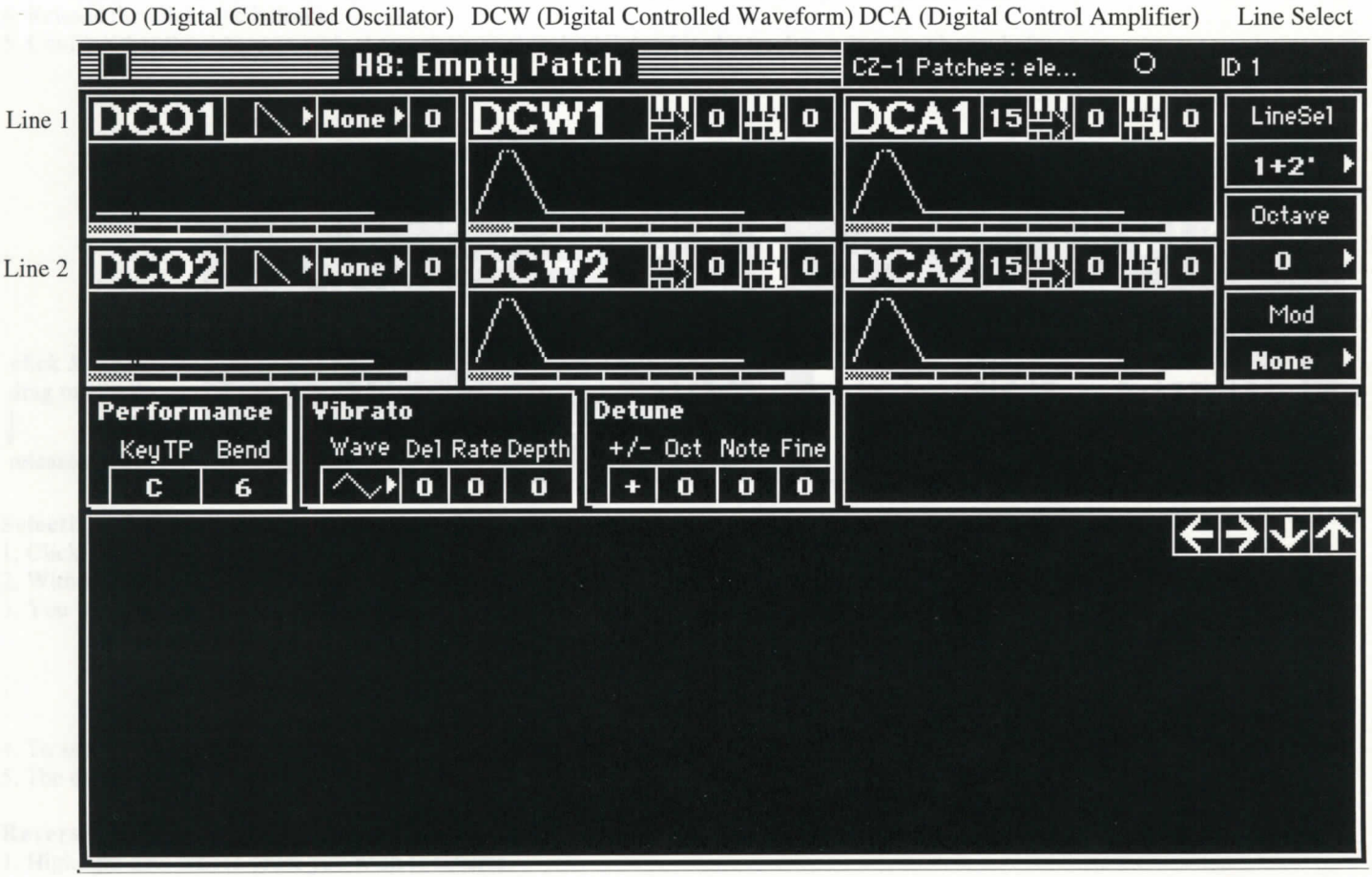
Overview of the Casio CZ-1's internal modular structure

1) The Casio CZ-1 is a digital synthesizer consisting of the following internal **modules**: 2 DCOs (Digital Controlled Oscillators), 2 DCWs (Digital Controlled Waveforms), and 2 DCAs (Digital Controlled Amplifier). These modules can be seen in the Galaxy editor window below.



2) The functions of these modules are defined as:

DCO or Digital Controlled Oscillator: A DCO is an **oscillator** which generates a waveform. The pitch of this waveform is digitally controlled by MIDI. The user may select type of waveform and create a pitch envelope of the oscillator.

DCW or Digital Controlled Waveform: A DCW is a **filter** which modifies the DCO's waveform. This filter may be digitally controlled by MIDI. The user may create a filter envelope for the DCW.

DCA or Digital Controlled Amplifier: A DCA is an **envelope generator** which modifies the amplitude of the filtered DCO's waveform. This envelope generator may be digitally controlled by MIDI.

3) These modules are organized into two **lines**, as shown below:

Line 1: DCO1 --> DCW1 --> DCA1

Line 2: DCO2 --> DCW2 --> DCA2

4) The **line select** option allows the user to combine these lines in one of the following ways:

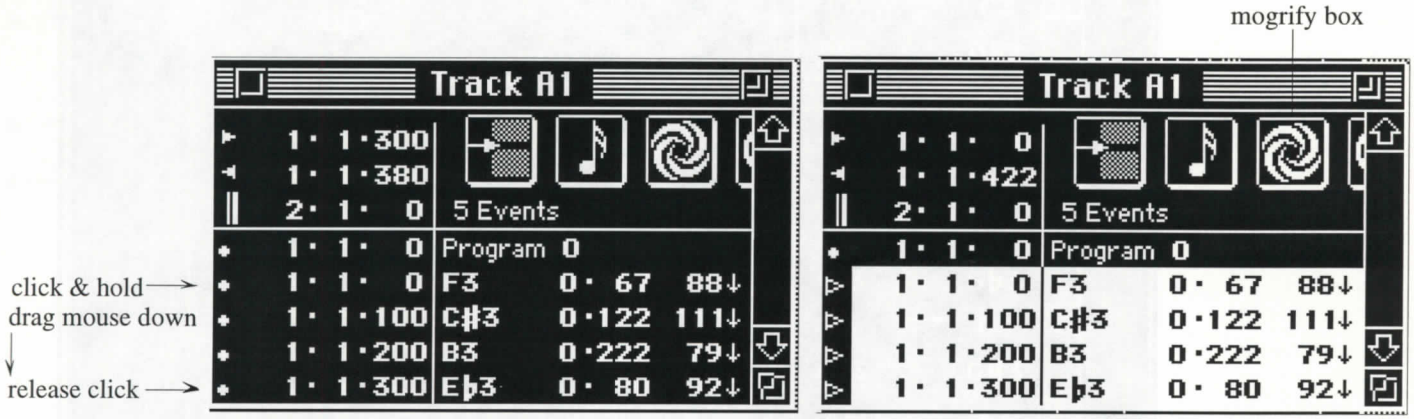
Line 1 ----------> output
Line 1 + Line 1' -->output (Line 1 is mixed with itself)
Line 1 + Line 2' -->output (Line 1 is mixed with Line 2)
Line 2 ----------->output (used only to monitor Line 2 when it is used in conjunction with Line 1)

Note that the prime mark indicates only that a line is combined with Line 1.

Global Transformations in Vision

Selecting data to be transformed

1. Find the beginning point of the data that you wish to transform.
2. Click and hold on the dot at the far left of the track window, next to the beginning point.
3. Without releasing the click, drag the mouse down to the end point of the data you wish to transform.
4. Release the click (see below).
5. Confirm that the data you wish to transform is now highlighted in the track window, as shown below.



Selecting the global transformation in the "mogrify" window

1. Click and hold on the mogrify box in the track window (shown above).
2. Without releasing the click, pull down the mogrify window.
3. You will see a number of different global transformation options. The ones we will use are:
    a) reverse time
    b) move events
    c) transpose
    d) scale time
4. To select one of the above, drag the mouse to one of the commands so that it becomes highlighted, then release the click.
5. The different global transformations are described below.

Reverse Time

1. Highlight data whose order you wish to reverse.
2. Pull down the **mogrify** window and select **reverse time.**
3. Confirm in the track window that the events have been reversed.
4. Notice that the data has also moved ahead n clock counts, where n is the duration of the last note of the untransformed data.

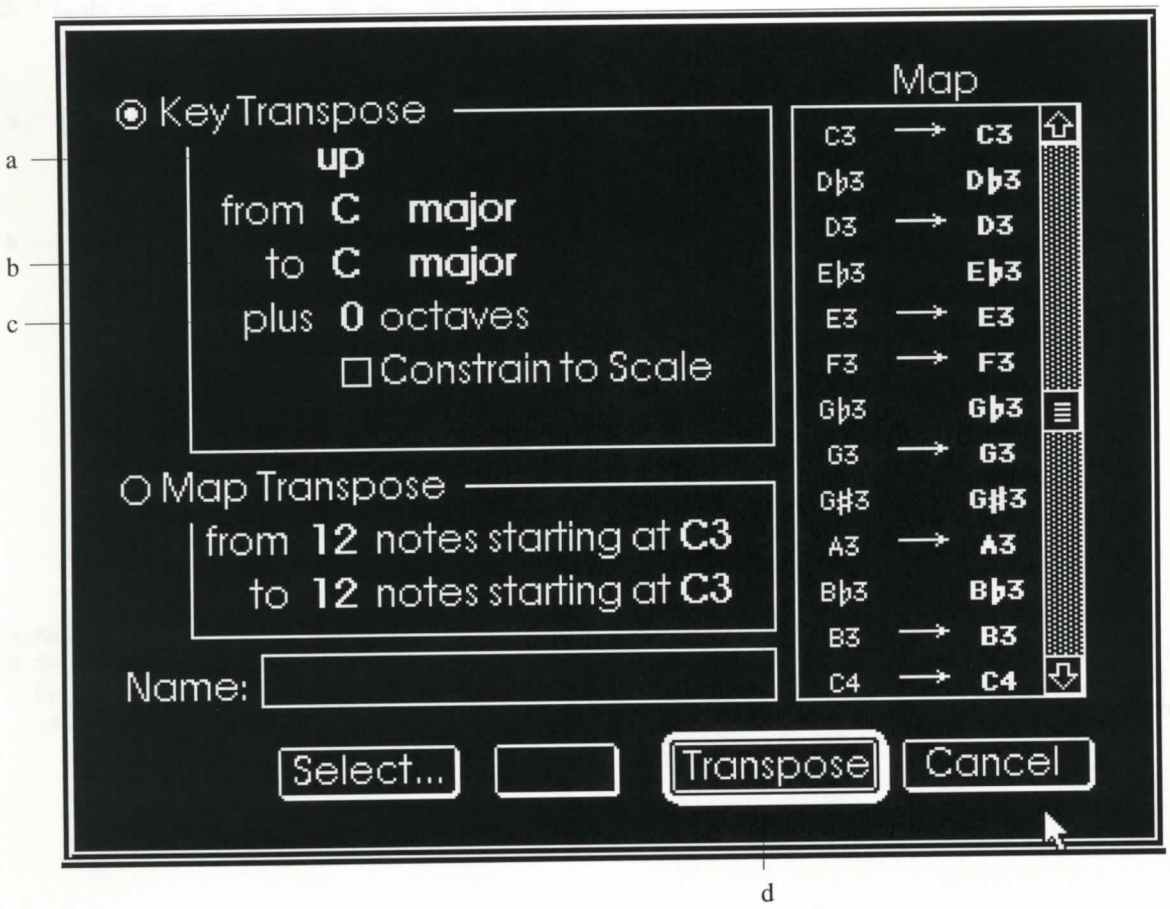
Move Events

1. Highlight data you wish to move forward or backward in time.
2. Pull down the **mogrify** window and select **move events.**
3. A **move events** window like the one below will pop up.

4. Select the options (as shown above):
    a) Click on the circle next to the words "to start at." (If the circle is already highlighted, ignore this step).
    b) Select the bar, beat, and clock count you wish your data to begin at.
    c) Ignore the other options.

Transpose

1. Highlight data you wish to transpose.
2. Pull down the **mogrify** window and select **transpose**.
3. A **transpose** window like the one below will pop up.

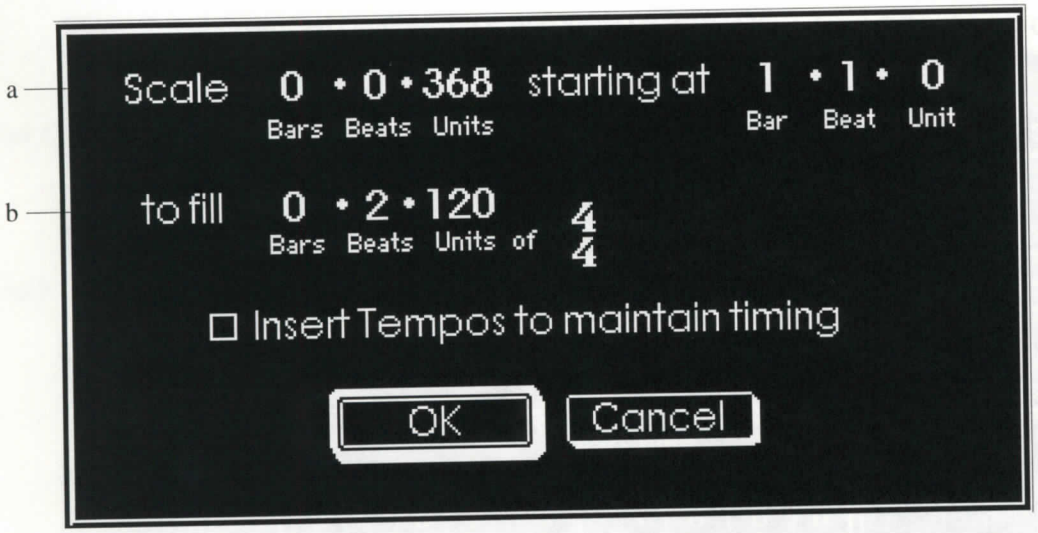


4. Select the following options (as shown above):
   a) Choose the direction of transposition by selecting **up** or **down**.
   b) Choose the interval of transposition by selecting the **major key** that represents the desired interval of transposition.
   c) Choose the number of octaves to be added to the interval of transpostion by selecting **octave.**
   d) After doing the above, click on **transpose** to make the changes take effect.

5. Ignore all the other options in this window.

Scale Time

1. Highlight data you wish to compress or expand.
2. Pull down the **mogrify** window and select **scale time**.
3. A **scale time** window like the one below will pop up.



4. Notice that the arrow "a" shows the total duration of the data you wish to transform.
5. Select bar, beat, and clock count (or unit), indicated by the arrow "b" above, of the new total duration you wish your data to have.
6. Important: If you compress your data, any other data which follows will be moved forward in time. If you expand your data, any other data which follows will be pushed back in time. Use the **move events** command on this data to correct this.