

Running PCT programs

NOTE: The discussion below refers to programs created by Bill Powers prior to 2008. They can be downloaded from www.livingcontrolsystems.com in zipped program packages that hold the program and its documentation in separate folders: docs and program. When you unzip, ask for subfolders. The documentaton of these early programs yields additional insight for the serious student of PCT.

Bill Powers's work *Living Control Systems III: The Fact of Control* (2008-2009) with updated programs is highly recommended. This book with its numerous programs provides a superior introduction to PCT.

A series of programs created to explain, illustrate and simulate Perceptual Control Theory have been created by Bill Powers over time.

DOS programs include demo1 and demo2, arm_one, arm_two (also known as little man one, little man two), crowd, inverted_pendulum, ecoli, square_circle, and 14_degrees_freedom.

Windows (Delphi) programs include crowd and track_analyze, multiple_control_systems, plus a recently updated Delphi version of arm_one and a Delphi version of inverted_pendulum, programmed by Bruce Abbott.

Further developments of some simulations include effects of reorganization. The DOS programs were created in the era of the IBM XT and AT computers. They are small and run fast.

To run these DOS programs under Windows 98, Windows NT4, Windows 2000 or Windows XP, you can double-click on the executable file in any file manager, such as My Computer or Windows Explorer. You can select the executable file and right-click to bring up a menu where you can select "Create Shortcut." You can drag the resulting shortcut to the desktop and you can edit the text that is shown under the MSDOS icon. Using a shortcut is convenient, but I have not noticed any difference in performance based on setting options under Preferences for the shortcut. Specifically, I have not been able to get Windows XP to display in a window (less than a Full screen), no matter how I set the preferences. If you know how, let me know (dag@livingcontrolsystems.com) so I can update this guide.

Some of these DOS programs generate files, such as tables of random numbers, as part of the execution of the program. These newly generated files overwrite previous files. Therefore, it is important that the files not be write-protected. If you copied these (uncompressed) files from a CD to your hard disk, the files will be write-protected, because you cannot overwrite files on a CD. I have found that when copying or downloading a zip file to my hard disk, then expanding it to the hard disk, the files are not write-protected. That's convenient.

If you have a problem with the program refusing to run, you can display the files in a file manager and check the attributes to make sure that they are not write-protected.

When you open one of these DOS programs, they typically are displayed Full-screen, the way they ran originally on a DOS computer with 480 x 640 resolution.

On a computer running the DOS operating system, you can pause these programs and press the PrntScrn key to print an image of the screen to your printer, but that requires that you boot your computer to DOS and install appropriate drivers for your printer. That is no longer realistic.

On a computer running Windows, the PrntScrn key does not work when running a DOS program full screen.

If you want to capture an image of the screen, you can (in most versions of Windows) press Alt+Enter to change the display from Full-screen to a window. An active window, including an active window displaying the DOS program you are running, can be copied to the Clipboard by pressing Alt+PrntScrn. From there, the image on the Clipboard can be pasted into any number of Windows applications such as Word, Paint, and specialized image handling programs such as Irfanview, available from <http://www.irfanview.com/>. Image capturing programs such as Snag It, <http://www.techsmith.com/products/snagit/> (not free) can also be used.

To return to the full window, be sure the DOS window is active, and again press Alt+Enter.

IrfanView is handy in that it is free (donation welcome) and very capable. When you paste the DOS window, you get the DOS display including the window frame. IrfanView is a file format conversion program, so you can save your image to any one of many file formats. But you cannot edit the image to remove the window frame. Notice that you can reverse the image from the DOS screen by selecting Image/Negative.

Paint is also handy. Paint is an application program that is included with Windows under Accessories. When you paste the DOS window, you get the DOS display including the window frame. With Paint, which is a bitmap editing program, you can edit the image to remove the window frame. For instance, you can use the Select rectangle, then copy your selection and paste it into a new file. Notice that you can reverse the image from the DOS screen by selecting Image/Invert Colors.