



Steve Helstrip concludes this two-part class by taking you through the basics of Cubase. And, if you enter our competition, you could win a Roland Personal Music Assistant

Making music



In last month's Computer Class we looked at ways in which you can use your PC to make music and, hopefully, answered any questions you had about MIDI (Musical Instrument Digital Interface) and digital audio. This month, we'll be showing you step-by-step how to create a basic song using the popular MIDI sequencing package, Cubase. We included a fully-working demo of Cubase on last month's free cover CD. If you already use a MIDI sequencer other than Cubase, don't be put off because much of what we'll be covering in this issue can be applied to alternative software packages, such as Cakewalk.



Installing Cubase

From Windows 95 select Run from the Start menu and type D:\cubase\cubase\install. If your CD-ROM drive is something other than drive D, replace this with the appropriate letter. In Windows 3.1, the Run command is found in the File menu of the Program Manager.

The installation routine enables you to select a full or custom install. A full installation requires around 12Mb of disk space. If you don't have sufficient room, the following components may be deselected when you choose custom install: Studio Module, Style Trax, Read Me files and Mixer Maps. After clicking Continue, Cubase will be installed on your hard disk and a program called Setup MME will automatically run. This allows you to disable and rename your MIDI ports. However, this shouldn't be necessary, so click the OK button to continue.

If you're running Windows 95, you will notice that a folder called Cubase Score 3.0 demo has been created in the Programs section of the Start menu. To launch Cubase, one swift click on the Cubase icon is all that's needed. Users of Windows 3.1 will need to locate the newly created Program Group, Cubase Score 3.0 demo, and double click the Cubase icon.

When Cubase loads you are presented with the main arrange window with nothing more than 24 empty tracks and a whole load of menus. We'll be looking at what lurks in these menus

later, but for now let's define what a track is. There are seven different types of tracks in Cubase. However, only two main types are commonly used – MIDI tracks and audio tracks – and it is these we'll be concentrating on.

A MIDI track is used to record and play back MIDI information using a synthesiser, such as the one on your sound card. The number of MIDI tracks available for use is limited only by your computer's memory. An audio track can be used to record sound from a microphone or a CD player. It is also possible to play back samples already stored on your hard disk, or from CD-ROM. A sample may be someone singing, playing the guitar or some weird sound you downloaded late one night from the Internet.

When you record audio, the data is recorded direct to your PC's hard disk for storage. This method of recording is commonly known as D2D (Direct to Disk) recording. The number of audio tracks you can play simultaneously largely depends on the configuration of your PC. A fast PC, such as a 100MHz Pentium with 16Mb of RAM, should be capable of playing six stereo tracks recorded at CD quality.

When audio is recorded at CD quality (or 44.1KHz 16-bit stereo for you techies) you need approximately 10Mb of disk space for every minute recorded. Since not everyone has gigabytes of free disk space, it is sometimes necessary to record at a lower sampling rate. Cubase supports four sampling rates: 11KHz, 22KHz, 44.1KHz and 48KHz. See the table below for disk space requirements.

As mentioned earlier, we will be working with both MIDI and audio tracks. But to start with, let's make sure your PC's sound card is working correctly and that Cubase is receiving MIDI information from your keyboard.

Disk space required for Digital Audio

Sampling Rate (KHz)	Resolution	Mono/Stereo	K/s
11KHz	16-bit	Mono	22
11KHz	16-bit	Stereo	43
22KHz	16-bit	Mono	43
22KHz	16-bit	Stereo	86
44.1KHz	16-bit	Mono	86
44.1KHz	16-bit	Stereo	172

Cubase works with any Windows-compatible sound card. So, before loading Cubase, check to see if your PC can play both MIDI and audio files. The best way to do this is to launch Media Player and test the MIDI and audio files supplied with Windows. You can find Media Player in the Multimedia folder of the Start menu. Alternatively, type `mp1player` from the run command.

In Media Player click the Device menu and select MIDI sequence. This will automatically start the Open-File dialog, from where you can select the Canyon file, which is stored in the Windows folder. If you can't hear anything when you play the

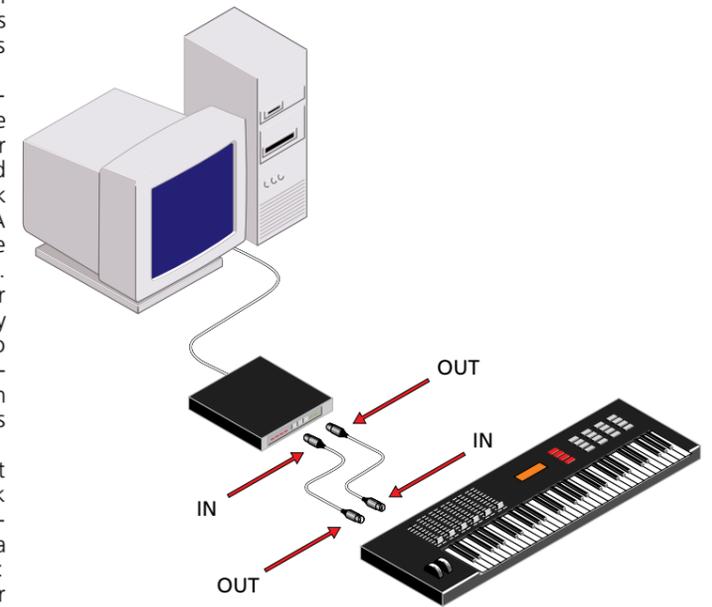


Diagram 1

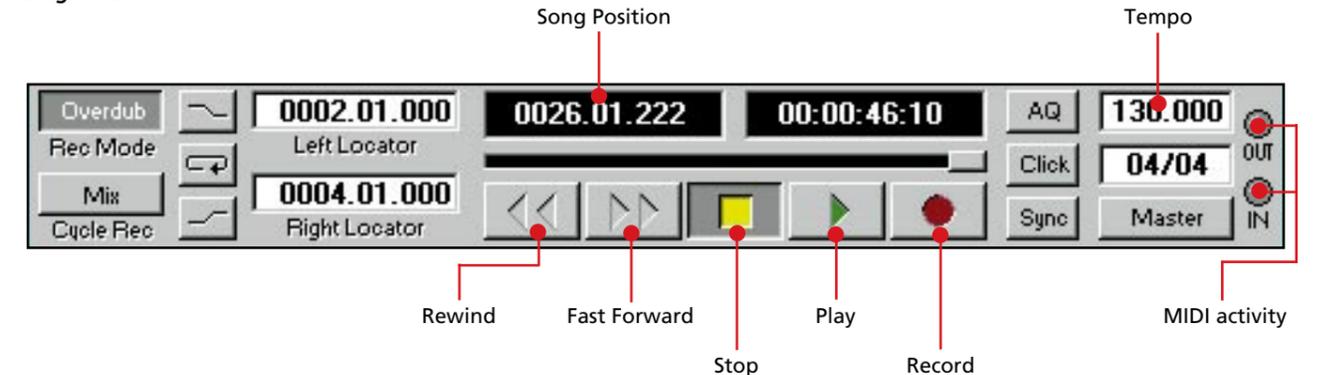
sequence, check that the volume is turned up on your speakers and the software mixer for your sound card. In addition, make sure you have correctly connected the output from your sound card to the speakers. If everything is OK, repeat the previous step, only this time selecting Sound from the Device menu. This will allow you to play one of several samples stored on your hard disk. If you still can't hear anything, it's time to check out the trouble-shooting section of your sound card's manual.

Once you have both MIDI and audio working correctly, load up Cubase and have a bash on your MIDI keyboard. If Cubase is receiving MIDI data correctly, the 'In' light will flash on the transport bar. If it doesn't, the most likely problem is that you have connected up your MIDI cables incorrectly. The output from your keyboard should be connected to the input of the MIDI interface, and the output from the MIDI interface connected to the input of the keyboard, as shown in **Diagram 1**. If you don't have a MIDI keyboard, it's still possible to enter notes into Cubase using your mouse.

Let's make some noise

A good place to start when composing a song is to lay down a drum track. This could either be programmed using MIDI instruments, or it could be a digital sample of a drum loop. The drum loop that we'll use in this example has a tempo of 130 beats per minute (bpm). Therefore, we must set Cubase to run at 130bpm. The tempo indicator can be found in the top right-

Diagram 2





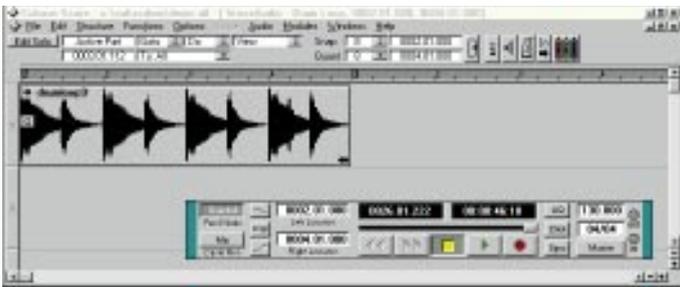
hand corner of the transport bar (see **Diagram 2**). The default tempo is 120. To change this, double click and key in 130.

Next, select audio track 1, if it isn't already highlighted, by clicking in the track column. It makes life easier in the later stages of arranging a song if each track is named. This is done by double-clicking on the track name, in this case Audio 1. Let's rename it Drum Loop.

To the right-hand side of the screen is the Arrange window, and above this is the bar ruler. If you click your left mouse button on the ruler you will notice that a vertical bar moves to where you clicked. This is called the left locator, and is used to determine the start point of a recording, or 'part'. Position the left locator on bar 2. The right locator, which tells Cubase where to end the part, is set by clicking the right mouse button on the bar ruler. Position this on bar 3.

The next step is to create a part. A part is simply an object that contains either audio or MIDI events. You can create one by pressing Control P, or by double-clicking your left mouse button between the left and right locators. The newly created part will be named automatically.

To place the drum loop sample within the part, double click the part to open the audio editor. The audio editor is used most often to fine tune the start and end points of samples, but in this case we'll be using it to import the drum loop sample. If you click the right mouse button, a tool box appears. Select the pencil tool and left click at the start of bar 2.



From the Open File dialog load the sample DRUMLOOP.WAV. This can be found on the cover-mounted CD-ROM in the folder called Samples in the root directory. You will see a graphical representation of the wave file within the editor (see screenshot, above). To the bottom right of this is a handle which can be clicked and dragged to adjust the length of the sample. Extend this to the beginning of bar 3 so that it fills a whole bar. When finished, press Return to go back to the arrange window.

We now have the foundation of our track in place. To hear the drum loop, press 1 on the numerical keypad to set the song position at the left locator. Then click the play button, or press Return. If you want to loop the part, one click on the cycle button will take care of this.

The next thing we have to do is set the output level – or volume – of the drum loop. This is taken care of by using a mixer utility called Monitors and this can be found in the Audio menu. Set the level of channel 1 to approximately half way, and then place the balance slider in the middle so that the loop plays from both speakers.

A song that lasts for just one bar isn't going to be much fun, so let's copy that part 15 times. This is done by highlighting the part and selecting Repeat from the Structure menu. The keyboard short cut for repeat is Control K.

Adding more tracks

On the second audio track, create another 1-bar part and then add the sample SNARE.WAV to beats 2 and 4 (see screenshot, above right). Doing this will give the rhythm more 'drive'. From the Arrange window, position the newly created part to start at bar 6 and make, for example, 11 copies.

To make the snare more interesting, experiment with positioning the sample at different points within the bar. If you need some ideas, load up the demo file (DEMO.SNG), or simply listen to some records in your collection. We could continue to add more audio tracks using the samples on this month's CD, but instead, let's look at programming MIDI.

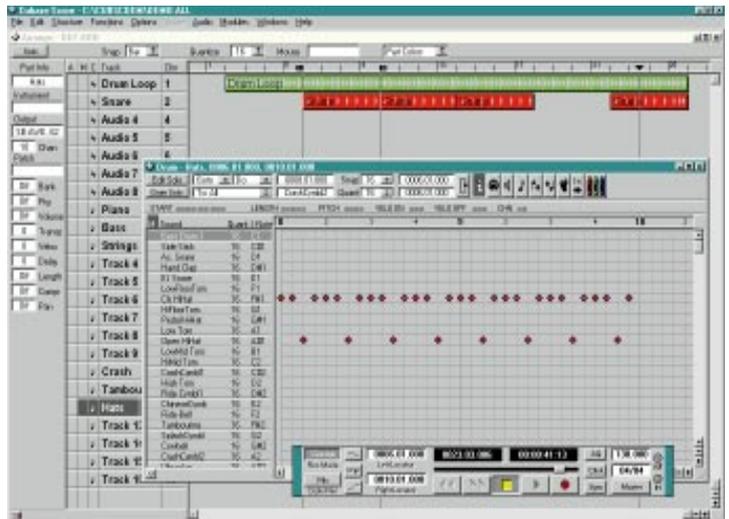


There are several things we can do to improve the drum loop, including adding more drum or percussion parts. Percussion sounds are accessed on MIDI channel 10. Because there is already a track set up on MIDI channel 10, rename it Crash Cymbal. Crash cymbals are commonly used at the start of 4-, or 8-bar, phrases. This doesn't mean that they can't be used anywhere else, though.

In the General MIDI percussion layout, there are two crash cymbals and one splash cymbal. These are mapped on to keys C#2, G2 and A2. First decide which one you like the best, then set the right and left locators to bars 6 and 10. Next, turn on Cubase's metronome. This is the button marked 'Click' on the transport bar and is used to count out the beat, helping you to 'come in' on time. To kick Cubase into record, either press the record button or the asterisk key on the numerical keypad. Cubase will give you a two-bar count in, then you're off.

When you have recorded the crash on beat one, press the space bar to stop recording. If the crash sounds a little out of time, this can be corrected using quantise. To do this, first set the quantise value to one, then press the letter Q. This will move the note to the start of the bar. When recording in cycle mode, it's possible to play in additional parts each time the cycle begins. But in this example, let's choose another track to record a second percussion sound.

Adding hi-hats to the existing parts will improve the overall drum section. So, select and name a new track, ensuring it is set to channel 10. You can use both open and closed hi-hat sounds. A commonly used pattern for hi-hats is to play semi-quavers, or 16 notes spaced equally in the bar. You can also



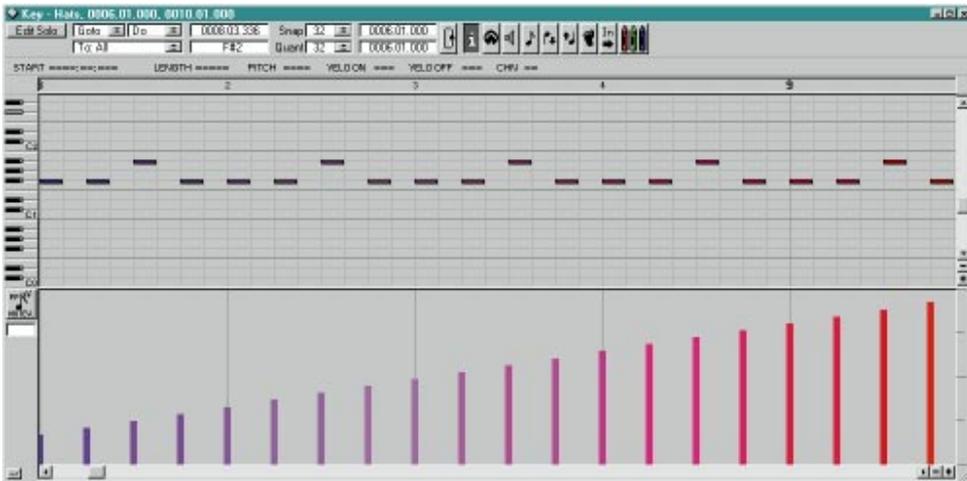
add an open hi-hat on the off-beat. To quantise the part afterwards, set the quantise value to 16.

When parts have been recorded, they can be viewed and edited in one of four editors: Score, Key, List and Drum. To view the hi-hat pattern in drum notation, select the part and press Control-D. From this editor, notes can be moved around, added or deleted. To add notes, select the pencil tool by clicking the right mouse button. Then, simply click where you want notes to occur. To delete notes, use the eraser tool, or simply press the delete key.

An easy way to build up percussion tracks is to cycle a 1-bar section while adding/removing notes in the drum editor. This way you can hear the effect each new note has on the track. ▶



Computer class How to make music on your PC part 2



simply delete the part and start again. If you're used to reading traditional music notation, try using the Score editor to fine tune your performances. Otherwise, you might find the Key editor easier to use.

More tracks can be added effortlessly. Try recording a bass line to complement the piano, or select a warm strings patch and play in some chords. An easy way to see how MIDI tracks are structured is to load a MIDI file. To do this, select import MIDI from the File menu.

We've only covered the bare essentials of sequencing in this Computer Class, but don't be afraid to get stuck in deeper. Check out all the commands in the drop-down menus and see what you can come up with. Who knows, you might have a hit single on your hands. ●

Another way to view the hi-hat part is to open the Key editor. This displays a piano keyboard to the left of the screen and MIDI events to the right. At the bottom of the screen, vertical bars represent the velocity of each note, or volume. Using the mouse, you can adjust each note individually, or use the gradient tool to create a fade in/out.

So we have now built up a typical drum groove using both audio and MIDI tracks. To record an additional part, such as a piano, select and name a new MIDI track.

Set the channel, and press Control-Y. This will bring up the GM editor, from where you can select an instrument.

When selected, set the left and right locators and try jamming along to the percussion tracks. When you have something you're happy with, record it in. If you make a mess of things,



On this month's CD

There are 10 samples on this month's CD to play with and they can be found in a folder aptly named Samples. We would like to thank Time + Space for providing the samples, which come from the CD PC dance tools. This is a collection of 1,200 sounds and vocals, essential for producing dance music. If you like the 10 samples on this month's CD, you can check out another 1,200 of them for £49.95 – that's less than 5p per sample.

Time + Space: 01442 870681

Win a Roland Portable Music Station



Entry coupon

1
2
3
4
5
6

Name

Address

Postcode

Telephone

Tick here if you do not wish to receive promotional material as a result of your entry into this competition.

Send this coupon to: Roland PMA-5 Competition, *What PC?*, VNU Business Publications, 32-34 Broadwick Street, London W1A 2HG.

Employees of VNU Business Publications and Roland UK and their agents are not permitted to enter. The editor's decision is final. The closing date for this competition is 31 January 1997.

We're giving away a brand-spanking-new Roland PMA-5 Personal Music Assistant. Not only is this a great gadget, it also has some of the coolest sounds around at the moment. Not to mention an eight-track sequencer, a no-compromise General MIDI synthesiser and a MIDI keyboard. To stand a chance of winning your very own PMA-5, simply answer the questions below and send your entry form off to the address on the coupon.



The questions we asked last month were:

1. What is MIDI an acronym for?
2. How many songs can the PMA-5 store in memory?
3. For a sound card to be General MIDI-compatible, how many instruments must it contain?

And this month's brain teasers are:

4. How much disk space is required to store one minute of stereo digital audio recorded at CD-quality?
5. What sampling rates does Cubase support?
6. What does PMA stand for?