

This guide provides the instructions for uploading the new WebPages feature onto the SF-3050 receiver and using each individual web page to send and receive GNSS data. WebPages are located in the NavCom Folder on the SF-3050 Product Configuration USB Flash Drive and are uploaded onto the SF-3050 receiver using the StarUtil 3000 v1.2.26 software loaded onto a PC.

WebServer pages can be viewed using several different browsers and vary slightly based on the browser in use. Optimal results are obtained by using Mozilla Firefox® or Google Chrome®. The IP address can be saved by the browser using Bookmarks or Favorites.

Upload WebPages

1. Update firmware on SF-3050 receiver. The latest version of the software (v3.3.10.0 or later) is required for this feature.
2. Determine the receiver's IP address OR give it a static IP address by entering the [ETHCONFIG] command in the Input Terminal screen.
 - Specify [ETHCONFIG]MANUAL to manually change the IP address.
 - Using [ETHCONFIG]AUTO will automatically set the IP address.

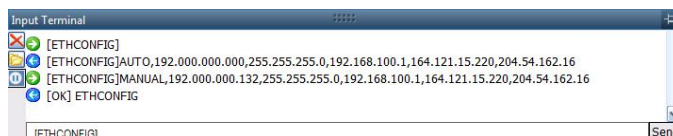


Figure 1: Input Terminal – [ETHCONFIG]



The IP address consists of the first four sets of three numbers separated by periods. For further information on this command, see the Technical Reference Manual.

3. Save the profile by entering [PROFILE]SAVEAS "XXX" in the Input Terminal screen where the Xs indicate the name chosen for the profile.



Figure 2: Input Terminal – Save Profile



If the profile is not saved, the IP address will be lost the next time the receiver is shut off and rebooted.

4. Format the internal memory by entering [FSFORMAT]A:;DEFAULT in the Input Terminal screen.

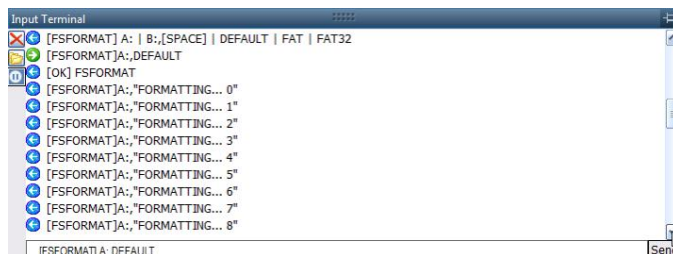


Figure 3: Input Terminal – Format Memory Card



The SF-3050 has a permanent 2GB SD card permanently installed. Once this card is formatted, there is no need to reformat it. Reformatting the memory after the 3.3.x.0 software update is necessary to repartition the memory chip.

5. To load the Webpage files, select the File Upload screen under the Receiver Options tab.
6. Click the Webpage Loader button and browse to the SolarisWebpagesv3.3.x/NCT file on the USB flash drive.

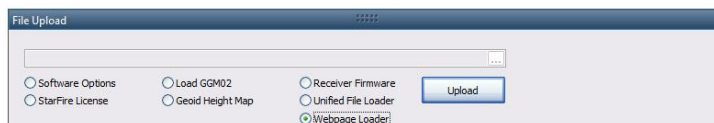


Figure 4: File Upload – Webpage Loader

7. Select the NCT folder and click **OK**.

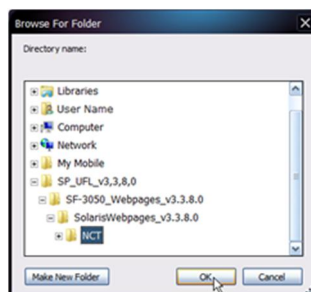


Figure 5: Webpage NCT Directory



The Webpage files are contained in the NCT directory. Loading the NCT directory will load all the webpage files.

8. Click the Load button to load the NCT directory.



Figure 6: Load Webpages NCT file

9. Enable the WebServer and choose webpage directory by entering the [WEBCONTROL]ENABLE,NCT command in the Input Terminal screen. This will ensure that the webpages in the NCT directory are enabled.

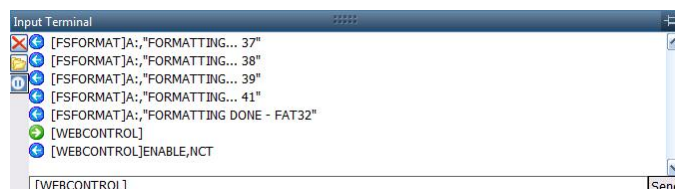


Figure 7: Input Terminal – Webcontrol

Access the WebServer

Type the IP address into the Address box on the browser page. A security screen will display.

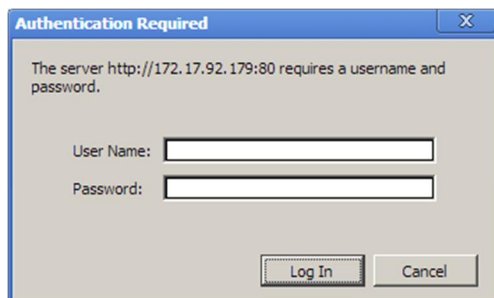


Figure 8: Windows Security Screen

A default user name and password is pre-programmed into the receiver's memory consisting of the following:

- User Name: admin
- Password: admin

This default user name automatically has ADMIN level access, which enables the user to view all webpages including the Input Terminal page and the Manage Accounts page. The user name and password for this default account can be changed in the Manage Accounts page. The password can be changed in the Change Password page. New user names, passwords and access levels (USER and TECH) can be added in the Manage Accounts page.



This ADMIN account cannot be deleted or given a different access level in the Manage Accounts page.

Welcome Page

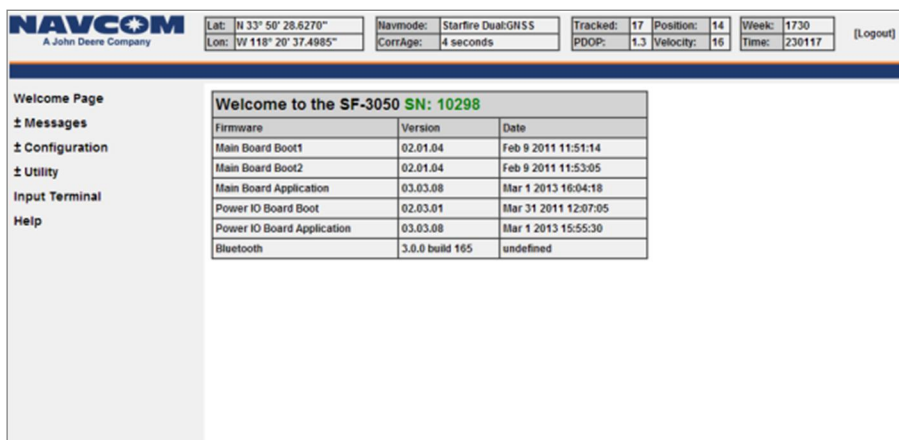


Figure 9: Welcome Page

The Welcome Page shows the following information:

- ✓ Serial Number of the SF-3050 receiver
- ✓ Firmware with version and date installed
- ✓ Bluetooth version

Receiver Location Bar

A bar across the top of the screen displays the current position and status of the receiver. This status is continually updated as new information is received from the satellites.



Figure 10: Location Bar



This bar appears across the top of every WebPage.

A Logout button is located in the upper right hand corner of the bar. The Logout function will allow the user to perform the following:

- ✓ Close out the web page feature without having to exit the browser.
- ✓ Log out of one user name and access level and log in with another user name and access level.
- ✓ Access another internet webpage while the webserver webpage is still active.

Main Menu

The main menu located on the left hand side of the welcome page shows links to the web pages available on the WebServer. Click each heading to open the desired menu.

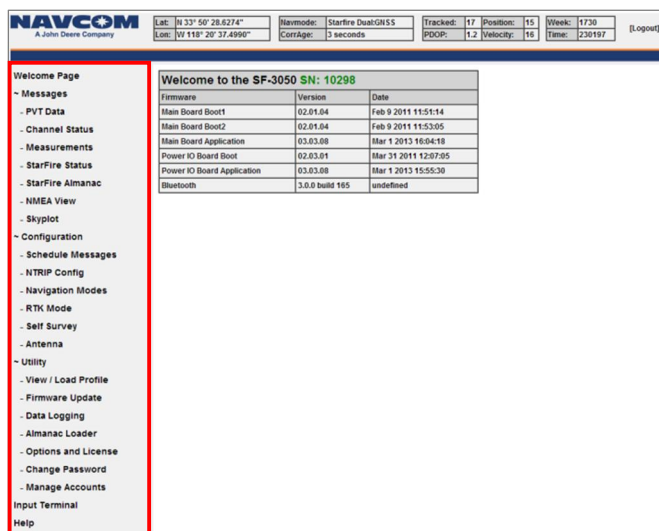


Figure 11: Welcome Page with Expanded Menu Bar

- Welcome Page
- Messages
- ✓ PVT Data
- ✓ Channel Status
- ✓ Measurements
- ✓ StarFire Status
- ✓ StarFire Almanac
- ✓ NMEA View
- ✓ Skyplot

■ Configuration

- ✓ Schedule Messages
- ✓ NTRIP Config
- ✓ Navigation Modes
- ✓ RTK Mode
- ✓ Self Survey
- ✓ Antenna

■ Utility

- ✓ View/Load Profile
- ✓ Firmware Update
- ✓ Data Logging
- ✓ Almanac Loader
- ✓ Options and License
- ✓ Change Password
- ✓ Manage Accounts

■ Input Terminal

■ Help

Messages

■ PVT Data

The PVT Data screen provides a quick view of the receiver's current position, velocity, estimated error, navigation status, antenna offset and solid earth tide.

PVT Data

Position		Velocity		Error Estimate	
Lat:	N 33° 50' 28.2412"	East:	0.0010 m/s	Position FOM:	42 cm
Lon:	W 118° 20' 37.0239"	North:	0.0000 m/s	Time FOM:	5
Ht:	8.682 m	Up:	0.0010 m/s	NORTH:	0.27 m PDOP: 1.2
Alt:	44.671 m	Ground Speed:	0.0010 m/s	EAST:	0.32 m HDOP: 0.6
Datum:	ITRF 2008 - GGM02	Ground Track:	0.00°	UP:	0.53 m VDOP: 1.0

Navigation Status	
Summary Nav Status:	Nav valid / No Doppler
Nav Mode:	Starfire Dual:GNSS : 3D : Dual freq
Constellation:	GPS / GLONASS
Starfire Engine Mode:	GPS and GNSS Modes; GNSS Takes Priority
Starfire Source:	INTERNAL
Correction Age:	6 sec
Age Limit:	1200 sec

Antenna Offset	
Phase Center(H1):	Not Applied
Slant Range:	Not Applied
Radius Antenna Body:	Not Applied

Solid Earth Tide	
North:	-50 mm
East:	10 mm
Up:	120 mm

Figure 12: PVT Screen

The PVT screen shows the following information:

- ✓ **Position:** Displays altitude, Longitude, Height, Altitude and Datum. Datum displays the selected reference model.
- ✓ **Velocity:** The speed over ground and direction of travel (true, not magnetic).
- ✓ **Navigation Status:** Displays Summary Nav Status, Nav Mode, Constellation (either GPS or GPS/GLONASS), StarFire Engine Mode, StarFire Source, Correction Age and Age Limit

- **Summary Nav Status:** Various indications of nav status, including Nav valid, Nav invalid, No Doppler, Doppler Used, etc.
- **Nav Mode:** Various indications of nav mode, for example, StarFire Dual:RTG; 3D: Dual freq; Non differential: 3D: Dual freq, etc.
- **Constellation:** GPS or GPS/GLONASS
- **Correction Age:** The age of the current aided navigation correction in seconds. This value changes depending on the correction source and the correction interval. A few seconds is okay, but many seconds indicate the fix is degrading over time, and becoming less and less accurate.
- **Age Limit:** The maximum amount of time in seconds the received correction will be used in case of an outage or drop in the reception of corrections. The maximum age limit is 100 seconds. The default is 300 seconds for SBAS (WAAS, EGNOS, MSAS, GAGAN) and RTCM type 1 or 9. The default is 1200 seconds for RTG (StarFire).

✓ Error Estimate

- **Position FOM:** The position Figure Of Merit is the estimated uncertainty in the navigation solution. FOM is the same as the One sigma error estimate. Refer to the Sapphire Technical Reference Manual (see Related Documents in the forematter).
- **Time FOM:** 10x TDOP
- **DOP:** Dilution of Precision. A class of measures of the magnitude of error in GPS position fixes due to the orientation of the GPS satellites with respect to the GPS receiver. There are several DOPs to measure different components of the error: GDOP (Position and Time), PDOP (Dimensional Position), HDOP (Horizontal Position), VDOP (Vertical Position), and TDOP (Time).

✓ Antenna Offset: If applicable.

✓ Solid Earth Tide: Displays earth's deformation vector in three dimensions, north, east and vertical.

■ Channel Status

The Channel Status screen provides instantaneous diagnosis of signal quality and performance for the tracked satellites in three constellations: GPS, GLONASS, and SBAS.

CHNLSTATUS1B - GPS Constellation																				
PRN	AZ	EL	CH (L1CA)	ST	C/N0	CR	AL	TM	CH (L1P1)	ST	C/N0	CR	AL	TM	CH (L2)	ST	C/N0	CR	AL	TM
1	282	51	8	LOCK	52.25	1	N	3	8	LOCK	51	0.94	N	3	9	COHY	47.75	0.99	N	3
11	245	41	4	LOCK	52.5	0.99	N	3	4	LOCK	51	0.88	N	3	5	COHY	46	1	N	3
14	52	26	10	LOCK	46	0.97	N	3	10	LOCK	44.5	0.75	N	3	11	COHY	40.75	1	N	3
20	310	29	14	LOCK	49	1	N	3	14	LOCK	48	0.8	N	3	15	COHY	42	0.98	N	3
22	111	22	16	LOCK	49.25	0.97	N	3	16	LOCK	48.5	0.95	N	3	17	COHY	44	1	N	3
23	260	15	6	LOCK	46.75	0.99	N	3	6	LOCK	44.25	0.83	N	3	7	COHY	41.25	0.97	N	3
25	59	10	18	LOCK	42.25	1	N	3	18	LOCK	39.25	0.41	N	3	19	COHY	37	0.9	N	3
30	149	13	20	LOCK	46	0.97	N	3	20	LOCK	45	0.75	N	3	21	COHY	39.25	0.92	N	3
31	109	71	0	LOCK	54.25	1	N	3	0	LOCK	53.25	0.92	N	3	1	COHY	50	0.99	N	3
32	325	54	2	LOCK	51.5	1	N	3	2	LOCK	50.25	0.91	N	3	3	COHY	46.25	0.96	N	3

CHNLSTATUS1B - GLONASS Constellation																				
PRN	AZ	EL	CH (G1C)	ST	C/N0	CR	AL	TM	CH (G2C)	ST	C/N0	CR	AL	TM	CH (G1P)	ST	C/N0	CR	AL	TM
1	16	55	25	LOCK	52	0.98	N	3	40	LOCK	36	0.99	N	3	-	-	-	-	-	-
2	313	21	26	LOCK	47.75	0.99	N	3	41	LOCK	33.75	1	N	3	-	-	-	-	-	-
10	31	22	29	LOCK	47	0.98	N	3	30	LOCK	30.75	0.99	N	3	-	-	-	-	-	-
11	86	64	33	LOCK	51.75	0.99	N	3	42	LOCK	37	0.99	N	3	-	-	-	-	-	-
12	176	34	24	LOCK	51.5	1	N	3	43	LOCK	41.5	0.99	N	3	-	-	-	-	-	-
17	294	17	31	LOCK	45.5	0.99	N	3	27	LOCK	35.75	0.98	N	3	-	-	-	-	-	-
24	240	14	38	LOCK	45	0.98	N	3	39	LOCK	36	0.99	N	3	-	-	-	-	-	-

CHNLSTATUS1B - SBAS Constellation																				
PRN	AZ	EL	CH (L1CA)	ST	C/N0	CR	AL	TM	CH (L1P1)	ST	C/N0	CR	AL	TM	CH (L2)	ST	C/N0	CR	AL	TM
135	205	47	49	LOCK	53.25	0.99	N	15	-	-	-	-	-	-	-	-	-	-	-	-
138	160	48	50	LOCK	52.75	0.95	N	15	-	-	-	-	-	-	-	-	-	-	-	-

Figure 13: Channel Status Screen

The data below is displayed for each channel on the GPS, GLONASS, and SBAS windows. Differences between the constellations are identified.

- ✓ **PRN:** The satellite number assigned to each channel.
- ✓ **GPS:** The valid range is 1-32. (The receiver allocates the range of 1-37, with 33-37 reserved for expansion.)
- ✓ **GLONASS:** The valid range is 1-24.
- ✓ **SBAS:** The valid range is 120-138.
- ✓ **AZ:** Azimuth. The horizontal angle of the satellite relative to the receiver position in reference to North ranging from 0 (360) to 359 degrees.+
- ✓ **EL:** Elevation. The vertical angle of the satellite off the horizon ranging from 0 degrees to a zenith of 90 degrees.
- ✓ **CH (Code Type):** The channel number of the receiver, within a range of 0 – 53. The code types tracked by the channel are:
 - **GPS:** L1CA, L1P1, L2, L2C, and L5 based on the [TRACKINGMODE] command settings
 - **GLONASS:** G1C, G2C, G1P, and G2P based on the [TRACKINGMODE] command settings
 - **SBAS:** L1CA (These code types are displayed, but don't apply: L1P1, L2, L2C, and L5.)
- ✓ **ST:** Status. The channel tracking status of each channel. The status code LOCK means the channel is locked up for measurement type and satellite, measurements are ready.
- ✓ **C/No:** Signal-to-Noise. The signal-to-noise value varies depending on satellite elevation and any obstructions between the satellites and the receiver. The typical performance range for C/N0 for all displayed L1/G1 (GPS/GLONASS) channels is 46dB to 52dB, although higher and lower values can be noted. The C/N0 for C/A and G1 is the same. G2 is similar to P2 C/No (6 [dB-Hz] less than G1). L1P is 3dB lower than CA, and L2 is 6dB lower than CA. A value > 50 is typical of a satellite with 50° elevation or higher and a clear view of the sky.
- ✓ **CR:** Costas Ratio: the estimate of maximum error in phase measurement. The Costas Ratio value has a range of 100 to -100.
- ✓ **AL:** Almanac. Y = almanac is available for the position solution. N = no almanac
- ✓ **TM:** The search timeout; i.e. the number of seconds before the search for the satellite is stopped.

■ Measurements

The MEAS1B output stream contains raw measurement data collected from the receiver's tracking channels. Measurements are tracked from both the GPS/SBAS constellation and the GLONASS Constellation. Raw measurements can be post-processed to achieve precise point positions.

MEAS1B - GPS Constellation														
PRN	CA (m)	L1-CA (m)	P1-CA (m)	P2-CA (m)	L2-CA (m)	L2C-CA (m)	L2C (code)-CA (m)	CA C/No (dB)	P2 C/No (dB)	L1CA Doppler (c/s)	L2P Doppler (c/s)	L5Q-CA (m)	L5-C/No (dB)	L5Q Doppler (c/s)
1	21215637.530	-1.509	-0.070	3.770	-5.966	-	-	52.000	48.000	467.803	364.522	-	-	-
11	22051174.850	-2.293	0.330	0.580	-23.583	-	-	53.000	46.000	-1579.795	-1231.009	-	-	-
14	23207375.210	-0.810	0.500	1.100	-24.149	-	-	47.000	41.000	-2450.975	-1909.851	-	-	-
20	22659226.110	-0.335	0.220	0.990	-20.201	-	-	49.000	42.000	2842.291	2214.772	-	-	-
22	23360605.380	-0.690	-0.330	-0.250	-17.220	-	-	50.000	44.000	-2547.562	-1985.114	-	-	-
23	24265383.900	2.901	0.250	0.720	-21.509	-	-	47.000	41.000	2385.234	1858.624	-	-	-
25	24589618.610	-5.032	0.500	6.400	-12.574	-	-	42.000	37.000	-45.036	-35.093	-	-	-
30	24516011.710	1.888	-0.820	3.310	-17.001	-	-	46.000	39.000	3125.774	2435.668	-	-	-
31	20294894.650	-0.582	0.610	-0.040	-23.410	-	-	55.000	50.000	62.246	48.503	-	-	-
32	21404191.940	-0.307	-0.280	1.340	0.468	-	-	52.000	46.000	1503.124	1171.245	-	-	-

MEAS1B - GLONASS Constellation														
PRN	G1C (m)	L1C-G1C (m)	L1P-G1C (m)	P1-G1C (m)	P2-G1C (m)	G2C-G1C (m)	L2-G1C (m)	G1C C/No (dB)	G2C C/No (dB)	G1 Doppler (c/s)	G2 Doppler (c/s)	P1 Doppler (c/s)	P2 Doppler (c/s)	
1	20067983.320	-1.265	-	-	-	4.470	3.160	52.000	37.000	651.263	506.538	-	-	
2	22533912.800	-2.255	-	-	-	7.740	5.023	48.000	34.000	2743.363	2133.727	-	-	
10	22439719.010	2.662	-	-	-	8.740	1.905	47.000	31.000	-3512.254	-2731.753	-	-	
11	19596722.100	0.106	-	-	-	5.630	0.878	52.000	38.000	11.997	9.331	-	-	
12	21374540.640	0.578	-	-	-	8.290	5.293	51.000	42.000	3858.470	3001.032	-	-	
17	22830297.740	1.626	-	-	-	2.040	-2.603	47.000	37.000	-896.219	-697.059	-	-	
24	23269080.890	-1.657	-	-	-	10.970	-2.179	44.000	37.000	-3353.519	-2608.293	-	-	

Figure 14: Measurements Screen

GPS/SBAS Constellation

- ✓ PRN: The satellite number assigned to each channel.
 - GPS: The valid range is 1-32. (The receiver allocates the range of 1-37, with 33-37 reserved for expansion.)
 - SBAS: The valid range is 120-138.
- ✓ CA (m): Coarse / Acquisition code. The number of meters (range measurement) to the satellite.
- ✓ L1-CA (m): The L1 frequency minus the CA measurement.
- ✓ P1-CA (m): The P1 pseudorange minus the CA measurement.
- ✓ P2-CA (m): The P2 pseudorange minus the CA measurement.
- ✓ L2-CA (m): The L2 frequency minus the CA measurement.
- ✓ L2C-CA (m): The L2C frequency minus the CA measurement.
- ✓ L2C(code)-CA (m): The L2C code measurement minus the CA measurement.
- ✓ CA C/No (dB): Carrier-to-noise ratio. The signal strength indicator.
- ✓ P2 C/No (dB): The P2 measurement Carrier-to-noise ratio. The signal strength indicator.
- ✓ L1CA Doppler (c/s): The representation (in cycles per second) of the motion toward or away from the L1CA signal.
- ✓ L2P Doppler (c/s): The representation (in cycles per second) of the motion toward or away from the L2P signal.
- ✓ L5Q-CA (m): The L5Q measurement minus the CA measurement.
- ✓ L5-CA (m): The L5 measurement minus the CA measurement.
- ✓ L5Q C/No (dB): The L5Q measurement Carrier-to-noise ratio. The signal strength indicator.
- ✓ L5Q Doppler (c/s): The representation (in cycles per second) of the motion toward or away from the L5Q signal.

Normally, the SF-3050 receiver locates and tracks SBAS satellites at run-time, periodically building a list of the satellites that will contribute to the navigation solution. However, a user can create a fixed list of SBAS satellites to track. Creating a list that does not contain any visible satellites disables the use of SBAS corrections in the navigation solution.

GLONASS Constellation

- ✓ PRN: The satellite number assigned to each channel. The valid range for GLONASS is 1-24.
- ✓ G1C (m): The civilian G1 code.
- ✓ L1-G1C (m): The L1 frequency minus the G1C measurement.
- ✓ P1-G1C (m): The P1 pseudorange minus the G1C measurement.
- ✓ P2-G1C (m): The P2 pseudorange minus the G1C measurement.
- ✓ G2C-G1C (m): The civilian G2 code measurement minus the G1C measurement.
- ✓ L2-G1C (m): The L2 frequency minus the G1C measurement.
- ✓ G1C C/No (dB): The G1C measurement Carrier-to-noise ratio. The signal strength indicator.
- ✓ G2C C/No (dB): The G2C measurement Carrier-to-noise ratio. The signal strength indicator.
- ✓ G1 Doppler (c/s): The representation (in cycles per second) of the motion toward or away from the G1 signal.
- ✓ G2 Doppler (c/s): The representation (in cycles per second) of the motion toward or away from the G2 signal.

- ✓ P1 Doppler (c/s): The representation (in cycles per second) of the motion toward or away from the P1 signal.
- ✓ P2 Doppler (c/s): The representation (in cycles per second) of the motion toward or away from the P2 signal.



Doppler consists of the coarse Doppler from the satellite block adjusted by the delta Doppler in each of the associated signal blocks. To generate the true Doppler, add the coarse Doppler to the delta Doppler. Refer to the Sapphire Technical Reference manual (see Related Documents in the fore-matter).

■ StarFire Status

The SFSTATUS1B message tracks the status of each of the StarFire Satellite signals.

SFSTATUS1B Message	
Signal Strength:	11.72
Good Packet Percentage:	100.00 %
Idle Packet Percentage:	11.08 %
Re-synchronization Counts:	5
Signal Status:	TRCK
StarFire License Status:	Active
Frequency Offset:	188 Hz
AGC Voltage:	0.86 V
Satellite ID:	402

Figure 15: StarFire Status Screen

- ✓ Signal Strength: This field represents the signal to noise ratio for the StarFire channel in dB/Hz. The LSB represents 0.25 dB/Hz.
- ✓ Good Packet Percentage: This field displays percentage of good packets in received StarFire data. It is updated every 20 seconds.
- ✓ Idle Packet Percentage: This field displays percentage of idle packets in received StarFire data. It is updated every 20 seconds.
- ✓ Re-synchronization Counts: This field represents the StarFire parser packet framing re-synchronization count.
- ✓ Signal Status: Indicates if the signal is being tracked.
 - TRCK (green background) indicates that the signal is locked in.
 - IDLE indicates that the signal is not being tracked.
 - SGDP indicates that the signal is being detected.
 - SGDF (red background) indicates that the signal has failed.
 - ACQ indicates that the signal is being acquired.
 - PLIN indicates the signal is being pulled in.
- ✓ StarFire License Status: Active indicates StarFire option is licensed and enabled.
- ✓ Frequency Offset: This field displays the difference between the expected baseband frequency and the tracked baseband frequency, in Hz.
- ✓ AGC Voltage: Automatic Gain Control. Indicates the strength of the signal. The higher the voltage, the weaker the strength. The desired range is 0.8 to 1.2. Maximum is 2.5.
- ✓ Satellite ID: This field represents the current StarFire satellite ID, in the range 320 to 680.

■ StarFire Almanac

This message outputs the StarFire over the air (OTA) almanac that is currently in use.

STARFIREALM1B							
Set Num		16					
Number of Records		7					
STARFIREALM1B Records							
Record Id	Health	NetID	Longitude				
0	1	0	-98	-	-	-	-
1	1	1	-54	-	-	-	-
2	1	1	-15.5	-	-	-	-
3	1	0	25	-	-	-	-
4	1	1	64	-	-	-	-
5	1	0	143.5	-	-	-	-
6	1	1	178	-	-	-	-

Figure 16: StarFire Almanac screen

- ✓ Record ID: Satellite record identifier number. Describes the ordering of the records in a set. Records with the same record ID imply no particular order. Almanac updates are delivered every hour.
- ✓ Health: Indicates health and status of satellite:
 - 0 = Unhealthy
 - 1 = Healthy
- ✓ NetID: Network identification number.
 - 0 = Net 1
 - 1 = Net 2
- ✓ Longitude: Indicates the position of the satellite in degrees of longitude.
(Range = -180 to +180)

■ NMEA View

The SF-3050 does not output NMEA messages by default. They must be scheduled by the user.



NMEA messages are scheduled using the Schedule Messages page located under the Configuration tab on the Welcome Page.

Clicking the Enable box beside the desired NMEA message under the Sentence ID column will show the message output. The format of the message will appear under the Sentence Contents column.

NMEA Sentences		
Sentence ID	Enable	Sentence Contents
DTM	<input checked="" type="checkbox"/>	GNDTM,999,.....999°54
GBS	<input type="checkbox"/>	-
GFA	<input type="checkbox"/>	-
GGA	<input type="checkbox"/>	-
GLL	<input type="checkbox"/>	-
GNS	<input type="checkbox"/>	-
GRS	<input type="checkbox"/>	-
GSA	<input type="checkbox"/>	-
GST	<input type="checkbox"/>	-
GSV	<input type="checkbox"/>	-
HDT	<input type="checkbox"/>	-
RMC	<input type="checkbox"/>	-
ROT	<input type="checkbox"/>	-
RRE	<input type="checkbox"/>	-
VTG	<input type="checkbox"/>	-
ZDA	<input type="checkbox"/>	-
PNCTDTM	<input type="checkbox"/>	-
PNCTGGA	<input type="checkbox"/>	-
PNCTGST	<input type="checkbox"/>	-
PNCTMDE	<input type="checkbox"/>	-
PNCTSET	<input type="checkbox"/>	-

Note: This NMEA page updates each message sequentially.

Figure 17: NMEA View Screen

- The DTM message automatically displays at the same rate as the GGA.
- Refer to the *Sapphire Technical Reference Manual (TRM)* for detailed information on the output formats of NMEA messages and NavCom proprietary NMEA type messages (see *Related Documents* in the fore-matter). In addition, refer to the section, *NMEA Messages Overview*, in the TRM.
- The NMEA View Screen page does not contain MLA or ALM due to the way they are output.

■ Skyplot

The Sky Plot tab displays the tracked satellite locations for each visible constellation. It provides an interface to select the constellations to be displayed. Each satellite is displayed on the Sky Plot by color and PRN: GPS = Green, GLONASS = Grey, SBAS = Orange, STARFIRE = Blue.

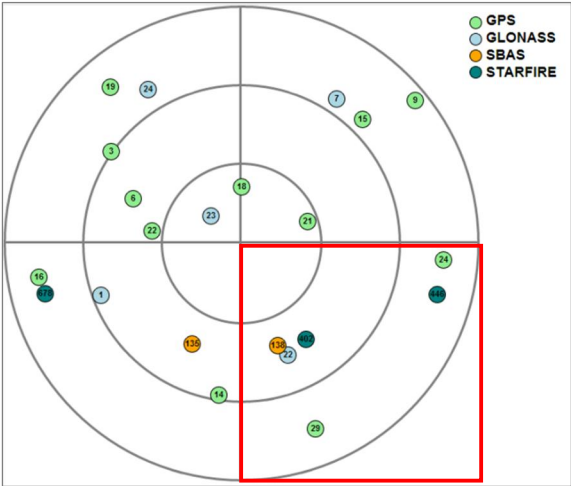


Figure 18: Skyplot Screen

Roll over a satellite (colored circle) to view a pop-up window showing PRN number (PRN), Elevation (Elev), and Azimuth (Azim).

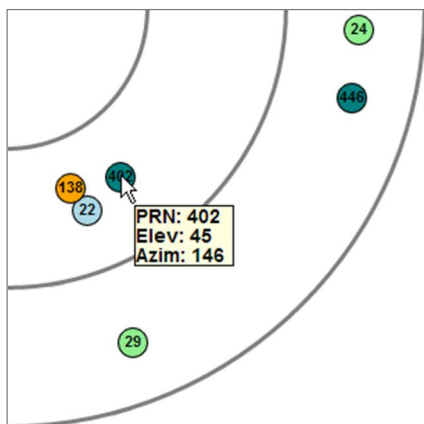


Figure 19: Skyplot Rollover Info

Configuration

■ Schedule Messages

Output messages can be individually scheduled by highlighting the desired message and selecting port and rate of output.

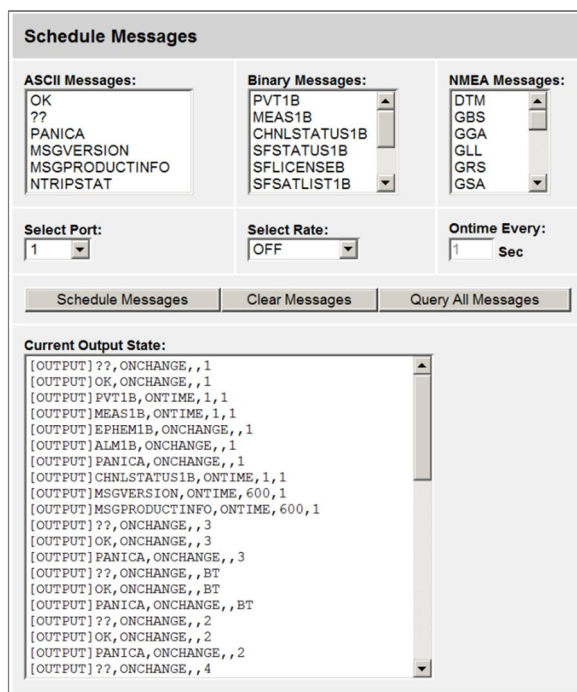


Figure 20: Schedule Messages Screen

- ✓ ASCII Messages: Click to highlight. Use the Select Port pulldown list to select the desired port or to display the current output on that port.
- ✓ Binary Messages: Click to highlight, then Select Rate: OFF, ONCHANGE or ONTIME
- ✓ NMEA Messages: Click to highlight, then enter Ontime rate in seconds.

Click one of the following buttons to complete the scheduling process:

- Schedule Message: Schedules the selected messages.
- Clear Message: Deselects all selected messages
- Query All Messages:



Only one message from each list can be selected at a time.

■ NTRIP Config

NTRIP CONFIG		
Caster Preset:	Starfire Settings	CURRENT CONFIGURATION
Caster:	<input type="text"/>	
Port:	<input type="text" value="0"/>	0
Mount Point:	<input type="text"/>	
Username:	<input type="text"/>	
Password:	<input type="text"/>	
Send NMEA GGA:	Off	OFF
Auto Connect As:	Off	OFF
Corrections Port:	Eth	ETH
Authentication:	Basic	BASIC
Send Ntrip Config		Refresh Current
NTRIP CLIENT		
Connect		Disconnect
		IDLE
NTRIP SERVER		
Connect		Disconnect
		IDLE

Figure 21: NTRIP Config Screen

This screen configures the information that the NTRIP client or server needs to connect to an NTRIP caster. If no configuration information is specified, the current settings will be displayed.

- ✓ *Caster Preset*: Enables StarFire Settings.
- ✓ *Caster*: Specifies name of the NTRIP caster to connect to.
- ✓ *Port*: Specifies caster port number to connect to
- ✓ *Mount Point*: Specifies the name of the mount point to connect to.
- ✓ *User Name*: Required for authentication
- ✓ *Password*: Required for authentication
- ✓ *Send NMEA GGA*: Indicates whether transmission of NMEA GGA message is required.
- ✓ *Auto Connect*: Indicates whether or not NTRIP should try to connect automatically to a client or a server.
- ✓ *Correction Port*: Indicates name of local port to use for NTRIP connection.
- ✓ *Authentication*: Indicates whether to use BASIC or DIGEST authentication.

- ✓ **NTRIP CLIENT:** Connects/disconnects to NTRIP client mount point.
- ✓ **NTRIP SERVER:** Connects/disconnects to NTRIP server mount point.



The NTRIP client and server cannot both be active at the same time. An error message will be displayed if any keyword other than a status request or DISCONNECT is issued to one while the other is active.

Click the StarFire Settings button to automatically configure the NTRIP StarFireNetwork Caster.

NTRIP CONFIG		
Caster Preset:	Starfire Settings	CURRENT CONFIGURATION
Caster:	NTRIP.StarfireNetwork.coi	
Port:	2101	0
Mount Point:	SFGNSS.15	
Username:		
Password:		
Send NMEA GGA:	Off	OFF
Auto Connect As:	Client	OFF
Corrections Port:	Eth	ETH
Authentication:	Digest	BASIC
Send Ntrip Config		Refresh Current
NTRIP CLIENT		
Connect Disconnect IDLE		
NTRIP SERVER		
Connect Disconnect IDLE		

Figure 22: NTRIP Config Screen with StarFire Settings enabled

Click the Send Ntrip Config button to enable the settings or click the Refresh Current button to return to the previous settings.

■ Navigation Modes

Provides access to navigation mode settings for the following modes:

- ✓ **RTCM Code:** Select On/Off
- ✓ **SBAS:** Select On/Off
- ✓ **StarFire:** Select On/Off and Internal/External.

SET NAVIGATION MODES		
		CURRENT NAVIGATION SETTING
RTCM Code:	On	ON
SBAS:	On	ON
StarFire:	On Internal	ON , INTERNAL
Apply Navigation Settings to the Receiver		

Figure 23: Navigation Modes Screen

Click Apply Navigation Settings to the Receiver button to enable the settings.

■ RTK Mode

Configures the RTK mode as follows:

RTKMODE CONFIG		
		CURRENT CONFIGURATION
Mode:	<input type="text" value="BaseRTCM1004"/>	BASERTCM1004
Type:	<input type="text"/>	
ID:	<input type="text" value="1"/>	1
Port:	<input type="text" value="2"/>	2
Dynamics:	<input type="text" value="Static"/>	STATIC
Scheduling Type:	<input type="text" value="Auto"/>	AUTO
RTK-X Mode:	<input type="text" value="none specified"/>	not applicable
<input type="button" value="Set RTKMODE"/>		<input type="button" value="Refresh Current"/>

Figure 24: RTK Mode Screen

- ✓ Mode: Configures the mode as Rover or Base
- ✓ Type: For a rover, this is a required field. It is used to validate the Site ID based on the correction type. For a base, this field must be empty.
- ✓ ID: Set ID range for rover site ID and base station. Receiver will use default value if this field is empty.
- ✓ Port: Enter port number if base. This field must be empty for rover mode.
- ✓ Dynamics: This is an optional field. The default is static or none specified. When setting the base station to output moving base DGPS/RTK corrections or setting the moving base RTK rover, set this field to Dynamic.
- ✓ Scheduling Type: This is an optional field specifying if messages are automatically scheduled. The default setting is AUTO.
- ✓ RTK-X: This is an optional field specifying whether or not the user would like the receiver to transition into RTK-X mode. If the user does not specify this keyword, nothing changes and the receiver will stay in the current mode. ON indicates RTK-X is enabled. This is the default mode. OFF indicates RTK is disabled.

Click Set RTKMODE to change settings or Refresh Current to return to current settings.

■ Self Survey

This command performs a self survey operation by averaging the GPS receiver's position over time and then applying that averaged position as the reference station position.

The receiver waits for a period of time (nominally 1400 minutes or 24 hours) to allow the RTG readings to “settle.” This means there will be no valid survey results until this time has passed. However, if the user specifies less than this value as the time limit, the survey will continue until complete.

The user can set the duration of the survey in minutes then, click the Start button to begin the survey, the Stop/Apply button to end the survey and the Cancel/Discard button to stop the survey and eliminate any results.

Self Survey Control			
Duration (min):	1440	Start	Stop/Apply
Cancel/Discard			
Self Survey Status			
Time:	503114.0000 sec	Current State:	off
Lat:	0.0000°	Sampled Positions:	0
Lon:	0.0000°	Duration to Survey:	0 sec
Ht:	0.0000 m	Remaining Time:	0 sec

Figure 25: Self Survey Screen



After the self survey is completed, the user must save the current profile. If the receiver reboots without saving the profile, the self survey position will be lost.

■ Antenna

Displays the appropriate bias adjustment values for the antenna model in use.

ANTENNA HEIGHT ADJUSTMENT		CURRENT ANTENNA HEIGHT SETTING
Enable/Disable Antenna Height Adjustment:	Disable ▾	OFF
- Antenna Phase Center Adjustment:	<input type="text"/>	none (-128 to +127 mm)
- Slant Range of Antenna Body:	<input type="text"/>	none (-32768 to +32767 mm)
- Radius of Antenna Body:	<input type="text"/>	none (-32768 to +32767 mm)
Configure Antenna Height		

Figure 26: Antenna Height Adjustment Screen

- ✓ Height Adjustment: Indicates whether or not the antenna offset is applied.
- ✓ Phase Center Adjustment: The offset in millimeters from the physical center of the antenna (the element) to the Mechanical Reference Plane (MRP). The MRP is at the bottom of the BSW antenna mount. The range limits are -128 to 127mm.
- ✓ Slant Range of Antenna Body: For a pole, the vertical measurement in millimeters from the Mechanical Reference Plane (MRP) to the control point. For a tripod, the measurement in millimeters from the edge of the antenna to the control point. The range limits are -32768 to 32767mm.
- ✓ Radius of Antenna Body: The measurement in millimeters from the physical center of the antenna to the edge of the antenna. For a pole, enter 0. For a tripod, the range limits are -32768 to 32767mm.

Utility

■ View/Load Profile

The SF-3050 receiver provides for storage of up to 20 user profiles in its non-volatile memory. Each user profile is stored with a name and contains a complete set of user-controlled configuration parameters. A profile can be selected from a profile list or retrieved from a computer file using the Choose File button. Once selected, a profile can be, saved, used or deleted.

Figure 27: View/Load Profile Screen

- ✓ PROFILE in use: shows the name of the current profile in **green text**. Use the Refresh button to update the profile already in use.
- ✓ Receiver Profiles: Profiles can be selected from the List of Profile(s) pulldown list. Click the Use button to enable the selected profile. A selected profile can be deleted by clicking the Delete button. The Delete All button will delete all the profiles in the receiver's memory.



Once a profile has been deleted, its contents cannot be retrieved. There is no way to undelete it. A new profile can be saved using the Save As function. Click the Save As button. A dialog box will open allowing the new profile to be named. Enter a name and click OK.

Figure 28: View/Load Profile Screen

The profile can also be saved to a browser file by clicking the Save to File link.



The Save to File function is only available with Firefox and Chrome browsers. This function will not work with Internet Explorer.

- ✓ Load from File: This function allows a profile to be uploaded to the receiver from a computer library. Click the Choose File button and select a file from the desired folder and click Load.

■ Firmware Update

This function allows firmware to be updated by uploading the most recent version from an external file, such as a USB drive.

Click the Choose File button to select the desired file. Click the Start Firmware Update button to initiate the upload process.

The progress of the upload will appear in the Firmware Update Status section.

Firmware Update

Choose File

No file chosen

Firmware File

Product	Version	Date
---------	---------	------

Start Firmware Update

Firmware Update Status

Progress	
Bytes Loaded	
Status	

Figure 29: Firmware Update Screen

■ Data Logging

This feature allows data to be logged onto one of two internal memory drives, either an internal memory drive (Drive A) or an external USB memory device (Drive B).

CONFIGURE INTERNAL LOGGING

CURRENT INTERNAL FILE LOGGING STATUS

Drive A:	<div>Start</div>	STOPPED	SD FLASH IS GOOD
<div>Log On Drive A:</div>			
Drive B:	<div>Start</div>	B: STOPPED	-
<div>Log On Drive B:</div>			

Figure 30: Data Logging Screen

- ✓ Drive A consists of the internal memory card of the SF-3050. It is formatted and segmented by using the [FSFORMAT] command (see Upload WebPages section).
- ✓ Drive B consists of a USB memory device that can be configured as follows:
 1. Connect the 9-pin Male end of the USB Host cable (94-310271-3006LF) to the COM-2 port on the SF-3050. Plug a USB flash drive into the USB Female end of the cable.
 2. Type [USBMODE]DEVICE, MASS STORAGE in the Input Terminal screen. This command will format the USB device as Drive B.



The USBMODE command automatically defaults to COMPORT. In order to log data onto a USB device, this command needs to be changed to MASS STORAGE.

■ Almanac Loader

The screenshot shows a web interface titled "Almanac". It contains a "Choose File" button, a text field displaying "No file chosen", and an "Inject" button. Below these is a link that says "Save/Open Current Almanac: [GPS](#), [GLONASS](#)".

Figure 31: Almanac Loader Screen

Click Choose File button to select a file from the desired directory. Click Inject to install the almanac in the receiver memory.

Click the GPS link to download the current GPS almanac into the browser. The GLONASS almanac can be downloaded the same way.



The Save/Open Current Almanac feature is only available in Firefox and Chrome browsers.

■ Options and License

This screen lists the Software Options loaded into the receiver and the status of the primary and secondary license.

It is also possible for the user to upload current license software as well as other software options by using the File Upload feature.

The screenshot shows a web interface titled "Receiver Options and License". It contains two main sections: "Software Options" and "Starfire License".

Software Options		Starfire License	Primary License	Secondary License
Model:	SF-3050	License Active?:	Active	n/a
Serial No:	10298	Time Period:	Calendar	n/a
GPS:	L1 L2 L2C L5	Precision Type:	Precise	n/a
GLONASS:	G1 G2	Net Authorization:	All	n/a
StarFire:	Enabled	Issue Date:	8/31/2012 16:49:0	n/a
Nav:	100 Hz	Start Date:	8/31/2012	n/a
Data:	100 Hz	End Date:	8/31/2015	n/a
1PPS/Event Latch:	Enabled	Regional Selection:	World Wide	n/a
SBAS Corrections:	Enabled	Days Issued:	0	n/a
RTK Base:	Enabled	Days Remaining:	n/a	n/a
RTK Moving Base:	Enabled			
RTK Rover:	Enabled	Starfire License	Point Radius	
RTK Extend:	Enabled	Latitude:	N 33° 50' 20"	
Network RTK:	Enabled	Longitude:	W 118° 20' 30"	
Starfire Over IP:	Disabled	Radius:	50 km	

Below the tables is a "File Upload" section with radio buttons for "Key" (selected) and "File". There is a text input field and a "Starfire License" radio button. At the bottom right is an "Upload" button.

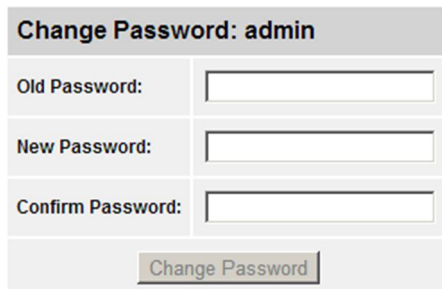
Figure 32: Options and License Screen



License updates and software options should be performed on a regular basis to ensure that the latest files are available for optimal use.

■ Change Password

This screen allows a user to change the password for the desired username as needed. The current user name is listed after Change Password. Only the password for that username can be changed with this feature. For other usernames and passwords, select the Manage Accounts screen.



Change Password: admin

Old Password:	<input type="text"/>
New Password:	<input type="text"/>
Confirm Password:	<input type="text"/>

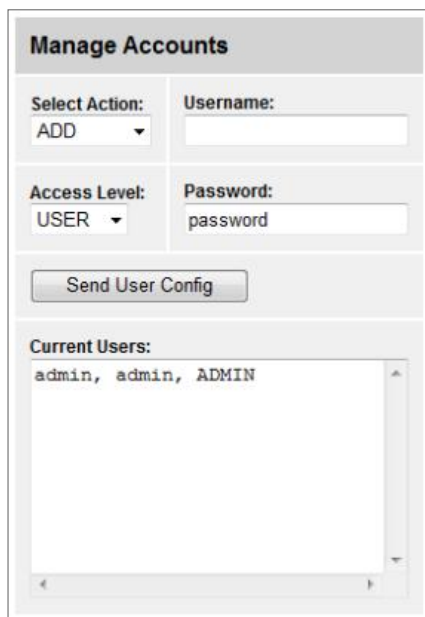
Figure 33: Change Password Screen



User names and passwords are both case sensitive.

■ Manage Accounts

Allows user to add, Remove or update users, change access levels and change usernames and passwords as needed.



Manage Accounts

Select Action: ADD ▼	Username: <input type="text"/>
Access Level: USER ▼	Password: <input type="text" value="password"/>

Current Users:

admin, admin, ADMIN

Figure 34: Manage Accounts Screen

- ✓ There are three levels of access:
 - USER: Able to view all webpages with the exception of Input Terminal and Manage Accounts
 - TECH: Same as USER but is able to view Input Terminal
 - ADMIN: Able to view all pages and modify user accounts
- ✓ There can be at least 1 and at most 9 accounts consisting of:
 - 1 ADMIN
 - 0-8 USER or TECH
- ✓ The default ADMIN account programmed into the receiver is stored in the NVRAM but not stored in the profile.
- ✓ All accounts (with the exception of the admin account) must only be modified by using the web pages. They cannot be modified by using StarUtil3000. Only the admin account can have its password updated by

StarUtil3000.

- ✓ Using the [NVCLEAR] command in the Input Terminal Screen will wipe out all user accounts except for the admin and will return the admin to the default password.
- ✓ The Manage Accounts screen is only available to Level Access TECH and ADMIN.

Input Terminal

The Input Terminal provides a text box for the input of NavCom proprietary commands and queries.

With a user profile loaded and in use, the receiver configuration may be changed with individual commands via the Input Terminal. Commands entered via the Input Terminal are not saved to NVRAM through a receiver power cycle. To maintain the new settings entered through the Input Terminal, the current settings must be retrieved and saved as a new user profile, or overwrite an existing profile before cycling receiver power.



Figure 35: Input Terminal Screen

Help

The Help function provides links to resources that can be useful in using the SF-3050 Webpages.

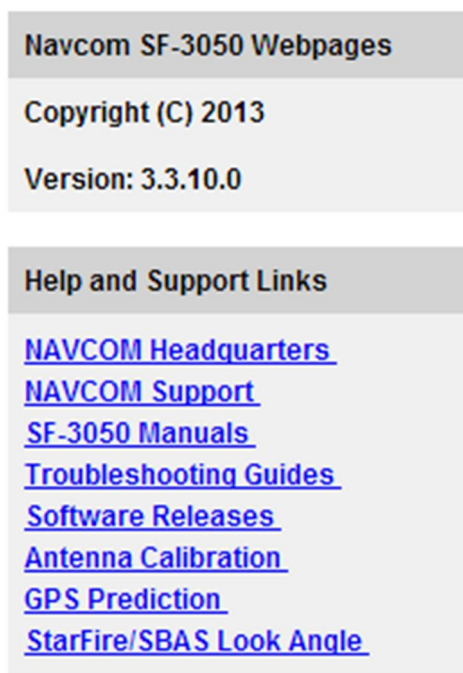


Figure 36: Help Screen



NOTE: This document relates to a legacy product that is no longer in production. The document may contain references to technology or marks, such as RTG or Real Time Gypsy, that are owned by the Jet Propulsion Laboratory of the California Institute of Technology or the National Aeronautics and Space Administration (NASA). As of July 15, 2015, current production NAVCOM products and services no longer utilize any technology of these entities.
