

Going Digital



ARRL The national association for
AMATEUR RADIO

What you will learn

- **What hardware?**
- **What software?**
- **Build your own digital station.**
- **This presentation will be available on line.**

What won't be covered

- Actual setup.
- Operating practices.
- Actual setup of each program.

Why not?

**Give a person a fish, or
teach a person to fish.
READ THE MANUAL!**

The Equipment

- Radio.
- Computer.
- Interface, (maybe).
- Some cables.

The Radio

- **Stability**
- **Power handling capability**
- **CAT**

The Radio

- **Power handling:**
 - **Duty Cycle** is a ratio of power on, to power off, as measured across a short, and ill defined time span.
 - **FT8:** 100%, across 15 seconds.
 - **SSB:** 40%, across an ill defined time frame.
 - **CW:** 30%, across an ill defined time frame.
 - **Make sure you KNOW what duty cycle is.**

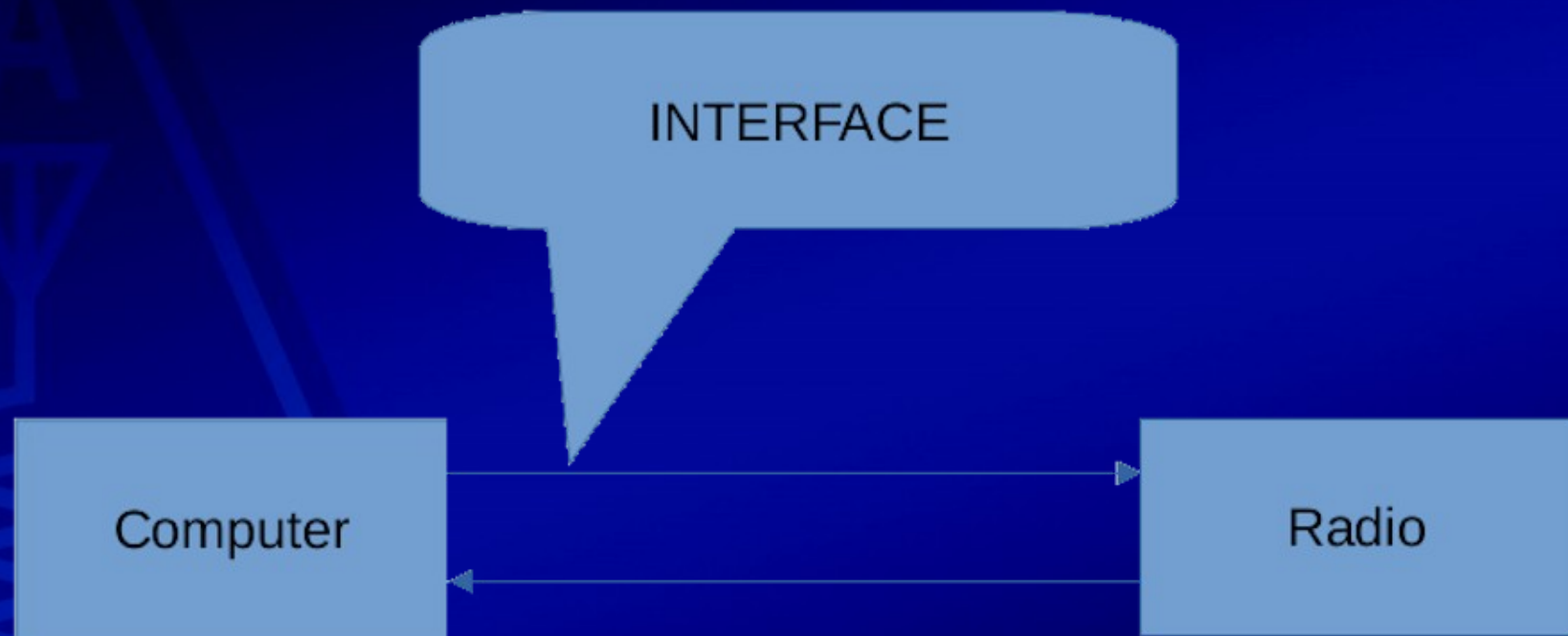
The Radio

- **CAT**
 - **Computer assisted Transceiver.**

The Computer

- Needs to be somewhat fast.
- Large display.
- Needs a sound card.

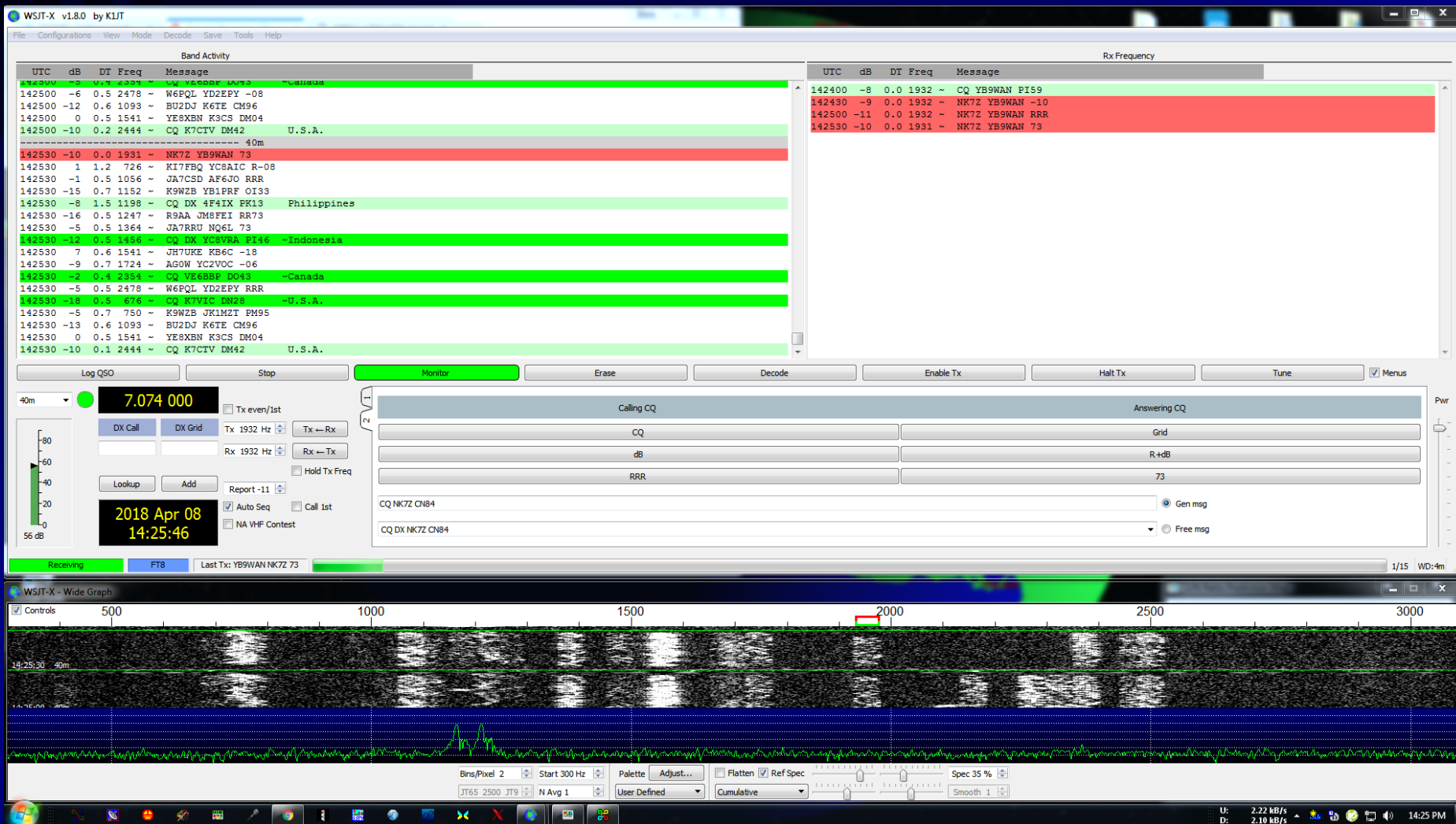
The Interface & Cables



The Decoder

- **WSJT-X:**
 - Provides the structure for a digital QSO.
 - Decodes the audio into something useful.
 - Provides signal/noise information.
 - Provides canned messages to transmit.
 - Provides controls the radio.
 - Reports contacts to upstream servers on the Internet.
 - WSJT-X is the control center of your digital world for now...

WSJT-X



Helper Applications

- **JT Alert:**
 - Connects to WSJT-X and transfers data.
 - Displays call and state information about each decoded signal.
 - Connects to any number of logging applications.
 - Allows for selection and initiation of a QSO.
 - Provides audible alerts if you have a second sound card.
 - Does awards management.
 - Makes your WSJT-X life simpler.

Helper Applications

- **PSK Reporter:**
 - Allows you to get real-time signal reports across the planet.
 - You know if a band is open if you see yourself someplace.
 - You don't know if a band is open if you don't see yourself someplace.
 - You know you have your radio set up correctly if you get decoded and shown on the PSK Reporter map.
 - Peace of mind is provided as a result of the above...

Helper Applications

- **Amateur Contact Log:**
 - Provides all logging and LoTW functions as well as other things...

Recent Contacts

Rec#	Call	Date / Time	Bnd	Mode	Power	Snt	Rec	Off	Country	Comments	ST	Count
6587	N0GM	2013/01/19 18:50	15	SSB	100				USA	NAQP	TX	BURJ
6586	K7SS	2013/01/19 18:49	15	SSB	100				USA	NAQP	WA	
6585	AD5XD	2013/01/19 18:47	15	SSB	100				USA	NAQP	TX	DALL
6584	N5VPC	2013/01/18 18:45	15	SSB	100	55	59		USA	VICTOR F SKINNER - 10 EVERGREEN DRIVE, ROUND ROCK, TX 7866	TX	Willar
6583	N4KRC	2013/01/17 21:15	15	SSB	100	59	59		USA	Rea Watercooler	LA	
6582	N0BQ-S	2013/01/17 21:12	15	SSB	100				USA		LA	
6581	K7LOP	2013/01/17 20:03	15	SSB	100				USA		NV	CLAR
6580	KF5SA	2013/01/17 16:37	15	SSB	100				USA			
6579	W4RH	2013/01/15 21:49	15	SSB	100	55	55		USA	DOUGLAS L DOWDS - 415 E 238th St CARSON, CA 90745-5810	WA	Los A
6578	KF5SA	2013/01/05 17:24	15	SSB	100				USA			
6577	W4MMB	2013/01/03 00:00	15	SSB	100				USA	Robert I Tucker - 76 61st Pl Long Beach, CA 90803, Bob Water Cooler	CA	Los A
6576	N4KRC	2013/01/02 22:06	15	SSB	100	57	59		USA	Don - DONALD W KEITH - 40 RED STICK ROAD, INDIAN SPRINGS VIL	AL	Shelb
6575	W4SFL	2013/01/02 20:43	15	SSB	100	52	55		USA	Ralph Water Cooler RALPH N REEVES - 216 Daley Road, CROCKETT, T	TX	Hous
6574	KF5SA	2012/12/27 20:10	15	SSB	100				USA			
6573	CU7CG	2012/12/21 15:38	15	SSB	100	52	55		Azores	Manuel Gomes - Rua 5 De Outubro, 42, 9900 - 093 Faial		
6572	KF5SA	2012/12/21 15:33	15	SSB	100				USA			
6571	CU7CG	2012/12/21 14:38	15	SSB	100				Azores			
6570	KF5SA	2012/12/20 19:34	15	SSB	100				USA			
6569	W1RYO	2012/12/19 18:58	15	SSB	100	52	51		USA	GARY W GONNELLA - 8527 HILLSIDE RD, ALTA LOMA, CA 91701	WA	San B
6568	W4RH	2013/12/18 19:15	15	SSB	100	57	51		USA	DONALD W KEITH - 40 RED STICK ROAD, INDIAN SPRINGS VIL	AL	Shelb

Ready to begin!

Call: _____ Date: _____ Band: _____ Mode: _____ Power: _____ Time On: _____ Sent: _____ Rec: _____ Country: _____

Name: _____ State: _____ County: _____ Frequency: _____ Other: _____

Bearing: _____ Miles: _____ Cont: _____

Comments: _____

☐ QSL Sent ☐ QSL Rcvd

7:35:39 AM
12:35:39 UTC

☐ Current time if blank

Call	Band	Mode	Power	Time On	Sent	Rec	Country
VPSW5CW	21.0240	Turks & Caicos Is.	15	CW	Confirmed	de: DL7NY	VPS 1235Z NA 127 1.606
7H4SJJ	7.1348	Japan	40	SSB	Unconfirmed	de: VE7SZ	7N 1235Z AS 322 6.405
VK0JJJ	28.4850	Antarctica	10	SSB	Unconfirmed	de: DL1EJA, now also QRV on 6m!!!	VK0 1235Z SA 163 10.129
CO8LY	21.0029	Cuba	15	CW	Confirmed	de: UF8T CQ	CO 1235Z NA 144 1.307
H8GDJ20SP	7.1480	Liechtenstein	40	SSB	Best	de: Y02MTG, HBFF-007, 73 & 44 Peter	H80 1235Z EU 45 4.841

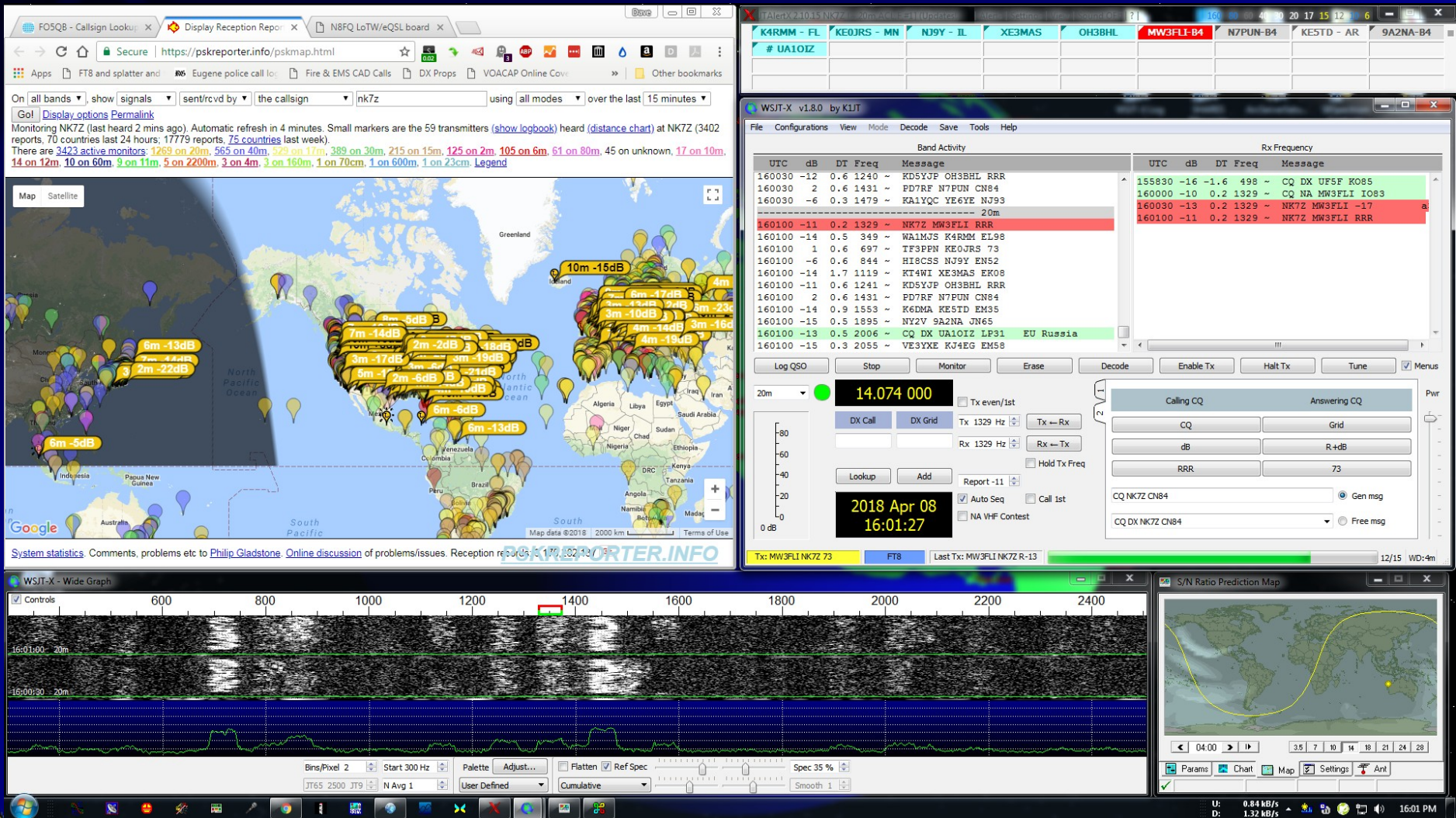
Helper Applications

- **BKT Time Sync**
 - All WSJT-X modes need time sync.
 - You need time sync for logging.
 - Why do you need to be in time sync:
 - FT8 runs in 15 second cycles.
 - It starts at 00, and each cycle is 15 seconds long.
 - There are four cycles per minute.
 - If you are not synced in time, you may start listening at 00:00:04, while the other station is starts transmitting at 00:00:00. Thus you miss the first four seconds of the other stations transmission.

The Internet

**You want Internet, but don't
need the Internet**

Putting it all together



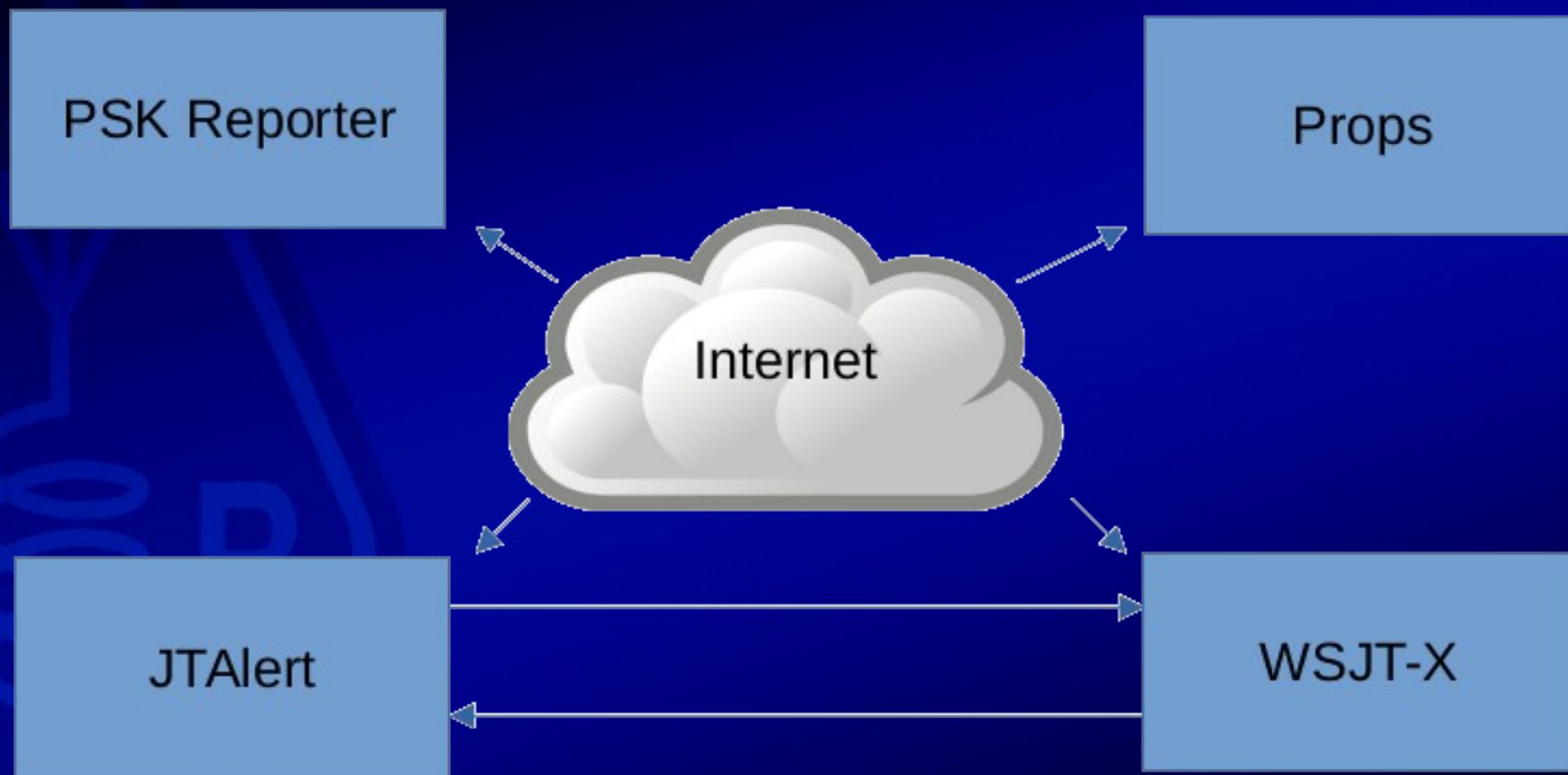
Putting it all together



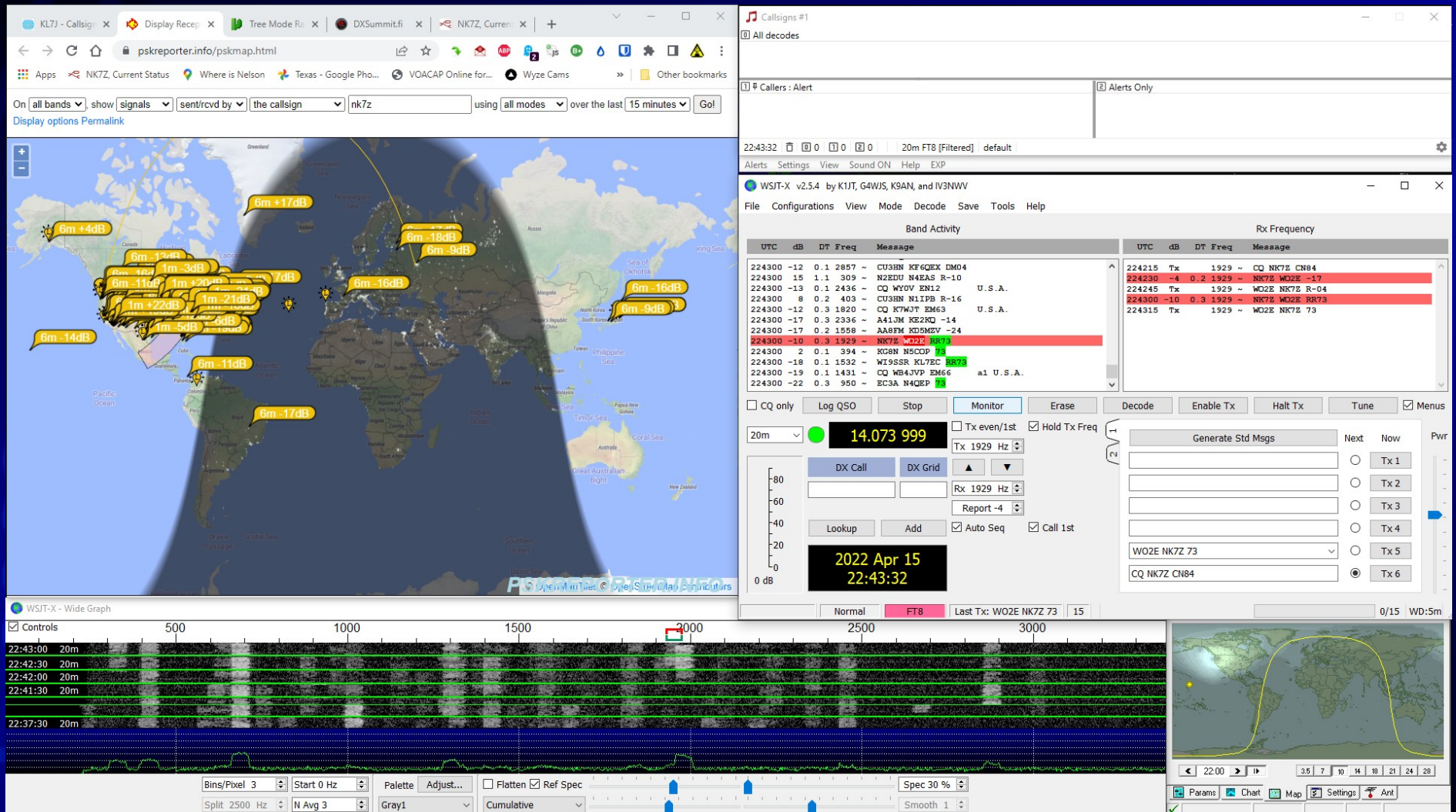
Data Flow

- Your radio talks to WSJT-X:
- WSJT-X talks to JT Alert.
- JT Alert talks to N3FJP Amateur Contact Log.
- Amateur Contact Log talks to LoTW.
- Amateur Contact Log talks to eQSL.
- Amateur Contact Log talks to Clublog.
- Hamcap shows you current propagation.
- Time sync program provides time sync for all.

Intercommunication



QSO Flow



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NK7Z, Version 1.00

All of this will change

- **WSJT-X** has already done some changing with version 2.
- **JT Alert** has followed with changes.
- **ACLog** is constantly changing.
- Many time sync programs are available.
- Computers are changing.
- What should you do?

What should you do?

- **EMBRACE THE PROBLEMS**
- **READ THE MANUAL!**
- **UNDERSTAND HOW THINGS WORK**
- **Install from scratch**
- **Don't be afraid to change things**
- **You WILL blow up your setup**
 - **THAT IS A GIFT!**

Citations

- Background provided by the ARRL.
- All graphics used are from US Military manuals, in the public domain, Creative Commons, or created by me.

Citations

- **WSJT-X**
 - <https://www.physics.princeton.edu/pulsar/k1jt/wsjsx.html>
- **JTAlert**
 - <https://hamapps.com/>
- **Amateur Contact Log**
 - <https://n3fjp.com/aclog.html>
- **PSKReporter**
 - <https://www.pskreporter.info/pskmap.html>

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Questions



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