



Workstation Innovation News

Understanding your desktop technology

» [Subscribe](#)

Brought to you in part by:

cadalyst



workstations **.tv**

Check out HP on YouTube!

Special Promotion

Two Is Better than One!

HP Workstations with dual processors and dual monitors
» [More details](#)

HP Smart Buys

Trade Up to a New HP Workstation

Move out the old and move in the new.



» [Learn more](#)

Two-Handed CAD Featured Products

Now \$359
84% of users report improvement in product design with less design flaws. Study finds an average of 21% productivity improvement, with payback period of less than 1 month. » [Learn more](#)



Performance Tuning Framework Tips & Tricks

HP SpacePilot 3D Controller

A cool tool that pays for itself by making 3D CAD software easier to use

By Robert Green, *Cadalyst* Contributing Editor



If you use 3D CAD design programs with a standard wheel mouse, you've probably found your own ways to navigate through 3D space. And if you're like me, you've never been entirely happy with the compromise of moving through a 3D world using a 2D mouse. Recently I've noticed that all the HP workstations at software trade shows have sported an HP SpacePilot controller. People familiar with them show a missionary zeal for the devices, even though they aren't cheap at \$359.

So it was with a sense of optimism that I unwrapped the SpacePilot controller and set out to evaluate its possibilities using my Autodesk Inventor mechanical modeling software as a test bed.

What it isn't and what it is

First off, the SpacePilot is not a mouse. In fact, it doesn't function as a mouse and won't allow you to get rid of your mouse, so let's put that misconception to rest right now.

Download PTF Today!

Find out how easy it is to upgrade your workstation performance.

Certification

Has your HP workstation been tested and certified? » [Check here to find out.](#)

Link to our Partners**Training**

» [Autodesk University](#)

Inside Autodesk Inventor 2008

» [Visit Cadalyst's Video Gallery at http://video.cadalyst.com](#)

Autodesk.com

» [Learn more about Autodesk Inventor](#)

» [Visit Autodesk's Manufacturing Community](#)

**Certified HP**» **Contact us**

Get the latest news about HP along with a host of resources for online technical help and support.

Personalized Services

**Cadalyst
Product of
the Year:
HP xw4600**

All-Star
awards honor

the best of the best – the most outstanding among all hardware and software products that earned Highly Recommended ratings from *Cadalyst Labs* over the past year. **The editors' pick for 2008 for hardware is the HP xw4600 and LP3065 30" LCD workstation/display combo. (\$3,775)**

The HP xw4600 workstation is



Roughly the size of a stenographer's pad, the SpacePilot houses the space controller joystick at the center, a button status display at the top, and function buttons to the left and right.

So what is it, then? The SpacePilot is a custom control device that allows 3D visualization in terms of rotation, twist, and roll using a three-axis "joystick" control mounted in a sturdily designed case (which doubles as a wrist rest). The control includes programmable buttons that, while overwhelming at first, ultimately reduce usage of the keyboard and on-screen menus, speeding you through common design tasks.

The SpacePilot comes bundled with two HP workstations: the HP xw4600, which has an Intel Core 2 Duo processor, and the HP xw6600, with an Intel Xeon processor. For details, see the [HP website](#).

Installation and Tutorial

You install the SpacePilot using the included CD, which automatically searches the Internet for updated software drivers. During my installation, updated drivers were available, so I downloaded them and restarted the process. Everything went smoothly including flawless plug-and-play synchronization after I plugged the SpacePilot into its USB socket.

At the end of the installation, a slick tutorial application pops up offering demos of the various motions that the controller supports (shown below). For those of you who eschew Help files and tutorials, please heed my advice and take 10 minutes with this tutorial — you'll be well rewarded with a dramatically lowered SpacePilot learning curve. I make this recommendation without hesitation because at first I took the "How hard can this be?" approach and turned off the tutorial. But I had to come back to the demo applications later.

based on a proprietary Foxconn motherboard that uses the Intel X38 Express chipset; the system *Cadalyst* tested had an Intel Core 2 Duo E6850 processor rated at 3.0 GHz with a front-side bus speed of 1,333 MHz. In June, reviewer Ron LaFon found the LP3065 30" LCD monitor to be "both pleasing and very useful" and judged the pricing, performance, and overall quality of the combo system to be ideal for a broad range of work.



The SpacePilot Control Panel software DEMOS routine can be accessed from its Help menu. Though not CAD-specific, these demo applications help you get the feel of the SpacePilot's controls.

Using the SpacePilot

» [Subscribe](#)

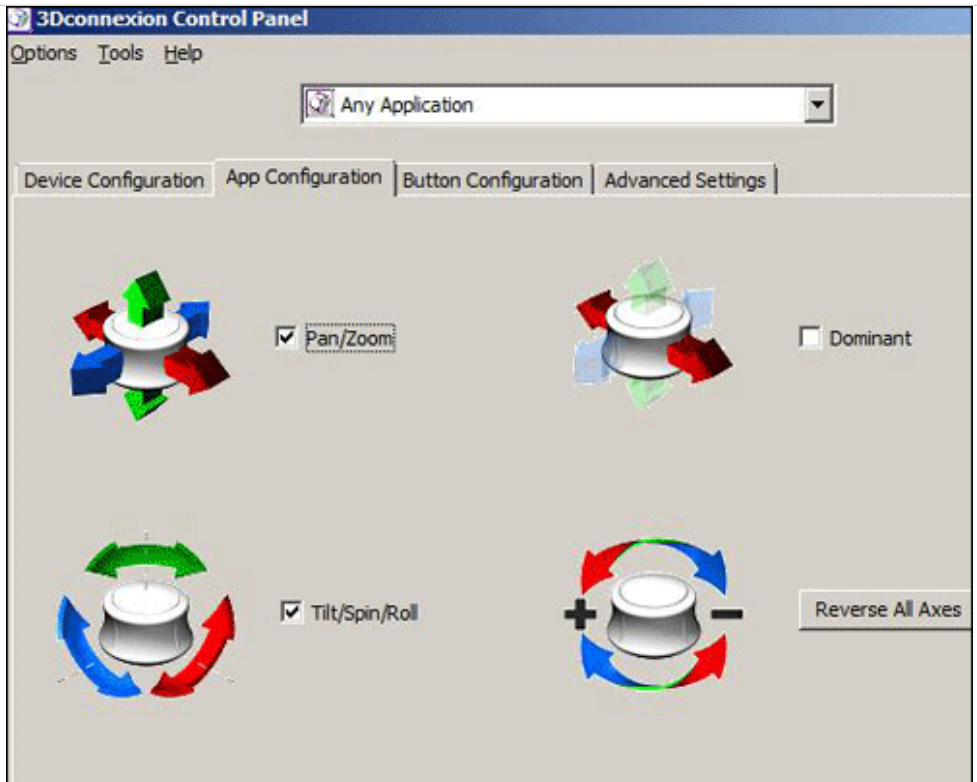
As soon as you unpack it, you can see the Space Pilot's obvious build quality, and it becomes more noticeable as you use it. This is no lightweight piece of plastic, but rather a substantial device with an integrated arm/wrist rest and non-skid shock-absorbing feet. Power and communications interfaces for the SpacePilot are provided by a standard USB interface.

The SpacePilot is designed to be used in conjunction with your mouse, so you'll almost certainly settle on a two-handed approach, with the mouse in your dominant hand (right for most) and the SpacePilot in the other. When using Inventor, I found that mousing with my right hand was easier than usual thanks to reduced clicks/picks. And my left hand got better at operating the SpacePilot as I became familiar with the interface. I noticed that I rarely used the keyboard or on-screen menu panels, motions that would ordinarily require letting go of the mouse and slow me down.



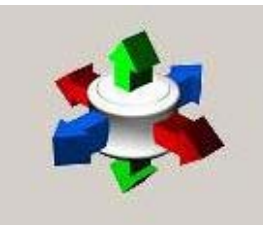

The SpacePilot works in conjunction with your normal mouse to allow control of the software application almost without use of the keyboard or toolbars. Here you see the default mode of operation I used with Inventor.

In all honesty, getting used to the SpacePilot joystick does require some patience. For me, the key to understanding was the device's Control Panel, which revealed that the joystick has more functionality than first appears.



The SpacePilot Control Panel shows graphically how many axes of control there are on the joystick. By switching off the modes of control and experimenting, you'll master the device much as you learned to ride a bike.

The functionality is defined in terms of "modes of control":

	Motion	Functionality
	Pull up or push down (green arrows)	Zoom
	Pan across left to right (red arrows)	Pan
	Pan across top to bottom (blue arrows)	Pan
	Revolve around axis	Change 3D view angle

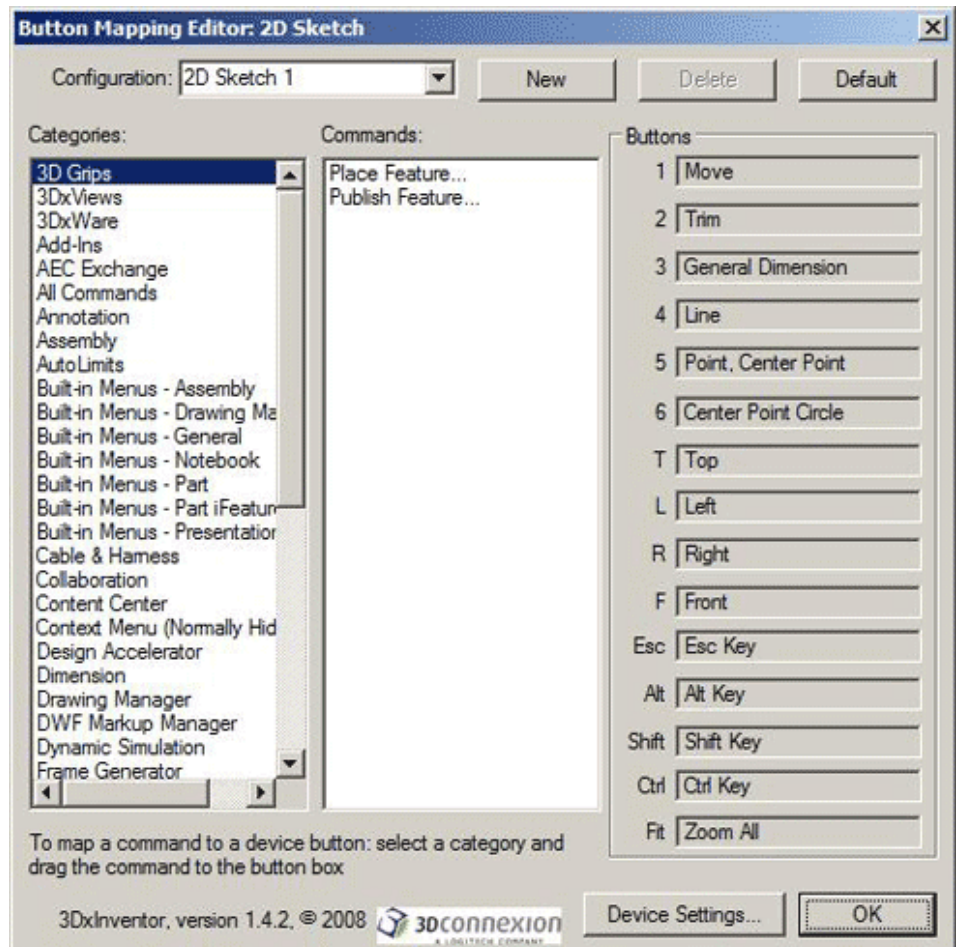
Upon first use I realized that I was trying to oversimplify the joystick motions by using it like a game controller. I had to mentally regroup to figure out which motion was which. I returned to the tutorial and ran threw some of the demos, which showed me what I had been doing wrong. I was able to get the feel for the device with a little more experimentation.

Once you get used to the joystick, you can start using the programmed buttons along the top of the unit, which function as shortcut keys. *(Tip: Once you learn to let your fingers dangle over the joystick to access the buttons, you won't have to move your hand at all to alternate between the joystick and buttons.)*



The SpacePilot provides six programmable buttons per application with button status shown in the top LCD window.

The buttons are automatically set to meaningful tasks based on whichever tool panel is active in the 3D software you're using. When I was creating a new part in Inventor, the 2D sketching panel was active and the buttons were assigned commands like Move, Trim, Lines, Circles, and Dimensions. If you don't like the default button assignments, you can remap them using the Control Panel Button Mapping Editor to create your own custom user environment. You can also assign repetitive operations to a single key, saving significant time.



Customizing the SpacePilot is easier than learning to move the joystick, thanks to the Button Mapping Editor that links the SpacePilot to the program in use (Autodesk Inventor in this case).

The Learning Curve

It took me about half a day to install and get acclimated to the SpacePilot. After a few hours of Inventor modeling to cement the concepts, I found that the SpacePilot had become second nature to me. I even made a few changes to the programmed buttons in Inventor's assembly mode to match the types of constraints I use most often.

The real verdict came when I tried doing some Inventor work on my laptop with only a mouse and found my left hand grasping for the SpacePilot.

The Economics of SpacePilot

After I'd become convinced that I wanted a SpacePilot, I started wondering how I could justify the device's \$359 price. Experience tells me that asking my boss for what might be thought of as a glorified \$359 mouse probably wouldn't go over very well. I realized that I'd have to estimate the time I'd save using the SpacePilot and see if it actually made economic sense.

I calculated the time I saved using the SpacePilot instead of toggling through menus, toolbars, keystrokes and viewing/visualization tools in Inventor. Being as objective as I could using standard sketching, modeling and assembly functions, I concluded that I saved about 4 minutes per hour. I saved time in two ways: fewer clicks/picks (in toolbars, menus and commands) and better visualization. In fact, I found myself doing more detailed zooming, panning and rotational orientation of my viewing angle to better view the key points, planes and constraints I needed to work with. I was also able to use more wireframe visualization instead of hidden line visualization, which makes Inventor run faster.

Total time savings: My usual time benchmark is 24 hours modeling work per week per engineer (leaving the other 16 hours for reviews, clerical work, calculations, etc.). My 4 minutes saved per hour adds up to 1.6 hours per week. Over the course of a 48-week year, this savings totals 76.8 hours — that's two full weeks I could be spending on other work, or a nice vacation!

Dollar savings: Using a \$50/hour labor rate for a mechanical engineer, the 76.8 hours per year saved using the SpacePilot becomes \$3,840 worth of engineering time. This time can be better spent doing tasks besides struggling with software, right?

ROI: The SpacePilot returns \$3,840 worth of engineering productivity for the price of \$359. The SpacePilot returns a staggering **1,007% return on investment** (\$3,840 divided by \$359 and converted to a percentage).

Having performed this calculation, I've resolved never to use Inventor without my SpacePilot! Of course your mileage may vary, but I bet you'll find that saving a few minutes per hour will make the SpacePilot pay for itself in no time.

Wrapping Up

With all the cool software, hardware, and operating systems we have to choose from, it's easy to overlook more mundane things like an input device. My experience with the SpacePilot has refocused my thinking on the fundamentals of greater user productivity via fewer picks/clicks and easier visualization, which can be less than ideal on 2D computer monitors.

And while it may take a few hours to get used to the SpacePilot controller, I believe it's well worth your while. After all, why spend all that money on hardware and software and then leave your productivity to chance with a \$29 mouse?

About the Author

Robert Green performs CAD and document management programming and consulting throughout the United States and Canada. He is a popular public speaker and holds a degree in mechanical engineering from the Georgia Institute of Technology. Check out his Web site at www.cad-manager.com or e-mail him at rgreen@greenconsulting.com.

HP is committed to protecting our customers' privacy and your feedback is very important to us. If you would no

longer like to receive emails from us, click [here](#).

Hewlett-Packard Company
3000 Hanover Street
Palo Alto, CA 94304-1185 USA

Phone: (650) 857-1501

[Privacy statement](#)

© Copyright 2009 Hewlett-Packard Development Company, L.P.

You are currently subscribed to %%list.name%% as %%emailaddr%%. To unsubscribe [click here](#) or visit [Unsubscribe](#).

Cadalyst is a division of Questex Media Group, Inc.

201 E. Sandpoint Avenue, Santa Ana, CA 92707

© 2009 Questex Media Group, Inc. All Rights Reserved.

Refer to our [Privacy Policy](#).

Reproduction in whole or in part is prohibited without written permission.