

N8VMX



Up 10.0.2.15 Ver 2.74

03:32 24

Sun Feb 27, 2022

UTC

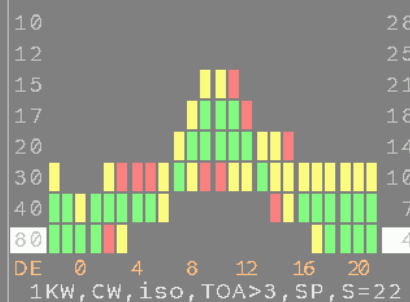


Sunspot Number

22.0

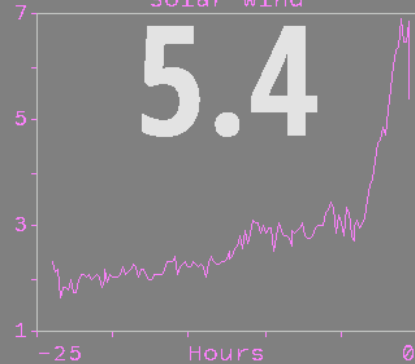


VOACAP DE-DX



Solar wind

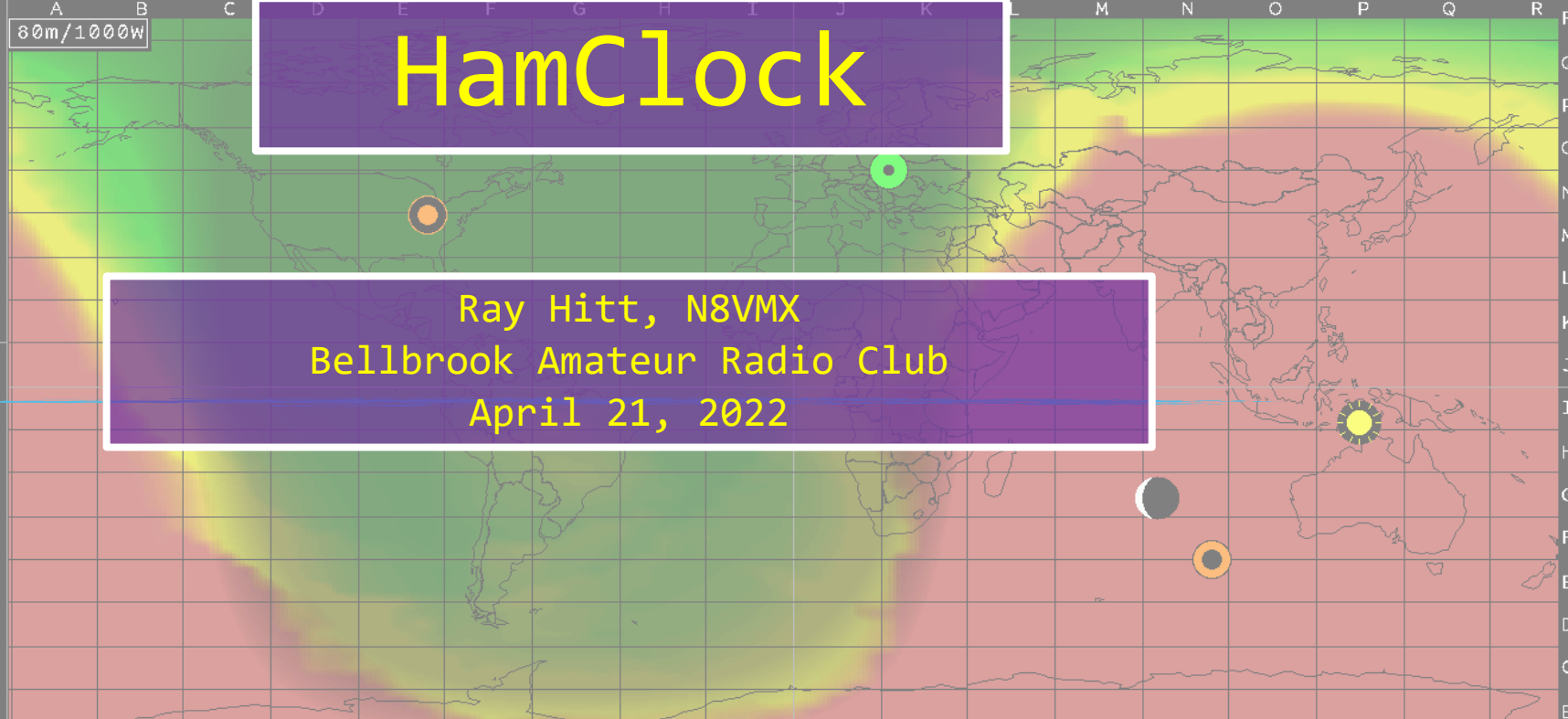
5.4



SSN 22
SFI 96
X-Ray B3.2
Kp 1

DE: UTC-5
22:32 Feb 26
40N 84W
EM79 R in 8:41
S 4:08 ago

DX: UTC+1
04:32 Feb 27
50N 22E
K010 R @ 6:21
S @ 17:08



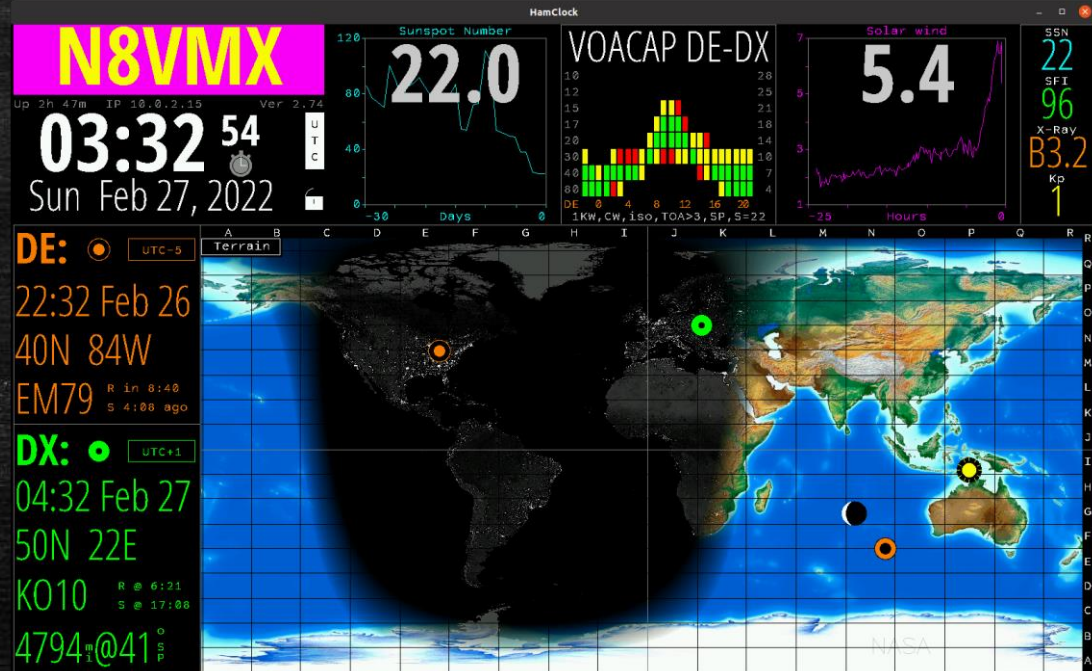
HamClock

Ray Hitt, N8VMX
Bellbrook Amateur Radio Club
April 21, 2022



HamClock - Topics

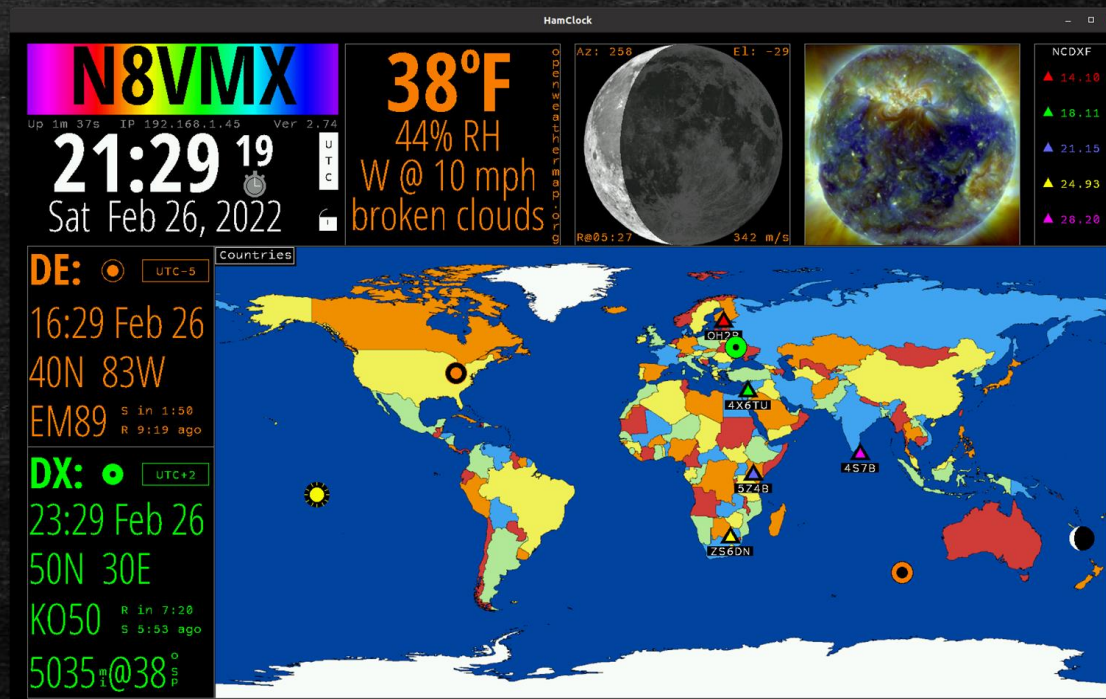
- What is it?
- Why would a ham like to use it?
- How can you get it running?
- Reference info





What is HamClock?

- HamClock is a graphical app designed by Elwood Downey, WBØOEW, showing the time, world map with sunlit and dark areas and numerous other utilities useful to hams:
- Customizable “panes” can be tailored to your requirements
- HamClock is available as Linux source code but can be used in many different ways:
 - Standalone clock appliance
 - Raspberry Pi with monitor
 - Linux desktop application
 - Linux on Windows or MacOS host (with some gyrations)





Features

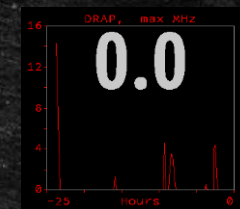
UTC date/time

- Enter your Callsign in Setup
- Click on time or date to change
- Click on UTC to sync
- Click on stopwatch to use
- Click on padlock to lock keys



D-Region Absorption Prediction

Shows highest frequency attenuated by at least 1 dB due to solar X-ray flux and SEP events



DE Weather

(Home QTH)



Northern CA DX Beacons

Color code for symbols on map where Beacon received and frequency (MHz)



DX Weather

- Click on map to select DX location
- (DX example is Kyiv)



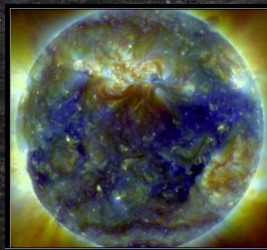


Features

* SDO: Solar Dynamics Observatory

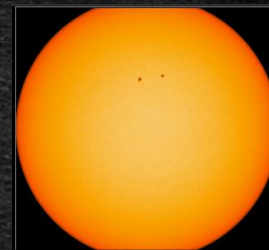
SDO* Composite

Red: 211 Å (coronal active regions)
Green: 193 Å (corona and hot flare plasma)
Blue: 171 Å (coronal loops and quiet regions)



SDO* 6173 Å

Intensitygram



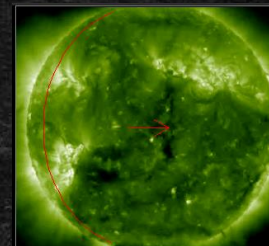
SDO* 193 Å

(Corona and hot flare plasma)



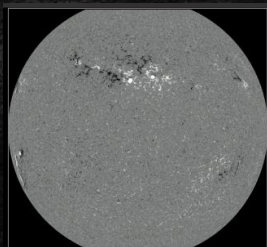
Stereo-A

Trails in earth's orbit about 35
Degrees (at the moment),
Shows elements of sun not yet
in view on earth



SDO* Magnetogram

Helioseismic and Magnetic Imager



Moon Info

Moonrise, moonset, phase,
Click to show DX Moonbounce
info on main map

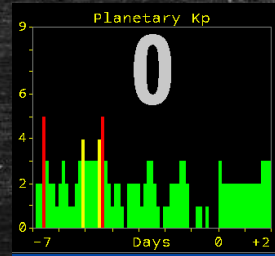




Features

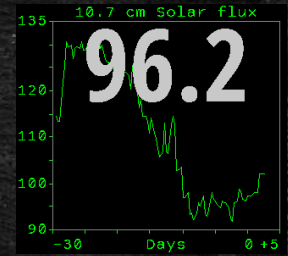
Geomagnetic Index

Planetary K



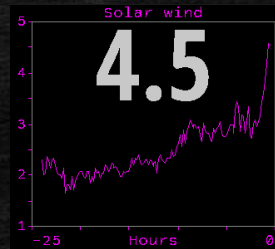
10.7 cm Solar flux

Current value
30 day history
3 day forecast



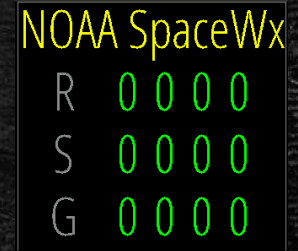
Solar Wind flux

10^{12} protons $m^{-2} s^{-1}$
> 5 good chance for aurora
24-hour history



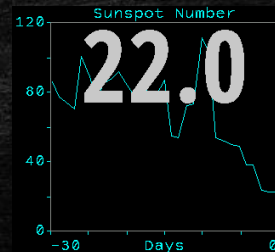
NOAA Space Weather

Now and 3 day forecasts
Scale goes from 0 .. 5
Radio blackouts
Solar Radiation Storms
Geomagnetic Storms



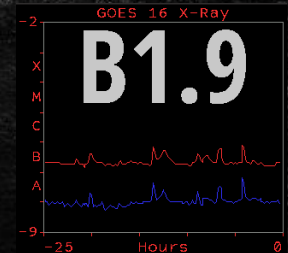
Sunspot number

Current value
30 day history



GOES 16 X-Ray flare class

Current level, $\log(W m^{-2})$
24-hour history





Features

DE (Home QTH) Info

- Many clickable parameters
- Date/Time/Location mode
- Calendar mode
- Change UTC offset
- Lat/Long adjust
- Change sunrise/sunset format

DE: UTC-5
16:29 Feb 26
40N 83W
EM89 S in 1:50
R 9:19 ago

DX: UTC+2
23:56 Feb 26
50N 30E
K050 R in 6:53
S 6:19 ago
5035^o_I@38^o_SP



DX Info

DX (Distant Station) Info

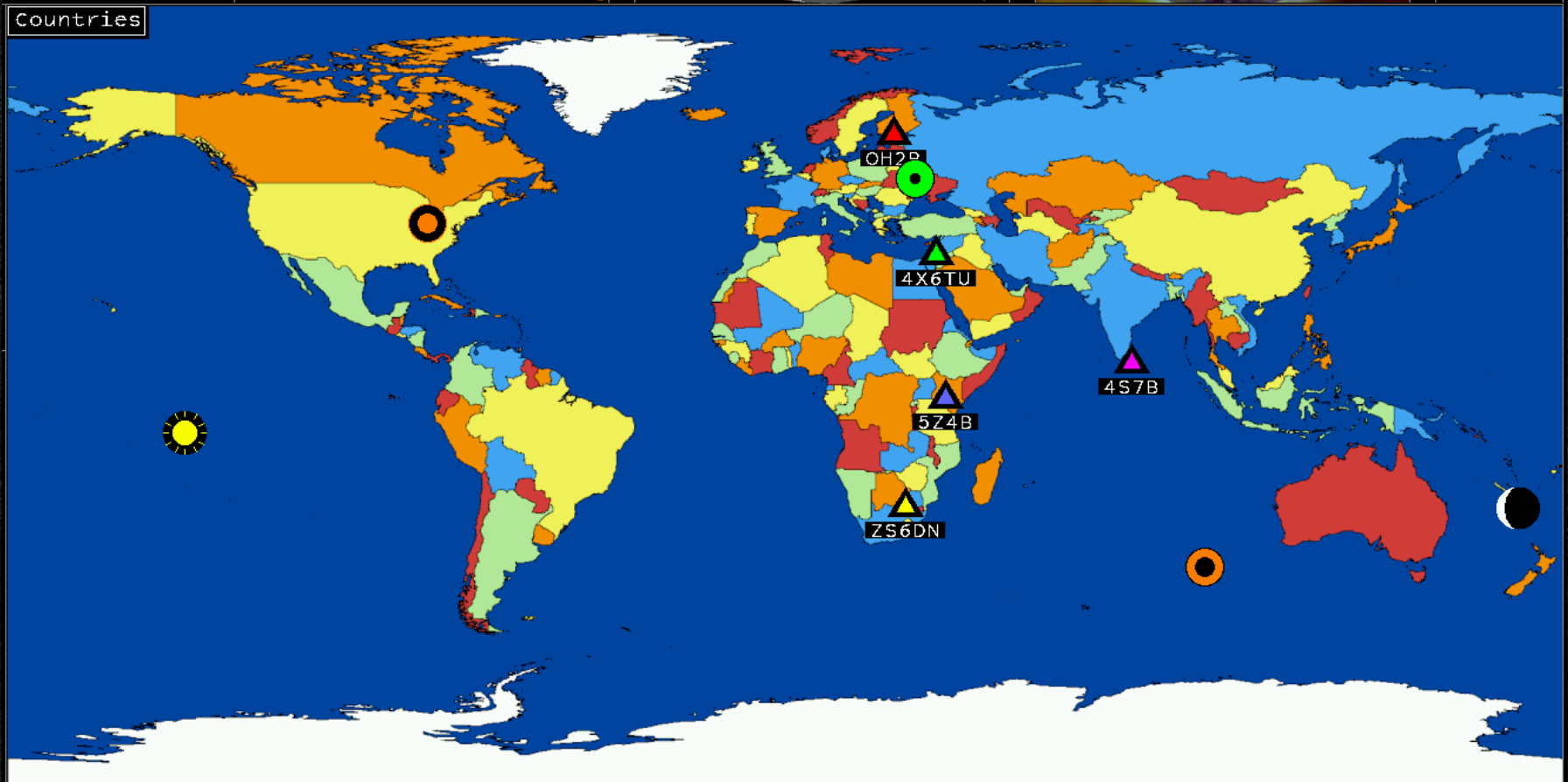
- Many clickable parameters
- Change UTC offset
- Lat/Long adjust
- Show WX
- Short/Long Path toggle
- Toggle **Satellite pass** or **DX info**

DX in this example is Kyiv

Satellite Pass Info

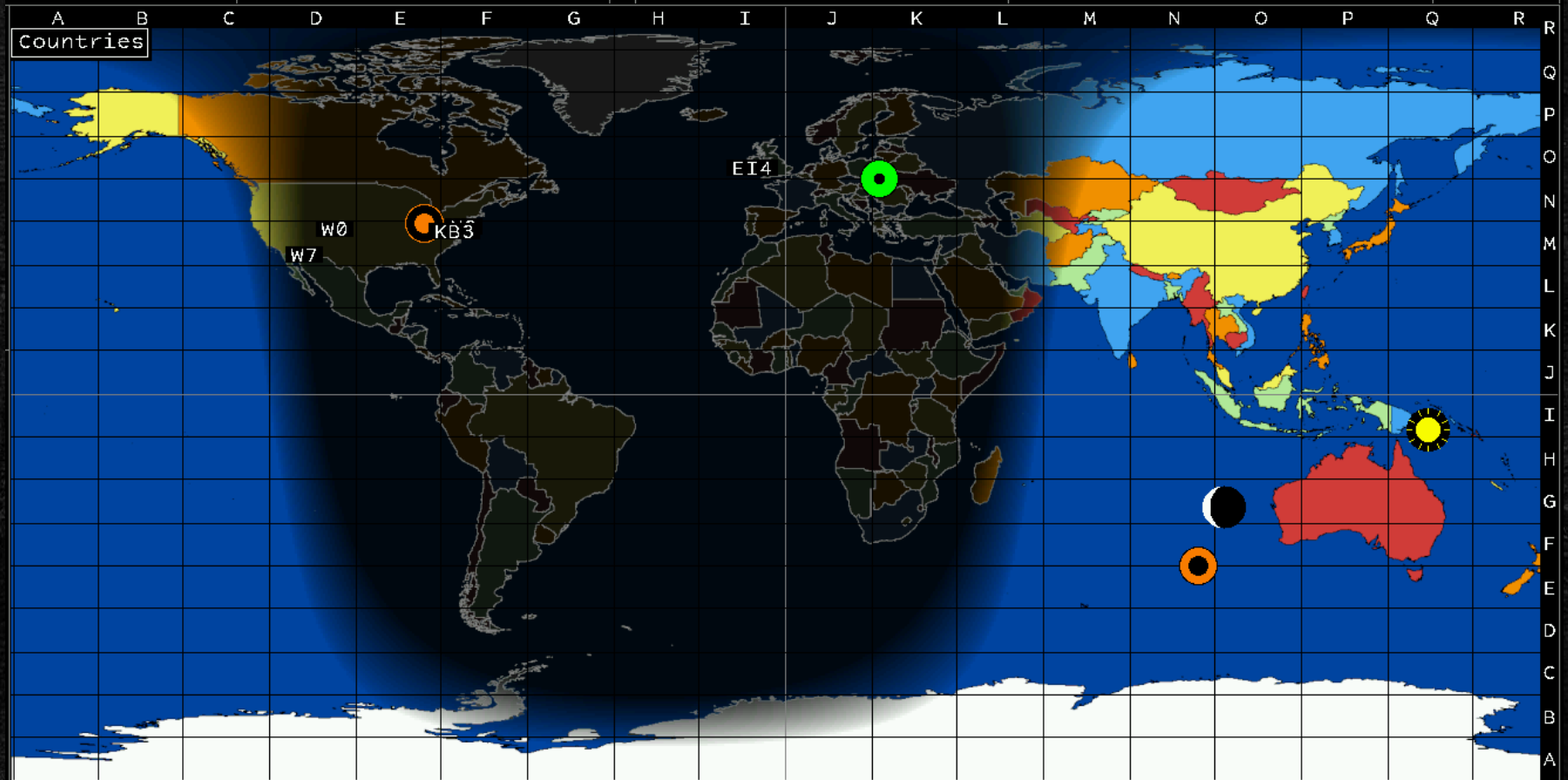


Map Panel Countries



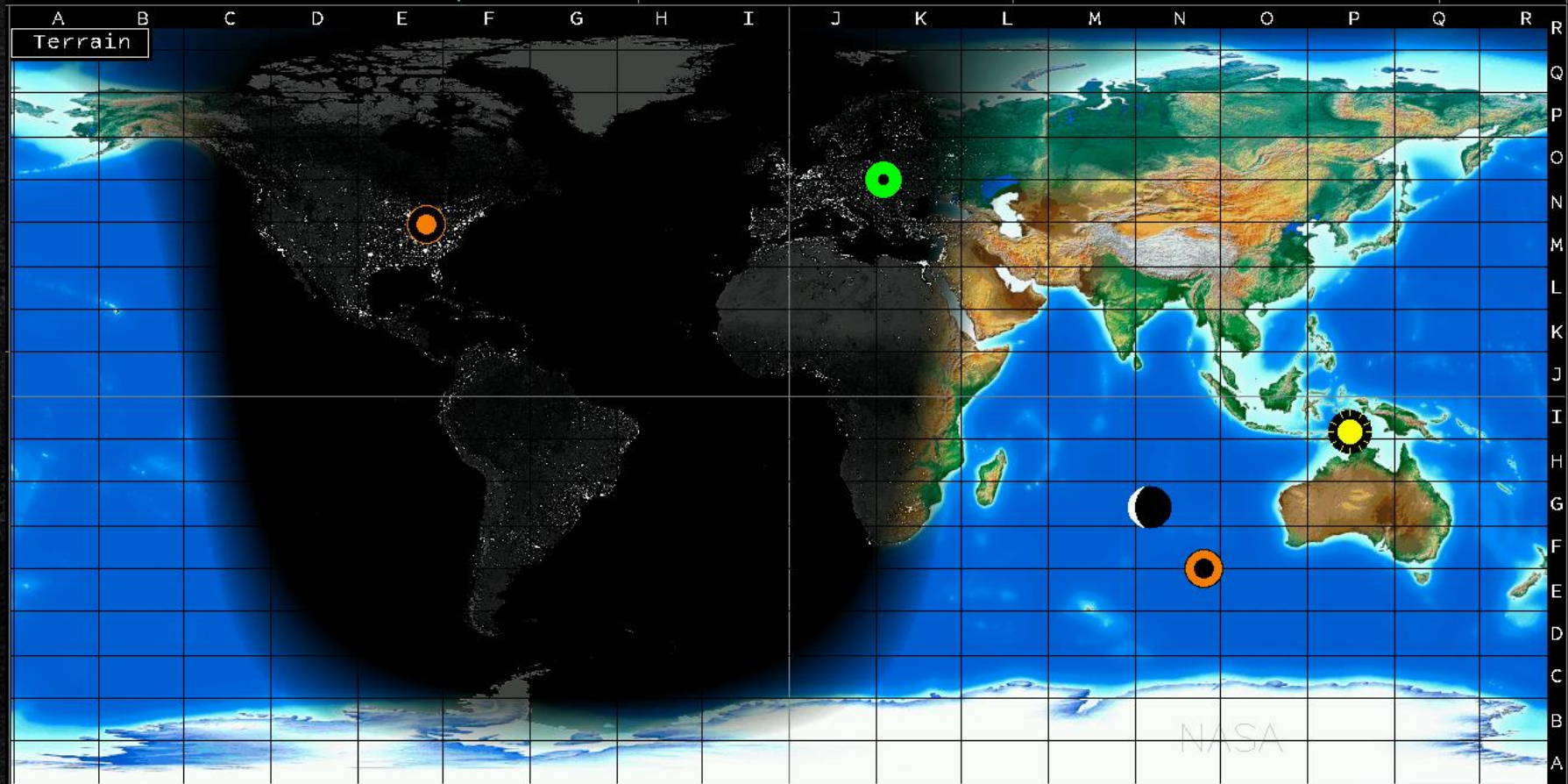


Map Panel Countries with Day/Night Coverage



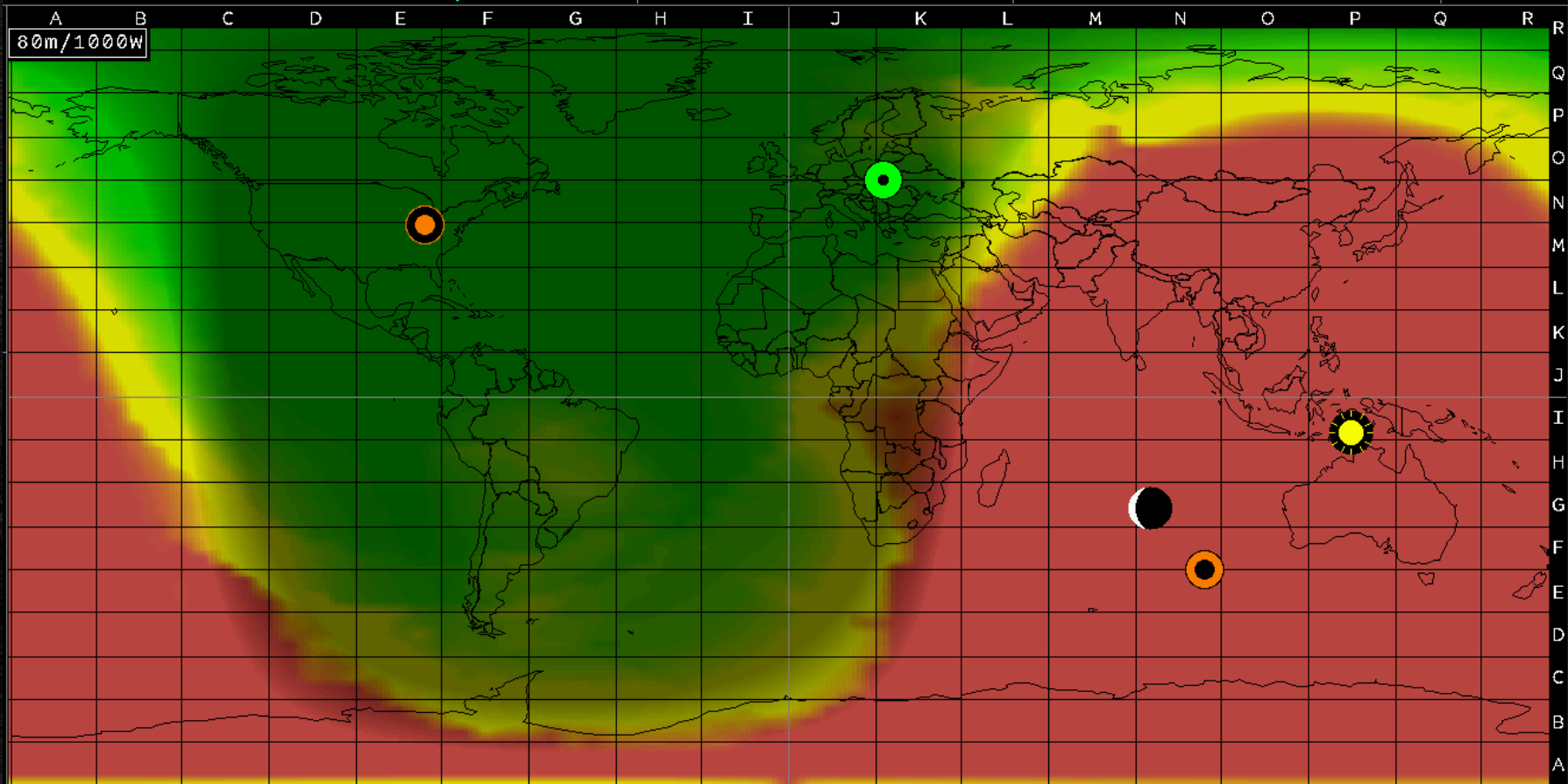


Map Panel Terrain with Day/Night Coverage





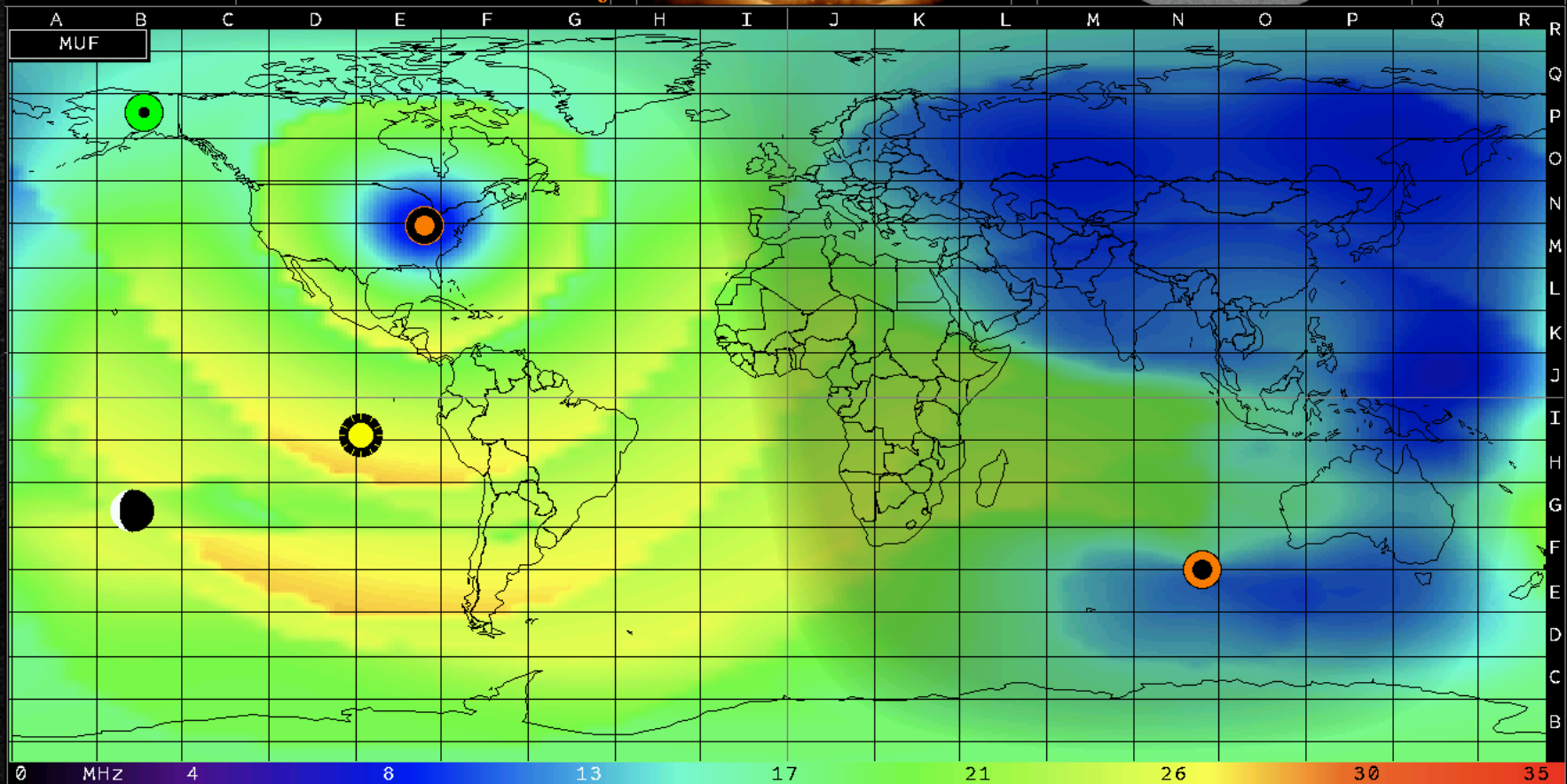
Map Panel VOACAP Coverage from DE (Home QTH)





Map Panel

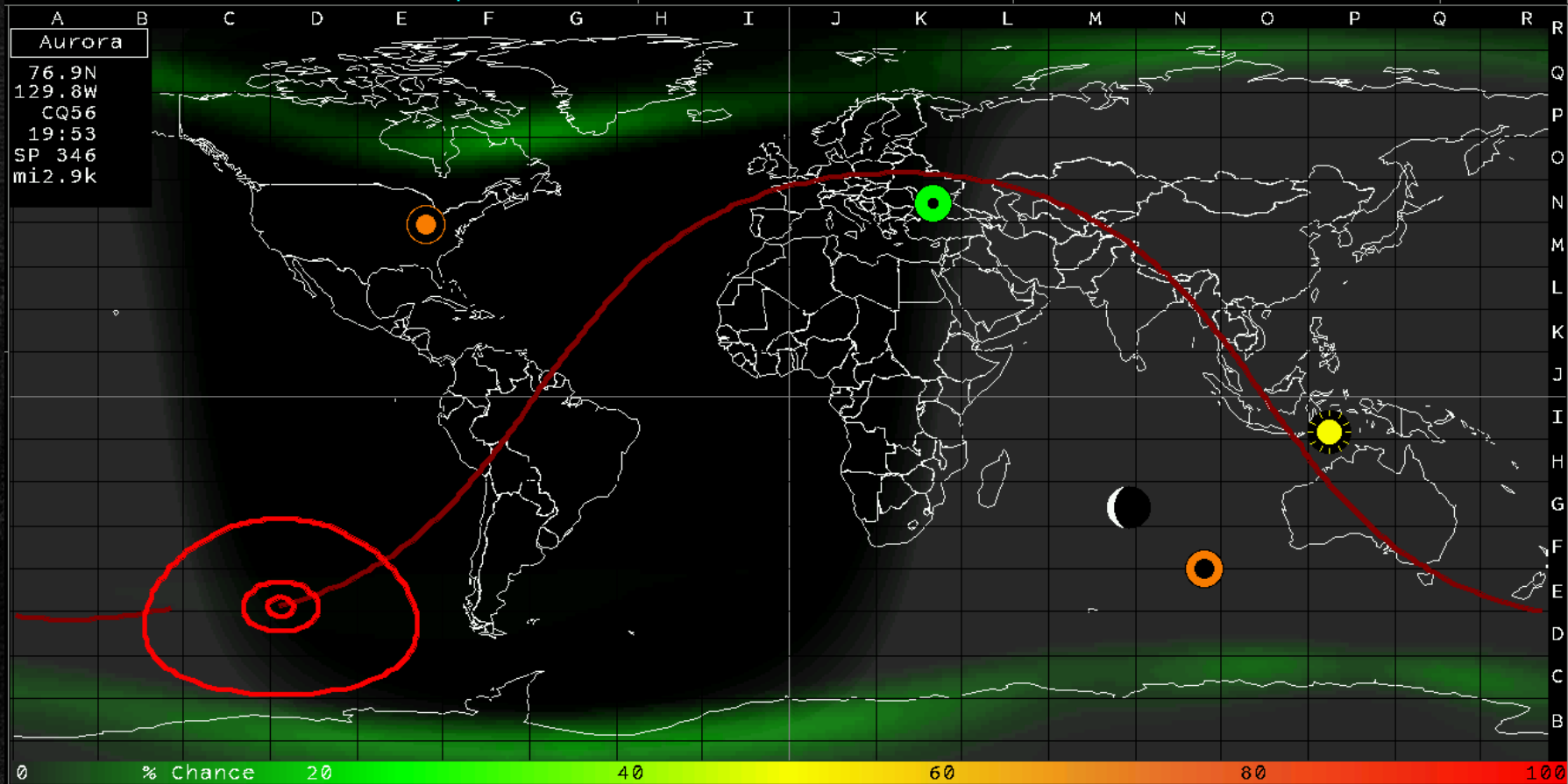
Maximum Usable Frequency from DE (Home QTH)





Map Panel

Aurora and ISS Orbit





Map Panel

Satellite Pass Times (ISS in this example)

Day	Rise	Set	Up
Sun	02h24	02h34	10:24
Sun	04h00	04h11	11:11
Sun	05h38	05h48	09:55
Sun	07h16	07h26	09:38
Sun	08h53	09h04	10:53
Sun	10h30	10h41	11:01
Sun	12h09	12h14	05:11
Mon	01h37	01h46	09:22

[Resume](#)

Mon	03h12	03h23	11:20
Mon	04h50	05h00	10:16
Mon	06h28	06h37	09:29
Mon	08h05	08h16	10:32
Mon	09h42	09h53	11:14
Mon	11h20	11h28	07:58
Tue	00h50	00h57	07:42
Tue	02h24	02h35	11:15



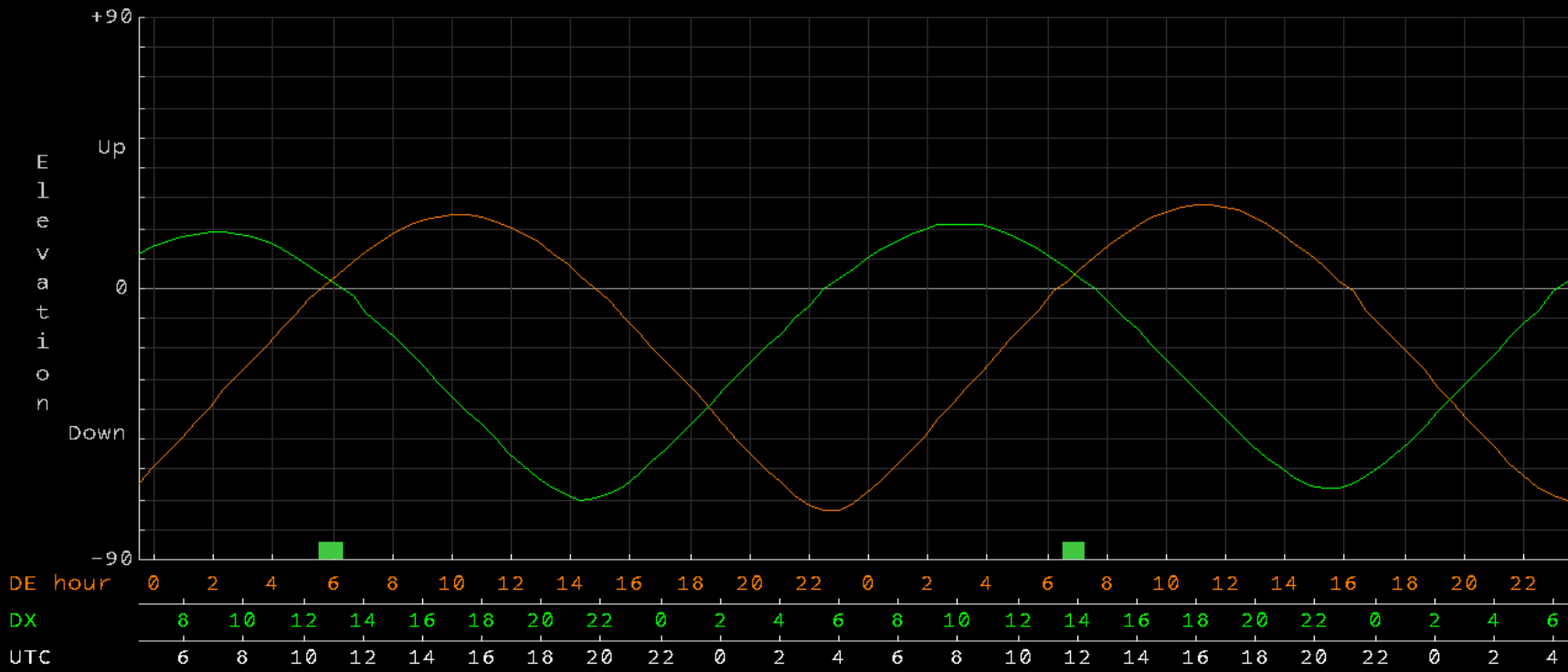
Map Panel

Moon Bounce to DX (Kyiv in this example)

Next both up 00h44
DE 05:33 06:18
DX 12:33 13:18
UTC 10:33 11:18

Lunar Elevation at DE and DX

[Resume](#)





HamClock – How to get it running

- **Purchase preassembled**
 - Raspberry Pi with your own monitor \$299
 - Assembled into Cherry, Walnut, Maple frame \$399
- **Build from Oct 2017 QST Article**
 - Single board computer, touch screen, etc.
 - Complexity: ☺☺☺, Cost: around \$100
- **Compile on Raspberry Pi**
 - Pi-3 or Pi-4, HDMI monitor
 - Complexity: ☺☺, Cost: depends on Pi and monitor (\$35-\$75 Pi, \$50-\$150 monitor)
- **Compile ESPHamClock software on Linux computer**
 - Complexity: ☺, Cost: \$0 (presuming Linux computer or VirtualBox Linux guest on Windows host computer)
- **Install on Windows 10**
 - Requires installation of WSL (Windows System for Linux) or VirtualBox running a Linux virtual machine
 - Detailed directions at <http://www.clearskyinstitute.com/ham/HamClock/#tab-contrib>
 - Complexity: ☺☺☺, Cost: \$0 (presuming you have Windows 10 or Windows 11 computer)

Note: supply chain affecting part availability for many of these items



HamClock – Original Parts List

- Adafruit HUZZAH ESP8266 Wi-Fi system-on-chip **\$16.95**
 - <https://www.adafruit.com/product/2821>
- RA8875 Driver Board for 40-pin TFT Touch Displays - 800x480 Max **\$39.95**
 - <https://www.adafruit.com/product/1590>
 - 40-pin FPC Extension Board + 200mm Cable **\$4.50**
 - <https://www.adafruit.com/product/2098>
- Pimoroni Raspberry Pi 7" Touchscreen Display Case – Noir **\$15.00**
 - <https://www.adafruit.com/product/2033>
 - Photo cell (CdS photoresistor) **\$0.95**
 - <https://www.adafruit.com/product/161>
- Adafruit BME280 I2C or SPI Temperature Humidity Pressure Sensor - STEMMA QT **\$14.95**
 - <https://www.adafruit.com/product/2652>
- **TOTAL \$92.30**

Note: supply chain affecting part availability for many of these items

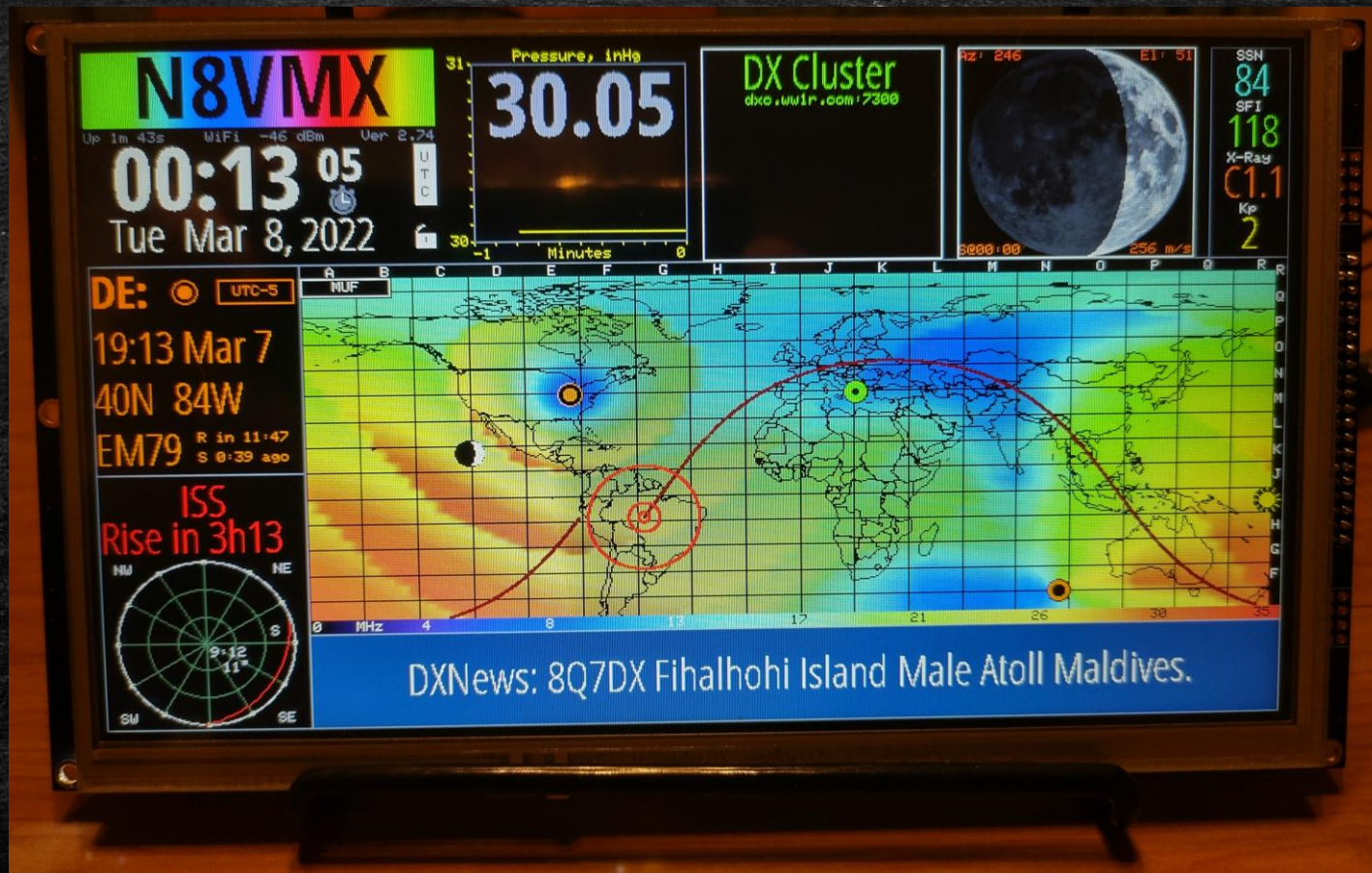


HamClock – Parts List for Optional 9” Display

- Adafruit HUZZAH ESP8266 Wi-Fi system-on-chip \$16.95
 - <https://www.adafruit.com/product/2821>
 - 9 inch LCD Module TFT Display w/Touch Panel \$92.83
 - <https://www.buydisplay.com/9-inch-lcd-module-tft-display-w-touch-panel-izc-serial-spi-arduino>
 - Photo cell (CdS photoresistor) \$0.95
 - <https://www.adafruit.com/product/161>
 - Adafruit BME280 I2C or SPI Temperature Humidity Pressure Sensor - STEMMA QT \$14.95
 - <https://www.adafruit.com/product/2652>
- **TOTAL** **\$125.98**

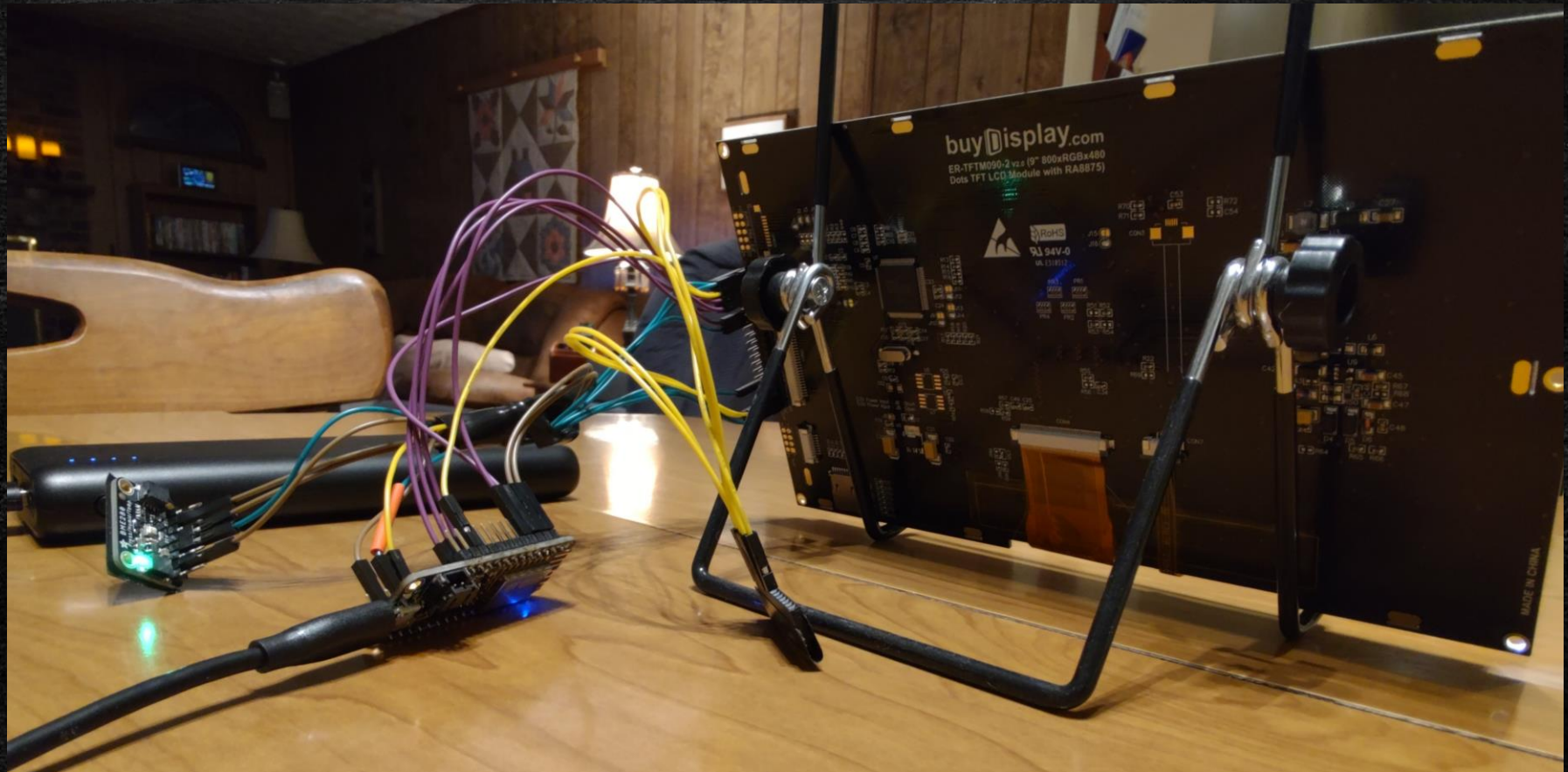


Hamclock - 9" Touch Screen Display





Hamclock - 9" Touch Screen Display





HamClock - References

- HamClock Website
 - <http://www.clearskyinstitute.com/ham/HamClock/>
- Original HamClock October 2017 QST Article
 - <http://www.clearskyinstitute.com/ham/HamClock/QST-HamClock.pdf>
- Preassembled HamClocks
 - <https://www.gigaparts.com/nsearch/?q=hfclock>
 - <https://veritiumresearch.com/hf-clock/>
- DL1GKK hampage (help and links to YouTube videos)
 - <https://dl1gkk.com/ham-clock-raspberry-pi/>
- Solar Dynamics Observatory (SDO)
 - <https://sdo.gsfc.nasa.gov/>

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03:32 24

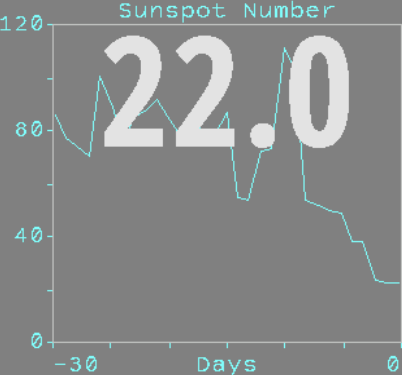
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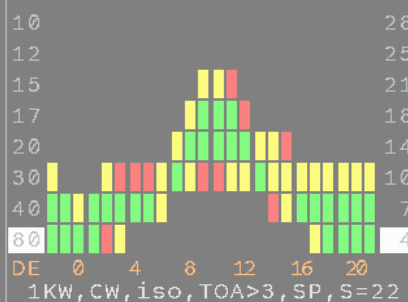


22.0

Sunspot Number



VOACAP DE-DX



5.4

Solar wind



SSN 22
SFI 96
X-Ray B3.2
Kp 1

DE: UTC-5

22:32 Feb 26

40N 84W

EM79 R in 8:41
S 4:08 ago

DX: UTC+1

04:32 Feb 27

50N 22E

KO10 R @ 6:21
S @ 17:08

4794m@41°S

Thanks!

