MIDI PERFORMANCE SYSTEM

ZYKLUS

MIDI PERFORMANCE SYSTEM

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By W. Marshall

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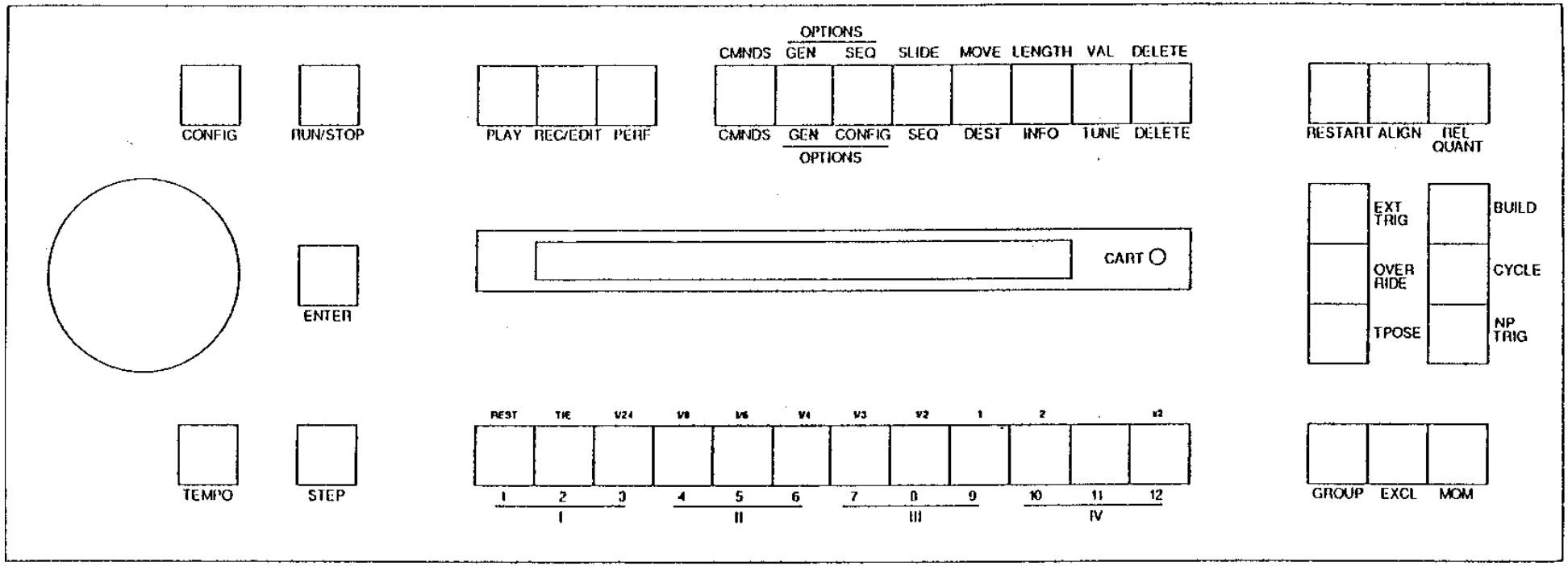
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MIDI PERFORMANCE SYSTEM

1 INTRODUCTION

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OVERVIEW

The Zyklus MIDI PERFORMANCE SYSTEM is a MIDI equipment controller designed to provide an unprecedented level of musical control. It achieves this by allowing the musician to interact with previously recorded MIDI data such as sequences so that complex music can be built up in real time. In a typical setup, the MIDI PERFORMANCE SYSTEM would be used in conjunction with a MIDI master keyboard or keyboard synthesiser, plus up to 64 slave MIDI devices - synthesisers, expanders, drum machines, MIDI-equipped signal processors, etc.

The MIDI PERFORMANCE SYSTEM can be thought of as a collection of sequencers, MIDI control boxes and MIDI effects units integrated into a single system. This system is designed so that it can be "played" like a musical instrument in its own right. At its most basic level it is rather like 12 polyphonic sequencers, each of which can be run at any transposition or set of simultaneous transpositions independently of the others, simply by pressing a note or chord on the MIDI control keyboard. 99 different sequences can be stored in each memory bank, of which any 12 can be assigned to the front panel for immediate access together with related control information. These sequences need not consist of repeating musical phrases. They could be single chords, short fast runs, fast runs which end on held chords, segments of control data such as MIDI program changes, the synthesiser/drum part for an entire song, etc.

In addition to keyboard triggering, sequences can be triggered from a footswitch, an external trigger source or directly from the front panel. The panel controls consist of 40 keys mostly with LED indicator, plus an encoder wheel used for tempo control, editing functions, menu selection, etc. User information is provided by a 40 x 2 backlit LCD display with externally adjustable brightness and contrast.

All internal and cartridge memory is battery-backed and therefore retains data automatically when power is switched off.

RECORDING

Recording can be done in real-time or step-time and these modes can be mixed while recording. The real-time recording features include rapid track selection, presettable & manual punch-in and reversible quantisation level. Step-time features are comprehensive, with single-key access to Move, Slide, Note-length and Note-velocity editing. Innovative features include "soft" punch-in in which sustained notes will overlap the punch-in point rather than cutting abruptly, and control over the relative start-times of tracks being monitored.

PLAYBACK

All sequences can be played polyphonically from a MIDI keyboard as though they were single notes and respond to keyboard velocity in the same way. In other words, each sequence can be triggered to run at several pitches simultaneously and each of these "control" pitches can have its own velocity. Up to 8 control pitches can be applied to each sequence, and the set of control pitches can be entirely different for each of the 12 sequences assigned to the front panel. The sequences can be routed to 12 different MIDI destinations spread across the 4 MIDI output ports.

TRIGGER PROFILE

A unique feature of the MIDI PERFORMANCE SYSTEM is that a vast number of triggering and control modes can be selected and the current mode, or "Trigger Profile" can be altered quickly and easily during playback without stopping. The Trigger Profile consists of 13 parameters or options, each of which has a separate key and can therefore be switched on or off by a single keypress. These features allow very flexible and spontaneous control during live performance, and in the studio allow rapid experimentation with musical ideas - sequences can be transposed, overlayed, re-triggered, single-stepped, etc. in almost any combination.

CONFIGS

Ease of use during performance is enhanced by the ability to store the current setup (the 12 sequence numbers, 12 MIDI destinations, Trigger Profile, tempo, etc.) as a "Configuration". Up to 24 Configurations can be stored then instantly recalled by pressing a panel key or footswitch. Any sequences currently running when the Configuration is changed can continue to run across the Config change until halted, or abrupt changes can be performed. This feature allows a performance to use all the stored sequences (or the same sequences in different ways) without breaks. By careful organisation of Config data, the musician can simply step through an entire performance.

PERFORMANCE RECORDING

An even more powerful level of MPS operation lies in its ability to record entire performances. At this level, all actions taken during performance, such as panel key presses, control keyboard note presses, tempo changes, etc. are stored. 12 such performances can be recorded, edited and replayed.

CONTROL STATION

Among its many other applications, the MIDI PERFORMANCE SYSTEM can be used as a sophisticated MIDI Control Station. Any of the 12 destinations in use can be defined as MIDI-thru and keyboard zoning & octave transpositions applied. These parameters can be stored as Configuration data, allowing total re-configuration on a single key or footswitch press. Simultaneously with the Config change, or on first activation of each destination after a Config change, MIDI program numbers and MIDI mode commands can be sent to each destination. An additional set of program numbers can be sent to 12 secondary destinations, e.g. to control a bank of MIDI-equipped signal processors.

Because it is such a powerful and flexible tool, the MIDI PERFORMANCE SYSTEM is inherently very complex. We have put a great deal of effort into attempting to hide this complexity or at least make it quickly accessible, but there are many ways of using the machine which are not immediately obvious. This User Manual aims to explain the principles and operation of the unit in some detail and we urge you to read it carefully, if possible by experimenting individually with each function. However, because the MIDI PERFORMANCE SYSTEM is also innovative in so many respects, it is very likely that many (perhaps most?) ways of using it have yet to be discovered. This is particularly true when two or more innovative functions are used in combination.

PANEL LAYOUT

The panel keys of the MIDI PERFORMANCE SYSTEM are divided into five groups :

The MODE keys (red keys) are used to select the main operating mode of the system, i.e. recording or playback of sequences or entire performances.

The CONTROL keys (blue keys) are used in conjunction with the external MIDI keyboard or other MIDI controller and are used for selecting and triggering sequences in real time. They are also used for selecting step size during step-time recording.

The FUNCTION keys (plain grey keys) are used mainly during editing and provide various options and utilities.

The TRIGGER PROFILE keys (grey keys with LED's on the right of the front panel) can be set on or off in any combination. This allows selection of several hundred sequence triggering modes. The Trigger Profile can be changed instantly during playback without affecting sequences already running.

The final keygroup, the WHEEL CONTROLS, are used in various ways depending on mode. The wheel is used for scrolling through sequences or performances during editing, changing tempo or configuration in real-time and for selection of Function key options presented on the display.

CONNECTING UP

The MIDI PERFORMANCE SYSTEM is fitted with a MIDI input and four MIDI outputs. In addition, the 3 gate or footswitch inputs allow starting and stopping of all active sequences (RUN/STOP), triggering of selected sequences (CONTROL) and duplication of the ENTER button. The latter allows the footswitch to be used for rapid changing of tempo, configuration, etc. A separate trigger input (similar function to CONTROL input), a programmable gate output, a metronome output and Sync input and outputs are also fitted. Various clock rates can be specified when using the external Sync input or output.

The four MIDI outputs, A, B, C and D operate independently. This effectively gives 64 channel addressing (4 x 16). The single MIDI input can be set to receive on any MIDI channel (OMNI) or a specific MIDI channel (1 to 16). This can be selected from the DATA FILTER available from the GENERAL OPTIONS menu (section 2.6 if in Record mode, section 3.7 if in Playback mode).

When four or less synthesisers or drum machines are to be used, it is good practice to connect each of these machines to its own MIDI port on the MIDI PERFORMANCE SYSTEM. When more equipment is to be driven, then the MIDI-THRU facilities on that equipment must be used or some form of MIDI patchbay utilised. The setting up of MIDI channel numbers, etc. on the MIDI PERFORMANCE SYSTEM are dealt with in section 3.1.

IMPORTANT NOTICE : MAINS WIRING

PLEASE ENSURE THAT THE VOLTAGE SELECTOR ON THE REAR OF THE MIDI PERFORMANCE SYSTEM IS SET TO THE CORRECT OPERATING VOLTAGE FOR YOUR COUNTRY.

Connection to the Mains Electricity Supply is via a three pin IEC connector. The other end of the cable should be wired to a standard Mains Plug in accordance with the following :

BROWN - LIVE BLUE - NEUTRAL
GREEN/YELLOW - EARTH

THIS UNIT MUST BE EARTHED.

STARTING AFRESH

When you first take delivery of the MIDI PERFORMANCE SYSTEM, you may wish to format (wipe clean) the memory. This can be done as follows :

1. Make sure the RUN/STOP key is OFF.
2. Make sure the PLAY key is ON.
3. Press the COMMANDS key.
4. Turn the wheel until the cursor rests on the FORMAT option.
5. Press ENTER.
6. The display will now change and ask if you wish to select the internal memory or the cartridge memory. The cursor will be resting on one of these options. Turn the wheel until the cursor rests on your choice and press ENTER again.
7. Since the FORMAT command cannot be reversed, a warning message will now be given as an additional safeguard against over-writing the memory. You will be asked if you wish to proceed with the FORMAT command and the cursor will be resting on the word NO. Turn the wheel until it rests on YES and again, press ENTER.
8. Now press the ASSIGN SEQUENCE key. Move the cursor to ASSIGN-12-FREE and press ENTER. This places a set of blank sequences onto the CONTROL keys ready for recording. These sequences will be replayed on MIDI channel 1 from output A.

2 RECORDING

CONTENTS

SETTING UP FOR RECORDING

2.1

ALWAYS MAKE BACKUPS OF VALUABLE DATA USING CARTRIDGES OR MIDI DUMP. The MIDI PERFORMANCE SYSTEM has a number of special features designed to minimise the possibility of data loss, but like any other computer-based system it can happen.

Music can be recorded in either REAL-TIME or STEP-TIME or both. Recordings are made on one of the 12 available CONTROL keys, and up to 11 other sequences can be monitored during recording.

Any one of the 99 possible sequences can be assigned to each CONTROL key, therefore, before you can begin recording you have to choose a sequence number for each of the keys on which we wish to record. However, assigning sequence numbers to particular CONTROL keys is a playback function and Section 3.1 should be consulted if you are unhappy with the current assignments.

In PLAY mode (RUN/STOP key OFF and PLAY key ON) the display will be similar to :

```
120   A1 A2 A1 A1 A1 B1 B1 B2 B3 C1 D1 A1
120   05 06 07 23 43 44 45 56 91 92 54 56
```

The figures on the left of the display show the Current and Next Tempo values when the TEMPO key is ON (Section 3.3). The lower row of figures show the sequence numbers pertaining to each CONTROL key. The upper row shows the MIDI destination (Port A, B, C or D and the Channel number, 1 to 16) to which each CONTROL key is assigned.

To enter record mode press the REC/EDIT key. The display will now instruct you to select a sequence on which to record by pressing the appropriate CONTROL key.

```
R/E:  Press a key below to select sequence
    :  05 06 07 23 43 44 45 56 91 92 54 56
```

After the sequence is selected, the CONTROL key will flash at the Current Tempo rate and you will now be ready for recording or editing.

[If you are using the MIDI PERFORMANCE SYSTEM for the first time, you may want to check at this point that everything is set up correctly. To do this,

1. Play a few notes on the keyboard.
2. Press the PLAY key.
3. Press the RUN/STOP key.
4. Make sure the EXT TRIG key is OFF then press the CONTROL key for the sequence just recorded.

Provided the MIDI channel and output port number (A, B, C or D) correspond with the channel and port of the connected synthesiser, you should now hear the sequence.]

2.2 STEP-TIME RECORDING

When first entering REC/EDIT mode the RUN/STOP key will be OFF and you will have selected a sequence on which to record. The display will now provide information in the following format :

```
Seq 27  : Stp  : Bar  109: C E G C# G
Mem 72%: 1/24 : Bt 03.23 : 3 3 3 3  2
```

Seq *nn*	This is the sequence number.
Mem *nn*%	This shows the percentage of free memory left.
Stp	This shows the current Step size, set at 1/24 in this example.
Bar	This shows the current bar (will be at 1 at the start of a sequence).
Bt	This shows the current beat and fraction of a beat within the current bar. This will be at 01.01 at the start of a new sequence. The resolution of the fraction is 1/96.

The remainder of the display shows the "Note Field" and is used for displaying all notes currently on (up to a maximum of 8) at the time shown by the bar and beat counter. The upper line in the Note Field shows the actual note while the lower line shows the octave in which the note was played. Notes lower than Octave 0 will be shown as a dash, e.g. C- . At the start of a new sequence, of course, there will be no notes displayed in the Note Field and the display will be similar to :

```
Seq 27  : Stp  : Bar    1 :
Mem 72%: 1/24 : Bt 01.01 :  >  <
```

The > and < arrows mean Start-of-Sequence and End-of-Sequence respectively. When the Start-of-Sequence marker is visible, the count displayed will always read 01.01.01 (bar, beat and fraction).

STEP SIZE

The CONTROL keys are also marked with a selection of Step sizes. The Step size can be changed by holding down the STEP key and pressing the required CONTROL key. The display will change to show the new Step size.

The . and x2 keys can be toggled on and off to alter the selected Step size by factors of 1.5 and 2 respectively.

The following information on note entry assumes that you are starting recording on a blank sequence, i.e. where the display shows > < . If this is not the case, you can delete the current sequence by holding down ENTER and pressing the DELETE key.

NOTE ENTRY

Step-time recording can now commence by simply playing the required notes on the MIDI keyboard (the notes played will be sent THRU to the previously assigned destination). Keyboard Velocity information will also be recorded. As long as at least one note is held down, other notes can be pressed and released and they will be entered into memory as a chord. Pressing the same note twice while at least one other key is held down will remove the note from memory.

Once all notes are released, the clock will advance by one division of the current Step size and the display will update to show only the End-of-Sequence marker (<) in the Note Field. Further notes can now be added in the same way.

Monophonic or polyphonic sequences can be built up very quickly in Step time by constructing the sequence as a series of "layers". This is done by turning the wheel to move back in time into the sequence, i.e. anti-clockwise. Any notes currently sounding at the time shown by the bar and beat counter will be shown in the Note Field. The cursor will only rest on individual notes, however, when their starting points are at the current position indicated. This feature ensures that you will always be able to tell when you are positioned on the exact beginning of a note.

OVERLAY

If new notes are now added from the keyboard, they will be overlayed with existing notes at the time shown and time will move forward by one step. No time is added to the sequence.

A maximum of 8 notes can be entered at any time during Step recording. However, more notes can be overlayed during subsequent editing. The MIDI PERFORMANCE SYSTEM will actually permit a total of 30 notes to share the same time but only 8 notes can be displayed simultaneously.

REST KEY

Rests can be added to the sequence by holding down the STEP key and pressing the first CONTROL key (marked REST). No time will be added to the sequence, however, unless you are at the End-of-Sequence marker.

TIE KEY

The TIE key can also be toggled to add a tie between two notes, shown as a "T" in the bottom right of the Note Field. The TIE facility works on note entry only therefore normal operation will be to play a note, hold down STEP and press TIE, then play another note. If the notes are the same, they will be tied otherwise a slur from first to second will be produced.

MISTAKES

If a mistake is made whilst recording, the DELETE key can be used to erase the last note(s) entered. Because the display will be looking at the End-of-Sequence marker, the DELETE key must be pressed twice - once to backspace onto the note and once more to remove it. If the last events played formed a chord, the DELETE key will have to be pressed a few times to delete all the notes of the chord. Individual notes of a chord can also be deleted as explained in the section on editing (2.4).

MONITOR

Other sequences can be monitored by pressing their CONTROL key. Pressing a key again switches monitoring off. Monitored sequences will normally restart when switched on, but if the ALIGN key is ON, they will be synchronised as if they had started together and run forward to the current time.

CHANGING SEQUENCE

To start recording on one of the other sequences currently assigned to the front panel, press REC/EDIT then press the appropriate CONTROL key. The sequence you have just been recording on will automatically switch to Monitor status.

2.3 REAL-TIME RECORDING

Real-Time recording is entered directly from Step recording by pressing the RUN/STOP key. When running, TEMPO can be varied by turning the wheel.

RECORDING ON BLANK SEQUENCES

If you are are about to record on a blank sequence, pressing the RUN key will make the MIDI PERFORMANCE SYSTEM enter a "wait" state during which the internal metronome will run (if enabled). Recording commences as soon as you begin playing on the MIDI keyboard. Alternatively, the ENTER key can be pressed to start recording when no notes are required at the beginning of the sequence.

The recording can be stopped at any time by pressing the REC/EDIT or the ENTER key (the latter makes footswitch operation possible). This action determines the position of the End-of-Sequence marker which will be the repeat point of the sequence, quantised to the nearest beat. The display will now ask you to select another sequence on which to record and the sequence you have just recorded will automatically switch to Monitor status. This method of real-time recording allows very rapid build-up of material.

MONITORING

Monitoring of previously recorded sequences works in the same way as for Step recording, where the relative timing of sequences is controlled by the RESTART, ALIGN and REL QUANT keys. In most cases the most useful combination is RESTART ON and ALIGN and REL QUANT OFF. This has the effect of restarting all monitored sequences when you start recording on a new sequence, or when you press a CONTROL key to switch monitoring ON.

MISTAKES

If a mistake is made when recording in real-time, the CONTROL key for that sequence can be pressed again to erase the material recorded so far. This feature allows several attempts at recording but this action must be made before the sequence is terminated by using the REC/EDIT, RUN/STOP OR ENTER KEYS.

MANUAL PUNCH-IN

If you attempt to record on an existing sequence, the sequence will be heard and the position indicator on the display will give a continual readout of the bar and beat as before. This feature allows sections of a work, perhaps recorded in Step time, to be quickly heard by wheeling back to the desired point then pressing the RUN key. If the sequence Repeat-mode has been set to REPEAT (Section 3.1), the sequence will repeat at the End-of-Sequence marker as expected. Playing notes on the MIDI keyboard will automatically cause a punch-in, i.e. the sequence will now mute and the new notes played will be heard. At the point recording is terminated by pressing the RUN/STOP, REC/EDIT or ENTER keys, the display will ask you to select if you wish the new material to replace the existing material (from the point you started playing). This method of punch-in allows the new material to be longer than the original. If this is the case, the End-of-Sequence marker will then be positioned at the end of the new material (at the point REC/EDIT, RUN/STOP or ENTER is pressed).

WARNING : Be careful when doing a manual Punch-In near the end of sequence. If you are slightly late, the sequence may have looped back to its start point and your Punch-In will therefore replace the start of the sequence rather than adding to the end. If you want to Punch-In near the end, it is safest to put the sequence into SINGLE-SHOT mode (see ASSIGN SEQUENCE in Section 3.1).

PRESET PUNCH POINTS

Punch-In and punch-out points can also be preset so that the existing sequence you are working on will monitor up to the punch-in point then enter Record mode. This feature over-rides the mechanism described above, and will be found useful as an additional safeguard against over-writing parts of the sequence. With no punch-out point selected, punch-in will terminate at the End-of-Sequence marker if the sequence Repeat Mode is set to REPEAT. If the Repeat Mode of the sequence is set to SINGLE SHOT, the length of the sequence can be extended and the End-of-Sequence marker will be repositioned accordingly. To set Punch points, refer to Section 2.5.

GATE OUTPUT

If a footswitch or Gate is connected to the CONTROL input on the rear panel, the ON/OFF events will also be recorded. On replay, the output will be from the GATE output socket.

IMMEDIATE EDITING FACILITIES

2.4

These apply to Step-time recording.

DISPLAY SCROLLING

The display can be thought of as a window looking at a particular Time in the sequence, the wheel being used to scroll backwards and forwards along the sequence length. The scrolling is normally in single clock pulse (1/96) increments and any notes shown in the Note Field will be audible. The cursor can also take two forms : the first is a block, and this will only be visible when the current position coincides with the start of the note (or other event). The other form the cursor takes is an underscore (_) which will be present in all other cases.

The display can also be scrolled from event to event by holding down ENTER while the wheel is turned. Scrolling can also take place in entire bar intervals by holding down the STEP key and turning the wheel. This is useful for rapid access to events in a long sequence. The immediate editing facilities require that the cursor is positioned on the start of an event (block cursor). If this is not the case (an underscore cursor will be shown), two presses of the required editing key will be required - one to backspace onto the last event and one to take action. Alternatively, a single press of the ENTER key will backspace you to the start of the previous event or the wheel can be turned while the ENTER key is held down, as mentioned above. In the case of simultaneous events such as a chord, the cursor will normally be positioned on or after the last event. To gain access to the other events, hold down ENTER and wheel backwards. If you go past the first (i.e. furthest left) of the simultaneous events, the cursor will jump back to the event before this, i.e. to an earlier event in time.

DELETE KEY

The DELETE key is self explanatory. However, repeated presses of the DELETE key will backspace and delete on an event-by-event basis. During editing, the DELETE facility will never remove Time from the sequence. Removing a note, therefore, will simply leave a gap into which a new note can be recorded. Entire sequences can also be deleted by holding down ENTER then pressing DELETE.

SLIDE KEY

The SLIDE key permits insertion and removal of Time within the sequence. The SLIDE key should be held down while the wheel is turned, and Time will be added or removed from that point, depending on wheel direction. Rests or similar gaps in the music are edited this way. It is not possible, however, to time-slide notes back past earlier notes. Forward time-sliding has no limit and the End-of-Sequence marker will move accordingly.

MOVE KEY

The MOVE facility is used for adjusting the starting points of individual notes without altering the overall timing of the sequence. The operation is similar to above - the wheel is turned while the MOVE key is held down. The starting point of the selected note will then be moved to the new position indicated. Likewise, notes cannot be moved past other notes. Single notes within a chord, for example, the E within C E G cannot be moved directly using the MOVE facility.

Both the SLIDE and MOVE features behave identically when adjusting the position of the End-of-Sequence marker. This is the only case where MOVE will add or remove Time within the sequence.

CAUTION : If you have a sequence with only one event or one set of simultaneous events, it is possible to SLIDE or MOVE the End-of-Sequence marker back so that it is at 01.01.01 . Do not leave the sequence like this. Because it has zero length, attempting to replay such a sequence with REPEAT mode assigned causes the machine to attempt an infinitely fast transmission of events - neither MIDI nor the MIDI PERFORMANCE SYSTEM can handle this!

LENGTH KEY

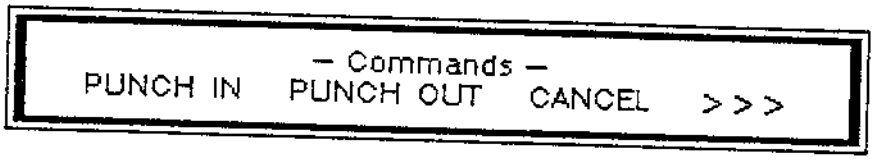
The LENGTH key is used to view the length of individual notes in the sequence. When the key is held down, the lower part of the Note Field will show the length of the note in terms of bar, beat and fraction. The wheel can be turned at this point to adjust this value.

VALUE KEY

The VAL key is used to view the VALue of individual events, e.g. recorded note velocity. When the key is held down, the lower part of the display will show this value, which can be changed by turning the wheel.

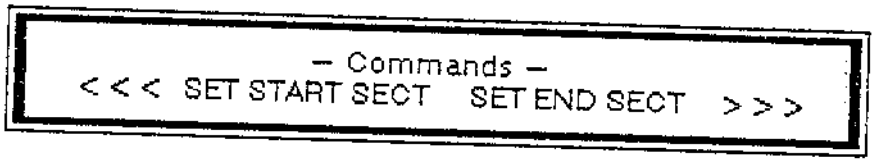
2.5 REC/EDIT COMMANDS

When the COMMANDS key is pressed while in REC/EDIT mode (the RUN/STOP key must be OFF), the display will show the following :



Press the REC/EDIT key again to "escape" from any list of options without taking action.

Selection of an option from the display is made by turning the wheel so that the cursor "jumps" between the options. Turning the wheel further, in the direction of the arrows, will cause the display to scroll and present further options for selection. When the cursor is resting on your choice, press ENTER. The full list of options available under the COMMANDS key in this mode are PUNCH-IN, PUNCH-OUT, CANCEL-PUNCH, SET-START-SECTION, SET-END-SECTION, CANCEL-SECTION and DELETE-SECTION.



PUNCH MARKERS

To use the Punch-In and Punch-Out facilities, it is first necessary to scroll the display so that the bar and beat counter is at the precise location where you want the Punch marker to occur. When this is done, selecting either PUNCH-IN or PUNCH-OUT will place the appropriate marker into the sequence, over-riding any previous marker. Inserting new note data into the sequence in real-time can now only take place between the Punch-In and Punch-Out markers (see Section 2.3).

CANCEL refers to cancelling the current Punch-In and Punch-Out markers.

DELETE SECTION

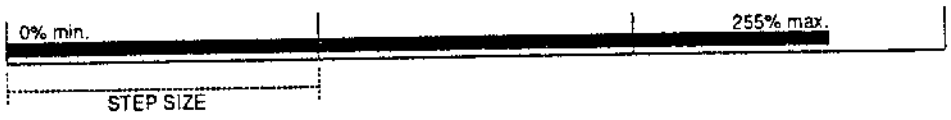
SET-START-SECTION and SET-END-SECTION are set up in the same way as for Punch markers, i.e. scroll the display to the desired point then select either option. This facility allows a section of a sequence to be deleted (by selecting DELETE from the above options). Deleting a section of a sequence in this case will remove Time.

GENERAL OPTIONS 2.6

The GENERAL OPTIONS key is used to specify and alter certain parameters which are applicable to recording in general (RUN/STOP key must be OFF). Press the REC/EDIT key again to "escape" from the list of options without taking any action.

NOTE LENGTH

This is expressed as a percentage of the current step size and can be altered by turning the wheel until the required percentage is shown, then pressing ENTER.



METRONOME

This allows the internal metronome (real-time recording only) to be switched on or off . The external metronome is not affected.

CLOCK

The display will first ask you to select the master clock source. INT allows the MIDI PERFORMANCE SYSTEM to respond to its own internal clock source. Selecting MIDI allows the unit to be driven from external equipment using the MIDI clock (24 pulses per quarter note). EXT/SYNC allows the unit to be driven from a pulse train present at the SYNC input socket on the rear panel. You will then be asked to specify whether you require 24, 48 or 96 p.p.q.n.

A pulse train can also be sent from the SYNC output on the rear panel and you will now be asked to specify 24, 48 or 96 p.p.q.n. as before.

The MIDI PERFORMANCE SYSTEM can also send MIDI clock (24 p.p.q.n.) on each of the four output ports, A, B, C and D. The display will now ask if you wish the clock enabled for each of the four outputs in turn.

The RUN/STOP key will obviously start and stop the EXT/SYNC output during playback. However, stopping and starting playback using the RUN/STOP key will affect the MIDI clock output in a slightly different way, i.e. STOP will cause a MIDI STOP command to be sent while RUN will send a MIDI CONTINUE command. A specific MIDI START command can be sent by holding down the PLAY key before pressing RUN.

INPUT OPTIONS

The first option under the INPUT OPTIONS will allow you to set the MIDI input to receive on OMNI (any channel) or to select an appropriate channel number if OMNI reception is not required. The wheel is turned until the required channel number is reached, then ENTER pressed.

You will then be presented with a list of items, each of which you can ignore or accept as required. These are : note data (useful for building Control sequences), program change messages, key pressure data, pitch bend and Other Data (controller information, MIDI Mode messages, etc.).

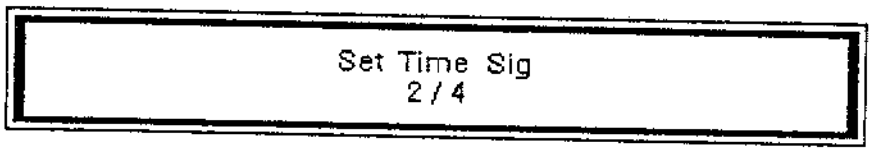
CLOCK and INPUT OPTIONS are also available from PLAY mode.

2.7 SEQUENCE OPTIONS

The Sequence Options key is used to specify and alter certain parameters applicable to the recording of individual sequences (the RUN/STOP key must be OFF). Press REC/EDIT to "escape" from any list of options without taking action.

TIME SIG

This allows the time signature to be set. The cursor will be resting on the first part of the fraction, which can be changed to any value between 1 and 32 by using the wheel. Pressing ENTER will now fix this value and the cursor will jump to the second part of the fraction. The value of this, which must be 2, 4 or 8, can also be selected by using the wheel and pressing ENTER.



KEYNOTE

The purpose of the keynote is to normalise transposition when a sequence is triggered from an external MIDI source (e.g. a keyboard) during playback. Transposition of externally triggered sequences will take place relative to the keynote. If the keynote, therefore, was middle C (this is the default) and the sequence was triggered from middle C, the sequence would run at its original recorded pitch. The default value can be changed by using the wheel then pressing ENTER or by playing the required note on the keyboard.

The keynote will have no effect on sequences which are triggered in a pitch exempt situation, e.g. directly from the front panel or from the CONTROL input on the rear panel.

QUANTISE

This display allows quantisatiion to be set for the particular sequence. Turning the wheel will present various values. This is a post quantisation process, i.e. it is applied during playback of the sequence.. The sequence can, therefore, be experimented with until the desired results are obtained without losing the originally recorded timing information. Press ENTER when the required quantisation value is showing in the display. Maximum quantisation is 1/4 (24 clock pulses).

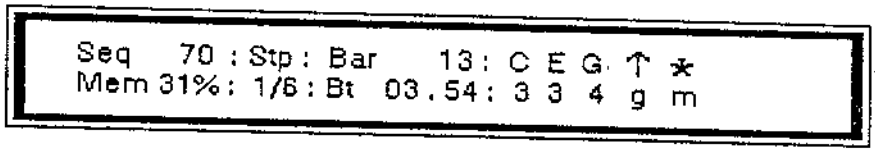
NAME

The final display option invites you to give the sequence a name of up to six characters. If the sequence has been recorded but has not been previously named, NONAME will appear in the display. Each character can be changed by turning the wheel. The cursor will be resting on the first character. When ENTER is pressed, the cursor will then move to the next character.

NON-NOTE EVENTS

2.8

The MIDI PERFORMANCE SYSTEM can also record several types of events in addition to MIDI note events. For example, the display could look as shown :



DISPLAY SYMBOLS

Upward or downward pointing arrows above a lower case "g" mean GATE output transitions, OFF and ON respectively. These can be programmed into the music in real-time or step-time simply by pressing or releasing a footswitch connected to the CONTROL input on the rear panel, at the required points.

The asterisk above a lower case "m" refers to other types of MIDI event such as pressure, program change, etc. The type of event can be seen by positioning the cursor on it then holding down the VAL (Value) key. If the event is a MIDI Program Change message (recorded by pressing the required program number key on the synthesiser or Control keyboard connected to the MIDI input) then the value can be edited by turning the wheel while the VAL key is held down.

Both Gate and MIDI events can be edited using the same facilities as for Note Data (Delete, Slide and Move).

3 PLAYBACK

CONTENTS

SETTING UP FOR PLAYBACK

When the MIDI PERFORMANCE SYSTEM is first switched on, it will be in PLAY mode and the RUN/STOP key will be OFF. The display will be similar to :

```
120    A1 A2 A1 A1 A1 B1 B1 B2 B3 C1 D1 A1
120    05 06 07 23 43 44 45 56 91 92 54 56
```

ASSIGN SEQUENCE KEY

Each of the 12 CONTROL keys have a sequence assigned to it, rather like the tracks on a 12 track tape recorder. The sequence numbers for each CONTROL key are shown in the lower half of the display. In this example, the current tempo is also shown on the left of the display.

Above each sequence number the MIDI DESTINATION can be seen, expressed as a letter (the MIDI output port) followed by a number (the MIDI channel).

Both the sequence numbers and the MIDI destinations can be changed at will so that it is possible to have the same sequence assigned to several CONTROL keys. This is a powerful feature well worth experimenting with.

To change the sequence assignment for any CONTROL key, press the function key marked ASSIGN SEQUENCE. To "escape" from any menu, press the PLAY key.

The display will now change and present you with two options, SINGLE-ASSIGN or ASSIGN-12-FREE. The latter will simply look for the first 12 blank (unrecorded) sequences and assign them, in ascending order, onto the CONTROL keys. This feature is useful when preparing for a recording session. The former option, SINGLE-ASSIGN allows individual sequences to be assigned to a CONTROL key and a repeat mode and velocity ratio to be specified.

After selecting SINGLE-ASSIGN, the display will then ask you to press the required CONTROL key to where the sequence is to be assigned. The next display will now show you the number, name and length of the sequence which was previously assigned to that key, and can be changed by using the wheel. Press ENTER when the required sequence is shown.

MIDI THRU

You will also notice that sequence number 0 is actually shown as a "T". This is a MIDI THRU facility - when activated, any data arriving at the MIDI input will be sent straight out to the MIDI destination assigned to that CONTROL key.

REPEAT MODE

After a sequence is selected, you will be asked to specify a REPEAT MODE for the sequence. This repeat mode is applicable only to the current assignment, i.e. the same sequence can be assigned to another CONTROL key using a different repeat mode or to the same CONTROL key in a different Configuration.

There are three repeat modes offered : REPEAT, SINGLE-SHOT and HOLD-AT-END. The REPEAT option is self explanatory. The sequence will continue repeating at the End-of-Sequence marker until turned off. The SINGLE-SHOT option causes the sequence to play once only then turn off. The final option, HOLD-AT-END is similar to Single-Shot but the last note or chord in the sequence will be sustained until turned off. This feature allows chords to be played polyphonically from the keyboard (chords consisting of chords) and allows the chords to be preceded by short fast runs or grace notes.

VELOCITY RATIO

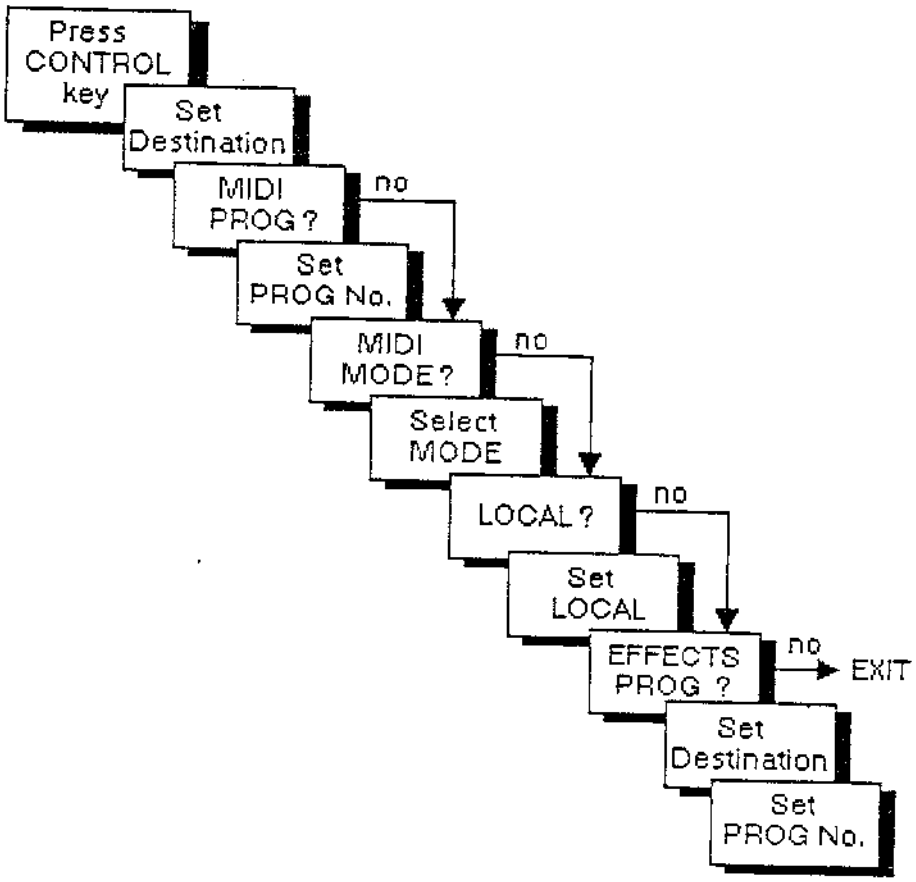
Once a repeat mode is specified, you will be given the option of specifying a VELOCITY RATIO. This is the ratio of key velocity recorded with the sequence to the key velocity used when triggering the sequence during playback. Five ratios are given : 0/100, 25/75, 50/50, 75/25 and 100/0. These options are applicable to the current assignment only. ENTER is pressed to set the desired velocity ratio and return you to PLAY mode. If you want to have 100% control over velocity during replay, select 0/100. If you want to preserve the original velocities, select 100/0. To have some live control while retaining some of the original dynamics (e.g. accents), select a value in between.

DELETING SEQUENCES

Entire sequences can also be deleted in PLAY mode by holding down the DELETE key and pressing the CONTROL key to which the sequence to be erased is assigned. You will then be asked to confirm your action by pressing ENTER. To cancel, press PLAY.

ASSIGN DESTINATION KEY

The function key marked ASSIGN DESTINATION is used to decide to which synthesiser you wish a particular CONTROL key to send its assigned sequence. You will first of all be asked to select the required CONTROL key. The display will then ask you to set the destination which is done by turning the wheel then pressing ENTER when the required destination is shown. A list of further options can now be specified, which are summarised below :



These options basically require you to answer YES or NO. As can be seen from the diagram, answering YES will then take you to another display where the particular parameter can be selected. Answering NO will take you to the next option. The list of options are as follows (overleaf) :

MIDI PROG

This allows a MIDI program change command to be sent to the assigned destination whenever the sequence is first triggered in the current configuration (section 3.4).

MIDI MODE

This allows a MIDI mode message to be sent to the assigned destination whenever the sequence is first triggered in the current configuration. The modes are :

1	OMNI ON POLY
2	OMNI ON MONO
3	OMNI OFF POLY
4	OMNI OFF MONO

LOCAL

This allows a LOCAL message (ON or OFF) to be sent to the assigned destination whenever the sequence is first triggered in the current configuration.

EFFECTS PROGRAM

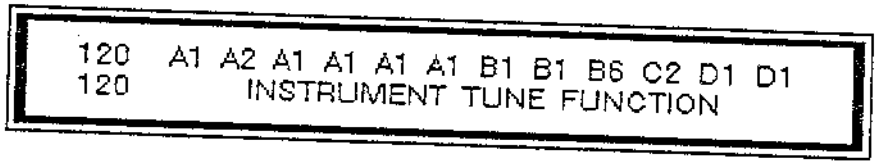
This allows another MIDI program change to be sent out to a different destination, for the purposes of changing program on other synthesisers or outboard MIDI controlled signal processors. The effects program change command will be sent out to its own destination whenever the configuration is changed irrespective of the CONTROL key state. This allows programs to be changed on external equipment prior to a sequence being played.

TOTAL RESTART

When RUN/STOP is OFF, holding down the PLAY key then pressing RUN will cause all the main program changes to be sent out, all effects program changes to be sent, all sequences previously running to be restarted and for the MIDI output clock (if enabled) to send a START command (a CONTINUE command is normally sent when the sequences are stopped and started using the RUN/STOP key on its own).

TUNE KEY

The function key marked TUNE accesses a utility to assist with the tuning of external synthesisers. The display will show the current set of destinations assigned to the CONTROL keys.



The MIDI input keyboard (or other MIDI controller) will now hold each note played until another is pressed. When a CONTROL key is pressed, the last note played on the input keyboard will be sent out to that destination. Any number of CONTROL keys can be switched on at the same time thus allowing several synthesisers to play while leaving the hands free for tuning.

TUNE is cancelled by pressing either ENTER or PLAY.

3.2 PLAYBACK

TRIGGER PROFILE

The sequence triggering options on the MIDI PERFORMANCE SYSTEM are dependent on the settings of the TRIGGER PROFILE keys (the grey keys on the right of the front panel plus the STEP key). Turning any Trigger Profile key ON or OFF, either singly or in groups, does not affect any sequences currently running but sets up the conditions for how the next sequence(s) are to be triggered.

The combinations of Trigger Profile keys which can be ON or OFF prior to triggering a sequence are vast and it is not possible within the scope of this manual to give a detailed account of all musically useful permutations. Instead, a brief synopsis of the function of each Trigger Profile key is given. However, for the purposes of aquiring familiarity with their operation, it is best to start experimenting with all Trigger Profile keys turned OFF.

Each of the 12 CONTROL keys can now be used to turn the sequences ON or OFF, with each sequence starting from the beginning each time it is activated. The RUN/STOP key behaves as expected - it either runs all active sequences or stops them. However, any sequences stopped then started again from the RUN/STOP key will play from the point they were halted. The RUN/STOP key can also be controlled from a footswitch input on the rear panel.

EXT TRIG KEY

If the EXT TRIG (EXTernal TRIGger) is now switched ON, pressing a CONTROL key will cause its LED to flash. This places the assigned sequence into a "pending" state, i.e. it is awaiting an external trigger before it runs. Pressing a note on the MIDI keyboard will then start the sequence running at the pitch of the note played. Playing another note on the keyboard will cause the sequence to transpose to the new pitch. This principle is extended to allow the same sequence to play at multiple pitches (up to 8). This will also apply if several sequences are pended at the same time prior to triggering. The general technique is that so long as <u>one</u> note is being held down, other notes can also be played and the sequences will all run at these multiple pitches. This means that a chord can be played directly or a single note held down and the remaining notes added one by one to achieve the desired effect. When all notes are released, the sequences will continue to run at these multiple pitches until another note or notes cancels the previous effect.

It is important to note, however, that when sequences are running, the action of pending a new sequence will effectively "pitch-lock" the currently running sequences. This is necessary so that transpositions can be applied to the new sequences as mentioned above without affecting those sequences already running.

When EXT TRIG is on, the footswitch or some other trigger (TRIG input) or gate (CONTROL input) can be used to activate pending sequences. The sequences will then run at their original recorded pitch without transposition.

RESTART KEY

When RESTART is OFF, each individual sequence when triggered or re-triggered will always start from the beginning without affect other sequences. When RESTART is ON, all currently running sequences will start from the beginning each time a sequence is triggered or re-triggered.

ALIGN KEY

This is used to align the starting points of all sequences, rather like the track mute/unmute facilities on a multi-track tape recorder. The first sequence activated after ALIGN is turned on will be the sequence to which all other triggered sequences will be aligned (not those currently running). This feature works well when several long sequences are being used since the mute/unmute action will be most apparent. The ALIGN key should be used with caution during a Configuration change (section 3.4) as the first sequence to run after the change will force all others to restart using any new assignments in the Configuration.

REL QUANT KEY

This is short for RELATIVE QUANTISATION and causes the next triggered sequence(s) to be quantised relative to those already running. There are two quantisation levels which can be applied, 1/4 (24 clock pulses) or 1/2 (48 clock pulses). Relative Quantisation should be set (section 3.5) to a sensible multiple of Quantisation levels (section 2.7), e.g. if Rel Quant is 1/4, then Quant level for the sequence should not be 1/6 (16 clock pulses).

If your timing is early when triggering a sequence, a delay will be heard before the sequence is actually triggered, due to the effect of Relative Quantisation. Relative Quantisation, therefore, should be switched off when immediate response is required.

TRANSPOSE KEY

This is really a second level transposition. It allows all active, i.e. running, sequences to be transposed in real-time from the MIDI keyboard. This transposition is essentially monophonic and other sequences can be triggered at the same time. However, transposition of active sequences will be referenced to the first note played if the new sequences are triggered from multiple pitches. The TRANSPOSE feature is particularly useful when NP TRIG is OFF. For example, transposition of the sequences can be applied with the left hand on the keyboard, and as long as the note is held down, "normal" playing is possible using the right hand without causing further triggering or transposition.

MOM KEY

This permits MOMENTARY action, i.e. the sequence(s) being triggered will only run while the notes on the keyboard are held down. This also applies to CONTROL key presses when EXT TRIG is OFF. Pressing MOM will also cause all currently running sequences to become "pitch-locked".

OVERRIDE KEY

It has been mentioned that after a group of sequences have been triggered, their pitch becomes "locked" as soon as another sequence is pended. The OVER-RIDE facility allows you to change the pitch of any "locked" sequence by holding down the new note on the keyboard then pressing the appropriate CONTROL key. OVER-RIDE can be used when EXT TRIG is OFF. When EXT TRIG is ON, OVERRIDE effectively disables it. OVERRIDE also disables the TRANSPOSE key.

BUILD KEY

This allows the notes triggering a sequence to be built up, one or more at a time, even if all notes are released in between. It also causes each note to have a toggle action. Up to 8 notes can be built up, any further notes replacing existing notes. BUILD has no effect if MOM is ON.

CYCLE KEY

This feature allows pending sequences to be triggered in a sequential manner from the MIDI keyboard or footswitch (CONTROL input). In other words, the first trigger received will activate the first pending sequence, the second trigger received will activate the next pending sequence, and so on until all pending sequences are activated. It then cycles back to the first sequence. If BUILD is ON, triggers from the keyboard deactivate the sequences in turn (i.e. return to a pending state) by pressing the same notes which initially triggered them.

EXCL KEY

This means EXCLUSIVE and will only allow one sequence to be running at a time, All others will be turned off automatically when a sequence is triggered.

GROUP KEY

This sets up four trigger groups (I, II, III and IV on the front panel) in which sequences can be separately controlled. The MIDI keyboard will also be zoned (divided into four predetermined regions) when GROUP is ON, each zone only triggering sequences in its corresponding group. The keyboard zoning can be different for each Configuration (set from Config Options, section 3.5) and can be particularly useful when some CONTROL keys are operating in THRU modes (see ASSIGN SEQUENCE, Section 3.1). The GROUP action also applies to EXCL, CYCLE and TRANSPOSE.

STEP KEY

This allows each incoming trigger (or CONTROL key press) to advance the sequence(s) by single simultaneous events. If you are planning to use a sequence by single-stepping it, then the sequence should be recorded in Step time otherwise events, e.g. chords, may not be actual simultaneous events and will subsequently not single-step as expected.

NP TRIG KEY

This means NEW PITCH TRIGGER and allows retriggering even if other notes on the keyboard are being held down, i.e it is not necessary to release all notes in order to retrigger. This is a useful feature when used with a group of HOLD-AT-END sequences, for example.

3.3 TEMPO ADJUSTMENT

The display shows the screen in PLAY mode with the TEMPO key ON :

```
120   A1 A2 A1 A1 A1 B1 B1 B2 B3 C1 D1 A1
120   05 06 07 23 43 44 45 56 91 92 54 56
```

SUDDEN CHANGES

The figures on the left of the display show the Current and Next tempo values. If the wheel is moved at this point, the upper of the two figures (the Next tempo value) will change. When ENTER is pressed, the Current tempo (the lower figure) will change to the new value. The TEMPO LED will flash at the appropriate rate as a visual indication of the new tempo. This can be done during playback, unlike use of the function keys which require the RUN/STOP key to be OFF.

GRADUAL CHANGES

Gradual tempo changes can be applied during playback by holding down the TEMPO key and turning the wheel. In this case, only the Current tempo value (the lower figure) shown in the display will alter. The original tempo of the music can, therefore, be restored by pressing ENTER since the Next tempo value will not have altered.

Tempo can also be adjusted while recording in real-time by turning the wheel, the actual tempo value being shown in the display. The diagram below shows a possible display while recording in real-time.

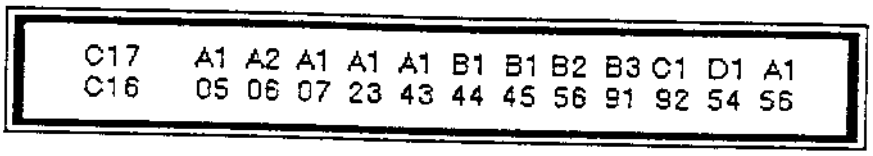
```
Seq   27 : Qnt  : Bar   14 : Bt size   4 :
Mem 80 % : 1/48 : Bt 03 . 01 : Tempo 120 : REC
```

During Real-time recording, tempo rate can be varied directly by turning the wheel.

EXTERNAL CLOCKING

If the clock driving the MIDI PERFORMANCE SYSTEM is external (from the SYNC input or MIDI clock), the tempo facilities will not operate.

The diagram shows the display in PLAY mode, with a possible set of sequence and destination assignments for each CONTROL key. If the CONFIG key is pressed, the figures shown in the left of the display will be prefixed by a "C".



These figures represent the Current (lower figure) and Next (upper figure) CONFIGURATION numbers. A Configuration is simply a stored program which contains a predetermined set of sequence and destination assignments similar to the above, plus some data regarding tempo, Trigger Profile, keyboard zoning, sequence behaviour when the config is changed, etc. The precise list of options are detailed in the next section (3.5).

It is important to note that whenever sequence or destination assignments are changed, you will be making alterations to whichever Configuration is in use, i.e. the Current Configuration.

24 different Configurations are stored by the MIDI PERFORMANCE SYSTEM, ready for instant recall. The Next Configuration is recalled simply by pressing the ENTER key (or footswitch). The Next Configuration number will be automatically set in the display to be one number higher than the Current Configuration number but the wheel can be used to change this as required before pressing the ENTER key.

Configurations can be changed during playback, i.e. when sequences are running. By careful organisation of the Configuration data, some spectacular effects can be produced when the change is made.

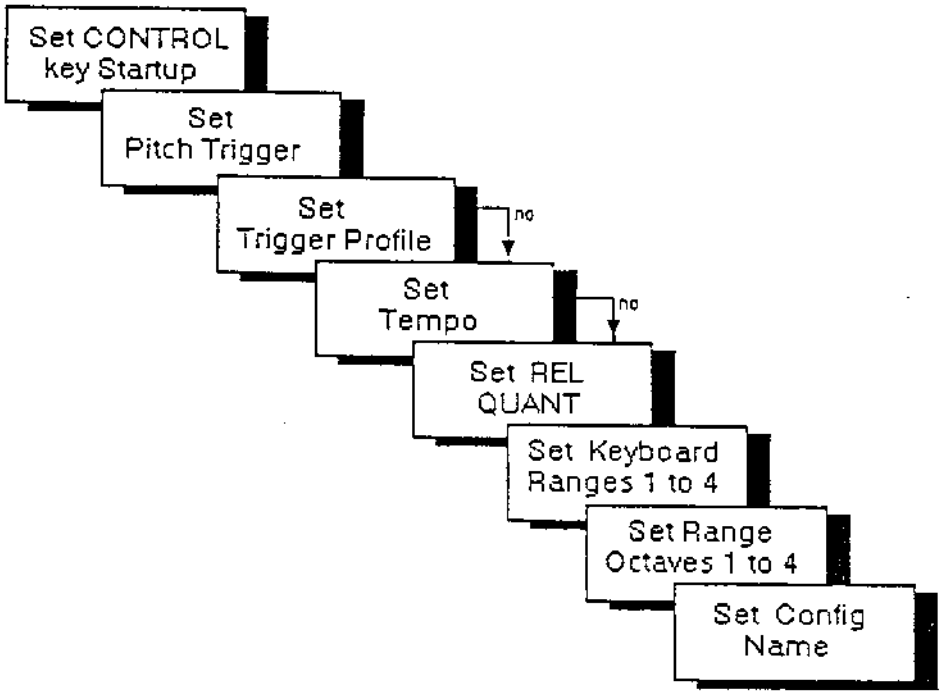
DELETE

Any Configuration can be deleted (RUN/STOP must be OFF) in PLAY mode by holding down the DELETE key then pressing the CONFIG key as instructed by the display. The display will now show the number and name of the Current Configuration, which can be changed by turning the wheel. ENTER is then pressed to delete the Configuration shown.

Deleting a Configuration will assign MIDI THRU sequences to destination A1 for each CONTROL key. All other data will be returned to a default state, which is discussed in the next section.

3.5 CONFIGURATION OPTIONS

When a new Configuration is selected, each CONTROL key will be automatically assigned the previous sequence and destination in use for that particular Configuration. However, there are several other parameters which can be changed. A list of the available options are to be found "under" the CONFIG OPTIONS function key. The diagram below outlines the various options in the order they are presented. The PLAY or REC/EDIT keys can be pressed at any time while this list is displayed to "escape" without further action being taken.



CONTROL KEY STARTUP

This decides how a sequence is to behave as soon as the Configuration is invoked. There are basically three choices, which can be set by pressing the required CONTROL key so that its display position reads ON, OF or is blank.

ON — A sequence which was previously running on the particular CONTROL key will terminate and the new sequence assigned to the key will be started. Pitch, or multiple pitch information will be retained when the new sequence is run. If no sequence was running on the CONTROL key when the Configuration was changed, the new sequence will either start immediately (if EXT TRIG is OFF) or become "pending" (if EXT TRIG is ON).

(Blank) This allows sequences already running to continue to run when the Configuration is changed until they are turned off. Only then will the "new" sequence be assigned to the CONTROL key. This is the default state reverted to when a Configuration is deleted.

OF — (OFF) This will stop any sequence currently running when the Configuration is changed.

PITCH TRIG

This allows sequences to be exempt from transposition, which is particularly useful when, for example, drum patterns are recorded. The sequences will trigger from the keyboard in the usual way, but will only run at their original recorded pitch. The default is for PITCH TRIGGERING to be ON, but can be changed by pressing the required CONTROL key(s).

TRIGGER PROFILE

This allows a new Trigger Profile to be set up each time the Configuration is invoked. If set to ACTIVE, the display will then ask you to set the required Trigger Profile by switching the appropriate keys ON or OFF. ENTER is then pressed to move to the next set of options.

TEMPO

You may also specify if a new tempo is to be used when the Configuration is invoked. Selecting tempo to be ACTIVE will then allow you to set the new tempo rate before proceeding.

REL QUANT

The RELATIVE QUANTISATION for the Configuration (section 3.2) can be changed from the default of 1/4 (24 clock pulses) to 1/2 (48 clock pulses) if required.

RANGES

This feature allows the MIDI input keyboard to be split into four non-overlapping regions. You will be asked to specify the lowest notes in each range either by playing the note on the keyboard or by turning the wheel until the required note is shown. The default values for these ranges are :

Range 1	C- (MIDI note 0)
Range 2	C2 (MIDI note 48)
Range 3	C3 (MIDI note 60)
Range 4	C4 (MIDI note 72)
Range Top	G8 (MIDI note 127)

This splits the keyboard into four ranges with range 1 being every note up to C2 and range 4 being every note above C4. It must be pointed out, however, that although these ranges will only be used when the Trigger Profile GROUP key is ON, the upper and lower limits specified effectively alter the <u>normal</u> operating range of the keyboard so that notes less than the bottom note of range 1 or the top note of range 4 will be ignored. By default, the entire MIDI note range is used (note 0 to 127).

RANGE OFFSETS

An Octave Offset for each of the four ranges can now be specified. A default of 0 is used for each range so that the keyboard will play normally. The Offset can be up to plus or minus 5 octaves if the MIDI minimum and maximum note limits are not exceeded.

NAME

The final option allows you to name the Configuration. The cursor will be resting on the first character, which can be changed by using the wheel. Pressing ENTER will then move you to the next character, and so on.

PROGRAM CHANGES

When a new Configuration is invoked, the previously specified EFFECT PROGRAM change commands will be sent out (section 3.1). Also, when any new sequence is run within the Configuration, any PROGRAM change commands associated with the sequence will also be sent. However, pressing PLAY and RUN together will cause <u>all</u> PROGRAM and EFFECT PROGRAM commands to be sent. A MIDI START message will also be sent if the MIDI OUTPUT CLOCK is enabled (section 2.6).

3.6 PLAYBACK COMMANDS

The full list of COMMANDS available in PLAY mode are listed below. Press PLAY to "escape" from any menu without taking further action.

COPY

This allows a Sequence, Configuration or Performance to be copied and the first display will ask you to specify which. You will then be asked to specify where the copying is to be done, i.e. between INT>INT memories, INT>CART, CART>INT or CART>CART. You will then be asked for the sequence, Configuration or Performance number to copy. This is selected by turning the wheel. Finally, you will be asked for the number of the sequence, Configuration or Performance to copy to, which is also selected by using the wheel.

APPEND

This allows a Sequence to be added to the end of another Sequence. The APPEND command, however, will take place within the memory currently selected, i.e. either Cartridge or Internal. You will first be asked for the number of the Sequence to Append then for the number of the Sequence to Append to. These are selected in the same way as the COPY command.

DUMP

The DUMP command allows entire memory contents to be copied to another storage device (on MIDI output D only). The options are INT/CART (internal to Cartridge memory), INT/MIDI (internal memory to an external storage device via MIDI) or CART/MIDI (Cartridge memory to an external storage device via MIDI).

If INT/CART is selected, the display will now warn you that this action will over-write the current Cartridge memory contents. The option of proceeding with the DUMP command or aborting it will be given.

If you select MIDI DUMP from either Internal or Cartridge memory, you will then be asked to set up the external device then press ENTER to start the process. A message will appear in the display when the DUMP is completed or if there were any problems which have prevented the DUMP from taking place.

The above are simplified instructions only. Please refer to the reference section of this manual.

LOAD

The LOAD command allows entire memory contents to be copied from another storage device. The options are CART/INT (Cartridge to Internal memory), MIDI/INT (an external storage device to Internal memory via MIDI) or MIDI/CART (an external storage device to Cartridge memory via MIDI).

If CART/INT is selected, the display will now warn you that this action will over-write the current Internal memory contents. The option of proceeding with the LOAD command or aborting it will be given.

If you select LOAD from an external source via MIDI, you will then be asked to set up the external device then press ENTER to start the process. A message will appear in the display when the LOAD is completed or if there were any problems which prevented the LOAD from taking place.

The above are simplified instructions only. Please refer to the reference section of this manual.

FORMAT

The FORMAT command prepares the Internal or Cartridge memory for use by the MIDI PERFORMANCE SYSTEM. Using the FORMAT command will, therefore, erase the previous memory contents. A warning will be given regarding this, and you will be given the option of proceeding with or aborting the FORMAT command.

GENERAL OPTIONS

3.7

The GEN OPTIONS key in PLAY mode (with the RUN/STOP key OFF) is used to specify and alter certain parameters applicable to the overall system. Pressing PLAY from any of the displays will allow you to "escape" without further action being taken.

INT/CART

This simply selects whether you wish to run from Internal or Cartridge memory. The red "CART" indicator will turn on when CART is selected.

WRITE-PROTECT

This will set write-protection ON or OFF in the currently selected memory. No recording or editing can take place when WRITE-PROTECT is ON.

CLOCK

The display will first ask you to select the master clock source. INT allows the MIDI PERFORMANCE SYSTEM to respond to its own internal clock source. Selecting MIDI allows the unit to be driven from external equipment using the MIDI clock (24 pulses per quarter note). EXT/SYNC allows the unit to be driven from a pulse train present at the SYNC input socket on the rear panel. You will then be asked to specify whether you require 24, 48 or 96 p.p.q.n. A pulse train can also be sent from the SYNC socket on the rear panel. Again, you will be asked to specify 24, 48 0r 96 p.p.q.n.

The MIDI PERFORMANCE SYSTEM can also send MIDI clock (24 p.p.q.n.) on each of the four output ports, A, B, C and D. The display will now ask if you wish the clock enabled for each of the four outputs in turn.

The RUN/STOP key will obviously start and stop the EXT/SYNC output during playback. However, stopping and starting playback using the RUN/STOP key will affect the MIDI clock output in a slightly different way, i.e. STOP will cause a MIDI STOP command to be sent while RUN will send a MIDI CONTINUE command. A specific MIDI START command can be sent by holding down the play key before pressing RUN.

INPUT OPTIONS

The first option under the INPUT OPTIONS will allow you to set the MIDI input to receive on OMNI (any channel) or to select an appropriate channel number if OMNI reception is not required. The wheel is turned until the required channel number is reached, then ENTER pressed.

You will then be presented with a list of items, each of which you can ignore or accept as required. These are : note data (useful for building Control sequences), program change messages, key pressure data, pitch bend and Other Data (controller information, MIDI Mode messages, etc.).

CLOCK and INPUT OPTIONS are also available from RECORD mode.

4 PERFORMANCES

CONTENTS

RECORDING A PERFORMANCE

The MIDI PERFORMANCE SYSTEM has the ability to record up to 12 complete "Performances". This means that it will store all keypresses and releases on the front panel, all notes played on the external MIDI keyboard (or other controller), footswitch actions, tempo and Configuration changes, etc.

While recording a Performance, the MIDI PERFORMANCE SYSTEM will behave similarly to PLAY mode. Editing is also similar to RECORD mode, with the addition of a few extra symbols in the display. It is important, therefore, that you are familiar with "normal" recording and playback operation before attempting any serious work with complete Performances.

To record a Performance, press the PERF key (the RUN/STOP key must be OFF). The display will now ask you to select the required Performance number by using the wheel and the ENTER key, as in other modes. When this is done, you will be placed in Performance PLAY mode. Performance RECORD mode can be obtained by pressing the REC/EDIT key. Normally Performances should be recorded in real-time then edited in step-time though it is possible to create simple Performances from scratch in step-time.

REAL-TIME RECORDING

Assuming you are starting with a blank, unrecorded Performance, real-time recording is commenced by pressing RUN. When RUN is ON, but before any CONTROL key is pressed, the Configuration, Trigger Profile and tempo may be set to the required values. This will be stored by the Performance so that replay will start from an identical condition.

```
120   Mem 61%  Bar 01 Bt 01.01 RECORD
120   14 15 16 16 17 25 91 34 72 71 11 12
```

The display will show the Current and Next tempo (or Configuration), the memory left, the Bar/Beat/Fraction and the current sequence assignments. As soon as a CONTROL key is pressed, recording will start. However, if this CONTROL key only pends a sequence, time will not advance until the sequence is activated. In other words, to all intents and purposes the Performance starts from the first activation of a sequence.

The MIDI PERFORMANCE SYSTEM can now be used as though it were in PLAY mode and all front panel keypresses and trigger notes played on the keyboard will be recorded in the Performance. If THRU modes are also included as part of the sequence assignments in the current configuration, all keyboard activity which accesses the THRU destinations will also be recorded. This allows prercorded and "live" material to be freely mixed.

Recording is terminated by pressing the RUN/STOP key. This returns you to Performance Step-time mode at the current time. When going from Step-time to Real-time recording on an existing Performance, the MIDI PERFORMANCE SYSTEM again enters at the current time but in this case it has to perform a very complex locating function in order to pick up correctly. This locate will normally take several seconds during which the display reads "Locating .. Please Wait".

PUNCH-IN

If the Performance on which you are recording contains previously recorded data, a manual Punch-In mechanism similar to sequence real-time recording will be operational. As soon as the RUN key is pressed to commence recording, the Performance will play. Pressing any key on the front panel, playing a note on the keyboard or moving the wheel will enable the Punch-In facility. At the point RUN/STOP is pressed again to terminate the recording, a message will appear in the display asking if you wish to keep the new data recorded from the Punch-In point.

DISPLAY SYMBOLS

You will be presented with a display very similar to the display used for Step-time recording, but additional symbols will be present in the Note Field. The complete list of symbols (which are entered automatically during real-time Performance recording) are :

C 3	This shows a recorded note with its corresponding octave. The velocity of the note can be altered using the VAL key.
* m	Non-note MIDI event, e.g. synthesiser program change events. Non-note events have no effect in Performances unless Thru sequences are assigned to the front panel.
↑ 8	This indicates a CONTROL key event. A down arrow means the CONTROL key has been switched ON while an up arrow means it has been switched OFF. The CONTROL key number is shown. ON or OFF events can be inserted by pressing the CONTROL key as appropriate.
↑ f	This represents a CONTROL footswitch/gate event (down for gate ON, up for gate OFF). These can be inserted using the CONTROL footswitch input.
* p	This represents a change in the Trigger Profile. This is inserted or edited by pressing the Trigger Profile keys.
* t	This represents a change in the current tempo to a new value. This can be inserted in Performance Step-time recording by holding down ENTER and pressing the TEMPO key. The VAL key can be used to edit the tempo value after recording.
+ t	This indicates that the tempo at this location increases (a "-" would indicate a decrease). This is can be entered by holding down the TEMPO key and turning the wheel.
* c	This indicates a change in the current Configuration and can be inserted in Performance Step-time recording by holding down ENTER and pressing the CONFIG key. The VAL function key can be used to edit the Configuration number after recording.

When first recording to a blank Performance, the MIDI PERFORMANCE SYSTEM automatically inserts initial data consisting of Configuration, tempo and Trigger Profile values. This is to ensure that the Performance always starts from the same initial state regardless of the Configuration, tempo or Trigger Profile on entry to Performance mode. In a blank Performance, the header data appears as four items : one each for Configuration and tempo and two for Trigger Profile. These cannot be deleted when the Performance is blank and it is inadvisable to delete them thereafter.

Once recorded, the Performance can be edited in a similar manner to that used for single sequences, e.g. note deletion and insertion, SLIDE, MOVE, LENGTH and VAL work as expected. However, when Performances are edited, it is sometimes necessary to keep a clear head. For example, assume you had recorded a short Performance with the EXT TRIG key OFF and you were simply triggering sequences from the CONTROL keys. If you now go back and edit the Performance so that the EXT TRIG key is now turned ON, replaying the Performance will only result in pending and unpending sequences as note data is not present.

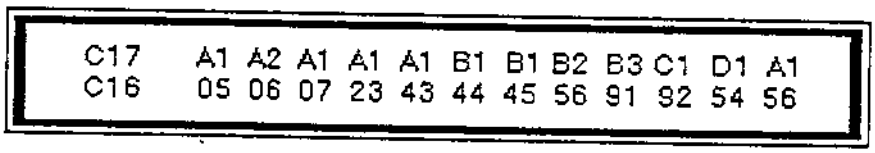
DELETE

The current Performance can also be deleted when RUN/STOP is OFF, by holding down the DELETE key then pressing ENTER.

Exit from Performance mode is by pressing the PERF key once more.

PLAYBACK OF PERFORMANCES 4.2

To replay a Performance, first enter Performance mode by pressing the PERF key. The display will now ask you to select the required Performance number by using the wheel and the ENTER key. When this is done, you will be in Performance PLAY mode.



The displays in Performance PLAY mode are identical to those used in sequence PLAY mode. Once the RUN key is pressed and playback is started, the CONTROL and Trigger Profile keys will illuminate as necessary to show their status as the song progresses.

Replay of the Performance can be stopped and started by using the RUN/STOP key as in normal playback. Holding down the PLAY key and pressing RUN will restart playback of the Performance from the beginning. When replay of the Performance has ended, the LED on the PERF key will go out. Pressing RUN again will re-run the Performance.

Tempo changes can still be made while the Performance is replaying, but any change made could be modified by the Performance itself. This also applies to the mixing of Performance and live data, particularly with regard to changing Configurations manually during Performance replay. Essentially, care should be taken when playing live over a replaying Performance to avoid unexpected and confusing results.

MIDI SONG POINTERS

MIDI Song Pointers can be used during Performance replay to access particular points in the Performance. In order to pick up the Song Pointer position, the MIDI PERFORMANCE SYSTEM does a silent locate from the start of the Performance in a manner similar to the transition from Step-time to Real-time recording. This locate can take several seconds, but the MIDI PERFORMANCE SYSTEM will follow any MIDI clock pulses it receives enabling it to synchronise correctly once the locate has finished. The only limitation is, therefore, that the control unit which is transmitting the Song Pointers, etc. to the MIDI PERFORMANCE SYSTEM (or the tape machine if using a SMPTE-MIDI convertor) should be started a few seconds before the time at which you want monitoring to start.

REFERENCE

CONTENTS

QUICK REFERENCE

TO QUANTISE A SEQUENCE	Switch to REC/EDIT mode then select sequence. Press SEQUENCE OPTIONS. Keep pressing ENTER to bypass the TIME SIG and KEYNOTE options. Adjust quantisation value using wheel.
TO SYNC UP A DRUM MACHINE	Make sure MIDI output clocks are enabled (press GENERAL OPTIONS then select CLOCK) for the MIDI port(s) connected to the drum machine. To start the drum machine from the beginning, hold down PLAY while pressing RUN. Alternatively, if using the SYNC outputs, make sure the output p.p.q.n. is set to what you require.
TO SET UP MIDI THRU's	From PLAY mode, press the ASSIGN SEQUENCE key. A sequence number of 0 represents a THRU mode to the destination. Destinations are also changed from PLAY mode by using the ASSIGN DESTINATION key.
TO CHANGE THE INPUT RECEIVE CHANNEL	From either RECORD or PLAY mode, press the GENERAL OPTIONS key and select INPUT OPTIONS. The MPS can now be made to receive on any channel or a specific channel.
TO FILTER OUT DATA WHEN RECORDING OR USING THRU MODES	This follows from the INPUT OPTIONS described above. The options are Note data, program change messages, key pressure data, pitch bend data and Other data.
METRONOME	The internal metronome can be turned on or off when recording (page 14). Alternatively, an external metronome output socket is fitted to the rear panel. The external metronome output should be connected directly to a small amplifier. This cannot be turned on or off from the MPS.
SAVING TO CARTRIDGE	From PLAY mode press COMMANDS then select DUMP.
LOADING FROM CARTRIDGE	From PLAY mode press COMMANDS then select LOAD.
RUNNING FROM CARTRIDGE	From PLAY mode press GENERAL OPTIONS then select CART.
DELETING SEQUENCES	In PLAY mode, hold down DELETE then press appropriate CONTROL key. In RECORD/EDIT mode, hold down ENTER then press DELETE to erase the current sequence.
DELETING PARTS OF SEQUENCES	Use the Section Delete facility. From REC/EDIT mode press COMMANDS then set start and end SECTION points by scrolling to desired points in the sequence. Then select DELETE SECTION. See page 13 for more information.
TO WRITE-PROTECT THE MEMORY	From PLAY mode press GENERAL OPTIONS then select WRITE PROTECT.
TO MAKE SEQUENCES EXEMPT FROM TRANSPOSITION	From PLAY mode, press CONFIG OPTIONS. Press ENTER to bypass the first option and reach the PITCH TRIG option. Press the required CONTROL keys to turn pitch triggerring on or off.
TO CHANGE TEMPO OR AUTO START/STOP SEQUENCES WHEN CHANGING CONFIG	From PLAY mode, press CONFIG OPTIONS. The various options will be presented. A diagram offering a full explanation is shown on page 25.
TO CHANGE STEP SIZE OR ADD RESTS WHEN RECORDING	Hold down the STEP key and press appropriate CONTROL key.

TROUBLESHOOTING

UNIT NOT RECORDING OR TRIGGERING FROM EXTERNAL KEYBOARD.	Ensure MPS receive channel matches the keyboard's transmit channel (page 14 or 28). Problems can also arise when the transmitter sends data on more than one channel simultaneously (e.g. a mother keyboard with DUAL or LAYERING capabilities) and when the MPS is receiving in OMNI (also page 14 or 28).
PITCH BEND OR OTHER DATA NOT BEING RECORDED OR SENT THRU	The Data Filter (part of the INPUT OPTIONS) may be blocking this data (page 14 or 28).
DRUM MACHINE NOT SYNCING UP	Ensure that MIDI CLOCK is enabled on the output port connected to the drum machine (page 14 or 28).
NO OUTPUT	Ensure that synthesisers are set to receive on the same channel as the assigned destination (page 19).
MPS WILL NOT GO INTO RECORD MODE	Ensure Memory Write-protect is OFF (page 28).
SOURCE KEYBOARD's VOICES PLAY WHEN TRIGGERING OR RECORDING.	Ensure that LOCAL OFF is selected on the synthesiser. Alternatively, LOCAL OFF messages can be sent from the MPS (page 20).
DELAYS WHEN TRIGGERING SEQUENCES	This may be an effect of REL QUANT. Either set to a different level (page 26) or turn off from TP key.
SEQUENCES WILL NOT TRANSPOSE	PITCH TRIGGER (part of CONFIG OPTIONS) will be set to OFF (page 26).
LIVE PLAYING NOT RECORDED IN A PERFORMANCE	This is because a THRU mode was not active when the Performance was being recorded (page 30).
CANNOT COPY TO OR FROM CARTRIDGE	Either the Cartridge or the Internal memory will be write-protected (page 28).
MPS WILL NOT RUN SEQUENCES	The MPS may be set to EXT CLOCK. This will be shown in the left of the display (page 14 or 28).
UNIT HAS "LOCKED UP"	Try turning machine off then on again (no data should be lost). Sometimes problems with MIDI LOAD can result in machine lock up to the extent that none of the front panel keys operate. Since this will prevent access to the memory FORMAT facility, an additional FORMAT mechanism can be used on power-up (page 39).
NOTES ARE MERGING INTO EACH OTHER AFTER RECORDING IN STEP TIME	Note Length may be set too high for the particular envelope used on the synthesiser. Set note length to lower value (default value is 75% - page 14).
SEQUENCE NOT TRANSPOSING FROM CORRECT PITCH	The keynote of the sequence may have been altered (default is middle C (C3) - page 15). Alternatively, if GROUP is ON, octave transposition offsets may be in use (page 26).

FUNCTION KEY OPTIONS : PLAY MODE

In PLAY mode, the function keys applicable are labelled in white below the keys.

COMMANDS	COPY APPEND DUMP LOAD FORMAT
GEN OPTIONS	INT/CART WRITE-PROTECT CLOCK INPUT OPTIONS
CONFIG OPTIONS	CONTROL KEY STARTUP CONTROL PITCH TRIGGER TRIGGER PROFILE OFF/ON TEMPO OFF/ON RELATIVE QUANTISATION RANGE 1 START NOTE RANGE 2 START NOTE RANGE 3 START NOTE RANGE 4 START NOTE RANGE 4 TOP NOTE RANGE 1 OCTAVE OFFSET RANGE 2 OCTAVE OFFSET RANGE 3 OCTAVE OFFSET RANGE 4 OCTAVE OFFSET CONFIG NAME
ASSIGN SEQUENCE	SINGLE / 12 FREE SELECT CONTROL KEY SELECT SEQUENCE NUMBER REPEAT MODE VELOCITY RATIO
ASSIGN DESTINATION	SELECT CONTROL KEY SELECT DESTINATION PROGRAM CHANGE OFF/ON MIDI MODE OFF/ON LOCAL OFF/ON EFFECT PROGRAM OFF/ON
INFO	Software Version number / Reserved for expansion.
TUNE	INSTRUMENT TUNE FUNCTION
DELETE	SELECT CONTROL OR CONFIG KEY (when held)

FUNCTION KEY OPTIONS : RECORD MODE

In RECORD/EDIT mode, the function keys applicable are labelled in grey above the keys.

COMMANDS	PUNCH IN # PUNCH OUT # CANCEL PUNCH # SET START SECTION SET END SECTION CANCEL SECTION DELETE SECTION
GEN OPTIONS	NOTE LENGTH METRONOME CLOCK INPUT OPTIONS
SEQ OPTIONS	TIME SIG KEYNOTE # QUANTISATION SEQUENCE / PERFORMANCE NAME
SLIDE	applicable to single events.
MOVE	applicable to single events.
LENGTH	applicable to single events.
VAL	applicable to single events.
DELETE	applicable to single events.

Not applicable in Performance Mode.

MISC. INFORMATION

SAMPLE DUMP

The MIDI PERFORMANCE SYSTEM (MPS) allows its memory contents or the contents of a Cartridge to be dumped and reloaded via MIDI. This allows data storage on external devices such as personal computers. The MPS dump/load feature mimics the SAMPLE dump standard defined in the MIDI specification. Although the MPS data is not sample data, the fact that it conforms to this standard allows data transfer to and from a wide range of equipment, i.e. any other device or software conforming to the MIDI dump standard.

The MPS dump/load software supports both "closed-loop" (2 way) and "open-loop" (1 way) communication. Essentially the two systems work as follows :

CLOSED-LOOP : Blocks of data are sent from the transmitting end to the receiving end. After each block, the receiving end checks the data to see whether it has arrived intact. If so, it stores the data and sends back a request for the next block. If the data has not arrived intact, it sends back a request for retransmission of the faulty block.

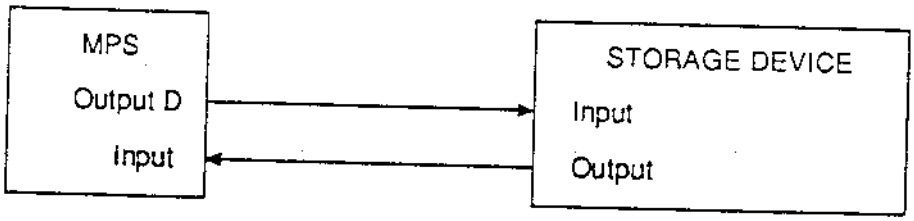
OPEN-LOOP : The transmitting end sends blocks of data with a short wait between each one. The receiving end has no way of replying, so the transmitting end does not know whether data is arriving intact. Hence it assumes everything is OK, and never retransmits blocks.

Generally, the closed-loop system is superior and should be used whenever possible. It has the advantages of speed (MPS dump or load is approx. 17 seconds as opposed to 27 seconds in open-loop case), a lesser chance of ending up with bad data and the transmitting end will know if the receiving end has entered some special state, e.g. if a pause is required to access a disc drive.

SETTING UP

The following procedure allows for closed-loop or open-loop communication (for dump and load), but has the advantage that it will default to closed-loop if the other device supports it.

1. Connect the two MIDI leads as shown. Note that the MPS output D must be used.



2. Set the MPS input to either OMNI ON mode (from the DATA FILTER, under GEN OPTIONS), or set its channel to correspond with the data dump channel on the other device. If the MPS is set to OMNI ON, you can normally ignore setting up dump channel numbers - the MPS will receive on any dump channel and will attempt to adapt its transmissions to whatever channel the other device is using. This may not work, however, if the other device only supports open-loop. In such cases, set both ends to the same channel number. Note that on the other device the dump channel MAY not be the same as its normal MIDI channel.

MIDI DUMP

After DUMP is selected from the COMMANDS menu (and Int or Cart selected), the display will read "Ready to dump. Set up external device. Press ENTER to start". Before pressing ENTER, set up the other device so that it is ready to accept a dump. If it asks you to select a sample number, select the lowest possible number (0 or 1). If the other device supports the closed-loop system, the dump will start up automatically. If not, pressing ENTER will start it from the MPS.

The display will now read, "Dump in progress. Press PLAY to abort". This will normally be displayed for approx. 15-30 seconds.

If the dump finishes successfully, the display will advise you and ask you to press ENTER to return to PLAY mode. You will also be advised if the other device aborts the dump for any reason, e.g. if you stop it manually from the other end.

MIDI LOAD

LOADING DATA VIA MIDI TO THE MPS CAUSES THE WHOLE OF THE CURRENT MEMORY (INTERNAL OR CARTRIDGE) TO BE OVERWRITTEN. IF YOU WANT TO KEEP THE DATA IN THE CURRENT MEMORY, SAVE IT BEFORE SELECTING LOAD.

After LOAD is selected from the COMMANDS menu (and Int or Cart selected), the display will read "Ready to load. Set up external device. Press ENTER to start". Before pressing ENTER, set up the other device so that it is ready to send the data you want to load into the MPS. If the other device supports the closed-loop system, the LOAD may start automatically. If not, pressing ENTER will start it from the MPS.

The display will now read, "Load in progress. Press PLAY to abort". This will normally be displayed for approx. 15-30 seconds. Generally, it is unwise to abort a LOAD since the MPS memory will become seriously corrupted. Only use it if the communication seems to have locked up for any reason. This can happen if repeated data transmission errors occur.

The display could also inform you that it is receiving Invalid Data and ask you to press ENTER to try again. The most likely cause for this message is attempting to load a non-MPS data file. The MPS looks for particular identification information and it will display this message if it is not found.

If the load finishes successfully, the display will advise you and ask you to press ENTER to return to PLAY mode. You will also be advised if transmission errors occur during the load and the other device does not support closed-loop communication. In this case, the MPS will proceed to the end of the LOAD as if everything were OK, but will then advise you that errors have occured. The safest course of action is then to try another LOAD.

DUMP / LOAD TECHNICAL INFORMATION

Default dump/load transmit channel is the universal channel (7FH). The MPS will always transmit on channel 7FH until it receives a message on another valid input channel. It then adapts to the received channel, sending all future messages on this channel. Note that the MPS will always respond to channel 7FH regardless of its input settings.

The "sample number" in the Dump Request and Dump Header must always be 0000H. The MPS does not support any other sample numbers.

The MPS uses a dummy Dump Header as identification to confirm that a data file really is an MPS file before loading it. This prevents accidental loading of data intended for other devices. A full MPS dummy header is as follows :

F0 7E cc 01 00 00 10 00 00 01 17 40 01 01 02 00 03 04 00 00 F7

FORMAT ON POWER-UP

Should the memory of the MPS become seriously corrupted, to the point that access to the FORMAT command cannot be obtained, a facility is included to allow the memory to be formatted on power-up. This is done by pressing and holding down CONTROL keys 1, 3 and 5 (no others). Switching on the mains input to the MPS will now format the memory.

TECHNICAL SPECIFICATIONS

1 x MIDI Input.

4 x MIDI Outputs.

1 x SYNC input (min. voltage 0.75V p-p, min. pulse width 25uS). 24, 48 or 96 ppqn.

1 x SYNC Output (0 to +5V). 24, 48 or 96 ppqn.

3 x Footswitch (or Gate) inputs for remote control of RUN/STOP, ENTER or sequence CONTROL (TTL levels, min. pulse width 25mS).

1 x TRIGGER Input (min. voltage 1.5V p-p, min. pulse width5uS).

1 x Programmable GATE Output (0 to +5V).

1 x METRONOME Output (0 to +5V, continuously running).

1 x DATA CARTRIDGE (37way D type connector).

Maximum voltage to any input : 15V

Inputs and Outputs are diode clamped against over-voltage. Mains filter and PCB transient suppressors built-in.

2 x 40 negative character backlit liquid crystal display (user-adjustable contrast and brightness controls on base of unit).

MAXIMUM INTERNAL STORAGE CAPACITY :

99 sequences, 24 Configurations, 12 Performances. Basic event capacity : 9000
Effective event capacity (typical Performance/sequence ratio) : > 60000

Internal memory is double battery-backed.

MAXIMUM CARTRIDGE STORAGE CAPACITY :

Same as Internal. Runs directly from Cartridge without loading to Internal.

DIMENSIONS :

509mm x 241mm x 68mm (rear) / 33mm (front).
Cartridge : 69mm x 76mm.
All sizes are approximate.

WEIGHT :

approx. 6 Kg

PATENTS PENDING

MIDI IMPLEMENTATION

ZYKLUS LTD. [MIDI PERFORMANCE SYSTEM]

MODEL MPS - 1 Date : 1.12.87 Version : 1.1

Function		Transmitted	Recognized	Remarks
Basic Channel	Default Channel	1 - 16 1 - 16	1 - 16 1 - 16	See note 1
Mode	Default Messages Altered	1 - 4 OMNI ON/OFF, MONO, POLY	1, 3 See note 4	
Note Number	True Voice	0 - 127	0 - 127	
Velocity	Note ON Note OFF	O O 8nH	O+ O+ 8nH or 9nH (v=0)	+Recognised when ACCEPT NOTE ON/OFF is selected
After Touch	Key's Ch's	O O	O+ O+	+Recognised when ACCEPT PRESSURE is selected
Pitch Bender		O	O+	+Recognised when ACCEPT PITCH BEND is selected
Control Change	0 - 121	O	O+	+Recognised when ACCEPT OTHER is selected
Prog Change	True #	O	O+	+Recognised when ACCEPT PROG is selected
System Exclusive		O	O	MIDI Dump/Load See Section in Manual
System Common	: Song Pos : Song Sel : Tune	O+ (All modes) X X	O (Perf modes only) X X	+MIDI output clock selected (per bus)
System Real Time	: Clock : Commands	O O+	O O+	+MIDI output/input clocks selected
Aux Mes-sages	: Local ON/OFF : All Notes Off : Active Sense : Reset	O O+ X X	See note 4 See note 4 X X	+On main mode changes

Notes

1. All assignments and selections retained in non-volatile memory.
2. Most 'recognised' options selectable in INPUT OPTIONS under GEN OPTS key.
3. Most 'transmitted' options selectable under ASSIGN DEST key.
4. Mode messages (OMNI ON/OFF, MONO, POLY, LOCAL ON/OFF, ALL NOTES OFF) can be recorded in sequences or Performances if ACCEPT OTHER is selected. These messages are not recognised in any other mode.

Mode 1 : OMNI ON, POLY
Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY
Mode 4 : OMNI OFF, MONO

X : Yes
O : No

INDEX

ADDITIONAL NOTES

TRANSPOSE KEY OPERATION

The TRANSPOSE Trigger Profile key allows transposition of sequences directly from an external keyboard or other MIDI source. However, because of the way transposition has to be applied to multi-channel polyphonic sequences, slight "glitching" may be heard if your timing is innacurate. This can be overcome in many cases by switching off the EXT TRIG key before transposition is applied. This is particularly true if the sounds used on the receiving synthesiser are short, transient-type sounds.