# Procyon Editor Software User's Guide

## Introduction

This document describes how to use the Procyon Editor software. This is a work-in-progress; we expect to continue to add features, fix bugs, etc. in an ongoing way following the release of the Procyon.

The Procyon is not precisely a successor to the Proteus, because there are some things that the Proteus can do better than the Procyon—at this stage, it includes more sophisticated audio features, such as multiple waveforms and cross-fading of the sounds, and also includes ThoughtStream-controlled sessions.

What the Procyon does especially well is to synthesize a wide range of colors, and that is our focus in the initial release. This software also includes a graphical editor in addition to the text-based editor; this can prove helpful since there are so many programmable functions for each session segment. We also introduce a valuable new feature with this software: looping. This allows the construction of very complex sessions without consuming excessive system memory.

The Procyon is also the first system we've released with a USB port, which most users have come to expect from their personal electronics.

## Installation

Once you've downloaded the software from the Procyon section of http://www.mindplacesupport.com, unzip it and run setup.exe. Follow any instructions you see on screen. Once you've completed installation, connect your Procyon via USB and start the Procyon Editor software; this completes installation of the USB driver.

*Note: This software is for Windows PCs only; it should run on XP, 2000, and 98. We do not produce, or intend to produce, Mac or Linux software for our products. It is possible that it will run using a PC emulation program or Windows on Mac via Boot Camp (or other PC emulation programs)—but we have not tested this.*

# Menu items

This section describes the functions of the various menu items in the Procyon Editor program.  Some of the menu functions can be accessed by function key or key combination shortcuts; these shortcuts are shown in parenthesis following the menu items below.

When you first open the Procyon Editor, you will see the following window:
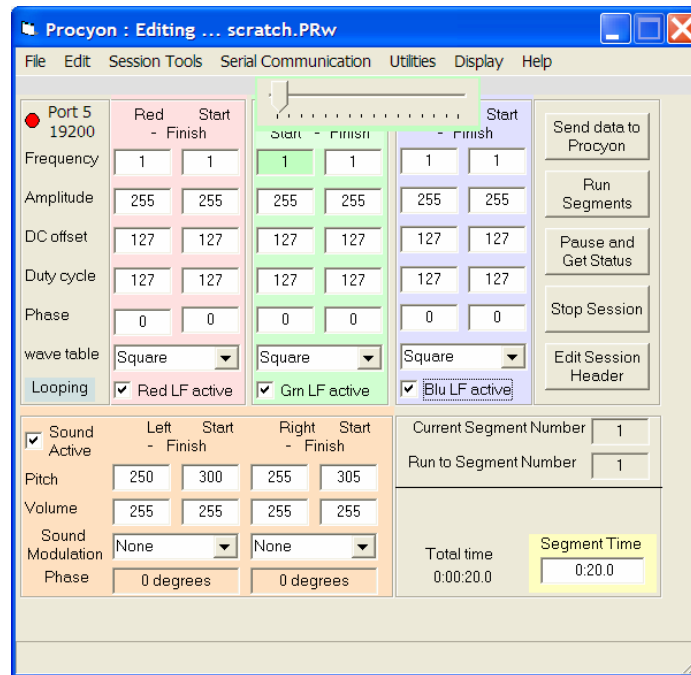


This is the default text-editor screen.  If you've used the Proteus Editor software you will immediately notice a difference:  whereas with the Proteus Editor shows a sequential list of segments, the Procyon shows only a single segment—in this case, segment 1 (as shown in the "current segment number" box on the lower right side of the window).  We'll describe the various parameters shown on this screen in the following section; for now, let's review the menu functions.

### File/New Session

This command closes any session you are currently working on (after offering you the chance to save it), then opens a new one segment session called "scratch.PRw".

### File/Open Session File

Opens a session file.  Procyon sessions use the suffix .PRw.

### File/Save Session

Saves the current session with the filename which shows on the bar at the top of the window; the "dummy" file which loads when you launch the program is called "scratch.PRw".

### File/Save Session As

Saves the currently open session with a name other than the one shown on the window's top bar.  This is useful for creating multiple versions of a session as well as changing the name of the current session.

### File/Close Session

Closes the session currently displayed in the Editor.  Notice that closing a session (preventing further changes to it) does not cause the session information being displayed to change; in order to start a new session, you need to exit and restart the program.

### File/Cancel Command (F2)

This command is only used if for some reason the USB link to the Procyon fails during a large file transfer, such as an album or OS upgrade.  In this way it's similar to the "escape" key on your computer.

### File/Exit

Terminates the Procyon Editor.

### Edit/Insert Segment (F3)

Inserts a new segment following the current segment number.  If you insert a segment between two others, then the ending values of the previous segment will become the default start values for the inserted segment, and the starting values of the segment which follows the inserted one will become the end values for the inserted segment.  In other words, the inserted segment values will be set up as a ramp between the two segments between which it was inserted.  Of course you can change these values to whatever you wish; we chose this approach because it seemed most likely to facilitate rapid session creation.

### Edit/Delete Segment (Shift+F3)

Deletes the currently selected segment,  which is shown in the "current segment number" box.

## Edit/Loop Control (Cntrl-L)

Brings up the loop control list screen, as shown in the image below.  Looping will be described in detail later in this guide.
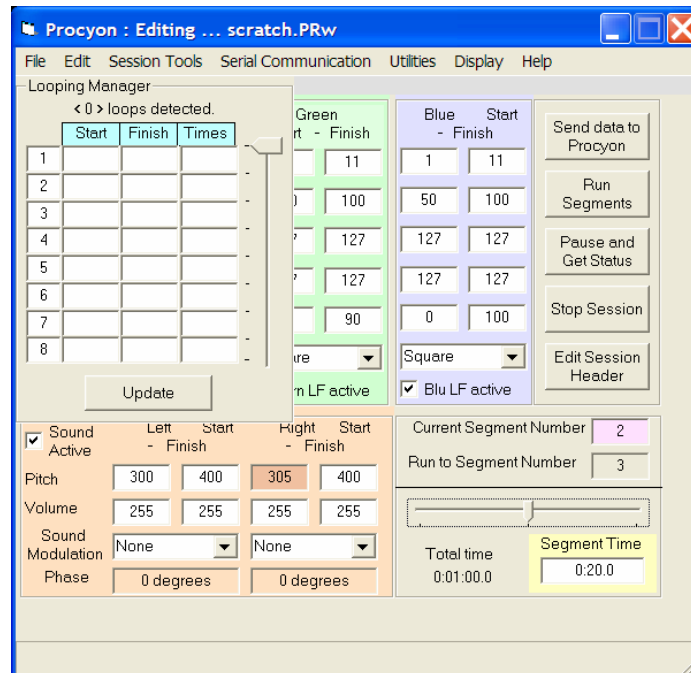

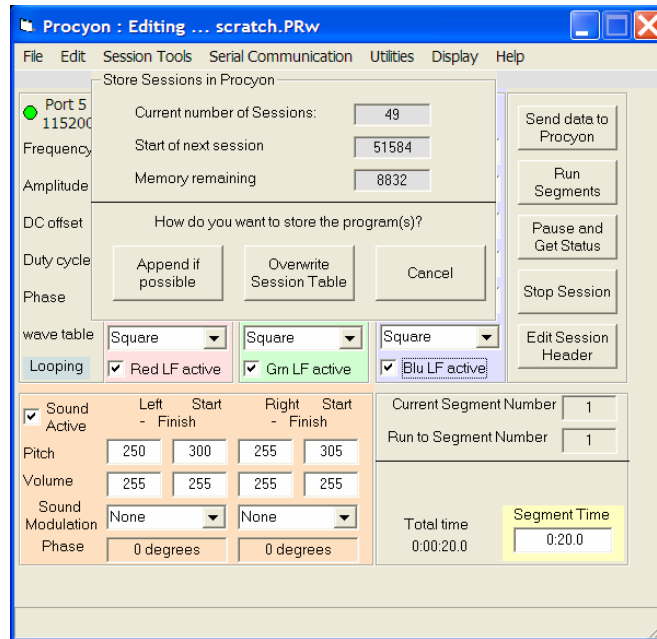
## Session Tools/Upload album of sessions to Procyon

This command allows you to upload an album of sessions to your Procyon.  An album is a collection of individual sessions organized into a sequence of your choice (see "How to create an album" later in this Guide).  When adding an album, you have several choices:

Append if possible – if enough memory remains to hold the album, then it will add it at the end of the current album list.  For example, if you add an album of 10 sessions to the factory album (sessions 0-49), then the sessions in your new album will be numbered 50-59.

Overwrite Session Table – This will replace any current contents of the Procyon's memory with your new album.  If you choose this, a new dialog box will open offering the choice of backing up the sessions you are about to erase onto your PC.

There are also information boxes indicating where the start of the next session is in memory, and the amount of memory remaining.

You also have the option of cancelling the album transfer.  Albums have the filename suffix *.PRb.
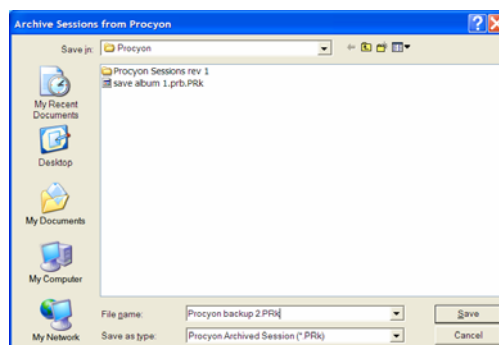


## Session Tools/Upload Session to Procyon

This command brings up the same dialog box as "upload album of sessions to Procyon", but in this case allows you to select individual sessions (which have the suffix *.PRw), and you can either append the session to the end of the currently stored session bank, or erase that bank and replace it with the selected session.

## Session Tools/Archive Procyon Sessions

You can backup the entire current contents of your Procyon as a single album with this command (these are stored with the suffix *.PRk).  Selecting this command brings up the following dialog box, which allows you to select what directory to store the file in as well as naming the file:

## Session Tools/Restore Archived Sessions

Use this command to replace the current contents of your Procyon with another album. When you select it you'll see a dialog box warning you that the current bank will be replaced, and giving you the option for backing it up:
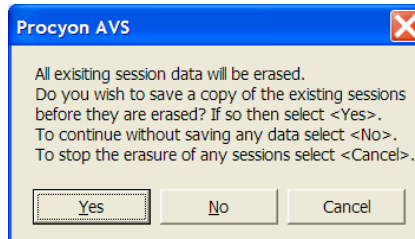


## Session Tools/Get Session Header

Session Headers are blocks of text which can be associated with a session, which includes various information about the session. They are intended mainly for use when creating SynchroMuse™ audio-synchronized sessions for distribution on compact disc.

If:
1) Procyon is connected to your computer,
2) The serial port is open,
3) Procyon is in "SES" mode and a session selected,

then the Header for the selected session is retrieved and displayed on the screen.

If you are working on a session, then the Header file for that session can be authored or edited by clicking the "Edit Session Header" command on the middle right side of the application window.

In both cases you will see this screen:
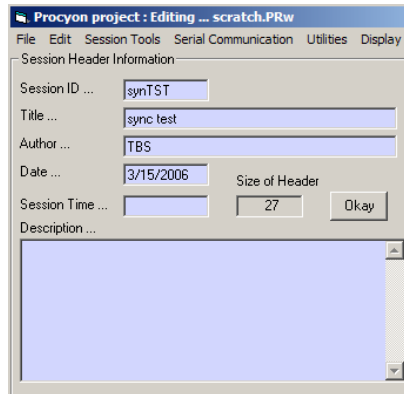
The eight-character Session ID entry is what DAS (Digital Audio Synchrony) uses to access and play SynchroMuse™ sessions that have been stored in the Procyon.

The other entries are used for general information.

Holding the <Shift> key while left clicking the following textboxes will automatically enter the following:

Title:            Displays the PRW file name
Author:       Looks in the "Environ" string and if it finds "USERNAME" will display its content.
Date:           The current date.
Session Time: Calculates Displays total time

The "Size of Header" box indicates how many bytes of memory are used by the session header.

*Note:  remember, adding session headers to your sessions does consume system memory and will reduce the amount of memory available for other sessions.  For this reason we have not included them with the factory–programmed sessions.*

## Serial Communication/Set COM port

After you've connected your Procyon to your PC and and turned both on, use this command to view available USB ports; those which are not available are "ghosted". For example, in the image below, the available ports are COM1, COM3 and COM5. If one of these is automatically selected you can proceed to open the port; often you will find that you don't need to "set" a port since Windows will usually handle this for you.  Once the port is open, the command changes to "Close COM port".
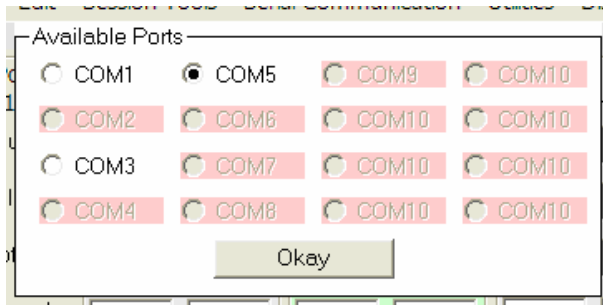
## Utilities/Run Segments

This allows you to test your sessions while you're developing them. To use it, you first click in the "Current Segment Number" box and use the slider which appears to select the first segment in the sequence you want to test, and do the same in the "Run to Segment Number" box. Then select this command to run the segments you've selected.

Note: this is identical to the Run Segments button on the right side of the Procyon Editor window.

## Utilities/Pause and get status

Suppose you are running a segment with multiple color ramps, and suddenly a particular color emerges which you especially like, and would like to preserve. This command allows you to view the exact data at the moment you choose it. The data looks like this:
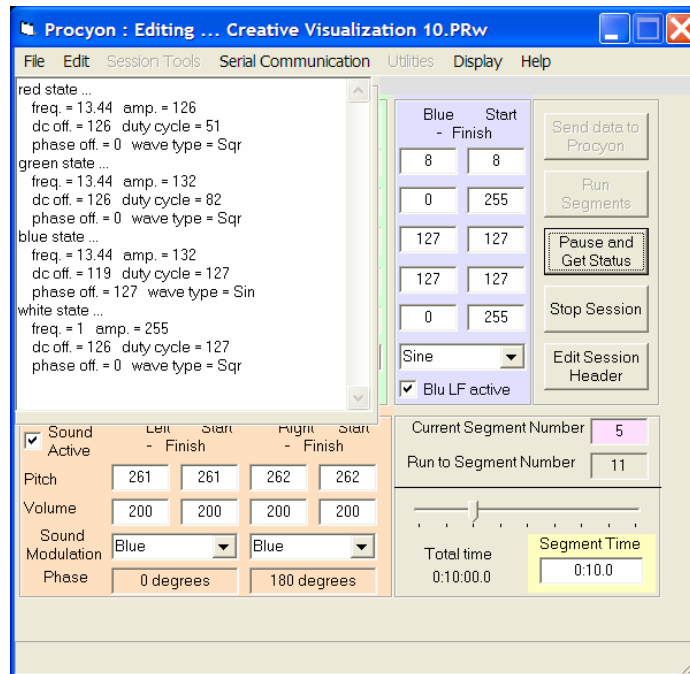
Notice that information is organized according to color, and each one includes the current frequency, amplitude, DC offset, duty cycle, phase shift, and waveform.

We created this command for development purposes and so it has a rough edge in this version:  the best way to save this information is as follows:

      a.  Right-click in the text area, and choose Select All, which will highlight all of the status text, and the select Copy.
      b.  Open a Notepad window and paste the text into it.  (R-click/Paste).

*[You will note a "white state" included; this supports a future upgrade.]*


## Utilities/Stop Session

Stops the currently running session.

## Utilities/Swap Color Parameters

This swaps all the information about one color channel with another one; this is particularly useful if you are converting Proteus sessions to Procyon sessions using our conversion software applet, "Proteus_Procyon1_1.exe", available from the Procyon section of www.mindplacesupport.com.

It's also a very helpful tool for quickly evaluating how various parameter changes can affect the visual effects. In the example below, on the left side the currently selected segment uses just red and green light (note the blue parameters are "ghosted"); I then swapped the blue and green channels to produce the image on the right.
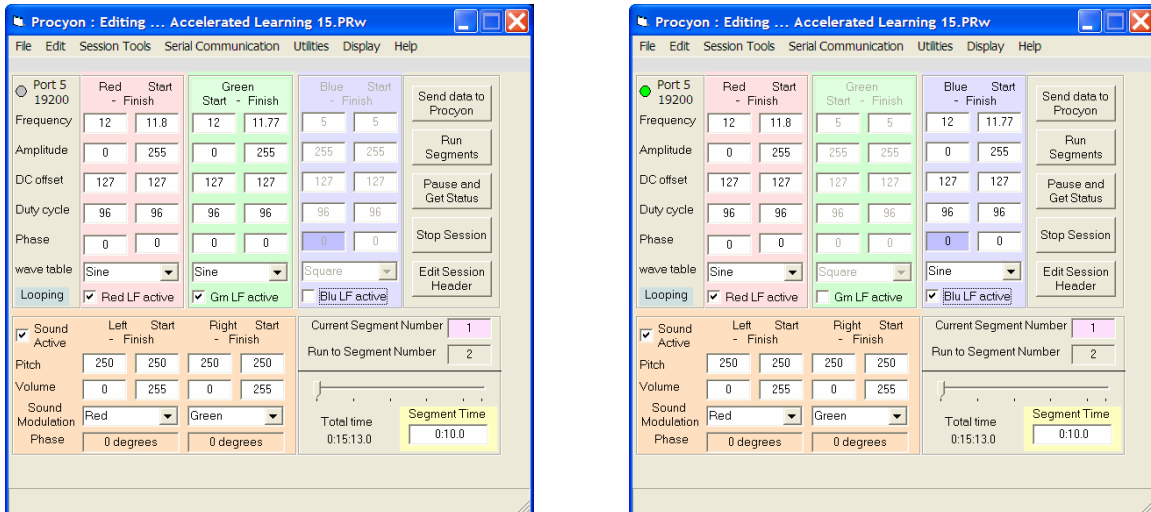


## Utilities/Send Highlighted Information

This command, which can also be accessed via the "Send data to Procyon" button on the top right side of the Editor window, allows you to update
When you click on one of the data boxes the background is highlighted. From there you can type in new values or drag the scroll bar to the desired value. Once a value has been set you have to click on the "Send data to Procyon" command button (or menu item) to update the value in the PROCYON unit.
Note... if you click on the colored "Red Start-Finish" label all the starting values are highlighted. Clicking on the "Send data to Procyon" button will update all of the Red color's parameters. This works for the green and white columns too.

Note the color "LF active" and "Sound active" check boxes only have an effect when running segments. When checked the corresponding parameters are grayed out and cannot be adjusted or sent.

## Utilities/Update Procyon OS
This command allows you to update the Procyon's internal operating system (OS). As with the Proteus, we expect to offer periodic, free updates to add functions etc. as we receive user feedback. The file suffix used for code updates is *.PR2.

When you've selected the OS file to transfer, a "progress" dialog box opens:
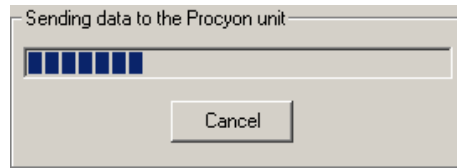
We don't recommend cancelling the transfer once it is underway, as part of the original OS will have been overwritten.

## Utilities/View Status Bar

We included this for testing and debugging purposes; you normally won't need to access this function. When selected, messages associated with communications or other errors will be shown in a bar at the bottom of the Editor window.

## Utilities/Create PreSage Biofeedback Segment

This function will be activated when our PreSage biofeedback system is released early in 2007, and allows users to use the multiple channels of biofeedback provided by PreSage to control various parameters of your Procyon light and sound session. For reference, the window which opens appears as below:
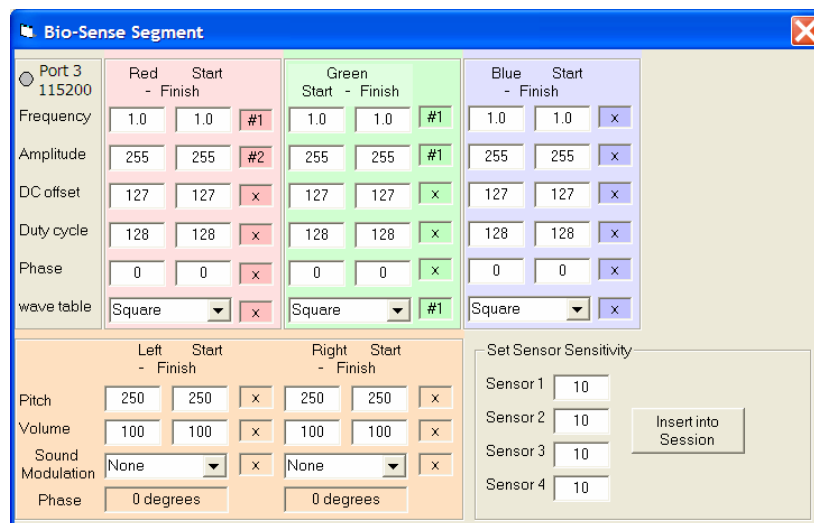


## Display/Use Graphics Editor

This command opens the graphical editor screen, which is described in detail in a later section; once open, the menu choices change as follows:

## Display/Use Text Editor

Changes the display back to text edit mode.

## Display/Display by color

Shows information for a single parameter at a time for each color channel.

## Display/Display by function

All parameters are displayed for a single color channel at a time.
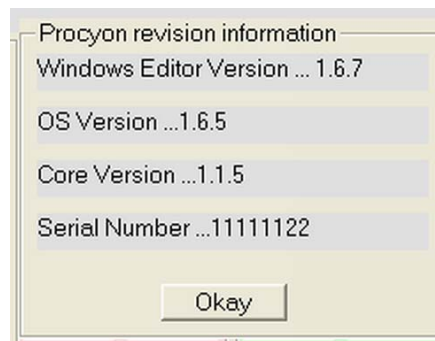
## Display/Display Sound Values

This allows you to adjust the audio pitch and volume graphically.

## Display/Adjust Border

Allows you to tweak the appearance of the graphical editor screen.

## Help/About

Opens the following window, which displays the current Proteus Editor version, OS version, Core (nonreprogrammable) version, and serial number of the unit (future use):



## Help/Open Log File

This was developed for internal debugging use and in most cases you will not need to use it. The file created by this command is called "Procyon_LOG.PRL" and is located in the Procyon directory.

**Help/Revision Documentation**

You can view changes made to both the Procyon Editor and OS here.

Currently, the Procyon Editor does not include online help beyond this.

# How to create a Procyon session

This section describes the programmable functions (parameters) included in this Procyon release, how to use the text and graphical editors, how to create albums, and how to transfer your finished work to the Procyon.

## I. Session structure and description of parameters.

A *session* is made up of a number of a number of *segments*.

Segments may vary in length from 0.5 seconds to 10.0 minutes, in half to a tenth of a  second increments.

For each segment, you choose  a *start value* and a *finish value* for each programmable parameter; those values then change in a linear manner from segment start to finish.
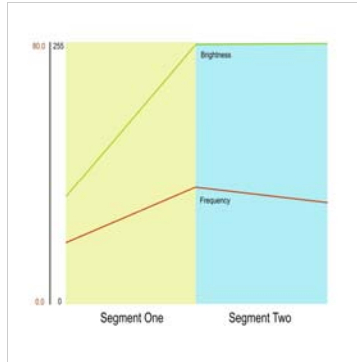
The illustration above shows the first two segments of a session; only brightness and frequency from a single color channel are displayed for the sake of clarity. Frequency starts in segment one at about 15 hz and ends at about 35 hz, while brightness starts at about 110 and ends at 255 (the maximum setting).

The main segment edit screen looks like this:
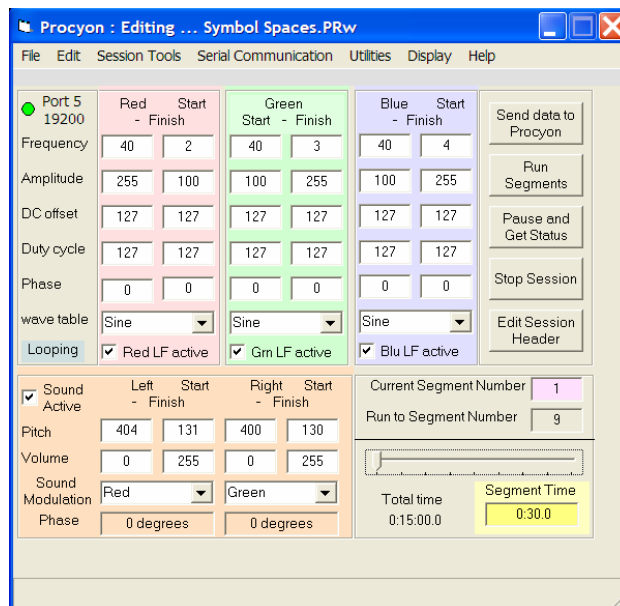


This text display shows all the programmable parameters for a single segment.  To view other segments (if present), click in the "current Segment Number" box on the lower right side and drag the slider to the segment number you wish to edit.  If you have just launched the Editor, only a single segment is present until you insert additional segments.

There is no particular limit to the number of segments in your session, other than how much memory remains in your Procyon;  the maximum number of segments

that can fit into memory is about 1,500; this number is actually a variable and depends on how complex each segment is. There is a limit of 250 sessions that can fit into memory at any one time.

*Programmable parameters* for visual effects include the following items, which may be set independently for each of the four color channels:

**Frequency –** The rate at which lights are flickering. This may range from 0.1 to 80.0 Hz, in 0.1 Hz increments.

**Amplitude --** This sets the brightness level, and ranges from 0 (off) to 255 (maximum).

**DC Offset –** Used to set the level of "shimmer" in a light channel. The default setting is 127, which would modulate normally between "on" and "off" as determined by the selected waveform. A setting of 250 for example will barely be flickering. Setting this to a value below 127 will cause the waveform to *clip* at top and bottom, which can generate additional interesting visual effects.

When the number is set to a value above 127, the lights never turn all the way off, so in the range 128-255, you are mixing unflickering light with flickering light, and the flicker portion shrinks towards zero as the numbers increase.

**Duty Cycle –** This determines the ratio of "on" to "off" time for the Square waveform. Ranges from 0 (off always) to 254 (on almost always). Typically, the most interesting visual effects are in the range of roughly 50 to 90, but this can vary with frequency, etc.

**Phase –** Determines when a waveform starts, relative to the start of a segment. If this is set to 0 for each color channel, all colors would be aligned, turning on and off at exactly the same time. However, very interesting effects are obtained (especially at very low frequencies) by offsetting the phases of the various colors. *See Color Channel Advanced Concepts, below.*

**Wavetable –** Use this popdown menu to select sine, square, triangle or user waveforms. Each of these light waveforms has a different apparent effect; sine waves are the "softest", square (pulse) waveforms have the most intense shifts in brightness and tend to create the best visual effects, and triangle waves are in between.

Procyon's sound is modulated by one or more of the light channels, and this will affect the sound; square/pulsed waveforms produce a "thumpier" sound, while sine produces the cleanest. For this reason, nearly all of the factory sessions used sine-wave modulated audio.

Notice also that there are check boxes below each color channel which allow you to turn a channel on or off in each segment.

When you've finished editing this segment, insert another after it using the **F3** key (or: *Session Tools/Insert Segment*). At this point, a slider bar appears in the lower right portion of the edit window, which looks like this:
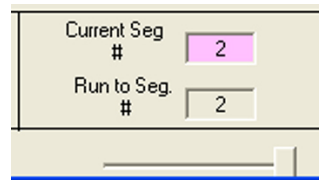


Use this slider to toggle between the segments you are editing. Be sure that the Current Seg. # box is purple (active) in this case, rather than the Run To Seg. # box.

You can also use the slide control to choose which segments to preview from the current session. For example, suppose your session includes 8 segments, and you wish to preview numbers 3 to 8. First click in the "Current Seg #" box and adjust the slider to "3". Then click in the "Run to Seg #" box and adjust the slider to "8". The results will look like this:
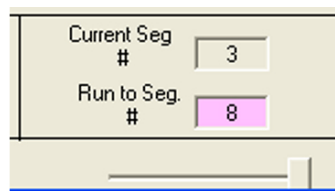


When inserting segments (which may be done at any place within a session except before the first segment), the "start" values displayed in the newly inserted segment will be identical to those of the segment preceding it, and the "finish" values will be the same as the "start" values for the segment which follows it. This is intended to make the process of session creation faster and easier, since that newly inserted segment "remembers" for you what the adjacent segment settings were.

## Testing segments and sessions

You can test an individual segment or a group of segments (including the entire session you are editing) by doing the following:

- Click your mouse pointer in the *Current Seg. #* box; it will confirm selection by turning purple.
- Use the slider to select the first segment you wish to test.
- Click your mouse pointer in the *Run To Seg. #* box, and

Use the slider to select the last segment.

- Click the *Run Segments* button on the right side of the screen.

Sometimes you may find, while running a segment, that a certain special color emerges which you would like to capture and reproduce for a longer period. To do so, click the Pause and Get Status button, which will produce a list of current parameters on the left side of the screen. To preserve this information:

- Right-click on the text area and choose Select All.
- Right-click on it again and choose Copy.
- Open Notepad or Wordpad [Start/Accessories/…] and paste the text into it for future reference.
- Manually enter the values in a new segment.

For complete session creation instructions and tutorials, see the Procyon section at www.mindplacesupport.com.

## Color channel advanced concepts.

In this section we'll discuss the color channel programming options in more detail.

The following image  illustrates the effect of shifting the *phase* of the red, green and blue lights relative to one another.  In this case, a *sine wave* is being used.
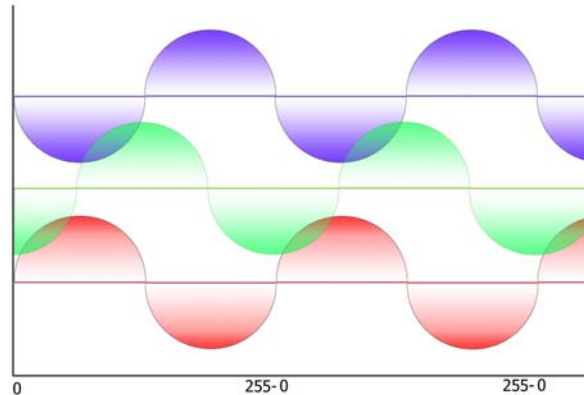
One full cycle of a waveform occurs over 360 degrees, and if there is no phase shift, it starts at 0 degrees, rises and falls in a half-circle, intersects the X-axis at 180 degrees, and completes the lower (negative) half circle at 360 degrees.  In the example below, this is illustrated by the color red.  Notice that blue is exactly the opposite of red and so they are 180 degrees out of phase with one another.

This means that when red is at maximum brightness, blue is off and vice versa.

Green is shifted by about a quarter of a full wave to the right, a 90 degree phase shift.  So it starts to turn on just as red reaches its maximum brightness, and reaches its maximum brightness as red is just turning off.  So the red and green are changing brightness relative to one another, producing a range of intermediate colors.

Green reaches its maximum brightness level as blue is starting to turn on, so although red and blue are not on at the same time, they both are on while green is on and mix with it.

Notice that you can specify phase in the range 0-255, which corresponds to 0-360 degrees.  So a 90 degree phase shift requires a value of about 64, and 180 degrees a value of about 127.

In the next example, we'll examine pulse width, using the "square" waveform.

The square waveform is more accurately a *pulse* waveform since its width may be varied.  It switches from off to maximum brightness (and vice-versa) almost immediately.  The pulse can have a variable width; if it is 50%, then it is a true square wave.  In the example pictured below, both blue and green have a width of about 40%, while the red is narrow, about 10%.
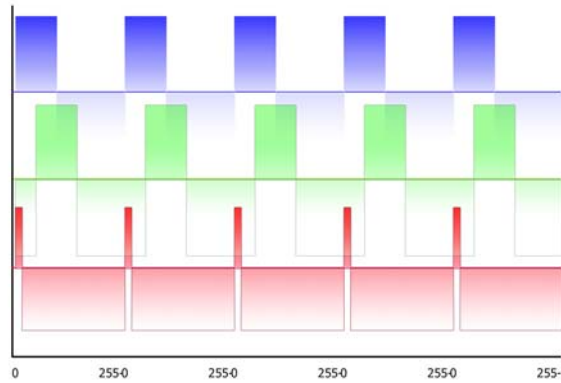
Also illustrated is the effect of *phase shift* on the mixing of pulse-width modulated color. Notice that blue and red turn on together, starting at 0 phase. The color would be purple until red turns off, then blue until green turned on, then blue-green.

This combination of pulse width modulation and phase shifting can create spectacular visual effects—allowing you to present entire sections of a rainbow within each pulse period.

*Pulse width* is set by an integer value ranging from 0 (not on at all) to 255 (on all the time); these are the equivalent of 0% to 100%. A pulse width of 127, then, would be about 50%--a square wave.

| Example approximate pulse width settings | | | |
|---|---|---|---|
| Pulse width % | Setting | Pulse width % | Setting |
| 10 | 25 | 60 | 153 |
| 20 | 51 | 70 | 178 |
| 30 | 76 | 80 | 203 |
| 40 | 102 | 90 | 229 |
| 50 | 127 | 100 | 255 |

Notice that a fundamental difference between the pulse, sine and triangle waveforms is that, while the pulse waveforms turn on and off instantly, sine and triangle waveforms increase from minimum to maximum in a smooth manner.

Try experimenting with the sine and triangle waveforms when the pulse rates are low, especially in the 1 to 8 hz range, and pulse waveforms when the pulse rates are in higher ranges (8+ hz).

## How phase shift affects color mixing

So far we have considered only the cases of static pulse width and phase shift. However, you can also choose to vary either or both across a segment. When the phase of one color is changing at a different rate than another, the resulting colors are constantly changing. We call this *dynamic phase shift*, illustrated in the example shown below.
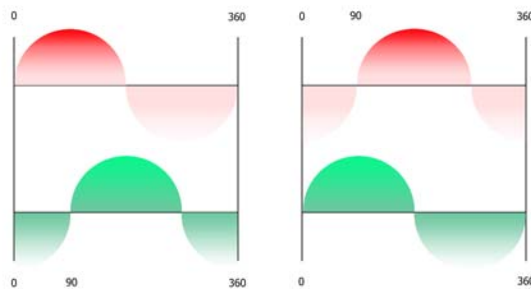


For simplicity, only the first and last pulses from a segment are shown. The phase shift is programmed as follows:

| Color | *Start* phase shift | *Finish* phase shift |
|-------|---------------------|----------------------|
| Red   | 0° (degrees)        | 90°                  |
| Green | 90°                 | 0°                   |

In other words, the phase of the *red* sine wave is moving slowly forward, while the phase of the *green* sine wave is slowly moving backwards. This causes the amount of each color to mix slightly differently in each cycle, producing a range of yellow/gold colors as well as green and red. Using this effect with low frequencies can produce some especially interesting color-mixing effects.

## Sound control

The sound produced by Procyon is controlled via the orange box on the bottom left side of the Editor window:



Notice that you can control the left and right channels independently.  Functions include:

<u>Sound Active check box</u>:  Use this to turn sound on or off for each segment.

<u>Pitch</u>:  The frequency of the internally synthesized sound.  Ranges from 60 to 600 Hz, in 1 Hz increments.  Notice that the pitch can change over time, ramping upwards or downwards over the course of the segment.

<u>Volume</u>:  How loud the sound is.  Ranges from 0 (off) to 255 (maximum).  We recommend

<u>Sound Modulation</u>:  determines which color channel modulates an audio channel. Choices are None, Red, Green and Blue.  If you wish to create binaural beats, use the "None" option.

<u>Phase</u>:  Determines whether the sound is pulsing together with the lights (0 phase) or in between light flashes (180 degrees).

Currently, the Procyon synthesizes sine waves.

## Segment control

This section on the lower right side of the display looks like this:
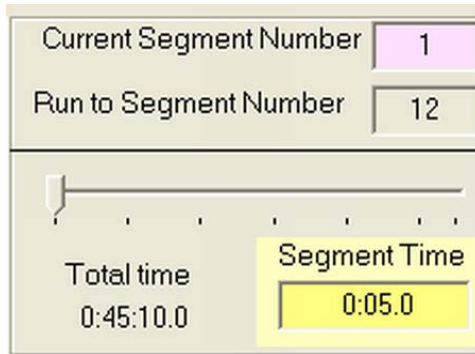
<u>Current Segment Number</u>:  Left-click in this box and drag the slider to the segment you wish to view/edit, or to set the first segment in a sequence you wish to run in real time.  Turns purple when active.

<u>Run to Segment Number</u>:  Works as above, and determines the last segment in the sequence you wish to run.

You can right-click on the segment bar as a shortcut to bring up the looping window.

<u>Segment Time</u>.  Determines how long the segment runs for.  When you left-click in this box, a new bar appears which shows the current segment time; you can drag the bar towards the time you wish to use, and/or use the left/right arrow keys to fine-tune the time.  Or you can type the length of time into the Segment Time box.

The format displayed is:  minutes: seconds: tenths of a second.

If you right-click on the segment time slider bar, you will see a choice of four available times:  30 seconds, one minute, five minutes, and ten minutes.
<u>Total time</u>.  This keeps a running tally of the length of all the segments in your session, including any looped segment sequences.

## II.  Create a session.

The basic steps for creating a session are as follows:

a.  Connect your Procyon to your PC and turn it on.
b.  Open the Procyon Editor software.
c.  Open a COM port.
d.  Create a session.
e.  Test your session.
f.  Save it, and transfer it to your Procyon.

This section describes the process in detail.  We'll use the default Text Editor this time around.

## Getting started

One important point to bear in mind when creating a session is:  what is your goal?  This determines which frequencies you use, whether segments change quickly or slowly and ramp or jump between segments, etc.

- Once you're ready to start, plug your Procyon into an available USB port and turn it on.  Be sure your GanzFrames are plugged into the connector on top of the unit, and plug your headphones into the appropriate jack on the right side of the console.

Note that you don't need to have batteries installed when it's connected to USB—but if they are installed, USB will still supply power, to maximize your battery life.

- Open Procyon Editor, and select Serial Communication/Set COM Port.  You will see a list of available ports; choose one which is not ghosted.  Usually, those with higher numbers work best.

- Then choose Serial Communication/Open COM Port.  The small red circle at the upper left side of the Editor window should turn green, indicating that your Procyon is now communicating with the Editor.

You are now ready to start your first session.

It's often desirable to have the light and sound "fade in" during the first segment, and to "fade out" during the last, so let's start by changing the audio volume and brightness.

Here's what the audio section will look like with a fade-in added:



Notice that I've set the audio pitch to 220 Hz ("A") in all the "Pitch" boxes.  This means that the same sound will be heard in both ears, and it will not change in

pitch during the segment, because the start and finish values are the same. Phase has been set to 0 degrees, so the light and sound will pulse together, and sound modulation is being controlled by the blue color channel.

Next, let's set up the color channels. The frequencies have all been set to 10 Hz, and amplitude (brightness) for the red and green color channels ramp from 0 to higher numbers. I've set the peak red amplitude (200) lower than green (255), because green light does not make its way through your closed eyelids as well as does red:



Notice that, though all three color channels are set as active (via the check boxes at the bottom of the image), the amplitude for blue has been set to zero. In this case we use the blue channel to modulate the sound with a sine wave. We're using the square waveform to modulate red and green, and I've set the duty cycle (pulse width) for those channels to start at 50 and end at 90.

Finally, let's leave the segment time at it's default value of 20 seconds; you can always change that later. It should look like this:



You're ready to test your first segment—just click the "Run Segments" button on the right side of the screen to see what your first segment is like!
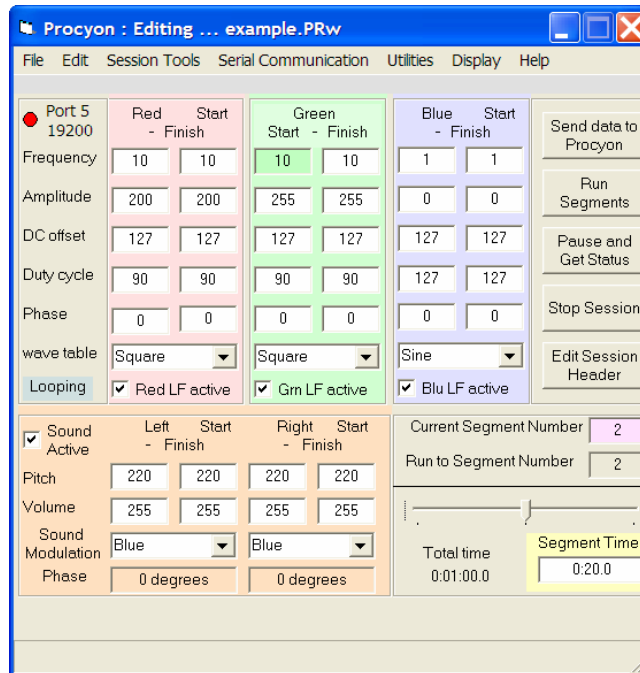
## Adding segments

Press the F3 key, or use the Edit/Insert Segment command to add a second segment to your session. Notice that the color channel and sound settings are mirror images of the first segment—the sound volume decreases again to zero, and likewise for the various light brightness settings. These settings are ideal for the last segment in your session—providing a gradual fade-out at the session's end. Let's let that sessions be the final one, and add a third one between the two.

In order to do this, click in the *current segment number* box and move the segment slider to the left; the "current segment number" will now show as 1, as below:
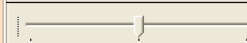


When you insert a segment, it is always inserted following the *current segment number*. Press F3 to insert one now.

Notice what has happened to the settings which appear by default in the segment you've just inserted:

The settings are all "flat" and show no ramps.  That's because the parameters for inserted segments always copy the "finish" values from the preceding segment as the new "start" values, and the "start" values from the following segment as the "finish" values.

Let's change the sound for this segment to a binaural beat.



Notice that the sound modulation has been changed from Blue to None, and the pitch for the right side is now 225 Hz.  This means that a 220 Hz sine wave will play in the left ear while a 225 Hz sine wave plays in the right; the result is a 5 Hz binaural beat.

This also means that the binaural beat does not have to be locked to the frequency of any of the color channels.

Try playing the entire session.  To do this, make sure that the *current segment number* is set to 1, and the run to segment number is set to 3.  Once you've done this, click the *Run Segments* button.

You can keep adding and testing segments until you have just the session you want; try experimenting with different visual waveforms, amplitude and frequency values. Once you have a session you'd like to keep, select File/Save Session As and save it with whatever name you wish.  Now you're ready to transfer it to your Procyon.

To do this, select Session Tools/Upload Session to Procyon.  When you see the following dialog box, select Append if possible.

You've just saved your session as the 50<sup>th</sup> internal session. Remember, session 000 is the "random" session, which cannot be deleted or changed and isn't counted as one of the standard sessions—so your newly added session will show as 051 on the display.

### Adding looping to your session

A loop is simply a sequence of two or more segments which repeat more than one time. This is a great way to add complexity without using up too much memory in the process. You can have multiple loops in a session, and they can overlap (nest) as long as two or more loops don't start on the same segment.

To add a loop to your session, do one of the following:

- Select Edit/Loop Control
- Use the shortcut <Ctrl> L
- Right-click on the segment bar
- Click on the blue Looping box just below the words "Wave table" on the middle left side of the Editor window.

The following window appears:
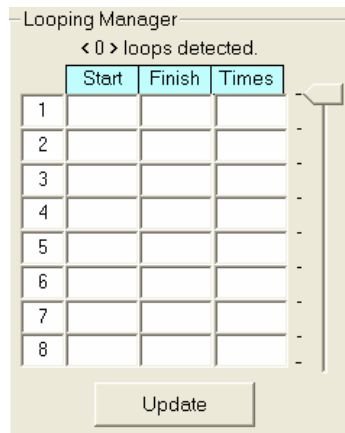


Loops are constructed simply as lists; to add a loop, click in the first Start box, type in the segment you wish to start the loop from and do the same in the Finish box, and add the number of times you want the loop to run in the Times box. You can include up to 32 loops in a session, and each one can run up to 32 times. Click the Update button to complete the process.

Notice that when you click the Run Segments button, the "total time" now reflects the time consumed by all loops in your session.

You can create very, very long sessions this way, though you might find yourself working more often with short segments.

You have enough information now to create your own sessions, though we'll cover this subject in more detail in future tutorials posted to www.mindplacesupport.com.

## III.   Using the graphics editor

The graphical editor allows you to display multiple segments on the screen, and to create segments by click/dragging on the ends of line segments to change the various parameters.  It's especially useful for keeping track of frequencies and amplitudes, but can be used to work with the other parameters as well.

- Open the graphical editor by selecting Display/Use Graphics Editor.

Once you open the Grapics Editor, you can display information in a number of ways, as you will see by selecting the Display command.  The options are described below.

### Display/Display by Function

This command opens a screen showing all the functions for a given color.

Click on the option buttons to change color; in the example below, red is selected.

Left-click on either end of the line segments and while holding the button down, drag the line up or down to change its value.   A textbox appears showing the current value.  Notice also that the box near the top with the segment number turns white when you are editing that segment.

The Up and Down Arrows can be used to more accurately step the values
If on a segment boundary then pressing < = > "equal key" will force the segment to the value of the value of the other segment boundary endpoint.

Notice that segment three in the example below is darker than the others; this indicates that the red color channel for segment three is inactive in this session.
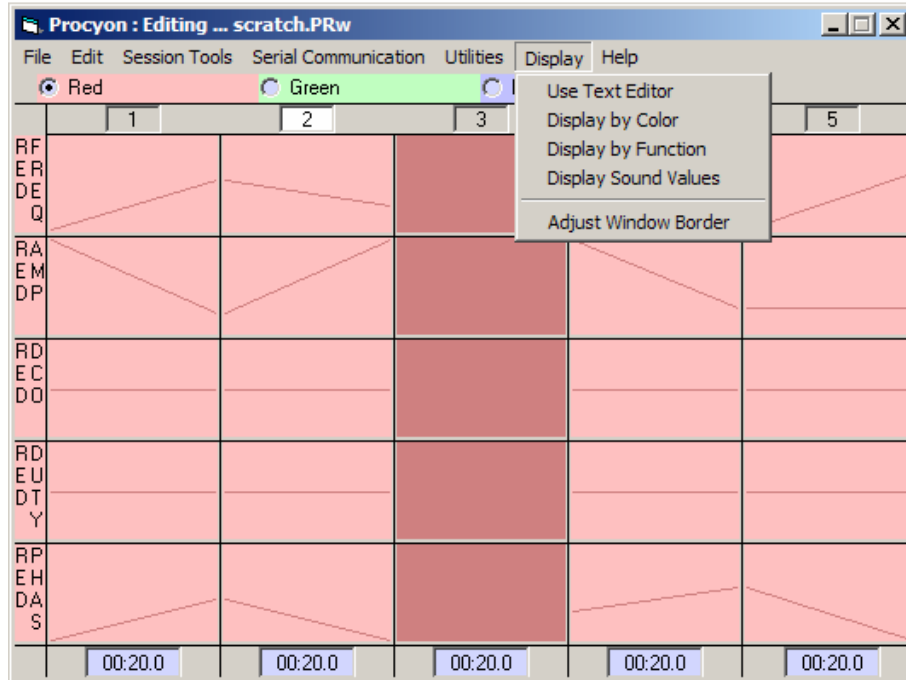
If your session includes more segments than can fit into the display window, a blue bar will appear near the top of the display which looks like this:
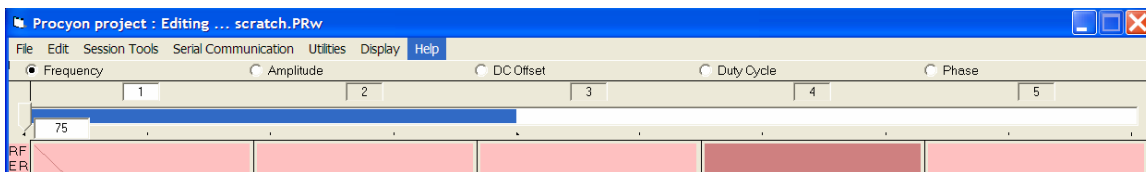


Just click on this bar and drag it to bring other segments into view.

Holding down the <Shift> and/or <Ctrl> keys will affect how the color values change.

| Function | Frequency | Amplitude, DC Offset, Duty Cycle, Phase |
|---|---|---|
| Range | 0.1 – 75 Hz | 0-255 |
| | | |
| Shortcut Key(s) | | |
| None | 0.1 Hz | 1 |
| Ctrl | 1 Hz | 4 |
| Shift+Ctrl | 5 Hz | 16 |
| Shift | 10 Hz | 64 |

For the DC offset function, 127 is the midpoint. Lower values can clip the bottom of the waveform. 0 will shut the color off. Higher values can clip the top of the waveform. 255 will result in a full on color ... other functions won't have any effect the output.

### Display/Display by Color

This invokes a window showing all the colors for a given function.

Click on the option radio buttons to change function; choices include frequency, amplitude, DC offset, duty cycle, and phase.

Left-click+drag the ends of the line segments to make adjustments, as above.
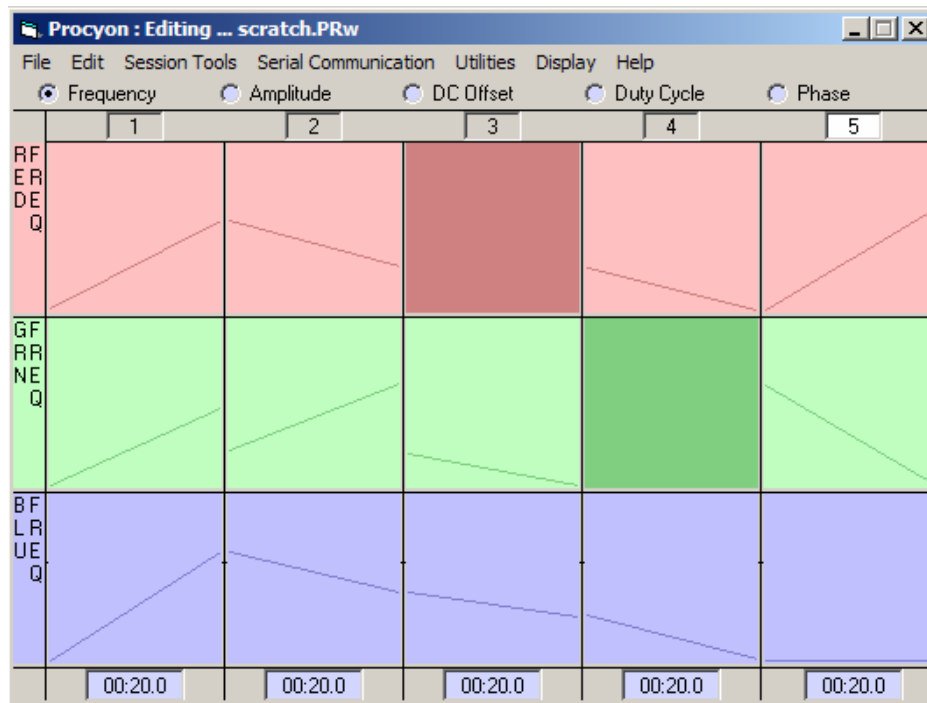


### Display/Display Sound Values

This window displays left and right Hz (pitch) and volume; if you right-click on one of the channels, you can change the other audio parameters available in this firmware revision, as shown below:

Options in this case include:

- To enable/disable the sound for that segment. If the sound is active then more options will appear.

- To enable/disable the left and right sound modulation for that segment. If the sound modulation is active then more options will appear.
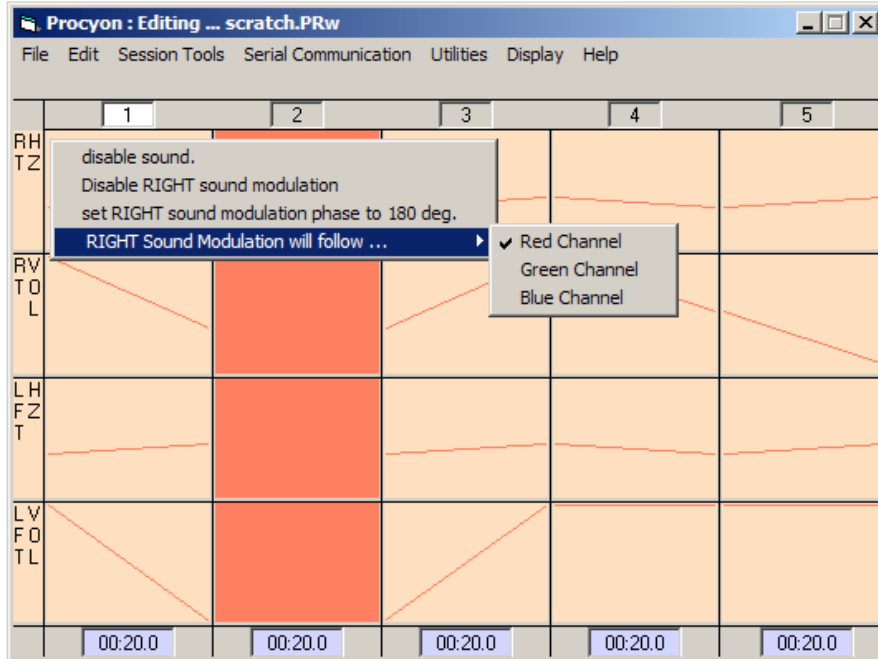
- Set the phase of the left and right sound modulation (0 or 180 degrees) relative to the driving light source.

- Set the source of the left and right sound modulation: Red, Green or Blue source. Both the flash rate and the waveform type (Sine, Square etc.) will affect the sound modulation.

You can change parameters using shortcut keys if you prefer:

| Function | Frequency | Volume |
|---|---|---|
| Range | 60-600 Hz | 0(off) – 255 (full on) |
| | | |
| Shortcut Keys | Step Size | |
| None | 1 Hz | 1 |
| Ctrl | 10 Hz | 4 |
| Shift+Ctrl | 50 Hz | 16 |
| Shift | 100 Hz | 64 |
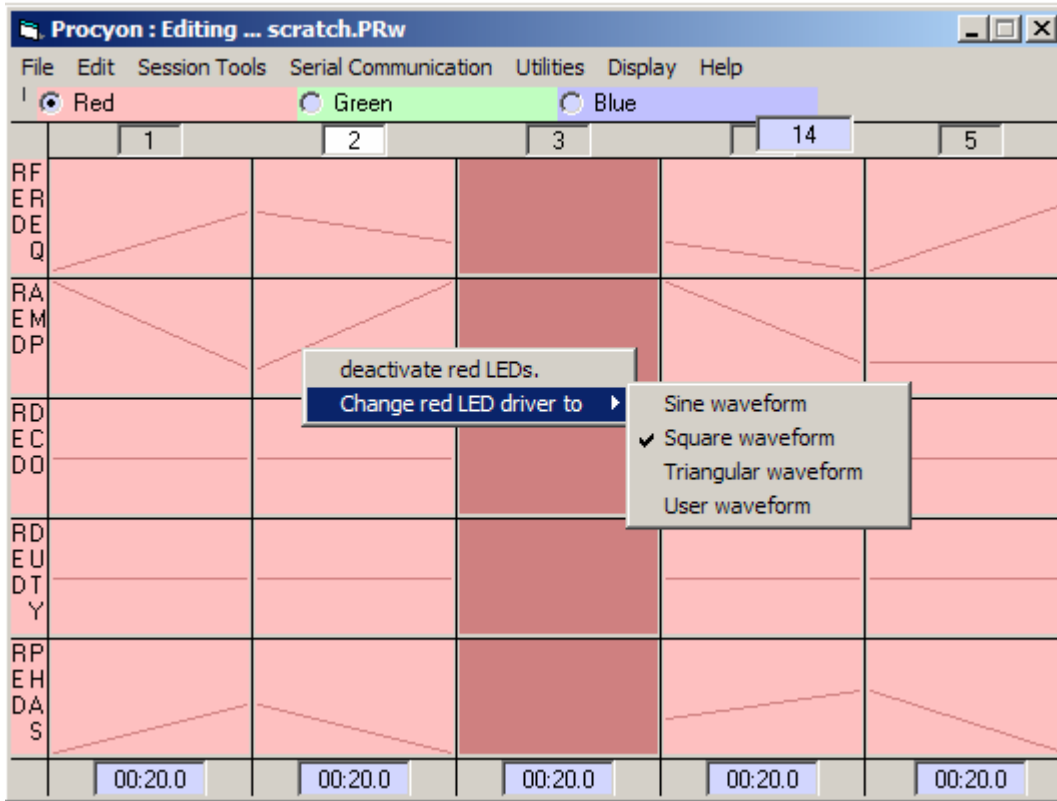
If you Right click on a segment while in either the "by Function" or "by Color" modes, a popup menu appears, allowing you to:

- Activate/deactivate individual color for that segment. If the color is active then more options appear.

- Change the Wavetable that drives each color (Sine, Square, Triangular or User defined)

* Note: 'User defined' has not been implemented in this firmware revision

## IV. How to create an album.

In order to create an album, you need to build a list of them using Notepad, and to save that list in the same directory that your sessions reside in. When you save it, do not save it with the usual *.txt suffix; instead, change the suffix to *.PRb. When you build the list, be sure to include the full name of the sessions, including their

*.PRw suffixes.  For example, the following image displays the album file for the factory-programmed sessions included in your Procyon:

```
Procyon rev 1.PRb - Notepad
File  Edit  Format  View  Help
Relax before exams.PRw
Accelerated Learning 15.PRw
Accelerated Learning 60.PRw
Accelerated Learning 35.PRw
Quick Alertness.PRw
Concentration.PRw
Attention Booster 15.PRw
Attention Booster 20.PRw
Quick Break.PRw
Athletic Warm Up.PRw
Power Recharge.PRw
Peak Composure.PRw
Performance Intensive.PRw
Mind Sauna.PRw
Quick Work Break.PRw
Regeneration 35.PRw
Regeneration 45.PRw
Quiet Hour.PRw
Deep Meditation.PRw
Meditative Mind 15.PRw
Meditative Mind 60.PRw
Deep Tranquility.PRw
Night Voyage 15.PRw
Night Voyage 25.PRw
Night Voyage 35.PRw
Night Voyage 45.PRw
Night Voyage 60.PRw
Quick Energy 10.PRw
Quick Energy 15.PRw
Full Energy 25.PRw
Full Energy 35.PRw
Full Energy 45.PRw
Total Alertness 60.PRw
Afternoon Break.PRw
Rejuvenation 15.PRw
Rejuvenation 25.PRw
Lunch Break 35.PRw
Lunch Break 45.PRw
Middle Mind Centering.PRw
Creative Visualization 10.PRw
Creative Visualization 15.PRw
Creative Visualization 25.PRw
Creative Visualization 35.PRw
Creative Visualization 45.PRw
Creative Visualization 60.PRw
Fast Trip.PRw
Symbol Spaces.PRw
Kaleidoscopic Mind.PRw
Pyromania.PRw
```

## Appendix One:  Converting Proteus sessions to Procyon format

You can convert any Proteus sessions you may have developed, or the "factory" Proteus sessions included with the Proteus Editor to Procyon format using the Proteus to Procyon conversion software tool available in the Procyon support section of www.mindplacesupport.com; instructions are included with that tool.


## Appendix Two:  SynchroMuse™

Your Procyon includes a technology called SynchroMuse, which allows you to create compact discs which synchronize audio tracks on the CD with a session internal to the Procyon.  In effect, this acts like a full-color version of the AudioStrobe® technology.  We anticipate converting our current AudioStrobe-encoded CDs to the SynchroMuse format, and watch our support site for detailed instructions for creating your own SynchroMuse CDs.




<u>Tips</u>

If you are not using one or more colors in a segment, turn the segment off; this will save memory.

One way to create a "ganzfeld" is to set the frequency to 80 Hz, which will appear to be a uniform field of light.

The best way to create a ganzfeld is to set the Amplitude to 0 then adjust the DC offset value between 127 (off) and 255 (full on). All values less than 127 will result in zero brightness.


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