Satellites: Just the facts, ham.

A SHORT PRIMER FOR AMATEUR SATELLITE OPERATION

W5PFG – LWARS AUGUST 20, 2022

Today's Objectives

- Understand the satellite mode and status
- Determine when and where the satellite will be
- Listen to AO-91 satellite pass

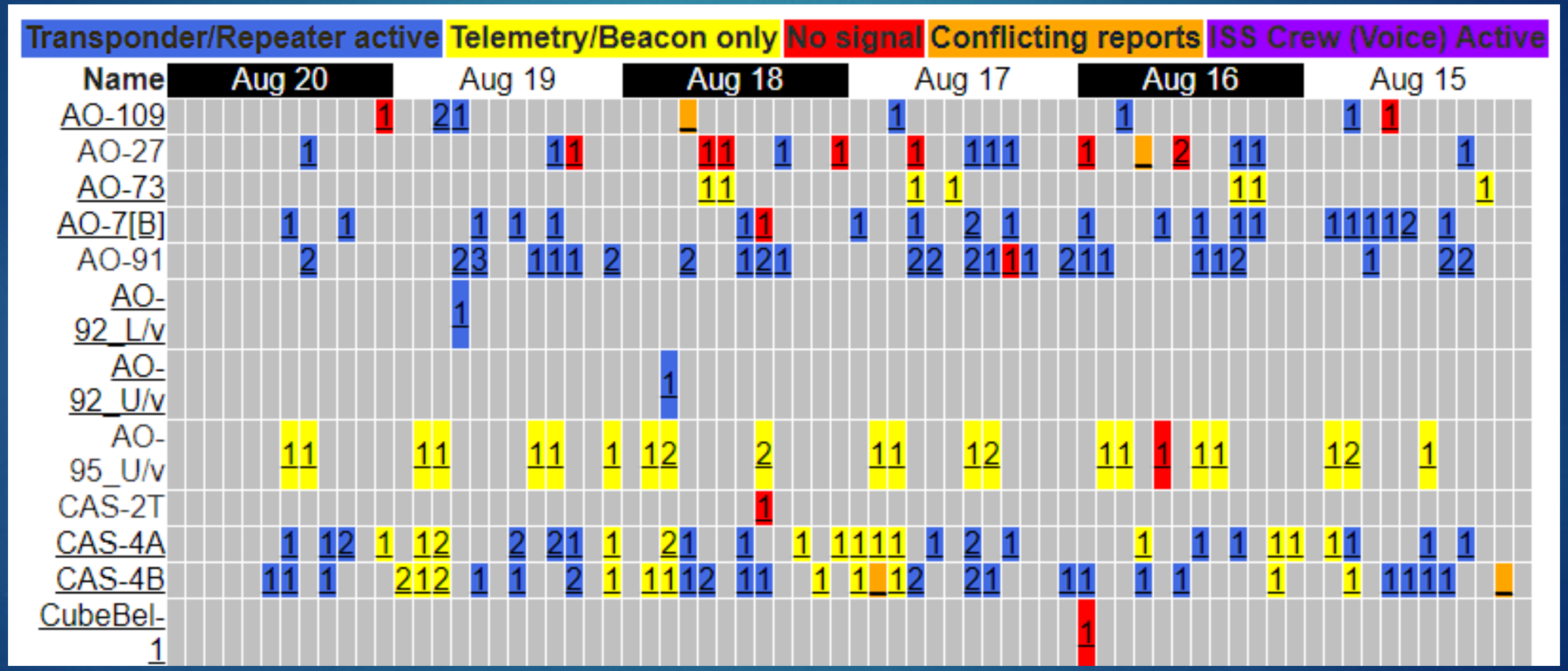
Satellite Mode & Status

- Linear Transponder (SSB) (~15)
- FM Transponder (Repeater) (~6)
- Digital (~7)
  - Packet/ APRS, FT-4, PSK31

Source: www.amsat.org -> Satellite Info -> Communications Satellites

- Real-time status page (with input from user community)
  - Address: https://www.amsat.org/status/

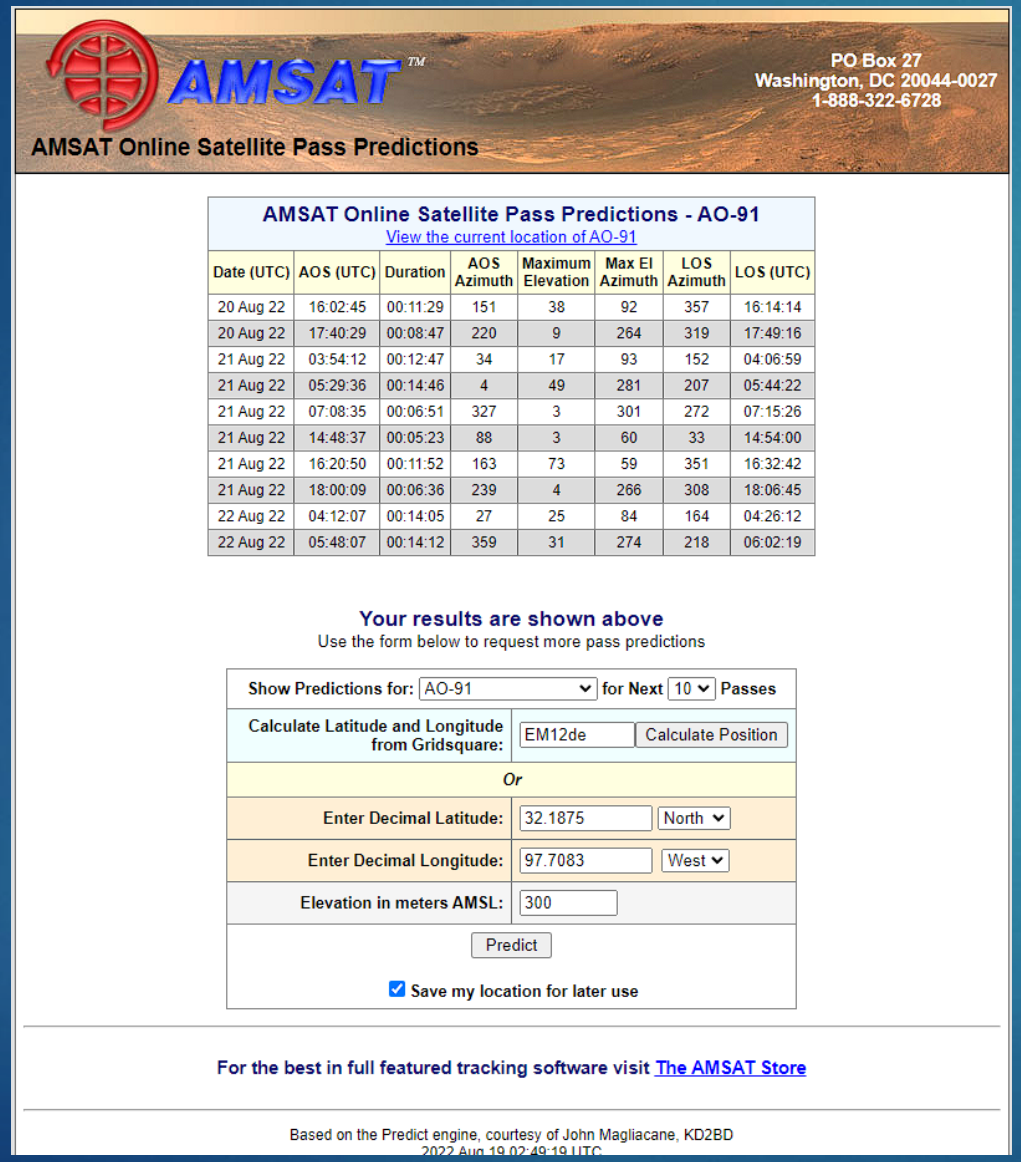
https://www.amsat.org/status/



Satellite Pass Prediction

- Critical elements to determining pass times
  - Your location (observer)
  - Date and time (pay attention to UTC or local)
  - Accurate Keplerian elements, regularly updated weekly
- Websites, Apps, and Desktop applications are popular to determine pass times

AMSAT's Pass Prediction Page



AMSAT™

PO Box 27
Washington, DC 20044-0027
1-888-322-6728

AMSAT Online Satellite Pass Predictions

AMSAT Online Satellite Pass Predictions - AO-91

View the current location of AO-91

Date (UTC)	AOS (UTC)	Duration	AOS Azimuth	Maximum Elevation	Max El Azimuth	LOS Azimuth	LOS (UTC)
20 Aug 22	16:02:45	00:11:29	151	38	92	357	16:14:14
20 Aug 22	17:40:29	00:08:47	220	9	264	319	17:49:16
21 Aug 22	03:54:12	00:12:47	34	17	93	152	04:06:59
21 Aug 22	05:29:36	00:14:46	4	49	281	207	05:44:22
21 Aug 22	07:08:35	00:06:51	327	3	301	272	07:15:26
21 Aug 22	14:48:37	00:05:23	88	3	60	33	14:54:00
21 Aug 22	16:20:50	00:11:52	163	73	59	351	16:32:42
21 Aug 22	18:00:09	00:06:36	239	4	266	308	18:06:45
22 Aug 22	04:12:07	00:14:05	27	25	84	164	04:26:12
22 Aug 22	05:48:07	00:14:12	359	31	274	218	06:02:19

Your results are shown above

Use the form below to request more pass predictions

Show Predictions for: AO-91 for Next 10 Passes

Calculate Latitude and Longitude from Gridsquare: EM12de Calculate Position

Or

Enter Decimal Latitude: 32.1875 North

Enter Decimal Longitude: 97.7083 West

Elevation in meters AMSL: 300

Predict

Save my location for later use

For the best in full featured tracking software visit The AMSAT Store

Based on the Predict engine, courtesy of John Magliacane, KD2BD
2022 Aug 19 02:49:19 UTC

Important inputs:

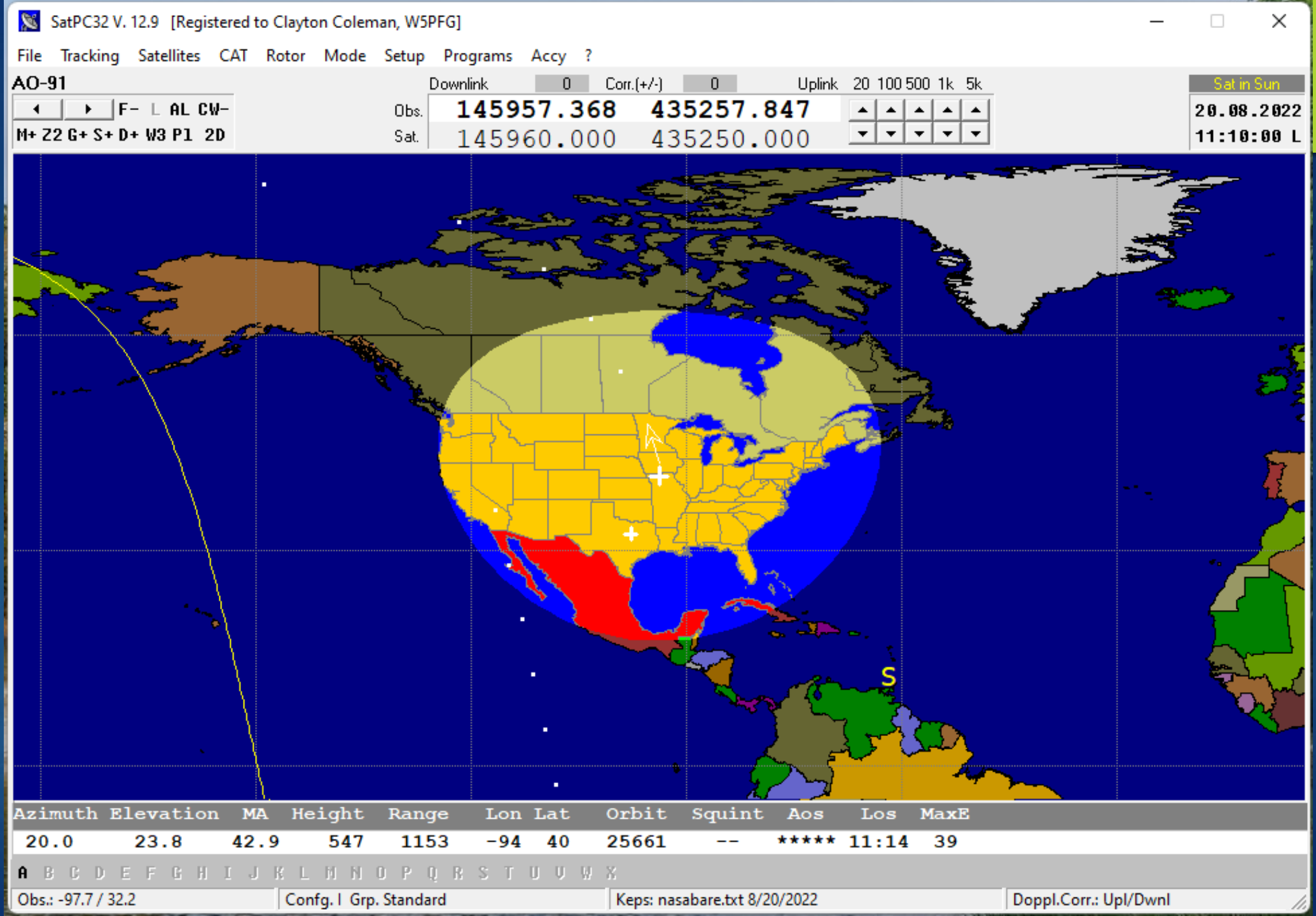
1. Target satellite
2. Our location (calculated by inputting gridsquare or inputting lat/lon)
3. Elevation

Pass prediction page will generate X number of upcoming passes based on your preference.

AO-91: August 20, 2022 @ 16:02 UTC

https://www.amsat.org/track

Date (UTC)	AOS (UTC)	Duration	AOS	Maximum	Max El	LOS	LOS (UTC)
			Azimuth	Elevation	Azimuth	Azimuth	
20-Aug-22	16:02:45	00:11:29	151	38	92	357	16:14:14


SatPC32 V. 12.9 [Registered to Clayton Coleman, W5PFG]
File Tracking Satellites CAT Rotor Mode Setup Programs Accy ?
AO-91
F- L AL CW-
M+ Z2 G+ S+ D+ W3 P1 2D
Downlink 0 Corr.(+/-) 0 Uplink 20 100 500 1k 5k
Obs. 145957.368 435257.847
Sat. 145960.000 435250.000
Sat in Sun
20.08.2022
11:10:00 L
S
Azimuth Elevation MA Height Range Lon Lat Orbit Squint Aos Los MaxE
20.0 23.8 42.9 547 1153 -94 40 25661 -- ***** 11:14 39
A B C D E F G H I J K L M N O P Q R S T U V W X
Obs.: -97.7 / 32.2
Confg. I Grp. Standard
Keps: nasabare.txt 8/20/2022
Doppl.Corr.: Upl/Dwnl

Putting it all together

- The satellite details
  - Satellite: AO-91
  - Mode: FM
  - Frequencies: (from the AMSAT frequency chart)
    - Downlink: 145.960 MHz – Uplink: 435.250 MHz
- We know when & where the next pass will occur
- Time to listen