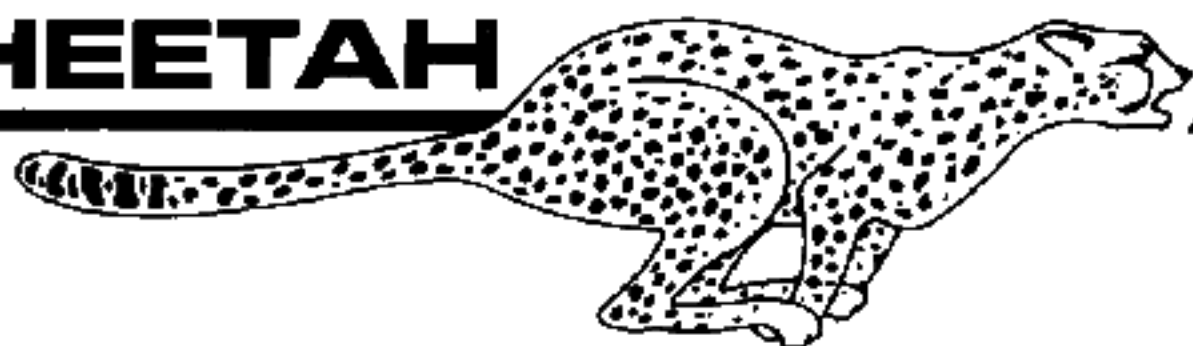


CHEETAH



OWNERS MANUAL

CHEETAH MD16/R
DIGITAL DRUM MACHINE

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THE CHEETAH MD16/R HIGH SAMPLE RATE 16 BIT DRUM MACHINE

OWNERS MANUAL

Thank you for choosing the CHEETAH MD16/R HIGH SAMPLE RATE 16 BIT DRUM MACHINE.

To assure you that your MD16/R will give you many years of enjoyment, please be sure to read this owners manual carefully before attempting to operate it.

IMPORTANT - PLEASE READ THIS CAREFULLY

Your MD16/R contains a rechargeable battery which is used to retain the user programmable memory (ie. your patterns, songs and pad setups) when you switch off the mains power to the drum machine.

The battery is kept fully charged when you use the MD16/R, and will normally keep your memory intact for at least one year. However, like all batteries, it will run down over a period of time. To ensure that it is kept charged up, it is recommended that you use the MD16/R for at least 1 day in a period of one year (or 1 hour every 2 weeks).

The MD16/R is a computer based device which has to move information around in memory when you are recording, deleting, copying, merging or editing the patterns and songs and when you are programming, rotating or swapping the pad setups.

If the power is interrupted, even briefly, during these operations, you may lose some or all of the data in memory, so that a cold start may be necessary (see page 101). Please be careful not to disconnect or switch other mains powered equipment on or off during these vulnerable operations (ie. try to avoid doing anything which causes the speakers to crackle), and you should experience no problem with your MD16/R's memory.

INTRODUCTION

The stand-alone MD16 and the rack-mounted MD16R are a new breed of drum machine which use the latest technology to produce high quality sounds, with powerful innovative features not found on other units.

These features are described briefly in the following pages :-

FEATURES

- * High quality 16 bit samples sampled at 44kHz, comprising drum, percussion and musical sounds.
- * Expansion port allows over 200 samples to be installed (available on Cheetah ROM Cartridges) and any sound can be played from within any pattern, or from the pads.
- * Over 700 sounds available in memory.
- * Sounds can be tuned from + 1 octave to - 6 octaves using Microtune mode, or +/- 1 octave in semitone steps using Chromatic mode.
- * Sounds can be played in reverse direction, and if the 'Auto Reverse' feature is selected, the sound will first play in the selected direction, then turn around and play in the opposite direction.
- * 'Auto Pitch' feature allows the tuning to increase or decrease automatically while the sound is playing. There are 8 different rates of change.
- * Sounds can have assigned 1 of 8 preset Volume Envelopes.
- * Sound length is programmable - 16 steps.
- * 8-note polyphony through 8 separately assignable voice outputs, plus a separate stereo mix output jack.
- * Voice outputs can be turned on or off in the stereo mix.
- * 'Auto Voice' feature allows automatic selection of the voice output used to play a sound, so that similar types of sounds are played through the same voice outputs.

- * A sound can be assigned to use any number of voices (eg. outputs 4, 5 & 6) to allow multiple triggering of any sound, but stopping the sound from 'spilling' into voice outputs reserved for snare drums, cymbals or hi-hats etc.
- * Sounds can be panned left or right across the stereo mix with 15 pan positions.
- * Sounds can have their pan position selected automatically according to the voice number being used to play the sound - with 'Auto Voice' this allows an instant stereo mix to be obtained with ease.
- * 'Auto Pan' feature allows sounds to dynamically pan from left to right or right to left as the sound is playing. There are 8 programmable rates at which the sound 'moves' across the stereo image.
- * 'Roll Pan' feature allows the sound to move to a new pan position (left or right) when the same sound is played again whilst it is already playing out. This allows a tom roll, for example, to automatically 'move' across the stereo image each time the drum is played again. The pan position step rate is programmable (1 to 8).
- * 'Opposite Pan' feature allows any sound programmed into a pattern with opposite pan selected, to have its pan position automatically moved to the opposite side of the stereo image (ie. for every other occurrence of the sound, or every 4th occurrence etc.). This is useful for percussion or hi-hat rhythms.
- * 16 velocity sensitive drum pads with 64 independent pad setups (on 4 pad levels). (MD16R is only velocity sensitive via MIDI).
- * 'Single' sound pads (pad numbers 1 to 48, on pad levels 1 to 3) can have 1 sound per pad assigned, with all sound/pad parameters.
- * 'Multi' sound pads (pad numbers 49 to 64, on pad level 4) can have 3 sounds assigned to each pad, with all sound/pad parameters programmable independently for each sound.
- * Any internal or external sample can be assigned to any pad.
- * 'Chromatic Pad' function allows any sound from a pad to be instantly spread chromatically across all 16 pads on one pad level, without losing the pad setups for that level. 'Fine tuning' parameter allows the sound to be tuned to the pitch of other instruments.
- * All 64 pads can be 'exchanged' with an auxiliary set in memory, giving a total of 128 pad setups available. Swapping is initiated from the keypad, from MIDI or via the footswitch.

- * Pads 1 to 40 can be rotated (in blocks of 8 pads, with 5 rotates before returning to initial position), from the keypad, from MIDI or via the footswitch. When used with a electronic drum pad to MIDI convertor (such as the Cheetah Programmable Pads to MIDI), this allows a new set of 8 sounds to be available on the drum pads at the press of a footswitch.
- * 8 pad velocity curves, including reverse curves (where the sound gets quieter for a harder hit), plus fixed velocity - 32 levels. The 'multi' sound pads can be programmed for velocity cross-fading between different sounds, by programming a mixture of normal and reverse velocity curves for the 3 sound setups.
- * Programmable MIDI note number for each pad - allows the 64 pads to be arranged and played via MIDI from a keyboard or sequencer. A simpler mode allows the MIDI note number to play the same sample number, with velocity switching to access sample numbers above 128.
- * 'Post-Quantise' feature allows any sound being programmed into a drum pattern, to have playback quantise turned on or off.
- * 'Human Level' feature allows the pitch and start point of the sample to be either randomised, or linked to the volume of the sound. This can produce both subtle and extreme variations in the way the sound is played and can be used, for instance, to produce more natural sounding hi-hat patterns. If 'fixed volume' is selected, then you can still get variations by setting the human level to randomise the volume around the actual programmed setting. Pitch shifts of up to 4 octaves can be selected so that playing the drum pads (or playing via MIDI) can give real-time tuning effects.
- * Programmable 'Accent' allows the accent key or a footswitch to produce a defined change in volume and therefore in pitch and sample start point as described above.
- * 2 programmable echo banks (A and B) allow each pad to have echo or flam effects added if required by setting 'Pad Echo' to on. Repeat rate, decay rate and the number of repeats are programmable for each bank, and the rate is synchronised to MIDI clocks. With the pitch linked to the volume as described above, each repeat will be tuned higher or lower than the previous one.
- * The level 3 pads can be programmed to trigger up to 16 different patterns. Trigger threshold is selectable, as are 'Re-trigger' or 'Queue-trigger' modes, which either trigger the new pattern during the current pattern or wait for the current pattern to finish and then trigger. You can also use the echo effects on pads from level 3 to re-trigger a pattern at the echo repeat rate. Once triggered, the pattern will play a pre-determined number of repeats or play continuously if 'Continuous trigger' is set.

- * Tempo is selectable from 20 to 240 beats per minute.
- * Internal resolution for patterns is 384 steps per bar, 96 ppqn (MIDI clock resolution is 96 clocks per bar).
- * 'Beats per Bar' is selectable from 1 to 16 beats allowing for any time signature.
- * 'Quantise' step used for record and playback quantise can be set from 1/4 notes to 1/192 and OFF.
- * 'Timing Randomise' (used for pattern playback) is selectable from +/- 1/16 to +/- 1/384 and OFF.
- * 'Cyclic Randomise' mode allows the timing of any selected events in a pattern to be varied on playback, for example, playing firstly behind the beat and then moving smoothly to play ahead of the beat by the amount selected for timing randomise. The time taken to cycle from one mode to the other can be set from 1 to 64 beats.
- * Tempo 'Swing' can be set from 1:1 to 1:6 or 6:1.
- * Metronome click can be set on/off for record, playback and count-in, and can be either on the beat, or at the quantise rate (including swing timings). The sample, tuning, pan and voice output for the metronome click can also be set and if all voices are in use, clicks can be set to use the tape output instead.
- * Timing and synchronisation can be at the internal tempo rate, from external clocks via MIDI or to the MD16/R tapesync code. MIDI song position pointers are fully supported even for the tapesync code, so that you can start the tape anywhere in a song and use the tape to synchronise the MD16/R and any other MIDI units (such as a sequencer) to the same song position. A programmable 'Sync Delay' allows slower units time to find the song position before starting. The 'Clock Delay' function allows sequencers which do not fully implement MIDI song position pointer timing to be synchronised with the MD16/R.
- * The MIDI input can merge incoming commands with those generated by the MD16/R and can even change the MIDI channel before merging and re-transmitting the MIDI messages if required. All types of transmitted and received commands can be enabled/disabled (eg. start/stop/continue, MIDI note on/off, patch/song select, song position pointers).

- * Real-time pattern recording can be performed in 'Tape' or 'Cycle' modes (tape mode acting like a tape recorder) and in cycle mode, you can select 'Mix' or 'Overwrite'. Overwrite mode will mix new event entries with those already in a pattern until the pattern has played through twice without a new pad entry. The next pad will clear the entire pattern and restart the recording, saving the bother of clearing all event entries manually. If the pattern is OK, you can press stop to exit record mode and save your work. To delete events, simply press the shift key and the required pads at the same time as the sound is played.
- * Global parameters such as voice output stereo mix settings are saved with each pattern so that you are not limited to just one setup for auto-pan & auto-pitch rates, sound envelope lengths, beats per bar etc.
- * 'Solo Sample' allows you to hear each drum part from a pattern or song individually during record or playback.
- * 'Pad Fill' automatically repeats a pad at the selected quantise rate - up to 1/192 rate.
- * Step-time edit mode also allows recording from the pads at a selected timing position, but can still play the pattern at the same time, so that edits can be heard immediately. All sound parameters described previously can be edited separately for any one event or for groups of events recorded, so that the way that the sounds are played in a pattern can be completely different to the pad settings. The timing position of an event can be changed easily, and groups of events can be rotated, quantised or have opposite pan selected for every 'n'th event (n = 1 to 16). Events can also be copied, inserted and deleted and you can even change the length of the pattern.
- * Patterns can be copied and deleted, and pattern merge allows one pattern to be combined with another. This allows, for instance, a drum fill to be mixed into another pattern at any timing position, or one pattern to be appended onto another.
- * Songs can be programmed by entering a list of patterns and the number of repeats of each pattern - up to 127 song steps. If you require the tempo to change during a song, a tempo track can be programmed for each song consisting of a start tempo, then any number of new tempo steps. Each step is made up of a new tempo value, a timing position (bars and beats) where the tempo should start to change and a rate of change value, so that the tempo can change immediately, or change gradually over several bars if required.
- * Patterns and songs can be given names of up to 11 characters.

- * Songs can be arranged in a 20 step 'Song Chain' for performance use. You can also program an automatic delay and count-in between songs, or just press the footswitch or START/STOP key.
- * A timing 'Cue Point' can be programmed so that pressing the PLAY key starts playing patterns and songs from any point. The Start/Stop key always plays from the beginning. When playing, the display shows bars, beats and 96ths/beat advancing in real-time.
- * The footswitch input can be programmed to perform Start/Stop, Accent, Pattern Trigger, Rotate Pads, Swap All Pads or start the next chained song. (The MD16R has two footswitch inputs).
- * Patterns, songs and internal settings can be saved via MIDI (system exclusive dump) or on tape. A dump can be verified and even unknown records can be checked for errors before attempting to load them.
- * The tape sync code generated will follow all programmed tempo track changes and it is insensitive to tape level and any form of noise reduction (Dolby B/C, dbx). Tape speed variations of up to +/- 50% are OK, and it can even recover from tape dropouts by automatically reading the next song position and re-syncing.

MENU FUNCTIONS

VOICE Key Menu

1)	SAMPLE	OFF, 1 - 41 (plus external samples)
2)	SOUND	OFF, 1 - 14
3)	TUNING	1 - 127
4)	REVERSE	ON/OFF
5)	PAN POSITION	0 - 15
6)	ENVELOPE	1 - 8
7)	USE SETUPS	A/B
8)	FIXED VOLUME	ON/OFF
9)	VOLUME LEVEL	PAD or 1 - 32
10)	PAD RESPONSE	FIX or 1 - 8
11)	VOICE NUMBER	1 - 8
12)	No. OF VOICES	1 - 8
13)	RAND. START	ON/OFF
14)	RAND. PITCH	ON/OFF
15)	HUMAN LEVEL	0 - 15
16)	OPPOSITE PAN	ON/OFF
17)	ROLL PAN	ON/OFF
18)	AUTO PAN	ON/OFF
19)	AUTO PITCH	ON/OFF
20)	AUTO REVERSE	ON/OFF
21)	PAD ECHO	ON/OFF
22)	MIDI NOTE No.	0 - 127

SHIFT VOICE Key Menu

1)	MASTER VOL.	1 - 4
2)	MONO MIX	ON/OFF
3)	STEREO MIX 1	ON/OFF
4)	STEREO MIX 2	ON/OFF
5)	STEREO MIX 3	ON/OFF
6)	STEREO MIX 4	ON/OFF
7)	STEREO MIX 5	ON/OFF
8)	STEREO MIX 6	ON/OFF
9)	STEREO MIX 7	ON/OFF
10)	STEREO MIX 8	ON/OFF

TEMPO Key Menu

1)	SET TEMPO	20 - 240
2)	BEATS PER BAR	1 - 16
3)	QUANTISE	OFF, 1/192 - 1/4
4)	RANDOMISE	OFF, +/- 1/16 - +/- 1/384
5)	CYCLIC RAND.	ON/OFF
6)	CYCLIC TIME	-8 - +8
7)	SWING	ON/OFF
8)	SWING DEPTH	-8 - +8
9)	RECORD CLIK	ON/OFF
10)	PLAY CLIK	ON/OFF
11)	QUANT. CLIK	ON/OFF
12)	COUNT-IN	ON/OFF
13)	CLIK > TAPE	ON/OFF
14)	CLIK SMP.	OFF, 1 - 41 (plus external samples)
15)	CLIK TUNING	1 - 127
16)	CLIK REVERSE	ON/OFF
17)	CLIK VOICE No.	1 - 8
18)	CLIK PAN	0 - 15

RECORD Key Menu

1)	RECORD PATT.	1 - 254, Press START/STOP key
2)	REC. MODE	CYCLE/TAPE
3)	CYCLE	MIX/OVERWRITE
4)	POST-QUANT.	ON/OFF

PATT Key Menu

1)	SELECT PATT.	1 - 254
2)	PATTERN NAME	Press EDIT (SHIFT RECORD) to edit name
3)	SET LENGTH	1 beat - 682 beats
4)	READ LENGTH	Length of selected pattern
5)	COPY PATT.	1 - 254
6)	MERGE PATT.	1 - 254
7)	DELETE PATT.	1 - 254
8)	SOLO SMP.	OFF, 1 - 41 (plus external samples)

SONG (SHIFT PATT) Key Menu

1)	SELECT SONG	1 - 254
2)	SONG NAME	Press EDIT (SHIFT RECORD) to edit name
3)	CUE POINT	1st beat - 682nd beat (BARS:BEATS)
4)	DELETE SONG	1 - 254

CHAIN (SHIFT PLAY) Key Menu

1)	CHAIN DELAY	0 - 126 beats
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FUNC Key Menu

1)	PAD FILL	ON/OFF
2)	CHROM. PAD No.	1 - 64
3)	CHROM. PADS	ON/OFF
4)	FINE TUNING	-9 - +10
5)	SET A FX RATE	1 - 32
6)	SET A FX RPTS	1 - 16
7)	SET A FX FADE	-8 - +8
8)	SET B FX RATE	1 - 32
9)	SET B FX RPTS	1 - 16
10)	SET B FX FADE	-8 - +8
11)	PAD 33>>PATT	1 - 254
12)	PAD 34>>PATT	1 - 254
13)	PAD 35>>PATT	1 - 254
14)	PAD 36>>PATT	1 - 254
15)	PAD 37>>PATT	1 - 254
16)	PAD 38>>PATT	1 - 254
17)	PAD 39>>PATT	1 - 254
18)	PAD 40>>PATT	1 - 254
19)	PAD 41>>PATT	1 - 254
20)	PAD 42>>PATT	1 - 254
21)	PAD 43>>PATT	1 - 254
22)	PAD 44>>PATT	1 - 254
23)	PAD 45>>PATT	1 - 254
24)	PAD 46>>PATT	1 - 254
25)	PAD 47>>PATT	1 - 254
26)	PAD 48>>PATT	1 - 254
27)	RE-TRIG MODE	ON/OFF
28)	CONT RE-TRIG	ON/OFF
29)	RE-TRIG RPTS	1 - 8
30)	THRESHOLD	1 - 4

SHIFT FUNC Key Menu

1)	PAD DEFAULTS	Press START/STOP key
2)	REC TAPESYNC	Press START/STOP key
3)	CHECK LEVEL	Press START/STOP key
4)	ROTATE PADS	Press START/STOP key
5)	SWAP ALL PADS	Press START/STOP key
6)	CLR AUX. PADS	Press START/STOP key
7)	SYS EX DUMP	Press START/STOP key
8)	TAPE DUMP	Press START/STOP key
9)	SET LOAD TYPE	1 - 3 (1=Load, 2=Verify, 3=Check)
10)	TAPE READ	Press START/STOP key

MIDI Key Menu

1)	SYNC CLOCK	INT/MIDI/TAPE
2)	SYNC DELAY	0 - 3
3)	CLOCK DELAY	ON/OFF
4)	RX CHANNEL	1 - 16, OMNI
5)	MIDI MERGE	ON/OFF
6)	RX NOTES	ON/OFF
7)	RX PATT/SONG	ON/OFF
8)	RX STRT/STOP	ON/OFF
9)	RX SONG PP	ON/OFF
10)	RX SOUND No.s	ON/OFF
11)	RX > TX CHAN	ON/OFF
12)	TX CHANNEL	1 - 16
13)	TX NOTES	ON/OFF
14)	TX CLOCKS	ON/OFF
15)	TX PATT/SONG	ON/OFF
16)	TX STRT/STOP	ON/OFF

UTILS (SHIFT MIDI) Key Menu

1)	ENV LENGTH A	1 - 16
2)	ENV LENGTH B	1 - 16
3)	AUTO PAN A	-8 - +8
4)	AUTO PAN B	-8 - +8
5)	ROLL PAN A	-8 - +8
6)	ROLL PAN B	-8 - +8
7)	AUTO PITCH A	-8 - +8
8)	AUTO PITCH B	-8 - +8
9)	AUTO VOICE	ON/OFF
10)	ACCENT LEVEL	-8 - +8
11)	FOOTSWITCH 1	1 - 6
12)	FOOTSWITCH 2	1 - 6
13)	CHROM. TUNE	ON/OFF
14)	TEST TUNING	ON/OFF
15)	ROLL OVER	ON/OFF
16)	SET ALL PADS	ON/OFF
17)	S/W VERSION	VX.XX
18)	FREE MEMORY	0% - 100%

BASIC OPERATION

CONNECTIONS

Stereo Operation

Connect the STEREO/PHONES output to a suitable monitoring system or stereo headphones using a 1/4 inch stereo jack plug.

Mono Operation

Connect the STEREO/PHONES output as described above, but use a mono jack plug.

The MD16/R uses the left and right sides of the stereo output automatically, so to listen in mono you must first turn the MONO MIX parameter ON as follows :-

1. Press and hold the SHIFT key.
2. Press the VOICE key twice to select the MONO MIX parameter.

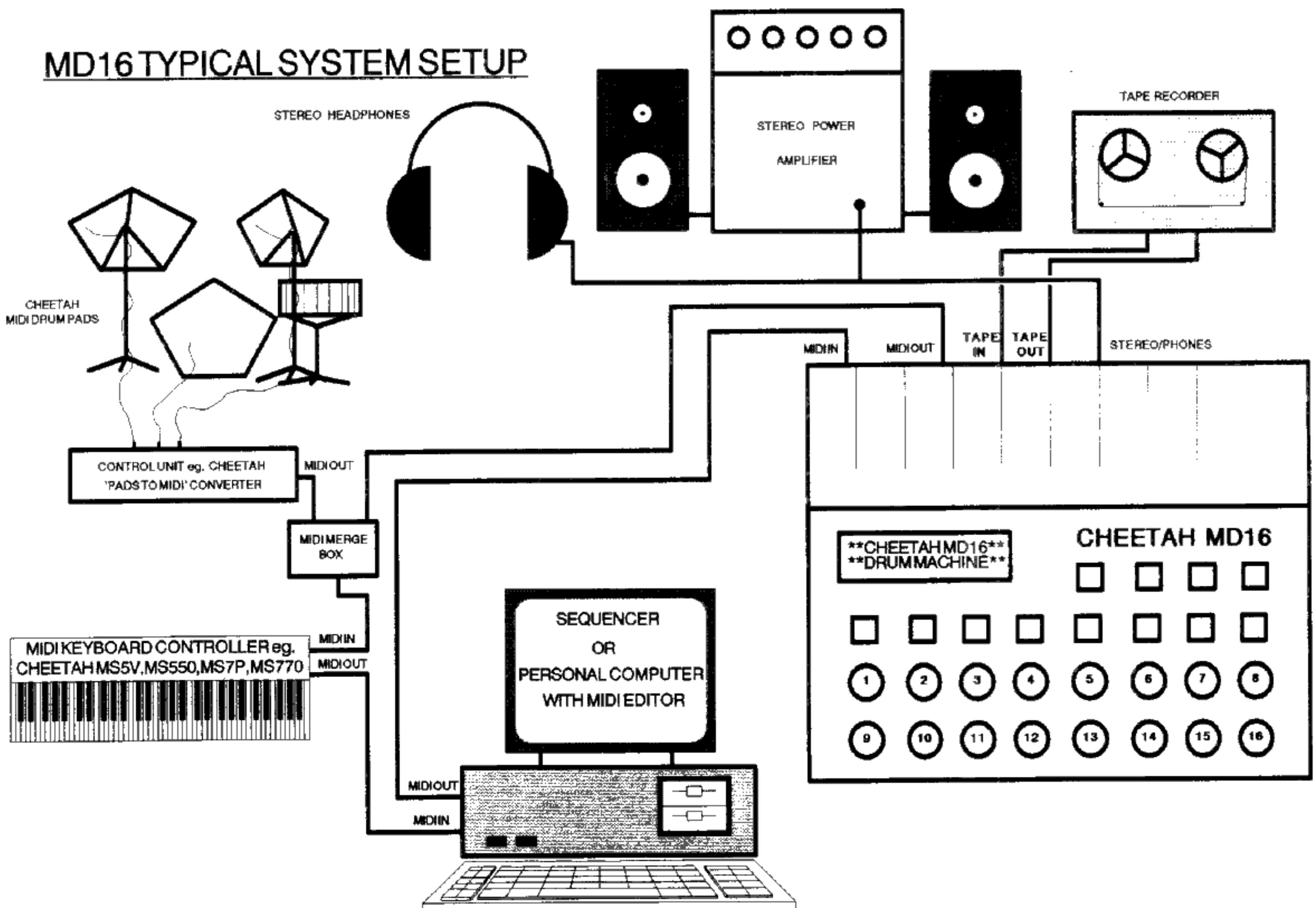
2)
MONO MIX OFF

3. Press the UP-ARROW key to turn MONO MIX - ON.

If you pass the MONO MIX parameter, keep pressing the SHIFT and VOICE keys until the display is as shown above and then press the UP-ARROW key.

MIDI Connections

If you wish to use a sequencer, keyboard or drum pads to play the MD16/R sounds, see the diagram below for MIDI connections.



POWERING ON

NOTE : When powering your MD16/R on or off ensure that the volume control on your amplifier is turned down, to avoid any damage to your speakers.

Connect the power supply plug to the POWER input, the display should now show :-

```
**CHEETAH MD16**  
**DRUM MACHINE**
```

OR

```
**CHEETAH MD16R*  
**DRUM MACHINE**
```

Playing the Drum Pads

The MD16/R has 16 drum pads, so that you can access all the internal samples easily, the MD16/R has 4 different levels of the pads - 64 pads in total !

Pressing the pads will play the 16 sounds assigned to pad level 1. To play the sounds assigned to the next pad level, simply select LEVEL (press SHIFT and ACCENT). The display should now show :-

```
| Lv2 |
```

The pad level can be changed at any time, so the rest of the display may not be blank as shown above.

You can now play all the sounds assigned to level 2. Pressing LEVEL again selects level 3, then 4 and finally back to level 1. Notice that holding SHIFT and ACCENT down continuously will step through the 4 pad levels. Most of the MD16/R functions will behave in the same manner, although many stop at the top or bottom of the setting range.

Playing the MD16/R Sounds from MIDI

If you are playing the MD16/R sounds via MIDI, pad 1 will be played by MIDI note 36 (the C two octaves below middle C), pad 2 by note 37 and so on, up to MIDI note 99 which plays pad 64.

Recording a Pattern - Real-time mode

Press the RECORD key, the display should now show :-

```
| 1) EMPTY |  
| RECORD PATT. 1 |
```

The UP and DOWN keys can be used to select the number of the pattern that you wish to record. For new patterns, an EMPTY message will appear on the top line of the display. Selecting a pattern which has already been recorded will either display its name, or blank the top line if a name has not been entered.

Press the START/STOP key to select pattern recording (this will create a new pattern, 4 beats long), displaying :-

```
| 1) |  
| PRESS START KEY |
```


Press the START/STOP key again to start the recording. The pattern timing position is displayed in BARS:BEATS:96ths form and will advance from 1: 1: 0/96 (1st BAR, 1st BEAT, NO 96ths of a BEAT) up to 1: 4:95/96 and then restart at the beginning. Also, you will hear a metronome click on each beat, with an accent at the start (every 4 beats), as the MD16/R is set to 4 beats per bar when you switch on for the first time.

1)	1: 2:48/96
PAD >	RECORD MIX

Recording Events into a Pattern - Real-time Mode

To enter an event (a sound), just press any pad at the required instant. The MD16/R is initially set to quantise (correct the timing of any events) to 16ths of a bar intervals (ie. 4 per beat), so that even if you play slightly out of time, the recording will be in time.

You can continue adding events from any pad on any level.

By now, you will probably have realised that the pads are velocity sensitive (the MD16/R is only velocity sensitive when played via MIDI) so that hitting a pad harder can play the sound more loudly. This volume will also be recorded in the pattern. If you want to change the volume of a recorded event, to make a snare drum louder for instance, all you have to do is play the same pad on top of the recorded event, at the new volume. The new pad entry then will replace the old one, without duplicating the same event.

Deleting Events from a Pattern

To delete any event, simply press the SHIFT key and the required pad as you hear the event you wish to delete being played out. You can hold the SHIFT key and a pad down continuously to remove any events previously recorded with that pad (which play out while you hold both keys down).

To stop recording, press the START/STOP key again.

Playing/Recording Hi-hats

The MD16/R treats playing/recording the hi-hats differently to all other types of sounds. This is because a hi-hat sound can 'cut short' the previous (mid or open) hi-hat, whereas a drum sound is allowed to decay naturally if the same pad is pressed again before the existing sound has finished.

You can try this by pressing a mid or open hi-hat and then a closed hi-hat immediately afterwards.

When recording, the MD16/R records all the pads played, except when the same pad is played on top of an existing entry (at the same timing). This means that you may end up with a closed hi-hat at the same timing position as an open hi-hat entry.

In this case, only the last hi-hat sound recorded will be played !!

Playing a Pattern

To play the currently selected pattern, press the PLAY key.

To select a new pattern number to play, press the PATT key and use the UP/DOWN ARROW keys as required, and the MD16/R will play the new pattern after completing the current one.

The START/STOP key can also be used to play the pattern from the beginning as long as the display is not showing the RECORD PATT message. While playing, pressing START/STOP stops the pattern, pressing PLAY restarts the pattern.

Programming a Simple Song

An MD16/R song is simply a list of patterns, with each entry having a value which gives the number of times each pattern is repeated. There is also a Tempo Track, used for slowing down or speeding up the song, but it is not necessary to use one (this is described later in the Advanced Operation section).

To program a song, you must first select SONG mode by pressing SHIFT PATT to bring up the Select Song message.

1) DEMO SONG
SELECT SONG 1

Song 1 is the Demo Song, so select an empty song number using the UP/DOWN keys (the display will show 'EMPTY').

Next press EDIT (SHIFT RECORD) to enter Song Edit Mode, which will display an 'END' message at step 1, as there are no pattern and repeat entries programmed for this song yet.

1) END

To enter a pattern/repeat entry, press the PATT key once. This will display

{--name--}
1) P 1 : R 1

 or

EMPTY
1) P 1 : R 1

depending on whether you have recorded and/or named pattern 1.

To select the pattern you require for the first step, press the PLAY key once, displaying :-

SELECT PATTERN
1) P 1 : R 1

Use the UP/DOWN keys to change the pattern number from 1 to 254. The pattern name will be displayed on the top line.

To select how many times the pattern will repeat when playing the song (before the MD16/R moves on to the next step), press the PLAY key again. The display will show :-

SELECT REPEATS
1) P 1 : R 1

Use the UP/DOWN keys to change the number of repeats from 1 to 255. The pattern name will again be displayed on the top line.

Pressing the PLAY key again will toggle back to the select pattern mode.

When this song step is correct, press the START/STOP key to exit this mode. An 'OK' message will be displayed on the top line.

The UP/DOWN keys can be used to move through the list of pattern/repeat entries. Pressing the UP key will move forwards to display the 'END' message as shown above (but now at step 2), while pressing the DOWN key will return to step 1.

To enter another pattern/repeats entry into the song, move to the step where you would like a new entry and press the PATT key. If you were at step 1, the new entry will be inserted at step 1 and the existing entry will move to step 2. If you were at the end of the song, the new entry will be the last entry in the song and the end message will move on one step. You can now change the pattern/repeats settings by pressing the PLAY key as above.

To remove a pattern/repeats entry from the song, move to the step you wish to delete and press SHIFT START/STOP. The current step will be removed, and all steps following this step will be 'pulled in' to close up the deleted entry.

When you have entered or edited the song steps and you are happy with your selection, press the START/STOP key to exit Song Edit Mode and return to the 'Select Song' menu entry.

Playing a Song

To play the currently selected song, first press SHIFT PATT to select SONG mode, then press the PLAY or START/STOP keys.

The Demo Song and Patterns

When you purchase your MD16/R, its memory is loaded with a demo song and 56 demo patterns, which demonstrate some of the advanced features of the MD16/R. The demo patterns are from pattern numbers 101 to 156, and the demo song is song number 1, using patterns 101 to 120.

If you need to use the memory taken by the demo song and patterns for your own songs and patterns, you may wish to save the memory contents of your MD16/R on a tape or via MIDI as a System Exclusive data dump (see page 85 in the Advanced Operation section). You will then be able to load them back later if you want to examine them to find out how you can achieve similar sounds in your own patterns.

Deleting songs and patterns is also described in the Advanced Operation section at pages 64 and 61.

The 56 demo patterns are listed below :-

101	FLICK 1	121	HIPHOP 1	140	FILL 1
102	BEAT 1	122	HIPHOP 2	141	FILL 2
103	BEAT 2	123	HOUSE 1	142	FILL 3
104	BEAT 3	124	HOUSE 2	143	PWL FILL
105	BREAK 1	125	SWING	144	TANGO
106	BREAK 2	126	Movin Swing	145	SAMBA
107	RIDEBEAT	127	SHAKE DOWN	146	BOSSA NOVA
108	BREAK 3	128	ACID	147	SLOW ROCK
109	BELLS 1	129	TECHNO	148	BOUNCE 1
110	BELLS 2	130	WELL ETHNIC	149	BOUNCE 2
111	BASS	131	Weird !	150	DISCO
112	LATINBREAK	132	WALTZ	151	8 BEAT 1
113	SALSA 1	133	JAZZ WALTZ	152	8 BEAT 2
114	SALSA 2	134	MARCH	153	16 BEAT 1
115	SALSA 3	135	COUNTRY	154	16 BEAT 2
116	ELECTROTOM	136	TAKE 5	155	THE END
117	HARDROCK	137	REGGAE	156	TheBigEnd
118	ELFILL 1	138	SYNCOPATE		
119	ELFILL 2	139	HEAVYMETAL		
120	END				

Changing the Tempo

To change the tempo, press the TEMPO key. The display will show :-

1)
SET TEMPO 120

You can change the tempo between 20 and 240 beats per minute using the UP/DOWN keys.

Pressing the tempo key while playing or recording will stop the timing being displayed on the top line but the pattern or song will still play as normal.

ADVANCED OPERATION

Using the Menus

There are 11 different menus under the VOICE, SHIFT VOICE, TEMPO, RECORD, PATT, SONG (SHIFT PATT), CHAIN (SHIFT PLAY), FUNC, SHIFT FUNC, MIDI, and UTILS (SHIFT MIDI) keys. The menu entries are listed in pages 8 to 11 and are described in the following sections.

To access the SHIFT functions (marked in BLUE), press and hold the SHIFT key and the required function key.

To select a menu just press the menu key (with the SHIFT key held down if required). The first menu entry will be displayed when this is the first time you have pressed a menu key after power on, or if you have changed from one menu to a new one. Pressing the same key(s) again will step to the next menu entry upwards (ie. menu entry 1 steps to menu entry 2 etc.), while holding the key(s) down steps automatically through the entries and eventually returns to the first menu entry.

If you are stepping through the menu and miss the menu entry you require, pressing the DOWN key while holding down the menu key will change the step direction (ie. menu entry 3 changes to menu entry 2), so that you can go back to the missed entry. The menu will then step in the down direction until you select a different menu, or until the UP key and the menu key are pressed at the same time.

VOICE Key Menu - Pad Setups

The VOICE MENU is selected by pressing the VOICE key. Under this key there are 22 parameters which assign the sound and how it is played to each pad.

Pressing the VOICE key when another menu is selected (or when no menu is selected) will allow you to edit Pad 1 parameters. To edit the parameters for other pads, just press the pad you require.

If Set All Pads mode is turned ON (UTILS menu entry 16 - page 100), then any parameter you edit will be programmed into all pads (except for the Pad Sample and Pad Sound parameters) if you have not selected a pad to change. If you do not press the UP/DOWN keys, none of the pads will be affected.

For setting all pads, pressing the VOICE key will display :-

1)	ALL PADS
SAMPLE	

1. Setting the Pad Sample

You can set up the sample assigned to each pad by selecting the first VOICE menu entry :-

1)	1	PAD 1
GATED KICK		

To select a new sample, just press the UP/DOWN arrow keys until the sample you require is shown.

To set another pad, just press the required pad (select a new pad level if you want) and the sample assigned to that pad will be shown.

All other parameters for each pad can also be selected by pressing the required pad and selecting a new parameter using the VOICE key.

2. Setting the Pad Sound

Select VOICE menu entry 2 and use the UP/DOWN keys to choose one of 14 different sounds available from the pad.

2)	PAD 1
SOUND	OFF

The Pad Sound parameter sets up all VOICE menu parameters (3 to 21) described in the following pages, to pre-determined values.

Setting the Pad Sound for Multi Sound Pads (Level 4)

Pad Sounds 1 to 11 contain one set of parameters which will set up either multi pad A, B or C, depending upon which was selected.

Pad Sounds 12, 13 and 14 contain complete multi sound pad set ups which will change all parameters for multi pads A, B and C. Many Pad Sounds have velocity cross-fading so that hitting the pad loudly produces a different sound to hitting the pad softly, with stereo combinations of the 3 sounds.

See page 33 for more information about how to use the multi sound pads.

3. Setting the Pad Tuning

The sound assigned to each pad can be tuned from +1 octave (127) down to -6 octaves (1), the normal tuning being 64 (this is for Microtune mode). Select VOICE menu entry 3 and use the UP/DOWN keys to alter the tuning :-

3)	PAD 1
TUNING	64

If the Chromatic Tune mode is ON (UTILS menu entry 13 - page 99), then the display will be as shown below :-

3)	PAD 1
TUNING	0

The mid tuning value of 64 will be displayed as 0, and pressing the UP/DOWN keys will change the tuning in semitone steps between 12 and -12 (ie. +/- 1 octave). If the Tuning was set with Chromatic Tune mode OFF, when you turn Chromatic Tune mode ON and look at the Tuning, the nearest semitone tuning will be displayed, but the actual tuning value will not be changed until the UP/DOWN keys are pressed.

4. Reversing the Sound Play Direction

The sound can be set to play backwards by setting Reverse to ON using the UP/DOWN keys, after selecting VOICE menu entry 4 :-

4)	PAD 1
REVERSE	OFF

5. Setting the Pan Position

To set the Pan Position, select VOICE menu entry 5. The pan position value can be changed with the UP/DOWN keys from 0 to 15.

5)	PAD 1
PAN POSITION	0

The value corresponds to the Pan Position shown below :-

LEFT		CENTRE		RIGHT
1 2 3 4 5 6		7 8 9 10 11 12 13		14 15

Pan Position 0 is a special case. The actual pan position is determined by the number of the voice used to play the sound. This setting can provide full stereo panning with the minimum of effort.

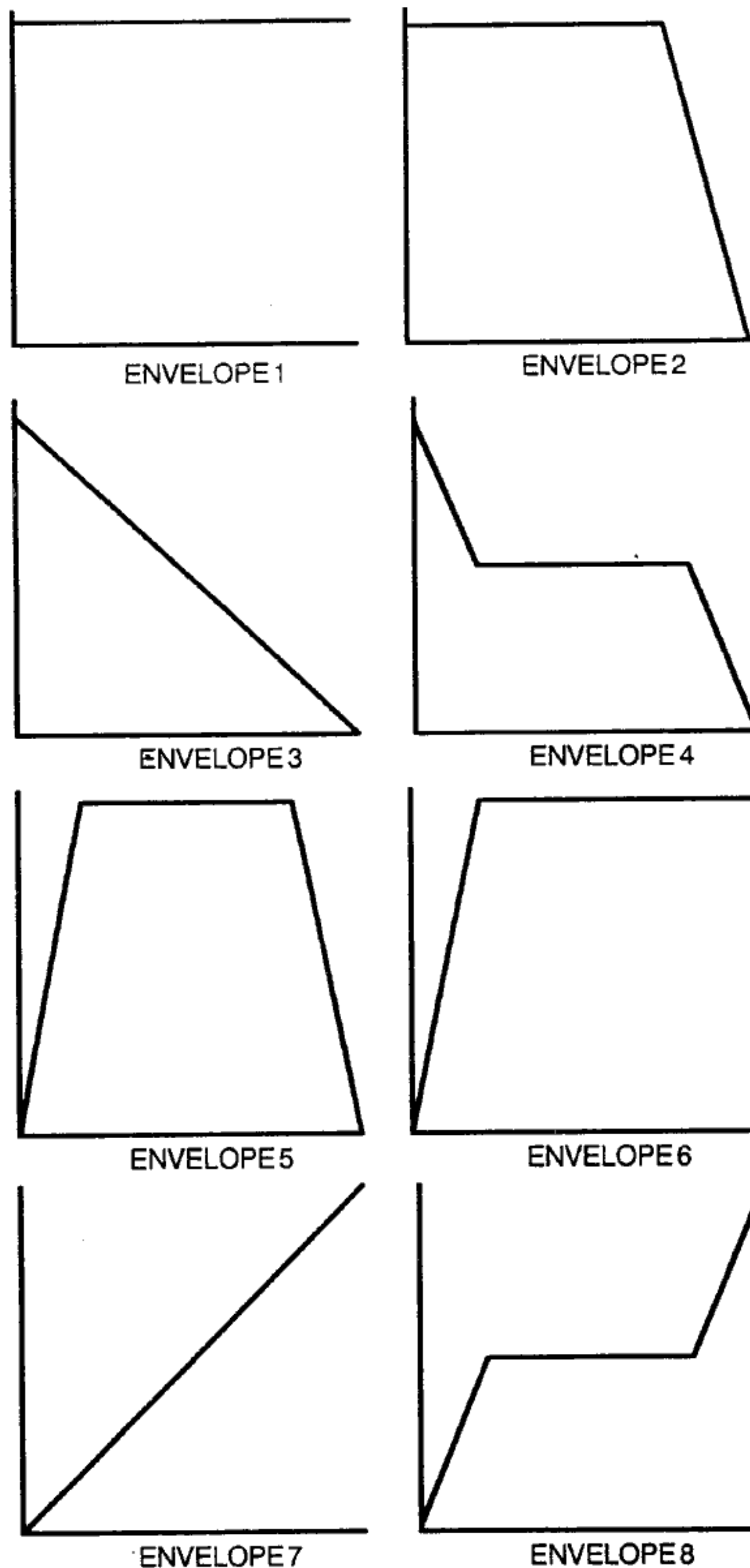
Voice 1	-	Pan Position 8
Voice 2	-	Pan Position 7
Voice 3	-	Pan Position 9
Voice 4	-	Pan Position 5
Voice 5	-	Pan Position 11
Voice 6	-	Pan Position 3
Voice 7	-	Pan Position 13
Voice 8	-	Pan Position 8

6. Setting the Volume Envelope

You can set a Volume Envelope for each pad, which allows the MD16/R sounds to be played with for example, a fade-in or fade-out envelope. Eight different Volume Envelope curves are available, just select VOICE menu entry 6 and use the UP/DOWN keys as before.

6)	PAD 1
ENVELOPE	1

The curves are shown below :-



7. Selecting Global A/B Setups

Each pad can be assigned to use one of two banks of global setups and echo effects (A or B), which affect how the sound will play. The four global parameters in each bank are set up in the UTILS menu and the echo effects are set up in the FUNC menu.

```
7)          PAD 1
USE SETUPS   A
```

Select VOICE menu entry 7 and use the UP/DOWN keys to select A or B.

The four global parameters are :-

ENVELOPE LENGTH A/B	Sets the length of the sound (1 to 16)
AUTO PAN A/B	Sets the Auto Panning step size and direction (-8 to +8)
ROLL PAN A/B	Sets the Roll Panning step size and direction (-8 to +8)
AUTO PITCH A/B	Sets the Auto Pitch shift rate and direction (-8 to +8)

The echo effects parameters are :-

```
ECHO REPEAT RATE A/B
NUMBER OF ECHO REPEATS A/B
ECHO FADE A/B
```

8. Turning off Pad Velocity Curves - Fixed Volume

To set a pad to Fixed Volume (so that the same volume is produced no matter how hard the pad is played), select VOICE menu entry 8 and use the UP/DOWN keys to turn fixed volume on or off.

```
8)          PAD 1
FIXED VOLUME ON
```

9. Setting the Fixed Volume Level

If Fixed Volume is selected, then VOICE menu entry 9 allows the volume level to be set from 1 to 32, using the UP/DOWN keys.

```
9)          PAD 1
VOLUME LEVEL 15
```

If Fixed Volume is turned off, the display is as shown below and the UP/DOWN keys are not allowed.

```
9)          PAD 1
VOLUME LEVEL PAD
```

10. Setting the Pad Velocity Curve - Pad Response

If the pad is set to fixed volume, the display is as shown below and the UP/DOWN keys are not allowed.

```
| 10)          PAD 1 |  
| PAD RESPONSE FIX |
```

If the Volume Level is set to PAD, the Pad Velocity Curve determines the volume level used to play a sound when a drum pad is pressed.

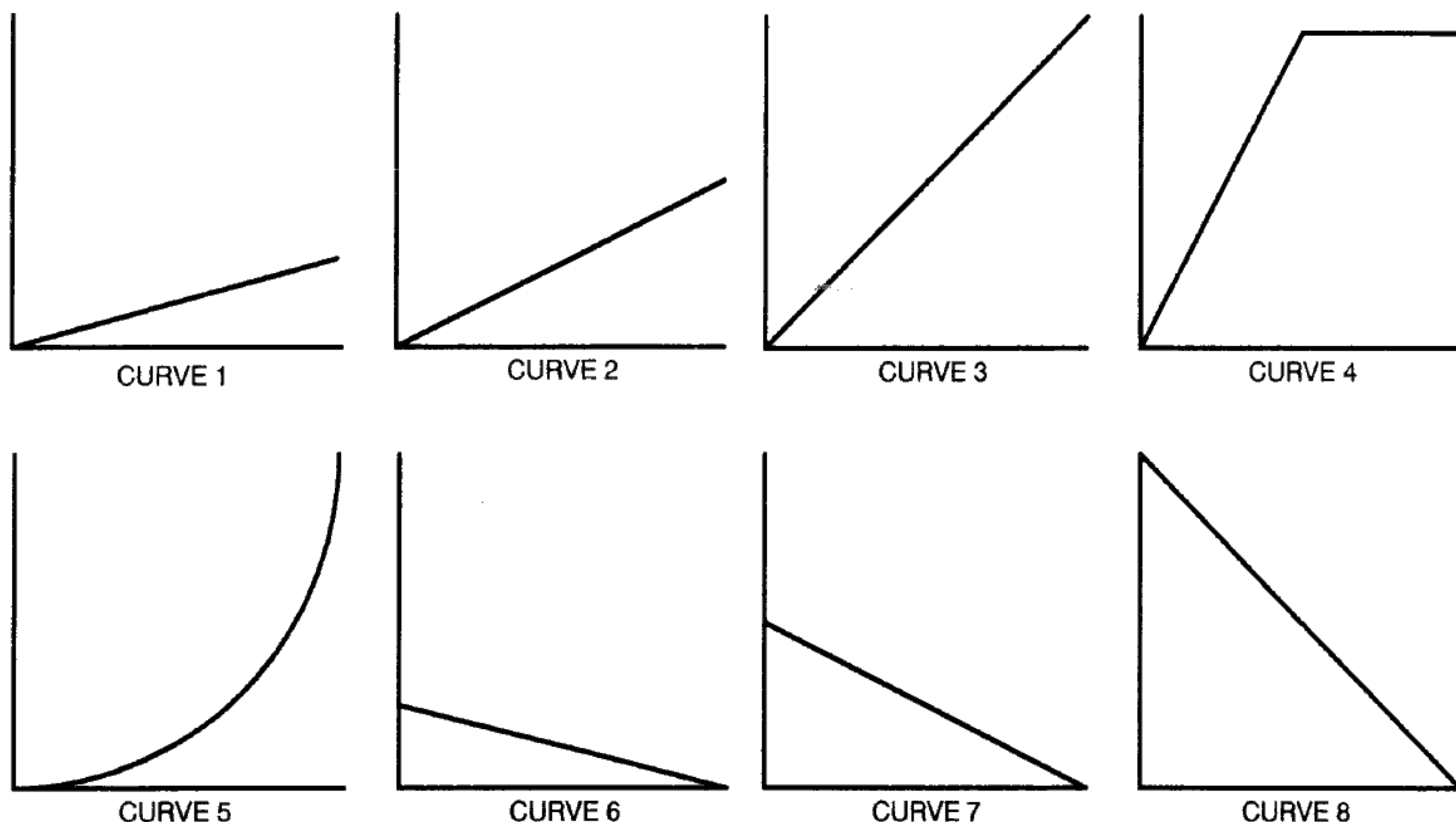
NOTE : The MD16R drum pads are not velocity sensitive, and so will produce a volume of 20 when pressed. The sounds are velocity sensitive when played from MIDI.

Select VOICE menu entry 10 and use the UP/DOWN keys to select one of eight different curves for each pad. Velocity curves 1 to 5 are the normal type, where playing the pad harder produces a louder volume, whereas curves 6, 7 and 8 are reverse velocity curves which produce a quieter volume for a harder playing action.

```
| 10)          PAD 1 |  
| PAD RESPONSE   1 |
```

The velocity curve selected is also used for notes received from MIDI, which play the pad setups (when Rx Sample Numbers mode is OFF, MIDI menu entry 10 - page 92).

The velocity curves are shown below :-



Basic Concepts 1 - Voice Outputs

The MD16/R is 8 note polyphonic, so that 8 sounds can be played at the same time, one through each VOICE output. At the rear of the MD16/R there are 5 stereo 1/4 inch jack sockets marked STEREO/PHONES, 1/2, 3/4, 5/6 & 7/8. Voice output socket 1/2 is for voices 1 and 2, socket 3/4 is for voices 3 and 4 and so on.

The STEREO/PHONES output provides a stereo mix of the signals at the 8 separate voice outputs but the stereo panning is **only** available at this socket.

Each separate voice output is monophonic, so that it can play **one** of the MD16/R sounds at a time, and playing another sound through the same voice output will cut off the first sound in order to play the second. This is fine for sounds such as closed or open hi-hats, but for sounds which decay slowly (eg. cymbals, toms), cutting off the sound in its prime may sound a bit odd. In the case of a snare drum roll, this results in the 'machine gun' effect which is typical of less sophisticated drum machines.

To avoid cutting off one sound when it is played again, you will need to assign the sound to use more than one voice output. The default setting, allows all sounds except for the hi-hats to use up to 8 voice outputs if required with the hi-hats only using voice output 8, so that a closed hi-hat is able to cut short an open hi-hat's decay.

Using the Separate Voice Outputs

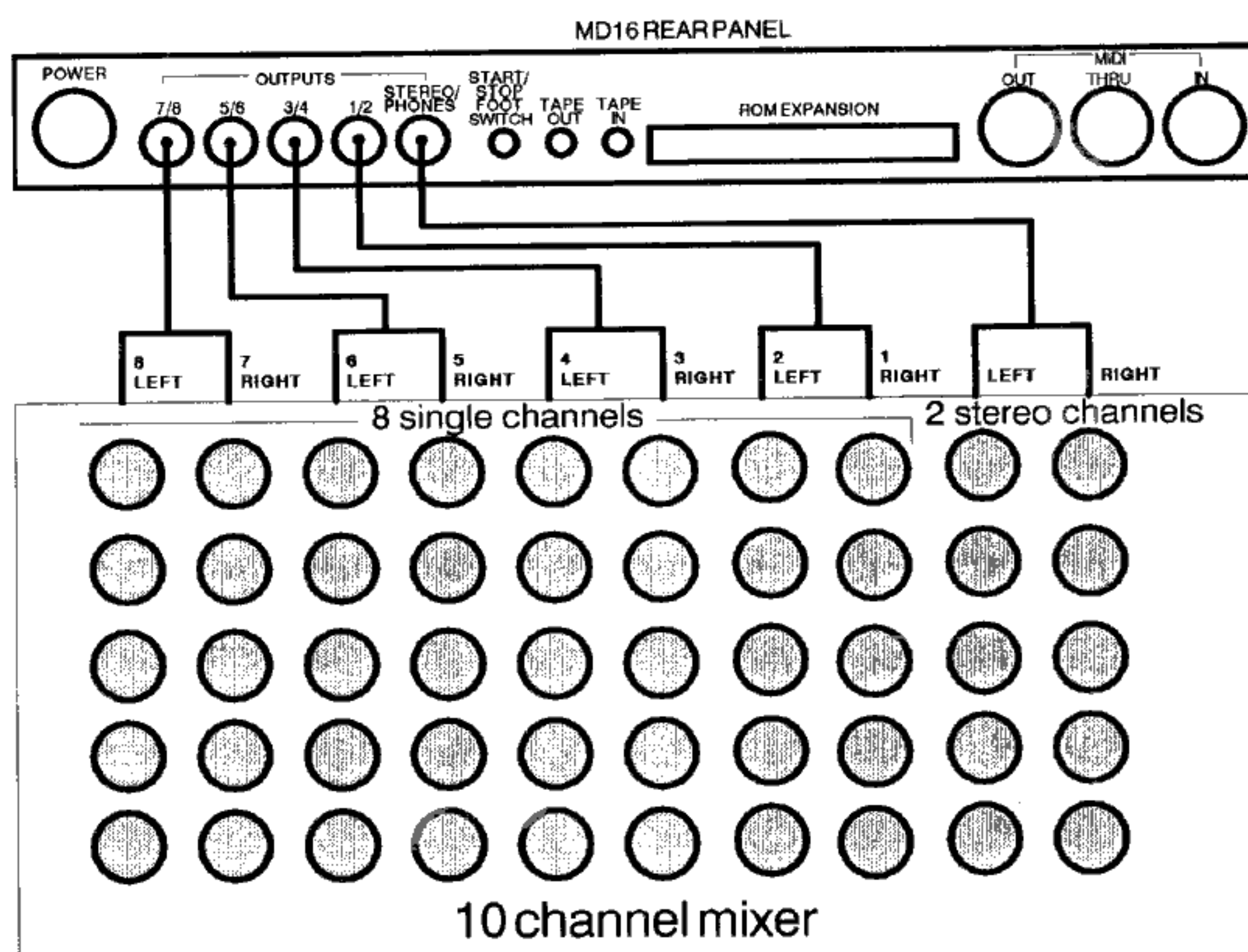
If you want to use the MD16/R with a mixing desk as shown overpage, you can decide which separate voice outputs are used for each sound, so that effects or tone equalisation can be applied just to the sounds required.

The MD16/R allows you to decide how many voice outputs can be used to play each sound (ie. how many polyphonic notes are allowed for each sound), so to avoid cutting the decay short, you would need to assign two or more voices for the toms, two voices for cymbals, but only one for hi-hats. However, you **can** assign more than one sound to the same voice output(s) providing that the two sounds are not played at the same time.

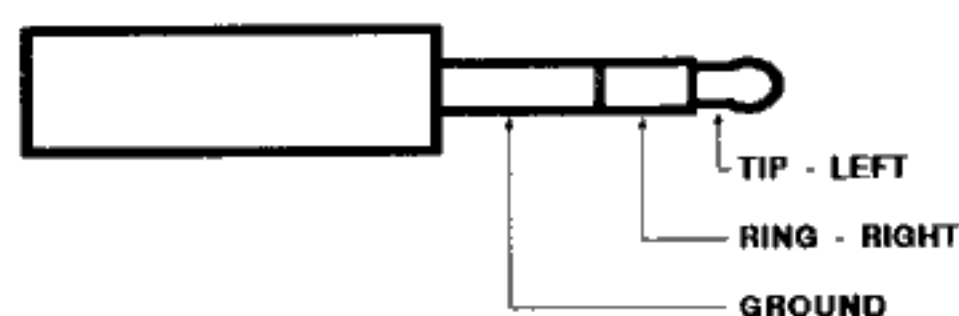
NOTE : The AUTO VOICE parameter must be turned OFF if you do not want to use the default Voice Output settings for the separate outputs (see page 97).

If you assign two sounds or more to use a number of outputs, then if the first one of the selected outputs is playing a sound, then the next available selected output will be used. If all selected voice outputs are in use, then the sound which is closest to finishing will be cut short to allow the new sound to be played.

Connecting the MD16 to a mixing desk



TYPICAL STEREO 1/4" JACK PLUG CONNECTIONS



To assign a sound to a number of voice outputs, you must set the VOICE OUTPUT parameter (page 27) for the **first** output required, and program the No. OF VOICES parameter (page 27) to set how many voice outputs can be used (polyphony).

Auto Voice defaults to ON, so that any changes you make to the Voice Output and No. of Voices parameters will be ignored until Auto Voice is turned OFF (see page 97).

The default settings for all pads depend upon the type of sound :-

KICK DRUMS

VOICE OUTPUT	=	1	-	first voice output allocated
No. OF VOICES	=	3	-	number of voices allocated

SNARE DRUMS AND SIDE STICK

VOICE OUTPUT	=	2	-	first voice output allocated
No. OF VOICES	=	4	-	number of voices allocated

HI HATS

VOICE OUTPUT	=	8	-	first voice output allocated
No. OF VOICES	=	1	-	number of voices allocated

TOMS, TIMBALE, ACID FLIK AND COWBELLS

VOICE OUTPUT	=	4	-	first voice output allocated
No. OF VOICES	=	4	-	number of voices allocated

CYMBALS AND PERCUSSION

VOICE OUTPUT	=	3	-	first voice output allocated
No. OF VOICES	=	5	-	number of voices allocated

ALL EXTERNAL SAMPLES (EXCEPT HI HATS)

VOICE OUTPUT	=	1	-	first voice output allocated
No. OF VOICES	=	7	-	number of voices allocated

If you want to remove a sound from the stereo mix outputs, but allow it to play through the separate voice outputs, you can program the sound to use say, two voice outputs, and then turn the STEREO MIX parameter off for each voice (SHIFT VOICE menu entries 3 to 10, see page 34). The sound will then only appear at the separate voice outputs which you have selected.

11. Assigning the Voice Output for a Pad

To set the first Voice Output that the sound is allowed to use, select VOICE menu entry 11.

11)	PAD 1
VOICE OUTPUT	1

Use the UP/DOWN keys to set the first voice output from 1 to 8.

12. Setting the Number of Voices Allowed

To set the Number of Voices, select VOICE menu entry 12 and use the UP/DOWN keys.

12)	PAD 1
No OF VOICES	8

The actual voice outputs that a sound will be allowed to use, start from the first voice output up to the number of voice outputs allocated.

ie. First voice = 1, number of voices = 4.
The sound is allowed to use voices = 1, 2, 3, 4

First voice = 6, number of voices = 4.
The sound is allowed to use voices = 6, 7, 8, 1

Basic Concepts 2 - Humanising Parameters

The MD16/R contains advanced features which can alter the way in which any of the sampled sounds are played, producing anything from subtle changes in pitch and timbre, similar to the way real drums vary, to patterns which are constantly changing, never playing the same way twice.

The Humanising parameters (VOICE menu entries 13, 14 and 15) allow you to program any combination of the dynamic/tonal variations listed below.

- i. Soften the attack of the sound at lower volumes.
- ii. Shorten the sound at lower volumes.
- iii. Detune the pitch of the sound at higher volumes.
- iv. Play volume dependent tunings over a 2 octave range.
- v. Randomise the volume away from the played level and link the new volume to the above parameters.
- vi. Randomise all of the above parameters independently.

These parameters can also be used to humanise a pattern, and any part of a pattern recorded with the Humanise parameters set up, will play differently each time. Don't worry if you have recorded patterns without humanise, as later on in the pattern editing section, you will find out how to edit the humanise parameters into an existing pattern.

13. Randomising the Sound Start Point

VOICE menu entry 13 allows the starting point of the sampled sound to be varied, starting further into the sound for lower volumes. This has the effect of removing the initial 'attack' portion of the sound, which produces a softer sound, similar to the effect found when using real drums. On the shorter sounds, particularly hi-hats, the length variation gives an extra rhythmic feel, imitating the way that the real instruments can be played.

13)	PAD 1
RAND.	START OFF

To enable the start point to be varied, turn ON using the UP/DOWN keys.

14. Randomising the Pitch of the Sound

VOICE menu entry 14, enables the pitch to be linked to the volume of the sound, tuning the pitch downwards for higher volumes.

14)	PAD 1
RAND. PITCH	OFF

Use the UP/DOWN keys to turn the Randomise Pitch parameter ON or OFF.

15. Setting the Humanise Level Parameter

The Humanise Level parameter determines the amount that the sound start point, pitch and volume will be varied. There are 5 levels of control, ranging from very subtle to extreme changes, and 3 different ways in which you can apply these changes.

15)	PAD 1
HUMAN LEVEL	0

The Human Level can be set by selecting VOICE menu entry 15 and using the UP/DOWN keys to program a level between 0 and 15.

Level 0 = OFF

The start point, pitch and volume will be exactly as played, even if the Randomise Start and Randomise Pitch parameters are turned ON.

Levels 1 to 5

The MD16/R uses the volume at which the sound is played and links it to the sound start point and the pitch if parameters 12 or 13 are set to ON. Level 1 gives the smallest variation, for subtle effects, while level 5 gives the maximum change, with extreme results.

Levels 6 to 10

The MD16/R adds or subtracts a randomised amount to the sound volume level (which is between 1 and 32) and then uses the new volume to link to the sound start point and pitch as describe above. This allows even sounds (and patterns) played with a fixed volume to have a feel of their own, by introducing a random element into the sound.

The maximum change in volume level for each setting is listed below :-

Level 6	-	Up to +/- 2 volume steps (subtle effects)
Level 7	-	Up to +/- 4 volume steps
Level 8	-	Up to +/- 8 volume steps
Level 9	-	Up to +/- 16 volume steps
Level 10	-	Up to +/- 32 volume steps (extreme effects)

Levels 11 to 15

These settings perform the same variations as for levels 6 to 10, except that the sound start point and pitch variations are not linked to the volume, but instead all three parameters are randomised separately. As before, level 11 gives the least change to the sound, with level 15 providing the most variation.

16. Selecting Opposite Pan

The Opposite Pan parameter simply sets the sound to play at the opposite side of the stereo image to the position programmed for the Pan Position parameter (VOICE menu entry 5). This may not sound very useful, as you could easily change the pan position and achieve the same result. However when you have recorded a pattern, you can edit the Opposite Pan so that every 2nd or 4th hi-hat event is set automatically to play from the opposite side of the stereo image. Using the opposite pan parameter uses the same amount of pattern memory whether it is set on or off, but using the pan position parameter to get the same effect will use more memory

16)	PAD 1
OPPOSITE PAN	OFF

Select VOICE menu entry 16 and use the UP/DOWN keys to set ON or OFF.

17. Selecting Roll Pan

The Roll Pan parameter (VOICE menu entry 17) allows a sound to be played at a different pan position (left or right) when the same sound is played again whilst it is already playing out. This allows a tom roll, for example, to automatically 'move' across the stereo image each time the drum is played again. The pan position step rate is set by either Roll Pan A or B (from the UTILS menu) depending upon whether global setups A or B are selected in VOICE menu entry 7.

17)	PAD 1
ROLL PAN	OFF

To use Roll Pan, first make sure that the Pan Position is not set to 0 (see VOICE menu entry 5) as roll pan will not work with an automatic pan position selection. Try setting the pan position to 8 (centre), then turn on Roll Pan using the UP/DOWN keys at VOICE menu entry 17. Roll pan works best with a long sound, so select a snare, tom-tom or cymbal sound.

Try playing the pad a few times, one after the other, and you should hear the sound move away from the centre to the left or right side and stay there. Once you have found out which side of the stereo image the sound moves to, change the pan position so that the sound starts at the opposite side to this. You will now find that it takes more consecutive pad presses to move the sound fully from one side to the other.

If you would like the sound to move in the other direction, or move across more quickly or slowly, see the page 96 for information on setting Roll Pan A or B global setups. (UTILS menu entries 5 and 6).

18. Selecting Auto Pan

Auto Pan is a very powerful feature that can move a sound across the stereo image in either direction - as the sound is playing. For example, you can start a cymbal playing in the left speaker and it will move across so that the sound will finish playing in the right speaker.

The direction and rate of moving the pan position are set by either Auto Pan A or B (from the UTILS menu) depending upon whether global setups A or B are selected in VOICE menu entry 7.

To use Auto Pan, first use the UP/DOWN keys to turn the function ON, then set the pan position to the centre, so that when the sound is played, you will hear the sound move from the centre towards the left or right speaker. When you have determined which way the auto pan is set, try setting the pan position fully left or right to obtain the maximum effect.

18)	PAD 1
AUTO PAN	OFF

If you would like the sound to move in the other direction, or move across more quickly or slowly, see page 96 for information on setting Auto Pan A or B global setups. (UTILS menu entries 3 and 4).

19. Selecting Auto Pitch

Auto Pitch works in a similar way to Auto Pan (described above), except that this time, the tuning changes as the sound is playing. Global setups Auto Pitch A & B (UTILS menu entries 7 and 8) determine how far the tuning shifts and whether the pitch goes up or down.

19)	PAD 1
AUTO PITCH	OFF

Select VOICE menu entry 19 and use the UP/DOWN keys to turn Auto Pitch ON or OFF.

You can use Auto Pan and Auto Pitch at the same time, but they will both either use global setups A or B as programmed in VOICE menu entry 7.

20. Selecting Auto Reverse

Auto Reverse does exactly as you would think. When the sound has finished playing, it turns around and plays back in the opposite direction. If the sound was set to play in reverse (in VOICE menu entry 4) then it will play in the reverse direction first, then in the forward direction.

20)	PAD 1
AUTO REVERSE	OFF

To set Auto Reverse, select VOICE menu entry 20 and use the UP/DOWN keys to turn Auto Reverse ON or OFF.

If you select Auto Reverse with Auto Pan and/or Auto Pitch turned ON as well, then when the sound finishes playing in the original direction, the pan and the tuning will also turn around and shift back to their starting settings.

21. Setting Pad Echo

VOICE menu entry 21 sets the Pad Echo feature ON or OFF. Each pad can use either echo bank A or B depending upon VOICE menu entry 7.

21)	PAD 1
PAD ECHO	OFF

22. Setting the MIDI Note Number for each Pad

Each pad can have a MIDI Note Number assigned, allowing you to set up your own drum layout if you are playing the sounds from a MIDI keyboard, sequencer or electronic drum pads. You can program the same MIDI Note Number for more than one pad, and the MD16/R will play all the sounds at the same time (up to a maximum of 8).

22)	PAD 1
MIDI NOTE No	36

The MIDI Note Number can be selected from 0 to 127 using the UP/DOWN keys.

Read the 'multi' sound pad information below before programming the same MIDI Note numbers on different pads, as one 'multi' sound pad allows up to three sounds per pad.

Pad Level 4 - 'Multi' Sound Pads

The 'Multi' sound pads on Pad level 4 are a special case, as you can program 3 complete sets of VOICE menu parameters for each pad. For instance, you could assign 3 different sounds to one pad and select different pad curves for velocity cross-fading, or select different pan positions/tunings of the same sound to give a full stereo image from one pad.

The three sets of parameters are identified by the pad number (49 to 64) followed by A, B or C. To change from one set of parameters to another, press and hold the SHIFT key and press the required level 4 pad. Pressing the pad again changes to the next set etc.

1)	8	PAD49A
FUSION SNARE		

Once A, B or C is selected, pressing other pads will display the same set of parameter for the new pad. If you change to another pad level, parameter set A will be selected next time you return to pad level 4.

SHIFT VOICE Menu - Setting Master Volume and Stereo/Mono Mix

Press the SHIFT and VOICE keys together to select this menu. Holding the keys down will step through the menu entries.

1. Master Volume

The MD16/R has four Master Volume settings, 1 to 4, selected using the UP/DOWN keys.

1)
MASTER VOL. 4

2. Setting Mono Mix Mode

You can set the MD16/R to play all sounds at the centre of the stereo image, ignoring all Pan Position settings (Mono Mix ON).

2)
MONO MIX OFF

Turn Mono Mix ON or OFF using the UP/DOWN keys once you have selected SHIFT VOICE menu entry 2.

3. Enabling the Voice Outputs in the Stereo Mix

SHIFT VOICE menu entries 3 to 10, allow each voice output to be turned ON or OFF in the stereo mix. This becomes very useful if you want to use the separate voice outputs with a mixing desk, to add tone equalisation or effects to some sounds, and still use the stereo output for other sounds.

You could assign, for instance, a snare drum to use voice outputs 5 and 6, and assign the other sounds to use the other voices (see VOICE menu entries 11 and 12 - page 27). If voice outputs 5 and 6 are then turned OFF in the stereo mix, the snare drum would only be present at the separate outputs for these two voices and the stereo mix would play all the other sounds.

3)
STEREO MIX 1 ON

To turn voice output 1 ON/OFF in the stereo mix, select SHIFT VOICE menu entry 3 and use the UP/DOWN keys. The other voice outputs are set by selecting SHIFT VOICE menu entries 4 to 10.

10)
STEREO MIX 8 ON

The Stereo Mix settings are Global parameters which are stored in the pattern when recording, so that when playing a pattern, they will change to the value that is stored.

If you want to edit the Stereo Mix parameters in an existing pattern, simply start the pattern recording and then change the Stereo Mix to the new settings. When recording is stopped, the new values will be stored in the pattern. When playing a song, as each pattern is played, the Stereo Mix settings stored in the pattern are loaded and are used to play the pattern in the exact way that it was recorded. When the song is stopped, the Stereo Mix parameters will hold the settings stored in the last pattern played.

The TEMPO Key Menu

The TEMPO menu contains 18 entries, which are used to program all parameters which affect the timing for playing or recording patterns and songs. Press the TEMPO key to select the first TEMPO menu entry.

1. Setting the Tempo

The Tempo parameter sets the master timing for playing and recording patterns, for playing songs which don't use a Tempo Track (see the TEMPO TRACK Editing section, page 65) and for the echo effects timing (see Pad Echo Effects, page 72). The Tempo can be programmed from 20 to 240 beats per minute using the UP/DOWN keys to change the setting.

1)
SET TEMPO 120

The Tempo is not stored with a pattern when recording, so all patterns will play at the current Tempo.

Basic Concepts 3 - Timing Resolution

Internal timing resolution is 384 time slots to a 4 beat bar (ie. 96 to each beat). The Pad Echo Effects are based upon MIDI clock resolution which is 24 clocks to each beat (ie. 1/4 of the internal resolution), so that setting the effects for 24 clocks will give a repeat rate which is in time with the beat.

2. Setting the Time Signature - Beats per Bar

TEMPO menu entry 2 sets the current time signature, in terms of the number of Beats per Bar. This parameter is used to determine when a metronome click accent is required (at the start of each bar) and also so that the timing display (BARS:BEATS:96THS) is correct for the programmed time signature.

2)
BEATS PER BAR 4

The number of Beats per Bar can be set from 1 to 16 using the UP/DOWN keys.

The Beats per Bar parameter is one of the Global parameters which are stored in the pattern when recording, so that when playing a pattern, the Beats per Bar will change to the value that is stored.

If you want to edit this value in an existing pattern, simply start the pattern recording and then change the Beats per Bar value to the new setting. When recording is stopped, the new value will be stored in the pattern. When playing a song, as each pattern is played, the Beats per Bar value stored in the pattern is loaded and is used to maintain the correct timing display and metronome click. When the song is stopped, the Beats per Bar parameter will hold the value stored in the last pattern played.

3. Setting the Timing Quantise

TEMPO menu entry 3 sets the current Timing Quantise parameter which is displayed as a fraction of a bar (internal resolution is 384 time slots to a 4 beat bar).

3)
QUANTISE 1/16

Select TEMPO menu entry 3 and use the UP/DOWN keys to set the Quantise value to one of the 13 different Quantise steps below :-

OFF	(1/384 resolution)
1/192	(2/384 quantise step size)
1/128	(3/384 quantise step size)
1/96	(4/384 quantise step size - MIDI clock rate)
1/64	(6/384 quantise step size)
1/48	(8/384 quantise step size)
1/32	(12/384 quantise step size)
1/24	(16/384 quantise step size)
1/16	(Quantise to sixteenth notes)
1/12	(Quantise to twelfth notes)
1/8	(Quantise to eighth notes)
1/6	(Quantise to sixth notes)
1/4	(Quantise on each beat - quarter notes)

Selecting 1/16 will give 16 quantised timing points in each bar (4 per beat) at the following timings :-

1: 1: 0/96		1: 2: 0/96		
1: 1:24/96		1: 2:24/96		
1: 1:48/96		1: 2:48/96		
1: 1:72/96		1: 2:72/96		
		BAR 1		
		BEAT 1		
1: 3: 0/96		1: 4: 0/96		
1: 3:24/96		1: 4:24/96		
1: 3:48/96		1: 4:48/96		
1: 3:72/96		1: 4:72/96		
		BAR 1		
		BEAT 3		
		BAR 1		
		BEAT 4		

The quantised timing points are every 24/96ths of a beat. This can be easily worked out by dividing the number of available timing points in a bar (384) by the number of quantise timing points required (16 required here), e.g.

$$384 \text{ divided by } 16 = 24$$

So for a Timing Quantise value of 1/12 (or twelfth notes) there will be a quantised timing point every 32/96ths of a beat.

$$384 \text{ divided by } 12 = 32$$

There is no need for you to work this out, simply set the required Timing Quantise value and record a pattern with lots of events (pad presses) at close timings. When you edit the pattern (see page 49 for Pattern Edit mode), the display will show the quantised timing points at which you have recorded an event.

There are two ways to use Timing Quantise when playing/recording a pattern.

i. Pre-Quantising

This is used when recording a pattern with Quantise set to anything other than OFF. No matter when you play a pad, the timing which is recorded will be corrected to the nearest Quantise step (previous or next) even though the sound will be played immediately.

The Quantise step will restart at the beginning of the pattern each time the pattern end is reached.

ii. Post-Quantising

Any pattern or part of a pattern which is recorded with Post-Quantise (RECORD menu entry 4) set to ON (or is edited to ON after recording), will be played back at the current Timing Quantise setting.

This allows you to perform real-time (or pre-quantised) recording and decide later whether to post-quantise your recording on playback.

After listening through the post-quantised pattern, you can decide on the Timing Quantise setting you like and then fix the event timings in Pattern Edit mode (see page 49 - Quantise).

iii. Deleting Events from a Pattern during Pattern Recording

Deleting an event when in pattern record mode is achieved by pressing the SHIFT key and a pad as the event is played (see page 15).

When Timing Quantise is set to any value except OFF, you can only delete events which fall on one of the quantised timing points.

If you are having trouble deleting events, particularly ones entered from pads with echo effects selected, try changing the Timing Quantise value to OFF. This will allow any event to be deleted from a pattern, no matter what its timing position. If this still does not work, see page 45 for more information about deleting events.

iv. Timing Quantise during Song Play

When playing a song, the Quantise step does not restart at the beginning of each pattern in the song. For instance, if you have selected a Timing Quantise value of 1/4 (quantise to the beat), the quantised timing points will be on each beat from the **beginning** of the song, even if it contains patterns which are not a whole number of beats in length.

4. Setting Timing Randomise

The Timing Randomise parameter works in a similar way to Timing Quantise described above. However, Timing Randomise does not correct the timing, but is able to move the timing position of an event in a pattern randomly backwards and forwards around the recorded timing position. Subtle variations in the timings of selected parts of the pattern help create a more natural sounding rhythm, especially if used in conjunction with the sound Humanise function from the VOICE menu.

Timing Randomise and Quantise can be used together, so that you can correct the timing of an event entry, and then add a random timing shift.

An event can be recorded in a pattern (or edited after recording) with Timing Randomise selected for that event, if the value is anything other than OFF when you record the pattern.

On playback, the value of the Timing Randomise parameter determines how far from the recorded or quantised timing position, the playback timing is allowed to shift.

4) RANDOMISE OFF

To set Timing Randomise, select TEMPO menu entry 4 and use the UP/DOWN keys to select one of the 10 values listed below :-

Timing Randomise	Maximum forwards or backwards timing shift
OFF	No shift allowed
+/- 1/384	1/384 of a bar
+/- 1/192	2/384 of a bar
+/- 1/128	3/384 of a bar
+/- 1/96	4/384 of a bar
+/- 1/64	6/384 of a bar
+/- 1/48	8/384 of a bar
+/- 1/32	1/8 of a beat
+/- 1/24	1/6 of a beat
+/- 1/16	1/4 of a beat

5. Setting Cyclic Randomise

The Cyclic Randomise parameter changes the way that events in a pattern which have Timing Randomise turned ON are shifted from the recorded timing position.

Normally, with Cyclic Randomise turned OFF, the amount that the events will be shifted is random, limited by the Timing Randomise setting described above.

With Cyclic Randomise turned ON, the maximum timing shift is still set by the Timing Randomise parameter. However, the shift is not random, but continuously changes smoothly from first playing ahead of the beat (backwards shift), through playing on the beat (no shift), to playing behind the beat (forwards shift), and eventually cycling back to play ahead of the beat again.

6. Setting the Cyclic Randomise Time

The Cyclic Randomise Time sets the number of beats that the MD16/R takes to repeat the cycle of playing ahead (before), and then playing behind (after) the beat.

6)
CYCLIC TIME 5

To set the Cyclic Time, select TEMPO menu entry 6 and use the UP/DOWN keys to set the parameter between -8 and 8. Negative values set the cycle to start playing behind the beat when the pattern or song is started, while positive values play ahead of the beat first.

The number of beats for each Cyclic Time value is shown below.

Cyclic Time value	Number of beats to repeat the cycle
1 and -1	1
2 and -2	2
3 and -3	3
4 and -4	4
5 and -5	8
6 and -6	16
7 and -7	32
8 and -8	64

7. Setting the Swing Parameter

The Swing parameter is used with Timing Quantise to alter the timing between successive quantised timing points, so that one becomes longer than normal, and the next becomes shorter by the same amount. This leads to a 'shuffle' feel to the timing and is often used for 1/8 note reggae hi-hat patterns.

Swing can be used both for pre-quantise when recording a pattern, and for post-quantise afterwards.

7)
SWING OFF

To program the Swing parameter, select TEMPO menu entry 7 and use the UP/DOWN keys to turn Swing ON or OFF.

8. Setting the Swing Depth

The Swing Depth value sets the amount of timing change between successive quantised timing points. The current Quantise value also plays a part in setting the timing variations.

8)
SWING DEPTH 5

To program the Swing Depth, select TEMPO menu entry 8 and use the UP/DOWN keys to set the parameter between -8 and 8. Negative values set the swing to start with a shortened quantised timing at the start of a pattern or song, while positive values start with a long quantised timing period. The timings for each Swing Depth value and Timing Quantise value are shown overpage.

Timing Quantise	Percentage Swing selected by Swing Depth Value							
	1	2	3	4	5	6	7	8
1/96	50%	62.5%	75%	87.5%	87.5%	87.5%	87.5%	87.5%
1/64	58.5%	66.7%	75%	83.3%	91.7%	91.7%	91.7%	91.7%
1/48	56.3%	62.5%	68.8%	75%	81.3%	87.5%	93.8%	93.8%
1/32	54.2%	58.3%	62.5%	66.7%	70.8%	75%	83.3%	91.7%
1/24	53.1%	56.3%	59.4%	62.5%	65.6%	75%	84.4%	93.8%
1/16	52.1%	54.2%	56.3%	58.3%	62.5%	66.7%	75%	83.3%
1/12	51.6%	53.1%	56.3%	59.4%	65.6%	75%	87.5%	93.8%
1/8	51%	52%	54.2%	58.3%	62.5%	66.7%	75%	83.3%
1/6	50.8%	51.6%	53.1%	56.3%	58.6%	62.5%	66.4%	75%

The percentages shown in the table above are for the lengthened quantised timing period for both positive and negative Swing Depth values. The shortened timing percentage can be found by subtracting the figure given in the table from 100.

To select, for instance, a swing of 66.7% / 33.3% with Timing Quantise set to 1/8, look along the table at the 1/8 row, until you find a value near 66.7%, then look up the column until you reach the Swing Depth value, which is 6 in this case. In 1/6 quantise, the Swing Depth would have to be set to 7 for the same percentage swing.

You don't have to use the table, however, as setting Swing Depth by ear is a far better method, and far quicker. All you have to do is start recording a pattern, so that you can hear the metronome click, then turn on Quantise Click (see 11 overpage), so that a click is played for each Timing Quantise interval. Also, turn the Swing parameter ON and try different Swing Depth values until you hear the setting you like.

9. Selecting Record Click

TEMPO menu entry 9 allows the metronome click to be turned ON or OFF during pattern recording, using the UP/DOWN keys.

9)
RECORD CLIK ON

10. Selecting Play Click

TEMPO menu entry 10 allows the metronome click to be turned ON or OFF when playing patterns or songs, using the UP/DOWN keys.

10)
PLAY CLIK OFF

11. Selecting Quantise Click

TEMPO menu entry 11 sets the metronome to play a click on each Timing Quantise interval. This allows you to hear how any events will be time-corrected when you record from the pads or from MIDI.

11)
QUANT. CLIK OFF

12. Selecting a Count-in Click before the Pattern/Song Start

TEMPO menu entry 12 allows you to select a count-in click when the pattern or song is played from the start (but not when the Start Offset is used to start playing further into the pattern or song).

12)
COUNT-IN OFF

The count-in will play the number of clicks as set by the Beats per Bar parameter (stored in the first pattern to be played), before the song or pattern is started. Count-in can also be used when recording a pattern. Use the UP/DOWN keys to turn the count-in ON or OFF.

13. Selecting Metronome Clicks from the Tape Output

The metronome click normally uses one voice output to play the sample selected in CLIK SMP. (TEMPO menu entry 14). This may cause problems when playing particularly 'busy' patterns, or if there are no voices free after allocating the sounds to their own voice outputs.

If you still require a metronome click, TEMPO menu entry 13 allows you to set the Tape Output socket to play the click, and you can stop the normal click by setting CLIK SMP. to OFF (see page 44). Use the UP/DOWN keys to turn CLIK > TAPE ON or OFF.

13)
CLIK > TAPE OFF

Setting the Metronome Click Parameters

TEMPO menu entries 14 to 18 allow you to set up the metronome click sample, pan position, tuning etc. to your own liking. The parameters are programmed in exactly the same way as the VOICE menu parameters described earlier.

14. Metronome Click Sample

14) CLIK SMP. 27 SIDE STICK

15. Metronome Click Tuning

15) CLIK TUNING 64

16. Metronome Click Reverse

16) CLIK REVERSE OFF

17. Metronome Click Voice Output

17) CLIK VOICE No 7

18. Metronome Click Pan Position

18) CLIK PAN 8

The RECORD Key Menu

Pressing the RECORD key selects the RECORD menu entries, but also selects PATTERN mode, so that pressing PLAY or START plays the current pattern rather than the current song or the chain.

1. Recording a Pattern in Real-time Mode

Select RECORD menu entry 1, the display will show :-

```
1)  {--name---}  
RECORD PATT.  1
```

The UP/DOWN keys can be used to select the number of the pattern that you wish to record. For new patterns, an 'EMPTY' message will appear on the top line of the display. Selecting a pattern which has already been recorded will either display its name, or blank the top line if a name has not been entered previously.

Press the START/STOP key to select pattern recording. The display will show :-

```
1)  {--name---}  
PRESS START KEY
```

If the pattern is empty, this will create a new pattern, with the length as programmed in Set Length (PATT. menu entry 3, page 58). Existing patterns will be opened to allow recording, but the length will not be changed (to edit the length of an existing pattern, see the Pattern Editing section - page 53).

Press the START/STOP key, footswitch or send a start command via MIDI to start recording. The display will show :-

```
1)  1: 2:48/96  
PAD > RECORD MIX
```

If Record Click is enabled (TEMPO menu entry 9) then a metronome click will be played, with an accent at the start of each bar set by the Beats per Bar setting (TEMPO menu entry 2).

You can now record events from the pads or from MIDI. You can also change any parameter from any menu while recording, except for RECORD or PATT menu parameters, which stop any recording.

To delete an event you have just recorded, press the SHIFT key and the pad together, as the sound is played. You may still hear the sound (if you press slightly after the sound plays), but the next time the pattern is played through, the sound should have disappeared. (You can also use the footswitch to perform the SHIFT key function - see page 98)

If you have difficulty in deleting an event, check the points listed below :-

- i. Make sure that the pad you are pressing has the same sound and other VOICE menu parameter settings as the event in the pattern. If not, the only way to delete the event is by using Pattern Edit (see page 53).
- ii. Check that the Timing Quantise setting will produce a quantised timing position which falls on the event you wish to delete. Just as you can time-correct an event when recording, deleting an event is also quantised. Setting Timing Quantise to OFF will allow any event to be deleted, irrespective of its timing position.

To stop recording, press either the START/STOP key, the footswitch or send a stop command to the MD16/R via MIDI.

Global Parameters Stored in the Pattern

There are several Global parameters which are stored in the patterns, allowing each pattern to set up the MD16/R differently.

When a new pattern is recorded, the current Global parameter settings are saved along with any drum events.

To change any of the Global parameters stored in an existing pattern, simply start the pattern recording as described above, then change the settings as required. When the recording is stopped, the new settings will be saved back into the pattern.

The stored Global parameters are :-

- Auto Pan Step Size A/B
- Roll Pan Step Size A/B
- Auto Pitch Step Size A/B
- Envelope Length A/B
- Number of Beats per Bar
- Auto Voice ON/OFF
- Stereo Mix Settings

Note : The Global parameters listed above are loaded from the currently selected pattern whenever you start the MD16/R playing in pattern, song or chain modes.

2. Setting the Record Mode

Recording pattern can be in one of two modes, Cycle or Tape. To set the Record Mode, select RECORD menu entry 2 and use the UP/DOWN keys to set Cycle or Tape mode.

When Cycle mode is selected, new patterns are created with the pattern length defined by the Set Length parameter, as described earlier. The display will show :-

```
2)
REC. MODE  CYCLE
```

In Tape mode, recording a pattern is similar to using a tape recorder, so that the length of the pattern is determined by the length of time that you are in record mode. Existing patterns can be extended by setting Tape mode and then recording past the end of the pattern. The new length is saved when you stop recording.

```
2)
REC. MODE  TAPE
```

If you are using electronic drum pads to play the MD16/R via MIDI, you can use Tape mode to make the MD16/R behave like a MIDI tape recorder, with full post editing and quantising facilities. With the tempo set to 120 beats per minute, you can record for 5 minutes 41 seconds (682 beats), so long as you have sufficient memory available.

3. Setting Cycle Mix or Overwrite Mode

If you have selected Cycle Record Mode, there are two ways that the MD16/R will respond during recording.

To set Cycle Mix or Cycle Overwrite, select RECORD menu entry 3 and use the UP/DOWN keys.

Cycle Mix mode is the normal case, where new events are mixed with any events already recorded in the pattern.

```
3)
CYCLE MIX
```

While recording, the display is as shown below :-

```
1)  1: 2:48/96
PAD > RECORD MIX
```

Cycle Overwrite mode starts off in a similar way, with new events mixing with existing ones and with the same record display as above.

```
3)
CYCLE OVERWRITE
```

However, if the MD16/R plays the pattern through twice without any new events being recorded or existing events deleted, the display will change to the one shown below :-

```
1)  1: 2:48/96
PAD > PATT CLEAR
```

Now, if you enter or delete any events, the pattern will be cleared and the new events will be entered into an empty pattern.

This allows you to record a pattern, and if you are not satisfied with the result, restart the pattern from scratch automatically. When you have made the pattern clear, the display will change back to the 'PAD > RECORD MIX' message again, until you wait through two complete cycles.

If you are happy with the resulting pattern, DO NOT PRESS A PAD !!

Press the START/STOP key to stop recording and then change the mode back to Cycle Mix (just in case you forget that the mode is still set to Overwrite and you erase a pattern unintentionally).

Take care when using the Overwrite mode, as it is very easy to erase a pattern before you realise what you have done. For this reason it is good practice to make a copy of an existing pattern before recording.

4. Setting Post-Quantise

RECORD menu entry 4 sets the Post-Quantise feature ON or OFF. When recording a pattern, there are two ways to correct the timing of anything you record.

4)
POST-QUANT. OFF

The first method is to record with Quantise (TEMPO menu entry 3) set between 1/192 to 1/4, and this records the pad at the nearest time interval to the instant that it was played. This is called 'pre-quantising' (see page 38 for more information).

The second method is to record with Quantise set to OFF, but with Post-Quantise set to ON. Now any pad presses will be recorded as you play them, but on playback, setting the Quantise value to anything other than OFF, will correct the timing to the time interval selected - without altering the pattern. This is called 'post-quantising' (see page 38) and can be used to try out different timings before deciding whether to 'fix' the timing at a particular setting (see Quantise Editing, page 54).

You can record with pre-quantise, and then change to a new quantise value later if Post-Quantise was ON when recording. If you have recorded a pattern with Post-Quantise set OFF, and you would like to change the timing, you can edit the pattern to turn Post-Quantise ON (see Pattern Editing, page 49).

Recording/Editing Patterns in Step-Time Mode

To record a pattern from scratch in STEP TIME mode, you must first create an empty pattern of the required length.

To create an empty pattern, first press the RECORD key and select the pattern number using the UP/DOWN keys, then press the START/STOP key three times (same as for real-time pattern recording).

Editing Existing Patterns

Once you have recorded a pattern into the MD16/R, you can change almost anything about it, including its length, the sounds it contains, their relative positions to each other and so on. Before editing any pattern you should remember that the original pattern will be lost, and it is wise wherever possible to create a copy of this pattern in a spare pattern location, just in case of any disasters. (See instructions on copying a pattern to find out how this is done - page 59).

Pattern Step-Time Record/Edit Mode

To enter the editing mode, press the PATT key to display the following message :-

```
1)
SELECT PATT. 1
```

Use the UP/DOWN keys to select the pattern you require and then press the EDIT key (SHIFT RECORD), which will cause any patterns playing to stop. The display will change to show the initial time slot of the pattern along with any sound set to occur at the selected slot (display shows EMPTY on lower line if there is no sound to play) :-

eg.

Ev1	1: 1: 0/96
KILLER SNARE	

 or

1: 1: 0/96
EMPTY

'Ev1' in the top left hand corner of the first display example indicates which event at the current time slot is being displayed. You will find this useful when you have two or more events at the same time slot which have the same sound, but differ in tunings for example. You will also notice that as an event is displayed on the screen, its sound will be played through the MD16/R outputs. This helps you to locate any event that you may want to alter.

Pattern Step-Time Record/Edit mode allows you to step through the pattern, one event at a time and change any of the settings related to any particular event (or group of events), including its timing position in the pattern. In this mode, you can also record complete patterns from scratch by selecting a timing position and entering pads in the same way as for real-time recording.

Pressing the PLAY key will play the pattern you are editing or recording, allowing you to hear any changes as they are made.

NOTE : Once a pattern is playing during editing then any alterations to the pattern made in this mode will be heard the next time that the pattern loops through the timing slot being displayed on the screen.

Moving the Display Window Through the Pattern

The display window can be moved forwards and backwards through the pattern either by using the UP and DOWN keys or by using SHIFT/UP and SHIFT/DOWN.

Pressing UP will make the display window move forward to the next event in the pattern from either the current or the next used timing position.

Pressing DOWN will make the display window move backwards to the previous event in the pattern from either the current or the previous timing position.

The SHIFT UP or SHIFT DOWN perform the same functions as the UP/DOWN keys, except that instead of the next used timing position, the next quantised timing position is displayed.

Editing an Event - VOICE Parameters

Pressing the VOICE key allows you to edit any of the parameters associated with an event in the pattern. The display will change to the following :-

eg.

1)	1 SAMPLE
GATED KICK	

In this mode you can change any parameter associated with the event shown by first pressing the VOICE key until the parameter that you want to change is displayed. The parameters available are almost all those under the VOICE key menu (the exceptions being 'Volume Level', 'Pad Response' and 'Midi Note Number', all of which are meaningless in this mode). A new parameter 'Timing Randomise' replaces 'Volume Level' in the list and allows for the introduction or removal of randomisation in the timing of the played sound.

You can also add or change the humanising parameters so that all or parts of a pattern will play differently each time (see Basic concepts 2 - HUMANISING PARAMETERS - page 28).

Pressing START/STOP exits this mode and saves the changes entered. However, the changes may be saved in one of three ways by answering 'yes' or 'no' to questions asked on the display. All questions default to answer 'no', and you must press the START/STOP key to enter your answer. To answer 'yes' simply press the UP key before entering START/STOP. (If you want to change your mind back to NO then press the DOWN key before entering START/STOP).

a) ALL EVENTS WITH SAME SOUND ?

Answering 'NO' will only allow the MD16/R to change this event before returning to Pattern Step-Time Record/Edit mode.

Answering 'YES' will cause all identical events in the pattern to be changed to the new values (events are assumed to be identical if all parameters except the following are the same).

- (1) Volume
- (2) Timing Randomise
- (3) Opposite Pan
- (4) Post-Quantise

The MD16/R will now ask another question :-

b) ALL EVENTS WITH SAME SAMPLE

Answering 'YES' will cause all events using the same sample to be changed to the new values, regardless of their original Tuning, Pan Positions, etc. This is extremely useful for changing for example the pan position, of a tuned bass part, where because the tunings are different, the previous test would not regard the events as being identical sounds.

Answering 'NO' returns to Pattern Step-Time Record/Edit mode, as it has already changed all the events which are identical to the edited one to the new values.

The MD16/R then returns to Pattern Step-Time Record/Edit mode.

Note : If the Opposite Pan setting has been altered, then the display will show the message :-

OPPOSITE PAN
CHECK COUNT 1

Press UP/DOWN to select the required number and then press START/STOP to enter. This will select a count for testing how many events are skipped before altering the opposite pan setting.

A count value of 1 means that every event which passes the previous conditions is changed.

A count value of 4 means that every 4th eligible event is changed.

This can be useful for moving every 'n'th hi-hat event to the other side of the stereo image, so producing a stereo hi-hat track with ease.

For this menu option, the pattern will only be altered from the current timing position up to the end of the pattern, and will not affect anything before the selected event that you started editing.

Moving the Timing Position of a Single Event

To move the position of a single event in the pattern then simply display the event that you want to move and then press the TEMPO key. The display will change to show 'TIME' in the top left hand corner to indicate that the current event can then be moved through the pattern.

Pressing the UP and DOWN keys will now move the selected event one location in either direction. However SHIFT UP and SHIFT DOWN will move the selected event 96 locations (or 1 beat) either forwards or backwards through the pattern.

Once you have moved the event to the position that you require, press the START/STOP key to 'Fix' the event back into the pattern and return to Pattern Step-Time Edit mode

Making a Copy of an Event

To make an exact copy of any event in the pattern simply move the display window to the event that you want to duplicate and then press the RECORD key. The new event will be placed as the last in the list at this time slot and the display window will move on to the last event to show that the duplication has been successful.

Entering Pads into the Pattern

Pressing a DRUM PAD will cause that pad, to be entered into the pattern at the point currently being displayed. If the event created by this pad exactly matches one that already exists at this point then the old event will be deleted and the new event will be entered instead. This may be used on the MD16 (but not the MD16R), to modify the volume of a pad that has already been entered, simply by pressing the same pad again at a different pressure. DRUM PAD events are always entered as the last event in the time slot being viewed, unless they are simply changing an existing event as indicated above.

Selecting the Pad Level

Pressing LEVEL (SHIFT ACCENT) will move the drum pads on to the next level of sounds in exactly the same as in the normal PLAY or RECORD modes of operation. The top left of the screen will display the message 'Lv' followed by the current shift level :-

eg.

Lv2	1: 1: 0/96
KILLER SNARE	

Deleting a Pad

To delete an event that you have entered into a time slot using one of the drum pads, simply point the display window anywhere in the time slot and then press the SHIFT key along with the pad key that you want to remove from the pattern. The VOICE parameters of the pad that you press must exactly match the pad that you used to enter the event into the pattern or else the MD16/R will not be able to delete the event.

Deleting Any Event

If you cannot remember which pad that you used to enter an event, or you have re-defined the drum pads since the pattern was entered, then it is still possible to delete any specific event from the pattern. To do this move the display window to show the event that you no longer want, and then press SHIFT START/STOP. The event will be deleted, and the display will change to show the next event at the chosen time slot (or 'EMPTY' if the time slot is now clear).

Changing the Length of the Pattern

Pressing the PATT key allows you to alter the length of the pattern currently being edited. The length may be increased or decreased one count at a time by pressing the UP and DOWN keys, or one beat (96 counts) at a time by pressing SHIFT UP and SHIFT DOWN.

NOTE : The minimum length of the pattern is one beat (96 counts).

When lengthening the pattern, the time between the old length and the new length will be filled with blank spaces, and no events will be entered. To put events in this space, you will have to return to either the Pattern Step-Time Record/Edit mode and enter events from the pads or re-record the pattern in real-time to mix in any extra events that you require.

When shortening the pattern, **BEWARE**. If reduce the pattern length so that events 'drop off' the end of the pattern, then these events cannot be recovered.

When you are happy that the length is correct, press the START/STOP key to return to Pattern Step-Time Record/Edit mode.

Quantising All Events or Selected Events

Either all or selective events in the pattern may be move to the nearest quantised timing point by pressing the FUNC key. The display will change to enable you to enter the current quantise amount that you want to use. (The default amount being the current quantise value set under the TEMPO menu).

Use the UP and DOWN keys as normal to select the quantise amount that you require, and then press START/STOP to carry on.

The next message displayed is :-

QUANTISE ALL EVENTS ?	NO
--------------------------	----

The MD16/R is now asking you whether you want it to move all events in the entire pattern on to the quantise points that you have selected above, or just those events which have their Post-Quantise parameters set ON.

Answering 'NO' to the question (pressing START/STOP) will only move events that have the Post-Quantise parameter set ON. However answering 'YES' (pressing UP followed by START/STOP) will result in the entire pattern being shifted onto quantised timing points.

The MD16/R will automatically return to Pattern Step-Time Record/Edit mode once the re-quantising has been completed. For long patterns, a 'BUSY' message will be displayed while the MD16/R calculates the new timing positions.

Patterns quantised in this way (by reducing the number of different time slots), will tend to use less memory to store than patterns entered randomly on many time slots. It should be noted however, that once a pattern has been quantised in this way it cannot be put back into its old unquantised form without moving every event one at a time using the TEMPO key, as described earlier.

After quantising, any Post-Quantise indications you have turned ON, will not have been turned OFF after quantising, so when you next play the pattern with a different Timing Quantise selected, these events will play differently. Make sure that you turn all Post-Quantise settings OFF in the VOICE menu if you don't want this to happen.

NOTE : Events close to the end of the pattern cannot be dragged all the way to a timing slot as there is no quantise point at the end of a pattern. The nearest quantise point (when a pattern is looping) is the start of the pattern. However events cannot be quantised to the start, as patterns only played once, would have events entered at the end suddenly being played at the start. Instead, events close to the end of a pattern are dragged to the last time slot available for placing sounds (one count less than the length of the pattern).

Rotating All Events or Selected Events

Pressing the MIDI key enters the Pattern Rotate mode and allows you to rotate events within the pattern. The display will change to :-

0: 0: 0/96
ROTATE OFFSET

This mode allows either all events, or selected events of a pattern to be rotated with respect to the start point. Events may not be moved outside the length of the pattern, and any attempt to do this will result in the events being 'wrapped' back in from the start. Events may only be rotated forwards through the pattern, but reverse rotation may be achieved by moving all the way through the end and back in from the start.

If a pattern is playing, then selecting Pattern Rotate mode will cause it to stop.

To set the amount that you want the events to rotate the press either UP, DOWN, SHIFT UP, or SHIFT DOWN.

Pressing UP, increments the number of counts that the pattern will be rotated (as indicated on the display). Pressing DOWN will decrement the number of counts that the pattern will be rotated. SHIFT UP adds a whole beat (96 counts), and SHIFT DOWN subtracts a whole beat from the amount to rotate by.

When you are happy with the Rotate Offset that you have set, press START/STOP to execute the rotate. If the Rotate Offset at this point is 0: 0: 0/96 then Pattern Rotate mode will be terminated without any further action. If not then the MD16/R will request which mode of rotate is required.

Firstly the display will ask the question :-

ROTATE COMPLETE
PATTERN ? NO

Answering 'YES' (press UP followed by START/STOP) will cause the whole pattern to be rotated regardless of what event was pointed to when Pattern Rotate mode was entered. For long patterns, a 'BUSY' message will be displayed while the MD16/R calculates the new timing positions. The MD16/R then returns to Pattern Step-Time Record/Edit mode.

Answering 'NO' (simply pressing START/STOP) will result in a second question being asked on the display :-

ALL EVENTS WITH SAME SAMPLE ? NO

Answering 'YES' to this question will cause all events with the same sample as that pointed at when Pattern Rotate mode was entered, to be rotated. The MD16/R then returns to Pattern Step-Time Record/Edit mode.

Answering 'NO' will cause only those events identical to that pointed at when Pattern Rotate mode was entered, to be rotated (events are assumed to be identical if all parameters except the following are the same).

- (1) Volume
- (2) Timing Randomise
- (3) Opposite Pan
- (4) Post-Quantise

NOTE : Pattern Rotate mode will not move one event at a time. Use the TEMPO key to move the timing position of a single event as described earlier.

Playing the Pattern

Pressing the PLAY key will cause the pattern currently being edited to play continuously. It is not possible to stop the pattern playing whilst in PATTERN EDIT mode unless you perform a Pattern Rotate or Quantise (pressing START/STOP before entering a Rotate Offset value stops the pattern playing immediately).

Saving the Pattern

Pressing the START/STOP key will cause the pattern currently being edited to be saved back to memory, and will return the MD16/R back to the SELECT PATT menu entry.

The PATT Key Menu

Pressing the PATT key selects the PATT menu entries, but also selects PATTERN mode, so that pressing PLAY or START plays the current pattern rather than the current song or the chain.

1. Selecting the Pattern

The first PATT menu entry allows you to select the current pattern.

1) EMPTY SELECT PATT. 1

The UP/DOWN keys can be used to select the pattern number you require. Unused pattern numbers will display EMPTY in the top line of the display, while recorded patterns will either have a blank top line or will show the name of the pattern, if you have previously entered one.

Changing the selected pattern whilst playing, plays the new pattern directly after the end of the current one. If you select an empty pattern, the MD16/R will continue playing, but will play a 4 beat blank pattern until you change to a used pattern.

2. Entering/Editing the Pattern Name

Selecting PATT menu entry 2 allows pattern names of up to 11 characters in length, to be entered or edited.

2) {--name--} PATTERN NAME 1

Press the SHIFT and RECORD keys to select EDIT mode, the display will show :-

ENTER NEW NAME

The cursor shows which character will be edited when the UP/DOWN keys are pressed.

Pressing SHIFT UP/DOWN moves the cursor right/left so that the next or previous character can be entered or edited.

Pressing SHIFT START/STOP erases the character at the current cursor position.

To save the edited name, press the START/STOP key to return to the menu.

It must be remembered that pattern names use up a small amount of memory available for patterns. If you are short of memory, you can delete the pattern name by moving the cursor to each character and pressing SHIFT START/STOP. When the displayed name is blank, press START/STOP. The memory previously used for this name will now be free.

3. Setting the Pattern Length - For New Patterns

PATT menu entry 3 allows you to set the length of a new pattern when recording using Cycle Record Mode (see page 46).

3) SET LENGTH
1: 0: 0/96

The display shows the length in the BARS:BEATS:96ths format using the current Beats per Bar value to determine the number of bars (ie. 2 bars with Beats per Bar = 5 gives 10 beats, but with 4 Beats per Bar 2 bars are 8 beats).

Use the UP/DOWN keys to change the length by 1/96th each key press.

Press SHIFT UP/DOWN to change the length by 1 beat each time.

The minimum pattern length is 1 beat, while the maximum is 682 beats and 63/96ths. With 4 beats per bar, this is 170 bars, 2 beats, 63/96ths.

4. Reading the Pattern Length

Select PATT menu entry 4 to read the length of the current pattern, displayed in the same manner as for Set Length above.

4) READ LENGTH
1: 0: 0/96

The pattern length cannot be changed here, but see page 53 for editing the length of an existing pattern.

5. Copying a Pattern

PATT menu entry 5 allows you to make a copy of the current pattern under a new pattern number. You should make a point of copying a pattern before editing it, just in case you change something disastrously.

5)	1	>>	1
COPY PATT.			

The current pattern number is shown on the left of the top line. The UP/DOWN keys select the pattern number (on the right) where the current pattern will be copied.

When you are happy with your selection, press the START/STOP key to copy the pattern.

You cannot copy a pattern to itself or to an existing pattern, attempting this will display :-

5)	1	>>	1
PATTERN IN USE			

Attempting to copy from an empty current pattern will display :-

5)	2	>>	3
NOT FOUND			

A successful copy operation will display :-

5)	1	>>	2
PATTERN COPIED			

If there is not enough memory left to make another copy of the current pattern, the display will show :-

5)	1	>>	55
MEMORY FULL			

6. Appending and Merging Patterns

It is often useful to be able to append one pattern onto the end of another or to merge two patterns together. The MD16/R allows you to do more than this, as you can specify a timing offset so that you could merge for instance, a 2 beat snare drum fill, half way through a 2 bar pattern. You can specify the timing offset to be longer than the pattern you are merging to, leaving a gap before you start to merge the second pattern into the first. The merged pattern length will then be greater than the original length.

Before starting a merge operation, remember to make a copy of the pattern you are merging into, so that if the merged pattern is not what you expect, you can still retrieve the original pattern easily.

6)	1	<<	2
MERGE PATT.			

Select PATT menu entry 6 and use the UP/DOWN keys to select the second pattern number (the one you are going to merge from). The pattern you are going to merge into (shown on the left) is the current pattern (selected in PATT menu entry 1).

When you are happy with the selection, press the START/STOP key.

If either of the patterns is empty, the display will show :-

6)	1	<<	2
NOT FOUND			

If both patterns exist, then the display will show :-

1: 1: 0/96			
MERGE OFFSET			

The timing offset shown above would start to merge the second pattern at the 1st beat of the 1st bar (ie. right at the start of the first pattern). Use the UP/DOWN keys to select the timing position where you would like to start the merge. For instance, a timing offset of 2: 1: 0/96 would start the merge at the 1st beat of the 2nd bar.

Press the START/STOP key to perform the merge operation. For long patterns, a 'BUSY' message may be displayed on the bottom line.

A successful merge will display :-

OK			
----	--	--	--

If the merged pattern requires more memory than is available, the display will show the 'MEMORY FULL' message. The merged pattern length will be correct, but some of the events from the second pattern will not have been merged.

7. Deleting Patterns

PATT menu entry 7 allows you to delete any patterns from the user programmable memory.

```
| 7)  {--name---}|  
|DELETE PATT.  1|
```

Use the UP/DOWN keys to select the pattern number you wish to delete.

Press the START/STOP key when you are happy with your pattern selection. The MD16/R will then check that you really intend to delete the pattern, displaying :-

```
| 7)  {--name---}|  
|   SURE ?   NO  |
```

The UP/DOWN keys will toggle between 'NO' and 'YES'. Pressing START/STOP with 'NO' displayed will abort the delete, and return to PATT menu entry 1 (SELECT PATT).

To delete the pattern select 'YES' and press the START/STOP key.

If the pattern does not exist, the display will show :-

```
| 7)  {--name---}|  
|   NOT FOUND   |
```

A successful delete operation will display :-

```
| 7)  {--name---}|  
|PATTERN DELETED|
```

8. Setting the Solo Sample Mode

PATT menu entry 8 allows you to listen to individual parts of a pattern while recording, editing or just playing the pattern.

```
| 8) SOLO SMP.  |  
|   OFF         |
```

With Solo Sample set to OFF, all parts of a pattern will be heard normally. Use the UP/DOWN keys to select the sample you would like to hear and all other parts will be muted.

```
| 8) SOLO SMP.  1|  
|GATED KICK     |
```

You can still play other sounds using the pads or via MIDI, but when recording a pattern in Real-Time Record mode, only sounds using the selected sample will be recorded or deleted. In record mode, you must set the Solo Sample you require before starting to record, as pressing the PATT key to select Solo Sample will stop recording.

The SONG (SHIFT PATT) Key Menu

Pressing the SONG key selects the SONG menu entries, but also selects SONG mode, so that pressing PLAY or START/STOP plays the current song rather than the current pattern or the chain.

1. Selecting the Song

The first SONG menu entry allows you to select the current song.

1) EMPTY SELECT SONG. 1

The UP/DOWN keys can be used to select the song number you require. Unused song numbers will display EMPTY in the top line of the display, while recorded songs will either have a blank top line or will show the name of the song, if you have previously entered one.

Changing the selected song whilst playing, will not start the new song until you either press the START/STOP key twice (to stop the current song and start the new one) or wait for the song to stop at the end of all the current pattern repeats, and then press START/STOP to start the next song.

2. Entering/Editing the Song Name

Selecting SONG menu entry 2 allows song names of up to 11 characters in length, to be entered or edited.

2) {--name---} SONG NAME 1

Press the SHIFT and RECORD keys to select EDIT mode, the display will show :-

ENTER NEW NAME

The cursor shows which character will be edited when the UP/DOWN keys are pressed.

Pressing SHIFT UP/DOWN moves the cursor right/left so that the next or previous character can be entered or edited.

Pressing SHIFT START/STOP erases the character at the current cursor position.

To save the edited name, press the START/STOP key to return to the menu.

It must be remembered that song names use up a small amount of memory available for patterns and songs. If you are short of memory, you can delete the song name by moving the cursor to each character and pressing SHIFT START/STOP. When the displayed name is blank, press START/STOP. The memory previously used for this name will now be free.

3. Setting the Cue Point for Playing Songs/Patterns

The Cue Point is used when you press the PLAY key, and instead of always starting the song or pattern from the beginning, lets you select how far into the song or pattern to start playing. Pressing the START/STOP key always starts at bar 1, beat 1, 0/96ths.

3) 1: 1 CUE POINT

To set the Cue Point, select SONG menu entry 3 and use the UP/DOWN keys to program the BARS:BEATS value you require (the UP/DOWN keys change the Cue Point one beat at a time).

When you press the PLAY key, there will be a short delay as the MD16/R performs a high speed 'fast forward' through the pattern or song. The display will show :-

SEARCHING

Eventually, the MD16/R will begin playing from the timing point you have selected. If you select a Cue Point greater than the length of a pattern, in PATTERN mode, the timing shown when playing starts will be somewhere in the pattern (as the pattern repeats indefinitely), and so eventually the MD16/R finds the number of beats and bars you have requested. In SONG mode, the MD16/R will pass the end of the song before it finds the requested timing, and so the song will not be played. Even though the Cue Point is programmed under the SONG menu, it works identically in both pattern and song modes.

The Cue Point is worked out at the current Beats per Bar value, and is really programmed as the number of beats into a song or pattern. If your song contains patterns with different time signatures (Beats per Bar values), then the Cue Point may not exactly match the true BARS:BEATS:96ths timing displayed when the song is played. However, you can still start from any position by trying different settings.

The MD16/R will always transmit MIDI Song Position Pointers when PLAY is pressed (as long as Transmit Start/Stop - MIDI menu entry 15, is turned ON), even if the song or pattern is empty.

4. Deleting Songs

SONG menu entry 4 allows you to delete any songs from the user programmable memory.

```
| 4)  {--name---}|  
| DELETE SONG    1|
```

Use the UP/DOWN keys to select the song number you wish to delete.

Press the START/STOP key when you are happy with your song selection. The MD16/R will then check that you really intend to delete the song, displaying :-

```
| 4)  {--name---}|  
| SURE ?      NO|
```

The UP/DOWN keys will toggle between 'NO' and 'YES'. Pressing START/STOP with 'NO' displayed will abort the delete, and return to SONG menu entry 1 (SELECT SONG).

To delete the song select 'YES' and press the START/STOP key.

If the song does not exist, the display will show :-

```
| 4)  {--name---}|  
| NOT FOUND      |
```

A successful delete operation will display :-

```
| 4)  {--name---}|  
| SONG DELETED   |
```

Defining and Editing a TEMPO TRACK

To define a TEMPO TRACK or edit one that already exists, then press the TEMPO key whilst in SONG EDIT mode (see page 16), to put the MD16/R into TEMPO TRACK EDIT mode.

TEMPO TRACK EDIT mode allows you to program in a sequence of tempo changes at selected song timing positions, which will play along with the song. When you first program the patterns and repeats into the song, the TEMPO TRACK is not used, so that the song will play at the Tempo set in TEMPO menu entry 1.

The TEMPO TRACK consists of a Start Tempo, followed by any number of entries which contain a Next Tempo value, a Timing Position value and a tempo change Rate value. The song will start playing at the Start Tempo value, and when the BARS:BEATS reaches the Timing Position of the next TEMPO TRACK entry, the tempo will start to change to the Next Tempo value at a rate set by the Rate value.

The first step in entering a TEMPO TRACK is to define a Start Tempo for the song. This done by simply pressing the TEMPO key. The display will change to :-

```
| START TEMPO  OFF |
```

If the Start Tempo is set to OFF, the song will not use a TEMPO TRACK.

To enter the Start Tempo, simply press the TEMPO key, which will display :-

```
| NEW TEMPO      |  
|                OFF |
```

Use the UP/DOWN keys to set the tempo value you require, then press the START/STOP key. The display will show the Start Tempo as above.

NOTE : If you do not require any tempo variations during the song, press the START/STOP key again to return to SONG EDIT mode.

To move on through the TEMPO TRACK simply press the UP key.

The display will change to :-

```
| END |
```

Press the PATT key to insert a TEMPO TRACK entry after the Start Tempo, displaying :-

N.T.	POSN.	RATE
120	1: 1	0

At first sight this may seem confusing, but it displays all the necessary TEMPO TRACK information on one screen, and is explained below :-

N.T. stands for NEXT TEMPO.

POSN. stands for POSITION, and shows the song timing position (in BARS and BEATS) at which the tempo will start to change to the NEXT TEMPO value.

The RATE parameter determines the speed at which the tempo will change from its current value to the NEXT TEMPO.

A RATE value of zero will result in an instant change in tempo when the selected position in the pattern is reached.

A RATE value of 1 is the slowest speed of change, and a rate of 254 is the fastest speed of change (excluding zero).

The RATE value can be related to beats by dividing it by 4. The resulting figure is the number of beats per minute that that the actual tempo will change by, every beat. For example: if the current tempo is 80 BPM and you want it to change to 120 BPM over 4 beats, then set RATE to 40, as illustrated below :-

Starting tempo	=	80 BPM
After 1 beat	=	90 BPM (increased by RATE /4)
After 2 beats	=	100 BPM (increased by RATE /4)
After 3 beats	=	110 BPM (increased by RATE /4)
After 4 beats	=	120 BPM (increased by RATE /4)

Once you are in the main TEMPO TRACK EDIT mode, then you may move forwards and backwards through the track at will by using the UP and DOWN arrow keys, until the entry that you want to edit is displayed on the MD16/R screen.

Setting the NEW TEMPO in the TEMPO TRACK

To edit the NEW TEMPO of the current tempo track entry, then simply press the TEMPO key. The display will change to :-

eg.

NEW TEMPO
120

You can now use the UP and DOWN keys to select the tempo that you want, and then press the START/STOP key to fix your new entry into the TEMPO TRACK.

Setting the POSITION of the Next Tempo Change in the TEMPO TRACK

To edit the POSITION in the song where the tempo will start to change from the 'Current' tempo to the 'Next' tempo, press the PLAY key.

The display will change to :-

eg.

NEW POSITION
1: 1

You can now use the UP/DOWN keys to select the POSITION. Press the START/STOP key to fix the value in the Tempo Track.

Setting the RATE at which the Tempo Changes to the NEW TEMPO

To edit the RATE at which the tempo changes from the 'Current' tempo to the 'New' tempo, press the RECORD key.

The display will change to :-

eg.

NEW RATE
0

You can now use the UP/DOWN keys to select the RATE. Press the START/STOP key to fix the value in the Tempo Track.

Inserting an Entry into the Tempo Track

Pressing PATT allows you to insert a new entry into the TEMPO TRACK. To insert an entry, simply set the screen to display the position where you want the new entry, and then press the PATT key. The rest of the TEMPO TRACK will be moved out one position and a duplicate of the current position will remain displayed ready for editing.

Deleting an Entry from the TEMPO TRACK

To delete an unwanted entry from the TEMPO TRACK, simply display the unwanted entry on the screen and then press SHIFT START/STOP. The current entry will be deleted and all subsequent entries will be pulled in one position, to fill the gap.

To remove the TEMPO TRACK completely, you must delete all the entries one at a time, and lastly, delete the Start Tempo entry.

Saving the TEMPO TRACK

Pressing the START/STOP key saves the current TEMPO TRACK and returns the MD16/R to SONG EDIT mode.

The CHAIN (SHIFT PLAY) Key Menu

Pressing the CHAIN (SHIFT PLAY) key selects the CHAIN menu entry, but also selects SONG CHAIN mode, so that pressing PLAY or START/STOP plays the song chain rather than the current pattern or song.

1. Setting the Automatic Chain Delay

CHAIN menu entry 1 allows you to program an automatic Chain Delay value, so that the MD16/R waits a pre-programmed number of beats when a song finishes, before starting the next song in the chain. If the Count-in is selected (TEMPO menu entry 12 - see page 43), then a 4 beat count will bring in the start of the next song.

1)
CHAIN DELAY 0

Use the UP/DOWN keys to program the Chain Delay between 0 and 126 beats (increments by 2 each time).

Selecting Chain Delay = 0 sets the MD16/R to stop at the end of the song, waiting for the footswitch or the START/STOP key to be pressed, or a START message to be received via MIDI, in order to start the next song from the chain.

Creating and Editing a CHAIN in Memory

Your MD16/R can link up to 20 songs together in a 'CHAIN', so that each is played in turn if the PLAY or START/STOP key is pressed after selecting the Chain Delay parameter (from the CHAIN menu - see above).

To create or edit the chain simply select the CHAIN menu as above and then press EDIT (SHIFT RECORD).

You are now in CHAIN EDIT mode, and the screen will display the number of the first song in the chain, along with its name (if there is one), or 'END' (if the chain is empty) as shown :-

{--name--}	or.	
1) {no.}		1) END

Pressing the START/STOP key will save the current CHAIN as displayed, and then return the MD16/R back to the Chain Delay menu entry. Use this key to exit the chain edit mode when you are happy that the chain that you have created is correct.

Adding a Song into the Chain

To add a song into the chain, simply point the display window at the required point in the chain and then press the PATTERN key. This will shift out the whole chain by one place, make a copy of the entry that you were looking at when the PATTERN key was pressed, and then move the display on to the next position. If the chain is now longer than 20 songs, then the 21st song will fall off the end of the chain and be lost.

If you were pointing at the chain 'END' marker when you attempted to add a song, then the chain will have song number '1' added as the last in the list, and the display will move on to show the 'END' marker at the next location.

Moving the Display through the Chain

By pressing the UP and DOWN keys, you can move forwards and backwards through the chain, simply to check the contents, or to edit any entries.

Editing the Song Number of a Chain Entry

If you want to change one of the entries that you have made in the chain, then simply move the display window so that it shows the song that you want to change. Then, by pressing SHIFT UP and SHIFT DOWN you can select the required song for this position. There is no need to press START/STOP to enter the song number as this will be done automatically.

BEWARE: As there is no need to press START/STOP, any changes that you make to the chain will be saved in memory. Take care therefore not to edit anything that you do not want to lose - without thinking !

Deleting a Chain Entry

Pressing SHIFT START/STOP, will delete the current song from the CHAIN list and pull all subsequent songs in one place to fill the gap. The length of the chain will obviously have decreased by one song after this operation.

The PLAY Key

Playing Patterns, Songs and Song Chains

Pressing the START/STOP key starts the selected pattern, song or the song chain playing from the beginning, depending upon which mode is selected. Pressing the PLAY key will also start playing, but for patterns and songs it uses the Cue Point parameter (SONG menu entry 3 - see page 63), to start playing from the selected timing position instead of from the beginning.

Playing a pattern will display :-

```
|PATT  2: 1:78/96|  
|PLAY  {--name---}|
```

If you select a new pattern number using the UP/DOWN keys whilst playing a pattern, the 'SELECT PATT' message and the new pattern number will be displayed on the lower line until the current pattern finishes playing. Then the new pattern name will be displayed as above. Selecting a new pattern via a MIDI PATCH command will display the new pattern name as it is played.

Playing a song will display the song name instead :-

```
|SONG   3: 3:55/96|  
|PLAY  {--name---}|
```

Playing the song chain plays the first song stored in the chain and will display :-

```
|CHN    1: 1:12/96|  
|PLAY  {--name---}|
```

When the next song in the chain is started, either by the automatic Chain Delay or by pressing the START/STOP key, the new song name will be displayed.

The FUNC Key Menu

The FUNC menu is selected by pressing the FUNC key. It contains parameters affecting the pads, such as echo effects setups and pad trigger modes.

1. Selecting Pad Fill

Pad Fill allows you to play a drum roll automatically, just by playing and holding one or more pads (you must also be playing or recording a pattern).

The speed of the drum roll (fill) is set by the current Timing Quantise and Tempo values (see TEMPO menu - page 36), and you can change these values while playing a fill.

The fill volume depends on how hard you initially hit the pad, but when more than one pad is pressed, the volume is set by the last pad press.

Select FUNC menu entry 1 and use the UP/DOWN keys to turn Pad Fill ON or OFF.

1)
PAD FILL ON

2. Selecting the Chromatic Pad

The MD16/R has tunable sounds, which can be tuned chromatically in semitones if Chromatic Tune is ON (UTILS menu entry 13). Tuning 16 pads in semitones (so that you can play tunes) can be done, but it is extremely time consuming and means that all 16 pads must be set to the same sound, so losing the original settings.

The MD16/R Chromatic Pad function allows you to select a pad, and instantly spread the sound programmed for that pad across all 16 pads on its pad level, tuned chromatically - without erasing any pad setups. This makes playing/recording tuned patterns very easy to achieve. There is also a Fine Tuning parameter so that the sounds can be tuned to the pitch of other instruments.

FUNC menu entry 2 allows you to set which pad will be selected as the current Chromatic Pad. You can select the pad either using the UP/DOWN keys or by pressing a pad on any pad level. Pressing another pad while still at this menu entry will program the new pad as the Chromatic Pad.

2)
CHROM. PAD No 41

3. Setting Chromatic Pad Mode

Chromatic Pad mode can be turned ON or OFF by selecting FUNC menu entry 3 and using the UP/DOWN keys.

3)
CHROM. PADS OFF

When Chromatic Pad mode is turned ON, all pads on the same level as the Chromatic Pad number will play the same sound, at semitone tuning intervals even though the parameters shown in the VOICE menu are normal. Pads on other levels will be unchanged, and will play the programmed sounds normally. When you turn Chromatic Pad mode OFF, the normal sounds and parameters will return.

4. Fine Tuning the Chromatic Pads

FUNC menu entry 4 allows you to tune the Chromatic Pads to the pitch of other instruments (in approximately 1/4 tone increments).

Using Fine Tuning, you can get a 2 octave range from the pads (from the lowest pad at Fine Tuning = -9, up to the highest pad at Fine Tuning = 9).

Select FUNC menu entry 4 and use the UP/DOWN keys to set Fine Tuning between -9 and 10. The display will show :-

4)
FINE TUNING 0

The MD16/R Pad Echo Effects Banks

The MD16/R has two independent Echo Effects banks (A and B), which can be selected for use with any number of pads (see Setting Pad Echo, page 32. Each bank can echo 4 pad presses at the same time, and you can program the repeat rate, the number of repeats and the fade rate (decay). If more than 4 pad presses are echoed, the pad entry which has had the most repeats will be replaced by the new pad.

5. Setting the Echo Repeat Rate for Bank A Effects

The Repeat Rate for effects bank A is synchronised to the current Tempo, and can be programmed with a value of 1 to 32. This will give a repeat delay from 1 to 120 MIDI clocks, which at a Tempo of 120 beats per minute, is from 21 milliseconds up to 2.5 seconds. At 240 beats per minute the delay is halved, while at 20 beats per minute, there is six times the delay.

5)
SET A FX RATE 10

To set the Repeat Rate, select FUNC menu entry 5 and use the UP/DOWN keys to select one of the values shown in the table shown below.

EFFECTS REPEAT RATE	NUMBER OF MIDI CLOCKS	NUMBER OF BEATS	DELAY AT 120 BPM
1	1	1/24	20.8mS
2	2	1/12	41.6mS
3	3	1/8	62.5mS
4	4	1/6	83.3mS
5	5	5/24	104.2mS
6	6	1/4	125.0mS
7	7	7/24	145.8mS
8	8	1/3	166.6mS
9	10	5/12	208.3mS
10	12	1/2	250.0mS
11	14	7/12	291.2mS
12	16	2/3	333.3mS
13	18	3/4	375.0mS
14	20	5/6	416.6mS
15	22	11/12	458.3mS
16	24	1	500.0mS
17	28		583.3mS
18	32		666.6mS
19	36	1 1/2	750.0mS
20	40		833.3mS
21	44		916.6mS
22	48	2	1.00sec
23	52		1.08sec
24	56		1.16sec
25	64		1.33sec
26	72	3	1.50sec
27	80		1.66sec
28	88		1.83sec
29	96	4	2.00sec
30	104		2.16sec
31	112		2.33sec
32	120	5	2.50sec

Remember that there are 24 MIDI clocks per beat, so that if you want to echo on the beat, you need to select a Repeat Rate value that gives 24 MIDI clocks delay as shown above (ie. 16).

6. Setting the Number of Echo Repeats for Bank A Effects

FUNC menu entry 6 allows you to set the number of Echo Repeats between 1 and 16 using the UP/DOWN keys.

```
| 6) |  
| SET A FX RPTS 4 |
```

7. Setting the Echo Fade for Bank A Effects

The Fade parameter is used to program how quickly the echoes fade out, by setting negative Fade values (-1 to -8). Fade = -8 gives the fastest fade-out and Fade = -1 the slowest.

The MD16/R also allows you to select a fade-in, if you select positive Fade values (1 to 8). Fade = 8 gives the fastest fade-in and Fade = 1 the slowest.

To set the Echo Fade parameter for effects bank A, select FUNC menu entry 7 and use the UP/DOWN keys to select the required value.

```
| 7) |  
| SET A FX FADE -3 |
```

8. to 10. Setting Echo Effects Bank B

FUNC menu entries 8 to 10 are identical to the effects bank A parameters in FUNC menu entries 5 to 7, except that effects bank B is selected.

Useful Hints on Using The Echo Effects

i. Flam Effects

Use the lower Repeat Rate values with a single repeat for 'flam' type drum effects.

ii. Select echo for one pad from 33 to 48 (ie. the drum pads on pad level 3) and set the pad to Re-Trigger a pattern (see page 77). This allows the pattern to be re-triggered at the echo repeat rate.

iii. Tuned Echoes

Assign a musical sound such as the AGOGO to one pad, and turn on Randomise Pitch (VOICE menu entry 14). Turn the Pad Echo parameter on (see page 32), with Rate = 4, Repeats = 6, and Fade = -2. Select a Humanise value of 5 (VOICE menu entry 15), so that as the volume of the echoes decrease, the pitch of the echo increases. Playing the pad harder decreases the starting pitch. If you set the Fade = 2, the pitch will decrease for each echo.

Try setting echo above for the same pad as the Chromatic Pad, and turn Chromatic Pads ON. You should now be able to play the AGOGO across all 16 pads on the pad level selected, with the tuned echo on each pad. Set the Humanise level for the same pad to 10 or 15, the echoes should then be tuned randomly.

Using Pad Fill (with Timing Quantise = 1/16) and echo together, can produce an effect similar to a Steel Drum band.

Triggering Patterns from Level 3 Pads

You can assign the level 3 pads to trigger up to 16 different patterns. You can also play the pads from MIDI or use the footswitch to trigger the patterns you have programmed for each pad (see UTILS menu entry 11). You can program a threshold value (FUNC menu entry 30) so that you can play the pad sound normally and then play harder to trigger the pattern.

Using Re-trigger mode (see FUNC menu entry 27), you can program up to 8 pattern repeats for each trigger (FUNC menu entry 29), or program the pattern to play continuously once triggered (FUNC menu entry 28). Pressing the pad before all of the pattern repeats have finished will re-trigger the pattern from the beginning.

Queue-Trigger Mode is selected by turning Re-trigger mode OFF. With the MD16/R playing a pattern or song and Continuous Trigger set OFF (FUNC menu entry 28), the triggered pattern will be played once only, at the end of the current pattern. This allows for instance, a pattern containing a drum fill to be triggered when required (maybe as a lead-in from a verse to a chorus), after which the MD16/R returns to playing the selected song or pattern. You can trigger the pattern as many times as you like, so that the pattern will play again when it reaches the end, without returning to the original pattern or song first.

With Continuous Trigger set ON, the pattern will play the new pattern continuously at the end of the current pattern.

11. to 26. Selecting a Trigger Pattern for Level 3 Pads

Select FUNC menu entry 11 to 26 and use the UP/DOWN keys to select the pattern which will be triggered by level 3 pads (ie. 33 to 48).

For pad 33, the display will show :-

11)
PAD 33>>PATT OFF

and for pad 48 :-

```
26)
PAD 48>>PATT OFF
```

Remember that the sound programmed for the pad will still play normally, but you can use VOICE menu entry 1 to turn the sound OFF.

27. Selecting Re-trigger or Queue-Trigger Mode

Select FUNC menu entry 27 and use the UP/DOWN keys to turn Re-trigger mode ON or OFF (with Re-Trigger OFF, Queue-Trigger is ON). The display will show :-

```
27)
RE-TRIG MODE ON
```

28. Setting Triggered Patterns to Play Continuously

With Re-Trigger mode ON, when the pattern is triggered, FUNC menu entry 28 determines whether the pattern plays continuously, or plays a number of pre-programmed repeats (see below) and then stops. With Queue-Trigger mode selected it determines whether the pattern plays continuously, or just once before returning to the previous pattern.

```
28)
CONT TRIGGER OFF
```

Use the UP/DOWN keys to turn Continuous Trigger ON or OFF.

29. Setting the Number of Repeats for Re-Triggered Patterns

Select FUNC menu entry 29 and use the UP/DOWN keys to set the number of pattern repeats for each trigger from 1 to 8. This parameter is used only for Re-trigger mode, as with Re-trigger OFF, only 1 repeat is allowed. The display will show :-

```
29)
RE-TRIG RPTS 1
```

30. Setting the Trigger Threshold

Select FUNC menu entry 30 and use the UP/DOWN keys to select a Trigger Threshold from 1 to 4. The display will show :-

```
30)
THRESHOLD 1
```

A Threshold of 1 means that any pad press will trigger the pattern, while with a Threshold of 4, only very hard pad presses will trigger.

The SHIFT FUNC Key Menu

1. Setting Pad Defaults

Selecting SHIFT FUNC menu entry 1 allows you to return all the pad VOICE menu parameters to the factory programmed conditions. You may wish to first save your own setups in memory in the Auxiliary Pads by performing a Swap All Pads operation (see SHIFT FUNC menu entry 5).

1) PAD DEFAULTS

Press the START/STOP key to setup the default pad settings. The display will show :-

1) OK

The MD16/R Tapesync Code - Synchronising to a Tape Recorder

The MD16/R will generate a synchronising code which allows you to 'lock' the MD16/R to one track of a tape recorder so that both units (MD16/R and tape recorder) run in unison. This means that you can use up one track of a multitrack system (eg. 4 track porta-studio, 16 track reel to reel recorder etc.) to keep the MD16/R locked, leaving the remaining tracks for recording other instruments. The advantage of this approach is that there is no need to record the drum track until the final mix, so that you are free to change the sounds, the volume levels or even the complete drum track right up until the last moment.

With 4 track systems this is invaluable, as due to the limited number of tracks available, you may have to 'bounce' tracks together several times in order to free up a track for vocals or lead instruments, and in the process you lose sound quality from the parts you have previously recorded. It may seem an extravagant use of one track, but it does mean that the drums will sound fresh and crisp in the final mix and it will be much easier to balance the levels with the levels of the other tracks.

If you use a MIDI sequencer to record synthesizer or other MIDI instrument parts, then you can use the MD16/R to lock to the tape, and provide MIDI Song Position Pointers and MIDI Clocks to start from the correct position and keep the sequencer in time. If you have a mixer, then there will be no need to record the parts recorded on the sequencer or the MD16/R until the final mix, leaving even more tracks free.

The tapesync code used by the MD16/R has a low bit-rate, which means that the crosstalk (low level interference) from the track used for the code to adjacent tracks will be much lower than for high bit-rate codes such as SMPTE code or the type used by most other drum machines.

The MD16/R tapesync code writes the song position on to the tape every 1/4 beat, so that when you play the tape, the MD16/R will read the song position, start playing from the same point in the song or pattern and send MIDI Song Position Pointers and Clocks to any external MIDI device. Most other drum machines only allow you to start the tape at the beginning of the song, whereas the MD16/R allows you to start anywhere, so that there is no need to rewind to the start each time if you are working on a part which is some way into the song.

The MD16/R tapesync code is not affected by changes in tape level or by tape speed variations (up to +/- 50%) and it will work happily with any kind of noise reduction.

2. Recording the Synchronising Code on Tape

SHIFT FUNC menu entry 2 is used for generating the MD16/R tapesync code.

- i. First, make sure that you have selected the pattern or song (or select the Song Chain) that you wish to synchronise to tape. For songs, the Tempo Track is used to determine the tempo which is used for the tapesync code whereas for patterns, the current Tempo value is used.

Also, make sure that you have selected either internal or MIDI sync clocks, not tape sync mode (see MIDI menu entry 1 - page 89).

- ii. Connect a lead from the Tape Out socket at the rear of the MD16/R (use a 3.5mm mono jack plug) to the input on your tape recorder.

- iii. Select SHIFT FUNC menu entry 2, the display will show :-

2) REC TAPESYNC

Now press the START/STOP key to select Record Tapesync.

2) PRESS START KEY

Press the START/STOP key again, the MD16/R will generate the tapesync code and the display will show :-

1: 1: 0/96 PATTERN PLAY

SONG PLAY or CHN PLAY will be displayed instead, if Song or Song Chain mode is selected.

- iv. Set the record level on the tape recorder. Any level from -15 to +5 VU will be OK, but aim to record at less than 0 VU. Any crosstalk to adjacent tracks will be reduced for lower record levels.
- v. Press the START/STOP key to stop the tapesync generation.
- vi. Press SHIFT FUNC key to display the REC TAPESYNC message and START/STOP to select the function again
- vii. Start the tape recording, then press START/STOP to start the tapesync generation. For multitrack tape recorders, it is best to use one of the 'outside' tracks on the tape (ie. for a 4 track machine, use either track 1 or 4) as any crosstalk from the code will only be on the track next to the tapesync track instead of on two tracks.

The MD16/R will play the pattern or song at the same time as the tapesync code is being generated. If you are playing a pattern, you will have to press START/STOP to stop the tapesync as the pattern will repeat indefinitely. If you are playing a song, the tapesync will stop automatically at the end of the song and for Song Chain mode, it will restart with the next song when you press START/STOP or when the programmed Chain Delay times out.

3. Checking the Tapesync Level

To check that the tapesync code recorded on tape gives enough signal level for the MD16/R to read the code, select SHIFT FUNC menu entry 3 and connect the Tape Input socket at the rear of the MD16/R (use a 3.5mm mono jack plug) to the tape recorder output (from the track used for the tapesync code). The display will show :-

3) CHECK LEVEL

Press the START/STOP key, the display will then show :-

3) TAPE LEVEL LOW

Play the tape, and increase the signal level until the display changes from LOW to OK as shown below :-

3)
TAPE LEVEL OK

Increase the signal still further (by 10dB to 15dB) to reduce the effect that any tape dropouts may have on reading the tapesync code.

If you have difficulty in getting sufficient level, first check that the connections are correct and make sure that the tapesync code shows a good level on the VU meters of your tape recorder (more than -10 VU).

Press the START/STOP key to exit the Check Level mode.

Synchronising to TAPE

If you have TAPE selected for the Sync Clock (MIDI menu entry 1 - page 89), then to synchronise to tape, just connect the Tape Out from the tape recorder (see SHIFT FUNC menu entry 2 - page 79 to record the MD16/R tapesync code) to the Tape Input at the rear of the MD16/R. Then press PLAY on the MD16/R and start the tape playing.

The display will show :-

1: 1:12/96
LOCKED TO TAPE

If an error occurs, the display will change to 'TAPE ERROR', and if you stop the tape, the display will show 'STOP'.

4. Rotating the Pad Setups - for use with MIDI Electronic Drum Pads

If you use the MD16/R as a sound source for MIDI electronic drum pads, you will usually have no more than 8 drum pads available, playing 8 different sounds.

The MD16/R overcomes this limitation by allowing you to rotate the sounds and all other VOICE menu parameters assigned to the pads. Pads 1 to 40 can be rotated in blocks of 8, so that after 5 rotates, they will be back to the original settings.

The sequence is as follows :-

PADS 9 - 16	>>	PADS 1 - 8
PADS 17 - 24	>>	PADS 9 - 16
PADS 25 - 32	>>	PADS 17 - 24
PADS 33 - 40	>>	PADS 25 - 32
PADS 1 - 8	>>	PADS 33 - 40

5. Swapping all Pads to Memory

SHIFT FUNC menu entry 5 allows all the current pad setups to be 'swapped' to memory, and an auxiliary set loaded in their place, so that 128 different pads can be defined.

5) SWAP ALL PADS

The first time that you use this function the auxiliary pads will not yet exist, so the MD16/R will define an identical set of pads in the user programmable memory. If there is not enough memory left for the auxiliary pads, the display will show :-

5) MEMORY FULL

If enough memory is free or if the auxiliary set have been defined previously, then the display will show :-

5) ALL PADS SWAPPED

Pressing the START/STOP key again will return the original pad setups.

You should assign the MIDI Note Numbers transmitted by your MIDI electronic drum pads to play the MD16/R pads 1 to 8, by setting the MIDI Note Numbers in both units. If more than one MD16/R pad has the same MIDI Note Number, then more than one sound will be played when the MD16/R receives the note from MIDI. The MIDI Note Number setting is the only VOICE menu parameter not rotated.

Select SHIFT FUNC menu entry 4, the display will show :-

4)
ROTATE PADS

Press the START/STOP key to rotate the pads once, the display will show :-

4)
ROTATE PADS 2

The sounds that were assigned to pads 9 - 16 should now be found by playing pads 1 - 8 and as you have programmed the MIDI electronic drum pads to play the MD16/R pads 1 - 8, they will play the new set of sounds.

Pressing the START/STOP key again rotates the pads a second time, and changes the rotate number on the display to 3. This number will increment with each rotation until it reaches 5, after which the next rotation will display a 1, as the pad setups have returned to their original positions.

Instead of selecting the menu function and pressing START/STOP, you can define the footswitch to perform the Rotate Pads operation (see UTILS menu entry 11 - page 98), allowing 'hands free' selection.

You can also perform a Rotate Pads operation via MIDI, using a MIDI Controller 71 (Switch) message with a control value between 64 and 127, transmitted to the MD16/R.

Pads from the lower line of level 3 (41 to 48) and from level 4 (49 to 64) are not rotated. If you don't want all the sounds assigned to your electronic drum pads to change when you rotate the pads, you can program your pad to midi unit (or MD16/R) to play some pads from 1 to 48 and some pads from 49 to 64.

You can perform a Swap All Pads operation via MIDI, using a MIDI Controller 70 (Switch) message with a control value between 64 and 127, transmitted to the MD16/R.

As for Rotate Pads, the footswitch can be also defined to initiate the Swap All Pads function.

6. Clearing the Auxiliary Pads

The Auxiliary Pads use up some of the same memory that is used for songs and patterns (about 3%). If you need more memory for patterns, and Auxiliary Pads have been defined previously, then SHIFT FUNC menu entry 6 allows you to Clear the Aux. Pads and make the memory available for patterns.

6)
CLR AUX. PADS

Press the START/STOP key to clear the Auxiliary Pads. The display will then show :-

6)
OK

If you have not previously performed a Swap All Pads operation, then the Auxiliary Pads will not exist, so 'NOT FOUND' will be displayed.

7. Transmitting a MIDI System Exclusive Dump

The MD16/R will dump its entire memory contents in the form of a MIDI System Exclusive message. This allows you to save your songs, patterns and pad setups to a sequencer or MIDI recorder capable of receiving System Exclusive messages. It also allows one MD16/R to transfer its memory into a second MD16/R.

7) SYS EX DUMP

Press the START/STOP key to transmit the dump, which will take about 40 seconds. The display will show :-

7) BUSY

and then :-

7) OK

when the dump has finished.

The MD16/R System Exclusive dump is 64166 bytes long, so if your receiving unit shows a different number of bytes, there may have been an error. In any case, it is wise to either verify or check the dump as described below, before proceeding any further. This will ensure that you do not lose any important work.

Receiving a MIDI System Exclusive Dump

The MD16/R can receive an MIDI System Exclusive dump from its MIDI Input at any time, except when in Pattern or Song Edit modes.

Connect the MIDI OUT socket on the unit which you have used to record the MD16/R System Exclusive dump, to the MIDI Input at the rear of the MD16/R.

NOTE : Read the section Setting the Dump Load Type on page 87 before proceeding any further.

Transmit the dump to the MD16/R, the display will show :-

XXXXXXING BUSY

where 'XXXXXXING' is LOADING, VERIFYING or CHECKING depending upon the value of the Dump Load Type parameter.

If receiving the dump is successful, the 'BUSY' message will change to 'OK'.

NOTE : This does not necessarily mean that the dump has been loaded, as the MD16/R may have been set to verify or just check the dump (see Setting the Dump Load Type on page 87).

If receiving the dump is unsuccessful, the display will show :-

XXXXXXING MIDI ERROR

In this case, if the Load Type is set to load or check the dump, then there is a data error in the dump itself. If, however, the Load Type is set to verify the dump against the internal memory, then the dump itself may be OK, but it is different to the internal memory.

8. Writing a Memory Dump to Tape

The MD16/R can dump its complete memory contents out through the Tape Output socket at the rear of the case, so that you can save the contents on tape. The procedure is as follows :-

i. Connect a lead from the Tape Out socket at the rear of the MD16/R (use a 3.5mm mono jack plug) to the input on your tape recorder.

ii. Select SHIFT FUNC menu entry 8, the display will show :-

8) TAPE DUMP

iii. Now press the START/STOP key to start the Tape Dump in order to set up the record level. The display will show :-

8) BUSY

iv. Set the record level on the tape recorder. Any level from -10 to +5 VU will be OK, but aim to record at 0 VU.

v. Press the START/STOP key to stop the tape dump, the 'BUSY' message will change to 'STOP'.

- vi. Start the tape recording, then press START/STOP to start the tape dump again, displaying the 'BUSY' message. The complete dump will take about 16 minutes, after which the display will show :-

8)
OK

- vii. Rewind the tape and connect the tape output to the Tape Input socket at the rear of the MD16/R (use a 3.5mm mono jack plug).

Use the Check Level function to set up the input level to the MD16/R (see SHIFT FUNC menu entry 3 - page 80), and then verify the dump as described in the following two sections.

9. Setting the Dump Load Type

SHIFT FUNC menu entry 9 allows you to select what action the MD16/R will take when a memory dump is received from the MIDI Input (System Exclusive dump) or Tape Input.

9)
SET LOAD TYPE

Use the UP/DOWN keys to set the Dump Load Type between 1 and 3.

The value programmed for the Dump Load Type will cause the MD16/R to perform the following action when a memory dump is received :-

- Dump Load Type = 1 - Read the dump and store the data in internal memory.
- Dump Load Type = 2 - Read the dump and verify the data against internal memory.
- Dump Load Type = 3 - Check the dump for errors, but do not store or verify the data.

10. Reading a Memory Dump from Tape

To Read a memory dump from tape, first set the Dump Load Type as described above, so that you either load, verify or check the data received.

- i. Connect the tape output to the Tape Input socket at the rear of the MD16/R (use a 3.5mm mono jack plug).
- ii. Use the Check Level function to set up the input level to the MD16/R (see SHIFT FUNC menu entry 3 - page 80). Make sure that you rewind the tape back to the start of the dump.
- iii. Select SHIFT FUNC menu entry 10, the display will show :-

10)
TAPE READ

- iv. Press the START/STOP key to start receiving from tape, the display will show :-

XXXXXXING
BUSY

where 'XXXXXXING' is LOADING, VERIFYING or CHECKING depending upon the value of the Dump Load Type parameter.

- v. Start the tape playing and play the dump to the end (this takes about 16 minutes)
- vi. If receiving the dump is successful, the 'BUSY' message will change to 'OK'.

NOTE : This does not necessarily mean that the dump has been loaded, as the MD16/R may have been set to verify or just check the dump (see Setting the Dump Load Type above).

If receiving the dump is unsuccessful, the display will show :-

XXXXXXING
TAPE ERROR

If this occurs, rewind the tape, press the START/STOP key to display the 'BUSY' message, and try to read the tape again. If this still doesn't work, try turning the input level up and start again, as the tape may have a dropout which will load correctly at a higher level.

- vii. While the 'BUSY' message is displayed, you can press the START/STOP key to exit Tape Read mode, the display will show 'STOP' instead of 'BUSY'.

The MIDI key Menu

The MIDI menu contains 16 entries which are used to set up the MD16/R's response for all types MIDI messages.

1. Selecting Internal, MIDI or Tape Timing Synchronisation Clock

MIDI menu entry 1 allows you to select from three timing synchronisation modes using the UP/DOWN keys - INT, MIDI or TAPE.

1) SYNC CLOCK INT

- INT - This selects internal timing synchronisation clocks, so that the patterns and effects run at the current internal Tempo setting.
- MIDI - This mode is used to synchronise the MD16/R from another MIDI unit (eg. a sequencer) which transmits MIDI clocks to the MD16/R. The internal Tempo setting will be ignored.
- TAPE - Selecting this mode allows the MD16/R to synchronise to its Tapesync signal played back from a tape recorder. In this mode, both internal and MIDI clocks are ignored.

2. Setting the MIDI Synchronising Delay

When the Sync Clock is set to INT or TAPE modes, starting the MD16/R playing a pattern or song will cause it to send a MIDI Song Position Pointer message to any other MIDI unit, so that it starts at the same point as the MD16/R. However, some devices will take some time to respond to this message and find the correct position in the pattern or song, and so will be unable to start playing immediately.

For this reason, the MD16/R allows you to program a Synchronising Delay value, so instead of transmitting a MIDI Continue message followed by MIDI Clocks immediately, the MD16/R can wait for up to 1.5 beats before starting the external MIDI device. This delay will not occur, however, if starting at the beginning of the pattern or song, as a MIDI Start command is transmitted instead of a Song Position Pointer, and a delay will not be required.

To set the Synchronising Delay, select MIDI menu entry 2 and use the UP/DOWN keys to set a value between 0 and 3.

2)
SYNC DELAY 0

Sync Delay = 0 - No delay is required
Sync Delay = 1 - Delay for 0.5 beat before starting
Sync Delay = 2 - Delay for 1 beat before starting
Sync Delay = 3 - Delay for 1.5 beats before starting

If you have problems with MIDI synchronisation, try increasing the Sync Delay parameter value.

3. Setting the MIDI Clock Delay

Some older sequencers do not fully implement the MIDI Song Position Pointer specification, so that the synchronisation will be one MIDI clock out. The Clock Delay parameter allows the MD16/R to work correctly with such systems. If you experience a delay problem which is particularly noticeable at low tempo values, then try setting the Clock Delay to ON.

3)
CLOCK DELAY OFF

Synchronising to MIDI

If you have MIDI selected for the Sync Clock (MIDI menu entry 1 - page 89), then to synchronise to MIDI, just connect the MIDI Out from the external MIDI device (eg. sequencer, Master Keyboard) to the MIDI Input at the rear of the MD16/R. Then press PLAY on the MD16/R and press start on the MIDI device. If the MIDI device transmits MIDI Song Position Pointers, then the display will be as shown below, instead of as shown previously for the PLAY key :-

1: 1:12/96
LOCKED TO MIDI

MIDI Song Position Pointer Messages

MIDI Song Position Pointer messages are used so that two or more MIDI devices (eg the MD16/R and a sequencer) are able to start from the same point in a song or pattern. The Song Position Pointer increments four times each beat (once for every 6 MIDI Clocks).

If you want to use a sequencer as a 'master' device and so you have set the MD16/R Sync Clock to the MIDI setting, then when you press play on the sequencer, if it supports MIDI Song Position Pointers, it will send the song position to the MD16/R, shortly followed by a MIDI Continue message. The MD16/R will receive the Song Position Pointer messages, find the correct position, then when the MIDI Continue message is received, will start on the next MIDI Clock transmitted by the sequencer.

There may be some delay from starting the sequencer to the MD16/R starting. This is normal, as the MD16/R is really winding fast-forward from the start to the required song position. The MD16/R will take note of the fact that the sequencer has started before the song position has been reached, and when the MD16/R is eventually ready to play, it will play at the same point as the sequencer is playing.

4. Setting the MIDI Receive Channel

MIDI menu entry 4 allows you to set the MIDI receive channel for the MD16/R. Use the UP/DOWN keys to program a channel from 1 to 16, or OMNI, which means 'receive on all channels'.

4)
RX CHANNEL OMNI

5. Selecting MIDI Merge from MIDI In to MIDI Out

MIDI menu entry 5 allows you to program whether MIDI messages received at the MIDI Input socket will be merged with any messages the MD16/R transmits from the MIDI Output socket.

5)
MIDI MERGE ON

Use the UP/DOWN keys to turn MIDI Merge ON or OFF.

6. Setting the MD16/R to Receive MIDI Note Messages

You can enable/disable the MD16/R playing its sounds when MIDI Note messages are received at the MIDI Input socket, by selecting MIDI menu entry 6, and turning Rx Notes ON or OFF with the UP/DOWN keys.

6)
RX NOTES ON

7. Setting the MD16/R to Receive Pattern/Song Changes from MIDI

You can change the MD16/R pattern from MIDI using a MIDI Patch Change message to select patterns from 1 to 128. The MD16/R can also change Songs when a MIDI Song Select message is received, again only song numbers 1 to 128 can be selected. In both cases the MIDI Patch/Song Number is one less than the MD16/R pattern/song number.

7) RX PATT/SONG ON

MIDI menu entry 7 allows you to turn this feature ON or OFF using the UP/DOWN keys.

8. Setting the MD16/R to Receive MIDI Start/Stop/Continue Messages

MIDI menu entry 8 allows you to program whether MIDI Start, Stop or Continue messages received at the MIDI Input socket will be able to start, stop or continue the MD16/R playing patterns or songs.

8) RX STRT/STOP ON

Use the UP/DOWN keys to turn Receiving MIDI Start/Stop ON or OFF.

9. Setting the MD16/R to Receive MIDI Song Position Pointer Messages

MIDI menu entry 9 allows you to program whether MIDI Song Position Pointer messages received at the MIDI Input socket will be recognised by the MD16/R.

9) RX SONG PP ON

Use the UP/DOWN keys to turn Receiving MIDI Song Position Pointers ON or OFF.

10. Setting the MD16/R Receive Sample Numbers Mode

The MD16/R has two modes for receiving MIDI Note Number messages. The normal mode (with Receive Sample Numbers mode OFF) is to play any pad programmed with the same MIDI Note Number. When Receive Sample Numbers mode is turned ON, the MIDI Note Number plays the MD16/R sample directly, without using the pad setups.

MIDI Note numbers 0 to 127 will play MD16/R samples 1 to 128 (if installed) as long as the Note velocities are less than 64. For Note velocities 64 to 127, the MD16/R will play samples 129 to 254, enabling all installed MD16/R samples to be played directly from MIDI.

With the lower bank samples, velocity 63 will give the maximum volume and velocity 0 the minimum. With the upper bank samples, velocity 127 will give the maximum volume, and velocity 64 the minimum.

To set Receive Sample Numbers mode, select MIDI menu entry 10 and use the UP/DOWN keys to turn the mode ON or OFF.

10)
RX SAMPLE No OFF

11. Changing the Received MIDI Channel to the MD16/R Transmit Channel

The MD16/R can receive MIDI messages on its Rx Channel setting, and change the channel to the Tx Channel setting before it merges the data with its own transmitted MIDI messages.

11)
RX > TX CHAN OFF

Select MIDI menu entry 11 and use the UP/DOWN keys to turn Rx > Tx Channel ON or OFF.

12. Setting the MD16/R MIDI Transmit Channel

MIDI menu entry 12 allows the MD16/R MIDI Transmit Channel to be programmed from 1 to 16 using the UP/DOWN keys.

12)
TX CHANNEL 1

13. Setting the MD16/R to Transmit MIDI Note Messages

You can enable/disable the MD16/R transmitting MIDI Note messages when pads or sounds are played, by selecting MIDI menu entry 13, and turning Tx Notes ON or OFF with the UP/DOWN keys.

13)
TX NOTES ON

When the pads are played, the MIDI Note Number programmed for the pad is transmitted. When sounds are played from a pattern, the sample number is transmitted. If you wish to record the MD16/R patterns into a sequencer, then the sample numbers will be recorded, with velocities from 0 - 63 used for sample numbers less than 128, and velocities 64 - 127 for sample numbers above 127 (sample numbers above 41 apply to external Cheetah ROM Cartridges).

To play them back using the MD16/R samples via MIDI, you must either turn the Rx Sample Numbers mode ON, or program the pads to match the sample numbers required (ie. pad 1 = sample number 1 etc.).

14. Setting the MD16/R to Transmit MIDI Clocks

MIDI menu entry 14 allows you to turn MIDI Clocks ON or OFF using the UP/DOWN keys.

14)
TX CLOCKS ON

MIDI Clocks will only be transmitted independently when Sync Clock is set to INT or TAPE modes, but in MIDI mode any received MIDI clocks will be merged at the MIDI Output.

15. Setting the MD16/R to Transmit Pattern/Song Changes to MIDI

MIDI menu entry 15 selects whether MIDI Patch Change messages are transmitted when a new pattern is played, or MIDI Song Select messages are transmitted when a new song is played. In both cases the MIDI Patch/Song Number is one less than the MD16/R pattern/song number.

15)
TX PATT/SONG ON

MIDI menu entry 15 allows you to turn this feature ON or OFF using the UP/DOWN keys.

16. Setting the MD16/R to Transmit MIDI Start/Stop/Song Position Pointers

MIDI menu entry 16 allows you to program whether MIDI Start, Stop, Continue or Song Position Pointer messages will be transmitted from the MIDI Output socket when the START/STOP or PLAY keys (or the footswitch) are pressed.

16)
TX STRT/STOP ON

Use the UP/DOWN keys to turn Transmitting MIDI Start/Stop/Continue or Song Position Pointers ON or OFF.

MIDI Start messages are only transmitted when START/STOP or PLAY is pressed to play from the start of a pattern or song. MIDI Song Position Pointer 0000 is also transmitted at the start.

When pressing the PLAY key to start further into the pattern or song, MIDI Song Position Pointers are transmitted followed by MIDI Continue.

MIDI Stop messages are transmitted when the START/STOP key is pressed to stop a pattern or song playing.

MIDI Continue messages are transmitted when SHIFT START/STOP is pressed.

UTILS (SHIFT MIDI) Key Menu

The UTILS menu contains 18 entries which allow you to program the Global Voice parameters (9 entries), set up various operating parameters and check the amount of memory remaining and Software Version installed.

Global Parameters

UTILS menu entries 1 to 9 are Global parameters which are stored in the pattern when recording, so that when playing a pattern, they will change to the values that are stored.

If you want to edit these parameters in an existing pattern, simply start the pattern recording, select the UTILS menu entry you require, and change the parameter value to the new setting. When recording is stopped, the new value will be stored in the pattern. When playing a song, as each pattern is played, the Global settings stored in the pattern are loaded and used to maintain the same Voice characteristics as the sounds had when recorded. When the song is stopped, the Global parameters will hold the values stored in the last pattern played.

1. Setting the Global Sound Envelope Length for 'A' Setups

UTILS menu entry 1 sets the Global Sound Envelope Length for all sounds which are assigned to use the 'A' setups.

1) ENV LENGTH A 16

Use the UP/DOWN keys to set the Sound Envelope Length between 1 and 16. The value programmed sets the played length of every sound using the 'A' setups in sixteenths of its full length (ie. 16 is full length, 1 = 1/16 of full length).

2. Setting the Global Sound Envelope Length for 'B' Setups

UTILS menu entry 2 sets the Global Sound Envelope Length for all sounds which are assigned to use the 'B' setups, in the same manner as for the 'A' setups above.

2) ENV LENGTH B 16

3. Setting the Global Auto Pan Rate for 'A' Setups

UTILS menu entry 3 sets the Global Auto Pan Rate for all sounds which are assigned to use the 'A' setups.

3)
AUTO PAN A 2

Use the UP/DOWN keys to set the Auto Pan Rate between -8 and 8. Negative values cause any sounds with Auto Pan set to ON (VOICE menu entry 18), to dynamically pan from right to left as the sound plays. Positive values move the pan position in the other direction.

The Auto Pan value determines the rate of Pan Position movement for any sound, from one side of the stereo image to the other. Values of 1 and -1 give the slowest movement, while 8 and -8 produce the fastest rate of movement.

4. Setting the Global Auto Pan Rate for 'B' Setups

UTILS menu entry 4 sets the Global Auto Pan Rate for all sounds which are assigned to use the 'B' setups, in the same manner as for the 'A' setups above.

4)
AUTO PAN B -2

5. Setting the Global Roll Pan Rate for 'A' Setups

UTILS menu entry 5 sets the Global Roll Pan Rate for all sounds which are assigned to use the 'A' setups.

5)
ROLL PAN A 3

Use the UP/DOWN keys to set the Roll Pan Rate between -8 and 8. Negative values cause any sounds with Roll Pan set to ON (VOICE menu entry 17), to start at a new Pan Position towards the left of the stereo image from the last pan used, when a sound is played while the same sound is already playing. Positive values start the next Pan Position to the right of the stereo image from the last pan position.

The Roll Pan value determines how much Pan Position movement is produced for each new instance of a sound (ie, how many many times the drum must be played without allowing it to stop ringing, in order to move it from one side of the stereo image to the other).

Values of 1 and -1 give the smallest movement, while 8 and -8 produce the largest movement step.

6. Setting the Global Roll Pan Rate for 'B' Setups

UTILS menu entry 6 sets the Global Roll Pan Rate for all sounds which are assigned to use the 'B' setups, in the same manner as for the 'A' setups above.

6)
ROLL PAN B -3

7. Setting the Global Auto Pitch Rate for 'A' Setups

UTILS menu entry 7 sets the Global Auto Pitch Rate for all sounds which are assigned to use the 'A' setups.

7)
AUTO PITCH A -3

Use the UP/DOWN keys to set the Auto Pitch Rate between -8 and 8. Negative values cause any sounds with Auto Pitch set to ON (VOICE menu entry 19), to shift the pitch downwards as the sound plays. Positive values move the pitch upwards.

The Auto Pitch value determines the amount of pitch shift for any sound. Values of 1 and -1 give the least pitch shift, while 8 and -8 produce the most shift.

8. Setting the Global Auto Pitch Rate for 'B' Setups

UTILS menu entry 8 sets the Global Auto Pitch Rate for all sounds which are assigned to use the 'B' setups, in the same manner as for the 'A' setups above.

8)
AUTO PITCH B 3

9. Setting Auto Voice Mode

UTILS menu entry 9 allows you to turn the Auto Voice mode ON or OFF using the UP/DOWN keys. When turned ON, Auto Voice makes the MD16/R ignore any of the voice output settings programmed in VOICE menu entries 11 and 12 - see Basic Concepts 1, page 25.

9)
AUTO VOICE ON

10. Setting the Accent Level

UTILS menu entry 10 allows you to set an Accent Level between -8 and 8, using the UP/DOWN keys.

10)
ACCENT LEVEL 5

Negative values reduce the volume of a pad press, positive values increase the volume.

Using the ACCENT Key

Having an ACCENT key on a drum machine with velocity sensitive pads may seem a bit strange at first, but there are times when the ACCENT key will be useful.

Pressing the ACCENT key and a pad together will combine the Accent Level and the volume of the pad (fixed or velocity sensitive) to produce a new volume level. The Accent Level can be programmed to be positive or negative, so that the overall volume can go up or down.

If you have Humanise selected for the pad, so that the volume is linked to the sound start point or the pitch you can use the Accent key to produce a defined change in the sound (volume, pitch & start point).

If you are using the MD16/R with electronic drum pads via MIDI, you can assign the footswitch to perform as an ACCENT key, so that holding down the footswitch changes the sound (see UTILS menu entries 11 and 12).

11. Programming Footswitch 1

You can assign Footswitch 1 to perform one of 7 different functions, by selecting UTILS menu entry 11 and using the UP/DOWN keys to set a value from 1 to 7.

11)
FOOTSWITCH 1 1

The functions selected are as follows :-

- 1 - Start/Stop
- 2 - Accent key
- 3 - Shift key (for deleting events while real-time recording)
- 4 - Swap All Pads
- 5 - Pad Rotate
- 6 - Re-Trigger Next Pattern (from Level 3 Pads)
- 7 - Queue-Trigger Next Pattern (from Level 3 Pads)

When the MD16/R is in Song Chain (see page 68) mode and is waiting between songs (when Chain Delay is zero or when an automatic delay is programmed), pressing Footswitch 1 will start the next song immediately, instead of performing its programmed function.

Modes 6 and 7 perform the pattern trigger functions as described on page 76, but the pattern selected to trigger will be from the next pad which has a trigger pattern programmed. When all the programmed patterns have been triggered in turn (by pressing the footswitch again), the sequence returns to the start.

This allows you to program a sequence of up to 16 different patterns which you can trigger at any time. For instance, in Queue-Trigger mode (with Footswitch 1 set to 7), you could start a normal pattern or song playing, and bring in different patterns for the lead-in to a chorus or bridge part, using the footswitch.

Connect your footswitch to the Footswitch socket at the rear of the MD16/R using a 3.5mm mono Jack Plug. The best operation is with a 'normally open' footswitch contact, but the MD16/R will also work with a 'normally closed' footswitch for all modes except mode 2 (Accent key) and mode 3 (Shift key), which will work in the opposite way to normal.

NOTE : The MD16R has Footswitch 1 and Footswitch 2 input sockets, which use 1/4 inch Jack Plugs instead of the 3.5mm type.

12. Programming Footswitch 2 - MD16R Only

Footswitch 2 is only available on the MD16R Rack Mounted version and has identical features to Footswitch 1 above.

12)
FOOTSWITCH 2 1

13. Selecting Chromatic Tune/Microtune Modes

Chromatic Tune mode sets the MD16/R to step the sound Tuning (VOICE menu entry 3 - page 20) in semitone steps, over a +/- 1 octave range.

13)
CHROM. TUNE OFF

To select Chromatic Tune mode, select UTILS menu entry 13 and turn ON using the UP/DOWN keys. Microtune mode is selected with Chromatic Tune set to OFF.

14. Setting the MD16/R to Test the Tuning Values When Deleting Events

When you delete events from a pattern by pressing the SHIFT key and the pad you wish to delete, the MD16/R looks at the pattern, and if an event plays with the same VOICE setups as the pad you are holding the keys down, it will be deleted. Sometimes, there will be events in the pattern which have the same sound, but the Tuning values will be different.

Normally the MD16/R is set to Test the Tuning values, and so ignore any events which have different tunings to the pattern events (this is in case you have Chromatic Pads selected and you just want to delete an event with one particular tuning).

However, you can make the MD16/R ignore the tuning values, and delete any event in the pattern having the rest of the VOICE parameters identical to the pad settings. To do this, select UTILS menu entry 14 and turn Test Tuning OFF using the UP/DOWN keys. This may be useful when you have recorded an event, changed the Tuning of the pad, and you wish to delete the event with the original Tuning.

14)
TEST TUNING ON

15 Setting Parameter Roll Over Mode

UTILS menu entry 15 allows you to program whether all the parameter values will 'roll over' from the highest value back to the lowest (or vice-versa) when you press and hold the UP/DOWN keys.

15)
ROLL OVER OFF

With Roll Over OFF, the parameters values will reach the top or bottom of the range and stop, when the UP/DOWN keys are held down. With Roll Over ON, maximum values will restart at the bottom, and minimum values will restart at the top.

16. Programming All Drum Pads at the Same Time

UTILS menu entry 16 allows you to select whether all drum pads are programmed with the same parameter value when you change the VOICE menu setups.

16)
SET ALL PADS OFF

Use the UP/DOWN keys to turn Set All Pads ON or OFF.

17. Checking the MD16/R Software Version

UTILS menu entry 17 displays the Software Version of the MD16/R operating system as shown below :-

17) S/W VERSION 1.00

18. Checking the Amount of Free Memory Remaining

The MD16/R user programmable memory is used for Patterns, Songs and Auxiliary Pads (if defined). UTILS menu entry 18 displays the percentage of memory that is still free.

18) FREE MEMORY 100%

The MD16/R Cold Start Procedure

The MD16/R checks the contents of the user programmable memory each time that you switch on the power to the unit. If the MD16 detects that there has been an error, it will display the message shown below on startup :-

COLD START ?

There are two ways to progress from this situation. You can either select a 'COLD' start, where the MD16/R clears all the memory and sets up the default pad settings, or you can attempt a 'SAFE' start where the MD16/R will attempt to correct the situation. There is no guarantee that after a 'SAFE' start, the patterns, songs, pads and other user-programmable parameters will not contain any errors. It may, however, allow you to dump the memory via MIDI or to a tape recorder to allow you to discover by trial and error which areas contain errors.

WARNING: Performing a 'COLD START' will erase all the demonstration patterns and songs supplied with your MD16/R.

If you do not want to lose them for good then you may save all the MD16/R memory either to tape (see page 86), or perform a complete memory dump to MIDI (see page 85).

To select a 'COLD' start, press SHIFT START/STOP only.

To select a 'SAFE' start, press SHIFT PATT only.

Pressing anything else will attempt to startup normally, and so the 'COLD START ?' message will definitely be displayed the next time you power up.

If even after attempting a 'SAFE' start, the MD16/R still will not work correctly, you can force the 'COLD START ?' message to occur by holding the SHIFT key down as you connect power to the MD16/R. You can then follow the above procedure for a 'COLD' start.

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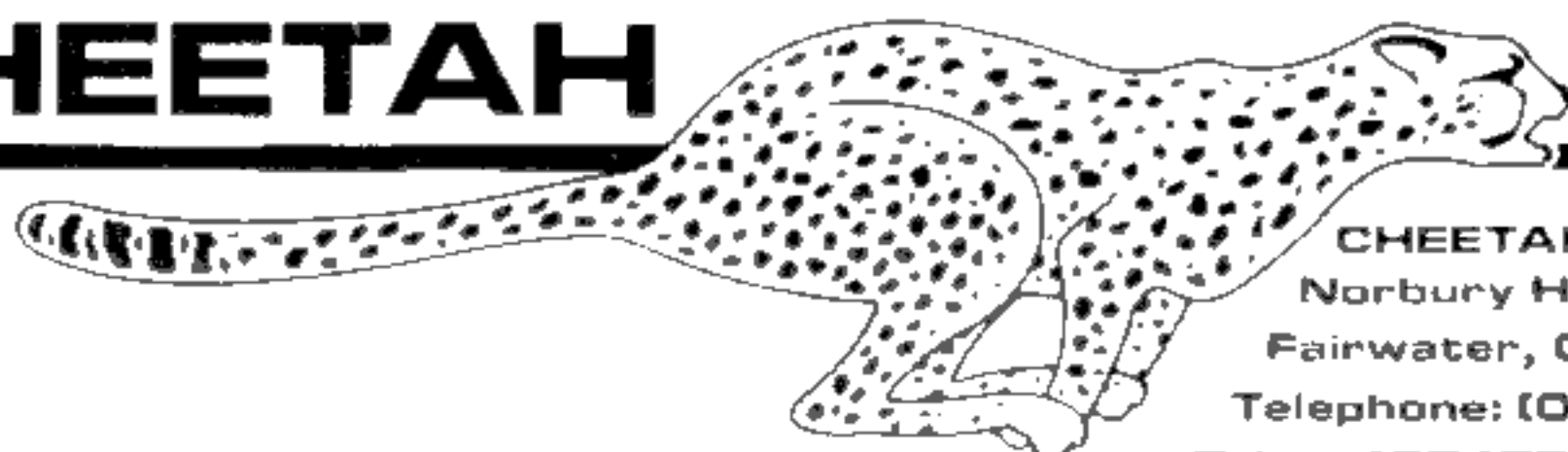
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