

Hybrid Music System

Nucleus

Summer 1987

"There is no comparable integrated music system for any micro."
COMPUTER GUARDIAN

The Hybrid Music System is the most powerful and versatile microcomputer music system available. It is:

- an expansion of the BBC Micro for general musical enjoyment, exploration and education in the home.
- a digital keyboard synthesiser with 96 pre-defined sounds and an easy-to-use instrument panel for making more.
- a music production studio with pitched instruments, percussion and sound effects in high-quality stereo.
- an eight-track digital recorder with overdubbing, pattern sequencing, live mixing, editing and printout.
- a music composition tool with comprehensive staff and text notations in a structured language environment.
- an educational music computer for creative use across the complete range of age, ability and application.
- a computer music workstation with integrated user interfaces and an extensible real-time programming language.
- a demonstration and research tool for a wide range of music and sound applications.



The Hybrid Music System consists of:

- the Music 5000 Synthesiser, a high-quality digital synthesiser unit with 16 sound channels, up to eight different instruments at once, and full mixing with volume and stereo control;
- the Music 4000 Keyboard, a high-quality four-octave keyboard with full-size keys, moulded end-cheeks, black plastic coated steel case, and footswitch;
- the AMPLE operating software, supplied on ROM and 40/80 track disc with two User Guides, Installation Guide, and function key strip;
- an existing BBC Microcomputer system of any model, with DFS-compatible disc drive. Shadow RAM is used if available;
- optional expansions including Music 2000 interface, Music 1000 Amplifier, AMPLE Nucleus Programmer's Guide, AMPLE music albums etc.

Staff printing arrives!

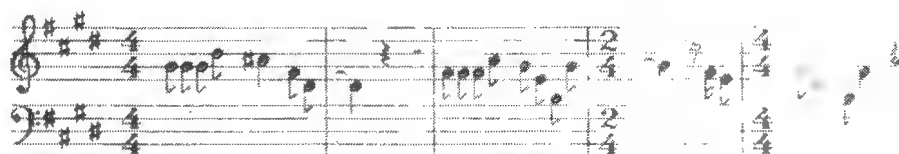
The latest version of the Hybrid Music System *Staff Editor* has a print-out facility. The new PRINT command prints the staves across the page in clear high-resolution graphics, using any Epson-compatible printer. It reproduces the full range of music symbols, including triplets, duplets, slurs, accents and chords, exactly as they appear on the screen, along with all special 'above staff' instructions such as articulation style, dynamic level, and user-defined musical

directives. Full control of spacing on the staff allows note groups to be laid out for best readability. Printing is also high-speed: the example below (shown half size) took less than 45 seconds.

As an introductory offer, staff printing is included in the current price of the Music 4000 Keyboard. For a small charge, existing users can have their original Issue Disc updated with the new software, called Studio 5000-4 Release 2, on sending it to Hybrid with return postage and self-addressed packing.

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A brief tour of the System

The heart of the Hybrid Music System is the music software system called AMPLE. It gives you an environment of easy-to-use editors and control panels selected from a Main Menu, each dedicated to a musical function such as staff scoring, sound design or mixing. Their consistent and common style of operation uses simple keystrokes, advanced pop-up menus and intuitive 'point and click' controls.

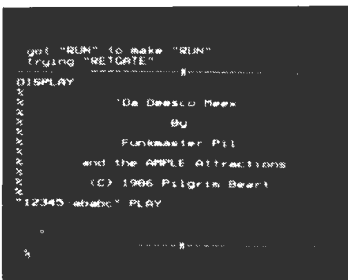
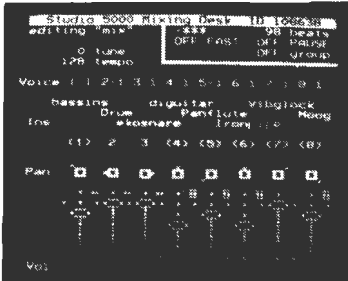
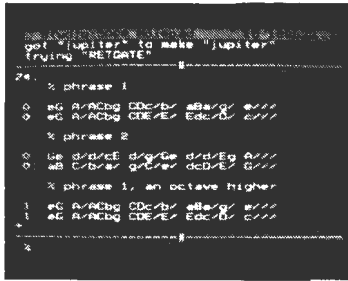
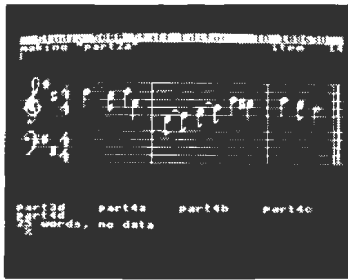
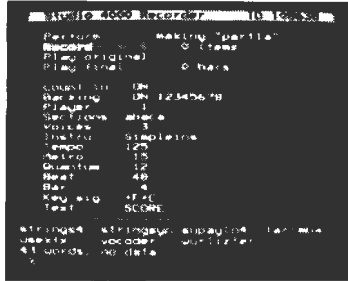
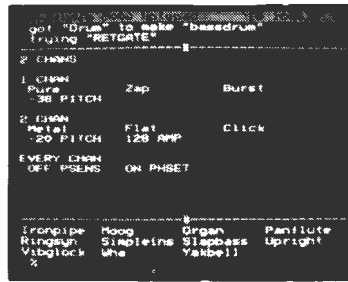
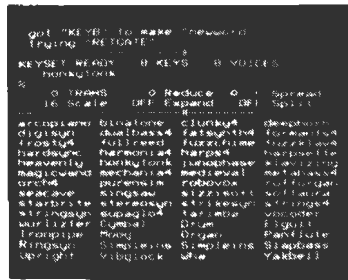
All editors and panels are interactive - they work with you, giving immediate feedback on the changes you make. For example, when you are entering part of a score, a single key press plays the music so far. AMPLE is multi-tasking, so you can work at the keyboard with a piece playing at the same time. This means that you can adjust sound, balance, tempo and so on actually as the music itself - a great source of satisfaction in itself.

Whatever your project, AMPLE holds each item of information you enter as a named word. The keyboard's instruments are words, and so are the parts of a simple piece. A full piece might have words for musical parts, instruments, and 'mixes'. As you work, you can call any word into the appropriate editor to alter it without disturbing the others. At any time, you can get a list of the words, and store them as a program on disc. The real power of the word is its ability to include another as an instruction. This makes music-building far easier and more enjoyable, and is also the basis of AMPLE's versatility.

The editors are integrated through their common use of words, so for example, a piece can have one part scored on the staff, another recorded from the keyboard, and a third entered in AMPLE's computer music notation. What's more, any one can be edited in any form - you could correct mistakes in the recording in AMPLE notation, and then print it out on a staff!

In creating sounds, you can start from any one of a dozen instrument types, or design your own from scratch. Basic options include over a hundred waveforms, pitch envelopes, amplitude envelopes and other sound settings. Further facilities include ring modulation, frequency modulation (FM) and wave 'sync', plus a new dimension of echo, ambience, simulated reverberation and full stereo.

Above all, the power of AMPLE makes the system easy to use, because at what ever level you work, you never need to worry about more complicated facilities if you don't need them. Whether you are listening to example pieces, playing tunes on the keyboard or staff, making a piece with just the Recorder and Mixing Desk, composing a work with the complete set of editors, or programming a whole new musical application, the Hybrid Music System lets you get the most out of however much you put in.



Use a control panel to select instrument sound and extra effects on the keyboard, which has up to 8-note polyphony and a sustain footswitch. The 96 pre-defined instruments include simulations (organ, piano, strings etc), and abstract, synthesiser and effects sounds - you can modify these or create your own from scratch. You can transpose, rescale, and divide the keyboard, spread the voices in stereo, and store a pattern to expand every note. The keyboard stays active when you switch to another screen.

Use a Notepad panel to make and change instrument sounds. Point with the cursor to turn a number up and down, or choose a new waveform or envelope from a pop-up list. The sound changes immediately, whether on the keyboard, on a test phrase, or in the complete piece playing at the time. Keep to the structure of the current sound, or add more controls from a wide choice including ring modulation, FM, 'sync' and many more - even expand the instrument to use up to 16 channels, for enormously complex sounds.

Use the Recorder to enter a single tune, or build a complete piece by multi-tracking in parts and sections. Record over backing tracks or to a two-tone metronome, slowed down or at full speed, and in free rhythm or automatically corrected to the beat. Change articulation or add effects, repeat and recall recorded sections in any order and correct mistakes on the staff or in AMPLE notation, complete with time and key signatures and automatic bar lines. Complete the session with a live mix-down on the Mixing Desk.

Enter music directly on to a scrolling double staff, using the computer or music keyboard, and play it back on the press of a key. Use chords, ties, dots, slurs, accents, triplets, duplets, articulation, dynamics, tempo control, percussion, multiple and non-standard time and key signatures, and a whole range of special 'above staff' instructions from stereo panning to true echo. Make a section and recall it by name for repeats, codas, first/second time, sequences, canons and any other musical structure.

Work in AMPLE's computer music notation for simple, direct and versatile music scoring, entering it using computer or music keyboard, or via Staff or Recorder. Use equivalents of all staff music symbols, plus direct rhythmic display, ornaments, arbitrary note lengths, overlapping voices, complex and strummed chords, gradual dynamic and tempo change and reverse time. Define music macros, choices, random functions, variations, real-time response to user input, and dynamic control of any parameter of sound.

Call-up the real-time Mixing Desk to interactively balance levels, choose stereo placement, select instruments, and adjust tempo and tuning while the music is playing. Control whole parts or individual voices and echoes. Watch flashing voice indicators, advancing beat counter, and faders & pan pots moving to stored settings. Return to start, fast wind, pause the music, step through by beat, strike any voice or play it from the music keyboard, and build multiple mixes and sub-mixes for recall at any point in the music.

Use Notepad to lay out titles, graphic displays, messages, lyrics, menus, and sequences of any named sections of music. Edit in detail the stored data from any other screens, build extra system commands and define custom music instructions. Edit and store any panel, including instrument and keyboard, and make up your own using any standard or user-defined controls. Finally, enter a new world of infinite musical possibilities through AMPLE's integrated multi-tasking music programming language.

In touch with MIDI

The Music 2000 Interface links MIDI-equipped instruments in to the Hybrid Music System, so that they can take their seats in the orchestra alongside the Music 5000. Simple selections send whole parts or single voices to individual MIDI keyboards, while the Music 5000 plays the rest. A drum machine can either be driven directly from patterns created and stored in AMPLE, or have its own internal patterns 'synchronised' to AMPLE's master tempo clock.

The Music 2000 has three totally independent MIDI outputs. Why three? For superior performance with two or more MIDI devices, eliminating the note-delaying 'bottleneck' of a single output. It also effortlessly accommodates the new generation of powerful MIDI synthesisers which really do justice to the power of AMPLE. Like the Music 5000, each one is really eight or more instruments in a single unit, since the voices can be controlled independently.

The extra dimensions of AMPLE control also bring out the best in low-cost MIDI instruments. For example, most synthesisers respond to 'key velocity' from AMPLE's musical dynamic level, even though their keyboards are not themselves velocity-sensitive. Though most small drum machines are limited to a single accent level in their own patterns, to external controllers they offer a full and separate control on each instrument. Put AMPLE in the driving seat, and you can capture a single snare hit in a decaying echo, 'loop' a sound and then reshape the envelope, or cross-fade between two instruments - these are just some of the possibilities.

The AMPLE MIDI driver module supports thirty-two MIDI voices, entirely integrated into the AMPLE environment. The new instruction MIDIV defines named instruments like 'junostings' or 'dxbrass' which allow MIDI's unfriendly channel and 'program' settings to be kept out-of-sight. For advanced users, instruction words for channel, program, all controllers, mode control, and even direct byte, word and message transmissions give very powerful control down to the lowest level. These allow interfacing to even the most awkward MIDI instruments, through access to non-standard and 'system exclusive' functions, and accommodate future additions to the MIDI specification.

Physically, the Music 2000 Interface looks like a Music 5000 with three LED indicators on the front: one for each output. The back of the unit carries the three MIDI out sockets and a fourth socket with a pulse clock for synchronisation of pre-MIDI drum machines and sequencers. A ribbon cable connects to the Music 5000, and a lead with pass-on socket draws power from the computer.

See page 8 for details of Clive Grace's 'Music from Numbers' tape, produced using the Music 2000 Interface.

Programmer's Guide

The model of AMPLE supplied as standard with the Hybrid Music System consists of AMPLE Nucleus in ROM and extensions for the Music 5000 Synthesiser and Music 4000 Keyboard on disc. AMPLE Nucleus contains 180 words, of which only the 50 most-used are described in the User Guide. The *AMPLE Nucleus Programmer's Guide* is the complete source of information on all user-accessible Nucleus words, and is invaluable for advanced music and programming applications. The Programmer's Guide is in two parts; an introductory section covering programming in AMPLE, and a reference section giving the following detailed information on each word:

- name
- description
- examples
- further information
- function and status
- input & output items
- related words

AMPLE Nucleus contains words in the following categories:

- music notation
- voice and sound control
- concurrency and time control
- program management
- module management
- arithmetic and logical operations
- string operations
- program control structures
- data structures
- input/output operations

"Music 7000"? "Music 87"?

Readers of BBC Microcomputer magazines were recently confused by an advert for a "Music 7000 Synthesiser", an implied development of, and successor to, the Hybrid Music 5000 Synthesiser. The advert offered a "Music 7000 AMPLE" and an upgrade for the Music 5000. On contacting the advertiser, readers were told that the Music 5000 was no longer available, but the "Music 7000" would not be available for some months.

The truth is that the Hybrid Music 5000 has not been discontinued, there is no such development of or successor to it, and there is no Hybrid product called "Music 7000". *Popular Computing Weekly* magazine revealed that the product on offer "appeared to be a warmed-over Music 500" and that "Music 7000 AMPLE" was none other than the old AMPLE Model BCE, on cassette, as supplied with the Acorn Music 500 three years ago. It contained none of the software of the Music 5000.

The advertiser gave Hybrid an undertaking to change the name of the product to "Music 87" and change the advert to remove any likely confusion with genuine Hybrid products. In particular, 'Music thousand' names will continue to be reserved for Hybrid products. Subsequently, the advert was dropped entirely from all magazines, and at the time of writing, has not reappeared or been replaced.



AMPLE amplification

Many home and school users don't have a hi-fi system they can monopolise for computer music, or even the table space to place it next to the computer. The answer is the Music 1000 Amplifier, a compact stereo monitor amp that matches the Music 5000 perfectly and sits neatly on top of it. Two mixable inputs handle the Music 5000 and either the BBC's internal sound output or

another instrument. The 8 watt outputs provide plenty of power for personal monitoring through bookshelf speakers, and in fact a speaker rating of 30 watts is recommended to handle the high-energy synthesised music signals. The front panel has sockets for three pairs of headphones - essential for considerate use in the classroom! A special signal output drives a tape recorder, mixing desk or high-power amplifier.

A musical offering

The idea of a marriage between music and computers is sometimes still frightening - the thought of computers doing the jobs of human musicians can suggest that music's warmth and feeling will be eliminated by the cold, unemotional computations of machines. While no doubt replacement of human performers could do this, it is the activity of composing (in the widest sense), not performing, to which the computer has most to offer.

Designers find that mimicking the nuances of human performance seem to go 'against the grain' of the technology, requiring powerful equipment and, ironically, large amounts of human effort. By contrast, even small computers are naturally suited to helping with composing. Their ability to capture, store, display (in pictures and sound) and process musical information makes the human's job easier, not more difficult, and more rewarding, rather than redundant.

In the rich world of the computer's musical applications it's possible to lose sight of basic musical activities, especially if we submit to suggestions that making music with technology is somehow fundamentally different from doing it any other way, and allow our true musical principles to be invalidated as a result. Initially there may be only a fine distinction between use of the computer as an active composing tool, offering direct control of compositional parameters, and as a passive composition aid: a 'slave' performing from the same kind of score you would give to a human. Though we can use a performance automaton for good, it's a dangerously short step away from the fruitless imitation and replacement of human performance.

More and more, educationalists can accept the strengths of the computer for music making without denying musical aspects of the activity. That we may use a 'non-musical' keyboard to control sound, a computer music 'language' in composing, or 'programming techniques' in building a tune from phrases is not a compromise of musical values, but confirmation that the mechanisms of computer operation and musical composition have much in common, and an undeniable suggestion that not only does musical development benefit from use of the computer, but understanding of the new technology is encouraged through its application in music.

Integration is the key

Though the use of computers in school music is still at an early stage, the need for an integrated approach that spans the full range of age, ability and application is already apparent. The Hybrid Music System is an open-ended and flexible integrated modular environment that supports a complete range of creative musical activities, and is already used from children to adults, total beginners to accomplished composers, and academic researchers to pop musicians - only it can meet this requirement.



Making music with computers and natural instruments

Computers in the music classroom

One factor encouraging the introduction of computers in to the music classroom is the new GCSE examination, of which a new and essential part is composing. Apart from solving the practical problem of providing all pupils with the means to develop and realise their compositions independently of instrument-playing abilities, the computer offers unique freedom of musical experimentation and expression. As thousands of home users well know, it really does let you create a full-sounding 'recording' of a complete piece, with drums, bass, chords and melodies (or any other parts you choose), 'mixed down' with instruments of your choice. At any point, you can suspend the session and store its state on disc for recall when work resumes - a colossal boon in the busy classroom.

Though the computer's music keyboard offers full multi-track recording, as often as not, 'non-playing' pupils use it just to create the raw material for a composition. They can record slowly to a metronome, then replay at full speed, or play in unsteady rhythm and automatically correct to a strict beat. They can use their recorded material in the same way as material entered note-by-note: edit it on the staff or in AMPLE's beat-based

letters notation, print it out in either form, repeat and recall it as a 'building block' in any part, and give it its own instrument sound, volume, stereo position and effects.

The computer is also effective in promoting group discussion and co-operation: in a small group gathered around the screen, every member can see and hear what's happening, and individuals are encouraged to suggest experiments and improvements by the fact that changes can be made quickly and easily, without permanent loss if they turn out to 'muck it up'!

Natural instruments are certainly not excluded by use of the computer, as pupils at St. Joseph's College, Trent Vale, demonstrated in a recent school concert. They used the computer to create an accompaniment for a live saxophone part. Their teacher Martin Walley is a strong believer in the motivating power of computers and electronic instruments: "Using the modern equipment is helping to generate a lot of enthusiasm from students. With its help, they can produce themselves almost studio-quality music for the first time."

A particularly exciting area of application is primary school music, where there is a prime need for systems that focus on individual dimensions of wider musical activities, but are also applicable in full-scale use at later stages of musical development. The modular structure of AMPLE allows any of its tools to be so used. For example, a Notepad 'work panel' for listening exercises shows three words describing timbre, pitch and loudness shapes of a sound that plays on the RETURN key, and teacher or child can choose from over fourteen alternatives for each word.

The 'work panel' is in fact AMPLE's standard instrument panel. At 9 years, the pupil could use it for stage sound effects, and at 11, in an original composition. In the hands of a 13-year old, it might be adjusting pizzicato as the music played. The 16-year could be devising new instrument families ... and the 18-year old? Who knows!

Further, AMPLE's integration lets teacher or developer prepare material in advance, for example, naming and storing the listening 'work panel' screens for recall by menu. However, the widest possibilities arise from use by developers



Pupils from Harlington Upper School on the Bedfordshire Music Bus

Music and movement

An exciting new development in music education could have far-reaching implications for the future of music technology in schools and colleges. Bedfordshire Education Authority have designed a 'Sound Technology Mobile Unit' - a 52-seater coach refitted as a music studio. Bedfordshire pioneered the use of mobile units in teaching in 1981, and was one of the first authorities to use computers in music education.

They first came up with the idea of a 'music bus' to carry expensive equipment and teaching expertise to many schools in 1984, but it wasn't until the educational climate of 1986 that the project received full approval from the Authority and the MSC. The bus was commissioned in early 1987 and is now on the road, actively supporting music departments in TVEI and TVEI-linked schools and providing valuable in-service training facilities.

Inside the bus, passenger seats have been replaced along the sides by eight purpose-built workstation units, and at the back by a 'master' station. In selecting equipment, Bedfordshire have been careful not to rely on one manufacturer where possible. Five of the stations carry computers - four BBC Master-based

of AMPLE's music programming language, to create stand-alone programs, or extensions to the AMPLE environment. An example of this is *Roundabout*, one of Hybrid's AMPLE 'microworlds' currently undergoing trials. Its subject is composing rounds: the pupil works on a single staff, simply inserting the special instructions '2nd' and '3rd' for entries of subsequent parts. Other microworlds include interactive musical automata such as 'tune factories', simulations of gamelan, drum machine and bell-ringing, musical adventure games for play and design by children, and, for infant and handicapped

Hybrid Music Systems and one Yamaha CX5M - and three carry synthesisers, drum machines etc. from Casio, Roland and Yamaha. The master station provides more electronic instruments and the main recording facility: Teac 8-track recorder, Studiomaster 24-input mixing desk and a rack of sound processors. All stations have Hybrid Music 1000 Amplifiers for mixing and monitoring, each sending a stereo signal to the mixing desk. Four JBL Control 1 loudspeakers provide for class listening.

Pupils work one or two at each station, listening on headphones. A third headphone output on the Music 1000 allows the teacher to join in, and the master station provides remote monitoring. Pupils record rough versions of work on portable cassette recorders, and use the link to the master station to record final results.

The 'music bus' is designed to complement, not replace, the equipment and activities of the music lessons in the schools it visits. Many pupils have the use of computers and synthesisers in their own school's music room, but the Bus gives them more time to work on their own music projects and better facilities for final recording.

children, musical 'toys' - entertaining programs that encourage exploration through simple manipulation of musical 'objects'.

No description of primary use is complete without a mention of AMPLE notation, the simple and powerful letters-based alternative to the staff. That in the primary classroom it is so successful as to be used away from the computer, and is also the choice of the vast majority of serious users of the system, is a fitting tribute to AMPLE's achievement in integration!

Taking the initiative

Nowhere is the growing use of computers in the school curriculum having more impact today than in the music classroom, but this is only after years of delay that could have left music education out of the information technology revolution. Despite the opportunity to make a start with the BBC Microcomputer, whose sound facilities were widely applauded at its launch in 1981, the MEP (Microelectronics Education Programme), the educational organisation nominally charged with national responsibility for development of educational microcomputing, neglected to provide the support and encouragement badly needed by music teachers and educational software developers keen to investigate the potential. The programme ended in 1986 leaving little evidence of its contribution, if any, to the use of the computer in music education.

In the absence of national co-ordination and information exchange, work began on a local scale. Progress was slow and some serious mistakes were made, including a disastrous attempt to standardise on Japanese MSX computers. At times, the efforts of some seemed to work against the directions of both music education and music technology.

However, there was much positive achievement: Andy Pierson's *Compose* program and Michael Miller and Kevin Hamel's *Sounds Useful* package were both developed over a period of years and have only recently become available. At the same time, the Hybrid Music System was being developed from work begun even earlier at Cambridge University. This first bore fruit in 1986 with the launch of the Music 5000 Synthesiser, solving the problems of the BBC Micro's limited internal sound, closely followed by further components of the system and its initial trials in schools.

Recently, music education has begun to receive valuable support from moves to integrate technology across the curriculum, and schemes designed to give all students experience of technology before they leave school. Many music departments now have access to formal in-service training and informal support and advice from their authority's centre for TVEI (Technical and Vocational Education Initiative) in liaison with their music advisory service.

Music technology in-service training is also available on a national scale through a new initiative at the Warwick University based MESU (Microelectronics Education Support Unit), the successor to the MEP. The brief is to identify how new technology can contribute to music education and to produce guidelines for its successful integration and application. Its head is educationist Phil Ellis, who has extensive experience of providing in-service training in music technology, beginning with use of electronics in the music classroom in 1978. It is hoped that the MESU initiative will provide much-needed support and guidance for the use of the computer in music education, now and in the future.

Start here

To new users of the Hybrid Music System, the finished pieces of others can be a great source of inspiration, assistance and enjoyment. All of the 20 or so example pieces supplied with the Music 5000/Music 4000 are well worth investigating, but it's best to start with a simple one of the style that you're most interested in.

The first stage is to listen to the music with the Mixing Desk on the screen. The flashing indicators show you the position on the Desk of each voice that you hear. You can highlight a voice by raising its volume fader, hit RETURN to strike it, or play it from the music keyboard. Putting the music on pause lets you experiment at your leisure, and then step the music beat-by-beat. Also try taking the tempo down to a near stop, and using 'fast wind' to move through.

You can literally play with a piece for hours on the Mixing Desk. At any point you can replace a voice's instrument or change its volume or stereo position, and store the change with MAKE - it will automatically return at the right point in the music next time you play. You can spot mix recalls of more complicated pieces by the change of name at the top of the screen. Watch out for other automatic movements of faders and pan pots, and changes of instrument. And remember, a piece can repeat forever!

You can move on to look at the contents of the piece. Start by entering the SHOW command (or just press f5) to display a list of the words. In a simple piece, you'll see just musical parts, and maybe some extra instruments, identifiable by their names. If the piece has a title display, as most do, you'll find it in the word called RUN, along with something like "1234" at the bottom, saying which players are used, or "1234-abac" to specify an order of sections or movements as well. You could enter, for example,

```
"3-cccc"PLAY
```

Programmers' corner

Did you know that AMPLE can execute a command line produced by your program? As AMPLE works its way along a typed-in command line, it holds the remaining part as a string on to which extra commands can be tacked by '\$+', the 'string add' operator, for example:

```
"sh" [ "SHOW" $+ ]
```

Your word sh will execute SHOW. Similarly, you can use the following short equivalent of LOAD RUN to leave maximum display space on the lines of a 'jukebox' menu:

```
"lr" [ "LOAD RUN" $+ ]
```

How about giving each program its own 'save' command, complete with file

to have player 3 perform the ending, 'solo', four times.

You can look inside any word using the TYPE command, Notepad, or, if it contains music, the Staff Editor. WRITE displays the whole piece on the screen word-by-word, and can send it to a printer if required.

Expanding keys

The keyboard panel's 'Expand' option is capable of some quite remarkable effects, by expanding each note you play in to a pattern of notes that you have set previously. This pattern can be any sequence or chord of notes over eight voices, and it copies the pitch and duration of the expanded key.

If you turn 'Expand' on, and hold down the footswitch while you play a chord, the chord is stored as the pattern. Now, each key will reproduce the full chord, transposed accordingly. Holding the footswitch and tapping the middle C repeatedly stores a sequence of echoes. Since each key expands to a new echo, the sounds can build up on each other to give very complex effects. The notes in the sequence don't have to be the same pitch either - the possibilities of a scale, tune or wide scatter of pitches go far beyond standard echo units.

One of the most impressive effects creates overlapping, harp-like chords. You store the notes of the chord played one-by-one in order, with the last two played quickly to set a fast expansion. Try it with all eight voices, '3 1 Spread' for a full sweep, and 'Ringsyn' or 'Vibglock' instruments.

Finally, advanced users can choose different instruments on individual voices, chosen on Mixing Desk and stored with MAKE. Combined with a slow pattern of notes, the results can be very interesting, and very disturbing!

name? Here's the word:

```
"save" [ " " "myprog" " ~ SAVE ]
```

You now just enter save to save the program. As in BASIC, you enter each " character as "" when it's in a string.

Here's a light-hearted application:

```
"instant" [ " instant " $+  
#IN $CHR $+ 0, ]
```

This takes each key you press and treats it as a command word, so, for example, the letters A-G play the notes. Try playing a tune, not forgetting that upper/lower case still applies! If you find this too easy, try playing something with rests, sharps and flats as well!

(Don't forget you must have a voice set up for this to sound - just select one on the keyboard panel first).

Creative echoes

Have you noticed that in many pop songs, extra voices join in to emphasise the tune in one repeated section? For this reason, it's called the 'chorus' section.

On the computer, you can use the Echo instruction to do the same: a second, brighter, voice with a slight delay can really add impact. You just write '4 2 Echo' (for example) above the staff at the start of the section, and 'OFF Echo' at the end, not forgetting to choose two instruments on the Mixing Desk. You can define better names if you like:

```
"loud" [ 4 2 Echo ]  
"soft" [ OFF Echo ]
```

If you use a pre-echo instead, for example '-4 2 Echo', the extra voice will play just before the beat, giving a more driving rhythm to the tune.

Echo is normally used to enrich the sound of a part, but it's possible to overdo it if you're not careful, especially on percussive instruments like 'Upright' and 'Vibglock'. You can make the effect more subtle by using the Mixing Desk to reduce the level of the echo or echoes, and place them at different stereo positions - just like a real hall echo in fact.

There's an even smoother reverberant effect that doesn't use the Echo instruction at all: instead, you swap the notes of the tune between two voices so that the sounds of successive notes overlap. This is done with the special music voice instructions '1;' and '2;', placed before the notes.

A deliberately strong echo can add fascinating rhythm and harmony effects to simple tunes. Here's a 'work panel' for you to try them on - just enter it on a fresh Notepad screen.

```
READY 8 VOICES Vibglock  
/  
1 0 2 Echo, 145 =T  
///  
0:agABCbCDE///a///
```

Press f2 to activate the panel - the numbers on the middle line become controls which you adjust using the cursor keys. Pressing f1 plays the tune on the bottom line.

The first two numbers are the length of beat and echo delay, so '2 1' makes a half beat delay, doubling the rhythm, and '1 2' makes a two-beat delay, giving a harmony effect. '2 3' gives a 'dotted note' delay that interleaves the notes of the tune. Try '3 4 3' to multiply the tune even more: the third number is the number of echoes. The result is so intricate that you'll probably want a slower tempo: just reduce the number before =T. Try changing the notes of tune (press f2), and remember, you can keep a whole stack of alternative tunes on the screen by putting '\$' before all but one of them. To keep the panel, store it with MAKE and then save it on disc.

'Tele-music'

The world of BBC Micro 'comms', from private bulletin boards to Prestel, continues to provide strong support for AMPLE users across the UK, confirming the theory that many home musicians are also modem users.

A modem is a unit that connects a computer to others via a telephone line, allowing home users to exchange messages and software through non-commercial 'bulletin boards' and charging magazine-style services.

The subject of music is particularly popular because AMPLE acts as a standard format for pieces. Each piece is an AMPLE program, including informative

text and the elaborate graphic title screens that have become the hallmark of AMPLE music 'tele-software'. Any user can 'download' a piece, play it through the Music 5000, and store it for future use.

Ampnet was the first AMPLE-only service when it started life as a section of Micronet on Prestel. It's now run as a non-commercial board by Tom Carey, providing news, music (free) and correspondence on everything related to the Hybrid Music System. One of the most active AMPLE bulletin boards is *Musictel*. It's run along similar lines to *Ampnet* by Guy Oldhams and Ian Guinan, who also contributes some of the best pieces.

AMPLE DCT is a free section of the

Dudley College of Technology Database for educational users of AMPLE. As well as music and news, it offers utility programs and instructional worksheets for students.

Probably the best-known commercial source of AMPLE tele-software is *Musicklink* on Prestel, but since the recent closure of its host section, Viewfax 258, it has not been updated. However, callers can still access its large library of music files, most of which are free.

Dial-up details:

Ampnet, 0789 728951, viewdata
Musictel, 0695 421493, viewdata/scroll
AMPLE DCT, 0384 239944, viewdata
Musicklink, Prestel 258 2185, viewdata

Dark Fuschias in Zanzibar?

Home computer musician Andy Bridle produces remarkable chance-based music that to some might seem impossible using his modest studio setup. The sound conjures up the sight of wall-to-wall equipment, but the only electronic sound source in use is the Music 5000.

His setup consists of BBC B+ with Music 5000, digital delay unit, Teac 'Portastudio' and standard hi-fi cassette deck. The delay unit adds extra echo and reverberation, and the Portastudio 4-track allows parts to be recorded one-at-a-time, so each can use all 16 of the Music 5000's sound channels.

Andy's first AMPLE piece, *In a Dark Time*, was recorded with just the cassette deck and digital delay. It began as an experiment with AMPLE's 'random' instruction, but he gradually replaced this with set musical sequences selected randomly using the IF statement. Seven similar parts were added, and interesting music began to emerge - each part made its own choices, and so shifted against the others. After many further refinements such as instrument design and random control of stereo and tone colour, the piece was complete - an intriguing and sinister atmospheric collage which never plays the same twice.

The newly acquired Portastudio was used for the next piece, *Life in Zanzibar*. This received a very positive review from *Music Technology* magazine, but the latest piece is the most ambitious and impressive yet. Titled *The Meaning of Fuschias* after an obscure Welsh poem, it is much more rhythmic and 'conventional' sounding than its predecessors, though still in an atmospheric style, and was created in sections with much multi-tracking. Apart from a few chords supplied by an ancient Juno 6 synthesiser, all sounds came from the Music 5000. Much of the piece is not reproducible, since Andy produced it interactively. As he says, "In AMPLE it is so easy and fast to experiment that it is a bit like painting, and your intermediate results are lost".

All three tapes are available direct from Andy Bridle, 39, The Fairway, Alsager, Stoke-on-Trent ST7 2BD.



Tim Souster

Classical AMPLE

In 1986, British audiences of the Arts Council's Contemporary Music Network concerts were greeted with an unfamiliar sight: a BBC Micro on stage next to the grand piano. The Hybrid Music System was an essential performer in the latest piece by electronic music composer Tim Souster: 'Work' for computer operating pianist. The piece sets out to test the relative abilities of human and machine, in particular the virtuosity of contemporary pianist Philip Mead, who commissioned the work, and the capabilities of the Music 5000 Synthesiser. The result is an entertaining musical game or contest between the two.

The computer part was first written in the early version of AMPLE for the Acorn Music 500. It was split into six programs, each of which loaded the next one in a



Philip Mead

gap in the music, relying on a constant disc speed to keep musical time! For performance, this was converted to the ROM-based AMPLE of the Music 5000, where it became a single program with better quality instrument sounds and improved tempo and expression control.

'Work' received its premiere in Cambridge, home of the composer and both performers. It has since been widely performed in the UK, France and Australia, including a broadcast on BBC Radio 3, and has been very well received. Tim Souster, who is known for his 'Hitchhiker's Guide' theme and commercial TV music as well as his extensive work in serious computer and electronic music, is currently planning a piece based on the fractal patterns of nature, and hopes to use the Hybrid Music System in its realisation.

New user group

September '87 will see the launch of an independent group for AMPLE users. AMPLINEX (AMPLE INFORMATION EXchange) takes the form of a regular newsletter on disc, with music, instruments, hints & tips and other articles on getting the best from AMPLE and the Hybrid Music System. The newsletter is itself written in AMPLE - it uses the language's menu and text display facilities to let the reader browse through the contents on the computer screen.

Organisers Roy Follet and Kevin

Doyle say the emphasis is on *exchange* - after playing a small initial subscription, each member will be asked for contribution to the newsletter, however small, to receive the latest issue. AMPLINEX is independent of any manufacturer or other user group. For more information, send a self-addressed envelope to:

AMPLINEX
26, Arbor Lane
Winnersh
Berkshire RG11 5JD

COSMIX

...is the title of the first AMPLE music album - that's an album of music in AMPLE program form, on disc, and playable on a BBC Micro with Music 5000. COSMIX is an fascinating collection of music composed and arranged in Ample by Pilgrim Beart. The twelve tracks cover an enormous range of styles, apparently drawn from musical ages present and future! The album's track menu is a work of art in itself - a tone-dial 'space phone' (complete with interstellar noise and crackle, and even crossed lines!) links through a 'time reversal module' to each track of music. The tracks include hidden messages, from poems to adverts for products of the future, heavily laced with the wacky style of humour that pervades the music itself.

Perhaps remarkably, none of this distracts from the ingenuity of the music and its incredible application of the power of AMPLE and the Music 5000 - COSMIX is probably the best demonstration to date of just what can be achieved with the system. Many users have already heard one of the tracks, 'In Concert' (it's supplied with the Music 4000 Keyboard as an example), and have been bowled over by the amazing 'heavy metal' guitar sound, complete with string bends and final power smash. All Music 5000 owners owe it to themselves to buy copies!

Note: The Thrognorton 'Auto-Muse' used in the recording of COSMIX will not be available before the 27th Official Acorn User Exhibition in 2002.



Pilgrim Beart

STOP PRESS!

Advanced Sound Studio Music 5000 software extension, including waveform and envelope design, announced. Contact Hybrid for details.

Typeset by Human-Computer Interface Ltd.



"AMPLEmentary, my dear Watson!"

Composer Patrick Gowers used the Hybrid Music System in creating the music for Granada TV's series 'The Return of Sherlock Holmes', and wrote a special AMPLE part for a demanding atmospheric piece that would have been near-impossible without it. In the story 'The Man with the Twisted Lip', the dreamy atmosphere for scenes in an opium den is built with Music 5000 Synthesiser, 'DX' MIDI synthesiser controlled through the Music 2000 Interface, and natural woodwind and string instruments.

The AMPLE score used random number sequences with weighted probabilities to generate a dense tinkling texture moving across all 16 channels of

the Music 5000. Simultaneously, a second part written in AMPLE's letter-based music notation played a slowly-evolving pattern of overlapping, shifting chords on twelve voices of the MIDI synthesiser. Finally, the woodwind and string parts were added (played by human beings!) with a multi-track tape recorder. The result is a breathtaking example of electronic and acoustic instruments working together.

Patrick is currently re-recording the music for an LP of 'Sherlock' music to be called the 'Sign of Four', after the full-length Sherlock Holmes adventure to be screened at the end of 1987. The record will be released about this time.

New Demo Tape

Selections from COSMIX feature on Hybrid's new Audio Demonstration Tape. Continuing the tradition of its two predecessors, this tape is modestly entitled *The Hybrid Music System Mega Compilation Album*, and is on the 256-byte Records label. It also contains excerpts from NEXI, Pilgrim's follow-up to COSMIX, for which he is using the Music 4000 Keyboard to record some of the parts. As before, the tape is digitally recorded on to high-quality chrome tape with absolutely no additional studio processing - all sounds are straight from the Music 5000 as you would hear them on a standard Hybrid Music System setup.



Clive Grace

Music 2000 taped

Clive Grace has produced a tape of music to show what can be achieved with the Hybrid Music System, and MIDI synthesisers that are affordable to the home user. He says "I also wanted to prove that you don't need a Fairlight CMI to get the same effects as you hear in the top 30 every week."

The sounds are produced by the Music 5000 Synthesiser, and, linked through the Music 2000 Interface, Siel DK600 and Casio CZ1000 synthesisers, Sequential Drumtracks drum machine, and Powertran MCS Sampler. Clive largely created the music in AMPLE on his home system, and made a rough demo recording there before moving to Solo Sound, Dave Yorath's computer music studio, for the final multi-track recording.

The tape is called 'Music by Numbers', runs for about 20 minutes, and is available for £1.99 inclusive from:

MIDI Tape Offer
A&B Computing
1, Golden Square
London W1R 3AB