

# Using Digital Modes on the Fly – – Old Technique Meets Modern Modes

Kai, KE4PT

October 2015

How good is your memory for  
complex tasks?

[Carol Sjursen, KJ4AWB, photo]



Video: 8 minutes:

[msnbcpod.vo.llnwd.net/l1/video/podcast/pdv\\_maddow\\_netcast\\_m4v-10-14-2014-195101.m4v](https://msnbcpod.vo.llnwd.net/l1/video/podcast/pdv_maddow_netcast_m4v-10-14-2014-195101.m4v) – [at about +12 min into program]

[www.newyorker.com/magazine/2007/12/10/the-checklist](http://www.newyorker.com/magazine/2007/12/10/the-checklist)

# What is the “Silver Lining” Here?



[U.S. Air Force photo]



# Boeing's Model 299 Prototype

- Final phase of aircraft evaluations under U.S. Army specification 98-201 (July 18, 1934)
- Boeing's Model 299 entry had swept all the evaluations
- **After normal takeoff, 299 suddenly stalled, crashed and burned**
- **Investigation found "Pilot Error" as the cause**, military test pilot **Maj. Ployer Peter Hill** (his first time flying the 299) was unfamiliar with the aircraft, **had neglected to release the elevator lock prior to take off**, killing himself and other crew members



[U.S. Air Force photo]

# The Result

- Newspapers had dubbed 299 ‘**too much plane for one man to fly**’ but the Air Corp ordered twelve more aircraft to keep the Model 299 project alive
- Pilots put their heads together – what was needed was some way of making sure that everything was done – that nothing was overlooked
- **The result was a pilot’s checklist**
- The Model 299 was not ‘too much airplane for one man to fly’, it was simply too complex for any one man’s memory
- **With the checklists, careful planning, and rigorous training, the twelve aircraft flew 1.8 million miles without a serious accident**

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- **With the checklists, careful planning, and rigorous training, the twelve aircraft flew 1.8 million miles without a serious accident**
- **The U.S. Army accepted the Model 299, and eventually ordered 12,731 of the aircraft they numbered the B-17 – one of the most important aircraft of the Second World War**

# From the **Pilot's Manual** for the Boeing B-17 Flying Fortress

## 3. FLIGHT INSTRUCTIONS.

### a. BEFORE ENTERING PILOTS' COMPARTMENT.

- (1) Check weight and balance data, form F, AN 01-1-40.
- (2) Check forms 1 and 1A and sign exceptional release if necessary.
- (3) Check flight engineer's report of preflight inspection.

### b. ON ENTERING PILOTS' COMPARTMENT. - Check for all flights:

PILOT

COPILOT

- (8) Ascertain free movement of flight control column, wheel and rudder pedals to the extremities of their operating range.

# The Legacy



## CESSNA 150 CHECKLIST

### PRE-FLIGHT INSPECTION CABIN

Document ~~A.R.R.O.W.~~

**Control Lock – REMOVE**

Ignition Switch – OFF

Master Switch – ON

Flaps – DOWN

Fuel Quantity – CHECK

Master Switch – OFF

Fuel Valve – ON

U.S. War Department named the site of the Ogden Air Depot "Hill Field" in honor of Major Ployer Peter Hill. In 1948, Hill Field was renamed Hill Air Force Base.



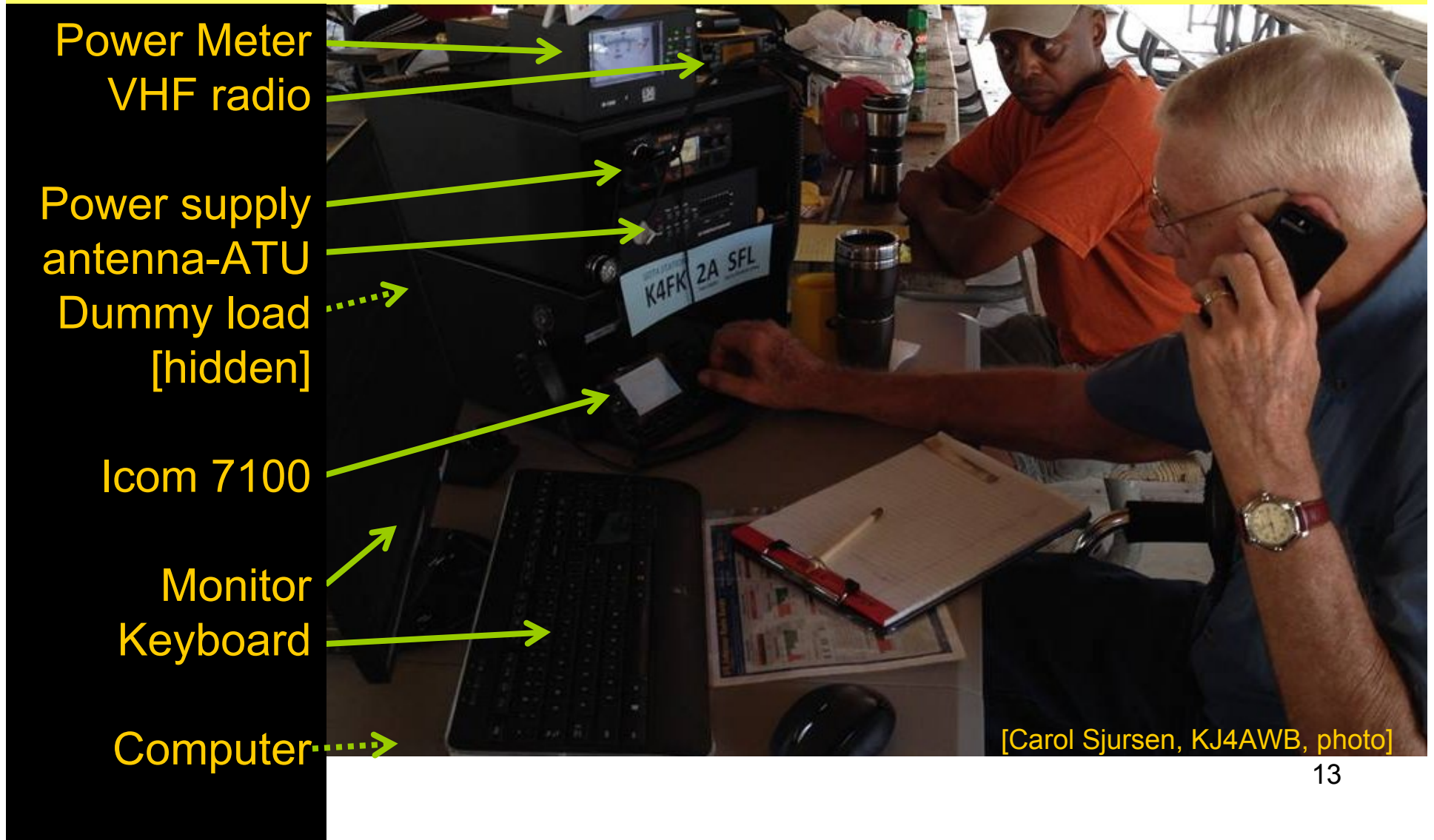
# On-the-Fly Digital Operations

- **Ad-Hoc Ham Radio digital operation setup** can likewise be “too complex for one’s memory”
- **Field Day or Emergency Operations can be complex [different than at the home station]:**
  - **Radio equipment setup**
  - **Computer, interface, monitor setup**
  - **Digital modem and other software setup**

# On-the-Fly Digital Operations

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  - Radio equipment setup
  - Computer, interface, monitor setup
  - Digital modem and other software setup
  - **How good is your memory?**

# Digital Station can be Complex



# Digital Station Cabling can be Complex

Power Meter  
VHF radio

Power supply  
antenna-ATU  
Dummy load

Icom 7100

Monitor  
Keyboard

Computer

- Label both ends of each cable with “model” and “plug ID”
- Have a cable diagram handy
- Test setup at home
- Re-assemble the rat’s nest of wires at the portable site



[www.teara.govt.nz](http://www.teara.govt.nz)



# Equipment Checklist for ZF2EM EME DXpedition

## What we needed to take:

HF/VHF Rig: Icom 7100 HF/6M/2M/440  
VHF AMP: IOJXX 1200 Watt 2 meter Amp  
Two 9 Element 2 Meter Yagis + phasing lines  
10 ft. x 1.5" cross boom (from ZF1A)  
Two antenna to one cable Combiner  
N to N jumper from combiner to LNA  
LNA Preamp/Antenna relay and Backup LNA  
LMR-600 Cable ends (75 ft. cable from ZF1A)  
Sequencer to control TX/RCV Sequence  
Control cable from laptop to rig w/interface  
Control cable from rig to sequencer  
Control cable sequencer to Amplifier  
Computer to rig audio/data interface and cables  
Control cable from sequencer to LNA (100 ft)  
Interface from computer to AZ/EL rotator  
Control cables from computer to AZ/EL Interface  
AZ/EL Rotator control + two 100 ft cables  
Azimuth-Elevation Rotator –Yaesu 5400B

ZF2EM Station license and equipment import  
waiver from the Cayman Government

Hand Tools  
Knife & file  
2 rolls electrical tape  
1 roll duct tape  
Wire ties  
Climbing belt

All clamps and hardware  
For the antennas and  
AZ/EL Rotator

Spare cables and jumpers  
(RF/Audio/Ccontrol)

Lots and lots of bubble wrap

3 laptop computers  
2 cel phones + 1 tablet

Two 2m/440 HTs w/chargers  
Two 2m/440 satellite antennas  
Jumper cables HT-Ant.

## ZF2EM

EME DXPEDITION TO  
THE CAYMAN ISLANDS

By Bill NZ5N and Pete N8PR  
May 20-25, 2015

[www.qsl.net/k4fk/presentations.htm](http://www.qsl.net/k4fk/presentations.htm)

# You Can Build a Rapid Deployment Radio Go-Box

“Setting up to support public service events is fast and easy with this station-in-a-box.”

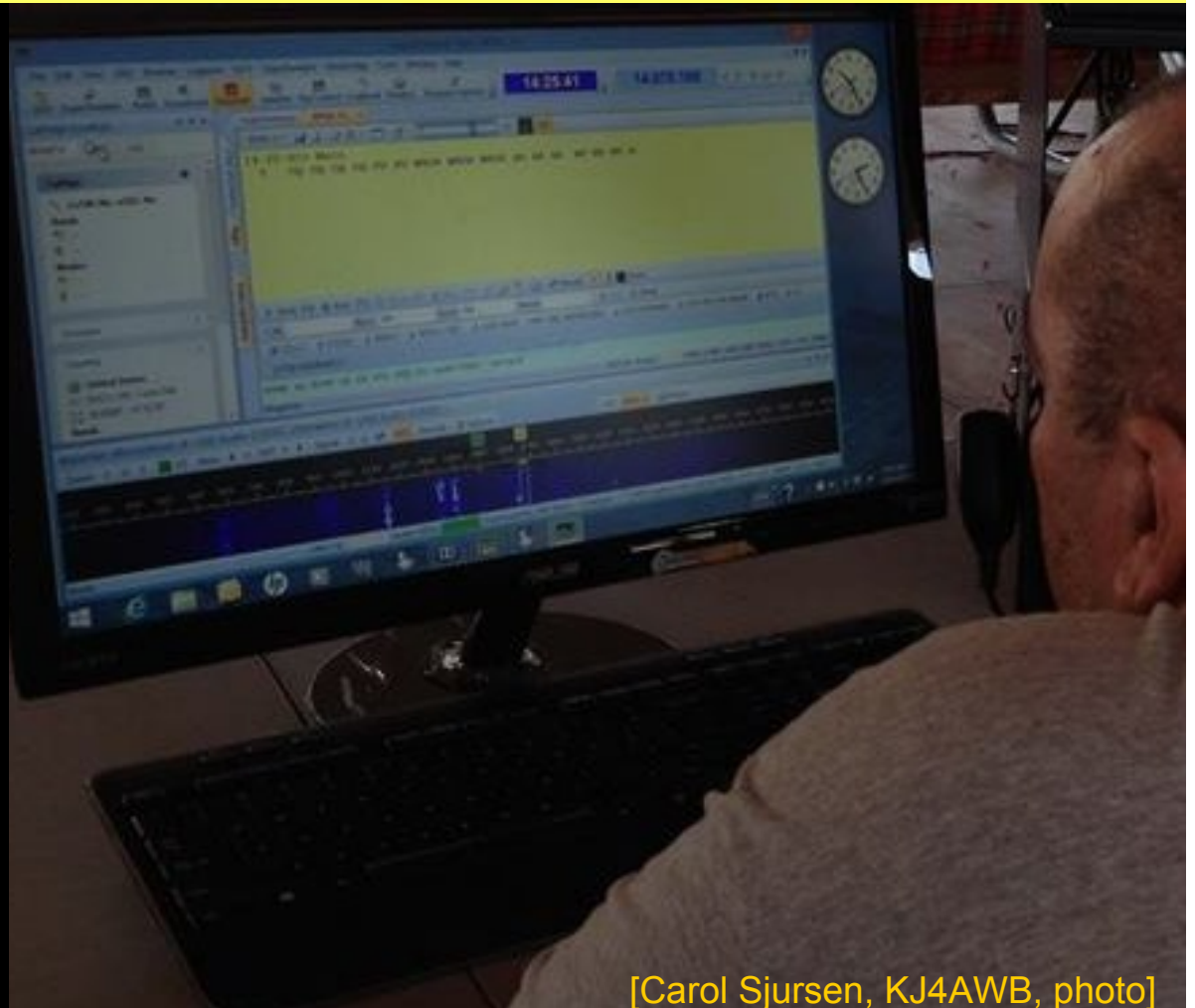


Glen Popiel, KW5GP, QST Sept 2015

# The Software

## Digital Software Includes

- “Digital Modem”  
[MMTTY, Digipan, WSJT-X, FLDIGI, FSQ, ... etc.]
- “Radio Control”  
[HRD, Logging,...]
- “Computer Maintenance”  
[Dimension 4, TARDIS, Browser, Klog]



[Carol Sjursen, KJ4AWB, photo]

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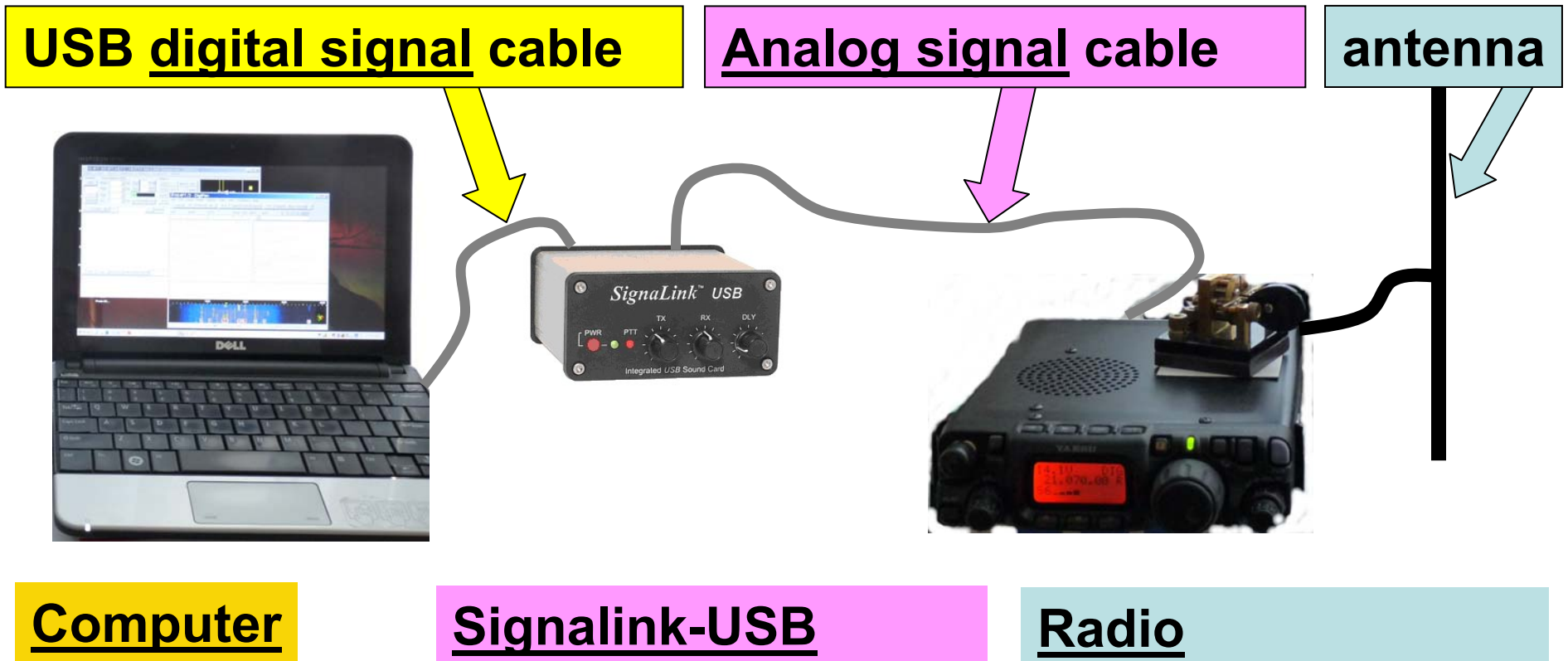
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[Dimension 4, TARDIS, Browser, Klog

- Maintain a list of software settings in *check list* form, for each piece of software
- Don't forget the computer driver settings, such as audio ports setting and sound levels – *keep a check list*
- Know the *demo settings* as well as the *operational settings*



# A Really Simple Digital Station



# A Really Simple Digital Station

## The Hardware (6 components, simple diagram)

- Small laptop computer (requires checklist)
- Cable – computer to sound card
- USB sound card
- Cable – soundcard to radio
- HF transceiver (requires checklist)
- Antenna cable and antenna

# Laptop Basic Check List

- While Internet is available, set computer time to national time standard
- Start WSJT-X, select the USB sound card
- In computer audio properties, set USB “Microphone level to max”, “Speaker level to mid-range”
- Verify program parameters (should be same as at home)
- **YOUR CHECK LIST WILL BE MORE DETAILED**

# “Check List” could include images of software settings

The image shows a screenshot of a Ham Radio software interface. The main window displays a log of received messages with columns for UTC, dB, DT, Freq, and Message. The messages are highlighted in pink. Below the log, there are controls for frequency (17m, 18.102 000), DX Call (ZS6WB), DX Grid (KG44), and a date/time display (2015 Sep 09 14:14:27). A waterfall display is visible at the bottom.

Two settings windows are overlaid on the main interface. The left window is the 'Settings' dialog, with the 'Radio' tab selected. The 'Radio' tab is circled in red. The right window is the 'Settings' dialog, with the 'General' tab selected. The 'General' tab is also circled in red. The 'Radio' tab in the right window is also circled in red.

The 'Radio' tab in the left window shows the following settings:

- Rig: None
- CAT Control: Serial Port: [dropdown]
- Serial Port Parameters: Baud Rate: 4800
- Data Bits: Seven (radio button), Eight (radio button)
- Stop Bits: One (radio button), Two (radio button)
- Handshake: None (radio button), XON/XOFF (radio button), Hardware (radio button)
- Force Control Lines: DTR (checkbox), RTS (checkbox)

The 'General' tab in the right window shows the following settings:

- Station Details: My Call: KE4PT, My Grid: EL96uf
- Message generation for type 2 compound callsign holders: Full call in Tx1
- Display:  Blank line between decoding periods,  Display distance in miles,  Tx messages to Rx frequency window,  Show DXCC entity and worked before status
- Behavior:  Monitor off at startup,  Monitor returns to last used frequency,  Double-click on call sets Tx enable,  Allow Tx frequency changes while transmitting,  Disable Tx after sending 73,  Runaway Tx watchdog,  CW ID after 73
- Periodic CW ID Interval: 0



# HF Radio Check List

- Select band
- Set dial frequency
- Make sure TX is not in “split” operation
- Set mode to USD (upper sideband digital)
- Make sure all audio processing is off
- Connect antenna and tune antenna
- *Listen, listen, listen*
- Then operate!

# From a Recent EME DXpedition

From EME chat via Bill, NZ5N:

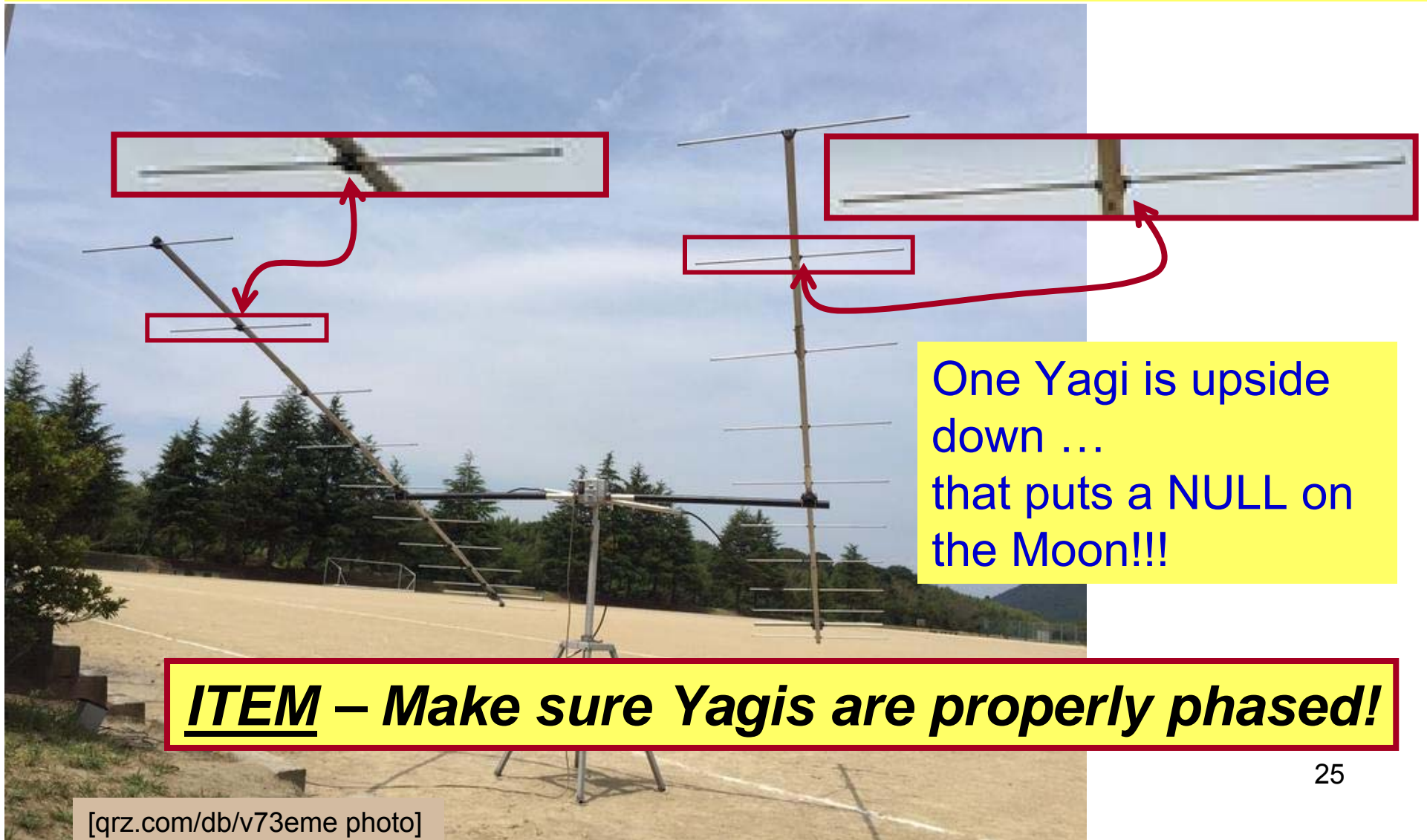
26Sep 17:07 V73EME/2X11V700 Please turn one antenna 180 degr. Same as the other.  
GN 73 ===== {SV8CS Spiros xx KM07js 94.64.103.96}

26Sep 17:08 SV8CS Spiros OK I will try after. Tnx. GN! =====  
{V73EME/2X11V700 Kay xx RJ57qc 117.103.91.89}

**THERE WERE MANY SUCH REPORTS ON THE EME CHAT PAGE,  
THIS ONE CAUGHT MY ATTENTION!**

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# Investigated Web Image of Their Antenna System



# “An Antenna Busters’ Job”

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26 Sep 23:37 email to Kay, V73EME,  
Analysis of your V73EME antenna picture on qrz.com suggests that one of the Yagis is  
upside down. ... Very best regards, Kai, KE4PT

27 Sep 05:57 email from Kay: Hello Kai,  
You may be right. Your suggestion makes me sense.  
I checked both antenna phase and rotated one antenna just now.  
I hope to fix my trouble.  
Thanks so much. Best regards, Kay V73EME

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**RESULT: 28 Sep 09:52+ KE4PT, NZ5N, N8PR and *many others* got  
V73EME in the log for 2m band EME QSO with Marshall Islands.**



# Checklist is NOT a New Concept!

- Check List save lives!
- Check List save time in an emergency deployment or Field Day
- Checklists can save an EME DXpedition
- Check lists would reduce the volumes of email messages on the various email 'help' reflectors [MMTTY, WSJT-X, and others!]
- Check lists allow easy transition to a new computer

# Not a New Idea!

Does the above sound somewhat reminiscent of Field Day? It should. Going out on an emergency mission is a lot like going out on FD, but is a lot more hurried and serious. Nevertheless, FD preparations are good practice. Make a list of things you will need, this FD, then time yourself on how long it takes to collect them, throw them in the car and be on your way. If it takes over an hour, this is too long. A half hour should be sufficient, if you are well organized.

If nothing else, make yourself an emergency check list and keep it at your operating position or somewhere handy. When or if the call to action comes, you won't have suddenly to try to recall what-all you need. What's that you say?

“If nothing else, make yourself an emergency check list and keep it somewhere handy... you won't have suddenly to try to recall what-all you need.”

– Emergency Check List. George Hart, W1NJM, QST Apr1969, p76-77



*That's all Folks!*

*Thanks for your Attention*