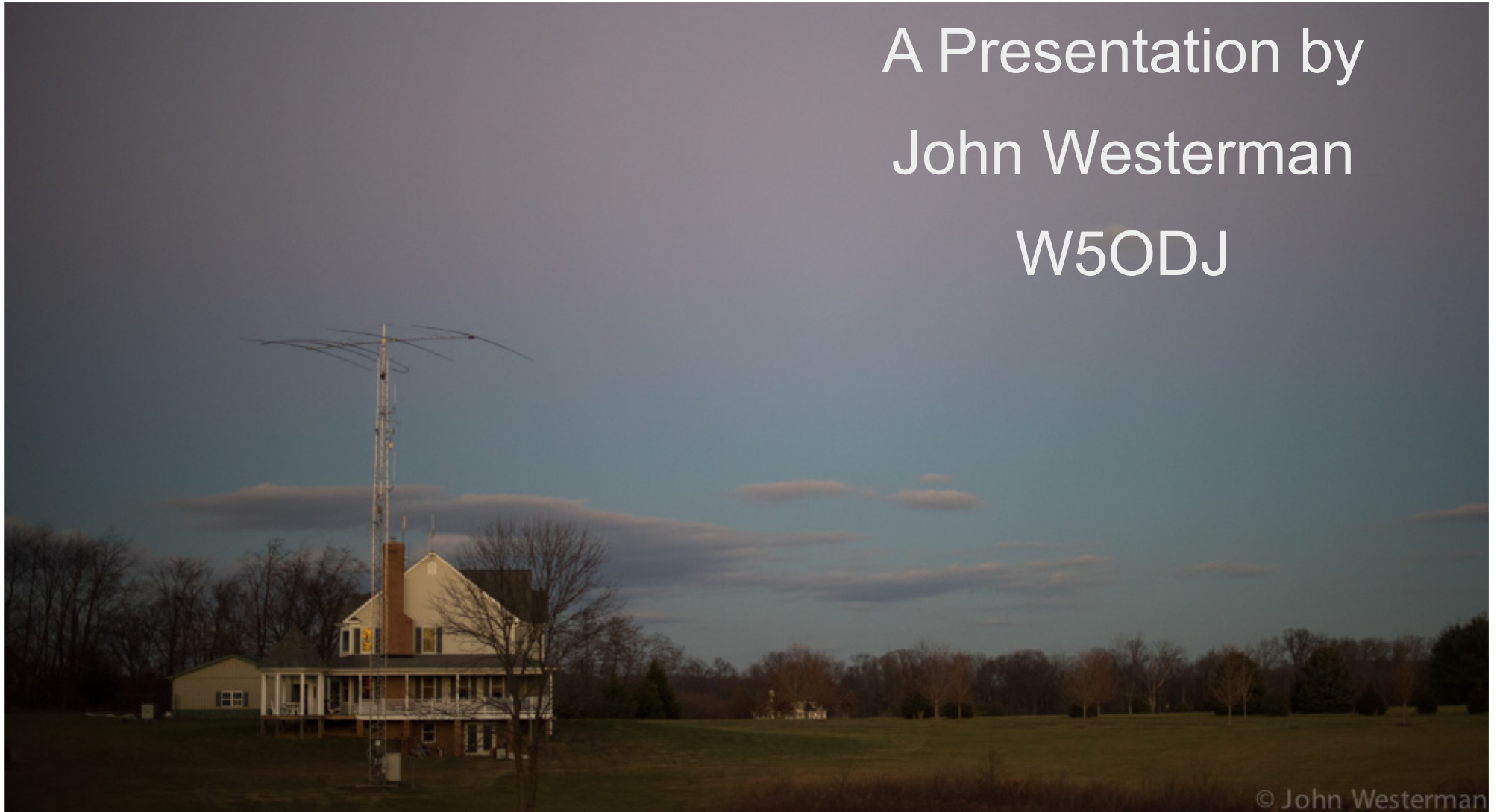# HF Digital Operation

A Presentation by

John Westerman

W5ODJ

Digital Operation - Agenda

- Digital Modes

- Digital Operation Tips

- Individual components of digital kit

- Details of how to sew system together

- Questions

- Live demonstration

- 30 minutes

My first Digital QSO, April 22, 2008:

CQ CQ Skirmish de WA4EEZ WA4EEZ WA4EEZ

WA4EEZ DE WB5ODJ WB5ODJ

WB5ODJ   LESLIE WA4   LESLIE WA4   WB5ODJ

HI LESLIE HANDLE HERE IS JOHN MY FIRST PSK QSO OVER

WB5ODJ de WA4EEZ...John, I am so happy to be ur first PSK QSO....You will enjoy this mode
and meet lots of new friends...I am in a PSK contest, and the exchange is the name, and
the prefix...so you can send me your prefix--like WB5--...
BTU John, de WA4EEZ kn

LESLIE ... THANKS FOR TAKING MY TRANSMISSION. I AM A COMPUTER GUY BUT THIS IS ALL VER NEW
TO ME. I WILL LET YOU GET BACK TO YOUR CONTEST. WA5EEZ DE WB5ODJ OVER

WB5ODJ de WA4EEZ...ok John, well I am most definitely not a computer gal, but sure enjoy
these digital modes....BTW ur sig is 599 599 and clean...very nice.
73 es thanks for this contact, and may you have many, many more!! 73 and good hamming to
you

WB5ODJ de WA4EEZ..oh my name is Leslie.. bk

wa4eez de wb5odj ... handle is John. QTH is Northern Virginia (lovettsville). Antenna is
new SteppIR at 80 feet. driven by a ICOM 756pro3. beam pointed to FL at the moment. UR
signal is also 599 599 599 over.

WB5ODJ de WA4EEZ...My kinfolk are from Giles County up there in VA....Thanks again John,
and will see you again, I am sure...73 de WA4EEZ sk

73 73 73 and good night. thanks a million for the qso. WB5ODJ clear

Digital Operation

➢ All digital communications use USB.

➢ Most radios want to use "D" (digital) mode; D(igital) mode will mute microphone input.

➢ Digital in most bands requires very little power (<= 25 watts), esp. when band is active/open.

➢ Digital modes consume consistent power as compared to CW or voice SSB.

➢ Computer will open carrier and transmit, even idle, 100% of the time.

Digital Operation

➢ Shorthand follows CW

  ➢ K = "Over"

  ➢ KN = "Over to N0GQ"

  ➢ SK = "End of transmission"

  ➢ BK = "Break"

  ➢ CQ = "Calling all stations"

➢ Anything works!

➢ Don't get caught up in semantics; no one cares.

➢ Observe the flow; get in and fumble around.

Digital Operation - Power

- ➤ It is best to use only the power you need at all times. You will be very surprised what you can do with 5 watts using OLIVIA protocol.

- ➤ If low power doesn't do the job often aggressive power won't either.

- ➤ Unnecessary high power in digital mode wastes bandwidth.

- ➤ It is obvious when used ("splatter") and does nothing for readability of your transmission.

Digital Operation - VNC

➢ VNC ("Virtual Network Computing") is common remote control software

➢ Use any computer as a client; Access Raspberry Pi remotely. Works well with VPN Works on any OS including phones and tablets.

➢ Let Pi computer focus on very few tasks; removing these tasks from your computer.

➢ RPi uses very little power in idle mode. I leave powered on.

➢ Use this setup with multiple radios; each with their own control computer. I use two; one on IC7610, the other IC7300. Each have their own antenna

Digital Operation - LARG Nets

- LARG DIGITAL NETS

    - Digital Watering Hole

    - Sunday night, 19:30 local time

    - In winter 80 meters is used.

    - Center frequency 3582.75 kHz

    - Olivia 500/8 mode

    - USB-D Mode 3581.25 kHz + 1500 Hz for center

    - Reference: https://k4lrg.org/nets/
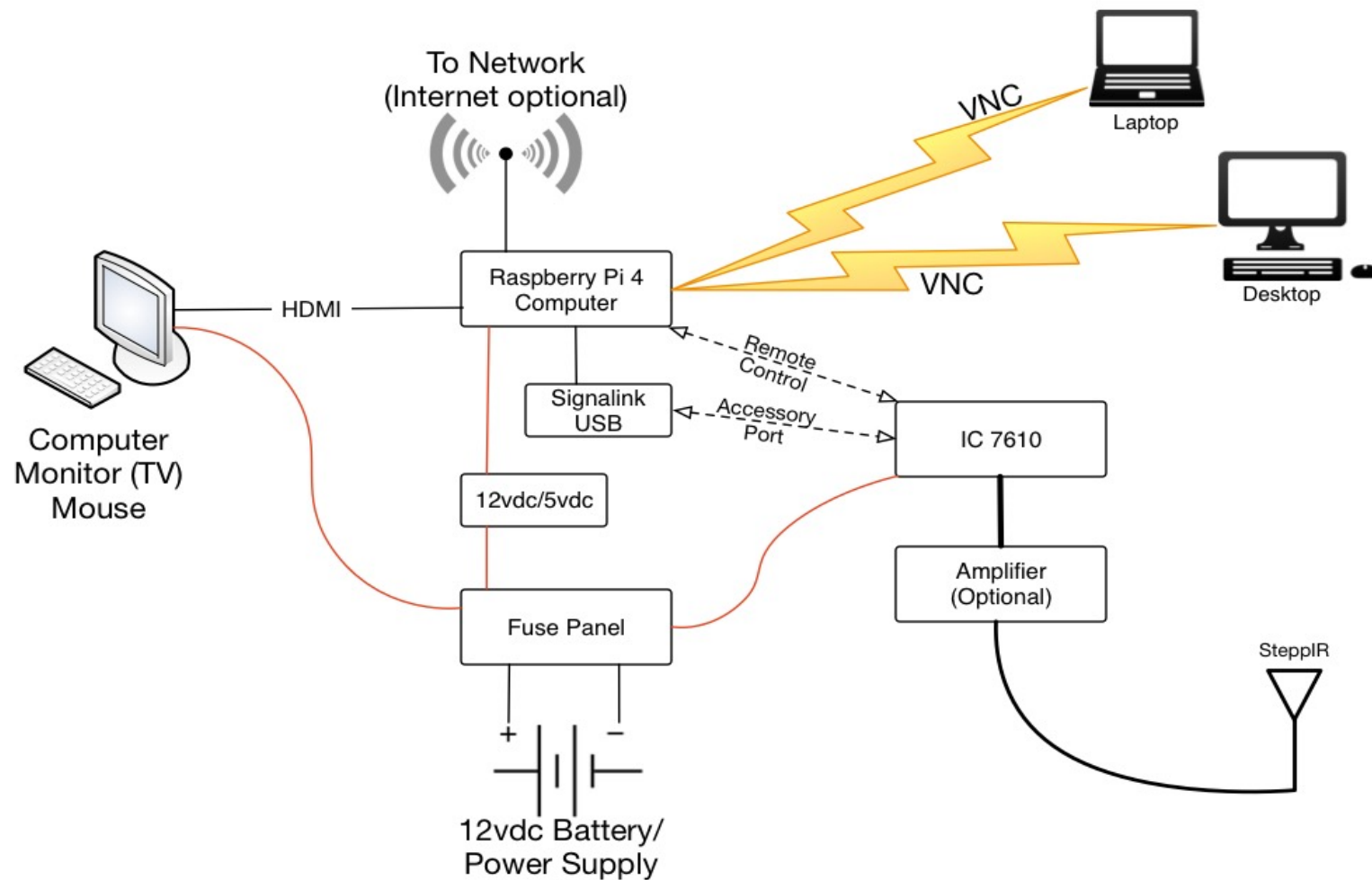
- CW

    - The original digital mode

    - Tuesday nights 20:00 local time

Digital Operation - Frequencies

- Frequencies
  - Many! See ARRL Band plan
  - 40 meters: 7.040 Mhz ($\pm$)
  - 40 meters: 7.078 Mhz (JS8Call)
  - 20 meters 14.070 Mhz ($\pm$)
- Reference LARG web site: https://k4lrg.org/nets/digital-modes/
- Get out there and listen around!

Digital Operation - Design

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Last Update: January 12, 2021
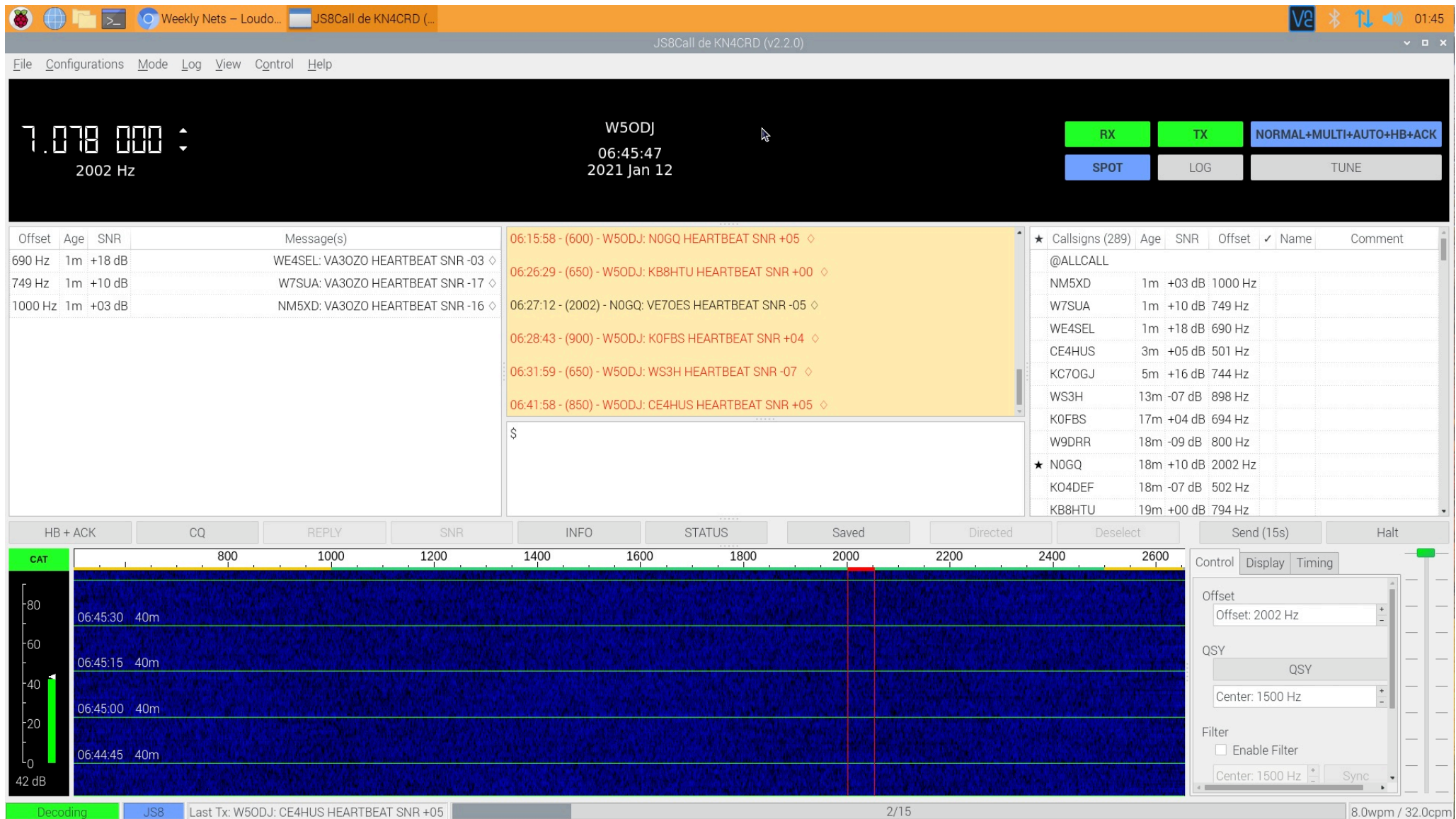
Digital Operation – IC7610 Setup

Digital
Operation –
IC7300
Setup

JS8 Operation

Live Demo

- ➤ Raspberry Pi 4

- ➤ Remote VNC control

- ➤ JS8Call digital software

- ➤ Antenna tuned for 40 meters; 7.078 Mhz

- ➤ 25 watts

- ➤ IC-7610 set for USB-D mode

  - o Digital modes always use USB

  - o D(igital) mode will mute microphone input

The end...
Thank you!