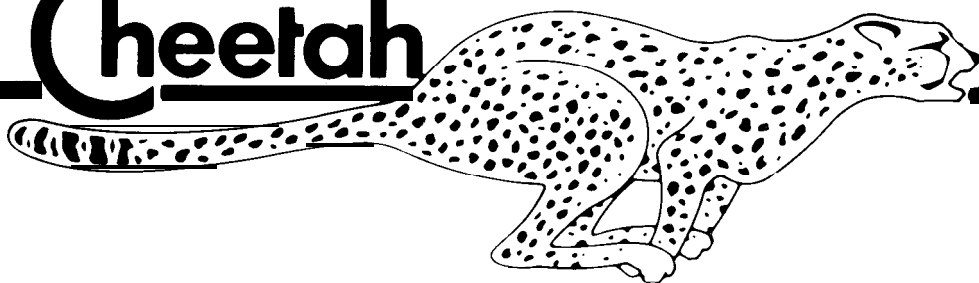


Cheetah



Cheetah **MSB**

**MULTI TIMBRAL
SYNTHESIZER** MODULE

OWNERS MANUAL

Affordable Excellence

CHEETAH MS6 MULTI TIMBRAL SYNTHESIZER MODULE.

OWNERS MANUAL.

Thank you for choosing the CHEETAH MS6 MULTI TIMBRAL SYNTHESIZER MODULE.

The MS6 uses traditional sound generation techniques combined with state of the art technology to bring you sounds with a richness and depth rarely found in most synthesizers today.

Sounds are created using parameters which should be familiar to the vast majority of synthesizer users, and are therefore easier to use than some other methods of synthesizer programming.

To assure you that your MS6 will give you many years of enjoyment, please be sure to read this owners manual carefully before attempting to operate it.

FEATURES

- * Multi-timbral - any voice assignable to any one of 16 MIDI channels
- * 320 ROM sounds
- * 96 Non-volatile RAM sounds
- * 64 User programmable performance memories
- * Dual DCO per voice
- * Six voice polyphonic
- * Velocity Sensitive
- * Aftertouch (pressure) sensitive
- * Dual ENV per voice
- * Six 24 dB / octave VCF's
- * Direct access patch change buttons
- * Fully programmable from the front panel
- * LED display
- * MIDI IN, OUT & THRU

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GETTING STARTED

The MS6 is a MIDI synthesizer module, which must be controlled by another MIDI device.

Any MIDI controller such as a MIDI Master keyboard, MIDI Guitar, MIDI Drum machine, MIDI Sequencer etc. will be suitable provided that it conforms to the MIDI standard.

No sound will be produced by the MS6 unless a MIDI device of some type is connected.

Connect the MIDI IN socket on the rear of the MS6 to the MIDI OUT of your MIDI controller.

Set your MIDI controller to transmit on MIDI channel 1.

Connect the Audio out socket on the rear of the MS6 to the audio input of a suitable amplifier.

Next, insert the power connector to the mains socket and switch on.

OPERATING THE MS6

When power is supplied to the MS6, it automatically enters PLAY MODE, and Bank 1, Patch 11 is selected.

The Bank and Patch Number is shown on the display.

The number on the left of the display is the current Bank Number, and the one on the right is the current Patch Number.

Playing any of the notes on your controller causes sound to be produced by the MS6. The sound produced is the one shown in the LED display.

A dot in the LED display will light whenever a voice is active. If you can't hear any sound produced by the MS6, first check to see that the MS6 is getting the MIDI data, and then check your audio connections.

The MS6 is velocity sensitive, and will respond to velocity data if the patch selected is programmed to do so.

Provided that the MIDI controller can transmit velocity data, altering the velocity with which you play the MIDI controller will result in a corresponding response from the MS6.

In this way it is possible to recreate some of the dynamic capabilities of real instruments.

No effect will occur with non-velocity sensitive MIDI controllers.

CHANGING PROGRAM

The MS6 allows recall of over 400 different patches from memory. The MS6 uses 8 banks, most consisting of sixty four Patch Numbers, numbered 11 to 88.

Some manufacturers equipment does not use this method of program identification. A Patch Number conversion table is provided at the end of this manual for ease of conversion.

To change sound, simply press any two number buttons on the front panel keypad. For example, press the 2 key and then the 4 key. The display will show 24 as the patch now playing. Any combination of numbers between 11 and 88 may be obtained.

Playing any notes on your MIDI controller will now play this sound from the MS6. Try sane other patches such as 75, 88 and 32.

CHANGING BANK

Once you have tried all the sounds in Bank 1, you may like to hear sane other sounds in other banks.

Press the BANK / WRITE key at the bottom right of the keypad, and you will enter Bank 2.

You may now play another 64 different sounds.

Press the Bank key again, and another 64 different sounds may be accessed.

There are 8 banks in the MS6.

When in Bank 8, pressing the Bank key returns you to Bank 1

Banks 1 to 5 are each banks of 64 ROM sounds.

Banks 6 and 7 are banks of RAM sounds.

Bank 6 has 64 sounds numbered 11 to 88.

Bank 7 has 32 sounds numbered 11 to 48.

Bank 8 is a bank of 64 performance memories.

Most of the performance memories in Bank 8 will be blank for you to program your own configurations.

Many of the Ram sounds in banks 6 and 7 will appear to be identical to each other, and to sounds in the ROM Banks 1 to 5. In most cases they will be slight variations of sounds used to program the performance memories to give a Unison detune effect. How this is done will be explained later in the manual.

You can reduce or increase the volume of the sound you have selected by pressing the VOL UP or VOL DOWN buttons on the front panel keypad. While you press one of these keys, the display will show the current volume value for that sound changing.

The maximum volume value is 63 and the minimum is 0. This volume setting is only for the voice you are currently using, and will not be memorised, so selecting the same patch number again will restore the volume setting to its original value.

If you would like to store the sound at a new volume setting, that can be done in EDIT mode which will be explained shortly.

Many users will find that all the sounds you will ever require are already stored in the memory of the MS6. In that instance, you need not concern yourself with most of the rest of this manual. If however, you wish to experiment and create some sounds of your own, read on but first of all, try editing sane sounds we've already made for you.

EDITING THE SOUNDS

As you can see from the top panel, the MS6 has many different parameters which may be used for creating sounds.

Changing only one of these parameters may have an enormous effect. Changing another may only have a slight effect.

The easiest way to see what the effect of these parameters are, is to edit a sound of your choice, a parameter at a time, until the function of each parameter is clear.

Select a sound you would like to edit.

To enter EDIT mode, press the PLAY / EDIT button at the top right of the keypad. The display will now show the parameter number on the left, and the current value of that parameter on the right.

In EDIT mode, the number keys select the parameter you wish to view, and not sounds. The parameter and value displayed refers to the sound you selected before you entered EDIT mode.

To change the value of the parameter you have selected, press the VALUE UP or VALUE DOWN buttons. When a negative value is displayed, a dot will appear in the display next to the value reading.

You may change as many different parameters as you like, and you do not have to return to PLAY mode to hear the effect of your changing values.

Play a note on your MIDI controller and listen as the sound changes while you change values. The only time you need to enter PLAY mode is to change Bank and Patch numbers.

To return to PLAY mode, simply press the PLAY / EDIT button once more. The display now shows Bank and Patch numbers again.

The PLAY / EDIT button is used whenever you wish to switch between PLAY and EDIT modes.

In Banks 1 to 7, the parameters displayed are the Tone edit parameters, as detailed on the left of the top panel of the MS6.

In Bank 8, the parameters displayed are the Performance edit / Utility edit parameters, as detailed on the right of the top panel of the MS6.

Bank 8 is the Bank you need in order to change the MIDI receive channel, Master tuning or load and save memory data.

TO CHANGE THE MIDI RECEIVE CHANNEL

Select Bank 8 and then enter EDIT mode.

Select parameter 81 using the number buttons, and the Basic MIDI receive channel number is displayed as the value on the right of the display.

Use the VALUE UP or VALUE DOWN buttons to change the MIDI channel to the number you require. The default is channel 1.

Return to PLAY mode and select other sounds you wish to play.

TO CHANGE THE MASTER TUNING

Select EDIT mode while in Bank 8.

Select parameter 84 to change the Master tuning of the MS6. The master tuning may be altered to +31 or -31 which corresponds to +93 or -93 cents. The default setting is 0.

PROGRAMMING THE MS6

When you edited the sounds earlier, the changes were not stored, so the sound was reset to its original setting when you selected its Patch number again.

This was only temporary editing of the sounds.

To make a permanent change to a sound, you must store the modified or new sound in memory.

Banks 6 and 7 are RAM sounds and can be stored with any changes you like into their current Patch number, or another Patch number.

Sounds in Banks 1 to 5 are ROM sounds and cannot be written into.

However, sounds in Banks 1 to 5 can be copied into Banks 6 and 7 so that your changes can be memorised.

WRITING A PATCH

Edit a sound.

When you are satisfied with any changes, press the BANK / WRITE button.

The display clears to await the new Bank and Patch number you would like this sound to be.

This may be the same Bank and Patch number (provided you are in Banks 6 or 7), in which case, the modified sound will be stored in its current location with all the changes memorised.

You may choose another Bank and Patch number, in which case the modified sound will be stored in that new location, deleting the previous sound in that other location automatically.

Enter the Bank number by pressing the corresponding number key.

Enter the Patch number by pressing the corresponding number keys.

Remember you cannot write into Banks 1 to 5. These are ROM Banks.

When you have entered the numbers, the display will flash to ask you to confirm that the numbers you have selected are correct.

If they are not the Bank and Patch numbers you want, press the PLAY / EDIT button to abort the Write function.

If the numbers are correct, confirm your choice by pressing the BANK / WRITE button once again.

The sound is now stored in the Bank and Patch number you selected, and the display returns to EDIT mode showing the value of the last parameter selected.

In order that you may create your own sounds using the MS6, each of the parameters you can use will now be explained.

THE TONE EDIT PARAMETERS

These are the parameters used in Banks 1 to 7 for sound creation.

PARAMETER 11 DCO A SHAPE RANGE 0 TO 2

0=SQUARE
1=TRIANGLE
2=SAWTOOTH

Selects the wave shape of oscillator A. Each waveshape has different sonic properties due to the different harmonic content of the waves.

PARAMETER 12 DCO A PULSE WIDTH RANGE 1 TO 15

1=THIN PULSE
8=SQUARE
15=INVERSE THIN PULSE

If SQUARE is selected for DCO A SHAPE, this control sets the pulse width of the squarewave. A value of 1 produces an extremely narrow pulse width, while a value of 15 produces an extremely wide pulse width, having practically the same sonic properties as a narrow pulse width. The difference is that the polarity of the wave is changed when compared with narrow. The harmonic content of the wave varies greatly at different pulse width settings. A narrow pulse width can be useful for harpsichord or woodwind sounds.

PARAMETER 13 DCO A RANGE RANGE 0 TO 3

0=LOW OCTAVE
1=LOW/MID OCTAVE
2=HIGH/MID OCTAVE
3=HIGH OCTAVE

This parameter controls the frequency range of DCO A from low to high frequencies.

PARAMETER 14 DCO A COARSE TUNE RANGE -12 TO +12

0=CENTRE TUNE
-12=-12 SEMITONES DETUNE
+12=+12 SEMITONES DETUNE

This parameter allows the pitch of DCO A to be adjusted by up to 12 semitones from the centre frequency, in semitone steps.

PARAMETER 15 DCO A LFO DEPTH RANGE 0 TO 63

0=NO LFO PITCH MOD
63=MAX LFO PITCH MOD

This parameter determines the amount of effect that the LFO has upon the pitch of DCO A. When used, this function can create a vibrato effect on DCO A. The rate of pitch modulation is determined by the LFO frequency. See parameter 63.

PARAMETER 16 DCO A ENV DEPTH RANGE -63 TO +63

-63=MAX NEGATIVE PITCH MOD
0=NO PITCH MOD
+63=MAX POSITIVE PITCH MOD

This controls the effect of the envelope on the pitch of DCO A. If negative values are used, the pitch of DCO A will be lowered and then returned to its original pitch. If positive values are used, the pitch of DCO A will be raised and then returned to its original pitch. How long this pitch change takes is determined by the ADSR settings of the envelope used. See parameter 21.

PARAMETER 17 DCO A PWM DEPTH RANGE 0 TO 63

0=NO PULSE WIDTH MOD
63=MAX PULSE WIDTH MOD

The pulse width can be modulated by an envelope or a separate PWM LFO. Use parameter 22 to select which one you use, and parameter 17 to control the amount you wish to vary the pulse width by. Care must be taken with the pulse width when the oscillators are in sync (see parameter 24). This parameter is useful for making a square wave on DCO A sound richer.

PARAMETER 18 DCO A BEND DEPTH RANGE 0 To +12

0=NO PITCHBEND
+12=MAX POSITIVE PITCH BEND

Use this parameter to control the effect of your MIDI controllers pitch bend wheel on the pitch of DCO A. This is the amount of bend when the wheel is moved to its greatest extent.

PARAMETER 21 DCO A ENV SELECT RANGE 1 OR 2

1=ENV 1
2=ENV 2

Select 1 to make ENV 1 control the DCO A pitch modulation effect set in parameter 16. Select 2 to make ENV 2 control the DCO A pitch modulation effect set in parameter 16.

PARAMETER 22 DCO A PWM SELECT RANGE 0 OR 1

0=LOW FREQUENCY CONTINUOUS - SET BY PWM RATE (SEE PARAMETER 48)
1=ENVELOPE ASSET BY PARAMETER 21

Use this parameter to select whether the pulse width modulation is controlled by the PWM rate parameter (48), or by the envelope selected in parameter 21.

PARAMETER 23 DCO A BEND SELECT RANGE 0 TO 1

0=PITCH BEND CONTROLLED BY PRESSURE
1=PITCH BEND CONTROLLED BY PITCH BEND WHEEL

Select 1 for normal operation of pitch bend on DCO A. If you have a MIDI controller which transmits pressure (aftertouch) data, you may wish to select 0, and pitch bend DCO A by applying pressure instead.

PARAMETER 24 DCO A SYNC TO DCO B ON/OFF RANGE 0 OR 1

0=DCO A NOT SYNCED TO DCO B
1=DCO A SYNCED TO DCO B

In this parameter, you can synchronise DCO A to DCO B. This effect is very useful for creating lead synthesizer sounds which really 'cut through'.

PARAMETER 31 DCOBSHAPE RANGE 0 TO 3

0=SQUARE
1=TRIANGLE
2=SAWTOOTH
3=NOISE

Selects the wave shape of oscillator B. Each waveshape has different sonic properties due to the different harmonic content of the waves. The noise setting is useful for adding a touch of 'breathiness' to woodwind and other sounds.

PARAMETER 32 DCO B PULSE WIDTH RANGE 1 TO 15

1=THIN PULSE
8=SQUARE
15=INVERSE THIN PULSE

If SQUARE is selected for DCO B SHAPE, this control sets the pulse width of the squarewave. A value of 1 produces an extremely narrow pulse width, while a value of 15 produces an extremely wide pulse width, having practically the same sonic properties as a narrow pulse width. The difference is that the polarity of the wave is changed when compared with narrow. The harmonic content of the wave varies greatly at different pulse width settings. A narrow pulse width can be useful for harpsichord or woodwind sounds.

PARAMETER 33 DCO B RANGE RANGE 0 TO 3

0=LOW OCTAVE
1=LOW/MID OCTAVE
2=HIGH/MID OCTAVE
3=HIGH OCTAVE

This parameter controls the frequency range of DCO B from low to high frequencies.

PARAMETER 34 DCO B COARSE TUNE RANGE -12 TO +12

0=CENTRE TUNE
-12=-12 SEMITONES DETUNE
+12=+12 SEMITONES DETUNE

This parameter allows the pitch of DCO B to be adjusted by up to 12 semitones from the centre frequency, in semitone steps.

PARAMETER 35 DCO B LFO DEPTH RANGE 0 TO 63

0=NO LFO PITCH MOD
63=MAX LFO PITCH MOD

This parameter determines the amount of effect that the LFO has upon the pitch of DCO B. When used, this function can create a vibrato effect on DCO B. The rate of pitch modulation is determined by the LFO frequency. See parameter 63.

PARAMETER 36 DCO B ENV DEPTH RANGE -63 TO +63

-63=MAX NEGATIVE PITCH MOD
0=NO PITCH MOD
+63=MAX POSITIVE PITCH MOD

This controls the effect of the envelope on the pitch of DCO B. If negative values are used, the pitch of DCO B will be lowered and then returned to its original pitch. If positive values are used, the pitch of DCO B will be raised and then returned to its original pitch. How long this pitch change takes is determined by the ADSR settings of the envelope used. See parameter 41.

PARAMETER 37 DCO B PWM DEPTH RANGE 0 TO 63

0=NO PULSE WIDTH MOD
63=MAX PULSE WIDTH MOD

The pulse width can be modulated by the main LFO or a separate PWM LFO. Use parameter 42 to select which one you use, and parameter 37 to control the amount you wish to vary the pulse width by. Remember that at its maximum setting (depending on the pulse width you have selected) the pulse width may be varied so greatly that the wave gets so thin that it disappears at times! This parameter is useful for making a square wave on DCO B sound richer.

PARAMETER 38 DCO B BEND DEPTH RANGE 0 TO +12

0=NO PITCH BEND
+12=MAX POSITIVE PITCH BEND

Use this parameter to control the effect of your MIDI controllers pitch bend wheel on the pitch of DCO B. This is the amount of bend when the wheel is moved to its greatest extent.

PARAMETER 41 DCO B ENV SELECT RANGE 1 OR 2

1=ENV 1
2=ENV 2

Select 1 to make ENV 1 control the DCO B pitch modulation effect set in parameter 36. Select 2 to make ENV 2 control the DCO B pitch modulation effect set in parameter 36.

PARAMETER 42 DCO B PWM SELECT RANGE 0 OR 1

0=LOW FREQUENCY CONTINUOUS - SET BY PWM RATE (SEE PARAMETER 48)
1=ENVELOPE AS SET BY PARAMETER 41

Use this parameter to select whether the pulse width modulation is controlled by the PWM rate parameter (48), or by the envelope selected in parameter 41.

PARAMETER 43 DCO B BEND SELECT RANGE 0 TO 1

0=PITCH BEND CONTROLLED BY PRESSURE
1=PITCH BEND CONTROLLED BY PITCH BEND WHEEL

Select 1 for normal operation of pitch bend on DCO B. If you have a MIDI controller which transmits pressure (aftertouch) data, you may wish to select 0, and pitch bend DCO B by applying pressure instead.

PARAMETER 44 DCO B FINE TUNE RANGE -31 TO +31

-31=93 CENTS NEGATIVE DETUNE (3 CENTS PER COUNT)
0=NO DETUNE
+31=93 CENTS POSITIVE DETUNE

With this parameter you can adjust the pitch of DCO B by a slight amount to be sharp or flat relative to the pitch of DCO A. This creates a very pleasant chorus type effect due to the beat frequency produced when both DCO's are used. Smaller values generally produce the most pleasant effect. See the section on Performance Edit Parameters, which will use this parameter to create a Unison detune effect.

PARAMETER 45 DCO A TO B MIX RANGE -31 TO +31

-31=DCO B ONLY
0=EQUAL AMOUNT OF DCO A AND DCO B
+31=DCO A ONLY

This is the parameter which mixes the outputs of both oscillators and allows you to control the relative levels of each in the output signal. When noise is selected on DCO B, this parameter is useful for reducing the amount of noise in the output.

PARAMETER 46 DCO A TO B MIX ENV DEPTH RANGE -63 TO +63

-63=MAX SWEEP TO DCO B BY ENVELOPE
0=NO SWEEP BY ENVELOPE
+63=MAX SWEEP TO DCO A BY ENVELOPE

This parameter can be used to automatically adjust the oscillator mix according to the envelope ADSR settings of the envelope selected in parameter 47. This parameter is used to produce Wave Mix sounds, where the oscillator mix is fully to one oscillator at the start of the envelope, and then changes to the other oscillator as the sound progresses. Many interesting effects may be obtained by selecting different waveforms for each oscillator, causing the sound to change from one type to another. Some examples of Wave Mix sounds are in the ROM Banks.

PARAMETER 47 DCO A TO B MIX ENV SELECT RANGE 1 OR 2

1=MIX CONTROLLED BY ENV 1
2=MIX CONTROLLED BY ENV 2

Select which envelope you wish to sweep the DCO A to B mix with this parameter.

PARAMETER 48 DCO A AND B PWM RATE RANGE 0 TO 63

0=SLOWEST LOW FREQ. PWM RATE
63=FASTEST LOW FREQ. PWM RATE

This is the parameter which controls the rate that the oscillators pulse width varies when selected by parameters 22 & 42.

PARAMETER 51 FILTER CUTOFF FREQUENCY RANGE 0 TO 99

0=LOWEST FREQUENCY (FILTER CLOSED)
99=HIGHEST FREQUENCY (FILTER OPEN)

The Filter is one of the most important features of a synthesizer, having an enormous effect upon the sound produced by the oscillators. The filter determines whether a sound is dull or bright, and can have its effect varied by several other controls which produce a complex resultant effect on the sound output. At high settings, little or no effect on the sound will be heard. At medium settings, the higher frequencies or harmonics will be reduced leaving the oscillators sounding smother and less bright. At minimum settings, a dull sound will be produced, or even no sound at all. The best setting for this parameter varies greatly according to the sound required. You will be using this parameter a great deal.

PARAMETER 52 FILTER RESONANCE RANGE 0 TO 63

0=NO FILTER RESONANCE
63=MAXIMUM FILTER RESONANCE

This parameter enhances the sound at the frequencies closest to the filter frequency, resulting in an effect which can produce a ringing sound. Useful for special effects and some woodwind sounds which depend on resonance.

PARAMETER 53 FILTER LFO DEPTH RANGE 0 TO 63

0=NO FILTER LFO DEPTH
63=MAX LFO FILTER DEPTH

Using this parameter, the filter can be opened and closed automatically by the main LFO.

PARAMETER 54 FILTER ENV DEPTH RANGE -63 TO +63

-63=MAX NEGATIVE FILTER ENVELOPE DEPTH - CLOSES filter
0=NO FILTER ENV DEPTH
+63=MAX POSITIVE FILTER ENVELOPE DEPTH - OPENS filter

This parameter can vary the filter frequency in time with the ADSR settings of the envelope you choose to control it. Negative values will open the filter with the envelope. Positive values will close the filter with the envelope.

PARAMETER 55 FILTER PRESSURE DEPTH RANGE -63 TO +63

-63=MAX NEGATIVE FILTER PRESSURE DEPTH - opens filter
0= NO FILTER PRESSURE DEPTH
+63=MAX POSITIVE FILTER PRESSURE DEPTH - closes filter

If your mIDI controller sends pressure (aftertouch) data, you can open or close the filter with this parameter.

PARAMETER 56 FILTER ENV SELECT RANGE 1 OR 2

1=ENV 1 CONTROLS FILTER CUTOFF
2=ENV 2 CONTROLS FILTER CUTOFF

Select which envelope you wish to use to vary the filter cutoff frequency. See parameter 54.

PARAMETER 57 FILTER KEY FOLLOW RANGE 0 TO 63

0=NO FILTER KEYBOARD FOLLOW (CUTOFF FREQ. REMAINS CONSTANT ACROSS NOTE RANGE)
63=MAX FILTER KEYBOARD FOLLOW (CUTOFF FREQUENCY RISES AS HIGHER NOTES ARE PLAYED)

This parameter is used to avoid high pitched notes from being cut off by the filter and so opens the filter as the notes played get higher.

PARAMETER 61 LFO SHAPE RANGE 0 TO 3

- 0=TRIANGLE LFO WAVEFORM
- 1=SAWTOOTH LFO WAVEFORM
- 2=SQUARE LFO WAVEFORM
- 3=RANDOM LFO WAVEFORM

The Low Frequency Oscillator is used to modulate the main oscillators and other parameters which make up a sound on the MS6. If the LFO is used to modulate the pitch of an oscillator (see parameters 15 & 35), a vibrato effect can be obtained. A triangle wave LFO will smoothly alter the pitch of an oscillator up and down. A sawtooth wave will alter the pitch smoothly up and then rapidly back to the original pitch. A square wave will change rapidly from sharp to flat relative to the original pitch. A random wave will alter the pitch randomly. The LFO can alter other parameters such as filter settings, and the effect upon the parameter will vary according to the waveform used.

PARAMETER 62 LFO DELAY TIME RANGE 0 TO 63

- 0=NO LFO DELAY FROM NOTE ON
- 63=MAX LFO DELAY FROM NOTE ON

This parameter controls the time it **takes** for the LFO to affect the other parameters you have select. A setting of 0 means the LFO will act as soon as you play a note. A higher setting will increasingly delay the LFO's effect from note on.

PARAMETER 63 LFO FREQUENCY RANGE 0 TO 63

- 0=MIN LFO FREQUENCY
- 63=MAX LFO FREQUENCY

Vary the speed of the LFO with this parameter.

PARAMETER 64 LFO PITCH MOD SELECT RANGE 0 OR 1

- 0=MOD WHEEL CONTROLS LFO PITCH MOD
- 1=PRESSURE CONTROLS LFO PITCH MOD

Normally, the modulation wheel is used to produce LFO pitch modulation when performing. The MS6 lets you use pressure data from your MIDI controller to do this instead if you so wish.

PARAMETER 65 LFO PITCH MOD DEPTH RANGE 0 TO 15

- 0=NO LFO PITCH MOD
- 15=MAX LFO PITCH MOD

This parameter sets the amount of LFO pitch modulation you require.

PARAMETER 66 LFO FILTER MOD SELECT RANGE 0 OR 1

0=MOD WHEEL CONTROLS LFO FILTER MOD
1=PRESSURE CONTROLS LFO FILTER MOD

Normally, the modulation wheel is used to produce LFO filter modulation when performing. The MS6 lets you use pressure data from your MIDI controller to do this instead if you so wish.

PARAMETER 67 LFO FILTER MODULATION RANGE 0 TO 15

0=NO LFO FILTER MOD
15=MAX LFO FILTER MOD

This parameter sets the amount of LFO filter modulation you require.

PARAMETER 68 VCA VOLUME RANGE 0 TO 63

0=NO OUTPUT FROM VCA = MINIMUM GAIN
63=MAX OUTPUT FROM VCA = MAXIMUM GAIN

The Voltage Controlled Amplifier controls the output level of the MS6. This parameter is useful for adjusting different sounds so that their output levels are similar. This parameter is also adjusted by the VOL UP and VOL DOWN keys when not in EDIT MODE, in which case the volume setting will not be remembered when you select another sound. Use this parameter in EDIT MODE to store a sound at a certain volume setting.

PARAMETER 71 ENV1 ATTACK TIME RANGE 0 TO 63

0=FASTEST ENV1 ATTACK TIME
63=SLOWEST ENV1 ATTACK TIME

This parameter controls the time it takes Envelope 1 to reach the output level set in parameter 68. The envelope settings are extremely important in shaping the sound output from a synthesizer. The envelopes can be used to vary the volume, filter setting, pulse width, pitch and other parameters. A short attack time is useful for percussive and plucked sounds. A longer attack time is useful for brass and string sounds.

PARAMETER 72 ENV1 DECAY TIME RANGE 0 TO 63

0=FASTEST ENV1 DECAY TIME
63=SLOWEST ENV1 DECAY TIME

Once the attack is complete, the envelope will begin to decay or diminish. How long this takes is determined by this parameter.

PARAMETER 73 ENV1 SUSTAIN LEVEL RANGE 0 TO 63

0=NO ENV1 SUSTAIN LEVEL
63=MAX ENV1 SUSTAIN LEVEL

If a note is kept pressed on your MIDI controller, this parameter sets the envelope output level while the note is pressed.

PARAMETER 74 ENV1 RELEASE TIME RANGE 0 TO 63

0=FASTEST ENV1 RELEASE TIME
63=SLOWEST ENV1 RELEASE TIME

Once you have released a note, this parameter controls the length of time for the envelope to die away.

PARAMETER 75 ENV1 SUSTAIN SWITCH RANGE 0 OR 1

0=ENV1 SUSTAIN PHASE IGNORED
1=ENV1 SUSTAIN PHASE CARRIED OUT

This parameter selects whether a key held down on the MIDI controller is obeyed by ENV 1, or instead the envelope goes straight into the Release phase after completing the Decay phase. The latter is useful for percussive sounds.

PARAMETER 76 ENV1 KEY FOLLOW RANGE 0 TO 15

0=NO ENV1 KEYBOARD FOLLOW (ENV CONSTANT ACROSS KEY RANGE)
15=MAX ENV1 KEYBOARD FOLLOW (ENV TIME DECREASE AS NOTE PITCH RISES)

This parameter can shorten the Decay and Release times of ENV1 for higher frequency notes. This is useful for piano sounds.

PARAMETER 77 ENV1 VELOCITY TO AMPLITUDE SENSITIVITY RANGE 0 TO 15

0=NO SENSITIVITY TO NOTE VELOCITY
(ENV1 ALWAYS AT MAX LEVEL)

15=MAX SENSITIVITY TO NOTE VELOCITY (ENV1 AMPLITUDE IS EXPONENTIALLY PROPORTIONAL TO NOTE VELOCITY)

Use this parameter to tailor the effect of key velocity on the output level of ENV1.

PARAMETER 78 VELOCITY TO ATTACK TIME SENSITIVITY RANGE 0 TO 15

0=NO ATTACK SENSITIVITY TO VELOCITY
(ATTACK TIME SET BY ENV1 ATTACK PARAMETER)

15=MAX ATTACK SENSITIVITY TO VELOCITY
(ATTACK TIME VARIES IN RELATION TO KEY VELOCITY UP TO SETTING ON ENV1 ATTACK
PARAMETER)

This parameter allows the attack time of ENV1 to be lengthened by notes with low velocity values. A key strike of maximum MIDI velocity will not shorten the attack time beyond that programmed in parameter 71.

PARAMETER 81 ENV2 ATTACK TIME RANGE 0 TO 63

0=FASTEST ENV2 ATTACK TIME
63=SLOWEST ENV2 ATTACK TIME

This parameter controls the time it takes Envelope 2 to reach the output level set in parameter 68. This envelope can be used to vary the filter setting, pulse width, pitch and other parameters.

PARAMETER 82 ENV2 DECAY TIME RANGE 0 TO 63

0=FASTEST ENV2 DECAY TIME
63=SLOWEST ENV2 DECAY TIME

Once the attack is complete, the envelope will begin to decay or diminish. How long this takes is determined by this parameter.

PARAMETER 83 ENV2 SUSTAIN LEVEL RANGE 0 TO 63

0=NO ENV2 SUSTAIN LEVEL
63=MAX ENV2 SUSTAIN LEVEL

If a note is kept pressed on your MIDI controller, this parameter sets the envelope output level while the note is pressed.

PARAMETER 84 ENV2 RELEASE TIME RANGE 0 TO 63

0=FASTEST ENV2 RELEASE TIME
63=SLOWEST ENV2 RELEASE TIME

Once you have released a note, this parameter controls the length of time for the envelope to die away.

PARAMETER 85 ENV2 SUSTAIN SWITCH RANGE 0 OR 1

0=ENV2 SUSTAIN PHASE IGNORED
1=ENV2 SUSTAIN PHASE CARRIED OUT

This parameter selects whether a key held down is obeyed or ignored by ENV 2. If the sustain phase is ignored, the envelope goes straight to the Release phase after completing the Decay phase.

PARAMETER 86 ENV2 KEY FOLLOW RANGE 0 TO 15

0=NO ENV2 KEYBOARD FOLLOW (ENV CONSTANT ACROSS KEY RANGE)
15=MAX ENV2 KEYBOARD FOLLOW (ENV TIME DECREASE AS NOTE PITCH RISES)

This parameter can shorten the Decay and Release times for ENV2 on higher frequency notes.

PARAMETER 87 ENV2 VELOCITY TO AMPLITUDE SENSITIVITY RANGE 0 TO 15

0=NO SENSITIVITY TO NOTE VELOCITY
(ENV2 ALWAYS AT MAX LEVEL)

15=MAX SENSITIVITY TO NOTE VELOCITY (ENV2 AMPLITUDE IS EXPONENTIALLY PROPORTIONAL TO NOTE VELOCITY)

Use this parameter to tailor the effect of key velocity on the output level of ENV2.

PARAMETER 88 VELOCITY TO ATTACK TIME SENSITIVITY RANGE 0 TO 15

0=NO ATTACK SENSITIVITY TO VELOCITY
(ATTACK TIME SET BY ENV2 ATTACK PARAMETER)

15=MAX ATTACK SENSITIVITY TO VELOCITY
(ATTACK TIME VARIES IN RELATION TO KEY VELOCITY UP TO SETTING ON ENV2 ATTACK PARAMETER)

This parameter allows the attack time of ENV2 to be lengthened by notes with low velocity values.

Now all the parameter functions and ranges have been explained, you can start to create your own new sounds. If any aspect of the parameters is unclear, try changing the value of the parameter in question on a sound already made. Its function should soon become clear.

Use banks 6 and 7 to store your own sounds.

BANK 8 - THE PERFORMANCE EDIT PARAMETERS

One of the outstanding features of the MS6 is its ability to play more than one sound simultaneously. Any combination of up to six different voices from the ROM or RAM sounds can be combined into a Multi-timbral performance. 64 of these performances can be stored in the memory of the MS6.

Of course, the six voices of the MS6 do not all have to be different, and where this is the case, a split keyboard or monophonic unison performance with or without detune can be programmed.

Firstly, let us see how to program a Multi-timbral performance.

Ensure you are in Bank 8 of the MS6.

Enter EDIT mode, and a set of parameters will be available as follows:

PARAMETER 11 INSTRUMENT 1 BANK NUMBER RANGE 1 TO 6

Choose the Bank from which you want the first sound to be called from. Note that sounds in Bank 7 cannot be used in a performance memory.

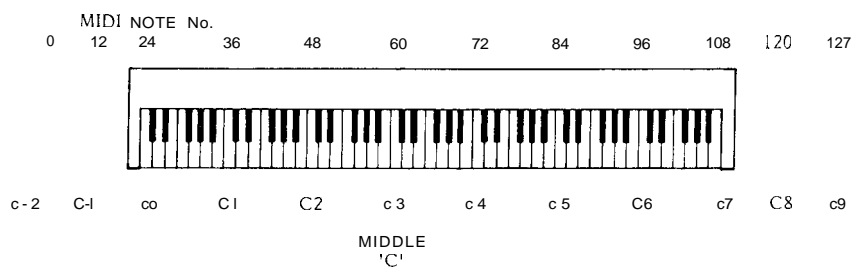
PARAMETER 12 INSTRUMENT 1 TONE NUMBER RANGE 11 TO 88

Choose the Patch (Tone) number of the sound you require from the Bank of sounds you have selected in the previous parameter.

PARAMETER 13 INSTRUMENT 1 NUMBER OF VOICES RANGE 0 TO 6

Set here the number of voices you wish to allocate to this sound. This allows you to program polyphonic sections as well as monophonic sections within a performance memory.

PARAMETER 14 INSTRUMENT 1 BOTTOM LIMIT RANGE C0 TO b7



This parameter sets the bottom note limit for the sound you wish to have as Instrument 1. C0 is MIDI note 24, and b7 is MIDI note 119. C3 is middle C, which is MIDI note 60. Set in conjunction with the next parameter for the top limit, it is possible to split and layer the MIDI controllers keys into zones capable of playing different sounds and layered sounds even if no key split facility exists on your MIDI controller.

PARAMETER 15 INSTRUMENT 1 TOP LIMIT RANGE C0 TO b7

This sets the top note limit for Instrument 1.

PARAMETER 16 INSTRUMENT 1 MIDI RECEIVE CHANNEL RANGE 1 TO 16

Use this parameter to set the MIDI channel you wish Instrument 1 to respond to. Using this parameter, you may have up to six different sounds playing on six different MIDI channels simultaneously.

PARAMETER 17 VOLUME RANGE 0 TO 15

0=MIN INSTRUMENT 1 VOLUME
15=MAX INSTRUMENT 1 VOLUME

Use this parameter to adjust the volume of Instrument 1.

Parameters 21-27, 31-37, 41-47, 51-57, & 61-67 refer to the corresponding functions for instruments 2,3,4,5 & 6 respectively.

To set up a Multi-timbral performance, set Instrument 1 to a bass sound (parameter 11&12) using one voice (parameter 13). Set the bottom note limit (par.14) to its lowest setting, and the top limit to a lowish setting such as b3 (par.15). Put the MIDI channel setting (par.16) on channel 1, and the volume setting on 15 (par.17).

Then put a string sound on Instrument 2 using four voices with a bottom limit of C4 to a top limit of b5, on MIDI channel 1 and volume setting 15.

Lastly put a Sync lead sound on instrument 3 using the last remaining voice, from C6 to C8 on MIDI channel 1 & volume 15.

You may now simultaneously play a bass sound at the lower end of your MIDI controller, a string sound in the centre, and a lead sound at the top end. Sounds good, doesn't it?

Write your performance into one of the empty performance memories.

If you had difficulty preparing the above setup, edit some others to get the hang of what is going on in each case.

Some examples of different performances are already in memory.

To take a sound and play it in MONO mode, set up a performance as follows:

Select the sound you require, and use this sound for all six instruments (one voice per Instrument), playing over the same note range on the same MIDI channel.

You may then play all six voices (producing the same sound) on one note. This technique is useful for powerful bass and lead sounds. In this monophonic setting, only one note at a time may be played however. Priority is given to the last note pressed.

Many of you will have already guessed that it is possible to have a different sound for each Instrument in a performance like this. You may play up to six completely different sounds on one note. If you choose six suitable sounds it can sound devastating. Be careful though, it can also sound awful if you don't choose your sounds carefully. Some Multi-timbral mono performances are already prepared in Bank 8.

A variation of this is used for a Unison (mono) detune effect.

First select the sound you would like to use.

Then copy the voice into a spare memory in Bank 6. Next edit the DCO B fine tune (parameter 44), to a new value a couple of counts away from its original setting. Store this edited sound in Bank 6 next to the original sound. Next, edit the DCO B fine tune a further couple of counts from its original setting, and store this sound in Bank 6 next to the last edited sound you stored. Keep changing the DCO B fine tune and storing subsequent voices until you have six nearly identical sounds stored in Bank 6, with the only difference being each sound having a different DCO B fine tune setting.

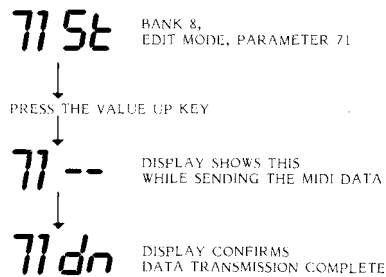
Next create a Multi-timbral performance using those six sounds in mono mode.

The result will be six voices all slightly detuned playing in unison, and sounding very powerful indeed. A number of these performances may be found in Bank 8, and their component detuned sounds in Bank 6.

THE UTILITY EDIT PARAMETERS

The Utility edit parameters are also found in Bank 8 EDIT mode, and are used for general functions which affect the whole synthesizer. Each of the functions is explained below. Note that unlike the other parameters, these parameters do not require their settings writing into memory. They are automatically remembered, even after the MS6 is turned off.

PARAMETER 71 SAVE TONE MEMORY



Select this parameter to dump the contents of Banks 6 & 7 via the MIDI OUT to another MS6 or to a MIDI data storage device. Select parameter 71, which shows St (save tones), and when you are ready to transmit the data, press the VALUE UP button. The St disappears for a few seconds while the MIDI data is being sent, and then dn (done) appears to show that the dump has been carried out.

PARAMETER 72 SAVE PERFORMANCE MEMORY

This function dumps all the performance memories in Bank 8 via MIDI. SP (save performance) is displayed. Press the VALUE UP key to save the performance memories. The display shows dn when saving is complete.

PARAMETER 73 LOAD TONE MEMORY

Select this function when you wish to load a new selection of RAM sounds via MIDI into Banks 6 & 7. The new sounds will overwrite the existing sounds in Banks 6 and 7. The display shows lt (load tones). Press the VALUE UP key and the lt disappears until the MIDI data has been sent, when dn appears to confirm the data has been received. Press the EDIT key if you need to escape from this function once you have pressed the VALUE UP key.

PARAMETER 74 LOAD PERFORMANCE MEMORY

Select this function when you wish to load a new selection of performance memories via MIDI into Bank 8. The new memories will overwrite the existing memories in Bank 8. The display shows lp (load performances). Press the VALUE UP key and the lp disappears until the MIDI data has been sent, when dn appears to confirm the data has been received. Press the EDIT key if you need to escape from this function once you have pressed the VALUE UP key.

PARAMETER 81 BASIC RECEIVE MIDI CHANNEL RANGE 0 TO 16

0=OMNI ON
1=CHANNEL 1
16=CHANNEL 16

You have already seen this parameter before, but have not used Omni mode. In Omni mode, the MS6 will respond to MIDI data received on any MIDI channel. **Any** other setting, and the MS6 will respond to data on that corresponding MIDI channel only. Note that the Multi-timbral performance memories are unaffected by this setting, and will receive data according to the parameters in their memory. This MIDI channel setting applies only to single sounds played in POLY mode.

PARAMETER 82 MIDI OVERFLOW ON/OFF RANGE 0 OR 1

0=MIDI OVERFLOW OFF
1=MIDI OVERFLOW ON

One excellent feature of the MS6 is the MIDI overflow function. If this function is selected, and all six voices are busy being played, any additional notes over the six the MS6 can play at one time are retransmitted via the MIDI CUT socket to a second MS6 synthesizer module. In this way, two MS6's can produce a 12 note polyphonic synthesizer when the first is set to MIDI overflow. Three MS6's gives 18 note polyphony. Imagine additional MS6's connected to produce a monster set-up capable of playing dozens of notes and dozens of different sounds simultaneously. This can be reality if you get some more MS6's!

PARAMETER 83 CALIBRATE DCO'S

The Digitally Controlled Oscillators in your MS6 have already been calibrated before the unit left the factory, and will remain stable in normal use. Should you at any time feel that you would like to re-calibrate the DCO's to ensure accurate waveforms, before a recording session for example, select this function. Cl is displayed until you press the VALUE UP key, when the MS6 will begin to calibrate both oscillators in each voice, first at low frequencies, and then at high frequencies. This process takes a minute or so, and cannot be stopped once started. When calibration is complete, dn is displayed to confirm this.

PARAMETER 84 TOTAL INSTRUMENT TUNING RANGE -31 To +31

-31 = -93 CENTS
0 = A=440Hz
+31 = +93 CENTS

When playing with other instruments, you may wish to tune the pitch of the whole MS6 to that of another instrument. Use this function to adjust the total MS6 tuning.

PATCH NUMBER CONVERSION TABLE

PROG.No.	PATCH	PROG.No.	PATCH
1	11	31	47
2	12	32	48
3	13	33	51
4	14	34	52
5	15	35	53
6	16	36	54
7	17	37	55
a	1a	38	56
9	21	39	57
10	22	40	58
11	23	41	61
12	24	42	62
13	25	43	63
14	26	44	64
15	27	45	65
16	28	46	66
17	31	47	67
1a	32	48	68
19	33	49	71
20	34	50	72
21	35	51	73
22	36	52	74
23	37	53	75
24	38	54	76
25	41	55	77
26	42	56	78
27	43	57	a1
28	44	58	a2
29	45	59	a3
30	46	60	a4
		61	a5
		62	86
		63	a7
		64	88

MIDI EXCLUSIVE DATA FORMAT

On Initiating a SAVE TONE MEMORY or SAVE PERFORMANCE MEMORY the MS6 will transmit a data dump with the following format.

Note :

X specifies undefined bits. When processing this dump data mask these undefined bits.

TONE MEMORY

HEADER

Byte No	Value	Description
1	11110000	EXCLUSIVE
2	00110110	CHEETAH MARKETING I.D. CODE
3	00000010	PRODUCT DESIGN CODE
4	00000000	MS6 SYNTH MODULE DATA PACKET
5	00000000	tone DATA IDENTIFIER

Certain parameters (Such as DCO A LFO depth) will be split into two bytes. If this is the case the first byte will contain the most significant bit or bits of that parameter. The range will be specified for BOTH bytes.

Those parameters having a NEGATIVE value (Such as DCO A to B MIX) will again be split into two bytes. When the two bytes are assembled into one, the first byte is the most significant Nybble. The most significant Nybble is redundant in all cases. The format is :-

FF - hex 0 -1
 FE - hex 0 -2
 FD - hex = -3
 etc.etc.

Byte No	Value	Description	Range
6	0000XXSS	DCO A SHAPE	SS = 0 -2
7	0000XXSS	DCO B SHAPE	SS = 0 - 3
8	0000WWW	DCO A PULSE WIDTH	ww = 0 - 15
9	0000WWW	DCO B PULSE WIDTH	ww = 0 - 15
10	0000XRR	DCO A RANGE	RR = 0 - 3
11	0000XRR	DCO B RANGE	R R = 0 - 3
12	0000XXLL	DCO A LFO DEPTH	LL= ;
13	0000LLL		LLLL = ; 0 - 63
14	0000XXLL	DCO B LFO DEPTH	LL= ;
15	0000LLL		LLLL = ; 0 - 63
16	0000EEEE	DCO A ENV DEPTH	EEEE = ;
17	0000EEEE	DCO A ENV DEPTH	EEEE 0 ; -63 +63
18	0000EEEE	DCO B ENV DEPTH	EEEE 0 ;
19	0000EEEE	DCO B ENV DEPTH	EEEE = ; -63 +63
20	0000MMM	DCO A TO B MIX	MMMM= ;
21	0000MMM	DCO A TO B MIX	MMMM = ; -31 +31
22	0000CCC	DCO A COARSE TUNE	CCCC = ;
23	0000CCCC	DCO A COARSE TUNE	cccc = ; -12 +12
24	0000000P	DCO A PWM SELECT	P = 0 =LFO 1=ENV
25	0000000P	DCO B PWM SELECT	P = 0 0 LFO 1=ENV
26	0000CCCC	DCO B COARSE TUNE	CCCC = ;
27	0000CCCC	DCO B COARSE TUNE	cccc = ; -12 +12
28	0000FFFF	DCO B FINE TUNE	FFFF = ;
29	0000FFFF	DCO B FINE TUNE	FFFF = ; -31 +31
30	0000000Y	DCO A TO B SYNC	Y 0=OFF 1=ON
31	00000022	DCO A TO B MIX ENV SEL	zz = 1=ENV1 2=ENV2
32	000000ee	DCO A ENV SELECT	ee = 1=ENV1 2=ENV2
33	000000ee	DCO B ENV SELECT	ee = 1=ENV1 2=ENV2
34	0000BBBB	DCO A BEND DEPTH	BBBB = 0 - 12
35	0000BBBB	DCO B BEND DEPTH	BBBB = 0 - 12
36	0000xpp	DCO A AND B PWM RATE	pp = ;
37	0000pppp		pppp = ; 0 - 63
38	0000XXdd	DCO A PWM DEPTH	dd= ;
39	0000dddd		dddd = ; 0 - 63

```

40      0000XXdd      DCO B PWM DEPTH      dd=      |
41      0000dddd      dddd =      | 0 - 63
42      0000Xfff      FILTER CUTOFF FREQ  ff =      |
43      0000ffff      ffff =      | 0 - 99
44      0000Xrrr      FILTER RESONANCE    rr =      |
45      0000rrrr      rrrr =      | 0 - 63
46      0000Xlll      FILTER LFO DEPTH    ll =      |
47      00001lll      llll =      | -63 +63
48      0000Xmmm      FILTER ENV DEPTH    mm =      |
49      0000mmmm      mmmm =      | -63 +63
50      0000xxxx      UNDEFINED
51      0000xsss      FILTER ENV SELECT  ss = 1=ENV1 2=ENV2
52      0000Xkkk      FILTER KEY FOLLOW   kk=
53      0000kkkk      kkkk =      | 0 - 63
54      0000gggg      ENV 1 KEY FOLLOW    gggg = 0 - 15
55      0000hhhh      ENV 1 VEL TO VOL SENS hhhh = 0 - 15
56      0000Xaaa      ENV 1 ATTACK        aa =
57      0000aaaa      aaaa =      | 0 - 63
58      0000Xbbb      ENV 1 DECAY         bb=
59      0000bbbb      bbbb =      | 0 - 63
60      0000xccc      ENV 1 SUSTAIN       cc =
61      0000cccc      cccc =      | 0 - 63
62      0000Xjjj      ENV 1 RELEASE       jj =
63      0000jjjj      jjjj =      | 0 - 63
64      0000gggg      ENV 2 KEY FOLLOW    gggg = 0 - 15
65      0000hhhh      ENV 2 VEL TO VOL SENS hhhh = 0 - 15
66      0000Xaaa      ENV 2 ATTACK        aa =
67      0000aaaa      aaaa =      | 0 - 63
68      0000Xbbb      ENV 2 DECAY         bb=
69      0000bbbb      bbbb =      | 0 - 63
70      0000xccc      ENV 2 SUSTAIN       cc=
71      0000cccc      cccc =      | 0 - 63
72      0000Xjjj      ENV 2 RELEASE       jj =
73      0000jjjj      jjjj =      | 0 - 63
74      0000iiii      ENV 1 VEL TO ATK SENS iiii = 0 - 15
75      00000000      ENV 2 VEL TO ATK SENS oooo = 0 - 15
76      0000000w      ENV 1 SUSTAIN SWITCH w = 0=OFF 1=ON
78      0000000y      ENV 2 SUSTAIN SWITCH y = 0=OFF 1=ON
79      0000Xttt      LFO DELAY TIME      tt=
80      0000tttt      tttt =      | 0 - 63
a1      0000xxxx      UNDEFINED
a2      0000xxvv      LFO SHAPE           vv = 0 - 3
a3      0000xxuu      LFO FREQUENCY       uu =
a4      0000uuuu      uuuu =      | 0 - 63
a5      0000000z      LFO PITCH MOD SELECT z = 0=WHEEL 1=PRESSURE
86      00000002      LFO FILTER MOD SELECT z = 0=WHEEL 1=PRESSURE
a7      0000xxvv      VCA VOLUME          vv=
88      0000vvvv      vvvv =      | 0 - 63
a9      0000XQQQ      FILTER PRESSURE DEPTH QQ=
90      0000QQQQ      QQQQ =      | 0 - 63
91      0000TTTT      LFO PITCH MOD DEPTH TTTT = 0 - 15
92      0000YYYY      LFO FILTER MOD DEPTH YYYY = 0 - 15
93      0000000D      DCO A BEND SELECT   D = 0=PRESSURE 1=WHEEL
94      0000000D      DCO B BEND SELECT   D = 0=PRESSURE 1=WHEEL
95      0000XNNN      DCO A TO B MIX ENV DPTH NN =
96      0000NNNN      NNNN =      | -63 +63

```

95 x 90 BYTES FOR NEXT 95 TONES

8646 11110111 END OF EXCLUSIVE

PERFORMANCE MEMORY

HEADER

```

-----
Byte No            Value            Description
-----
1            11110000            EXCLUSIVE
2            00110110            CHEETAH MARKETING I.D. CODE
3            00000010            PRODUCT DESIGN CODE
4            00000000            MS6 SYNTH MODULE DATA PACKET
5            00000001            PERFORMANCE DATA IDENTIFIER

```


INSTRUMENT 1

Byte No	Value	Description	Range
6	U000TTTT	TONE NUMBER 1st DIGIT	TTTT = 1 - 8
7	0000TTTT	TONE NUMBER 2nd DIGIT	TTTT = 1 - 8
8	0000BBBB	BANK NUMBER	BBBB = 1 - 7
9	0000VVVV	VOICES USED	VVVV = 0 - 6
10	0000LLLL	MIDI BOTTOM LIMIT 1st DIGIT-hex	LLLL = 1 - 7
11	0000LLLL	MIDI BOTTOM LIMIT 2nd DIGIT-hex	LLLL = 0 - F
12	0000MMMM	MIDI TOP LIMIT 1st DIGIT-hex	MMMM = 1 - 7
13	0000MMMM	MIDI TOP LIMIT 2nd DIGIT-hex	MMMM = 0 - F
14	0000VVVV	VOLUME	VVVV = 0 - 15
15	0000CCCC	MIDI CHANNEL	cccc = 0 - 15

INSTRUMENT 2

Byte No	Value	Description	Range
16	0000TTTT	TONE NUMBER 1st DIGIT	TTTT = 1 - 8
17	0000TTTT	TONE NUMBER 2nd DIGIT	TTTT = 1 - 8
18	0000BBBB	BANK NUMBER	BBBB = 1 - 7
19	0000VVVV	VOICES USED	VVVV = 0 - 6
20	0000LLLL	MIDI BOTTOM LIMIT 1st DIGIT-hex	LLLL = 1 - 7
21	0000LLLL	MIDI BOTTOM LIMIT 2nd DIGIT-hex	LLLL = 0 - F
22	0000MMMM	MIDI TOP LIMIT 1st DIGIT-hex	MMMM = 1 - 7
23	0000MMMM	MIDI TOP LIMIT 2nd DIGIT-hex	MMMM = 0 - F
24	0000VVVV	VOLUME	VVVV = 0 - 15
25	0000CCCC	MIDI CHANNEL	cccc = 0 - 15

INSTRUMENT 3

Byte No	Value	Description	Range
26	0000TTTT	TONE NUMBER 1st DIGIT	TTTT = 1 - 8
27	0000TTTT	TONE NUMBER 2nd DIGIT	TTTT = 1 - 8
28	0000BBBB	BANK NUMBER	BBBB = 1 - 7
29	0000VVVV	VOICES USED	VVVV = 0 - 6
30	0000LLLL	MIDI BOTTOM LIMIT 1st DIGIT-hex	LLLL = 1 - 7
31	0000LLLL	MIDI BOTTOM LIMIT 2nd DIGIT-hex	LLLL = 0 - F
32	0000MMMM	MIDI TOP LIMIT 1st DIGIT-hex	MMMM = 1 - 7
33	0000MMMM	MIDI TOP LIMIT 2nd DIGIT-hex	MMMM = 0 - F
34	0000VVVV	VOLUME	VVVV = 0 - 15
35	0000CCCC	MIDI CHANNEL	cccc = 0 - 15

INSTRUMENT 4

Byte No	Value	Description	Range
36	0000TTTT	TONE NUMBER 1st DIGIT	TTTT = 1 - 8
37	0000TTTT	TONE NUMBER 2nd DIGIT	TTTT = 1 - 8
38	0000BBBB	BANK NUMBER	BBBB = 1 - 7
39	0000VVVV	VOICES USED	VVVV = 0 - 6
40	0000LLLL	MIDI BOTTOM LIMIT 1st DIGIT-hex	LLLL = 1 - 7
41	0000LLLL	MIDI BOTTOM LIMIT 2nd DIGIT-hex	LLLL = 0 - F
42	0000MMMM	MIDI TOP LIMIT 1st DIGIT-hex	MMMM = 1 - 7
43	0000MMMM	MIDI TOP LIMIT 2nd DIGIT-hex	MMMM = 0 - F
44	0000VVVV	VOLUME	VVVV = 0 - 15
45	0000CCCC	MIDI CHANNEL	cccc = 0 - 15

INSTRUMENT 5

Byte No	Value	Description	Range
46	0000TTTT	TONE NUMBER 1st DIGIT	TTTT = 1 - 8
47	0000TTTT	TONE NUMBER 2nd DIGIT	TTTT = 1 - 8
40	0000BBBB	BANK NUMBER	BBBB = 1 - 7
49	0000VVVV	VOICES USED	VVVV = 0 - 6
50	0000LLLL	MIDI BOTTOM LIMIT 1st DIGIT-hex	LLLL = 1 - 7
51	0000LLLL	MIDI BOTTOM LIMIT 2nd DIGIT-hex	LLLL = 0 - F
52	0000MMMM	MIDI TOP LIMIT 1st DIGIT-hex	MI-m1-1-7
53	0000MMMM	MIDI TOP LIMIT 2nd DIGIT-hex	MMMM=0 -F
54	0000VVVV	VOLUME	vvvv = 0 - 15
55	0000CCCC	MIDI CHANNEL	cccc = 0 - 15

INSTRUMENT 6

Byte No	Value	Description	Range
56	0000TTTT	TONE NUMBER 1st DIGIT	TTTT = 1 - 8
57	0000TTTT	TONE NUMBER 2nd DIGIT	TTTT = 1 - 8
58	0000BBBB	BANK NUMBER	BBBB = 1 - 7
59	0000VVVV	VOICES USED	VVVV = 0 - 6
60	0000LLLL	MIDI BOTTOM LIMIT 1st DIGIT-hex	LLLL = 1 - 7
61	0000LLLL	MIDI BOTTOM LIMIT 2nd DIGIT-hex	LLLL = 0 - F
62	0000MMMM	MIDI TOP LIMIT 1st DIGIT-hex	MMMM = 1 - 7
63	0000MMMM	MIDI TOP LIMIT 2nd DIGIT-hex	MMMM=0 -F
64	0000VVVV	VOLUME	vvvv = 0 - 15
65	0000CCCC	MIDI CHANNEL	cccc = 0 - 15

63 x 60 BYTES FOR NEXT 63 PERFORMANCES

3846 11110111 END OF EXCLUSIVE

MS6 VOICE LIST

We hope that you will forgive us for not listing each voice by an individual name. To have devised names for the hundreds of voices within the MS6 would probably have taken as long to invent as the product did to develop. Most of these names would have been unprintable anyway!

BANK 1	11 - 88	STRINGS
BANK 2	11 - 58 61 - 88	PIANOS/CLAVI NETS BRASS
BANK 3	11 - 38 41 - 58 61 - 88	ORGANS EFFECTS/VOX STRING/BRASS
BANK 4	11 - 68 71 - 88	BASS SYNC/LEAD
BANK 5	11 - 24 25 - 44 45 - 58 61 - 68 71 - 88	WAVE MIXES PERCUSSION/EFFECTS SOLOS HARPSI CHORDS SYNTH BRASS

MS6 MIDI IMPLEMENTATION CHART

FUNCTION	RECOGNIZED?	REMARKS/DESCRIPTION
MODE	1, 3 ✓ 2, 4 X	MEMORIZED SEE NOTE 1.
BASIC CHANNEL	1 - 16 ✓	MEMORIZED
NOTE ON NOTE OFF	24 - 119 ✓ 24 - 119 ✓	
VELOCITY	NOTE ON 1 - 127 ✓ NOTE OFF X	
AFTERTOUCH	KEY X CHANNEL ✓	
PITCH BEND	0 - 12 SEMITONES ✓	7 BIT RESOLUTION
CONTROL CHANGE	No.1. ✓ No.7 ✓ No.64 ✓	MODULATION WHEEL VOLUME SUSTAIN
PROG.CHANGE	0 - 127 ✓	
SYS.EXCLUSIVE SYSTEM	✓ SONG SELECT X SONG POS X TUNE X REALTIME X CLOCK X	SEE NOTE 2.

AUX. ALL NOTES OFF
X = NO ✓ = YES

NOTES:

1. MONOMODE CAN BE SELECTED BY A VOICE ASSIGNMENT IN A MULTI TIMBRAL SET-UP - BANK 8
2. SEE SYSTEM EXCLUSIVE MIDI DATA FORMAT CHART.

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SERVICE INFORMATION ONE YEAR GUARANTEE

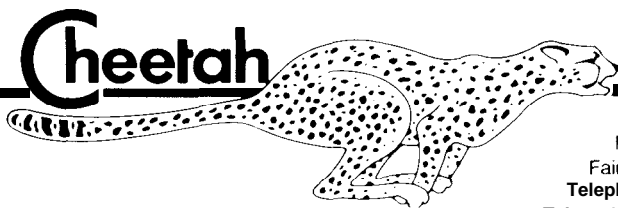
Your new Cheetah product has been tested before leaving the factory. It is guaranteed against defective materials or workmanship for a period of one year from the original purchase date provided it has been properly operated and maintained.

During the above guarantee period, any defects in parts or workmanship will be repaired by Cheetah Marketing Limited at no charge, except for a handling and return transportation charge of f 1.50 which must be enclosed when returning your unit for service. Make remittance by cheque or postal order payable to Cheetah Marketing Limited. Do not send cash or stamps. Return your unit postpaid to Cheetah Service Department, Norbury House, Norbury Road, Fairwater, Cardiff CF5 3AS, (C.O.D. packages will not be accepted). Please pack your unit carefully with proper wrapping to avoid breakage as no liability can be accepted for damage or loss in transit. To expedite processing, please ensure nature of failure is indicated.

As an option, Cheetah Marketing Limited, may elect to replace the entire unit rather than repair it. This guarantee is void if the defect is due to the use of the product for other than the purpose it is designed for, or to accidental damage (whether in transit or otherwise), misuse, neglect or repair other than by the manufacturer.

Cheetah Marketing Limited disclaim any liability for incidental or consequential damages. This guarantee becomes effective only if a letter is completed and mailed within ten days of purchase giving the following details: When and where purchased, with copy of receipt. These statements in no way prejudice the statutory rights of the purchaser.

This applies to UK only.



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