BUTTONS		
BANK 6 Edit Letter "L"	This button will select Bank 6 Tones under normal play mode. The Tone will immediately load. Each Bank has 8 Tones which are selected using the TONE buttons	During Seq Editing this button will allow overdubs on an existing sequence. This is explained in more detail in the Sequencer description During Name Editing this button will select the number L
BANK 7 Edit Letter "M"	This button will select Bank 7 Tones under normal play mode. The Tone will immediately load. Each Bank has 8 Tones which are selected using the TONE buttons	During Seq Editing this button will allow a step to be inserted at the current step on an existing sequence. This is explained in more detail in the Sequencer description During Name Editing this button will select the number M
BANK 8 Edit Letter "N"	This button will select Bank 8 Tones under normal play mode. The Tone will immediately load. Each Bank has 8 Tones which are selected using the TONE buttons.	During Seq Editing this button will allow a step to be deleted at the current step on an existing sequence. This is explained in more detail in the Sequencer description During Name Editing this button will select the number N

RED BUTTONS		
TONE 1-8	These buttons will select Tones 1 to 8. The Tone will immediately load.	To Load a sequence the SEQ SELECT button must be pressed before the
Edit Letters "O-V"	<ul> <li>8. The Tone will immediately load.</li> <li>The same tone that is selected when the synth is switched off will automatically loaded when the Kiwi- 8P is switched on.</li> <li>Note - If the tone being used when the synth is powered off has an Arp or Sequence running when it is saved it will automatically start running when the synth is powered on or the Tone is loaded.</li> <li>When writing a Tone these buttons will select the Tone number that the Tone will be stored under. The Tone will be written to memory when the Tone Button is pressed.</li> <li>Note – Write protect must be off to write a tone to memory. A MEM PROTECTED message will show on</li> </ul>	button must be pressed before the Tone button. During Name Editing these buttons will select the letters O to V
	the display if a write is attempted with the protect on.	

		18
PG-800 Support		
PG-800	The PG-800 is supported by the Kiwi- 8P. Because of the nature of the PG- 800 interface the edits made this way can have audible stepping. This is because the hardware interface in the PG-800 is fairly slow. Smoother edits can be achieved by using the Parameter Editing system and using the Edit slider or by using a midi editor. If this is a problem it is recommended to use a midi controller.	

PG-8

# **Performance Control Section**

Pitch Bender Range	This four position switch allows you to change the range of the Bend lever. In the original JX-8P these ranges were 2, 3, 5 & 7 semitones. The Kiwi-8P has extended the range and it is now 2, 3, 5 & 12 semitones	Note - This Switch settings is saved with the Tone. This was not possible with the original JX-8P
LFO Trigger	The Bend lever LFO trigger in the JX-8P is a simple on/off switch. The output level of this can be set separately for the Midi Output (Global Parameter 614) and Tone modulation (Tone Parameter 537)	On all factory programs the LFO button has been configured to a moderate level of DCO LFO level on the DCO to give a vibrato effect. Note – The LFO source from the bend lever trigger does not include the LFO Delay and is always present.
Portamento	Portamento is available in all playing modes. The Portamento On/Off and Rate are set on the Panel next to the Bend Lever. Changing the Portamento On/Off or moving the Rate Control will change the saved setting in the edit buffer.	Note - This Slider setting is saved with the Tone. This was not possible with the original JX-8P. Note - The Portamento setting will only be changed and overwritten in the Tone while the Portamento Switch is set to 'ON'. If the switch is 'OFF' then the Portamento Rate will be saved as zero when the Tone is written to memory.
Aftertouch	The After touch slider is a hardware level that changes the after touch level before it reaches the Kiwi-8P. For this reason this level cannot be saved with the Tone. The JX-8P has a problem with the after touch strip that is under the keys. These oxidize internally over time and this reduces the AT effect that can be produced. This is a difficult and labour intensive repair as the entire keyboard needs to be disassembled and is usually expensive and has limited long term success rate.	The Kiwi-8P has tried to address this by adding a AT multiplier parameter. This parameter will allow the AT strip output to be made more sensitive by multiplying the output from this by 2, 4 or 8 times. This parameter is a Global setting number 515.

Digital Oscillators	The JX-8P Synthesizer uses programmable dividers from a single master oscillator to generate the pitch of the notes. While this does create very a stable pitch it does create some issues. Because the dividers are being reprogrammed every time the pitch for that voice changes, the leading edge of the DCO pulse is constantly changing in relation to the other voices. This is a 'feature' of the JX-8P hardware and cannot be altered. This is especially noticeable when playing in Square wave with Unison or one of the Poly multiple voice modes as more than one voice is playing the same pitch but the start point of the voice waves will not be the same. The audible result of this is that random notes can sound 'thin' with much of the bass portion missing at certain start point combinations. Anything that effects the pitch of a voice (detune, analogue feel, pitch bending, Ifo mod, Portamento etc) will change the DCO wave voice start points and change the sound.	Another 'feature' of this type of oscillator is with smooth changes between notes audible stepping will increase the higher the frequency. The reason for this is the change required in the divider ratio gets smaller as the frequencies get higher with fewer divider steps between notes. This will be audible on LFO, Bend, portamento etc and the higher the frequency and the faster the change the worse the problem. This is a hardware problem and cannot be addressed
Front Panel Buttons	All the front panel buttons on the JX- 8P have been designed without blocking diodes. The result of this is if you push two buttons at the same time unintended effects happen.	This also happens in the JX-8P but is more obvious in the Kiwi-8P as the display updates any switch presses. The JX-8P does not display many of the button or switch changes.
Tuning	In version 4+ of the Kiwi-8P program the synth will undergo a tuning process whenever the Kiwi-8P is switched on.	This tuning fine tunes the SAW waveform shape.

Display	The Kiwi-8P display provides feedback and instructions that make navigating the menu much easier. On normal play the display will show the Tone number (G/B/T) followed by a space followed by the first 12 characters of the tone name.	As edits are made with the PG- 800 or midi the parameter being edited will display along with the GBT location and the value.
Factory Presets	The factory presets are now supplied as sysex dumps labelled Kiwi Factory 1-4 and can be restored if required.	The factory restore option will wipe all the internal tones so make sure you have back up your tones first.
Midi Received	Midi data received will flash the MIDI Led if it is recognized by the JX-8P.	
Midi Panic	The MIDI PANIC button next to the WRITE button will cancel any sounding notes including internal.	To stop all output from the JX-8P press and release MIDI PANIC.
Note Hold	The Original JX-8P has no Note Hold except when using a hold pedal. A Hold Function has been added to the Kiwitechnics Kiwi-8P Upgrade front panel and uses the HOLD button. Pressing HOLD will toggle Hold on or off. The HOLD LED will be lit when hold is on.	The HOLD light will flash when the Hold Pedal is used
Edit Buffer Compare	Whenever the edit buffer does not match the saved Tone showing on the display the three decimal points on the G/B/T part of the display will be lit.	To retain these changes when the Tone is changed or the JX-8P is powered off the Tone must be written to memory.

LFO Generators	The Kiwi-8P has 3 independent LFO generators. These each have 6 waveforms and can be free running or sync'd with the master clock with a divider. Each LFO has it's own sync divider with 16 possible divide ratios including swing options. LFO 1 & 2 will continue to free run when a new note is pressed after all notes were lifted. LFO 3 will restart (sync) its wave to a first note played after all notes lifted. When LFO's are running as sync'd they need 2-3 cycles of the clock	Each LFO can be Normal or Plus mode. Normal will move the base above and below the normal parameter level and plus mode will only move the base level up. Each section of the Kiwi-8P that uses LFO input can select from one of the 3 LFOs and can also select whether the LFO is normal or inverted.
	to correctly measure the current rate and generate a sync'd rate. Until this is measured the LFO will not run correctly. This can take a while with a slow master clock and/or long division times.	
Envelopes	The Kiwi-8P has three independent Envelope Generators. The Envelopes generated are also available as Matrix sources. Envelopes 1-3 are the traditional ADSR type and closely match the existing JX-8P envelopes. Note – Due to technical problems the EnvKey control is currently disabled. We are not sure if this can be solved or not at this stage.	Sustain Level Sustain Level Attack "Decay Time Time Sustain Level Release Time Time

# Sequencer

The JX-8P Upgrade contains a polyphonic 6 track sequencer that has the capacity of 124 step automatic playing. The clock for the Sequencer is always the Master Clock and this can be divided by one of 13 different ratios including swing options. The Seq Clock Divide parameter is G4B3T8 or the Seq Step button on the front panel. Note - If the Master clock source is set to the Midi Clock and no midi clock is present the Sequencer will not run.	<ul> <li>SEQ SELECT</li> <li>This button followed by a Tone button is used to select and load a sequence.</li> <li>There are 8 Sequence memories and only one of these can be selected at a time. If a new sequence is loaded while one is playing the playing one will finish before the new one will take effect.</li> <li>SEQ EDIT</li> <li>This button will enter sequence edit section)</li> <li>SEQ STEP TIMING</li> <li>This button is a shortcut to editing parameter 438 Seq Step Timing. The step timing is changed using the EDIT slider. Press Seq Step Timing again to exit this mode.</li> <li>SEQ LENGTH</li> <li>The playing length of a sequence can be changed non-destructively. If the length is made longer than the seq in memory the extra steps are treated as REST steps and will not sound</li> <li>SEQ NEW</li> <li>This button followed by a tone button 1-8 followed by the WRITE button will blank a sequence</li> </ul>

Sequencer Writing / Editing	]	
	The memory protect switch on the rear of the JX-8P must be set to Off to change a sequence in memory. The way to erase or blank a	(3) By playing the keyboard and using the Tie button and Rest buttons, write steps one after another.
	sequence is by using the Seq NEW Button followed by the Tone button that the sequence is under followed by the WBITE button (see the menu	Note - if more than 6 notes are used in one step only the last 6 notes used will play and be stored.
	that the sequence is under followed by the WRITE button (see the menu map). This is equivalent to writing 124 Rests and setting the length to 1. If you choose an existing sequence when Seq Write is pressed then any step(s) you write will overwrite all notes in the existing step(s) already in the sequence unless you press the OVERDUB button (Bank 6) while you play notes. The BANK 1 (first step), BANK 4 (backwards) and BANK 5 (forwards) buttons will allow non destructive stepping within a sequence. e.g. if the existing sequence is C, D, E, F, G and you step to the third step and play the chord C E G the resulting sequence will now be C, D, CEG(chord), F, G. You will have overwritten the third step. You can write the pitch by playing the keyboard (or midi keyboard), and the rhythm by pressing the Tie button and the Rest button. Note levels are also saved. This will allow notes to be accented. (1) Find the shortest time value in the phrase you wish to write. Then divide the longer time values by that shortest one. (e.g)	<ul> <li>used will play and be stored.</li> <li>(4) If writing is complete press the Write button followed by a Tone button to Save the Sequence to permanent memory or the SEQ EDIT or CANCEL Buttons to exit edit mode. The SEQUENCER button will start the sequence playing on the next clock received. If the Seq is not written to memory the sequence will be lost if the JX-8P is powered off or another sequence is loaded. Pressing the SEQUENCER button again will stop the sequence playing (refer to Sequencer Playing in the next section).</li> <li>(5) Return the Memory Protect Switch to the Off Position.</li> <li>When a sequence is playing the seq name &amp; the current step will display.</li> </ul>
	2) Press SEQ EDIT button to begin	

Sequencer Writing / Editing	]	
	Button use in detail	
	Bank 1 – First Step When the Bank 1 button is pressed while in edit mode the sequence will step back to the first step and sound the step.	Bank 6 – Overdub When the Bank 6 button is pressed while in edit mode and notes are being played the sequence step notes already in the sequence step will be combined with any being played to a maximum of six
	Bank 2 – Rest	notes.
	When the Bank 2 button is pressed while in edit mode a blank step will be inserted at the current sequence step.	The sequence to achieve this is 1) move to the step you wish to overdub using the STEP FWD or STEP BACK buttons
	Note - this button can only be used if no notes are being pressed. If notes are pressed this button will be ignored.	<ul><li>2) Play the notes you wish to add and while holding the notes press and release the OVERDUB button</li><li>3) Release the notes</li></ul>
	<ul> <li>Bank 3 – Tie</li> <li>When the Bank 3 button is pressed while in edit mode a tied step will be inserted at the current step.</li> <li>Note - this button can only be used if no notes are being pressed. If notes are pressed this button will be ignored.</li> </ul>	Bank 7 – Insert Step When the Bank 7 button is pressed while in edit mode and notes are being held the sequence step is inserted at the current step that is showing on the display. Note – if the sequence is full (124 steps) the last step will be lost when the Bank 7 button is pressed.
	Note – A tie can only follow a sequence step that contains note data. Therefore it cannot be placed after a rest or at the first step in a sequence. If these conditions are not met the button will be ignored.	<ul> <li>The sequence to achieve this is</li> <li>1) move to the step you wish to insert using the STEP FWD or STEP BACK buttons</li> <li>2) Play the notes you wish to insert and while holding the notes press and release the INSERT button</li> <li>3) Release the notes</li> </ul>
	When the Bank 4 button is pressed while in edit mode the sequence will step back one position if possible and sound the step.	Bank 8 – Delete Step When the Bank 8 button is pressed while in edit mode the sequence step that is showing on the display is deleted and all steps after this
	Bank 5 – Step Forward When the Bank 5 button is pressed while in edit mode the sequence will step forward one position if possible and sound the step. It is possible to step one position past the last step so new steps can be added at the sequence end point unless the sequence is full (124 steps).	point are moved up one position.

#### C) Playing

#### Load Sequence

A Sequence can be loaded in two ways. A Sequence is loaded **manually** by pressing SEQ SELECT followed by a Tone Button 1-8. The Sequence that is stored under the Tone button selected will be loaded to memory

A Sequence can be assigned to a Tone and can load **automatically** when the Tone is loaded. To do this place the Sequence number 1-8 in the Load Sequence Field in the Tone Parameter Editing (midi editing only) or save the Tone with the sequence running. Place a zero in this field if you do not want a Sequence to load or save the tone with the sequence stopped. The last Sequence will stay in memory and continue to play (if enabled) in this case.

If you press the SEQUENCER button the indicator on the button will light and the data written into the sequencer will be played. The first note of the sequence will only sound once a clock has been received. This allows a seq to be queued to start. When all the notes are played the data will return to the beginning and be played again from the start. Pressing the SEQUENCER button once more will stop the sequence playing immediately. The tempo of the playing will be determined by the clock source. If the clock source is the Internal Clock then the tempo will be set by the Master Clock which can be further divided using the SEQ STEP TIMING button.

- \* If you stop the Sequence part way through and then restart it the data will start from the beginning.
- \* If you wish to only play the data once, put some rests are the end so it is easier to stop the sequence in the correct place.

It is possible to play along with the sequencer. The JX-8P has 6 voices in total and if not enough voices remain for all the sequence note(s) then notes will be lost according to the steal rules that have been specified in parameter 422 (Voice Steal Mode). i.e. if the sequence step has four notes and three are being played then one note will not sound.

Note - If a new sequence or Tone is loaded while a sequence is playing the load of the Tone and Seq will delay until the current sequence reaches the end and is about to loop back to the start. At this point the Tone and Sequence (if auto load enabled) will then load and the next note(s) to sound will be with the new selection.

If the Sequencer is on (Sequencer Button light on) when a Tone is saved the Sequencer will be switched on and the currently selected sequence will begin to play when the Tone is loaded. If the Seq is off when a Tone is saved the Seq state will be off when that Tone is loaded. Saving the Tone with the sequence on will also load the current playing sequence into the Load Sequence parameter in the Tone. The effect of this is that the Sequence will load & begin to play when the Tone is loaded.

## Arpeggiator

πρεγγιαίοι		
	The KiwiTechnics JX-8P Upgrade has a built in Arpeggiator that can be applied to any sound. Arpeggiator Mode is started and stopped by pressing the ARP Button. The indicator will light when the ARP is playing. Note – The Arp settings are saved with the Tone. i.e. if the Arp is on when the Tone is saved it will be on when the Tone is loaded The clock for the Arpeggiator is always the Master Clock and this can be divided using Patch Parameter 437 Edit or the front panel button ARP STEP TIMING. There are 13 different ratios including swing options. The Arp Clock Source parameter is located under G4B3T7 or by using the ARP STEP TIMING button and the EDIT SLIDER. The behavior or the Arpeggiator can be set using the ARP MODE & OCTAVE RANGE buttons. The ARP MODE will set the style and will cycle through UP only, DOWN only, UP & DOWN, RANDOM and AS PLAYED. The OCTAVE RANGE button will cycle through the range which can be 1, 2, 3 or 4 octaves. These are saved with the Tone.	Canceling Arpeggiator Mode. Arpeggiator mode can be stopped by pressing the ARP button. The light on the ARP button will go out. Note - If the Arpeggiator notes held are spread over more than 1 octave and more than one octave is selected in the Arp Range the notes played will be as follows. All the first octave notes held will play followed by the same pattern moved up one, two or three octaves. The result of this will be the first note of the second pass can be lower than the last note of the first pass. This can sound odd if you have selected one direction for the Arp Mode. If the Arp is on ('light showing on the ARP button) when a Tone is saved the Arp will be switched on when the Tone is loaded. If the Arp is off when a Tone is saved the Arp state will be unaltered when that Tone is loaded.

Chord Mode		
	A Chord is set by playing the Chord and then pressing and releasing the CHORD Button while the keys of the chord are being held. The chord that	As only one chord can be played at a time the keys played have last note priority.
	is set will then play for each key pressed as the base note.	<b>Changing a chord.</b> To change a chord play the new chord and press and release the
	Note - it is best to set the chord using middle 'C' as the base note.	CHORD Button while the chord keys are pressed.
		<b>Canceling Chord Mode.</b> To cancel chord mode press and release the CHORD Button with no notes pressed.



Parameter Editing		
	<ul> <li>Parameter Editing can be done in three ways. Using midi, using the front panel or by using the PG-800. Midi details can be found in the midi section of this manual.</li> <li>The PG-800 hardware interface is quite slow and audible stepping will be heard on some edits. If this is a problem then use midi or the front panel to edit.</li> <li>All parameters can be edited using midi or the front panel but only the parameters on the PG-800 can be edited using this.</li> </ul>	Parameter numbers are in three parts and contain a 'G', a 'B' and a 'T' number and will look like 212 for VCF Cutoff for example. To edit this parameter press PARAMTER EDIT, GROUP 2, BANK 1 and TONE 2. Then edit the value using the EDIT slider.
DCO Parameters	111 - DCO 1 Range $121 - DCO 2 Range$ $112 - DCO 2 Range$ $112 - DCO 1 Wave$ $122 - DCO 2 Wave$ $113 - DCO 1 Tune$ $123 - DCO 2 Tune$ $124 - DCO 2 Fine Tune$ $114 - DCO 1 LFO Amount$ $125 - DCO 2 LFO Amount$ $115 - DCO 1 LFO Select$ $126 - DCO 2 LFO Select$ $116 - DCO 1 ENV Amount$ $127 - DCO 2 ENV Amount$ $117 - DCO 1 ENV Select$ $128 - DCO 2 ENV Select$ $118 - DCO 1 Freq Dynamics$ $131 - DCO 2 Freq Dynamics$ $132 - DCO 1 Mix$ $133 - DCO 2 Mix Envelope Level$ $135 - DCO 2 Mix Envelope Level$ $136 - DCO 2 Mix ENV Select$ $138 - X Mod$	Options are 16', 8', 4' or 2' (For 32' or 1' use DCO Tune) Options are Saw, Pulse, Square or Random Range is ± 1 Octave in half tone steps Range is ± 50 Cents Range is 0-127 Options are LFO1, 2 or 3 and normal or inverted Range is 0-127 Options are ENV1,2 or 3 and normal or inverted Range is 0-127 Key velocity effects DCO Pitch (up Only) Range is 0-127 Range is 0-127 Range is 0-127 Options are ENV1,2 or 3 and normal or inverted Options are ENV1,2 or 3 and normal or inverted

VCF Parameters	211 – HFP Cutoff	Options are 0, 1, 2, 3
	212 – VCF Cutoff	Range is 0-127
	213 – VCF Resonance	Range is 0-127
	214 – VCF LFO	Range is 0-127
	215 – VCE LEO Select	Options are LEO1 2 or 3 and normal or
		inverted
	216 – VCE Envelope Level	Bange is 0-127
	217 – VCE Envelope Select	Options are ENIV1 2 or 3 and normal or
		inverted
	218 – VCF Key	Range is 0-127
	221 – VCF Dynamics	Range is 0-127
LFO Parameters	222 – LFO 1 Wave	Options are Sine, Triangle, Saw, Rev
		Saw, Square, Random
	223 – LFO 1 Rate	Range is 0-127
	224 – LFO 1 Delay	Range is 0-127
	225 – LFO 1 Mode	Options are Normal or Plus
		Normal will raise and lower parameter
		being edited and Plus will only raise the
		parameter being edited
	226 - 1 EO 1 Sync	Options are
		Free Pup 4 Notes 2 Notes 1 Note
		1/2 Note $1/4$ Note $1/2$ Note $1/2$ Trip
		1/2Note, 1/4 Note, 1/6 Note, 1/6 Mp
		Note, 1/16 Note, 1/16 Irip Note, 1/32
		Note, 1/32 Irip Note, 1/64 Note
	227 - LFO 2 Wave	Options are Sine, Triangle, Saw, Rev
		Saw, Square, Random
	228 – LFO 2 Rate	Range is 0-127
	231 – LFO 2 Delay	Range is 0-127
	232 – LFO 2 Mode	Options are Normal or Plus
	233 – LFO 2 Sync	Options are
		Free Run, 4 Notes, 2 Notes, 1 Note,
		1/2Note , 1/4 Note, 1/8 Note, 1/8 Trip
		Note, 1/16 Note, 1/16 Trip Note, 1/32
		Note, 1/32 Trip Note, 1/64 Note
	234 – LFO 3 Wave	Options are Sine, Triangle, Saw, Rev
		Saw. Square. Random
	235 – LFO 3 Bate	Range is 0-127
	236 – LEO 3 Delay	Bange is 0-127
	237 – LEO 3 Mode	Ontions are Normal or Plus
		Options are Normal OF Flus
		Free Pup 4 Notes 0 Notes 1 Note
		FILE RULL, 4 NOLES, $\angle$ NOLES, 1 NOLE,
		1/2INOTE, 1/4 INOTE, 1/8 INOTE, 1/8 Irip
		Note, 1/16 Note, 1/16 Trip Note, 1/32
		Note, 1/32 Trip Note, 1/64 Note

Modulation Matrix	311 – Matrix 1 - 6 Source 315, 321, 325, 331, 335	Matrix Source options are 0 - Off 1 - Bend Up 2 - Bend Down 3 - Bend Full 4 - Mod Wheel 5 - Edit Slider 6 - Key Velocity 7 - Key Note 8 - LFO1 (bipolar) 9 - LFO1 (unipolar) 10 - LFO2 (bipolar) 11 - LFO2 (bipolar) 12 - LFO3 (bipolar) 13 - LFO3 (unipolar) 14 - ENV1 15 - ENV2 16 - ENV3 17 - MidiCC#1 18 - MidiCC#2 19 - MidiCC#3 20 - MidiCC#4 21 - MidiCC#5 22 - MidiCC#6 23 - MidiCC#7 24 - MidiCC#8 25 - After Touch 26 - Seq Track 1 Output 27 - Seq Track 2 Output 28 - Seq Track 3 Output 29 - Seq Track 4 Output 30 - Seq Track 5 Output 31 - Seq Track 6 Output 32 - Bend LFO Switch* * LFO Bend Switch is Off or On(Full) only
	312 – Matrix 1 - 6 Level 316, 322, 326, 332, 336	Range is 0-127

313 – Matrix 1 - 6 Mod	Matrix Mod options are
317, 323, 327, 333, 337	0 - Fixed Amount
	1 - Fixed Amount (Inverted)
	2 - Bend Up
	3 - Bend Up (Inverted)
	4 - Bend Down
	5 - Bend Down (Inverted)
	6 - Bend Full
	7 - Bend Full (Inverted)
	8 - Mod Wheel
	9 - Mod Wheel (Inverted)
	10 - Edit Slider
	11 - Edit Slider (Inverted)
	12 - After Touch
	13 - After Touch (Inverted)
	14 - MidiCC#1
	15 - MidiCC#1 (Inverted)
	16 - MidiCC#2
	17 - MidiCC#2 (Inverted)
	18 - MidiCC#3
	19 - MidiCC#3 (Inverted)
	20 - MidiCC#4
	21 - MidiCC#4 (Inverted)
	22 - MidiCC#5
	23 - MidiCC#5 (Inverted)
	24 - MidiCC#6
	25 - MidiCC#6 (Inverted)
	26 - MidiCC#7
	27 - MidiCC#7 (Inverted)
	28 - MidiCC#8
	29 - MidiCC#8 (Inverted)
	30 - Seq Track 1 Output
	31 - Seq Track 2 Output
	32 - Seq Track 3 Output
	33 - Seq Track 4 Output
	34 - Seq Track 5 Output
	35 - Seq Track 6 Output
· · · · · · · · · · · · · · · · · · ·	

	314 – Matrix 1 - 6 Destination 318, 324, 328, 334, 338	Matrix Destination options are 0 - Off 1 - DCO1 Freq 2 - DCO2 Freq 3 - All DCO Freq 4 - DCO1 Wave 5 - DCO1 Range 6 - DCO2 Wave 7 - DCO2 Range 8 - Detune amount 9 - DCO1 Mix (all voices only) 10 - DCO2 Mix (can do/voice) 11 - VCF Cutoff 12 - VCF Resonance 13 - HPF (0-3 only) 14 - VCA Level 15 - Synth Output Volume 16 - Portamento Rate 17 - LFO1 Rate 18 - LFO2 Rate 19 - LFO3 Rate 20 - LFO1 Level 21 - LFO2 Level 22 - LFO3 Level 23 - ENV1 Rate 24 - ENV2 Rate 25 - ENV3 Rate
VCA Level	411 VCA Level	Range 0-127
VCA LFO Level	412 VCA LFO Level	Range 0-127
VCA LFO Select	413 VCA LFO Select	Options are LFO 1-3 Normal or Inverted
VCA ENV Select	414 VCA ENV Select	Options are Gate, ENV 1, 2 or 3
VCA Dynamics	415 VCA Dynamics Level	Range 0-127
Chorus	418 Chorus Mode	Options are Off – No Chorus 1 – Chorus type 1 2 – Chorus type 2

Voice Assign Mode	421 Voice Assign Mode	Voice Assign Mode selects the way the 6 playing voices are assigned to notes played Options are Poly Single – 6 notes trigger 6 voices Poly Dual – 3 notes max trigger 2 voices each Poly Triple – 2 notes max trigger 3 voices each Unison – the last note played will trigger 6 voices Solo – The last note played will trigger 1 voice
Voice Mode Steal	422 Voice Mode Steal	<ul> <li>When more than 6 notes are played and Poly Chain is set to Off a voice can be optionally stolen depending on the selection made here</li> <li>Options are</li> <li>Oldest – The oldest voice is selected (this is the default)</li> <li>Off – No voice is stolen (7<sup>th</sup> note is ignored)</li> <li>Newest – The last note played is selected</li> <li>Highest – The note with the highest pitch is selected</li> <li>Lowest - The note with the lowest pitch is selected</li> <li>Quietest – The note with the lowest volume is selected.</li> <li>Note – If Voice Assign mode is Unison or Solo or Chord Mode or Arp are on then voices are not Stolen and this option is disabled</li> </ul>
Voice Mode Staccato	423 Voice Mode Staccato	Options are Staccato/Legato When staccato is selected every new note will trigger a new envelope attack stage. When legato is selected a new envelope attack stage will only be triggered after all notes are lifted.
Detune	424 – DCO Detune	Range 0-127. This injects a fixed amount of detune to each voice. DCO Detune will have no effect on Solo keying
Analogue Feel	425 Analogue Feel	This parameter injects a very subtle random tune adjusts to each note. This is changed each time a note is played.

Patch Clock	436 Patch Clock	If this parameter is set to non zero this setting will override the Master Clock Rate while the Tone is loaded. If this parameter is set to zero the Master Clock Rate will be used.
ARP Step Timing	437 Arp Step Timing	The Arp Clock Timing can be set to 1 of 13 options. These are: Half Note (48 Clocks/Step) Quarter note (24 Clocks/Step) 8th note (12 Clocks/Step) 8th note, half swing (14,10 Clocks/Step) 8th note, full swing (16,8 Clocks/Step) 8th note triplets (8 Clocks/Step) 16th note (6 Clocks/Step) 16th note, half swing (7,5 Clocks/Step) 16th note, full swing (8,4 Clocks/Step) 16th note triplets (4 Clocks/Step) 32nd note (3 Clocks/Step) 32nd note triplets (2 Clocks/Step) 64th note triplets (1 Clocks/Step)
SEQ Step Timing	438 Seq Step Timing	The Seq Clock Timing can be set to 1 of 13 options. These are: Half Note (48 Clocks/Step) Quarter note (24 Clocks/Step) 8th note (12 Clocks/Step) 8th note, half swing (14,10 Clocks/Step) 8th note, full swing (16,8 Clocks/Step) 8th note triplets (8 Clocks/Step) 16th note (6 Clocks/Step) 16th note, half swing (7,5 Clocks/Step) 16th note, full swing (8,4 Clocks/Step) 16th note triplets (4 Clocks/Step) 32nd note (3 Clocks/Step) 32nd note triplets (2 Clocks/Step) 64th note triplets (1 Clocks/Step)
Seq Control	431-435	These have been removed.
ENV ADSR	511 – 514 Env 1 ADSR 516 – 521 Env 2 ADSR 523 – 526 Env 3 ADSR	Range is 0-127
Quick Edit Assign	531 Quick Edit Assign	This parameter assigns a parameter number to the Quick Edit Button. Pressing the QE button allows a shortcut to the parameter to be edited. This is saved with the Tone.

Mod Wheel Destination	536 Mod Wheel Destination	The Parameter injects LFO into the destination selected at the level set in 536 To set the LFO used to other than LFO1, or more than one output, sysex must be used. The editor can do this. MW Destination options are OFF – MW will have no effect DCO - DCO 1 & 2 VCF - VCF Cutoff VCA - VCA Level
Mod Wheel Level	537 Mod Wheel Level	Range 0-127 The mod wheel in the JX-8P is a simple on/off switch. This parameter lets the level to be set
AT Destination	538 After Touch Destination	The Parameter injects LFO into the destination selected at the level set by the AT Slider on the front panel and the AT multiplication factor set in 615 o set the LFO used to other than LFO1, or more than one output, sysex must be used. The editor can do this. AT Destination options are OFF – AT will have no effect DCO - DCO 1 & 2 VCF - VCF Cutoff VCA - VCA Level
GLOBAL PARAMETERS		
Device ID	611 Device ID	This parameter sets the ID for the Kiwi- 8P. Range is 0-15.
Master Clock Source	612 Master Clock Source	Options are Internal or Midi. Note – If midi is selected and there is no midi clock present then Arp, Seq or Sync'd LFOs will not run
Midi Clock Gen	613 Midi Clock Generation	Options are Off, On The Kiwi-8P will output a midi clock which is set by the internal clock rate when this parameter is set On
		1
--------------------------------	-------------------------	---
Mod Wheel Level	614 MW Midi Level	Range is 0-127 The MW in the JX-8P is an on/off switch. This parameter allows the midi output level of the MW to be adjusted Note – This only effect the midi output level. To change the Tone MW Level and destination use the Tone MW Edits 536 & 537
Aftertouch Level Multiplier	615 AT Level Multiplier	Range is 0, 2x, 4x or 8x The Aftertouch strip in the JX-8P slowly oxidizes over time and this is a difficult and costly repair. The effect of this is the output from the AT strip is reduced. This parameter attempts to reverse this by making the output more sensitive.
Hold Pedal Mode	617 Hold Pedal Mode	Options are O or C This option let you use a normally Open or normally Close sustain pedal. If your Hold Pedal has hold off when you press it and hold on when you release it (HOLD light flashing) then change this option. This edit was a late addition and was added after the first run of front panel label were produced.
Cart Import	637 Cart Import	This option followed by the WRITE button will import the contents of the Cart into the Group that is currently selected starting at the current Bank and Tone selected and copying the next 32 tones. WARNING – This will overwrite tones in the current group.
Factory Reset	638 Factory Reset	This option followed by the WRITE button will blank all tones.

### Setting up with External Devices

#### Midi Notes

Midi though should be used if multiple units are being used on the midi chain to reduce delays. While every effort has been made to make the midi as fast as is possible within the KiwiTechnics JX-8P Upgrade there will always be small delays between the midi input and midi output. The way the JX-8P was designed the midi is input to the cpu board, then transmitted to the voice board cpu internally and then sent out the midi out. While the communication between the internal boards is at a high speed this still creates extra delays as the commands need to be interpreted twice which cannot be done until a full command arrives at each cpu.

Warning – Because of the extra work needed to handle midi it is possible to feed midi into the Kiwi8P faster than it can be processed. While the input buffer is large it is still possible to overflow it which will cause random midi errors as bytes are lost.

Full midi command details are at the end of the manual.

#### Hold Pedal

Any pedal that shorts the tip to ground when pressed or open can be used. If you find that the HOLD light flashes when the pedal is not pressed and stops flashing when it is pressed you can reverse the hold pedal sensing by using Global Parameter G6B1T7. This was a late addition that didn't make the first label run so it isn't showing on the front panel edit map.

# Importing/Exporting Tones

Importing Tones	There are several methods for importing tones.	MKS-70/JX-10 Sysex Dump. These come in two parts. The Patch section is ignored and the Tone section will
	<b>Kiwi-8P sysex dumps</b> . These can be a single tone or a group of 64 tones.	be saved into the currently Selected Group at the location specified in the Roland Dump. This is typically 1:1 to
	A <b>Single Tone</b> will be loaded into the edit buffer and it can then be saved to any memory position by pressing WRITE followed by the G/B/T location. The actual write to memory	normally have all the Patches first in the file and as these are ignored nothing may appear to be happening until the Tones start sending.
	is done when the Tone button is pressed so this should be pressed last if you are changing Groups or Banks. If the currently selected Group or Bank is unchanged then you can skip pressing these.	<b>Cart</b> / <b>RAM Import.</b> The inserted CART and internal RAM can be imported into the currently selected Group starting at 1:1 by selecting the Edit Parameter 6:3:7 which is then followed by the WRITE button. This will import the 32 tones that are
	A <b>Group Dump</b> will be loaded and saved into the currently selected Group overwriting anything in that group. These will save into the location specified in the dump but in the current group.	in the CART into the currently selected Group starting at 1:1 and finishing at 4:8. This is followed by the 32 tones that are stored in the internal 8P RAM. These will be saved into memory locations 5:1 to 8:8
	A <b>JX-8P sysex dump</b> . There are two parts to these. The tone dump part will load into the edit buffer and the optional Sysex Save Command will store the Tone into the memory	Note – Imported tones may need some editing to work correctly. The following will not be 100% correct when importing tones. This is manly
	location in the Save Command in the currently selected Group. If the Save	due to expanded ranges on some parameters.
	will only be put into the Edit Buffer and will be lost if it is not saved to memory before a new Tone is selected or the synth is powered off.	In some Tones the DCO tuning may be out by a small amount on one or both DCOs Tones that rely on DCO Tuning using
	Note - The Write Protect on the rear of the 8P must be in the 'OFF' position for a restore to memory to work.	the Env Level parameter will need retuning The LFO rate & delay times Env A/D/R times VCA Level
Exporting Tones	Exporting of Tones is done using sysex Dumps. To do this press SYSEX DUMP followed by the dump type you require using the yellow Seq buttons followed by the WRITE button. The dump will not start until the WRITE button is pressed.	The DUMP ALL TONES has been changed to DUMP CURRENT GROUP in release 1.4 and higher. Dumping a single group of 64 tones is better for transferring Groups and the file size is more manageble.

### Firmware Updates

#### **Firmware Updates**

Firmware updates in the Kiwi-8P are more involved than other Kiwitechnics Upgrades due to the fact that there are two cpus and each need their own firmware files. Because all midi must enter the main cpu and updates for the voice board cpu need to be passed between the boards.

It is most important therefore that files are loaded in the correct order. First must be the CPU Boot loader, second is CPU Program, third is VB Boot loader and last is VB Program.

The CPU & VB Program files are large and not all midi interfaces can handle these. There are many cheap USB to Midi interfaces and these will more than likely have problems. Symptoms will be the file freezing midway and the update not working.

Note – If all the LEDs turn on then there was an error during the update and you should repeat the update. When a firmware update file is playing into the Kiwi-8P the display will change to show the file being loaded and the 6 LEDS will show progress by rotating. If the display does not change and the lights do not show then the file is not being transmitted to the Kiwi-8P correctly and you should check your midi setup.

To start the firmware upload press and hold the MIDI PANIC button as you power on the Kiwi-8P. The display will show 'WAITING 4 UPDATE' and you then play in the first file. Repeat this for each of the 4 files.

Note – During VB update all activity in the voice board is stopped. This can cause random noise to sound out the output as the MUX is no longer being updated and this can get quite loud. It is recommended to turn down the volume during this process.

### Test Mode



|--|

Test Mode is only used to set the trims on the Voice board and is only used during the initial setup.

There is a special test mode patch number 8:8:8 which is selected automatically when test mode is started. This patch is like any other in the Kiwi8P and can be edited so it is best to leave this patch unaltered if test mode is to be used. A power on factory restore will also restore this patch.

Test mode is entered by pressing and holding the CANCEL button as the Kiwi8P is powered on. The display will read TEST MODE. As each note is pushed the voice that is sounding will display on the LEDs.

- HOLD= Voice 1ARP= Voice 2SEQ= Voice 3KEY MODE= Voice 4CHORD= Voice 5
- GLOBAL TEMPO
- \_
- = Voice 6

www.kiwitechnics.com

#### **Upgrade** install



### Disclaimer.

This modification is at your own risk and Kiwitechnics will not be held liable for any damage done by not doing this modification correctly.

If you are in any doubt at all or do not understand any part of this document then have this work done by a professional.

The KiwiTechnics Kiwi-8P Upgrade must be installed by a competent technician with the correct tools or damage to your JX-8P can occur. KiwiTechnics will not be responsible for damage done to your precious JX-8P if this upgrade is not fitted correctly.

www.kiwitechnics.com

JX-8P Upgrade User Manual v151



# There are dangerous voltages inside the unit and it must not be opened until the power plug is removed from the power supply.

Two 40 pin cpus, one 40 I/O chip and a 16 pin A to D chip and other components need to be removed and replaced with three 40 pins sockets, some links and some resistors which are supplied with the KiwiTechnics JX-8P Upgrade. These instructions are supplied as a guide for your technician only and it is your responsibility to have this done professionally. This can take up to 60 mins depending on your skill level.

Step 1) Opening the JX-8P – Turn over the JX-8P and support it so that no weight is on the joystick lever. With the synth front keys facing you remove the six screws located in the end panels and the two larger black screws on the underside that are marked in the drawing. There are 8 screws in total. Carefully turn the synth back over to the right side up keeping hold of the lid so it does not open.

### Remove 6 x small & 2 x Large screws marked in Red



Step 2) Removing the 8P voice board. With the top still closed remove the two small back screws either side of the midi connectors on the rear of the JX-8P. Now open the top. It is a good idea to mark the voice board cables with a felt pen so that you get them back into the correct sockets. Make special note of plug CN3 which is a 10 pin plug in a 12 pin socket. Mark this so that you can put it back exactly as it is. Carefully unplug all the cables from the board (8 in total marked with purple and orange arrows). The plugs marked with orange arrows will not plug back into the voice board but will instead plug into the Kiwi8P cpu board. Remove the 9 screws holding the board into the 8P (Yellow arrows in the picture). Mark which way around the gray ribbon cable leading to the cartridge socket is and then unplug this cable. This is done by pulling it straight out of the socket it is in. The voice board can now be removed from the JX-8P.



Step 3) Desolder the listed ICs, resistors and transistor and fit the supplied 40 pin IC sockets, resistors and links.

#### It is very important that this step is done correctly.

On the top side of the voice board underneath the ICs (Integrated Circuits) that need to be removed are some fine tracks that will be damaged and difficult to repair if all the solder is not removed correctly.

# All the solder must be removed from all the 40 holes in the three large ICs and the 16 holes in the small IC and the pins free of the hole edges before the ICs are lifted out of the board.

All the CPU pins should be able to move freely in the holes which shows that they are not still soldered to the hole sides. The best way to achieve this is with a good vacuum desoldering tool. A combination of a quality Solderwick and a hand vacuum can be used but you will need to take care as these can cause damage to the board. The copper used in these older resin based circuit boards is very soft at 300+ degrees and is very easily lifted from the surface. A hand vacuum tool will jump and can damage tracks as it is triggered. If tracks are damaged they will need to be repaired before proceeding to the next step. The best way to do this is with a fine enameled copper wire which is the same as is used to wind transformers and can be found in most electronics parts stores.

The following ICs and parts need to be removed. IC8 (40 pin IC marked HD63B03), IC20 (16 pin IC marked uPD7001), IC30 (40 pin IC marked 8051), IC34 (40 pin IC marked 8155). Also remove the following resistors R35, R52, R53, the transistor Q10, and the Resistor Net RA6. Also remove the ROM chips IC6 & IC22 marked JX8P A & JX8P B from their sockets as these are not required for the upgrade.



Step 4) Carefully solder in the supplied 40 Pin Sockets into IC8, IC30 and IC34 holes making sure that the notch in the socket is the same orientation as the mark on the board. This photo shows these fitted and the other components except R35 removed.



Notice in the photo where RA6 was removed that one of the holes has a box around it (next to where RA6 is written on the board). This is pin one of RA6 which you will need to know for step 6

- Step 5) Fit the two supplied 16k resistors into the R52 & R53 holes. There are 3 x 10k and 2 x 16k resistors supplied in the upgrade so make sure you use the right ones. The 3 x 10k resistors are used in step 6. Fit links into the following holes where IC20 & R35 were removed. It is a good idea to put a piece of tape under the IC20 links to prevent the possibility of a short to one of the tracks. This has not been done in the photo.
  - Link 1 Pin 15 to Pin16
  - Link 2 Pin 3 to Pin 13
  - Link 3 Pin 4 to Pin 12 Link 4 Pin 5 to Pin 11
  - Link 5 Pin 6 to Pin 10

Link 6 R35 – This the the resistor removed during step 3 and this needs to be replaced with a link.



Step 6) Fit the three supplied 10k resistors. These go between RA6 pin 1 and Pin 2, Pin 1 and 3 and Pin 1 and Pin 5 as in the diagram. Pins 4, 6 & 7 should have nothing in them. Pin one has a box around it on the circuit board.





Step 7) When fitting the upgrade boards into the sockets make sure all the pins are in all the socket holes and press in half way. This will seat the board into the holes. Then with the 8P board on a static free firm surface and something firm directly under the daughter boards area you need to press down firmly until the daughter boards are seated fully. It is best to press one end at a time and then the sides until they are fully inserted. The photo shows the boards in the final positions. Fit the CPU daughter board into the socket marked IC8. The notch printed on the Kiwi8P CPU board must match the notch printed onto the Jupiter 8P Board (see photo). Fit the Voice daughter board into the sockets market IC30 & IC34. The notches printed the Kiwi8P Voice board must match the notches printed onto the Jupiter 8P Board (see photo). This is a tight fit and will require some force to insert correctly. Be gentle but firm and support the board directly under the sockets as you press them in.



- Step 8) Fit the Voice board back into the 8P with the 9 screws removed in step2. Replug all the cable except the ones from the keyboard (6 pin CN4, 10 pin CN5 & 8 pin CN6). Pay special attention to replugging CN3 that you put it back exactly as it was. CN4, CN5 & CN6 are now plugged into the Kiwi8P Upgrade board into the CN4, 5 & 6 sockets provided. Be careful when these are inserted that you do not unseat the Kiwi8P board from it's socket. Insert the gray ribbon cable to the Cartridge by holding both sides and lining it up with the slot and then pushing it into the slot making sure to keep it straight.
- Step 9) Close the JX8P making sure the Aftertouch wire from the keyboard to the bender board is not under the top panel metal support & refit the screws removed in Step 1

#### **Upgrade Label**

The Kiwitechnics Kiwi-8P Upgrade comes with a label that is placed over the existing front panel label on the JX-8P.

It is recommended that you lay the label on a flat surface to let it relax from being rolled into the shipping box. This may take a while (days) so be patient. You can still use the upgrade without it applied as it can be a reference.

Once the label is flat it is applied by pealing back some of the backing starting at the left hand end and lining up the part of the label with the backing still on up with the existing 8P label. The start point for lining up is the lower left hand corner nearest to the joystick (yellow arrow in photo). It should be up against the left and lower sides of the recessed part of the JX-8P. When it is lined up press down the part that you have removed the backing from and then pull out the rest of the backing paper as you press down the label. If it goes wrong the label will still be able to be removed without damage for another attempt. Keep it close to the bottom edge of the recess as you work along the synth.



#### Aftertouch Strip repair

The Aftertouch strip in the 8P slowly reduces it effectiveness over time requiring a much harder key press to operate. This is due to the materials in the strip oxidising over time. The AT strip is difficult to access and involves a complete keyboard and AT Bar strip down and not a job to be taken lightly. Also the strip will likely oxidise again so the repair has limited success. To avoid this difficult and costly work an AT multiplication parameter has been built into the Kiwi-8P upgrade. This will make the AT more sensitive by a factor of x2, x4 or x8. This works in conjunction with the AT level slider on the front panel to fine tune the AT amount desired.

#### Adjustments for the JX-8P



# THE JX-8P WILL BE ON WITH THE LID OPEN DURING THIS PROCEDURE AND THERE ARE LETHAL VOLTAGES PRESENT!

LEAVE THIS TO A PROFESSIONAL IF YOU ARE AT ALL UNSURE.

The Roland JX-8P can be adjusted while it is apart. To do the adjustments you will require an oscilloscope and a small screwdriver.

1) Warm up the JX-8P

Leave the Synth running for at least 10 minutes to let the electronics stabilize.

2) Enter TEST MODE. The next adjustments use a special test mode that is built into the Kiwi-8P Upgrade. This is entered by Pressing and Holding the CANCEL button while the JX-8P is powered on. The display will show 'Test Mode' when test mode is active. As you press notes the voice being used is displayed on the 6 lights on the front panel. Voice one is Poly, 2 is Unison, 3 is Solo, 4 is Vibrato (this button is HOLD in the upgrade), 5 is Brilliance (this button is CHORD in the upgrade), 6 is Volume (this button is INTERNAL CLOCK in the upgrade).

3) Set up the following patch parameters (these are in Patch 888 after a factory reset).

		```
G1 B1 T1	DCO1 Range	8'
G1 B1 T2	DCO1 Wave	SQF
G1 B1 T3	DCO1 Tune	00
G1 B1 T4	DCO1 LFO	00
G1 B1 T6	DCO1 ENV	00
G1 B2 T2	DCO1 Mix	99
G1 B2 T3	DCO2 Mix	00
G2 B1 T2	VCF Freq	54
G2 B1 T3	VCF Res	99
G2 B1 T4	VCF LFO	00
G2 B1 T6	VCF ENV	00

G2 B1 T8	VCF KEY	00
G5 B2 T4	VCA Level	70
G5 B2 T7	VCA Mode	GATE
G5 B3 T1	Chorus	OFF

4) Connect an oscilloscope to the output jack or TP5 on the main board. While playing A above middle C adjust each voice (the voice playing is shown on the LEDs) so that the VCA Level is full amplitude.

5) Exit Test Mode by pressing Cancel or Powering the 8P off.

### Midi Data

Function	Transmitted	Recognized	Notes
Basic Channel	1-16	1-16	If Omni selected the Kiwi106 will recognize any midi channel
Note Number	24(C1)-108(C8)	0-127	Notes that are received outside the Kiwi106 range of 24-108 are transposed to the nearest octave within range.
Mode	0	0	Voice Modes need to be changed using Midi Control or Sysex commands
Velocity Note On	х	х	Midi Note Velocity can be disabled using Global Dynamics Variable. If disabled midi notes will use the Internal Velocity Level.
Note Off	Х	Х	
Aftertouch Keys	х	x	
Channels	Х	х	
Pitch Bender	0	0	Midi and internal bends are additive within the Kiwi106.
Control Change	0	0	Only if Midi CC option is Enabled. See Control Change Tables for details
Program Change	0	0-127	If CCO=0 then CC32 & Program change select Tone 1-512. Each CC32 number (0 - 3) accesses 128 Tonees using Program Change (0-127)
System Exclusive	0	0	Only if Midi Sysex option is Enabled - See Sysex Table for details Note - The editor uses sysex and will override the sysex disable setting while it is in use.
System Real Time Clock Commands	0	0	Will Transmit from Master Clock if Clock Output is enabled. Input clocks are passed through to midi out unaltered and with minimal delay. Midi Clocks are recognized within the Kiwi106 only if the clock source has been set to midi on the Master clock source
Modulation	0	0	Midi and internal Modulation are additive within the Kiwi106

Notes X=No O=Yes

Supported Midi Messages	Status	Second	Third	Notes
Note Off	\$8n (128-143)	\$kk	\$yy	<pre>n = 0-15 midi channel kk = note number (0-127) - Notes outside range 24-108 are transposed to the nearest octave yy = Don't care (ignored)</pre>
Note On	\$9n (144-159)	\$kk	\$yy	<pre>n = 0-15 midi channel kk = note number (0-127)-outside 24-108 are transposed to the nearest Octave yy = 0=Note Off, 1-127 = Note Velocity. Notes are sent at velocity set by Global Parameter</pre>
Continuous Controllers	\$bn (160-191)	\$kk	\$уу	n = 0-15 midi channel \$kk & \$yy see CC table
Program Change	\$cn (192-207)	0-127		n = 0-15 midi channel If CC0 = 0 then for CC32 = 0 for Tones 1-128 1 for Tones 129-256
Channel Aftertouch	\$dn (208-223)	\$kk		
Pitch Bend	\$en (224-239)	\$kk	\$yy	<pre>n = 0-15 midi channel kk = Least Significant 7 bits yy = Most Significant 7 bits Note - Midi pitch bend is mixed with internal bend Internal hardware can only support 12 bits so the 2 LSB are dropped</pre>
				Note \$xx = hex number

Continuous Controllers				
Continuous Controllers	Second	Third	Notes	
Bank Select MSB	\$00 (00)	\$00-\$01	0=Bank Selection, 1=Not Used, 2=Seq Selection Used in conjunction with CC32 Bank Select LSB	
Modulation Wheel Level	\$01 (01)	\$00-\$7f (0-127)		
Breath Controller	\$02 (02)	\$00-\$7f (0-127)	Not Supported	
Portamento Time	\$05 (05)	\$00-\$7f (0-127)	Sets Portamento Time	
NRPN MSB	\$06 (06)	\$00-\$7f (0-127)	Not Supported.	
Overall Synth Volume	\$07 (07)	\$00-\$7f (0-127)	Sets Output Level	
DCO1 Coarse Tune	\$08 (08)	\$00-\$30 (0-48)	$0-24 = -12 \rightarrow + 12$ notes in semitone steps	
DCO1 LFO	\$09 (09)	\$00-\$7f (0-127)		
DCO1 ENV	\$0a (10)	\$00-\$7f (0-127)		
DCO1 DYN	\$0b (11)	\$00-\$7f (0-127)		
DCO2 Coarse Tune	\$0c (12)	\$00-30 (0-48)	$0-24 = -12 \rightarrow + 12$ notes in semitone steps	
DCO2 Fine Tune	\$0d (13)	\$00-\$64 (0-100)	$0-100 = -50 \rightarrow + 50$ cents	
DCO2 LFO	\$0e (14)	\$00-\$7f (0-127)		
DCO2 ENV	\$0f (15)	\$00-\$7f (0-127)		
DCO2 DYN	\$10 (16)	\$00-\$7f (0-127)		
DCO Detune	\$11 (17)	\$00-\$7f (0-127)		
DCO 1 Mix Level	\$12 (18)	\$00-\$7f (0-127)		
DCO 2 Mix Level	\$13 (19)	\$00-\$7f (0-127)		
DCO 2 Mix DYN	\$14 (20)	\$00-\$7f (0-127)		
VCA Level	\$15 (21)	\$00-\$7f (0-127)		
VCA DYN	\$16 (22)	\$00-\$7f (0-127)		
VCF Low Pass Cutoff	\$17 (23)	\$00-\$7f (0-127)		
VCF Low Pass Resonance	\$18 (24)	\$00-\$7f (0-127)		
VCF LFO	\$19 (25)	\$00-\$7f (0-127)		
VCF ENV	\$1a (26)	\$00-\$7f (0-127)		
VCF KEY	\$1b (27)	\$00-\$7f (0-127)		
VCF DYN	\$1c (28)	\$00-\$7f (0-127)		
ENV 1 Attack	\$1d (29)	\$00-\$7f (0-127)		
ENV 1 Decay	\$1e (30)	\$00-\$7f (0-127)		
ENV 1 Sustain	\$1f (31)	\$00-\$7f (0-127)		
Bank Select LSB	\$20 (32)	\$00-\$7f (0-127)	Selects Bank sets for Program Select \$00 (0) for Tones 1-128 \$01 (1) for Tones 129-256	
ENV 1 Release	\$21 (33)	\$00-\$7f (0-127)		
ENV 2 Attack	\$22 (34)	\$00-\$7f (0-127)		
ENV 2 Decay	\$23 (35)	\$00-\$7f (0-127)		
ENV 2 Sustain	\$24 (36)	\$00-\$7f (0-127)		
ENV 2 Release	\$25 (37)	\$00-\$7f (0-127)		
NRPN LSB	\$26 (38)	\$00-\$7f (0-127)	Not Supported.	
LFO 1 Rate	\$27 (39)	\$00-\$7f (0-127)		
LFO 1 Delay	\$28 (40)	\$00-\$7f (0-127)		
LFO 2 Rate	\$29 (41)	\$00-\$7f (0-127)		
LFO 2 Delay	\$2a (42)	\$00-\$7f (0-127)		
LFO 3 Rate	\$2b (43)	\$00-\$7f (0-127)		

#### www.kiwitechnics.com

Continuous Controllers				
Continuous Controllers	Second	Third	Notes	
LFO 3 Delay	\$2c (44)	\$00-\$7f (0-127)		
Internal Clock Rate	\$2d (45)	\$00-\$7f (0-127)	GLOBAL - 0-127=5-299 BPM	
Patch Clock Tempo	\$2e (46)	\$00-\$7f (0-127)		
Matrix Midi CC #1	\$2f (47)	\$00-\$7f (0-127)	Source Input for Matrix - Use Sysex for Matrix Control	
Matrix Midi CC #2	\$30 (48)	\$00-\$7f (0-127)	Source Input for Matrix	
Matrix Midi CC #3	\$31 (49)	\$00-\$7f (0-127)	Source Input for Matrix	
Matrix Midi CC #4	\$32 (50)	\$00-\$7f (0-127)	Source Input for Matrix	
Matrix Midi CC #5	\$33 (51)	\$00-\$7f (0-127)	Source Input for Matrix	
Matrix Midi CC #6	\$34 (52)	\$00-\$7f (0-127)	Source Input for Matrix	
Matrix Midi CC #7	\$35 (53)	\$00-\$7f (0-127)	Source Input for Matrix	
Matrix Midi CC #8	\$36 (54)	\$00-\$7f (0-127)	Source Input for Matrix	
MW Tone Level	\$37 (55)	\$00-\$7f (0-127)	Sets the Tone MW Level	
ENV 3 Attack	\$38 (56)	\$00-\$7f (0-127)		
ENV 3 Decay	\$39 (57)	\$00-\$7f (0-127)		
ENV 3 Sustain	\$3a (58)	\$00-\$7f (0-127)		
ENV 3 Release	\$3b (59)	\$00-\$7f (0-127)		
Analogue Feel	\$3c (60)	\$00-\$7f (0-127)		
DCO 2 Mix Env Level	\$3d (61)	\$00-\$7f (0-127)		
Hold Pedal	\$40 (64)	\$уу	yy = \$00-\$3f (0-63) Off \$40-\$7f (64-127) On	
DC01 Range	\$41 (65)	\$yy	$\begin{array}{rcl} yy &=& \$00-\$1f & (0-31) & 16' \\ && \$20-\$3f & (32-63) & 8' \\ && \$40-\$5f & (64-95) & 4' \\ && \$60-\$7f & (96-127) & 2' \end{array}$	
DCO1 Wave	\$42 (66)	\$ <sub>УУ</sub>	yy = \$00-\$1f (0-31) Noise \$20-\$3f (32-63) Saw \$40-\$5f (64-95) Pulse \$60-\$7f (96-127) Square	
DCO1 LFO Source	\$43 (67)	\$ <sub>YY</sub>	<pre>yy = \$00-\$0f (0-15) LFO 1 Bipolar \$10-\$1f (16-31) LFO 1 Unipolar \$20-\$2f (32-47) LFO 2 Bipolar \$30-\$3f (48-63) LFO 2 Unipolar \$40-\$4f (64-79) LFO 3 Bipolar \$50-\$7f (80-127) LFO 3 Unipolar</pre>	
DCO1 ENV Source	\$44 (68)	\$ <sub>yy</sub>	<pre>yy = \$00-\$0f (0-15) ENV 1 Normal \$10-\$1f (16-31) ENV 1 Inverted \$20-\$2f (32-47) ENV 2 Normal \$30-\$3f (48-63) ENV 2 Inverted \$40-\$4f (64-79) ENV 3 Normal \$50-\$7f (80-127) ENV 3 Inverted</pre>	
DCO2 Range	\$45 (69)	\$ <sub>YY</sub>	yy = \$00-\$1f (0-31) 16' \$20-\$3f (32-63) 8' \$40-\$5f (64-95) 4' \$60-\$7f (96-127) 2'	
DCO2 Wave	\$46 (70)	\$ <sub>yy</sub>	yy = \$00-\$1f (0-31) Noise \$20-\$3f (32-63) Saw \$40-\$5f (64-95) Pulse \$60-\$7f (96-127) Square	
DCO2 LFO Source	\$47 (71)	\$ <sub>YY</sub>	<pre>yy = \$00-\$0f (0-15) LF0 1 Bipolar \$10-\$1f (16-31) LF0 1 Unipolar \$20-\$2f (32-47) LF0 2 Bipolar \$30-\$3f (48-63) LF0 2 Unipolar \$40-\$4f (64-79) LF0 3 Bipolar \$50-\$7f (80-127) LF0 3 Unipolar</pre>	

Continuous Controllers				
Continuous Controllers	Second	Third	Notes	
DCO2 ENV Source	\$48 (72)	\$уу	<pre>yy = \$00-\$0f (0-15) ENV 1 Normal \$10-\$1f (16-31) ENV 1 Inverted \$20-\$2f (32-47) ENV 2 Normal \$30-\$3f (48-63) ENV 2 Inverted \$40-\$4f (64-79) ENV 3 Normal \$50-\$7f (80-127) ENV 3 Inverted</pre>	
High Pass Filter Cutoff	\$49 (73)	\$ <sub>YY</sub>	yy       =       \$00-\$1f (0-31)       HPF Off         \$20-\$3f (32-63)       HPF 1         \$40-\$5f (64-95)       HPF 2         \$60-\$7f (96-127)       HPF 3	
VCF LFO Source	\$4a (74)	\$уу	<pre>yy = \$00-\$0f (0-15) LF0 1 Bipolar \$10-\$1f (16-31) LF0 1 Unipolar \$20-\$2f (32-47) LF0 2 Bipolar \$30-\$3f (48-63) LF0 2 Unipolar \$40-\$4f (64-79) LF0 3 Bipolar \$50-\$7f (80-127) LF0 3 Unipolar</pre>	
VCF ENV Source	\$4b (75)	\$ <sub>YY</sub>	<pre>yy = \$00-\$0f (0-15) ENV 1 Normal \$10-\$1f (16-31) ENV 1 Inverted \$20-\$2f (32-47) ENV 2 Normal \$30-\$3f (48-63) ENV 2 Inverted \$40-\$4f (64-79) ENV 3 Normal \$50-\$7f (80-127) ENV 3 Inverted</pre>	
VCA Mode	\$4c (76)	\$ <sub>YY</sub>	<pre>yy = \$00-\$1f (0-31) Gate \$20-\$3f (32-63) ENV 1 Normal \$40-\$5f (64-95) ENV 2 Normal \$60-\$7f (96-127) ENV 3 Normal</pre>	
VCA LFO Source	\$4d (77)	\$уу	<pre>yy = \$00-\$0f (0-15) LF0 1 Bipolar \$10-\$1f (16-31) LF0 1 Unipolar \$20-\$2f (32-47) LF0 2 Bipolar \$30-\$3f (48-63) LF0 2 Unipolar \$40-\$4f (64-79) LF0 3 Bipolar \$50-\$7f (80-127) LF0 3 Unipolar</pre>	
LFO 1 Wave	\$4e (78)	\$ <sub>YY</sub>	<pre>yy = \$00-\$0f (0-15) Sine \$10-\$1f (16-31) Triangle \$20-\$2f (32-47) Saw \$30-\$3f (48-63) Rev Saw \$40-\$4f (63-79) Square \$50-\$7f (80-127) Random</pre>	
LFO 2 Wave	\$4f (79)	\$ <sub>YY</sub>	<pre>yy = \$00-\$0f (0-15) Sine \$10-\$1f (16-31) Triangle \$20-\$2f (32-47) Saw \$30-\$3f (48-63) Rev Saw \$40-\$4f (63-79) Square \$50-\$7f (80-127) Random</pre>	
LFO 3 Wave	\$50 (80)	\$ <sub>yy</sub>	<pre>yy = \$00-\$0f (0-15) Sine \$10-\$1f (16-31) Triangle \$20-\$2f (32-47) Saw \$30-\$3f (48-63) Rev Saw \$40-\$4f (63-79) Square \$50-\$7f (80-127) Random</pre>	
Chorus Off/I/II	\$51 (81)	\$ <sub>YY</sub>	yy = \$00-\$1f (0-31) Chorus Off \$20-\$3f (32-63) Chorus On I \$40-\$7f (64-127) Chorus On II	
Load Sequence	\$52 (82)	\$00-\$08 (0-8)	0 = Do not load sequence 1-28= Load Seq 1-8 All other numbers ignored Seg 1-8 are 124 step	

Continuous Control	lers				
Continuous Controllers	Second	Third	Notes		
Midi Control (Midi Start/Stop Enable) Note: if a Tone is saved with ARP and/or SEQ running the midi Start Enable will also be saved for each section running	\$53 (83)	\$уу	ΥУ =	\$00-\$1f (0-31) \$20-\$3f (32-63) \$40-\$5f (64-95) \$60-\$7f (96-127)	All Off ARP Enabled SEQ Enabled ARP+SEQ Enabled
XMod	\$54 (84)	\$ <sub>YY</sub>	\$yy =	\$00-\$1f (0-31) \$20-\$3f (32-63) \$40-\$5f (64-95) \$60-\$7f (96-127)	Off Sync 1 Sync 2 Cross Mod
Key Mode	\$55 (85)	\$ <sub>YY</sub>	уу =	\$00-\$0f (0-15) \$10-\$1f (16-31) \$20-\$2f (32-47) \$30-\$3f (48-63) \$40-\$7f (64-127)	Poly Single Poly Dual Poly Triple Unison Solo
Arpeggiator Mode	\$56 (86)	\$уу	\$yy =	\$00-\$0f (0-15) \$10-\$1f (16-31) \$20-\$2f (32-47) \$30-\$3f (48-63) \$40-\$7f (64-127)	Up Down Up & Down Random As Played
Arpeggiator Range	\$57 (87)	\$уу	\$yy =	\$00-\$1f (0-31) \$20-\$3f (32-63) \$40-\$5f (64-79) \$60-\$7f (80-127)	1 Octave 2 Octaves 3 Octaves 4 Octaves
Arpeggiator Clock Divide	\$58 (88)	\$уу	\$ <sub>YY</sub> =	\$00-\$09 (0-9) - Ha \$0a-\$13 (10-19)-Q1 \$14-\$1d (20-29)-87 \$1e-\$27 (30-39)-87 \$28-\$31 (40-49)-87 \$32-\$3b (50-59)-87 \$3c-\$45 (60-69)-17 \$46-\$4f (70-79)-17 \$50-\$59 (80-89)-11 \$5a-\$63 (90-99)-11 \$64-\$6d (100-109)-7 \$6e-\$77 (110-119)-7 \$78-\$7f (120-127)-7	<pre>lf Note (48/Step) uarter note (24/Step) th note (12/Step) th note, 1/2 swing (14,10/Step) th note, full swing (16,8/Step) th note triplets (8/Step) 6th note (6/Step) 6th note, half swing (7,5/Step) 6th note triplets (4/Step) -32nd note (3/Step) -32nd note triplets (2/Step) -64th note triplets (1/Step)</pre>
Sequencer Clock Divide	\$59 (89)	\$ <sub>YY</sub>	\$yy =	\$00-\$09 (0-9) - Ha \$0a-\$13 (10-19)-Q \$14-\$1d (20-29)-81 \$1e-\$27 (30-39)-81 \$28-\$31 (40-49)-81 \$32-\$3b (50-59)-81 \$3c-\$45 (60-69)-11 \$46-\$4f (70-79)-11 \$50-\$59 (80-89)-11 \$5a-\$63 (90-99)-10 \$64-\$6d (100-109)-10 \$6e-\$77 (110-119)-10 \$78-\$7f (120-127)-10	If Note (48/Step) uarter note (24/Step) th note (12/Step) th note, 1/2 swing (14,10/Step) th note, full swing (16,8/Step) th note triplets (8/Step) 6th note (6/Step) 6th note, half swing (7,5/Step) 6th note, full swing (8,4/Step) 6th note triplets (4/Step) -32nd note (3/Step) -32nd note triplets (2/Step) -64th note triplets (1/Step)
Master Clock Source	\$5a (90)	\$ <sub>YY</sub>	\$yy =	\$00-\$3f(0-63) \$40-\$7f(64-127)	Internal Midi
Bend Range	\$5b (91)	\$уу	\$yy =	\$00-\$1f(0-31) \$20-\$3f(32-63) \$40-\$4f(64-79) \$60-\$7f(80-127)	2 Semitones 5 Semitones 7 Semitones 12 Semitones
Mod Wheel Destination	\$5c (92)	\$ <sub>YY</sub>	\$yy = For com	\$00-\$1f(0-31) \$20-\$3f(32-63) \$40-\$5f(64-79) \$60-\$7f(80-127) binations use syse	OFF DCO 1 & 2 VCF VCA x control

Continuous Controllers			
Continuous Controllers	Second	Third	Notes
AT Destination	\$5d (93)	Şyy	<pre>\$yy = \$00-\$1f(0-31) OFF \$20-\$3f(32-63) DCO 1 &amp; 2 \$40-\$5f(64-79) VCF \$60-\$7f(80-127) VCA For combinations use sysex control</pre>
NRPN Data Plus	\$60 (96)		Not Supported
NRPN Data Minus	\$61 (97)		Not Supported
NRPN Data LSB	\$62 (98)		Not Supported
NRPN Data MSB	\$63 (99)		Not Supported
RPN Data LSB	\$64 (100)		Not Supported
RPN Data MSB	\$65 (101)		Not Supported
Voice Mode Reassign	\$66 (102)	\$уу	yy = \$00-\$3f (0-63) \$40-\$7f (64-127) Reassign Voice if Possible
Voice Mode Steal Option	\$67 (103)	\$ <sub>УУ</sub>	<pre>yy = \$00-\$0f(0-15) Steal Oldest \$10-\$1f(16-31) Steal Newest \$20-\$2f(32-47) Steal Highest \$30-\$3f(48-63) Steal Lowest \$40-\$4f(64-79) Steal Quietest \$50-\$7f(80-127) Do Not Steal</pre>
Voice Mode Envelopes	\$68 (104)	\$уу	yy = \$00-\$3f (0-63) Staccato \$40-\$7f (64-127) Legato
Start/Stop Arp	\$69 (105)	\$уу	yy = \$00-\$3f (0-63) Arp Stopped \$40-\$7f (64-127) Arp Playing
Start/Stop Seq	\$6a (106)	\$уу	yy = \$00-\$3f (0-63) Seq Stopped \$40-\$7f (64-127) Seq Playing
Mix ENV Source	\$6b (107)	\$уу	<pre>yy = \$00-\$0f (0-15) ENV 1 Normal \$10-\$1f (16-31) ENV 1 Inverted \$20-\$2f (32-47) ENV 2 Normal \$30-\$3f (48-63) ENV 2 Inverted \$40-\$4f (64-79) ENV 3 Normal \$50-\$7f (80-127) ENV 3 Inverted</pre>
Program Change	\$77 (119)	\$уу	yy = \$00-\$7f (0-127) Program Number Note - this is only here because the BCR2000 is not able to step programs using two buttons
All Sound off	\$78 (120)		Stops all output immediately
All Notes off	\$7b (123)		Stops all output immediately

Real Time Commands				
Midi Clock	\$f8 (248)	Midi Timing Clock		
Start	\$fa (250)	Start Arp/Sequence Play		
Stop	\$fc (252)	Stop Arp/Sequence Play		
Continue	\$fb (251)	Continue Arp/Sequence Play		



## Midi Sysex Support

Function	Transmitted	Recognized	Notes
Basic ID	1-16	1-16	Set using Device ID in Global Variable
Load	0	0	
Dump	0	0	

Function				
Device Enquiry	\$F0 \$7E <mid< td=""><td colspan="3">7E <midi channel=""> \$06 \$01 \$F7</midi></td></mid<>	7E <midi channel=""> \$06 \$01 \$F7</midi>		
Device Enquiry Response	\$F0	Sysex Start		
	\$7F	Non Real time reply		
	xx	Midi Channel (0-15)		
	\$06	Enquiry Message		
	\$02	Enquiry Reply		
	\$00 \$21 \$16	Kiwitechnics ID		
	\$60	Kiwitechnics Family ID		
	\$04	Product Family ID (Kiwi-8P)		
	\$00	Product ID		
	xx	Major Program Version Byte		
	xx	Minor Program Version Byte		
	xx	Major BootLoader Version Byte		
	xx	Minor BootLoader Version Byte		
	XX	Build Number		
	XX	Device ID (Global Parameter)		
	\$F7	End of Sysex		

Midi Sysex Data				
		Notes \$nn = Hexadecimal Data - Decimal data is in Brackets e.g. \$0a (10)		
Sysex Header	\$f0	Sysex Start		
	\$00 \$21 \$16	Kiwitechnics Manufacturers ID		
	\$60	Kiwitechnics Family ID		
	\$04	Kiwitechnics JX-8P ID		
	nn	Device ID (\$00-\$0f) (JX-8P Device ID 1-16)		
	XX	Command ID (see table 1.0) \$01 = Request Global Dump \$02 = Transmit/Receive Global Dump \$03 = Request Tone Edit Buffer Dump \$04 = Transmit/Receive Tone Edit Buffer Dump \$05 = Request Tone Dump \$06 = Transmit/Receive Tone Dump \$06 = Transmit/Receive Seq Dump \$09 = Request Seq Dump \$04 = Request Tone Parameter \$04 = Request Tone Parameter \$05 = Transmit/Receive Tone Parameter \$05 = Request Global Parameter \$06 = Transmit/Receive Global Parameter \$10 = Transmit/Receive Global Parameter \$13 = Request Sequence Edit Buffer Dump \$14 = Transmit/Receive Sequence Edit Buffer Dump		
	Data	Depending on command type (see table 1.0)		
	\$f7	Sysex Footer		

WARNING! Sysex dumps have the ability to put non valid settings into memory and few checks are made for validity. If the JX-8P becomes unusable due to non valid data you may need to do a full restore of the JX-8P which will lose all saved memory.

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 0	Data Details	
\$01 (1) Request Global Dump	No Data		JX-8P transmits a \$02 (2) command	
\$02 (2) Transmit or Receive Global Dump 48 data bytes	\$00 (0) = Midi Channel In	000yxxxx	xxxx = 0-15 for midi channel 1-16 y = set for Omni	
	\$01 (1) = Midi Channel Out	0000xxxx	xxxx = 0-15 for midi channel 1-16	
	\$02 (2) = Seq Midi Channel Out	0000xxxx	xxxx = 0-15 for midi channel 1-16	
	\$03 (3) = Device ID	0000xxxx	xxxx = 0-15 for ID 1-16	
	\$04 (4) = Enable MidiCC	000000xx	<pre>xx = 00=Off 01=CC Receive Enabled (Default) 02=CC Transmit Enabled 03=CC Receive &amp; Transmit Enabled Note - Mod Wheel CC will always send</pre>	
	\$05 (5) = Enable Sysex	0000000x	x = Off/On (set=On)	
	<pre>\$06 (6) = Enable Program Change</pre>	000000xx	<pre>xx = 00=None 01=PC Receive Enabled (Default) 02=PC Transmit Enabled 03=PC Receive &amp; Transmit Enabled</pre>	
	\$07 (7) = Midi Soft Through	00000xx	<pre>xx = 00=Stop all 01=Pass all 10=Pass only nonCC 11=Stop only CC we have used Note - Midi real time (&gt;\$F8) will always pass Note - SysEx intended for the JX-8P will not be passed Note - Active Sensing commands are suppressed within the 8P and are not passed on</pre>	
	\$08 (8) = Enable Midi Clock Gen	0000000x	x = Off/On (set=On)	
	\$09 (9) = Master Clock Source	0000000x	x= 0-Internal 1-Midi	

0000xxxx

0000уууу

\$0a (10) = Int Clock RateHi

\$0b (11) = Int Clock RateLo

This byte is sent as two nibbles which are combined to

This byte is sent as two nibbles which are combined to

make single 8 bit command. 0000xxxx + 0000yyyy = xxxxyyyy

make single 8 bit command. 0000xxxx + 0000yyyy = xxxxyyyy

0-255 = 5-300 BPM

0-255 = 5-300 BPM

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 0	Data Details
	\$0c (12) = MW Midi Level	0*****	x = Range $00-7f$ (0-127) This parameter only effects the MW Level that is sent to Midi. For Tone MW Level use the parameter in the Tone
	\$0d (13) = Reserved	0	Not currently Used
	<pre>\$0e (14) = Memory Protect</pre>	000000z	z = Memory Protect - 0=Protected 1=Not Protected Note - This is read only and can only be changed by the Memory Protect Switch on the rear of the JX-8P
	\$0f (15) = Master Fine Tune	0xxxxxx	x = Master Fine Tune (+- 100 cents)
	\$10 (16) = AT Multiplication	000000xx	xx = 00=none,01=x2,10=x4,11=x8
	\$11 (17) = Reserved	0	Not currently Used
	\$12 (18) = Hold Pedal	000000x	<pre>x = 0 = Normally Open Pedal 1 = Normally Closed Pedal</pre>
	\$13-\$1f (19-31) = Nulls		Not currently Used

\$03 (3) Request Tone Edit Buffer Dump	\$00 (0) - Voice #	00000yx	x = y =	Lower Board (set to select) Always 1 in the 8P Reserved. Always 0 in the 8P
	2 x Null			

\$04 (4) Transmit/Receive Tone Edit Buffer Dump Voice # + Null x 2 + 128 data bytes	\$00 (0) - Voice #	000000yx	<pre>x = Lower Board (set to select) Always 1 in the 8P y = Reserved. Always 0 in the 8P</pre>
	\$01-\$02 (1-2) - 2 x Null + 128 bytes data		2 x null bytes sent followed by 128 bytes of data in the following format
	\$00-\$13 (0-19) = Tone Name	Ascii Bytes	Tone Name
	\$14 (20)=DCO1 Wave/Range	0000zzxx	<pre>xx = DCO1 Range 00=16' 01=8' 10=4' 11=2' zz = DCO1 Wave 00=Saw 01=Pulse 10=Square 11=Noise</pre>
	\$15 (21)=DCO1 Coarse Tune	0xxxxxxx	$x=0-48 = -12 \rightarrow + 12$ notes in half semitone steps
	\$16 (22)=DCO1 LFO Amount	0xxxxxxx	x = Range \$00-\$7f (0-127)

	JJ
ta Details	
= Range \$00-\$/I (0-12/)	
= Range \$00-\$7f (0-127)	
<pre>= DCO1Env(00=Env1,01=Env2,10=Env3) = DC01LFO(00=LF01,01=LF02,10=LF03)</pre>	
<pre>DCO1Env Pol(0=Norm,1=Inverted)</pre>	
<pre>= DCO1LFO Pol(0=Norm,1=Inverted)</pre>	

\$18 (24)=DCO1 DYN Amount	0xxxxxx	x = Range \$00-\$7f (0-127)
\$19 (25)=DCO1 Control	00wxyyzz	<pre>zz = DCO1Env(00=Env1,01=Env2,10=Env3) yy = DCO1LFO(00=LFO1,01=LFO2,10=LFO3) x = DCO1Env Pol(0=Norm,1=Inverted) w = DCO1LFO Pol(0=Norm,1=Inverted)</pre>
\$1a (26)=DCO2 Wave/Range/XMod	00xxyyzz	<pre>zz = DC02 Range</pre>
\$1b (27)=DCO2 Coarse Tune	0xxxxxx	$x=0-48 = -12 \rightarrow + 12$ notes in half semitone steps
\$1c (28)=DCO2 Fine Tune	0xxxxxx	<pre>x=0-127 +- 50 Cents and zero 0-63 is shifted down 64 is not shifted 65-127 is shifted up</pre>
\$1d (29)=DCO2 LFO Amount	0xxxxxxx	x = Range \$00-\$7f (0-127)
\$1e (30)=DCO2 ENV Amount	0xxxxxx	x = Range \$00-\$7f (0-127)
\$1f (31)=DCO2 DYN Amount	0xxxxxx	x = Range \$00-\$7f (0-127)
\$20 (32)=DCO2 Control	00wxyyzz	<pre>zz = DC02Env(00=Env1,01=Env2,10=Env3) yy = DC02LF0(00=LF01,01=LF02,10=LF03) x = DC02Env Pol(0=Norm,1=Inverted) w = DC02LF0 Pol(0=Norm,1=Inverted)</pre>
\$21 (33) = Voice Detune Amount	0xxxxxx	x = Range \$00-\$7f (0-127)
\$22 (34)=DCO1 Mix Amount	0xxxxxx	x = Range \$00-\$7f (0-127)
\$23 (35)=DCO2 Mix Amount	0xxxxxx	x = Range \$00-\$7f (0-127)
\$24 (36)=DCO2 MIX DYN Amount	0xxxxxx	x = Range \$00-\$7f (0-127)
\$25 (37)=DCO2 MIX Env Amount	0xxxxxx	x = Range \$00-\$7f (0-127)

Da

x

Data Type Byte details 7 ----- 0

0xxxxxxx

Data Byte

\$17 (23)=DCO1 ENV Amount

Table 1.0 Command ID

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 0	Data Details
	\$27 (39)=HPF Level	000000xx	xx = 0-3
	\$28 (40)=VCF Cutoff Hi	000xxxxx	
	\$29 (41)=VCF Cutoff Lo	ΟΥΥΥΥΥΥΥ	Hi & Lo are combined to make single 12 bit command. 000xxxxx + 0yyyyyyy = 0000xxxx xyyyyyyy x = Range \$0-\$fff (0-4095)
	\$2a (42)=VCF Resonance Hi	000xxxxx	
	\$2b (43)=VCF Resonance Lo	Оууууууу	Hi & Lo are combined to make single 12 bit command. 000xxxxx + 0yyyyyyy = 0000xxxx xyyyyyyy x = Range \$0-\$fff (0-4095)
	\$2c (44)=VCF LFO Amount	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$2d (45)=VCF ENV Amount	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$2e (46)=VCF KEY Amount	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$2f (47)=VCF DYN Amount	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$30 (48)=VCF Control	00wxyyzz	<pre>zz = VCFEnv(00=Env1,01=Env2,10=Env3) yy = VCFLFO(00=LF01,01=LF02,10=LF03) x = VCFEnv Pol(0=Norm,1=Inverted) w = VCFLFO Pol(0=Norm,1=Inverted)</pre>
	\$31 (49)=VCA Level	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$32 (50)=VCA LFO Amount	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$33 (51)=VCA Control	OwOyyzzz	<pre>zzz = VCAENV(000=Gate, 001=Env1,010=Env2,011=Env3) yy = VCALFO(00=LF01,01=LF02,10=LF03) w = VCALFO Pol(0=Norm,1=Inverted)</pre>
	\$34 (52)=VCA DYN Amount	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$35 (53)=Matrix 1 Source	000xxxxx	x = 0-32 - See Table 1
	\$36 (54)=Matrix 1 Control	000xxxxx	x = 0-35 - See Table 2
	\$37 (55)=Matrix 1 Level	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$38 (56)=Matrix 1 Destination	000xxxxx	x = 0-25 - See Table 3
	\$39 (57)=Matrix 2 Source	000xxxxx	x = 0-32 - See Table 1
	\$3a (58)=Matrix 2 Control	000xxxxx	x = 0-35 - See Table 2
	\$3b (59)=Matrix 2 Level	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$3c (60)=Matrix 2 Destination	000xxxxx	x = 0-25 - See Table 3
	\$3d (61)=Matrix 3 Source	000xxxxx	x = 0-32 - See Table 1
	\$3e (62)=Matrix 3 Control	000xxxxx	x = 0-35 - See Table 2
	\$3f (63)=Matrix 3 Level	0xxxxxxx	x = Range \$00-\$7f (0-127)

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 0	Data Details
	\$40 (64) - Matrix 3 Destination	000	x = 0 = 25 = See mable 3
	\$41 (65) = Matrix 4 Source	000,,,,,,,	x = 0.23 See Table 3
	S41 (65)-Matrix 4 Source	000xxxxx	x = 0.25 See Table 1
	\$42 (66) - Matrix 4 Control	0	$x = 0^{-53} - 520$ (2.127)
	\$43 (67)=Matrix 4 Level		x = Range = 500 - 5/1 (0 - 12/)
	\$44 (68)=Matrix 4 Destination	000xxxxx	x = 0-25 - See Table 3
	\$45 (69)=Matrix 5 Source	000xxxxx	x = 0-32 - See Table 1
	\$46 (70)=Matrix 5 Control	000xxxxx	x = 0-35 - See Table 2
	\$47 (71)=Matrix 5 Level	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$48 (72)=Matrix 5 Destination	000xxxxx	x = 0-25 - See Table 3
	\$49 (73)=Matrix 6 Source	000xxxxx	x = 0-32 - See Table 1
	\$4a (74)=Matrix 6 Control	000xxxxx	x = 0-35 - See Table 2
	\$4b (75)=Matrix 6 Level	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$4c (76)=Matrix 6 Destination	000xxxxx	x = 0-25 - See Table 3
	\$4d (77)=ENV1 Attack	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$4e (78)=ENV1 Decay	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$4f (79)=ENV1 Sustain	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$50 (80)=ENV1 Release	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$51 (81)=ENV1 Key	0xxxxxxx	x = Range \$00-\$7f (0-127) - Note - Currently disabled
	\$52 (82)=ENV2 Attack	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$53 (83)=ENV2 Decay	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$54 (84)=ENV2 Sustain	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$55 (85)=ENV2 Release	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$56 (86)=ENV2 Key	0xxxxxxx	x = Range \$00-\$7f (0-127) - Note - Currently disabled
	\$57 (87)=ENV3 Attack	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$58 (88)=ENV3 Decay	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$59 (89)=ENV3 Sustain	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$5a (90)=ENV3 Release	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$5b (91)=ENV3 Key	0xxxxxxx	x = Range \$00-\$7f (0-127) - Note - Currently disabled

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 0	Data Details
	\$5c (92)=LFO 1 Wave	00000xxx	<pre>xxx = 000=Sine 001=Triangle 010=Square 011=Saw 100=Reverse Saw 101=Random</pre>
	\$5d (93)=LFO 1 Rate	0xxxxxx	x = Range \$00-\$7f (0-127)
	\$5e (94)=LFO 1 Delay	0xxxxxx	x = Range \$00-\$7f (0-127)
	\$5f (95)=LFO1Control	00xxxxy	<pre>y = 0=Mode (0=Normal,1=Plus) xxxxx 00000-Free Running 00001-Sync Two Notes (192 Clocks/Step) 00010-Sync Dotted Whole Note (144 Clocks/Step) 00010-Sync Dotted Half Note (144 Clocks/Step) 00100-Sync Dotted Half Note (72 Clocks/Step) 00101-Sync Half Note (48 Clocks/Step) 00110-Sync Dotted 1/4 Note (36 Clocks/Step) 00111-Sync Quarter note (24 Clocks/Step) 01000-Sync Dotted 1/8 Note (18 Clocks/Step) 01001-Sync 1/4 Note Triplets (16 Clocks/Step) 01010-Sync 8th note (12 Clocks/Step) 01010-Sync 16th note triplets (8 Clocks/Step) 01100-Sync 16th note triplets (4 Clocks/Step) 01101-Sync 32nd note triplets (2 Clocks/Step) 01111-Sync 32nd note triplets (1 Clocks/Step) 01111-Sync 64th note triplets (1 Clocks/Step) 10000-Sync 64th note triplets (1 Clocks/Step)</pre>
	\$60 (96)=LFO 2 Wave	000000xxx	<pre>xxx = 000=Sine 001=Triangle 010=Square 011=Saw 100=Reverse Saw 101=Random</pre>
	\$61 (97)=LFO 2 Rate	0xxxxxx	x = Range \$00-\$7f (0-127)
	\$62 (98)=LFO 2 Delay	0xxxxxx	x = Range \$00-\$7f (0-127)

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 0	Data Details
	\$63 (99)=LFO 2 Control	00xxxxy	<pre>y = 0=Mode (0=Normal,1=Plus) xxxx= 00000-Free Running 00001-Sync Two Notes (192 Clocks/Step) 00010-Sync Dotted Whole Note (144 Clocks/Step) 00011-Sync Whole Note (96 Clocks/Step) 00100-Sync Dotted Half Note (72 Clocks/Step) 00101-Sync Dotted 1/4 Note (72 Clocks/Step) 00110-Sync Dotted 1/4 Note (36 Clocks/Step) 00111-Sync Quarter note (24 Clocks/Step) 01000-Sync Dotted 1/8 Note (18 Clocks/Step) 01001-Sync 1/4 Note Triplets (16 Clocks/Step) 01001-Sync 8th note (12 Clocks/Step) 01011-Sync 8th note triplets (8 Clocks/Step) 01001-Sync 16th note triplets (4 Clocks/Step) 01100-Sync 16th note triplets (4 Clocks/Step) 01101-Sync 32nd note (3 Clocks/Step) 01111-Sync 32nd note triplets (2 Clocks/Step) 10000-Sync 64th note triplets (1 Clocks/Step) Sync source is Master Clock</pre>
	\$64 (100)=LFO 3 Wave	000000xxx	<pre>xxx = 000=Sine 001=Triangle 010=Square 011=Saw 100=Reverse Saw 101=Random</pre>
	\$65 (101)=LFO 3 Rate	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$66 (102)=LFO 3 Delay	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$67 (103)=LFO 3 Control	00xxxxy	<pre>y = 0=Mode (0=Normal,1=Plus) xxxx= 00000-Free Running 00001-Sync Two Notes (192 Clocks/Step) 00010-Sync Dotted Whole Note (144 Clocks/Step) 00010-Sync Dotted Half Note (144 Clocks/Step) 00100-Sync Dotted Half Note (72 Clocks/Step) 00101-Sync Half Note (48 Clocks/Step) 00110-Sync Dotted 1/4 Note (36 Clocks/Step) 00111-Sync Quarter note (24 Clocks/Step) 01000-Sync Dotted 1/8 Note (18 Clocks/Step) 01001-Sync 1/4 Note Triplets (16 Clocks/Step) 01001-Sync 8th note (12 Clocks/Step) 01010-Sync 8th note (12 Clocks/Step) 01011-Sync 8th note triplets (8 Clocks/Step) 01010-Sync 16th note (6 Clocks/Step) 01101-Sync 16th note triplets (4 Clocks/Step) 01101-Sync 32nd note triplets (2 Clocks/Step) 01111-Sync 32nd note triplets (1 Clocks/Step) 10000-Sync 64th note triplets (1 Clocks/Step) Sync source is Master Clock</pre>

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 0	Data Details
	\$68 (104)=Chorus Control	000000xx	xx = 00=off 01=Type 1 10=type 2
	\$69 (105)=Portamento Rate	0xxxxxxx	x = Range \$00-\$7f (0-127)
	\$6a (106)=Load Sequence	000xxxxx	Seq number to load (1-8) - 0 is do not load Seq
	\$6b (107)=Voice Mode 1	000wxyyy	<pre>yyy = 000=Poly Single (1 voice/note - max 6 notes) 001=Poly Dual (2 voices/note - max 3 notes) 010=Poly Triple (3 voices/note - max 2 notes) 011=Not Used 100=Unison 101=Solo x = 0 = Rotate Voice allocation 1 = Reassign Voice if possible w = 0 = Staccato - Envs restarted for each note 1 = Legato - Envs restarted only if all notes off</pre>
	\$6c (108)=Voice Mode 2	00000333	<pre>yyy = 000=Steal Oldest Voice 001=Steal Newest Voice 010=Steal Highest Voice 011=Steal Lowest Voice 100=Steal Quietest Voice 101=Steal Off (7<sup>th</sup> note ignored)</pre>
	\$6d (109)=Arp Control	00yyy0zz	zz = 00=10ct,01=20ct,10=30ct yyy = 000=Up,001=Dn,010=U/D,011=Rndm,100=As Played
	\$6e (110)=AT Control	00000xyz	$ \begin{array}{llllllllllllllllllllllllllllllllllll$
	\$6f (111)=MW Control	00000xyz	z = DCO LFO (1=on) y = VCF Cutoff (1=on) x = VCA Level (1=on)
	\$70 (112)=MW Tone Level	0xxxxxx	<pre>x = Range \$00-\$7f (0-127) Note - this effect the MW level in the Tone only. The MW Midi level is set with the Global Parameter</pre>
	\$71 (113)=Midi Control	0000w0yz	<pre>z = Arp Enable (1=Enabled) y = Sequence Enable (1=Enabled) w = Hold Enabled (1=Hold On)</pre>
	\$72 (114)=Patch Clock TempoHi	0000xxxx	If this is nonzero it will replace the internal Clock speed with this temporary value. If this value is zero the internal clock will remain unchanged. 0-255 = 5-300 BPM This byte is sent as two nibbles which are combined to make single 8 bit command internally. 0000xxxx + 0000yyyy = xxxxyyyy

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 0	Data Details
	\$73 (115)=Patch Clock TempoLo	0000уууу	
	\$74 (116)=ArpClockDivide	0000xxxx	<pre>xxxx= 0000-Half Note (48 Clocks/Step) 0001-Quarter note (24 Clocks/Step) 0010-8th note (12 Clocks/Step) 0011-8th note, half swing (14,10 Clocks/Step) 0100-8th note, full swing (16,8 Clocks/Step) 0101-8th note triplets (8 Clocks/Step) 0110-16th note (6 Clocks/Step) 0111-16th note, half swing (7,5 Clocks/Step) 1000-16th note, full swing (8,4 Clocks/Step) 1001-16th note triplets (4 Clocks/Step) 1010-32nd note (3 Clocks/Step) 1011-32nd note triplets (2 Clocks/Step) 1100-64th note triplets (1 Clocks/Step)</pre>
	\$75 (117)=SeqClockDivide	0000xxxx	<pre>xxxx= 0000-Half Note (48 Clocks/Step) 0001-Quarter note (24 Clocks/Step) 0010-8th note (12 Clocks/Step) 0011-8th note, half swing (14,10 Clocks/Step) 0100-8th note, full swing (16,8 Clocks/Step) 0101-8th note triplets (8 Clocks/Step) 0110-16th note (6 Clocks/Step) 0111-16th note, half swing (7,5 Clocks/Step) 1000-16th note, full swing (8,4 Clocks/Step) 1001-16th note triplets (4 Clocks/Step) 1010-32nd note triplets (2 Clocks/Step) 1011-32nd note triplets (1 Clocks/Step) 1100-64th note triplets (1 Clocks/Step)</pre>
	\$76 (118) Bend Range	000000xx	<pre>xx = 00 - 2 Semitones 01 - 5 Semitones 10 - 7 Semitones 11 - 12 Semitones</pre>
	\$77 (119) Not Used	0	
	\$78 (120) Not Used	0	
	\$79 (121) Analog Feel Level	0xxxxxx	x = Range \$00-\$7f (0-127)
	\$7a (122) Quick Edit Param	0xxxxxx	<pre>X = Range \$00-\$7b (0-123) Note \$29 &amp; \$2b are not valid. To edit VCF Cutoff or VCF Resonance use \$28 or \$2a</pre>
	\$7b-\$7f (123-127)	Reserved	Set to \$00
\$05 (5) Request Tone Dump Voice # + Bank + Tone	\$00 (0) - Voice #	000000ух	<pre>x = Lower Board (set to select) Always 1 in the 8P y = Reserved. Always 0 in the 8P</pre>

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 0	Data Details
WARNING! This command will overwrite the current sounding Tone with the Tone selected	\$01 (1) - Bank Number	000000xx	xx = 0 for Tones 1-128 1 for Tones 129-256
	\$02 (2) - Tone Number	0xxxxxx	x = 0-127 JX-8P transmits a \$06 (6) command
\$06 (6) Transmit/Receive Tone Dump Voice # + Bank + Tone + 256 data bytes	\$00 (0) - Voice #	000000yx	<pre>x = Lower Board (set to select) Always 1 in the 8P y = Reserved. Always 0 in the 8P</pre>
WARNING! This command will overwrite the current sounding Tone with the Tone selected	\$01 (1) - Bank Number	000000xx	xx = 0 for Tones 1-128 1 for Tones 129-256
	\$02 (2) - Tone Number	0xxxxxx	x = 0-127 for Tone 1-128 JX-8P transmits data in the same format as the \$04 Command
\$09 (9) Request Seq Dump Voice Number + Seg Number	\$00 (0) - Voice #	000000yx	<pre>x = Lower Board (set to select) Always 1 in the 8P y = Reserved. Always 0 in the 8P</pre>
WARNING! This command will overwrite the current sounding Seq with the Seq selected	\$01 (1) - Sequence Number	000xxxxx	x = 0-7 for Sequence 1-8 JX-8P transmits a $0^{0}$ (10) command with 1659 data bytes
<pre>\$0a (10)Transmit / Receive Seq Dump</pre>	\$00 (0) - Voice #	000000yx	<pre>x = Lower Board (set to select) Always 1 in the 8P y = Reserved. Always 0 in the 8P</pre>
WARNING! This command will overwrite the current sounding Seq with the Seq selected	\$01 (1) - Sequence Number	000xxxxx	x = 0-7 for Sequence 1-8 JX-8P transmits a \$0a (10) command with 1659 data bytes
	\$00-\$13 (0-19) = Seq Name	20 Ascii Bytes	Sequence Name
	\$14 (20) = Seq Length	0xxxxxx	x = 0 = No Seq Recorded 1-124 = No of Seq Steps for seq 0-7
	\$15-\$2e (21-46) = Reserved		26 bytes Reserved for future expansion

Data Byte	Data Type Byte details 7 0	Data Details
\$2f-\$67b (47-1659) = Seq Steps	124 x 13 (1612) Note 1 0xxxxxx Note 2 0xxxxxx Note 3 0xxxxxx Note 4 0xxxxxx Note 5 0xxxxxx Note 6 0xxxxxx Byte 7 00abcdef Byte 8 0xxxxxx Byte 9 0xxxxxx Byte 9 0xxxxxx Byte 10 0xxxxxxx Byte 11 0xxxxxxx Byte 12 0xxxxxxx Byte 13 0xxxxxxx	<pre>Step is 13 bytes Byte 1-6 xxxxxx = note number (32-96) Note Bytes are \$00 (0) if not used Byte 7 a-f is tie bits 1-6 (set if tie set) Byte 8-13 xxxxxx = voice 1-6 Level (0-127) Seq 0-7 can have a maximum of 124 steps</pre>
\$00 (0) - Voice #	000000yx	<pre>x = Lower Board (set to select) Always 1 in the 8P y = Reserved. Always 0 in the 8P</pre>
\$01 (1) - Tone Parameter Number Data format the same as \$04 Parameter Number is Data Posn	0xxxxxx	<pre>x = Data Offset Use Data Position for Parameter Number e.g. \$28=VCFCutoffHi JX-8P transmits a \$0e (14) command</pre>
\$00 (0) - Voice #	000000yx	<pre>x = Lower Board (set to select) Always 1 in the 8P y = Reserved. Always 0 in the 8P</pre>
<pre>\$01 (1) - Tone Parameter Number Data format the same as \$04 Parameter Number is Data Posn</pre>	0xxxxxx	<pre>x = Data Offset Use Data Position for Parameter Number e.g. \$28=VCFCutoffHi JX-8P transmits a \$0e (14) command</pre>
\$03 (3) - Parameter Value (Hi)	000xxxxx	Data format depends on Parameter Data format the same as \$04 Note - This byte is \$00 for all non 12 bit parameters
\$04 (4) - Parameter Value (Lo)	Оууууууу	Hi & Lo are combined to make single 12 bit command. 000xxxxx + 0yyyyyyy = 0000xxxx xyyyyyyy
	Data Byte \$2f-\$67b (47-1659) = Seq Steps \$00 (0) - Voice # \$00 (1) - Tone Parameter Number Data format the same as \$04 Parameter Number is Data Posn \$00 (0) - Voice # \$00 (0) - Voice # \$00 (0) - Voice # \$01 (1) - Tone Parameter Number Data format the same as \$04 Parameter Number is Data Posn \$03 (3) - Parameter Value (Hi) \$04 (4) - Parameter Value (Lo)	Data ByteData Type Byte details 7 0\$2f-\$67b (47-1659) = Seq Steps124 x 13 (1612) Note 1 0xxxxxx Note 1 0xxxxxx Note 2 0xxxxxxx Note 3 0xxxxxx Note 4 0xxxxxxx Note 6 0xxxxxxx Byte 7 00abcdef Byte 8 0xxxxxxx Byte 10 0xxxxxxx Byte 10 0xxxxxxx Byte 10 0xxxxxxx Byte 11 0xxxxxxx Byte 12 0xxxxxxx Byte 13 0xxxxxxx Byte 13 0xxxxxxx\$00 (0) - Voice #0000000yx\$01 (1) - Tone Parameter Number Data format the same as \$04 Parameter Number is Data Posn0xxxxxxx\$00 (0) - Voice #0000000yx\$01 (1) - Tone Parameter Number Data format the same as \$04 Parameter Number is Data Posn0xxxxxxx\$03 (3) - Parameter Value (Hi)000xxxxx\$04 (4) - Parameter Value (Lo)0yyyyyy

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 0	Data Details
\$0f (15) Request Global Parameter Global Param Number	\$00 (0) - Global Parameter Number	000xxxxx	<pre>x = Data Offset Use Data Position for Parameter Number Data format the same as \$02 e.g. \$00 (0) = Midi Channel In Note - reply will be 2 data bytes for all 12 bit returns and 2 bytes with a leading \$00 for all others</pre>
\$10 (16) Transmit / Receive Global Parameter Global Param Number + 2 data bytes	\$00 (0) - Global Parameter Number	000xxxxx	<pre>x = Data Offset Use Data Position for Parameter Number Data format the same as \$02 e.g. \$00 (0) = Midi Channel In</pre>
	\$01 (1) - Parameter Value (Hi)	000xxxxx	Data format depends on Parameter Data format the same as \$04 Note - This byte is \$00 for all non 12 bit parameters
	\$02 (2) - Parameter Value (Lo)	0	Hi & Lo are combined to make single 12 bit command. 000xxxxx + 0yyyyyyy = 0000xxxx xyyyyyyy
\$13 (19) Request Sequence Edit Buffer Dump	\$00 (0) - Voice #	000000yx	<pre>x = Lower Board (set to select) Always 1 in the 8P y = Reserved. Always 0 in the 8P</pre>
			JX-8P transmits a \$14 (20) command
\$14 (20) Transmit/Receive Sequence Edit Buffer Dump Voice Number + Null + 1659 data bytes	\$00 (0) - Voice #	000000yx	<pre>x = Lower Board (set to select) Always 1 in the 8P y = Reserved. Always 0 in the 8P</pre>
	\$01 (1) - Null		
	1659 bytes Data		Data Format is the same is \$0a (10) Command (with 0 Sequence Number)
## Table 2

Matrix	x Source Types	Ma	trix Level Mod Types	Ma	atrix	Destinations
0	Off	0	Fixed Amount	0		Off
1	Bend Up	1	Fixed Amount (Inverted)	1		DCO1 Freq
2	Bend Down	2	Bend Up	2		DCO2 Freq
3	Bend Full	3	Bend Up (Inverted)	3		All DCO Freq
4	Mod Wheel	4	Bend Down	4		DCO1 Wave
5	Edit Slider	5	Bend Down (Inverted)	5		DCO1 Range
6	Key Velocity	6	Bend Full	6		DCO2 Wave
7	Key Note	7	Bend Full (Inverted)	7		DCO2 Range
8	LFO1 (bipolar)	8	Mod Wheel	8		Detune amount
9	LFO1 (unipolar)	9	Mod Wheel (Inverted)	9		DCO1 Mix (all voices only)
10	LFO2 (bipolar)	10	Edit Slider	10	)	DCO2 Mix (can do/voice)
11	LFO2 (unipolar)	11	Edit Slider (Inverted)	11		VCF Cutoff
12	LFO3 (bipolar)	12	After Touch	12	2	VCF Resonance
13	LFO3 (unipolar)	13	After Touch (Inverted)	13	3	HPF (0-3 only)
14	ENV1	14	MidiCC#1	14	ł	VCA Level
15	ENV2	15	MidiCC#1 (Inverted)	15	5	Portamento Rate
16	ENV3	16	MidiCC#2	16	3	LFO1 Rate
17	MidiCC#1	17	MidiCC#2 (Inverted)	17	7	LFO2 Rate
18	MidiCC#2	18	MidiCC#3	18	3	LFO3 Rate
19	MidiCC#3	19	MidiCC#3 (Inverted)	19	)	ENV1 Rate
20	MidiCC#4	20	MidiCC#4	20	)	ENV2 Rate
21	MidiCC#5	21	MidiCC#4 (Inverted)	21	l	ENV3 Rate
22	MidiCC#6	22	MidiCC#5			
23	MidiCC#7	23	MidiCC#5 (Inverted)			
24	MidiCC#8	24	MidiCC#6			
25	After Touch	25	MidiCC#6 (Inverted)			
26	Seq Track 1 Output	26	MidiCC#7			
27	Seq Track 2 Output	27	MidiCC#7 (Inverted)			
28	Seq Track 3 Output	28	MidiCC#8			
29	Seq Track 4 Output	29	MidiCC#8 (Inverted)			
30	Seq Track 5 Output	30	Seq Track 1			
31	Seq Track 6 Output	31	Seq Track 2			
32	Bend LFO Switch (Off/Full only)	32	Seq Track 3			
		33	Seq Track 4			
		34	Seq Track 5			
		35	Seq Track 6			