www.garmin.com

Follow the leader.

**Garmin International, Inc.**
1200 East 151st Street, Olathe, KS 66062
p: 913.397.8200 f: 913.397.8282

Garmin (Europe) Ltd., Liberty House, Hounsdown Business Park, Southampton, Hampshire, SO40 9RB, U.K.
p: 44.1794.519944 f: 44.1794.519222

Garmin Singapore Pte. Ltd.,46 East Coast Road #05-06, Singapore 428766
p: 65.63480378 f:65.63480278 e: avionics.asia@garmin.com



0112 M02-10204-00

Helicopter Solutions

Garmin technology brings enhanced safety and utility to real-world helicopter operations.

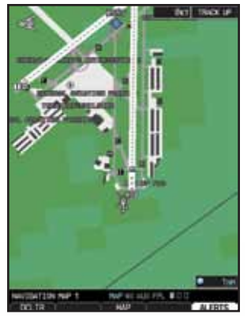
## [Visualize better situational awareness with these Garmin helicopter upgrades.]

The versatility that helicopters bring to the world of aviation is reflected in the wide range of missions they fly: Emergency medical services, law enforcement, offshore logistics, search and rescue, aerial touring, heavy-lift, executive transport, pilot training, and many more. Each has its own operational challenges. And for some, these challenges have grown – as busier airspace and ever-more-demanding flight environments have increased the focus on safety, industry-wide. An FAA task force identified three primary areas where operational risks for helicopters need special attention: 1) inadvertent flight into instrument meteorological (IMC) conditions, 2) night operations, and 3) controlled flight into terrain (CFIT). A number of ongoing studies have reinforced these findings. And in response, many operators are now asking for technologies that can proactively (and affordably) help address these safety issues.

To that end, Garmin is focusing our decades of experience in aviation safety technology on the specialized needs of today's helicopter community. And we're proud to offer a robust array of systems and solutions designed specifically for helicopters – many of which you'll find featured on these pages. Whether it's high-resolution terrain/obstacle graphics with HTAWS alerting and voice callouts of altitude when descending below 500 feet, or XM WX™ Satelite Weather with NEXRAD imagery, or HSVT™ synthetic vision technology that renders terrain-alerting data into a realistic 3-D "virtual reality" landscape on the primary flight display – whatever it takes, just know that Garmin is serious about helicopter safety. To find out more, see your authorized Garmin avionics center. Or visit us on the web at: www.garmin.com

## Garmin G500H flight display.

Engineered for safety and reliability in today's helicopter environment, Garmin's G500H "glass cockpit" suite provides an integrated flight solution to significantly enhance situational awareness. Proven AHRS attitude/heading reference delivers high-precision spatial sensing for the G500H digital instrumentation – replacing old-style gyros. And dual 6.5-inch LCD screens, mounted side-by-side in a single bezel, put Primary Flight Display (PFD) and Multi-Function Display (MFD) capabilities right in front of the pilot for easy scanning and interpretation. The PFD screen on the right side shows attitude, airspeed, climb rate, altitude and course/heading information – while the left side MFD provides detailed moving-map graphics depicting the helicopter's current position in relation to ground features, chart data, navaids, flight plan routings, and more. Optional Garmin HSVT™ synthetic vision technology adds a 3-D virtual perspective view of terrain, traffic, airports and obstacles to the pilot's PFD. In addition, geo-referenced SafeTaxi® diagrams for over 1,000 U.S. airports come preloaded on the system. So does a trial version of Garmin FliteCharts®. And there's also a video input option that lets the MFD function as a FLIR live-cam monitor or other video source.*



* Camera not included.


Since many helicopters are flown from the right seat, while others are flown from the left, Garmin's G500H is available in your choice of right- or left-hand display configurations – with the PFD positioned at the side of the bezel that offers easier viewing from the pilot position.

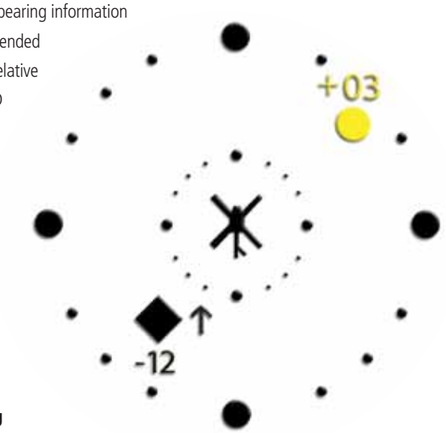
Compared to the 3-color shading graphics used for fixed-wing Terrain Proximity displays, the crisp 5-color shading scheme featured on Garmin's helicopter systems yields additional elevation reference data for pilots who routinely fly lower and closer to terra firma.

## Garmin HSVT™ synthetic vision technology.

Specially adapted to the needs of helicopter operators, Garmin's HSVT synthetic vision technology brings a unique graphical perspective to "glass cockpit" instrumentation. Available on the G500H as an option, HSVT can make a world of difference when visibility deteriorates. Using sophisticated computer modeling to recreate a virtual topographic landscape from the system's terrain-alerting database, HSVT gives helicopter pilots a clear depiction of ground and water features, airports, obstacles, traffic and more – all shown in 3-D perspective on the primary flight display. Garmin's HSVT graphics look so real, it's almost like having a clear-day "out-the-window" view of your flight situation – even in the darkest nighttime VFR or other low-visibility conditions. Although synthetic vision is not intended to replace traditional attitude and directional cues as one's primary flight reference, it clearly does augment the pilot's view of this data, by giving it a realistic visual frame of reference. For example, when flying in areas where rising terrain may pose a hazard, Garmin HSVT uses its database to "paint" the landscape with amber or red overlays showing where potential CFIT risks exist. As with Garmin's HTAWS alerting, this HSVT "paint" feature offers pilot-selectable Reduced Protection to accommodate low-level operations without excessive terrain alerts. Towers or obstacles that may encroach upon one's flight path are also color-highlighted with hazard-appropriate symbology. So, when it comes to maintaining situational awareness, it's easy to see that Garmin HSVT is great technology to have.

## Garmin traffic systems.

For help in "seeing and avoiding" other aircraft in busy airspace, nothing beats having an extra set of electronic eyes in the cockpit. That's why smart helicopter pilots are looking to Garmin's GTS™ Series of traffic surveillance systems. Featuring exclusive Garmin CLEAR CAS™ (Correlated Location Enhanced ADS-B Receiver Collision Avoidance System) technology, these affordable TAS and TCAS I systems combine both active and passive surveillance, including 1090 MHz ADS-B "In", to correlate target data and pinpoint traffic threats. Three distinct product configurations are available: GTS 800, GTS 820 and GTS 850. The low-power system offers up to 12nm of interrogation range while the high-power and TCAS I system offers up to 40nm of interrogation range. All three systems use surveillance data from nearby transponder-equipped aircraft to generate expanded audio alerts in an ATC-like spoken format: "Traffic. 10 O'Clock. High (or Low or Same Altitude). Two miles." If bearing information is not available, "Traffic, No Bearing" is spoken. Passive surveillance of aircraft equipped with ADS-B "extended squitter" capability enables the system to more accurately derive the target aircraft's range, bearing and relative altitude. With traffic data graphically displayed on the GNS navigator or G500H MFD (and also on the PFD with optional HSVT enabled), pilots can track specific flight trajectories of other aircraft in their vicinity – gaining a much clearer picture of their overall flight situation. Up to 60 traffic targets can be tracked simultaneously, with up to 30 intruder threats being displayed at a time, using familiar TCAS-defined symbology. What's more, with Garmin's expanded voice alerts, pilots know instantly where to look outside for called traffic – thus saving vital time when traffic is converging quickly.




**Garmin traffic system alerting**
provides both visual and spoken audio advisories to help helicopter pilots maintain safe separation from other aircraft in busy airspace.

## Garmin HTAWS terrain alerting upgrade.

Providing visual and aural advisories to help keep pilots safely separated from hazardous terrain, this TSO-C194-approved technology is engineered specifically for helicopter flight regimes. When optionally installed in select Garmin WAAS GPS navigators, the HTAWS (Helicopter Terrain Awareness and Warning System) offers "forward looking" terrain avoidance (FLTA) capability to predict in advance where potential hazards may exist – and allow time for the pilot to take corrective action. WAAS GPS position information is compared with the navigation system's internal terrain/obstacles/airport databases to determine conflict scenarios. If one's helicopter has inadequate terrain and/or obstacle clearance ahead, based on the system's projected flight path, HTAWS caution and warning alerts are issued to the pilot. Accompanying FLTA voice alerts also indicate the relative threat level, with messages such as "Caution, Obstacle, Obstacle" or "Warning, Terrain, Terrain." In addition to terrain and obstacle alerting (with 5-color Terrain Proximity display for helicopters), Garmin's HTAWS system also features voice callouts, or VCOs, which audibly announce the helicopter's height above terrain when descending below 500 feet. VCO altitude callouts operate in all HTAWS modes, and Garmin's technology allows the pilot to select multiple callout menus, in one hundred foot intervals, descending from 500 down to 100 feet. To minimize "nuisance" alerts, Garmin HTAWS offers pilot-selectable options to: 1) suppress an active audible caution alert (while still displaying visual annunciations), or 2) use a "reduced protection" or "RP" Mode, which allows for low-level operations and off-airport landings with reduced alerting, while continuing to provide protection from terrain and obstacles. A third option inhibits HTAWS alerting altogether – but still allows voice callouts to audibly annunciate the aircraft's height above terrain when descending to 500 feet or below. Garmin developed a special helicopter obstacle database for its HTAWS option, adding over 30,000 lower-height structures to its existing software – and enabling the system to depict some 25 percent more obstacles that might pose a hazard to helicopter operations. Customers with existing Garmin GNS 430W/530W series navigators may opt to easily upgrade their units with HTAWS capability by taking it to an Authorized Garmin Service Center for an on-site upgrade.



**Garmin HTAWS terrain alerting**, designed specifically for helicopters, will be optionally available with Garmin's newest GTN Series touchscreen avionics. It's also available as an upgrade to existing GNS 430W and 530W series navigators. It uses an expanded database containing over 30,000 more structures, obstacles and oil rigs than the Garmin fixed-wing aviation versions.

## Garmin WAAS GPS navigation.

Garmin's newest GTN 650/750 Series of touchscreen avionics, as well as its legacy GNS 430W/530W units, are provisioned to enable helicopter pilots to join their fixed-wing counterparts in the world of WAAS navigation. The FAA's Wide Area Augmentation System, or WAAS, uses enhanced GPS signals to enable IFR flight and vertical glidepath approaches into non-ILS-equipped runways and heliports. A special helicopter-specific Garmin aviation database lets operators easily navigate to over 5,500 heliports, without having to create their own user waypoints at those locations. What's more, on the comm side, a helpful recall function lets pilots store multiple radio frequencies in memory for quick access during flight. This safety-enhancing feature enables pilots to easily select from often-used radio frequencies without removing their hands from the flight controls.


**With a user-friendly touchscreen interface**, Garmin's GTN™ 650/750 series of panel-mount avionics offer a true revolution in pilot efficiency and situational awareness. Page navigation is more intuitive. The TFT displays are super-sharp. And integration capability for a wide array of avionics and sensors not only streamlines tuning and mode selection – but, in effect, lets pilots utilize the GTN touchscreen as a virtual flight management system.

## Garmin Iridium-based flight data services.

In today's time-critical world, the ability to maintain connectivity on the go has become a high priority for many companies. To help helicopter operators meet this need, Garmin has developed the GSR 56, an Iridium-based satellite transceiver. Through a constellation of low-earth orbiting (LEO) satellites, this flight service, powered by the Iridium network, offers virtually seamless global coverage, enabling the Garmin Iridium transceiver to provide a wide range of 2-way communication and datalink services – including the ability to make and receive phone calls, send and receive text messages and emails, plus have access to graphical weather, METARs, TAFs, Winds Aloft, PIREPS and more, on a worldwide basis.

## XM WX™ Satellite Weather.

A great tool for helping helicopter pilots avoid inadvertent flight into adverse weather or low visibility conditions, XM WX Satellite Weather service is available with the installation of Garmin's GDL 69 datalink receiver (XM subscription required). With this option, high-resolution NEXRAD imagery, METARs, TAFs, TFRs, winds aloft, echo tops, surface precipitation, lightning strikes, storm cell data, and other weather updates for the entire U.S. can be accessed from your G500H flight display. XM's geo-synchronous satellites over the east and west coasts of the continental U.S. enable this weather coverage to be accessed from any altitude. And for added entertainment value, there's also a user interface with the GDL 69A that offers inflight access to over 170 channels of digital-quality XM Satellite Radio audio programming (additional XM service fee required).