



SIDEWALK EME

DOUG MILLAR K6JEY

THE ULTIMATE DX

- Half a million miles
 - 97% loss bouncing off the moon
 - A moving object
 - Technically challenging
 - But it can be done and even simply
 - Here's what it sounds like on 1296MHz
-

A LITTLE HISTORY

- I was first licensed in 1957 as KN6JEY
- I had a first EME QSO in 1990 on 2m with W5UN. Used two 35' yagis and 500watts.
- I wanted to work on other bands and with no more roof space, that started the Sidewalk EME idea.

IMPOSSIBLE?

- No room on a city lot for antennas that are traditionally big enough.
 - Way too noisy in a city environment to hear anything.
-

NEVER LET ASSUMPTIONS GET IN THE WAY

- Use the gear you have and then upgrade as you go along.
- I started collecting gear.
- It really helped to have friends involved like W6SZ and KJ6HZ.

THE FIRST TESTS-
ONLY THE LOUDEST CW
SIGNALS WERE HEARD.
DID NOT TRY JT MODE.
PORTABLE OR FIXED?
I DECIDED ON FIXED.



7 foot dish on 1296MHz. 150w output. Made CW contacts.



2Meter testing. 12el antenna. I heard signals on CW. Preamp was .5db NF



OVERALL DESIGN
GEAR CHOICES AND TESTING

DESIGN CONCEPT- MAKE THINGS SIMPLE

- Everything is marked and labeled
- All the radio gear in the garage
 - antennas are outside.

Cables wrapped and marked with
frequency and loss.

- Everything is measured for loss.
- All key gear has spares.
- Work with friends.

LOSS TESTING SET UP



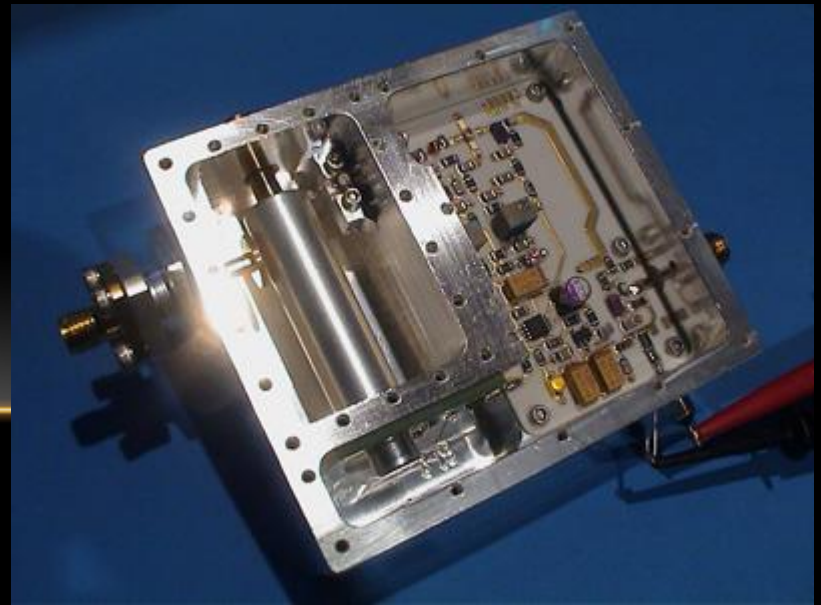
In line amps. No burn out from behind



Get a new or tested preamp and a spare. Shoot for .5db noise Figure on 2m. .3db on 23cm.



23cm HB9BBD preamp below.



1296MHz Preamps. .2db and

.18db noise figure.



Typical Relay. Isolation 90db or more at frequency

Transco 402



SEPTUM FEED RX
RELAY-

ON FOR RX.

LED LETS YOU
KNOW ITS ON.

FEED SEES 50Ω
ON TX.

LOSS.05DB.

TX PORT
ISOLATION -20DB.



SYSTEM NOISE FIGURE

- Do sun noise to ground and cold sky to ground measurements with an SDR receiver.
 - Record the data for reference.
 - When you set up your system, repeat the measurements to verify that it is working.
 - M2 inserts a diode as a noise source in the preamp so that you can verify it is working.
-

1296MHz 150w amp
2C39 /7289tubes



2 Meter Portable EME Station For JT mode

2 watts drive= 300w out

Switching Power Supply

FT817 radio



There are lots of interfaces, including easy to make home built ones. This one goes through the USB port and has a built in sound card. Not too expensive. Microham also makes them.





GS15b Amp

Keyer, sequencer and power supply

DSP and TS790A

Water Temp

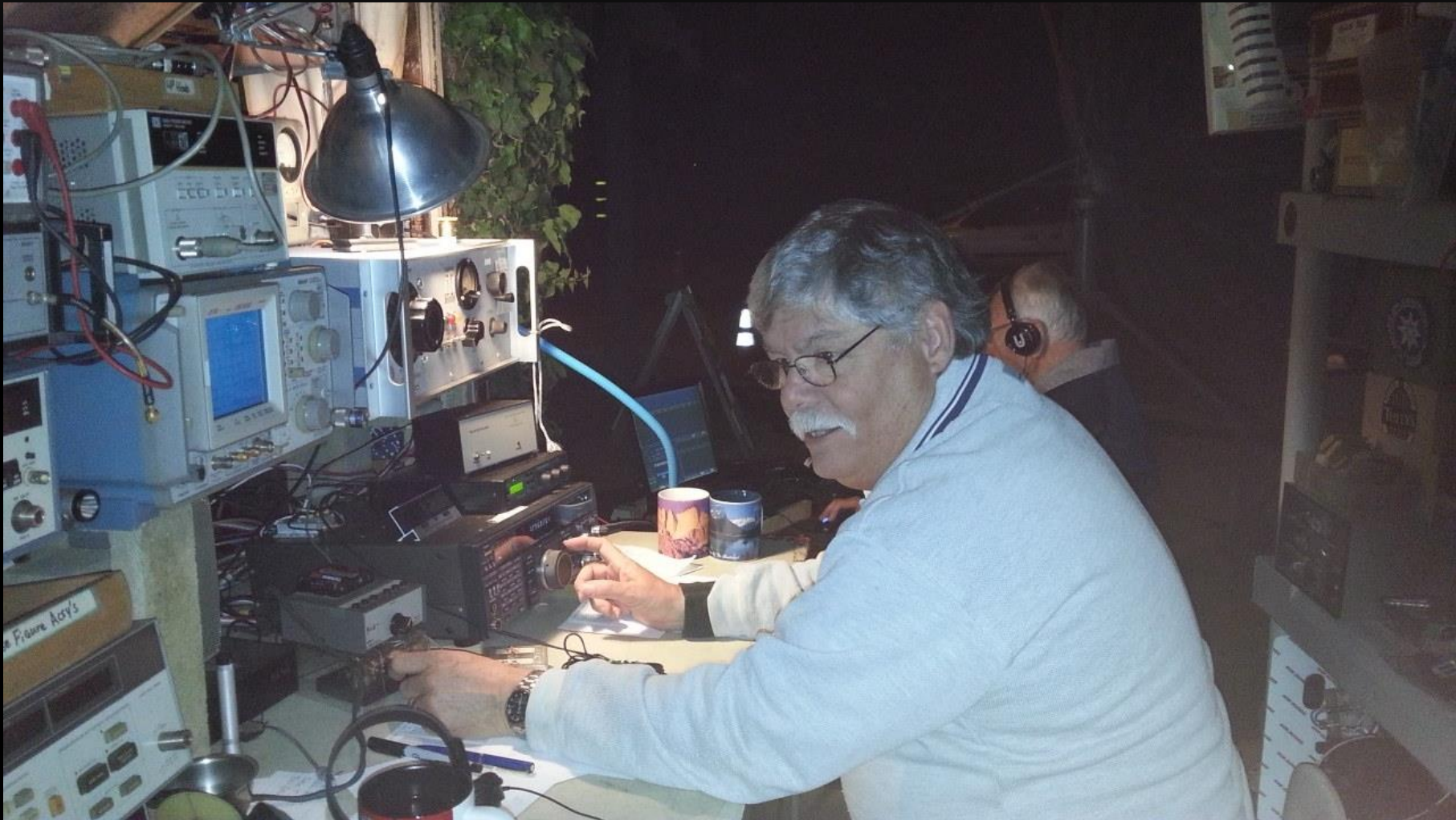


Dish interface

THE RIG AND ME- RIG INSIDE AND 7' DISH OUTSIDE.



1.2GHZ 10' DISH. REIN USING FUNCUBE SDR TO
MONITOR THE BAND.



COPYING ON THE RIG AND MONITORING ON SDR
NOTICE HOW MUCH BIGGER THE 10' DISH SEEMS TO BE.



HELEN AND REIN WORKING JT MODE



A COLD WINTER NIGHT ON 23CM CW. THE SPARE AMP IS ON DUTY



ANTENNAS

7 FOOT DISH AND FEED. SIMPLE TO USE AND SIMPLE TO POINT. NOTE SEPTUM FEED.



10 FOOT DISH. HARDER TO USE BUT
MANY MORE SIGNALS.



Dish Guiding- use an astronomical finder scope and an auto
Use the guider output to trigger motors to keep the moon in t
Problem: visual guiding only.



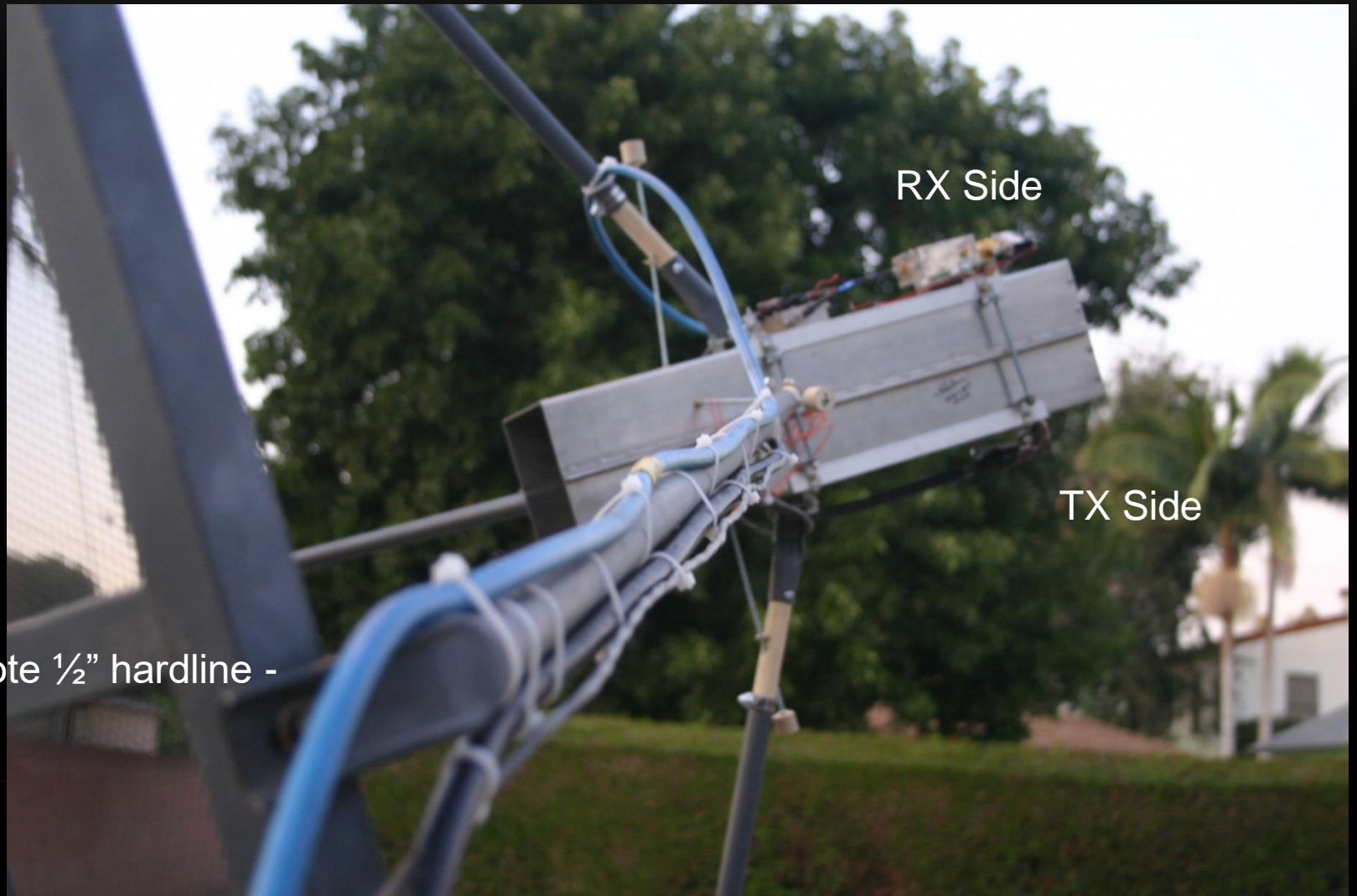
BIRDBATH POSITION-ALL THE BOLTS AND PIECES ARE KEYED TO ONLY FIT A CERTAIN WAY AND COLOR CODED.



REAR LAYOUT-



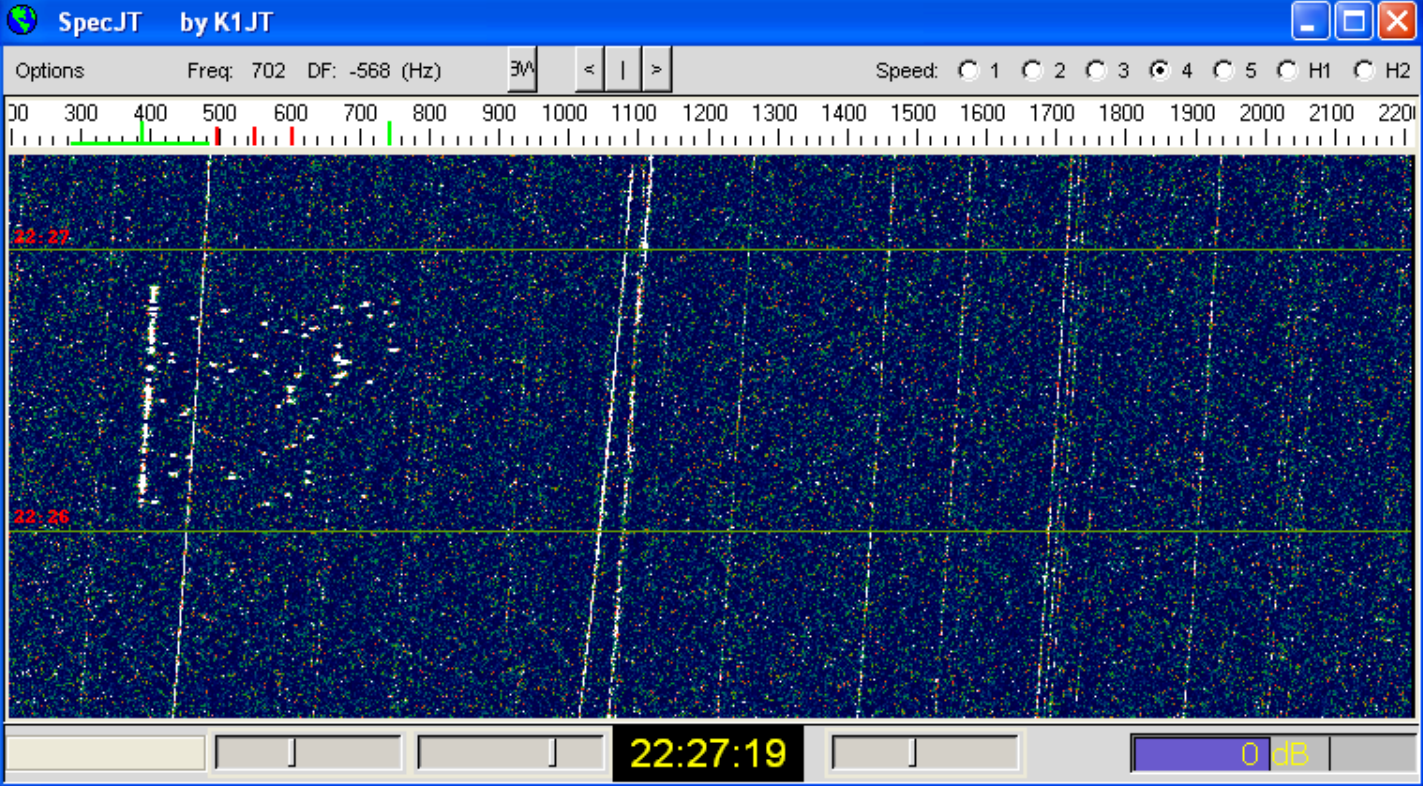
SEPTUM FEED BY KL6M.



Note 1/2" hardline -

JT MODE

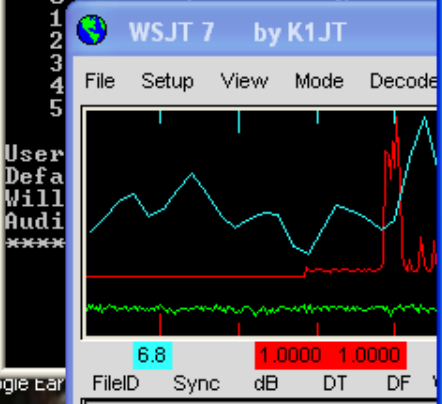
- If you are going to do JT mode, practice on HF and /or get someone who has used it to tutor you. It is quicker and less frustrating.



WSJT7

 WSJT Version 7.03 r1090 by
 Revision date: 2009-03-03 11:
 Run date: Sat Jan 23 22:22:

Rel	Audio Device	Input Channels	Output Channels
0		2	0
1			
2			
3			
4			
5			



FileID	Sync	dB	DT	DF
222300	0	-33	10.0	-869 1
222400	0	-21	2.3	-928 6
222400	0	-19	5.5	-915 3
222400	0	-19	5.5	-915 3
222500	0	-33	0.5	-923 3
222600	1	-17	2.3	-869 20 *

222600 1 1/2 CQ DL7APV J062 1 0
 222600 2 0/2

Log QSO	Stop	Monitor	Save	Decode	Erase	Clear Avg	Include	Exclude	TxStop
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To radio: IS0M0JU Lookup
 Grid: JN40dn Add
 Az: 38 6286 mi

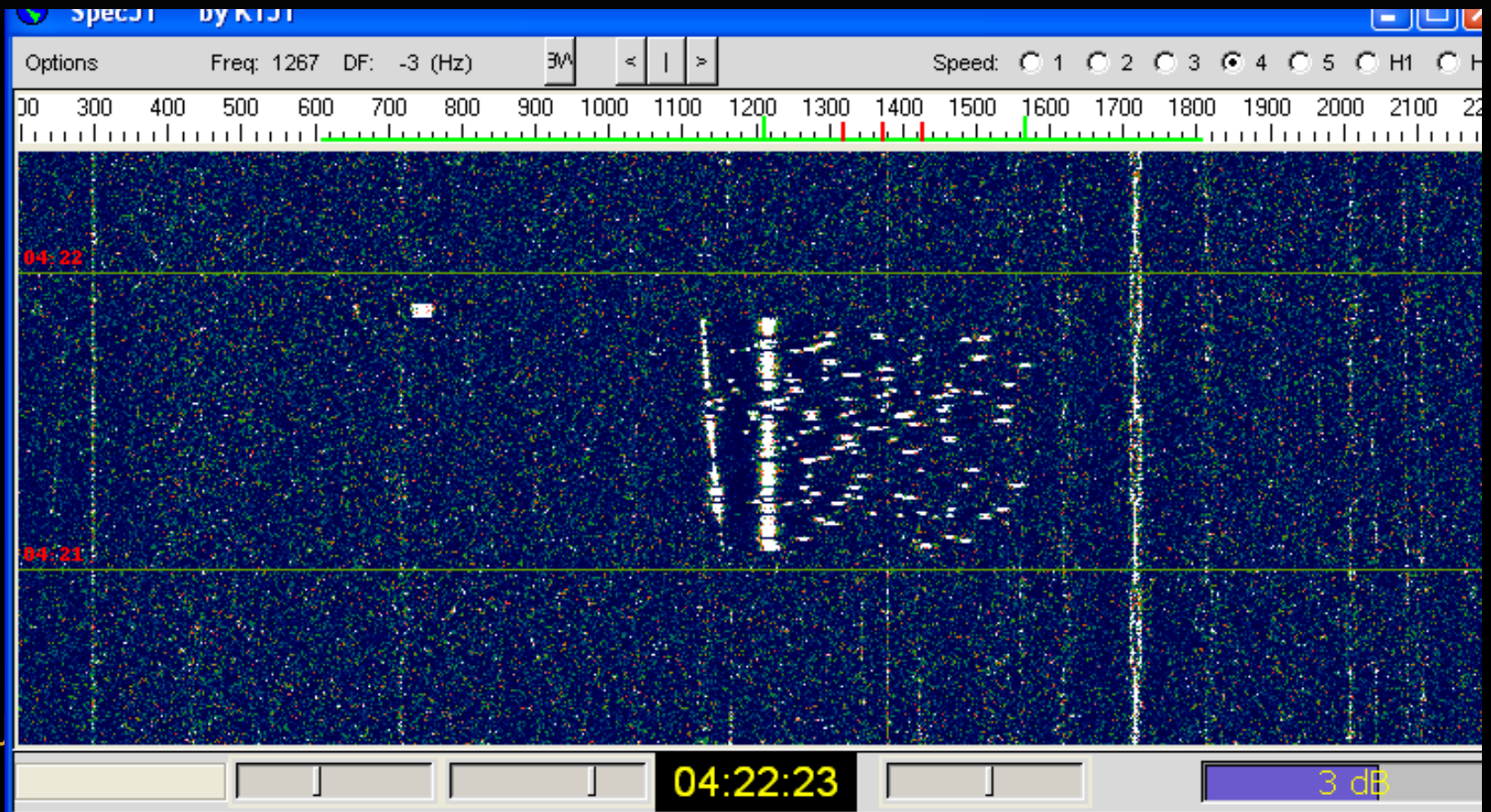
2010 Jan 23
 22:27:19

Sync 1 Zap
 Clip 0 NB
 Tol 100 Freeze
 Defaults AFC
 Dsec 0.0 Shift 0.0

Tx First IS0M0JU K6JEY Tx1
 26 Rpt IS0M0JU K6JEY 000 Tx2
 Sh Msg RO Tx3
 TxDF = 0 RRR Tx4
 GenStdMsgs 73 Tx5
 Auto is Off CQ K6JEY DM03 Tx6

1.0002 1.0070 JT65B Freeze DF:-883 Rx noise: 0 dB TR Period: 60 s Receiving

JT 65 SCREEN SHOTS.



My Computer DeludGPS... pl-2303_driv...

Online Services CD Files WSJT4

Recycle Bin TheSky Astrono... WSJ kvasd

Setup MSN Internet A... Astronomy WSJ

Outlook SynTac

Misc Radio

My Network Places Grids

Terminal MapSource

NETGEAR WGS11v Moonsked

Auto

WSJT Versi

Revision d

Run date:

Audio Device Ch

0

1

2

3

User requ

Default de

Will open devices:

Audio streams running

Options Freq: 1469 DF: 198 (Hz) 3M < | >

Speed: 1 2 3 4 5 H1 H2

00 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200

04:43

04:41

04:39

04:37

WSJT 7 by K1JT

File Setup View Mode Decode Save Band Help

0.8 1.0000 1.0000 Time (s) K1JT_081115_044100

FileID	Sync	dB	DT	DF	W				
043500	0	-24	4.4	-756	5				
043700	0	-32	3.5	-762	3				
043900	3	-20	1.0	420	12 #	K1JT W7UPF DM42	000	1	0
043900	2	-20	1.6	-923	6 *	R -9 GL		1	0
044100	5	-18	1.6	452	6 *	K1JT W7UPF DM42		1	0
044100	5	-18	1.6	452	6 *	K1JT W7UPF DM42		1	0

044100 2 2/6 K1JT W7UPF DM42 1 0

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

To radio: K1JT Lookup

Grid: FN20gj Add

Az: 66 2425 mi

2008 Nov 15 04:43:24

Sync 1 Zap Tx First K1JT K6JEY DM03 Tx1

Clip 0 NB Rpt 25 K1JT K6JEY DM03 000 Tx2

Tol 50 Freeze Sh Msg RO Tx3

Defaults AFC TxDF = 0 RRR Tx4

Dsec 0.0 Shift 0.0 GenStdMsgs 73 Tx5

Auto is OK CQ K6JEY DM03 Tx6

1.0064 1.0014 JT65C Freeze DF: 451 Rx noise: 0 dB TR Period: 60 s Receiving

WSJT 7 by K1JT SpecJT by K1JT 8:43 PM

OPERATIONAL NOTES

- Using JT65 we have worked many stations our size and up.
- Friday is the best day to operate
- We use manual steering
- Our horizon is +20deg el.
- We have three operators-
 - Main CW
 - JT Mode
 - Logger/band monitor

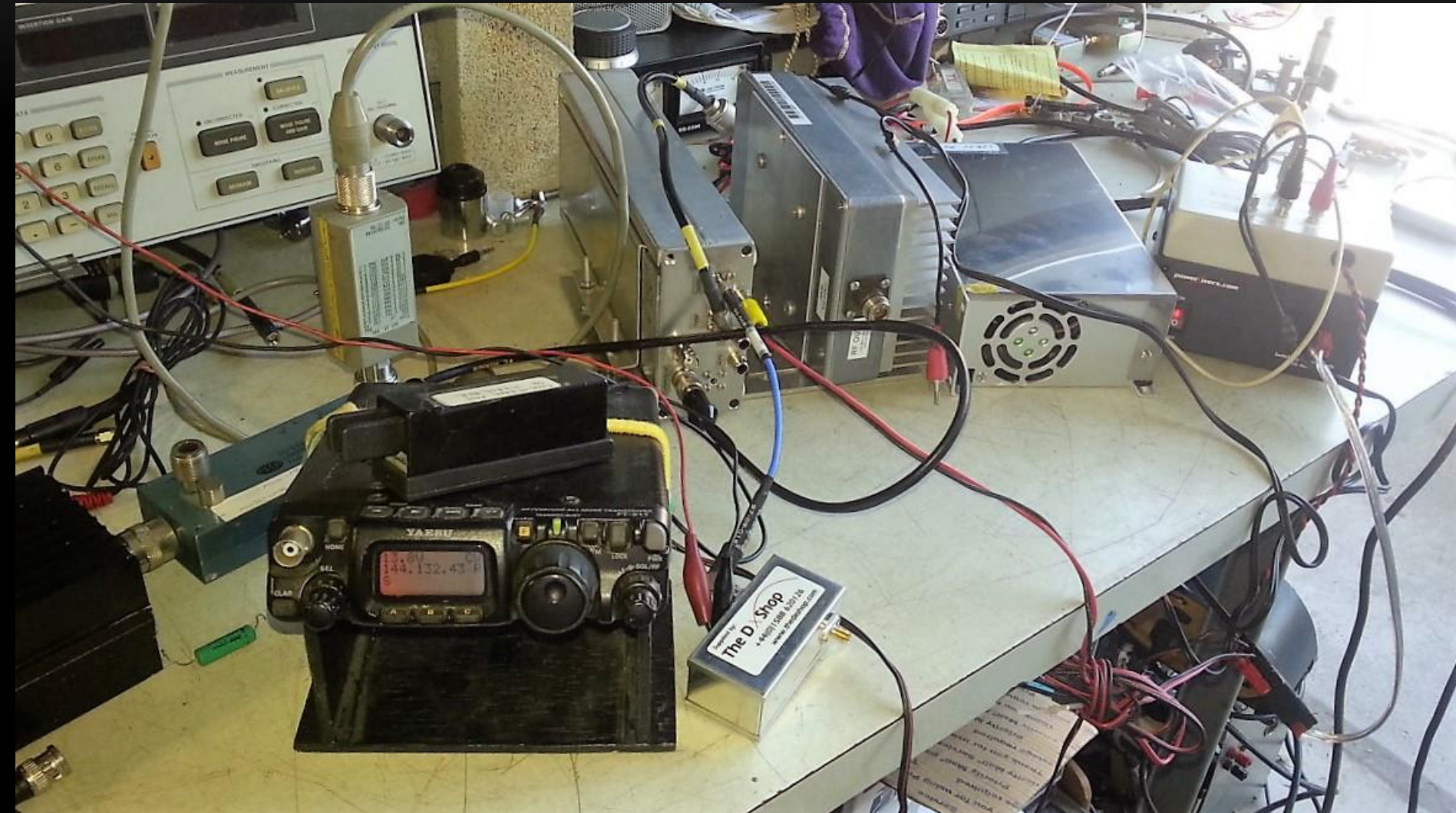
WORKING 1.2GHZ



JT POSITION N5BF COURTNEY OPERATING



NEXT STEP 2.3GHZ TESTING PHASE



NEW 7 FOOT ANTENNA WITH 2.3GHZ FEED



JEY Group Pictures
Rein W6SZ, Doug, John KJ6HZ, and Bill N6MN



MANY THANKS

- To Helen KI6LQV- for keeping Chez Helen open for food at almost any hour and for encouragement.
 - Rein W6SZ for all his help and design ideas.
 - John KJ6HZ for encouragement and help operating
 - And the rest of the “JEY Group” who have helped us get on the air.
-

W6SZ, KJ6HZ, KK6MXP, N5BF, K6JEY, N6GP, N6EV



International EME Contest

In recognition of achieving a winning score by working fellow amateurs around the world, using the moon as a passive reflector, on designated Amateur Radio frequencies above 50 MHz during the contest period.

This award is presented to

K6JEY

(+W6SZ, N6NM, KJ6HZ, N6EV)

SCORE: 9,000

THIRD PLACE

Multi Operator All Mode 1.2 GHz

2015

Ron Rolush

K5UR

President, ARRL

Bart Jahmke

W9JJ

Contest Manager

EME



ARRL The national association for
AMATEUR RADIO



RESULTS

No neighbor complaints!

Lots of contacts, but mostly on the digital modes

Lots of fun

And it worked!

Here is our website-

www.nitehawk.com/k6jey/



HOOKING IT UP

- The old XP computer drives a TigerTronics USB adaptor
- The adaptor drives the TS790A for TX/RX
- The TS790A Provides PTT output to the amp.
- The Amp drives the relays- one before the amp and one at the antenna with the preamp.