

Project: ST2 rotator interface working with G-5400B and Ham Radio Deluxe.

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The equipment used are Windows 10 PC, running Ham Radio Deluxe v6.7.0.323, communicating with ST2 interface driving the Yaesu G-5400B controller.

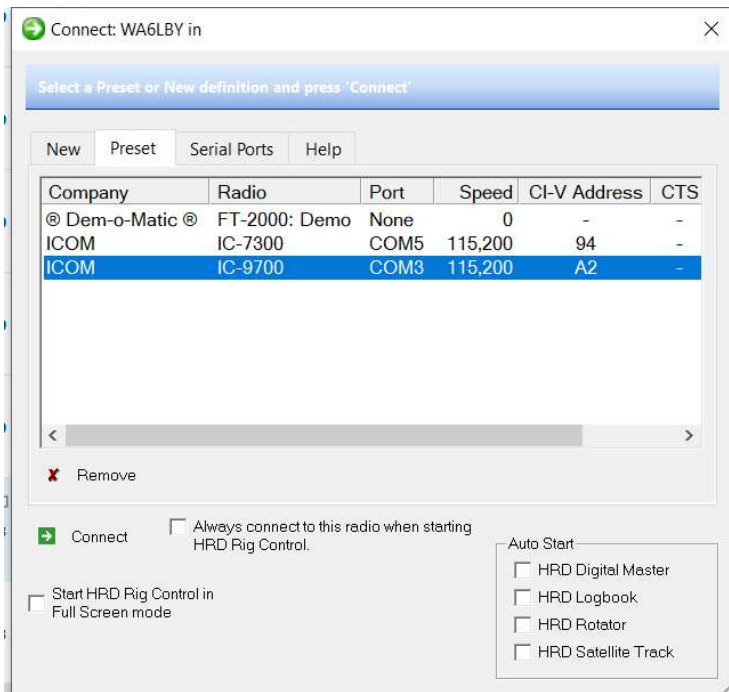
ST2 should be connected to a USB port and the control wires to the G-5400B DIN connector. I set my ST2 power jumper to draw power from my USB3.0 port.

Windows Device Manager shows ST2 driver CH340 appears on COM6 at 9600baud. Yours will likely be different, note down this info for rotator setup later.

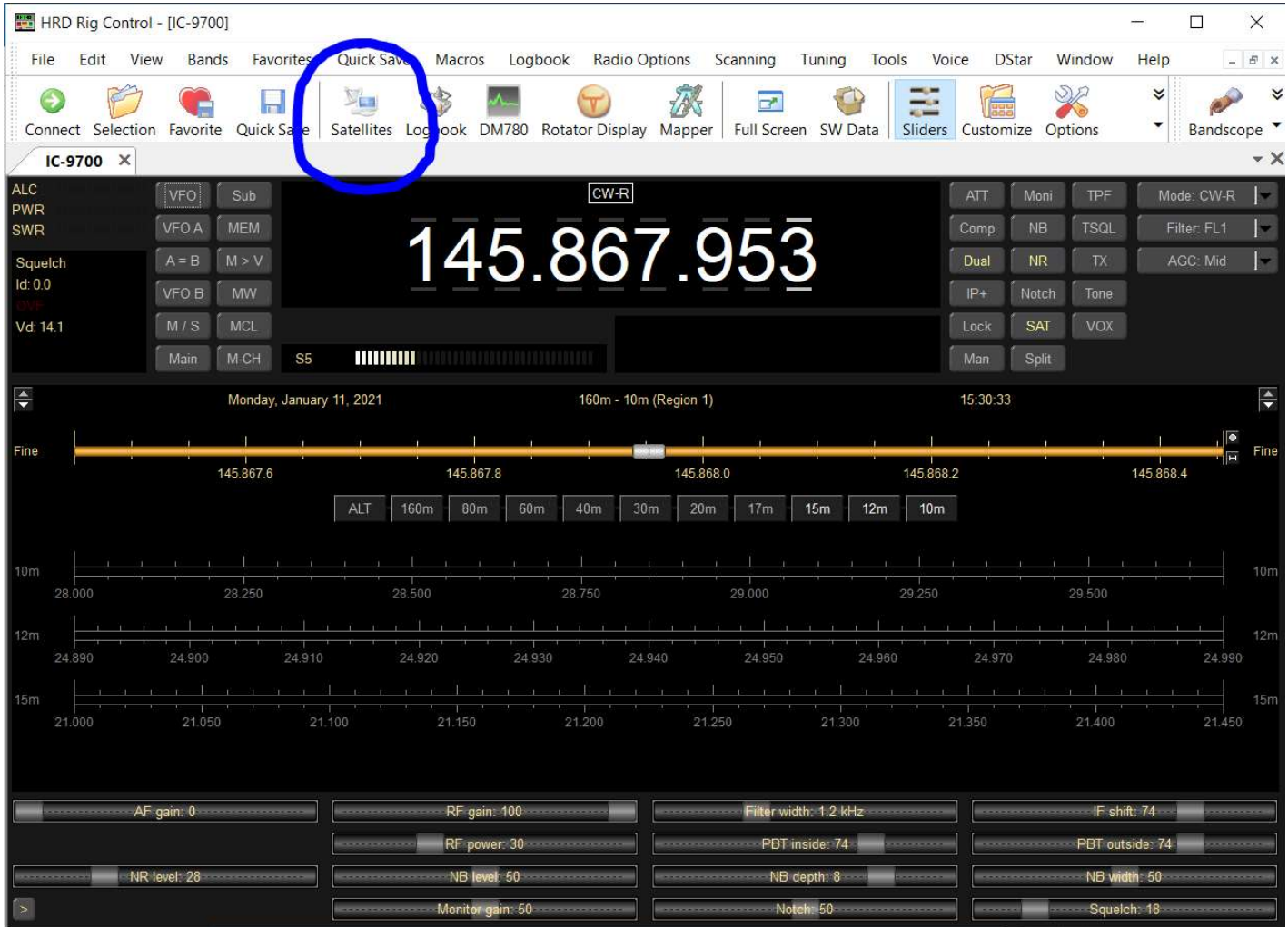


Power up the computer, ST2, G-5400B, and transceiver.

Start HRD. By default it will start up "HRD Rig Control"



From "HRD Rig Control", second row icon, click "Satellite". This will start the "HRD Satellite Tracking" program.



From "HRD Satellite Tracking" ensure that dropdown menu item "Satellite", "Tuning" is enabled. This will bring up the "Frequency" dialog box. Select the RX Box. For daytime testing, we select tracking for SUN.

The screenshot displays the HRD Satellite Tracking software interface. The title bar shows "HRD Satellite Tracking - [[RX] SUN]". The menu bar includes File, Edit, View, Rotator, Satellite, Tools, Window, and Help. The toolbar contains icons for Radio Pane, New Satellite, Satellite Defns, Announce, Rig Control, Mapper, Digital Master, Rotator, and Logbook. The main window is titled "Radio: localhost" and shows a "Tuning Dial" with "Satellite: SUN" and "Track: 1 hour". The "Manual Tuning" section has an "Enable" checkbox, which is highlighted with a blue arrow. The "RX" checkbox is checked, and the "TX" checkbox is unchecked. The VFO-A frequency is 145.867.953, and the VFO-B frequency is 445.419.576. The "DOWNLINK" frequency is 445.420.000. The "Next Passes" section shows "LOS 01:27:10". The "Options" section includes "Beacon" and "Freq" buttons. The main display area shows a world map with satellite tracks for SUN, ISS, and MOON. A circular display in the bottom right corner shows the SUN's position with "AZ:230.0°" and "EL:15.1°".

HRD Satellite Tracking - [[RX] SUN]

File Edit View Rotator Satellite Tools Window Help

Radio Pane New Satellite Satellite Defns Announce Rig Control Mapper Digital Master Rotator Logbook 15:32:33 Google Earth

Radio: localhost Logfile X Satellite Definitions X [RX] SUN X Passes X

Connect Options

IC-9700

VFO-A 145.867.953

VFO-B

RX-Mode TX-Mode

ModeRX ModeTX

Filter: FL1 AGC: Mid

TX SAT Tone

M/S Main Sub

AF gain: 0

Mic gain: 50

Squelch: 18

RF power: 30

Tuning Dial Favourites Rotator Satellite: SUN Track: 1 hour Center Zoom Show

Next Passes Home Page LOS 01:27:10 Options

Manual Tuning

Enable

RX VFO-A 445.419.576 DOWNLINK 445.420.000 Beacon RX

TX

Undo Freq

ISS AOS: 04:07:20

SUN LOS: 01:27:10
Elv: 15.1°
Rng: 91,419,593.8 mi
Alt: 91,416,671.9 mi

MOON LOS: 00:02:20

SUN
AZ:230.0° EL:15.1°

From "HRD Satellite Tracking" drop down menu (first row), select "Rotator", "enable". This will start and enable the Rotator program, but it wont steer the rotator just yet.

The screenshot shows the HRD Satellite Tracking software interface. The "Rotator" menu item is circled in blue. The interface displays various tracking parameters for the ISS, including AOS (00:14:28), RX and TX frequencies, and a world map with a circular tracking area around the satellite's position. A circular gauge in the bottom right corner shows the ISS's Azimuth (AZ: 251.1°) and Elevation (EL: -31.8°).

HRD Satellite Tracking - [TX/RX] ISS

File Edit View **Rotator** Satellite Tools Window Help

Radio Pane New Satellite Next Passes Satellite Defns Announce Rig Control Mapper Digital Master Rotator Logbook 22:40:05 Google Earth

Radio: localhost

Connect Options

IC-9700

VFO-A 437.808.224

VFO-B

RX-Mode: USB TX-Mode: LSE

ModeRX ModeTX

Filter: FL2 AGC: Mid

TX SAT Tone

M/S Main Sub

AF gain: 18

Mic gain: 50

Squelch: 32

RF power: 100

Logfile X Satellite Definitions X [TX/RX] ISS X Passes:Active X

Tuning Dial Favourites Rotator Satellite: ISS Track: 1 hour Center Zoom Show

Next Passes Home Page AOS 00:14:28 Options

Manual Tuning

Enable

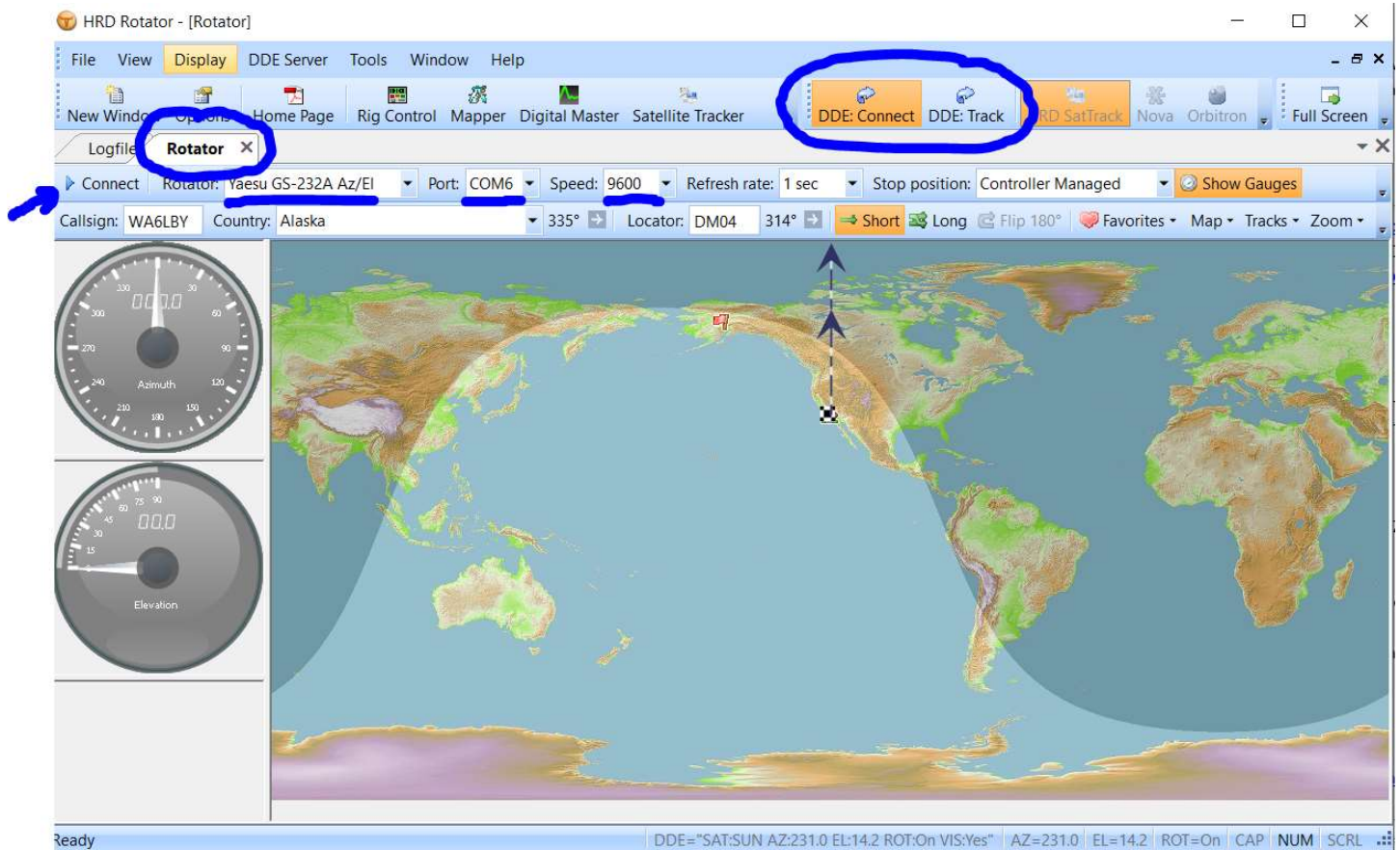
✓ RX	VFO-A	437.808.224	DOWNLINK	437.800.000	Repeater/Split
✓ TX	VFO-B	145.987.257	UPLINK	145.990.000	Undo

Freq

ISS AOS: 00:14:28
Elv: -31.8°
Rng: 4,636.8 mi
Alt: 261.1 mi

ISS
AZ:251.1° EL:-31.8°

On the HRD Rotator screen, you should see on the third row menu a tab named "Rotator". If you do not see this, click the "New Window" icon on the second row. Below the "Rotator" tab, you will see a dropdown selector for rotators. Select "GS-232A Az/EI". Port: "COM6" (as noted from device manager assignment to ST2, use your own values). Speed: "9600" (also from device manager). My refresh rate is set to 1sec. Stop Position is computer managed. Now click "Connect" on the left side of the tab menu. Next, click the "DDE Connect" and then the "DDE Track" icons.

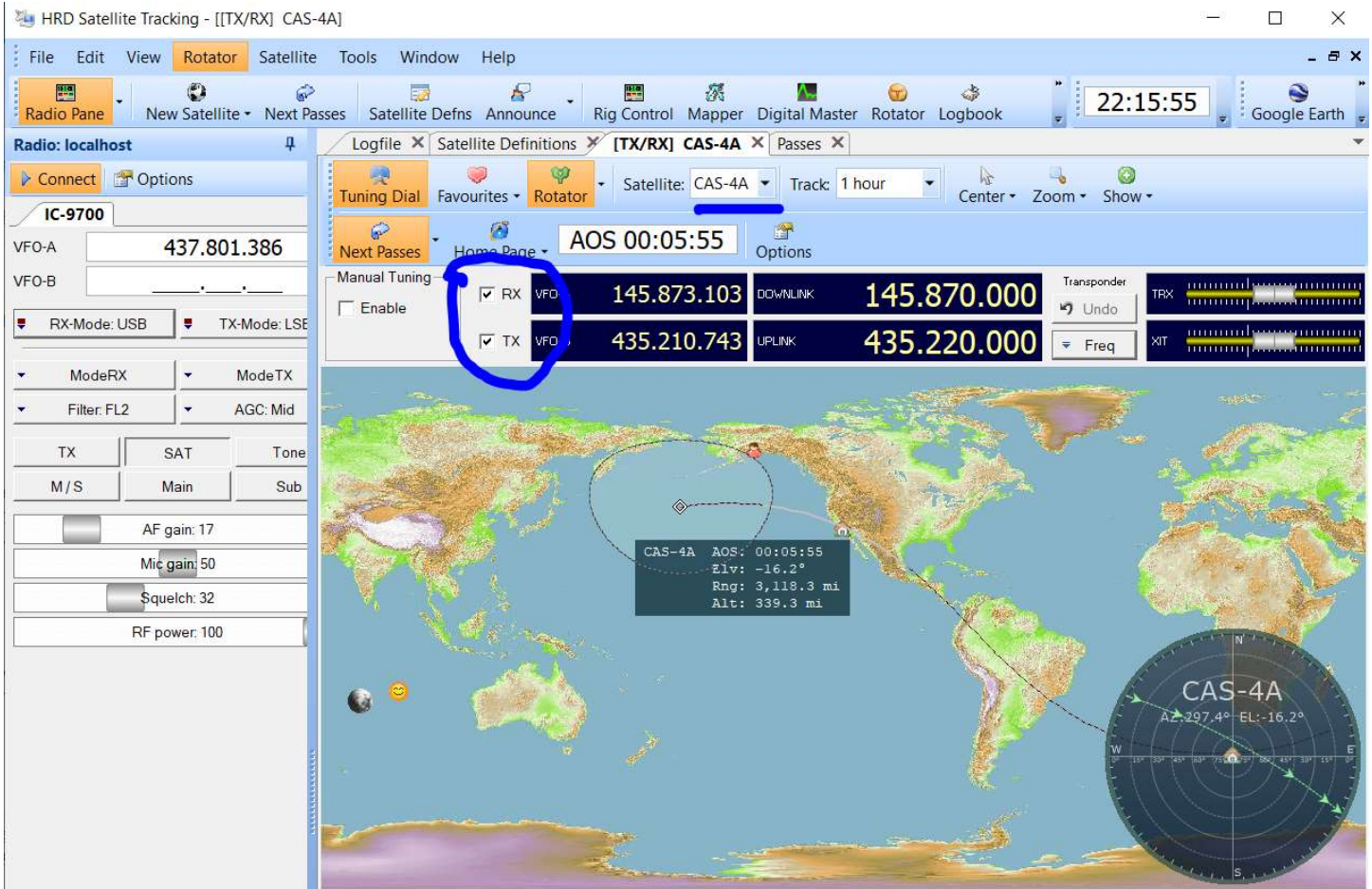


You will see the target coordinates on the ST2 display and hear the G5400 relays respond to the selected rotator heading. I use the SUN as my celestial reference to align the antenna. Don't sight down the boom at the SUN. Align for minimum boom shadow on the ground.

Remember that for tracking to activate, you must have:

1. Satellite selected
2. Frequency Rx and/or Tx box checked.
3. HRD Rotator "Connect"
4. DDE Connect
5. DDE Track

To track a satellite, use "Satellite Tracking" drop down menu to make your selection. When RX and or TX are checked, tracking will begin. Here is one for CAS-4A:



It is good practice to write up a checklist for your special setup. Satellite passes are swift, don't get caught fumbling.

Trouble shooting: If no response, on HRD Rotator, deselect and reselect "DDE Connect" and "DDE Track" and it should work.

I have been using ST2 with HRD and G5400B for six months and is very reliable. Communication and support from FD is superb!

Please refer to the HRD online manual for operational details. Now, what did I miss?

Good tracking and 73,
Peter WA6LBY