Gliss Bliss
The 'glissando' (bending the musical pitch from one note to another) is easily performed on a stringed instrument by sliding the fingers up or down the fretboard. A synthesiser needs careful programming to reproduce this as a 'slide' effect, and not as a series of distinct notes

MIDI differs from the RS232 interface design in an important respect. The rate of data transmission with the RS232 is 1,920 serial words per second, or 19.2 Kbaud: MIDI is half as fast again. This does not affect compatibility with home computers because logic circuitry within the MIDI itself sets a new clock speed of 3,125 words per second, or 31.25 Kbaud. This is a relatively high speed for serial transmission, but arguably it is not fast enough. We will consider why this may be so later in this article.

MIDI is designed to interface with more than a single receiving instrument. Where more than one instrument is receiving MIDI instructions, the first requirement must be that the correct data is sent to the appropriate instrument — otherwise a drum machine may end up trying to play a carefully sequenced melody, and a polyphonic synthesiser end up reproducing a bass drum pattern on its middle C. MIDI-compatible instruments are expected to have a numerical identification code or ID. One of the 16 available MIDI channels is assigned the code, so that only that channel accepts data for that instrument. The first part of a full MIDI transmission is then a status byte that includes the ID. All the data following this routing instruction can then specify how the command should be interpreted.

The unit, about 100 × 120 × 45 mm (4 × 5 × 2 in) in size, has two five-pin DIN sockets, marked 'MIDI IN' and 'MIDI OUT'. 'MIDI IN' accepts all instructions from a microcomputer or master synthesiser, and 'MIDI OUT' transmits the modified bitstream to the receiving instrument. Many models also have 'MIDI THRU', a second output socket that simply transmits the original unmodified bitstream sent to 'MIDI IN'. This may then be sent to a second interface. The cable, which has a maximum length of 15 metres, is fitted with five-pin DIN plugs, and connects to the back panel of a microcomputer or master synthesiser.

In a music system, the computer has two possible roles, depending on the particular MIDI unit in use: firstly, it must switch MIDI into active mode in the first place, and provide the memory base for recording music; secondly, it may also support the MIDI software if that is not resident in MIDI itself. Similarly, MIDI may be simply a digital interface between the musical instruments and the computer, or it may be an interface with active control over the data transmitted.

There are two transmission modes, record and playback. In record mode, music produced on the instruments is sent through MIDI to memory — either in the computer or in MIDI's buffer. In playback mode this digital information is processed by MIDI en route to the instruments: timing, synchronisation and control information is attached to it as specified in the user-defined protocol

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MIDDLE C

Let us imagine a first-time user of MIDI. He has a short melody he wishes to try out. The melody starts on middle C, moves upwards to E, then to G, and so on. How he instructs this will depend on the type of music software he is using. He may be using a light pen to dot in the notes on a five-line stave displayed on the VDU. This stave arrangement has been used as a standard notation format in Western music for over four centuries. He may be entering the information on the alphanumeric keyboard of his microcomputer, using some sort of MCL (Music Composition Language), again with a VDU display. Another alternative would be playing the notes of the melody on a music keyboard peripheral. This keyboard might have no sound of its own, but would produce one or other of the displays outlined above. But, however the music is entered, the MIDI transmission will always be the same: to start the tune, the first byte — transmitted as a serial word with its two extra bits from the ACIA chip — will instruct PLAY / ON CHANNEL 6; the second byte, MIDDLE C.

This minimal instruction will produce the note middle C from the receiving instrument. And the synthesiser will continue sounding middle C unless there is also an instruction to limit its duration, such as STOP PLAYING / ON CHANNEL 6, byte one; MIDDLE C, byte two; and ALLOWING FOR A DURATION OF X, byte three. If this second