Studio Mac
Music software for professionals

By Colin Grimmer

Sequencing

The most important activity for a professional musician is the recording and processing of music. This is most commonly referred to as sequencing. A sequencer is best thought of as an electronic multi-track tape recorder: it provides essentially the same service of recording and playback.

But whereas a tape machine records the actual sound made by an instrument, a sequencer records only the control information — in this case, the MIDI data. The separation of control from sound is powerful in concept, providing a flexibility never possible in analogue technology.

Three programs of this type have become popular. They are: Performer from Mark of the Unicorn, Southworth Music System's Total Music and the MidiMac Sequencer by Opcode.

Performer appears to be the most widely established, viewed by many as an industry standard. It is the simplest to use and understand, mimicking closely the operation of a conventional tape machine. It lacks the more complex features provided by the other two, but has a sophisticated range of options nevertheless.

The Opcode sequencer is slightly more difficult to operate. But after the initial shock, it becomes equally efficient in use. It employs a logical and hierarchical approach to building up a song from individual sequences. MIDI functions are extensive: you can define MIDI "instruments" and channel mapping. It works a little like the patch bay in a recording studio.

Total Music has been a dark horse. Its release to the market place was accompanied by rave reviews and several famous musicians singing its praises. Then it went through a period of "growing up in public", with perhaps too much being attempted too rapidly. Earlier versions were bug prone, and serious doubts were raised about its effectiveness as a professional tool. The current version appears solid enough, but the stigma remains, in the eyes of many.

The graphic display and visual manipulation of music data is Total Music's immediate claim to fame. Notes show as bars of different lengths and shades. The bars can be zoomed, stretched and, of course, cut and pasted. A built-in patch librarian is on hand for storing synthesiser patches.

What is a sequencer?

The "sequence" is the term of reference in sequencer terminology. A sequence is a logical section of music and can be of any length. Within the sequence, notes are recorded on to separate tracks. I prefer the analogy of a roll of multi-track tape upon which different tracks can be recorded independently.

Performer allows only one sequence comprising 16 tracks; in effect, a single roll of tape. Total music can have up to 99 separate sequences, each of which has 16 tracks (one for each MIDI channel). MIDIMac has 24 sequences with a possible 16 tracks for each, and all tracks can be assigned to any MIDI channel. Both MIDIMac and Total Music enable sequences to be called from each other at any point, in both a linear and parallel organisation, whereas Performer relies on cut and paste to achieve the same effect.

The first two allow sequences to be started and transposed from both the computer and musical keyboard. MIDIMac allows this operation to be recorded, so that an arrangement can be constructed in realtime.

As a variation to the normal sequence format, MIDIMac provides what it calls generated sequences. These facilitate the construction of arpegiated and repeated patterns. Total Music provides something similar, using an interactive function called the "rhythm repeater": any held notes are repeated in time with the track, to a set interval. This is great for drum tracks. Unfortunately, the software cannot arpegiate.
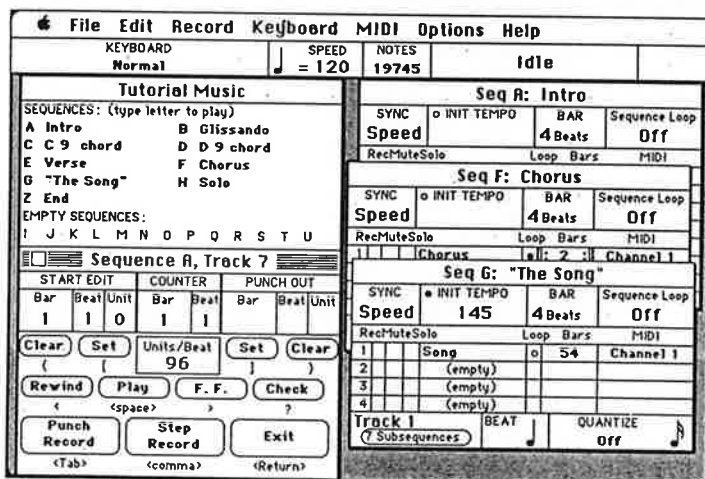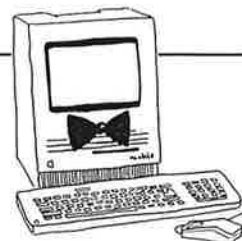

Midi Mac Sequencer
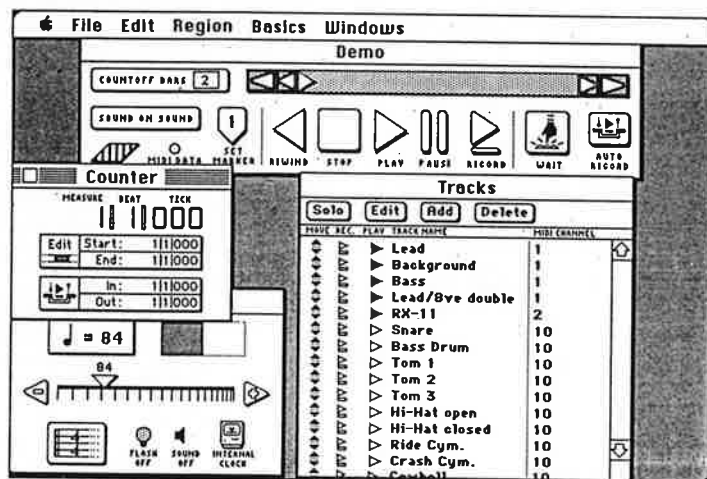
Performer

Mendelssohn *Mahler* *Mantovani* *Mac*

Basic recording is straightforward with any of these programs. All use the tape machine controls such as: Play, Record, Fast Forward, Rewind and Stop. In this sense, the recording process resembles the analogue machine, but all have an additional option whereby the tape doesn't start rolling until a note is played. All programs support automatic punch in and punch out, a possible (but not common) operation in conventional recording.

The real power of the sequencer is revealed after the music has been entered. The most immediately obvious new function is "quantisation". This is a means of adjusting notes so that they fall on the nearest subdivision of the bar. This can be specified according to the type of performance. If, for example, 16th note quantisation were chosen, each bar would be divided into 16 parts and each note rounded off in time so that it fell on the nearest part. The timing of a performance can be tightened up considerably.

All programs allow different styles of quantisation as well as a choice of timing divisions. Because MIDI notes consist of two separate events, note on and note off, each can be quantised separately. Adjusting only the note on events would in effect change the length of the notes, whilst adjusting

both would make the performance more even. Both Total Music and Performer permit percentage adjustments. Instead of each note being moved to the nearest 16th, it would be moved only 50 per cent of the way. This has a tightening effect, while retaining some human feel.

All programs allow tracks to be transposed, cut and pasted, and generally pulled apart in a variety of ways. MidiMac and Total Music support various forms of looping; all

> *"Martin Armitger swears by his copy of Total Music, and has produced the music for two films with it"*

have selective filtering. The filter, in sequencing terminology, has a completely different effect to its analogue counterpart.
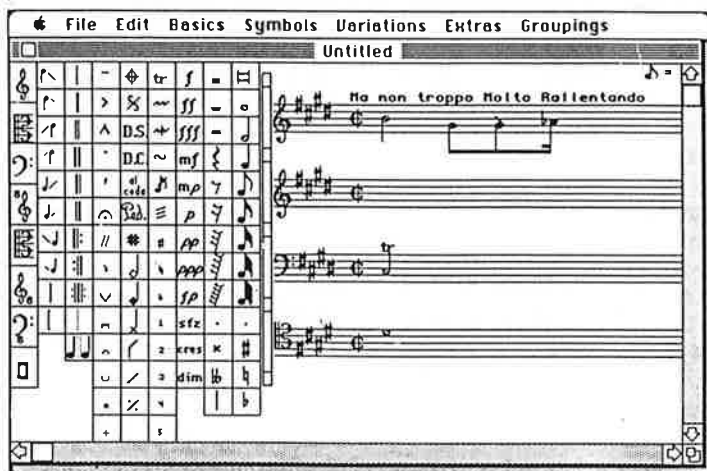
Filtering is best thought of as a word processor style of editing. It allows operations such as the transposing of all notes within a certain note range, the removing of all patch changes within a certain number of bars, and the raising of volume of a whole section by a set value. Each program implements this feature in a slightly

different fashion. Total Music is perhaps the most complete, offering a global change function. Almost any aspect of a performance may be changed by a set value, within definable limits. Performer instead allows gradual changes such as crescendos to be specified.
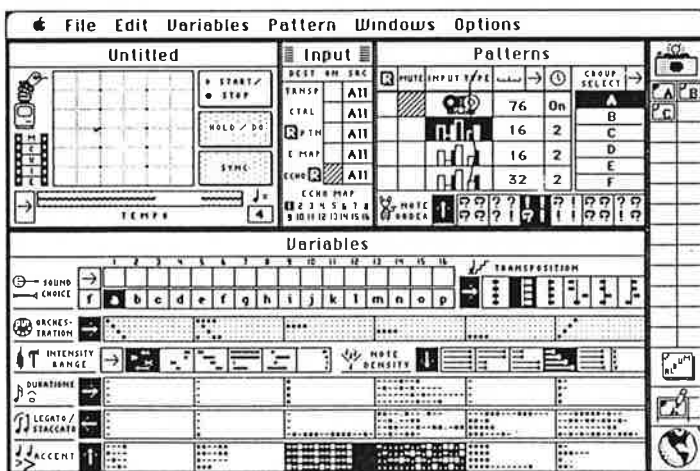
If all else fails, you can always look at the raw MIDI data. Both Total Music and Performer can display and alter individual MIDI events. This is not a particularly user-friendly way to edit, but it can be the only way to repair one aspect of the performance.

Editing functions can be used for special effects. A whole section of music may be moved backwards or forwards using cut and paste. The slow attack of a sound or any delays in the system can be compensated for. An echo effect is created by pasting multiple copies of a section of music down the track (sic), at ever decreasing volumes. If the paste points are close enough together, interesting results such as chorus and phasing can be heard. Performer can even reverse or invert sections.

The sequencer can be a versatile tool, both in and out of the studio. Its only requirement is that each music section must be recorded once in a reasonably acceptable fashion. A well played and accurate performance can be modified with subtle and complex
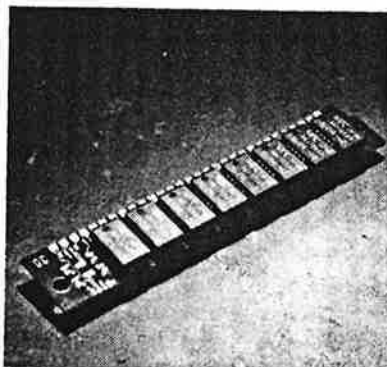
Professional Composer   *"M"*

changes that are beyond the scope of the initial performer.

The work can be done away from the studio. This leads to great savings in recording costs. And because only the control information is recorded, you can perform your music in your bedroom using a couple of cheap synthesisers. In the studio, the same performance could be played back and recorded on the highest quality sound equipment.

Which Sequencer?

I have talked to several professional producers and musicians on the subject of choice, and the answers vary. Cameron Allen, an early Total Music owner, found its reliability unacceptable for professional use and is changing over to the new Southworth products, MIDI Paint and JamBox. Martin Armitger on the other hand, swears by his more recent copy of Total Music, and has successfully produced the music for two films with it. Simon Lloyd (see interview elsewhere in the issue) uses the MIDIMac system with success, and echoes Cameron Allen's sentiments about Total Music.

Personally, I liked the graphical editing of Total Music, and the inclusion of the patch librarian. The MIDI implementation on MIDIMac was particularly good. But my overall favourite would have to be Performer. Its simple operation makes it the most effective. Yet Performer contains enough features to hold its own professionally. Pardon my English, Performer outperforms the others.

Much more recent versions of MIDIMac are appearing in the US, and Performer version 3.0 is due soon as well. It promises SMPTE* functions and a whole range of enhancements. Development on Total Music has stopped, but Southworth's new program, MIDI Paint, is soon to be released. It features a MacPaint style interface that builds on the concepts of Total Music, and it is SMPTE compatible.

Cameron Allen voiced rumors of a new program by Voyetra, originally for the PC. It is supposedly being ported

SMPTE is a timing standard used initially by film and video producers. It has been linked with MIDI, making the marriage of the two media a lot easier.

across to the Mac. It is said, by those who have seen it, to be the best sequencer ever programmed. I recently had a sneak preview of a locally written product nearing completion. When (and if?) it is released, it should compete well with the overseas products and break new ground too.

Scoring Music

Musicians coming from the more traditional end of the spectrum, should not be dismayed if sequencing seems too alien an approach. Several score generating programs exist, and more are coming. The original, and some say the best, is Professional Composer, the companion program to Performer. Composer enables all manner of musical notation to be used. Notes can be input by either

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mouse, Macintosh keyboard, or a combination of both. Composer supports just about every musical symbol you would require, including the more popular jazz symbols.

The insertion of lyrics is possible with Composer, as is transposition to other keys and clefs (including tenor and alto) and playback over the internal Mac speaker — admittedly with a rather nasty sound. Your masterpiece will give a truer response if you transfer the file to Performer. Bars are converted into measures and

COMPOSER TABLE

Features	Professional Composer
R.R.P.	$1014.00
Australian Distributor	Ikon Distribution, Hutchings Keyboards
Publisher	mark of the Unicorn
Note Display	Staff
Key Signatures	All
Time Signatures	All
Smallest Note	96th
Tuplets	Variable
Definable Instruments	Yes •1
Multiple Time Signatures	Yes
Tempo Changes	Yes
Multiple Key Signatures	Yes
Dynamics Changes	Yes
Notes/Lyrics	Yes
Beamed Notes	Yes
Guitar Chords	Yes •2
Number of Internal Voices	4
Number of MIDI Channels	N/A
Entry Method	Mouse, Mac Keyboard, or import •3
Copy Protection	Yes

• 1 Internal Mac sounds or export to MIDI sequencer
• 2 with optional guitar chord font
• 3 import from sequencer files

SEQUENCER TABLE

Features	Performer	Total Music	Opcode Sequencer	'M'
R.R.P.	$627.00	$1,539.00	$729.00	$290.00
Version of S/W	2.0	1.14	2.1	0.94
(Includes Interface)	No	Yes	No	No
Australian Distributor	Hutchings Keyboards, Ikon Distribution	Ikon Distribution	Ikon Distribution	Ikon Distribution
Publisher	Mark of the Unicorn	Southworth Music Systems	Opcode	Intelligent Music
Note Display	MIDI events	Graphical, MIDI events, Staff	None	No
Time Signatures	Variable	Variable	Variable	No
Punch In/out	Yes •1	Yes •1	Yes •6	No
Quantisation	Yes •2	Yes •2	Yes	No
Event Filtering	Yes	Yes — all events	Yes	N/A
Smallest Note	96th	96th	96th	N/A •8
Tempo Changes	Yes	Yes	Yes •7	Yes •9
Dynamics Changes	Yes	Yes	No	Yes •9
Merge Tracks	Yes	Yes	Yes	No
Number of Sequences	1	99	24	1
Number of Tracks	16	16	16	4
Sequences play in parallel	No	Yes	Yes •7	No
Number of MIDI Channels	16	16 •4	16 •3	16
Score Generation	No	Yes •5	No	No
Other		Has patch librarian built-in	Definable MIDI instruments	improvises on entered notes — see article
Copy protection	Yes	Yes	Yes	No

- 1 to nearest clock, also merge or replace when paste
- 2 quantise has effectiveness
- 3 can connect two interfaces simultaneously and map to either
- 4 [   ] has four outputs
- 5 [   ] mentary
- 6 track to track only
- 7 programmable in real time
- 8 dependent on speed of pattern
- 9 defined by pattern set up

dynamics are preserved. The reverse transfer is also possible, although care must be taken to quantise properly, otherwise horribly unreadable scores full of dotted and tied 32nd notes result.

A similar program, soon to be released, is HighScore from Southworth. A copy was not available for review at time of writing.

Other Professional Music Programs

The final two programs are hard to slot into a category. They are "M" (that's its entire name!) and Jam Factory, both from Intelligent Music. As the company name implies, they are delving into a long feared area — that of computer generated music.

At its simplest, M is a rudimentary sequencer, with real and step time entry, playback and simple editing. The software lets you alter aspects of the performance in a variety of ways. The order in which notes are played, the note density, note intensity, transposition, accent and duration factors, and even the MIDI channel and patch number are parameters which can be changed.

The music effect can be minimal and defined, or completely wild and random, but in a strangely, "intelligent" fashion. A conductor function is integrated, with which any number of these parameters can be changed simultaneously, according to the movement of a mouse-controlled baton around a grid. A snapshot of the performance can be made and stored. This can be ported to other sequencer software as the foundation for more conventional development.

Initially, the user is presented with a bewildering array of options. The screen sports the most controls I've ever seen in a program. As I worked slowly and systematically through the manual, the picture became a little clearer. By the end of an hour I was merrily orchestrating my own random pieces of cacophony.

The immediate application area for M that springs to mind, is so-called "ambient" music. The composers Glass, Cage and Eno would love this program. Both M and Jam Factory employ novel features, venturing into the world of artificial intelligence and pointing towards unknown musical territory.

MAC