DIGITAL HAPPENINGS #22

(May 2014)

By W0NAC ("Matt")

As you probably already know, for some time now I have been recommending Fldigi software. It is gratifying to note that Dave Freese, W1HKJ (who develops and distributes the Fast Light Digital Modem Application) was recently awarded the Technical Excellence Award at the 2014 Dayton Hamvention. The award goes on to state that "FLDIGI is an easy to use, free of charge, and open source computer program intended for Amateur Radio Digital Modes operation using a Personal Computer." I, for one, believe that Dave well deserves this recognition for developing such a great piece of software! If you don't currently have Fldigi in your "bag of tricks", you can download the latest version (3.21.82) at this link: http://www.w1hkj.com/download.html . There are many different programs available on this site (shown below), but I have circled (in red) the main ones you will need to get started in Fldigi using Microsoft Windows:

Download page: updated 1 May 2014

	Linux Binary	Windows Setup	OS X dmg	Puppy Pet (1)	Source	Help	Release Info
Fldigi / Flarq:	fldigi-3.21.82.bin	fldigi-3.21.82 setup	fldigi-3.21.82 dmg	fldigi-3.21	fldigi-3.21.82	Fldigi-Help	Maint'
	README			flarq-4.3		Flarq-Help	
						Fldigi-Help (pdf file)	
				pet libs	required for all fl___ applications		
		SHA256 checksums for various windows installers					
RigCat Xmls	xml archives						
Flamp:	flamp-2.1.02.bin	flamp-2.1.02 setup	flamp-2.1.02.dmg	flamp	flamp-2.1.02	Flamp-Help(html)	
						Flamp-Help - adobe reader	
Flwrap:	flwrap-1.3.4.bin	flwrap-1.3.4 setup	flwrap-1.3.4 dmg	flwrap	flwrap-1.3.4	Flwrap-Help	Maint'
Flmsg:	flmsg-2.0.3.bin	flmsg-2.0.3 setup	flmsg-2.0.3 dmg	flmsg	flmsg-2.0.3	Flmsg-Help	Maint'
						Flmsg-Help-PDF	
Flwkey:	flwkey-1.1.6.bin	flwkey-1.1.6 setup	flwkey-1.1.6 dmg	flwkey	flwkey-1.1.6	Flwkey-Help	Maint'
Flrig: Supported rigs	flrig-1.3.15.bin	flrig-1.3.15 setup	flrig-1.3.15 dmg	flrig-1.3.15	flrig-1.3.15	flrig-help	Maint'
Fllog:	fllog-1.1.8.bin	fllog-1.1.8 setup	fllog-1.1.8 dmg	fllog-1.1.8	fllog-1.1.8	fllog-help	Maint'
Flnet	flnet-7.0.1 bin	flnet-7.0.1 setup	flnet-7.0.1 dmg		flnet-7.0.1	net help	
Kcat	kcat-1.1.02 bin	kcat-1.1.02 setup	kcat 1.1.02 dmg		kcat-1.1.02	kcat help	

Sharon and I were planning a trip through Alaska on the way to the National Convention in July. We are sorry to report that we had to cancel the Alaska part of the trip. We are calling this our "TOO" trip because it was "TOO" far (9300 miles), "TOO" long (33 days), "TOO" expensive (Over $4,000), and we both now have "TOO" many physical limitations. We will still be putting out a lot of digital counties on both the way to and our return from the National so watch for us on your waterfall. Exact plans will be given a bit later on both K3IMC's site and by email to digital folks.

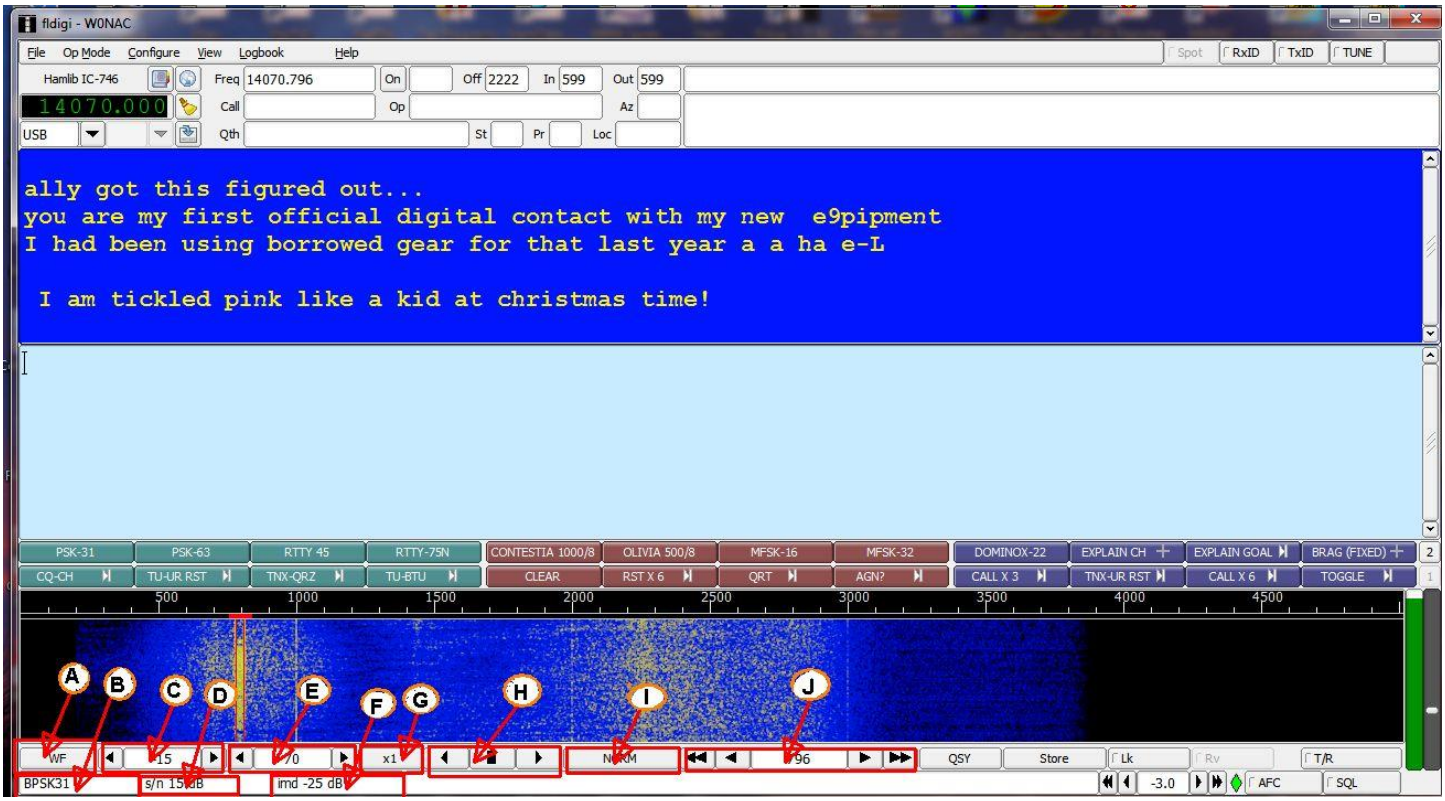
Now, on to the main topic for this month.

Less Well Known Features of Fldigi

Before I begin, let me repeat that the beauty of the Fldigi program is that you can successfully use it with mostly default settings and never need to understand or use all the features of what is a very complex piece of software. But, for the more adventuresome people out there, the rich feature set of Fldigi will allow you to extract even higher performance from the software.

In this article I only have time and space to cover 10 of these features (from now on these will be called “buttons”). These 10 buttons only “scratch the surface”. I may be able to cover more in later articles, but I don’t want to deprive you of the pleasure of delving into the Fldigi Manual (LOL)!

You can find the location of Buttons (A – J) on the full Fldigi screen shown below:

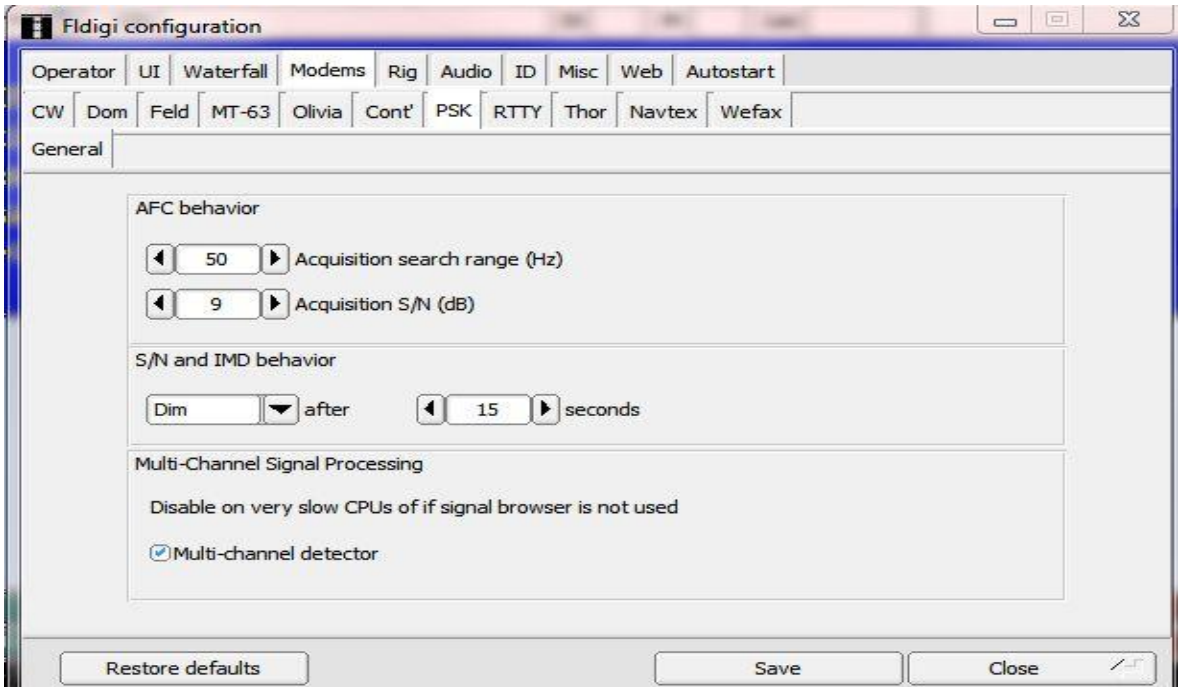


I will now discuss each button individually.

Button A – This button displays your current signal display mode and also allows you to “toggle” between three modes (Water Fall, Fast Fourier Transform [FFT], and Scope) by left mouse clicks. The default is the WF or Waterfall display.

Button B – This button displays your current operating mode & sub-mode, but has two other very useful functions. A left click on this button produces a pull-down list of sub-modes for BPSK which you can left click to immediately change to a different sub-mode.

A right click will take you directly into the detail Fldigi configuration screen for the mode you are using. For example, in the sample screen above, a right click on this button will immediately display the Fldigi configuration/Modems/PSK/General settings menu below:



Since this configuration selection automatically defaults to the correct menu screen for the mode you are currently using, this can save you a lot of time trying to “drill down” several layers in a rather complex Fldigi menu system. Pretty neat!

If operating in the CW mode, this button also displays the speed (WPM) of the received CW signal which is automatically calculated by the CW decoder.

Button C – This button is used to both display the current waterfall/spectrum display Upper Signal Level (dB) and to raise or lower this setting. Each left click on the arrow at the right end of the button will raise the level by 1 dB. Each left click on the arrow at the left end of the button will lower the level by 1 dB. That is all fine, but the question arises: “What is optimum setting for this control?” Since this control interacts with Button E, I will defer trying to answer this question until Button E is discussed later, but for now the default value of -10 dB works fine in most cases.

Button D – This Button has several different functions that change with the operating mode. For example, when using any PSK mode this button displays the signal to noise ratio (s/n) for the signal on which you are tuned. Actually, the PSK decoder estimates both the s/n and the intermodulation distortion (IMD), but displays only the s/n value on this button and the IMD on Button F.

For any RTTY mode this button displays the baud rate/frequency shift associated with the sub-mode. For example, when operating RTTY-45, this button will display “45.45/170”. If you are operating RTTY-75N, this button will display “75/170”. For most other digital modes (Contestia, Olivia, MFSK, and Dominox) this button will display either s/n or be blank. If you are operating in the CW mode, this button displays transmit speed (WPM) with arrows at both ends that can be used to adjust speed.

This button (and Button F) will automatically clear or dim after the number of seconds set in the Fldigi configuration / Modems / PSK / General settings menu shown above. Setting this time to 0 (zero) disables the clear/dim action.

Button E – This button displays the current setting for the total range over which signals will be displayed on the waterfall/spectrum display. This range is relative to the upper signal level controlled by Button C above. For example if you select -10 dB for Button C and 40 dB for Button E, the waterfall will display signals falling between -10 dB and -50 dB.

The only suggestion I can give to you on where these two controls should be set, is to start with the default values of -10/40 and experiment. Personally, I usually use settings of -10/70. For you to find your own optimum settings, just set your transceiver dial to 14.070 MHz and watch how PSK signals and noise change on the waterfall as you set different values. For example, if you set the upper level too low (high negative number), noise will increase because the floor value (range) moves down at the same time into the noise. If you set the range to a value that is too small, the minimum signal level ends up too high and weak signals disappear. It takes fairly large changes in the values for both of these controls to cause a significant difference in how signals are displayed, so don't be afraid of making bold changes. You can always return to earlier settings that worked better.

Button F – If you are operating in a PSK mode, this button displays the Intermodulation Distortion (IMD) value for the PSK signal you are tuned to. If not tuned to any signal the IMD number (if displayed) is meaningless. Also, the PSK decoder can only calculate an accurate IMD when the PSK signal being received is fairly strong and is in idle, i.e. not sending any characters. However, in my experience, IMD reports are still reasonably accurate even if the other station is sending information (not in idle) as long as their signal is fairly strong. Just keep in mind that all IMD values are an estimate only and that the PSK decoder is NOT a laboratory grade instrument. If someone wants a more accurate report on the quality of their signal, there are better ways of doing this, but they are too lengthy to explain here.

This button also changes function with operating mode. For RTTY it displays s/n. For most other digital modes it remains blank.

Button G – This button displays and controls your current waterfall scale. You can "toggle" the waterfall scale from X1 (Normal scale) to X2, to X4, and back to X1 with successive mouse clicks on this button. The X2 and X4 scales can be useful when using modes that require extremely accurate tuning to get solid decoding (like MFSK-32).

Button H – This button is basically a waterfall shift control. The 2 arrows at either end, when clicked, will shift the entire waterfall (including scale and any signals) up or down by 100 Hz for each mouse click when in X2 or X4 scale factor. If you are operating in the default scale factor of X1, these arrows appear to be disabled.

The function of the middle button is to “center the signal”. When you are tuned to a signal that is close to either end of your waterfall, you can automatically move the entire waterfall so that your signal is centered by clicking on the square in the center of this button. After the move, the signal will still show with the same offset frequency it had before. Things may appear more symmetrical to your eye, but nothing else is really changed. I haven’t found this function to be very useful, but maybe you can. If you find a good use for this function that is not purely cosmetic, please let me know. Also, like the shift arrows, this function only seems to work when using the X2 and X4 scale factors.

Button I – This button is used to control the speed of your waterfall drop. This is a “rotary” type button which cycles through the options in circular fashion with each mouse click. The speeds available are SLOW, NORM, FAST, and PAUSE. Since the load on your computer’s CPU is proportional to the speed selected, you may need to select SLOW or PAUSE if you have a slow CPU. In actual use I have yet to find a computer with a slow enough CPU to require any speed slower than NORM, but if you experience problems, you might try a slower speed setting to see if it helps.

Button J – This button both displays the offset frequency of any signal you are tuned to and allows you to make fine tuning corrections for those modes that require extremely accurate tuning (i.e. MFSK-16 and MFSK-32) before they will decode properly. The center part of this button simply displays (to 1 Hz accuracy) the offset frequency of your tuning bar. If you are accurately tuned to a signal, this would also correspond to the offset frequency of the signal. Most people (me included) tune on a signal by moving the tuning bar with their mouse to center it on the signal trace as best you can before clicking with the mouse to lock it in place. Then we let the AFC function complete the final tuning. This is all well and good unless you are trying to tune very weak signals or signals transmitting with modes that don’t support AFC or those few modes that are super critical on tuning before they will decode reliably. I wish I could give you a complete list of modes, etc. that are difficult to tune, but at this point I am aware of only MFSK-16 and MFSK-32 in common use by county hunters.

Trying to tune to either type MFSK signal (especially if they are weak to begin with) can be very difficult when using the mouse. Here is when the fine tuning functions of this button can be very helpful. There is a single arrow and a double arrow at each end of this button. You can mouse click on either single arrow to move the offset frequency up or down by 1 Hz per click. The double arrows will move the offset frequency up or down by 10 Hz per click. If you are using a true mouse, it is pretty easy to use these functions. However, if you are using a laptop in your vehicle and all you have is a touch pad, using all functions is slower and a bit more difficult. Also, don’t leave the AFC function ON when trying this tuning technique as you will end up fighting each other. Please give this tuning method a try. After using it a few times, I’m sure you will like it.

Once more, I encourage you to dig into the Fldigi Manual (pdf version). This manual was last updated for Version 3.21.75 (Latest version is 3.21.82) and contains some incorrect information, but it is still well worth the effort! As we used to say in the military, “RTFM !!”

The updated Table 3 is given below:

Table 3 - Active Digital County Hunters Award Status

#	CALL	NAME	STATUS* (M,F,I)	USA - DIGITAL COUNTIES (of 3077)	(1 MODE)	(2 MODES)	FIVE MODE COUNTIES (3 MODES)	(4 MODES)	(5 MODES)	TOTAL	% 5-Mode Completed	LAST UPDATED
1	AA8R	Randy	F	1344	3077	3077	1461	576	203	8394	54.6%	5/24/2014
2	AC0B	Cliff	F	205	-	-	-	-	-	0	0.0%	12/10/2012
3	AD1C	Jim	F	-	-	-	-	-	-	0	0.0%	
4	K0DEQ	Bill	F	-	-	-	-	-	-	0	0.0%	
5	K0FG	Fred	F	188	3077	3013	187	20	6	6303	41.0%	4/14/2014
6	K0PVW	Rob	F	-	-	-	-	-	-	0	0.0%	
7	K0WJ	Lou	F	-	-	-	-	-	-	0	0.0%	
8	K4PBX	Jim	F	229	2948	214	72	50	15	3299	21.4%	5/23/2014
9	K5GE	Gene	F	26	1893	575	8	0	0	2476	16.1%	5/26/2013
10	K5SF	Dick	F	-	-	-	-	-	-	0	0.0%	
11	K5WAF	Bill	F	599	3044	?	?	?	?	3044	19.8%	5/2/2013
12	K7REL	Tom	F	-	-	-	-	-	-	0	0.0%	
13	K8QWY	Ed	F	-	-	-	-	-	-	0	0.0%	
14	K8ZZ	Ed	F	-	-	-	-	-	-	0	0.0%	
15	KA4RRU	Mike	M/F	975	3077	2939	944	49	1	7010	45.6%	1/10/2014
16	KA8JQP	Pamela	M/F	22	202	64	53	28	4	351	2.3%	9/12/2013
17	KC3X	Hollis	F	-	-	-	-	-	-	0	0.0%	
18	KC6AWX	Bob	F	450	3077	1592	264	59	14	5006	32.5%	5/7/2013
19	KC7YE	Jack	F	-	-	-	-	-	-	0	0.0%	
20	KD5YUK	Billy	F	-	-	-	-	-	-	0	0.0%	
21	KD7KST	Bill	M/F	1792	-	-	-	-	-	0	0.0%	9/30/2012
22	KF7PKL	Davis	F	379	879	211	48	15	1	1154	7.5%	10/9/2013
23	KG5RJ	Greg	F	706	3050	2125	646	268	105	6194	40.3%	5/22/2014
24	KM1C	Bill	F	-	-	-	-	-	-	0	0.0%	
25	KU4YM	Dave	F	86	2841	83	40	8	2	2974	19.3%	4/23/2014
26	KM6HB	Mark	F	714	3077	2936	694	87	1	6795	44.2%	2/3/2013
27	KW1DX	Dave	M/F	68	3077	991	65	50	24	4207	27.3%	4/26/2014
28	N0KV	Barry	M/F	502	3077	3031	2351	360	71	8890	57.8%	4/29/2014
29	N0LXJ	Sharon	M/F	1373	3077	2274	1232	506	257	7346	47.7%	5/29/2014
30	N1API	Al	F	751	3077	2358	691	465	323	6914	44.9%	5/25/2014
31	N4JT	Jim	M/F	911	3077	3067	919	417	296	7776	50.5%	5/18/2014
32	N5MLP	Ron	M/F	391	3077	409	54	37	9	3586	23.3%	5/19/2013
33	N6PDB	Dennis	M/F	942	3077	2936	1161	842	674	8690	56.5%	5/27/2014
34	N8CIJ	Dick	F	782	3077	3034	775	400	297	7583	49.3%	5/25/2014
35	N8HAM	Jim	F	0	3077	0	0	0	0	3077	20.0%	4/2/2013
36	N9WNN	Steve	F	0	2180	0	0	0	0	2180	14.2%	2/24/2013
37	NA8W	Darl	F/M	579	3022	852	381	212	99	4566	29.7%	9/12/2013
38	NF0N	Mike	F	900	3077	3077	1091	283	127	7655	49.8%	4/18/2014
39	NN9K	Pete	F	816	3077	859	78	1	0	4015	26.1%	3/23/2012
40	NT2A	Gene	F	-	-	-	-	-	-	0	0.0%	
41	NU4C	Paul	F	-	-	-	-	-	-	0	0.0%	
42	NW6S	Jim	F	784	3077	3077	805	114	79	7152	46.5%	5/6/2014
43	NX4W	Lloyd	M/F	1185	3077	1327	493	338	103	5338	34.7%	4/26/2014
44	W0NAC	Matt	M/F	1843	3077	2849	2019	1142	490	9577	62.2%	5/29/2014
45	W3DLM	Don	F	359	3077	2390	298	101	55	5921	38.5%	10/12/2013
46	W3ZUH	Dick	F	5	3077	2048	11	2	0	5138	33.4%	12/4/2013
47	W4IHI	Gary	F	-	-	-	-	-	-	0	0.0%	
48	W4SIG	Kerry	F	-	-	-	-	-	-	0	0.0%	
49	W4YDY	Dave	F	1000	3077	3077	1149	495	300	8098	52.6%	4/22/2014
50	W5QP	Rick	M/F	339	3077	2721	366	205	167	6536	42.5%	5/20/2014
51	W6RK	Risto	F	-	-	-	-	-		0	0.0%	
52	W6RLL	Joe	F	-	-	-	-	-	-	0	0.0%	
53	W7FEN	Larry	F	25	3077	2975	32	1	0	6085	39.6%	10/3/2013
54	W7IN	Larry	F	-	-	-	-	-	-	0	0.0%	
55	W7QQ	Bill	M/F	-	-	-	-	-	-	0	0.0%	
56	W9JR	Rich	F	90	3077	1674	44	0	0	4795	31.2%	10/31/2012
57	W9SUQ	Larry	F	-	-	-	-	-	-	0	0.0%	
58	WA4EEZ	Leslie	F	1086	3077	1742	699	234	31	5783	37.6%	1/6/2014
59	WA4UNS	Doug	F	-	-	-	-	-	-	0	0.0%	
60	WA6OCV	Susan	M/F	328	3077	328	320	130	10	3865	25.1%	3/28/2013
61	WA7ETH	Ed	F	194	1924	405	35	3	0	2367	15.4%	5/27/2014
62	WA7JHQ	Sterling	F	-	-	-	-	-	-	0	0.0%	
63	WB0M	Jeff	F	-	-	-	-	-	-	0	0.0%	
64	WB2ABD	Paul	F	-	-	-	-	-	-	0	0.0%	
65	WD4OIN	Jack	F	1074	3077	3070	1084	507	254	7992	51.9%	5/18/2014
66	WQ7A	Terry	F	201	3077	3028	206	132	112	6555	42.6%	8/24/2013
67	WY4D	Ben	F	281	3077	303	36	15	9	3440	22.4%	2/11/2014

How To Get Your 5 – Mode Statistics Updated:

Several past Digital Happenings articles have given detailed instructions on a new and easy way to update your digital statistics for Table 3 by using a small program called “Digital Report Utility”. This new program will create a report for you showing your progress for both the **USA – Digital** and the **5 – Mode Awards** and email it to W0NAC. Instead of repeating these instructions every month I have included them in a Microsoft Word document that you can download by clicking on the following link: https://dl.dropboxusercontent.com/u/26171574/Happenings/5%20Mode%20Update.doc

Other possible topics for future months include (in no particular order):

“More Lesser Well Known Features of Fldigi”
“How to Log Your Digital Contacts in Logger”
“Macros – Revisited”
“New Digital Awards?”
“Digital Software Installation – Revisited”
“Award Difficulty Index”

If anyone has a story or tip that you wish to contribute, I will certainly try to include it. Short stories describing your experiences/joys/frustrations/etc. in getting started in digital ops would be especially welcome. Summaries of any digital trips you make (or have made in the past) would also be good. I look forward to hearing from you. Don’t be shy!

Please email me with your comments/suggestions at w0nac@comcast.net and don’t forget to send your updated status for the **USA – Digital** and **5 - Mode Awards** so I can update the Active Digital County Hunters Award Status list again next month.

73’s and we hope to see you at the digital meeting in Visalia, CA in July. If not, on our waterfall again real soon!

Matt – W0NAC