

HFClock V 2.35 Controls and Symbols

Getting Started

Welcome to HFClock. On the ESP, HFClock starts by asking you to calibrate the touch screen. Then, or firstly on other platforms, it offers a chance to open the Setup screen. Both of these time out if ignored.

A typical Setup screen is shown below. Orange text denotes passive prompts for the corresponding white data entry fields to their right. Cyan text denotes active on/off toggles or other binary options. Tapping on a white data entry field will show a green underbar cursor. As you tap characters on the keyboard, they are placed at the cursor and the cursor moves forward to the next position. Tap **Delete** to erase the last character. You may tap anywhere any time. When finished, tap **Done**. If any fields do not pass basic checks, they are marked with a red Err and you remain on the Setup screen until these are corrected.

- **Call:** enter your call sign, up to 11 characters. This is how you will login into a dx cluster, if used.
- **DE Lat, Long:** these fields are your station latitude and longitude. You may enter +/- degrees or use N/S suffix with Lat and E/W with Long. These fields disappear if IP Geolocate is Yes.
- **Units?** Toggle between Imperial and Metric units
- **Flip screen?** Yes will render the display upside down, useful for some cabling situations. Available only on ESP.
- **IP Geolocate?** If Yes, uses your public IP to set Lat and Long, and removes their prompts. This is usually pretty accurate, but always double-check the results.
- **Cluster?** This toggles whether you want to connect to a Spider DX cluster (other cluster formats are not supported). If active, enter the internet host name and tcp port number of your preferred telnet cluster in the given fields. A nice list may be found at <https://www.ng3k.com/Misc/cluster.html>.
- **WiFi?** This toggles whether to set up WiFi. It is required on ESP clocks so can not be turned off. It is optional on Raspberry Pi and not available on other platforms. When active, type the SSID network name and password in the given fields. On RPi, it is recommended to use this only if you are using wifi only; leave it off if you are using wired ethernet or both.

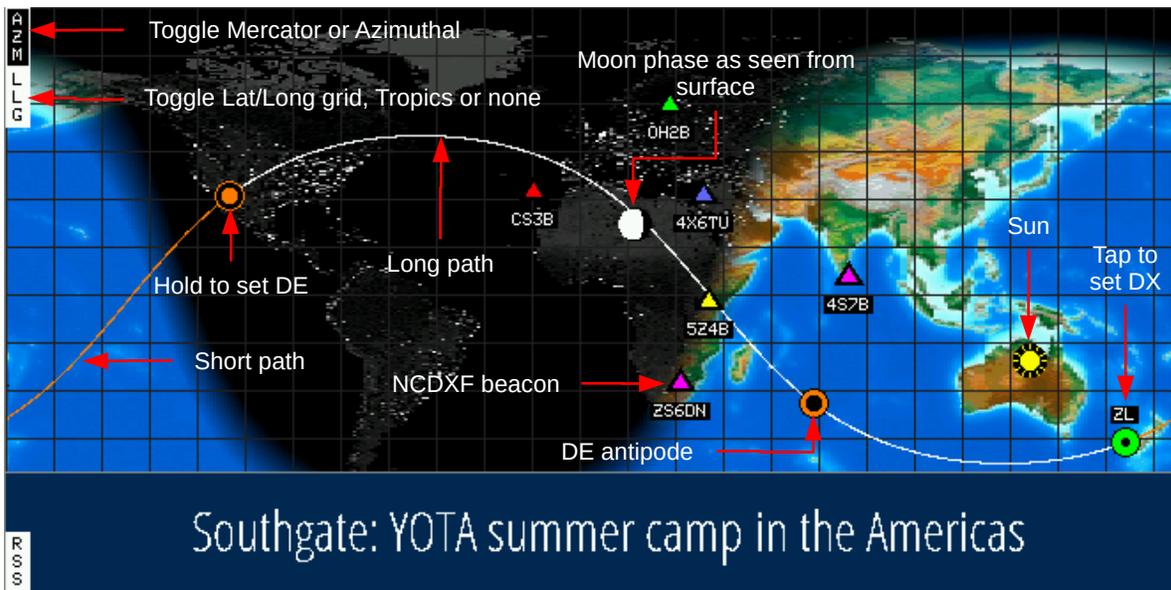
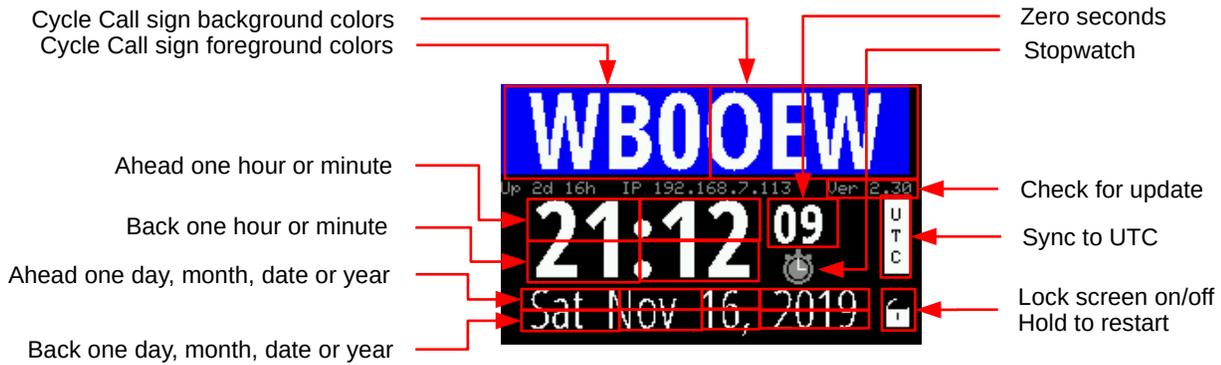
The screenshot shows the HFClock Setup screen with the following configuration:

- Call:** WBOOEW
- DE Lat:** 32N
- Long:** 111W
- Units?** Imperial
- Flip screen?** No
- IP Geolocate?** No
- Cluster?** Spider host: dxfun.com
- port:** 8000
- WiFi?** SSID: clearskyinstitute
- Pass:** from651plan

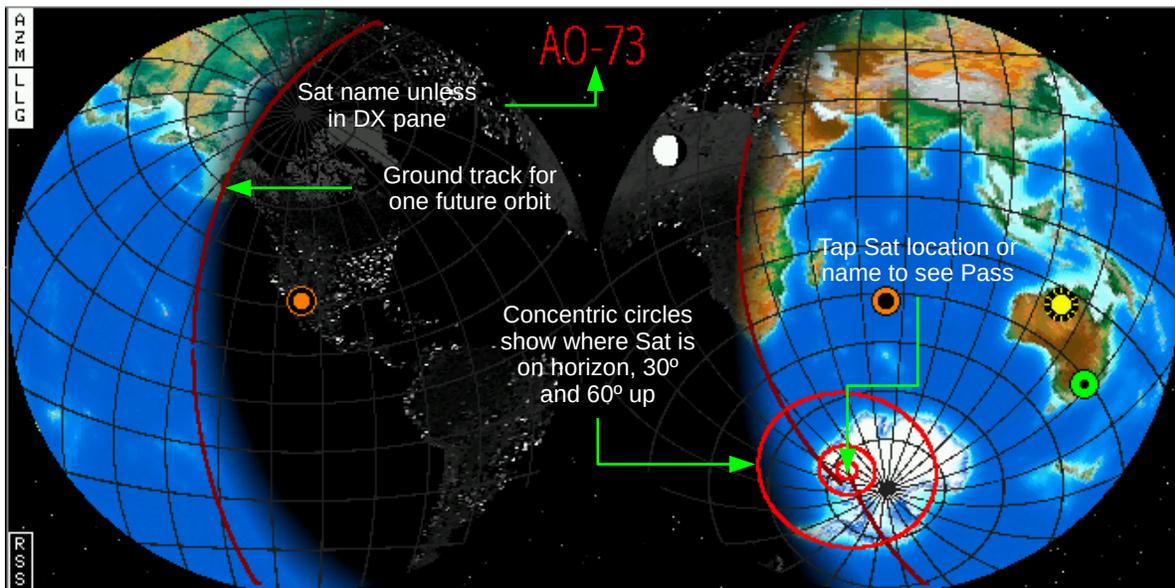
Below the configuration fields is a keyboard with the following layout:

~	!	@	#	\$	%	^	&	*	()	-	+
`	1	2	3	4	5	6	7	8	9	0	_	=
q	w	e	r	t	y	u	i	o	p	{	}	
Q	W	E	R	T	Y	U	I	O	P	[]	\
	a	s	d	f	g	h	j	k	l	:	"	
	A	S	D	F	G	H	J	K	L	;	'	
		z	x	c	v	b	n	m	<	>	?	
		Z	X	C	V	B	N	M	,	.	/	
Delete												Done

HFClock V 2.35 Controls and Symbols

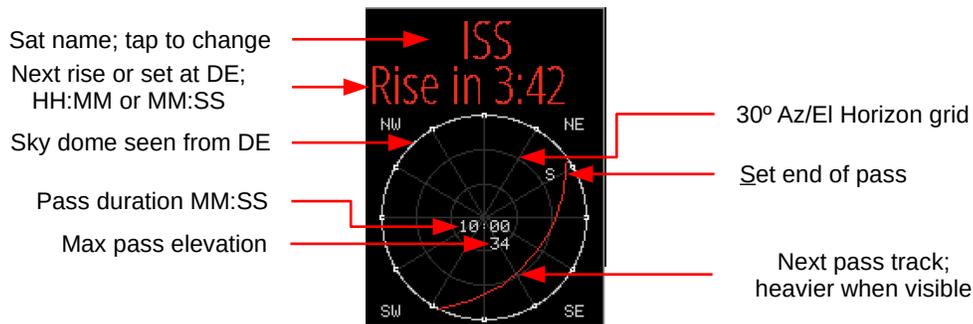


Toggle RSS on/off Mercator projection



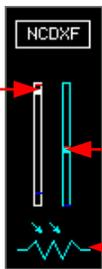
Azimuthal projection

HFClock V 2.35 Controls and Symbols



Display Brightness Control (ESP only)

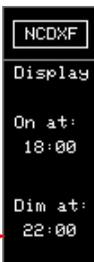
Optional photoresistor reading



Indicates photoresistor is present

Tap to set display brightness at current photoresistor reading

Display On/Off Control (not for GUI)



DE On time

DE Off time

NCDXF Beacons on/off

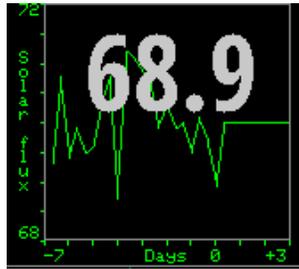
Map color key



Frequency, MHz

HFClock V 2.35 Controls and Symbols

- Solar flux**
- current value
 - 7 days history
 - 3 days forecast

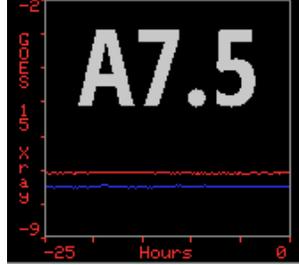
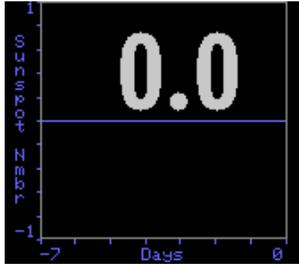


DX Cluster
dxc.wv1r.com:7300

7298.3	K5TA	0353
3670.0	K0UXU	0353
7221.4	KP2M	0354
3515.5	L28E	0354
7231.4	K2ADA	0354
7027.0	UN7ZW	0354
7178.4	NS0R	0354

- Scrolling DX Spider cluster spots**
- Telnet host:port
 - Tap line to set DX
 - DX call kHz
 - UTC HHMM

- Sunspot number**
- current value
 - 7 days history



- GOES 15 Xray flux**
- current event
 - 25 hour history

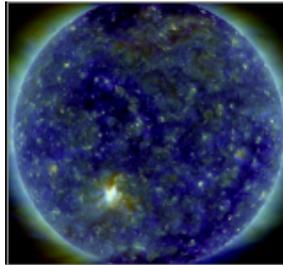
VOACAP DE-DX path reliability for each band

- 100W
- CW
- Isotropic antennas
- Take Off Angle > 3
- Short path
- Mean Sunspot number

VOACAP DE-DX

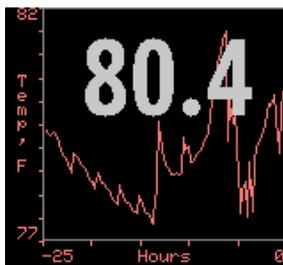
80	54%	17	0
40	69	15	0
30	47	12	0
20	0	10	0

100W, CW, iso, TOA>3, SP, S=0



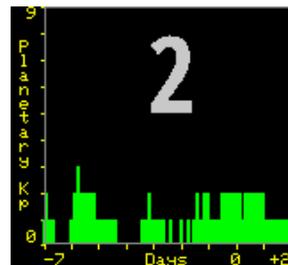
- Solar Dynamic Observatory**
- Composite
 - Magnetogram
 - 6173 A

Current weather conditions at new DX



- Optional Sensor**
- Temperature
 - Humidity
 - Dew point
 - Station pressure
 - 25 hour history

- Geomagnetic index**
- current index
 - 7 days history
 - 2 days forecast



- Gimbal or Rotator controls**
- Manual adjust CW/CCW
 - Axis state
 - Current Azimuth
 - Target Azimuth
 - Current Elevation
 - Target Elevation
 - Manual or Auto tracking
 - Manual adjust Up/Down
 - E Stop

HFClock V 2.35 Controls and Symbols

Page 5 of 5

Notes

Time: The time shown in large white letters always refers to the HFClock's idea of UTC. If the UTC button is black-letters-on-white-background it really is UTC. But the operator may modify this value by tapping on various locations (see chart on Page 1), for example to show a satellite location at some moment in the past or future. Doing so causes the UTC button to become white-on-black as a reminder the HFClock is no longer tracking real UTC. Tapping the UTC button will return abruptly back to real UTC. The times shown in the DE and DX panes are best-effort estimates of local time at those locations but no attempt is made to correct for daylight savings time. The operator may adjust for this manually, if needed, by tapping the DST button to add one hour.

Satellite pass: The lower left pane of HFClock is normally used to display DX information. But if you tap on the current location of the satellite, this pane is repurposed to display the satellite name; the time until next rise or set; and a diagram showing the overhead view of the next pass. To emphasize this new purpose, the text color also changes to match the satellite path color on the map. Before the satellite rises, the time is a countdown showing time until the next rise. If it is more than an hour away the units are Hour:Minute. Once it becomes less than an hour until rise it changes to Minute:Seconds. Once the satellite rises, the count is the time remaining until set in Minute:Seconds. When it sets, the next pass is calculated and the cycle repeats like this forever. Tap on the name to choose a different satellite. The lower left pane goes back to the normal DX info if you tap anywhere on the map other than where the satellite is currently.

Display brightness: If a photoresistor is installed on ESP or RPi HFClocks, toggling NCDXF will replace the beacon key with two vertical scales, the one on the left showing the current display brightness and the other the current photoresistor reading. To calibrate a desired brightness response, start by exposing the photoresistor to the nominal bright light intensity then click on the display scale to set the desired display brightness at the bright light level. Then expose the sensor to the nominal dim light intensity and click again to set the desired brightness at the low light level. The two settings will be marked on the scales for reference, the bright settings in red and the dim settings in blue. Note the settings may be reversed if desired to make the display brighter in dim lighting and dimmer in bright lighting. On ESP or RPi, tapping NCDXF again will provide a means to control brightness with two event timers, one to turn the display On and one to Dim (or Off on RPi). The timers may be adjusted by tapping above or below their hour and minutes digits. The photoresistor only affects brightness while the display is ostensibly On.

VOACAP: Path percentage reliability predictions for the current conditions from DE to DX are an option in either plot pane. The predictions use VOACAP based on a 100 W signal, CW mode, isotropic 0 dBi antennas on both ends, take-off angle greater than three degrees, quiet location noise (-153 db) and the current mean sunspot number. If selected in the right plot pane they are always visible, if selected in the left pane, they appear after the DX weather information expires. The predictions are for short or long path, depending on the bearing selection in the DX pane, and are labeled in the VOACAP caption.

Gimbal (available soon): If the optional I2C devices for Gimbal or Rotator control are installed these are managed in the right plot pane. If azimuth and elevation axes are detected, the pane is labeled Gimbal and shows both values, if just an azimuth axis is detected the pane is labeled Rotator and elevation is not shown. The pane shows the current axis angles and their respective target values. The target values may be set manually by tapping on the directional arrows to add or subtract 10 degrees at a time; or they may be set automatically to track the current satellite (if Gimbal) or rotate a beam towards the current DX (if Rotator). The Gimbal will use elevation angles greater than 90 if necessary to avoid tracking a satellite through north. If an inertial measurement unit is detected, it is assumed to be aligned with the antenna and is used to determine pointing direction, otherwise the raw axis resistors are used. All motion may be stopped at any time by tapping Stop. Motion is always stopped when the pane is not visible.