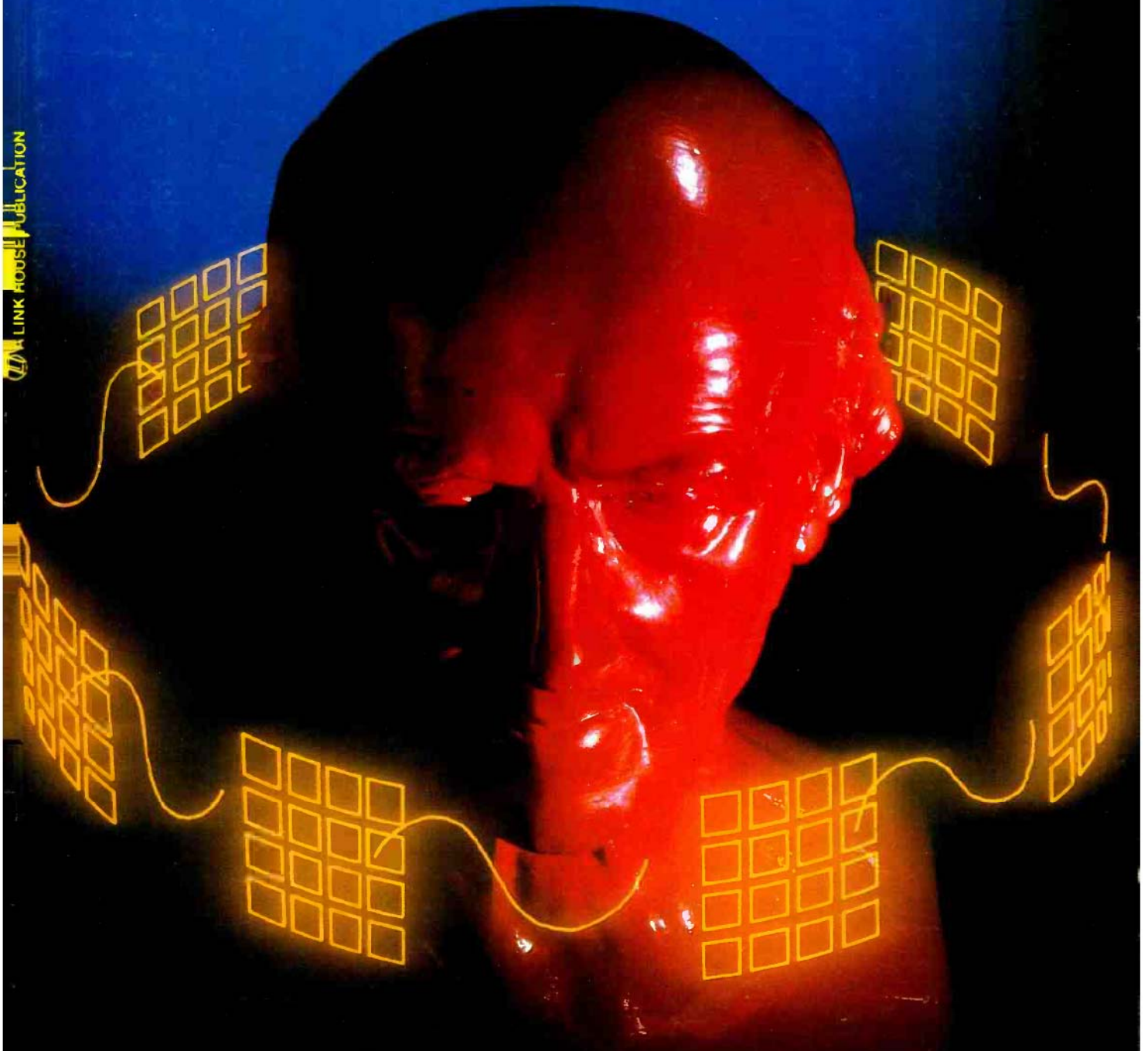


studio sound

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AND BROADCAST ENGINEERING

LINK HOUSE PUBLICATION



**Surround sound
Music synthesis**

GR-700 synth unit.

Another important feature of the GR-700 is that Roland have realised that guitarists want to keep their *Les Pauls*, *Strats* and *Schecters*, so they're setting up guitar centres to insert the electronics into your own guitar to give it full polyphonic synthesis (plus the original guitar sound and external MIDI control). Chandler guitars are the first appointed UK centre.

Although, in principle, any solid guitar can be retrofitted, some guitars have as many as five or six dead spots where the fundamental is missing and its presence is required for correct operation. The GR-707 is fitted with a stabiliser arm to eliminate unwanted resonances and maintain strong fundamental tone on all notes. The new GR700 synth unit will also operate from the existing GR-300 and GR-500 guitars.

Completing the MIDI line-up, several companies have produced a MIDI/CU interface will put your analogue IV/octave mono synths into your MIDI system. There are also expansion boxes (one MIDI In to four Thru) and master clocks with tempo readout compatible with SMPTE and EBU time codes for correct studio sync to tape and autolocate capability.

As for possibilities, it is almost incredible to see and hear a guitarist playing Hammond organ or a pianist playing a dynamic drum solo!

Moving more to the micro end of MIDI, a whole series of software/hardware packages should be around for the Frankfurt Music Fair for sophisticated sequencing, programming, graphics and training. In this country there is a specialist company called Electromusic Research Ltd set up in liaison with the main manufacturers to answer musicians' problems on interfacing, as well as provide suitable hardware/software.

Choosing the right micro for full exploitation of MIDI will be essential and the current implementation of either Z-80 or 6502-based 8-bit micros in the home will make software programming go possibly one way or the other. So the term 'home' applied to computer is not strictly true for the musician as some of these will be ideal for stage and studio use.

The *Apple II* (and *Ile*) is already well established as a 'musician's micro' with several dedicated systems (more on this later). It's 6502-based and is likely to be joined by two other 6502 machines: the *BBC B* and the *Commodore 64*. The latter is already widely used in Europe and the United States. The Sinclair *Spectrum* would seem to be a firm favourite too, but the latest issue 3 of the micro has internal configuration changes that are already causing many problems for games software manufacturers.

Other less likely contenders to pick up much music software are the *IBM PC*, *TRS-80 3 & 4*, *Oric* (very popular in France), *Lynx*, *Dragon*, *Atari*, with *ZX-81*, *Sharp MZ-80A*, *Sord M5*, *Aquarius* and *Texas TI 99-4* at the end of the line. What may sway you into your final choice could be that the *Apple* has Roland (previously Amdek) *CompuMusic*, *AlphaSyntauri*, *Jen Musipack*, *Passport Designs Soundchaser*, and *Rhodes Chroma*; the *Commodore 64* also runs the *Chroma* and will soon have an add-on keyboard to control its special SID music chip; *ZX-81* runs the *MPCI Drum Computer* and the *MUZIX81*; and of course, there's the music synthesis offered on the actual micro.

Interfacing and control

In a well-equipped studio, a lot of time can be spent setting up correct triggers and syncs to instruments and tape machines. Simple trigger interfaces can be made, to invert or divide master clock outputs and so on, but the one instrument that covers most possibilities is Garfield's *Doctor Click* controller from Syco Systems. It also gives two independent rhythm-activated envelopes as

well as outputs synchronised to a live drummer. However, the use of MIDI could reduce interfacing to single cables that never need changing once set up as all switching functions are handled digitally.

As an alternative to the serial MIDI, the Chroma keyboards division of Fender Musical Instruments introduced the *TRIAD* system that connects synthesisers to micros via a 25-pin D connector cable. Multi-instrument set-ups can use one Triad interface as a star-network controller. It operates via two uni-directional 8-bit parallel ports, offering similar features to MIDI and connecting to the Rhodes *Chroma* and *Polaris*. An unusual function on the latter is a tempo adjusting control that sets an external drum machine or sequencer sync pulse to give the right playback/record rate.

Another kind of interfacing is the link between humans and the synthesiser controller. Whilst not forgetting *Synclavier II*'s link to a Roland GR-500 guitar, it's Roland's new guitar controller that could put the guitarist's skills back in perspective, and instruments like the Lyricon wind synthesiser have led to Yamaha incorporating a unique breath controller on their *CS01* and *DX* instruments.



The new GR-707 guitar controller

On the keyboard side, although several instruments have velocity sensitive keys and even less have weighted keys or pressure (after touch) control, it could be that Dr Robert Moog's company called Big Briar has developed what appears to be the ultimate controller (the *100 series*). Wood action keys and digital scanning detect four independent, continuously variable modes of touch sensitivity: left-to-right position of the finger on the front half of the key surface, front-to-back position on the same area, up-down position of the key itself, and key pressure when fully depressed. In addition, the key's downward velocity is measured. Big Briar also produce touch-sensitive plates (*300 series*) and a Therenin-type controller (*500 series*) with numerous control options.

The possibilities of the MIDI system have already paved the way for a new modular synthesis system, such as the Roland *MK-1000*, where a 'mother' keyboard is all that's needed to communicate with a host of appropriate 19in rack-mounted modules. The *MK-1000* has weighted wooden keys, touch sensitivity, programmable split point, and mono or poly modes. After touch control is such a good thing to have too—particularly as an assignable function as on the *Voyetra 8*, *Chroma* and *DX-7/1*—but it does swallow up the micro's memory when used through MIDI. On note played on the *DX* with pressure changes can take 5 kBytes of memory in a few seconds.

External control of echo to synchronise with your drum machine or tape tracks can now be cheaply done using the Boss *DE-200* digital delay's 'rhythm sync' function. Natural sounds can be captured and replayed in time in the same way as a sampling machine.

Drum machines

It is worth pausing here to consider the influx of drum machines we've had over the last year or so. We've seen the change from analogue to sampled sounds and the use of micro control to create sophisticated playback of complete 'songs'. In retrospect, many would say they know a Linn (for example) when they hear one, and that might suggest that the ultimate is still the Fairlight, in conjunction with its *Page R* real time sequencer, because of its complete ability to change all the sounds at any time.

From the studio angle, a lot of mixer channels can be saved by using a single sync track to control a multi-output machine with its own stereo panned mixdown and treatment send/returns. While variations on the analogue/digital PCM/sampled sound continue to appear, the MIDI link could clinch the control possibilities.

Multitrack

With the inclusion of sophisticated multitrack recording on board the Fairlight *CMI*, *PPG Waveform* and the *Synclavier II*, it is not surprising that the trend in polyphonic synthesisers has been to include similar facilities, albeit at a much less intelligent level in many cases. Instruments like the *Synergy*, *Emulator*, *Voyetra 8*, *Prophet 600* and *T8*, Roland *JX-3P*, Yamaha *CS-70M*, *Elka Synthex*, *OSC Oscar* and the new Moog *SL-8* all have sequencers built in. Most are concerned with remembering notes played and although some are also polytimbral (playing more than one voice per track), you have to go to a dedicated computer-linked system to get completely different voices per track.

Another point to consider is the method of input: Manual (step-by-step) or Real Time. Most of these polyphonics have real time recorders, that is, you input notes exactly as they should play back. Often, this can be done at a slower speed than actually required and various levels of editing would be available.

The method of Manual input has definite advantages for certain types of music sequence and is certainly not just for the less able playing-wise or the less experienced in musicianship. Casio, Yamaha, Technics, and other manufacturers—particularly Seiko, with their new *DS-320* digital 4-track recorder—have manual and/or real time recording systems that puts this facility right across the price range.

Storage of sequences can be from internal memory with battery back-up, cassette tape, floppy disk, or a special memory cartridge. Tape storage is significantly slower than the others to be unsuited to stage use and, while the cartridge format gives instant access in a handy portable pack, the new Sony 3.5 in floppy disk may prove a less costly storage medium as it becomes more available, as well as being more rugged down than the current 5.25 in or 8 in disks.

The implementation of manual input does open the door to sound engineers and non-musicians having a hand in programming. Fairlight's Kim Rylie says there are already plenty of people who can type in the required data straight from a music score into the machine without having to play a note of music. Nevertheless, serious use of manual input systems in studios is only possible when all time signatures can be freely used and clear graphics define the composed score for quick editing over several tracks. Adequate sync ins is also essential.

Both Yamaha and SCI will soon bring out