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## PSK for Beginners

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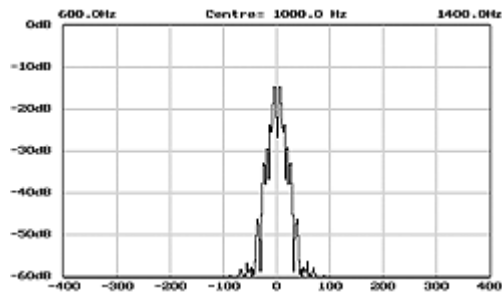
*You may have heard about PSK31, a fairly new mode of communication that's getting quite popular with hams. With PSK, you use your home computer with your radio to send and receive digital signals with other hams. The signals come through the radio, are fed into the computer and are decoded by software as the words being sent appear on the screen. The computer then turns the words you type into a signal that is sent through your radio to the ham you're talking to. It all works amazingly well, and pretty simply at that. With that in mind, here's a basic explanation of how to get involved in PSK31.*

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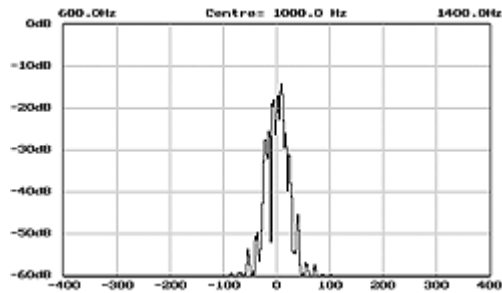
### Getting Started

If you want to get started using PSK31, I suggest that you begin by listening (and watching) some PSK signals. First, go on the Internet and download the latest version of the [Digipan](#) program to your computer (just follow the links and instructions). *Digipan* is free and simple, so it's a good place to start.

You'll want to run a cable from the headphone or speaker jack of your radio to the "line in" jack on the back of your computer (next to this jack will probably be a drawing of an arrow pointing to the center of a circle). Keep in mind that not all computers have a LINE input (most laptops don't). If yours does not, you'll have to use the microphone input.



**PSK31 in bspk mode**



**PSK31 in qspk mode**

Next, adjust your sound card controls (double click the little "speaker" icon at the bottom of your computer screen) so the "line in" volume is at about 75 percent and is not muted. When you double click the tiny speaker, you'll see the VOLUME controls, which control transmit audio, not the RECORD controls that you need to adjust for receiving. To get the RECORDING window, you have to click on OPTIONS in the upper left corner of the VOLUME window, then click OPTIONS, then PROPERTIES, then RECORDING, then OK.

Next, open Digipan, tune the radio to about 14.070 MHz, adjust the radio volume until the program's computer screen shows a neutral dark color and maybe some noticeable trails of signals that stand out

clearly from the background. You are now looking at the "waterfall display." You also can try listening on or around 7.070 or 21.070 MHz.

You may need to tune the radio a few kHz either way to get a good signal to read. I find it best to tune the rig so the signal you're monitoring is around the "1000" marker on the waterfall display. PSK signals sound like high-pitched warbling, and they appear very thin and individual on the display. Use your mouse to double click on a trail, and the words being sent should appear on the larger receiving box on *Digipan*. You are now reading PSK signals, which should keep you busy for a while. Notice the friendly tone that the operators use and the relaxed feeling of most exchanges. This is something most PSK ops seem to enjoy a lot.

You'll want to send some signals and talk to other operators. Do a dry run practice session first. Connect the speakers (or a headset) to your computer and adjust your sound card to make sure you have moderate volume coming out of them. Then type some text in the smaller "transmitting" box and click the "T/R" button at the top of *Digipan*. You will hear a signal coming out of the speakers and see the text you would be transmitting scroll across the screen. If you again click the "T/R" button at the top while this is happening, the program will automatically finish sending the whole text before going back to receive (this trick will come in handy later). Play around with this for a bit and see how it feels. In fact, spend some time getting used to using the program in this "practice" mode.

### **PSK the "Easy Way"**

Eventually, you'll feel ready to send a signal on the air. Here's a simple tip on how to send PSK the easy way. Put your computer speaker right up against your

rig's microphone (make sure you're in a quiet room), and wrap them up in cloth or foam to keep out extraneous noise. Set the rig on the right sideband for the band you're using. Turn on the rig's VOX, or set up a little PTT switch (many rigs have an outboard connector for this on the back panel). You can send PSK directly from the computer speaker through the microphone. Although the rig's switch may say SSB, the mode you're transmitting is PSK, so it's quite legal. There are a couple of things to remember:

- The PSK signal drives the rig pretty easily, so turn the soundcard volume control for the speakers way down to about 15-20 percent.
- When transmitting, advance your rig's power output (slowly) starting from no power at all. I like to stop at about 20 percent of full power. You may be able to use more, but PSK is pretty much a full duty mode, so go easy on your rig.
- Watch your transceiver ALC (automatic level control) meter. If the ALC is indicating anything other than "zero," you are overdriving the radio.

This method may not provide quite as clean a signal as if the PSK went directly through the microphone plug, but I've used this method with about 20 W out with very good (clean) signal reports. One measure of a signal's purity is the IMD, which should be below -25. Another ham can check this for you, and *Digipan* will check this on a received signal in the little "IMD" box at the bottom. Check the IMD when a PSK signal is on "transmit," but while text is not being sent.



Jeff Brone, WB2JNA, gets ready to operate PSK31.

You also can feed the computer speaker's output directly into your microphone plug. Connect the ground side of the computer speaker jack to the mic plug's ground side, and the center pin of the speaker jack to the non-ground, mic input side of the mic plug. If you don't have VOX or a PTT jack on the back of the rig, you may need to fashion a PTT connection switch through the mic plug. Turn the computer's speaker volume output way, way down (to about 20 percent), transmit a PSK tone and gradually inch up


the rig's power to the desired level. I don't even use any interface circuit between the rig and computer, and it seems to work well. You may need an interface, and there are several on the Internet if you'd like to build one, or you can always buy one. Many *QST* advertisers, like [West Mountain Radio](#), [MFJ](#), [Tigertronics](#) and [RigExpert](#) sell them, as well as other companies like [MicroHAM](#) and [MixW](#). Remember: watch the ALC or you could be generating a horrible signal and interfering with others.


## High Tech Thrills

You can also experiment with the program's functions, including the macros, allowing you to assign transmission text to certain buttons at the top of the program. This makes it easier to send the standard information, such as call sign, location and rig, without retyping everything. You can clear the text in either or both of the transmit and receive windows. Check out the help file for lots of good ideas and information. There's a lot to learn to the program, and I recommend playing around in the previously described practice mode for a good while before you go on the air.

PSK can be quite a thrill, as it seems kind of high tech, yet still is good old radio at heart. Have fun!

*Jeff Brone, WB2JNA, an Amateur Extra class licensee, has been involved with Amateur Radio for over 35 years. He enjoys CW, PSK31, Echolink and vintage radios. Jeff holds a PhD in theatre and works in customer service. He lives in Baltimore, Maryland. To learn more about PSK31, check out the [PSK31 section](#) on the ARRL Web site or the June 2006 issue of QST (p 82) for how to use PSK31 on a Pocket PC.*

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