

Helicopter Solutions

**GARMIN**



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™ Satellite 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/helicopters



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, nav aids, flight plan routings, and more. Optional Garmin HSVT™ synthetic vision technology (if installed) 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 900 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 or live-cam monitor.*



* Camera not included.



Since many helicopters are flown from the right seat, Garmin's standard G500H locates the PFD on the right side of the bezel for easier viewing from the pilot position. An optional version moves the PFD screen and controls to the left-hand side of the unit for added flexibility in cockpit configuration.

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 as an option on the G500H, HSVT can make a world of difference when visibility is less than ideal. 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 user-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.



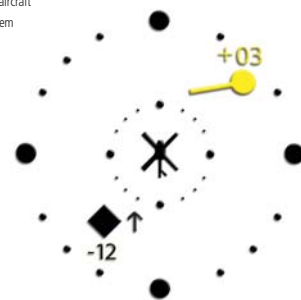
Garmin traffic systems.



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 new 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.

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 on Garmin's GNS 430W/530W series 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 GNS 430W/530W units' internal terrain/obstacles 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 callouts, 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 announce 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 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, is optionally available with Garmin's GNS 430W and 530W series navigators. It uses an expanded database containing nearly 30,000 more structures, obstacles and oil rigs than the Garmin fixed-wing aviation versions.

Garmin WAAS GPS navigation.

Garmin's popular GNS 430W/530W integrated avionics systems now 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. Both the GNS 430W and 530W feature an advanced 15-channel GPS receiver capable of five position updates per second—teamed with a 2280-channel capable VHF comm transceiver and 200-channel VOR/ILS navigation receiver with localizer and glide slope. When configured for helicopters, the GNS navigators have been upgraded with a new 5-color Terrain Proximity display to better meet the needs of low-altitude helicopter operations. Also, a special helicopter-specific Garmin aviation database now lets operators easily navigate to over 5,500 heliports, without having to create their own user waypoints at those locations.

Garmin Iridium satellite datalink.



In today's time-critical world, the ability to keep track of mobile assets and personnel 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. Among other features, it provides an affordable, worldwide position tracking solution that enables aircraft location data to be monitored via a web-based display on authorized base-ops computers (subscription required). Through a constellation of low-earth orbiting (LEO) satellites,

XM WX™ Satellite Weather.

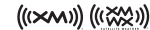
A great tool for helping helicopter pilots avoid inadvertent flight into adverse weather or low visibility conditions, XM WX Satellite Weather service is available with the installation of Garmin's GDL 69 datalink receiver (XM subscription required). With this option, high-resolution NEXRAD imagery, 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

whereas more, on the comm side, a helpful recall capability lets pilots store up to 16 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. For added distance and power output, a 16-watt comm transceiver is optionally available (in lieu of the 10-watt standard version).



the Iridium network provides seamless global coverage, enabling the Garmin Iridium transceiver to transmit your helicopter's position data from anywhere on the planet. These GPS-referenced position reports are automatically relayed at predetermined intervals, allowing you to easily monitor the location, flight track, and time/date of each transmission. Position reporting is available on G500H and additional built-in growth capabilities for the future will ultimately enable the Garmin transceiver to provide a wide range of 2-way communication and datalink services.

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).



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