

## CloudCube – instructions for use

**Caveat:** The CloudCube software was written in order to fulfil a single purpose: to create the raw material for the main work in the portfolio, the orchestral piece *Cloud Triptych*. As such, it does not represent in any way a ‘generic’ version of the software, useable beyond this purpose. Furthermore, as it was intended only for my own personal use, it does not utilise an entirely user-friendly or self-explanatory interface. Both of these aspects are to be pursued in future development.

CloudCube’s functionality includes occasions where files are created that need to be saved. As the CD is read-only, to use this feature of the program the original data files (listed below) should be copied from the CD to a writeable folder on the user’s computer. Attempting to use this feature directly from the CD will cause the program to crash.

This disc contains the following data files:

- **CloudCube.exe** – Windows executable version of CloudCube;
- **CloudCube.txt** – complete code of the CloudCube BBC BASIC for Windows file in plain text format;
- **pi\_1m.txt** – contains the first 1,000,000 decimal places of pi, used by CloudCube;
- **README.PDF** – this PDF file containing instructions for use.

There are also two subfolders:

- **DATA** – contains datafiles created and used by CloudCube in order to generate material;
- **Screenshots** – contains screenshot bitmap files created when generating material.

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- Double-click the file **CloudCube.exe**. The program will start.

CloudCube has two modes of operation: **Mode 1 (Composition)** is used to create the final material for compositions; **Mode 2 (Diagnostics)** is used during the design of individual behaviours for test purposes.

- Press either **1** or **2**, depending on which mode is desired.
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## Mode 1 (Composition)

In order to generate material, CloudCube needs to use a pre-designed trajectory in order to know how to move through the metacube. This is done either using an existing trajectory or by designing one at this stage. A trajectory consists of two files:

<i>filename.cloudPOS</i>	contains the x/y/z coordinate data, the duration of the trajectory and the number of timesteps
<i>filename.cloudMOD</i>	contains all the decisions for each timestep concerning choice of behavioural modules

- At the **Record Motion Capture Data? (Y/N)** prompt, press **Y** to design a new trajectory or **N** to use an existing one.

### *Designing a new trajectory*

1. Enter a filename at the **Positions/modules filename?** prompt.  
CloudCube will display the overview of the metacube, a large horizontal view from above on the left – showing the behavioural nodes and their cores and orbits – beside a narrow sideways vertical view.
2. At the **Curved or Straight trajectory (C/S)?** prompt, press **C** to create a Bezier curve or **S** to create a straight line.  
Control points are now added to the display using the mouse. First left-click in the horizontal view on the left to set the x/y coordinates, and then in the vertical view on the right to set the z coordinate. Clicking in the wrong part of the display will make a short low buzz to alert the user.  
Right-click is used to undo previously set points. Control points can be aligned to the nearest behavioural node by pressing the following button while left-clicking:  
**Shift** – to align horizontally (left-right – x/y coordinates only),  
**Alt** – to align vertically (up-down),  
**Ctrl** – to align at the centre of the node.  
As each control point is added, CloudCube displays the complete trajectory. When using a Bezier curve, the trajectory is recalculated with the addition of each new point. It should be noted that Bezier curves are not recommended with more than five or six control points, as they become increasingly hard to fine-tune. In this case, it is preferable to create multiple trajectories each using a smaller number of points that can then be linked together to obtain the desired effect much easier.

3. When the trajectory is completed, left-click on the green **CLICK TO FINISH** button at the top of the screen.
4. At the **Duration in seconds?** prompt, enter the duration as a number of seconds.  
CloudCube now divides up the trajectory into timesteps and calculates the trajectory's module data. The cloudPOS and cloudMOD files are created and saved at this stage (in the DATA subdirectory), using the filename specified in step 1.
5. At the **Continue trajectory chain? (Y/N)** prompt, press **Y** to create a new trajectory linked to the present one (and return to step 2 above) or **N** to finish.
6. At the prompt **Start creating material now? (Y/N)**, press **Y** to proceed with creating material now (and continue with the *Using an existing trajectory* section below) or **N** to do this later (the program will exit).  
This is the end of the trajectory design process.

#### *Using an existing trajectory*

CloudCube will first initialise and setup various aspects of the program, which are reported to the screen.

1. When the pop-up window appears, select the desired cloudPOS file and left-click **Open**.  
If the file is a link in a trajectory chain, CloudCube will ask whether to use the rest of the chain. Press **Y** to do this, or press **N** to use the trajectory in isolation.
2. At the **Single player, range or complete set (S/R/C)?** prompt, press **S** to create material for a single player, **R** for a range of players or **C** for a full orchestral set.  
If S or R are selected, CloudCube will display the complete list of orchestral players.
3. **S:** at the **Select player** prompt, enter the number of the desired player.  
**R:** at the **Select First Player** prompt, enter the number of the first player in the desired range. At the **Select Last Player** prompt, enter the number of the last player in the desired range (the range is concurrent).  
**C:** no selection is necessary.
4. At the **Save screenshots (Y/N)?** prompt, press **Y** or **N** to save screenshots of the material generated by CloudCube. If **N** is selected, at the **Screen Pauses?** prompt, press **Y** to make CloudCube pause at the end of each screen of generated material or **N** to proceed without pauses.  
CloudCube will generate a tempo map. When this is completed, press any key to begin generating material.

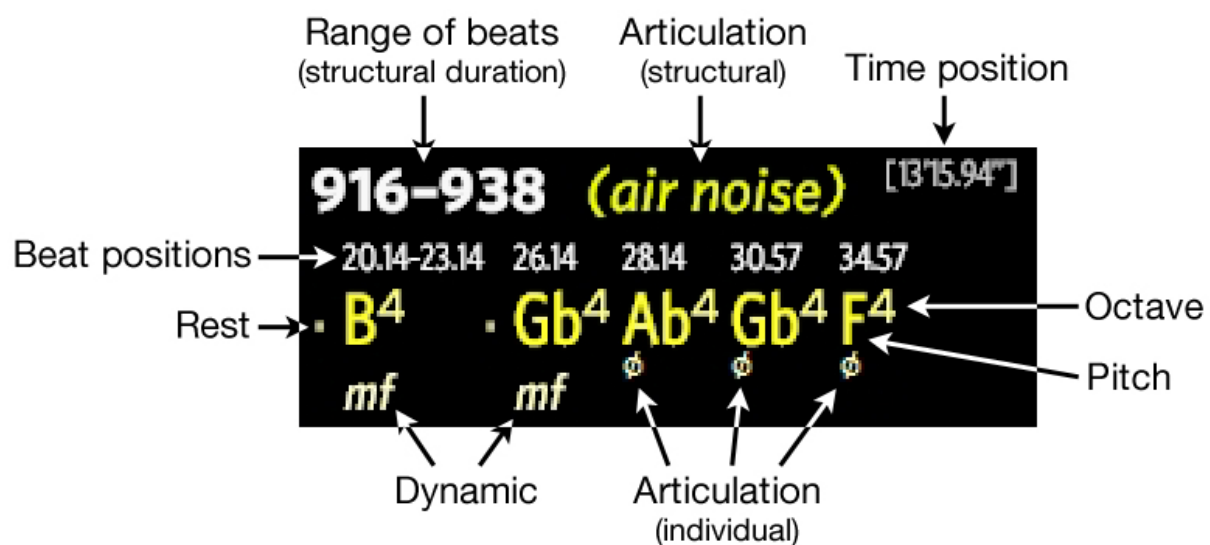
- CloudCube now generates material, displaying the progress along the trajectory on the left, and the musical material on the right. To understand the way CloudCube displays the material, refer to the Legend below.

If Screenshots were selected to be saved in step 4, these are created as a series of bitmap files stored in the Screenshots subfolder.

If Screen Pauses were selected in step 4, the program makes a short beep and the user is prompted to press a key when each screen is completed, otherwise CloudCube continues until finished and then exits automatically.

**NB.** It must be noted that due both to the stochastic nature and the complexity of the calculations made to generate material, it is possible (though unlikely) that a situation could arise where CloudCube is unable to resolve conflicting behavioural rules, and hangs or crashes as a result. In this situation, the program should be forcibly exited (clicking on the X at the top-right of the screen, in the usual way) and the process begun again from the beginning.

## Legend



The following articulation symbols are used:

>	accent	<i>f</i>	fluttertongue
^	strong accent	∅	semideterminate pitch
°	harmonic	x	indeterminate pitch
~	trill	+	cuivré (horns)
÷	timbral trill	î	ricochet (strings)
€	tremolando	†	pizzicato
·	staccato	‡	Bartok pizzicato
s	vibrato	®	damped note
§	wide vibrato		

## Mode 2 (Diagnostics)

The purpose of this mode is to test a single behaviour to ensure it is functioning correctly. The output from this mode is deliberately crude, simply intended to provide quick feedback.

1. At the **Select altitude** prompt, press **1**, **2** or **3** to select CL (Low), CM (Medium) or CH (High) respectively.
2. At the **Which node (1–9)?** prompt, press a number from 1 to 9 to select the desired behaviour.

CloudCube will initialise and setup various aspects of the program, which are reported to the screen. CloudCube will then display the complete list of orchestral players.

3. At the **Select Player** prompt, enter the number of the desired player.
4. At the **Screen Pauses?** prompt, press **Y** to make CloudCube pause at the end of each screen of generated material or **N** to proceed without pauses. Then press any key to begin the diagnostic.

If the selected player is used in the selected behaviour, the diagnostic will continue indefinitely, otherwise CloudCube will report **\*\* TACET \*\*** and the program will end.

5. When finished, close the program by clicking on the **X** at the top-right of the screen in the usual way.