



Identifying Intervals of Interest In CinePlex[®] Video Files

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Introduction

This document presents a sample experiment that makes use of markers and marker occurrences to identify intervals of interest in the Plexon[®] CinePlex[®] video stream, thus simplifying the analysis of simultaneously recorded neural and video data.

In this experiment, we will identify intervals of chewing behavior—times during which the animal is not engaged in any behaviors of interest. The data in these intervals can then be removed from the analysis of the neural and video streams while preserving the data of greatest interest for further analysis.

CinePlex Applications to Use

Use the CinePlex Studio functions to record the video.

Use the CinePlex Editor functions to specify markers and insert marker occurrences directly onto the data stream.

Integrated System

The configurations presented in this document are:

- Applicable to a CinePlex System integrated with an Plexon OmniPlex[®] D Neural Data Acquisition System
- Based on Version 3.7 of CinePlex Studio and Version 3.6 of CinePlex Editor software

It is assumed that the CinePlex and OmniPlex Systems, including the PC and software, have been factory prepared and tested by Plexon prior to shipment.

Technical Support

Plexon technical support is available by telephone at (+1) 214-369-4957 or by email at support@plexon.com.

Additional Resources

For detailed feature descriptions, licensing options, hardware requirements, start-up procedures and advanced configuration options, see the CinePlex User Guides on the Plexon website, www.plexon.com.

Viewing Neural and Video Files Simultaneously

Recording Procedure

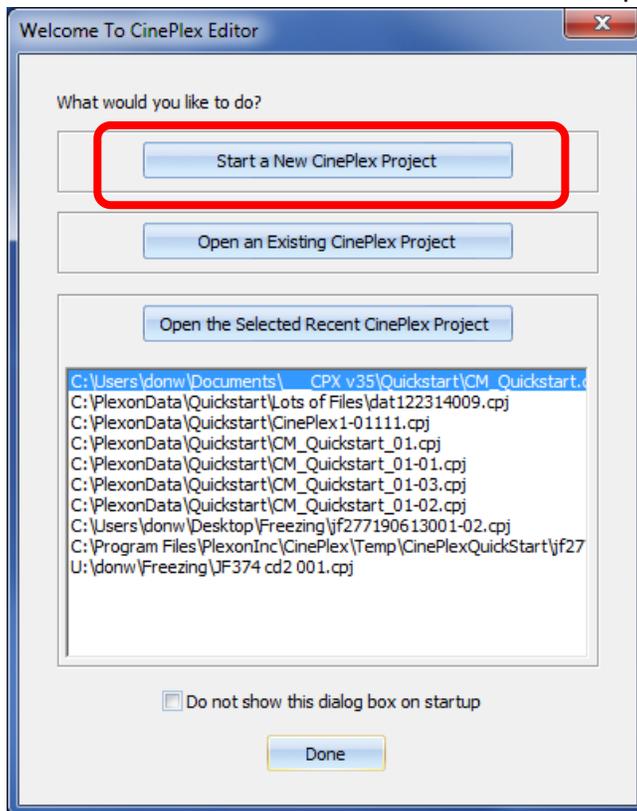
Set up the camera, start the system and create the video file by means of the procedures described in the CinePlex Studio User Guide.

During the recording process it is not necessary to track the animal's location in the arena or configure any behavioral events. Therefore, we will use the basic CinePlex Studio/Editor license (CPX V3) and one camera that can view the entire experimental arena from above.

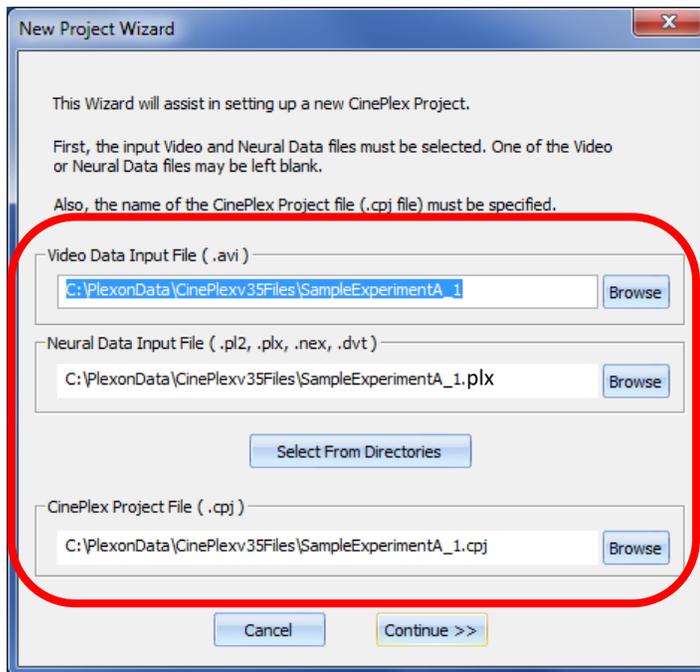
Viewing the Files and Adding Marker Occurrences

To view the neural and video files together, use CinePlex Editor. Follow the procedures described in the CinePlex Editor User Guide. The highlights are presented below.

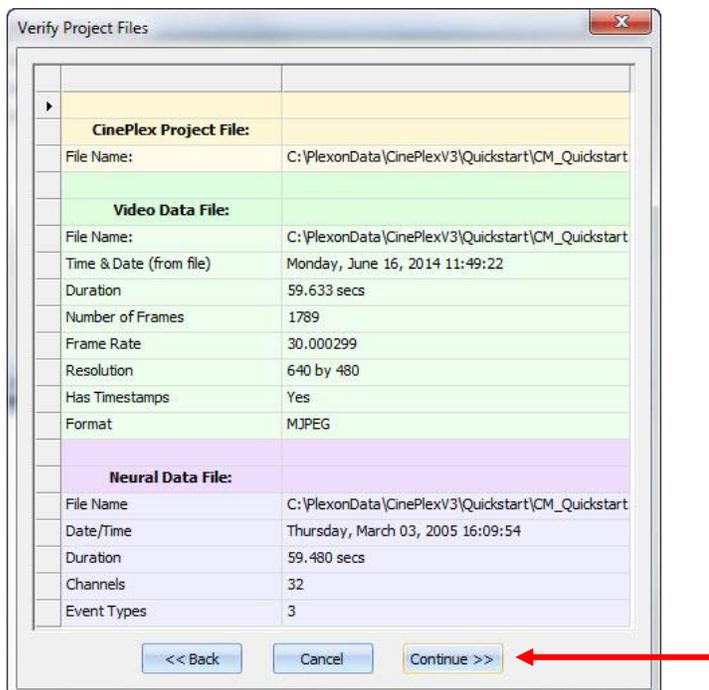
1. Double-click the CinePlex Editor icon (). Wait for the CinePlex Editor application main window to appear on the monitor.
2. On the Welcome screen, start a new Editor project by clicking on the **Start** button.



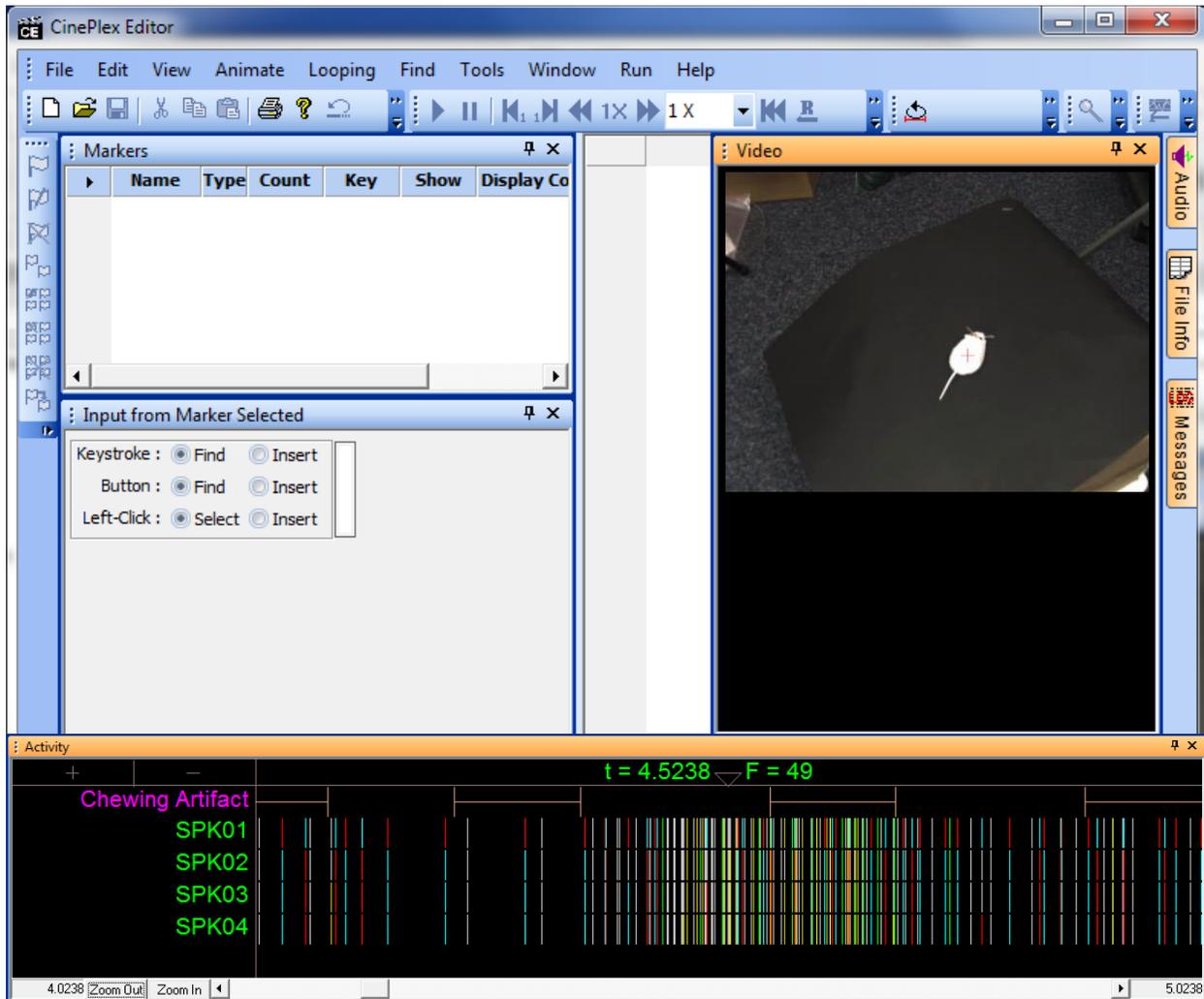
- Browse to select the AVI file and the neural data file that were recorded during a specific experiment. In this case, the files are from “SampleExperimentA.” The “_1” at the end of the AVI file name indicate that the original video was taken with Camera 1. Use an appropriate name for the project (cpj) file. Then click the **Continue>>** button.



- In the Verify Project Files dialog box, verify that the information is correct. Then click the **Continue>>** button.



CinePlex Editor creates the CPJ file and opens the CinePlex Editor main view.



Slider

5. View the animal's activity frame by frame by moving the slider left and right. The video images and neural activity indicators are time-locked (synchronized), because both recordings were created under the control of a single clock.

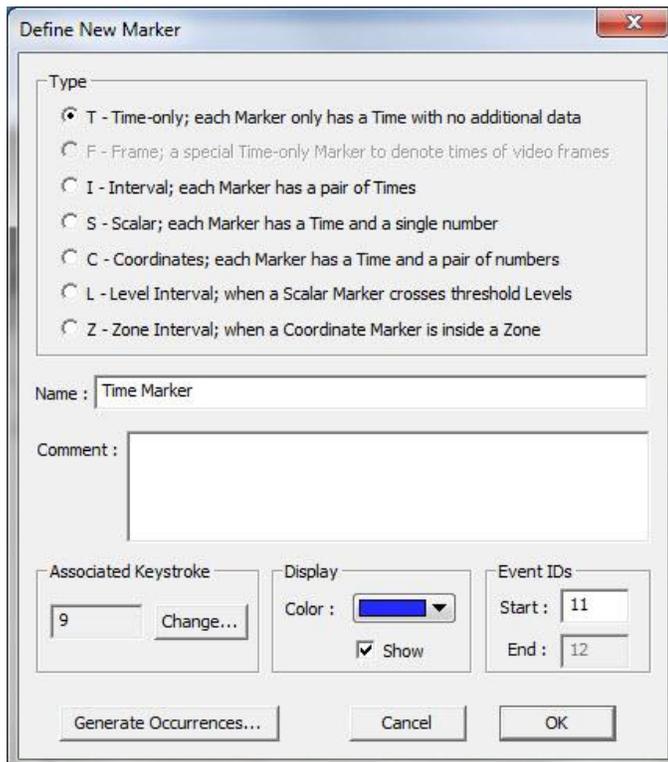
Adding a Marker to Identify Important Points in the Data

For the purpose of this quick-start example, suppose you want to use CinePlex Editor to invalidate intervals in the data that are not of interest for this experiment, in this case from the animal chewing. You do this by [1] defining a marker to bracket the chewing interval, then [2] entering marker occurrences whenever chewing behavior is seen in the video stream.

Defining the Marker “Chewing Artifact”

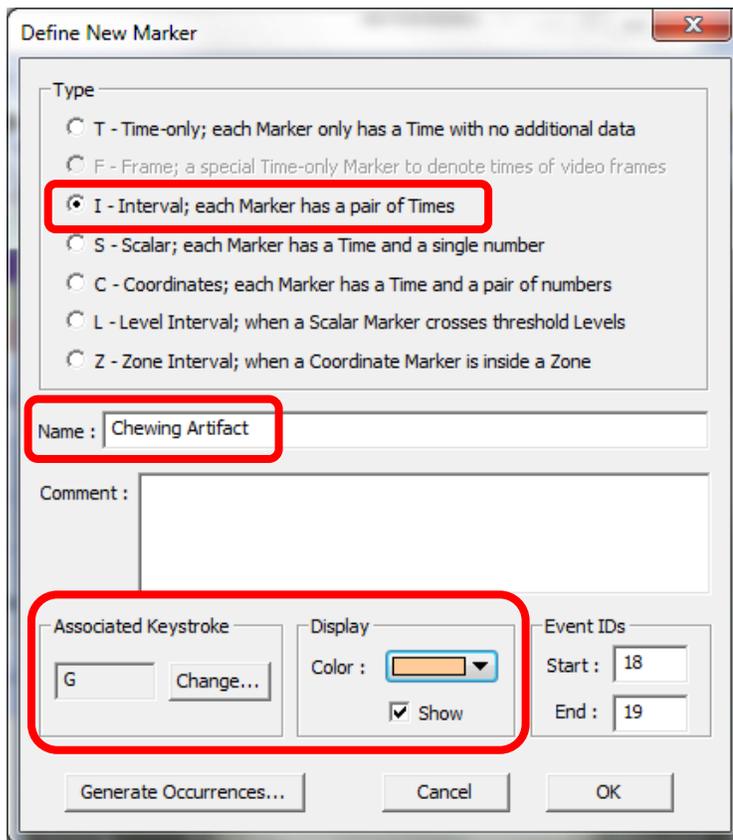
1. Click **Play** (▶) to start the video and neural data, then click **Pause** (⏸).
(Although pausing is not required, the video can be distracting when you are performing other operations in CinePlex Editor.)
2. Define a new marker to denote the time intervals that are dominated by artifacts. This can be done in three ways:
 - a. Click the **New Marker** button ,
 - b. or, from the Edit menu, click **Define New Marker**,
 - c. or, from the right-click menu in the Markers window, select **Define New Marker**.

The Define New Marker dialog box appears.



Note: The F (Frame) marker is a special time-only marker applied automatically by CinePlex Studio to associate a time with each video frame. This marker always appears grayed out in the Define New Marker dialog box because it is system-generated.

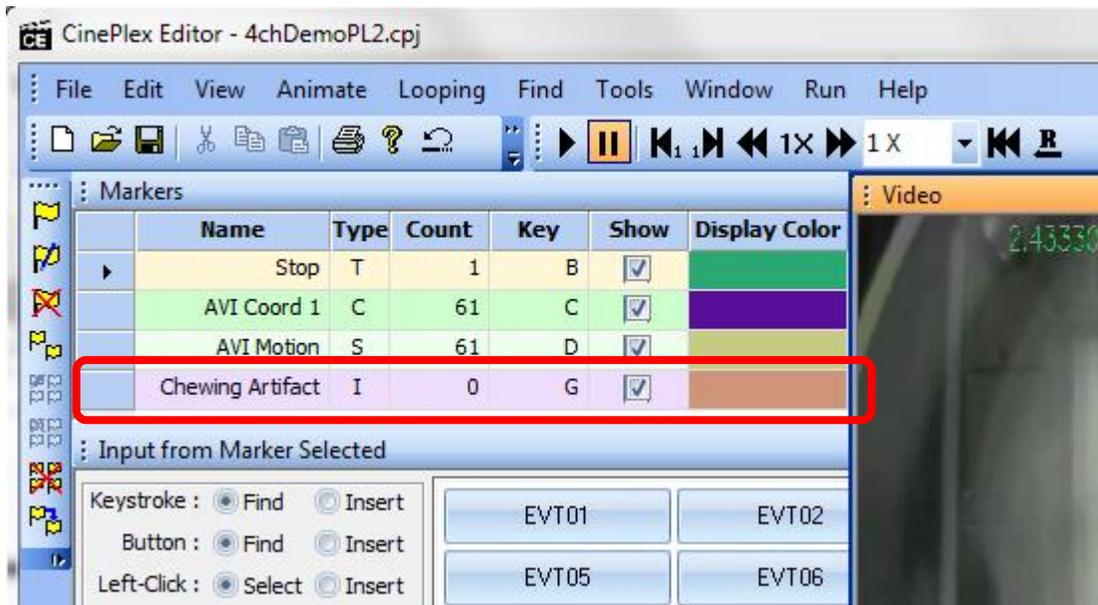
3. In the Type area, click “I” to define an interval marker.
4. In the Name box, in the place of the default name Interval type “Chewing Artifact.” Retain the default settings for the other items.



Notice in the example above that the **Associated Keystroke** (which will be used for Marker Occurrences) is “G” and the display **Color** is beige. You can change these values if desired.

5. Click **OK**.

The Chewing Artifact entry appears in the Markers window. However, there are no occurrences of this marker, so the value in the Count column is 0.



Adding Marker Occurrences To Intervals with Chewing Behavior

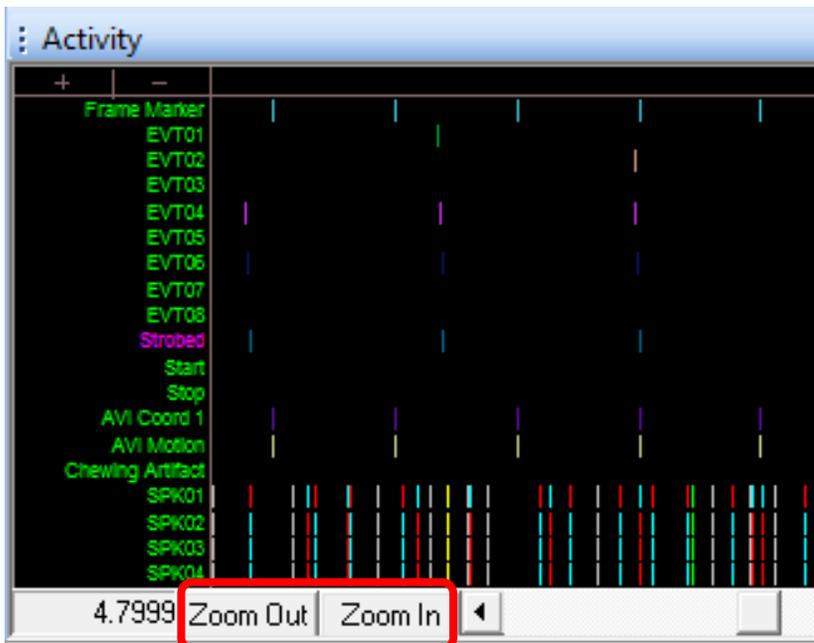
Initially, we *rough in* all the marker occurrences during one continuous pass through the video, then we go back and adjust each marker occurrence to be as accurate as possible. Then this information is saved to a NEX file, from which we can easily load it into the NeuroExplorer® application for analysis.

Denoting chewing behavior in the video (*roughing in* marker occurrences)

1. Click **Play** (▶). Adjust the Faster and Slower settings (◀◀ 1X ▶▶ 1/4 X) to a comfortable speed to view the video, which balances the desire to get through the video quickly against the risk of missing the behavior should it occur too quickly to spot.

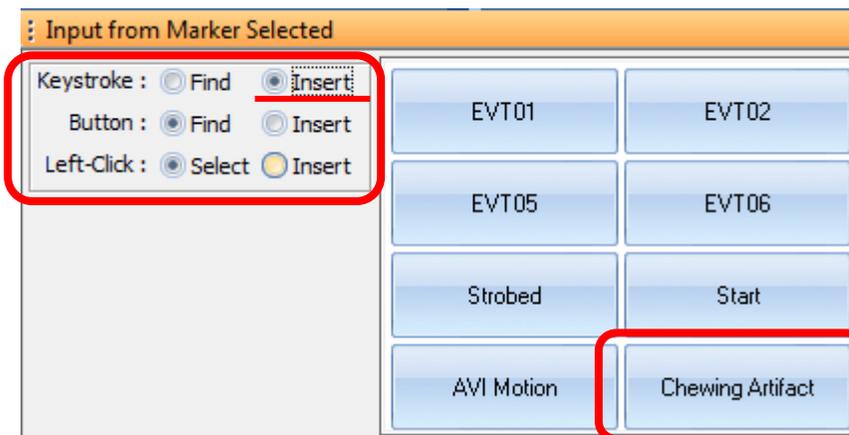


2. Use the **Zoom In** and **Zoom Out** buttons at the bottom of the Activity window to adjust the time range such that, should the chewing behavior be spotted in the video view, a key on the keyboard can be hit before the time of the first chewing behavior scrolls out of the Activity window.

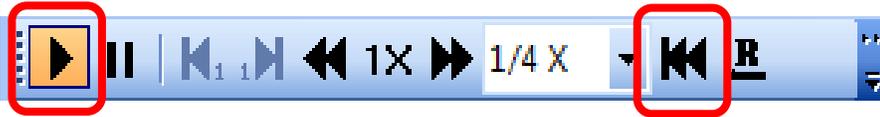


3. In the Input window, at Keystroke, click **Insert**. (You could just as easily use the Button or Left-click input method here.) CinePlex Editor is now armed to enter new occurrences of the new marker when you press that marker's associated key.

Notice that “Chewing Artifact” is displayed as one of the available Markers.



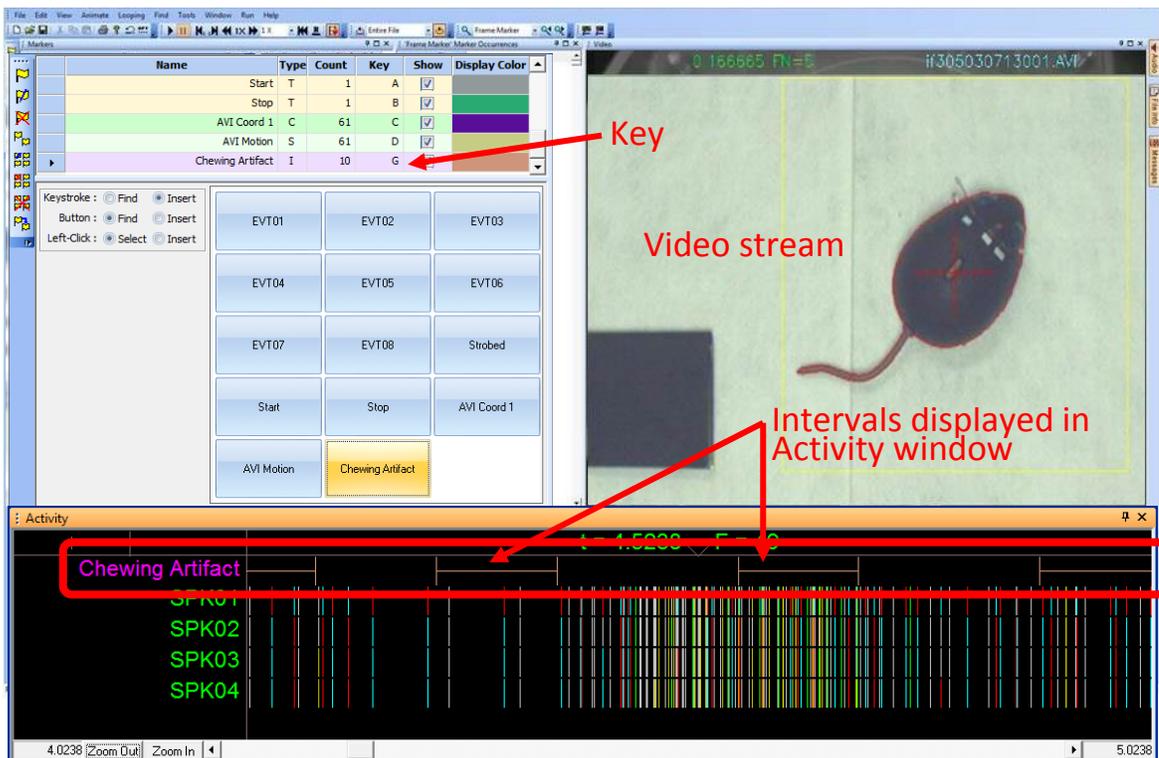
- Click **Rewind**. Click **Play**. Position a finger over the associated keystroke as you watch for the “Chewing Artifact” event.



- Watch the video closely as it plays. When you see the chewing behavior *starting* in the video, quickly press the associated key (“G” in this example).

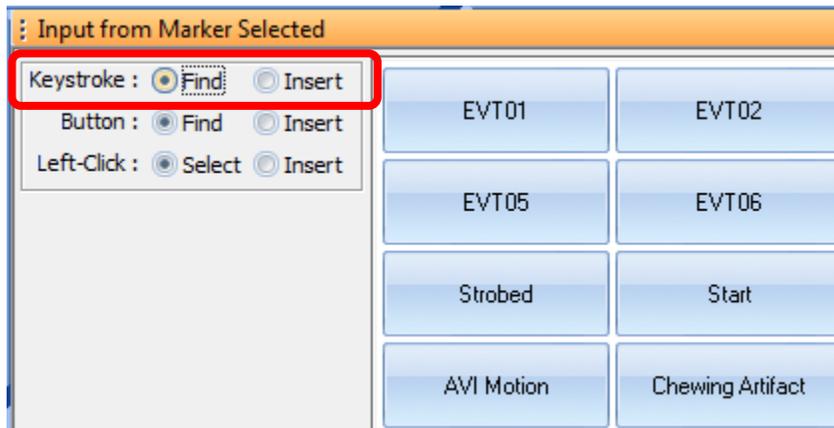
When you see the chewing behavior stopping in the video, press the key (“G”) again to complete the interval. These two keystrokes (starting and stopping) define this particular marker occurrence as a “Chewing Artifact” interval. The interval appears in the Activity window.

You can press the key as many times as necessary during the playing of the video to identify all the chewing intervals. Accuracy is not important at this point; fine-tuning will come later. Go through the entire video.

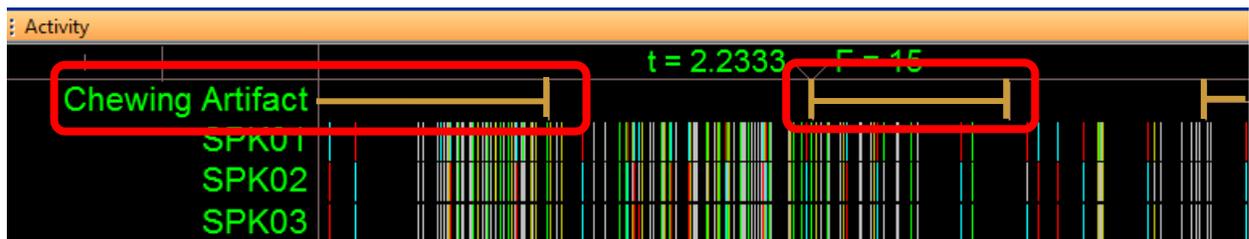


Making fine adjustments to marker occurrences

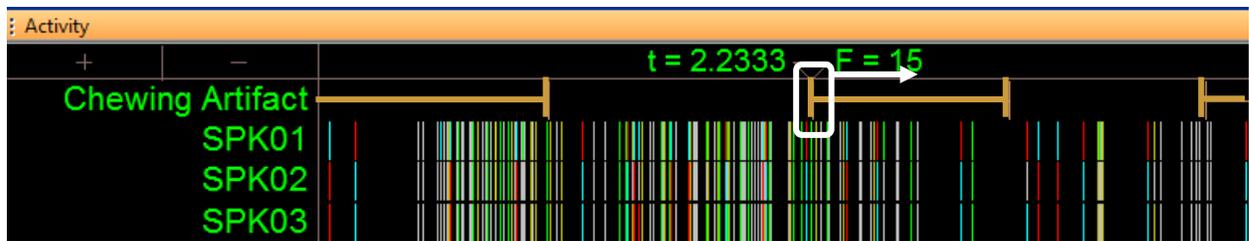
- Now we will go back through and adjust the time of the “Chewing Artifact” marker occurrences to be more accurate. We will use the **Find** function to quickly locate our marker occurrences. In the Input window, after Keystroke, click **Find**.



- Rewind the video file, then press the assigned key for the “Chewing Artifact” marker. This causes the system to jump to the start of the first marker occurrence in the Activity Window. Notice that the complete interval for each occurrence is displayed (start to finish). Use the left and right arrow keys on the keyboard to look at each frame of the video to decide where the chewing actually occurs.



- In the Activity window, drag the marker occurrences to the correct time. To do so, press and hold the Shift key, then click near the tick mark for the marker occurrence. Drag the tick mark to the desired time and release the mouse button. You can move the Start and Stop tick marks for each interval in this manner.



Saving the Data

To save the data: On the File menu, click Export to NEX, and if desired, select the appropriate **What to Export** checkboxes. Click **Export!** to write the file.

Note: Exporting markers is supported for PLX files but not PL2 files.

Perform additional analyses and data management procedures in the NeuroExplorer application.