# **StarView**

# User Manual

(for NovAtel SUPERSTAR II-Based Products)

9200	🔹 СОМ1 💌 🍩		
:	🔲 Display Messages Wi	ndow 📃	🛛 🗶 🗖 Receiver Status (ID49) 🔹 🗖 🗶 🔲 HW/SW Configuration - Msg 45 🔹 🗖 🗙
_	•		
1	Received: 67 Bytes , ID#33		System Mode: Navigation SV Tracking Mode: All In View Oper. SW Part No : 1.300A2-L1
1	01 21 DE 3D 0C E4 41 19 0	1 31 E3 3D 50 00 31 E1 38 BC	00 32 Not Change Ha
		)1 2D E6 18 55 00 2A F7 17 30 28 85 01 0A 01 00 20 09 72 44	UU ZU Tropo Model Epabled: ON Config #1 Part No : 169-613955-202
1	20 05 FC 5C 26 AD 12	20 00 01 04 01 00 20 00 72 4	MSL Model Enabled: UN Config #2 Part No
			Time Courses Cold Config #4 Part No :
			CONFIG #5 Part NO :
			Amanac Week: 1319 Config #6 Part No: Week Number: 1319 Config #7 Part No:
	Transmitted: 6 Bytes , ID#49	(One Shot)	GPS SV Deselection: (Red) Deselected Config #8 Part No :
	01 31 CE 00 00 01		Measurements Window - Msg 23 -
וו	LUNY.	W 114 02 17.711 (Deg)	Boot SW Checksum: 2221B278 Predicted GPS Time: 222567.999997
	Alt:	1064.75 m	CH SV CN Code Covier Config #1 Checksum: F9EE8134
		0.00	Customer PSN : UX604381905
AT	Velocity N: Velocity E:	0.00 m/s 0.00 m/s	01 5 49.50 1951198579 3318110128 02 4 47.75 1951223110 1489912336
s	Velocity L: Velocity U:	0.00 m/s	03 2 49.50 1947748721 172843072
4	Felderty O.	0.00 m/s	04 9 45.25 1935220442 3302676056
	HFOM:	1.67 m	05 7 42.00 1932115822 2019631592 14
	VFOM:	1.79 m	
	Ground Speed:	0.00 m/sec	08 20 42.00 1922360867 2623024020 39
E	Track Angle:	0.00 rad	09 1 38.00 1918292863 298811788 10 14 32.50 1916097781 254583340
	Nav Mode:	Diff. 3-D	
	DGPS Source:	SBAS	Channel Assignment Window - Msg 6 & 7
	HDOP:	1.0	
	VDOP:	1.6	Ch# Sv# SNR Rsrvd Carr. Freq
	UTC Date:	2005-04-19	01         24         44.2         8         2685         M         184         260         122           02         38         45.8         8         -3665         M         184         260         122
	UIC Date.	2003-04-13	03 02 49.6 0 -2875 M
° 4	UTC Time:	13:49:08.999997083	04 20 42.2 0 1625 M 05 14 31.8 0 1605 M
	Nb SVs used:	10	05         14         31.8         0         1605         M           06         05         49.7         0         -1555         M         30         30
	Up Hours:	19	07 09 45.1 0 2735 M
	Datum Number:	0	
	Confidence Level: GPS Time Alianment:	High Disable	09         04         47.9         0         545         M           10         07         43.5         0         2315         M
	System Mode:	Disable Navigation	
			12 134 37.8 0 -415 M 180

# StarView User Manual for SUPERSTAR II-Based Products

Publication Number:	OM-2000081
<b>Revision Level:</b>	4
<b>Revision Date:</b>	2005/05/16

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# **Table of Contents**

Software License	6
Customer Service	8
Foreword	9
1 Getting Started	11
-	
1.1 File/Port Menu	
1.1.1 Serial Port	
1.1.2 Save Data	
1.1.3 Input Log File 1.1.4 Save Config	
1.1.5 Restore Factory Config	
1.1.6 Parser Active	
1.1.7 Stop	
1.1.8 Exit	
2 Binary Protocol	17
2.1 View	17
2.2 Window	
2.2.1 Channel Assignment	
2.2.2 Received Messages	
2.2.3 Display Messages	
2.2.4 Terminal (COM1)	
2.2.5 Terminal (COM2)	
2.2.6 DGPS Configuration	
2.2.7 DGPS Data	
2.2.8 DGPS Status	
2.2.9 LLH Position	
2.2.10 XYZ Position	
2.2.11 Plot	
2.2.12 Satellites Status	
2.2.13 Satellites Position	
2.2.14 Satellites Health	
2.2.15 Satellites Almanac	
2.2.16 Ephemeris	
2.2.17 Measurements	
2.2.18 SBAS Status	
2.2.19 Base Status	
2.2.20 Receiver Configuration	
2.2.21 Receiver Status	
2.2.22 Timing Information	
2.2.23 Automatic Log Summary 2.2.24 HW/SW Part Number	
2.2.24 HW/SW Part Number	
2.3 1001 Setting 2.3.1 Almanac Data Transfer	
2.3.2 Clear NVM	
2.3.3 Deselect Channel	
2.3.4 Deselect SVs	
2.3.5 Fixed Height	
2.3.6 MSL Model Use	
2.3.7 Protocol	

52

2.3.8 Restart System	
2.3.9 Set Configuration	
2.3.10 Set Date/Time and Force 1 Shot 1PPS	
2.3.11 Set Datum	
2.3.12 Set Default Msg List	
2.3.13 Set DGPS Config	
2.3.14 Set Differential Msg Rate	
2.3.15 Set Mask Angle	
2.3.16 Set Operating Mode	
2.3.17 Set Timing Parameters	
2.3.18 Set Tropospheric/Ionospheric Model Use	
2.3.19 Track SV Request	
2.4 Send Messages	
2.4.1 General Message Request	
2.5 Help	

# **3 NMEA Protocol**

3.1 View	
3.2 Window	53
3.2.1 GPS Fix Data	
3.2.2 Geographic Position	54
3.2.3 DOP & Active SVs	54
3.2.4 SVs in View	
3.2.5 Recommended Minimum GPS	55
3.2.6 Track & Speed	55
3.2.7 Time & Date	56
3.2.8 Navigation Status	56
3.2.9 Self-Test Results	56
3.2.10 To Waypoint	57
3.2.11 User Position	57
3.2.12 Receiver Status	
3.2.13 Receiver Configuration	58
3.2.14 Received Messages	59
3.2.15 Terminal (COM1)	59
3.2.16 Terminal (COM2)	
3.3 Tool Setting	60
3.3.1 Clear NVM	60
3.3.2 Define Waypoint	
3.3.3 Select Waypoint	
3.3.4 Protocol	
3.3.5 Initialization Data	63
3.3.6 Set Configuration	63
3.3.7 Set Receiver Parameter	
3.3.8 Set Default Message List	65
3.4 Send Messages	
3.5 Help	

# Tables

1	Related Publications	9
2	File/Port Menu	. 14
3	Window Menu	. 18
4	Tool Setting Menu	. 35
	Transmit Messages (Xmit Msg) Menu	. 49
6	Message Modes	. 50
7	NMEA Window Menu	. 53
8	Tool Setting Menu	. 60

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# **Customer Service**

# **Contact Information**

If you have any questions or concerns regarding your SUPERSTAR II-based product, please contact NovAtel Customer Service using any one of the following methods:

NovAtel GPS Hotline:	<b>1-800-NOVATEL</b> (Canada and the U.S.) 403-295-4900 (International)
Fax:	403-295-4901
E-mail:	support@novatel.ca
Website:	www.novatel.com
Write:	NovAtel Inc. Customer Service Dept. 1120 - 68 Avenue NE Calgary, Alberta, Canada T2E 8S5

Before contacting NovAtel Customer Service regarding software concerns, please do the following:

1. Issue the *NVM Reset* command, *Message ID# 99*, with value 0 to reset all NVM. Your receiver automatically resets after the NVM erase has been completed.

(For details on individual commands and logs, refer to the SUPERSTAR II Firmware Reference Manual)

2. Log the following data requests to a file on your PC for 30 minutes:

Receiver Status, ID# 49	one shot	Navigation Data (ECEF), ID# 21	continuous
Ephemeris Data, ID# 22	continuous	Navigation Data (User), ID# 20	continuous
Measurement Block, ID# 23	1 Hz	Satellite Visibility, ID# 33	continuous
Fault Log, ID# 57	one shot	Channel Assignment, ID# 6	continuous
HW/SW Identification, ID# 45	one shot		

3. Send the file containing the log to NovAtel Customer Service, using the <u>support@novatel.ca</u> e-mail address.

# **Firmware Updates**

Firmware updates are firmware revisions to an existing model, which improves basic functionality of the GPS receiver. Refer also to the *Firmware Updates* section of the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on *Page 9*.

Firmware upgrades are firmware releases, which increase basic functionality of the receiver from one model to a higher level model type. When available, upgrades may be purchased at a price, which is the difference between the two model types on the current NovAtel GPS Price List plus a nominal service charge.

If you need further information, please contact NovAtel using one of the methods given above.

# Foreword

This user manual is intended to help you install, test, gather information or perform maintenance using the *StarView* graphical user interface (GUI) software on NovAtel's SUPERSTAR II-based products. Results may be displayed in real time or stored in a file.

The SMART ANTENNA and FlexPak-SSII are SUPERSTAR II-based.

# **User Manual Updates**

The most up-to-date version of this manual can be downloaded from the Documentation Updates section on our website at <u>http://www.novatel.com/Downloads/docupdates.html</u>.

# Prerequisites

As this reference manual is focused on the SUPERSTAR II, it is necessary to ensure that the GPS receiver has been properly installed and powered up according to the instructions outlined in your product's companion hardware user manual before proceeding (references [5] to [6] in *Table 1* below). In these manuals you will find instructions on the basic setup of your GPS receiver as well as a DGPS setup.

You will also need:

A personal computer (PC) with a mouse, CD drive and Windows software: IBM or compatible 486 or Pentium version NT 3.51 or later, Windows 95 or later

PUBLICATION NAME	PUBLICATION NAME
[1] ICD-GPS-200 Rev. B	NAVSTAR GPS Space Segment/Navigation Interface <sup>a</sup>
[2] RTCM-104 version 2.1, January 1994	Recommended Standards for Differential NAVSTAR GPS Radio Technical Commission for Maritime Services (RTCM) <sup>a</sup>
[3] NMEA-0183 Rev 2.20	National Marine Electronics Association Standard for Interfacing <sup>a</sup>
[4] SUPERSTAR II Firmware Reference Manual	NovAtel Part Number OM-20000086 <sup>b</sup>
[5] SMART ANTENNA User Manual	NovAtel Part Number OM-20000078 <sup>b</sup>
[6] SUPERSTAR II User Manual	NovAtel Part Number OM-20000077 <sup>b</sup>

# **Related Publications**

a. Refer to the Standards/References section of the *GPS+ Reference Manual* available on our website at <u>http://www.novatel.com/Downloads/docupdates.html</u> for contact information.

b. See our website at the address shown in *a* above

#### **Table 1: Related Publications**

Many of the *StarView* windows are based on Message ID#s, details of which can be found in *Reference* [4] above. See also *Chapter 1*, *Getting Started* on *Page 13*.

# **StarView Installation**

Once the GPS receiver is connected to the PC, antenna, and power supply, install the *StarView* software. If a *StarView* CD is not supplied, *StarView* is available on our website (see *below*).

From CD:

- 1. Start up the PC.
- 2. Insert the StarView CD in the CD-ROM drive of the computer.
- 3. Install the *StarView* software and follow the steps on the screen. If the setup utility is not automatically accessible when the CD is inserted, select *Run* from the *Start* menu and press the *Browse* button to locate Setup.exe on the CD drive. Click on the *OK* button to install the *StarView* software and follow the steps on the screen.

From our website:

- 1. Start up the PC and launch your internet service program.
- 2. Go to our website at http://www.novatel.com/Downloads/fwswupdates.html and scroll down to the *Other Application Software* section.
- 3. Download the StarView setup program and save it in a temporary directory (for example, C:\temp).
- 4. Use the setup program to install the StarView software by following the steps on the screen.
- After installation, *StarView* also appears in the Windows Start menu at *Start | Program Files | NovAtel L1 Software*.

Once the *StarView* software is installed, see *Page 10*, double click the *StarView* icon: . The *StarView* window appears. The *StarView* window below shows some of the windows that you might typically have open.

IDeprive Colspan="2">Colspan="2">Colspan="2">Monsurements Window - Mag 22         IDeprive Colspan="2">INV/SW Configuration - Mag 45         IDEPRIVE Colspan="2">IDEPRIVE Configuration - Mag 45         IDEPRIVE Configuration - Mag 40         IDEPRIVE Configuration - Mag 20         IDEPRIVE Configuration - Mag 20 <th cols<="" th=""><th>Display Messages Window         W/SW Configuration - Msg 45         Messages Window         Messages Window</th><th colspan="6">STARVIEW MONITOR</th></th>	<th>Display Messages Window         W/SW Configuration - Msg 45         Messages Window         Messages Window</th> <th colspan="6">STARVIEW MONITOR</th>	Display Messages Window         W/SW Configuration - Msg 45         Messages Window         Messages Window	STARVIEW MONITOR					
Image: product of the second of the secon	Image: Sty Submark       Image: St	19200	сом1 🗸 🕼					
Image: Sys Status = Mag 33       Image: Sys Status = Mag 33 <td< th=""><th>Navigation Window (User Loop)       Style Loop       Style Status       Market Status       Ma</th><th></th><th>Received: 77 Bytes , ID#20     114 EB 47 0F 10 00 C0 42     45 6C 72 8C EC 3F C0 57 2     00 00 00 00 00 00 00 00 00 00     48 40 52 82 8A 40 0B 00 11</th><th>2 F6 FF FF 4B 40 05 05 D5 D5 07 53 FE 71 D8 FF BF 33 18 83 44 00 00 00 00 00 00 00 00 00 00 00 00 E0 F 00 A2 08 03 00 00 C9 15</th><th>Oper. SW Part No : 1.300A6-L1         Predicted GPS Time: 399099.39           Config #1 Part No : 1.110-SSII         Other SW Part No : 1.110-SSII           Config #1 Part No : 169-613955-202         Config #2 Part No : 02           Config #2 Part No : 00005683 20937         Other SW Part No : 03           Config #2 Part No : 00005683 20937         Other SW Part No : 03           Config #2 Part No : 00005683 20937         Other SW Part No : 03           Config #3 Part No : 00005683 20937         Other SW Part No : 03           Config #4 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 20         Other SW Part No : 20           Config #5 Part No : 20         Other SW Part No : 20           Config #5 Part No : 20         Other SW Part No : 20</th><th>99998 er 668332 90444 57980 93208 884004 59368 50644</th></td<>	Navigation Window (User Loop)       Style Loop       Style Status       Market Status       Ma		Received: 77 Bytes , ID#20     114 EB 47 0F 10 00 C0 42     45 6C 72 8C EC 3F C0 57 2     00 00 00 00 00 00 00 00 00 00     48 40 52 82 8A 40 0B 00 11	2 F6 FF FF 4B 40 05 05 D5 D5 07 53 FE 71 D8 FF BF 33 18 83 44 00 00 00 00 00 00 00 00 00 00 00 00 E0 F 00 A2 08 03 00 00 C9 15	Oper. SW Part No : 1.300A6-L1         Predicted GPS Time: 399099.39           Config #1 Part No : 1.110-SSII         Other SW Part No : 1.110-SSII           Config #1 Part No : 169-613955-202         Config #2 Part No : 02           Config #2 Part No : 00005683 20937         Other SW Part No : 03           Config #2 Part No : 00005683 20937         Other SW Part No : 03           Config #2 Part No : 00005683 20937         Other SW Part No : 03           Config #3 Part No : 00005683 20937         Other SW Part No : 03           Config #4 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 00005683 20937         Other SW Part No : 03           Config #5 Part No : 20         Other SW Part No : 20           Config #5 Part No : 20         Other SW Part No : 20           Config #5 Part No : 20         Other SW Part No : 20	99998 er 668332 90444 57980 93208 884004 59368 50644		
Long:         W 114 02*17.731" (Deg)         Svs visible = 12         T           Alt:         1048.79 m         Svs visible = 12         T           Velocity N:         0.00 m/s         Status         Azi(deg) [Ex[deg] SNR         T           Velocity V:         0.00 m/s         Use Nav         66         88         48         40         100 erail (SIII) (SIII) (SIII) (SIII) (SIII) (SIIII) (SIIIII) (SIIII) (SIIII) (SIIII) (SIIII) (SIIII) (SIIII) (SIIII) (SIIII) (SIIIII) (SIIIII) (SIIII) (SIIII) (SIIIII) (SIIIII (SIIIII) (SIIIIII) (SIIIII) (SIIIII) (SIIIIII) (SIIIIII) (SIIIII) (SIIIIII) (SIIIII (SIIIII) (SIIIII) (SIIIII) (SIIIIII) (SIIIII (SIIIII) (SIIIII) (SIIIII (SIIIII) (SIIIII) (SIIIII (SIIIII) (SIIIII) (SIIIII) (SIIIII (SIIIII) (SIIIII) (SIIIII (SIIIII) (SIIIII) (SIIIII) (SIIIII (SIIIII) (SIIIII) (SIIIII (SIIIII) (SIIIII) (SIIIII) (SIIIIII) (SIIIIII) (SIIIIII) (SIIIII (SIIIII) (SIIIIII) (SIIIII (SIIIII) (SIIIIII) (SIIIII) (SIIIIII) (SIIIIII) (SIIIIII) (SIIIIII) (SIIIIII) (SIIIIIII) (SIIIIII) (SIIIII) (SIIIII) (SIIIIII) (SIIII	Long:       W 114 02'17.731" (Deg)       SVs wisble = 12       T         Alt:       1048.79 m       SVs wisble = 12       T       SVs wisble = 12       T         Welocity N:       0.00 m/s       SVs wisble = 12       SVs		<del>0</del>	N 051 06'58.976" (Deg)	Confin #R Part No : 09 21 38.00 1917345121 30681			
Alt:       1046.75 m         Alt:       1046.75 m         Velocity N:       0.00 m/s         Velocity E:       0.00 m/s         Velocity U:       0.00 m/s         Velocity E:       0.00 m/s         Velocity U:       0.00 m/s         VFOM:       3.14 m         VFOM:       4.33 m         Ground Speed:       0.00 m/sec       13       42(49)       38         VFOM:       4.33 m       177       View       238       44       01         VFOM:       4.33 m       177       View       238       44       01       169-61 3955-2024fùli 1.110-SSII       mieGumeGumeGumeGumeGumeGumeGumeGumeGumeGum	Aft:       1046.73 m         Velocity N:       0.00 m/s         Velocity E:       0.00 m/s         Velocity U:       0.00 m/s         Velocity V:       0.00 m/s         Velocity V:       0.00 m/s         Velocity V:       0.00 m/s       101       124 m/s 3       111         Velocity V:       0.00 m/s       13       14       3       33         Vir Yew       28       44       0       13       14       3       16         DGPS Source:       None	ml			SVs visible = 12 N: Clear Data			
Velocity N:       0.00 m/s	Velocity N:       0.00 m/s		Alt:	1048.79 m	SV# Status Azi(deg) Ele(deg) SNR "			
Velocity E:       0.00 m/s       6       0.0e Nav       6       0.0e Nav       1000       100       100	Velocity E:       0.00 m/s       6       Use Nav       289       48       47       100 <td>-</td> <td></td> <td>0.00 I</td> <td>1 30 10se Nav 1244 136 131 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td> <td></td>	-		0.00 I	1 30 10se Nav 1244 136 131 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
Velocity U:       0.00 m/s       100       Use Nav       135       47       48       45[] @ 0 ½ (AUD 'O BO (Ist + II/TBI @ 0 h ½ (ÿ) 9? - < 2ty h ‰ IIÿ) 9? N' Å         W       HFOM:       3.14 m       15       167       38       44       167       14       42       10       100 Use Nav       167       38       44         VEOM:       4.33 m       17       View       48       13       0       14       42       11       100 Use Nav	Velocity U:       0.00 m/s       10       Use Nav       135       47       48       45[gdØ324 XMID'0BO[IsH+II[TBI@db%20]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^-<2tyb%10]9^	STAT						
VFUM:       4.33 m       17       //www       48       13       0         Track Angle:       0.00 rad       10       42       10       42       10       42         Max Mode:       Nav 3.D       DGPS Source:       None       114       9       35       114       9       35         HDDP:       1.1       View       48       114       9       35       114       9       35         UTC Date:       2005-05-05       00       Current Status       Current Status       Costatus Chan Mode Reserved Parity       0 <td>VFUM:       4.33 m       17       View       48       13       0         Ground Speed       0.00 m/sec       0.00 m/sec       10       40       10</td> <td>Res</td> <td></td> <td></td> <td></td> <td></td>	VFUM:       4.33 m       17       View       48       13       0         Ground Speed       0.00 m/sec       0.00 m/sec       10       40       10	Res						
VFUM:       4.33 m       17       //www       48       13       0         Track Angle:       0.00 rad       10       42       10       42       10       42         Max Mode:       Nav 3.D       DGPS Source:       None       114       9       35       114       9       35         HDDP:       1.1       View       48       114       9       35       114       9       35         UTC Date:       2005-05-05       00       Current Status       Current Status       Costatus Chan Mode Reserved Parity       0 <td>VFUM:       4.33 m       17       View       48       13       0         Ground Speed       0.00 m/sec       0.00 m/sec       10       40       10</td> <td></td> <td>velocity o.</td> <td>0.00 m/s</td> <td></td> <td>1</td>	VFUM:       4.33 m       17       View       48       13       0         Ground Speed       0.00 m/sec       0.00 m/sec       10       40       10		velocity o.	0.00 m/s		1		
VFUM:       4.33 m       17       //www       48       13       0         Track Angle:       0.00 rad       10       42       10       42       10       42         Max Mode:       Nav 3.D       DGPS Source:       None       114       9       35       114       9       35         HDDP:       1.1       View       48       114       9       35       114       9       35         UTC Date:       2005-05-05       00       Current Status       Current Status       Costatus Chan Mode Reserved Parity       0 <td>VFUM:       4.33 m       17       View       48       13       0         Ground Speed       0.00 m/sec       0.00 m/sec       10       40       10</td> <td></td> <td>HEOM</td> <td>3.14 m</td> <td>4 Use Nav 61 14 42 11 (@DDDDDDDDAII (FFO_1.500A0-E1</td> <td></td>	VFUM:       4.33 m       17       View       48       13       0         Ground Speed       0.00 m/sec       0.00 m/sec       10       40       10		HEOM	3.14 m	4 Use Nav 61 14 42 11 (@DDDDDDDDAII (FFO_1.500A0-E1			
Ground Speed:       0.00 m/sec       11       10       42         Track Angle:       0.00 rad       11       14       4       0         Nav Mode:       Nav 3-D       238       4       0       14       4       0         DBPS Source:       None       114       9       36       9       9       9       14       9       9         With Work:       Nav Mode:       Nav 3-D       DBPS Source:       None       Current Status       0 <t< td=""><td>Ground Speed:       0.00 m/sec         Track Angle:       0.00 rad         Nav Mode:       Nav 3-D         DGPS Source:       None         HDDP:       1.1         UTC Date:       2005-05-05       0       -2252       4       3       33         UTC Time:       15:16:55.999998839       0       -2475       Measready       Tracking       Auto       0</td><td></td><td></td><td></td><td>25 Use Nav 306 13 41 10501 35352204101.1 105301</td><td></td></t<>	Ground Speed:       0.00 m/sec         Track Angle:       0.00 rad         Nav Mode:       Nav 3-D         DGPS Source:       None         HDDP:       1.1         UTC Date:       2005-05-05       0       -2252       4       3       33         UTC Time:       15:16:55.999998839       0       -2475       Measready       Tracking       Auto       0				25 Use Nav 306 13 41 10501 35352204101.1 105301			
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DGPS Source:       None       Channel Assignment Window - Msg 6 & 7         HDOP:       1.1       Current Status       Current Status       Co. Status Chan Mode Reserved Parity         VDOP:       1.7       Cht Sutt SNR       Rsrud Carr. Freq       Tk Status       Loc Status Chan Mode Reserved Parity         UTC Date:       2005-05-05       02       248.0       1385       Heasready       Tracking       Auto       0       0         UTC Time:       15:16:55.999998839       94.13       41.2       0       -1945       Heasready       Tracking       Auto       0       0         Nb SVs used:       8       0       344.1       0       95       94.42.8       0       3065       Heasready       Tracking       Auto       2       0         Datum Number:       0       86       25.5       94.8       0       265       Heasready       Tracking       Auto       2       0         Ochidence Level:       High       89       147.9       -2475       Heasready       Tracking       Auto       2       0         Option       0       81.447.9       0       -2455       Heasready       Tracking       Auto       2       0       0       0       0<	DGPS Source:         None         Channel Assignment Window - Msg 6 & 7           HDDP:         1.1         Current Status         Corrent Status         Channel Assignment Window - Msg 6 & 7           WDP:         1.7         Current Status         Corrent Status         Corrent Status         Channel Assignment Window - Msg 6 & 7           UTC Date:         2005-05-05         Corrent Status         Corrent Status         Tracking Auto         0         0           UTC Time:         15:16:55.999998839         06         49.8         0         345         Measready         Tracking Auto         0         0           Nb SYs used:         8         0         64.42.8         0         345         Measready         Tracking Auto         2         0           Datum Number:         0         86         25.42.1         0         95         Measready         Tracking Auto         2         0           Ordifience Levei:         High         99         21         0.8         2665         Measready         Tracking Auto         2         0           Optimum Number:         0         98         10         47.9         9         -2475         Measready         Tracking Auto         8         0         0         0	9	Nav Mode:	Nav 3-D	134 Track 252 4 36 Indirectine Contestine Co			
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VDOP:       1.7       Cht# Sv#       SNR       Rsrud Carr. Freq       Tk Status       Loc Status       Chan Mode Reserved Parity         UTC Date:       2005-05-05       0       42       48.0       0       1385       Heasready       Tracking       Auto       0       0         UTC Date:       2005-05-05       0       22       48.0       0       1385       Heasready       Tracking       Auto       0       0       0         Nb SVs used:       8       0       413       41.2       0       -1045       Heasready       Tracking       Auto       0       <	VDOP:       1.7       Chill Suit SNR       Rsrud Carr. Freq       Tk Status       Loc Status       Chan Mode Reserved Parity         UTC Date:       2005-05-05       00       48.0       0       -2755       Measready       Tracking       Auto       0       0         UTC Time:       15:16:55.999998839       00       49.8       0       330       49.8       345       Measready       Tracking       Auto       0       0         Nb SVs used:       8       05       94.42.8       0       3005       Measready       Tracking       Auto       0       0       0         Datum Number:       0       07       05       44.8       0       2665       Measready       Tracking       Auto       0       0       0         Ornidence Level:       High       09       18       10       2       0							
UTC Date:       2005-05-05       0       0       -2755       Heasready       Tracking       Auto       1       0       9         UTC Time:       15:16:55.999998839       0       0       248.0       0       1385       Heasready       Tracking       Auto       0 </td <td>UTC Date:         2005-05-05         06         47.5         0         -2755         Heasready         Tracking         Auto         1         0         0         0         0         0         134         0         134         0</td> <td></td> <td colspan="6">o darrene bedeus</td>	UTC Date:         2005-05-05         06         47.5         0         -2755         Heasready         Tracking         Auto         1         0         0         0         0         0         134         0         134         0		o darrene bedeus					
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Nb SYs used:         8         05         04         42.8         0         3005         Measready         Tracking         Auto         2         0           Up Hours:         0         06         25         42.1         0         95         Measready         Tracking         Auto         0         0           Datum Number:         0         07         05         44.8         0         2665         Measready         Tracking         Auto         0         0           Confidence Level:         High         08         10         47.9         0         -2475         Measready         Tracking         Auto         0         0           GPS Time Alignment:         Disable         09         21         0.0         -3965         Not Ready         Location         Auto         0         0           System Mode:         Navigation         11         134         36.5         0         -3965         Not Ready         Location         Auto         0 <td>Nb SVs used:         8         05         04         42.8         0         3005         Measready Measready         Tracking Tracking         Auto         2         0           Up Hours:         0         06         25         42.8         0         95         Measready         Tracking         Auto         0         0           Datum Number:         0         06         25         44.8         0         2665         Measready         Tracking         Auto         0         0           Datum Number:         0         08         10         47.9         0         -2475         Measready         Tracking         Auto         0         0           Confidence Level:         High         09         21         0.0         0         -3965         Not Ready         Location         Auto         0         0           GPS Time Alignmet:         Disable         10         21         0.0         -3965         Not Ready         Location         Auto         0         0           System Mode:         Navigation         11         134         36.5         0         -3965         Not Ready         Location         Auto         0         0         0         0</td> <td></td> <td>LITC Time:</td> <td>15-16-55 999998839</td> <td>100 00 149.0 0 345 Measready Tracking Huto 0 0</td> <td></td>	Nb SVs used:         8         05         04         42.8         0         3005         Measready Measready         Tracking Tracking         Auto         2         0           Up Hours:         0         06         25         42.8         0         95         Measready         Tracking         Auto         0         0           Datum Number:         0         06         25         44.8         0         2665         Measready         Tracking         Auto         0         0           Datum Number:         0         08         10         47.9         0         -2475         Measready         Tracking         Auto         0         0           Confidence Level:         High         09         21         0.0         0         -3965         Not Ready         Location         Auto         0         0           GPS Time Alignmet:         Disable         10         21         0.0         -3965         Not Ready         Location         Auto         0         0           System Mode:         Navigation         11         134         36.5         0         -3965         Not Ready         Location         Auto         0         0         0         0		LITC Time:	15-16-55 999998839	100 00 149.0 0 345 Measready Tracking Huto 0 0			
Up Hours:         0         66         25         42.1         0         95         Measready         Tracking         Auto         0         0           Datum Number:         0         07         05         44.8         0         2665         Measready         Tracking         Auto         2         0           Datum Number:         0         08         10         47.9         0         -2475         Measready         Tracking         Auto         0         0         0           Confidence Level:         High         09         21         0.0         0         -3965         Not Ready         Location         Auto         0	Up Hours:         0         66         25         42.1         0         95         Measready         Tracking         Auto         0         0           Datum Number:         0         07         05         44.8         0         2665         Measready         Tracking         Auto         2         0           Datum Number:         0         08         16         47.9         0         -2475         Measready         Tracking         Auto         0         0           Confidence Level:         High         09         21         0.0         -2475         Measready         Tracking         Auto         0         0           GPS Time Alignmet:         Disable         10         21         0.0         0         -3965         Not Ready         Location         Auto         0         0           System Mode:         Navigation         11         134         36.5         0         -495         Measready         Tracking         Auto         0         0	en e			05 04 42.8 0 3005 Measreadú Tracking Auto 2 0			
Datum Number:         0         07         05         544.8         0         2665         Measready         Tracking         Auto         2         0           Confidence Level:         High         08         10         47.9         0         -2475         Measready         Tracking         Auto         0         0           GPS Time Alignment:         Disable         09         21         0.0         0         -3965         Not Ready         Location         Auto         0         0           GPS Time Alignment:         Disable         10         21         0.0         0         -3965         Not Ready         Location         Auto         0	Datum Number:         0         07         05         44.8         0         2665         Measready         Tracking         Auto         2         0           Confidence Level:         High         08         10         47.7.9         0         -2475         Measready         Tracking         Auto         0         0           GPS Time Alignmet:         Disable         09         21         0.0         0         -3965         Not Ready         Location         Auto         0         0           GPS Time Alignmet:         Disable         10         21         0.0         0         -3965         Not Ready         Location         Auto         0         0           System Mode:         Navigation         11         134         36.5         0         -495         Measready         Tracking         Auto         0				06 25 42.1 0 95 Measreadú Tracking Auto 0 0			
Confidence Level:         High         08         10         47.9         0         -24/5         Measready         Iracking         Huto         0         0           GPS Time Alignment:         Disable         10         21         0.0         0         -3965         Not Ready         Location         Auto         0         0           System Mode:         Navigation         11         134         36.5         0         -495         Measready         Tracking         Auto         0         0	Big         Big <td></td> <td></td> <td></td> <td>07 05 44.8 0 2665 Measready Tracking Auto 2 0</td> <td></td>				07 05 44.8 0 2665 Measready Tracking Auto 2 0			
GPS Time Alignment:         Disable         19         21         0.0         0         -3905         Not Ready         Location         Auto         0         0           System Mode:         Navigation         11         134         36.5         8         -495         Measready         Tracking         Auto         8         8	GPS Time Alignment:         Disable         10         21         0.0         0         -3965         Not Ready         Location         Auto         0         0           System Mode:         Navigation         11         134         36.5         0         -495         Measready         Tracking         Auto         0         0							
System Mode: Navigation 11 134 36.5 0 -495 Measready Tracking Auto 0 8	System Mode: Navigation 11 134 36.5 8 -495 Measready Tracking Auto 8 8							
				Navigation	11 134 36.5 0 –495 Measreadý Tracking Auto 0 0			

These windows are opened from the *Window* menu. For example, select *Window | Messages | Display Messages* to show the Display Messages window:

Window Tool Setting	Xmit Msg Help	Display Messages Window
Channel Messages DGPS Navigation Satellites Status Timing Information Other	Received messages     Display Messages     Terminal (Com1)     Terminal (Com2)	Received: 101 Bytes , ID#45 O1 2D D2 5F 31 2E 33 30 30 41 32 2D 4C 31 20 20 20 20 31 36 39 2D 36 31 33 39 35 35 2D 32 30 32 34 81 EE F9 31 2E 31 31 30 2D 53 53 49 49 20 20 20 20 01 00 00 00 00 00 00 00 00 00 00 00 00
		Transmitted: 6 Bytes , ID#45 (One Shot) 01 2D D2 00 00 01

Before you can transmit, receive or view data however, you must use the *File/Port* menu to open a connection between your GPS receiver and the PC. For example, select *File/Port | Auto Connect* from the main menu:

×
Close
Start

Select the COM port on your PC to which the GPS receiver is connected. Click on the *Start* button to activate the connection. Wait until a message appears to tell you that the connection is successful and then click on the Close button. If the connection is successful you will see the COM port displayed to the right of the status bar at the bottom of the *StarView* window. *StarView* is now ready to use, see also *Figure 1* on *Page 13*.

All menus are accessed from the main menu. The main menu is comprised of 6 menu items whether in NMEA or Binary protocol: File/Port, View, Windows, Tool Setting, Xmit Msg and Help.

First change the *StarView* interface to either NMEA or Binary by clicking on one of these buttons:



Click on the *Protocol* button, is, to display the Configure COM1 Port Mode edit window in order to change the protocol and baud rate of the GPS receiver's COM1 port:

Configure Com1 Po	rt Mode 🛛 🔯
Current setting Mode NMEA Binary Baud rate	Desired setting Mode NMEA Binary Baud rate
Force to bina	ary, 9600 BPS
ОК	Cancel

- When you use the NMEA or BIN buttons, shown above, you are simply changing the *StarView* menus and windows. You must use the *Configure Port Mode* dialog to change the configuration of your card. The *Configure Port Mode* dialog is available using the *Protocol* button or by selecting Tool Setting | Protocol from the main menu.
  - 2. Your receiver's current settings must match those selected in the *Current setting* section of the dialog. If they do not match the protocol can not change. If you do not know your receiver's current settings, use the *Force to binary*, *9600 BPS* button and then use the *Desired setting* section.
  - 3. The minimum baud rate is 300 bps and the maximum is 19200 bps.

To save data to a file rather than only seeing it live on screen, select *File/Port | Save Data | Automatic Logging* from the main menu.

When you select menu options that are followed by an arrow, a pull down menu appears. Most of *StarView* binary functions are represented by a button as shown in *Chapter 2, Binary Protocol* starting on *Page 17. Chapter 3, NMEA Protocol* starts on *Page 52.* 

When you mouse over menu items in StarView, there is often information in the status bar:

Receiver Status Window (ID49)

Com2: 4930 msg

#### Figure 1: Status Bar

When an item is opened from the *Window* or *Xmit Msg* menus, the corresponding Message ID# may be shown in the title of the open window:

Receiver Status (ID	49)	
Power up Mode: Time Source: Almanac Week: Week Number: GPS SV Deselection: 1 2 3 4 5 6 13 14 15 16 17 18 25 26 27 28 29 30 SV Usable (Dr SBAS (1 1 2 3 4 5 6	ON Cold SV with Nav 1319 (Red) Deselected 7 8 9 10 11 12 319 20 21 22 23 24 0 31 32 19]): 5 7 8 9 10 11 12 8 19 20 21 22 23 24 0 31 32	
Mask Angle: Discrete Input: 000101 TCX0 Error Est: TCX0 Aging: Search Noise: Navigation Mode:	0.0 degree 0x16 (Red) Off 1 0 -419 25.4 270.0 Diff. 3-D	

Please refer to the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on *Page 9*, for details on individual messages.

# 1.1 File/Port Menu

The File/Port menu looks the same for both the NMEA and Binary protocols.

The File/Port menu, see *Table 2* on *Page 14*, allows you to select the communication port of the PC, locate a file for incoming data, save a configuration, stop communication between the PC and the GPS receiver, stop logging data and exit the application.

#### Table 2: File/Port Menu

Menu Option	Toolbar Button	Refer to				
Serial Port <sup>a</sup>		Section 1.1.1, Serial Port on Page 15				
Auto Connect		Chapter 1, Getting Started starting on Page 11				
Save Data						
COM1 Port <sup>b</sup>	COH					
COM2 Port <sup>b</sup>	COH2	Section 1.1.2, Save Data on Page 15				
Automatic Logging						
Playback Rate <sup>c</sup>		Section 1.1.3, Input Log File on Page 15				
Input log file <sup>c d</sup>	团	Section 1.1.3, Input Log File on Page 15				
Save Config		Section 1.1.4, Save Config on Page 15				
Restore Factory Config		Section 1.1.5, Restore Factory Config on Page 16				
Parser Active		Section 1.1.6, Parser Active on Page 16				
Stop	<b>500</b>	Section 1.1.7, Stop on Page 16				
Exit	x	Section 1.1.8, Exit on Page 16				
StarView Interface d		Page 12				
Baud Rate <sup>a d</sup>	19200 💌	Section 1.1.1, Serial Port on Page 15				
COM Port <sup>a d</sup>	СОМ1 💌	Section 1.1.1, Serial Port on Page 15				

a. COM port of the PC

b. COM1/COM2 of the receiver

c. Available with the binary protocol and not NMEA

d. Not in the File/Port menu

#### 1.1.1 Serial Port

Select a port to establish communication between the GPS receiver and *StarView*. I/O messages are transmitted through this port. The Serial Port Configuration dialog shows the available ports and baud rates. Consider the case where COM1 is being used by another application while COM2 is still available. To choose COM2 with a baud rate of 19200:

Serial Port Configuration							
Com Port							
H/W Flow Control							
ОК	Cancel						

You can also select a COM port and baud rate, or stop the connection, directly from the File Port tools below the main menu:



 $\boxtimes$  1. Data flow has no effect in your application.

2. You can select or change the COM port on the toolbar to start a connection.

#### 1.1.2 Save Data

This option allows you to log messages from the GPS receiver into a file. Ensure messages are selected before activating logging mode using the *Tool Setting | Set Default Msg List* from the main menu in Binary or NMEA mode. Choose COM1, COM2, or allow the GPS receiver to automatically decide. All messages received are recorded in the log file. You are shown a Save As window. Give your log file a meaningful name to help you remember what it contains.

☐ In Binary mode, *Message ID#s 20, 21, 22, 33, 45* and *49* are requested by default if you select *File/Port* / *Save Data* / *Automatic Logging* from the main menu.

WARNING: When using StarView, ensure the Power Settings on your PC are not set to go into Hibernate or Standby modes. Data will be lost if one of these modes occurs during a logging session.

#### 1.1.3 Input Log File

This option allows you to view data from a previously logged file (it is not in the menu but available as a button option). It is applicable only to binary protocol files. Choose how fast the data is viewed by selecting Playback Rate from the File/Port menu or by clicking on the *Playback Rate* button.

#### 1.1.4 Save Config

Window positions can be saved in a configuration file. *StarView* keeps its configuration in a STARVIEW.CFG file. This file is created if it does not already exist, for example, when the application is launched for the first time. Toolbar settings are saved in a STARVIEW.INI file, which is created and managed by Windows.

StarView saves the windows on display but does not save any settings on the receiver.

#### 1.1.5 Restore Factory Config

This option sets the window positions and sizes to the default configuration.

#### 1.1.6 Parser Active

Keep this menu option checked to see information in StarView.

If you uncheck Parser Active, a message asking you to confirm that you only want to see information in the Terminal window appears:



If you select Yes, a red Parser Inactive message appears in the main StarView window. See also Figure 2 below.

Lat: Long: Alt: Cerminal (COM1) Clear Data	Jser Coor) - Ms X N 051 06'58.886" (Deg) W 114 02'17.710" (Deg) 1048.82 m	PARSER IS INACTIVE
4!!Þ=IöXyIIëG 4ŇÄÿÿ4@IIÔI <kiì?i 4líÿÿ5@IIÔIÔ.hI{Iì?+I 4l!Þ=IöXyIIëG 4ì?ÁIIåqØÿčIIID!!Þ=It 4ÔIINuI{Iì?&lt;ÄôäqØÿč</kiì?i 	ວ່µQâqØÿċIIID!!Þ=löXyIIë BâqØÿċIIID!!Þ=löXyIIëG iXy,úlúIIëG IIID!!Þ=löXy5UIIëG	Vi9ïIDI!Þ=Iû0II0c?IIIIëGI
Nav Mode: DGPS Source:	Diff. 3-D SBAS	SVs Status - Msg 33         T           FD (IIÉGIIII)=IûOII0ç?Iji1
HDOP: VDOP:	1.0 1.2	SV# Status Azi(deg) Ele(deg) SNR
UTC Date:	2004-12-02	16 Use Nav 85 53 48 20 Use Nav 185 30 44
UTC Time: Nb SVs used: Up Hours: Datum Number: Confidence Level: GPS Time Alignment: System Mode: Tracking Mode:	13:52:45.999996918 11 0 0 High Disable Navigation All SVs in View	27     Use Nav     250     17     41       25     Use Nav     70     17     42       24     Use Nav     314     13     41       4     Use Nav     285     13     44       2     View     324     10     0       1     Use Nav     114     8     43       122     Use Nav     114     9     40       134     View     252     5     0

Figure 2: Parser Active (Left) Verses Parser Inactive (Right)

#### 1.1.7 Stop

This option stops communication between your PC and the GPS receiver. File logging is also stopped.

#### 1.1.8 Exit

The Exit menu option terminates the application session.

Binary messages are meant strictly as a machine readable format. They are also ideal for applications where the amount of data being transmitted is fairly high. Because of the inherent compactness of binary as opposed to ASCII data, the messages are much smaller. This allows a larger amount of data to be transmitted and received by the GPS receiver's communication ports. The message block structure of binary messages from a SUPERSTAR II-based receiver follows the general conventions as noted here:

byte 1:	Start of Header (SOH)
byte 2:	Message ID#
byte 3:	Complementary ID#
byte 4:	Message Data Length (0255)
byte 5 n:	n-4 Data Bytes
byte n+1 n+2:	Checksum

*StarView* allows you to view binary messages in ASCII format. Saved data is stored in its original Binary format.

Please refer to the SUPERSTAR II Firmware Reference Manual, Reference [4] on Page 9, for more details on the structure of binary messages and for details on individual messages associated with windows and settings.

NMEA protocol information is in *Chapter 3* starting on *Page 52*.

All menus are accessed from the main menu. The main menu is comprised of 6 menu items whether in NMEA or Binary protocol:

File/Port	See Section 1.1, File/Port Menu starting on Page 13
View	See Section 2.1, View below
Windows	See Section 2.2, Window starting on Page 18
Tool Setting	See Section 2.3, Tool Setting starting on Page 35
Xmit Msg	See Section 2.4, Send Messages starting on Page 49
Help	See Section 2.5, Help starting on Page 51
Windows Tool Setting Xmit Msg	See Section 2.2, Window starting on Page 18 See Section 2.3, Tool Setting starting on Page 35 See Section 2.4, Send Messages starting on Page 49

#### 2.1 View

The View menu option allows you to select toolbars. Buttons are grouped by functionality in 4 toolbars:

File/Port:	9600 🔽 Com1 💌 🎟 🚠 🏹 🛃 🔜 🛲 📟
	See Section 1.1, File/Port Menu starting on Page 13.
General:	Ŷ
	See Section 2.5, Help starting on Page 51.
Tool Setting:	🔽 🌬 🖭 <u>😪 😔 🕺 👫 😪</u>
	See Section 2.3, Tool Setting starting on Page 35.
Window:	** 🜠 🎑 🐈 💷 📰 🗺 🇞 🏊 🕮 🛫 🕋 🏤 🚟
	See Section 2.2, Window starting on Page 18.

# 2.2 Window

The Window menu allows you to open one or more windows. Make sure you open the appropriate window(s) corresponding to the message(s) sent.

The command message to be sent must be selected separately either from the Xmit Msg menu or by clicking the right mouse button over the window selected. The right mouse button is active when the clicking is present in the window. Selected windows are updated after command messages are sent.

Table 3 shows the windows available when you select Window from the main menu.

Menu Option	Toolbar Button	Refer to							
Channel	Channel								
Channel assignment		Page 20							
Message	I								
Received messages	**	Page 20							
Display Messages	1010 10114	Page 21							
Terminal (COM1)	<b>5</b>	Page 21							
Terminal (COM2)	2	Page 22							
DGPS	•								
DGPS Configuration		Page 22							
DGPS Data		Page 23							
DGPS Status <sup>a</sup>	<b>鉴STAT</b> 小山山	Page 23							
Navigation	•								
LLH Solution <sup>a</sup>	<b>M</b>	Page 24							
XYZ Solution	XX III	Page 25							
Plot		Page 26							
Satellites									

Table 3: Window Menu

Continued on Page 19

Status	200	Page 27		
Position		Page 27		
Health		Page 28		
Almanac		Page 28		
Ephemeris <sup>a</sup>	Q2	Page 30		
Measurements <sup>a</sup>		Page 30		
Status	•			
SBAS Status <sup>b</sup>	SBAS Stability	Page 31		
Base Status <sup>c</sup>	BASE	Page 31		
Receiver Status	BCX	Page 32		
Receiver Configuration	*	Page 32		
Timing Information	<u>Q</u>	Page 33		
Other				
Automatic Log Summary		Page 34		
HW/SW Part Number <sup>c</sup>		Page 34		

a. Use your right mouse button to request this message in Continuous mode

b. You must have an SBAS-capable model in order to use SBAS

c. Use your right mouse button to request this message in One Shot mode

### 2.2.1 Channel Assignment

The Channel Assignment window shows you the current satellites assigned to channels 1 through 12. It is associated with *Message ID#s* 6 and 7.

🔲 Ch	Channel Assignment Window - Msg 6 & 7									
Ð	Current Status									
Ch#	Sv#	SNR	Rsrvd	Carr. Freq	Tk Status	Loc Status	Chan Mode	Reserved	Parity	
01	24	43.2	0	3065	Measready	Tracking	Auto	2	0	
02	30	47.6	9	-2775	Measready	Tracking	Auto	1	0	
03	02	50.9	6	-1475	Measready	Tracking	Auto	1	0	
04	10	44.0	0	-4235	Measready	Tracking	Auto	0	0	
05	06	43.7	0	-3535	Measready	Tracking	Auto	1	0	
06	05	49.9	6	-75	Measready	Tracking	Auto	0	0	
07	09	43.1	6	3255	Measready	Tracking	Auto	0	0	
08	25	40.6	6	-2555	Measready	Tracking	Auto	0	0	
09	04	47.5	6	1865	Measready	Tracking	Auto	1	0	
10	07	42.6	9	2585	Measready	Tracking	Auto	-1	0	
11	122	39.8	0	-425	Measready	Tracking	Auto	0	0	
12	134	37.8	0	-425	Measready	Tracking	Auto	0	0	

#### 2.2.2 Received Messages

The Received Message window shows messages received from the GPS receiver. It also shows the size of the file used to save incoming data and protocol errors.

Ē	Rece	eived M	lessage	s Winde	w							C	
Buffer read: 77 (0.1%) Valid msg: 865 Protocol error: 0													
							FIC	locol en	or: U				
	0	10	20	30	40	50	60	70	80	90	100	110	120
0	0	0	112	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	34	433	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	140	0	0	0	0	0	0	0	0	0	0	0	5
7	140	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	1	0	0	0	0	0	0	0	

# 2.2.3 Display Messages

This window displays the input and output messages in hexadecimal format. The size and the number of the message are shown in decimal format.

🔲 Display Messages Window 📃 🗆 🔀
•
Received: 77 Bytes , ID#20
01 14 EB 47 0E 22 00 50 B4 E6 FF 7F 47 40 13 04 D5 07 15 6C FB 11 7C 8C EC 3F 14 98 51 EF 71 D8 FF BF 85 1D 85 44 00 00 00 00 00 00 00 00 00 00 00 00 00
Transmitted: 6 Bytes , ID#20 (One Shot)
01 14 EB 00 00 01

# 2.2.4 Terminal (COM1)

The Terminal (COM1) window shows the messages received from the COM1 port of the GPS receiver before processing. If COM1 is not the active port, *StarView* displays the Serial Port Configuration dialog for you to edit first, see *Page 15*.

Terminal (COM1)
Clear Data
₽ÿI9ê'/}?çÝIIIIIIIIIIIBúÞI~II-I-Ò_1.200-L1
169-613955-2024lîù1.110-SSII
IIIëGIIIIëGIIIIëGIIIIIëGIIIIëGII äÿÿ:@IIÕI‰álh lì?¹`é¥qØÿ¿#MIDIIëGIIIIëGI
IIIëGIIIIëGIIIIëGIIIIIëGIIIIëGIIIóÿÿ@@µIÕI]V;h Iì?å5(¦qØÿ¿ <mid′0bo{isi+< td=""></mid′0bo{isi+<>
I¦ITBI@ûh¼ÍÿI9?¬ <ziyh¼iiïÿi9?ń'}*ĩĩ¯i@bbbbbbbbbåii~ii-i-ò_1.30òa6-< td=""></ziyh¼iiïÿi9?ń'}*ĩĩ¯i@bbbbbbbbbåii~ii-i-ò_1.30òa6-<>
L1 169-613955-20241iù1.110-SSII
IIIëGIIIIëGIIFóÿIB@IIÕIIm Iì?,QìüqØÿ¿¿IIDIIëGIIIIëGIIIIëGIIIIëGIIIIëGIIIIë
GIIIIëGIIcôÿÿE@IIÕI»=In lį̇́?]ÒIýqØÿċIIIDIIëGIIIIëGIIIIëGIIIIëGIIIIëGIIIIëGI
IIIëGIIyõÿIĺ@IIÕIIB,m Iì?İÚIþqØÿ¿IÍIDIIëGIIIIëGIIIIëGIIIIëGIIIIëGIIII
III~IIIIIëGI:IIëGI:IIëGI:IIëGI:IIëGI:I <sup>*</sup> IIIIIëGI:IIÞ=IeMII1i9PIIëGI:ÿ¿pIIDI!Þ=Ie
MII1i9P%IIIIëGI:FI()
IIIùU:IIIIøUIIëGI:I!Þ=IeMII1i9PIIùUþÿllëGI:I!Þ=IeMII1i9PIIùU:II&IIIëGI:I!Þ=
IeMII1i9PIIùUIIëGI:I!Þ=IeMII1i9PIIùUIIëGI:I!Þ=IeMII1i9PIIùU''É\$IIIëGI:ÿ¿I
IIDI!Þ=IeMII1i9P\$IIIIùUIIëGI:I!Þ=IeMII1i9PFI()
IIIùU:\$IIIøUIIëGI:I!Þ=IeMII1i9PIIùUÿÿIIëGI:I!Þ=IeMII1i9PIIùU:II&IIIëGI:I!Þ
=leMII1i9PIIùUIIëGI:I!Þ=leMII1i9PIIùUIIëGI:I!Þ=leMII1i9PIIùU''É\$IIIëGI:ÿ
¿-IIDI!Þ=IeMII1i9P\$IIIIùUIIëGI:I!Þ=IeMII1i9PFI()
IIIùU:'IIIøUIIëGI:I!Þ=IeMII1i9PIIùUIIëGI:I!Þ=IeMII1i9PIIùU:II&IIIëGI:I!Þ=Ie
MII1i9PIIùUIIëGI:I!Þ=IeMII1i9PIIùUIIëGI:I!Þ=IeMII1i9PIIùU''É\$IIIëGI:ÿ¿«II
DI!Þ=IeMII1i9P\$IIIIùUIIëGI:I!Þ=IeMII1i9PFI'
IIIùU:þIIIøUIIëGI:I!Þ=IeMII1i9PIIùUÿÿIIëGI:I!Þ=IeMII1i9PIIùU:II&IIIëGI:I!Þ
=leMI119PIIùUIIëGI:I!Þ=leMI119PIIùUIIëGI:I!Þ=leMI119PIIùU''É\$IIIëGI:ÿ
¿ÙIIDI!Þ=IeMII1i9P\$IIIIùUI″IIIIIùUIIëGI:I!Þ=IeMII1i9PFI()

# 2.2.5 Terminal (COM2)

The Terminal (COM2) window shows the messages received from the COM2 port of the GPS receiver before processing. If COM2 is not the active port, *StarView* displays the Serial Port Configuration dialog for you to edit first, see *Page 15*.

Terminal (Com2)	
Clear Data	
	<u>``</u>

### 2.2.6 DGPS Configuration

The DGPS Configuration window shows the DGPS configuration of the GPS receiver. It is associated with *Message ID# 43*, see also *Page 41*.

DGPS Configuration	n Window - Msg 43	- 🗆 🔀
0		
Differential:	On	
Mode:	Reference	
Туре:	RTCM	
Port:	Dedicated	
Diff. Coast Time:	45	
Corr. Coast Time:	120	
Baud rate:	9600	
Msg #5 Decoding	enabled	
Msg retransmitted:	ОЬ 0111 1100	
_	ОЬ ОО1О О1ОО	
	ОЬ ОООО ОООО	
	ОЬ ОО1О ОООО	
	ОЬ ОООО ООО1	
	ОЬ ОООО ОООО	
	ОЬ 1001 0001	
	ОЬ 1011 1110	

The *Msg retransmitted* fields shown in the window above are not available and should be ignored.

#### 2.2.7 DGPS Data

The DGPS Data window shows the RTCM data received by the GPS receiver in hexadecimal format and some message information in ASCII format. It is associated with *Message ID# 83*.



#### 2.2.8 DGPS Status

The DGPS Status window shows DGPS messages received unless the GPS receiver is a BASE model. In this case, it shows encoded DGPS messages. This window is associated with *Message ID# 48*.

	DGPS 9	Status - Msg	j 48					-08
P,	Station	n ld # :	1		Valid word ci	nt:	935	
Ĭ	Ref sta	ation health :	Service pro	vider 0	Parity error c	nt:	0	
	Modifie	ed Z Count :	2666		Age of corre	ction: 89		
		10: <mark>0</mark>	20 : <mark>0</mark>	30 : <mark>0</mark>	40 : <mark>0</mark>	50 : <mark>0</mark>	60 : <mark>0</mark>	
1	1:0	11: <mark>0</mark>	21 : <b>0</b>	31 : <mark>0</mark>	41 : <mark>0</mark>	51 : <mark>0</mark>	61 : <mark>0</mark>	
2	2:0	12: <mark>0</mark>	22: <b>0</b>	32 : <mark>0</mark>	42 : <mark>0</mark>	52 : <mark>0</mark>	62 : <b>0</b>	
3	3:29	13: <mark>0</mark>	23: <mark>0</mark>	33 : <mark>0</mark>	43 : <mark>0</mark>	53 : <mark>0</mark>	63 : <mark>0</mark>	
4	4:0	14: <mark>0</mark>	24 : <b>0</b>	34 : <mark>0</mark>	44 : <mark>0</mark>	54 : <mark>0</mark>	64 : <mark>0</mark>	
5	5:0	15: <mark>0</mark>	25 : <b>0</b>	35 : <mark>0</mark>	45 : <mark>0</mark>	55 : <mark>0</mark>		
6	G : O	16: <mark>0</mark>	26 : <b>0</b>	36 : <mark>0</mark>	46 : <mark>0</mark>	56 : <mark>0</mark>		
7	7:0	17: <mark>0</mark>	27 : <b>0</b>	37 : <mark>0</mark>	47 : <mark>0</mark>	57 : <mark>0</mark>		
8	3: <b>0</b>	18: <mark>0</mark>	28 : <b>0</b>	38 : <mark>0</mark>	48 : <mark>0</mark>	58 : <mark>0</mark>		
9	9:0	19: <mark>0</mark>	29: <mark>0</mark>	39 : <mark>0</mark>	49 : <mark>0</mark>	59 : 9		

#### 2.2.9 LLH Position

The Navigation Data (user coordinates) window contains the position (latitude, longitude and altitude coordinates) and velocity (m/s) computed by the GPS receiver. It is associated with *Message ID# 20*. In addition, it reports height and velocity Figures of Merit (FOMs) which are quality indicators.

Datum #0 in StarView is the WGS84 datum. See also Tool Setting | Set Datum on Page 40.

The Nav Mode field displays one of the following navigation modes:

Initialization Required Initialized NAV 3-D NAV 2-D Diff. 3-D Diff. 2-D Dead Reckoning

Navigation Window (L	Jser Coor) - Msg 20 🛛 🗖 🛛
0	
ĭ Lat:	N 051 29'42.730" (Deg)
Long:	₩ 114 41'35.007" (Deg)
Alt:	1047.00 m
Velocity N:	0.00 m/s
Velocity E:	0.00 m/s
Velocity U:	0.00 m/s
HFOM:	0.00 m
VFOM:	0.00 m 0.00 m
	0.00 m 0.00 m/sec
Ground Speed:	0.00 m/sec
Track Angle:	0.00 rad
Nav Mode:	Nav 3-D
DGPS Source:	None
	Hone
HDOP:	1.1
VDOP:	1.4
UTC Date:	2005-04-19
UTC Time:	15:33:46.999996972
Nb SVs used:	9
Up Hours:	21
Datum Number:	0
Confidence Level:	High
GPS Time Alignment:	
System Mode:	Navigation
Tracking Mode:	All SVs in View

## 2.2.10 XYZ Position

The Navigation Data window contains the GPS receiver's position and velocity in earth-centered-earth-fixed (ECEF) coordinates. It is associated with *Message ID# 21*. In addition, it reports height and velocity FOM and Dilution of Precision (DOP) values, which are quality indicators.

The Nav Mode field displays one of the navigation modes shown in Section 2.2.9, LLH Position on Page 24.

Navigation GPS	Solution (ID21) 🛛 🗖 🖾
•	
Pos X(m): Pos Y(m): Pos Z(m): Vel X(m/s): Vel Y(m/s): Vel Z(m/s): Clock Bias(s): Clk Drift(PPM): HFOM: VFOM:	
HDOP: VDOP:	1.1 1 <b>4</b>
Nav. Mode:	

### 2.2.11 Plot

The navigation Plot window shows the position computed. You can compare it with the known position or with another computed solution. The window has a zoom range of 1 to 1000 m. This window has its own menu that includes options for viewing the coordinates or grid. Use the Dot Style and Dot Size menu to adjust the dot. See also *Section 2.2.9, LLH Position on Page 24*, which is also associated with *Message ID# 20*.



#### 2.2.12 Satellites Status

The SVs Status window shows the status of each satellite in view. It also gives the elevation and azimuth of the satellites in the sky in degrees and the signal to noise ratio (SNR).

<b></b> 5\	🔲 SVs Status - Msg 33 👘 🗐 🔯										
SVs visible = 12											
SV#	Status	Azi(deg)	Ele(deg)	SNR							
2 6 10 5 25	Use Nav Use Nav Use Nav Use Nav Use Nav Use Nav Use Nav Use Nav Track Track	233 66 290 129 186 302 35 62 239 7 113 251	56 53 52 50 33 10 10 8 3 9 5	<b>49</b> <b>49</b> <b>49</b> <b>49</b> <b>49</b> <b>47</b> <b>43</b> <b>44</b> <b>42</b> <b>40</b> <b>30</b> <b>30</b> <b>31</b> <b>31</b> <b>31</b> <b>31</b> <b>31</b> <b>31</b> <b>31</b> <b>31</b>							

#### 2.2.13 Satellites Position

The SVs Position window shows the satellites in view in the sky above you. The window also displays rings of azimuth and elevation in degrees. The window can also display the mask angle used by the GPS receiver.



### 2.2.14 Satellites Health

The Satellites Health window shows the health of each satellite. It is associated with *Message ID# 50*. A healthy satellite is shown with an ASCII H and binary indicator 00, otherwise it is unhealthy and is shown with an ASCII U and binary indicator 11.

	Satellites Health - Msg 50																
Ð																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
	00	00	00	00	00	00	00	00	11	00	00	00	00	00	00	00	
	н	н	н	н	н	н	н	н	U	н	н	н	н	н	н	н	
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
	00	00	00	11	00	00	00	00	00	00	00	00	11	11	00	00	
	н	н	н	U	н	н	н	н	н	н	н	н	U	U	н	н	

#### 2.2.15 Satellites Almanac

This message window contains the decoded almanac parameters from subframes four and five as received from the satellite with the parity information removed and appropriate scaling applied. It is associated with *Message ID#* 76. For more information on Almanac data, refer to the GPS SPS Signal Specification. Contact information is available in the *GPS+ Reference Manual* on our website at <u>http://www.novatel.com/Downloads/docupdates.html</u>.

The L1 family of receivers automatically saves almanac information in their non-volatile memory (NVM), therefore creating an almanac boot file is not necessary.

#### 2.2.16 Ephemeris

The Ephemeris window shows ephemeris data for one satellite. It is associated with *Message ID#* 22. The data is transmitted at a rate of one message per second until the ephemeris data list is complete, and then it is transmitted only if there is new ephemeris data.

This data is received in ICD-GPS-200 format. Refer to the NAVSTAR GPS Space Segment/Navigation Interface document ICD-GPS-200 Rev. B or later for specifics on the format of the ephemeris data. NAVSTAR contact information may be found in the *Standard/References* section of the *GPS+ Reference Manual* available on our website at <a href="http://www.novatel.com/Downloads/docupdates.html">http://www.novatel.com/Downloads/docupdates.html</a>.

🔲 Ephem	eris Windov	y - Msg 22 🔳	
🛡 sv:30			
49D001	248947	E70ADA	
87D6BD	FFB3EE	BE3A02	
0000D1	122F10	BEF9A8	
32AA57	3B6386	FA7004	
156E4E	14CBA1	ODD OB 9	
3A027E	0031DD	EDF600	
FFA526	70213A	165F33	
A44020	FFA89C	BEOOAC	

#### 2.2.17 Measurements

The Measurements window shows raw data carrier phase and code phase data. It is associated with *Message ID# 23*. Measurements data can be sent at 1, 2, 5 or 10 Hz depending on your receiver model.

Sending this message in One Shot mode, turns it off and does not return any data. To start or turn the message back on, send it in Continuous Mode.

Refer also to the *Measurements* appendix of the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on *Page 9*, for details on raw code phase and carrier phase measurements.

This message is only available on GPS receiver models that have Carrier Phase Output capability (CP).
 Refer also to the SUPERSTAR II Card Models appendix in the SUPERSTAR II Firmware Reference
 Manual, Reference [4] on Page 9.

Measurements Window - Msg 23 📃 🗖 🛛								
Ð	Pred	licted (	GPS Time: 231	380.999997				
СН	S٧	CN	Code	Carrier				
01	6	48.75	1947703858	492999816				
02	10	49.00	1948781886	3002044308				
03	30	49.25	1947661804	4074436576				
04	2	47.25	1946637902	1082050720				
05	5	45.25	1934378344	1072644088				
06	21	42.00	1922325957	1331744916				
07	25	43.00	1921337781	4281866276				
08	13	42.50	1922959885	2880807116				
09	4	43.50	1919146607	3284025296				

### 2.2.18 SBAS Status

The SBAS Status window shows the number of SBAS (for example WAAS and EGNOS) messages received by the GPS receiver for specific SBAS satellites. It is associated with *Message ID# 68*. A global count of all valid and erroneous messages is also displayed. You must have an SBAS-capable model in order to use SBAS.

To enable SBAS, select Tool Setting | DGPS Config, see *DGPS Configuration* on *Page 22*. Set the DGPS Type to SBAS only or Automatic. The receiver then automatically tracks SBAS satellites in your coverage area.

🔲 s	🔲 SBAS Status - Msg 68 📃 🔲 🛛					
<b>P</b> :	SV Number:	122	Pro	tocol errors:	0	
ľ, ľ	Valid Messages:	15269	Age	of correction:	0 seco	nds
0:	0 10:1	20 : <mark>0</mark>	30 : <mark>0</mark>	40 : <mark>0</mark>	50 : <mark>0</mark>	60 : <b>0</b>
1:	1 11:0	21 : <b>0</b>	31 : <mark>0</mark>	41 : <mark>0</mark>	51 : <mark>0</mark>	61:0
2:	11 12:0	22 : <b>0</b>	32 : <mark>0</mark>	42 : <mark>0</mark>	52 : <mark>0</mark>	62:2
3:	11 13:0	23 : <mark>0</mark>	33 : <mark>0</mark>	43 : <mark>0</mark>	53 : <mark>0</mark>	63:10
4 :	0 14:0	24 : 11	34 : <mark>0</mark>	44 : <mark>0</mark>	54 : <mark>0</mark>	
5:	0 15:0	25 : <mark>8</mark>	35 : <mark>0</mark>	45 : <mark>0</mark>	55 : <mark>0</mark>	
6:	0 16:0	26 : <mark>0</mark>	36 : <mark>0</mark>	46 : <mark>0</mark>	56 : <mark>0</mark>	
7:	1 17:1	27 : <mark>0</mark>	37 : <mark>0</mark>	47 : <b>0</b>	57 : <mark>0</mark>	
8:	1 18:1	28 : <mark>9</mark>	38 : <mark>0</mark>	48 : <mark>0</mark>	58 : <mark>0</mark>	
9:	1 19:0	29 : <mark>0</mark>	39 : <mark>0</mark>	49 : <mark>0</mark>	59 : <mark>0</mark>	

#### 2.2.19 Base Status

The Base Status window shows the position of the base station as received through RTCM messages. It is associated with *Message ID# 47*. The window also has the time remaining in the survey, the status of the base station, and the RTCM messages in use and their rates. This information is set at the base station using *Set Operating Mode* and *Set Differential Message Rate* dialogs. See *Page 43* and *Page 42* respectively for details on these commands.

In this example, the unit is in Base Station mode and the position is initialized.

Base Status - Msg 47	
Base Status: Baud Rate:	Position Initialized 9600
Time Survey Remaining	r: 0.00 hr(s)
CEP:	0.00 m
Latitude: Longitude: Altitude:	N 051 29'42.730" (Deg) W 114 41'35.007" (Deg) 1047.00 m
Nbr Diff Msg:	0

#### 2.2.20 Receiver Configuration

The Receiver Configuration window shows receiver configuration data. It is associated with *Message ID# 30*. See also *Section 2.3.9*, *Set Configuration on Page 39*.

🔲 Receiver Configuration Window - Msg 30 / \$PMCAG, 912 🔳 🔲 🔀			
Predefined configuration: Maximum velocity: Maximum acceleration: Stand still threshold:	Car 45 m/sec 8 m/sec2 0.20 m/sec		
Dead reckoning threshold:	10 sec		
Navigation rate:	1 Hz		
Antenna type:	Active		

#### 2.2.21 Receiver Status

The Receiver Status window shows the configuration of the GPS receiver. It is associated with *Message ID*# 49.

Receiver Status (ID49)	
<ul> <li>System Mode:</li> <li>SV Tracking Mode:</li> <li>NVM Status:</li> <li>Tropospheric/Ionospheric Model Enabled:</li> <li>MSL Model Enabled:</li> <li>Power up Mode:</li> <li>Time Source:</li> <li>Almanac Week:</li> <li>Week Number:</li> <li>GPS SV Deselection:</li> <li>1 2 3 4 5 6 7 8 9 101112</li> <li>1314 1516 17 18 19 20 21 22 23 24</li> <li>25 26 27 28 29 30 31 32</li> <li>SV Usable (Or SBAS (119)):</li> <li>1 2 3 4 5 6 7 8 9 101112</li> <li>1314 15 16 17 18 19 20 21 22 23 24</li> <li>25 26 27 28 29 30 31 32</li> <li>SV Usable (Or SBAS (119)):</li> <li>1 2 3 4 5 6 7 8 9 101112</li> <li>1314 15 16 17 18 19 20 21 22 23 24</li> <li>25 26 27 28 29 30 31 32</li> <li>Channel Deselection:</li> </ul>	Navigation All In View Idle ON OFF Warm SV with Nav 1321 1321 (Red) Deselected
1 2 3 4 5 6 7 8 9 1011 12 Mask Angle: Discrete Input:	4.5 degree 0x16 (Red) Off
00010110 TCX0 Error Est: TCX0 Aging: Search Noise: Navigation Mode:	-508 25.4 258.5 Nav 3-D

### 2.2.22 Timing Information

The Timing information window gives precise timing information. It is associated with Message ID# 113.

The clock bias and drift parameters are computed using the pseudorange measurements and the predicted true range (using the known user position). A Time Figure Of Merit (TFOM) for the clock errors is derived using the residuals of the least-square time solution. When using GPS measurements only, the TFOM does not take into account any bias in the residuals that may be induced by the atmospheric errors. Therefore it provides a relative accuracy estimate. When the SBAS channel is available, the clock bias estimate is virtually free of systematic errors and the computed TFOM approximates an absolute accuracy of the 1PPS output by the GPS receiver.

- This message is only available on GPS receivers models that have Precise Timing (T) capability. See also the SUPERSTAR II Card Models appendix in the SUPERSTAR II Firmware Reference Manual, Reference [4] on Page 9.
  - 2. You must have an SBAS-capable model in order to use SBAS. To enable SBAS, select Tool Setting | DGPS Config, see *DGPS Configuration* on *Page 22*. Set the DGPS Type to SBAS only or Automatic. The receiver then automatically tracks SBAS satellites in your coverage area.

Timing Information (II	0113) 📃 🗖 🔀
P.	
Cable Delay:	0 ns
1PPS Offset:	0 ns
1PPS Pulse Length:	1000000 ns
Nbr SVs:	8
Mask Angle:	3.000 deg
Leap Second Change:	_
Leap Second Value:	13 s
Clock Bias:	-1.683486640 ns
Clock Drift:	-0.27716 ppm
UTC Date:	19/04/2005
UTC Time:	16:25:53.999997129
1PPS Residual:	-2871 ns
Timing Operating Mode	: Standard
TRAIM Status:	Normal
Static Operation Status	s: Successful
-	Active
Static operation:	Active
TFOM:	4 ns
TBAIM Alarm limit:	1000 ns
Intrinsic Delay:	1900 ns

#### 2.2.23 Automatic Log Summary

This window appears if you start a log file using the File/Port | Save Data | Automatic Logging menu, see *Page 15*. It shows a summary of the information contained in an example log file in progress.

🗖 Automatic Log Summary 🛛 🗖 🛛				
0				
Com Parameter:	COM1	19200		
Protocol:	Binary			
Log File:	April1920	105.log		
Elapsed Time:	0:38			
Msg 20: 39				
Msg 21: 39				
Msg 22: 8				
Msg 33: 39				
Msg 45: 1				
Msg 49: 38				
1				

#### 2.2.24 HW/SW Part Number

The HW/SW Configuration window provides hardware and software identification information. It is associated with *Message ID# 45*.

HW/SW Configuration - Msg 45		
•		
Oper. SW Part No : Boot SW Part No : Config #1 Part No : Config #2 Part No : Config #3 Part No : Config #4 Part No : Config #5 Part No : Config #6 Part No :	1.110-SSII	
Config #7 Part No : Config #8 Part No :		
Boot SW Checksum: Oper.SW Checksum: Config #1 Checksum: Customer PSN :	A71469B6	

Oper. SW Part No is the version of firmware loaded onto the receiver. Config #1 Part No is the model part number that is loaded onto the receiver. Refer also to the *SUPERSTAR II Card Models* appendix in the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on *Page 9*.

# 2.3 Tool Setting

The Tool Setting menu allows you to send commands to the GPS receiver. *Table 4* shows the menu options available when you select Tool Setting from the main menu.

Menu Option	Toolbar Button	Refer to
Almanac Data Transfer		Page 36
Clear NVM		Page 36
Deselect		
Channels		Page 37
SVs	8	Page 37
Fixed Height		
None Auto		Page 37
MSL Model Use		Page 38
Protocol		Page 38
Restart System		Page 38
Set Configuration	SET	Page 39
Set Date/Time + Force 1shot 1PPS		Page 40
Set Datum		Page 40
Set Default Msg List		Page 41
Set DGPS Config		Page 41
Set Differential Msg Rate	100	Page 42
Set Mask Angle	*	Page 42
Set Operating Mode	₿ <mark>\</mark> ₿	Page 43
Set Timing Parameters	SET	Page 47
Set Tropospheric/Ionospheric Model Use		Page 48
Track SV Request		Page 48

Table	4:	Tool	Setting	Menu

#### 2.3.1 Almanac Data Transfer

This dialog allows you to transfer a YUMA almanac to the receiver. It is associated with *Message ID#s* 78 and 79.



#### 2.3.2 Clear NVM

This menu option erases the receiver NVM. It is associated with Message ID# 99.

The NVM Element options are

00	All
01-04	Reserved
05	Almanac
06-08	Reserved
09	TCXO parameters
10	IONO and UTC parameters
11	Position
12	Time
13	DGPS configuration
14	Default NMEA message list
15	RS232 configuration and default binary message list
16-19	Reserved
20	Ephemeris

Clear NVM	8
NVM Element:	q
ОК	Cancel
### 2.3.3 Deselect Channel

The Channels Deselect dialog is used to deselect channels. If you are unsure about which channels have been deselected, use the Clear button to clear all deselections followed by the Send button. Then deselect the channels you want to deselect and click on the Send button. This dialog is associated with *Message ID# 64*.

Channel Deselect 💦 🔀		
□ 1 □ 7 □ 2 □ 8	Deselect ALL	
□ 3 □ 9 □ 4 □ 10	Clear	
□ 5 □ 11 □ 6 □ 12	Send	
	Exit	

### 2.3.4 Deselect SVs

The SV Deselection dialog is used to deselect satellites. If you are unsure about which SV have been deselected, use the Clear button to clear all deselections followed by the Send button. Then deselect the SVs you want to deselect and click on the Send button. It is associated with *Message ID# 90*.

5V Deselection		×
● GPS SVs	O SBAS SVs	Send
SV1       SV9       SV17       SV25         SV2       SV10       SV18       SV26         SV3       SV11       SV19       SV27         SV4       SV12       SV20       SV28         SV5       SV13       SV21       SV28         SV5       SV14       SV22       SV30         SV6       SV14       SV22       SV30         SV7       SV15       SV23       SV31	120       128       136         121       129       137         122       130       138         123       131         124       132         125       133         126       134         127       125	Clear Deselect ALL Exit
SV 8 SV 16 SV 24 SV 32	127 135	

- $\boxtimes$  1. You must have an SBAS-capable model in order to use SBAS.
  - 2. If you wish to deselect GPS and SBAS satellites, you must send them separately (click on the *Send* button after each satellite system selection).
  - 3. To reinstate a particular satellite, return to the SV Deselection dialog and uncheck, or clear, its checkbox. Then, click on the *Send* button.

### 2.3.5 Fixed Height

This command is used to select a fixed height mode. When NONE is selected, the receiver can not go in 2-D mode. When AUTO is selected, the receiver automatically tries to go in 2-D mode if only 3 satellites are available. NONE is the default. This value is stored in NVM. See also *Receiver Status* on *Page 32*, which shows the Navigation Mode value.

#### 2.3.6 MSL Model Use

Use the Set Mean Sea Level dialog to enable (On) or disable (Off) the use of the mean sea level model. It is associated with *Message ID# 86*. The MSL model mode is Off by default.

☐ If you select Xmit Msg | General Message Request from the main menu and enter *Message ID# 86* then sending it in One Shot mode turns on MSL model use and sending it in Continuous mode turns off MSL model use. See also *Section 2.4, Send Messages on Page 49*.



### 2.3.7 Protocol

Use the Configure Main Port Mode dialog to switch the receiver mode (binary protocol or NMEA) and the baud rate. It is associated with *Message ID# 110*. The *Force to Binary, 9600 BPS* button allows you to set the receiver in binary mode at 9600 bps in binary protocol and with message \$PMCAG,000 in NMEA protocol.

Configure Com1 Port Mode		
Current setting Mode NMEA Binary Baud rate	Desired setting Mode NMEA Binary Baud rate	
Force to bina	ary, 9600 BPS	
ОК	Cancel	

- ☑ 1. Your receiver's current settings must match those selected in the *Current setting* section of the dialog. If they do not match the protocol can not change. If you do not know your receiver's current settings, use the *Force to binary, 9600 BPS* button and then use the *Desired setting* section.
  - 2. When you use the NMEA or BIN buttons, shown on the right, you are simply changing the *StarView* menus and windows. You must use the *Configure Port Mode* dialog to change the configuration of your card. The *Configure Port Mode* dialog is available using the *Protocol* button or by selecting Tool Setting | Protocol from the main menu.

#### 2.3.8 Restart System

Select Tool Setting | Restart System to reset the GPS receiver and initiate a receiver cold start. This menu option is associated with *Message ID# 2*.

### 2.3.9 Set Configuration

The characteristics defined here are not limits where the receiver stops functioning. They are rather limits within which the receiver performance and behavior are optimal for the application. Exceeding these limits causes receiver performance to degrade when used in the specified application:

Preset Configuration	Maximum Velocity (m/s)	Maximum Acceleration (m/s <sup>2</sup> )	Stand Still Threshold (m/s)
Man	10	3	0.2
Car	45	8	0.2
Tractor	20	7	0.2
Marine	20	7	0.1
Plane	100	20	0.2
Rocket	510	40	0.2

The Configuration dialog is associated with *Message ID# 30*.

Configuration dialog box -	Binary 30 / NMEA \$PMCAG,012 🔳
Predefined configuration	Dead reckoning threshold     User value     255 seconds     Current value
Maximum velocity 45 meter/second Maximum acceleration 8 meter/second2	Antenna • Auto • Passive • Active
Stand still threshold 0.2 meter/second Navigation rate 1 Hz	
OK	Cancel

- I. SUPERSTAR II-based receivers are capable of a navigation rate of 1 Hz. If you have a model with 5 Hz PVT, select 5 Hz in the *Navigation rate* field above. Refer also to the *SUPERSTAR II Card Models* appendix in the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on Page 9.
  - 2. You must reboot your receiver for a new navigation rate to take effect.
  - 3. If you choose Auto in the Antenna fields, the receiver starts with a Passive setting and then switches to Active if an active antenna is detected.

### 2.3.10 Set Date/Time and Force 1 Shot 1PPS

The Set Date/Time and Force 1 Shot 1PPS dialog is used to enter a date and a time into the GPS receiver and/or request One Shot 1PPS output. It is associated with *Message ID# 103*.

Set Date/Time & Force 1 shot 1PP5 🛛 🛛
Set Date and Time only
C Request 1 Shot 1PPS Output
Date and Time
06 35 21 HH:MM:SS
19 4 2005 DD:MM:YYYY
Send Cancel

#### 2.3.11 Set Datum

Use the Datum dialog to select or define a datum for the GPS receiver. It is associated with *Message ID# 88*. The position computed by the receiver is according to the set datum. Refer to the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on *Page 9*, to see a complete *Datum Description* table.

Datum		×
	Name	- Options
# 0	WGS 1984	Select Datum
	Countries	C Define Datum
	Global definition	Select and define Datum
	Ellipse : WGS-84	DX = 0 m
	Semi-major: 6378137 m	DY = 0 m
	Inv. Flat : 298.257223563	DZ = 0 m
	(OK	Cancel

### 2.3.12 Set Default Msg List

Use the Binary Messages List dialog to select messages that you want the GPS receiver to output. It is associated with *Message ID# 105*. The messages you select here will be generated by default at start-up.

Binary Messages List 🛛 🔀	
🔽 6, Assignment Data (ch1-6)	
🔽 7, Assignment Data (ch7-12)	
🔽 20, Navigation Data (user coor)	
🔲 21, Navigation Data (XYZ coor)	
22, Ephemeris (ICD-GPS200)	
🔲 23, Measurement 10Hz	
🔲 33, Satellites Status	
43, DGPS Configuration	
45, HW/SW Part Number	
🔲 47, Base Station Status	
🗹 48, DGPS Status	
49, Receiver Status	
📃 50, Satellites Health Summary	
51, Initiated BIT Result	
57, Fault Log	
65, Raw DGPS	
67, SBAS Data	
68, SBAS Status 76, Almanac Data	
<ul> <li>76, Alinariae Data</li> <li>113, Timing Information</li> </ul>	
OK Clear	
Note: Only checked messages will be requested	

## 2.3.13 Set DGPS Config

Use the DGPS Configuration dialog to specify the GPS receiver's differential mode parameters. It is associated with *Message ID# 83*.

DGPS Configuratio	n			×
DGPS OFF ON	DGPS Type O No DGPS O SBAS only	<ul> <li>○ Beacon only</li> <li>⊙ Automatic</li> </ul>	Port C Com1 C Com2	
Diff. Coast Time: Corr. Coast Time:	45 <sub>seconds</sub> 120 <sub>seconds</sub>		Baud Rate 19200 💌 bauds	~

#### 2.3.14 Set Differential Msg Rate

Use the Set Differential messages dialog to specify which messages will be encoded by the GPS receiver and at what rate. It is associated with *Message ID# 91*. The default message periods are set as follows: RTCM Type 1 every second and RTCM Type 3 every 10 seconds. Use the arrows in the Rate field to change the message rate.

- ☑ 1. This message is only available on SUPERSTAR II-based BASE models. See also the SUPERSTAR II Card Models appendix in the SUPERSTAR II Firmware Reference Manual, Reference [4] on Page 9.
  - 2. Use the Send Command button when you pick a message or rate from the RTCM Message section.

Set Differential messages	Set Differential messages	
,	TCM Message Differential GPS Corrections (Type 1) Reference Parameters (Type 3) Rate 1 Send Command	

#### 2.3.15 Set Mask Angle

Use the Set Mask Angle dialog to set the elevation angle below which your GPS receiver will not track satellites. It is associated with *Message ID# 81*. You can input a mask angle value in the Angle field within the range 0 to 90 degrees.

Set Mask Angle	
O Degree	C Radian
Angle : 5	Degree
OK )	Cancel

### 2.3.16 Set Operating Mode

Use the Operating Mode Setting dialog to switch a GPS receiver into a DGPS Base Station or to switch a DGPS Base Station into a GPS receiver if your receiver is a BASE model. It is associated with *Message ID#* 80. The station ID, station health and survey time are also set by this dialog. Remember to use the Send button before you exit this dialog.

Operating Mode Setting
Mode
Set User Position
C Go in Rover Mode
C Go in Base Mode (manual)
C Go in Base Mode (self survey) Get Survey Position
Base Setting
Information Station ID : 1 Health : 💌 Not Monitored
Survey Time 0 Hour(s)
Position
© LLH C XYZ
Altitude: 1047.73 meters × -1662555.21564662 meters
Latitude: 51 29 42.73
Longitude: -114 41 35.0069
[Send Information ]
Exit

In the *Mode* section, the *Go in Base Mode* options are only available on BASE model receivers. See also the *SUPERSTAR II Card Models* appendix in the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on *Page 9*.

#### 2.3.16.1 BASE STATION CONFIGURATION WITH KNOWN POSITION

Establish communication between the PC and the GPS receiver, see Page 12.

Select the *Set Operating Mode* button and the Operating Mode Setting dialog box will appear. Select the operating mode, Go in Base Mode (manual), from the Mode section:

Mode	
Set User Position	
O Go in Rover Mode	
Go in Base Mode (manual)	
O Go in Base Mode (self survey)	Get Survey Position

Only the fields applicable to the chosen mode are active, the others appear gray.

Enter the Station ID and select the Health field to choose a health parameter:

1	- Information -			
	- monnation-		-1	
		Station ID : 1	Health : 🚔 Not Monitored	
		- · · · · · · · · · · · · · · · · · · ·		

The Station ID can be a number between 0 and 1023 and the station health parameters are described in the RTCM specification.

Choose the LLH (user defined) or XYZ (ECEF) coordinates type and enter the coordinates.

Position —		
⊙ LLH		C XYZ
Altitude:	1047.73 meters Deg Min Sec	× -1662555.21564662 meters
Latitude:	51 29 42.73	Y -3615808.29427425 meters
Longitude:	-114 41 35.0069	Z 4968850.0974306 meters

Send information to the GPS receiver by clicking on the Send Information button.

The board is now a DGPS Base Station and the information is saved in NVM. If the DGPS Base Station loses power in this mode, it restarts in the same mode.

#### 2.3.16.2 BASE STATION CONFIGURATION WITHOUT KNOW POSITION

Establish communication between the PC and the GPS receiver, see Page 12.

₿ 🚯	
-----	--

Select the *Set Operating Mode* button \_\_\_\_\_, the Operating Mode Setting dialog appears.

Select the operating mode, Go in Base Mode (self survey), from the Mode section:

Go in Base Mode (self survey)	Get Survey Position	

Only the fields applicable to the chosen mode are active, the others appear gray.

Enter the Station ID and select the Health field to choose a health parameter:

- Information -	Station ID : 1	Health : 📑 Not Monitored

The Station ID can be a number between 0 and 1023 and the station health parameters are described in the RTCM specification.

Enter a Survey Time:

Survey Time			
		20	Hour(s)

The Survey Time can be in fractions of hours, for example 12.5 hours. The Survey Time is limited to 48 hours.

Send the information to the GPS receiver by clicking on the Send Information button.

The board is now a DGPS Base Station and the information is saved in NVM. If the DGPS Base Station loses power in this mode, the Survey Time is not saved. When this occurs, the receiver is in Self Survey mode but the position is not initialized until you click on the *Get Survey Position* button.

Use the Get Survey Position button to set the DGPS Base Station position with the current position computed by itself. This functionality is useful when the entered Survey Time is too long or if the DGPS Base Station has reset during the Survey Mode.

The DGPS Base Station starts to encode differential messages when the Survey Time is completed or when you use the *Get Survey Position* button.

#### 2.3.16.3 ROVER CONFIGURATION

Select the Set Operating Mode button

Establish communication between the PC and the GPS receiver, see Page 12.



, the Operating Mode Setting dialog appears.

Select the operating mode, Go in Rover Mode, from the Mode section:

Mode	
Set User Position	
Go in Rover Mode	
🔘 Go in Base Mode (manual)	
C Go in Base Mode (self survey)	Giet Survey Position

Only the fields applicable to the chosen mode are active, the others appear gray.

Use the Send Information button to send the information to the receiver.

The board is now a rover receiver and the information is saved in NVM. If the rover receiver loses power, it restarts in the same mode.

#### 2.3.17 Set Timing Parameters

Use the Set Timing Parameters dialog to configure timing parameters. It is associated with Message ID# 69.

There are 3 operating modes:

Constant: aligned on GPS time continuously

Free-Running: free-running or not-aligned

One Shot: aligns with GPS time on power up

Refer to the *Time Mark Output 1PPS* section in your product's hardware manual for more details on these modes and timing parameters. Refer also to the *Precise Timing* appendix of the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on *Page 9*, for details on precise timing.

This message is only available on GPS receivers models with Precise Timing (T) capability. See also the *SUPERSTAR II Card Models* appendix in the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on *Page 9*.

The default operating mode for GPS receiver models without T capability is Free-Running.

Set Timing Parameters		
Cable Propagation Delay	Modified	Mode Free-Running
1 PPS Offset	Modified	C One Shot Alignment C Constant Alignment
1 PPS Pulse Length 0 ns Value rounded to nearest 100 ns.	Modified	1PPS Output Control     ✓ Modified     C Continuously     O Only when tracking at least 1 GPS SV
TRAIM Alarm Limit	Modified	C Only when an alarm not raised by TRAIM C Combination (1SV and not alarm by TRAIM) C No Output
Intrinsic Delay-	Modified	<ul> <li>Only when receiver has position</li> <li>Combination (Position plus no alarm by TRAIM)</li> </ul>
	(OK)	Cancel

### 2.3.18 Set Tropospheric/Ionospheric Model Use

Use the Set Tropospheric/Ionospheric Model Use dialog to enable (On) or disable (Off) the use of tropospheric and ionospheric models. It is associated with *Message ID# 84*. The default is On.

- ☑ 1. The Set Tropospheric/Ionospheric command should only be used by advanced users of GPS. Turning off this model will seriously affect your results.
  - 2. If you select Xmit Msg | General Message Request from the main menu and enter *Message ID#* 84 then sending it in One Shot mode turns on tropospheric model use and sending it in Continuous mode, not recommended, turns off the model use. See also *Section 2.4, Send Messages on Page 49*.

Set Tropospheric/lonospheric Model Use - Msg 84	×
C On	
© Off	
OK Cancel	

### 2.3.19 Track SV Request

Use the Track SV Request dialog to track a specific satellite. It is associated with *Message ID# 95*. This dialog allows you to track an SV# on any available channel that is not currently tracking or that has not been deselected. It starts the search at a given Doppler frequency offset to the carrier (Doppler Center Freq field). The search window option can be specified from 0 to 100 kHz in 1 kHz increments. Enter an SV# using the following guidelines (you must have an SBAS-capable model in order to use SBAS):

GPS 1 to 32 SBAS 120 to 138

By default, the receiver tracks the SV only if it is not already being tracked. If you select the Manual check box, the receiver is forced to track the SV on an idle channel.

Track SV Reque	st 🛛 🔀
SV # Min C\N	Doppler Center Freq (Hz)
SV Type GPS SBAS	Search Window (KHz) 10 Doppler Rate (Hz/s) 10
Г	Manual
ОК	Cancel

 $\square$  In the dialog above, the satellite is directly above the user.

## 2.4 Send Messages

Send specific messages to your GPS receiver by selecting them from the Xmit Msg menu. To see the content of a requested message, open the corresponding window from the Window menu. See also the *Window* section starting on *Page 18*.

Table 5: Transmit Messages (Xmit Msg) Menu

Menu Option	Toolbar Button	Refer to		
Channel				
Channel Assignment				
DGPS				
DGPS Status				
Navigation				
LLH Solution				
XYZ Solution				
Satellites				
Almanac Data Request				
GPS - One Shot				
GPS - Continuous				
SBAS <sup>a</sup> - One Shot				
SBAS <sup>a</sup> - Continuous				
Ephemeris		Page 49		
Measurement Block	•			
1 Hz				
2 Hz				
5 Hz				
10 Hz				
One Shot				
Status				
Receiver Status				
SBAS Status <sup>a</sup>				
Base Status				
Initlink				
Timing Information				
Other	•			
HW/SW Part Number				
General Message Request	ASK HSC	Page 51		
Request All (ID#s 20, 21, 22, 23, 65) <sup>b</sup>	9			

a. You must have an SBAS-capable model in order to use SBAS.

b. Appears as a button only and is not in the Xmit Msg menu

When you select a message from the Xmit Msg menu, a rate dialog appears. Consider the case where you have selected Xmit Msg | Status | Receiver Status. The following dialog appears:

Rcy Status Request (49) 💦 🔀		
<ul> <li>One Shot</li> <li>Continuous</li> </ul>		
OK Cancel		

Select One Shot or Continuous. The table below indicates Message ID#s where using One Shot (Normal) or Continuous (Special) does not send the message out in One Shot or Continuous mode but rather as in *Table 6* below.

Message ID#	Description	Normal Mode	Special Mode
2	Reset Receiver	Reset	N/A The information does not change so this is unnecessary - to continuously reset the receiver is not recommended
23	Request Measurement Block Data	Off Turns off Continuous mode and does not give a One Shot output	On (default)
45	HW/SW Identification Number	Identify	N/A The information does not change unless you update your software so this is unnecessary
83	Set DGPS Configuration	Set	N/A Once set, the DGPS mode does not need to be updated continuously
84	Ionospheric/Tropospheric Model Use	On (default)	Off It is not recommended that you turn off the use of this model - for advanced users of GPS only
86	Mean Sea Level Model Use	On	Off (default)
87	Set Fixed Height Mode	Auto The receiver automatically goes in 2-D mode if only 3 satellites are available	None (default) The receiver can not go in 2-D mode
103	Set Date and Time	Set	N/A Once set, the date and time do not need to be updated continuously

#### Table 6: Message Modes

Please refer to the *Message Modes* table in the *Messages* chapter of the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on *Page 9*, for more examples. See also the *Menu Option* column of *Table 5*, *Transmit Messages* (*Xmit Msg*) *Menu* on *Page 49* for a list of the available messages.

### 2.4.1 General Message Request

Use the General Message Request dialog to request a specific message.



## 2.5 Help

Select Help | About StarView... from the main menu or use the *General* toolbar button to view the About StarView information box.

Menu Option	Toolbar Button
Help	
About StarView	ę

About S	tarView	
<b>*</b>	StarView 8.1.0.0 Build Date: Apr 11 2005 13:51:26 NovAtel Inc. Copyright © 2003-2005	
	OK	

# **Chapter 3**

An explanation of the supported NMEA protocol and its field definitions is provided in the *Message Formats* section of your product's hardware manual. Please refer to the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on Page 9, for details on individual NMEA commands and logs.

For further details on the NMEA message structure and formats, please refer to NMEA 0183 specification. Contact information may be found in the *Standards/References* section of the *GPS+ Reference Manual* available on our website at <u>http://www.novatel.com/Downloads/docupdates.html</u>.

Binary protocol information is in Chapter 2 starting on Page 17.

All menus are accessed from the main menu. The main menu is comprised of 6 menu items whether in NMEA or Binary protocol:

File/Port	See Section 1.1, File/Port Menu starting on Page 13
View	See Section 3.1, View below
Windows	See Section 3.2, Window starting on Page 53
Tool Setting	See Section 3.3, Tool Setting starting on Page 60
Xmit Msg	See Section 3.4, Send Messages starting on Page 66
Help	See Section 3.5, Help starting on Page 66

## 3.1 View

This menu option allows you to select toolbars. Buttons are grouped by functionality in 4 toolbars: File/Port, General, Tool Setting and Window. See also *Chapter 2, Binary Protocol* starting on *Page 17*.

These are the toolbar buttons that can be used with the NMEA protocol:



### 3.2 Window

Window menus allow you to open one or more windows. Make sure you open the appropriate window(s) corresponding to the message(s) sent.

The command message to send must be selected separately either from the Xmit Msg menu or by clicking the right mouse button over the window selected. The right mouse button is active when the  $\bigcirc$  icon is present in the window. Selected windows are updated after command messages are sent.

Table 7 shows the windows available when you select Window from the main menu.

	Menu Option	Toolbar Button	Refer to	
\$GPGGA	GPS Fix Data		Page 54	
\$GPGLL	Geographic Position		Page 54	
\$GPGSA	DOP & Active SVs		Page 54	
\$GPGSV	SVs in View		Page 55	
\$GPRMC	Recommended Minimum GPS		Page 55	
\$GPVTG	Track and Speed		Page 55	
\$GPZDA	Time and Date		Page 56	
\$PMCAG, 900 Navigation Status			Page 56	
\$PMCAG, 902	Self-Test Results		Page 56	
\$PMCAG, 906	To Waypoint		Page 57	
\$PMCAG, 907	User Position		Page 57	
\$PMCAG, 908	Receiver Status		Page 58	
\$PMCAG, 912	Receiver Configuration		Page 58	
Received messages		$ \substack{ \Rightarrow \ \Rightarrow \\ \leftarrow \ \leftarrow }$	Page 59	
Messages				
Display Messages		Shows binary messages only.		
Terminal (COM1)		1	Page 59	
Terminal (COM2)		2	Page 59	

Table 7:	NMEA	Window	Menu
----------	------	--------	------

### 3.2.1 GPS Fix Data

The GPS system fix data - \$GPGGA window shows the position, the time, the number of satellites used in the solution and information about differential corrections.

20:19:52.00
51* 29.7122' N
I 14* 41.5834' ₩
I I.1 I047.0 M 17 M 2 313

### 3.2.2 Geographic Position

The Geographic position - \$GPGLL window shows the position in latitude and longitude of the present solution, the time of position and the status.

In the Status row:

A = Data Valid B, V = Data Invalid

Geographic position - \$GPGLL		
E Latitude: Longitude: UTC of Position: Status:	51* 29.7122' N 114* 41.5834' W 20:26:48.00 A	

### 3.2.3 DOP & Active SVs

The DOP and active satellites - \$GPGSA window shows the satellites used by the GPS receiver for navigation, the DOP values and the position mode. The Operation Mode field is reserved.

🔲 DOP and active satellites - \$GPGSA 🗐 🛛			
0			
Operation Mode:	Α		
Position Mode:	3D		
SVs Used:	21		
PDOP:	1.8		
HDOP:	1.1		
VDOP:	1.4		

#### 3.2.4 SVs in View

The GPS satellites in view - \$GPGSV window shows the number of satellites in view, the satellite PRN numbers, their azimuth and SNR values.

	🔲 GPS satellites in view - \$GPGSV 💦 🗐 🛛				
e	,				
	Total Messa	ages:	4		
	Message N	umber:	4		
	Total of Sa	tellites in View	w: 15		
	S¥s Used	Elevation	Azimuth	SNR	
	18	86	233	49.0	
	15	73	293	40.0	
	21	59	114	49.0	
	22	52	242	49.0	
	3	37	295	49.0	
	26	35	53	40.0	
	29	22	42	49.0	
	19	18	317	49.0	
	9	7	114	49.0	
	14	5	193	40.0	
	31	4	340	49.0	
	16	3	247	49.0	

#### 3.2.5 Recommended Minimum GPS

The Recommended minimum specific GPS data - \$GPRMC window shows the time, the date, the position, the course and the speed. See *Section 3.2.2, Geographic Position* on *Page 54* for details on the Status field.

🔲 Recommended minimum specific GP5 data - \$GPRMC 🛛 🗐 🔯		
•		
UTC:	20:30:23.00	
Status:	Α	
Latitude:	51* 29.7122' N	
Longitude:	114* 41.5834' W	
Speed:	0.0 knots	
Heading	0.0* from North	
Date:	190405	

### 3.2.6 Track & Speed

The Track made good and ground speed - \$GPVTG window shows the actual track made good and the speed relative to the ground.

Track made good and ground speed - \$GPVTG 🛛 🗐 🛛		
₿		
Track:	182.0* from North	
Degrees:	T	
Speed:	0.1 knots	
Speed:	0.1 km/h	

#### 3.2.7 Time & Date

The Time and date - \$GPZDA window shows the UTC time and date. Local zone is a reserved field that is not currently in use.



#### 3.2.8 Navigation Status

The Navigation status - \$PMCAG, 900 window shows the current navigation mode and GPS fix quality indicator where:

L = Low, navigation solution is computed from less than 5 satellite measurements

H = High, navigation solution is computed from at least 5 satellite measurements

Navigation status - \$PMCA	G,900	
Navigation Mode: 2GPS Fix Quality Indicator:	128C3	

#### 3.2.9 Self-Test Results

The Self-test results - \$PMCAG, 902 window shows the results of the GPS receiver self-test.

Self-test results - \$PMCA	G,902	
•		
_ S₩ Part Number		
(root number):	1	
SW Variation Number:	0130C	
SW Revision Letter:	Α	
Engine Selftest:	PASS	
Number of Active Faults:	0	
Faults Identifier:	63	
RAM:	PASS	
Flash:	PASS	
EEprom:	PASS	
Uart:	PASS	
Real Time Clock:	PASS	
Correlator & RF:	PASS	
<u> </u>		

### 3.2.10 To Waypoint

The bearing, distance and delta-elevation to waypoint - \$PMCAG, 906 window shows its values to a specified waypoint from the present solution. The solution is computed along the great circle path.

See Section 3.2.2, Geographic Position on Page 54 for details on the Status field.

To Waypoint - \$PMC/	4G, 906 📃 🗖 🔀
•	
Zone Number:	11
Zone Letter:	U
Square Column:	D
Square Row:	D
Grid Easting:	400
Grid Northing:	0
Altitude:	1055.0 m
Waypoint Name:	NOSEHILL
Waypoint Number:	2
True Bearing:	325.9 degrees
Distance:	591658.100 m
Delta-Altitude:	25.4 m
Status:	A

### 3.2.11 User Position

The User position - \$PMCAG, 907 window shows the current position in Military Grid Reference System (MGRS) format and the UTC time of position.

See Section 3.2.2, Geographic Position on Page 54 for details on the Status field.

User position - \$PMCAG,907 🛛 🗖 🛛		
•		
Zone Number:	11	
Zone Letter:	U	
Square Column:	Р	
Square Row:	Т	
Grid Easting: Grid Northing: Altitude: UTC Time: Status:	60138 7419 1029.6 13:35:51 A	

#### 3.2.12 Receiver Status

The Receiver status - \$PMCAG, 908 window shows the configuration of the GPS receiver and the data it uses.

- $\boxtimes$  1. You must have an SBAS-capable model in order to use SBAS.
  - 2. In StarView, Datum 0 is the WGS84 datum. See Tool Setting | Set Receiver Parameter on Page 64.

In the MSL Model Use and Tropo Model Use rows:

E = Enabled

D = Disabled

In the DGPS Mode row, the following apply:

D = Disable E = Automatic W = SBAS only B = DGPS only

Receiver status - \$PMCAG	,908 🖃 🖬
<b>0</b>	
Nb of Elements:	15
GPS Time Alignment Mode:	E
MSL Model Use:	D
Tropo Model Use:	E
Mask Angle:	0.0
Datum Number:	0
DGPS Mode:	E
Diff. Coast Time:	45
Com2 Port Baud Rate:	9600
Lat/Long Resolution:	4
UTC Time Resolution:	2

#### 3.2.13 Receiver Configuration

The Receiver configuration - \$PMCAG, 912 window shows the configuration parameters of the GPS receiver. See also *Section 2.3.9, Set Configuration* starting on *Page 39* for applications and their limits.

Receiver Configuration Window - Msg 30 / \$PMEAG, 912 🖃 🖾	
Predefined configuration: Maximum velocity: Maximum acceleration: Stand still threshold: Dead reckoning threshold:	Car 45 m/sec 8 m/sec2 0.20 m/sec 10 sec
Antenna type:	Passive

### 3.2.14 Received Messages

The Received NMEA Messages window shows the number of each NMEA message received from the GPS receiver. It also shows the size of the file used to save incoming data and protocol errors.

Received NME	A Messages Window 🗐 🗖 🔀
🗎 Buffer read: 0	Protocol error: 0
900: 1 901: 0 902: 0 903: 0 906: 932 907: 1 908: 20	GGA: 0 GLL: 1 GSA: 2 GSV: 0 MSS: 0 RMC: 0 VTG: 16 ZDA: 1

### 3.2.15 Terminal (COM1)

The Terminal (COM1) window shows the messages received from the COM1 port of the GPS receiver before processing. If COM1 is not the active port, *StarView* displays the Serial Port Configuration dialog for you to edit first, see *Page 15*.

Terminal (COM1)	
Clear Data	
\$GPGSV,4,2,13,22,38,234,49,29,33,052,,03,28,307,43,06,14,166,43*7[ \$GPGSV,4,3,13,16,14,257,43,19,7,321,,08,3,009,,35,8,112,40*4C \$GPGSV,4,4,13,47,4,250,37,,,,,,*7F \$PMCAG,907,11,U,P,T,60138,07419,1047.0,195627.00,A*4D	) 🔼
\$GPGSV,4,1,13,21,74,101,	~

## 3.2.16 Terminal (COM2)

The Terminal (COM2) window shows the messages received from the COM2 port of the GPS receiver before processing. If COM2 is not the active port, *StarView* displays the Serial Port Configuration dialog for you to edit first, see *Page 15*.



## 3.3 Tool Setting

The Tool Setting menu allows you to send commands to the GPS receiver. *Table 8* shows the menu options available when you select Tool Setting from the main menu.

Menu Option	Refer to
Clear NVM	Page 60
Define Waypoint	Page 61
Select Waypoint	Page 61
Protocol	Page 62
Initialization Data	Page 63
Set Configuration	Page 63
Set Receiver Parameter	Page 64
Set Default Msg List	Page 65

#### Table 8: Tool Setting Menu

#### 3.3.1 Clear NVM

This option erases the receiver NVM by sending NMEA message \$PMCAG,007.

The options are:

00	ALL <sup>1</sup>
01-04	Reserved
05	ALMANAC
06-08	Reserved
09	TCXO PARAMETERS
10	IONO & UTC PARAMETERS
11	POSITION
12	TIME
13	DGPS CONFIGURATION
14	DEFAULT NMEA MSG LIST
15	RS232 CONFIGURATION <sup>1</sup>

Clear NVM	×
NVM Element:	14
OK	Cancel

<sup>1.</sup> These commands force the receiver to go into binary mode at the default baud rate for your model on the next power-up.

### 3.3.2 Define Waypoint

Use the Define waypoint dialog to define waypoints in MGRS format.

If the Square Column field (latitude band) is X, then the Zone number field should not be set to 32, 34 or 36. These zones were incorporated into other zone numbers and do not exist. Refer also to NMEA message \$PMCAG,009 in the SUPERSTAR II Firmware Reference Manual, Reference [4] on Page 9.

Define waypoint	:		
Waypoint name: Waypoint ID:	NOSEHILL		
Zone number: Zone letter: Square column: Square row:	11 U P W	Grid easting: Grid northing: Altitude:	60155 07419 1060
OK		Cano	el

### 3.3.3 Select Waypoint

Use the Select waypoint dialog to choose an active waypoint to use in subsequent requests.



### 3.3.4 Protocol

Use the Configure Main Port Mode dialog to switch the GPS receiver mode (binary protocol or NMEA) and the baud rate. The *Force to Binary, 9600 BPS* button allows you to set the GPS receiver in binary mode at 9600 bps. This option is associated with *Message ID# 110* in binary protocol and with message \$PMCAG, 000 in NMEA protocol.

Configure Com1 Port Mode				
Current setting Mode NMEA Binary Baud rate	Desired setting Mode NMEA Binary Baud rate 19200 T			
Force to binary, 9600 BPS				
ОК	Cancel			

- ☑ 1. Your receiver's current settings must match those selected in the *Current setting* section of the dialog. If they do not match the protocol can not change. If you do not know your receiver's current settings, use the *Force to binary*, 9600 BPS button and then use the *Desired setting* section.
  - 2. When you use the NMEA or BIN buttons, shown on the right, you are simply changing the *StarView* menus and windows. You must use the *Configure Port Mode* dialog to change the configuration of your card. The *Configure Port Mode* dialog is available using the *Protocol* button or by selecting Tool Setting | Protocol from the main menu.

#### 3.3.5 Initialization Data

Use the Initialization Data dialog to set the GPS receiver with reference UTC date, UTC time and your position.

Initialization Data 🛛 🛛 🖡
Date and Time
14 44 43 HH:MM:SS
20 4 2005 DD:MM:YYYY
Position
Altitude: 1048.207 meters Deg Min Sec
Latitude: 51 15 15.73
Longitude: -114 03 35.07
OK Cancel

### 3.3.6 Set Configuration

Use the Configuration dialog to set the GPS receiver configuration. If Tool Setting | Set Configuration in the main menu appears gray, you can access this dialog by right clicking in the Receiver Configuration window from the Window menu, see *Page 32*. See also *Section 2.3.9* on *Page 39* for more details on this dialog.

Configuration dialog box - Binary 30 / NMEA \$PMCAG,012 🔀				
Predefined configuration	Dead reckoning threshold C User value 255 seconds C Current value			
Maximum velocity 45 meter/second Maximum acceleration 8 meter/second2 Stand still threshold 0.2 meter/second	Antenna Auto C Passive C Active			
OK	Cancel			

### 3.3.7 Set Receiver Parameter

Use the Set receiver parameter dialog to set the GPS receiver configuration. This dialog is associated with many commands.

Set receiver parameter				
GPS Time Alignment MSL Model Use Tropospheric/Ionosph Model Use	Enable © C eric •	Disable C C		
DGPS Mode No DGPS C Beacon only SBAS only C Automatic				
Datum Number:	0	Datum		
Mask Angle:	0	Degrees		
Diff. Coast Time:	45	Seconds		
Com2 Port Baud	9600	Bauds		
Position Resolution:	4	Digits		
Time Resolution:	2	Digits		
OK		Cancel		

 $\square$  In the Set receiver parameter dialog, the maximum position resolution is 5 digits.

#### 3.3.8 Set Default Message List

Select Tool Setting | Set Default Msg List to display the NMEA Messages dialog. The window allows you to request NMEA messages (in One Shot or Continuous mode) and to update the NMEA NVM Message List.

To change the requested data rate, select the row containing the message, highlight the row and then click once on its Rate field. To stop messages, set the Rate to 0 and select Continuous.

If you have a 5 Hz model, enter 999 for the rate. The NMEA messages that can be output at 5 Hz are GGA, GLL, GSA, RMC, VTG and 906. Refer also to the *SUPERSTAR II Card Models* appendix in the *SUPERSTAR II Firmware Reference Manual*, Reference [4] on Page 9.

When you click on the Send button, StarView requests all messages that are checked at their specified rates.

N	MEA	Messa	iges			
		Rate	Msg ID	Description		
	Ø	1	900	Navigation status	O One Shot (#00-	4)
		1	902	Self-test results	<ul> <li>Continuous (#0</li> </ul>	05)
	$\checkmark$	1	906	To Waypoint		
	$\checkmark$	1	907	User Position	🔽 Update NVM Lis	t
		1	908	Receiver status		
		1	912	Receiver configuration		
		1	GGA	GPS system fix		
		1	GLL	Geographic position		
		1	GSA	DOP and active SV		
		1	GSS	Beacon signal status		
	$\mathbf{\nabla}$	1	GSV	Satellites in view		
		1	RMC	Minimum specific data		
		1	VTG	Track and speed		
		1	ZDA	UTC Time and date		
					Send	i I
					Cance	

## 3.4 Send Messages

Send specific messages to your GPS receiver by selecting them from the Xmit Msg menu. To see the content of a requested message, open the corresponding window from the Window menu. See also the *Window* section starting on *Page 53*.

	Menu Option
\$GPGGA	GPS Fix Data
\$GPGLL	Geographic Position
\$GPGSA	DOP & Active SVs
\$GPGSV	SVs in View
\$GPRMC	Recommended Minimum GPS
\$GPVTG	Track and Speed
\$GPZDA	Time and Date
\$PMCAG, 003	Initiate Self Test
\$PMCAG, 900	Navigation Status
\$PMCAG, 902	Self-Test Results
\$PMCAG, 906	To Waypoint
\$PMCAG, 907	User Position
\$PMCAG, 908	Receiver Status

When you select a message from the Xmit Msg menu, a rate dialog appears.

Consider the case where you have selected Xmit Msg | \$GPGSV SVs in View. The following dialog appears:

SVs in View Request (GSV) 🛛 🔯		
<ul> <li>One Shot</li> <li>Continuous</li> </ul>		
ОК	Cancel	

Select One Shot or Continuous.

## 3.5 Help

Select Help | About StarView... from the main menu or use the *General* toolbar button to view the *About StarView* information box. See also *Section 2.5, Help* starting on *Page 51*.

Menu Option	Toolbar Button
Help	
About StarView	ę

# Index

1, 2, 5 or 10 Hz rate, 39, 49, 65 1PPS, 33 2-D Or 3-D Mode, 24, 37, 50

#### A

About StarView..., 51, 66 Accuracy, 33 Almanac, 19 Data, 35–36, 49 Message, 28 Save, 28 Scaling, 28 Automatic Log Summary, 19, 34

#### B

Base Status, 19, 31, 49 Binary Protocol, 17 Block, Measurement, 49

#### С

Car, 39 CD, 10 Channel, 18, 20, 35, 48–49 Clear NVM, 36, 60 Clock, 33 COM port, 18, 53 Configuration, Receiver, 19 Connector, 10 Customer Service, 8

## D

Data Almanac, 35–36, 49 DGPS, 18, 22–23 GPS Fix, 54 Initialization, 60, 63 Date, 50 Datum Number, 24, 40, 64 Define Waypoint, 60–61 Deselect, 35, 37 DGPS, 18, 49 Configuration, 18, 22 Data, 18, 23 Status, 18, 23, 49 Display Messages, 18, 21 DOP & Active SVs, 25, 54

### E

Earth-Centred-Earth-Fixed (ECEF), 25 Ephemeris, 19, 30, 49 Exit, 16

### F

Factory Configuration, Restore, 16 Figure of Merit (FOM), 25, 33 File/Port Menu, 13 Firmware Update, 8 Fix Data, GPS, 54 Fixed Height Mode, 37 Force 1 Shot 1PPS, 35

### G

General Message Request, 49, 51 Geographic Position, 54 Getting Started, 11 GPS Fix Data, 54

## H

Health, 19 Height, 25, 37 HW/SW Number, 19, 34, 49–50

## Ι

ICD-GPS-200 Rev. B, 9 Identify, 50 Initialization Data, 60, 63 Initlink, 49 Ionospheric Model Use, 35, 48

## L

L1 GPS Firmware Reference Manual, 9 LLH Position Solution, 18, 24, 49 Log Summary, Automatic, 19, 34

### M

Man, 39 Marine, 39 Mean Sea Level Model Use, 35, 38, 50 Measurements, 19, 30, 33, 49 Memory, 28 Message, 18 Display, 18, 21 Received, 18, 20, 53, 59 Request, 49–51 Mode, Binary or NMEA, 60 Model Use Mean Sea Level, 35, 50 Tropospheric/Ionospheric, 35, 48, 50

## N

Navigation, 18, 49 NAVSTAR Interface, 9, 30 Status, 56 NMEA-0183 Rev 2.20, 9, 52 Non-Volatile Memory (NVM), 28, 35– 36, 60

## P

Parity, 28 Parser, 16 Plane. 39 Plot, 18, 26 Port. 15 Position, 19 Base Station, 31 Coordinates, 25 Geographic, 54 In Time Solution, 33 LLH, 24 User, 57 XYZ, 25 Prerequisites, 9 Protocol, 17, 35, 38, 52, 60, 62 Pseudorange, 33

## R

Received Messages, 18, 20, 53, 59 Receiver Configuration, 19, 32, 58 Status, 19, 32, 49, 58 Recommended Minimum GPS, 55 Request, Message, 49–51 Reset, 50 Restart System, 35, 38 Restore Factory Configuration, 16 Result, Self-Test, 56 Rocket, 39 RTCM-104 version 2.1, 9, 31 *S* Satellite, 18, 49

Almanac, 28 Ephemeris, 30 Health, 28 Position, 27 Status, 27 Tracking, 48 Save Almanac, 28 Config, 15 Data, 15 SBAS, 19, 31, 33, 49 Scaling, Almanac, 28 Scope, 9 Select Waypoint, 60-61 Self-Test Result. 56 Serial Port, 15 Set, 50 Configuration, 35, 39, 60, 63 Date/Time, 35, 40, 50 Datum, 35, 40 Default Message List, 35, 41, 65 DGPS Configuration, 35, 41 Differential Message Rate, 35, 42 Force 1 Shot 1PPS, 40 Mask Angle, 35, 42 Operating Mode, 35, 43 Receiver Parameter, 60, 64 Timing Parameters, 35, 47 Tropospheric/Ionospheric Model Use, 35, 48 SMART ANTENNA User Manual, 9 Solution, Position, 18, 49 Square Column field, 61 Standard for Interfacing, National Marine Electronics Association, 9 Standard Positioning Service (SPS), 28 Standards for Differential NAVSTAR GPS Radio Technical Commission for Maritime Services. 9 Status, 19, 49 Base, 19, 31, 49 DGPS, 18, 23, 49 Receiver, 19, 49 SBAS, 19, 49 Stop, 16 Subframe, 28

Summary, Automatic Log, 19, 34 SUPERSTAR II User Manual, 9 SVs, 35, 54–55 System, Restart, 35, 38 T Terminal (COM), 18, 21-22, 53, 59 Time, 50 & Date, 56 Information, 19, 33, 49 Solution, 33 To Waypoint, 57 Track & Speed, 55 SV Request, 35, 48 Tractor, 39 Tropospheric/Ionospheric Model Use, 35, 48, 50  $\boldsymbol{U}$ Update Firmware, 8 User Position, 57 V Velocity, 25 View, 17, 52 W Waypoint Define, 60-61 Select, 60-61 To, 57 X XYZ Position Solution, 18, 25, 49 Y YUMA almanac, 36 Ζ Zone Number, 61

