

600S™ Installation and Operation Manual

016-0171-614 Rev. A

10/15

E26538



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CHAPTER

1

*Important Safety
Information*

NOTICE

- Follow all safety information presented within this manual.
- If you require assistance with any portion of the installation, contact the Raven Industries Applied Technology Division for support.

FCC Statement

This device complies with Part 15 of FCC Rules. Operation of this device is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment generates, uses, and may radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is not guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception (which can be determined by turning the equipment off and on), the user is encouraged to try to correct the interference using one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Updates

Updates for Raven manuals as well as software updates for Raven consoles are available at the Applied Technology Division web site:

www.ravenhelp.com

The Raven Service Tool is required to perform software updates of the Hawkeye nozzle control system. Refer to the Raven Service Tool Operation manual for additional assistance with updating the Hawkeye nozzle control valves or the product controller II ECU.

Sign up for e-mail alerts to receive notifications when updates for your Raven products are available on the Raven web site.

At Raven Industries, we strive to make your experience with our products as rewarding as possible. One way to improve this experience is to provide us with feedback on this manual.

Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better.

To serve you best, please send an email with the following information to

techwriting@ravenind.com

-600S™ Installation and Operation Manual

-P/N 016-0171-614 Rev. A

-Any comments or feedback (include chapter or page numbers if applicable).

-Let us know how long have you been using this or other Raven products.

We will not share your email or any information you provide with anyone else. Your feedback is valued and extremely important to us.

Thank you for your time.

CHAPTER

2

Installation & Configuration

Introduction

The purpose of this manual is to provide instructions for installing and configuring the 600S™ Antenna.

600S Features

The 600S Antenna includes:

- All models feature L1/L2 support along with GLONASS and DF GL1DE
- SBAS (WAAS, EGNOS, MSAS)/Autonomous with Dual Frequency (DF) GL1DE
- GS/Slingshot GS - with unlock part number (Base Model to GS)
- RTK - with unlock part number options (Base Model to RTK / GS to RTK)

Purchasing GS Corrections and Unlock Codes

The table below provides the purchase location for additional satellite unlocks. After purchasing the unlocks for additional features, navigate to the Authorization Code Entry tab and enter the purchased Authorization Code.

Note: *Have the receiver model, serial number, firmware version, and PAC code available to purchase unlocks.*

TABLE 1. Unlock and Correction Purchase Information

Feature	Where to Purchase
GS and RTK Corrections	Contact a Raven dealer
Satellite GS	www.ravenslingshot.com/store
Slingshot GS	Contact a Raven dealer

After purchasing additional capabilities, enter the code on the Authorization Code Entry tab.

FIGURE 1. Authorization Code Entry



Note: After successfully inputting a new authorization code, the receiver model information will update on the GPS information page.

Receiver Performance

The table below shows receiver accuracy performance for Absolute and Pass to Pass accuracy for different sources.

TABLE 2. Receiver Performance

Correction Type	Absolute Accuracy* (Horizontal)	Pass to Pass* Horizontal Over 15 Minutes
Autonomous	5' [1.5 M]	12" [30 cm]
WAAS	2' [0.6 M]	9" [23 cm]
Slingshot GS	6" [15 cm]	4" [10 cm]
Satellite GS	2" [4 cm]	1" [2.5 cm]
RTK	1" [2 cm]	.75" [1.75 cm]

*All accuracy claims are specified to 1-sigma (68% of the time) and may vary due to atmospheric condition and/or distance from the correction source.

Required Components

- 600S Antenna (one of the models listed below)
 - a. Base Model (063-2000-001)
 - b. GS Model (063-2000-002)
 - c. RTK Model (063-2000-003)
- Cable (one of the cables listed below)
 - a. Standard Cable (115-0172-246)
 - b. Phoenix 200 Adapter to 600S Cable (115-0172-303)
 - c. Case/Miller Adapter Cable (115-0172-285)
 - d. Case 30 Series Cable (115-0172-288)

System Power Requirements

In order for the 600S to perform properly they system must meet the following criteria:

- +8 to 36V DC
 - 12V at the switched power is operational voltage for convergence. Lower voltages may work but convergence times will be longer or may not converge.
- 2.9 Watts

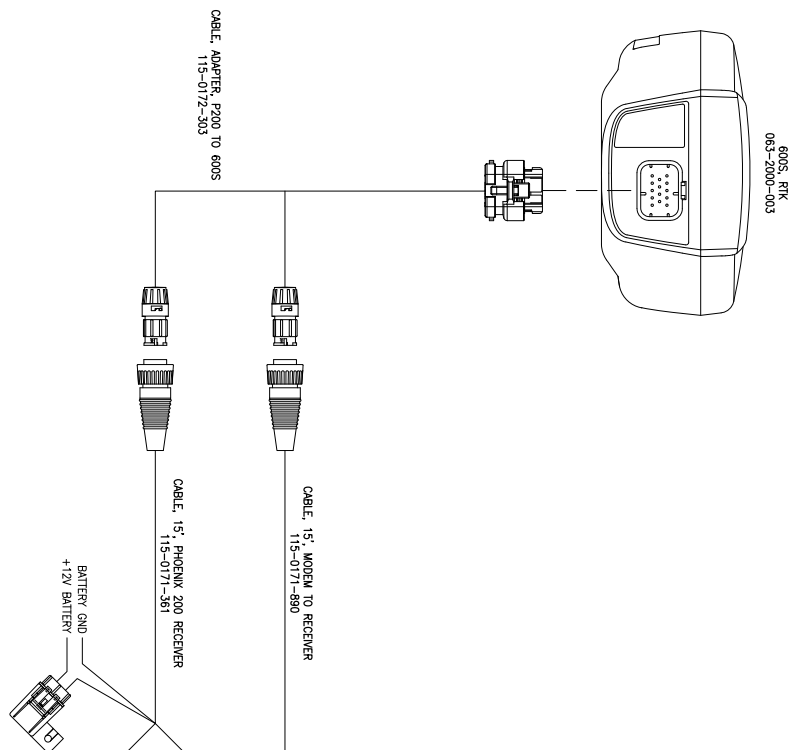
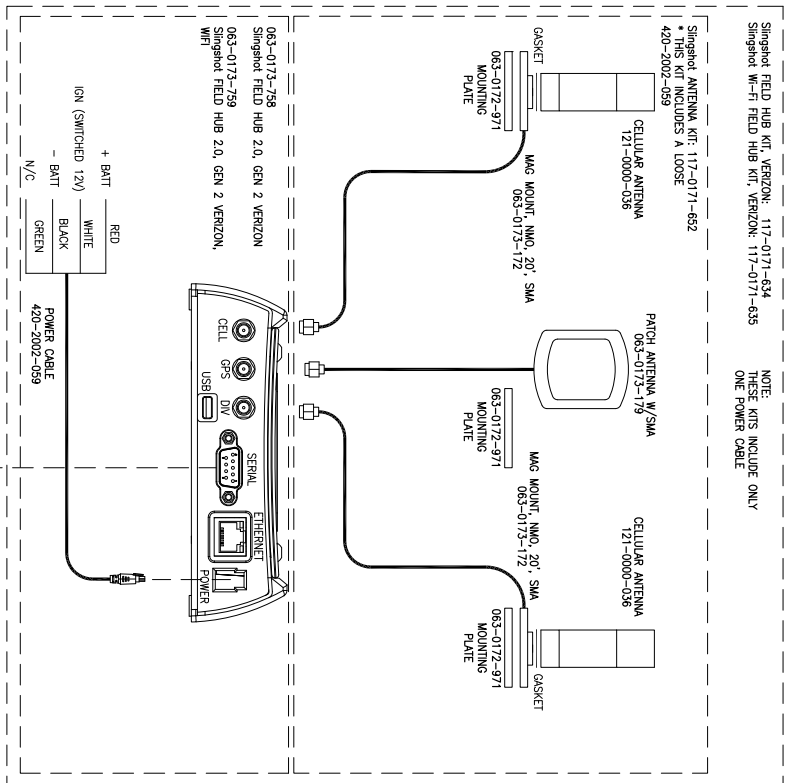
Installation

1. Mount the GPS receiver on top of the vehicle cab with no overhead obstructions.
2. Follow the appropriate system drawing (below) for cable connections.

FIGURE 2. Phoenix 200 to 600S RTK Connections

PHOENIX 200 TO 600S RTK CONVERSION

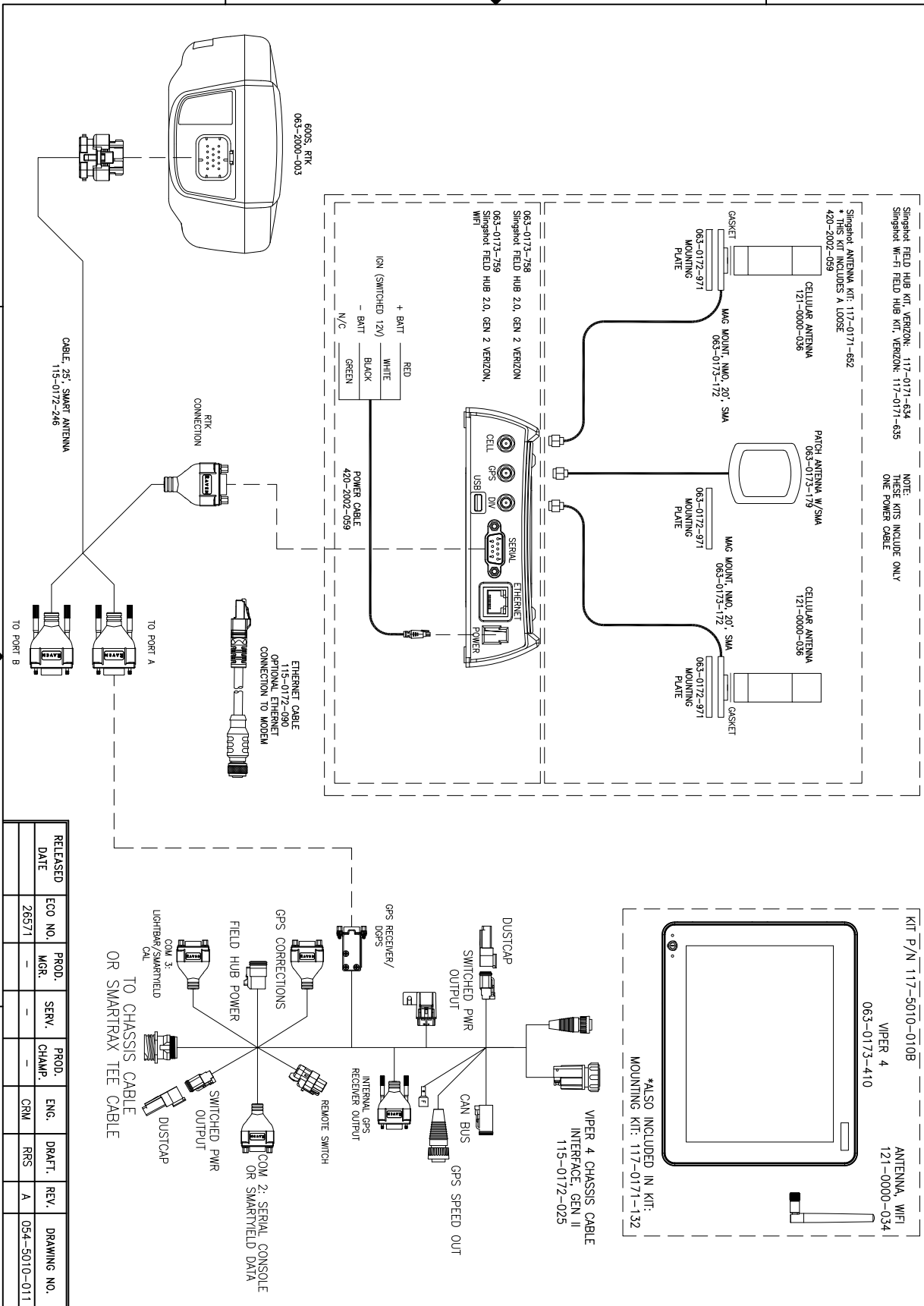
NOTE:
THESE KITS INCLUDE ONLY
ONE POWER CABLE



RELEASED DATE	ECO NO.	PROD. MGR.	SERV.	PROD. CHAMP.	ENG. CRM	DRAFT. RRS	REV. A	DRAWING NO.
	26571							054-3600-016

FIGURE 3. Viper 4 with 600S GPS and Slingshot 2.0

VIPER 4 WITH 600S GPS AND SLINGSHOT 2.0



RELEASED DATE	ECO NO.	PROD. MGR.	SERV.	PROD. CHAMP.	ENG. CRM.	DRAFT. RRS	REV. A	DRAWING NO.
	26571	-	-	-	CRM	RRS	A	054-5010-011

Viper[®] 4 Configuration

Once the 600S Antenna is installed, configure the system in the Viper 4 software to ensure proper communication between the components.

Note: Depending on the version of software being used, the screens may appear slightly different than shown.

Software Configuration

1. Select the node system configuration button from the Viper[®] 4 Start-Up Screen.
2. Select the serial device configuration button.

FIGURE 4. Device Redetect



3. Press the device redetect button. The Viper 4 will start detecting serial devices.

Note: If the 600S is detected properly, the 600S will be listed on this page. If the 600S is not listed, additional software may be required to allow the system to communicate or be configured.

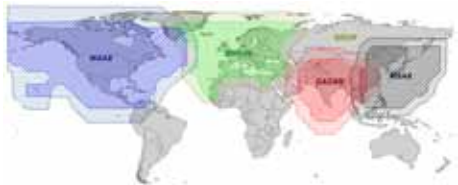

FIGURE 5. Detecting Serial Devices




4. Configure the 600S on the GPS Configuration Screens based of the type of differential or accuracy.

Note: All 600S receivers are unlocked to support GPS and GLONASS as well as the enhanced Dual Frequency GL1DE to improve pass to pass accuracy.

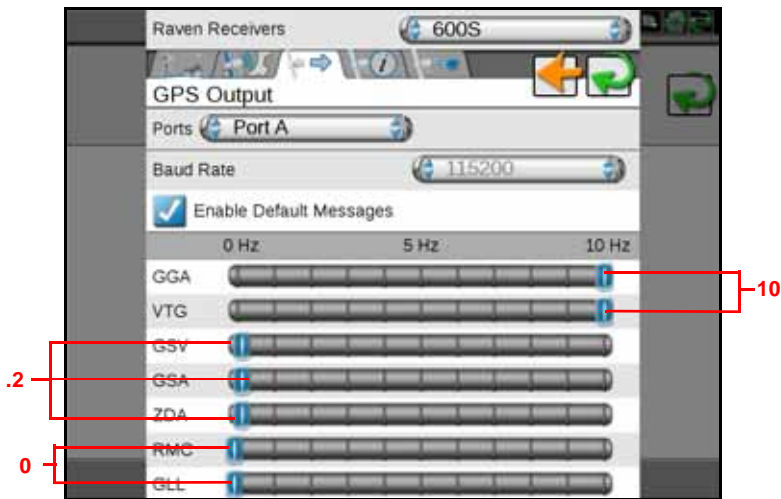
TABLE 3. 600S GPS Configuration

Correction Type	Details	Additional Information
GL1DE Only (Autonomous Mode)	Because of the limited accuracy, this mode is only recommended for customers where SBAS (WAAS, EGNOS, MSAS) is unavailable.	
SBAS (WAAS, EGNOS, MSAS)	<p>This mode is available for customers in North America and Europe. Refer to the figure below to determine SBAS availability.</p> 	<ul style="list-style-type: none"> • Leave the PRN settings to ATUO for optimal SBAS availability. • To fix the satellite PRN for SBAS correction, select a satellite from the list. 
GS Slingshot	<p>In order to support GS, the receiver model must be an unlocked model (063-2000-002, 063-2000-003) or enter an unlock authorization code. Authorization codes can be purchased at www.ravenhelp.com.</p> <p>To receive Slingshot GS corrections through the Slingshot Field Hub, contact a Raven dealer to purchase the unlock.</p>	<p>Select the accuracy level to begin field operations. Note that smaller accuracy levels will result in longer convergence wait times at receiver startup before the GPS status indicators reach a green state.</p> <ul style="list-style-type: none"> • Receiver convergence times depend on satellite availability (clear view of the sky) and atmospheric disturbance levels. • Slingshot GS absolute horizontal position accuracy is typically 6" (15 cm) when fully converged. <p>Note: Leave the accuracy level at maximum for quicker first time convergence.</p>

Correction Type	Details	Additional Information
GS Satellite	<p>To support GS, the receiver must be a GS or RTK unlocked model (063-2000-002, 063-2000-003) or enter an unlock authorization code.</p> <p>To receive satellite GS correction, purchase a satellite correction plan at http://ravenslingshot.com/store.</p>	<p>Select the desired accuracy to begin field operations. Note that smaller accuracy levels will result in longer convergence wait times at receiver startup before the GPS status indicators reach a green state.</p> <ul style="list-style-type: none"> Receiver convergence times depend on satellite availability (clear view of the sky) and atmospheric disturbance levels. Satellite GS absolute horizontal position accuracy is less than 3" (7 cm) when fully converged on a moving vehicle. Satellite GS can reach absolute horizontal position accuracy of 1.5" (3.8 cm) when stationary and fully converged. <p>Note: Leave the accuracy level at maximum for quicker first time convergence.</p>
RTK	<p>To support RTK, the receiver must be an RTK unlocked model (063-2000-003) or enter an unlock authorization code.</p>	<p>Leave the default settings shows in the image below when using a Slingshot Field Hub for RTK corrections.</p> 

5. Verify Port A Baud Rate is 115200.

FIGURE 6. Port A Configuration



Note: A Baud Rate of 115200 for Port A indicates that the receiver is configured correctly.

Note: Port B may be used to output NMEA information to the auxiliary components at a user selectable Baud Rate.

Troubleshooting

GPS Status

The GPS information page provides information on receiver hardware, software as diagnostic information on GPS position and correction data quality.

Note: Available on Viper 4 Version 2.1.8 and higher.

FIGURE 1. GPS Details Screen



The screenshot shows a mobile application interface for a Raven Receiver. At the top, it says 'Raven Receivers' and '600S'. Below that is a 'GPS Information' section with a list of fields and their values. The interface includes navigation icons at the top and bottom.

GPS Information	
Model	D2LRPGTT0A
Serial Number	0F4E4520464
Firmware Version	OEM060610RND000
PAC code	QT173.9500.0000
Latitude	N43.550912°
Longitude	W96.724844°
Elevation	3484.37 ft
Satellites	18
Diff ID	0
Diff Age	0 seconds
HDOP	0.7
GGA Quality	2
UTC Time	15:22:26
UTC Date	Mon Sep 14 2015

LED Status Indicator

The 600S Receiver has LED status indicators that provide status information on GPS signal, and receiver power. The table below describes how to troubleshoot using the LED status indicators.

TABLE 1. Status LEDs

LED Color	State	Description
Green	Position Valid	Indicates a valid position solution is available.
Yellow	Error	Receiver is in the error state and tracking is disabled. Possible causes include: <ul style="list-style-type: none"> • A fatal error • An unusual receiver status indicator, setup to act like a fatal error. Note: Error status remains until the cause of the error is corrected and the receiver is reset.
Red	Power	The unit is receiving power.

Replacement Parts

The table below lists the replacement parts along with part numbers.

TABLE 2. Replacement Parts

Replacement Parts	Part Number
Mounting Plate	063-2000-004
Standard Cable	115-0172-246
Phoenix Adapter Cable to 600S	115-0172-303
Miller Adapter Cable and 600S to Case Harness Cable	115-0172-285
Case 30 Series Cable	115-0172-288
600S to Case Harness Cable	115-0172-288
600S Base Model	063-2000-001
600S GS Model	063-2000-002
600S RTK Model	063-2000-003