

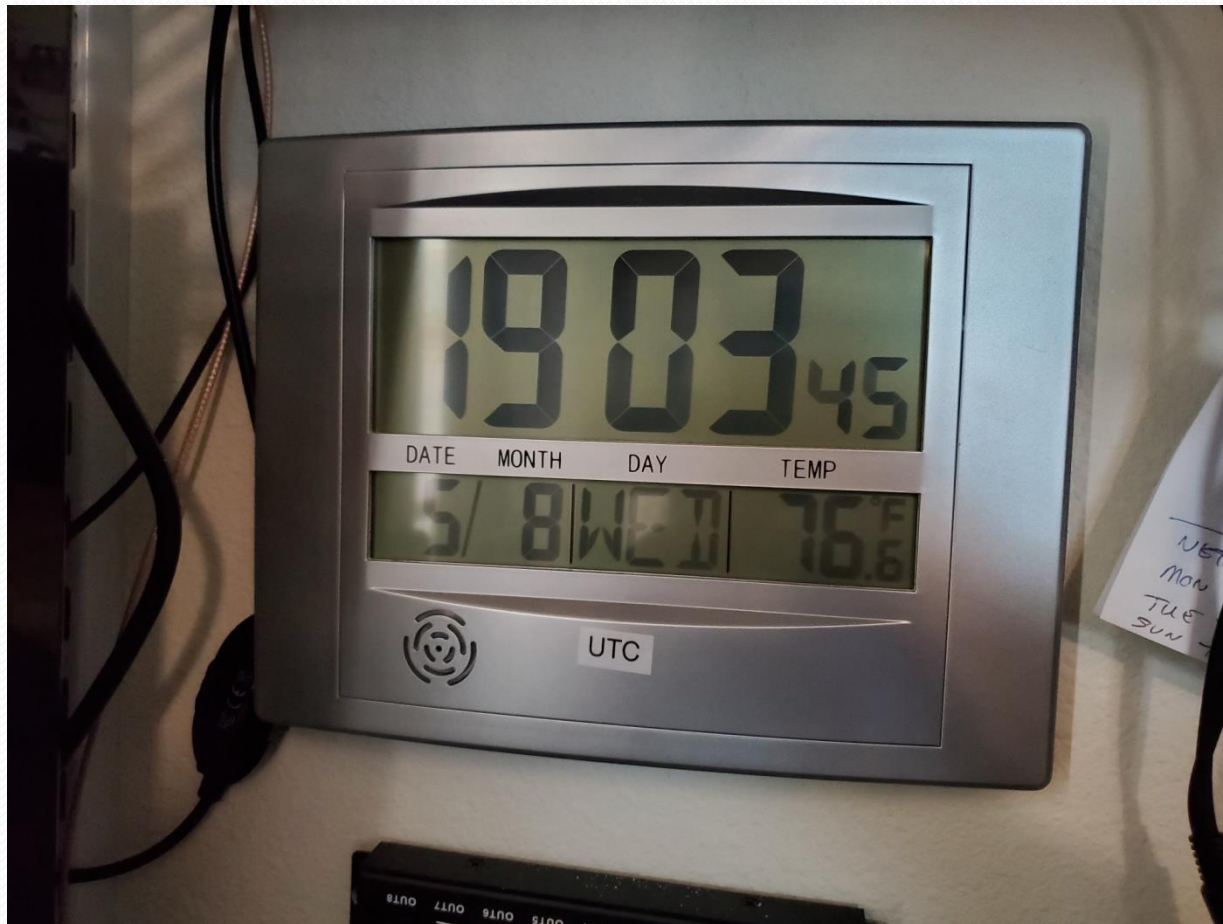
# An Easy to build HamClock

By Don KI5AIU

# Why?

- Everyone needs a clock
- UTC and Local time (and date!)
- Current gray line
- Satellite rise and set times

# My first HamClock



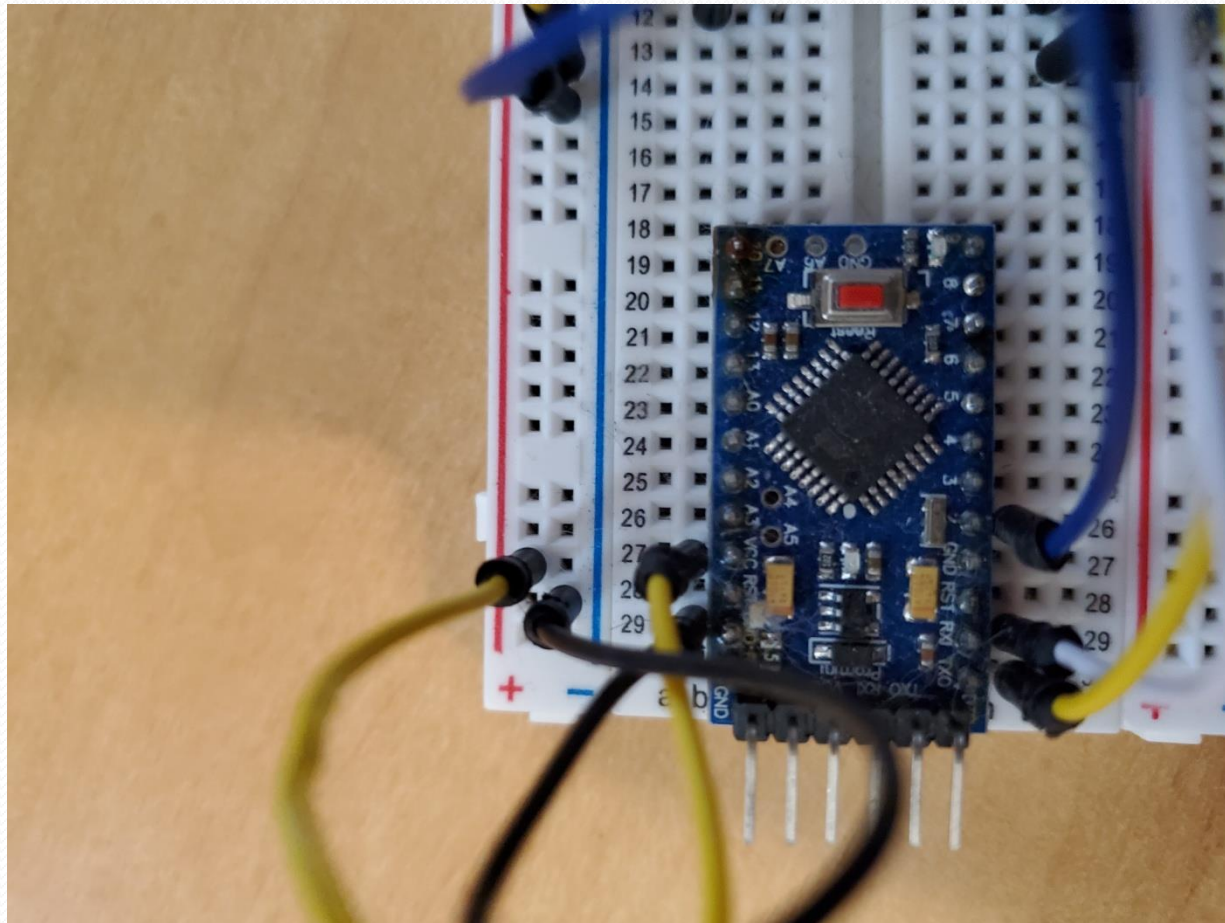
# Options

- Started coding a two clock display (local and UTC) using an Arduino and a two line display.....
- Read about ESPHamClock in QST (October 2017)
- <http://www.clearskyinstitute.com/ham/HamClock/QST-HamClock.pdf>

# HamClock

- Initially based on an Arduino ESP micro controller.
- Pros
  - Inexpensive
  - Low power
  - Very small
- Cons
  - No direct support for HDMI

# Arduino ESP MCU



# Raspberry Pi?

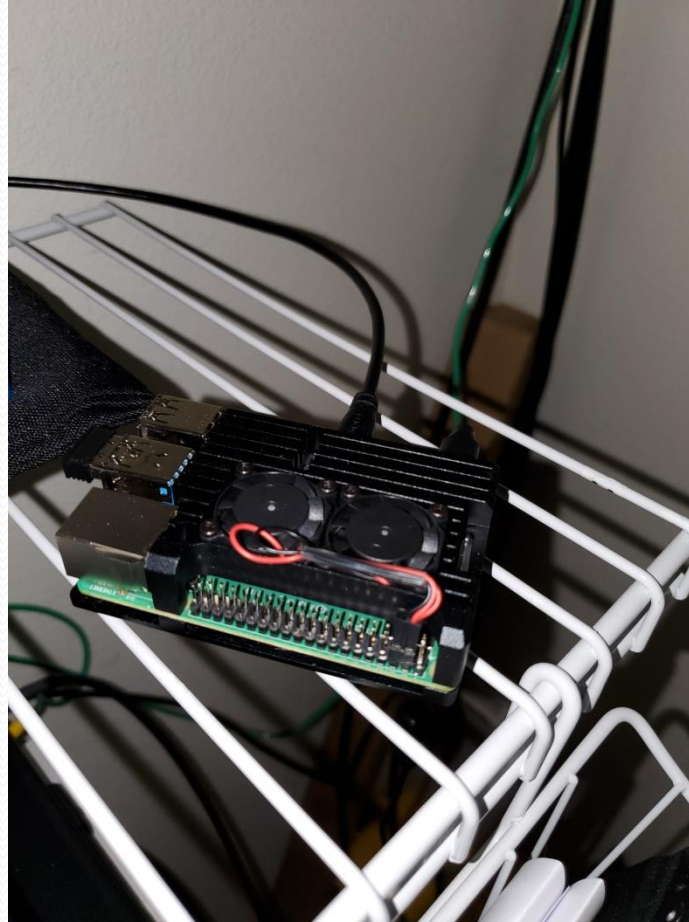
- Fortunately, the HamClock also runs on Raspberry Pi
- Tested on
  - Pi Zero – runs; but runs high utilization and hot
  - Pi 3B – runs fine, no issues
  - Pi 4 – runs fine, no issues; and now easier to find than Pi 3B!
  - **Note that each of these Raspberry Pi systems uses a DIFFERENT HDMI cable! Pi Zero uses an HDMI mini, Pi 3B uses a regular HDMI, and Pi4 uses a HDMI micro! Get the right cable! DAMHIKT.**

# HamClock on a Pi 3B





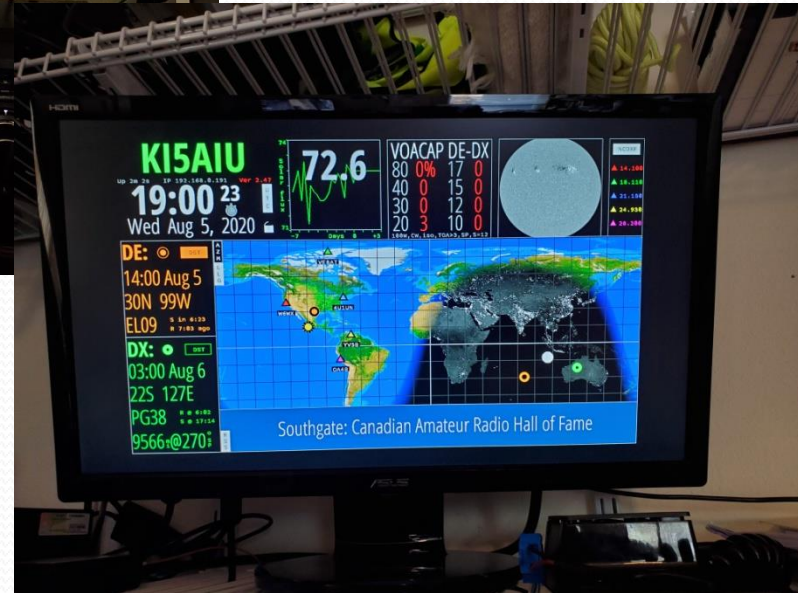
# HamClock on Pi 4



# HamClock Display

- Lots of detail, so a large display works best
- I use the Pi to drive an 22" computer display with HDMI, DVI and VGA inputs
  - HDMI – for Ham Clock display
  - DVI – for radio display
  - VGA – for computer/SDR display
- User selectable input

# Display

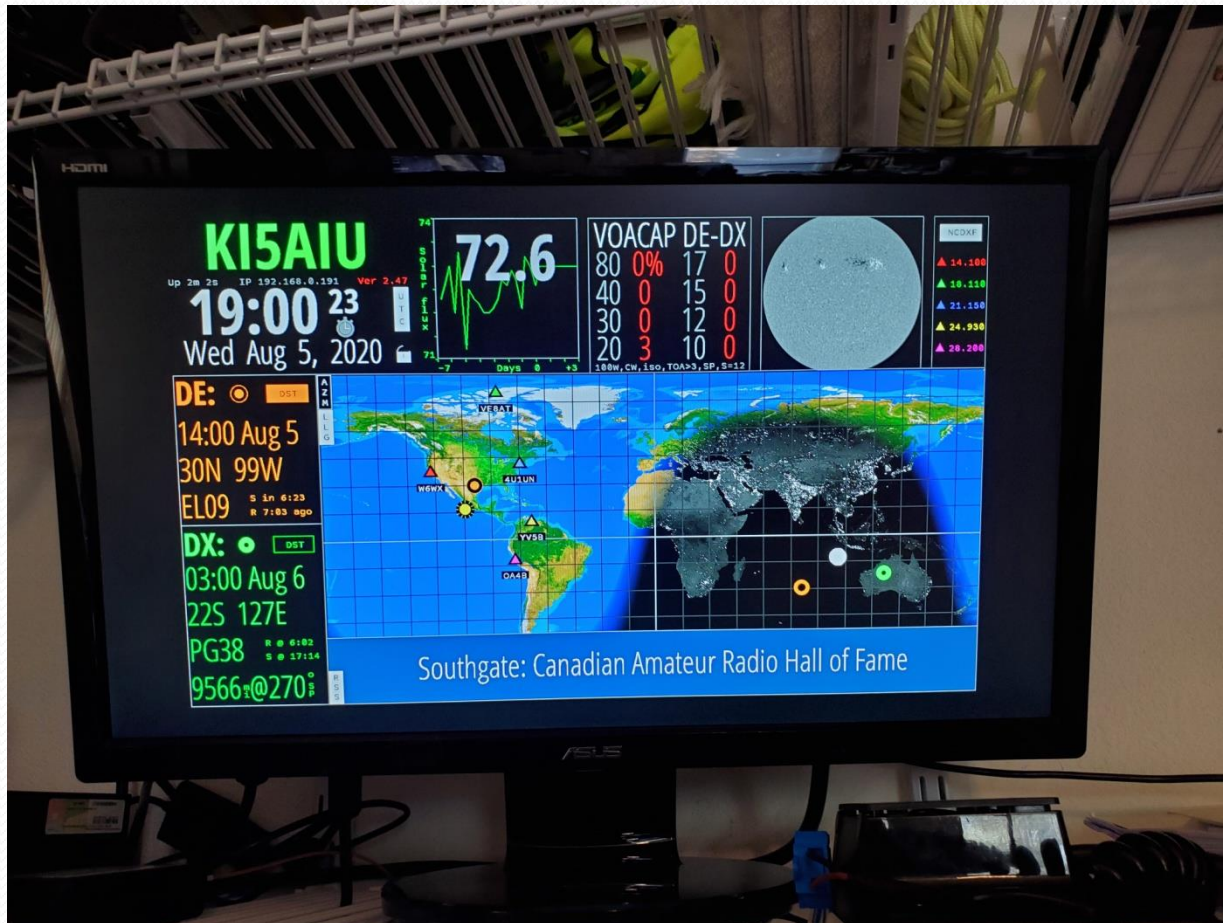


# How to build for HDMI

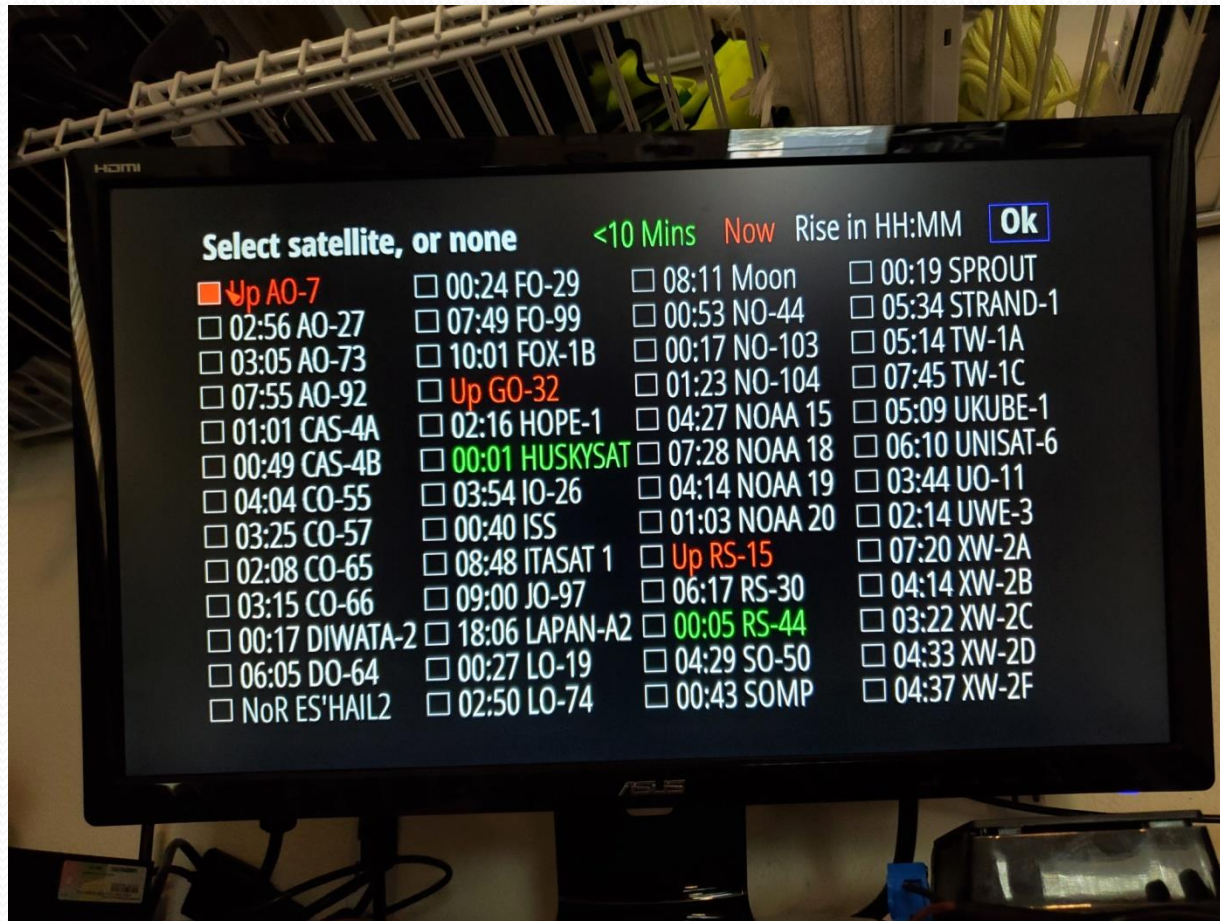
1. log in via ssh (or putty, etc)
2. run `sudo raspi-config` one time and set the following options:
  - **For HDMI only:** Advanced options -> Resolution -> choose one the same or a little larger than a HamClock size
3. reboot
4. connect to your RPi again with ssh and run the following commands:
  - `curl -o ESPHamClock.zip http://www.clearskyinstitute.com/ham/HamClock/ESPHamClock.zip`
  - `unzip ESPHamClock.zip`
  - `cd ESPHamClock`
  - `make -j 3 hamclock-fbo-1600x960`
  - `sudo ./hamclock-fbo-1600x960`
5. The example make command above will build HamClock at 1600x960 pixels for fbo. If you want the smaller size 800x480 for the 7" display, redo the make and sudo commands with `hamclock-fbo-800x480`. Type `make help` for a list of other fbo sizes available.

Full details at: <http://www.clearskyinstitute.com/ham/HamClock/>

# Results



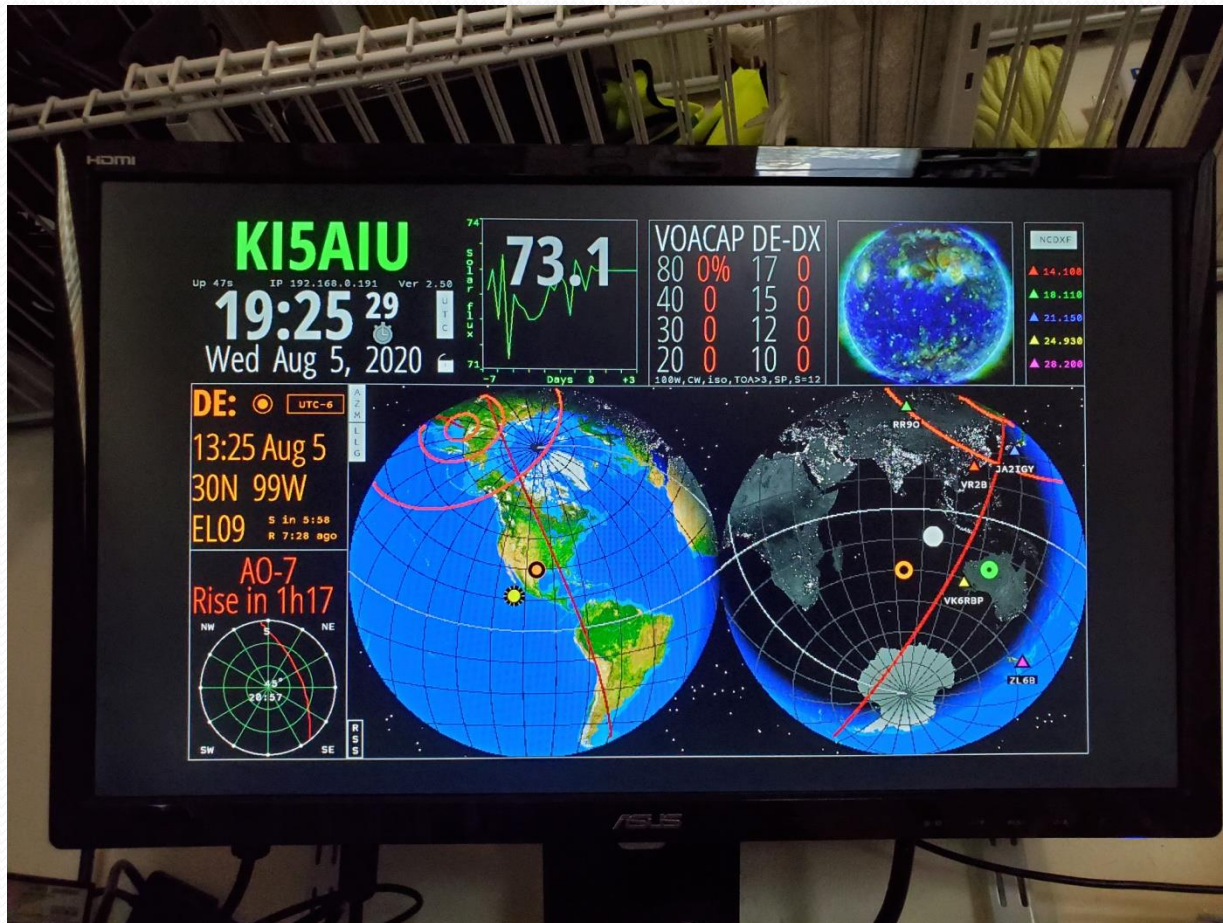
# Results



# Results



# Results





# Decoding the screens

HamClock Touch Controls and Map Symbol Key  
V 2.07

The screenshot shows the HamClock Touch Controls interface with various touch controls and map symbols annotated with red arrows and text labels. The interface is divided into several sections:

- Top Section:** Contains call sign, temperature, humidity, wind speed, and sky condition. Call sign: **WBOOEW**, Temperature: **43°F**, Humidity: **59% RH**, Wind: **SW @ 10 mph**, Sky: **clear sky**.
- Time and Date Section:** Shows the current time and date. Time: **17:22 48**, Date: **Sat Sep 15, 2018**.
- Map Section:** A world map showing the current location and various touch controls. Location: **DE: 10:22 Sep 15**, **32N 111W**, **DM42**. Map symbols include **DE Add 1 hour**, **DE East 1 degree**, **DE West 1 degree**, **DX Add 1 hour**, **DX West 1 degree**, **DX East 1 degree**, **DE Antipode**, **NCDXF beacon**, **Tap to set DX**, **Short path**, **Long path**, **Sun**, and **Moon**.
- Bottom Section:** Shows the current location and various touch controls. Location: **DX: 03:22 Sep 16**, **35S 144E**, **QF25**, **8217/@244**. Touch controls include **Toggle Miles or km**, **Short or Long path**, and **Toggle RSS feeds on/off**.

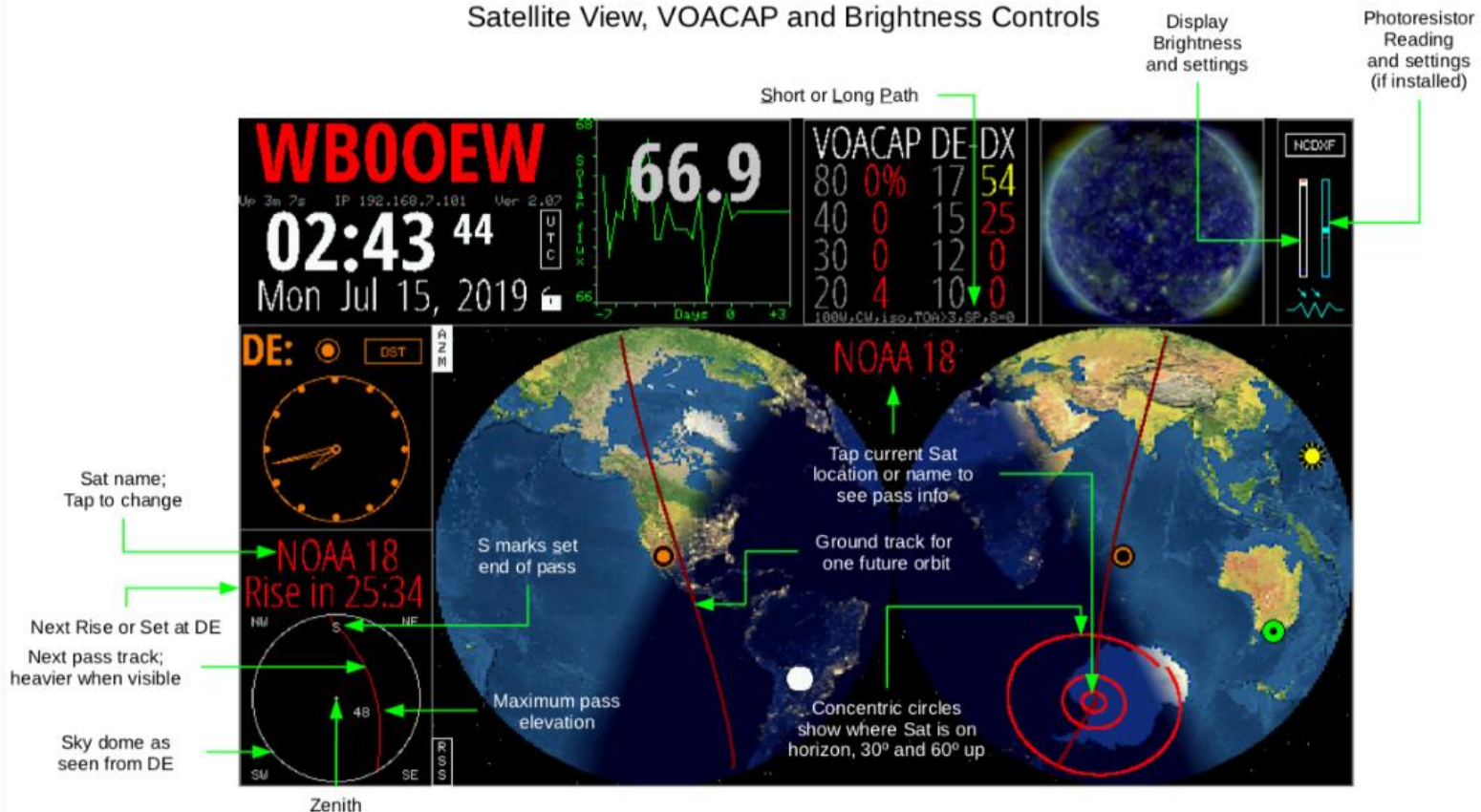
Touch Controls and Map Symbols:

- Cycle Call sign background colors
- Cycle Call sign foreground colors
- Ahead one hour or minute
- Back one hour or minute
- Ahead one day, month, date or year
- Back one day, month, date or year
- Toggle analog clock
- DE North 1 degree
- DE South 1 degree
- Toggle alternate grid
- Choose satellite
- DX North 1 degree
- DX South 1 degree
- Toggle alternate grid
- Toggle Miles or km
- Short or Long path
- Toggle RSS feeds on/off
- Zero seconds
- Check for update
- Set to UTC
- Lock screen on/off
- Hold to restart
- Toggle Sunspots or Solar flux; shows weather after new DX
- Toggle XRay or Kp index or VOACAP
- Cycle Solar images
- Toggle NCDXF beacons on/off
- Display brighter
- Display dimmer
- DE Add 1 hour
- DE East 1 degree
- DE West 1 degree
- DX Add 1 hour
- DX West 1 degree
- DX East 1 degree
- DE Antipode
- NCDXF beacon
- Tap to set DX
- Short path
- Long path
- Sun
- Moon

Southgate: Hurricane Florence: ARRL Hurricanes page

# Decoding the screens

Satellite View, VOACAP and Brightness Controls





Questions?