Wireless Technology Club

Workshops

Official:

(can publish)

- **June 8** - Horus Demodlib Mobile Tracking Station (Max W0MXX)
    - **June 15** - Horus Demodlib Builds Continued

Unofficial:

(not for publication)

-
- **May 25** -
- **June 22** -

Planning Section

Ready to start:

In Progress:

- Microcontroller Development Boards: Building a Nestduino (Max W0MXX and Charlie KC1SFR)
    - 3.3v regulator circuit needs fixing
    - Parts need ordering
    - Kits need packing
    - Cost needs to be figured out
    - “MCU Dev Boards” slide deck needs building
- Decoding your Infrared TV Remote (Seth KC1PZY and/or Max W0MXX)
    - Plan laid out
        - Arduino project to decode people’s IR remotes
        - IR protocols

            - Participants can bring their own IR TV remotes from home
            - Set up Arduino to recognize remote and turn on LEDs when buttons are pressed
        - V1 circuit and code is working
        - More remotes need to be supported
        - IR protocol content in progress
- SMD Soldering Practice (Max W0MXX)
    - Need to order practice boards and SMD components
    - Needs outline and dry run
- Selecting and Terminating Coax Cables (Jeremy Breef-Pilz KB1REQ)
    - To connect tape measure Yagi to HT/attenuator
    - RG-58
    - Need to put parts list together
- 70cm Tape Measure Yagi Build (Bob K5TEC)
    - Need to gather more parts
    - Do a bit more testing
- Horus Demodlib Mobile Tracking station (Max W0MXX)
    - Re-use existing Auto-RX station and set up Horus Binary
    - This will allow people/students to participate in tracking and chasing our own amateur balloon launches
- Distance Sensing with Ultrasonic Sensors (Max W0MXX)
    - Arduino Project
        - Group build: Read from Ultrasonic sensor to Serial Plotter
        - Show off more examples they can make on their own:
            - Rotating “RADAR” using “Processing”
            - Obstacle avoiding rover
- Kellye K1SOE - Portable Ops
    - Go Kit
    - Power
    - Antennas
    - Set up, operate, take down
    - Just need go ahead from Kellye on readiness

Has owner but still in idea phase:

- W0MXX - **Fox Hunt attenuator build**
    - Need to iterate on current version
- W0MXX/Need - **Fox Hunts**
    - Direction Finding
    - Radio Orienteering
- Joe KM1P - Electromagnetic wave/null demo UHF
    - Prebuilt and set up

    - Demo, try it out
    - Lights off, long-exposure/video
- Joe KM1P - Satellite Communication
    - Work-sat.com
    - Weatherfax
    - Jonathan Godfrey?
    - SSTV (from ISS)
- Joe KM1P - 10m Dipole Build
- Joe KM1P - Human Presence Sensing
- Max W0MXX - Tiny4FSK Build
    - Needs reflow oven
- Oliver Johnson - Field Trip to ARRL Headquarters
- Shantanu - Generating and Reading Electrical Signals (2+ sessions)
    - Oscilloscope and Signal Generator
- Shantanu - Converting Electrical to Magnetic Fields
- Shantanu - Generating Electrical Power from Mechanical Energy
- Shantanu - Young's Double Slit Experiment
    - Constructive and Destructive Interference
- Brett - Various small kits builds

High Priority Topics that Need an Owner:

- Antenna Tuning/Sizing
    - Building simple dipoles at different frequencies perhaps
        - Something we can test together
    - Using antenna calculator to calculate length
    - Using antenna analyzer to tune/trim
        - NanoVNA
        - RigExpert
    - Hook up to RTL-SDRs and test receiving

Speculative Ideas (need owner):

- How NOT to Use Your Electrical Components
    - Magic Smoke!
    - Sparks!
    - Shocks!
- Amsat CubeSatSim
- Laser-based motion sensor

- Free space optical communication
- FPV live video systems
- Spoofing and Jamming with HackRF
- Simple wireless-related circuit builds (Brett Miwa or Shantanu)
    - Matching circuit
    - Other RF circuits
- RADAR system build
- SWR Bridge Build
- Faraday Shielding
    - Use HackRF One as transmitter
    - Experiment with different types of shields
    - Real-world examples
- WSPR Demonstration
    - Compare antennas
    - Can check in over multiple sessions
    - Receive WSPR balloons
- DMR
    - Ways in which DMR is used in public service, etc.
    - Origin of DMR?
    - Set up your radio on DMR
    - Try it out
- IoT
    - LoRa
    - Bluetooth
    - Wireless
    - Text messaging over radio mesh network
    - These could each be their own workshop (Arduino builds)
- Remote Ham Radio
- Shortwave receiving kit
    - Prepper lifestyle
    - Talk about propagation
    - Solder the kits (analog and digital)
    - Put up a very basic wire antenna
    - Find some interesting reliable stations
- Starlink
    - Bruce is thinking of getting Starlink for his camper
- Instant messaging via amateur radio
    - HF Winlink
- Uno R4 to build Smart Systems
    - Interfacing with web servers
- Circuit Design Process
    - Breadboard to Perfboard to PCB
- Low Power Electronics
- Reflow Oven Build

- Radio Orienteering
- QRZ or Gigaparts Kits (look into)
- Look for workshops and kits in QST

Possible Guest Workshop Leaders (to reach out to):

- Marty Sullaway NN1C - (talk to him about involvement)
- 5G/6G Cellular Systems (Prof. Tomás Palacios, MIT) **- CONTACTED**
- Mesh networking (Jim Garner KC1BHD)
- Chip Cohen W1YW **- CONTACTED**
    - Radio Astronomy
    - Fractal Antennas
    - Whatever he wants
- ATV (Roland Hoffman KC6JPG)
- Radiation Exposure
    - Uranium
    - Geiger Counters (RadSens Arduino sensor)
    - Geiger counter mesh node
        - Safecast Bgeige
        - Send it home while running with different student each time to compare radiation levels
        - Possible guest speaker Azby Brown in Fukushima, Japan
        - Tie in to IoT topic
- Building and Operating Radios in Minecraft (Lucas W1BTR)

Previous Sessions:

- **Jan 13** - Types of Antennas and Common Uses (Joe KM1P)
- **Jan 27** - Setting Up Antennas and Radio Equipment for Winter Field Day (Bruce N9JBT)