

Using digital modes on 6 and 4 meter bands

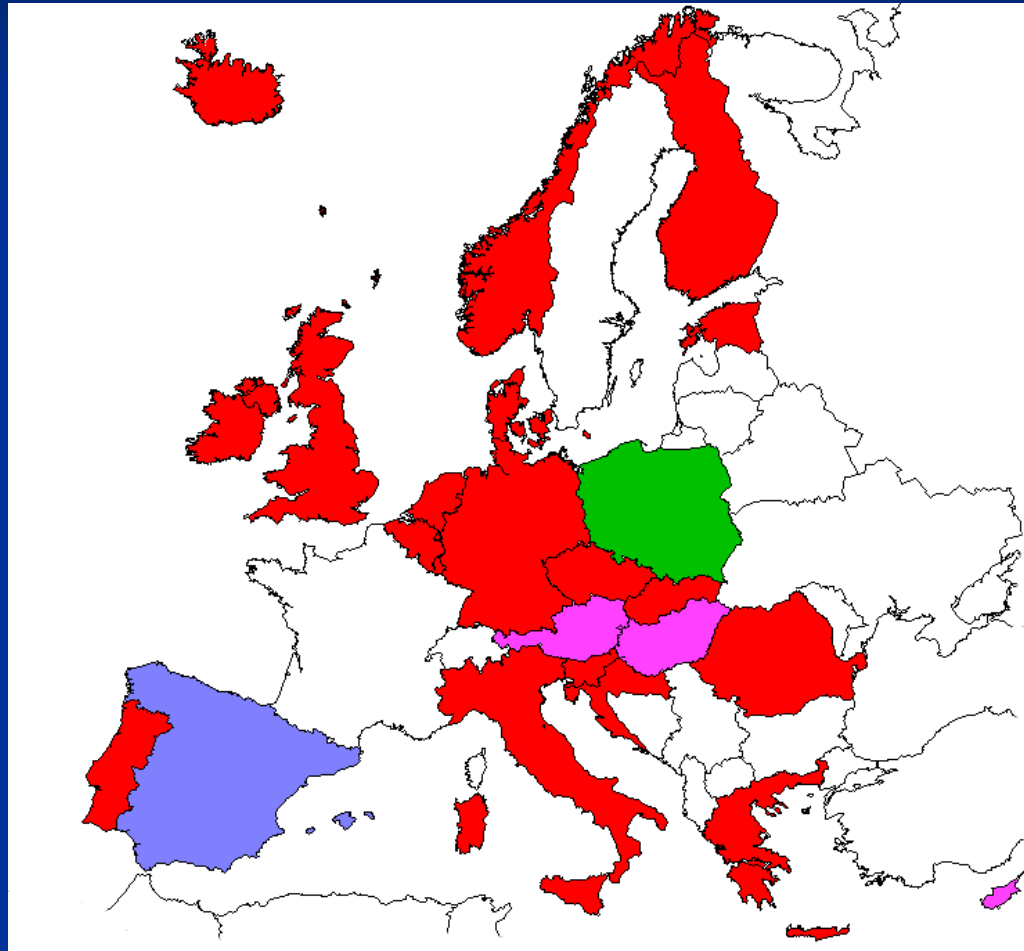
Gennadi Klevtsov, ES3RF

ERAÜ XIV TALVEPÄEV 2012

What it could be useful for?

- To work on 6 and 4 during the “dead season”;
- To get rare squares, which are hard to get via usual (Tropo, Aurora, E-spor) propagation;
- To get bigger score in the VHF-contests;
- Simply make life on VHF bands more interesting!

70 MHz Europe Countries



What QRG is for digital operation on 6 meters ?

(IARU R1, 1st Jan 2012)

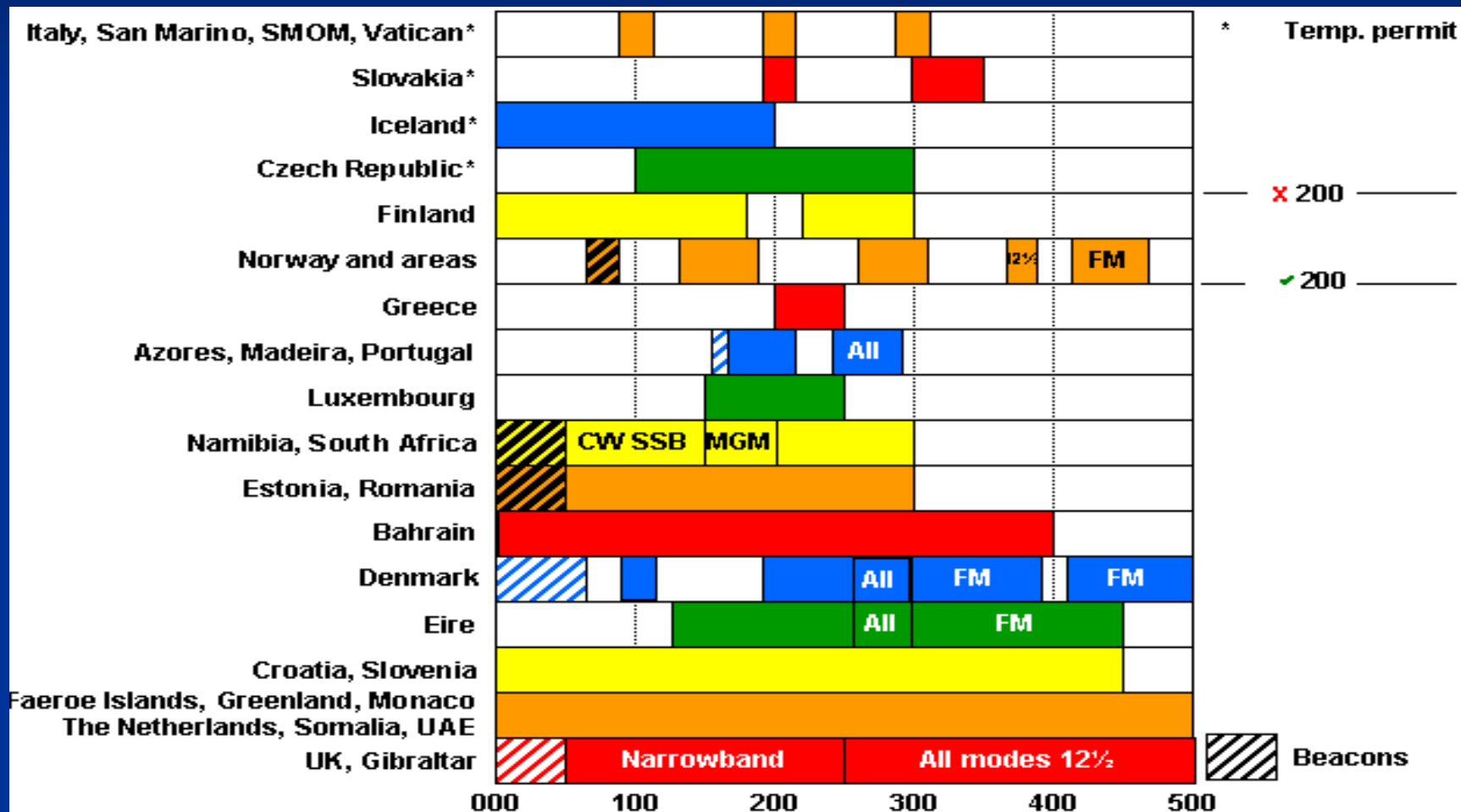
Frequency	Bandwidth	Mode	Usage
50.100	2700 Hz	SSB, Telegr.	50.100-.130 50.110 50.130-.200 Intern. section
50.200	2700 Hz	SSB, Telegr.	50.150 Int. activ. centre General usage
50.300			50.285 for crosband
50.300	2700 Hz	MGM, Narrow-band Telegraphy	50.305 PSK activ. centre 50.310-320 EME ativ. centre 50.320-380 MS activ. Centre
50.400			

What QRG is for digital operation on 4 meters?

(IARU R1, 1st Jan 2012)

Frequency	Bandwidth	Mode	Usage
70.100	2700 Hz	Telegraphy	70.185 Crossband
70.250		SSB	70.200 CW/SSB call
70.250		MGM	70.250 MS calling
70.250	12 KHz	AM/FM	70.260 AM/FM call
70.294			70.270 MGM centre of activity

International 70 Mhz Allocation



Digital modes

■ 6 METER BAND

CQ QRG for DIGI MODES:

50.230 MHz

Useful range +/- 20 KHz.

Most useful modes:

JT6M, FSK441.

More rare: ISCAT, JTMS,
JT65A

■ 4 METER BAND

Most often used QRG:

70.250 MHz

Useful range +/- 40 KHz.

Most useful modes:

FSK441, JT6M

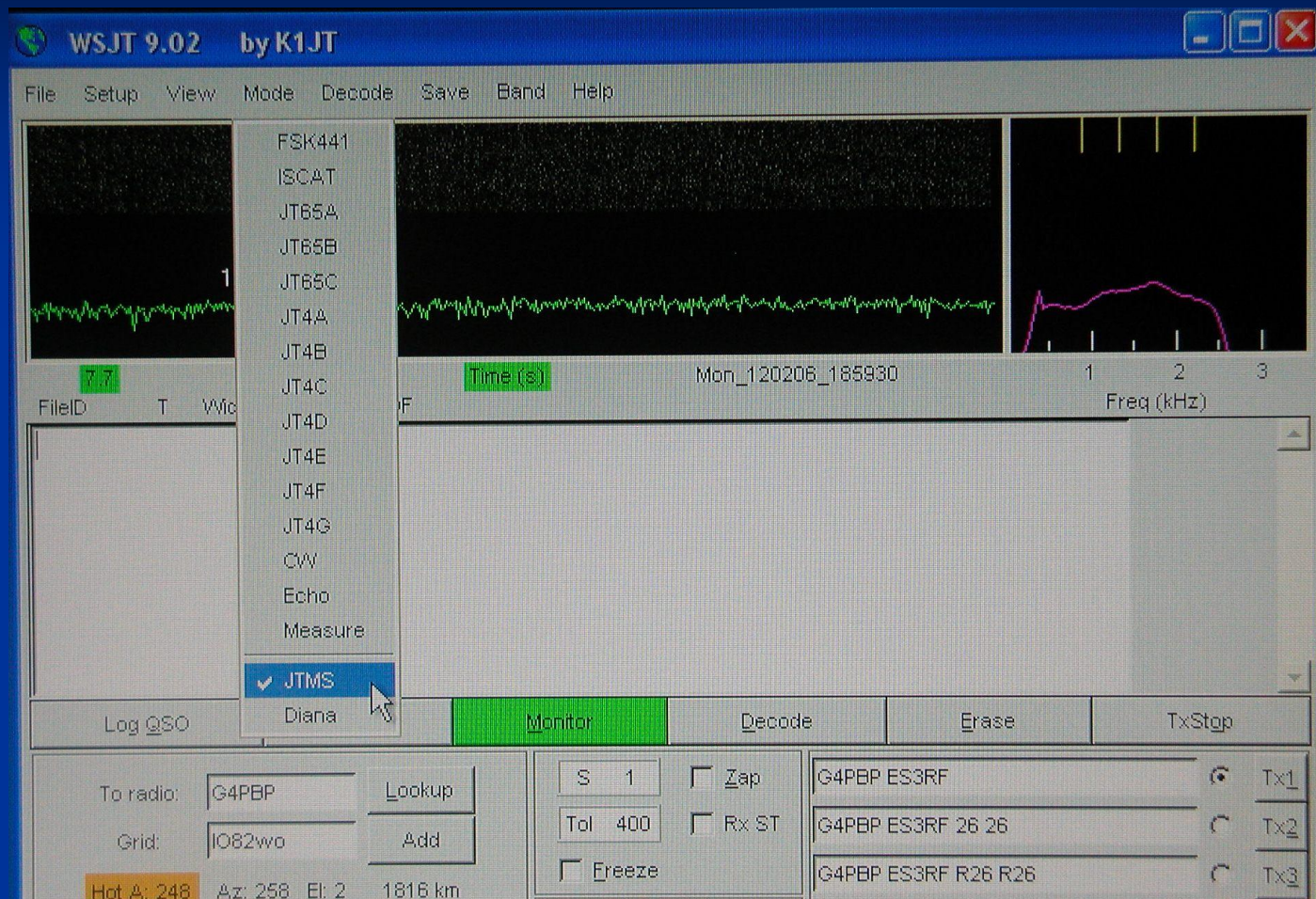
Software for digital modes on VHF

1. **WSJT** by Joe Tailor, **K1JT**.
<http://physics.princeton.edu/pulsar/K1JT/wsjt.html>
2. **PSK2K** – a new meteorscatter mode by **DJ5HG**
<http://www.dk5ew.de/2012/01/13/psk2k-a-new-meteorscatter-mode-by-dj5hg/>
3. **JT65-HF** by Joe Large, **W6CQZ**
<http://sourceforge.net/projects/jt65-hf/files/>

WSJT

- Version 7.03 r1090 for FSK441 and JT6M;
- Version 9.02 r2226 for FSK441, ISCAT, JTMS

New modes in WSJT9



Make file “experimental” without extension and put into WSJT9- directory to get JTMS

FSK441 mode MS QSO on 4m

WSJT 7 by K1JT

File Setup View Mode Decode Save Band Help

12:43:30

21.2 Time (s) ON5VW_120205_124330

FileID	T	Width	dB	Rpt	DF	
123130	19.2	300	3	26	30	RF ON5VW ES3RF ON5VW ES3RF ON5VW ES3RF,0
123429	14.4	160	1	26	7	VW3EP MS LN5VW W ?? ON6
123429	14.0	40	1	16	11	S3RF ON
123429	14.4	160	1	26	11	3RB VW3EP MS LN5VW W ?
123630	16.9	380	2	26	22	F ON5VW R26 R26 ES3RF ON5VW R26 R26 ES3R
124330	1.6	1020	3	36	19	ON5VW 73 73 ON5VW 73 73 ON5VW 73 73 ON5
124330	3.1	980	2	26	18	N5VW 73 73 ON5VW 73 73 ON5VW 73 73 ON5VW
124330	17.7	100	2	16	22	N5VW 73 73 ON5VW#

Log QSO Stop Monitor Save Decode Erase Clear Avg Include Exclude TxStop

To radio: ON5VW Lookup
Grid: JO10VV Add
Hot A: 234 Az: 244 Et: 3 1615 km

2012 Feb 05
12:44:07

S 2 Zap
Clip 0 NB
Tol 400 Freeze
Defaults AFC
Dsec 0.0 Shift 0.0

Tx First ON5VW ES3RF Tx1
26 Rpt ON5VW ES3RF 26 26 Tx2
 Sh Msg ON5VW ES3RF R26 R26 Tx3
TxDF = 0 3RF RRR Tx4
GenStdMsgs RF 73 73 73 Tx5
Auto is ON CQ ES3RF KO29 Tx6

1.0005 1.0002 FSK441 Freeze DF: 0 Rx noise: 0 dB TR Period: 30 s Txing: 3RF RRR

SpecJT by K1JT

Options Time: 16.9 s Freq: 2304 Hz 3W Speed: 1 2 3 4 5 H1 H2


5 10 15 20 25 30

12:44:00

12:43:30

12:44:07

0 dB



JT6M mode QSO on 6 m band

WSJT 7 by K1JT

File Setup View Mode Decode Save Band Help

20:03:00

0.0 Time (s) LA4LN_120209_200300

FileID	T	Width	dB	DF	
200300	8.5	2.0	7	-59	3RF LA4LN ES3RF LA4LN ES3#S
200300	10.5	0.3	-10	-59	,HN
200300	28.7	1.3	4	-59	LA4LN ES3RF LA4LN
200300			-9	-59	LA4LN ES3RF * 12

Log QSO Stop Monitor Save Decode Erase Clear Avg Include Exclude TxStop

To radio: LA4LN Lookup
Grid: jp50ja Add
Hot A: 268 Az: 282 El: 9 788 km

2012 Feb 09
20:03:39

S -10 Zap
Clip 0 NB
Tol 200 Freeze
Defaults AFC
Dsec 0.0 Shift 0.0

Tx First LA4LN ES3RF Tx1
26 Rpt LA4LN ES3RF 26 26 KO29IF Tx2
 Sh Msg LA4LN ES3RF R26 R26 KO29IF Tx3
TxDF = 0 3RF RRR RRR Tx4
GenStdMsgs 3RF 73 73 73 Tx5
Auto is ON CQ ES3RF KO29IF Tx6

1.0001 0.9998 JT6M Freeze DF: 0 Rx noise: 4 dB TR Period: 30 s Txing: LA4LN ES3RF 26 26 KO29IF

SpecJT by K1JT

Options Time: 10.9 s Freq: 2304 Hz 3W < | > Speed: 1 2 3 4 5 H1 H2

20:03:00

20:02:00

20:03:39 3 dB



Typical MS pings

JT6M mode QSO on 6 m

WSJT 7 by K1JT

File Setup View Mode Decode Save Band Help

8.5 Time (s) PA5JS_120209_214930

FileID	T	Width	dB	DF	Text
214930	13.7	3.4	11	-81	6 R26 ES3RF PA5JS R26 R26 ES3RF PA5JS R26 R26 ES
214930	17.1	3.4	10	-81	3RF PA5JS R26 R26 ES3RF PA5WS R26 R26 ES3RF PA5J
214930	20.4	3.4	6	-81	S R26 R26 ES3RF PU5JYVR06 R2L,ES3RF PA5JSKR26JH?
214930	24.3	0.6	-9	-81	PAHMDXCX8
214930	26.1	1.2	-7	-81	W26 RA6/EBADMG48
214930	28.5	0.2	-11	-81	7C
214930	29.1	0.7	-6	-81	6 RFJ Y0E1
214930			-2	-81	R26 * 4

Log QSO Stop Monitor Save Decode Erase Clear Avg Include Exclude TxStop

To radio: PA5JS Lookup
Grid: jo21tq Add
Hot A: 233 Az: 243 El: 4 1462 km

2012 Feb 09 21:50:52

S -11 Zep
Clip 0 NB
Tol 200 Efreeze
Defaults AFC
Dsec 0.0 Shift 0.0

Tx First PA5JS ES3RF Tx1
27 Rpt PA5JS ES3RF 27 27 ko29if Tx2
 Sh Msg PA5JS ES3RF R27 R27 Tx3
TxDF = 0 3RF RRR RRR Tx4
GenStdMsgs 3RF 73 73 73 Tx5
 Auto is ON CQ ES3RF KO29IF Tx6

1.0002 0.9996 JT6M Freeze DF: 0 Rx noise: 0 dB TR Period: 30 s Receiving

SpecJT by K1JT

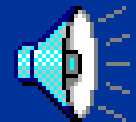
Options Time: 1.1 s Freq: 1550 Hz 3W < | > Speed: 1 2 3 4 5 H1 H2

21:50:30

21:49:30

21:50:52 0 dB

MS+E-sporadic



Split operation on 4 m band



Germany (DL), Belgium (ON): 69.950 MHz +/-

PSK2K is a new mode for MS QSO

PSK2k V4.7 by DJ5HG

File Options help

General Messages

20:29:35 12 -30 4 ES3RF de ON5VM
 20:40:57 54 -24 0 ES3RF de ON5VM 3dB

Messages Addressed to my Callsign

UTC	#	Δf	SNR	address	sender	received information	Received QSO Messages

UTC 06-Feb-2012 20:41:06

volume 0 dB

save **audio** graphic

to call ON5VM

report 3dB

pings 1

QTF 240°

Standard Messages

generate: **normal** contest clear

QST:

CQ de ES3RF QTF=240° period= 30s

QRZ de ES3RF

ON5VM de ES3RF

ON5VM de ES3RF 3dB

ON5VM de ES3RF R3dB

ON5VM de ES3RF RRR

ON5VM de ES3RF TNX 73

ON5VM de ES3RF

Signal Amplitude


time within receive period [s]

Signal Spectrum

frequency [Hz]

manual **QSO** reply CQ STOP TX

RX Only TX 1st TX 2nd TX Only



My summary of using digital modes on 4 m band (Feb, 2012)

QSO		DXCC		Squares	
Total	Digital	Total	Digital	Total	Digital
414	118	31	24	135	78

JT65-HF Screen shot on 14 MHz

JT65-HF Version 1.0.9.3 [RB Enabled, not logged in. QRG = 0 KHz][ES3RF QRV]

Setup Rig Control Raw Decoder Transmit Log About JT65-HF

Audio Input Levels

L 9

R 2

Optimum input level is 0 with only background noise present.

Digital Audio Gain

L: 6

R: 6

2012-Feb-10

11:10:14

Dial QRG KHz

0

Clear Decodes Decode Again 0 DT Offset Restore Defaults

Current Operation: Receiving

Color-map Brightness Contrast Speed Gain

Grey0 4 2 Smooth

RX/TX Progress

Message To TX: F1ABL ES3RF KO29

TX Text (13 Characters) **TX OFF**

TX Generated

F1ABL ES3RF KO29 TX Even TX Odd

Call CQ and answer callers

Answering CQ

TX DF RX DF TX DF = RX DF TX to Call Sign Rpt (-#)

371 371 AFC F1ABL -03

Zero Zero Noise Blank

Single BW Multi BW Enable Multi

100 100 Enable RB Enable PSKR

RB/PSKR Counts 0

Sound In: 01-Realtek AC97 Audio

Sound Out:

UTC	Sync	dB	DT	DF	Exchange
11:09	9	-5	-1.0	929	B MI0GOZ ES1HJ RRR
11:09	3	-22	-0.1	678	K SP3NGI JH1KYA PM95
11:09	17	-4	-0.1	-19	B SP3CUG M0NPQ JO02
11:09	10	-6	-0.4	-256	B LU1XPK RV9WF LO74
11:09	4	-9	-0.0	-519	B IK6Q00 G8LGE IO93

11:08	12	-7	-0.2	912	B ES1HJ MI0GOZ R-07
11:08	4	-8	0.0	261	B VK5PO GM0KWW IO75
11:08	6	-7	0.7	-27	B CQ US5CCO KN59
11:07	10	-4	-1.1	918	B MI0GOZ ES1HJ -26
11:07	4	-17	-1.0	689	K SP3NGI RK6ALL LN04
11:07	4	-17	-1.0	689	K SP3NGI RK6ALL LN04

Double click an entry in list to begin a QSO. Right click copies to clipboard.