

A Macromedia Flash™ extension for creating  
interactive teaching modules.

## Official Manual

Software Version 1.02

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## Acknowledgements

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Welcome to Student PACS module creator, an extension for Macromedia Flash. This program runs inside Macromedia Flash to help a user create educational case modules out of radiological images. Let's go over some critical pointers:

- ❖ ALWAYS CLICK NO when you are asked if you would like to abort a Javascript. This is a failsafe built into Flash to keep a computer from crashing if a user runs bad Javascript. Some parts of our code are repetitive and take some extra time to run, so Flash can think its bad code. Rest assured though, that we have tested our code enough to know that these error messages are insignificant.
- ❖ NEVER click outside the panel unless you are asked to do so. (Or unless you know what you're doing within Flash) This may result in corrupt or non-functioning modules. Typically, Flash will ask you if you would like to "unlock this layer for editing," whenever this happens. CLICK NO!
- ❖ ALWAYS use the *SPACS menu* to open, save, and close StudentPACS *.FLA* files. Using Macromedia Flash's buttons will result in loss of your work and possibly corrupt files or program crashes.

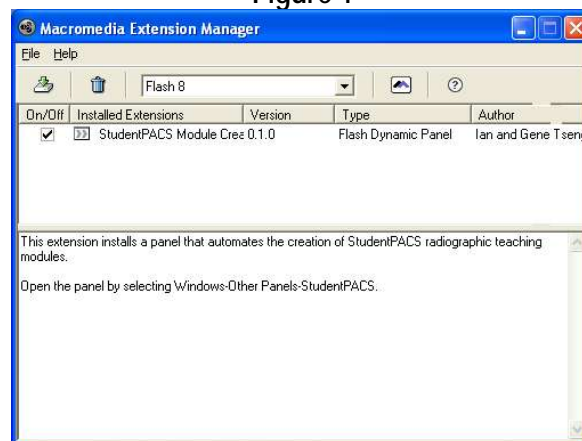
Before you begin, you should be familiar with the way a finished teaching module works. See some samples on our website: [www.studentpacs.com](http://www.studentpacs.com).

Notice that all StudentPACS commands in this manual **look like this**, whereas Flash and Windows commands *look like this*.

## Installing the StudentPACS Extension Panel

- ❖ Install Adobe/Macromedia Flash Professional, version 8, available at [www.adobe.com/downloads](http://www.adobe.com/downloads) and most software vendors. Registration is required to download a trial version. Educational editions of the program can be purchased at significant discounts, if you are eligible, through your educational institution or through Adobe itself.
- ❖ Download the file StudentPACS102.mxp from [www.studentpacs.com](http://www.studentpacs.com). Double click on the file and the Macromedia Extension Manager will appear. Click **Accept** and the extension panel will install. Make sure that the extension panel appears as pictured in Figure 1 when installation is complete.

Figure 1

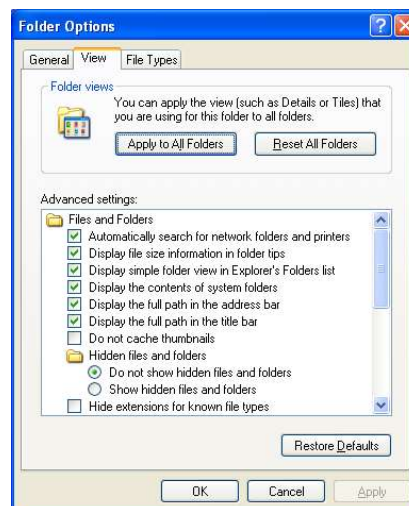


- ❖ Edit your folder options so that Student PACS can work correctly. Open **My Computer** from your start menu or desktop, click on the **Tools** menu, and select **Folder Options** (Figure 2). The window in Figure 3 will appear. Make sure that **Hide extensions of known file types** is UNCHECKED. Click **OK**.

Figure 2



Figure 3

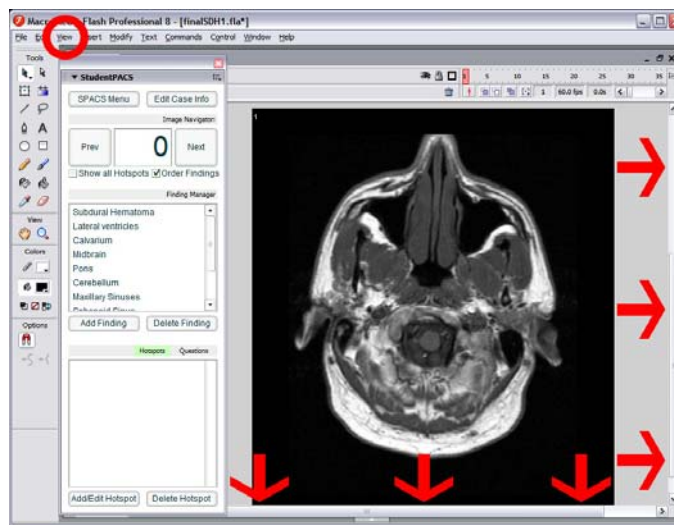


## Setting up your workspace

- ❖ To open the StudentPACS extension panel, click **Window -> Other Panels -> StudentPACS** in Flash's main menu bar. The **Window** menu is only visible when a file is open, so the first time you open this, you will have to create a new document by clicking **Flash Document** in the "Create New" column of Flash's intro screen. You should see a panel with only two buttons, **New** and **Open**.
- ❖ If you leave the StudentPACS panel open, it will stay open the next time you run Flash.
- ❖ Maximize your workspace by clicking on the arrows circled in the following picture.



- ❖ Use the scroll bars at the right and bottom of the screen to pan around your image while creating modules. Use **Ctrl+** and **Ctrl-** or **View** in Flash's main menu to zoom in or zoom out. If an image appears too big to fit on the screen, you need to zoom out.



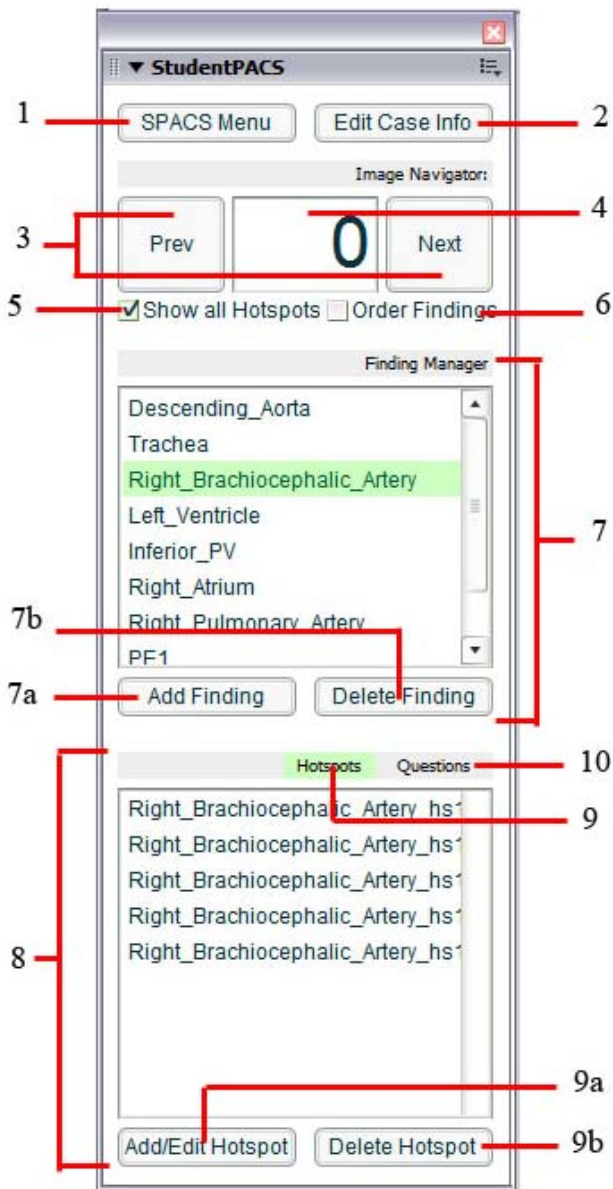
## Making a Module (Just a quick overview)

These steps describe the basic flow of creating a module. If you look at these steps along with the next few sections of this manual, you'll be a pro at this in no time.

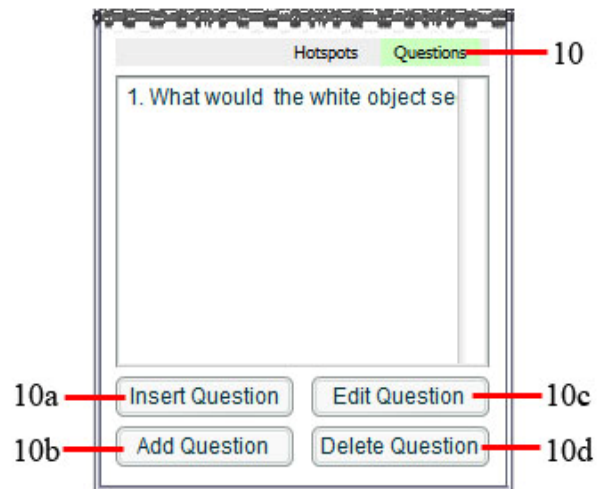
- ❖ Save your images in a **separate directory**, make sure they are **numbered in the order you want them to appear**.
- ❖ Open Macromedia Flash from the start menu. Click the **New** button on the SPACS panel. Navigate to a directory you will remember, type a name for the module you are about to make, and click **OK**. **Do not overwrite "template fla"** or you will need to reinstall StudentPACS. **Don't name the file after a diagnosis** or you will give it away immediately.
- ❖ You will be asked for a directory of images. Navigate to the directory where you saved your images and then click **OK**.
- ❖ **Click NO** if you are asked if you would like to abort the JavaScript.
- ❖ Start by clicking **Case Info** and entering any text that you want to appear in the right panel when the case is first opened. Repeat "A" and "B" below for each finding you want to point out in your images.
  - A. Click **New Finding** in the middle of the panel, and type a name for whatever you intend to label next. Repeat the following to make clickable "hotspots" for that finding.
    - 1) Use the **Next** and **Prev** buttons at the top to go to the slice that has your finding. Use the **scroll bars** in Flash and **Ctrl+ or Ctrl-** on your keyboard to fit your image in Flash's work area.
    - 2) Click on the **Hotspots** tab, and then the **New/Edit Hotspot** button at the bottom right. Select the paintbrush tool, select a color and a brush size and then color over the entire finding. (Save time by outlining the finding and then using the Paint Bucket Tool)
    - 3) Click **Done** on the panel and repeat these three steps until you've labeled your finding in all of the slices in which it appears.
  - B. When you are done, click on the **Questions** tab and then repeat the following to enter the questions you wish to ask when someone clicks on your finding.
    - 1) Click **Add Question**.
    - 2) Type a question, at least one answer choice, and an explanation.
    - 3) Click on the circle to the left of the correct answer.
    - 4) Click **Apply** in the lower left, and repeat these last four steps until you've entered all of your questions for that finding.
- ❖ When you're finished drawing hotspots and entering questions for each finding, click the **SPACS Menu** button in the upper left and select **Save** to save your work. Click the **SPACS Menu** button again and select **Publish**. To look at your case, click **Control** in Flash's menu and then select **Test Movie**.

# The StudentPACS Panel Controls (The Details)

The StudentPACS extension panel....

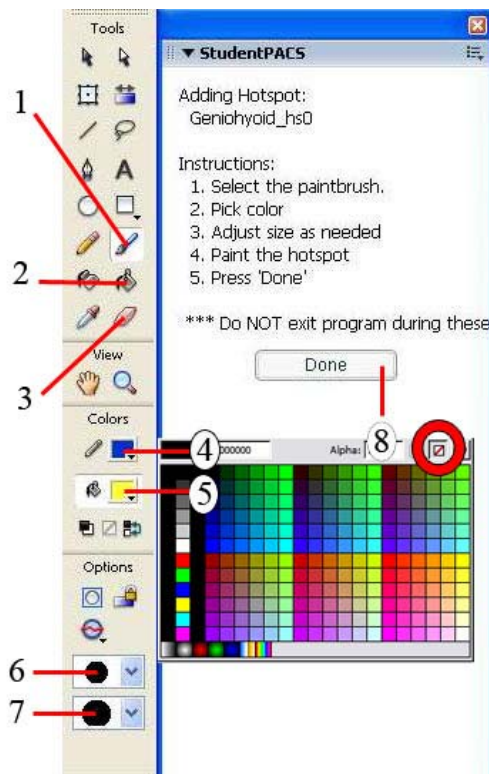


The bottom of the panel after you click the "Questions" tab.



- 1) **SPACS menu:** Use this button to open, close, save, publish, and create new StudentPACS modules.
  - ◆ **New, Open, Close, Save, and Save As** work like they do any other Windows program except that you'll need to remember to ALWAYS use this button instead of anything outside the panel so that you don't lose your work.
  - ◆ The **Publish** command creates two files in the same directory as your ".FLA" file; a ".SWF" and a ".HTML" file. The ".SWF" file is the published version of your module. The ".HTML" lets you open the module from an internet browser. Put both of these files on the web or on a CD and your module can be viewed by anyone.
- 2) **Edit Case Info:** Use this button to enter general information about your case that you want to appear when the module first loads. (A 50 yo male presents...)
  - ◆ Tell the user what you want them to do first, whether its searching for a specific finding, or just clicking around when they see an abnormality.
- 3) **Next, Prev:** Use these buttons to flip through your images. At this time, there's no way to flip images with your mouse wheel.
- 4) **Jump:** Enter the number of an image into this box and then press the "Enter" to jump to that image.
- 5) **Show All Hotspots:** If an image has multiple hotspots for different findings, you can see all of them at once by checking this box.
- 6) **Order Findings:** When this box is checked, Flash will publish your modules so that a user must click on your findings in the order that they appear in the Finding Manager. This is essential for "walking" a student through a study. When unchecked, a user can click on any finding in any order.
- 7) **Finding Manager:** Think of "findings" as a group of hotspots and questions.
  - A) **Add Finding:** This button creates a finding. You will be prompted for a name. The name is for your purposes only and will not be seen by module users.
  - B) **Delete Finding:** Use this button to erase a finding and all of its hotspots and questions.
- 8) **Hotspots/Questions list:** This part of the StudentPACS panel displays either the hotspots or questions that make up the finding selected in the finding manager depending on whether the **Hotspots** or **Questions** tabs are selected.

- 9) **Hotspots Tab:** This tab lets you highlight structures that make up a finding and turn them into “hotspots” which trigger questions to appear when a user clicks on them. Each finding can have multiple hotspots, meaning you can highlight the same structure over multiple frames, allowing a user to click anywhere, for instance, on the aorta as it travels through the abdomen.
- 1) **Add/Edit Hotspot:** Opens the window show below to create a new hotspot, or to edit a hotspot selected in the hotspot list. When this window is open, you can use all of the drawing tools available in Flash to highlight your findings. We describe the ones we use most below.
  - 2) **Delete Hotspot:** Deletes the hotspot selected in the hotspot list.



- 1) **Paintbrush:** Your basic tool for marking hotspots
- 2) **Fill:** Use this for large hotspots. Outline the spot, making sure you close the shape, then select this tool and click in the middle.
- 3) **Eraser:** Great for editing.
- 4) **Line Color:** Leave this on no color (the slashed-out box shown in the circle)
- 5) **Fill Color:** Choose a color for your hotspots.
- 6) **Brush Shape:** Round usually works best.
- 7) **Brush Size:** Stick to thicker sizes because small hotspots can be hard to click on.
- 8) **Done:** Click here to turn your highlighting into a hotspot.

- 10) **Questions Tab:** This tab lets you add questions to a finding selected in the “Finding Manager”. These questions display in the right-hand panel. Like with hotspots, each finding can have multiple questions that will display one after the other when a user clicks on a finding.
- ◆ **IMPORTANT:** Each hotspot must have at least one question or you will get an error message when you “Publish” your project.

- A) **Insert Question:** Creates a question ABOVE the selected question in the question list.
- B) **Add Question:** Creates a question at the end of the question list.
- C) **Edit Question:** Opens the selected question for editing.
- D) **Delete Question:** Deletes the selected question.

## Making Better Modules (The Fine Details)

- ❖ **Types of Modules:** You can make two types of modules: guided and unguided. In a guided case, students look for one finding at a time in the order that you specify. In an unguided case, a student can click on any finding in any order. Technically, the only difference between each type of module is whether or not the **Order Findings** box is checked off, but other things, such as the way you word your questions, will be significantly different
  - ◆ If the **Order Findings** box is NOT checked when you publish the case, students can click on any finding in your module in any order. This would work, for instance if you wanted to create a quick case for residents where you wanted to point out only a few findings. This would also work for creating an atlas-like module for anatomy students where everything is labeled but very simple, or even blank questions are asked. (Note that each finding needs to have at least one question to work, but the question, its answer choices, or its explanation can all be left blank. In an unguided case, the student would be able to go from one hotspot to another without answering the questions)
    - Your case info should end with a vague instruction such as, "See what you can find." You could include a list of findings or some general information about the study but there would be no need to point a student towards a specific finding.
    - Your questions and their explanations should refer only to the hotspot that triggers them.
  - ◆ If the **Order Findings** box IS checked when you publish the case, students must click on each finding in the order that is shown in the **Finding Manager**. This type of module is ideal for teaching a student or resident to look through a study methodically.
    - Your case info should end with a specific instruction to look for the first finding, such as "Find the liver."
    - Your questions should lead the user from one finding to the next. Each explanation should end with instructions to look for the next finding.
    - The explanation for your last question should say, "THE END."
- ❖ **File Types:** StudentPACS is compatible with all images in the JPG, GIF, BMP, PNG, and TIFF formats. If your PACS workstation or reconstruction software is not able to export images, consider using a free DICOM reader such as Dicomworks, available at [www.dicomworks.com](http://www.dicomworks.com), to do the job.

- ❖ **File Sizes:** StudentPACS allows up to 100 images with resolutions up to 1920x1200, however, this is MUCH bigger than most computers can handle.
  - ◆ A module created from 100 1024x768 jpgs will take up about 13 megabytes on disk. A module of this size would be the largest we would recommend. While this size is feasible for a user on a fast broadband connection, it might take several minutes to download on the congested networks in schools and hospitals.
  - ◆ Macromedia Flash files, when opened, are far bigger than they are on disk. The 13 megabyte module described above would take up about 320 megabytes of RAM, which is definitely pushing the envelope if your students will be viewing modules on older school or hospital systems. We don't recommend exceeding 500 megabytes of RAM usage
  - ◆ An easy way to check how much memory your module uses is by opening the module in an internet browser (use a new browser window and make sure you don't have more than one browser window or tab open). Scroll to the last image of the module and then hold **Ctrl+Alt+Delete** to open the Task Manager. Click on the **Processes** tab and then look for your browser, either "Iexplorer.exe" or "Firefox.exe" and follow the row to the right to see how much memory is being used.
  - ◆ Optimize your images by cropping away excess borders and/or resizing very large images. This is downright tedious to do for even a few of images, so we recommend using a program like Picasa 2, which is a free download from Google to crop or shrink all of your images at once.
  - ◆ Use only every other image, or every 3<sup>rd</sup> or 4<sup>th</sup> image for very large studies. A very quick way to do this is to open the folder containing the images in windows. Select **View -> Thumbnails**. Resize the window to show 2, 3, or 4 columns if you wish to use every other, 3<sup>rd</sup>, or 4<sup>th</sup> image, respectively, by dragging the right side of the window. Select an entire column of images by drawing a selection rectangle around it. Start at the top and move the mouse towards the bottom of the window. The window will automatically scroll to the end. You can hold **Ctrl** and select multiple columns at once. Copy these images into a different directory for use.
  
- ❖ **Save Time:** Highlighting a finding that appears in many slices of a study is tedious. A simple workaround for this is to ask your question in reference to certain slices of the study. Eg. "Find the aorta in slices 10-15. The numbers you see in the Image Navigator section of the panel correspond to the numbering that appears in the final module. If your images contained numbering when you saved them from your PACS system, you may want to crop the numbers out to avoid any confusion. In general, you should remove all patient info and numbering from within your PACS system, as this is easier and faster than cropping them out later.

## Handy Things to Know About Flash

- ❖ When using StudentPACS you will encounter three different file types:
  - ◆ .FLA – This is file that you work with. Your projects are saved in this format and these are the files that you should open for editing.
  - ◆ .SWF – This is a flash movie file. Your modules are published into this format. You will notice that after you publish a module, a .SWF file with the same name as your .FLA file will appear in the same directory. Open this file to view your case. You cannot edit this file.
  - ◆ .HTML – This is a standard html file that is generated when you publish your module. It tells browsers how to open your .SWF file and checks to see if a student has the correct version of Flash installed. If not, it displays a link for downloading the latest Flash Player.
  
- ❖ To distribute your module for viewing, include both the .SWF and the .HTML file in the SAME directory. Whether you email the files, burn them to CD, or host them on the web, you'll want to include links or instructions for users to open the .HTML file.
  
- ❖ A handy way to preview your module is to select *Control* -> *Test* in Flash's menu, AFTER using **Publish** in the **SPACS menu**.