

STRATUS

STRATUS 1S/2S PORTABLE RECEIVER

PILOT'S GUIDE



APPAREO

sporty's®

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To view the current Pilot's Guide, go to www.appareo.com/stratus.

QUICK START INSTRUCTIONS

1. Charge the Stratus portable receiver's battery to 100% using the wall charger.
2. Place mount in aircraft.
3. Place unpowered receiver in mount.
4. Power on receiver by pressing the power button.
5. Connect your iPhone®, iPad®, or iPod touch® to the Stratus Wi-Fi network from the iOS device's **Settings** menu.
6. Open ForeFlight Mobile and confirm connection to receiver.

NOTE: Because ADS-B signals are broadcast by ground towers, the receiver will not receive weather and traffic information while it is on the ground.

SHIPPING CONTENTS

1. Stratus receiver
2. Window mount
3. Wall charger and charging cable
4. Stratus 1S/2S Pilot's Guide
5. Carrying case

ABOUT STRATUS 1S/2S

Stratus 1S and 2S are battery-operated portable receivers that work in conjunction with the ForeFlight Mobile app. They provide pilots with subscription-free in-flight weather and traffic and are a source of accurate Wide Area Augmentation System (WAAS) GPS position. They receive Automatic Dependent Surveillance-Broadcast (ADS-B) weather information (FIS-B), traffic information (TIS-B), and other related data and broadcast it to ForeFlight Mobile via a Wi-Fi network.

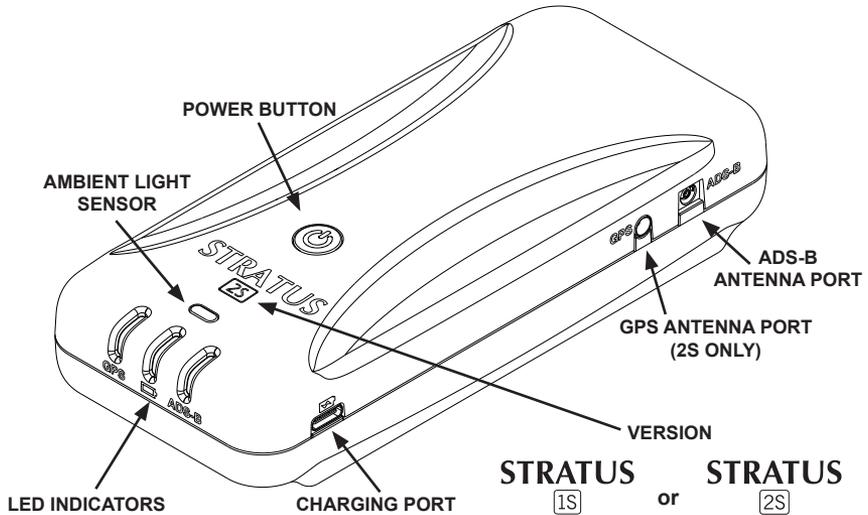
Stratus 2S is also an attitude heading reference system (AHRS), flight data recorder, and pressure altitude sensor. See pages 17 and 18 for more information about these features.

These receivers are classified as Personal Electronic Devices (PEDs) and complement the instrument panel in your aircraft. If there is a discrepancy between a receiver and the instrument panel, use the readings on your instrument panel.

ABOUT FOREFLIGHT

Stratus receivers work exclusively with the ForeFlight Mobile app to display the information collected by the receivers. For more information about any of the features available through ForeFlight Mobile, refer to the ForeFlight Mobile Pilot's Guide, which is available within the app or at the ForeFlight Mobile website.

STRATUS INTERFACE



STRATUS 1S AND 2S FEATURES

Feature	1S	2S
AHRS		X
Pressure Altitude Sensor		X
978 MHz weather and traffic	X	X
1090 MHz traffic		X
Flight data recording		X
WAAS GPS	X	X
Remote GPS antenna (optional)		X
Remote ADS-B antenna (optional)	X	X

PRODUCT REGISTRATION

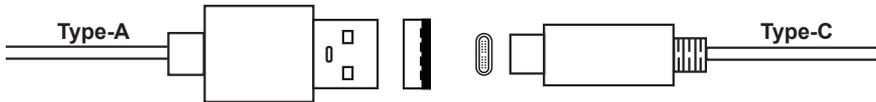
Your receiver is automatically registered with the retailer at the time of purchase—you do not need to perform additional steps to activate the warranty. The Stratus Portable Receiver Limited Warranty is valid one year after the device is shipped from the retailer and is non-transferable.

COMPATIBLE ACCESSORIES

Visit www.sportys.com/stratus or www.appareo.com/stratus for a list of compatible Stratus portable receiver accessories, including mounts, remote antennas, and chargers.

CHARGING THE BATTERY

The receiver comes with a Type-A to Type-C USB charging cable.



Fully charge the receiver's battery prior to first use. To charge the battery:

1. Insert the charging cord's Type-A USB plug into the wall charger's port.
2. Plug the Type-C USB plug into the receiver's charging port. There is no designated top or bottom and can be plugged in with either side facing up.
3. Plug the wall charger into an electric wall outlet. When connected to an external power source, the power LED will pulse. Refer to the LED Indicator table on page 14 to determine when the battery is fully charged.

NOTE: You may check the battery's current charge level from the Stratus Status page in ForeFlight. See page 19 for more information.

WARNING: Use of non-approved battery chargers may result in decreased battery performance, permanent damage to the USB port, or inoperability of the receiver, and voids the warranty. The receiver requires a 2.0 amp charger. Most computer ports do not supply 2.0 amps.

USING BATTERY POWER

If the receiver is not connected to an external power adapter, such as a wall charger or vehicle power adapter, it will automatically draw power from its internal battery.

STRATUS REPLAY

To extend your iPad battery life, you may allow the iPad to sleep or switch to an app other than ForeFlight Mobile. Once you return to ForeFlight Mobile, the receiver will automatically send any missed ADS-B weather information to the app.

THERMAL SHUTDOWN

Do not operate the receiver in environments where temperatures exceed 35°C (95°F). The receiver is equipped with a thermal sensor that will alter the function of the unit at high temperatures, as shown in the table below.

Temperature	Not plugged in	Plugged in
above 45°C (113°F)	functional	functional, but will not charge
above 60°C (140°F)	powers off	functional, but will not charge
67°C (152°F)	powers off	powers off

BATTERY CARE

The receiver can run off of battery power for about 8 hours when it is new. Use the following guidelines for maximum battery performance.

- Do not store the receiver in environments where temperatures exceed 45°C (113°F) or are lower than -20°C (-4°F).
- Do not store the receiver for long periods of time without charging. This can permanently damage the overall battery capacity.
- The receiver contains a fan inside the battery compartment that will turn on if the battery reaches a high temperature. The fan draws ambient air in through vents on the front of the device and exhausts warm air through vents on the back. If dash mounted, place the front of the receiver as close to the pilot as possible so that it can draw air from the cabin.
- The receiver contains a lithium battery. Do not disassemble the device. Do not incinerate or puncture the device or the battery.
- Ensure that disposal of the receiver is in accordance with local requirements for the recycling of electronic appliances and batteries.
- Check with current Federal Aviation Administration (FAA) rules before carrying the device on checked luggage.

It is normal for a lithium battery to lose capacity after many charge/discharge cycles or if it is subjected to high temperatures. A battery replacement kit for Stratus 2S can be purchased from Appareo or Sporty's.

PLACING RECEIVER IN AIRCRAFT

The snap-in window mount secures the receiver to its mounting location during flight. **Stratus 2S should not be powered on until it has been mounted so that it can calibrate correctly.**

To mount the receiver in the aircraft:

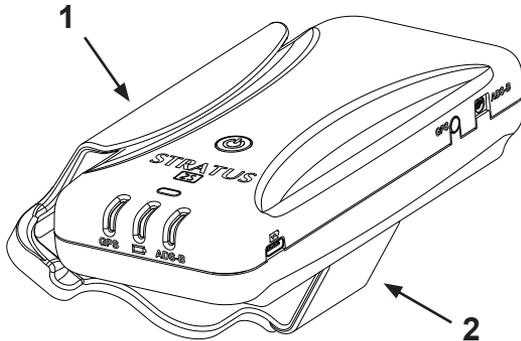
1. Position the mount in the desired location inside of the aircraft.
2. Lay the receiver in the snap-in mount so that it is leaning against the longer arm of the mount's cradle. The LEDs and Stratus logo should face the back of the aircraft. If the receiver is facing the wrong direction, AHRS data (2S only) will be incorrect and the chance of overheating will be significantly increased.

NOTE: The arrow on the back of the receiver should point in the direction of flight.

3. Press on the top of the receiver until the device snaps into place in the cradle, as shown in the figure on the following page.

NOTE: The window mount provides better reception and better temperature control than a dash mount. However, an optional dash mount that allows for mounting the receiver on the glare shield is available from your Stratus retailer.





Inserting receiver into window mount

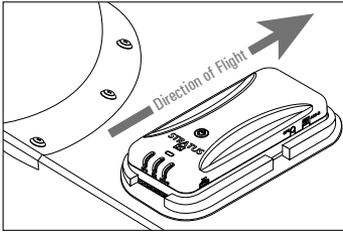
To remove the receiver from the mount:

1. **Disconnect all cables from the receiver.** Improper disconnection of cables from the receiver can damage connectors and/or ports.
2. Gently bend the shorter arm of the mount's cradle away from the receiver.
3. Remove the receiver from the snap-in mount.

Do not carry or handle the receiver by its cables. Store the receiver in its carrying case to protect it when it is not in use.

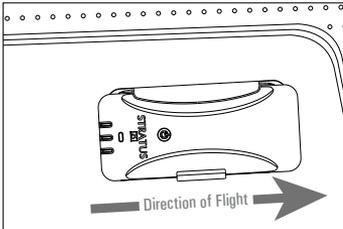
MOUNTING LOCATIONS

GOOD



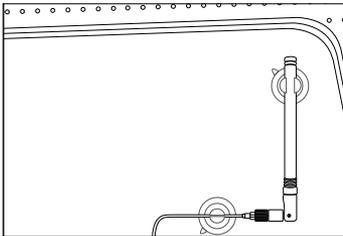
Dash mounted*

BETTER



Window mounted

BEST



Connected to a
remote ADS-B antenna*

*Available from your Stratus retailer

POWERING RECEIVER ON OR OFF

After mounting, press the power button to power on the receiver. All LED indicators will briefly illuminate red and then green as the receiver powers on and auto-calibrates. If Stratus 2S is moved after being powered on, it must be re-calibrated in ForeFlight Mobile.

POWER OPTION SETTINGS

You can select how the receiver is powered on: only when the power button is pushed, or automatically whenever the device receives power. By default, the receiver will power on only when the power button is pushed, but automatic power-on may be enabled by enabling the “Turn on When Powered” switch in the ForeFlight Mobile Stratus Status page. For more information about the Stratus Status page, see page 19.

NOTE: If the receiver is set to automatically power on and external power is removed, it will power off within two minutes if the aircraft is traveling under 5 knots. If the aircraft is traveling faster than 5 knots, the receiver will not power off and will draw from the battery power. To override the automatic power-off, press the power button after removing power.

ABOUT REMOTE ANTENNAS

The receiver contains internal ADS-B and GPS antennas; however, remote ADS-B and GPS antennas are also available from your Stratus retailer. These antennas may improve the receiver's reception quality and provide more mounting options for the receiver. Remote GPS antennas are available for Stratus 2S only.

PLACING REMOTE ANTENNAS IN AIRCRAFT

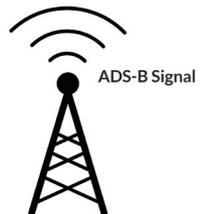
Place the remote GPS antenna in a location in your aircraft that provides an unobstructed view of the sky (GPS satellites) (2S only).



Place the remote ADS-B antenna in a location in your aircraft that provides an unobstructed view of the ground (ADS-B towers).

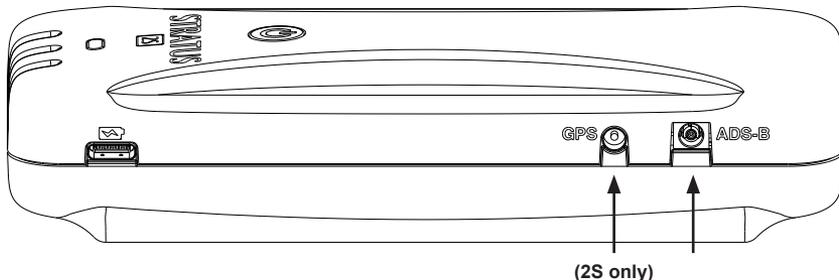
If using remote antennas, the receiver itself can be placed in any part of the aircraft.

When mounting a remote antenna, ensure the connecting cable is long enough to route to the receiver's mounting location without straining the cable or connector.



CONNECTING A REMOTE ANTENNA

The ports labeled “GPS” and “ADS-B” on the side of the receiver are for connecting remote antennas. To connect the receiver to a remote antenna, insert the remote antenna cable connector into the respective receiver port and use the suction cups or magnet included with the remote antenna to place the antenna in its mounting location. Remote GPS antennas are available for Stratus 2S only.



WARNING: Ensure you are connecting the antenna to the correct port. Inserting the antenna into an incorrect port may result in permanent damage to the port or the antenna.

WARNING: Avoid pinching or bending the external GPS cable, especially near the antenna. This could damage the cable and cause interference between the antenna and other on-board GPS receivers. The cable's minimum bend radius is 1 inch.

LED INDICATOR STATUS

Label	Color	Condition Indicated
GPS signal	Green	3-D lock
	Yellow	2-D lock
	Yellow (flashing)	No lock, searching for signal
	Off	Receiver is powered off
Power (battery symbol)	Green (pulsing)	Battery is at 100% charge
	Green (solid)	Battery is at 20% to 99% charge
	Yellow (pulsing)	Battery is charging
	Yellow (solid)	Battery is at 5% to 19% charge
	Red (solid)	No external power is being received, battery is at 1% to 4% charge
	Red (flashing)	Connected to an incompatible charger, or charger is unable to provide sufficient power
	Red (flashing for five seconds)	Receiver does not have sufficient battery power to power on or stay on
	Off	No external power is being received, device is powered off

Label	Color	Condition Indicated
ADS-B signal	Green	ADS-B FIS-B signal has been received from multiple towers in the past three seconds
	Yellow	ADS-B FIS-B signal has been received from one tower in the past three seconds
	Off	ADS-B FIS-B signal has not been received in the past three seconds
All indicators	Briefly red and then green	Receiver is powering on and calibrating
	Red (flashing)	Built-in-Test failure. Contact support for assistance
	Yellow (flashing)	Installing firmware update
	Yellow (solid)	Applying firmware update
	Green for two seconds	Firmware update complete
	Off for five seconds, then flashing green	Power button is depressed. After 30 seconds, factory reset process will begin.
	Green to yellow to green	Factory reset process is complete

CONNECTING TO FOREFLIGHT MOBILE

Your iOS device must be connected to the Stratus Wi-Fi network (not Bluetooth) for the receiver to communicate with ForeFlight Mobile. Multiple iOS devices in the cockpit may be connected to the receiver simultaneously.

NOTE: The Stratus Wi-Fi network provides a wireless connection between the receiver and ForeFlight Mobile. It does not provide an internet connection.

1. Tap the **Settings** icon on your iOS device's home screen.
2. Tap **Wi-Fi**.
3. Ensure that Wi-Fi is enabled.

Tap the Stratus wireless network, displayed under "Choose a Network..." to connect. Your SSID (network name) is on the label on the back of your receiver.

SSID: [Your Wi-Fi network name here]

PN: 153510-000008

Contains FCC ID: YOPGS2100MIP

Once your iOS device is connected to the Stratus wireless network, a checkmark will appear next to the network name.

4. Confirm that the receiver is connected in the Stratus Status page of ForeFlight Mobile. See the Stratus Status Page section on page 19 for more information on this feature.

NOTE: Receiver Wi-Fi network security can be configured in ForeFlight Mobile.

ABOUT AHRS

ForeFlight Mobile users can use Stratus 2S for backup AHRS (attitude, heading, and reference system) to enhance situational awareness. For the most accurate AHRS information, ensure that the receiver is mounted parallel with the centerline of the aircraft running front to back, and the logo and LEDs on the device should face opposite of the direction of flight. Refer to the graphic on the bottom of the receiver for the correct mounting alignment with the aircraft.

NOTE: AHRS and Synthetic Vision data provided by the receiver and ForeFlight Mobile should be used for supplemental purposes only.

CALIBRATION

Stratus 2S is automatically calibrated to the position in which it is mounted a few seconds after being powered on. Do not power on Stratus 2S until it has been mounted.

If Stratus 2S is moved after being powered on, it can also be re-calibrated to straight and level in ForeFlight Mobile. If your aircraft isn't straight and level, the alignment can be manually adjusted in the app.

ABOUT FLIGHT DATA RECORDING

Stratus 2S has a flight data recording feature that will record position, speed, attitude, and barometric altitude data during each flight. Approximately 20 hours of data can be stored in Stratus 2S's built-in memory. After your flight, you can export your Track Log data in ForeFlight by tapping **Track Logs** in the "More" view, and then tapping the cloud icon (the iOS device must be connected to the internet). Flights can be displayed in a supported app or shared on many social media platforms. The flight data recorder is enabled by default.

PRESSURE ALTITUDE SENSOR

Stratus 2S is equipped with a pressure altitude sensor that sends uncorrected barometric pressure information to ForeFlight Mobile. This information is viewable while using the app and is also recorded in the flight data log.

SYNTHETIC VISION

Stratus 2S supplies attitude information to ForeFlight Mobile's Synthetic Vision, which allows you to view a 3-D picture of terrain and obstacles in the area in which you are flying. Synthetic Vision can be enabled in ForeFlight Mobile.

STRATUS STATUS PAGE

Once the receiver is connected to ForeFlight Mobile, you can view information about your device and adjust settings via the Stratus Status page in the app. To access the Stratus Status page in ForeFlight Mobile, tap **Devices** while in the “More” tab. Then tap the **Stratus Connected** box.

The Stratus Status page displays general information about the receiver, such as its current battery charge, serial number, and firmware version. The Stratus Status page in ForeFlight Mobile also displays the number of ADS-B towers the receiver is receiving data from, and allows you to adjust the LED brightness and turn on power saving mode.

LED AUTO-DIMMING

The receiver contains an ambient light sensor that will brighten or dim the LEDs in response to the ambient light level. You can also manually change the LED brightness settings using the LED Brightness slider on the ForeFlight Mobile Stratus Status page.

ABOUT ADS-B WEATHER

The receiver receives ADS-B weather data and relays this information to ForeFlight Mobile. The table below lists the weather information that is available from ADS-B broadcasts. See the FAA's Aeronautical Information Manual, tables 7-1-1 and 7-1-2 for more information.

Product	Range	Broadcast intervals
National Radar Update (CONUS)	Contiguous US	15 minutes
Local Radar Update	250 NM	2.5 minutes (updated every 5 minutes)
AIRMETs	100 NM airport surface 500 NM en route/terminal	5 minutes
SIGMETs and Convective SIGMETs	100 NM airport surface 500 NM en route/terminal	5 minutes
METARs	100 NM airport surface 500 NM en route/terminal	5 minutes
NOTAM(D) and FDC NOTAM (including TFR)	100 NM	10 minutes
PIREPs	500 NM en route/terminal	10 minutes
Special Use Airspace	500 NM en route/terminal	10 minutes
TAF	100 NM airport surface 500 NM en route/terminal	10 minutes
Wind/temperature aloft	1000 NM	10 minutes

ABOUT ADS-B TRAFFIC

The receiver receives 978 MHz and 1090 MHz (2S only) traffic information from ADS-B ground towers and ADS-B transmitter-equipped (ADS-B Out) aircraft and relays it to ForeFlight Mobile.

If air traffic data is detected by the receiver, it will display in ForeFlight Mobile relative to your aircraft.

Air-to-Air Traffic

Be aware that the receiver will only receive air-to-air broadcasts from other aircraft if they are ADS-B Out equipped and within range of the receiver. Air traffic that is not equipped with a UAT ADS-B Out or Mode S Extended Squitter transmitter will not be detected by the receiver air-to-air.

Rebroadcast Traffic

Using its network of ADS-B ground stations, the FAA can rebroadcast a custom traffic report to ADS-B Out equipped aircraft that are within a 15 nautical mile radius and within 3500 feet in altitude of the ADS-B Out aircraft. If your aircraft is not ADS-B Out equipped, it will not receive rebroadcast traffic unless it is within range of an ADS-B Out equipped aircraft that triggers it. If your aircraft is ADS-B Out equipped but is not in contact with an ADS-B ground station, it will not receive rebroadcast traffic.

The FAA can rebroadcast traffic information about aircraft equipped with the following transponder types: Mode C, Mode S, Mode ES, and UAT. Mode A transponders and primary radar targets detected by the FAA are not included in rebroadcasted traffic reports.

Since not all aircraft are ADS-B Out equipped and not all traffic is rebroadcast, the use of the receiver does not eliminate the need for “see-and-avoid” procedures.

Stratus 1S and 2S are not active traffic interrogation systems or ADS-B Out devices.

NOTE: The receiver is not likely to receive weather or rebroadcast traffic information on the ground because ADS-B information is broadcast by ground towers. The altitude at which the receiver begins to receive weather and rebroadcast traffic information will vary depending on the distance to nearby towers and terrain and other obstacles that may be between the receiver and a tower.

For more information and graphics about how ADS-B traffic works, refer to ADS-B Traffic 101 at ipadpilotnews.com/traffic.

UPDATING FIRMWARE

Occasionally, receiver firmware updates will be released. These updates may activate new capabilities or address known issues. If a firmware update is available, it will be sent to your iOS device as an update to ForeFlight Mobile in the Apple App Store. You may be notified of an update to ForeFlight Mobile via an update badge, push notification, or banner, depending on your iOS device's notification settings.

NOTE: Not all ForeFlight Mobile updates will contain firmware updates for the receiver.

Once you have updated ForeFlight Mobile, you can apply the receiver firmware update, if one is available, from the Stratus Status page. The receiver must be powered on and the iOS device must be connected to the Stratus Wi-Fi network. If a firmware update is available, the firmware version on the Stratus Status page will be followed by the text "Tap to Update."

NOTE: Do not apply firmware updates while in flight.

To apply the update, tap the firmware version number in the Stratus Status page and follow the on-screen instructions. It may take several minutes to update the receiver's firmware. Do not power off your receiver or iOS device during a firmware update or close ForeFlight Mobile. You may need to reconnect to ForeFlight Mobile after your receiver's firmware has been updated.

WARNINGS

Data

- Stratus portable receivers are ADS-B In only products and do not satisfy the FAA's 2020 ADS-B Out requirement.
- Use of personal electronic devices while in flight may be hazardous. Use of Stratus portable receivers in an operating aircraft is subject to approval by the Pilot in Command.
- Position information provided by Stratus portable receivers should be used for situational awareness only and should not be used as your primary navigation source.
- AHRS and Synthetic Vision data provided by Stratus portable receivers and ForeFlight should be used for supplemental purposes only.

Weather

- ADS-B weather information is provided within the United States only.
- Weather information provided by Stratus portable receivers is delayed and may not always be available. Do not rely solely on the information provided by the receiver to make tactical decisions.

Traffic

- Stratus portable receivers do not replace the need for collision avoidance systems or see-and-avoid procedures. Most aircraft are not currently ADS-B Out equipped and therefore not detectable by Stratus portable receivers.

FCC DECLARATION

This device complies with Part 15 of the FCC limits for Class B digital devices. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Furthermore, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference, the user is encouraged to try to correct the interference by relocating the equipment or connecting the equipment to a different circuit than the affected equipment. Consult an authorized dealer or other qualified avionics technician for additional help if these remedies do not correct the problem.

Operation of this device is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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RESETTING TO FACTORY SETTINGS

To return your receiver to its default factory settings, press and hold the power button for 30 seconds while the device is on. Once the factory reset is complete, all of the LED indicators will cycle from green to yellow to green. The factory reset will change the LED dimming and power mode settings back to default and auto-calibrate the receiver.

SERVICING

Stratus portable receivers are not field-serviceable. If you believe your receiver requires repair or maintenance, please contact the retailer you purchased your receiver from for further instruction. Contact information for Stratus portable receiver retailers may be found on the back cover of this Pilot's Guide.

Repairs made outside of a Stratus-approved repair center could void the warranty and may result in further damage to the device.

WARRANTY

The Stratus Limited Warranty is valid one year after your receiver is shipped from the retailer. To view the full warranty, visit www.appareo.com/support.

SUPPORT

For product support, contact your original retailer:

Sporty's

513-735-9000

stratus@sportys.com

www.sportys.com/stratus

Appareo

support@appareo.com

www.appareo.com/stratus

For questions about ForeFlight:

ForeFlight

team@foreflight.com

www.foreflight.com/stratus

FAQs

Answers to your frequently asked questions and a map of current national ADS-B coverage may be found on any of our websites.

This system incorporates elements of the UBR technology developed by the Mitre Corporation on behalf of the U.S. Government.

MITRE
TECHNOLOGY APPLIED

