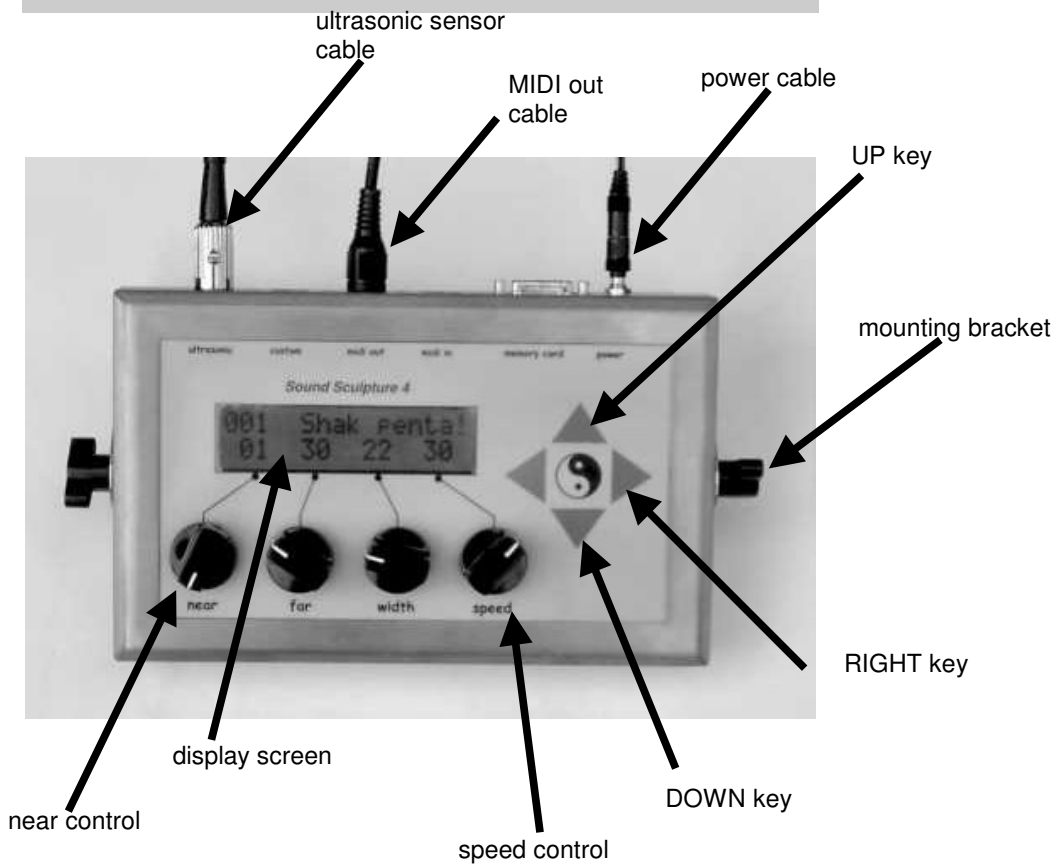
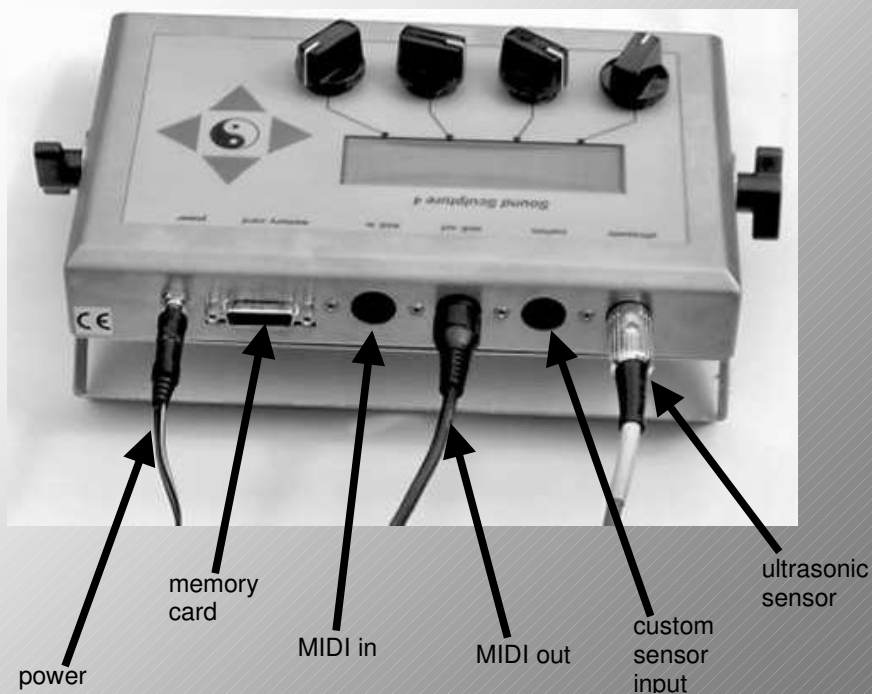


# Specification and parameter listing



Here is a view of the back of the Sound Sculpture showing the connections...



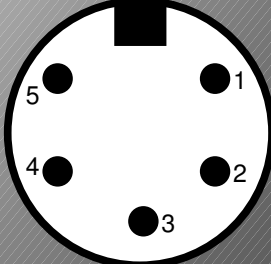
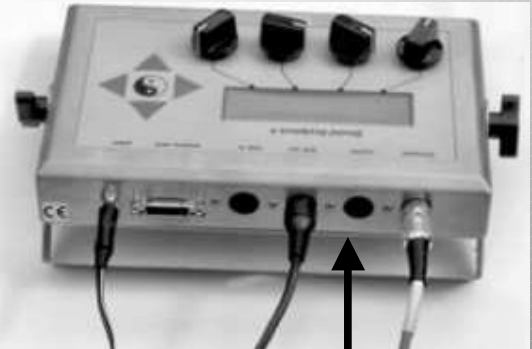
**power input** use only with the power adapter provided. Switch off or unplug at the wall socket when not in use.

**TECHINFO** The power supply is 9 volts 300mA ( current draw is about 220mA) pin is positive, sleeve is negative, protected against reverse polarity.

**custom sensor socket** this socket allows you to use a wide range of sensors which provide a **voltage input** between zero and 5 volts.

**TECHINFO**

Here is the custom socket as viewed looking at the back of the sound sculpture...



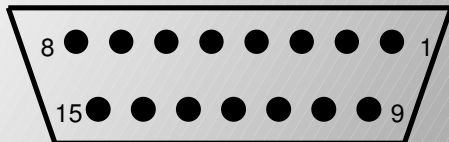
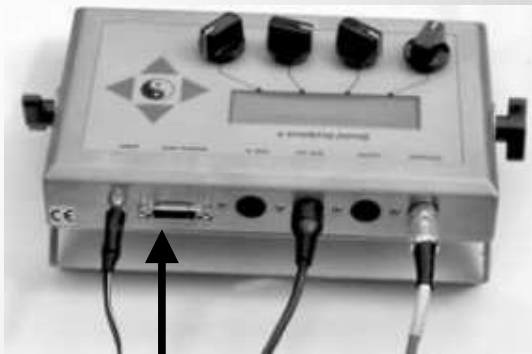
Pin 1	ground / 0 Volts
Pin 2	+ 5 Volts
Pin 3	0 to 5 volts signal
Pin 4	not connected
Pin 5	not connected

**custom sensor voltage input** 0 to 5V, 5 pin 270degree DIN socket, pin 1 - ground, pin 2 - 5V (current limited by 22R), pin 3 is the 0-5V input. input impedance is 100k. There are clamp diodes to limit input voltage.

The removeable **memory card** has 100 patches for save/load/transfer between units. It plugs into the socket marked '*memory card*', this socket also has other functions...computer (RS232 interface), remote keypad.

## TECHINFO

Here is the memory card socket as viewed looking at the back of the sound sculpture



Pin 1	ground / 0 Volts
Pin 2	RS232 transmit
Pin 3	RS232 receive
Pin 4	not connected
Pin 5	ground / 0 Volts
Pin 6	left
Pin 7	down
Pin 8	up
Pin 9	right
Pin 10	not connected
Pin 11	do not use
Pin 12	memory card data
Pin 13	memory card clock
Pin 14	ground / 0 Volts
Pin 15	+ 5 Volts

**Hysteresis** there is 50% hysteresis built into the ultrasonic sensor to make it more useable...

**Multiple sensors** can be used without interference by synchronising several units together using a sequencer (you need MIDI splitter and merge unit),

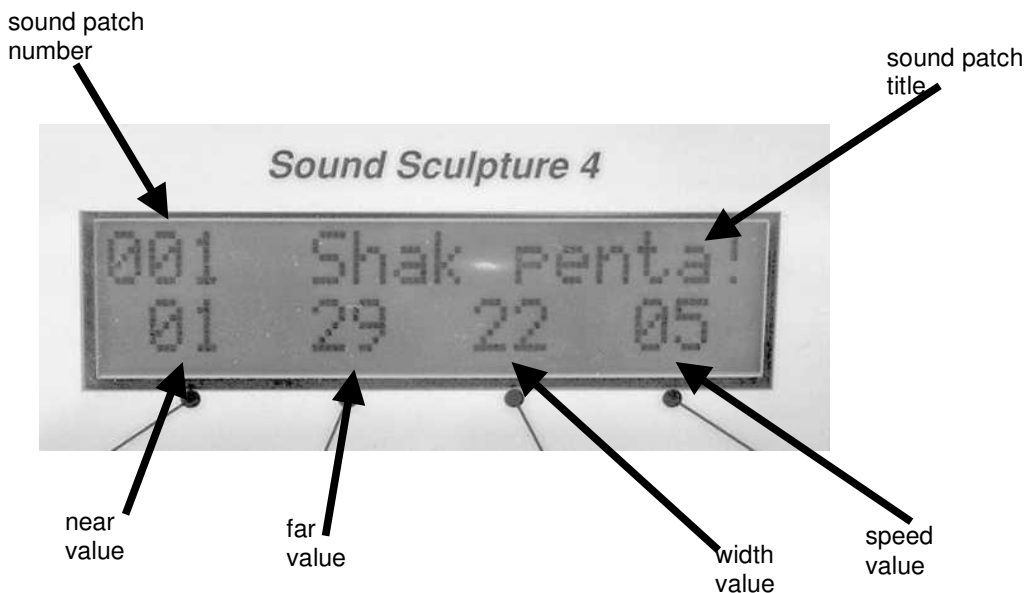
there are limitations... for reliable operation need to delay each unit by 100millisec or so, by sequencing on different channels or using different synch notes.

The delay of 100millisec corresponds to about a 16<sup>th</sup> note at 40bpm, or an 8<sup>th</sup> note at 80 bpm or a quarter note at 160 bpm. Shorter delays can be effective at close range in a low reflection environment (carpets and curtains). longer delays may be required in a reflective room (hard floors windows, hard furniture eg. desks, metal chairs etc)

**Program change** messages transmit and receive channels can be individually set to suit multitibrals synths etc, see parameters 29 and 30

**Record mode**, each patch can store a recorded sequence of up to **191 notes**, as single notes or chords or a mixture. Chords can have any number of notes (up to 191).

**Home Display**



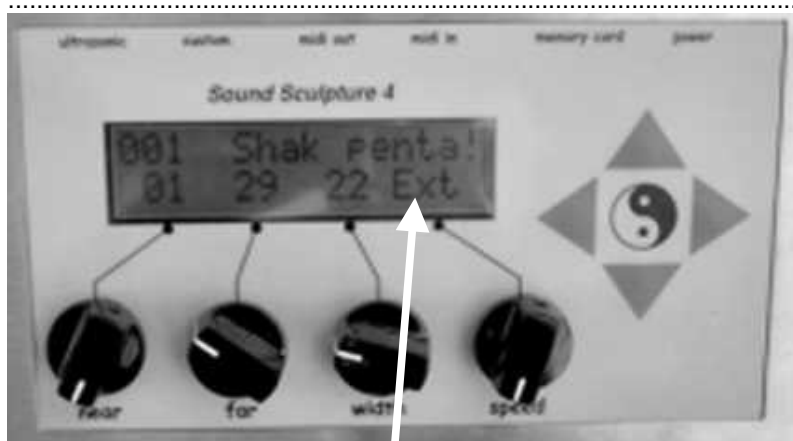
The main display has the patch number, title, a readout of the NEAR, FAR, WIDTH and TEMPO pots



the FAR value has an asterisk which flashes when theres a reflection... to help in reducing unwanted reflections when setting up in the room. There is a blue LED fitted to the sensor which flashes at the same time to help with a visible indication that you are in the active space



the NEAR value also has an asterisk which flashes when theres a reflection from close to the sensor. When this asterisk is displayed an *All Notes Off* message is sent to the synthesiser which silences it. This allows you to stop all sound by interrupting the beam near to the sensor... good for interrupting sustained sounds like flutes etc...



TEMPO.. when set to minimum *Ext* is displayed... this means the unit is waiting for a trigger (MIDI *Note On* message for the note selected in Synchval parameter). See *Parameter 19 'Ext. Synch Note'* . receive channel number must be set appropiately. See *Parameter 29 'RXCh Note / Cont'*

\*\*\*\*\*  
\*\*\*\*\*

**PARAMETERS...** each parameter screen has a title on the left and a parameter number on the right.

Navigate between the screens using the **Left** and **Right** pushbuttons.

Vary the parameter values using the **Up** and **Down** pushbuttons.

Here's a quick list of the parameters that you can edit...

\*\*\*\*\*  
\*\*\*\*\*

**Short Menu**-----  
.....

<b>Record</b>	
Off	01

RECORD... when selecting ERASE you are asked for confirmation (the message Sure? Erase ?), press ^ and the erase is done and the screen returns to OFF

**Record** (Off, Record, Erase) sets the record mode. A note sequence can be recorded via MIDI  
**01**

<b>Scale</b>	
Pentatonic	02

**Scale**  
**02** Chromatic  
Wholetone  
Diminished  
Augmented  
Pentatonic  
Blues  
Major  
Pure Minor  
Harmonic Minor  
Melodic Minor  
Lydian Augmented (diminished Wholetone, or 'alt')  
Double Harmonic  
Fourths  
Recorded (this is recorded using the record function)  
Percussion

Note when ' Percussion' is selected the transmit channel is automatically switched to Channel 10... the default percussion channel for most synths. and the scale used is automatically set to chromatic

Note SCALE has no effect when Control Change/ Program change is selected (see Parameter 27)

<b>Transpose</b>	
+0	03

**Transpose** (+ or - 24) transpose value, semitones (use for key changes)  
**03**

<b>Low Note</b>	
C 2	04

**Low Note** (C0 to C7 in semitone steps) lowest note played  
**04**

<b>High Note</b> C 7	<b>05</b>
-------------------------	-----------

**High Note** (C0 to C7 in semitone steps) highest note played  
**05**

<b>Voice / Timbre</b> 50	<b>06</b>
-----------------------------	-----------

**Voice / Timbre** (1 to 128) sends a program change message to the synthesiser to select a particular sound or timbre. Set the MIDI channel using parameter number 30. You can also switch off this feature using parameter number 30.  
**06**

<b>Sustain Type</b> Normal	<b>07</b>
-------------------------------	-----------

**Sustain Type** (Normal, Sustain, Sequence, One Shot)  
**07**  
*Normal*- one note at a time  
*Sustain*- polyphonic (as in Loud Pedal) number of notes heard simultaneously is set by the POLYPHONY parameter. See parameter number 18.  
*Sequence*- repeats the notes played at the selected speed or tempo, or using an external sequencer if the **speed** control is set to **External**  
*Single*- Only one note is played each time you enter the *active space*

<b>Bulk Data</b> Off	<b>08</b>
-------------------------	-----------

**Bulk Data** (Off, Save Low, Save High, Load Low, Load High)  
**08**

Use the UP and DOWN keys to navigate to the desired option e.g. SAVE Low will save patches 1 to 100 to the memory card. Load Low will overwrite patches 21 to 100 with the patches stored on the memory card.

< returns back to ' Off'  
> goes to ' Sure? (^)' Save Low

then press ^ to confirm (message' Doing... Save Low' is displayed) then returns to ' Off'

if there is no memory card present the Message ' No memory!' is displayed and returns to ' Off'

or press v to return to ' Off'

**note-** that the High half of the patch memory (Patches 101 to 200) is write protected, attempting to load from a memory card to High memory will not be allowed and the message ' No Memory !' will be displayed.

**Title Edit**  
**(Yes= ^)**      **09**

**Title Edit**      Press ^ to enter the title edit mode... < and > move the  
**09**                    cursor ^ and v change the character. There are 11  
                          characters... to return to main menu use < or > to drop  
                          off the end of the editor...

**note-** the order that the characters appear is...  
CAPITALS/ lower case /space /punctuation /numerals

**Save To...**  
**01**                    **10**

**Save To...**      ( 1 to 200) selects the patch to save to (See SAVE...  
**10**                    later)

**Save ? 01 -> 01**  
**(Yes= ^)**      **11**

**Save ?**            if you want to save this patch then select where to  
**11**                    save it to (default is to itself) using '**Save To**' then  
                          press the UP key. A confirmation will be requested.

**Menu Switch**  
**Full Menu**      **12**

**Menu switch**    ( Short Menu, Full Menu)  
**12**

gives the option to switch between the compact simple menu or  
continue to the larger advanced menu

\*\*\*\*\*  
\*\*\*\*\*

**Extended Menu-----**

**Musical Parameters-----**

**Play Mode**  
**03**                    **13**

**Play Mode** ( 1 to 6) single scale, repeated scale, repeated and reversed... etc pictorial description below...

13

1



2



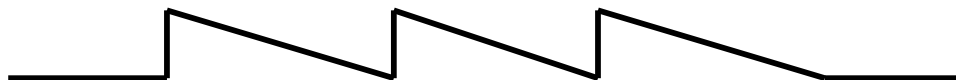
3



4



5



6



**Auto-Transpose**  
Off 14

**Auto-Transpose**(Off, 1 to 12 semitones) automatic transpose,  
(use with **Play Mode** 2 or 5)

14

**Arpeggio X**  
Off 15

**Arpeggio Y**  
Off 16

**Arpeggio Z**  
Off 17

**Arpeggio X**   **Arpeggio Y**   **Arpeggio Z**   (1 to 10)

15

16

17

These three parameters control the 'arpeggio engine' when they are all set to 1 the 'arpeggio engine' has no effect at all. However it's a very powerful musical tool if you get to grips with it (experiment...)

ARPEG X sets the number of notes in the arpeggio

ARPEG Y sets the interval skip between adjacent notes of the arpeggio.

ARPEG Z sets the jump interval between each arpeggio

For example to create ascending 4 note arpeggios of the tertiary chords in the harmonised major scale (C M7, D m7, E m7, F M7, G 7, A m7, B m7 flat 5)...

Choose the major scale (using *Parameter 2 'Scale'*)

Select a 4 note arpeggio (set *Parameter 15 'Arpeggio X'* to 4)

Select interval skip of 3 for tertiary type arpeggio (set *Parameter 16 'Arpeggio Y'* to 3)

Select jump of 1 (set *Parameter 17 'Arpeggio Z'* to 1)

This will produce the following note sequence from the major scale...  
 C-E-G-B D-F-A-C E-G-B-D F-A-C-E G-B-D-F A-C-E-G B-D-F-A  
 etc...

major arp

C Maj7 D min7 E min7 F Maj7 G 7 A min7 B min7 b5 C Maj7

.....

<p><b>Polyphony</b> 08 18</p>
-----------------------------------

Polyphon... refer to SUSTAIN Type, parameter number 07

**Polyphony** ( 1 to 24) number of notes played simoultaneously  
 18 when SUSTAIN is selected (polyphony)

.....

<p><b>Ext Synch Note</b> C 3 19</p>
---

**Ext. Synch Note** (C0 to C7 in semitone steps) this selects the  
 19 note that will trigger the Sound Sculpture if external  
 synch is selected (TEMPO = Ext )

Synchval... refer also to SPEED ...  
 needs to be set to Ext (minimum)

.....

<b>Synch Identity</b>	
01	20

**Synch Identity** ( 1 to 8)  
 20 Used to reduce interaction between multiple sensors.

<b>Quiet Mode ?</b>	
Off	21

**Quiet Mode ?** (On / Off) This sets the ultrasonic transmitter to low power or full power. For short range use (up to 3 metres) the low power mode can be used. This makes the audible click from the transmitter much Quieter.

<b>End Delay</b>	
20	22

**End Delay** (OFF, 1 to 128) After a period of inactivity an 'all notes off' message will be sent to silence the synthesiser. This period is longer if the End Delay is increased.

when set to OFF this feature is disabled.

\*\*\*\*\*  
 \*\*\*\*\*

**Manual Controls (pots)**-----

<b>Manual Controls</b>	
On	23

**Manual Controls** (off / on) enables/ disables the control knobs (when the knobs are disabled the values stored in the patch are used instead)

<b>Near</b>	
01	24

**Near** (1 to 99) nearest range  
 24

<b>Far</b>	
29	25

**Far** (1 to 99) farthest range  
**25**

**Width**  
**10** **26**

**Width** (1 to 99) resolution  
**26**

**Tempo**  
**32** **27**

**Tempo** (Ext... 1 to 99) tempo when set to Ext a midi note message will trigger the Sound Sculpture. See SYNCHVAL later (this sets the trigger note).  
**27**

\*\*\*\*\*  
\*\*\*\*\*

**MIDI Control**-----

**TxCh Note / Cont**  
**01** **28**

**TXCh Note / Cont** (off, 1 to 16) MIDI transmit channel number for note on/ off messages  
**28**

**RxCh Note / Cont**  
**01** **29**

**RXCh Note / Cont** (off, 1 to 16) MIDI receive channel number for note on/ off messages  
**29**

**Tx Prog Change**  
**01** **30**

**TXCh Prog Change** ( off, 1-16 ) MIDI transmit channel number for Program Change messages  
**30**

**Rx Prog Change**  
**01** **31**

**RXCh Prog Change** ( off, 1-16 ) MIDI receive channel number for  
31 Program Change messages

**Control Message**  
**Velocity** 32

Note LO NOTE and HI NOTE changes to a numerical value when Control Change/ Program change is selected

**Control Message** ( Vel, Mod, Pitch, Program Change, 00 to 121)  
sets the  
32 type of control change message sent ...  
(Velocity, modulation or pitch, Program Change)

**note... if sending control only... need to turn off end delay to prevent sending all notes off...**

**Control Low**  
**01** 33

**Control Low** (0-128) Sets the minimum value of control change or  
program change  
33

**Control High**  
**128** 34

**Control High** (0-128) Sets the maximum value of control change or  
program change  
34

\*\*\*\*\*  
\*\*\*\*\*

**Sensor control group**-----  
.....  
.....

**Ultrasonic Input**  
**Note** 35

**Ultrasonic Input** (Note, Control, Off) sets the function of the  
ultrasonic  
35 sensor

When set to 'Note' the ultrasonic sensor sends note values, When set to control it sends control Change messages. (program change, velocity, pitch, modulation... See CC MESSAGE...)

also note that when sending control messages with ultrasonic then the sustain type parameter has no effect... only ' normal' is available

---

<b>Voltage Input</b>	
Off	36

**Voltage Input** (Note, Control, Off, Ext Synch)  
36 set the function of the analogue voltage (custom) input

When set to 'Note', the analogue voltage input sends note values, When set to control, it sends control Change messages. (velocity, pitch, modulation... See CC MESSAGE... later)

When set to Ext Synch a voltage pulse applied to the input will trigger the Ultrasonic beam, provide that the Speed control is set to ' Ext' (minimum).

note when assigned the same nothing happens ... no messages are sent..

---

<b>V-I Min Volts</b>	
01	37

**V-I Min Volts** ( 1 to 50)  
37

---

<b>V-I Max Volts</b>	
50	38

**V-I Max Volts** ( 1 to 50)  
38

---

<b>V-I Sensitivity</b>	
01	39

**V-I Sensitivity** ( 1 to 50)  
39

\*\*\*\*\*  
\*\*\*\*\*

Miscellaneous-----  
.....

<b>Serial Number</b> 2004001A01    40
--

**Serial Number** ( ww-yy-xxx-fff) (week/year/serial/firmware)  
40

note... if sending control only... need to turn off end delay to prevent sending all notes off...

also note that when sending control messages with ultrasonic then the sustain type parameter has no effect... only ' normal' is available

6<sup>th</sup> June 2004

# Sound Sculpture 4... MIDI Implementation Chart

Function		Transmitted	Recognised	Remarks
Basic Channel:	Note / Control Program Change	1-16 1-16	1-16 1-16	Memorized
Mode	Default	3	3	
Note Number:		Y	Y	
Velocity:	Note On Note Off	Y Y	Y N	
Aftertouch:	Keys Channel	N N	N N	
Pitch Bend:		Y	N	As Control Source when enabled
Control Change:	1-120 121 123	Y Y Y	N N N	As Control Source when enabled (range is variable) Reset all controllers All notes off
Program Change:		Y 0-99	Y 0-99	When selected and enabled (range is variable)
System Exclusive		N	N	
System Common:	Song position Song select Tune request	N N N	N N N	
System Real Time:	Clock Commands	N N	N N	
Aux Messages:	Local On/Off All Notes off Active Sensing System Reset	N Y N N	N N N N	( Control Change number 123)

**Key...**

Mode1: OMNI ON, POLY  
 Mode2: OMNI ON, MONO  
 Mode3: OMNI OFF, POLY  
 Mode4: OMNI OFF, MONO

**N = No**  
**Y = Yes**

**Technical Notes...**

Note On	9X_NN_vv	( X is the channel number, NN is the note number, vv is velocity )
Note Off	8X_NN_vv	
Pitch Bend	EX_00_vv	( vv is variable value)
Program Change	CX_vv	( vv in the range 0-99)
Control Change	BX_CC_vv	( CC is the control change number)
Modulation	BX_01_vv	
Reset Controllers	BX_79_00	
All notes off	BX_7B_00	

Transmit does not use running status.  
 Note off message always has velocity = zero.

Running status is recognised for external synch.  
 Note on message with velocity = zero is recognised as a note off in external synch mode.

Running status is not recognised in record mode  
 (this means that when recording chords they must be played slowly, like a sustained arpeggio.)