Roland KIWI-3P Matrix

KIWITECHNICS UPGRADE

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Kiwi-3P Matrix Features

- 1024 Tones & 8 Sequences can be stored and edited, Sequences can be optionally linked to tones. It is also possible to temporarily edit any Tone or Seq
- Tones are stored in Flash memory so no battery is required.
- Pulse Width Module is included with the Kiwi3P Matrix. This allows Pulse Width control and wave combinations.
- Saw, Pulse Width & Square Waveforms can be solo or mixed in any combination.
- Sysex support for all and MidiCC for most parameters, Midi Sysex support for Tone Dump & Load
- Patch Editor Control of Parameters (requires PE v 8.3 or later)
- Full Matrix system with 29 Source and 40 Destination types.
- 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 key modes
- Note Detune available in all key modes, DCO 1 & 2 have separate Tune controls (±12 semitones) and DCO2 has a Fine Tune (±50 cents). There is also an Analogue Feel parameter that adds a small random detune to notes.
- Master Synth Fine Tune adjust in both hardware and software.
- Three independent envelope generators. These are traditional ADSR type and are modeled on the Original JX-3P. Each ENV Mod can select from ENV 1 - 3 and has an Inverted or Normal modes. These are faster than the traditional JX-3P 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.
- Midi Note Aftertouch (Channel & Note), Midi and Internal Modulation Level and Midi Note Dynamics are all Matrix sources and can be sent any Matrix Destination.
- LFO Button is a Matrix Source and can inject mod control to any matrix destination(s)
- Bend Lever is coded to DCO Frequency for Bend but is also a Matrix Source which can be sent to any Destination
- Front panel editing is available for all parameters. These can be edited via midi or the PG-200.
- Master, Sequencer and Arpeggiator clocks can optionally display on the front panel
- Key transpose allows transposition to any key. The range for this is -1 Octave to +2 Octaves
- Chorus has Manual Mode & variable speed

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

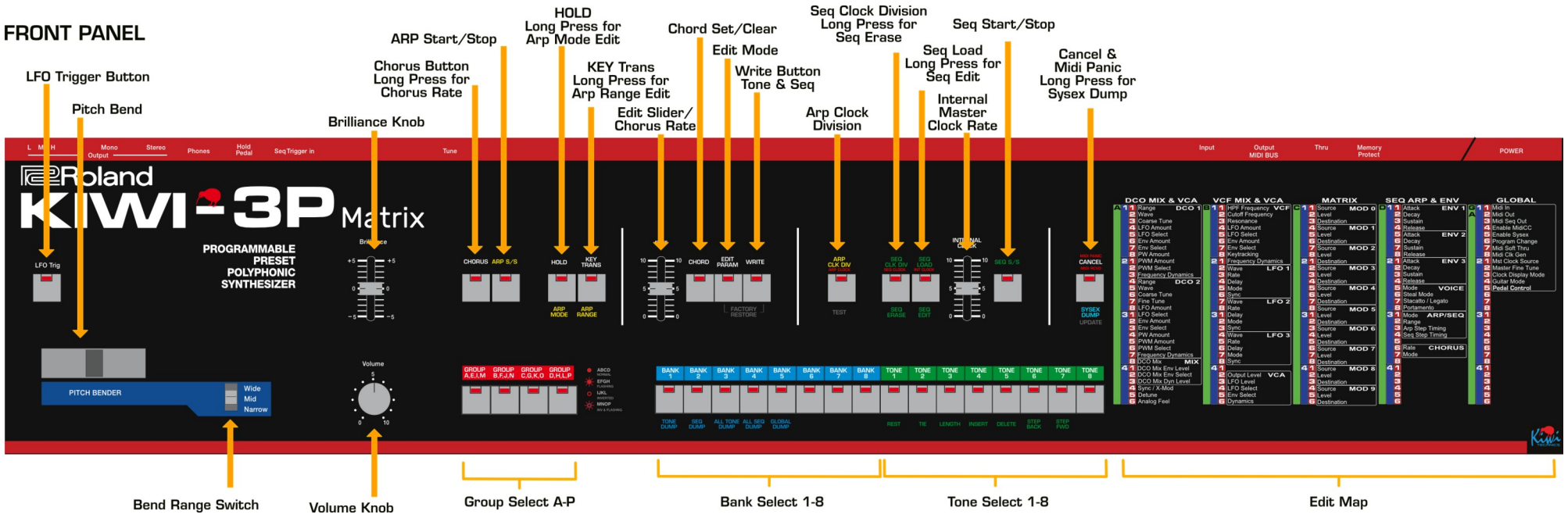
SEQUENCER

- 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 can be Started, Stopped & Continued using Midi Commands
- Sequencer will Output Midi Data

PG-200

- Full PG-200 support
- PG-200 will output midi data

Front Panel Description



Basic Connections

Rear Panel

PG-200 MIDI IN/OUT

Not Used

Ext Clock Input

Hold Pedal

Power Switch

External Selector Switch

Center Position will stop memory being overwritten. PG-200 & Midi will both work in all switch positions

Tune

This is used to tune the pitch with the external musical instrument (at its center position A-442Hz, variable range - ±1/4 tone).

Menu Flow Chart

KIWI-3P Matrix — Menu Structure v2.0

POWER ON

TONE MODE

SELECT GROUP | LOAD TONE | SAVE TONE | SET CHORD | LFO BUTTON | CHORUS MODE | CHORUS RATE | HOLD MODE | KEY TRANSPOSE | MIDI PANIC

$00

- Group Button A-P — Set current Group. Groups Changed to Next 4 by pressing the same Bank twice. This will also load Tone
- Group A-P Bank 1-8 Tone 1-8 — Each Select loads Tone
- Write Pushed — Check Protect if on flash error and exit to 00
- EXIT/ABORT
- $01 Select GROUP & BANK — TONE is saved to memory when TONE button pressed
- Cancel Pushed
- $04 CHORD Button Pressed — If note(s) playing Set Chord; If no midi notes playing Clear Chord
- LFO Pushed — This is a Matrix input only
- Chorus Pushed — Toggle Chorus Off/On/Manual
- $02 Chorus Long Push — Set Chorus Rate using EDIT Slider; Press Chorus to Exit
- Hold Pushed — Toggle Hold Mode
- $03 KEY Trans Held — C3-C6 to set transpose. Press C4 to clear
- CANCEL Button
- Stop All Sounding Voices

ARPEGGIATOR

ARP ON/OFF | ARP MODE | ARP RANGE | ARP STEP TIMING

- ARP S/S Button Pushed — Toggles Arp Play Mode
- Long Press HOLD Button — Set Arp mode using EDIT Slider
- $10 To Exit Press HOLD or CANCEL Buttons
- Long Press KEY T Button — Set Arp Range using EDIT Slider
- $11 To Exit Press KEY T or CANCEL Button
- $12 'ARP STEP' Button Pushed — Select Arp Step Timing Using the EDIT Slider; Press 'ARP STEP' again to exit; 1 to 1/64 Master Clock

SEQUENCE PLAY/EDIT

SEQ LOAD | SEQ START/STOP | SEQ STEP TIMING | EDIT/CREATE SEQUENCE | ERASE SEQUENCE

- Press LOAD Seq
- $20 Press TONE 1-8 — Load Seq to working memory
- SEQ S/S Button Pushed — Toggles Seqs Play Mode
- $21 'SEQ STEP' Button Pushed — Select Seq Step Timing Using the EDIT Slider; Press 'Seq STEP' again to exit; 1 to 1/64 Master Clock
- Long Press SEQ LOAD — Enter Seq Edit Mode; Display Step on Tone lights
- $22

EDIT SEQUENCE

NOTE(s) | REST | TIE | STEP | SET LENGTH | INSERT STEP | DELETE STEP | SAVE | EXIT/ABORT

- Midi Note(s) Played — Seq Step written when all note(s) lifted Inc Seq Step
- Tone 1 Pushed — Write Blank Seq Step Inc Seq Step
- Tone 2 Pushed — Repeat Last Seq Step Inc Seq Step
- Tone 6 or Tone 7 Pushed — Move Backward/Foreward 1 Step
- Tone 3 Pushed — Sets Seq Length to current step
- Tone 4 Pushed — will insert step after current posn
- Tone 5 Pushed — will delete step at current posn
- WRITE — Checks Memory Protect
- CANCEL Pushed
- ABORT
- $23 Tone Button 1-8 — Save Seq -> Memory
- CANCEL Pushed

ERASE SEQUENCE

- LONG PRESS SEQ CLK DIV — Check Memory Protect
- $24 Tone Button 1-8 — Select Seq to Initialise
- ABORT
- CANCEL Pushed
- $24 WRITE — Initialise Seq
- ABORT
- CANCEL Pushed

SYSEX DUMP

LONG PRESS CANCEL Button — $30

- $30 BANK 1 Button — Send Tone Edit Buffer
- $31 Button 2 — Send Seq Edit Buffer
- $32 Button 3 — Send Current Tone Group. WARNING - Large File size
- $33 Button 4 — Send All Sequences. WARNING - Large File size
- $34 Button 5 — Send Global Params
- WRITE Long Push — Send Current Dump to Midi
- $35-39
- CANCEL Pushed — Abort Current Dump

GLOBAL/TONE PARAMETER EDIT

LONG PRESS PARAMETER EDIT (Press again to exit) — $80

- SELECT PARAM USING — GROUP DIGIT A-D or LONG PRESS GROUP A for Global Parameters; BANK DIGIT 1-4; TONE DIGIT 1-8
- EDIT VALUE USING EDIT Slider

DCO MIX & VCA

A
- 1 Range — DCO 1
- 2 Wave
- 3 Coarse Tune
- 4 LFO Amount
- 5 LFO Select
- 6 Env Amount
- 7 Env Select
- 8 PW Amount
- 2 1 PWM Amount
- 2 PWM Select
- 3 Frequency Dynamics
- 4 1 Range — DCO 2
- 2 Wave
- 3 Coarse Tune
- 4 Fine Tune
- 5 LFO Amount
- 6 LFO Select
- 7 Env Amount
- 8 Env Select
- 3 1 PW Amount
- 2 PWM Amount
- 3 PWM Select
- 4 Frequency Dynamics
- 5 DCO Mix — MIX
- 6 DCO Mix Env Level
- 7 DCO Mix Env Select
- 8 DCO Mix Dyn Level
- 4 1 Sync / X-Mod
- 2 Detune
- 3 Analog Feel

VCF MIX & VCA

B
- 1 HPF Frequency — VCF
- 2 Cutoff Frequency
- 3 Resonance
- 4 LFO Amount
- 5 LFO Select
- 6 Env Amount
- 7 Env Select
- 8 Keytracking
- 2 1 Frequency Dynamics
- 2 Wave — LFO 1
- 3 Rate
- 4 Delay
- 5 Mode
- 6 Sync
- 7 Wave — LFO 2
- 8 Rate
- 3 1 Delay
- 2 Mode
- 3 Sync
- 4 Wave — LFO 3
- 5 Rate
- 6 Delay
- 7 Mode
- 8 Sync
- 4 1 Output Level — VCA
- 2 LFO Level
- 3 LFO Select
- 4 Env Select
- 5 Dynamics
- 6

MATRIX

C
- 1 Source — MOD 0
- 2 Level
- 3 Destination
- 4 Source — MOD 1
- 5 Level
- 6 Destination
- 7 Source — MOD 2
- 8 Level
- 2 1 Destination
- 2 Source — MOD 3
- 3 Level
- 4 Destination
- 5 Source — MOD 4
- 6 Level
- 7 Destination
- 8 Source — MOD 5
- 3 1 Level
- 2 Destination
- 3 Source — MOD 6
- 4 Level
- 5 Destination
- 6 Source — MOD 7
- 7 Level
- 8 Destination
- 4 1 Source — MOD 8
- 2 Level
- 3 Destination
- 4 Source — MOD 9
- 5 Level
- 6 Destination

SEQ ARP & ENV

D
- 1 1 Attack — ENV 1
- 2 Decay
- 3 Sustain
- 4 Release
- 5 Attack — ENV 2
- 6 Decay
- 7 Sustain
- 8 Release
- 2 1 Attack — ENV 3
- 2 Decay
- 3 Sustain
- 4 Release
- 5 Mode — VOICE
- 6 Steal Mode
- 7 Stacatto / Legato
- 8 Portamento
- 3 1 Mode — ARP/SEQ
- 2 Range
- 3 Arp Step Timing
- 4 Seq Step Timing
- 5
- 6 Rate — CHORUS
- 7 Mode
- 8
- 4 1
- 2
- 3
- 4
- 5
- 6

GLOBAL

G
- A 1 Midi In
- 2 Midi Out
- 3 Midi Seq Out
- 4 Enable MidiCC
- 5 Enable Sysex
- 6 Program Change
- 7 Midi Soft Thru
- 8 Midi Clk Gen
- 2 1 Mst Clock Source
- 2 Master Fine Tune
- 3 Clock Display Mode
- 4 Guitar Mode
- 5
- 6 PW Control
- 7
- 8
- 3 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 4 1
- 2
- 3
- 4
- 5
- 6

Matrix Destination Types
0 Off
1 DCO1 Freq
2 DCO2 Freq
3 All DCO Freq
4 DCO1 Range
5 DCO1 Wave
6 DCO1 LFO Level
7 DCO1 ENV Level
8 DCO1 PW
9 DCO1 PWM
10 DCO2 Range
11 DCO2 Wave
12 DCO2 LFO Level
13 DCO2 ENV Level
14 DCO2 PW
15 DCO2 PWM
16 DCO Mix Level
17 DCO Detune
18 VCF High Pass
19 VCF Cutoff
20 VCF Resonance
21 VCF LFO Level
22 VCF ENV Level
23 VCF KEY Level
24 VCA Level
25 VCA LFO Level
26 Portamento Rate
27 LFO1 Rate
28 LFO2 Rate
29 LFO3 Rate
30 ENV1 Attack Rate
31 ENV1 Decay Rate
32 ENV1 Release Rate
33 ENV2 Attack Rate
34 ENV2 Decay Rate
35 ENV2 Release Rate
36 ENV3 Attack Rate
37 ENV3 Decay Rate
38 ENV3 Release Rate
39 Chorus Rate

Matrix Source Types
0 Off
1 Bend Up
2 Bend Down
3 Bend Full
4 Midi Mod
5 Key Down Velocity
6 Key Up Velocity
7 Key Note
8 LFO1 (bipolar)
9 LFO1 (unipolar)
10 LFO2 (bipolar)
11 LFO2 (unipolar)
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 Midi Channel After Touch
24 Midi Note After Touch
25 Keyboard Gate
26 Midi Hold
27 Hold Pedal
28 LFO Trig Button

Power On Options

FACTORY RESTORE	FIRMWARE UPDATE
EDIT PARAM & WRITE Held — WARNING! WILL ERASE ALL TONES	CANCEL Held — Play update into Midi In Port; Stops with Group D lit if successful

Kiwi TECHNICS

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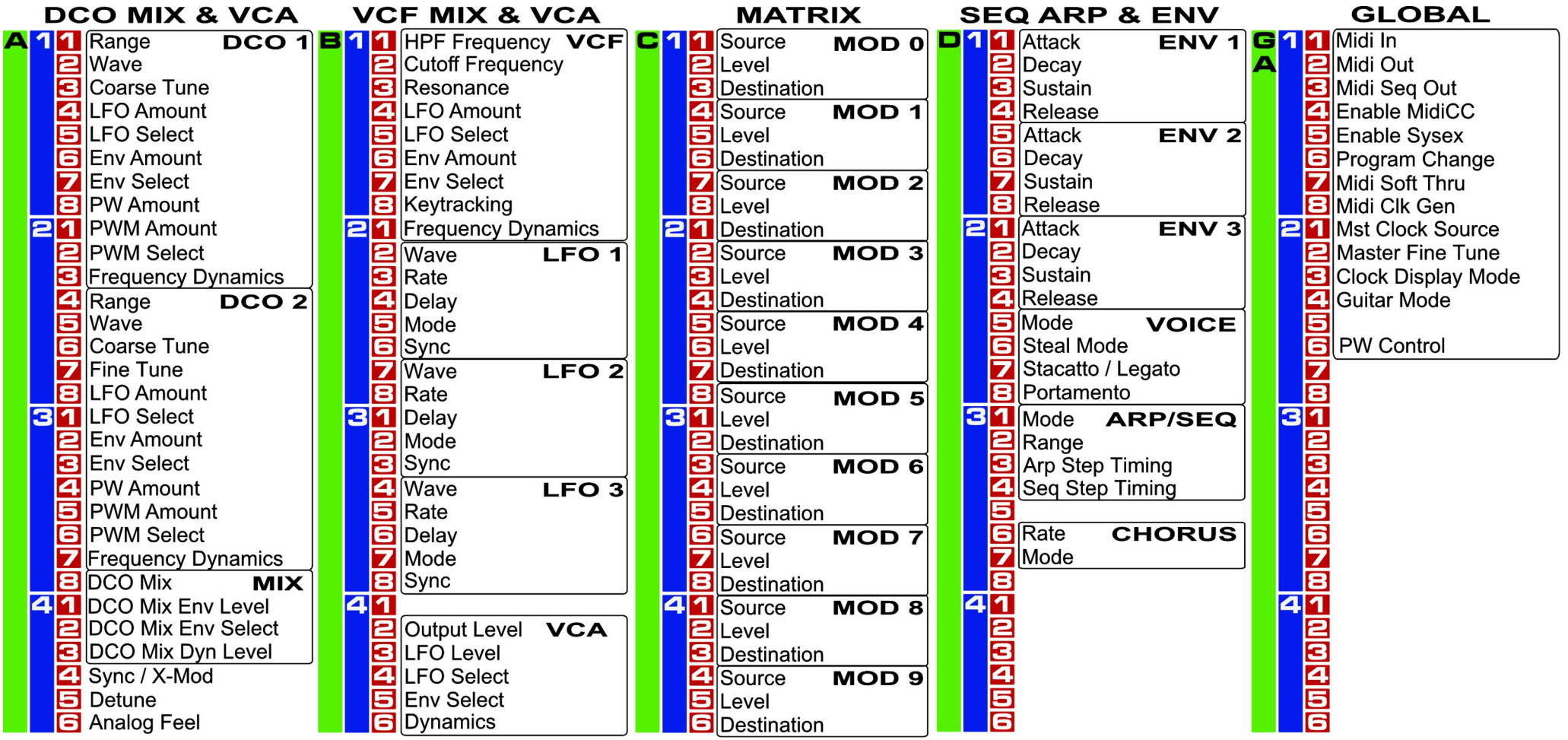
Edit Map


DCO MIX & VCA
A 1 1 Range DCO 1
2 Wave
3 Coarse Tune
4 LFO Amount
5 LFO Select
6 Env Amount
7 Env Select
8 PW Amount
2 1 PWM Amount
2 PWM Select
3 Frequency Dynamics
4 Range DCO 2
5 Wave
6 Coarse Tune
7 Fine Tune
8 LFO Amount
3 1 LFO Select
2 Env Amount
3 Env Select
4 PW Amount
5 PWM Amount
6 PWM Select
7 Frequency Dynamics
8 DCO Mix MIX
4 1 DCO Mix Env Level
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VCF MIX & VCA
B 1 1 HPF Frequency VCF
2 Cutoff Frequency
3 Resonance
4 LFO Amount
5 LFO Select
6 Env Amount
7 Env Select
8 Keytracking
2 1 Frequency Dynamics
2 Wave LFO 1
3 Rate
4 Delay
5 Mode
6 Sync
7 Wave LFO 2
8 Rate
3 1 Delay
2 Mode
3 Sync
4 Wave LFO 3
5 Rate
6 Delay
7 Mode
8 Sync
4 1
2 Output Level VCA
3 LFO Level
4 LFO Select
5 Env Select
6 Dynamics
MATRIX
C 1 1 Source MOD 0
2 Level
3 Destination
4 Source MOD 1
5 Level
6 Destination
7 Source MOD 2
8 Level
2 1 Destination
2 Source MOD 3
3 Level
4 Destination
5 Source MOD 4
6 Level
7 Destination
8 Source MOD 5
3 1 Level
2 Destination
3 Source MOD 6
4 Level
5 Destination
6 Source MOD 7
7 Level
8 Destination
4 1 Source MOD 8
2 Level
3 Destination
4 Source MOD 9
5 Level
6 Destination
SEQ ARP & ENV
D 1 1 Attack ENV 1
2 Decay
3 Sustain
4 Release
5 Attack ENV 2
6 Decay
7 Sustain
8 Release
2 1 Attack ENV 3
2 Decay
3 Sustain
4 Release
5 Mode VOICE
6 Steal Mode
7 Stacatto / Legato
8 Portamento
3 1 Mode ARP/SEQ
2 Range
3 Arp Step Timing
4 Seq Step Timing
5
6 Rate CHORUS
7 Mode
8
4 1
2
3
4
5
6
GLOBAL
G 1 1 Midi In
A 2 Midi Out
3 Midi Seq Out
4 Enable MidiCC
5 Enable Sysex
6 Program Change
7 Midi Soft Thru
8 Midi Clk Gen
2 1 Mst Clock Source
2 Master Fine Tune
3 Clock Display Mode
4 Guitar Mode
5
6 PW Control
7
8
3 1
2
3
4
5
6
7
8
4 1
2
3
4
5
6

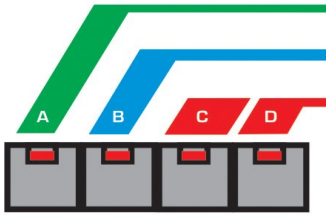
Menu Notes

The menu system in the 3P Upgrade is complex. This is unavoidable due to the number of features and the limited number of buttons available.

The parameters for editing can all be accessed using menu system. Tone parameters are all saved with the Tone and will be changed whenever a Tone is loaded. Global Parameters will remain unchanged on Tone loads.

Tone Selection

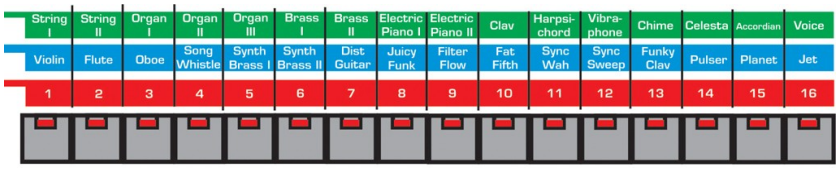
Group Buttons (A-D)



There are 16 Groups of 64 Tones in the Kiwi-3P matrix. Each group is made up of 8 Banks of 8 Tones giving a total of 1024 Tones (16x8x8). As there are only 4 Group buttons there are 4 layers of Groups. The current Group layer is changed by pressing the currently selected Group button again. For example to change from Group A to Group E press the Group A button when it is lit. One more press of the same button will select Group I and another press will select Group M. Another press will return you to Group A.
The Group lights will show which Group is selected as follows

Group Layer 1 (Groups A-D)	Selected Group On Steady - others Off
Group Layer 2 (Groups E-H)	Selected Group On Flashing - others Off
Group Layer 3 (Groups I-L)	Selected Group Off - others On Steady
Group Layer 4 (Groups M-P)	Selected Group Flashing - others On Steady

Bank and Tone Buttons (1-8)



The buttons 1-16 have been split into two groups of 8. The buttons 1-8 are the BANK Selection buttons and the buttons 9-16 are the TONE Selection buttons 1-8. See the Front Panel layout on page 5. All tones have a Group, Bank and Tone ID. The first tone has the location A:1:1, the second is A:1:2 and the last is P:8:8.

The Group, Bank and Tone buttons will light to show the selection.

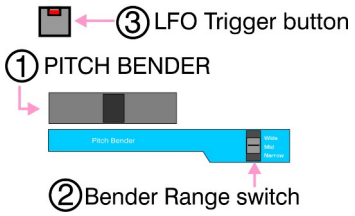
Note - The memory protection switch on the rear of the 3P will prevent memory writing. The write button will not function if the rear panel switch is in the middle position.

All the Tone lights will flash once if a write is attempted with the protect on.

You can only select one tone at a time

All tones on all banks can be edited and programmed (1024 in total)

Performance Control Section



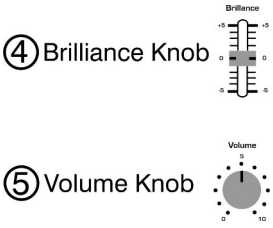
① Pitch Bender

This allows you to change the pitch of the DCOs. The Bender is hard coded to the DCOs to enable note bends but this is also three different Matrix sources. The three types are Up only, Down only or Both up & down. These can sent to any Matrix destination.

② Bend Range Switch

This sets the Maximum effect of the bender.

- Wide...Maximum effect. This will be an Octave for DCOs
- Mid...Medium effect. This will be a major perfect 5th for DCOs
- Narrow...Smallest effect. This will be a two semitones for DCOs



④ Brilliance Knob

This control sets the overall tone of the 3P. It achieves this by altering the filter cutoff level for all voices using the 3P hardware and will alter any programmed filter settings.

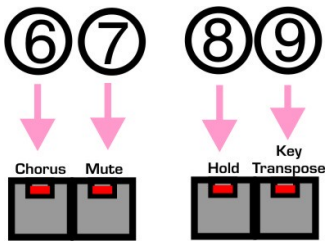
③ LFO Trigger Button

This button will add modulation and is a Matrix source. The destination of this modulation can be any of the Matrix destinations.

On all factory programs the LFO button has a Matrix entry that will give a moderate level of DCO LFO level on both DCOs to give a vibrato effect.

⑤ Volume Knob

This sets the overall output level of the 3P.



⑥ Chorus button

Press this button to turn on the chorus effect. The indicator LED will light when the effect is on. Press this button again to select Manual Mode and again to turn the Chorus off. If manual mode has been selected then this button will flash. The SENS slider will alter Chorus Rate or Manual Position when it is not being used for editing.

⑧ Hold button

The Hold button is used for two different functions

A short press of the Hold button will toggle the hold function and the indicator LED will light when HOLD is operating. While hold is on notes played will continue to sound at the envelope sustain or gate level depending how the VCA mode has been selected using Parameter edit B:4:5. If notes are played after all notes were released the held notes are cleared and a new hold is started. To hold multiple notes play them all before releasing the last note. This differs from the original 3P hold method.

A long press of the HOLD button will enter ARP MODE Edit. This is a shortcut for Parameter Edit D:3:1 The ARP MODE value can be changed using the Edit Slider. Press HOLD again to exit edit mode.

⑦ ARP (3P Mute) button

This button start and stops the Arpegiator. When the Arpegiator is on this button LED will flash.

⑨ Key Transpose button.

Transposition to any key is possible by pressing the Key Transpose button and pressing the Note you wish to transpose to. The transpose note can be any note between C below middle C to C two octaves above middle C giving a three octave range.

Note - Key Transposing will not apply to midi note data sent to the 3P. It is possible to have the 3P playing a different note to another keyboard using the same midi note data if the Key Transpose has been set.

A long press of the KEY TRANSPOSE button will enter ARP RANGE Edit. This is a shortcut for Parameter Edit D:3:2. The ARP RANGE value can be changed using the Edit Slider. Press KEY TRANSPOSE again to exit edit mode.

3P Upgrade Notes

Waveforms	The Kiwi-3P Matrix changes the JX-3P Waveforms available. These can be mixed in any combination. The Wave types are SAW PULSE WIDTH SQUARE. Note – Each raw wave type is at the maximum level in the JX-3P hardware. When you mix them they are added together increasing the level further. This can distort the internal hardware. No damage will occur but the sound is not always as you would expect.	Some notes about the PW wave. The Pulse wave is derived from the Sawtooth wave that the 3P generates. The hardware to do this is 1970s style resistors, capacitors and op amps making the result not very precise and will change with temperature changes. As the quality of the PW wave generation depends on the quality of the Saw wave the PW clarity can suffer. We have built in to the upgrade a system to adjust out the worst of the variations and improve the Saw wave shape but it will change with temperature and is a feature of the 3P sound that the waves are not perfect.
Sync	The Kiwi-3P Matrix has three types of Sync SYNC1 – The Square wave of DCO1 is used to gate (reset) the clock generator of DCO2. This effects all the waves of DCO2. SYNC2 - The Square wave of DCO1 is used to gate (reset) the clock generator of DCO2. In addition the Square wave of DCO1 is used to reset the SAW wave generator in DCO2. This effects all the waves of DCO2.	METAL - The Square wave of DCO1 is used to reset the SAW wave generator in DCO2. The sound of the DCO2 SAW is the only wave effected.
Sens Control	The behaviour of the Sens control during parameter editing has been changed from the way the original 3P works. When editing a parameter the current value of the parameter must be matched before the Sens Control will have any effect on the parameter value. e.g. if the filter cutoff is set to 7 the Sens must be moved to 7 before it will begin to edit the setting. This has been done so that a parameter will not jump to the Sens setting which can cause unpredictable and sometimes unpleasant results.	The switch settings are not changed using the Bank buttons as with the original JX-3P. They are now also changed using the Sens control. See the section on Parameter Editing for details on this.

Clock Display	The Arp, Sequencer & Master clocks can display on the front panel. The Clocks will display on the three buttons to the left of the Master Clock Rate slider.	This has been made optional as flashing lights can be annoying.
Midi Switch	The 3P should be run with the protect switch in the centre position. This will protect the memory. This can be moved to 'Protect off' in either direction to change patches.	The Midi and PG-200 inputs will work in all switch positions.

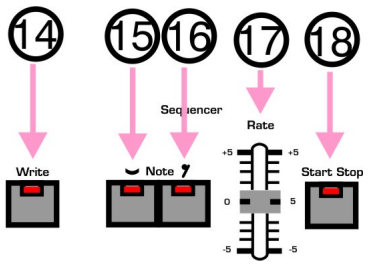
Kiwi-3P Matrix Upgrade Notes

Digital Oscillators	The Kiwi-3P Matrix Synthesizer uses programmable dividers from two master oscillators to generate the pitch of the notes. While this does create a very 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 DCOs in the same and the other voices. This is a 'feature' of the Kiwi-3P Matrix hardware and cannot be altered. This is especially noticeable when playing in 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, lfo mod, Env 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. The number of steps halves for each octave. The Octave select for each voice changes the clock going to the dividers so the actual steps between frequencies can vary for any given frequency. As an example if you have 16' set, the tune knob set to +12 and playing high notes the stepping will be worse than using 4', tune -12 and playing lower notes. While the output frequency might be the same the number being fed into the divider chips is not the same and therefore the stepping will not be the same. 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.
Chorus	In normal play mode the Chorus Speed can be adjusted using the SENS Edit slider. this is a shortcut to parameter edit D:3:6.	If the Chorus is in Manual Mode changing the SENS slider will shift the Chorus position.
Midi Received Midi Panic	Midi data received will flash the TAPE Memory button light if it is recognized by the 3P. **The TAPE button also acts as Midi Panic and will cancel any sounding notes both midi and internal.**	To stop all output from the 3P press and release the TAPE button.

PG-200 Support	The Kiwi-3P Matrix supports the PG-200 controller using a dedicated second cpu. Due to the limited controls on the PG-200, only the parameters with controls on the PG-200 can be edited using this.	Note - The PG-200 controller should be plugged into the JX-3P before it is powered on to work correctly. There are power wires in the PG-200 cable that are unfused. **Do not plug or unplug this cable while the synth is turned on. If the cable is damaged do not use the PG-200 as serious damage to the synth or PG-200 could occur.**
Sysex Dump	Sysex dump mode is entered by holding down the TAPE button and the following dump types have been provided. 1) Tone and Sequence edit buffers (BANK 1 & BANK 2). When these are loaded into the Kiwi-3P Matrix they will overwrite the currently selected Tone or Sequence in the edit buffer only and are not written to permanent memory. After loading the edit dump it will need to be written to memory if it is to be retained. 2) The 'All Tone Dump' will dump all 64 Tones from the currently selected Group. To dump all 1024 Tones it will be necessary to perform 16 Group dumps. The All Sequence Dump will dump all 8 Sequences. When these dumps are played into the Kiwi-3P Matrix they will load into the same Group that was selected when the dump was made **and will overwrite all memory locations in that Group**.	3) The Global dumps will dump all the global settings. Note - All Dumps and Loads use the edit buffer to transfer data. Any unsaved edits will be lost. e.g. If you dump Tones the saved version will be dumped not the edit buffer. Note - Write Protect must be off to Load Dumps The Kiwi-3P Matrix will recognise a number of different sysex dump types for importing Tones. These include Kiwi-3P, Kiwi8P, Kiwi-1000, Kiwi-SJX (Tones only), Roland 8P. The Kiwi-3P Matrix cannot support every parameter in these imports but it will get as close as it can. Some editing may be required.
Portamento	The way portamento works changes for the 5 different keying modes and if Chord mode is set. For Poly (6 voices), Double (three voices) & Triple (2 voices) each voice will slide independently for new notes played. For Unison (6 voices) and Solo (1 voice) and Chord (1 voice/note) voices will slide in unison to the next note played.	

Sequencer

The JX-3P Upgrade contains a polyphonic sequencer that has the capacity of 124 step automatic playing. Up to 6 notes can be played at a time so writing a chord is possible.



⑭ Sequencer Write Button

This button is used for ARP CLOCK DIVIDE edit in the Kiwi-3P Matrix and is not used for the sequencer

⑮ Sequencer Tie Button

This button is used for SEQ CLOCK DIVIDE edit in the Kiwi-3P Matrix. Press this button and edit the Clock Divide using the SENS Edit slider. Press again to exit Seq Clock edit mode.
This button is also used for Sequence Erase. To ERASE a Seq long press this button.

⑯ Sequencer Rest Button

This button is used for SEQ LOAD and SEQ EDIT in the Kiwi-3P Matrix. To Load a Sequence into the Edit Buffer press this button followed by a Tone button 1-8. Note that the TONE buttons are the JX-3P buttons 9-16.

To Edit a Sequence Long press this button to start Edit mode.

Note - if more than 6 notes are used in one step only the last 6 notes will play.

⑰ Rate Knob

This controls the speed of the Master Clock if the clock source is selected as internal using parameter control GA:2:1. If the clock source is set to MIDI source this control will have no effect. Also if a clock source is plugged into the external socket labeled “Seq Trigger In” on the rear of the 3P this will override the internal clock and this control.

If the 3P has been configured to send midi Clocks then the Rate control will set the speed of these. Note - if anything is plugged into the External Input labeled “Seq Trigger In” the internal Clock will stop. This is a hardware function of the 3P.

⑱ Start/Stop Button

This button is used to start or stop the sequencer playing. Each time you press this button the sequencer will start or stop. Note - If the clock source is midi or external the sequence will not begin playing until the first clock is received.

Writing and Editing

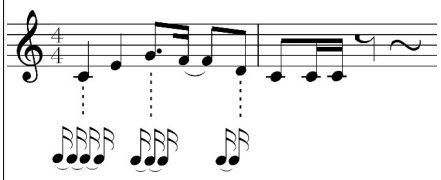
The 3P Upgrade differs from the original 3P in the way a Sequence is edited. The only way to erase or blank a sequence is by a long press of the Seq Tie button. **If you choose an existing sequence when Seq Edit (3P SEQ REST) is pressed then any step(s) you write will overwrite all notes in the existing step(s) already in the sequence.** The Tone 6 (step backward) and Tone 7 (step forward) 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.

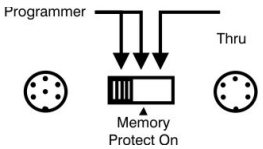
You can write the pitch by playing the keyboard (or midi keyboard), and the rhythm by pressing the Tie button and the Rest button. (The pitch and rhythm should be simultaneously written).

(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)



(2) The external selector switch should remain in the PG-200 or MIDI position when writing to memory.

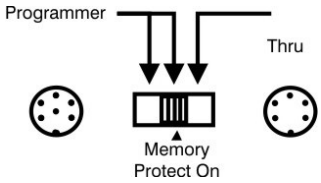


(3) During Seq Editing pressing the Write button followed by the Tone button will save the Sequence to memory. The current Sequence number will flash on the Tone lights to show the current Sequence but the WRITE can be made to any tone number 1-8 (These are the original JX-3P buttons 9-16).

(4) By playing the keyboard and using the Tie button (Tone 2) and Rest button (Tone 1), write steps one after another.

(5) If writing is complete press the Write button followed by a Tone button 1-8 to Save the Sequence to permanent memory or the Start button or Shift Button to exit edit mode. The Start button will also start the sequence playing on the next clock received. If the Seq is not saved the sequence will be lost if the 3P is powered off or another sequence is loaded. Pressing the Start/Stop button again will stop the sequence playing and the Start indicator will go out.

(6) Return the Ext Switch to the Memory Protect Position.



Arpeggiator

The KiwiTechnics 3P Upgrade has a built in Arpeggiator that can be applied to any sound.

Arpeggiator Mode is entered and exited by pressing and releasing the ARP (3P Mute) button.

The ARP button will flash when the ARP is running.

The clock for the Arpeggiator can be divided from the master clock using the ARP DIVIDE button (3P SEQ WRITE button) and the divide setting changed using the SENS slider. The 13 divide options are:-

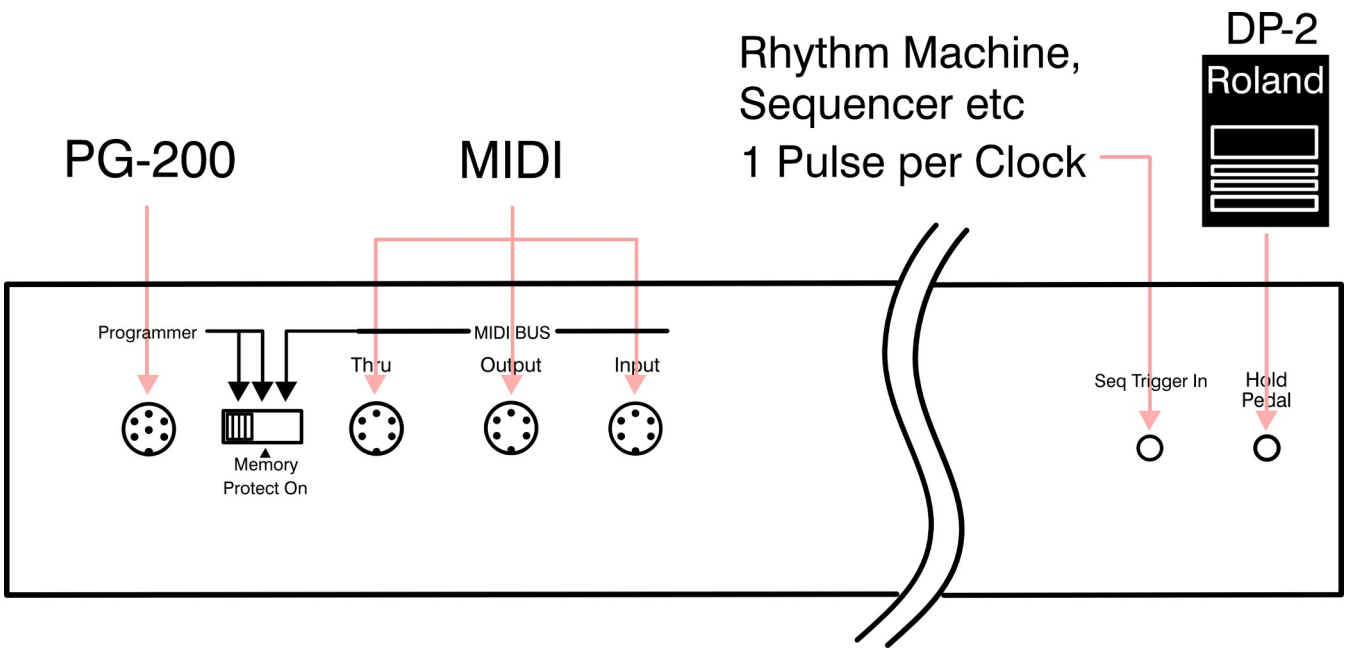
Half Note (48/Step)
Quarter note (24/Step)
8th note (12/Step)
8th note, 1/2 swing (14,10/Step)
8th note, full swing (16,8/Step)
8th note triplets (8/Step)
16th note (6/Step)
16th note, half swing (7,5/Step)
16th note, full swing (8,4/Step)
16th note triplets (4/Step)
32nd note (3/Step)
32nd note triplets (2/Step)
64th note triplets (1/Step)

A long press of the HOLD button allows the ARP MODE to be changed using the SENS slider. Press HOLD again or Cancel (3P TAPE) to exit this mode. Options are UP (Tone 1 light), DOWN (Tone 2 light), UP/DOWN (Tone 3 light), RANDOM (Tone 4 light) & AS PLAYED (Tone 5 light)

A long press of the KEY TRANS button allows the ARP RANGE to be changed using the SENS slider. Press KEY TRANS again or Cancel (3P TAPE) to exit this mode. Options are 1 Octave (Tone 1 light on), 2 Octaves (Tone 2 light on), 3 Octaves (Tone 3 light on) or 4 Octaves (Tone 4 light on).

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 or two 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.

Setting up with External Devices



External Clock

You can adjust the tempo, and start or stop the Arpeggiator and/or Sequencer of the JX-3P with the controls on the external unit.

Before starting external synchronization with the external unit, make sure that the built-in sequencer in the JX-3P is not running. Press the Start/Stop button and it's indicator will light then start the synchronization.

Midi Notes

If your JX-3P has Midi though fitted this should be used if multiple units are being used on the midi chain to reduce delays. Full midi command details are at the end of the manual.

Hold Pedal

The Roland DP-2 is shown but any pedal that shorts the tip can be used. The polarity of the hold pedal is autosensed when the Kiwi-3P Matrix is powered on. For this work correctly the Hold Pedal should not be pressed as the synth is powered on. There is a Global Parameter (GA:2:5) that lets you change the polarity of the pedal so the autosense can be overridden until the 3P is switched off.

The Hold Pedal is also a matrix source which can be sent to any destination.

PG-200 Controller

The PG-200 can be used with the Kiwi-3P Matrix upgrade. Only the parameters on the PG-200 can be edited using this. Edits are made to the edit buffer only and will need to be saved to memory if you wish to keep them.	The WRITE button on the PG-200 duplicates pushing the front panel WRITE button. The tone is not saved and you will still need to enter a G:B:T number. To overwrite the same tone simply press WRITE followed by the TONE number part of the G:B:T only (3P buttons 9-16 for TONE 1-8). Pressing CANCEL (3P TAPE) or WRITE again will cancel the TONE WRITE.	PG-200 editing can sound a little steppy. This is a function of the way the PG-200 sends it's commands.

Editing a Patch

	The Edit Parameter table on the next pages shows all the parameters that can be edited with the Kiwitechnics 3P Matrix Upgrade. **Note – the Group buttons mentioned here refer to the buttons A-D that are used for tone selection and not the buttons labelled GROUP A (now Chord) and GROUP B (now Edit Param) on the original 3P front panel.** Use the menu map as a guide to the editing button sequence. For example to edit the ENV2 Attack Rate press EDIT PARAM (3P Group B), GROUP D, BANK 1 then TONE 5 and edit the value using the Sense Slider. Press CANCEL (3P TAPE) or EDIT PARAM (3P Group B) again to exit edit mode. To change from Parameter Editing to Global editing long press the TONE GROUP A button. Long press TONE GROUP A again to return from Global editing to parameter editing.	The first digit (e.g. B:3:4) is the Group A-D and is selected using the four Group buttons. The second digit of the parameter ID is selected using the BANK buttons 1-4. The third digit of the parameter ID is selected using the TONE buttons 1-8. The current parameter being edited is displayed as follows. The First letter A-D is displayed on the GROUP buttons. The second digit is displayed on the BANK buttons as a flashing light and the third digit is also displayed on the BANK buttons as a steady light. This is done so that the value of the parameter can be displayed using the TONE lights. If the second and third digits of the parameter are the same (e.g. A:1:1) then the third digit will override the second and only a steady light will show. Controls that have 0-127 or 0-4095 steps will display as 1-8. This doesn't mean the number of steps is reduced.
	All Parameters are edited using the Sens control unlike the original 3P which used the Bank buttons to set switches. These are now changed using the Sens slider as well. Note - The behaviour of the Sens control during parameter editing has been changed from the way the original 3P works. When editing a parameter the current value of the parameter must be matched before the Sens Control will have any effect on the parameter value.	e.g. if the filter cutoff is set to 7 the Sens must be moved to 7 before it will begin to edit the setting. This has been done so that a parameter will not jump to the Sens setting which can cause unpredictable and sometimes unpleasant results. Raising a control towards 10 will deepen an effect.

TONE – DCO

Parameter	Edit Location	Values displayed on TONE lights
Range 16', 8', 4'	A:1:1 DCO 1 A:2:4 DCO 2	1 = 16', 2=8', 3=4'
Wave Saw, Pulse, Square Noise (DCO2 Only)	A:1:2 DCO 1 A:2:5 DCO 2	1 = Saw, 2= Pulse, 3=Square 4 = Saw + Pulse 5 = Saw + Square 6 = Saw + Pulse + Square 1 = Saw, 2= Pulse, 3=Square 4 = Saw + Pulse 5 = Saw + Square 6 = Saw + Pulse + Square 7 = Noise
DCO Coarse Tune ± 1 Octave	A:1:3 DCO1 A:2:6 DCO2	Range 0-24 (-1 Octave -> +1 Octave)
DCO 2 Fine Tune	A:2:7	Range 0-127 (~-50 cents -> +50 cents)
DCO 1 LFO Modulation Depth DCO 2 LFO Modulation Depth	A:1:4 A:2:8	Range 0-127
DCO 1 LFO Source DCO 2 LFO Source	A:1:5 A:3:1	1 = LFO 1, 2 = LFO 2, 3 = LFO3
DCO 1 Env Modulation Depth DCO 2 Env Modulation Depth	A:1:6 A:3:2	Range 0-127
DCO 1 Env Source DCO 2 Env Source	A:1:7 A:3:3	1 = ENV 1, 2 = ENV 2, 3 = ENV 3
DCO 1 Pulse Width DCO 2 Pulse Width	A:1:8 A:3:4	Range 0-127
DCO 1 Pulse Width Modulation DCO 2 Pulse Width Modulation	A:2:1 A:3:5	Range 0-127 This parameter is added to PW.
DCO 1 PWM Source DCO 2 PWM Source	A:2:2 A:3:6	1 = ENV 1, 2 = ENV 3, 3 = LFO 2, 4 = LFO 3
DCO 1 Dynamics Depth DCO 2 Dynamics Depth	A:2:3 A:3:7	Range 0-127
DCO Mix	A:3:8	Range 0-127 (0=DCO1, 64 = 50/50, 127 = DCO2)
DCO Mix Env Level	A:4:1	Range 0-127
DCO Mix Env Source	A:4:2	1 = ENV 1, 2 = ENV 2, 3 = ENV 3
DCO Mix Dynamics Depth	A:4:3	Range 0-127
DCO Cross Modulation	A:4:4	1 = Off, 2 = Sync 1, 3 = Sync 2, 4 = Metal
Detune	A:4:5	Range 0-127
Analog Feel	A:4:6	Range 0-127

TONE - VCF

Parameter	Edit Location	Values displayed on TONE lights
VCF High Pass Filter	B:1:1	Range 0-127
VCF Cutoff	B:1:2	Range 0-127. This edits 128 steps. For 4096 step resolution use sysex
VCF Resonance	B:1:3	Range 0-127. Ditto to VCF for greater resolution
VCF LFO Modulation Depth	B:1:4	Range 0-127
VCF LFO Source	B:1:5	1 = LFO 1, 2 = LFO 2, 3 = LFO3
VCF Env Modulation Depth	B:1:6	Range 0-127
VCF Env Source	B:1:7	1 = ENV 1, 2 = ENV 2, 3 = ENV 3
VCF Pitch Follow	B:1:8	Range 0-127
VCF Dynamics Depth	B:2:1	Range 0-127

TONE - LFO

Parameter	Edit Location	Values displayed on TONE lights
LFO 1, 2 & 3 Wave	B:2:2 LFO 1 B:2:7 LFO 2 B:3:4 LFO 3	1 = Sine 2 = Triangle 3 = Saw 4 = Rev Saw 5 = Square 6 = Random 7 = Fast Random
LFO 1 Rate LFO 2 Rate LFO 3 Rate	B:2:3 LFO 1 B:2:8 LFO 2 B:3:5 LFO 3	Range 0-127 (0=slowest)
LFO 1 Delay LFO 2 Delay LFO 3 Delay	B:2:4 LFO 1 B:3:1 LFO 2 B:3:6 LFO 3	Range 0-127 (0=no delay)
LFO 1 Mode LFO 2 Mode LFO 3 Mode	B:2:5 LFO 1 B:3:2 LFO 2 B:3:7 LFO 3	1 = LFO 1, 2 & 3 Normal (above and below base note) 2 = LFO 1, 2 & 3 Plus (above base note only)
LFO 1 Sync LFO 2 Sync LFO 3 Sync	B:2:6 LFO 1 B:3:3 LFO 2 B:3:8 LFO 3	1 = Free Running 2 = Sync Two Notes (192 Clocks/Step) 3 = Sync Dotted Whole Note (144 Clocks/Step) 4 = Sync Whole Note (96 Clocks/Step) 5 = Sync Dotted Half Note (72 Clocks/Step) 6 = Sync Half Note (48 Clocks/Step) 7 = Sync Dotted 1/4 Note (36 Clocks/Step) 8 = Sync Quarter note (24 Clocks/Step) 1(F) = Sync Dotted 1/8 Note (18 Clocks/Step) 2(F) = Sync 1/4 Note Triplets (16 Clocks/Step) 3(F) = Sync 8th note (12 Clocks/Step) 4(F) = Sync 8th note triplets (8 Clocks/Step) 5(F) = Sync 16th note (6 Clocks/Step) 6(F) = Sync 16th note triplets (4 Clocks/Step) 7(F) = Sync 32nd note (3 Clocks/Step) 8(F) = Sync 32nd note triplets (2 Clocks/Step) 1(FF) = Sync 64th note triplets (1 Clocks/Step) Sync source is Master Clock (F)= Flash, (FF) = Fast Flash

TONE - VCA

Parameter	Edit Location	Values displayed on TONE lights
VCA Level	B:4:2	Range 0-127
VCA LFO Modulation Depth	B:4:3	Range 0-127
VCA LFO Source	B:4:4	1 = LFO 1, 2 = LFO 2, 3 = LFO3
VCA Env Source	B:4:5	1 = GATE, 2 = ENV 1, 3 = ENV 2, 4 = ENV 3
VCF Dynamics Depth	B:4:6	Range 0-127

TONE - MATRIX

Parameter	Edit Location	Values displayed on TONE lights
Matrix 0 Source Matrix 1 Source Matrix 2 Source Matrix 3 Source Matrix 4 Source Matrix 5 Source Matrix 6 Source Matrix 7 Source Matrix 8 Source Matrix 9 Source	C:1:1 C:1:4 C:1:7 C:2:2 C:2:5 C:2:8 C:3:3 C:3:6 C:4:1 C:4:4	Options are Off, Bend Up, Bend Down, Bend Full, Midi Mod Key Down Velocity, Key Up Velocity, Key Note LFO1, LFO2, LFO3, ENV1, ENV2, ENV3 MidiCC1,MidiCC2,MidiCC3,MidiCC4,MidiCC5,MidiCC6 Midi Channel After Touch, Midi Note After Touch Keyboard Gate, Midi Hold, Hold Pedal, LFO Trigger Button
Matrix 0 Level Matrix 1 Level Matrix 2 Level Matrix 3 Level Matrix 4 Level Matrix 5 Level Matrix 6 Level Matrix 7 Level Matrix 8 Level Matrix 9 Level	C:1:2 C:1:5 C:1:8 C:2:3 C:2:6 C:3:1 C:3:4 C:3:7 C:4:2 C:4:5	Range 0-127
Matrix 0 Destination Matrix 1 Destination Matrix 2 Destination Matrix 3 Destination Matrix 4 Destination Matrix 5 Destination Matrix 6 Destination Matrix 7 Destination Matrix 8 Destination Matrix 9 Destination	C:1:3 C:1:6 C:2:1 C:2:4 C:2:7 C:3:2 C:3:5 C:3:8 C:4:3 C:4:6	Options are Off, DCO1 Freq, DCO2 Freq, All DCO Freq, DCO1 Range DCO1 Wave, DCO1 LFO Level, DCO1 ENV Level DCO1 PW, DCO1 PWM, DCO2 Range, DCO2 Wave DCO2 LFO Level, DCO2 ENV Level, DCO2 PW, DCO2 PWM Mix Level, DCO Detune, VCF High Pass, VCF Cutoff, VCF Res VCF LFO, VCF ENV, VCF KEY, VCA Level, Portamento LFO1, LFO2, LFO3, ENV1 Attack Rate, ENV1 Decay Rate ENV1 Release Rate, ENV2 Attack Rate, ENV2 Decay Rate ENV2 Release Rate, ENV3 Attack Rate, ENV3 Decay Rate Chorus Rate

TONE – ENV 1-3

Parameter	Edit Location	Values displayed on TONE lights
Envelope 1, 2 & 3 Attack	D:1:1 ENV 1 D:1:5 ENV 2 D:2:1 ENV 3	Range 0-127
Envelope 1, 2 & 3 Decay	D:1:2 ENV 1 D:1:6 ENV 2 D:2:2 ENV 3	Range 0-127
Envelope 1, 2 & 3 Sustain	D:1:3 ENV 1 D:1:7 ENV 2 D:2:3 ENV 3	Range 0-127
Envelope 1, 2 & 3 Release	D:1:4 ENV 1 D:1:8 ENV 2 D:2:4 ENV 3	Range 0-127

TONE – Voice Mode

Parameter	Edit Location	Values displayed on TONE lights
Voice Mode	D:2:5	1 = Poly Single (1 voice/note - max 6 notes) 2 = Poly Dual (2 voices/note - max 3 notes) 3 = Poly Triple (3 voices/note – max 2 notes) 4 = Unison 5 = Solo
Voice Steal Mode	D:2:6	1 = Steal Oldest Voice 2 = Steal Newest Voice 3 = Steal Highest Voice 4 = Steal Lowest Voice 5 = Steal Quietest Voice 6 = Do Not Steal (7th Note ignored)
Voice Staccato / Legato	D:2:7	1 = Staccato – Envs restarted for each note 2 = Legato – Envs restarted only if all notes off
Portamento Rate	D:2:8	Range 0-127

TONE - ARP/SEQ

Parameter	Edit Location	Values displayed on TONE lights
ARP Mode	D:3:1	1 = Up 2 = Down 3 = Up and Down 4 = Random 5 = As Played
ARP Range	D:3:2	1 = 1 Oct, 2 = 2 Octs, 3 = 3 Octs, 4 = 4 Octs
ARP Step Timing	D:3:3	1 = Half Note (48 Clocks/Step) 2 = Quarter note (24 Clocks/Step) 3 = 8th note (12 Clocks/Step) 4 = 8th note, half swing (14,10 Clocks/Step) 5 = 8th note, full swing (16,8 Clocks/Step) 6 = 8th note triplets (8 Clocks/Step) 7 = 16th note (6 Clocks/Step) 8 = 16th note, half swing (7,5 Clocks/Step) 1(F) = 16th note, full swing (8,4 Clocks/Step) 2(F) = 16th note triplets (4 Clocks/Step)3 3(F) = 32nd note (3 Clocks/Step) 4(F) = 32nd note triplets (2 Clocks/Step) 5(F) = 64th note triplets (1 Clocks/Step) Clock source is Master Clock (F)= Flash
Seq Step Timing	D:3:4	1 = Half Note (48 Clocks/Step) 2 = Quarter note (24 Clocks/Step) 3 = 8th note (12 Clocks/Step) 4 = 8th note, half swing (14,10 Clocks/Step) 5 = 8th note, full swing (16,8 Clocks/Step) 6 = 8th note triplets (8 Clocks/Step) 7 = 16th note (6 Clocks/Step) 8 = 16th note, half swing (7,5 Clocks/Step) 1(F) = 16th note, full swing (8,4 Clocks/Step) 2(F) = 16th note triplets (4 Clocks/Step)3 3(F) = 32nd note (3 Clocks/Step) 4(F) = 32nd note triplets (2 Clocks/Step) 5(F) = 64th note triplets (1 Clocks/Step) Clock source is Master Clock (F)= Flash

GLOBAL – Midi and General Settings

Parameter	Edit Location	Values displayed on TONE lights
Midi In Channel	GA:1:1	1-8 = Channel 1-8 (Midi 0-7) 9-16 = Channel 1-8(F) (Midi 8-15) All Tone Lights will flash for OMNI (F)= Flash
Midi Out Channel	GA:1:2	1-8 = Channel 1-8 (Midi 0-7) 9-16 = Channel 1-8(F) (Midi 8-15) (F)= Flash
Seq Midi Out Channel	GA:1:3	1-8 = Channel 1-8 (Midi 0-7) 9-16 = Channel 1-8(F) (Midi 8-15) (F)= Flash
Enable Midi CC	GA:1:4	1 = Off 2 = Midi CC Receive Enabled 3 = Midi CC Transmit Enabled 4 = Midi CC Receive & Transmit Enabled
Enable Midi Sysex Receive	GA:1:5	1 = Midi Sysex Receive Disabled 2 = Midi Sysex Receive Enabled Note – Sysex is Enabled at power on.
Enable Program Change Command	GA:1:6	1 = Off 2 = Midi PC Receive Enabled 3 = Midi PC Transmit Enabled 4 = Midi PC Receive & Transmit Enabled
Enable Midi Soft Through note - real time midi commands will always pass	GA:1:7	1 = Stop All 2 = Pass All 3 = Pass only nonCC 4 = Stop only CC we have used
Enable Midi Clock Generation	GA:1:8	1 = Midi Clock not generated 2 = Midi Clock Generated from Internal
Master Clock Source	GA:2:1	1 = Internal 2 = Midi
Master Fine Tune	GA:2:2	Range 0-127 (± 100 cents)
Clock Display	GA:2:3	1 = Off 2 = Internal, Arp & Seq clocks will display
Guitar Mode	GA:2:4	1 = Off 2 = On Guitar Mode uses midi channels Base number+0-5 only to control voices 1-6
Wave Board Select	GA:2:6	0 = None 1 = Kiwitechnics PW v1.x 2 = Kiwitechnics PW v2.x or higher 3 = Reserved

KIWI-3P Upgrade Special Functions

Midi In	The incoming midi channel can be set to any channel from 0-16. 0=Omni 1-16=channel number This is set using the Global Parameter Edit GA:1:1
Midi Out	The outgoing midi channel can be set to any channel from 1-16. This is set using the Global Parameter Edit GA:1:2
Sequencer Midi Out	The Sequencer outgoing midi channel can be set to any channel from 1-16. This is set using the Global Parameter Edit GA:1:3
Factory Restore	All 1024 programs and Global Settings can be restored to factory settings by the following action:- Press and hold PARAM EDIT & WRITE while powering the 3P on. **WARNING - There will be no confirmation and all Tones & Sequences will be cleared.** The Memory Protect must be set to off. The 3P will stop responding while the restore is being done. All tones and Seqs will be cleared. A sysex dump of the 1024 factory tones is provided in the firmware update file.
Program Update	The KiwiTechnics 3P Upgrade has built in ability to update the firmware when updates become available. This section is entered by pressing the CANCEL (JX-3P Tape button) while the 3P is powered on. The Update file is then 'played' into the 3P midi in using midiOX or similar. The update progress is displayed on the Bank Lights. Once complete the Group D button will light and the 3P should be repowered. **WARNING - If this procedure fails the 3P will be rendered unusable and will require reprogramming or a replacement CPU from KiwiTechnics. Use at your own risk.** The current releases are displayed on the Bank and Tone Selector lights for about 1 sec at power on. Bank Lights 1 - 8 display the program release and Tone Lights 1 - 8 display the Bootloader release. e.g. Bank 2 & Tone 1 would mean Prog v2.0 and BL v 1

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-3P Matrix Upgrade must be installed by a competent technician with the correct tools or damage to your JX-3P can occur. KiwiTechnics will not be responsible for damage done to your precious JX-3P if this upgrade is not fitted correctly. The install will take about 2 hours labour.

Kiwi-3P CPU Board Install

Step 1) Opening the 3P - After removing the four screws located in the end panels and the 4 screws on the underside at the rear the top can be opened.

Step 2) Removing the main board. Remove the screws securing the keyboard from the underside of the JX-3P so the keyboard can be moved forward and give access to the main board. Remove the 8 screws shown in Photo 1.

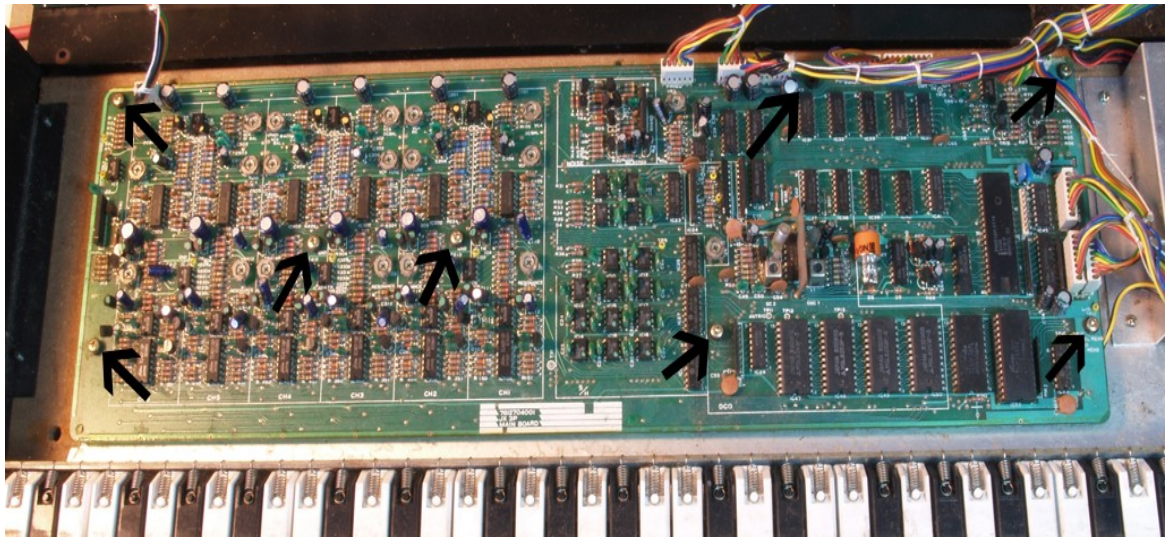
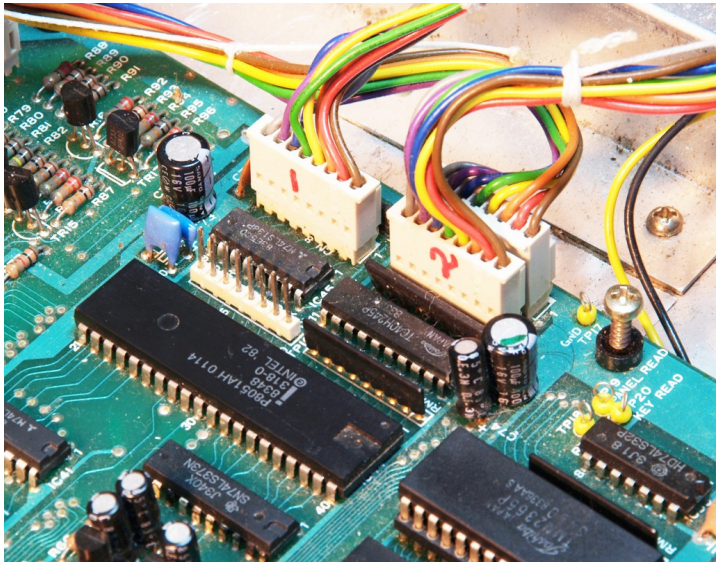


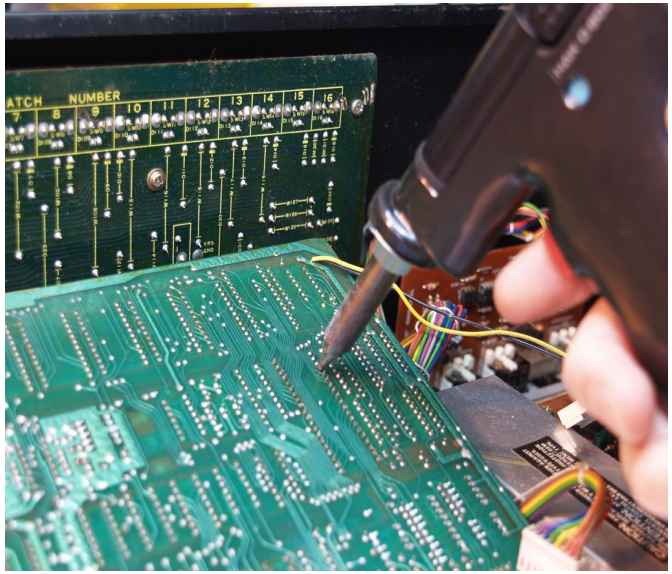
Photo 1 - Screw Locations in the JX-3P main board

Step 3) Remove the 6 cable plugs and turn the board over.

Step 4) Desolder the CPU (IC44) and fit the supplied 40 pin IC Socket.

It is very important that this step is done correctly.



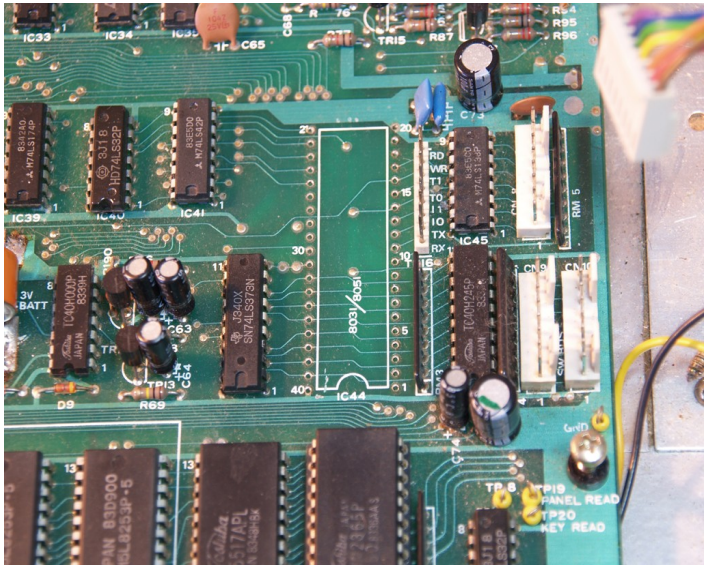


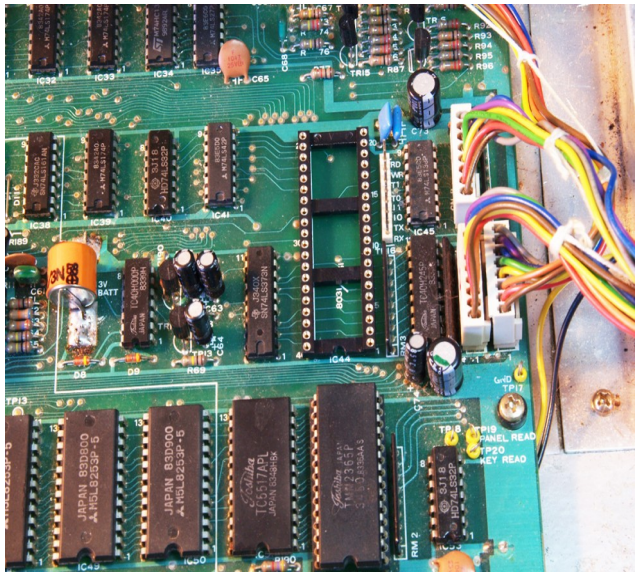
On the top side of the board underneath the IC44 CPU are some fine tracks that will be damaged and difficult to repair if all the solder is not removed correctly. **All the solder must be removed from all the 40 holes and the pins free of the hole edges before the CPU is lifted.** The CPU pins should be able to move freely in the hole 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. The photo shows an older Hakko being used. A hand vacuum can be used but these can cause damage to the board as they can jump and damage tracks as they are triggered. Quality Solder wick is a better approach than a hand desolderer.

HINT

The trick with soldering and desoldering on these old resin boards is to not let things get too hot. The board and the copper both get soft at 300°+ and are easily damaged. Do not keep retrying a pin that will not work the first time. Work on other pins, let that one cool and try again when it has cooled. If it will not desolder try resoldering it with fresh solder, let it cool and try again. As a last resort cut the cpu pin as close to the cpu as you can with fine cutters, remove the pin from the hole by hooking it out with a soldering iron using the cut bent top, let it cool and then desolder the hole.

Step 5) Carefully solder in the supplied 40 IC socket.





Step 6) Fit the KiwiTechnics 3P Matrix Upgrade Board into the socket. Note that there is already a socket pressed onto the Kiwi-3P Matrix cpu board. This is there to lift the Kiwi-3P Matrix board above the capacitors that are to the left of the cpu socket and should be left in place. **Pin 1 on the upgrade board is marked and this end MUST be at the pin 1 end of the socket**. Pin 1 is marked on the socket & upgrade board by a notch in one end (see pictures) and is at the keyboard end. It is most important **to make sure all the pins are located inside all the socket holes** before pressing the upgrade firmly into the socket. This will need a firm push to seat and if pins are not located correctly they will bend and are likely to break off which will require a replacement.

Step 7) The white wire on the Kiwi-3P CPU board will be fitted to the Midi board in the next part of the install. Do not refit the main board yet.

Midi Board PG-200 Mod

This mod allows the JX-3P synth to accept midi with the rear switch in any position and a PG-200 controller to be used with the Kiwi-3P Matrix upgrade.
After fitting this mod the rear switch is only used for memory protect and the midi and PG-200 will always work with the switch in any position.

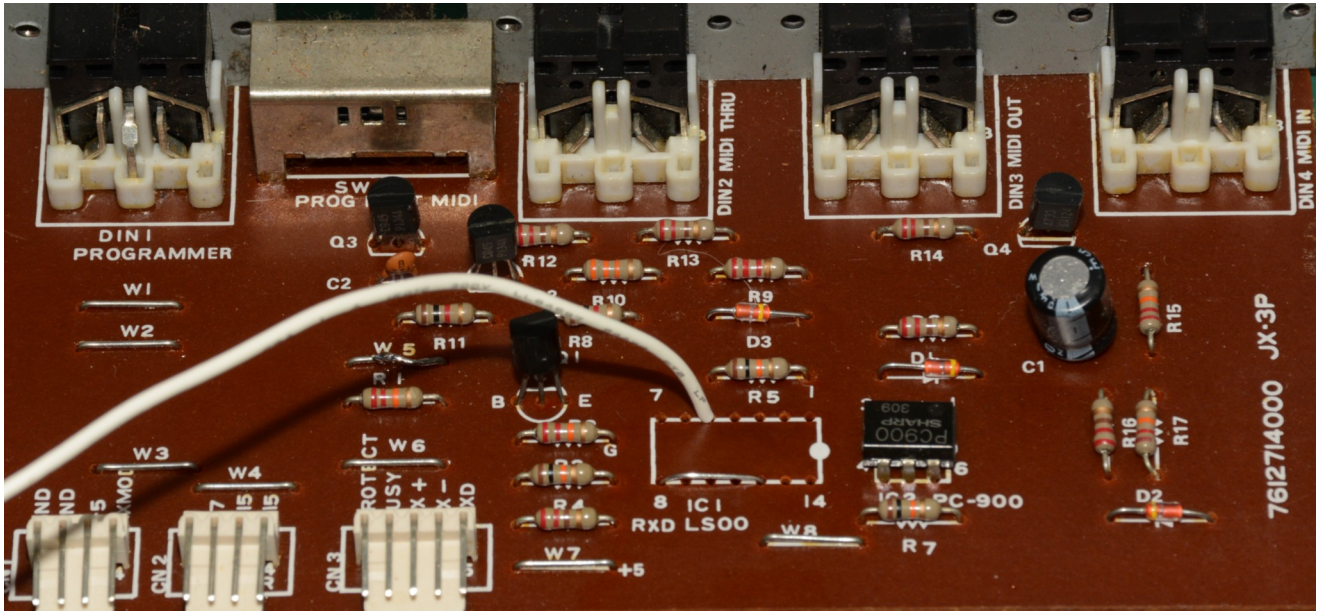
Step 1) Remove the JX-3P Midi board. This is done by removing the 3 black screws on the rear of the synth that are next to the Programmer, Midi Through (if fitted) & Midi In sockets.

Step 2) Remove IC1 (74LS00).

Step 3) Fit the link provided between pins 8 & 12 of IC1 as is shown in the photo.

Step 4) Fit the white wire from the Kiwi3P Matrix cpu board to pin 5 of IC1 and tie this wire to the existing loom so it is tidy and will not be damaged and refit the midi board.

If you are changing from the Kiwi-3P upgrade to the Kiwi-3P Matrix you will need to rejoin W5 which was cut during the Kiwi-3P install. You can see in the photo that this has been resoldered.



Pulse Width Mod Install

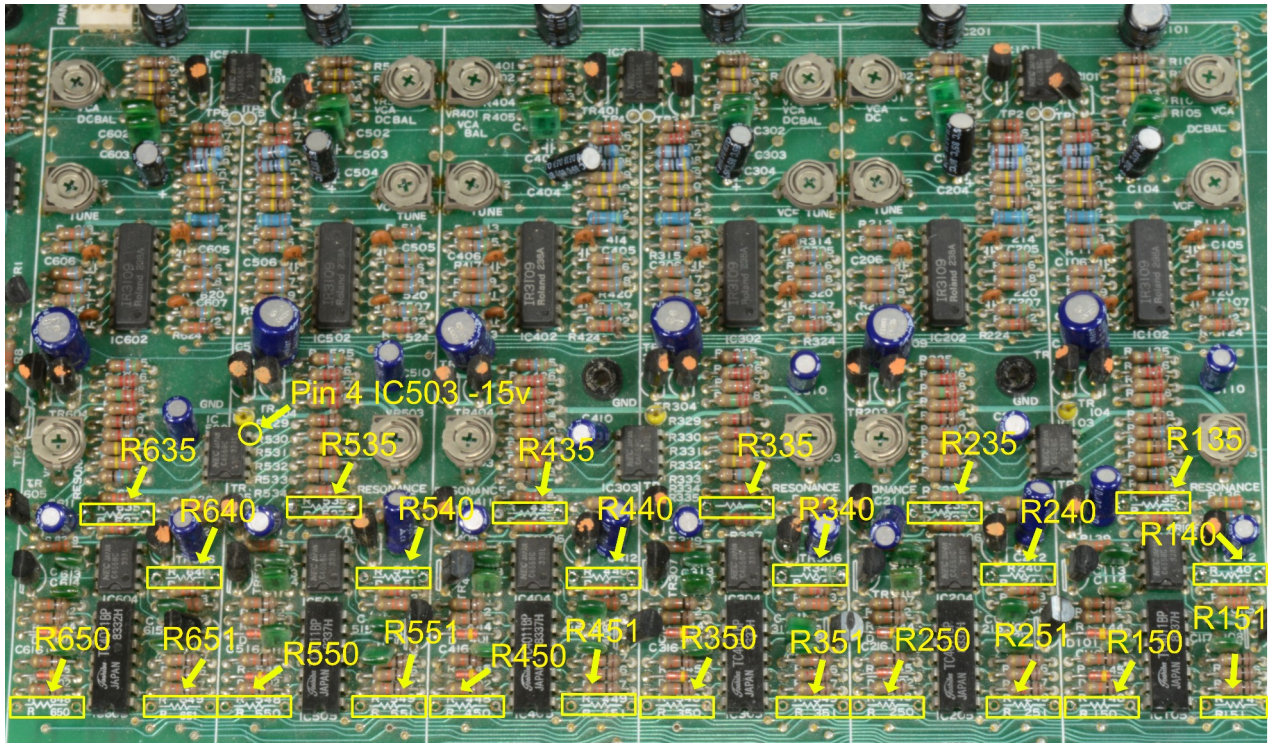
The Kiwi Pulse board adds the ability to mix the three wave types (Saw, Pulse and Square) and allows Pulse Width control on the Pulse waveform.

Mixing waves or Pulse Width control was not possible in the original JX-3P.

Step 1) Fitting the Kiwi-PW board requires 24 resistors to be removed from the main board and 28 wires to be soldered from the Kiwi-Pulse board. All these wires have been prefitted on the Kiwi-Pulse board.

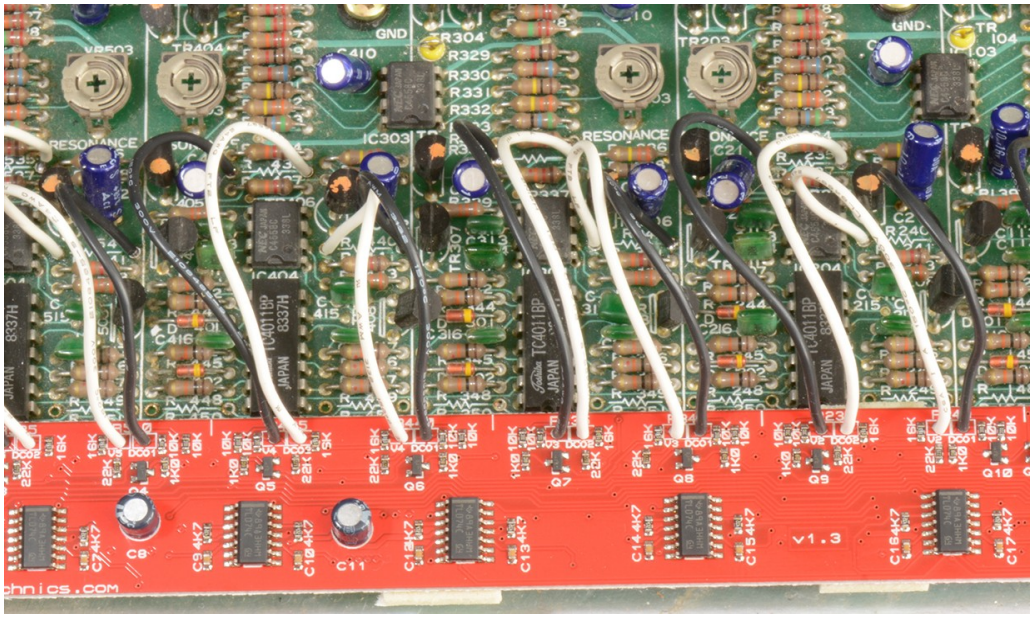
The following resistors need to be removed from the Voices area of the JX-3P main board. The photo shows the locations and the resistor numbers are

R135, R140, R150, R151
R235, R240, R250, R251
R335, R340, R350, R351
R435, R440, R450, R451
R535, R540, R550, R551
R635, R640, R650, R651

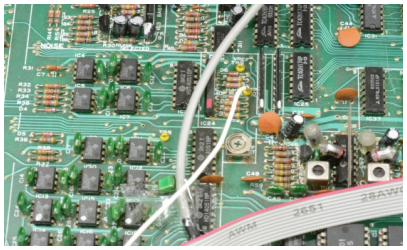


These resistors are bent on the solder side before they are soldered making removal more difficult. It is easier to cut them off from the top side and then remove the remainder of the leads from the underside with a desoldering tool. R135 & R140 (R235,R240 etc) have wires soldered into the holes from the Kiwi-Pulse board so it is best to remove the remainder of the leads in each voice for these resistors to clear the holes. The legs of R150, R151 ,R250 etc can be left in the holes to save work.

Step 2) The 12 coloured and white wires need to be soldered into the holes left by the removal of the R135 & R140 resistors. It is important that these are put in the correct way around. In all DCO1 voices (R140, R240 etc) the coloured wire goes on the right side of the resistor holes (facing toward the rear of the synth) as is shown in the photo. For all the DCO2 voices (R135,R235 etc) the coloured wire goes on the left side of the resistor holes. The wires are prefitted into the Kiwi-Pulse board in this order ready to be soldered into the JX-3P main board. Note the photo is an older version of the board but the voice wires are in the same order.



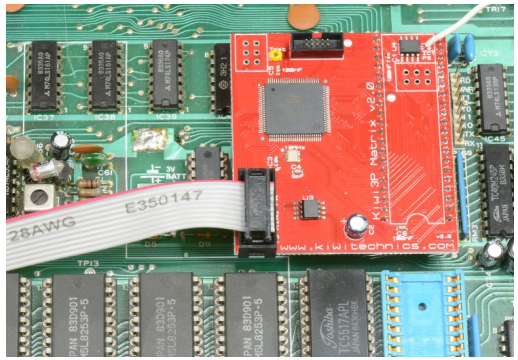
Step 3) The longer white wire needs to be soldered to the TP10 DAC Output on the Main Board (see photo).



Step 4) The power wires need to be soldered to the GND test point next to IC103 and to the ±15v on IC103. The Orange wire needs to be soldered to IC103 Pin 8 (+15v) and the Blue wire needs to be soldered to IC103 Pin 4 (-15v). Be careful not to bridge the legs of IC103 with too much solder. Also work quickly and don't get the IC too hot.

Step 5) Fitting the board is done by cleaning the area on the top side of the JX-3P main board where the Kiwi-Pulse board is going to be placed (see photo) and then removing the backing paper from the Kiwi-Pulse board and fixing it to the JX-3P main board in the position in the photo.

Step 6) The ribbon cable needs to be inserted into the socket on the Kiwi-3P Matrix cpu board **before you stick down the Pulse board** so the cable reaches the cpu board.



Note – The waves will not sound correctly until the adjustments on page 40 are finished.

Chorus Speed Mod Install

The Chorus Upgrade will allow control of the Chorus Speed in the JX-3P which can be controlled via midi and saved with a program patch. There is also a manual mode to allow the chorus sweep to be stopped in any position or controlled at any speed.

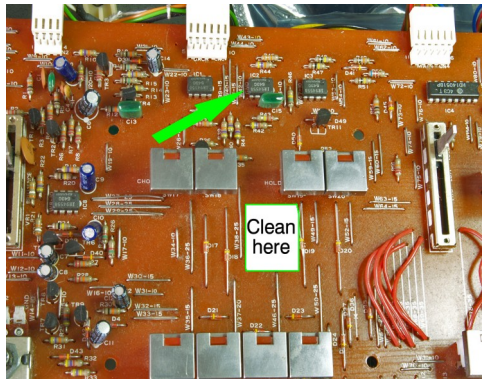
Step 1) Remove the front panel board. To do this it will be necessary to remove the Jack board to allow access to the mounting screws for the front panel. This is done by removing the four screws at the ends of the jacks on the rear of the 3P. The front panel can then be removed by removing the slider knobs and then undoing the mounting screws.

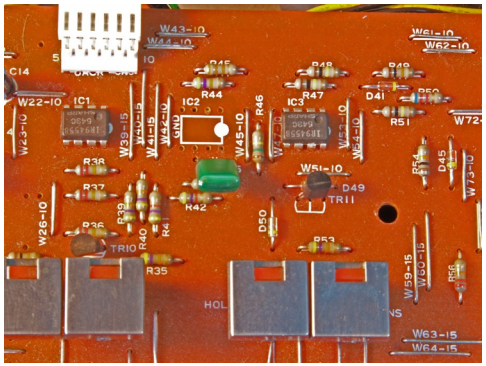
Step 2) Remove IC2 (green arrow in picture)

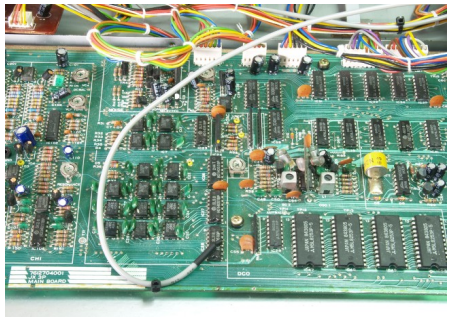
Step 3) Clean and dust or dirt from the labelled space on the board in the photo using a damp cloth and then dry. Bend down C15 as much as will easily bend away from the IC2 holes. Do not force. Remove the tape from the double sided sponge on the Chorus Mod PC board and press the board onto this spot. Solder in the 8pin header into the IC2 holes with the cable going over C15 (see photo). Make sure the bottom of the Chorus Board does not touch any of the wire links.

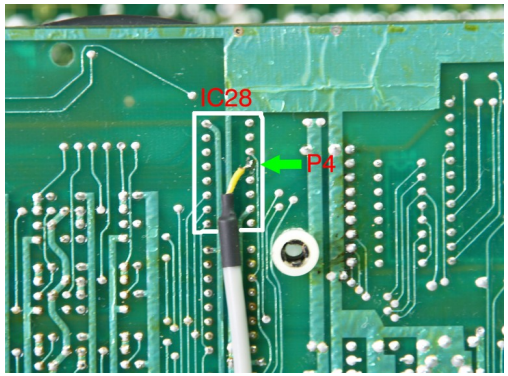
Step 4) Uncoil the shielded cable and tie this to the existing wiring loom down to the main voice board.

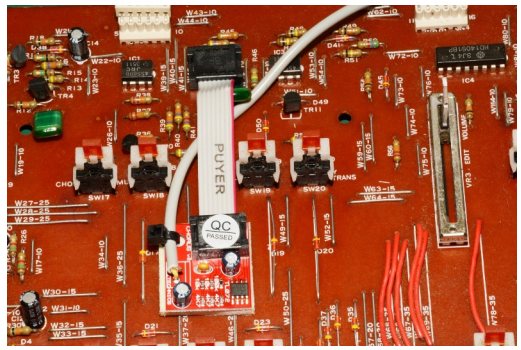
Step 5) Carefully Solder the end of the cable to pin 4 of IC28 making sure you have not bridged the IC pins with solder. This is arrowed on the picture. This will need to be done fairly quickly so the IC does not get too hot which will damage it. The cable can be soldered to the top or bottom of the board. The cable should be tied to the hole in the board next to IC28 (see photos).











Optional Fixes for the Kiwi-3P

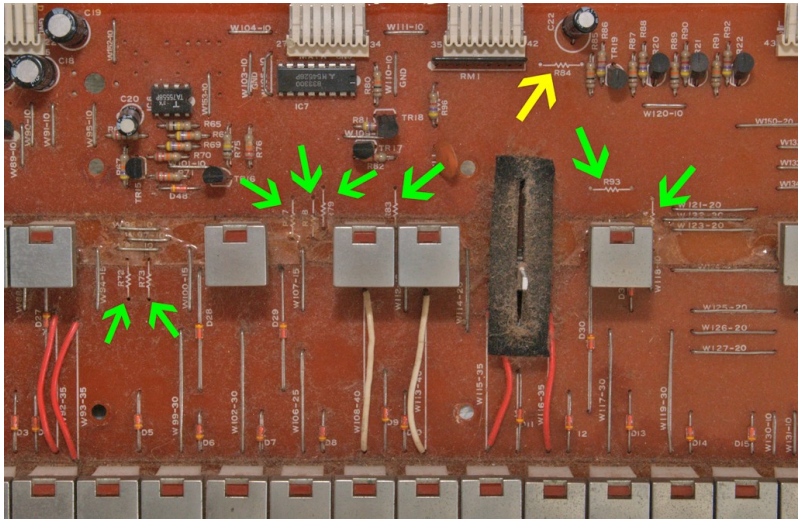
The following are optional modifications that can be made. The first changes the way the LEDs are powered which will reduce the flickering that occurs as LED are changed on the display. This is more noticeable once the Kiwitechnics 3P Matrix Upgrade is fitted due to the enhanced use of the LEDs.

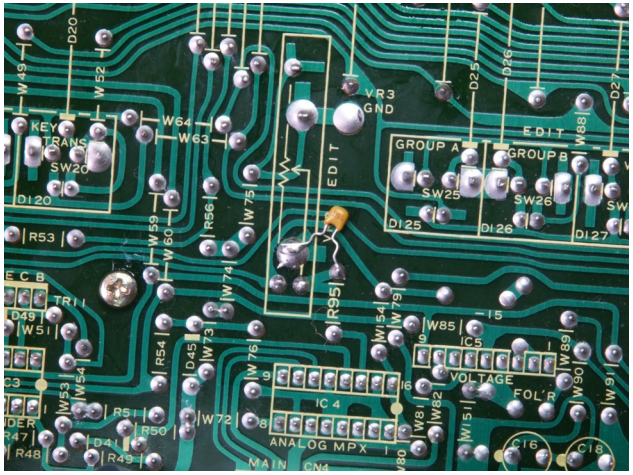
Step 1 Remove the front panel board. To do this it will be necessary to remove the Jack board to allow access to the mounting screws for the front panel. This is done by removing the four screws on the rear of the 3P. The front panel can then be removed by removing the slider knobs and then undoing the mounting screws.

Step 2 Remove all of the nine 100R resistors identified with arrows. The photo shows these already removed.

Step 3 Place a link in place of R84 which is identified by the yellow arrow and fit the eight supplied 220R resistors to the eight green arrow locations. There is a resistor numbering error in the service manual so use the photo as your guide.

Step 4 Replace the front panel board, the rear jack board and front panel knobs

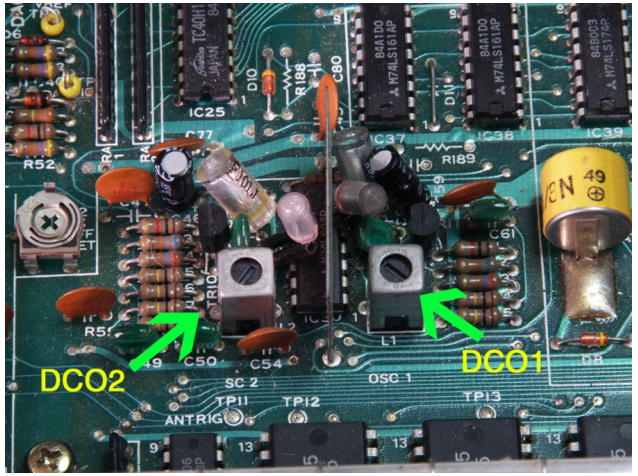




The second modification improves the stability of the Sens slider. On our test JX-3P we had noise issues with the Sens pot which caused it to be noise prone and jumpy. This can be improved by fitting the supplied 0.1uF cap to ground on the junction between the Sens Edit Pot slider connection and R95. This is most easily fitted on the underside of the front panel board as shown in the photo. The Sens Pot is located near the center of the front panel board and has the word 'EDIT' next to it.

Adjustments for the JX-3P (Test Mode)

To enter test mode press and hold the ARP CLOCK button (3P SEQ WRITE button) as you power on the JX-3P. Let the JX-3P run for 15mins or so to warm and stabilise.



Except for test mode #3, while in TEST MODE the ARP CLOCK button will slow flash and the current test tone will fast flash on the BANK LEDs. As keys are pressed the voice being allocated will show on Tone LED 8-3. Voice 1 will show on Tone LED 8, Voice 2 on Tone LED 7 etc . These are the same order that the voices are on the JX-3P main board. Test mode #3 uses the buttons differently (see below).

1) Test #1 – Set DCO2 Master Tune. This is selected by pressing BANK 1. Bank 1 will flash.
   Center the Tune trim on the rear of the JX-3P and make sure that the Master Fine Tune Global parameter is centred. The Kiwi-3P Matrix is shipped with the MFT centred so if it has never been changed it will be fine. Press A4 and tune DCO2 using the DCO2 trimmer to 440Hz. If you do not have a hardware tuner try the APTuner app. Note - The DCO 1&2 trims are pretty fragile and are effected by metal. Be **very** gentle turning them and move the metal away in between adjustments. Use a plastic screwdriver if you have one.

2) Test #2 – Set DCO1 Master Tune. This is selected by pressing BANK 2. Bank 2 will flash.
   Press A4 and tune DCO1 using the DCO1 trimmer until the beating between the DCOs is at a minimum.

3) Test #3 – Set DAC and voice Saw wave Offsets. This is selected by pressing BANK 3. Bank 3 will flash.
   First the Reference voltage needs to be set. Connect an accurate voltmeter to TP9 (Marked VREF) and adjust VR1 (marked VREF ADJ) so that 4.70volts is on TP9.

   Next each voice needs to have the Sawtooth wave form adjusted for the low end. As there is no auto tune hardware in the JX-3P this must be done manually. At low frequencies the Saw wave is very sensitive to component tolerances (and also temperature) it is important to adjust these out as much as possible so that the new Pulse Width wave works correctly.

   Turn the VR2 adjust (marked DAC ADJUST) to centre. Press the bottom C on the keyboard at least 6 times to make sure all voices are outputting this note. Next search all the voices for the voice with the longest clipping the bottom of the wave on the oscilloscope by looking at all 12 outputs of IC104-604 looking at both pin1 and pin7 outputs. Clipping looks like a flat part of the wave at the bottom (see photo). The voice with the longest flat portion is the one you want. Once this voice is found adjust VR2 while watching this output until the flat portion is just gone and it is at the highest level possible. No voice should have any flat portion on the wave before you begin trimming.

On the JX-3P front panel there are 12 buttons on the top row. These are in the same order as the voices being trimmed and are from right to left Voice 1 DCO 1, Voice 1 DCO 2, Voice 2 DCO 1, Voice 2 DCO 2 and so on. The current voice being trimmed will flash on the top row. Trimming is done using TONE buttons 6, 7 and 8 (Original JX-3P buttons 14, 15 & 16) which will flash on the bottom row.

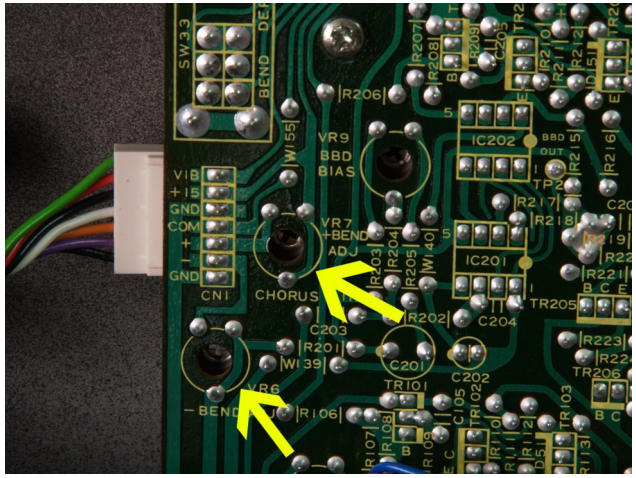
The voice outputs are IC104-604 with Voice 1 DCO1 output on pin1 of IC104, voice 1 DCO 2 output is on pin7 of IC104 and so on through to Voice 6 DCO2 output which is on pin7 of IC604.

The process is, select the voice to trim using the top row of buttons (it will flash), connect the oscilloscope to the DCO output being trimmed (pin 1 or 7) and trim the SAW level using the Tone 7 (down) and Tone 8 (up) buttons to adjust the level until it is just below the clip point. If you get lost Tone 6 will reset the adjustment to zero so you can try again.
These setting are saved to permanent memory and shouldn't need to be changed again.

4) Test #4 – Set VCF Tune. This is selected by pressing BANK 4. Bank 4 will flash.
This test is used to set VCF Tune. Press C4 and tune VR102-VR602 for output at 1kHz. Do this for each voice. Use the front panel lights as a guide to which voice is sounding.

5) Test #5 – Set VCF Resonance. This is selected by pressing BANK 5. Bank 5 will flash.
This test is used to set the VCF Resonance level. Connect an oscilloscope between TP-7 (POLY OUT) & GND. Cycle through all 6 voices setting VR103-VR603 so that the output is 600mV peak to peak. Use the front panel lights as a guide to which voice is sounding.

6) Test #6 – Set VCA Balance. This is selected by pressing BANK 6. Bank 6 will flash.
This test is used to set the VCA Offset. Connect an oscilloscope between TP-7 (POLY OUT) & GND.
There are special notes to use for this test. The lowest 6 white notes are used to trigger the 6 voices. These are in the order C = Voice6, D=Voice5, E=Voice4, F=Voice3, G=Voice2 and A=Voice1.
While repeatedly pressing the note related to the voice being trimmed adjust VR102(Voice1)-VR602(voice6) for a minimum change in the output as the note is pressed.



Bend Lever Adjustment

With the bend switch set to Wide Range check the the bend range is one octave up and down. The maximum and minimum settings can be adjusted using VR6 (-) and VR7 (+).

Midi Data

Function	Transmitted	Recognized	Notes
Basic Channel	1-16	1-16	If Omni selected the 3P will recognize any midi channel
Note Number	24(C1)-108(C8)	0-127	Notes that are received outside the JX-3P range of 24-108 are transposed to the nearest octave within range.
Mode	X	X	Voice Modes need to be changed using Midi Control or Sysex commands
Velocity Note On Note Off	 O X	 O X	All keys sent from the JX-3P have a velocity set by the Global Parameter A4 (or midiCC 107)
Aftertouch Keys Channels	 X X	 X O	Due to the small number of keyboards supporting Key AT only Channel AT has been implemented.
Pitch Bender	O	O	Midi & internal bends are additive within the 3P. Midi bend input is effected by the Range switch.
Control Change	O	O	Only if Midi CC option is Enabled. See Control Change Tables for details
Program Change	X	0-127	If CC0, CC32 is 0,0 then 0-63 selects Tone Bank 1, 64-127 Selects Tone Bank 2 If CC0, CC32 is 0,1 then 0-63 selects Tone Bank 3, 64-127 Selects Tone Bank 4
System Exclusive	O	O	Only if Midi Sysex option is Enabled - See Sysex Table for details
System Real Time Clock Commands	O	O	Will Transmit from Seq Clock if Clock Output is enabled. Input clocks passed through to midi out unaltered. Recognized within the 3P only if the clock source has been set to midi on the Pattern, Arp or Sequence clocks
Modulation	O	O	Will adjust patch value(s) as a temporary effect if enabled.
Notes X=No O=Yes			

Supported Midi Messages	Status	Second	Third	Notes
Note Off	$8n (128-143)	$kk	$yy	n = 0-15 midi channel kk = note number (0-127) -outside range 24-108 are ignored yy = Don't care (ignored)
Note On	$9n (144-159)	$kk	$yy	n = 0-15 midi channel kk = note number (0-127)-outside 24-108 are transposed to the nearest Octave yy = 0=Off, 1-127 = Note Velocity.
Continuous Controllers	$bn (160-191)	$kk	$yy	n = 0-15 midi channel $kk & $yy see CC table

Program Change	$cn (192-207)	0-127		n = 0-15 midi channel
				If CC0, CC32 is 0,0 then
				0-63 selects Tone Bank 1, 64-127 Selects Tone Bank 2
				If CC0, CC32 is 0,1 then
				0-63 selects Tone Bank 3, 64-127 Selects Tone Bank 4

Channel Aftertouch	$dn (208-223)	$kk	---	n = 0-15 midi channel kk = Channel Pressure (0-127)
Pitch Bend	$en (224-239)	$kk	$yy	n = 0-15 midi channel kk = Least Significant 7 bits yy = Most Significant 7 bits
				Note $xx = hex number

Continuous Controllers

Continuous Controllers	Second	Third	Notes
Bank Select MSB	$00 (00)	$00-$01	0=Bank Selection, 1=Pattern Selection, 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)	
NRPN MSB	$06 (06)	$00-$7f (0-127)	Not Supported
Overall Volume	$07 (07)	$00-$7f (0-127)	Sets VCA Level
DCO1 Coarse Tune	$08 (08)	$00-$18 (0-24)	x=0-24 (-12 → +12 notes)
DCO1 LFO	$09 (09)	$00-$7f (0-127)	
DCO1 ENV	$0a (10)	$00-$7f (0-127)	
DCO1 PW	$0b (11)	$00-$7f (0-127)	
DCO1 PWM	$0c (12)	$00-$7f (0-127)	
DCO1 DYN	$0d (13)	$00-$7f (0-127)	
DCO2 Coarse Tune	$0e (14)	$00-$18 (0-24)	x=0-24 (-12 → +12 notes)
DCO2 Fine Tune	$0f (15)	$00-$64 (0-100)	0-100 = -50 → + 50 cents
DCO2 LFO	$10 (16)	$00-$7f (0-127)	
DCO2 ENV	$11 (17)	$00-$7f (0-127)	
DCO2 PW	$12 (18)	$00-$7f (0-127)	
DCO2 PWM	$13 (19)	$00-$7f (0-127)	
DCO2 DYN	$14 (20)	$00-$7f (0-127)	
DCO Detune	$15 (21)	$00-$7f (0-127)	
DCO Mix	$16 (22)	$00-$7f (0-127)	
Mix ENV	$17 (23)	$00-$7f (0-127)	
Mix DYN	$18 (24)	$00-$7f (0-127)	
Chorus Rate	$19 (25)	$00-$7f (0-127)	
VCA DYN	$1a (26)	$00-$7f (0-127)	
VCF Low Pass Cutoff	$1b (27)	$00-$7f (0-127)	
VCF Low Pass Resonance	$1c (28)	$00-$7f (0-127)	
VCF LFO	$1d (29)	$00-$7f (0-127)	
VCF ENV	$1e (30)	$00-$7f (0-127)	
VCF KEY	$1f (31)	$00-$7f (0-127)	
Bank Select LSB	$20 (32)	$00-$7f (0-127)	Selects Bank sets for Program Select $00 (0) for Patches 1-128 $01 (1) for Patches 129-256 $02 (2) for Patches 257-384 $03 (3) for Patches 385-512
VCF HPF	$21 (33)	$00-$7f (0-127)	
VCF DYN	$22 (34)	$00-$7f (0-127)	
ENV 1 Attack	$23 (35)	$00-$7f (0-127)	
ENV 1 Decay	$24 (36)	$00-$7f (0-127)	
ENV 1 Sustain	$25 (37)	$00-$7f (0-127)	
NRPN LSB	$26 (38)	$00-$7f (0-127)	Not Supported.
ENV 1 Release	$27 (39)	$00-$7f (0-127)	
ENV 2 Attack	$28 (40)	$00-$7f (0-127)	
ENV 2 Decay	$29 (41)	$00-$7f (0-127)	

Continuous Controllers	Second	Third	Notes
ENV 2 Sustain	$2a (42)	$00-$7f (0-127)	
ENV 2 Release	$2b (43)	$00-$7f (0-127)	
LFO 1 Rate	$2c (44)	$00-$7f (0-127)	
LFO 1 Delay	$2d (45)	$00-$7f (0-127)	
LFO 2 Rate	$2e (46)	$00-$7f (0-127)	
LFO 2 Delay	$2f (47)	$00-$7f (0-127)	
LFO 3 Rate	$30 (48)	$00-$7f (0-127)	
LFO 3 Delay	$31 (49)	$00-$7f (0-127)	
Matrix Midi CC #1	$34 (52)	$00-$7f (0-127)	Source Input for Matrix - Use Sysex or Kiwi-3Pv2 Edit for Matrix Control
Matrix Midi CC #2	$35 (53)	$00-$7f (0-127)	Source Input for Matrix
Matrix Midi CC #3	$36 (54)	$00-$7f (0-127)	Source Input for Matrix
Matrix Midi CC #4	$37 (55)	$00-$7f (0-127)	Source Input for Matrix
Matrix Midi CC #5	$38 (56)	$00-$7f (0-127)	Source Input for Matrix
Matrix Midi CC #6	$39 (57)	$00-$7f (0-127)	Source Input for Matrix
VCA LFO Level	$3a (58)	$00-$7f (0-127)	
ENV 3 Attack	$3b (59)	$00-$7f (0-127)	
ENV 3 Decay	$3c (60)	$00-$7f (0-127)	
ENV 3 Sustain	$3d (61)	$00-$7f (0-127)	
ENV 3 Release	$3e (62)	$00-$7f (0-127)	
Analogue Feel	$3f (63)	$00-$7f (0-127)	
Hold Pedal	$40 (64)	$yy	yy = $00-$3f (0-63) Off $40-$7f (64-127) On
DCO1 Range	$41 (65)	$yy	yy = $00-$0f (0-31) 16' $20-$3f (32-63) 8' $40-$4f (64-127) 4'
DCO1 Wave	$42 (66)	$yy	yy = $00-$1f (0-31) Saw $20-$2f (32-47) Pulse $30-$3f (48-63) Square $40-$4f (64-79) Saw + Pulse $50-$5f (80-95) Saw + Square $60-$7f (96-127) Saw + Pulse + Square
DCO1 LFO Source	$43 (67)	$yy	yy = $00-$1f (00-31) LFO 1 $20-$3f (32-63) LFO 2 $40-$7f (64-127) LFO 3
DCO1 ENV Source	$44 (68)	$yy	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
DCO2 Range	$46 (70)	$yy	yy = $00-$0f (0-31) 16' $20-$3f (32-63) 8' $40-$4f (64-127) 4'
DCO2 Wave	$47 (71)	$yy	yy = $00-$1f (0-31) Saw $20-$2f (32-47) Pulse $30-$3f (48-63) Square $40-$4f (64-79) Noise $50-$5f (80-95) Saw + Pulse $60-$6f (96-111) Saw + Square $70-$7f (112-127) Saw + Pulse + Square

Continuous Controllers	Second	Third	Notes
DCO2 LFO Source	$48 (72)	$yy	yy = $00-$1f (00-31) LFO 1 $20-$3f (32-63) LFO 2 $40-$7f (64-127) LFO 3
DCO2 ENV Source	$49 (73)	$yy	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
VCF LFO Source	$4b (75)	$yy	yy = $00-$1f (00-31) LFO 1 $20-$3f (32-63) LFO 2 $40-$7f (64-127) LFO 3
VCF ENV Source	$4c (76)	$yy	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
VCA Mode	$4d (77)	$yy	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
VCA LFO Source	$4e (78)	$yy	yy = $00-$1f (00-31) LFO 1 $20-$3f (32-63) LFO 2 $40-$7f (64-127) LFO 3
LFO 1 Wave	$4f (79)	$yy	yy = $00-$0f (0-15) Sine $10-$1f (16-31) Triangle $20-$2f (32-47) Saw $30-$3f (48-63) Rev Saw $40-$4f (64-79) Square $50-$5f (80-95) Random $60-$7f (96-127) Fast Random
LFO 2 Wave	$50 (80)	$yy	yy = $00-$0f (0-15) Sine $10-$1f (16-31) Triangle $20-$2f (32-47) Saw $30-$3f (48-63) Rev Saw $40-$4f (64-79) Square $50-$5f (80-95) Random $60-$7f (96-127) Fast Random
LFO 3 Wave	$51 (81)	$yy	yy = $00-$0f (0-15) Sine $10-$1f (16-31) Triangle $20-$2f (32-47) Saw $30-$3f (48-63) Rev Saw $40-$4f (64-79) Square $50-$5f (80-95) Random $60-$7f (96-127) Fast Random
Load Sequence	$52 (82)	$00-$08 (0-8)	0 = Do not load sequence 1-8=Load Seq 1-8 All other numbers ignored Seq 1-8 are 124 step
XMod	$54 (84)	$yy	yy = $00-$1f (0-31) Off $20-$3f (32-63) Sync1 $40-$5f (64-95) Sync2 $60-$7f (96-127) Metal
Key Mode	$55 (85)	$yy	yy = $00-$0f (0-15) Poly Single $10-$1f (16-31) Poly Dual $20-$2f (32-47) Poly Triple $30-$3f (48-63) Unison $40-$7f (64-127) Solo

Continuous Controllers	Second	Third	Notes
Arpeggiator Mode	$56 (86)	$yy	yy = $00-$0f (0-15) Up $10-$1f (16-31) Down $20-$2f (32-47) Up & Down $30-$3f (48-63) Random $40-$7f (64-127) As Played
Arpeggiator Range	$57 (87)	$yy	yy = $00-$1f (0-31) 1 Octave $20-$3f (32-63) 2 Octaves $40-$5f (64-95) 3 Octaves $60-$7f (96-127) 4 Octaves
Arpeggiator Clock Divide	$58 (88)	$yy	yy = $00-$09 (0-9)- Half Note (48/Step) $0a-$13 (10-19)-Quarter note (24/Step) $14-$1d (20-29)-8th note (12/Step) $1e-$27 (30-39)-8th note, 1/2 swing (14,10/Step) $28-$31 (40-49)-8th note, full swing (16,8/Step) $32-$3b (50-59)-8th note triplets (8/Step) $3c-$45 (60-69)-16th note (6/Step) $46-$4f (70-79)-16th note, half swing (7,5/Step) $50-$59 (80-89)-16th note, full swing (8,4/Step) $5a-$63 (90-99)-16th note triplets (4/Step) $64-$6d (100-109)-32nd note (3/Step) $6e-$77 (110-119)-32nd note triplets (2/Step) $78-$7f (120-127)-64th note triplets (1/Step)
Sequencer Clock Divide	$59 (89)	$yy	yy = $00-$09 (0-9)- Half Note (48/Step) $0a-$13 (10-19)-Quarter note (24/Step) $14-$1d (20-29)-8th note (12/Step) $1e-$27 (30-39)-8th note, 1/2 swing (14,10/Step) $28-$31 (40-49)-8th note, full swing (16,8/Step) $32-$3b (50-59)-8th note triplets (8/Step) $3c-$45 (60-69)-16th note (6/Step) $46-$4f (70-79)-16th note, half swing (7,5/Step) $50-$59 (80-89)-16th note, full swing (8,4/Step) $5a-$63 (90-99)-16th note triplets (4/Step) $64-$6d (100-109)-32nd note (3/Step) $6e-$77 (110-119)-32nd note triplets (2/Step) $78-$7f (120-127)-64th note triplets (1/Step)
Master Clock Source	$5a (90)	$yy	yy = $00-$3f(0-63) Internal $40-$7f(64-127) Midi
DCO1 PWM Source	$5c (92)	$yy	yy = $00-$1f (0-31) ENV 1 $20-$3f (32-63) ENV 3 $40-$5f (64-95) LFO 1 $60-$7f (96-127) LFO 2
DCO2 PWM Source	$5d (93)	$yy	yy = $00-$1f (0-31) ENV 1 $20-$3f (32-63) ENV 3 $40-$5f (64-95) LFO 1 $60-$7f (96-127) LFO 2
Voice Mode Steal Option	$5f (95)	$yy	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
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 Envelopes	$66 (102)	$yy	yy = $00-$3f (0-63) Staccato $40-$7f (64-127) Legato

Continuous Controllers	Second	Third	Notes
Start/Stop Arp	$67 (103)	$yy	yy = $00-$3f (0-63) Arp Stopped $40-$7f (64-127) Arp Playing
Start/Stop Seq	$68 (104)	$yy	yy = $00-$3f (0-63) Seq Stopped $40-$7f (64-127) Seq Playing
Mix ENV Source	$69 (105)	$yy	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
Chorus Off/Auto/Manual	$6a (106)	$yy	yy = $00-$3f (0-31) Chorus Off $20-$5f (32-63) Chorus On Auto $40-$7f (64-127) Chorus On Manual
Matrix 0 Level	$6c (108)	$00-$7f (0-127)	
Matrix 1 Level	$6d (109)	$00-$7f (0-127)	
Matrix 2 Level	$6e (110)	$00-$7f (0-127)	
Matrix 3 Level	$6f (111)	$00-$7f (0-127)	
Matrix 4 Level	$70 (112)	$00-$7f (0-127)	
Matrix 5 Level	$71 (113)	$00-$7f (0-127)	
Matrix 6 Level	$72 (114)	$00-$7f (0-127)	
Matrix 7 Level	$73 (115)	$00-$7f (0-127)	
Matrix 8 Level	$74 (116)	$00-$7f (0-127)	
Matrix 9 Level	$75 (117)	$00-$7f (0-127)	
Master Tune	$76 (118)	$00-$7f (0-127)	
Program Change	$77 (119)	$yy	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 Sequence Play
Stop	$fc (252)		Stop Sequence Play

Midi Sysex Support

Function	Transmitted	Recognized	Notes
Basic ID	1-16	1-16, Omni	Set using Device ID in Global Variable S:B:4
Load	O	O	
Dump	O	O	

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 ID
	$08	Kiwitechnics 3P Matrix ID
	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 $09 = Request Seq Dump $0a = Transmit/Receive Seq Dump $0d = Request Tone Parameter $0e = Transmit/Receive Tone Parameter $0f = Request 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 3P becomes unusable due to non valid data you will need to do a full restore of the 3P 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		3P transmits a $02 (2) command
$02 (2) Transmit or Receive Global Dump 32 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) = Enable MidiCC	000000xx	xx = 00=Off 01=CC Receive Enabled (Default) 10=CC Transmit Enabled 11=CC Receive & Transmit Enabled
	$04 (4) = Enable Sysex	0000000x	x = Off/On (set=On)
	$05 (5) = Enable Program Change	000000xx	xx = 00=None 01=PC Receive Enabled (Default) 10=PC Transmit Enabled 11=PC Receive & Transmit Enabled
	$06 (6) = Midi Soft Through	000000xx	xx = 00=Stop all 01=Pass all 10=Pass only nonCC 11=Stop only CC we have used Note - SysEx intended for the Kiwi-3P will not be passed Note – Active Sensing commands are suppressed within the Kiwi-3P and are not passed on
	$07 (7) = Enable Midi Clock Gen	0000000x	x = Off/On (set=On)
	$08 (8) = Master Clock Source	0000000x	x= 0-Internal 1-Midi
	$09 (9) = Master Fine Tune	0xxxxxxx	x = Master Fine Tune (+- 100 cents)
	$0a (10) = Clock Display	0000000x	x= 0-Off 1-On
	$0b (11) = Guitar Mode	0000000x	X = 0-10 0 = Off 1 = On. Base midi channel 1 2 = On. Base midi channel 2 3 = On. Base midi channel 3 4 = On. Base midi channel 4 5 = On. Base midi channel 5

			6 = On. Base midi channel 6 7 = On. Base midi channel 7 8 = On. Base midi channel 8 9 = On. Base midi channel 9 10 = On. Base midi channel 10 Guitar Mode uses midi channels Base number+0-5 only to control voices 1-6
	$0c (12) = Not Used		Not Used
	$0d (13) = PW Control	000000xx	xx= 00=Off - do not use as PW will not work 01=Kiwi-PW v1 10=Kiwi-PW v2 11=Reserved
	$0e-$1f (14-31) = Nulls		Not Used

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 ------- 0	Data Details
$03 (3) Request Tone Edit Buffer Dump	No Data		
$04 (4) Transmit/Receive Tone Edit Buffer Dump Null x 2 + 128 data bytes	2 x Null + 128 bytes data		2 x null bytes sent followed by 128 bytes of data in the following format
	$00-$0f (0-15) = Tone Name	Ascii Bytes	Tone Name
	$10 (16) = DCO1 Wave/Range	000wxyzz	zz = DCO 1 Range 00=16' 01=8' 10=4' y = DCO 1 Saw Wave x = DCO 1 Pulse Wave w = DCO 1 Square Wave Note - if no Wave bits are set Saw will be selected
	$11 (17) = DCO1 Tune	0xxxxxxx	x=0-24 (-12 → 0 → +12 notes)
	$12 (18) = DCO1 LFO Mod Amount	0xxxxxxx	(0-127)
	$13 (19) = DCO1 Env Mod Amount	0xxxxxxx	(0-127)
	$14 (20) = DCO1 PW Amount	0xxxxxxx	(0-127)
	$15 (21) = DCO1 PWM Amount	0xxxxxxx	(0-127)
	$16 (22) = DCO1 DYN Amount	0xxxxxxx	(0-127)
	$17 (23) = DCO1 Control	0wwxyyzz	zz = DCO1Env(00=Env1,01=Env2,10=Env3) yy = DCO1LFO(00=LFO1,01=LFO2,10=LFO3) x = DCO1Env Pol(0=Norm,1=Inverted) ww = DCO1PWM Src(00=Env1,01=Env3,10=LFO2,11=LFO3)
	$18 (24)=DCO2 Wave/Range	00vwxyzz	zz = DCO 2 Range 00=16' 01=8' 10=4' y = DCO 2 Saw Wave Enable x = DCO 2 Pulse Wave Enable w = DCO 2 Square Wave Enable Note - if no Wave bits are set Saw will be selected v = DCO 2 Noise Enable - Noise overrides and turns off y,x&w
	$19 (25) = DCO2 Tune	0xxxxxxx	x=0-24 (-12 → 0 → +12 notes)

	$1a (26) = DCO2 Fine Tune	0xxxxxxx	x=0-127 +- 50 Cents and zero 0-63 is shifted down 64 is not shifted 65-127 is shifted up
	$1b (27) = DCO2 LFO Mod Amount	0xxxxxxx	(0-127)
	$1c (28) = DCO2 Env Mod Amount	0xxxxxxx	(0-127)
	$1d (29) = DCO2 PW Amount	0xxxxxxx	(0-127)
	$1e (30) = DCO2 PWM Amount	0xxxxxxx	(0-127)
	$1f (31) = DCO2 DYN Amount	0xxxxxxx	(0-127)
	$20 (32) = DCO Cross Mod	000000xx	xx = 00=off 01=sync1 10=sync2 11=metal
	$21 (33) = DCO2 Control	0wwxyyzz	zz = DCO2Env(00=Env1,01=Env2,10=Env3) yy = DCO2LFO(00=LFO1,01=LFO2,10=LFO3) x = DCO2Env Pol(0=Norm,1=Inverted) ww = DCO2PWM Src(00=Env1,01=Env3,10=LFO2,11=LFO3)
	$22 (34) = Detune Amount	0xxxxxxx	(0-127)
	$23 (35) = DCO Mix	0xxxxxxx	(0-127)
	$24 (36) = DCO Mix Env Level	0xxxxxxx	(0-127)
	$25 (37) = DCO Mix DYN	0xxxxxxx	(0-127)
	$26 (38) = DCO Mix Control	000000zz	zz = MixEnv(00=Env1,01=Env2,10=Env3)
	$27 (39) = HPF Level	0xxxxxxx	(0-127)
	$28 (40) = VCF Cutoff Hi	000xxxxx	
	$29 (41) = VCF Cutoff Lo	0yyyyyyy	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	0yyyyyyy	Hi & Lo are combined to make single 12 bit command. 000xxxxx + 0yyyyyyy = 0000xxxx xyyyyyyy x = Range $0-$fff (0-4095)
	$2c (44) = VCF LFO Mod Amount	0xxxxxxx	(0-127)
	$2d (45) = VCF Env Mod Amount	0xxxxxxx	(0-127)
	$2e (46) = VCF Key Mod Amount	0xxxxxxx	(0-127)
	$2f (47) = VCF Key DYN Amount	0xxxxxxx	(0-127)

	$30 (48) = VCF Control	000xyyzz	zz = VCFEnv(00=Env1,01=Env2,10=Env3) yy = VCFLFO(00=LFO1,01=LFO2,10=LFO3) x = VCFEnv Pol(0=Norm,1=Inverted)
	$31 (49) = VCA Level	0xxxxxxx	(0-127)
	$32 (50) = VCA LFO Mod Amount	0xxxxxxx	(0-127)
	$33 (51) = VCA DYN Amount	0xxxxxxx	(0-127)
	$34 (52) = VCA Control	0000yyzz	zz = VCAENV(00=Gate,01=Env1,10=Env2,11=Env3) yy = VCALFO(00=LFO1,01=LFO2,10=LFO3)
	$35 (53)=Matrix 0 Source	000xxxxx	x = 0-26 – See Table 1
	$36 (54)=Matrix 0 Level	0xxxxxxx	x = Range $00-$7f (0-127)
	$37 (55)=Matrix 0 Destination	000xxxxx	x = 0-35 – See Table 3
	$38 (56)=Matrix 1 Source	000xxxxx	x = 0-26 – See Table 1
	$39 (57)=Matrix 1 Level	0xxxxxxx	x = Range $00-$7f (0-127)
	$3a (58)=Matrix 1 Destination	000xxxxx	x = 0-35 – See Table 3
	$3b (59)=Matrix 2 Source	000xxxxx	x = 0-26 – See Table 1
	$3c (60)=Matrix 2 Level	0xxxxxxx	x = Range $00-$7f (0-127)
	$3d (61)=Matrix 2 Destination	000xxxxx	x = 0-35 – See Table 3
	$3e (62)=Matrix 3 Source	000xxxxx	x = 0-26 – See Table 1
	$3f (63)=Matrix 3 Level	0xxxxxxx	x = Range $00-$7f (0-127)
	$40 (64)=Matrix 3 Destination	000xxxxx	x = 0-35 – See Table 3
	$41 (65)=Matrix 4 Source	000xxxxx	x = 0-26 – See Table 1
	$42 (66)=Matrix 4 Level	0xxxxxxx	x = Range $00-$7f (0-127)
	$43 (67)=Matrix 4 Destination	000xxxxx	x = 0-35 – See Table 3
	$44 (68)=Matrix 5 Source	000xxxxx	x = 0-26 – See Table 1
	$45 (69)=Matrix 5 Level	0xxxxxxx	x = Range $00-$7f (0-127)
	$46 (70)=Matrix 5 Destination	000xxxxx	x = 0-35 – See Table 3
	$47 (71)=Matrix 6 Source	000xxxxx	x = 0-26 – See Table 1
	$48 (72)=Matrix 6 Level	0xxxxxxx	x = Range $00-$7f (0-127)
	$49 (73)=Matrix 6 Destination	000xxxxx	x = 0-35 – See Table 3
	$4a (74)=Matrix 7 Source	000xxxxx	x = 0-26 – See Table 1
	$4b (75)=Matrix 7 Level	0xxxxxxx	x = Range $00-$7f (0-127)
	$4c (76)=Matrix 7 Destination	000xxxxx	x = 0-35 – See Table 3

	$4d (77)=Matrix 8 Source	000xxxxx	x = 0-26 – See Table 1
	$4e (78)=Matrix 8 Level	0xxxxxxx	x = Range $00-$7f (0-127)
	$4f (79)=Matrix 8 Destination	000xxxxx	x = 0-35 – See Table 3
	$50 (80)=Matrix 9 Source	000xxxxx	x = 0-26 – See Table 1
	$51 (81)=Matrix 9 Level	0xxxxxxx	x = Range $00-$7f (0-127)
	$52 (82)=Matrix 9 Destination	000xxxxx	x = 0-35 – See Table 3
	$53 (83) = Env 1 Attack	0xxxxxxx	(0-127)
	$54 (84) = Env 1 Decay	0xxxxxxx	(0-127)
	$55 (85) = Env 1 Sustain	0xxxxxxx	(0-127)
	$56 (86) = Env 1 Release	0xxxxxxx	(0-127)
	$57 (87) = Env 2 Attack	0xxxxxxx	(0-127)
	$58 (88) = Env 2 Decay	0xxxxxxx	(0-127)
	$59 (89) = Env 2 Sustain	0xxxxxxx	(0-127)
	$5a (90) = Env 2 Release	0xxxxxxx	(0-127)
	$5b (91) = Env 3 Attack	0xxxxxxx	(0-127)
	$5c (92) = Env 3 Decay	0xxxxxxx	(0-127)
	$5d (93) = Env 3 Sustain	0xxxxxxx	(0-127)
	$5e (94) = Env 3 Release	0xxxxxxx	(0-127)
	$5f (95) = LFO 1 Wave	000000xxx	xxx = LFO 1 Wave 000=Sine 001=Triangle 010=Square 011=Saw 100=Reverse Saw 101=Random 110=Fast Random
	$60 (96) = LFO 1 Rate	0xxxxxxx	(0-127)
	$61 (97) = LFO 1 Delay	0xxxxxxx	(0-127)

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 ------- 0	Data Details
	$62 (98) = LFO 1 Control	00xxxxxy	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) 00011-Sync Whole Note (96 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) 01011-Sync 8th note triplets (8 Clocks/Step) 01100-Sync 16th note (6 Clocks/Step) 01101-Sync 16th note triplets (4 Clocks/Step) 01110-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
	$63 (99) = LFO 2 Wave	00000xxx	xxx = LFO 1 Wave 000=Sine 001=Triangle 010=Square 011=Saw 100=Reverse Saw 101=Random 110=Fast Random
	$64 (100) = LFO 2 Rate	0xxxxxxx	(0-127)
	$65 (101) = LFO 2 Delay	0xxxxxxx	(0-127)

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 ------- 0	Data Details
	$66 (102) = LFO 2 Control	00xxxxxy	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) 00011-Sync Whole Note (96 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) 01011-Sync 8th note triplets (8 Clocks/Step) 01100-Sync 16th note (6 Clocks/Step) 01101-Sync 16th note triplets (4 Clocks/Step) 01110-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
	$67 (103) = LFO 3 Wave	00000xxx	xxx = LFO 1 Wave 000=Sine 001=Triangle 010=Square 011=Saw 100=Reverse Saw 101=Random 110=Fast Random
	$68 (104) = LFO 3 Rate	0xxxxxxx	(0-127)
	$69 (105) = LFO 3 Delay	0xxxxxxx	(0-127)

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 ------- 0	Data Details
	$6a (106) = LFO 3 Control	00xxxxxy	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) 00011-Sync Whole Note (96 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) 01011-Sync 8th note triplets (8 Clocks/Step) 01100-Sync 16th note (6 Clocks/Step) 01101-Sync 16th note triplets (4 Clocks/Step) 01110-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
	$6b (107) = Portamento Rate	0xxxxxxx	(0-127)
	$6c (108) = Load Sequence	0000xxxx	xxxx = Sequence number to load 0 = do not load Sequence 1-8 = Load Seq # 1-8
	$6d (109)=Voice Mode 1	000w0yyy	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=Unison 100=Solo w = 0 = Staccato – Envs restarted for each note 1 = Legato - Envs restarted only if all notes off
	$6e (110)=Voice Mode 2	00000yyy	yyy = 000=Steal Oldest Voice 001=Steal Newest Voice 010=Steal Highest Voice 011=Steal Lowest Voice 100=Steal Quietest Voice 101=Steal Off (7th note ignored)
	$6f (111)=Arp Control	00yyy0zz	zz = 00=1Oct,01=2Oct,10=3Oct yyy = 000=Up,001=Dn,010=U/D,011=Rndm,100=As Played

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 ------- 0	Data Details
	$70 (112)=ArpClockDivide	0000xxxx	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)
	$71 (113)=SeqClockDivide	0000xxxx	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)
	$72 (114) Analog Feel Level	0xxxxxxx	x = Range $00-$7f (0-127)
	$73 (115) Chorus Rate	0xxxxxxx	(0-127)
	$74 (116) Chorus Control	000000xx	xx = 00 = Off 01 = Auto 10 = Manual
	$75-$7f (117-127)	Not used	All set to $00

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 ------- 0	Data Details
$05 (5) Request Tone Dump Null x 2 + 128 data bytes	Bank Number	0000000x	x = 0 for Patches 1-128 1 for Patches 129-256 2 for Patches 257-384 3 for Patches 385-512 4 for Patches 513-640 5 for Patches 641-768 6 for Patches 769-896 7 for Patches 897-1024
WARNING! This command will overwrite the current sounding tone with the Tone selected	Tone Number	0xxxxxxx	x = 0-127 for tone 1-128 if Bank Number is 0 0-127 for tone 129-256 if Bank Number is 1 0-127 for tone 257-384 if Bank Number is 2 0-127 for tone 385-512 if Bank Number is 3 0-127 for tone 513-640 if Bank Number is 4 0-127 for tone 641-768 if Bank Number is 5 0-127 for tone 769-896 if Bank Number is 6 0-127 for tone 897-1024 if Bank Number is 7 3P transmits a $06 (6) command
$06 (6) Transmit/Receive Tone Dump Bank + Tone + 128 data bytes	Bank Number	0000000x	x = 0 for Patches 1-128 1 for Patches 129-256 2 for Patches 257-384 3 for Patches 385-512 4 for Patches 513-640 5 for Patches 641-768 6 for Patches 769-896 7 for Patches 897-1024
WARNING! This command will overwrite the current sounding tone with the Tone selected	Tone Number	0xxxxxxx	x = 0-127 for tone 1-128 if Bank Number is 0 0-127 for tone 129-256 if Bank Number is 1 0-127 for tone 257-384 if Bank Number is 2 0-127 for tone 385-512 if Bank Number is 3 0-127 for tone 513-640 if Bank Number is 4 0-127 for tone 641-768 if Bank Number is 5 0-127 for tone 769-896 if Bank Number is 6 0-127 for tone 897-1024 if Bank Number is 7 3P transmits data in the same format as the $04 Command
$09 (9) Request Seq Dump Seq Number	Sequence Number	0000xxxx	x = 0-7 for Sequence 1-8 3P transmits a $0a (10) command
WARNING! This command will overwrite the current sounding Seq with the Seq selected			

$0a (10) Transmit/Receive Seq Dump Seq Number + 917 data bytes	Sequence Number	0000xxxx	x = 0-7 for Sequence 1-8
WARNING! This command will overwrite the current sounding Seq with the Seq selected	$00 (0) = Seq Length	0xxxxxxx	x = 0 = No Seq Recorded 1-124 = No of Seq Steps
	$01-$14 (1-20) = Seq Name	20 Ascii Bytes	Sequence Name
	$15-$395 (21-917) = Seq Steps	128 x 7 (896) Note 1 axxxxxxx Note 2 bxxxxxxx Note 3 cxxxxxxx Note 4 dxxxxxxx Note 5 exxxxxxx Note 6 fxxxxxxx Byte 7 00abcdef	Each Step is 7 bytes xxxxxxx = note number (32-96) Bits a-f are removed from each note byte and placed in the 7th byte. The a-f note bits are then set to zero Note Bytes are $00 (0) if not used Each used step byte is a note number (32-96) and the bits a-f are set if the note has been tied to the previous note.

Table 1.0 Command ID	Data Byte	Data Type Byte details 7 ------- 0	Data Details
$0d (13) Request Edit Buffer Tone Parameter 1 Data Byte	$00 (0) - Tone Parameter Number Data format the same as $04 Parameter Number is Data Posn	0xxxxxxx	x = Data Offset Use Data Position for Parameter Number e.g. $15=DCO1Tune 3P transmits a $0e (14) command
$0e (14) Transmit / Receive Edit Buffer Tone Parameter 2 data bytes	$01 (1) - Tone Parameter Number Data format the same as $04 Parameter Number is Data Posn	0xxxxxxx	x = Data Offset Use Data Position for Parameter Number e.g. $1f=DCO12Mix Kiwi-3P transmits a $0e (14) command
	$02 (2) - 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
	$03 (3) - Parameter Value (Lo)	0yyyyyyy	Hi & Lo are combined to make single 12 bit command. 000xxxxx + 0yyyyyyy = 0000xxxx xyyyyyyy
$0f (15) Request Global Parameter 1 Data Byte	$00 (0) - Global Parameter Number	000xxxxx	x = Data Offset Use Data Position for Parameter Number Data format the same as $02 e.g. $0a (10) = Midi Channel In
$10 (16) Transmit/Receive Global Parameter 2 data bytes	$00 (0) - Global Parameter Number	000xxxxx	x = Data Offset Use Data Position for Parameter Number Data format the same as $02 e.g. $0a (10) = Midi Channel In
	$01 (1) - Parameter Value	0xxxxxxx	Data format depends on Parameter Data format the same as $02 Command
$13 (19) Request Sequence Edit Buffer Dump		No Data	3P transmits a $14 (20) command
$14 (20) Transmit/Receive Sequence Edit Buffer Dump Null + 917 data bytes	Null + 917 bytes Data		Data Format is the same is $0a (10) Command (with 0 Sequence Number)

Table 2

Matrix Source and Destination List

Matrix Source Types	
0	Off
1	Bend Up
2	Bend Down
3	Bend Full
4	Midi Mod
5	Key Down Velocity[1]
6	Key Up Velocity[1]
7	Key Note[1]
8	LFO1 (bipolar)
9	LFO1 (unipolar)
10	LFO2 (bipolar)
11	LFO2 (unipolar)
12	LFO3 (bipolar)
13	LFO3 (unipolar)
14	ENV1[1]
15	ENV2[1]
16	ENV3[1]
17	MidiCC#1
18	MidiCC#2
19	MidiCC#3
20	MidiCC#4
21	MidiCC#5
22	MidiCC#6
23	Midi Channel After Touch
24	Midi Note After Touch[1]
25	Keyboard Gate
26	Midi Hold
27	Hold Pedal
28	LFO Trig Button

Matrix Destination Types	
0	Off
1	DCO1 Freq[2]
2	DCO2 Freq[2]
3	All DCO Freq[2]
4	DCO1 Range[3]
5	DCO1 Wave[3]
6	DCO1 LFO Level[3]
7	DCO1 ENV Level[3]
8	DCO1 Pulse Width[3]
9	DCO1 PWM[3]
10	DCO2 Range[3]
11	DCO2 Wave[3]
12	DCO2 LFO Level[3]
13	DCO2 ENV Level[3]
14	DCO2 Pulse Width[3]
15	DCO2 PWM[3]
16	Mix Level[3]
17	DCO Detune[3]
18	VCF High Pass[3]
19	VCF Cutoff[2]
20	VCF Resonance[3]
21	VCF LFO Level[3]
22	VCF ENV Level[3]
23	VCF Key Level[3]
24	VCA Level[2]
25	VCA LFO Level[3]
26	Portamento Rate[3]
27	LFO1 Rate[3]
28	LFO2 Rate[3]
29	LFO3 Rate[3]
30	ENV1 Attack Rate[3]
31	ENV1 Decay Rate[3]
32	ENV1 Release Rate[3]
33	ENV2 Attack Rate[3]
34	ENV2 Decay Rate[3]
35	ENV2 Release Rate[3]
36	ENV3 Attack Rate[3]
37	ENV3 Decay Rate[3]
38	ENV3 Release Rate[3]
39	Chorus Rate[3]

[1] = Source is per voice
[2] = Destination is per voice
[3] = Destination is used in all voices