Digipan

by Ernie Mills, WM2U.
*Please print this article and use it as a hand out at Club talks and lectures*

tnx Dany Surquin, in .pdf format ON4NB or in text http://www.on4nb.be/digipan.htm

Possibly regarded as the *PSK standard interface for PSK31 and PSK63 operation*. It is the result of a joint effort between *Skip Teller, KH6TY* and *Nick Fedoseev. UT2UZ*. This is a very easy program to *download*, *install*, *configure* and *operate*. It is well supported and would you believe it is *Freeware*.

Digipan stands for *Digital Panoramic Tuning* and brings to the operator a panoramic display of the *frequency spectrum* in the form of an active dial scale display extending the full width of the computer screen. With existing transceivers you get a display coverage of *2000Hz* to *3000Hz* of spectrum space, which if the *IF bandwidth* of the rig is set *wide open*, you could see as many as *40* to *80 PSK31* stations simultaneously.

With this unique waterfall spectrum display you can immediately see unused frequencies available for calling CQ and by simply setting the *two available cursers* on any PSK31 trace, you can *copy both QSO's* at the same time. To place a curser simply click the mouse button on the spectrum in the spot you would like to place the curser. *Left* click sets the Red Diamond shaped curser and *Right* click sets the other.
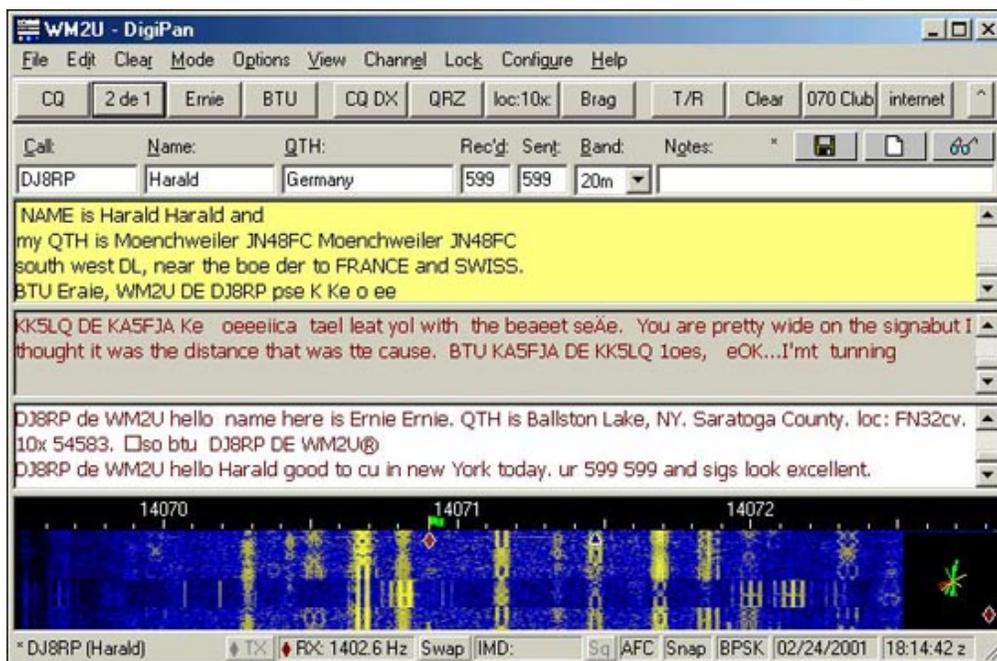
Ok, lets get this show on the road. First off download the software from **http://www.digipan.net/download/**, click on the .exe file and install it. You have interfaced the Computer to the Radio eh? If not go to my *hookup page at* **http://www.qsl.net/wm2u/interface.html** and do it.
NOTE: this from Skips web page: **Digipan 2.0 works best on a 266 MHz or faster Pentium processor and requires Windows 95 or greater**.

Fire up the program and you will see a window similar to the above. Click on **Configure**, and fill in your personal data like *Call Sign*, *Name*, *QTH*, etc. Click on **Channel** and select *Dual Channel Mode*. Now go to **View** and make sure *all the options are selected*, then click on **Options** and select *AFC*, *Snap* and *Rx*. In the **Mode** menu item check *BPSK*. In the Clear menu you will find that you can selectively clear any or all of the windows. Snap will make the cursor 'snap' to the closest signal.

Under the **Configure** menu, you can write your *F(n)* macros, your *Ctrl-F(n)* macros, and set the *sampling rate* to 11025Hz. For a good explanation of the sampling rate please refer to Peter Martinez' help write-up here. Click on **Set-up** then *Sampling Rate*. Don't forget to tell the program which is your *active com port* and while your at it select which line you are going to use for

PTT switching. RTS or DTR! On this menu you can also adjust your preferences for window *color* and *font*. I like to have both the *Rx windows* different colors so that I know which is the active window.

So, using the settings above *will get your system working*. Read the *help files* to tune the settings for best *performance* and for you *personal preferences*.

Along the bottom of the screen you will see a few more buttons. The *swap button* is quite neat because it will swap between the two *Rx windows* making the non active, active. This is really handy if you are working one station and monitoring the another. If you want to work the other station after you finish your QSO, simply click *swap* and start working the other station.

The *IMD indicator* (Intermodulation Distortion), is unique to PSK. Since the *RST values*, Readability, Strength and Tone, don't tell the operator much about the condition of there PSK transmission, the IMD is used instead. This measures the *ratio* of the *3rd harmonic* to the *main signal* and the result is logarithmic. A value of *-25dB* is considered good.
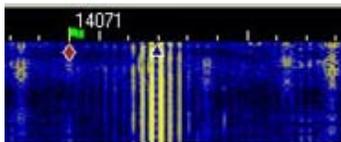
This *waterfall screen shot* is an example of a *badly overdriven sound card*. Notice that you can count out to the *15th harmonic* and it is *splattering* over *500Hz* taking out at least *6 PSK31 QSO's*

Click the *Waterfall Drive* in the **Configure** menu and set the microphone slider to about 75%. Now, into a dummy load, click the *T/R button* and send out a signal. Click on the *Transmitter Drive* also in the **Configure** menu and increase the *Volume*, and/or *Wave* slider, while watching the *ALC indicator* on the rig. As soon as the ALC starts to read, **STOP**. This is the *maximum power output* you can use to maintain a *clean signal*. On my system this will typically be between 50 and 70 watts output.
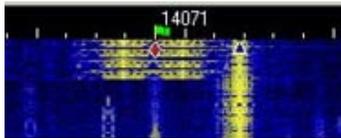

This *waterfall screen shot* shows a *Pactor* signal that fired up directly on top of *my PSK QSO*, completely wiping out the *Rx text*. Some sick puppies out there eh!.

You can see that the Pactor signal could wipe out about *4 PSK QSO's*. but the *switching clicks* are covering the complete display of the waterfall indicator from one side to the other. Please make sure your signals are not causing this type of *splatter*.

UTC	kHz	Mode	Call	Sent	Rcvd	Name	QTH
12/09/2000 16:23:12	21100....	BPSK	DK8TX	559	559	paul	Germany
12/09/2000 16:31:49	21100....	BPSK	T9KA	559	559	AKIF	Bosnia
12/09/2000 16:40:40	21100....	BPSK	YO3AWT	559	589	Paul	Romania
12/09/2000 16:47:47	21100....	BPSK	FB1BDX	599	579	Jo	France
12/09/2000 16:50:45	21100....	BPSK	LZ2HA	599	599	Vesko	Bulgaria
12/09/2000 16:55:34	21100....	BPSK	J28NH	559	559	Jean-Louisn	Djibouti
12/09/2000 17:14:16	21100....	BPSK	DH1EOM	559	559	Bernd	Germany
12/09/2000 17:33:22	21100....	BPSK	OZ7AD	599	599	ASBJORN	Denmark
12/09/2000 17:36:01	21100....	BPSK	F8OX	599	589	Ray	France

Edit   Delete   To File   Close

You will notice, just below the log buttons and to the right a bit, there are three buttons we have not talked about. These are your *logger control buttons*. The small *"*"* at the left of these shows you that you have not entered the latest info into the log yet. To do this simply click the *Save button*. The button with the *eyeglasses* on pops up the *logger editing window*, and from here you can *Delete*, *Edit* or *Send* all or some of the log to a file. This file can then be easily printed out or e-mail mailed..
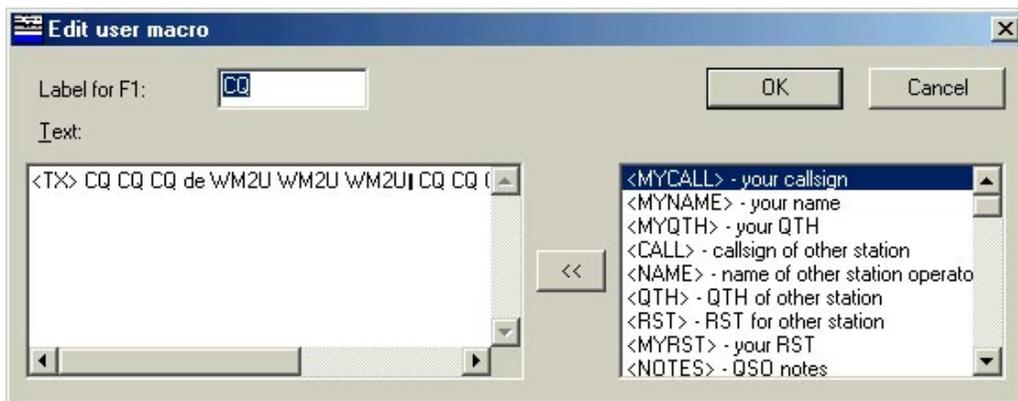
Before I let you go, just a quick word about *Macros*. Writing Macros in Digipan could not have been made any easier. There are *twelve buttons* along the top of the main window. These are the *F(n) macro* buttons and if you click the small button marked with *"^"* you will be presented with twelve *Cntl F(n) macro* buttons. If you right click on any one of them, an *edit window* will open.

First off enter a *label* for your macro button in the small window at the top. The larger window to the left is where you write your macro. Now checkout the window to the right. These are your *metacommands* which you can *embed* into your macro script. Click the curser in the position on your text where you want to embed a metacommand, select the metacommand from the right window and simply click on the *'<<'* button to enter it. Neat eh!

To keep your *transmitted text lookin! good*, don't forget to add a *<CR>* carriage return to the end or beginning of the macros that you will be using to stack or queue. This will allow your *text flow* to be even and pleasing. I think the metacommands are pretty well self explanatory so we will not dwell on this point any longer.

Under *Configure/Waterfall drive*, adjust the appropriate Windows *Recording* Control level controls for a *speckled blue background* on the *Spectrum Window*, which is the window on the bottom of the DigiPan screen with the calibrated scale across the top. If you are using *Windows 95*, to get to the *Recording Control* window, select *Options/Properties/Adjust volume* for recording and press OK. Be sure either *Microphone* or *Line level* controls are checked for display. Press the *T/R* button on the Control Bar, and under *Configure/Transmitter drive*, adjust the *Volume* and *Wave* level controls so that the *ALC* is just sat on *Zero*. Once the ALC reads you could be distorting the output. Press the *T/R button* again to stop transmission and return to Receive mode.

Ok, now for those who want to *work split* or indeed some DX operators will work split especially in an attempt to control a pile up, then checkout the menu item named *Lock* comes in. Click on *LOCK* and you can either switch into Split mode or switch out Split mode. *Lock TX Frequency.* When this is selected, the *TX frequency is fixed* at the position of the active cursor, and the flag above the cursor *changes to red*. When you select a n Rx frequency the little flag will stay at Tx and your curser will follow you to Rx. This allows you to transmit on one frequency and receive on another. *Unlock TX Frequency* When this is selected, transmission will occur on the same frequency as receive, as indicated by the diamond or triangle cursor, and the flag above the cursor will be green.

Setting up the *DigiPan dial scale* to read actual transmitted RF frequency: Under *Configure/Band*, mark the band you wish to be displayed on the dial scale as active, tab to the *Spectrum Start box* and enter the *Spectrum start frequency in kHz*, or kHz and tenths of kHz, and check if you want the dial scale to display the *Tone frequency, USB*, or *LSB*. If you select *USB*, which is the standard, the *Spectrum start frequency to enter* is the low end of the band segment you want to cover and if you select LSB, it is the upper end of the band segment. It is important to note that the Spectrum Start frequency is the "zero beat" frequency, which is the same as the transceiver dial setting, so it is suggested that the Spectrum start frequency, and accordingly the transceiver dial, be set about *0.5 kHz* away from the first desired frequency of operation. As an example, for 20 USB meter operation of PSK31, starting at 14070, enter 14069.5 as the Spectrum start frequency. Set your transceiver dial to 14.069.5 MHz and DigiPan will tune from 14.069.5 MHz to 14.073 MHz for you. Do not touch the transceiver dial after setting it and the DigiPan dial scale will read correctly. Assign the frequency to a memory if you have one.

It is *strongly recommended* that the operation of PSK31 and PSK63 are practiced in *separate bands*. There was a problem when a few of the software packages that made it possible to switch between PSK31 and PSK63 on the fly, caused bad QRM to adjacent QSO's when switched from PSK31 to PSK63. If it is necessary to run switching tests, use the PSK63 section. It is therefore recommended that the following be adopted.

The calling frequencies for **PSK31**, that have been decided upon for the time being are:

1838.15kHz, 3580.15kHz, 7070.15kHz, 7035.15kHz, 14070.15kHz, 21070.15kHz, 28120.15kHz, 50.290mHz, 144.144mHz, 222.07mHz, 432.2mHz, 909mHz and

10137.15kHz, 18100.15kHz and 24925kHz suggested for the WARC Bands.

The calling frequencies for **PSK63**, that have been decided upon for the time being are:

1838.15kHz, 3582.5kHz, 7072.5kHz, 7037.5kHz, 14072.5kHz, 21072.5kHz, 28122.5kHz, 50.290mHz, 144.144mHz, 222.07mHz, 432.2mHz, 909mHz and

10142.5kHz, 18102.5Hz and 24925kHz suggested for the WARC Bands.

Use the *widest IF filter* available. If the IF filter is 3.5 kHz wide, stations between 14.070 and 14.0730 should be workable. If the IF filter is only 2.5 kHz wide, stations between 14.070 and 14.072 will be workable. Even though it may be possible to copy strong stations somewhat outside the filter bandwidth, attempted transmission too far from the *filter passband* will usually result in operation at *greatly reduced power levels*.

If you need to use LSB, check LSB, set the transceiver to 14.073 MHz, and the Spectrum Start frequency to 14073.0 kHz, and DigiPan will tune down 2.5 kHz or the width of the IF filter for you. DigiPan will remember the dial scale settings you enter, so when you change band, it will usually only be necessary to select the active band and the dial scale will read correctly. You can edit the default Band and Spectrum start frequency to any band and any frequency and the DigiPan dial scale will read correctly, as long as the frequency is entered in kHz. *Just remember to always set the Spectrum start frequency and the transceiver dial frequency to the same value* and select the same sideband on each.

OK. A quick comment off Skip about **Microsoft Vista**, in part he says, "........ Vista is a problem with Digipan because configure/transmitter drive and configure/waterfall drive no longer work because Microsoft left out sndvol32.exe" VISTA is not backward compatible with XP, so transmit drive and waterfall drive do not work in DigiPan. You have to set the transmit drive level with the VISTA speaker volume control and the waterfall drive with the microphone or line input gain under VISTA.

A comment about CAT control: If you are trying to achieve PTT with DigiPan and CAT, be aware that DigiPan does not support PTT by CAT command.

Thats it! Nothing to it eh! So click on a few traces on the waterfall indicator and see if anyone is sending out a *CQ*. If so click on the *call sign* and it will *automatically enter* into the *call sign window* of the logging bar. If you arrange a Macro to say *<TX> <CALL> de <MYCALL><RX>* and click on it your Rig will fire up and the station will see you calling him. While he is transmitting you can type your response in the TX window, stack Macros on the end of your text and even embed metacommands ready for transmitting in your turn. Oh! if you click on *text*, it will automatically be entered in the *Name* field and if you hold the *shift key* and click on *text* it will be entered in the *QTH* field.

Uhmm! by the way! In the *modes menu* you will find that there is a setting to allow the Rx of *Pactor* stations. Great thing this. :) You will, at sometime, be stomped on by a Pactor station either on purpose or maybe one of those infernal robots. Simply switch to *Pactor mode*, get the *date, time, mode,* and *frequency* of the occurrence plus any other relevant details and email them to the FCC. They are very interested in stopping this illegal Pactor interference.

OK. A quick comment off Skip about Microsoft Vista, in part he says, "........ Vista is a problem with Digipan because configure/transmitter drive and configure/waterfall drive no longer work because Microsoft left out sndvol32.exe" :-((

Well that should get ya! going and on the air fast. Hope to see your trace in the waterfall soon eh! *Enjoy, Ernie WM2U*