

# Connecting a SP80 Receiver to a NTRIP/DIP Mount Point with Wi-Fi and SurvCE / FAST Survey

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Date: 22 January 2017, Rev A



The SP80 is billed as 'the most connected receiver' and without question, it is.

The internal Wi-Fi transmitter makes it possible to connect a SP80 directly to a Mi-Fi, which reduces the amount of data on the Bluetooth channel.

Let's look at a comparison between the traditional 'Data Collector Internet' (DCI) configuration vs. the SP80 method:

The Traditional Method:



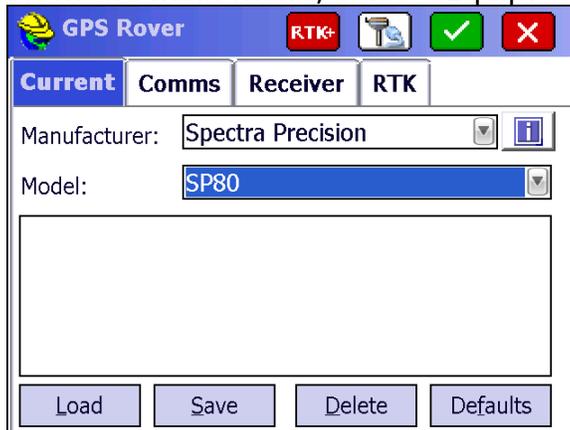
The SP80 Method:



A step-by-step guide on how to setup a SP80 as a rover in CRTN DIP (Direct IP) follows.

1. Start a new job, configure a reasonable projection.

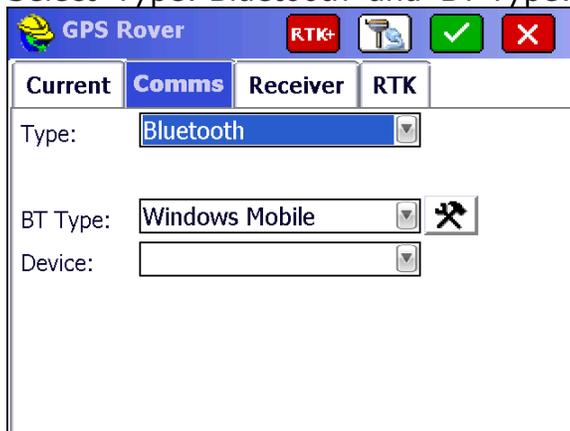
2. From the main menu, select "Equip: GPS Rover"



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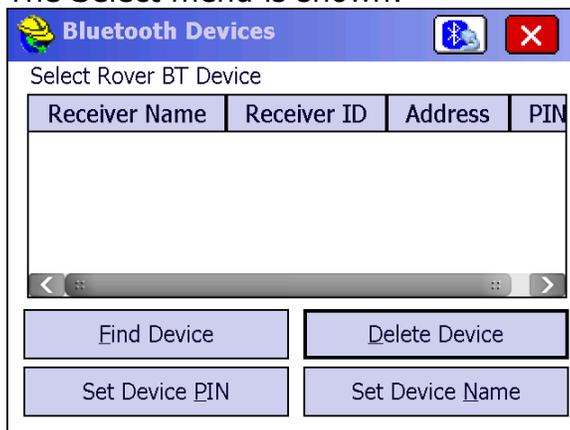
Choose 'Manufacturer: Spectra Precision' and 'Model: SP80'. Click on the 'Comms' tab.

3. Select 'Type: Bluetooth' and 'BT Type: Windows Mobile' as shown:



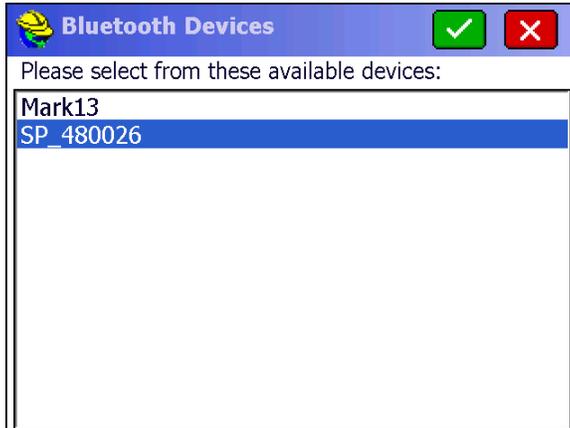
Click on the Settings button (Hammer/Wrench) to the right of 'BT Type'.

4. The Select menu is shown:



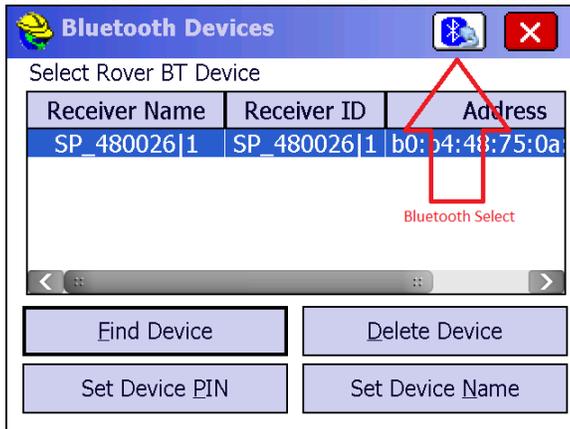
If your SP80 device is not shown, click on the 'Find Device' button.

5. The 'Bluetooth Device List' is shown:



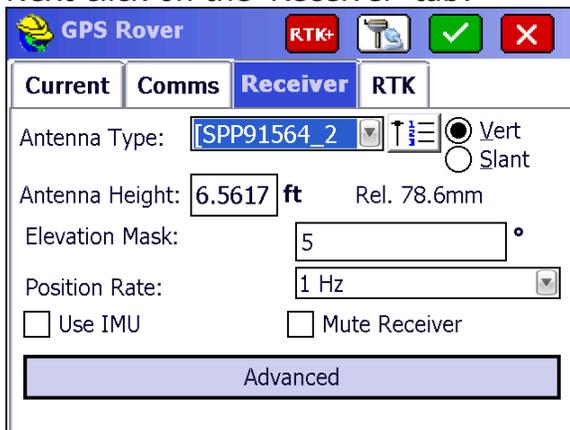
Select your device by clicking on it to highlight, then click on the green check mark.

6. You will be back to the device list with your device selected/highlighted:



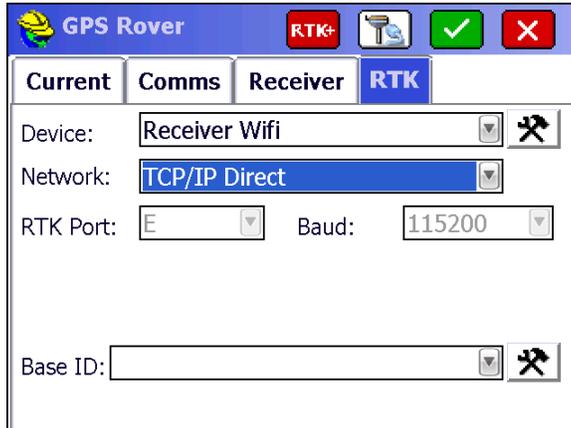
Click on the 'Bluetooth Select' button.

7. Next click on the 'Receiver' tab:



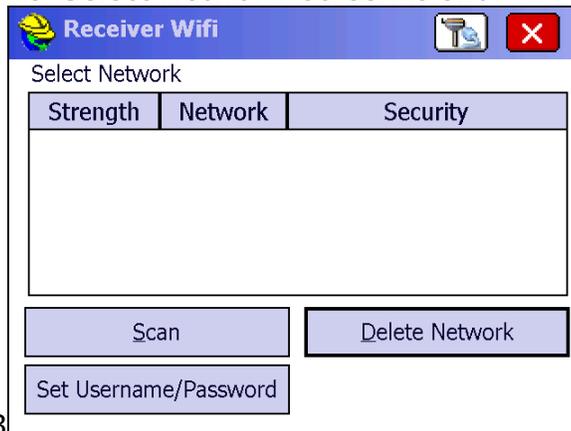
Enter the HI (Antenna Height), set a reasonable 'Elevation Mask'. Then click on the 'RTK' tab.

8. On the 'RTK' tab:



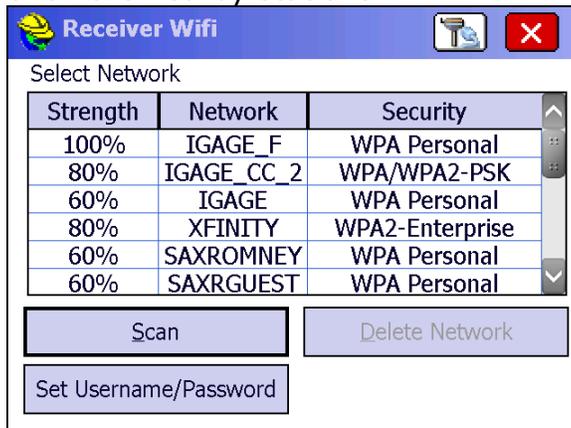
Choose 'Device: Receiver Wifi'. CRTN is a TCP/IP Direct connection. Click on the Settings button to the right of 'Device'.

9. The 'Select Network' screen is shown:

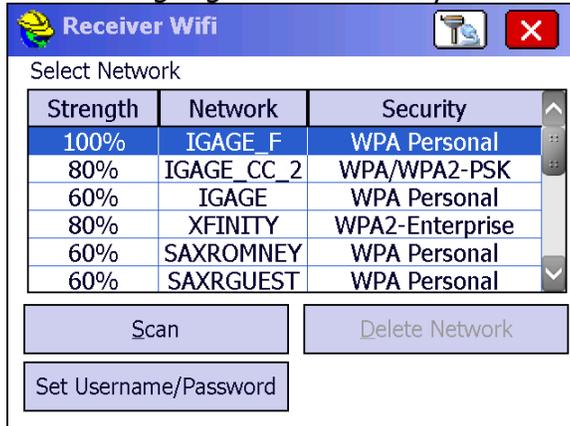


Click on the 'Scan' button.

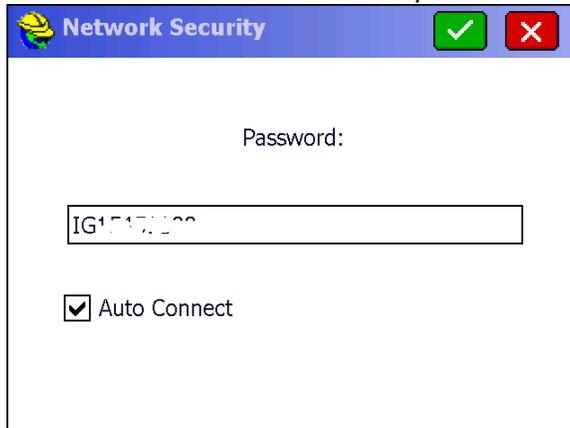
10. You may need to press the 'Scan' button twice as it may take a few extra seconds for the WiFi transceiver to turn on. After it scans, you will see a list of all the nearby stations:



11. Click to highlight the station you want to use:

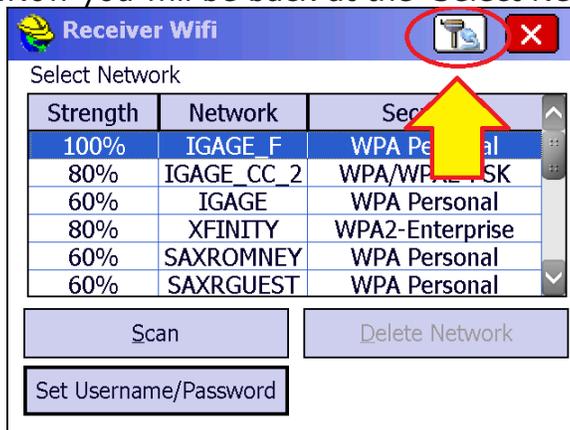


12. Now click on 'Set Username/Password':



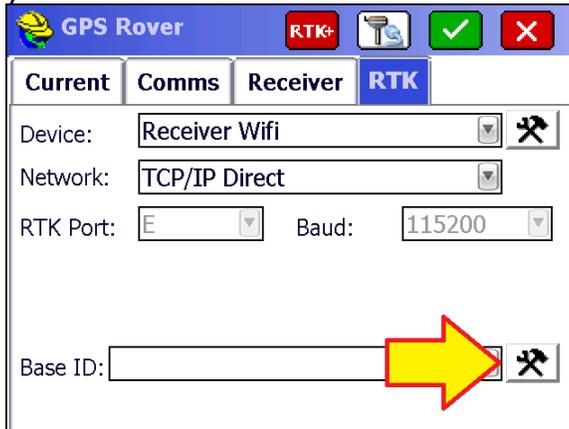
Enter the correct password for your device. I like to click on 'Auto Connect' because the head will automatically connect when it powers up. Click on the green check mark when set.

13. Now you will be back at the 'Select Network' screen:



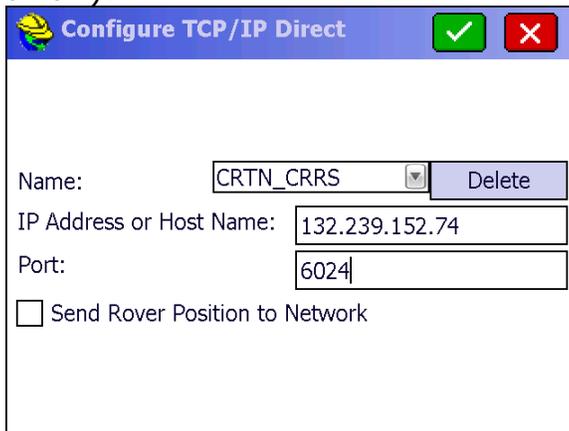
Click on the Wi-Fi connect button (see highlight above).

14. There will be a short delay while the SP80 connects to the hotspot, then you will return back to the RTK tab:



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15. Click on the Base ID settings button (highlighted above with Red/Yellow arrow):

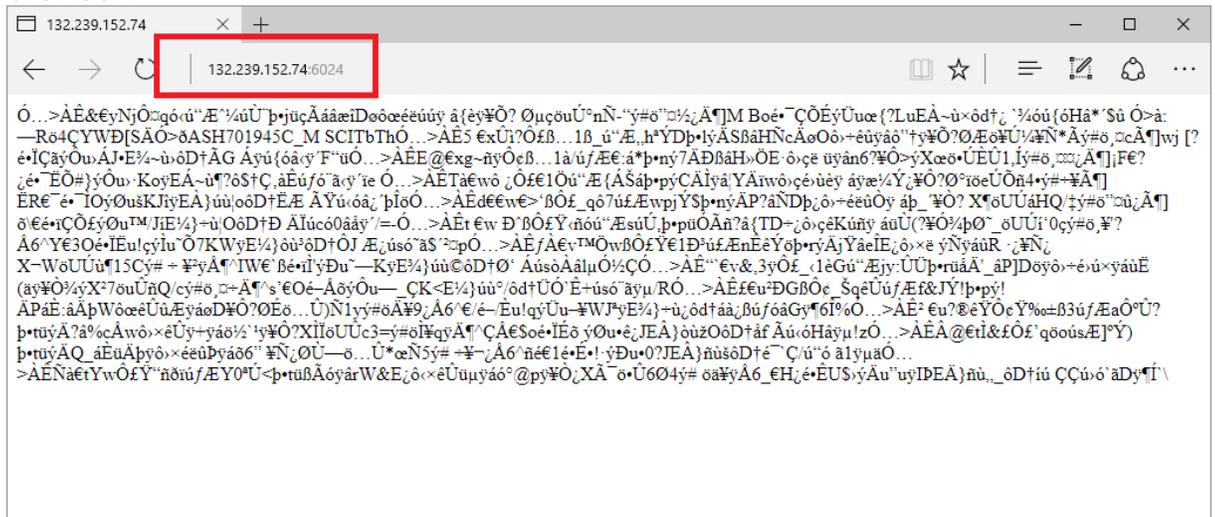


Enter the correct IP Address and Port for the host. The example above shows a RTCM3.0 mount point for CRRS (Westmorland). These credentials were taken from the mount table spreadsheet:



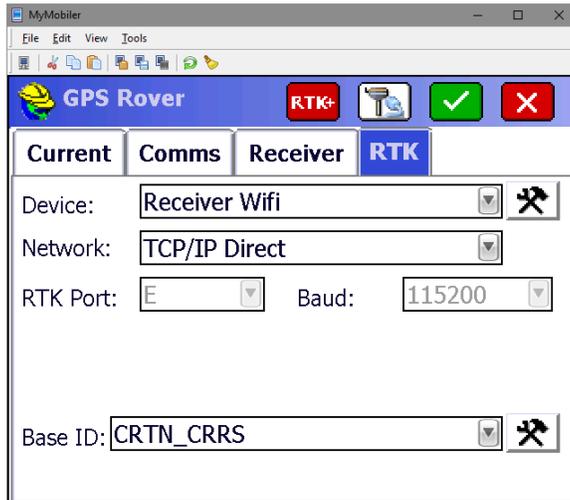
11 Individual Port Support:		142 Stations				
		IP=132.239.152.74				
		Port Numbers				
Code	Station Name	RTCM 2.2	RTCM 2.3	RTCM 3.0	Raw	Raw Format
15	BLSA Cypress	7000	8000	6000	9000	MBEN
16	CCCS Placentia	7001	8001	6001	9001	MBEN
17	SNHS La Habra	7002	8002	6002	9002	MBEN
18	SBCC Mission Viejo	7003	8003	6003	9003	RT17
19	SACY Santa Ana	7004	8004	6004	9004	MBEN
20	WHYT Lake Forest	7005	8005	6005	9005	MBEN
21	MJPK Modjeska Peak	7006	8006	6006	9006	MBEN
22	CAT2 Avalon, Catalina Island	7007	8007	6007	9007	RT17
23	FVPK Costa Mesa	7009	8009	6009	9009	MBEN
24	OEOC Silverado	7010	8010	6010	9010	MBEN
25	TRAK Irvine	7011	8011	6011	9011	MBEN
26	PSAP Palm Springs	7013	8013	6013	9013	MBEN
27	WIDC Sky Valley	7014	8014	6014	9014	MBEN
28	COTD Palm Desert	7015	8015	6015	9015	MBEN
29	KYVW Joshua Tree	7016	8016	6016	9016	MBEN
30	SLMS Salton City	7017	8017	6017	9017	RT17
31	USGC Ocotillo Wells	7018	8018	6018	9018	RT17
32	PMOB Palomar Mountain	7019	8019	6019	9019	MBEN
33	PIN1 Pinyon Flat 1	7020	8020	6020	9020	MBEN
34	SIO5 La Jolla	7021	8021	6021	9021	MBEN
35	GLRS Niland	7022	8022	6022	9022	RT17
36	AZRY Anza	7023	8023	6023	9023	MBEN
37	CRRS Westmorland	7024	8024	6024	9024	RT17
38	DHLC Dumont Hill	7025	8025	6025	9025	MBEN
39	DAAD	7027	8027	6027	9027	RT17

If you want to verify that a specific station is up and running, you can type the address and port number into the Edge, Internet Explorer or Firefox browser:



If you see wild characters, the station is up. This 'trick' will NOT work in Chrome.

16. Once the network credentials are entered correctly, click on the green check mark:

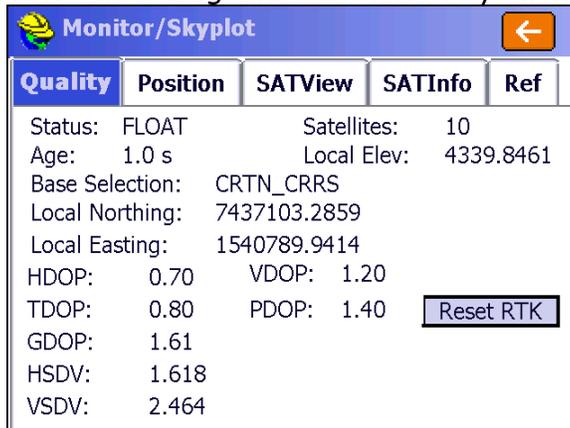


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17. Finally click on the green check mark again and the rover will be configured and you will return to the Equip menu:

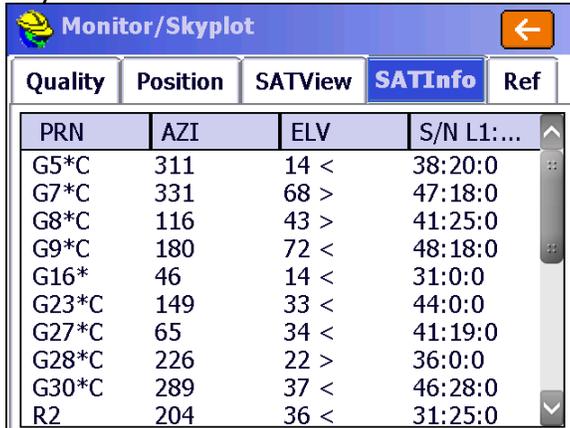


18. You can debug the connection by clicking on 'Monitor Skyplot':



If you are successfully connected, you will have a FLOAT or FIXED status. The Age should be 0, 1 or 2.

19.If you click on 'SATInfo':

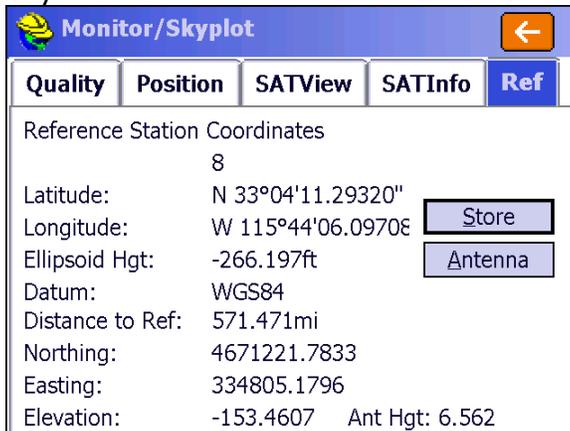


Quality	Position	SATView	SATInfo	Ref
PRN	AZI	ELV	S/N L1:...	
G5*C	311	14 <	38:20:0	
G7*C	331	68 >	47:18:0	
G8*C	116	43 >	41:25:0	
G9*C	180	72 <	48:18:0	
G16*	46	14 <	31:0:0	
G23*C	149	33 <	44:0:0	
G27*C	65	34 <	41:19:0	
G28*C	226	22 >	36:0:0	
G30*C	289	37 <	46:28:0	
R2	204	36 <	31:25:0	

You will see a full list of satellites. SV's in use will have a '\*'. SV's in common between the Base (via the network) and the Rover will have a 'C'.

Note that if the base is GPS only, none of the 'R' SV's (Russian GLONASS) will be used or in common.

20.If you click on the 'Ref' tab:



Reference Station Coordinates

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Latitude: N 33°04'11.29320"

Longitude: W 115°44'06.09708"

Ellipsoid Hgt: -266.197ft

Datum: WGS84

Distance to Ref: 571.471mi

Northing: 4671221.7833

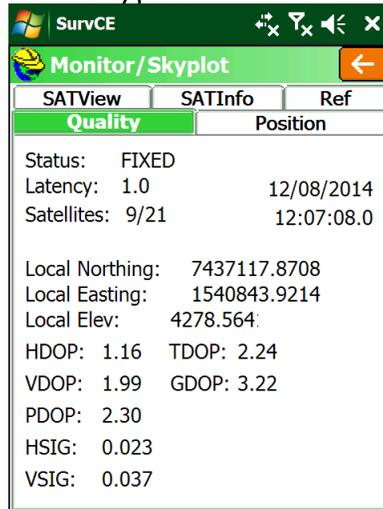
Easting: 334805.1796

Elevation: -153.4607 Ant Hgt: 6.562

You will see the location of the base and the distance to the base. In this example, I am in Salt Lake City Utah and connected to a base 571.471 miles distant. It is doubtful that I will be able to obtain a FIXED position.

## Troubleshooting a UHF Base / Rover Pair

While connected to the Rover, from the main menu click on the 'Equip' tab, then '7. Monitor Skyplot':



What is the displayed 'Status'?

**Status = 'FIXED':**

You are ready to survey!

**Status = 'AUTONOMOUS' or 'DGPS':**

The Rover is NOT receiving Base corrections or the Rover is indoors or under very heavy canopy.

1. Have you waited 30 seconds? The base only transmits the base position record once every 30 seconds. The Rover must receive this position record prior to reporting a 'FLOAT' solution. You may need to wait for a full 30 seconds.
2. Is the Base broadcasting corrections? Try connecting to the base via a browser on a PC and verify that it is actually up and sending data.
3. Is the Rover receiving the base corrections? If it is, then the latency will be under 4 seconds.

**Status = 'FLOAT':**

If the Rover reports 'Float' then corrections are being received however the GNSS engine cannot resolve ambiguities to Fix the solution.

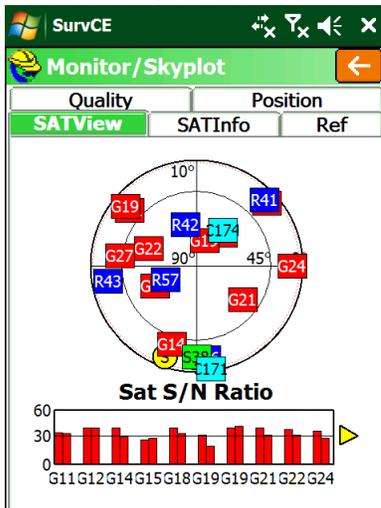
1. Is the receiver's view of the sky open and unimpeded? Heavy canopy or extremely bad multipath will keep the receiver from Fixing.
2. Is the Base within 30 miles of the Rover position? Extremely long baseline distances will keep the Rover from Fixing.



Make sure the Distance to Ref is reasonably short.

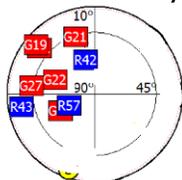
3. If the Rover is FLOAT, but never fixes, there could be high multipath or canopy at the base or rover.
4. Is the Latency less than 4 seconds? If the Latency builds up to values larger than 5 seconds there is probably someone else on the same UHF radio frequency or the UHF radio signal is not strong enough to reach the rover dependably.

Check the 'SATView' under 'Monitor/Skyplot'. A satellite distribution like this:



is good and the receiver should FIX within 30 seconds if in open sky.

However a skyplot like this:



where all of the satellites are in one quadrant, or the satellite count is very low, just won't be sufficient to get a Fixed solution